Rik Kowall, Supervisor
Anthony L. Noble, Clerk
Mike Roman, Treasurer

Trustees
Scott Ruggles
Steve Anderson
Andrea C. Voorheis
Liz Fessler Smith

WHITE LAKE TOWNSHIP
7525 Highland Road • White Lake, Michigan 48383-2900 • (248) 698-3300 • www.whitelaketwp.com

March 18, 2025

Dear Board members,

I was assigned the task of selecting a company to perform the Low Voltage and Audio-Visual installation for the Civic Center Buildings. The first phase was finding a company to complete the design sketches and specifications needed to obtain bids on short notice. Tom Conway from VC3 and Teffera Kowalske from Redstone Architects both recommended MDIS (Metro Detroit Integrated Systems, LLC).

Once MDIS was selected through bid a process, they began working very closely and patiently with the Township, and our vendors for electrical wiring, security, and Information Technology for the Civic Center project. Upon completion of the drawings and specifications, I sent out bids utilizing section 4.7 (c) 7. Request for Qualification in our policy manual for the low voltage, audio-visual equipment and installation of each for both new buildings.

The committee established consists of myself, Dan Keller, and John Holland. The committee members agree that MDIS not only has the lowest bid, but the most comprehensive and accurate bid. MDIS has thus far proven to be competent and responsive to our requests. MDIS has supplied references for large projects that they have completed. In addition to MDIS being referred by VC3 and Redstone, VC3 has worked with MDIS on many projects in the past and speaks highly of their work. MDIS has also successfully completed a couple of small jobs for the Township.

As a part of their bid, MDIS will perform end to end testing, which means they test every connection to ensure everything they installed is working before we get in the building. The testing will be documented in a certification report needed for the 25-year warranty on cables and fiber optics. In addition, MDIS has agreed to a 1-year service warranty period where no labor will be charged to the Township. All equipment warranties follow the warranty of the manufacturer, which will be supplied to us upon completion of the project work.

Please see the attached spreadsheet for the breakdown of pricing information. The committee recommendation is that MDIS be awarded the low voltage and audio-visual business for the Civic Center building project in the amount of $835,289.32, upon a mutually acceptable signed agreement reviewed by the Township attorney, and receipt of performance and payment bonds.

Trish Pergament
Deputy Supervisor

John Holland
Fire Chief

Dan Keller
Police Chief

Rik Kowall, Supervisor
Anthony L. Noble, Clerk
Mike Roman, Treasurer

Trustees
Scott Ruggles
Steve Anderson
Andrea C. Voorheis
Liz Fessler Smith

WHITE LAKE TOWNSHIP

7525 Highland Road • White Lake, Michigan 48383-2900 • (248) 698-3300 • www.whitelaketwp.com

NOTES

- THIS RFP INCLUDED INSTALLATION FOR ALL LOW VOLTAGE CABLING FOR THE BUILDING AND THE AV EQUIPMENT AND INSTALLATION
- IT EQUIPMENT NETWORK SWITCHES, WIFI ACCESS POINTS, GATEWAYS, FIREWALLS, MODEMS, AND SERVERS ARE BEING HANLED BY VC3
- VC3 IS RESPONSIBLE FOR CONFIGURING THE NEW NETWORK AND WIRELESS ACCESS NETWORK FOR THE BUILDINGS.
- SECURITY HARDWARE AND INSTALLATION IS BEING HANDLED BY SUMMERS AND ASSOCIATES
- QUOTE DOES INCLUDE RACKS FOR IT SERVERS IN BOTH BUILDINGS, FAN KITS, OVERHEAD TRAYS, AND CABLE MANAGEMENT SYSTEMS WHICH MDIS WILL ORGANIZE FOR US.
- ALL INCLUSIVE QUOTE – ONLY CHANGES IN PRICE FOR THINGS WE REQUEST THAT ARE OUT OF THEIR CONTROL
- 25 YEAR WARRANTY FOR CABLES AND FIBER OPTICS
- 1 YEAR SERVICES WARRANTY FREE LABOR – CAN BUY UP TO 60 MONTHS UPON REQUEST
- EQUIPMENT WARRANTIES ARE INDIVIDUAL
- CERTIFICATION TESTING ON CABLING, DOCUMENTING RESULTS FOR COMPLIANCE TO SUBMIT FOR MFG CABLE WARRANTY AND TO ENSURE EVERYTHING IS WORKING PRIOR TO MOVING INTO THE BUILDING
- USER TRAINING SESSIONS FOR AV EQUIPMENT
- INVESTIGATE USE OF PEG FEES FOR AV EQUIPMENT IF WE PUT BOARD MEETINGS ON CABLE CHANNEL

REFERENCES

PAST PROJECTS

- CITY OF HAMTRAMCK - $287,772 – MULTI SITE CCTV, ACCESS CONTROL, INTERCOM, JAIL CELL MONITORING, CABLING PROJECTS, AND DISPATCH AV INSTALLATION. **(VC3)**
- CITY OF ECORSE - $269,014 – MULTI SITE CCTV, ACCESS CONTROL, INTERCOM, LICENSE PLATE CAPTURE CAMERAS, CAT 6 CABLING & WIFI UPGRADES, AND DISPATCH AV INSTALLATION.
- CITY OF CENTERLINE - $210,769 – LIVE BROADCASTING AND DISTRIBUTED AV SYSTEM IN COURTROOM, CITYWIDE CCTV, ACCESS CONTROL, INTERCOM, JAIL CELL MONITORING, CABLING PROJECTS, AND DISPATCH AV INSTALLATION.

CURRENT PROJECT (VC3)

- CHARTER TOWNSHIP OF REDFORD - $634,078 – NEW $25 MILLION WELLNESS AND COMMUNITY CENTER. AXIX COMMUNICATIONS SECURITY CAMERAS, ICT PROTÉGÉ ACCESS CONTROL, ALARM SYSTEMS, PANDUIT STRUCTURED CABLING, UNIFI ENTERPRISE NETWORK, HAMAN DISTRIBUTED AUDIO, SHARP NEC DISPLAY SOLUTIONS, AND QSYS CONTROL AUTOMATION SOLUTIONS.

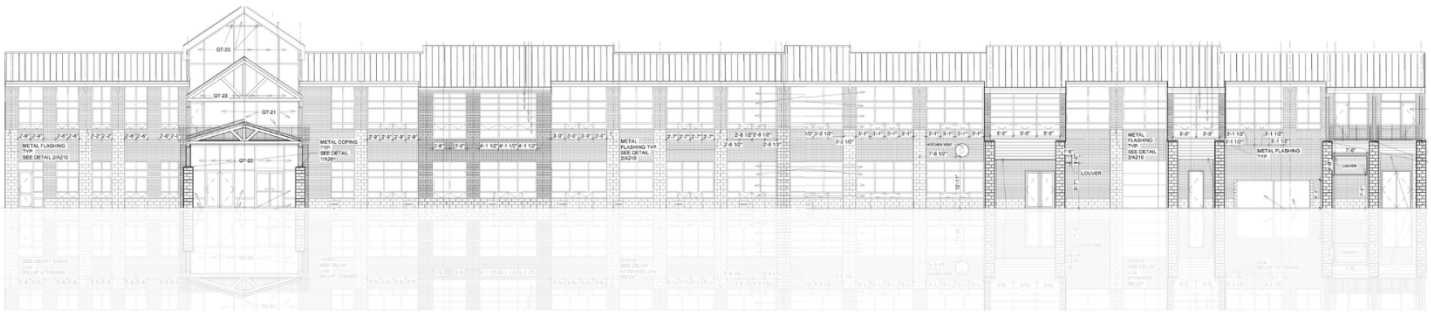
LOW VOLTAGE BID SUMMARY

	MDIS (Metro Detroit Integrated Systems, LLC)	*Challenger 2	Moter City Electric Technologies
	LOW BID	Incomplete Bid	Bid Excludes OT and Dumpsters
Public Safety Building	$407,128.24	*$472,986.30	$529,490.00
Township Building	$397,418.00	*$379,220.00	$460,640.00
	**$434,911.08	Didn't appear to quote AV options 1 & 2	**$475,496.50
Total Both Buildings	$842,039.32 - $6,750.00 = $835,289.32	n/a	$1,004,986.50
- Without AV Opts 1 & 2	$804,546.24 - $6,750.00 = $797,796.24	$852,206.30	$990,130.00
Design Fee Refund	$6,750.00		

***Submitted Incomplete Quote - No pricing breakdown as requested.**

****Includes additonal options 1 & 2 quoted for Board Room AV**

Motor City Quote does not include OT or patch cables for either building.



□ hite Lake Charter Township Low □oltage □ A□ Proposal – Township □all □ Senior Center

Re□uest For Proposal (RFP)

ATTN: Supervisor's Office - Trish Pergament
White Lake Township
7525 Highland Road
White Lake, MI 48383

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SECTION 1:

LETTER OF INTEREST

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073-1020

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383-2938

Subject: Letter of Interest for Low Voltage Installation & Audiovisual Procurement for Township Hall & Senior Center

To Whom It May Concern:

Thank you very much for the opportunity to submit Metro Detroit Integrated Systems' (MDIS) proposal for the Low Voltage Installation and Audiovisual Work for White Lake Charter Township's new Township Hall & Senior Center facility.

This letter serves as an unequivocal expression of MDIS's interest in performing the low voltage and audiovisual work outlined in Exhibits A and B of the RFP, for the Township Hall & Senior Center. We are honored for the chance to contribute to the creation of a facility that will serve as a foundation for community growth and engagement for years to come.

MDIS affirms that we have thoroughly reviewed the designs and specifications set forth in the RFP and that we understand the scope, complexity, and technical requirements of this project. MDIS is wholly confident in our ability to execute the requested services efficiently and effectively for White Lake Charter Township. MDIS is fully committed to meeting all the requirements outlined in the RFP and assures you of our competency, skills, and extensive experience in similar projects.

Furthermore, MDIS makes the following certifications:

1. All information provided in our submission is true, accurate, and complete.
2. MDIS understands and accepts that White Lake Charter Township reserves the right to select the solution that best fits its needs, which may include selecting multiple vendors, a non-lowest bidder, or no vendor at all.
3. MDIS warrants that it has no conflicts of interest that would impede White Lake Charter Township's impartial selection process.
4. MDIS will not charge White Lake Charter Township any sales tax, acknowledging the Township's tax-exempt status, and will rely on receiving a certificate of tax exemption upon award.

5. MDIS shall provide White Lake Charter Township a complete one-year warranty covering all systems, equipment, and workmanship from the date of occupancy. MDIS stands fully behind the quality of its design, equipment, installation, configuration, and training services.
6. MDIS understands that the final product and all related materials will become the sole property of White Lake Charter Township.
7. MDIS will provide the required Certificates of Insurance (COIs) in compliance with White Lake Charter Township's specifications for this project.
8. MDIS shall indemnify, defend, and hold harmless White Lake Charter Township, its officials, employees, and agents from all claims, damages, or expenses arising from MDIS's performance of work under the contract. This indemnification is primary and in addition to any required insurance coverage.
9. MDIS will secure a Performance Bond to White Lake Charter Township covering the full project value, as additional assurance for our timely and complete execution of the work.
10. MDIS certifies that it is in full compliance with the Iran Sanctions Act (Michigan Public Act 517 of 2012). We confirm that neither MDIS nor any of its parent companies, subsidiaries, or affiliates are in any way affiliated with Iran.
11. MDIS affirms that the proposed compensation outlined in our submission is sufficient for us to execute all phases of the required services.
12. MDIS confirms that our proposals will remain valid for a period of six months from the RFP submission deadline.

MDIS is ready to provide clarifications, revisions, or additional information as needed. Should you have any questions during the evaluation of our proposal, please do not hesitate to reach out, and we will happily assist you however we can.

Thank you for the privilege of submitting our proposal and for considering MDIS for this important project. We are enthusiastic about the opportunity to contribute to White Lake Charter Township's new Township Hall & Senior Center, and look forward to the prospect of working together.

Warm regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals, Metro Detroit Integrated Systems, LLC

SECTION 2:

INTRODUCTION

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383

Subject: Introduction to Metro Detroit Integrated Systems, LLC

Metro Detroit Integrated Systems (MDIS) is a **full**-service low voltage and technology systems integration firm that is headquartered in Royal Oak, Michigan. MDIS specializes in the design, prewiring, installation, configuration, training, and support of advanced, turn-key low voltage systems for municipalities and other businesses.

Founded in 2013, for over 11 years, MDIS has partnered with municipalities and businesses to deliver reliable, high-quality solutions designed to meet both current and future needs. At MDIS, we are driven by a commitment to uncompromising excellence. Our philosophy is simple: do it right the first time. We take immense pride in our meticulous installations, utilizing only high-end, proven equipment to ensure every project meets the highest standards of reliability and performance. From keeping all wiring "*sexy*" and organized, to carefully planning for long-term serviceability and scalability, at MDIS we have a culture of going the extra mile to deliver systems that stand the test of time. These principles have made MDIS a trusted partner of over 1,000 municipal and business customers, and have earned us a reputation for being a strong, dependable, and forward-thinking low-voltage firm. When you work with MDIS, you're not just getting a system for today's needs—you're aligning yourself with a partner that's ready to grow and evolve with you.

MDIS's Core Services Include:

- **Data and Fiber Optic Cabling**: Designing and installing large-scale structured cabling systems for robust and efficient network infrastructures.
- **Audiovisual Systems**: Implementing advanced audio and video solutions for conference rooms, live broadcasting, multi-room audio setups, and digital signage.
- **Automation and Control**: Providing custom automation solutions that simplify the control of complex environments.
- **Paging and Intercom Systems**: Installing reliable communication systems for seamless information dissemination.
- **Wi-Fi Networking**: Designing and deploying wireless networks for consistent, high-performance connectivity.

- **Access Control and Video Intercom Systems**: Enhancing security with advanced access control measures and intercom installations.
- **CCTV Surveillance**: Offering high-definition analog and IP camera systems with DVR/NVR recording and remote monitoring capabilities.

At MDIS, we manage all our installations in-house, maintaining a high level of control over project execution. Our team is comprised of 20 experienced professionals who approach every project with precision and dedication, whether it's data cabling, fiber optic pathways, advanced security solutions, or audiovisual systems. At MDIS, we have a strong company culture based on a belief that every detail matters, and our work reflects our passion for delivering lasting solutions that help communities and organizations thrive.

We are genuinely excited about the opportunity to bring our expertise to White Lake Charter Township's Civic Center projects. We are confident that our approach, paired with our proven track record, will help create two state-of-the-art facilities that will serve your community for many years to come.

Warm regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals
Metro Detroit Integrated Systems, LLC

SECTION 3:

WORK PROGRAM

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383

Subject: Work Program for White Lake Township Hall & Senior Center

To Whom It May Concern:

Metro Detroit Integrated Systems (MDIS) is pleased to present our comprehensive work program for the structured cabling and audiovisual package at the White Lake Township Hall & Senior Center. The following framework represents our tried-and-true approach that MDIS has successfully deployed for thousands of low voltage installations across former government and commercial projects. We have fine-tuned the categories and timelines to align specifically with the unique needs of the White Lake Township Hall and Senior Center project, to help provide a clear understanding of the timeframe, milestones, and phases you can expect as we bring your project to life.

Project Initiation (ASAP)

- **Performance Bond Conversion**: Upon notification of the award, MDIS will convert the bid bond into a performance bond.
- **Kickoff Meetings**: Conduct numerous internal and external meetings with stakeholders to align on project scope, deliverables, and expectations.
- **Sales Orders and Project Creation**: Initiate sales orders and establish project frameworks with design and coordination teams.

Planning Phase (2 Weeks)

- **Design and Coordination**: Develop connection diagrams, punch lists, rack drawings, labeling schemes, and IP schemes internally, in close collaboration with township representatives, architects, electrical contractors, and VC3.
- **Site Walkthroughs**: Conduct comprehensive walkthroughs to review existing conditions and finalize logistical planning.
- **Permitting**: Ensure all required permits are obtained before work commences.

Procurement Phase (6-8 Weeks)

- **Equipment Review and Ordering**: Verify compatibility and accuracy of all equipment, focusing on budget compliance and design specifications. Orders for

standard items will be placed within 1-2 weeks, with special order items taking up to 6-8 weeks.

- **Warehousing and Staging**: Stage equipment at MDIS's secure warehouse.

Rough-In Phase (2 Weeks)

- **Site Preparation**: Establish cabling pathways, coordinate with other trades, and ensure cable trays and equipment enclosures are securely installed.
- **Grounding and Bonding**: Install 6AWG grounding cables and jumpers to protect equipment from power fluctuations.

Pre-Wiring and Termination (4-6 Weeks)

- **Cabling Pre-Wiring**: Pull, label, and route low-voltage cables (e.g., data, control, power, bundled access control, speaker) from IDF/MDF areas to endpoints. MDIS will adhere to BICSI-compliant wiring standards and document a detailed cable ID scheme for future servicing.
- **Cable Termination**: Terminate Cat6 cabling in wall plates, keystone jacks, and patch panels. Label both ends with vinyl ID labels for easy identification and maintenance.
- **Fiber:** Fiber optic cabling will be installed, spliced, and certified for speed and reliability.

Equipment Installation (4-6 Weeks)

- **Initial Equipment Installation:** MDIS will start the process by closing up openings with equipment and wall plates. The installation process will begin with securing simpler components, such as wall-mounted speakers and wall plates, ensuring these fixtures are properly fastened and aligned.
- **Finishing Equipment Installation:** Once the job site is secure, MDIS will bring in high-value audiovisual systems, including displays, microphones, touch panels, and broadcasting equipment, for installation. Each device will be mounted, connected, and properly positioned. Rack-mounted low-voltage equipment, cable management systems, and audiovisual control devices will be installed and integrated into the system.

Configuration and Testing (2 Weeks)

- **System Configuration**: Program and configure all systems per RFP specifications, ensuring seamless integration to meet client's needs.
- **Testing**: Conduct thorough tests to verify system functionality and identify any required adjustments. MDIS will perform an in-depth test of all installed systems, to ensure they meet expected quality and functionality.

Certification, Documentation, and Handoff (2-3 Weeks)

- **Certification Testing**: Perform certification tests on cabling, documenting results for compliance to submit for manufacturer lifetime cabling warranty.
- **As-Built Documentation**: Provide comprehensive as-built drawings, IP address logs, test results, and instruction manuals.
- **User Training**: Deliver training sessions to ensure designated users are fully equipped to operate the systems.

MDIS Warranty (1 Year from Occupancy)

- **Workmanship Guarantee**: Provide a one-year warranty on all workmanship, with options for extended service agreements upon request.

We are enthusiastic about the opportunity to contribute to this project and are confident in our ability to deliver timely and quality results.

This timeline serves as a preliminary plan, providing a structured framework for how MDIS intends to execute the scope of work efficiently and effectively. While it reflects our current understanding of the project requirements, it is subject to adjustments based on construction progress, coordination with other trades, and unforeseen variables. MDIS remains committed to maintaining open communication with all stakeholders and will promptly address any necessary updates to ensure the project stays on track and aligned with White Lake Township's goals.

Should you require additional information or clarification, please do not hesitate to contact us.

Warm regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals
Metro Detroit Integrated Systems, LLC

SECTION 4:

CONSULTANT PERSONNEL

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383

Subject: Key Personnel List for Charter Township of White Lake Civic Center Projects

To Whom It May Concern:

Metro Detroit Integrated Systems (MDIS) is pleased to provide a comprehensive list of key personnel who will oversee and execute the scope of work for this project. Our team is structured to ensure a seamless blend of leadership and technical execution.

While the individuals listed below represent the managers and team leads for the project, additional tradespersons will work under their direct supervision to perform manual labor-intensive tasks, such as cabling, mounting, and equipment installation. All tradespersons are trained in-house to uphold MDIS's rigorous standards and are closely supervised to ensure the highest quality of work.

Administrative Team:

Eric William Hubers
- **Role**: President & CEO, Principal
- **Experience**: 15+ Years
- **Employment Status**: Full Time
- **Education**:
  - Oakland University
  - Media Dynamics (2009, Toronto): Comprehensive training in AV system design, integration, and installation
- **Certifications**:
  - CEDIA Level II Technology Professional
  - MECP Certified

Alexander Michael Hubers, Esq.
- **Role**: CFO & CLO, Principal
- **Experience**: 7+ Years in Accounting, Legal, and Business Strategy
- **Employment Status**: Full Time
- **Education**:
  - Doctor of Law (JD), University of Michigan Law School
  - Bachelor of Business Administration (BBA), Accounting and Finance, University of Michigan - Stephen M. Ross School of Business

Jason W. Hanse

- **Role**: Sales - Account Manager
- **Experience**: 6+ Years
- **Employment Status**: Full Time
- **Education**:
  - Bachelors in Business Management, Calvin College

Jeffrey H. Robinson

- **Role**: General Manager (Purchasing, HR, Warehouse)
- **Experience**: 10+ Years
- **Employment Status**: Full Time
- **Education**:
  - Western Michigan University

Karyl Duffy

- **Role**: Accounting (Invoicing, Accounts Receivable, & Bookkeeping)
- **Experience**: 29 Years
- **Employment Status**: Full Time
- **Education**:
  - Bachelor of Science in Business Accounting, University of Phoenix

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Operations Team:

Aaron Gates

- **Role**: Project Manager
- **Experience**: 9+ Years
- **Employment Status**: Full Time
- **Certifications**:
  - PMP Certification for Project Management
  - NetSuite Project Management Training
  - CEDIA Certified Level I
  - Panduit Certified Installer

Justin Van Hecker

- **Role**: Foreman
- **Experience**: 8+ Years
- **Employment Status**: Full Time
- **Certifications**:
  - Axis Certified Professional
  - CEDIA Certified Level I
  - BICSI Certified Installer
  - Panduit Certified Installer

Kevin Stansky

- **Role**: Sr. Lead AV Integrator/Programmer
- **Experience**: 6+ Years
- **Employment Status**: Full Time
- **Education**: Graduate of College for Creative Studies
- **Certifications**:
  - QSYS Certified Technician
  - Atlona Certified Technician

- Unifi Level III Advanced Training
- ClearOne DSP Certified
- Harman Audio Architect Specialist

Mason Waldrip

- **Role**: Sound Engineer / AV Integrator
- **Experience**: 2+ Years
- **Employment Status**: Full Time
- **Education**: BS in Audio Production & Technology, Michigan Technological University
- **Certifications**:
  - Dante Level 2 Certified
  - QSYS Certified Technician
  - Atlona Certified Technician
  - ClearOne DSP Certified
  - Harman Audio Architect Specialist
- **Expertise**: Sound system design, live sound, AutoCAD, and mixing

John Burnell III

- **Role**: Advanced Network Specialist & Support Specialist
- **Experience**: 5+ Years
- **Employment Status**: Full Time
- **Certifications**:
  - Unifi Level III Advanced Training
  - Avigilon Certified Professional
  - Axis Communications Certified Installer
  - ICT GX Certified Professional
  - Bosch Certified Professional

Blake Van Tiem

- **Role**: Installations Team Lead
- **Experience**: 4+ Years
- **Employment Status**: Full Time
- **Certifications**:
  - CEDIA Certified Level I
  - Axis Certified Professional

With the aforementioned team, MDIS will ensure that all tasks needed for the Charter Township of White Lake Civic Center Projects —both managerial and operations— are handled with precision and professionalism. Should you require any additional information or further clarification, please do not hesitate to reach out.

Warm regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals
Metro Detroit Integrated Systems, LLC

SECTION 5:

LIST OF CLIENTS

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383

Subject: List of Client References for Charter Township of White Lake

To Whom It May Concern:

Metro Detroit Integrated Systems (MDIS) is pleased to provide a list of client references. Below, you'll find a list of a few of our clients and examples of MDIS's recently completed and ongoing government/municipality projects, highlighting our expertise in delivering comparable services. These projects showcase our firm's capabilities in providing innovative low-voltage solutions, including structured cabling, security/access control, paging/sound masking, digital signage, and complex audio-visual systems. They also demonstrate our ability to meet the unique needs of government and municipal clients through meticulous planning, professionalism, and the integration of cutting-edge technology. Included is a list of clients, a brief scope of work detailing services performed, total revenue of the projects, and points of contact.

CITY OF HAMTRAMCK

Project Dollar Amount: $287,772.00
Project Completed: 2023
Services Provided: Multi-site CCTV, Access Control, Intercom, Jail Cell Monitoring, Cabling Projects, and Dispatch AV Installation.

MDIS has established itself as a reliable partner for the City of Hamtramck, offering a comprehensive range of services to enhance safety and security. In this project, MDIS installed over 70+ Axis Communications IP surveillance cameras at key locations such as Hamtramck City Hall, PD, Parks, Fire Department, and remote ballot box camera locations, ensuring thorough coverage and effective monitoring capabilities. The team also integrated a total of 43 Access Control Doors at multiple sites with cutting-edge IP access control and intercom solutions, enhancing security with secure entry systems, access control cards, and fobs. Additionally, MDIS successfully planned, subcontracted, and facilitated the installation of multiple motorized commercial gates, high-voltage electrical systems, concrete camera pole and pedestal installations, asphalt paving/repair, and directional boring, as required by our customers for these projects completed in 2023. This ensured the smooth facilitation of these challenging services on their behalf and seamless integration of these systems with our IP Access Control and

Card Readers/IP Intercom. Furthermore, MDIS executed installations of Cat 6 structured cabling projects to establish reliable infrastructure supporting various systems and operations. Demonstrating our commitment to meeting diverse needs, MDIS supplied and installed specialized equipment, including microphones, audio systems, on-air lights for broadcasting needs, and microphone toggle switch solutions for the Treasurer's Office. Furthermore, MDIS designed and implemented a unique jail cell monitoring alert system, incorporating Axis strobe lights, proximity sensors, and officer alerts to ensure regular inmate checks for their safety. These initiatives highlight MDIS's dedication to delivering innovative solutions tailored to the city's specific requirements.

Contact:

Max Garbarino J.D.
City Manager
City of Hamtramck
1st Floor, 3401 Evaline Street
Hamtramck, MI 48212
Desk: (313) 800-5233 extension 327
Cell: (313) 721-1494
Email: mgarbarino@hamtramckcity.com

CITY OF ECORSE

Project Dollar Amount: $269,014.77
Project Completed: 2022
Services Provided: Multi-Site CCTV & Access Control, Intercom, License Plate Capture Cameras, Cat 6 Cabling & WiFi Upgrades, and Dispatch AV Installation.

MDIS successfully completed several major projects with the City of Ecorse during the latter part of the COVID-19 pandemic, navigating health and hygiene protocols while finishing projects under budget and ahead of schedule. MDIS provided a range of IP solutions to enhance safety and surveillance, including installing Axis CCTV Surveillance and access control systems at key city sites like City Hall, Court, PD, Fire, Library, Water Pump Sites, Parks & more. MDIS also implemented surveillance at Dingell Park, installed CCTV at Bernard Popp Park, and provided additional Axis Communications equipment licenses. Additional cameras were installed at the Senior & Community Center, Public Library, and boat ramp along the Detroit River bordering Canada, improving surveillance coverage. These solutions used a mix of on-premise and remote servers, existing network and fiber backbone, and wireless bridging technology. MDIS also assisted with structured cabling, uplink, and rack overhauls at multiple MDF and IDF locations in the building, adhering to local codes and minimizing disruptions to operations by closely collaborating with city staff. These efforts highlight MDIS's commitment to delivering innovative solutions tailored to the City of Ecorse's specific needs.

Contact:

David Sapp
IT Director for the City of Ecorse
Phone: 313-436-4006
Email: dsapp@ecorsemi.gov
Address: 3869 W Jefferson Ave, Ecorse, MI 48229

CITY OF CENTER LINE

Project Dollar Amount: $210,769.90
Project Completed: 2022
Services Provided: Live Broadcasting and Distributed AV System in Courtroom, Citywide CCTV, Access Control, Intercom, Jail Cell Monitoring, Cabling Projects, and Dispatch AV Installation.

MDIS collaborated with the City of Center Line on significant courtroom AV upgrades and distributed IP video setup and control. We installed multiple HD PTZ video conferencing cameras, Shure wired/wireless microphones with Shure antenna distribution systems for local speech reinforcement, beamforming ceiling-mounted microphones, commercial confidence monitors for courtroom staff to review case information and camera angles, Barco USB-C wireless casting, and an Atlona IP automation system. These systems are CLEMIS-compliant, recording audio and video for review and record-keeping, with MDIS providing setup instructions and training. This project enabled the City to continue operations and court cases during COVID-19, all within budget.

Additionally, MDIS collaborated with the City's Police Chief to design a comprehensive RFP for a city-wide IP video surveillance system. Awarded to MDIS, this project involved installing dozens of strategically placed IP cameras, fisheye cameras, multisensory cameras, and LPR cameras, feeding back to the City's PD and City Hall from various locations. The installation required WAN internet, wireless bridging, and the city's fiber backbone, necessitating planning and coordination of various tasks. Despite not being the cheapest option, MDIS won the bid because the city believed MDIS best met their needs and provided the best value. We are honored to continue working with Center Line as their AV and security needs evolve.

Contact:
John Turpin
jturpin@centerline.gov
City of Center Line
7070 E. 10 Mile Rd.
Center Line, MI 48015
Direct: 586-718-8632
Office: 586-757-6800

CHARTER TOWNSHIP OF REDFORD

Project Dollar Amount: $634,078.85
Project Timeline: Started 2024 – Current (Work I*n Progress)*
Services Provided: Axis Communications Security Cameras, ICT Protege Access Control, Alarm Systems, Panduit Structured Cabling, Unifi Enterprise Network, Harman Distributed Audio, Sharp NEC Display Solutions, and QSYS Control/Automation Solutions.

MDIS is proud to have been awarded the 'entire low-voltage package' for the new $25 million Wellness and Community Center in Redford Township. This state-of-the-art facility will include basketball courts, an overhead mezzanine running track, gym areas, an auditorium, pools, and much more—becoming a key resource for the community.

MDIS is responsible for everything from the resale and warranty of all equipment to prewiring all low-voltage systems, physical installation, cabling, programming/configuration, and documentation. For this project, we're installing 52 Axis Communications IP security cameras, 38 ICT Protege access control doors with electrified hinges and motorized commercial mortise door handles, a building-wide QSYS paging system, 600+ Cat6/6A data drops with Panduit structured cabling, APC Lithium UPS battery backup solutions, and Chatsworth racks, cabinets, and cable tray systems.

Additionally, MDIS is installing 25 Sharp NEC 4K 500-NIT commercial 24/7 displays on a mix of fixed, tilt, and articulating mounts throughout the building. These will serve as security camera viewing monitors, digital signage screens, displays for cable TV in fitness areas, and BYOD (Bring Your Own Device) entertainment in community rooms. The administrative meeting room areas will be set up with Microsoft Teams video conferencing systems to improve communication.

In total, we're installing 86 commercial 70V speakers from JBL/Harman, including a variety of styles and colors to blend seamlessly with the building's decor—ceiling, pendant, and line array models. These will power distributed audio-visual systems integrated with QSYS control and automation solutions. The auditorium will feature dual motorized projector screens, projectors, multiple pairs of line array speaker systems, and a QSYS automation system to control the entire complex, with a divisible space setup managed through touchscreens.

All of this work, except for the alarm system, is being handled in-house by MDIS's skilled team. The alarm system for the building—covering panic buttons, motion sensors, and all doors and windows—is being installed by a trusted subcontractor, ensuring full compliance with the RFP.

The Charter Township of Redford has been a longstanding customer of MDIS. Over the past decade, we've successfully completed dozens of projects together at over 11 different sites. We've built a close, ongoing working relationship, consistently delivering innovative solutions that meet the township's unique needs.

Contact:
Adam D. Bonarek, MBA
Director of Operations and Finance
Charter Township of Redford
12121 Hemingway Street
Redford, MI 48239
Direct #: (313) 387-2769
Main #: (313) 387-2760
Email: abonarek@redfordtwp.com

*****MORE REFERENCES AVAILABLE UPON REQUEST*****

This list of clients and project examples exemplifies MDIS's unique skill sets and capabilities in successfully completing a wide array of CCTV, access control, data cabling, and complex audio-visual projects and solutions for municipal customers.

We are eager for the opportunity to contribute to the Charter Township of White Lake's Civic Center projects, and please reach out with any questions.

Warm Regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals
Metro Detroit Integrated Systems, LLC

SECTION 6:

TIMEFRAME FLOW CHART

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383

Subject: Timeframe Flow Chart for White Lake Township Hall & Senior Center

To Whom It May Concern:

Metro Detroit Integrated Systems (MDIS) is pleased to present a tentative timeframe flow chart for the White Lake Township Hall & Senior Center project.

This Gantt chart provides an estimated project timeline, assuming a start date at the start of Q2 in 2025. It aligns with the "Work Program" section provided earlier and serves as a visual representation of the project's phases and milestones.

This timeline is subject to change based on potential delays from other trades or adjustments in the overall construction schedule. MDIS remains highly flexible and adaptable to ensure project success. If acceleration is required, we can allocate additional personnel to expedite specific phases. Conversely, if delays occur, our team is ready to pause and adjust, maintaining alignment with the larger construction effort.

PLEASE REFERENCE THE GAANT CHART ON THE FOLLOWING PAGE

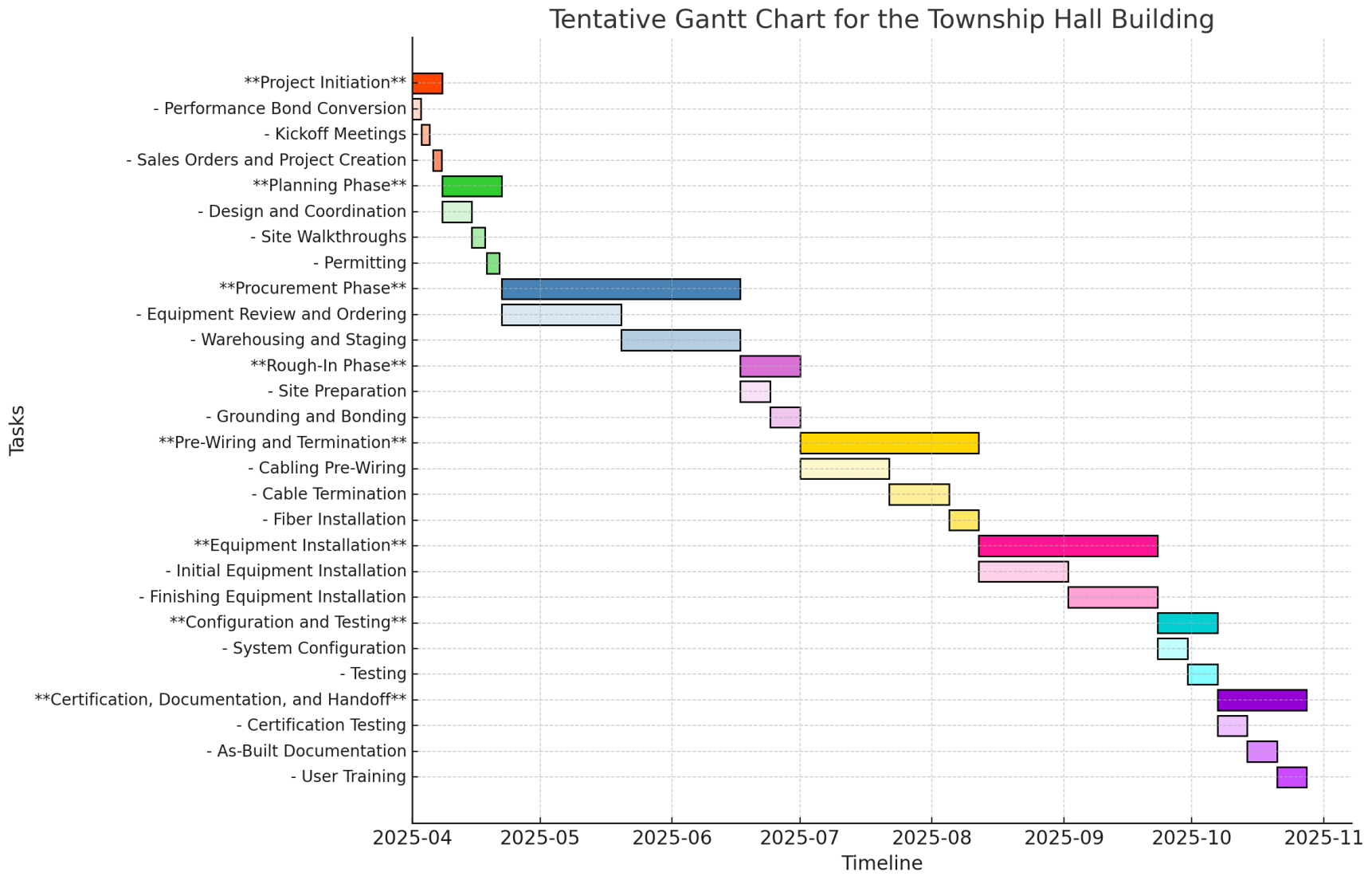
As experienced professionals, MDIS is well-versed in working within general contracting frameworks and ensuring smooth coordination with other trades. We take pride in delivering quality work that integrates seamlessly into larger construction timelines.

If you have any questions, need further information, or require any adjustments, please don't hesitate to contact us. We are always happy to assist and ensure the project's success.

Warm regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals
Metro Detroit Integrated Systems, LLC



1-Year Warranty: Effective from White Lake Township's occupancy of the space

SECTION 7:

ESTIMATED COSTS

We have prepared a quote for you

Low Voltage & AV Proposal – Township Hall

Quote # JWH002649 Version 1

Prepared for:

White Lake Township

P: (248) 289-8500 E: jhanse@mdisnow.com W: www.mdisnow.com

P: (248) 289-8500 E: jhanse@mdisnow.com W: www.mdisnow.com

i) STRUCTURED CABLING (1) GENERAL OVERVIEW - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(2) PARTS TO INCLUDE - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
XG64212BS000L	Panduit - XG64212BS000L - Panduit FlexFusion Rack - Server Cabinet - 42U Rack Height - Black	$3,754.65	1	$3,754.65	True
R2P	Panduit 2-Post Rack, 45RU, #12-24 Threaded E-Rails, Aluminum, Black	$194.12	1	$194.12	True
	Data Network & Wireless Access Point Cabling (Category 6) (BLUE)				
7131800	GenSPEED 6 Cat 6 Cable, CMP, U/UTP, Blue	$356.25	62	$22,087.50	True
NK688MBU	Panduit Netkey UTP RJ45 Cat 6 Punchdown Keystone Jack Module Blue	$4.56	396	$1,805.76	True
UTP28SP1BU	Panduit Cat 6 28 AWG UTP Copper Patch Cord 1 ft Blue	$8.44	198	$1,671.12	True
UTP28SP10BU	Panduit Cat 6 28 AWG UTP Copper Patch Cord 10 ft Blue	$19.78	198	$3,916.44	True
	VoIP Phone Cabling (Category 6) (WHITE)				
7131801	GenSPEED Cat 6 Cable, CMP, U/UTP, White	$356.25	21	$7,481.25	True
NK688MIW	Panduit UTP RJ45 Cat 6 Keystone Punchdown Jack Module WH	$4.56	132	$601.92	True
UTP28SP1	Panduit NetKey Category 6 F/UTP Patch Network Cable - 1 ft Category 6 Network Cable White	$8.44	66	$557.04	True
UTP28SP10	Panduit NetKey Category 6 F/UTP Patch Network Cable - 10 ft Category 6 Network Cable White	$19.78	66	$1,305.48	True
	CCTV & Access Control Cabling (Category 6) (ORANGE)				
7131805	GenSPEED 6 Cat 6 Cable, CMP, U/UTP, Orange	$356.25	18	$6,412.50	True
NK688MOR	Panduit Network Connector - 1 Pack - 1 x RJ-45 Network Male - Orange	$4.56	102	$465.12	True

(2) PARTS TO INCLUDE - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
UTP28SP1OR	Panduit Cat 6 28 AWG UTP Copper Patch Cord 1 ft Orange	$8.44	102	$860.88	True
	Audiovisual Network Cabling (Category 6) (PURPLE)				
7131809	GenSPEED 6 Cat 6 Cable, CMP, U/UTP, Purple	$356.25	6	$2,137.50	True
NK688MVL	Panduit Network Connector - 1 Pack - 1 x RJ-45 Network Male - Violet	$4.56	38	$173.28	True
UTP28SP1VL	Panduit Cat 6 28 AWG UTP Copper Patch Cord 1 ft Violet	$8.44	19	$160.36	True
	MISC CABLING: CABLE FOR CARD READERS, DB, DC, COAXIAL, HDMI				
ZX-HDMICP06	Vanco HDMICP06 6ft. Certified Premium High Speed HDMI Cable	$16.64	40	$665.60	True
ZX-HDMICP30	Vanco HMDICP30 Certified Premium High Speed HMDI Cables	$68.74	20	$1,374.80	True
WPAQC369	Belden 22/6 Solid Bare Copper Conductor, Foil Shielded, with an Aquaseal tape and Overall Jacket	$646.38	19	$12,281.22	True
224GY1000	Belden 18/2 Stranded Bare Copper Conductors, Unshielded With An Overall Jacket	$222.35	9	$2,001.15	True
244GY1000	Belden 18/4 Stranded Bare Copper Conductors, Unshielded With An Overall Jacket	$412.85	2	$825.70	True
4112704/10	Commscope WHRL RG6 QD 1000 RG 6 Type Quad Shield Plenum Video Coaxial Cable, White Jacket, 1000 FT (305 m) reel	$519.36	3	$1,558.08	True
	Accessories (Faceplates, Organizers, Misc Keystones, Patch Panels)				
NK1FWHY	Panduit NetKey® Flush Mount Faceplate, 1-Port	$1.56	34	$53.04	True
NK2FWHY	Panduit NetKey® Flush Mount Faceplate, 2-Port	$1.62	75	$121.50	True
NK4FWHY	Panduit NetKey® Flush Mount Faceplate, 4-Port	$2.35	22	$51.70	True
WMPSE	Panduit PatchLink™ Horizontal Dual-Sided Manager, 1RU, 8.9 in. Depth	$85.36	14	$1,195.04	True
NKFP24Y	Panduit Modular Patch Panel - 24 - 24 Port(s) - 1U High	$49.21	14	$688.94	True

(2) PARTS TO INCLUDE - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
NKFIG	Panduit Coaxial Antenna Connector - 1 Pack - F Connector Antenna	$2.88	8	$23.04	True
NKHDMIWH	Panduit NetKey HDMI Audio/Video Cable - 1 Pack - 1 x HDMI (Type A) HDMI 1.4 Digital Audio/Video Female - 1 x HDMI	$38.25	80	$3,060.00	True
NKBMWH-X	NetKey Blank Keystone Module 1 Port White	$3.25	22	$71.50	True
100660172	Poly Pull Line with Orange Tracer 6500-Foot	$56.22	1	$56.22	True
P12E22G	Panduit™ G6 Monitored Switched PDU features (12) 5 -20R outlets. It is a 20 amp, 120 V, single phase PDU	$1,887.49	2	$3,774.98	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$81,387.43**

(2) PARTS TO INCLUDE - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	**MDIS will be installing a Panduit GenSPEED Data Cabling system, that will come with a 25-Year Cabling Equipment Warranty.** MDIS will provide a comprehensive data cabling installation for the new Township Hall Building. Our team is committed to delivering a high-quality, organized, and efficient cabling solution. MDIS is going to color code our cabling, and keystones, based on the purpose of the wire. • **Data & Access Points:** We will install blue Category 6 cabling for data cabling & wireless access points (202 cables). • **VoIP Phones:** White Category 6 cabling will be used for data connections (66 cables). • **CCTV & Access Control:** Orange Category 6 cabling will be used for security purposes (51 data cables & 3 future locations). 18/4, 18/2, and 22/6 cabling will be ran to (88) locations. • **Audiovisual:** Purple/violet Category 6 cabling will be used for audiovisual connections that require local system data cabling. • **Low Voltage 18 AWG and similar:** White, Gray, and/or Black cabling will be utilized and standardized per system application. We will deploy color-coordinated keystones and appropriately sized wall-plates for a cohesive and professional appearance. Our installation will include Keystone Patch Panels and Panduit Horizontal Cable	$53,550.00	False

(2) PARTS TO INCLUDE - INSTALLATION

Category	Installation Description	Amount	Is Taxable
	Organizers to ensure a well-organized and accessible setup. We plan to use Panduit Patch Panels for efficient cable management. MDIS will provide matching patch cables to complement our color scheme at device and patch panel sides. MDIS will use the Cable Trays, Ladder Racks, J-Hooks, and related pathway hardware to run all cabling in a clean, organized, and professional installation. ***MDIS is NOT responsible for providing Network Switches, Access Points, Gateways, Firewalls, Modems, Servers*** ***MDIS is NOT responsible for installing "Conduit Sweeps" or "Floor Cores" for data cabling.*** ***MDIS is NOT responsible for installing the underground pathway to the parking lot intercom / key-card readers, however we will coordinate with trenching company and advise on needs if applicable.*** ***VC3 will be responsible for providing ALL network switches for this project. VC3 will also be responsible for patching all drops into their designated switch ports. VC3 will also be responsible for configuring the new network and wireless access network for this facility. Any of this equipment or labor expected to be performed by MDIS outside of the described RFP / MDIS proposal will need to be approved in a Change Order before moving forward***		

Subtotal: **$53,550.00**

(3) APPROVED PARTS MANUFACTURERS - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(4) RELATED WORK - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(5) COLOR CODING FOR CABLING & KEYSTONES - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(6) DOCUMENTS - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(7) PATHWAYS FOR COMMUNICATIONS SYSTEMS - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
BCH32	Eaton BCH32 B-Line Series 2" CBL J-Hook with Retainer, Stainless Steel	$3.12	200	$624.00	True
BCH64	Eaton BCH64 B-Line Series Single Cable Hook, 4", Steel, Pre-Galvanized	$5.94	100	$594.00	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$1,218.00**

(7) PATHWAYS FOR COMMUNICATIONS SYSTEMS - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS technicians to install Eaton BCH32 B-Line Series 2" CBL J-Hook with Retainer, Stainless Steel throughout the facility, ensuring that all low voltage cabling ran by MDIS technicians is secured in a professional IT standard and cabling pathway hardware requirements by manufacturer. MDIS to install 4" Trunk pathway hardware. MDIS to install cable runway in the MDF and related indicated areas. MDIS to install related supporting hardware for the cable pathways and install fire pathway kits where required by code.	$7,650.00	False

Subtotal: **$7,650.00**

(8) CABLE TRAY & CEILING/WALL SUPPORT FOR (MDF) SERVER ROOM AND (IDF) AREAS - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
10250-E12	Chatsworth Products Universal Cable Runway (BLACK)	$180.62	6	$1,083.72	True
12362-712	Chatsworth Products Cable Runway Center Support Kit (BLACK)	$67.51	8	$540.08	True
11746-712	Chatsworth Products Triangular Support Bracket for cable runway (BLACK)	$64.66	10	$646.60	True
EZDP44S2	Fire-rated Pathway Kit, Includes Device, Wall Plates And Labels	$474.89	6	$2,849.34	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$5,119.74**

(8) CABLE TRAY & CEILING/WALL SUPPORT FOR (MDF) SERVER ROOM AND (IDF) AREAS - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS to install cable runway in the MDF and related indicated areas. MDIS to install related supporting hardware for the cable pathways and install fire pathway kits where required by code.	$4,590.00	False

Subtotal: **$4,590.00**

(9) GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
GB2B0312TPI-1	Panduit Grounding Busbar, Copper	$168.74	2	$337.48	True
RGRKCBNJY	Panduit Rack Mounted Grounding Busbar	$308.68	4	$1,234.72	True
ACGK	Panduit Structured Ground Armored Cable Grounding Kit	$15.99	2	$31.98	True
GPC2-1-Q	Panduit Bronze Pipe Clamp	$12.50	2	$25.00	True
MISCELLANEOUS	MISCELLANEOUS (Bonding Accessories, Antioxidant Joint Compound, Pedestal Clams, AWG #6 Green Wire)	$500.00	1	$500.00	False

Subtotal: **$2,129.18**

(9) GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	Conductor connections to the TMGB or TGB shall be made with two-hole bolt-on, double irreversible compression lugs sized to fit the busbar and the conductors. Each lug shall be attached with stainless steel hardware after preparing the bond according to manufacturer recommendations and treating the bonding surface on the busbar with antioxidant to help prevent corrosion at the bond. The wall-mount busbar shall be bonded to ground as part of the overall Telecommunications Bonding and Grounding System. MDIS to connect the TMGB to the building main ground using minimum of a #4 or larger insulated copper wire per the electrical diagram riser. MDIS to connect the TGB to the TER TMGB with a minimum of a #6 or larger insulated copper wire and to the electrical panel serving the room per the electrical diagram riser. MDIS will ground the cable runway to the TMGB using #6 or larger insulated copper wire. Abrade the finish on the cable runway where the ground wire is attached, and bond all cable runway junctions.	$3,825.00	False

Subtotal: **$3,825.00**

(10) QUALITY ASSURANCE - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(11) LABELING - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(12) CERTIFICATION TESTING - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
MISCELLANOUS	MISCELLANEOUS - Fluke DSX 5000 - Certification Tool Utilization (Copper & Fiber Modules)	$0.00	1	$0.00	True

Subtotal: **$0.00**

(12) CERTIFICATION TESTING - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Certification Testing	MDIS technicians to certify all strands of Single Mode OS2 cabling using a Fluke Networks Fiber Cabling Certification device and MDIS will provide a detailed certification report provided to the customer. MDIS will provide 25-year warranty on the Corning Fiber-optic cabling to customer. MDIS to perform Optical Time Domain Reflectometer (OTDR) testing on all installed fibers to verify continuity, signal loss, and overall performance. MDIS to provide detailed as-built drawings, test results, and maintenance documentation in PDF format upon completion of the installation.	$3,825.00	False

Subtotal: **$3,825.00**

(13) CABLING WARRANTY - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(1) Lower Level (a) BOARD ROOM 001; AV ROOM 002 - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(a) BOARD ROOM 001; AV ROOM 002				
CE-86UH5JH	LG Pro 86UH5J-H Digital Signage Display - 500NIT, 24/7 Rated	$5,529.08	3	$16,587.24	True
NX-TL4290	Commercial Wall Mount for TV, Flat Panel Display - Black - Height Adjustable - 30" to 90" Screen Support - 175 lb Load Capacity - 100 x 100, 700 x 400 - VESA Mount Compatible	$71.24	3	$213.72	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	3	$60.18	True
FG-003248-R001	Vizrt NDI HX PTZ3 Camera (Black)	$2,283.93	3	$6,851.79	True
BDL-000000032	Vizrt TriCaster TC410 Plus and Flex Control Panel Bundle	$18,392.00	1	$18,392.00	True
PTP-000000003	NewTek Protek Prime Coverage Plan for TriCaster 410 Plus and the Control Panel (1 Year)	$479.90	1	$479.90	True
PTP-000000020	NewTek Protek Prime Coverage Plan for Control Panel (1 Year)	$339.70	1	$339.70	True
PFS-000000003	Vizrt 4-Hour Professional Services Plan	$995.80	1	$995.80	True
VCSHDMI	Vizrt Viz Connect Solo HDMI	$989.90	8	$7,919.20	True
DEU3223QEAK (B&H Kit)	Dell UltraSharp 31.5" 4K HDR Monitor & MSA20 Monitor Arm Kit	$787.22	2	$1,574.44	True

(1) Lower Level (a) BOARD ROOM 001; AV ROOM 002 - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
G2V4X	Dell OptiPlex 7020 Small Form Factor Desktop Computer - Windows 11	$743.62	1	$743.62	True
R9861622USB2	Barco ClickShare CX-50 Gen2 - US Version With 2 Buttons - For Boardroom, Meeting Room, Video Conferencing - 3840 x 2160 Video (Content) - 4K UHD - 1 x Network (RJ-45) - 1 x HDMI Out - Audio Line Out - USB - Gigabit Ethernet - Wireless LAN - Standalone	$3,450.00	1	$3,450.00	True
W9-XSM4328CV	Netgear XSM4328CV-100NES 24-Ports SFP+ and 4-Ports SFP28 25G Managed Switch	$4,199.52	1	$4,199.52	True
FU-M8LX	Furman M-8LX 15A Merit Series Power Conditioner with Lights	$110.05	1	$110.05	True
CB-5035678	Soundcraft 5035678 Soundcraft Si Expression Digital Mixer	$3,417.80	1	$3,417.80	True
LD-CNNCT702	LEA Professional CONNECT 702 19" 2-Channel Amplifier, 700W per Channel	$1,457.49	1	$1,457.49	True
JF-C26CTWH	JBL Professional Control 26CT 6-1/2" Ceiling Loudspeaker Transducer Assembly, Pair, White	$373.80	6	$2,242.80	True
SB-X415RLPDF	Shure MX415RLPDF/C Wired Electret Condenser Microphone	$233.74	12	$2,804.88	True
SB-A400MB	Shure Mute Button & Adapter Base	$257.49	12	$3,089.88	True
SB-SLXD24M5H	Shure Dual Wireless System with SLXD2/SM58 Handheld Transmitters	$1,287.49	2	$2,574.98	True
RK-ER27U	27 Unit Equipment Rack, Assembled - For Networking & AV - 27U Rack Height - Floor Standing Enclosed Cabinet - Steel, Tempered Glass - 900 lb Maximum Weight Capacity	$724.99	1	$724.99	True
LM-LCS12001	Listen Technologies LCS-120 11-Piece Wi-Fi/RF Base System	$1,588.76	1	$1,588.76	True
WP-4346AFBK1	West Penn 23/4 AWG Shielded CAT6A Cable, 1000', Black	$443.00	1	$443.00	True
6500FE 010U1000	Belden 22/2 Stranded Shielded Plenum Cable, 1000' Black	$214.30	1	$214.30	True
224GY1000	Belden 18/2 Stranded Bare Copper Conductors, Unshielded With An Overall Jacket	$222.35	1	$222.35	True

(1) Lower Level (a) BOARD ROOM 001; AV ROOM 002 - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$80,698.39**

(1) Lower Level (a) BOARD ROOM 001; AV ROOM 002 - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS technicians to install a turn-key audiovisual and broadcasting solution for the board room. MDIS to install the related low voltage cabling and equipment. MDIS to install (3) LG Professional 86” TV’s for local content presentation of individually controlled sources for the displays. MDIS to install (3) Vizrt (NewTek) NDI PTZ Cameras to allow for preset or controlled video capture for conferencing, broadcasting or recording. MDIS to install a Vizrt Tricaster TC410 Plus and Control Panel for utilizing the full range of audiovisual capabilities in this space. MDIS to provide Vizrt (NewTek) Coverage Plans for the designated equipment. MDIS to provide Vizrt Spark Plus I/O’s for encoding and decoding. MDIS to provide (2) Dell 31.5” 4K monitors, monitor arms, and a Dell PC for the control operator in the A/V room. MDIS to install a Soundcraft Digital Mixer for audio inputs and control. MDIS to install a LEA Amplifier to power the speakers. MDIS to install (12) Shure MX415RLPDF/C Wired Electret Condenser Microphones with mute buttons. MDIS to provide (2) Dual Wireless Microphone Systems. MDIS to install all audiovisual equipment within a 27U rack enclosure. MDIS to install a Listen Technologies 11-piece kit for ADA compliance. MDIS to install Cabling related to this audiovisual solution. MDIS to configure all provided equipment for conferencing, broadcasting, and recording in this boardroom. MDIS will ensure that all proposed equipment and systems are compatible with existing infrastructure and meet the specified requirements. MDIS will provide required training, warranties, and service maintenance agreements on programming and audiovisual installation with final pricing.	$26,775.00	False

Subtotal: **$26,775.00**

(ii) Optional Alternate Request I: Recording Solution - EQUIPMENT & INSTALLATION

Category	Installation Description	Amount	Is Taxable
Mediasite Recorder	Mediasite Recorders are room-based, rack-mountable capture appliances to record and deliver on-demand video plus slide content or a single HD video. (Optional upgrade license available to stream live.) Integrates with automation systems.	$7,950.00	False
Mediasite Customer Care - Mediasite Recorder - 1 Year	Support and maintenance plan for Mediasite Recorder (100/200 Series Recorders) providing one full year of: • Software upgrades and maintenance releases • Prioritized, unlimited technical support via phone or email • Hardware warranty extension from standard 90-days to one year • Mediasite replacement coverage • Privileged Mediasite Customer Assurance Portal access (Knowledge Base, rich video tutorials, documentation).	$1,695.00	False
Mediasite RL100/200 Series Recorders - LIVE Streaming Upgrad	Mediasite RL100/200 Series Recorders - LIVE Streaming Upgrade is a software license upgrade to the Mediasite RL100 and 200 Series Recorders which enables live streaming capability when connected to the Mediasite Video Platform. Customer must license all Mediasite RL 100/200 Series Recorders connected to a single Mediasite Video Platform.	$2,449.00	False
Mediasite Video Cloud - Entry	Mediasite Video Cloud Entry Level Subscription includes up to 5,000 hours of content stored, 250 concurrent viewers, a maximum of 5 physical encoding appliance connections, unlimited viewing, and unlimited Mediasite Mosaic and Mediasite Capture for one year. Requires a minimum three-year subscription. Additional hours available in 1,500 hour blocks.	$12,000.00	False
Mediasite Training - Getting Started with Mediasite 1	Getting Started with Mediasite 1 is a four- hour training course that will teach your Mediasite Administrators and Content Creators to begin to use Mediasite to create, manage, enhance and share videos with My Mediasite and Mediasite Mosaic. This service includes: - A private training session lasting up to 4 hours - Guided instruction with a Sonic Foundry technical consultant - Digital copies of a user guide that acts as a great reference after the training - Plenty of time for Q&A with your trainer	$1,490.00	False

(ii) Optional Alternate Request I: Recording Solution - EQUIPMENT & INSTALLATION

Category	Installation Description	Amount	Is Taxable
Mediasite Integration	MDIS Mediasite Integration with control system. Installation, Wiring, Configuration, and training are included.	$3,825.00	False
Miscellaneous	Miscellaneous	$0.00	False

Subtotal: **$29,409.00**

(iii) Optional Alternate Request II: Automation & IP Control Setup or Secondary Control Workstation - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
U2424H	Dell UltraSharp 24" HDR Monitor	$265.95	1	$265.95	True
MSA20	Dell Single Monitor Arm - MSA20	$170.20	1	$170.20	True
G2V4X	Dell OptiPlex 7020 Small Form Factor Desktop Computer - Windows 11	$743.62	1	$743.62	True
FG-001854-R001	Vizrt NewTek LivePanel for TriCaster TC1 and IP Series (Electronic Download)	$1,058.51	1	$1,058.51	True
PFS-000000003	Vizrt 4-Hour Professional Services Plan	$995.80	1	$995.80	True
MISCELLANEOUS	Apple Air 13" iPad w/ WiFi	$800.00	1	$800.00	False
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$4,034.08**

(iii) Optional Alternate Request II: Automation & IP Control Setup or Secondary Control Workstation - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS to install the Dell 4K monitor, and the Intel PC to run the Vizrt Live Panel Access to allow for PC control of the Vizrt system and connected equipment.	$4,050.00	False

Subtotal: **$4,050.00**

(c) ACTIVITY SPACE 031, ACTIVITY SPACE 032, ACTIVITY SPACE 033, ACTIVITY SPACE 034, ACTIVITY SPACE 035 - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(c) ACTIVITY SPACE 031, ACTIVITY SPACE 032, ACTIVITY SPACE 033, ACTIVITY SPACE 034, ACTIVITY SPACE 035				
9D-1260M	dbx DBX-1260MVVM dbx 1260m ZonePRO 1260 12x6 Digital Zone Processor	$943.75	1	$943.75	True
9D-DBXBOBV	DBX DBXBOB-V Zone Controller	$93.74	2	$187.48	True
9D-ZC2	DBX ZC-2 Wall-Mounted Zone Controller for DriveRack 220i, 260 and ZonePRO	$61.24	5	$306.20	True
9D-ZC3	dbx DBXZC3V dbx ZC-3 Program Selector Zone Controller for DriveRack and ZonePRO Systems	$64.99	5	$324.95	True
LD-CNNCT168	LEA Professional CONNECT 168 19" 8-Channel Amplifier, 160W per Channel	$2,111.09	1	$2,111.09	True
JF-C26CTWH	JBL Control 26CT Speaker 6.5" (Pair) (White)	$373.80	12	$4,485.60	True
RA-AP41OM2	Audix AP41 OM2 40 Series Wireless Microphone System, R41 Diversity Receiver with H60/OM2 Handheld Transmitter	$429.99	5	$2,149.95	True
RA-ADS48	Audix ADS48 UHF Antenna Distribution System with Rack Mount	$474.99	2	$949.98	True
RL-TXTPR3A	RDL TX-TPR3A Active Three-Pair Receiver, Twisted Pair Format-A, Balanced Line Outputs	$198.99	2	$397.98	True
RL-DBT1A	RDL D-BT1A Wall-Mounted Bluetooth Audio Format, Interface, White	$358.74	5	$1,793.70	True

(c) ACTIVITY SPACE 031, ACTIVITY SPACE 032, ACTIVITY SPACE 033, ACTIVITY SPACE 034, ACTIVITY SPACE 035 - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
RL-TXTP4PW	RDL TX-TP4PW TX Series Power Inserter Signal Breakout with RJ45 Jacks for Twisted Pair Senders and Receivers	$102.81	2	$205.62	True
FU-M8LX	Furman M-8LX 15A Merit Series Power Conditioner with Lights	$110.05	1	$110.05	True
RK-ER18U	18 Unit Equipment Rack, Assembled - For Networking & AV - 18U Rack Height - Floor Standing Enclosed Cabinet - Tempered Glass, Steel - 600 lb Maximum Weight Capacity	$624.99	1	$624.99	True
NO-UD3	Middle Atlantic UD3 UD Series Utility Rack Drawer, RU, Black	$163.74	1	$163.74	True
224GY1000	Belden 18/2 Stranded Bare Copper Conductors, Unshielded With An Overall Jacket	$222.35	1	$222.35	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$14,977.43**

(c) ACTIVITY SPACE 031, ACTIVITY SPACE 032, ACTIVITY SPACE 033, ACTIVITY SPACE 034, ACTIVITY SPACE 035 - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS technicians to install a turn-key audio system with capability to record utilized wireless microphones as a replacement “new meeting space” for the boardroom that will still broadcast audio. MDIS to install a dbx DBX-1260MVVM dbx 1260m ZonePRO 1260 12x6 Digital Zone Processor to route the microphones, speakers & related audio devices connected in this space. MDIS to install DBX zone controllers as this space will be able to split into (5) separate rooms that can be utilized in synchrony. MDIS to install a LEA amplifier to power the speakers. MDIS to install an Audix wireless microphone system to allow for (1) to be used in each space, or for them to be used together when the room is combined. MDIS to install all related supporting audio equipment. MDIS to install audiovisual control components in the 18U rack enclosure. MDIS to install related cabling for this solution. MDIS will ensure that all proposed equipment and systems are compatible with existing infrastructure and meet the specified requirements. MDIS will provide required training, warranties, and service maintenance agreements on programming and audiovisual installation with final pricing.	$12,240.00	False

Subtotal: **$12,240.00**

(2) Upper Level - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(a) CONFERENCE ROOM 003				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
WT-WB200CE4	WattBox WB-200-CE-4 Power Conditioner with Coax and Ethernet Protection, 4-Outlet, 4' Cord	$86.24	1	$86.24	True

iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
1B-842415111	Bose Professional Videobar VB1 All-in-One USB Conferencing System	$1,236.24	1	$1,236.24	True
R9861612USB1	Barco CX-20 Gen 2 Wireless Collaboration System with 1 Button	$2,180.85	1	$2,180.85	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(b) LOBBY 011				
CE-65UH5JH	LG Pro 65UH5J-H 65" High Haze UHD Standard Signage	$2,016.24	1	$2,016.24	True
BS-LS445	BrightSign LS445 4K Player	$401.24	1	$401.24	True
BS-SDHC-16C10-1	BrightSign Approved Micro SD Cards, 16GB	$34.72	1	$34.72	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
KR-VS211X	Kramer 20-80549090 VS-211X 2x1 HDMI Switcher, 4K60 4:4:4	$319.05	1	$319.05	True
WT-WB200CE4	WattBox WB-200-CE-4 Power Conditioner with Coax and Ethernet Protection, 4-Outlet, 4' Cord	$86.24	1	$86.24	True
JF-C26CTWH	JBL Professional Control 26CT 6-1/2" Ceiling Loudspeaker Transducer Assembly, Pair, White	$373.80	2	$747.60	True
VCSHDMI	Vizrt Viz Connect Solo HDMI	$1,014.48	1	$1,014.48	True
AT-AT100D	100 Watt Decora Wht Vol Contr	$37.49	1	$37.49	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(b) LOUNGE/RECEPTION 016				
CE-55UH5JH	LG Pro 55UH5J-H 55" High Haze UHD Standard Signage - 24/7	$1,618.26	2	$3,236.52	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	2	$124.98	True
BS-LS445	BrightSign LS445 4K Player	$401.24	2	$802.48	True
BS-SDHC-16C10-1	BrightSign Approved Micro SD Cards, 16GB	$34.72	2	$69.44	True
WT-WB200CE4	WattBox WB-200-CE-4 Power Conditioner with Coax and Ethernet Protection, 4-Outlet, 4' Cord	$86.24	2	$172.48	True

iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$13,883.76**

iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
(a) CONFERENCE ROOM 003			
Installation	MDIS to install (1) 55" Commercially-rated TV on its indicated mounting hardware. MDIS to install (1) Bose Professional VB1 to allow for video-conferencing. MDIS to install Barco Clickshare Gen2 CX-20 Wireless Collaboration System. MDIS to install related surge protection and supporting accessories.	$765.00	False
(b) LOBBY 011			
Installation	MDIS to install (1) 65" TV on an low profile mount. solutions. MDIS to install all related supporting accessories for the TV's. MDIS to install & configure BrightSign Media Players for digital signage solutions where indicated. MDIS to install a Kramer 2x1 switcher for the Lobby 011 to allow for overflow, or digital signage applications. MDIS to install (3) JBL professional speakers. MDIS to install Vizrt decoder for the TV.	$3,060.00	False
(b) LOUNGE/RECEPTION 016			

iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS to install (2) 55" Commercially-rated TV's that are rated for 24/7 usage on their indicated low profile mounting hardware. MDIS to install & configure BrightSign Media Players for digital signage solutions where indicated. MDIS to install related surge protection and supporting accessories.	$3,060.00	False

Subtotal: **$6,885.00**

iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(a) EXTERIOR				
SB-P2-55-4K-BL	SunBrite SB-P2-55-4K-BL Pro 2 Series 55" 4K Ultra HDR Full Sun Outdoor TV, Black	$5,951.16	2	$11,902.32	True
BS-LS445	BrightSign LS445 4K Player	$401.24	2	$802.48	True
BS-SDHC-16C10-1	BrightSign Approved Micro SD Cards, 16GB	$34.72	2	$69.44	True
TVPRO5560	Outdoor Display Enclosure Tilt Mount w/ Fan Kit & Mounting Hardware	$1,879.00	2	$3,758.00	True
MISCELLANEOUS	Outdoor Surge Protector - 2 Outlet, 15AMP	$56.19	2	$112.38	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(b) DEPUTY SUPERVISOR 105				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(c) SUPERVISOR OFFICE 106				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True

iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	2	$40.12	True
1B-842415111	Bose Professional Videobar VB1 All-in-One USB Conferencing System	$1,236.24	1	$1,236.24	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(d) CONFERENCE ROOM 108				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
1B-842415111	Bose Professional Videobar VB1 All-in-One USB Conferencing System	$1,236.24	1	$1,236.24	True
WT-WB200CE4	WattBox WB-200-CE-4 Power Conditioner with Coax and Ethernet Protection, 4-Outlet, 4' Cord	$86.24	2	$172.48	True
R9861612USB1	Barco CX-20 Gen 2 Wireless Collaboration System with 1 Button	$2,180.85	1	$2,180.85	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(e) LOBBY 111				
CE-55UH5JH	LG Pro 55UH5J-H 55" High Haze UHD Standard Signage - 24/7	$1,618.26	2	$3,236.52	True
BS-LS445	BrightSign LS445 4K Player	$401.24	2	$802.48	True
BS-SDHC-16C10-1	BrightSign Approved Micro SD Cards, 16GB	$34.72	2	$69.44	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
NX-SCM125	Large Ceiling Mount for 37"- 80" Flat Panel Displays, UL/ULC	$177.49	1	$177.49	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	4	$80.24	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(f) CONFERENCE ROOM 116				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True

iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
1B-842415111	Bose Professional Videobar VB1 All-in-One USB Conferencing System	$1,236.24	1	$1,236.24	True
WT-WB200CE4	WattBox WB-200-CE-4 Power Conditioner with Coax and Ethernet Protection, 4-Outlet, 4' Cord	$86.24	2	$172.48	True
R9861612USB1	Barco CX-20 Gen 2 Wireless Collaboration System with 1 Button	$2,180.85	1	$2,180.85	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(g) CLERK ROOM 132				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
1B-842415111	Bose Professional Videobar VB1 All-in-One USB Conferencing System	$1,236.24	1	$1,236.24	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	2	$40.12	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(h) DEPUTY CLERK ROOM 133				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
	(i) DEPUTY TREASURER ROOM 151				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(j) TREASURER ROOM 152				

iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
1B-842415111	Bose Professional Videobar VB1 All-in-One USB Conferencing System	$1,236.24	1	$1,236.24	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	2	$40.12	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(k) PLANNING DIRECTOR 163				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
	(l) DPS DIRECTOR 173				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(m) RECEPTION 120				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(n) RECEPTION 130				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True

iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(o) RECEPTION 160				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	1	$62.49	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(p) EMPLOYEE WELLNESS CENTER 190				
CE-75UR340C9	LG Pro 75UR340C9UD 75" 3840 2160 Ultra HD Commercial Lite LED backlit LCD TV	$1,679.99	1	$1,679.99	True
NX-FML4390	Full-Motion Large Mount for 43"- 90" Displays up to 120 lb, UL, ULC	$153.74	1	$153.74	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$50,314.26**

iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
(a) EXTERIOR			
Installation	MDIS to install (2) 55" Outdoor Commercial TV's rated for full sun and exterior-rated components with related outdoor accessories. MDIS to install the TV's in a commercial enclosure with a fan kit. MDIS to install & configure BrightSign Media Players for digital signage solutions.	$5,355.00	False

iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
(b) DEPUTY SUPERVISOR 105			
Installation	MDIS to install (1) 55" Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories.	$382.50	False
(c) SUPERVISOR OFFICE 106			
Installation	MDIS to install (1) 55" Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories. MDIS to install (1) Bose Professional VB1 to allow for video-conferencing.	$765.00	False
(d) CONFERENCE ROOM 108			
LABOR_STANDARD	MDIS to install (1) 55" Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories. MDIS to install (1) Bose Professional VB1 to allow for video-conferencing. MDIS to install the Barco CX-20 Clickshare wireless collaboration system.	$765.00	False
(e) LOBBY 111			
Installation	MDIS to install (2) 55" Commercial rated TV's on the low profile mounting hardware. MDIS to install & configure BrightSign Media Players for digital signage solutions.	$3,060.00	False
(f) CONFERENCE ROOM 116			
Installation	MDIS to install (1) 55" Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories. MDIS to install (1) Bose Professional VB1 to allow for video-conferencing. MDIS to install the Barco CX-20 Clickshare wireless collaboration system.	$765.00	False
(g) CLERK ROOM 132			

iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS to install (1) 55” Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories. MDIS to install (1) Bose Professional VB1 to allow for video-conferencing.	$765.00	False
(h) DEPUTY CLERK ROOM 133			
Installation	MDIS to install (1) 55” Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories.	$382.50	False
(i) DEPUTY TREASURER ROOM 151			
Installation	MDIS to install (1) 55” Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories.	$382.50	False
(j) TREASURER ROOM 152			
Installation	MDIS to install (1) 55” Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories. MDIS to install (1) Bose Professional VB1 to allow for video-conferencing.	$765.00	False
(k) PLANNING DIRECTOR 163			
Installation	MDIS to install (1) 55” Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories.	$382.50	False
(l) DPS DIRECTOR 173			
Installation	MDIS to install (1) 55” Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories.	$382.50	False
(m) RECEPTION 120			
Installation	MDIS to install (1) 55” Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories.	$382.50	False

iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
(n) RECEPTION 130			
Installation	MDIS to install (1) 55” Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories.	$382.50	False
(o) RECEPTION 160			
Installation	MDIS to install (1) 55” Commercial rated TV on the low profile mounting hardware. MDIS to install related surge protection and supporting accessories.	$382.50	False
(p) EMPLOYEE WELLNESS CENTER 190			
Installation	MDIS to install (1) 75” Commercial rated TV on the articulating mounting hardware. MDIS to install related surge protection and supporting accessories.	$382.50	False

Subtotal: **$15,682.50**

TOWN HALL BOND COST

Category	Installation Description	Amount	Is Taxable
TOWN HALL BOND COST	**TOWN HALL BOND COST - 3%**	$12,667.3131	False

Subtotal: **$12,667.31**

P: (248) 289-8500 E: jhanse@mdisnow.com W: www.mdisnow.com

MDIS INSTALLATION WARRANTY

Category	Installation Description	Amount	Is Taxable
MDIS_ESP_12MO	**MDIS Extended Service Plan** This MDIS Extended Service Plan specifically addresses issues directly tied to this Sales Order, ensuring that all necessary MDIS Service Labor charges are covered. Please note that it does not include the cost of replacement equipment, typically protected by separate factory warranties. However, it provides full coverage for all MDIS Labor required for processes such as RMA facilitations/exchanges of equipment, troubleshooting, and the installation of replacement hardware or equipment. ***Please inquire with your sales representative regarding the potential to extend this MDIS ESP up to 60 Months, allowing you to extend your MDIS Service Labor coverage on this Sales Order for an even longer period.***	$0.00	False

Low Voltage & AV Proposal – Township Hall

Prepared by:

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Quote Information:

Quote #: JWH002649

Version: 1
Delivery Date: 11/18/2024
Expiration Date: 05/18/2025

Quote Summary

Description	Amount
(2) PARTS TO INCLUDE - EQUIPMENT	$81,387.43
(2) PARTS TO INCLUDE - INSTALLATION	$53,550.00
(7) PATHWAYS FOR COMMUNICATIONS SYSTEMS - EQUIPMENT	$1,218.00
(7) PATHWAYS FOR COMMUNICATIONS SYSTEMS - INSTALLATION	$7,650.00
(8) CABLE TRAY & CEILING/WALL SUPPORT FOR (MDF) SERVER ROOM AND (IDF) AREAS - EQUIPMENT	$5,119.74
(8) CABLE TRAY & CEILING/WALL SUPPORT FOR (MDF) SERVER ROOM AND (IDF) AREAS - INSTALLATION	$4,590.00
(9) GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS - EQUIPMENT	$2,129.18
(9) GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS - INSTALLATION	$3,825.00
(12) CERTIFICATION TESTING - EQUIPMENT	$0.00
(12) CERTIFICATION TESTING - INSTALLATION	$3,825.00
(1) Lower Level (a) BOARD ROOM 001; AV ROOM 002 - EQUIPMENT	$80,698.39
(1) Lower Level (a) BOARD ROOM 001; AV ROOM 002 - INSTALLATION	$26,775.00
(ii) Optional Alternate Request I: Recording Solution - EQUIPMENT & INSTALLATION	$29,409.00
(iii) Optional Alternate Request II: Automation & IP Control Setup or Secondary Control Workstation - EQUIPMENT	$4,034.08
(iii) Optional Alternate Request II: Automation & IP Control Setup or Secondary Control Workstation - INSTALLATION	$4,050.00
(c) ACTIVITY SPACE 031, ACTIVITY SPACE 032, ACTIVITY SPACE 033, ACTIVITY SPACE 034, ACTIVITY SPACE 035 - EQUIPMENT	$14,977.43

P: (248) 289-8500 E: jhanse@mdisnow.com W: www.mdisnow.com

Quote Summary

Description	Amount
(c) ACTIVITY SPACE 031, ACTIVITY SPACE 032, ACTIVITY SPACE 033, ACTIVITY SPACE 034, ACTIVITY SPACE 035 - INSTALLATION	$12,240.00
iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - EQUIPMENT	$13,883.76
iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - INSTALLATION	$6,885.00
iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - EQUIPMENT	$50,314.26
iii) SMALL SPACES AUDIOVISUAL (1) Upper Level - INSTALLATION	$15,682.50
TOWN HALL BOND COST	$12,667.31
Total:	**$434,911.08**

Interest at 1.25% per month will be charged on overdue balances
25% restock fee
No returns on special order items
Additional add-ons will be billed as parts & labor @ $150.00/hr

Metro Detroit Integrated Systems

Signature:

Name: Jason Hanse

Title: Account Manager

Date: 11/18/2024

White Lake Township

Signature:

Name: Patricia Pergament

Date:

P: (248) 289-8500 E: jhanse@mdisnow.com W: www.mdisnow.com

Appendix

Payment Terms

- **See detailed document outlining MDIS's Payment Terms - "*The 50/50/50/50"***

Terms & Conditions

- Interest at 1.25% per month will be charged on overdue balances.
- 25% restock fee may apply.
- No returns on special order items.
- Additional add-ons will be billed as parts and labor @ $150 hour.
- Quote sub components are interdependent and not severable without approval by MDIS.

Note to Recipient

- Please mail all payments to **4921 Leafdale Blvd. Royal Oak, MI 48073-1020**
- 3.5% Processing Fee will be added if paying by credit card.
- Thank you for choosing MDIS!

SECTION 8:

PAYMENT TERMS

MDIS Payment Terms - *"The 50/50/50/50"*

MDIS shall, as a condition precedent to its right to receive any payment, submit to the Charter Township of White Lake an application for payment along with all necessary receipts, vouchers, and other documentation to establish payment for labor and materials and to confirm the absence of any liens or other claims on the property, work, or funds related to the Work.

Required documentation may include:

1. MDIS's sworn statement.
2. MDIS's partial or final waiver of lien.

PAYMENT SHALL FOLLOW THE TERMS OUTLINED BELOW:

For **Equipment:**

- The **first 50%** of the total equipment cost shall be due upon contract execution. This deposit enables MDIS to procure and allocate the necessary materials to begin the project.
- The **final 50%** shall be due upon MDIS's receipt of and secure storage of all equipment, supported by documentation such as proof of insurance, receipts, bills of lading, photographs, and other items necessary to confirm delivery and proper storage.

For **Labor**:

- The **first 50%** of the total labor cost shall be due thirty (30) days prior to the start of onsite installation.
- The **final 50%** shall be due upon project completion, which includes the successful resolution of any punch list items, delivery of as-built documentation, training provided to the owner, and receipt of the Owner's written approval confirming system handoff.

FULL CREDIT FOR MDIS DESIGN SERVICES *(IF APPLICABLE)*

Clients who have purchased MDIS design services, will be eligible for **FULL 100% CREDIT FOR ALL DESIGN SERVICES RENDERED**, applied as a discount to their final invoice, if the project is awarded to MDIS.

CONDITIONS FOR PAYMENT:

Payment by the Charter Township of White Lake shall be contingent upon:

- Submission of required documentation, including lien waivers, as outlined above.
- Inspections conducted to verify the Work has been completed according to contract specifications.
- Approval of Work by the Owner.

Payments do not constitute a waiver of any defects or relieve MDIS from their obligation to correct defective Work. Issuance of the final payment does not waive the Township's rights to address any defects or incomplete Work discovered after payment.

The final payment for Work shall be made only after:

1. MDIS has fully performed all obligations under the contract.
2. All Work has been inspected and approved by the Charter Township of White Lake.
3. All required waivers and documentation have been submitted.

RIGHT TO WITHHOLD PAYMENTS:

The Charter Township of White Lake reserves the right to withhold any payment if reasonably necessary to address:

- Defective or non-conforming Work.
- Claims, liens, or disputes with subcontractors or third parties.
- Damage or liabilities caused by MDIS.
- MDIS's failure to meet contractual obligations.

Funds withheld may be applied to offset costs, damages, or liabilities incurred by the Township as a result of MDIS's actions or omissions.

SECTION 9:

REQUIRED INSURANCE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 11/14/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Shelly Lockaby	
The Salvati Insurance Group, Inc. 42370 Van Dyke Avenue Suite 711 Sterling Heights MI 48314	PHONE (A/C, No, Ext): (248) 720-1130	FAX (A/C, No): (586) 863-1979
	E-MAIL ADDRESS: slockaby tsig1.com	

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Michigan Millers Insurance Company	14508
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED

Metro Detroit Integrated Systems LLC Dba Mdis
4921 Leafdale Blvd
Royal Oak MI 48073

COVERAGES **CERTIFICATE NUMBER:** Master 24-25 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY X PRO-JECT LOC OTHER:	Y		C0127835	10/03/2024	10/03/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	1,000,000 100,000 5,000 1,000,000 2,000,000 2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY HIRED AUTOS ONLY SCHEDULED AUTOS NON-OWNED AUTOS ONLY			V0106156	10/03/2024	10/03/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Uninsured motorist	1,000,000 1,000,000
A	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION 10,000	Y		V0106156	10/03/2024	10/03/2025	EACH OCCURRENCE AGGREGATE	5,000,000 5,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		W0118538	10/03/2024	10/03/2025	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 500,000 500,000 500,000
A	Property Insurance			C0127835	10/03/2024	10/03/2025	BPP Equipment	266,772 493,550

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Project: White Lake Township Hall Building
2025 Civic Center Drive
White Lake Township, MI 48383, all elected
and appointed officials, all employees and volunteers, agents, all boards, commissions,
and/or authorities and board members, including employees and volunteers thereof are Additional Insured on a primary and non-contributory basis to any other insurance the Client may have. Thirty (30) days, Ten (10) days for non-payment of premium, Advance Written Notice of Cancellation, Non-Renewal, Reduction, and/or Material Change shall be sent to: White Lake Township, Attention: Patricia Pergament

CERTIFICATE HOLDER

White Lake Township
7525 Highland Road
White Lake MI 48383

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – SCHEDULED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name of Person or Organization:
ANY PERSON OR ORGANIZATION THAT YOU ARE REQUIRED TO ADD AS ADDITIONAL INSURED TO THIS POLICY BY WRITTEN CONTRACT OR AGREEMENT

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

Who Is An Insured (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of your ongoing operations performed for that insured.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – COMPLETED OPERATIONS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)	Location And Description Of Completed Operations
ANY PERSON OR ORGANIZATION THAT YOU ARE REQUIRED TO ADD AS ADD'L INS TO THIS POLICY BY WRITTEN CONTRACT OR AGRMT	
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. **Section II – Who Is An Insured** is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work" at the location designated and described in the Schedule of this endorsement performed for that additional insured and included in the "products-completed operations hazard".

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

CHANGES - AMENDMENT OF CANCELLATION PROVISIONS

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE PART
COMMERCIAL GENERAL LIABILITY COVERAGE PART
COMMERCIAL INLAND MARINE COVERAGE PART
LIQUOR LIABILITY COVERAGE PART
COMMERCIAL LIABILITY UMBRELLA COVERAGE PART
COMMERCIAL PROPERTY COVERAGE PART
COMMERCIAL UMBRELLA LIABILITY PART

In the event of cancellation of this policy, we agree to mail prior written notice of cancellation to:

SCHEDULE

1. Name: White Lake Township ATTN: Patricia Pergament.

2. Address: 7525 Highland Road
White Lake, MI 48383

We reserve the right to cancel the policy as permitted by policy terms and conditions. We will give the same advance notice of cancellation to the person(s) or organization(s) shown in the schedule above as we give to the Named Insured shown in the Declarations unless indicated differently below.

30 Number of days except for non-payment of premium. Policy terms and conditions apply for non-payment of premium.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

COMMERCIAL GENERAL LIABILITY PAK

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE FORM (CG 00 01)

SUMMARY OF COVERAGES

Description	Limit of Insurance	Page
Additional Insured - Broad Form Vendors	Included	4
Additional Insured - Lessor of Leased Equipment	Included	4
Additional Insured - Managers or Lessors of Premises	Included	4
Additional Insured - State or Political Subdivisions - Permits	Included	4
Additional Insured - Volunteers	Included	5
Additional Insureds by Written Contract	Included	3
Broad Form Named Insured	Included	3
Broad Form Property Damage	$25,000 Per Occurrence	2
Broad Knowledge / Notice of Occurrence	Included	6
Damage To Premises Rented to You	$300,000 Any One Premises	2
Incidental Medical Malpractice Liability	Included	6
Liberalization	Included	7
Medical and Dental Payments	$10,000 Medical Expense Limit	2
Mental Anguish	Included	6
Mobile Equipment	Included	6
Newly Acquired Organizations	Included	3
Non-Owned Watercraft	51 feet	1
Personal Injury and Advertising Injury Redefined	Included	7
Property Damage Liability - Borrowed Equipment	$25,000 Occurrence / $50,000 Aggregate	3
Property Damage Liability - Elevator and Sidetrack Agreement	Included	2
Supplementary Payments Increased Limits		
Bail Bonds	$2,500	2
Loss of Earnings per Day	$1,000	2
Waiver of Transfer of Rights Of Recovery Against Others to Us	Included	6

The terms and conditions of this policy are amended as indicated below:

I. Non-Owned Watercraft

SECTION I - COVERAGES, COVERAGE A. BODILY INJURY AND PROPERTY DAMAGE, Exclusion **2.g.(2)** is revised as follows:

This exclusion does not apply to:

(2) A watercraft you do not own that is:

(a) Less than 51 feet long; and

(b) Not being used to carry persons or property for a charge;

This provision applies to any person, who with your expressed or implied consent, either uses or is responsible for the use of the watercraft.

This provision does not apply if the insured has any other insurance for "bodily injury" or "property damage" liability that would also be covered under this provision, whether the other insurance is primary, excess, contingent or on any other basis. In that case, this provision does not provide any insurance.

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II. Damage To Premises Rented To You

Under **SECTION I - COVERAGES, COVERAGE A. BODILY INJURY AND PROPERTY DAMAGE,** the last paragraph of **2.** is deleted and replaced with the following:

Exclusions **c.** through **n.** do not apply to "Property Damage" to the premises while rented to you or temporarily occupied by you with permission of the owner. A separate Damage To Premises Rented To You Limit of Insurance applies to this coverage which is the greater of:

a. The Damage To Premises Rented To You Limit for Each Occurrence shown in the Declarations; or
b. $300,000

Under **Section III - LIMITS OF INSURANCE,** paragraph **6.** does not apply.

III. Supplementary Payments

SECTION I - COVERAGES, SUPPLEMENTARY PAYMENTS - COVERAGES A & B, is revised as follows:

1. In paragraph **2.**, the limit of $250 for bail bonds is increased to $2,500.
2. In paragraph **4.**, the limit of $250 for daily loss of earnings is increased to $1,000.

IV. Medical And Dental Payments

Under **SECTION I - COVERAGES, COVERAGE C. MEDICAL PAYMENTS,** if **COVERAGE C. MEDICAL PAYMENTS,** is not otherwise excluded from this Coverage Part:

1. The Medical Payments Limit is changed to the greater of:

a. $10,000; or
b. The Medical Expenses Limit shown in the Declarations of this Coverage Part.

2. The provision, in **C. 1.a.(2)** that the expenses must be incurred and reported to us within one year of the date of the accident, is increased to three years.

V. Broad Form Property Damage

Under **SECTION I - COVERAGE A**, Exclusion **2.j.** is amended as follows:

1. Paragraph **(3)** does not apply.
2. Paragraphs **(4)** and **(6)** do not apply to customer's property at your described premises.

We do not cover any property:

1. Subject to motor vehicle registration; or
2. While being used to perform construction operations.

Our limit for any one "occurrence" under this coverage provision is $25,000.

The insurance afforded by reason of this provision is excess over any valid and collectible property insurance (including any deductible) available to the insured, and **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS 4.** Other Insurance is changed accordingly.

VI. Property Damage Liability - Elevators And Sidetrack Agreements

The following is added under **SECTION I - COVERAGES, COVERAGE A. BODILY INJURY AND PROPERTY DAMAGE LIABILITY:**

1. Exclusions **j. (3), (4)** and **(6)** do not apply to the use of elevators.
2. Exclusion **k.** does not apply to:

a. The use of elevators; or
b. Liability assumed under a sidetrack agreement.

The insurance afforded by reason of this provision is excess over any valid and collectible property insurance (including any deductible) available to the insured, and **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS 4. Other Insurance** is changed accordingly.

VII. Property Damage Liability - Borrowed Equipment

The following is added to Exclusion **j.** under **Coverage A.** (Section I):

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Paragraph **(4)** of this exclusion does not apply to equipment which you borrow unless the "property damage" occurs while such equipment is being used by an insured at a job site.

Subject to all of the terms of **SECTION III - LIMITS OF INSURANCE**, the maximum limit in any one occurrence is $25,000 and an annual aggregate of $50,000.

This insurance afforded by reason of this provision is excess over any valid and collectible property insurance (including any deductible) available to you, and **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS 4.** Other Insurance is changed accordingly.

VIII. Broad Form Named Insured

The following is added under **SECTION II - WHO IS AN INSURED**:

1.e. An organization other than a partnership, joint venture or limited liability company, any of your subsidiary companies or any company over which you exercise control and actively manage and to which other insurance does not apply are an insured.

IX. Newly Acquired Organizations

Under **SECTION II - WHO IS AN INSURED**, **4**. is deleted and replaced with the following:

1. If you are an organization other than a partnership, joint venture, or limited liability company, any organization you newly acquire or form over which you maintain ownership or majority interest, exercise control and actively manage and to which no other similar insurance is available is a named insured. However:

a. Coverage A does not apply to "bodily injury" or "property damage" that occurred before you acquired or formed the organization; and
b. Coverage B does not apply to "personal and advertising injury" arising out of an offense committed before you acquired or formed the organization.

X. Additional Insureds By Written Contract

A. SECTION II - WHO IS AN INSURED is amended to include as an additional insured any person or organization that you are required to add as an additional insured to this policy by a written contract or written agreement that is:

1. Currently in effect or becoming effective during the term of this policy; and
2. Executed prior to the "bodily injury", "property damage", "personal and advertising injury".

B. The insurance provided to the additional insured applies as follows:

1. That person or organization is only an additional insured with respect to liability caused by your negligent acts or omissions at or from:

(a) Premises you own, rent, lease, or occupy or
(b) Your ongoing operations performed for the additional insured at the job indicated by written contract or agreement.

2. The limits of insurance applicable to the additional insured are those specified in the written contract or agreement or in the Declarations of this policy whichever is less. These limits of insurance are inclusive of and not in addition to the limits shown in the Declarations.

C. Section IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, under 4. other insurance, is amended as follows:

The following is added to this provision:

1. Regardless of whether other insurance is available to an additional insured on a primary basis, this insurance will be primary and noncontributory if a written contract between you and the additional insured specifically requires that this insurance is primary.

D. With respect to the insurance afforded these additional insureds, the following additional insured exclusion applies:

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1. If the additional insured is an architect, engineer, or surveyor, this insurance does not apply to "bodily injury", "property damage", "personal and advertising injury" arising out of the rendering of or the failure to render any professional services by or for you, including:

   (a) The preparing, approving, or failing to prepare or approve maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings, designs or specifications; or
   (b) Supervisory, inspection, architectural or engineering activities.

2. The insurance afforded the additional insured does not apply to:

   (a) "Bodily injury" or "property damage" occurring after:

      (1) All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on the behalf of the additional insured(s) at the site of the covered operations has been completed; or
      (2) That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than the contractor or subcontractor engaged in performing operations for a principal as part of the same project.

XI. Additional Insured - State or Political Subdivisions - Permits

The following is added to **SECTION II - WHO IS AN INSURED:**

1. Any state or political subdivision which has issued a permit to you, subject to the following provisions:

   a. This insurance applies only with respect to operations performed by you or on your behalf for which the state, governmental agency or political subdivision has issued a permit or authorization.
   b. This insurance does not apply to:

      (1) "Bodily injury", "property damage", "personal and advertising injury" arising out of operations performed for the federal government, state or municipality; or
      (2) "Bodily injury' or "property damage" included within the "products-completed operations hazard".

XII. Additional Insured - Managers Or Lessors of Premises

The following is added to **SECTION II - WHO IS AN INSURED:**

1. Any manager or lessor of premises shown in the Declarations is also an insured, but only with respect to liability arising out of the ownership, maintenance or use of that part of the premises leased to you and shown in the Declarations and subject to the following additional exclusions:

The following exclusions are added:

1. This insurance does not apply to:

   a. Any "occurrence" which takes place after you cease to be a tenant in that premises.
   b. Structural alterations, new construction or demolition operations performed by or on behalf of any manager or lessor of premises shown in the Declarations.

XIII. Additional Insured - Lessor of Leased Equipment

The following is added to **SECTION II - WHO IS AN INSURED:**

1. The person(s) or organization(s) who leases equipment to you for use in your business is also an insured, but only with respect to liability for "bodily injury", "property damage", "personal and advertising injury" caused, in whole or in part, by your maintenance, operation or use of equipment leased to you by such person(s) or organization(s).

With respect to the insurance afforded to these additional insureds, this insurance does not apply to any "occurrence" which takes place after the equipment lease expires.

XIV. Additional Insured - Broad Form Vendors

The following is added to **SECTION II - WHO IS AN INSURED:**

1. Any person(s) or organization(s) (referred to below as vendor) with whom you agreed, because of a written contract or agreement to provide insurance is also an additional insured, but only with respect to "bodily injury" or "property damage" arising out of "your products" which are distributed or sold in the regular course of a vendor's business, subject to the following additional exclusions:

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a. The insurance afforded the vendor does not apply to:

(1) "Bodily injury" or "property damage" for which the vendor is obligated to pay damages by reason of the assumption of liability in a contract or agreement. This exclusion does not apply to liability for damages that the vendor would have in the absence of the contract or agreement;
(2) Any express warranty unauthorized by you;
(3) Any physical or chemical change in the product made intentionally by the vendor;
(4) Repackaging, except when unpacked solely for the purpose of inspection; demonstration, testing, or the substitution of parts under instructions from the manufacturer, and then repackaged in the original container;
(5) Any failure to make such inspections, adjustments, tests, or servicing as the vendor has agreed to make or normally undertakes to make in the usual course of business, in connection with the distribution or sale of the products;
(6) Demonstration, installation, servicing or repair operations, except such operations performed at the vendor's premises in connection with the sale of the product.
(7) Products which, after distribution or sale by you, have been labeled or relabeled or used as a container, part or ingredient of any other thing or substance by or for the vendor; or
(8) "Bodily injury" or "property damage" arising out of the sole negligence of the vendor for its own acts or omissions or those of its employees or anyone else acting on its behalf. However, this exclusion does not apply to:
(a) The exceptions contained in Sub-Paragraphs **(4)** or **(6)**; or
(b) Such inspections, adjustments, tests or servicing as the vendor has agreed to make or normally undertakes to make in the usual course of business, in connection with the distribution or sale of the products.

b. This insurance does not apply to any insured person or organization, from whom you have acquired such products, or any ingredient, part or container, entering into, accompanying or containing such products.
c. This provision does not apply to any vendor included as an insured by an endorsement issued by us and made part of the Coverage Part.
d. This provision does not apply if "bodily injury" or "property damage" included within the "products-complete hazards" is excluded either by the provisions of the Coverage Part or by endorsement.

XV. Additional Insured - Volunteers

A. Under **SECTION II - WHO IS AN INSURED** is amended to include as an insured any person(s) who are "volunteer worker(s)" for you only while performing duties related to the conduct of your business.

However, no "volunteer worker(s)" are insureds for:

(1) "Bodily injury," "property damage," "personal and advertising injury" arising out of rendering or the failure to render professional services by a "volunteer worker".
(2) "Bodily injury", "personal and advertising injury":
(a) To you, to your partners or members (if you are a partnership or joint venture), to your members (if you are a limited liability company), to a "employee" while in the course of his or her employment or performing duties related to the conduct of your business, or to other "volunteer worker(s)" while performing duties related to the conduct of your business;
(b) To the spouse, child, parent, brother or sister of that "employee" or "volunteer worker" as a consequence of paragraph **(2)(a)** above; or
(c) For which there is any obligation to share damages with or repay someone else who must pay damages because of the injury described in Paragraphs **(2)(a)** or **(b)** above.
(3) "Property damage" to property:
(a) Owned, occupied or used by,
(b) Rented to, in the care, custody or control of, or over which physical control is being exercised for any purpose by you, any of your "employees", "volunteer workers", any partner or member (if you are a partnership or joint venture), any member (if you are a limited liability company).

B. Exclusion **2. a.** of **Coverage C** (Section I) is replaced by the following:

2. a. To any insured, except "volunteer workers".

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C. "Volunteer worker(s)" means a person(s) who is not your "employee", and who donates his or her work and acts at the direction of and within the scope of duties determined by you, and is not paid a fee, salary or other compensation by you or anyone else for their work performed for you.

XVI. Incidental Medical Malpractice Liability

SECTION II - WHO IS AN INSURED is amended to add the following paragraph:

However, Part **2.a.(1)(d)** does not apply to employed nurses or other employees, excluding physicians or medical doctors, who provide incidental health care services within the scope of their employment by you.

XVII. Broad Knowledge/Notice Of Occurrence

The following is added under **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS:**

The requirement in condition **2.a.** that you must see to it that we are notified of an "occurrence" or offense applies only when the "occurrence" or offense is known to:

1. You, if you are an individual;
2. A partner, if you are a partnership;
3. A member, if you are a joint venture;
4. An "Executive Officer" or insurance manager, if you are a corporation; or
5. A member, if you are a limited liability company.

The requirement in condition **2.b.** that you must see to it that we receive notice of a claim or "suit" will not be considered breached unless the breach occurs after such claim or "suit" is known to:

1. You, if you are an individual;
2. A partner, if you are a partnership;
3. A member, if you are a joint venture;
4. An "Executive Officer" or insurance manager, if you are a corporation; or
5. A member, if you are a limited liability company.

If you report an accident to your Workers' Compensation insurance carrier which later develops into a liability occurrence, coverage for which is provided by this policy, failure to report such occurrence to us at the time of the accident shall not be a violation of the notification of loss condition in this policy (**Condition 2. in Section IV**). It is understood and agreed, however, that you shall give notification of such occurrence to us as soon as you are made aware of the fact that the particular accident has developed into a liability claim.

XVIII. Waiver Of Transfer Of Rights Of Recovery Against Others To Us

Under **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS,** the paragraph **8. Transfer of Rights of Recovery Against Others To Us** condition is amended by the addition of the following:

We waive any right of recovery we may have against a person or organization because of payments we make for injury or damage arising out of your ongoing operations or "your work" done under a contract with that person or organization and include in the "products - completed operations hazard" when you have waived such right of recovery under a written contract with that person or organization. Such written contract must be:

1. Currently in effect or becoming effective during the term of this policy; and
2. Executed prior to the "bodily injury", "property damage", "personal and advertising injury"; or
3. Executed after "bodily injury", "property damage", "personal and advertising injury" if:
   a. The terms and conditions of the written contract or written agreement had been agreed upon prior to the "bodily injury", "property damage", "personal and advertising injury"; and
   b. The insured can definitively establish that the terms and conditions of the written contract or written agreement ultimately executed are the same as those which had been agreed upon prior to the "bodily injury", "property damage", "personal and advertising injury".

XIX. Mental Anguish

The definition of "bodily injury" in **SECTION V - DEFINITIONS** is replaced by the following:

3. "Bodily injury" means bodily injury, sickness or disease sustained by a person, including mental anguish or death resulting from any of these at any time.

XX. Mobile Equipment

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The following is added under **SECTION V - DEFINITIONS, 12. "Mobile Equipment":**

Paragraph **f.(1)** does not apply to self-propelled vehicles of less than 1,000 pounds gross vehicle weight.

XXI. Personal and Advertising Injury

SECTION V - DEFINITIONS, "Personal and advertising injury" **d.** & **e** are deleted and replaced by the following:

d. Oral or written publication, in any manner, of material that slanders or libels a person or organization or disparages a person's or organization's goods, products or services;
e. Oral or written publication, in any manner, of material that violates a person's right of privacy;

XXII. Liberalization

With respect to coverage provided by this endorsement, if we adopt any revisions that would broaden the coverage under this endorsement without additional premium, the broadened coverage will apply to this policy. It will apply when the change becomes effective in your state.

All policy provisions not in conflict with this endorsement shall continue to apply. This endorsement is a valid part of the policy when the form number is shown on the declarations.

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THE Salvati INSURANCE GROUP

Toll Free: (888) 644-6398
Fax: (586) 863-1979
Email: Thomas@Salvati-Insurance.com
Website: www.Salvati-Insurance.com

November 14, 2024

RE: Metro Detroit Integrated Systems LLC

4921 Leafdale Blvd

Royal Oak MI 48073

Please be advised that the above reference insured has been a client for approximately 10 years in excellent standing with no issues or concerns. I see no issues with them complying with Exhibit E and the policy has been endorsed accordingly per the contract terms regarding the below projects:

White Lake Township Hall Building:

2025 Civic Center Drive

White Lake Township, MI 48383

White Lake Public Services Building:

10911 Elizabeth Lake Rd

White Lake, MI 48383

Feel free to contact me with any questions.

Sincerely,

Shelly Lockaby
Account Manager
248-720-1130
slockaby@tsig1.com

SECTION 10:

BID BOND

Bond No. N/A

BID BOND

The American Institute of Architects,
AIA Document No. A310 (February, 1970 Edition)

KNOW ALL MEN BY THESE PRESENTS, that we Metro Detroit Integrated Systems, LLC
4921 Leafdale Blvd.
Royal Oak, MI 48073

as Principal hereinafter called the Principal, and Old Republic Insurance Company

a corporation duly organized under the laws of the state of Pennsylvania as Surety, hereinafter called the Surety, are held and firmly bound unto White Lake Township
7525 Highland Road
White Lake, MI 48383

as Obligee, hereinafter called the Obligee, in the sum of Five Percent of the Attached Bid**********
****

Dollars ($ 5% of attached bid***), for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for White Lake Township Hall
Low Voltage: Data/Fiber Cabling & Audio-Visual Services

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this 18th day of November, 2024

Witness

Metro Detroit Integrated Systems, LLC
Principal (Seal)

By: _____
Name/Title

Witness

Old Republic Insurance Company
Surety (Seal)

By: Cheryl Hughes
Cheryl Hughes
Attorney-in-Fact

ORSC 21328 (5/97)

OLD REPUBLIC INSURANCE COMPANY

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That OLD REPUBLIC INSURANCE COMPANY, a Pennsylvania stock insurance corporation, does make, constitute and appoint:

BARRY W. BERMAN CHERYL HUGHES

of NOVI, MI

its true and lawful Attorney(s)-in-Fact, with full power and authority for and on behalf of the Company as surety, to execute and deliver and affix the seal of the Company thereto (if a seal is required), bonds, undertakings, recognizances or other written obligations in the nature thereof, (other than self-insurance workers compensation bonds guaranteeing payment of benefits, or black lung bonds), as follows:

ALL WRITTEN INSTRUMENTS

and to bind OLD REPUBLIC INSURANCE COMPANY thereby, and all of the acts of said Attorneys-in-Fact, pursuant to these presents, are ratified and confirmed. This appointment is made under and by authority of the board of directors at a meeting held on December 10, 2019. This Power of Attorney is signed and sealed by facsimile under and by the authority of the following resolutions adopted by the board of directors of the OLD REPUBLIC INSURANCE COMPANY on December 10, 2019.

RESOLVED FURTHER, that the chairman, president or any vice president of the Company's surety division, in conjunction with the secretary or any assistant secretary of the Company, be and hereby are authorized and directed to execute and deliver, to such persons as such officers of the Company may deem appropriate, Powers of Attorney in the form presented to and attached to the minutes of this meeting, authorizing such persons to execute and deliver and affix the seal of the Company to bonds, undertakings, recognizances, and suretyship obligations of all kinds, other than bail bonds, bank depository bonds, mortgage deficiency bonds, mortgage guaranty bonds, guarantees of installment paper and not guaranty bonds. The said officers may revoke any Power of Attorney previously granted to any such person.

RESOLVED FURTHER that any bond, undertaking, recognizance, or suretyship obligation shall be valid and binding upon the Company

(i) when signed by chairmen, president or any vice president of the Company's surety division and attested and sealed (if a seal be required) by any secretary or assistant secretary; or

(ii) when signed by a duly authorized Attorney-in-Fact and sealed with the seal of the Company (if a seal be required).

RESOLVED FURTHER, that the signature of any officer designated above, and the seal of the Company, may be affixed by facsimile to any Power of Attorney or certification thereof authorizing the execution and delivery of any bond, undertaking, recognizance, or other suretyship obligations of the Company, and such signature and seal when so used shall have the same force and effect as though manually affixed.

IN WITNESS WHEREOF, OLD REPUBLIC INSURANCE COMPANY has caused these presents to be signed by its proper officer, and its corporate seal to be affixed this 3rd day of October, 2023.

OLD REPUBLIC INSURANCE COMPANY

Karen J. Haffner
Assistant Secretary

Alan Pavlic
Vice President

STATE OF WISCONSIN, COUNTY OF WAUKESHA - SS

On this 3rd day of October, 2023, personally came before me, Alan Pavlic and Karen J. Haffner, to me known to be the individuals and officers of the OLD REPUBLIC INSURANCE COMPANY who executed the above instrument, and they each acknowledged the execution of the same, and being by me duly sworn, did severally depose and say: that they are the said officers of the corporation aforesaid, and that the seal affixed to the above instrument is the seal of the corporation, and that said corporate seal and their signatures as such officers were duly affixed and subscribed to the said instrument by the authority of the board of directors of said organization.

Kathryn R. Pearson
Notary Public

My Commission Expires: September 28, 2026

(Expiration of notary's commission does not invalidate this instrument)

CERTIFICATE

I, the undersigned, assistant secretary of the OLD REPUBLIC INSURANCE COMPANY, a Pennsylvania corporation, CERTIFY that the foregoing and attached Power of Attorney remains in full force and has not been revoked; and furthermore, that the Resolutions of the board of directors set forth in the Power of Attorney, are now in force.

Signed and sealed at the City of Brookfield, WI this 18th day of November, 2024.

Karen J. Haffner
Assistant Secretary

46-5186

ORSC 11008 (6-93)

CONSTRUCTION BONDING SPECIALISTS, LLC.

CBS – Construction Bonding Specialists, LLC
29445 Beck Road, Suite A-209, Wixom, MI 48393
Phone No. (248) 349-6227 Fax: (248) 348-6762

RETURN TO: Barry Berman
Construction Bonding Specialists, LLC.
Fax: (248) 348-6762

BID RESULTS FORM

Please complete and return (fax or mail) to Construction Bonding Specialists, LLC within seven (7) days of the bid opening to release the bid bond. *Release of the bid bond will also constitute release of the associated collateral and bonding capacity availability*.

BOND NO: N/A

CONTRACTOR NAME: Metro Detroit Integrated Systems, LLC

PROJECT NAME: White Lake Township Hall - Low Voltage: Data/Fiber Cabling & Audio-Visual Services

OBLIGEE: White Lake Township

DATE OF BID: 11/18/2024

THREE LOWEST BIDDERS:

1._____ BID AMOUNT: $_____
2._____ BID AMOUNT: $_____
3._____ BID AMOUNT: $_____

Contractor's Bid Amount: $_____

Form Completed By: _____
Company Name: _____
Date: _____

SECTION 11:

PRODUCT DATASHEETS

FlexFusion™ Cabinets

PANDUIT®
SPECIFICATION SHEET

specifications

FlexFusion Cabinets shall consist of a welded and assembled steel frame construction available in 600mm, 700mm, and 800mm widths, 1070mm and 1200mm depths and 42 RU, 45 RU, 48 RU, and 52 RU heights. The top of cabinet shall be available with either molded edge protection and snap-in covers for CoolBoot® Grommet Cable Seal or brush cable seal and rear lift-up lid for PDU cable lay-in. Fully adjustable front and rear cage nut equipment rails. Available options includes front single hinged door and rear split-hinged doors with 80% open perforation, horizontally split side panels, cable management fingers, vertical cable manager bracket, PDU mounting bracket and casters. The entire cabinet shall be electrically bonded without the use of bonding wires. Cabinet shall have a 1591kg (3500 lbs.) static load rating and 1136kg (2500 lbs.) rolling load rating.

PANDUIT FlexFusion™

technical information

Available cabinet sizes:	Height	42, 45, 48, or 52 RU
	Width (mm)	600, 700, or 800
	Depth (mm)	1070 or 1200
Material:	Steel with durable Black or White polyester epoxy powder coat finish	
Compliance:	EIA/ECA-310-E, TIA/EIA-942, UL2416	
Packaging:	Cabinets ships assembled, one per pallet	

key features and benefits

Performance	Best-in-class static load rating of 3,500 lbs. and 2,500 lbs. rolling load is the result of a sturdy and robust cabinet design that safely allows housing of heavier and high-density equipment. 80% open perforated doors assures maximum airflow thru the cabinet for high thermal application.
Rapid Deployment	Easy to adjust equipment rails with choice of time saving tool-less or standard hardware fastener, tool-less vertical cable manager bracket, and tool-less top cap rear entry allows for a faster cabinet installation time than other cabinets
Versatility	Cabinet is available in wide range of sizes and options for hot aisle/cold aisle or thermal containment deployment
Scalability	Configure to order platform to achieve the cabinet to your specification and save time and reduce Capex in your network deployment
Bonding	Cabinets and accessories are integrally bonded without the use of grounding wires to provide a safe and reliable network while reducing installation costs
Durable coating	Cabinets are powder coated in a durable, low maintenance polyester epoxy paint available in Black (RAL9005) or White (RAL9003)

applications

FlexFusion Cabinets are ideal for network or server equipment that provides maximum flexibility and the capacity to manage high cable density in data center, enterprise or co-location deployment. Safely houses 19" rack mount IT equipment in an indoor environment, provides extensive cable management options and thermal efficient cabinet.

cabinet options

Features	Options to Choose From
Equipment Rails (cage nut)	Tool-less or hardware fastener
Top Cap Seal	Brush Seal or CoolBoot® Cover
Doors	Single Hinged Front/Split-Hinged Rear or None
Door Lock	Mechanical Keyed, 3-Digit Combo Keyed, SmartZone™ G5 Security Handle, HID w/Humidity Sensor, or HID/Keypad w/Humidity Sensor*
PDU Mounting Bracket	Left Side, Right Side, Both Sides, or None
Cable Management Fingers	Short (4"), Long (6"), or None
Vertical Cable Management Bracket	Left Side, Right Side, Both Sides, or None
Casters	Yes or No
PDU Included	Choice of several G5 PDU or None
Temperature and Door Sensor**	Yes or No
Side Panel Sensor**	Yes or No

*Requires Intelligent G5 PDU to control.

**Requires electronic handle.

Visit www.panduit.com/configure-cabinet to configure your FlexFusion™ Cabinet

configured cabinet

Series	Width	Height	Depth	Side Panels	Color	Cabinet Type	Configured Part Designator Based on Selected Options
XG	6 = 600mm 7 = 700mm 8 = 800mm	42 = 42 RU 45 = 45 RU 48 = 48 RU 52 = 52 RU	1 = 1070mm 2 = 1200mm	1 = Left Side Only 2 = Both Sides 3 = Right Side Only 9 = No Side Panels	B = Black W = White	S = Standard	xxxx

cabinet part number sample

Part Number	Width (mm)	Height (RU)	Depth (mm)	Side Panels	Color	Top Cap Type	Doors	PDU Mounting Bracket	Cable Management Fingers	Vertical Cable Manager Bracket	Casters	PDU Included
XG64212BS0001	600	42	1070	Both Sides	Black	Brush Seal	Yes	Left Side	No	No	Yes	No
XG64512BS0001	600	45	1070	Both Sides	Black	Brush Seal	Yes	Left Side	No	No	Yes	No
XG64822WS0003	600	48	1200	Both Sides	White	CoolBoot® Cover	Yes	Left Side	No	No	Yes	No
XG74519BS0002	700	45	1070	None	Black	Brush Seal	Yes	Left Side	Yes	No	Yes	No
XG74522BS0004	700	45	1200	Both Sides	Black	CoolBoot® Cover	Yes	Left Side	Yes	No	Yes	No
XG74822WS0001	700	48	1200	Both Sides	White	Brush Seal	Yes	Left Side	No	No	Yes	No
XG84212WS0003	800	42	1070	Both Sides	White	CoolBoot® Cover	Yes	Left Side	No	No	Yes	No
XG84522BS0005	800	45	1200	Both Sides	Black	Brush Seal	Yes	Both Sides	Yes	Left Side	Yes	No
XG84829BS0006	800	48	1200	None	Black	CoolBoot® Cover	Yes	Both Sides	Yes	Left Side	Yes	No

accessories

Replacement Door

Series	Type	Width	Height	Color
XG-DR	SH = Single Hinged Perforated SP = Split-Hinged Perforated	6 = 600mm 7 = 700mm 8 = 800mm	42 = 42 RU 45 = 45 RU 48 = 48 RU 52 = 52 RU	B = Black W = White

Examples:
XG-DRSH642W is a single door kit for 600mm wide, 42 RU, White cabinet.
XG-DRSH845B is a single door kit for 800mm wide, 45 RU, Black cabinet.
XG-DRSP845B is a split-hinged door kit for 800mm wide, 45 RU, Black cabinet.

Side Panels

Series	Type	Height	Depth	Color
XG-SP	FS = Full Set, 1 side	42 = 42 RU 45 = 45 RU 48 = 48 RU 52 = 52 RU	1 = 1070mm 2 = 1200mm	B = Black W = White

Examples:
XG-SPFS421W is a side panel kit for 42 RU, 1070mm deep, White cabinet.
XG-SPFS452B is a side panel kit for 45 RU, 1200mm deep, Black cabinet.
XG-SPFS482W is a side panel kit for 48 RU, 1200mm deep, White cabinet.

PDU Mounting Bracket

Part Number	Color
XG-PBRB	B = Black
XG-PBRW	W = White

Vertical Cable Management Panel

Series	Height	Color
XG-VCM	42 = 42 RU 45 = 45 RU 48 = 48 RU 52 = 52 RU	B = Black W = White

Examples:
XG-VCM42B is a vertical cable management panel for 42 RU, Black cabinet.
XG-VCM45B is a vertical cable management panel for 45 RU, Black cabinet.
XG-VCM48W is a vertical cable management panel for 48 RU, White cabinet.

Cable Management Finger

Series	Length	Cabinet Height	Color
XG-FM	S = Short (4 in.) L = Long (6 in.)	45 = 42 and 45 RU 48 = 48 RU 52 = 52 RU	B = Black W = White

Examples:
XG-FMS45B is a cable management finger kit for 42 RU and 45 RU, 4 in. long, Black color.
XG-FML45B is a cable management finger kit for 42 RU and 45 RU, 6 in. long, Black color.
XG-FML48W is a cable management finger kit for 48 RU, 6 in. long, White color.

Air Dam Seal Kit

Series	Width	Color
XG-ADS	6 = 600mm 7 = 700mm 8 = 800mm	B = Black W = White

Examples:
XG-ADS7W is a air dam seal kit for 700mm wide, White color cabinet.
XG-ADS8B is a air dam seal kit for 800mm wide, Black color cabinet.

Front to Back Cable Management Trough

Part Number	Color
XG-FTBB	B = Black
XG-FTBW	W = White

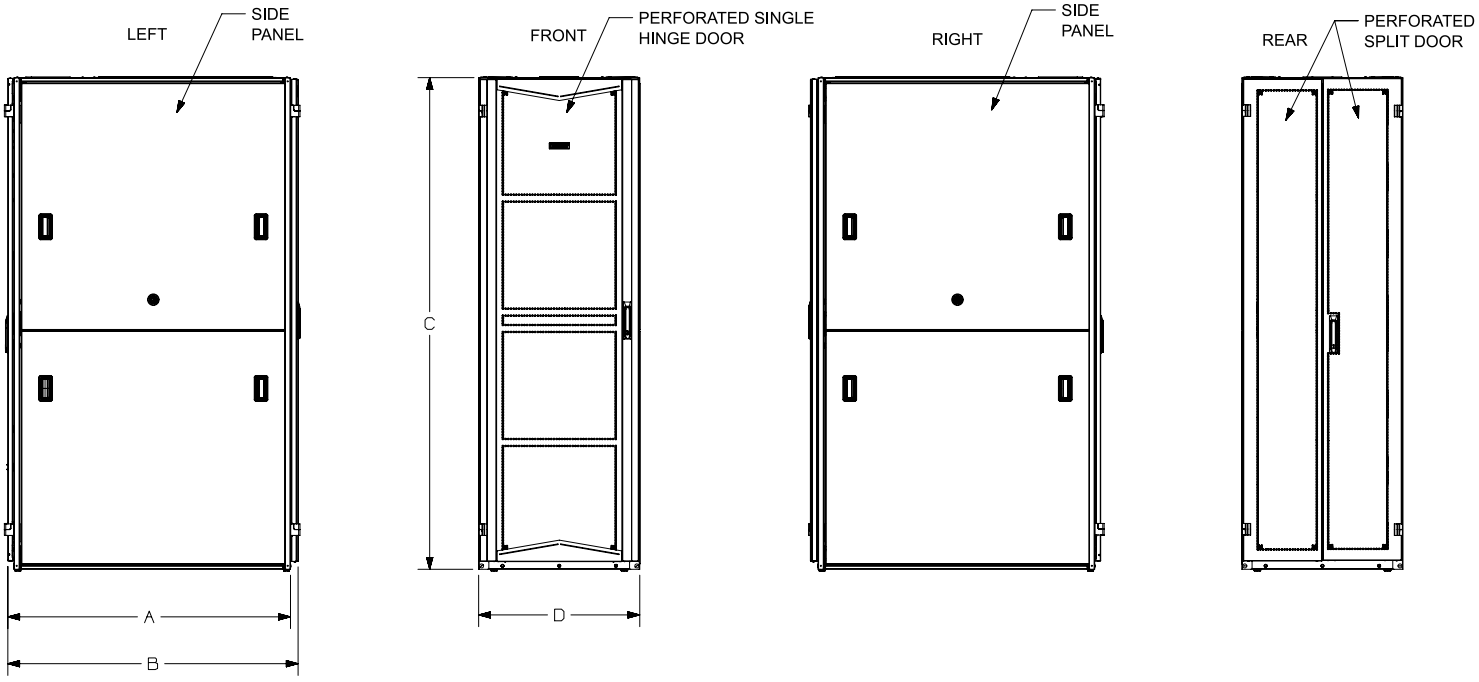
This kit is for either 700 or 800mm wide cabinets.

FlexFusion™ Cabinets

All cabinets include:

- Adjustable front and rear equipment rails
- Rail position markers
- Heavy-duty leveling legs
- Ganging brackets
- Standard floor mounting brackets
- 25 each M6 cage nuts and screws

cabinet dimensions



Dimension A	Dimension B	Dimension C*	Dimension D
1070mm (42.0")	1104mm (43.5")	42 RU - 2022mm (79.6") 45 RU - 2157mm (84.9") 48 RU - 2289mm (90.1") 52 RU - 2443mm (96.2")	600mm (23.6") 700mm (27.5") 800mm (31.4")
1200mm (48.0")	1254mm (49.4")		

*Cabinet height includes caster. Height of cabinet without caster and leveling legs fully retracted is 24mm (0.94") less.
**Casters are not included on 52 RU height cabinets. 52 RU height dimensions is without caster.

WORLDWIDE SUBSIDIARIES AND SALES OFFICES

PANDUIT US/CANADA
Phone: 800.777.3300

PANDUIT EUROPE LTD.
London, UK
Phone: 44.20.8601.7200

PANDUIT SINGAPORE PTE. LTD.
Republic of Singapore
Phone: 65.6305.7575

PANDUIT JAPAN
Tokyo, Japan
Phone: 81.3.6863.6000

PANDUIT LATIN AMERICA
Guadalajara, Mexico
Phone: 52.33.3777.6000

PANDUIT AUSTRALIA PTY. LTD.
Victoria, Australia
Phone: 61.3.9794.9020

For a copy of Panduit product warranties, log on to www.panduit.com/warranty

For more information
Visit us at www.panduit.com/flexfusion
Contact Customer Service by email: cs@panduit.com
or by phone: 800.777.3300

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RKSP195--WW-ENG
8/2022

2-Post Standard Equipment Rack

PANDUIT®
SPECIFICATION SHEET

specifications

The data equipment rack shall meet EIA-310E standards and be constructed of extruded aluminum or steel capable of accepting 19" wide EIA equipment. The telecommunications rack shall be constructed of extruded aluminum and capable of accepting 23" wide telecommunications equipment. Rack construction method shall ensure an electrically-bonded structure for ease of grounding. The 3" channel rack shall be UL listed for 1000 lbs. load rating and the 6" channel rack shall be UL listed for 1500 lbs. load rating. The equipment mounting rails shall be double-sided #12-24 EIA universal mounting hole spacing. The equipment mounting rails shall include printed rack space identification on the front and back and be numbered up. The channel of the rack shall be capable of mounting NetRunner™ or PatchRunner™ 2 Vertical Cable Managers. 24 #12-24 mounting screws shall be included with the rack.

technical information

Dimension:	Part Number	RU	Height In. (mm)	Width In. (mm)	Depth In. (mm)
	R2P^	45	84.0 (2134)	20.3 (514)	3.0 (76)
	R2P48	24	48.0 (1219)	20.3 (514)	3.0 (76)
	R2P79	42	79.0 (2007)	20.3 (514)	3.0 (76)
	R2P96	52	96.1 (2441)	20.3 (514)	3.0 (76)
	R2PW	45	84.0 (2134)	24.5 (616)	3.0 (76)
	R2PS	45	84.0 (2134)	20.3 (514)	3.0 (76)
	R2P6S	45	84.0 (2134)	20.3 (514)	6.0 (152)
	R2P6S96	52	96.1 (2441)	20.3 (514)	6.0 (152)
Packaging:	Includes right and left mounting rack channels, top and bottom brackets, assembly hardware with paint piercing washers and anti-oxidizing paste for complete rack bonding				

key features and benefits

Rack spaces:	The 8' rack with 52 RUs allows more equipment in the same footprint to maximize real estate for lowest cost of ownership
Extruded aluminum construction:	Designed to be lightweight and durable for easier deployment and reduced transportation costs; UL listed for 1000 lbs.
Heavy duty steel construction:	6" channel rack designed for higher weight capacity for large equipment; UL listed for 1500 lbs.
Printed rack space identification:	Allows for quick location of rack mounted equipment for faster installation and less rework; see individual customer drawings for specific rack RU numbering
Paint piercing washers:	Fully electrically bonds rack components to simplify grounding process for improved network reliability
Double-sided #12-24 mounting holes:	Provides ability to mount equipment on both sides of the rack channel for improved system flexibility
Multiple mounting hole locations:	Provides flexibility to mount to floor using any of three hole locations. Note: Utilizing holes closest to the vertical uprights will minimize deflection
J-bolt accessibility:	J-bolt can be attached to top bracket without violating top RU space for added stability

applications

2-Post standard equipment rack provides a reliable foundation for mounting telecommunication and data center equipment. The rack can be used to manage high performance copper and fiber patch cables. This modular rack system is compatible with horizontal and vertical cable managers. The 2-Post standard equipment rack is part of a complete rack and cable management system that manages, protects, and showcases your network investment.

www.panduit.com

3" Channel Racks – #12-24 threaded rail, Aluminum	
84"H x 19"W:	R2P^
48"H x 19"W:	R2P48
79"H x 19"W:	R2P79
96"H x 19"W:	R2P96
84"H x 23"W:	R2PW
3" Channel Racks – #12-24 threaded rail, Steel	
84"H x 19"W:	R2PS
6" Channel Racks – #12-24 threaded rail, Steel	
84"H x 19"W:	R2P6S
96"H x 19"W:	R2P6S96
2-Post Rack Accessories for 19" Racks – Front Mount Shelves	
1.7"H x 19.0"W x 15.2"D:	SRM19FM1
3.5"H x 19.0" W x 15.2"D:	SRM19FM2
Cantilevered Shelf Vented 5.2"H x 19.2"W x 12.5"D:	SRM19CMV3
Cantilevered Shelf 5.2"H x 19.0"W x 12.5"D:	SRM19CM3
Adjustable Shelf	
19.0"W x 18.0"D:	SRM19X18A
19.0"W x 25.0"D:	SRM19X25A
Power Distribution Unit (PDU) Mounting Bracket	
2-Post rack (PDU) bracket (set of 2):	R2PPDUB^
Additional Hardware	
100 #12-24 screws:	S1224-C
Rack anchor kit for concrete floor:	RFAKIT
Rack anchor kit for raised floor:	RFA3KIT
NetRunner Vertical Cable Managers – 7' Front and Rear	
45 RU, 4" x 5":	WMPV45E
45 RU, 6" x 6":	WMPVHC45E
Front Only	
45 RU, 4" x 5":	WMPVF45E
45 RU, 6" x 6":	WMPVHCF45E
PatchRunner 2 Vertical Cable Managers with Doors - 7'	
Dual-sided with two doors:	PR2VD**+^
Dual-sided with one door:	PR2VSD**+^
Single-sided with one door:	PR2VFD**+^

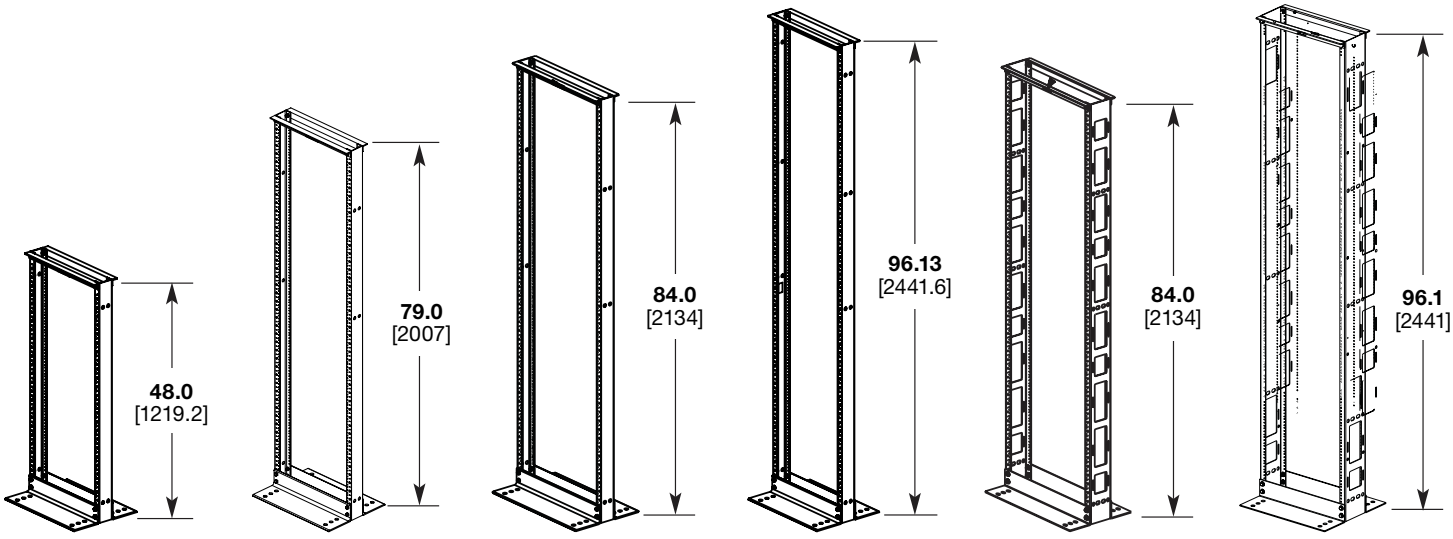
+For parts 6.5' tall, add "79" to the end of the part number. For part numbers 8' tall, add "96" to the end of the part number. Ex: R2P96

^For part numbers in white, add "WH" to end of part number. Ex: R2PWH

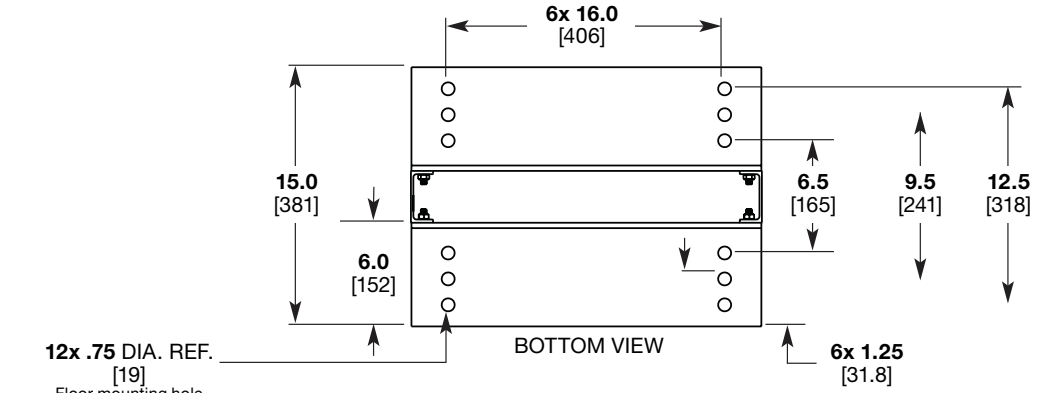
**For part widths, add 06 (6"), 08 (8"), 10 (10"), or 12 (12"). Ex: PR2VD0696WH

6.5' tall parts are only available in 06 and 12 widths

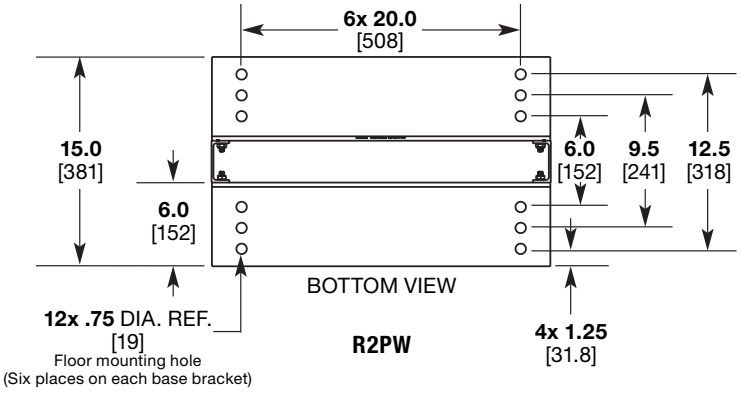
2-Post Standard Equipment Rack



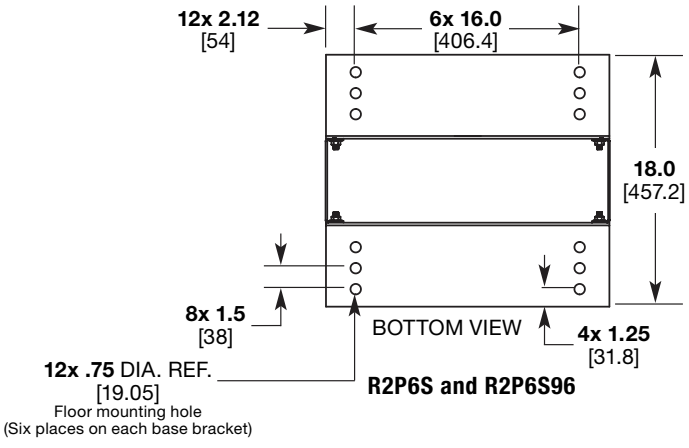
R2P48 **R2P79** **R2P, R2PW, R2PWH, and R2PS** **R2P96** **R2P6S** **R2P6S96**



R2P48, R2P79, R2P, R2P96, and R2PS



R2PW



R2P6S and R2P6S96

Dimensions are in inches. [Dimensions in **brackets** are metric].

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RKSP143-WW-ENG
6/2023

GenSPEED® 6 Category 6 Cable
Standards-Compliant Extended Frequency

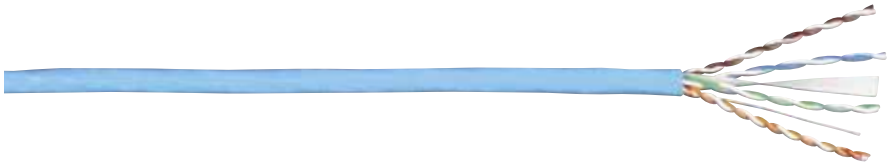
Features and Benefits
- Unique separator design engineered for consistent electrical performance
- Performance guaranteed to 350 MHz
- TRU-Mark® print legend contains footage markings from 1000' to 0'
- Third-party verified for guaranteed performance
- Made in U.S.A.

Applications
- IEEE 802.3: 1000 BASE-T, 100 BASE-TX, 10 BASE-T, PoE, PoE+
- ANSI/TIA 854: 1000 BASE-TX
- CDDI, Token Ring, ATM
- Digital Video
- Broadband and Baseband Analog Video

Standard Compliances
- ANSI/TIA 568-C.2
- NEC/CEC Type CMR (UL 1666) for Non-Plenum
- NEC/CEC Type CMP (NFPA 262) for Plenum
- UL 444
- RoHS Compliant Directive 2011/65/EU
- ANSI/TIA 862 (Building Automation)
- ICEA S-116-732
- ICEA S-102-700
- ISO/IEC 11801 Ed. 2.0 (Class E)

LISTED VERIFIED TIA 568-C.2 RoHS Compliant Directive 2011/65/EU Made in U.S.A.

Data subject to change without notice.



CONSTRUCTION

Conductors
- 23 AWG solid bare annealed copper

Insulation
- Non-Plenum: Polyolefin
- Plenum: Fluoropolymer

Color Code
- Pair 1: Blue-White/Blue
- Pair 2: Orange-White/Orange
- Pair 3: Green-White/Green
- Pair 4: Brown-White/Brown

Separator
- Divider

Rip Cord
- Applied longitudinally under jacket

Jacket
- Non-Plenum: Flame-Retardant PVC
- Plenum: Low-Smoke, Flame-Retardant PVC

PHYSICAL DATA

	CMR (Non-Plenum)	CMP (Plenum)
Nominal Cable Diameter (in)	0.220	0.205
Nominal Cable Weight (lbs/1000 ft)	24	25
Minimum Bend Radius (in)	1.0	1.0
Maximum Pulling Force (lbs)	32	32
Temperature Rating (˚C)		
Installation:	0 to +60	0 to +60
Operation:	-20 to +75	-20 to +75

PART NUMBERS

Standard packaging: 1000' Pull-Pac® II

	Pull-Pac® II		Spool-Pac®		Spool	
Jacket Color	CMR (Non-Plenum)	CMP (Plenum)	CMR (Non-Plenum)	CMP (Plenum)	CMR (Non-Plenum)	CMP (Plenum)
Blue	**7133800**	**7131800**	**7133840**	**7131840**	**7133860**	**7131860**
White	**7133801**	**7131801**	**7133841**	**7131841**	**7133861**	**7131861**
Yellow	**7133802**	**7131802**	**7133842**	**7131842**	**7133862**	**7131862**
Gray	**7133803**	**7131803**	**7133843**	**7131843**	**7133863**	**7131863**
Red	**7133804**	**7131804**	**7133844**	**7131844**	**7133864**	**7131864**
Orange	**7133805**	**7131805**	**7133845**	**7131845**	**7133865**	**7131865**
Green	**7133806**	**7131806**	**7133846**	**7131846**	**7133866**	**7131866**
Black	**7133807**	**7131807**	**7133847**	**7131847**	**7133867**	**7131867**
Pink	**7133808**	**7131808**	**7133848**	**7131848**	**7133868**	**7131868**
Purple	**7133809**	**7131809**	**7133859**	**7131859**	**7133869**	**7131869**

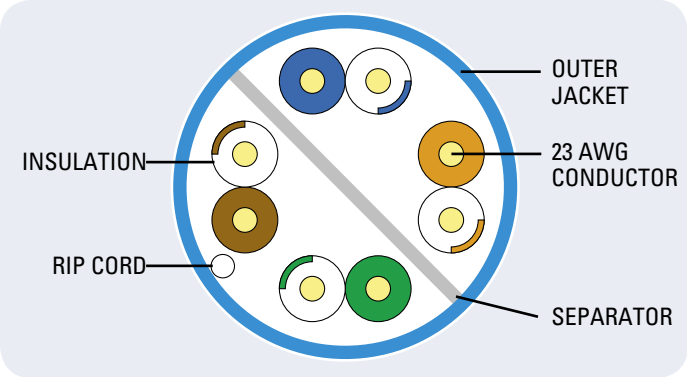
Note: Bulk reels are available as a special request with a maximum allowable length of 3000 feet per reel. Minimum run and lead time may apply.
Non-stock items may be subject to minimum order quantities.

ELECTRICAL PERFORMANCE

Frequency MHz	PSACR* (min)	ACR* (min)	Insertion Loss (max)	PSNEXT (min)	NEXT (min)	PSACRF (min)	ACRF (min)	Return Loss (min)	TCL (min)	ELTCTL (min)
1	70.3	72.3	2.0	72.3	74.3	64.8	67.8	20.0	40.0	35.0
4	59.3	61.5	3.8	63.3	65.3	52.8	55.7	23.0	40.0	23.0
10	51.3	53.3	6.0	57.3	59.3	44.8	47.8	25.0	40.0	15.0
16	46.7	48.7	7.6	54.2	56.2	40.7	43.7	25.0	38.0	10.9
20	44.3	46.3	8.5	52.8	54.8	38.8	41.7	25.0	37.0	9.0
31.25	39.2	41.2	10.7	49.9	51.9	34.9	37.9	23.6	35.1	—
62.5	29.9	32.0	15.4	45.4	47.4	28.9	31.8	21.5	32.0	—
100	22.5	24.5	19.8	42.3	44.3	24.8	27.8	20.1	30.0	—
150	14.9	16.9	24.7	39.7	41.7	21.3	24.3	18.9	28.2	—
200	8.8	10.8	29.0	37.8	39.8	18.8	21.8	18.0	27.0	—
250	3.5	5.5	32.8	36.3	38.3	16.8	19.8	17.3	26.0	—
350	—	—	39.8	34.1	36.1	13.9	16.9	16.3	—	—
400	—	—	43.0	33.3	35.3	12.8	15.8	15.9	—	—
500	—	—	48.9	31.8	33.8	10.8	13.8	15.2	—	—

Note: Values are expressed in dB per 100 m (328 ft.) length @ 20°C. Results beyond 350 MHz are for reference only.
*PSACR & ACR not specified in ANSI/TIA 568-C.2

GenSPEED® 6 CATEGORY 6 CROSS-SECTION



ELECTRICAL CHARACTERISTICS

	Max.	Nom.
DC Resistance Ohms/100 m (328 ft) @ 20˚C	9.38	7.50
DC Resistance Unbalance Individual Pair %	4.00	< 1
Delay Skew ns/100 m	45	CMP: 30 CMR: 35
Nom. Velocity of Propagation % Speed of Light	CMP: 70 CMR: 68	
Characteristic Impedance Frequency (f): 1-350 MHz	Ohms 100 ± 15	

NetKey® Category 6 Punchdown Jack Modules

PANDUIT®
SPECIFICATION SHEET

SPECIFICATIONS

Category 6/Class E, 8-position keystone jack module terminates unshielded twisted 4-pair, 22 – 26 AWG, 100 ohm cable. Punchdown tool properly terminates each conductor for optimum performance. Universal label is color coded T568A and T568B wiring schemes.

TECHNICAL INFORMATION

Category 6/Class E channel and component performance:	Exceeds ANSI/TIA-568.2-D Category 6 and ISO 11801 Class E channel requirements at swept frequencies up to 250 MHz Exceeds ANSI/TIA-568.2-D and ISO 11801 Category 6 component requirements at swept frequencies up to 250 MHz
FCC and ANSI compliance:	Meets ANSI/TIA-1096-A; contacts plated with 50 microinches of gold for superior performance
IEC compliance:	Meets IEC 60603-7 and IEC 60512-99-002
PoE and PoH compliance:	Meets IEEE 802.3af/802.3at and 802.3bt type 3 and type 4 Supports Power over HDBaseT up to 100 watts
c(UL)us Listed:	UL 1863 (Use as communications circuit accessory); CSA standard C22.2 UL 2043 (Suitable for use in air-handling spaces)
Operating temperature:	14°F to 167°F (-10°C to 75°C)
RoHS compliance:	Compliant

KEY FEATURES AND BENEFITS

100% performance tested:	Confidence that each jack module delivers the specified performance
110 style punchdown termination:	Utilizes industry standard termination style and includes a wire retention cap
Modular:	Universal keystone jack modules snap in and out of all NetKey Faceplates, Modular Patch Panels, and Surface Mount Boxes for fast moves, adds, and changes
Individually serialized:	Marked with quality control number for traceability
Bulk packaging (optional):	25 jacks packaged in one easy to open container, eliminating the time to open each individual package and reducing on-site waste; ideal for high volume installations

APPLICATIONS

Applications include:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet), and 1000BASE-T (Gigabit Ethernet)
- Voice over Internet Protocol (VoIP)

NetKey Category 6 Jack Modules	
Module:	NK688M*
Bulk Pack of 25 Modules:	NK688M*-Q
NetKey Patch Panels with Labels	
24-port, 1 RU:	NKFP24Y
48-port, 2 RU:	NKFP48Y
Termination and Cable Prep Tools	
Punchdown Tool:	PDT110‡
Punchdown Base:	NKSPB
JackRapid+ Termination Tool:	JR-PAN-2‡‡
Cable Snipping Tool:	CWST
Cable Stripping Tool:	CJAST
Replacement retention caps:	DRWCIW-24

*Colors: IW (Off White), EI (Electric Ivory), IG (International Gray), WH (White), BL (Black), OR (Orange), RD (Red), BU (Blue), GR (Green), AW (Arctic White), VL (Violet), or YL (Yellow)

‡Terminates the NetKey Keystone Punchdown Jack Module and NetKey Patch Panel.

‡‡Terminates the NetKey Keystone Punchdown Jack Module. Fluke JackRapid Termination Tool available through distribution

To locate the local office, visit **www.flukenetworks.com/contact**

+JackRapid is a trademark of Fluke Networks

-Q indicates bulk packages of 25 pieces to reduce single-use plastic

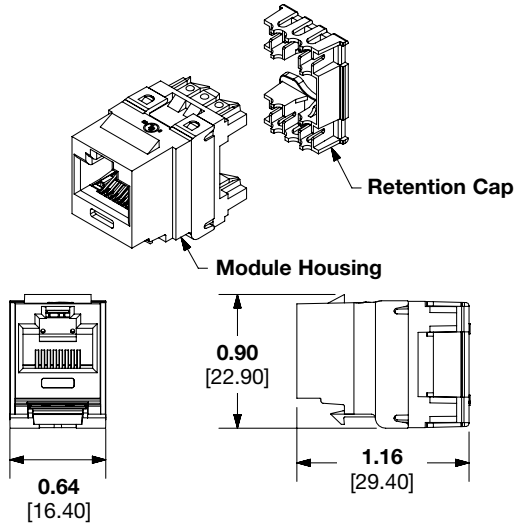
TEST RESULTS

Mechanical Test	Test Method	Measurement	Typical Test Results
Normal	ANSI/TIA-1096-A	Load (grams)	>100
Vibration	IEC 512-6d	Circuit Resistance (mOhms)	< 40
Shock	IEC 512-6c	Contact Disturbance (microsecond)	< 5
Durability	IEC 512-6a	Circuit Resistance (mOhms)	< 20
Mating/Un-mating	IEC 512-6b	Mating Force (N)	< 20
		Un-mating Force (N)	< 20
Termination Cycles	IEC 352	Number of Cycles	> 20
Mating Cycles	IEC 60603-7	Number of Plug Insertions	>2500

Electrical Test	Test Method	Measurement	Typical Test Results
Low Level Circuit Resistance	IEC 512-2a	Resistance (mOhms)	< 20
Dielectric Withstand Voltage	IEC 512-4a	1000 VAC, 1 minute	Passed
Insulation Resistance	IEC 512-3a	Resistance (MOhms)	>500

Mechanical Test	Test Method	Measurement	Typical Test Results
Temperature Life	IEC 512-9b	Circuit Resistance (mOhms)	< 40
Humidity	IEC 512-11c		
Thermal Shock	IEC 512-11d		
Climatic Sequence	IEC 512-11a		
Flowing Mixed Gas Corrosion	IEC 512-11g		

ENGINEERING DRAWINGS



Dimensions are in inches. [Dimensions in brackets are metric].

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COSP588-WW-ENG
7/2024

TX6™ Performance 28 AWG UTP Patch Cords

PANDUIT®
SPECIFICATION SHEET

SPECIFICATIONS

Category 6/Class E, UTP, small diameter patch cords shall be constructed of 28 AWG, unshielded, twisted pair, stranded copper (dual-rated CM/LSZH) cable with high performance RJ45 modular plugs. Patch cords shall be offered in multiple lengths and colors for design flexibility.

Category 6 28 AWG Patch Cords	
Feet lengths:	UTP28SP*^
Meter lengths:	UTP28SP**M^
Inches lengths:	UTP28SP***^

*Foot lengths: 1 - 50 feet (every 1 foot)
55 - 130 feet (every 5 feet)

**Meter lengths: 0.5 - 10 meters (every 0.5 meters)
11 - 20 meters (every 1 meters)
15 - 40 meters (every 5 meters)

***Inch lengths: 6 and 8 inches

^Colors other than Off White: BU (Blue), BL (Black), GR (Green), RD (Red), OR (Orange), YL (Yellow), GY (Gray), or VL (Violet)

◊Lengths 1 meter to 15 meters or 6 inches to 49 feet are guaranteed to meet TIA and ISO component and channel requirements. Lengths greater than 1 5 meters or 49 feet are guaranteed to meet ISO component and both TIA and ISO channel requirements.

TECHNICAL INFORMATION

Category 6/Class E channel and component performance:	Exceeds all ANSI/TIA-568V.2-D Category 6 and ISO 11801 Class E electrical performance requirements for frequencies up to 250 MHz◊ Note: 28 AWG patch cords have attenuation de-rating value of 1.9. Supports 96 meter channels that include 90 meter permanent links. Supports 93 meter channels with 10 meters of patch cords included in the channe
FCC and ANSI compliance:	Meets ANSI/TIA-1096-A (formerly FCC Part 68)
IEC compliance:	Meets IEC 60603-7
PoE compliance:	Supports IEEE 802.3af/802.3at (48 cables in a bundle) and 802.3bt type 3 and type 4 (24 cables in a bundle) PoE applications
c(UL)us compliance:	UL 1863 and CAN/CSA-C22.2 (UL File E129886)
RoHS compliance:	Compliant
Cable diameter:	0.15 in. (3.8mm) nominal
Operating temperature:	14°F-167°F (-10°C-75°C)
Storage temperature:	-40°F-158°F (-40°C-70°C)
Plug housing:	UL94V-0 rated clear Polycarbonate
Contacts:	Gold plated phosphor bronze: contacts plated with 50 microinches of gold for superior performance
Flammability rating:	CM/LSZH dual-rated

KEY FEATURES AND BENEFITS

100% Performance tested for wire map, NEXT, and return loss:	Confidence that each patch cord delivers critical electrical component-level performance. Centered de-embedded plug performs in center of ANSI/ TIA-568.2-D Category 5e component range, ensuring interoperability and optimum performance
Smaller diameter, flexible cable design:	Tight bend radius enables improved cable routing and management in high density applications. Smaller cable diameter allows twice the number of cords to be routed through cable managers and pathways compared to traditional Category 5e patch cords. Reduced cable diameter facilitates improved air flow, cooling, resulting in lower operating costs than traditional Category 5e patch cords
Integral pair manager:	Immediate compatibility with the most common Mini-Com UTP and shielded jacks
Patented tangle-free latch:	Prevents snags and provides easy release, saving time on frequent moves, adds, and changes
Robust construction:	Plug contact plated with 50 microinches of gold and rated to 2500 mating cycles
Flexible stranded cable:	U/UTP stranded 28 AWG copper cable with a nominal diameter of 0.149 in. (3.8mm) allows for high density installations and superior panel cable management

PANDUIT RAPIDID enabled

TX6™ Performance 28 AWG UTP Patch Cords are pre-labeled with the RapidID™ Network Mapping System to enable faster tracing, placing, and network documentation.

Learn more: www.panduit.com/rapid-id

TAA Compliant

All listed part numbers are compliant with the U.S. Trade Agreements Act (TAA) for purchases shipped to customers in the United States.

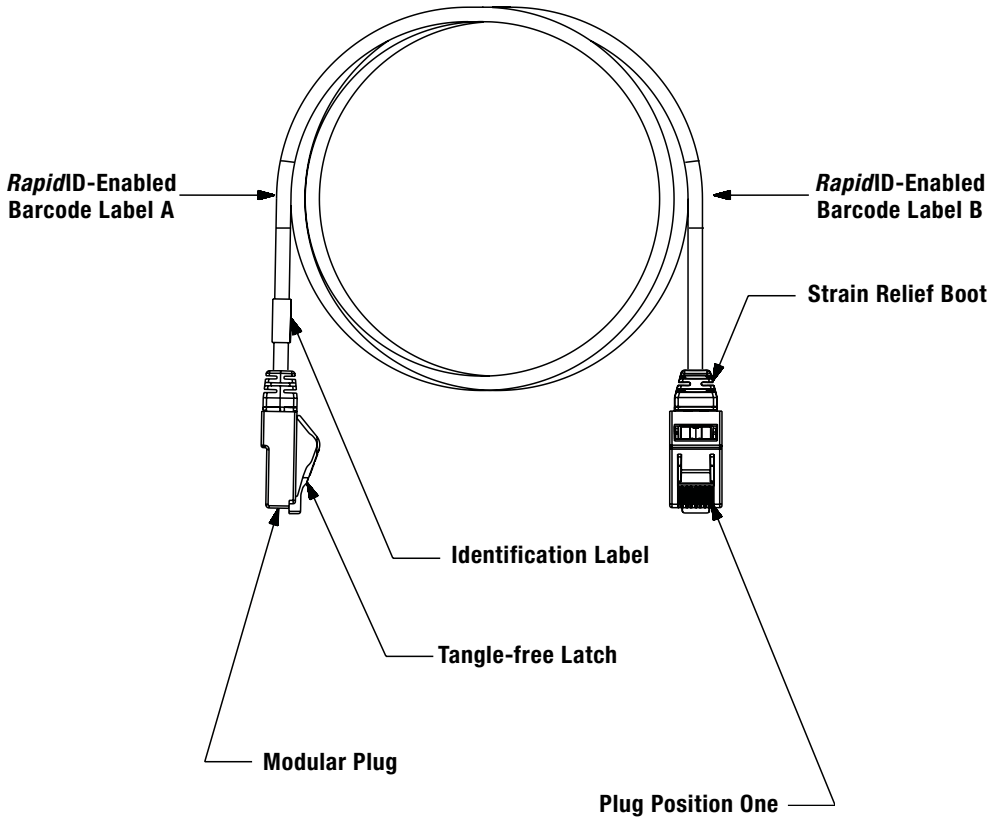
TX6™ Performance 28 AWG UTP Patch Cords

APPLICATIONS

Category 6 Performance 28 AWG UTP Patch Cords support the following applications:

- 1000BASE-T (Gigabit Ethernet), 100BASE-T (Fast Ethernet)
- 155 Mb/s ATM, 622 Mb/s ATM, 1.2 Gb/s ATM
- Digital video and broadband/baseband analog video
- Voice/data systems
- Voice over Internet Protocol (VoIP)

ENGINEERING DRAWING



Recycle at end of life

T568B Wiring Scheme	
Plug Position	**Cable Wire**
1	White/Orange
2	Orange
3	White/Green
4	Blue
5	White/Blue
6	Green
7	White/Brown
8	Brown

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VANCO
ADVANCING...CONNECTIVITY

Certified Premium High Speed HDMI® Cables with Ethernet

- Enables transmission of High Dynamic Range (HDR) video
- Full 18Gbps bandwidth
- UltraHD, 4K@60 2160p
- EMI tested to ensure cables minimize interference with wireless signals
- Up to 32 audio channels with ARC for a multi-dimensional immersive audio experience
- Support for the wide angle theatrical 21:9 video aspect ratio
- Certified Premium HDMI ensures installations are ready for today's 4K/UltraHD environment and are future-proofed
- UL Listed, CL3 Rated

PART NUMBER	LENGTH	AWG	O.D.
HDMICP01	1 ft	28	7.3 mm
HDMICP03	3 ft	28	7.3 mm
HDMICP06	6 ft	28	7.3 mm
HDMICP10	10 ft	28	7.3 mm
HDMICP12	12 ft	28	7.3 mm
HDMICP15	15 ft	26	8.8 mm
HDMICP20	20 ft	24	10.5 mm
HDMICP25	25 ft	24	10.5 mm
HDMICP30	30 ft	24	10.5 mm

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www.HDMI.org

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vanco1.com

Technical Data Sheet
Aquaseal® Communication Cables

WEST PENN WIRE

2833 West Chestnut Street
Washington, PA 15301
Toll Free: (800) 245-4964
Fax: (724) 222-6420
www.westpenn-wpw.com

Aquaseal cables

PART NUMBER: **AQC369**

DESCRIPTION: 22/6 Solid bare copper conductor, unshielded/shielded, with an Aquaseal tape and overall jacket.

NEC RATING: CM or CL3, NEC Article 800 and 725

APPROVALS: (UL) C(UL) Listed, (ETL)us Listed

APPLICATION: Materials suitable for outdoor use, and indoor trays, allows a variety of uses for (Intercom, Security, Sound, Audio, Background music)

Construction Parameters:

Conductor	22 AWG Bare Copper
Stranding	Solid
Insulation Material	PVC
Insulation Thickness	0.010" Nom.
Number of Conductors (2 Shielded)(4 Unshielded)	6
Shield	100% Aluminum Polyester Foil
Drain	Solid Tinned Copper
Water-Blocking Tape	Internal and Overall 2 ply water swellable tape
Jacket Material	Sunlight/Moisture Resistance PVC
Jacket Thickness	0.025" Nom.
Overall Cable Diameter	0.240" Nom.
Approximate Cable Weight	30 Lbs/1M' Nom.
Flame Rating	UL 1685 Vertical Tray

Electrical & Environmental Properties:

Temperature Rating	-20deg C to 60deg C
Operating Voltage	300 V RMS
Max.Capacitance Between Conductors @ 1 KHz	54 pf/ft Nom.
Capacitance Between Conductors to Shield @ 1 KHz	97 pf/ft Nom.
DC Resistance per Conductor @ 20deg C	17.5 Ohms/1M' Nom.
Insulation Colors	Black, Red, White, Green, Brown, Blue
Jacket Color	Gray
RoHS Compliant	--
TIA455-82B Water Infiltration Test Compliant	Yes
UL 444 & 13 Compliant	Yes

Mechanical Properties:

Max. Recommended Pull Tension	69 lbs.
Min. Bend Radius (Install)	2.4”

Specification Issue Date: 7/06

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Standard Lengths are 1000ft.
The Jacket is sequentially footmarked.
The information presented here is, to the best of our knowledge, is true and accurate. However, since conditions of use are beyond our control, all recommendations or suggestions are presented without guarantee or responsibility on our part. We disclaim all liability in connection with the use of information contained herein or otherwise.

Technical Data Sheet
Communication Cables

WEST PENN WIRE

2833 West Chestnut Street
Washington, PA 15301
Toll Free: (800) 245-4964
Fax: (724) 222-6420
www.westpenn-wpw.com

PART NUMBER: **224**

DESCRIPTION: 18/2 STRANDED BARE COPPER CONDUCTORS, UNSHIELDED WITH AN OVERALL JACKET

NEC RATING: CMR, NEC Article 800

APPROVALS: (UL) C(UL) Listed or c(ETL)us Listed

APPLICATION: Indoor for: Intercom, Security, Sound, Audio, Background Music, and Power Limited Control Circuits

Construction Parameters:

Conductor	18 AWG Bare Copper
Stranding	7x26
Insulation Material	PVC
Insulation Thickness	0.008" Nom.
Number of Conductors	2
Shield	None
Drain	None
Jacket Material	PVC
Jacket Thickness	0.017" Nom.
Overall Cable Diameter	0.156" Nom.
Approximate Cable Weight	16.1 Lbs/1M' Nom.
Flame Rating	UL 1666 Riser Flame Test

Electrical & Environmental Properties:

Temperature Rating	-20°C To +60°C
Operating Voltage	300 V RMS
Max.Capacitance Between Conductors @ 1 KHz	30 pf/ft Nom.
DC Resistance per Conductor @ 20deg C	6.2 Ohms/1M' Nom.
Insulation Colors	Black ,Red
Jacket Color	Gray, Black, Brown, White
RoHS Compliant	Yes

Mechanical Properties:

Max. Recommended Pull Tension	42 lbs.
Min. Bend Radius (Install)	1.6”

ADVANTAGE BOX MADE IN USA

Specification Issue Date: 7/06

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Technical Data Sheet
Communication Cables

WEST PENN WIRE

2833 West Chestnut Street
Washington, PA 15301
Toll Free: (800) 245-4964
Fax: (724) 222-6420
www.westpenn-wpw.com

PART NUMBER: **244**

DESCRIPTION: 18/4 Stranded bare copper conductors, unshielded with an overall jacket.

NEC RATING: CMR, NEC Article 800

APPROVALS: (UL) C(UL) Listed or c(ETL)us Listed

APPLICATION: Indoor for: Intercom, Security, Sound, Audio, Background Music, and Power Limited Control Circuits

Construction Parameters:

Conductor	18 AWG Bare Copper
Stranding	7/26
Insulation Material	PVC
Insulation Thickness	0.008" Nom.
Number of Conductors	4
Shield	None
Drain	None
Jacket Material	PVC
Jacket Thickness	0.017" Nom.
Overall Cable Diameter	0.183" Nom.
Approximate Cable Weight	29.9 Lbs/1M' Nom.
Flame Rating	UL 1666 Riser Flame Test

Electrical & Environmental Properties:

Temperature Rating	-20°C To +60°C
Operating Voltage	300 V RMS
Max.Capacitance Between Conductors @ 1 KHz	30 pf/ft Nom.
DC Resistance per Conductor @ 20deg C	6.2 Ohms/1M' Nom.
Insulation Colors	Black, Red, White, Green
Jacket Color	Gray
RoHS Compliant	Yes

Mechanical Properties:

Max. Recommended Pull Tension	89.6 lbs.
Min. Bend Radius (Install)	1.9”

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NetKey® Faceplates

PANDUIT®
DATA SHEET

specifications

NetKey faceplates shall be available in 1, 2, 3, 4, and 6-port single gang for vertical applications and 2-port and 4-port single gang for horizontal applications. Faceplates shall accept all NetKey modules for UTP, STP, fiber-optic, and audio/video applications. Faceplates shall be available in a flush or sloped design, and available with or without labels. Sloped design shall increase wall depth to improve the bend radius control.

technical information

Mounting options:	Screw holes with retention tabs, spaced for single gang openings; compatible with wall board adapter
Packaging:	Supplied with two 1" long, #6 – 32 slotted head screws; select styles include labels and label covers; faceplates without labels include matching mounting screws to match the faceplate; faceplates packaged one per bag, ten per box.

key features and benefits

Modular	Accepts all NetKey modules which snap in and out for easy moves, adds, and changes
Identification	Choice of adhesive labeling or dedicated label pocket for easy identification
Various port densities	Provides design flexibility
Sloped design	Allows proper bend radius control

applications

NetKey faceplates mount to any standard size single gang junction box and can also mount to a wall board adapter or raceway mounting brackets. When using NetKey faceplates with surface raceway, color matching is guaranteed. NetKey faceplates with label and label cover offer a quick and easy way to identify the ports. Mounting screw colors match the faceplate for a clean, consistent look.

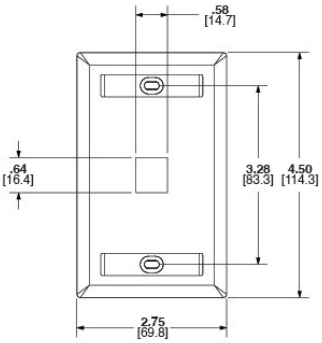
Dedicated sloped faceplates provide additional room for bend radius control to help comply with standards.

Vertical Sloped Faceplates with Labels Slots	
4-port:	NK4VSFIW
Vertical Faceplates with Labels	
1-port:	NK1FIWY
2-port:	NK2FIWY
4-port:	NK4FIWY
6-port:	NK6FIWY
Vertical Faceplates without Labels	
1-port:	NK1FNIW
2-port:	NK2FNIW
3-port:	NK3FNIW
4-port:	NK4FNIW
Horizontal Faceplates Sloped with Labels	
2-port:	NK2HSFIWY
4-port:	NK4HSFIWY
Double Gang Faceplate	
10-port:	NK8FIW
Wall Board Adapter	
Single gang:	MWBA1

Go to **www.panduit.com** for additional color options.

NetKey® Faceplates

NK1F**Y



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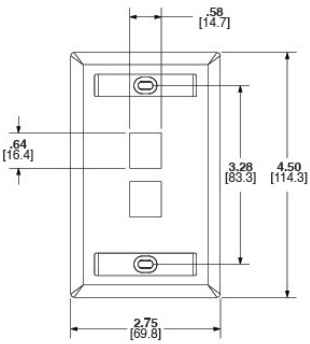

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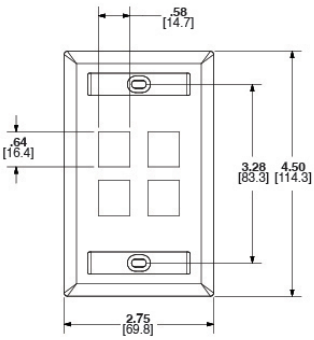

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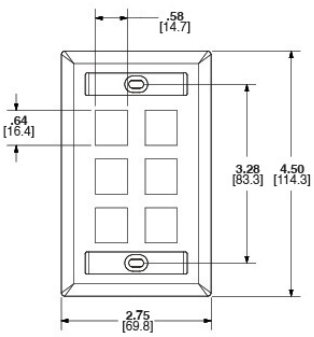

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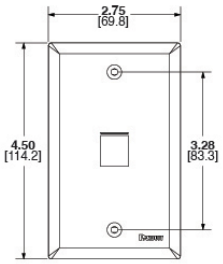

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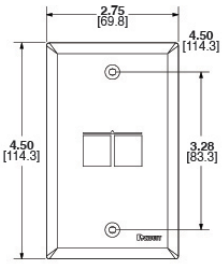

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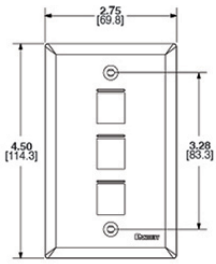

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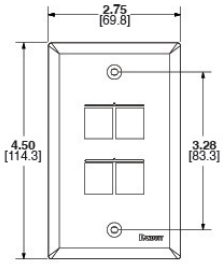

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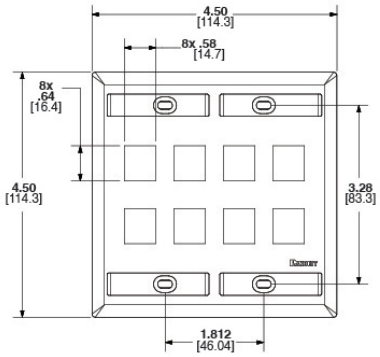

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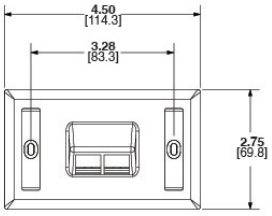

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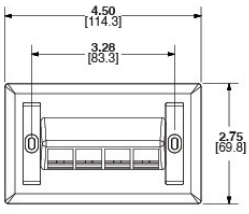
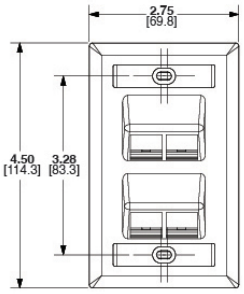


NK4VSF**



Dimensions are in inches. [Dimensions in **brackets** are metric].

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Visit us at www.panduit.com
Contact Customer Service by email: cs@panduit.com
or by phone: 800.777.3300

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NKDS70--WW-ENG
10/2022

PatchLink™ Horizontal Cable Managers

PANDUIT®

SPECIFICATION SHEET

specifications

Horizontal cable managers shall be capable of managing cables on the front and rear of any 19" EIA rack. The manager shall consist of a 1-piece construction that is molded out of plastic. Horizontal managers shall have pass through holes that incorporate integral bend radius control as well as fingers with rounded edges. The manager shall have rigid end fingers that incorporate integral bend radius control. Hinged covers shall allow access to the cable pathway without having to completely remove the cover from the manager.

technical information

Dimensions:	WMPH2E:	3.5"H x 19.0"W x 8.9"D (88.9mm x 482.6mm x 225.5mm)
	WMPHF2E:	3.5"H x 19.0"W x 3.7"D (88.9mm x 482.6mm x 93.7mm)
	WMP1E:	3.5"H x 19.0"W x 8.9"D (88.9mm x 482.6mm x 225.5mm)
	WMPF1E:	3.5"H x 19.0"W x 3.7"D (88.9mm x 482.6mm x 93.7mm)
	WMPSE:	1.7"H x 19.0"W x 8.9"D (44.1mm x 482.6mm x 225.5mm)
	WMPFSE:	1.7"H x 19.0"W x 3.7"D (44.1mm x 482.6mm x 93.7mm)
	WMPLSE:	1.7"H x 19.0"W x 7.9"D (44.1mm x 482.6mm x 200.1mm)
	WMPLFSE:	1.7"H x 19.0"W x 2.7"D (44.1mm x 482.6mm x 69.1mm)
Packaging:	Cable managers include hinged cover(s), mounting hardware, and wire retainers	

key features and benefits

Integral bend radius control	Maintains bend radii as cables transition to and from horizontal and vertical pathways
Dual hinged cover	Opens upward or downward to provide easy access to cables in horizontal pathway without having to completely remove cover
Increased finger spacing	Provides larger area for high performance Category 6 cables
One piece, plastic construction	Provides durability and easy installation
Flexible fingers	Provide for easy installation and organizes cables simplifying moves, adds, and changes
Rounded edges on fingers	Protect cables from snags and damage to cable
Cable pass through holes	Provide ease of installation and cable maintenance
Wire retainers	Snap on finger to keep cables in place during moves, adds, and changes

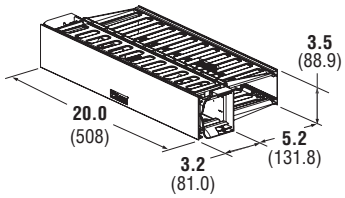
applications

Panduit® PatchLink™ Horizontal Cable Managers provide a neat and efficient way to manage patch cables on any EIA 19" rack. They can be used in multimedia applications to manage copper, fiber optic, and coax cables. Flexible fingers organize the patch cords simplifying moves, adds, and changes while the integral bend radius control and "closed" design protects the patch cables in the pathway. All of these features combine to provide the user with a horizontal cable management solution that simplifies cable routing in a finished, professional appearance. When used with the Panduit® Mini-Com® patch panels, patch cords, vertical cable managers, and racks, the user receives a total system that satisfies functional and aesthetic requirements for telecommunications rooms.

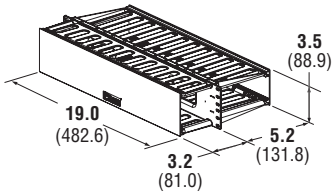
2 Rack Space Manager, Front and Rear	
3"x 3" front, 19" cover:	WMPH2E
3"x 3" front, 17" cover:	WMP1E
WMP1E 5-pack:	WMP1E-V
2 Rack Space Manager, Front Only	
3"x 3" front, 19" cover:	WMPHF2E
3"x 3" front, 17" cover:	WMPF1E
WMPF1E 10-pack:	WMPF1E-X
1 Rack Space Manager, Front and Rear	
1.7" H x 3" D front:	WMPSE
WMPSE 10-pack:	WMPSE-X
1.7" H x 2" D front:	WMPLSE
1 Rack Space Manager, Front Only	
1.7" H x 3" D front:	WMPFSE
WMPFSE 20-pack:	WMPFSE-E
1.7" H x 2" D front:	WMPLFSE
Racks	
19" EIA standard:	CMR19X84
4 post rack 7' 30" depth with #12-24 threaded rails:	R4P
4 post rack 7' 30" depth with cage nut rails:	R4PCN
4 post rack 7' 23" depth with #12-24 threaded rails:	R4P23
4 post rack 7' 23" depth with cage nut rails:	R4P23CN
4 post rack 7' 36" depth with #12-24 threaded rails:	R4P36
4 post rack 7' 36" depth with cage nut rails:	R4P36CN
4 post rack 7' 42" depth with #12-24 threaded rails:	R4P42
4 post rack 7' 42" depth with cage nut rails:	R4P42CN
Panel Extender Brackets	
1 RU:	PEB1
2 RU:	PEB2
22 RU:	PEB22
44 RU:	PEB44

PatchLink™ Horizontal Cable Managers

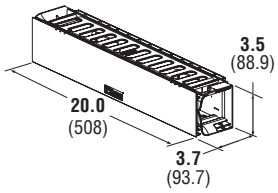
WMPH2E
with CMSRC2 Clips



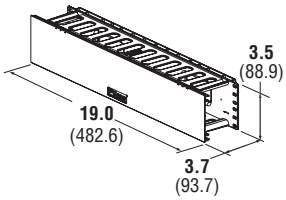
WMP1E



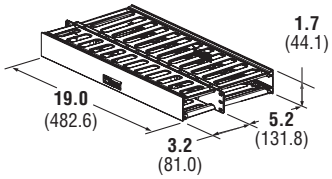
WMPHF2E
with CMSRC2 Clips



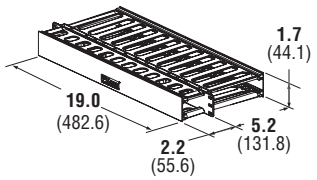
WMPF1E



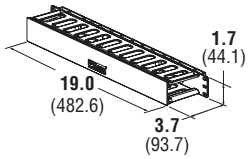
WMPSE



WMPLSE



WMPFSE



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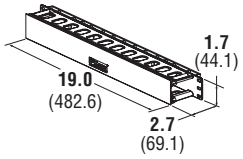

All managers have 17" long front covers except for the WMPH2E and WMPHF2E, which have19 3/8" long front covers for complete coverage to vertical managers.

Cable Capacity Chart

Part Number	Category 6 (0.250")		Category 5e (0.187")	
	Front	Back	Front	Back
WMP1E	48	48	72	72
WMPF1E	48	–	72	–
WMPFSE	16	–	24	–
WMPH2E	48	48	72	72
WMPHF2E	48	–	72	–
WMPLFSE	12	–	16	–
WMPLSE	12	12	16	16
WMPSE	16	16	24	24

Dimensions are in inches. (Dimensions in parenthesis are metric.)

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PANDUIT®

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WW-RKSP46
Replaces SA-RKSP04
2/2010

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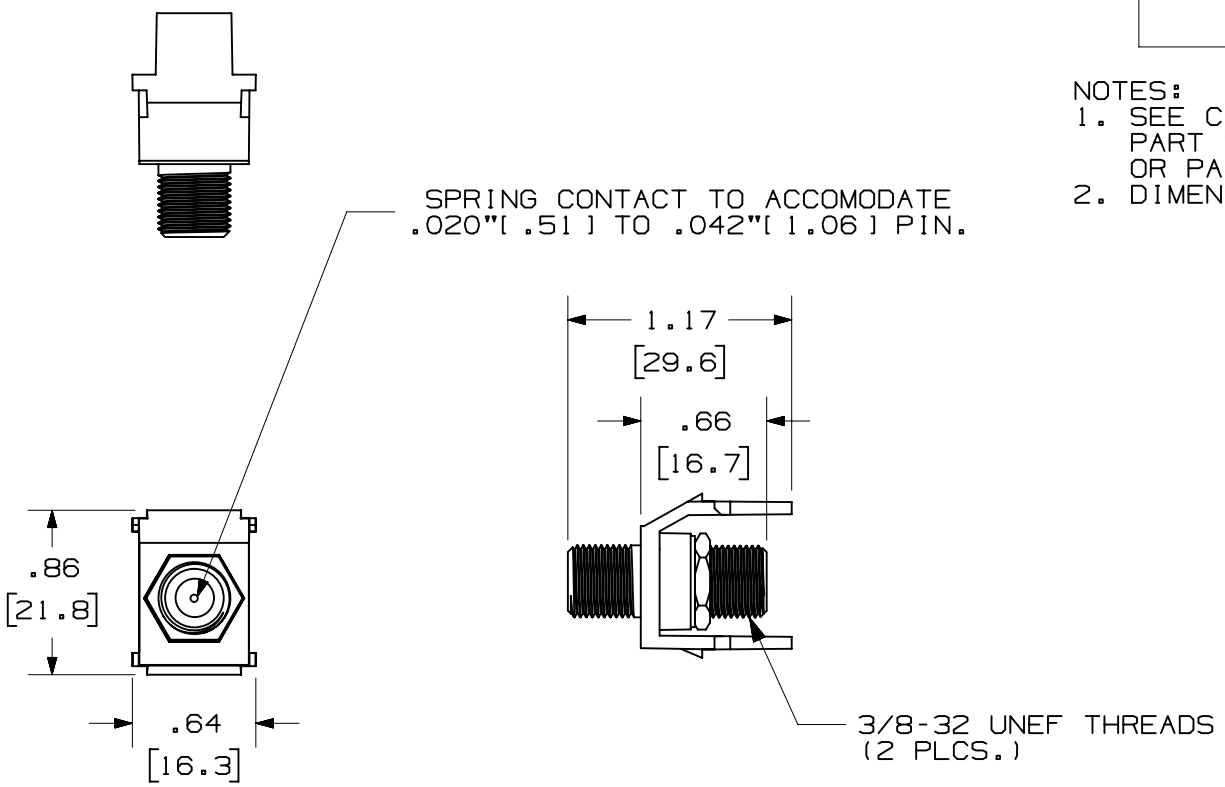
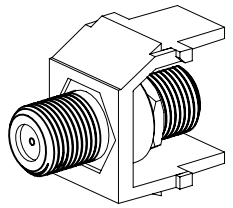
PANDUIT P/N	WEIGHT
NKF**	.25 LB/10 PCS (115 g/10 PCS)

NOTES:
1. SEE CURRENT CATALOG FOR ADDITIONAL PART SUFFIXES TO INDICATE COLOR AND OR PACKAGE QUANTITY.
2. DIMENSIONS IN [ ] ARE IN METRIC.





PART NUMBER: NKF**

TITLE: NETKEY 3GHz F-TYPE COUPLER MODULE

CUSTOMER DRAWING

ITEM REVISION NAME: M01557AB/01

DATASET FILE NAME: M01557AB_DC05/01A

UNLESS OTHERWISE SPECIFIED, DIMENSIONAL TOLERANCES ARE: IN [mm]
.X ± .XXX ± .010 [.3]
.XX ± .03[.8] ANGLES ±
THIRD ANGLE PROJECTION

MATERIAL:
MODULE BASE: ABS
COULPER: NICKEL PLATED BRASS

DRAWING NUMBER: 01557-05

DRAWN BY	DATE	CHK	SCALE	SIZE
JSP	3-16-04	MJD	NONE	A

SHT 1 OF 1

REV	DATE	BY	CHK	APR	DESCRIPTION	ECN
2	01/23/17	MDJR	NAGL	MMR	B. UPDATED DRAWING WITH NEW MODEL.	01557-05
1	5/19/14	JSP	REFR	JCK	A. REVISED DRAWING TITLE BLOCK.	01557-05
R	3-16-04	JSP	MJD	MJD	RELEASED TO PRODUCTION	01557-05

D10100DA/14

NetKey® Modular Patch Panels with Faceplates

PANDUIT®
DATA SHEET

specifications

Modular patch panels shall consist of a metal panel with molded snap-in faceplates which can be front releasable. Patch panels shall accept all NetKey Modules for UTP, fiber, or A/V applications and shall mount to standard 19" racks. Patch panels shall be available in 24 and 48-port standard density. Angled patch panels shall be designed at an optimum angle to help route the cable.

technical information

Mounting options:	Mounts to standard EIA 19" racks or 23" racks with optional extender brackets
Material:	Stamping is CRS and faceplate is ABS
Packaging:	Packaged with appropriate pre-installed snap-in faceplates, a set of mounting screws (#12-24), and label/label cover where applicable

key features and benefits

Removable faceplates:	Allow front accessibility to installed modules for easy moves, adds, and changes
Modular:	Accepts all NetKey Modules to mix and match media types in the same panel
Angled design:	Allows cable to flow to each side of the rack and minimizes the need for horizontal cable managers by enabling patch cords to be routed directly into vertical cable managers which leads to increased closet density
Optional label:	Available with and without labels to accommodate various needs
Optional strain relief bars:	Help support and manage cables
Optional filler panels:	Fill unused rack openings to provide a clean and consistent look

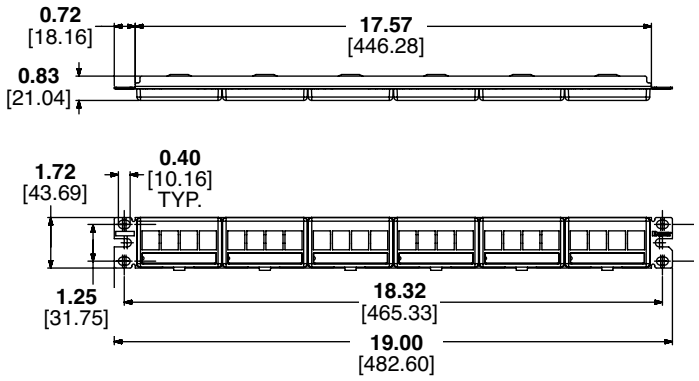
applications

NetKey Modular Patch Panels are ideal for multi-media applications. They accept all NetKey Modules which can be accessed through the front of the panel to snap in and out for easy adjustments. Various styles and port densities available to fit most needs with a labeling feature available on select styles. Angled patch panels are available for applications where rack space is limited. The design allows cable to flow to each side of the rack, minimizing the need for horizontal cable managers and increasing the density of the rack space.

Patch Panels with Labels	
24-port, 1 RU, includes six NK4MFL labeled faceplates:	NKFPL24
48-port, 2 RU, includes twelve NK4MFL labeled faceplates:	NKFPL48
Patch Panels without Labels	
24-port, 1 RU, includes six NK4MF faceplates:	NKFP24Y
48-port, 2 RU, includes twelve NK4MF faceplates:	NKFP48Y
Angled Patch Panels without Labels	
24-port, 1 RU, includes six NK4MF faceplates:	NKFPA24
48-port, 2 RU, includes twelve NK4MF faceplates:	NKFPA48
Angled Patch Panel with Labels	
24-port, 1 RU, includes six NK4MFL labeled faceplates:	NKFPAL24
Strain Relief Bars	
Straight:	SRBS19BL-XY
Extended, 2":	SRB19BLY
With hook and loop ties:	SRBM19BLY
With adjustable clips:	SRBWCY
Deep, 5":	SRB19D5BL
Deep, 7":	SRB19D7BL
Multi-depth:	SRB19MDBL
Extender Brackets	
1 RU:	PEB1
2 RU:	PEB2

NetKey® Modular Patch Panels with Faceplates

NKFPL24



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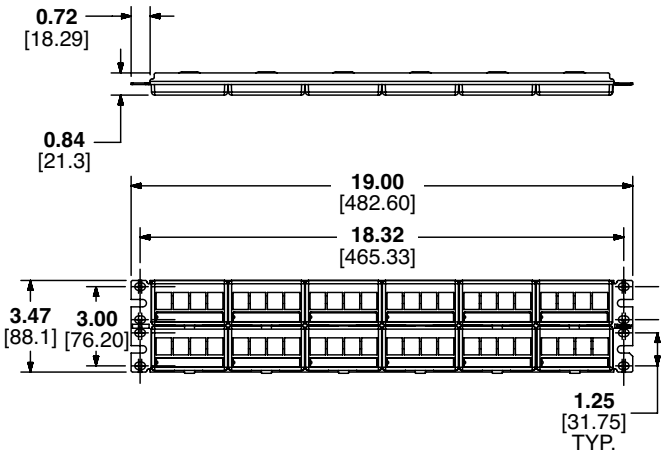

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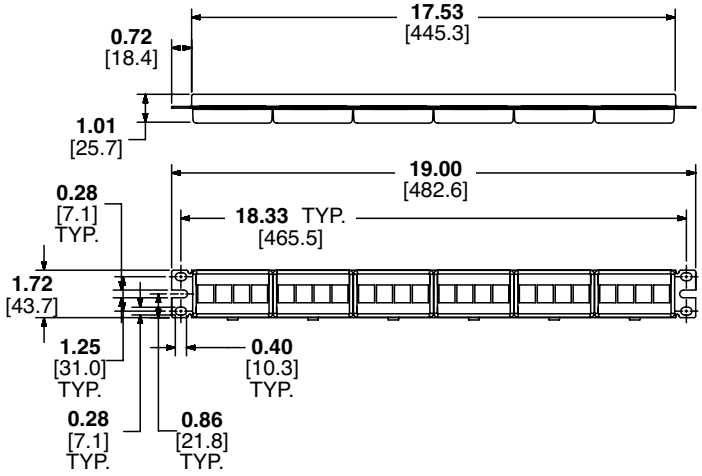

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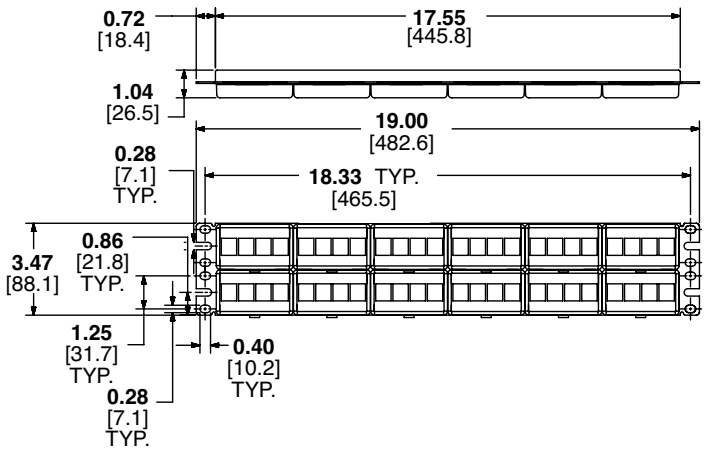

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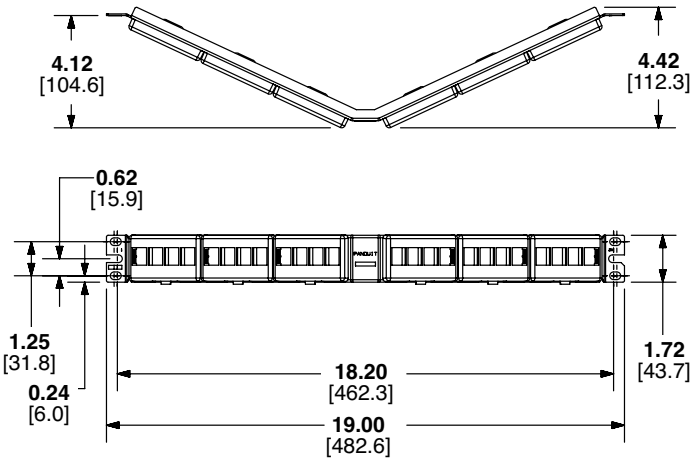

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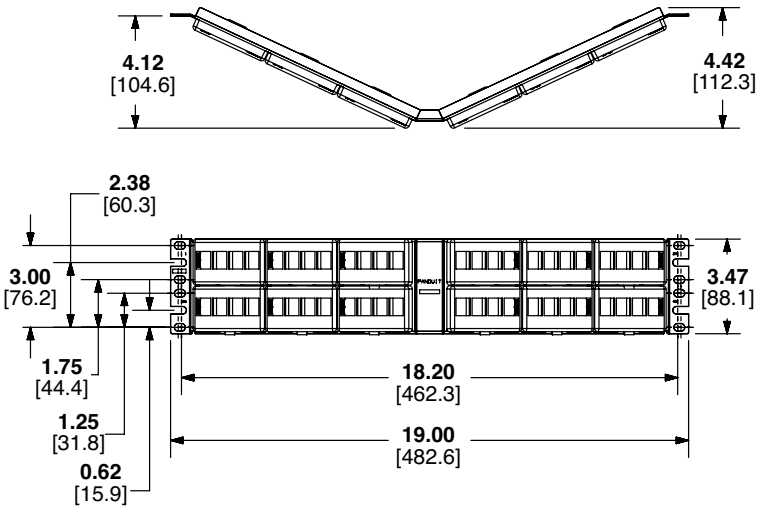

Dimensions are in inches. [Dimensions in **brackets** are metric].

WORLDWIDE SUBSIDIARIES AND SALES OFFICES

PANDUIT US/CANADA
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PANDUIT EUROPE LTD.
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PANDUIT LATIN AMERICA
Guadalajara, Mexico
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Victoria, Australia
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For more information
Visit us at www.panduit.com
Contact Customer Service by email: cs@panduit.com
or by phone: 800.777.3300

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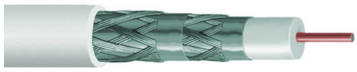
NKDS68-WW-ENG
3/2023

4112704/10 | 2227V WHRL RG6 QD 1000



RG 6 Type Quad Shield Plenum Video Coaxial Cable, white jacket, 1000 ft (305 m) reel

Product Classification

Regional Availability	Asia | Australia/New Zealand | EMEA | Latin America | North America
Portfolio	CommScope®
Product Type	Coaxial video cable

General Specifications

Product Number	2227V
Cable Type	Series 6
Center Conductor Type	Solid
Construction Type	Non-armored
Jacket Color	White
Supported Application	Video

Dimensions

Cable Length	304.8 m | 1000 ft
Diameter Over Center Conductor, specific	0.0403 in per 1 strand
Diameter Over Dielectric	4.318 mm | 0.17 in
Diameter Over Inner Shield (Braid)	5.131 mm | 0.202 in
Diameter Over Jacket, nominal	6.604 mm | 0.26 in
Diameter Over Jacket Tolerance	±0.006 in
Diameter Over Outer Shield (Braid)	5.74 mm | 0.226 in
Jacket Thickness	0.406 mm | 0.016 in
Jacket Thickness, minimum spot	0.33 mm | 0.013 in
Center Conductor Gauge	18 AWG
Inner Shield (Braid) Gauge	34 AWG
Outer Shield (Braid) Gauge	34 AWG

Electrical Specifications

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Capacitance	50.853 pF/m | 15.5 pF/ft
Characteristic Impedance	75 ohm
Characteristic Impedance Tolerance	±3 ohm
Conductor dc Resistance	93.832 ohms/km | 28.6 ohms/kft
Dielectric Strength, conductor to shield	2000 Vdc
Jacket Spark Test Voltage	2500 Vac
Nominal Velocity of Propagation (NVP)	84 %
Shield dc Resistance	17.388 ohms/km | 5.3 ohms/kft
Structural Return Loss	15 dB @ 1000–3000 MHz | 20 dB @ 5–1000 MHz
Structural Return Loss Test Method	100% Swept Tested

Attenuation

Frequency (MHz)	Attenuation (dB/100 ft)
1.0	0.38
10.0	0.7
50.0	1.48
100.0	2.01
200.0	2.86
400.0	4.23
700.0	5.96
900.0	6.96
1000.0	7.45
1200.0	8.25
1450.0	9.34
1800.0	10.69
2200.0	11.54
2500.0	11.7
3000.0	13.07

Material Specifications

Center Conductor Material	Copper-clad steel wire
Dielectric Material	Foam FEP
Jacket Material	PVC
Inner Shield (Braid) Coverage	60 %

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Inner Shield (Braid) Material	Aluminum
Inner Shield (Tape) Material	Aluminum/Poly
Outer Shield (Braid) Coverage	40 %
Outer Shield (Braid) Material	Aluminum
Outer Shield (Tape) Material	Aluminum/Poly, non-bonded

Mechanical Specifications

Minimum Bend Radius, loaded, times	20 times
Minimum Bend Radius, unloaded, times	10 times

Environmental Specifications

Environmental Space	Plenum
Temperature Rating, UL	75 °C | 167 °F
Flame Test Method	CMP
Safety Standard	ETL | cETL

Packaging and Weights

Cable weight	43.157 kg/km | 29 lb/kft
Packaging Type	Reel

Regulatory Compliance/Certifications

Agency	Classification
CHINA-ROHS	Below maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
REACH-SVHC	Compliant as per SVHC revision on www.commscope.com/ProductCompliance
ROHS	Compliant
UK-ROHS	Compliant

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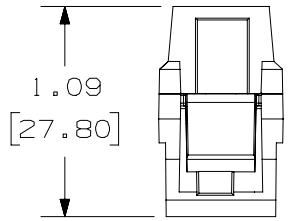
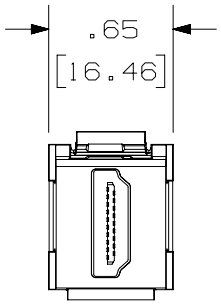
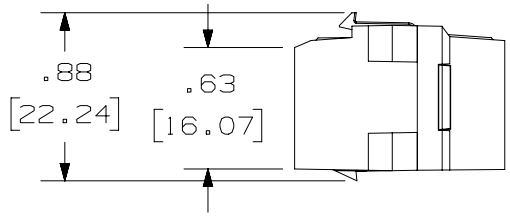
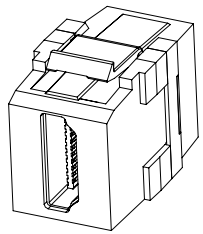
NOTES:
1. VISIT OUR ON-LINE CATALOG AT WWW.PANDUIT.COM FOR A LIST OF CURRENT PARTS APPLICABLE FOR USE WITH THIS PRODUCT.
2. DIMENSIONS IN [ ] ARE METRIC.
3. WEIGHT: 0.02 LB/EACH PC
   19.17 g/ EACH PC
4. PART INCLUDES:
   1- CONNECTOR - COPPER, LDPE
   2- HOUSING ABS
4. PART IS RoHS COMPLIANT









PART NUMBER

NKHDMI**

TITLE

NETKEY HDMI 2.0 TYPE "A"
FEMALE TO FEMALE COUPLER

CUSTOMER DRAWING

ITEM REVISION NAME: M03197AB/04

DATASET FILE NAME: M03197AB_DC13/04B

THIRD ANGLE PROJECTION

MATERIAL: SEE NOTE 4

DRAWING NUMBER: 03197-13

DRAWN BY	DATE	CHK	SCALE	SIZE
MDJR	8-18-09	HMK	FULL	A

SHEET 1 OF 1

REV	DATE	BY	CHK	APR	DESCRIPTION	ECN
2	2-4-20	BJN	VJV	MMR	UPDATED TITLE	03197-13
1	5-28-19	BJN	VJV	MMR	UPDATED TITLE BLOCK & NOTES, TITLE NOW 2.0, WAS 1.3 REVISED & REDRAWN PREVVIOUS REVS REMVD FOR CLARITY	03197-13

A-SIZE CUSTOMER

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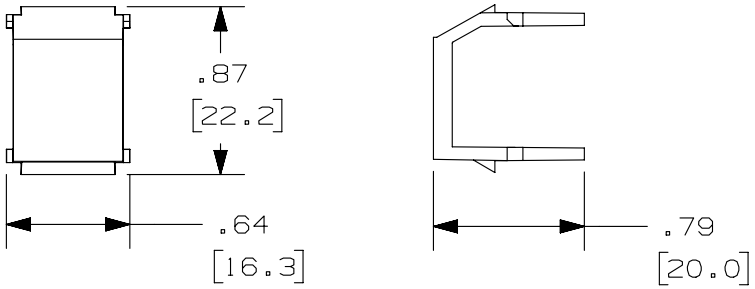
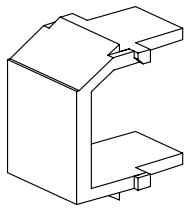
PANDUIT P/N	WEIGHT
NKBM**-X	.22 LB/10 PCS (102 g/10 PCS)
IAPNKBMWH-X	

NOTES:

1. SEE CURRENT CATALOG FOR ADDITIONAL PART SUFFIXES TO INDICATE COLOR AND OR PACKAGE QUANTITY.
2. DIMENSIONS IN PARENTHESES ARE IN METRIC.





REV	DATE	BY	CHK	APR	DESCRIPTION	ECN
3	5-16-14	MDJR	REFR	JCK	A. UPDATED TITLE BLOCK. PREVIOUS REVISIONS OMITTED FOR CLARITY.	38361-09

PART NUMBER: SEE TABLE

TITLE: NETKEY BLANK MODULE

CUSTOMER DRAWING

ITEM REVISION NAME: D38361BI/00

DATASET FILE NAME: D38361BI_DC09/00D

UNLESS OTHERWISE SPECIFIED, DIMENSIONAL TOLERANCES ARE: IN [mm]

.X ± .XXX ± .010 [.3]

.XX ± .03[.8] ANGLES ±

THIRD ANGLE PROJECTION

MATERIAL: ABS

DRAWING NUMBER: 38361-09

DRAWN BY	DATE	CHK	SCALE	SHT 1 OF 1	SIZE
JHNU	11-30-01	HIW	NONE		A

D10100DA/14

Poly Pull Line with Orange Tracer 6500-Foot

The Poly Pull Line with Orange Tracer provides a high-quality solution for wire pulling. Its unique orange tracer line makes identification easier. When used with other products from Klein Tools' complete line of wire pulling and conduit tools, professionals can get the job done quicker while saving time, effort and materials.

Specifications

Application:	Light Duty Cable or Rope Pulling	**Special Features:**	Rot and Mildew Resistant Line
Container:	Five-Gallon Bucket	**Overall Length:**	6500' (2 km)
Tensile Strength:	210 lb (95.2 kg)	**Material:**	Polypropylene
Weight:	11.0 lb (5.0 kg)	**Color:**	Orange/White

G6 Intelligent Power Distribution Unit (iPDU) USGv6 Certified

PANDUIT®
SPECIFICATION SHEET

OVERVIEW

The best just got better. The G6 iPDU is more than a power distribution unit and energy monitoring device. These iPDUs monitor the data center power and environment (at the rack or cabinet level), by continuously scanning for electrical circuit overloads, and physical environmental conditions that place critical IT equipment at risk. The iPDUs provide comprehensive, accurate, energy measurement data to efficiently use power resources, make informed capacity planning decisions, improve uptime, measure PUE (power usage effectiveness), and drive green data center initiatives to save energy and money.

Making the right choice in IT equipment is essential for a safe, efficient data center operation. Panduit's full range of G6 iPDUs, environmental sensors, and dual locking power cords are the key to fulfilling mission-critical data center needs.

TECHNICAL INFORMATION

		Width In. (mm)	Depth In. (mm)	Height In. (mm)
Dimensions:	**0U HALF:**	2 (52)	2.1 (53)	36.1 (917)
	0U MID:	2 (52)	2.1 (53)	58.6 (1490)
	0U FULL:	2 (52)	2.1 (53)	69 (1750)
	0U FULL Wide:	3.3 (85)	2.1 (53)	69 (1750)
Mounting:	Vertical units provide up to 48 outlets without encroaching on the EIA space.			

KEY FEATURES AND BENEFITS

Combination outlets[1]:	Combination outlets provide the ultimate in flexibility by allowing a customer to use an outlet as either an C13/C15 outlet or a C13/C15/C19/C21 outlet respectively. All combination outlets also accept the Panduit dual locking power cords to eliminate accidental disconnects.
Dual rated PDUs:	Simplify your supply chain by selecting a Dual Rated PDU. Dual rated PDUs have ratings and NRTL approvals for both North American & EMEA on the same part number.
HotSwappable controller:	Replace the controller and display module without having to power down the rack
Redundant network access:	Specifically designed for Landlord/Tenant (Co-Lo's) allowing for remote access of real-time, vital statistics and operating information on two separate, secure networks
Hardened security:	NMP v3, TLS, Encrypted Security; allows for Panduit PDUs to pass standard popular industry certified security scans. USGv6 Certified IPV6 Stack
Dual 1GB Ethernet:	Reduces deployment time by auto-negotiating with data center level network switches and can daisy chain up to 32 iPDUs on a single IP address using only one network switch port
Plug & play sensors:	Digital sensors not only allow for multiple sensors on the same bus; but also identify themselves to the controller to simplify setup and commissioning
Multi-color PDUs:	Different color PDUs simplify power feed identification in redundant power schemes
Mobile & desktop friendly web GUI:	Enhanced web interface that detects the type of device that you are on (laptop, tablet or smart phone); and automatically adjusts the screen for an optimal experience
Mobile and desktop friendly web GUI:	Enhanced web interface that detects the type of device the user is on (laptop, tablet, or smart phone), and automatically adjusts the screen for an optimal experience
Outlet density:	Meets demands of densely packed IT equipment in rack or cabinet space
Form factor:	Optimal form factor enables efficient rack space utilization and airflow
Operating temperature:	60°C ambient at full load for operational reliability in high temperature areas
Cable retention:	Innovative cable tie accepting outlets allow for secure cord retention (C13 & C19 only) using a cable tie for addedsafety and security. (Panduit part number: PLT2I-C0)
Circuit breakers:	Protects data center equipment for increased reliability by interrupting potentially hazardous circuit over-current conditions*
Color coded circuits[2]	Easily identify phase to outlet banks to aid in fault isolation or load balancing
External chassis ground:	Meets NEC requirements and installation guidelines for IT equipment
Load balancing:	Monitored through visual display on oLED (for three-phase units only)
Multiple input plug options:	A full breadth offering to seamlessly interoperate with existing building power wiring schemes
Multiple mounting options:	Enables simple out of the box commissioning and flexibility with Panduit cabinets and industry standard mounting features enabling installation into third party cabinets
Mounting buttons:	Allows tool-less mounting of rack PDUs for faster installations on vertical 0U units
Supported metering:	Frequency, VA, PF, plus aggregate and per phase Amperage, Voltage, Wattage, and Kilowatts per hour

1 Applies to products outfitted with combination outlets
2 Applies to products outfitted with circuit breakers

G6 Intelligent Power Distribution Unit (iPDU) USGv6 Certified

iPDU PRODUCT FAMILIES

MI series:	Rack PDUs that have the ability for aggregate power monitoring to quickly identify potential power issues, and reclaim available or under-utilized power capacity.
MS series:	Rack PDUs that have the ability for aggregate power monitoring and outlet level switching capabilities for individual outlets or a group of outlets. Enabling power sequencing, rebooting equipment or restrict unauthorized use of individual outlets.
MPO series:	Rack PDUs that have the ability for outlet level (and aggregate) power monitoring to quickly identify potential power issues, and reclaim available or under-utilized power capacity at the outlet level enabling the redeployment or decommissioning of individual servers to reclaim available or under-utilized power capacity.
MSPO series:	Rack PDUs that have the ability for outlet level (and aggregate) power monitoring and outlet level switching capabilities for individual outlets or a group of outlets. Power monitoring at the individual outlet level provides actionable management data on the power consumption of each connected IT device enabling the redeployment or decommissioning of individual servers to reclaim available or under-utilized power capacity. Ideal for remote power reset, and cabinet power on sequencing and restrict unauthorized use of individual outlets.

ELECTRICAL SPECIFICATIONS

Input voltage:	**North America** • Single-Phase 120 V • Single-Phase 208 V • Three-Phase Delta 208 V • Three-Phase Wye 120/208 V • Three-Phase Wye 415 V • Three-phase WYE 240/415 V	**International models** • Single-Phase 240 V • Three-Phase Wye 240/415 V (for Japan 415 V only) • Three-Phase Delta 208 V
Input current (per phase):	**North America** • 15A, 20A, 30A, 50A, 60A	**International models** • 16A, 32A, 63A
Input power:	**North America** • 1.4 - 34.5 (kVA)	**International models** • 3.7 - 44.4 (kVA)
Input frequency:	50/60 Hz	
Output voltage:	120 - 240 VAC	
Maximum output current: (outlet)	IEC C13: 10A IEC C19: 16A NEMA 5-20R: 16A	
Overload protection (where applicable):	Circuit Breakers, hydraulic magnetic	

10 kAIC Circuit Breakers for all 415 V models for North America

GENERAL SPECIFICATIONS

Temperature (operating):	50°F to 140°F (10°C to 60°C)		
Temperature (storage):	-4°F to 140°F (-20°C to 60°C)		
Relative humidity (operating):	10% to 90% non-condensing		
Relative humidity (non-operating):	5% to 95% RH		
Relative humidity (storage):	5% to 95%		
Elevation (operating):	0 to 10,000 ft. (0 to 3000m)		
Elevation (storage):	0 to 30,000 ft. (0 to 9144m)		
Conformance (standards):	USA & Canada3 - UL, CB Test Approved File number: E218078 Mexico: NOM Approved[3] Europe - CE/UKCA Approved[3] Australia - RCM Approved[3] Brazil: Approved	Chile: Approved Peru: Approved Uruguay: Approved Costa Rica: Approved United Arab Emirates (UAE): Approved	India: Approved China: Approved Hong Kong: Approved Singapore: Approved Indonesia: Approved Philippines: Approved
Environmental compliances:	RoHS & REACH		

3 Applies to select products

CABINET COMPATIBILITY

Intelligent PDUs can be easily installed into Panduit (or third-party cabinets) by utilizing the installed mounting buttons (18.4mm diameter). Where necessary, a small diameter (14.5mm) mounting button is available (sold separately, P/N: MA018). Panduit PDUs feature threaded inserts on the back and both sides for the ultimate in mounting flexibility. They safely and efficiently manage and distribute power to multiple devices through a single input power connector, per PDU, to enhance scalability of network build outs.

G6 Intelligent Power Distribution Unit (iPDU) USGv6 Certified

PRODUCT SPECIFICATIONS

MI SERIES

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
100-240VAC, 1 PHASE	**P42D06G**	EMEA	32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	42	(36)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P38D25G	NA	30	0U FULL	NEMA L6-30P	2	5	38	(32)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24D03G	EMEA	32	0U MID	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P34D41G	EMEA	32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	34	(28)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24D40G	EMEA	16	0U MID	IEC 60309 2P+E 6h 16A (IP44)	0	3.7	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P24D24G	NA	20	0U MID	NEMA L6-20P	0	3.3	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P24D07G	NA	30	0U MID	NEMA L6-30P	2	5	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P24D23G	NA	30	0U MID	NEMA L5-30P	2	2.9	24	(24)5-20R	2 (52)	2.1 (53)	69 (1750)
	P36D26G	NA	50	0U FULL	CS8265	3	8.3	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P16D20G	NA	15	0U HALF	NEMA 5-15P	0	1.4	16	(16)5-20R	2 (52)	2.1 (53)	69 (1750)
208 VAC, 3 PHASE	**P38D28G**	NA	30	0U FULL	NEMA L21-30P	3	8.6	38	(30)C13 (6)C19 (2)5-20R	2 (52)	2.1 (53)	69 (1750)
	P36D08G	NA	30	0U FULL	NEMA L15-30P	3	8.6	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24D34G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	24	(12)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P36D29G	NA	50	0U FULL	CS8365	3	10	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P30D02G	NA	30	0U FULL	NEMA L21-30P	3	8.6	30	(18)C13 (6)C19 (6)5-20R	2 (52)	2.1 (53)	69 (1750)
	P24D01G	NA	30	0U MID	NEMA L21-30P	3	8.6	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P48D21G	NA	30	0U FULL	NEMA L21-30P	3	8.6	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P48D22G	NA	30	0U FULL	NEMA L15-30P	3	8.6	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42D20G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42D22G	NA	50	0U FULL	CS8365	6	14.4	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P36D30G	NA	50	0U FULL	CS8365	6	14.4	36	(24)C13 (12)C19	2.2 (55)	3.1 (80)	70 (1780)
	P36D31G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	36	(24)C13 (12)C19	2.2 (55)	3.1 (80)	70 (1780)

PRODUCT SPECIFICATIONS (CONTINUED)

MI SERIES

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
230/415 VAC, 3 PHASE	**P42D04G**	EMEA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	42	(30)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P30D05G	EMEA	16	0U MID	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	30	(24)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24D43G	EMEA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	24	(12)C13 (12)C19	2.2 (55)	2.1 (53)	69 (1750)
	P42D07G	NA	30	0U FULL +	NEMA L22-30P	6	17.3	42	(36)C13 (6)C19	2 (51)	2.1 (53)	69 (1750)
	P48D20G	NA/ EMEA	30/ 32	0U FULL	IEC 60309 3P+N+E 6h 30A/32A (IP44)	6	17.3/ 22.0	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (55)	3.1 (80)	70 (1780)
	P48D23G	NA/ EMEA	20/ 16	0U MID	IEC 60309 3P+N+E 6h 20A/16A (IP44)	0	11.5/ 11.0	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42D21G	NA/ EMEA	60/ 63	0U FULL	IEC 60309 3P+N+E 6h 60A/63A (IP44)	12	43.5/ 34.6	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)

MS SERIES

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
100-240VAC, 1 PHASE	**P32E06G**	NA/ EMEA	30 /32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	5.8/ 7.4	32	(24)C13 (8)C19	2 (52)	2.1 (53)	69 (1750)
	P24E28G	NA	30	0U FULL	NEMA L6-30P	2	5	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P24E04G	EMEA	16	0U Mid	IEC 60309 2P+E 6h 16A (IP44)	0	3.7	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P18E23G	NA	30	0U MID	NEMA L5-30P	2	2.9	18	(18)5-20R	2 (52)	2.1 (53)	69 (1750)
	P12E22G	NA	20	0U HALF	NEMA L5-20P	0	1.9	12	(12)5-20R	2 (52)	2.1 (53)	69 (1750)
	P16E27G	EMEA	16	0U HALF	IEC 60309 2P+E 6h 16A (IP44)	0	3.7	16	(12)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P16E24G	NA	20	0U HALF	NEMA L6-20P	0	3.3	16	(12)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P44E07G	EMEA	32	0U FULL - Wide	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	44	(38)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P12E21G	NA	20	0U HALF	NEMA 5-20P	0	1.9	12	(12)5-20R	2 (52)	2.1 (53)	69 (1750)
	P12E20G	NA	15	0U HALF	NEMA 5-15P	0	1.4	12	(12)5-20R	2 (52)	2.1 (53)	69 (1750)

PRODUCT SPECIFICATIONS (CONTINUED)

MS SERIES (CONTINUED)

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
208 VAC, 3 PHASE	**P24E32G**	NA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	24	(12)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P36E35G	NA	16	0U MID	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P36E12G	NA	16	0U FULL	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P36E34G	NA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24E29G	NA	30	0U FULL +	NEMA L22-30P	6	17.3	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24E30G	NA	30/ 32	0U FULL	IEC 60309 3P+N+E 6h 30A/32A (IP44)	6	17.3/ 22.0	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P48E21G	NA	20/ 16	0U MID	IEC 60309 3P+N+E 6h 20A/16A (IP44)	0	11.5/ 11.0	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P48E22G	NA	60/ 63	0U FULL	IEC 60309 3P+N+E 6h 60A/63A (IP44)	12	43.5/ 34.6	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42E24G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42E26G	NA	50	0U FULL	CS8365	6	14.4	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
230/415 VAC, 3 PHASE	**P24E02G**	EMEA	16	0U FULL	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24E03G	EMEA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	24	(12)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P36E08G	EMEA	16	0U FULL	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P48E20G	NA/ EMEA	30/ 32	0U FULL	IEC 60309 3P+N+E 6h 30A/32A (IP44)	6	17.3/ 22.0	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P48E23G	NA/ EMEA	20/ 16	0U MID	IEC 60309 3P+N+E 6h 20A/16A (IP44)	0	11.5/ 11.0	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P48E25G	NA/ EMEA	60/ 63	0U FULL	IEC 60309 3P+N+E 6h 60A/63A (IP44)	12	43.5/ 34.6	48	(24)C13/C15 (24)C13/15/C19/C21	3.3 (85)	3 (75)	70 (1780)

PRODUCT SPECIFICATIONS (CONTINUED)

MPO SERIES

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
100-240VAC, 1 PHASE	**P32F10G**	EMEA	32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	32	(24)C13 (8)C19	2 (52)	2.1 (53)	69 (1750)
	P36F15G	NA	30	0U FULL	NEMA L6-30P	2	5	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24F01G	NA	30	0U FULL	NEMA L6-30P	2	5	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
230/415 VAC, 3 PHASE	**P36F13G**	EMEA	32	0U FULL - Wide	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	36	(24)C13 (12)C19	3.3 (85)	2.1 (53)	69 (1750)
	P36F12G	EMEA	16	0U FULL	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)

MSPO SERIES

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
100-240VAC, 1 PHASE	**P36G18G**	NA	30	0U FULL	NEMA L6-30P	2	5	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24G01G	NA	30	0U FULL	NEMA L6-30P	2	5	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P24G06G	EMEA	32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P32G13G	EMEA	32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	32	(24)C13 (8)C19	2 (52)	2.1 (53)	69 (1750)
	P44G14G	EMEA	32	0U FULL - Wide	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	44	(38)C13 (6)C19	3.3 (85)	2.1 (53)	69 (1750)

PRODUCT SPECIFICATIONS (CONTINUED)

MSPO SERIES (CONTINUED)

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
208 VAC, 3 PHASE	**P36G20G**	NA	50	0U FULL	CS8365	3	10	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24G03G	NA	30	0U FULL	NEMA L21-30P	3	8.6	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P36G19G	NA	30	0U FULL	NEMA L21-30P	3	8.6	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24G05G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	24	(12)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P24G02G	NA	30	0U FULL	NEMA L15-30P	3	8.6	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P48G31G	NA	30	0U FULL	NEMA L21-30P	3	8.6	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P48G32G	NA	30	0U FULL	NEMA L15-30P	3	8.6	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42G20G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42G22G	NA	50	0U FULL	CS8365	6	14.4	42	(21)C13/C15 (21)C13/15/C19/C21	2.2((56)	3 (75)	70 (1780)
	P36G30G	NA	50	0U FULL	CS8365	6	14.4	36	(24)C13 (12)C19	2.3 (58)	2.9 (75)	66 (1679)
	P36G31G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	36	(24)C13 (12)C19	2.3 (58)	2.9 (75)	66 (1679)
230/415 VAC, 3 PHASE	**P36G16G**	EMEA	32	0U FULL - Wide	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	36	(24)C13 (12)C19	3.3 (85)	2.1 (53)	69 (1750)
	P48G04G	NA	30	0U FULL - Wide +	NEMA L22-30P	6	17.3	48	(48)C13	3.3 (85)	2.1 (53)	69 (1750)
	P24G08G	EMEA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	24	(12)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P36G15G	EMEA	16	0U FULL	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P36G33G	NA/ EMEA	30/ 32	0U FULL	IEC 60309 3P+N+E 6h 30A/32A (IP44)	6	17.3/ 22.0	36	(24)C13 (12)C19	2.3 (58)	2.9 (75)	66 (1679)
	P48G30G	NA/ EMEA	30/ 32	0U FULL	IEC 60309 3P+N+E 6h 30A/32A (IP44)	6	17.3/ 22.0	48	(24)C13/15/C19/C21 (24)C13/C15	2.2 (56)	3 (75)	70 (1780)
	P48G33G	NA/ EMEA	20/ 16	0U MID	IEC 60309 3P+N+E 6h 20A/16A (IP44)	0	11.5/ 11.0	48	(24)C13/15/C19/C21 (24)C13/C15	2.2 (56)	3 (75)	70 (1780)
	P42G21G	NA/ EMEA	60/ 63	0U FULL	IEC 60309 3P+N+E 6h 60A/63A (IP44)	12	34.5/ 44.4	42	(21)C13/15/C19/C21 (21)C13/C15	2.2 (56)	3 (75)	70 (1780)
	P36G32G	NA/ EMEA	20/ 16	0U FULL	IEC 60309 3P+N+E 6h 20A/16A (IP44)	3	11.5/ 11.0	36	(24)C13 (12)C19	2.3 (58)	2.9 (75)	66 (1679)

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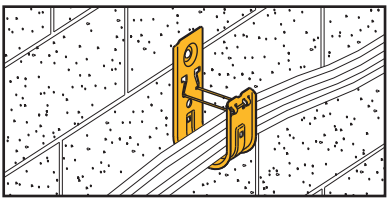


Cable Hooks

- Supports Cat. 5/5e/6/6A fiber optic, innerduct and low voltage cabling requirements.
- Qwik-Latch™ cable retainers included with hooks.
- Static Load Capacity: 30 Lbs.
- Finish: Pre-Galvanized

BCH12

Open

Closed

BCH21

BCH32

BCH64

UPC/Part Number	Catalog Number	Hook Size	Capacity Up To	Box Qty.
782051 28060	**BCH12**	3/4"	16 4-Pair UTP Cat 5e or 2-Strand Fiber Optic Cable or 10 CAT6	50
781011 04713	**BCH21**	1 5/16"	50 4-Pair UTP Cat 5e or 2-Strand Fiber Optic Cable or 32 CAT6	50
781011 04717	**BCH32**	2"	80 4-Pair UTP Cat 5e or 2-Strand Fiber Optic Cable or 50 CAT6	50
781011 04721	**BCH64**	4"	300 4-Pair UTP Cat 5e or 2-Strand Fiber Optic Cable or 185 CAT6	25

Patent #5961081

For special finish colors see page 151

(See pages 234-235 for technical data.)

Read safety/installation instruction sheets in packages before use.

Painted Cable Hooks

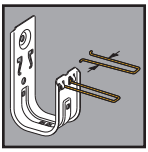
- Powder coated cable hooks are available in a range of colors to help meet your cable identification requirements.
- Standard riveted assemblies are available with painted cable hooks.
- Part numbers can be made by adding the paint color suffix after the cable hook part number.
- Minimum order quantity 500 pieces.
- Standard lead time is 5-10 working days.

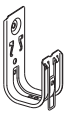
Bright White - BW	Green - GR
Brown - BR	Orange - OR
Computer White - CW	Regal Red - RR
Equipment Blue - BL	Safety Yellow - YL
Flat Black - FB	Telcom Gray - TG

Part # Example:
Painted Cable Hook Part Number - BCH32BW
Painted Cable Hook Assembly - BCH32BW-U24

Replacement Cable Retainers

- Exclusive Qwik-Latch™ retainers are included on all cable hook purchases.
- Provides secure containment of cables and offers quick open/close feature to add or remove cables.
- Finish: Pre-galvanized





Retainer in open position

Push retainer down to lock

UPC/Part Number	Catalog Number	Cable Retainer For Hook Size	Box Qty.
781011 04847	**BCHR21**	$1\frac{5}{16}$”	50
781011 04848	**BCHR32**	2”	50
781011 04849	**BCHR64**	4”	50

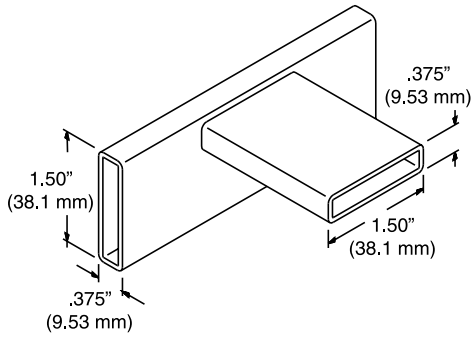
Patent #5961081

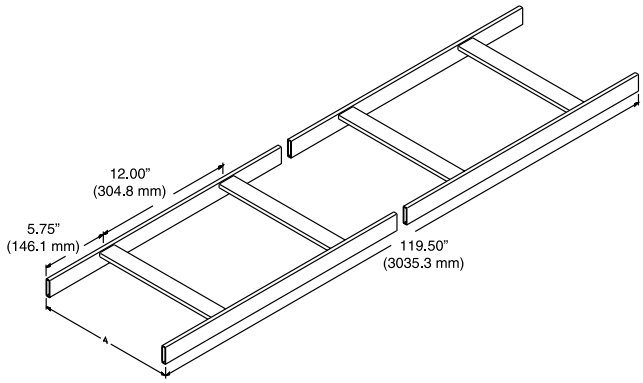
Read safety/installation instruction sheets in packages before use.

CHATSWORTH PRODUCTS

PRODUCT SPEC SHEET

Universal Cable Runway





Universal Cable Runway

Our most popular cable runway is designed for value conscious customers. The Universal Cable Runway offers the industry standard features you've come to expect. With the runway supported every 5' (1.5 m), maximum load with minimal deflection is 132 lb/ft (59.9 kg).

- Made of 3/8" x 1-1/2" x .065" (9.53 mm x 38 mm x 1.65 mm) wall rectangular steel tubing
- Cross members welded at 12" (300 mm) intervals
- Individually boxed to prevent scratches and damage
- Standard length is 9'-11 1/2"/119.5" (3035 mm)
- Installation Best Practices includes Runway Elevation Kit
- U.L. classified for suitability as an equipment grounding conductor (must remove paint from side stringers or use grounding strap
- 11301 Butt-Splice Kit Installation Instructions chatsworth.com

NOTE: CPI 10250, 11252, 11275 and 14300 cable runway systems are listed under UL E138966 and tested to the requirements in the Standard for Safety for Metal Cable Tray Systems, NEMA VE 1-2017 and ANSI/NFPA 70.

ORDERING INFORMATION

Part Number	Width (Dim. A) in (mm)	Shipping Weight lb (kg)
10250-X04	4 (100)	18 (8.2)
10250-X06	6 (150)	19 (8.6)
10250-X09	9 (230)	20 (9.1)
10250-X12	12 (300)	25 (11.3)
10250-X15	15 (380)	27 (12.2)
10250-X18	18 (460)	29 (13.2)
10250-X24	24 (610)	32 (14.5)
10250-X31	30 (760)	35 (15.7)
10250-X37	36 (910)	38 (17.2)

X=color; 1=Gray, 7=Black, E=Glacier White.

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Cable Runway Load-Span Table

Maximum load with minimal deflection is 132 lb/ft when the runway is supported every 5′.

Load-Span Table, CPI Cable Runway

Safety Factor	Span (ft)	4	5	6	7	8	9
1.5	Maximum Load (lb/ft) Defection (in)	206 0.41	132 0.64	92 0.92	67 1.25	52 1.62	41 2.03
2.0	Maximum Load (lb/ft) Defection (in)	154 0.31	99 0.48	69 0.68	50 0.93	39 1.21	31 1.531
	K factor	0.002	0.005	0.010	0.019	0.032	0.050

CPI recommends supporting cable runway runs every 5 feet.

To calculate deflection for loads lighter than maximum loads listed in table, .multiply load for which deflection is desired by K factor listed in table for cable runway support span utilized.

Example: To calculate maximum deflection using a safety factor of 1.5 for a length of cable runway supported every 5' and loaded with 80 pounds per foot:

Defection = (80) (0.005) = 0.40"

NOTE: CPI 10250, 11252, 11275 and 14300 cable runway systems are listed under UL E138966 and tested to the requirements in the Standard for Safety for Metal Cable Tray Systems, NEMA VE 1-2017 and ANSI/NFPA 70.

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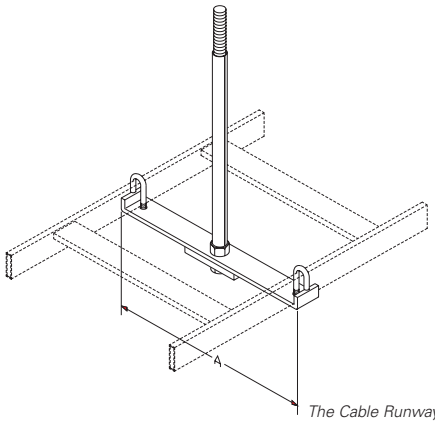
Cable Runway Center Support Kit



The Cable Runway Center Support Kit is available in sizes to support 6" to 24"W (150 mm to 610 mm) cable runway. Not included: Threaded Rod (P/N 11440-00X) and Ceiling Support Bracket (P/N 11406-002).

Cable Runway Center Support Kit

This kit has been designed to make installation of cable runway in the ceiling even easier by using just a single point of attachment. The center attachment design not only makes installation easy, but also provides quick and simple cable routing with no need to thread the cable between the runway supports. The support kit securely attaches to the cable runway stringer, eliminating possible dislocations.

- Made of steel
- Provides an "open" support system with quick and simple cable routing
- Threaded rod cover protects cable insulation from damage
- Compatible with Adjustable Cable Runway

Kit includes:
- (1) support bracket
- (1) reinforcement bar
- (2) 5/8-11 hex nuts;
- (1) 5/8 split lock washers
- (1) 12"L (300 mm) threaded rod cover
- (1) J-bolt kit (2 J-bolts; 2 nuts; 2 washers)

ORDERING INFORMATION

Part Number	Description Width - in (mm)	Dim. A in (mm)	Shipping Weight lb (kg)
12362-X06	6 (150)	6.56 (166.6)	2 (0.9)
12362-X12	12 (300)	12.56 (319.0)	2 (0.9)
12362-X15	15 (380)	16.20 (411.5)	3 (1.4)
12362-X18	18 (460)	19.20 (487.7)	4 (1.8)
12362-X24	24 (610)	25.20 (640.1)	5 (2.3)

X=color: 0=Gold, 1=Gray, 7=Black, E=Glacier White. Gold and Glacier White kits have gold colored hardware. Gray and Black kits have black colored hardware.

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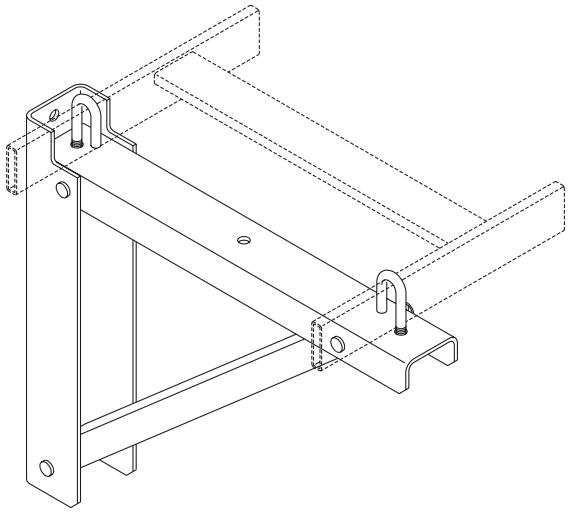
CHATSWORTH PRODUCTS

PRODUCT SPEC SHEET

Triangular Support Bracket, Steel



Triangular Support Bracket, Steel
Triangular Support Bracket provides wall support for Cable Runway. Made of cold rolled steel. Load rating is 400 lb (181.4 kg).for cable runway.
• Compatible with Adjustable Cable Runway

Kit includes:
• (1) vertical wall-mounting bracket
• (1) runway support channel
• (1) angle support channel
• (3) clevis pins (5/16" diameter) & cotter pins
• (2) 5/16-18 x 2 1/4" J-bolts
• (2) 5/16-18 hex nuts & 5/16 lock washers

ORDERING INFORMATION

Part Number	Runway Widths in (mm)	Shipping Weight lb (kg)
11746-X12	4-12 (100-300)	5 (2.3)
11746-X18	9-18 (230-460)	8 (3.6)
11746-X24	9-24 (230-610)	9 (4.1)

X=color: 0=Gold, 1=Gray,7=Black, E=Glacier White. Gold and Glacier White kits have gold colored hardware. Gray and Black kits have black colored hardware.

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EZ-PATH® SERIES 44+ FIRE RATED PATHWAY

APPLICATIONS

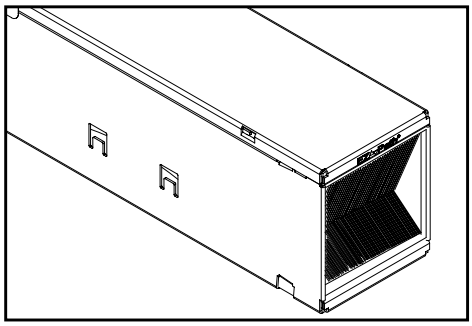
EZ-PATH® Series 44+ Fire Rated Pathway is designed for easy installation in floors and walls. Tested and approved cable capacities range from 0 to 100% visual fill. EZ-PATH® Series 44+ Fire Rated Pathway when installed with available single wall plates is designed for new cable installations. In these installations, the device does not require mechanical attachment to either the wall or the wall framing and must be installed after the wallboard has been installed. Split floor plates and multi-gang wall and floor brackets permit installation around previously installed cables if so desired. These installations require mechanical attachment to the barrier. A list of available accessories along with their intended use is shown on page 2 under available components.

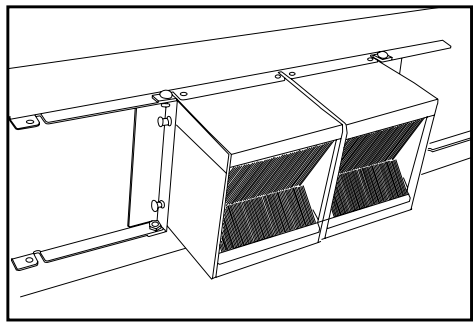
EZ-PATH® Series 44+ Fire Rated Pathway Fire Rated Pathway provides exceptional cable capacity. A single unit installed in a wall exceeds the cable carrying capacity of a 6" (152 mm) sleeve utilizing typical putty firestop systems (35% cable loading). Multiple ganged pathways utilizing available wall bracket kits provide additional capacity or segregation of cables by use, type, installer or vendor as desired.

PRODUCT DESCRIPTION

The EZ-PATH® Series 44+ Fire Rated Pathway is a pathway device designed to allow cables to penetrate fire-rated walls and floors without the need for firestopping. This device features a built-in fire and smoke sealing system that automatically adjusts to the amount of cables installed. Once installed in a fire barrier, cables can be easily added or removed at any time without the need to remove or reinstall firestopping materials.

The EZ-PATH® Series 44+ Fire Rated Pathway consists of an enclosed heavy gauge galvanized steel pathway lined with intumescent material engineered for rapid expansion when exposed to fire or high temperatures, quickly sealing the pathway and preventing the passage of flames and smoke. EZ-PATH® Series 44+ Fire Rated Pathway is painted safety orange for easy identification. Its compact square profile allows a maximum number of cables to be installed in a relatively small area. The pathway measures approximately 4" x 4 5/8" and is 14" long (102 x 118 x 356 mm) and can be increased by 6" (152mm) for every Series 44+ Extension module (EZD44ES) installed..





PERFORMANCE

EZ-Path® Series 44+ Fire Rated Pathway is UL Tested and Classified in accordance with ASTM E814 (UL1479) & CAN/ULC-S115. Systems are available for common floor and wall constructions with ratings up to and including 4 hours.

SPECIFICATIONS

All data, video, and communications cable bundles shall utilize an enclosed fire rated pathway device wherever said cables penetrate rated walls and floors. The fire-rated pathway shall contain a built-in fire sealing system sufficient to maintain the hourly fire rating of the barrier being penetrated. The self-contained sealing system shall automatically adjust to the installed cable loading and shall permit cables to be installed, removed, or retrofitted without the need to remove or reinstall firestop materials. The pathway shall be UL Classified and/or FM Systems Approved and tested to the requirements of ASTM E814 (UL1479) & CAN/ULC-S115.

SPECIFIED DIVISIONS

DIV. 7	07 84 00	Penetration Firestopping
DIV. 26	26 00 00	Electrical
DIV. 27	27 00 00	Communications

FEATURES & BENEFITS

- Easy to install.
- No firestopping required.
- Firestopped at all stages of use.
- UL Tested - Low Leakage!
- Acoustically Tested
- UL Classified for the complete range of its capacity.
- Interlocking design for easy gang installations.
- Permits cable segregation by use, type, vendor.
- More than TWICE the capacity of Standard EZ-Path 33.

FIRESTOP DEVICE CERTIFIED FOR USE IN THROUGH-PENETRATION FIRESTOP SYSTEMS SEE UL ONLINE CERTIFICATIONS DIRECTORY.

INSTALLATION INSTRUCTIONS

EZ-Path® Series 44+ Fire Rated Pathway is designed for use in all common constructions. Single pathways and mounting hardware may be purchased separately or in complete kits. For multi-gang installations, pathways and appropriate mounting hardware must be purchased separately. Single pathways may be installed in either square or round openings. Ganged pathways are designed to be installed in either square or rectangular openings appropriately sized for the number of units desired (See Installation Instructions). In gypsum board walls where pathways are ganged, wall plates must be secured to the wall's internal studs.

Technical Service 1-800-992-1180
www.stifirestop.com

CABLE INSTALLATION

Cables may easily be added or removed at any time without removing or reinstalling the fire seal. Cables may be added individually or in bundles. Wrapping ends with a low-friction tape facilitates cable insertion. Avoid any sharp or exposed conductors that can potentially damage interior pads. A self-adjusting cable throat automatically adjusts to accommodate the cable bundle as it passes through the pathway. Installation of a pulling line will facilitate future cabling additions.

MAINTENANCE

No maintenance of the pathway is normally required.

TECHNICAL SERVICE

Technical information including Product Data Sheets, Installation Instructions, applicable UL Classified Systems, Certificates of Conformance, and suggested specifications are available at the company's web site (www.stifirestop.com). For all other information, contact the manufacturer directly by dialing (800) 992-1180.

PRECAUTIONARY INFORMATION

The use of this device is subject to local, regional and national codes. Consult the local Building Code Official or Authority Having Jurisdiction regarding any regional or local requirements that might influence the selection or use of this product.

AVAILABILITY

See Ordering Information below. EZ-PATH® Fire-Rated Pathway Products are available from designated authorized STI distributors. Consult the factory or visit the web site (www.stifirestop.com) for the names and locations of the nearest sales representatives or distributors.

ORDERING INFORMATION

Catalog Number	Description
EZDP44S2	EZ-Path Series 44+ Fire-Rated Pathway Kit Full Kit with device, wall plates & labels
EZDP144FKS2	EZ-Path Series 44+ Fire-Rated Pathway Floor Kit Full Kit with device, floor plate & labels
EZP144W	One Pair (2) 44 single wall plate pack
EZP544W	EZ-Path Series 44+ 5 gang wall plate brackets
EZP144F	EZ-Path Series 44+ Split floor plate pack
EZD44S2	EZ-Path Series 44+ Device
EZD44ES	EZ-Path Series 44+ Extension Module
EZDG444S2	Single Bank Floor Grid - Four (4) Devices with floor frame
EZDG844S2	Multi-slot Frame Kit for 8 Pathways - (Includes eight (8) Series 44 devices with EZG844)
EZDG1644S2	Multi-slot Frame Kit for 16 Pathways - (Includes sixteen (16) Series 44 devices with EZG1644)
EZG444	Multi-Slot Frame for Four (4) Pathways
EZG444CP	Splice Plate for Floor Grid
EZG844	Multi-Slot Frame for Eight (8) Pathways
EZG1644	Multi-Slot Frame for Sixteen (16) Pathways
EZP144RS	(Retrofit Wall Plate Pack)
EZDP144RS2	(EZ-Path Series 44+ Fire-Rated Pathway Retrofit Kit Full Kit with device, wall plates & labels

PHYSICAL PROPERTIES

Dimensions:	4" w x 4 5/8"H x 14" L (102 x 118 x 356 mm)
Shell Composition:	0.059" (1.5 mm) thick galv. steel
Cable Loading Area:	3 3/8" x 3 3/4" (86 x 95 mm)
Allowable Cable Fill:	0 to 100% visual fill
Fire Ratings:	1, 2, 3 or 4 hours
Expansion Begins:	350°F (177°C)
Volume Expansion:	800%
Sample Cable Volume:	210 (Cat6 0.236" OD)
In-Service Temperature:	Not to exceed 120°F (49°C)
Shelf Life:	No Limit

IMPORTANT NOTICE: All statements, technical information, and recommendations contained herein are based upon testing believed to be reliable, but the accuracy and completeness thereof is not guaranteed.

LIMITED WARRANTY: STI warrants that its products will be free of defects for one year from the date of purchase. In the event a product does not conform to this warranty, the sole and exclusive remedy is, at STI's option, replacement of the product or refund of the purchase price. The warranty provided herein shall be void and of no effect in the event that the product is not installed in accordance with STI's published instructions, listed systems and applicable building and safety codes. THIS WARRANTY IS IN LIEU OF ALL OTHER REPRESENTATIONS AND EXPRESSED OR IMPLIED WARRANTIES (including the implied warranties of merchantability or fitness for a particular use) AND UNDER NO CIRCUMSTANCES SHALL STI BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING, WITHOUT LIMITATION, ANY LOSS OF REVENUE, PROFIT OR USE. Prior to use, the user shall determine the suitability of the product for its intended use, and the user assumes all risks and liability for subsequent use. No person other than an officer of STI is authorized to bind STI to any other warranty for any product for which this warranty is issued.

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Specified Technologies Inc.
THE FIRESTOP AUTHORITY

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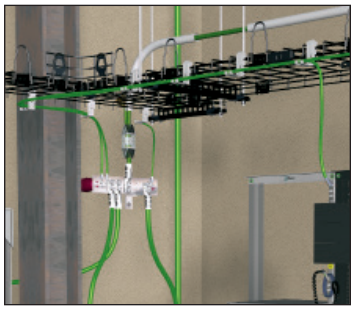
StructuredGround™ Telecommunications Room Grounding and Bonding Kits for TIA-607-C Compliance

PANDUIT®

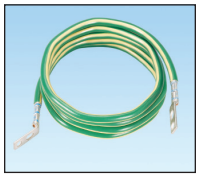
SPECIFICATION SHEET

specifications

Grounding and bonding kits shall bond each rack to Secondary Bonding Busbar (SBB) also known as Telecommunications Grounding Busbar (TGB) using Telecommunications Equipment Bonding Conductor (TEBC). Hardware kit shall bolt TEBC to SBB/TGB with 1/4" stainless steel hardware. Each bolt requires a nut, flat washer on both sides, and a Belleville washer on the bolt side of the stack up. TEBC shall be bolted to rack with #12-24 thread-forming screws. Abrasive cleaning pad shall remove oxidation from lug and mounting surfaces. Copper to copper joint compound shall also be utilized to prep lug mounting surfaces. The front and back of each rack requires one ESD Port Kit and ESD wrist strap. Bond SBB/TGB to electrical panel serving equipment in telecommunications room.



kit information

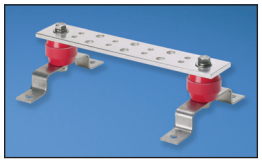


TEBC Kits:
Pre-terminated jumper on both ends – #6 AWG jumper with 45° bent lug on rack side to straight lug on SBB/TGB.

Part Number	Length In.
GJ672UH	72
GJ696UH	96
GJ6120UH	120
GJ6144UH	144
GJ6168UH	168
GJ6192UH	192
GJ6216UH	216
GJ6240UH	240
GJ6264UH	264
GJ6288UH	288

TEBC Kits:
Pre-terminated jumper on one end only – #6 AWG jumper with 45° bent lug for bonding to rack.

Part Number	Length In.
GJS660U	60
GJS696U	96
GJS6120U	120
GJS6180U	180



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SBB/TGB Kits:
Pre-assembled with brackets and insulators – bar size 1/4" x 2".

Part Number	Bar Length In.	1/4" Stud Hole with 5/8" Hole Spacing	3/8" Stud Hole with 1" Hole Spacing
GB2B0304TPI-1	10	4	3
GB2B0306TPI-1	12	6	3
GB2B0312TPI-1	20	12	3

Compression Lugs for SBB/TGB:
Two-hole straight tongue compression lug with window.

Part Number	Copper Conductor Size	Stud Hole Size In.	Stud Hole Spacing In.
LCC6-14JAW-L	#6 AWG	1/4	0.50 – 0.63
LCC2-14AW-Q	#2 AWG	1/4	0.63
LCC1/0-14AW-X	1/0 AWG	1/4	0.63
LCC3/0-38DW-X	3/0 AWG	3/8	1.00
LCC4/0-38DW-X	4/0 AWG	3/8	1.00

Armored Fiber Cable Grounding Kits:
Pre-terminated jumper on both ends – straight lug and terminal. Provided with mechanical clamp and cover for terminal and two each #12-24 and M6 hex head thread-forming screws.

Part Number	Armored Cable Diameter In.	Grounding Cable Length In.
ACG24K	Up to 0.84	24
ACG24K-500	0.84 to 1.03	24

applications

StructuredGround™ Telecommunications Room Grounding and Bonding Kits deliver a complete grounding solution, designed to exceed industry standards for ensured electrical continuity and ease of installation. Bonding of rack and equipment to SBB/TGB and proper ESD protection is critical to the reliability and safety needs of the physical infrastructure. Integrated technology from Panduit addresses comprehensive grounding and bonding needs to protect systems, equipment, and personnel for optimum availability of services and lower operational costs. As solution architecture, a range of installation tooling, design software, and services complement StructuredGround™ Grounding System.

For the complete StructuredGround™ Grounding System offering, refer to www.panduit.com/dcgrounding.

www.panduit.com

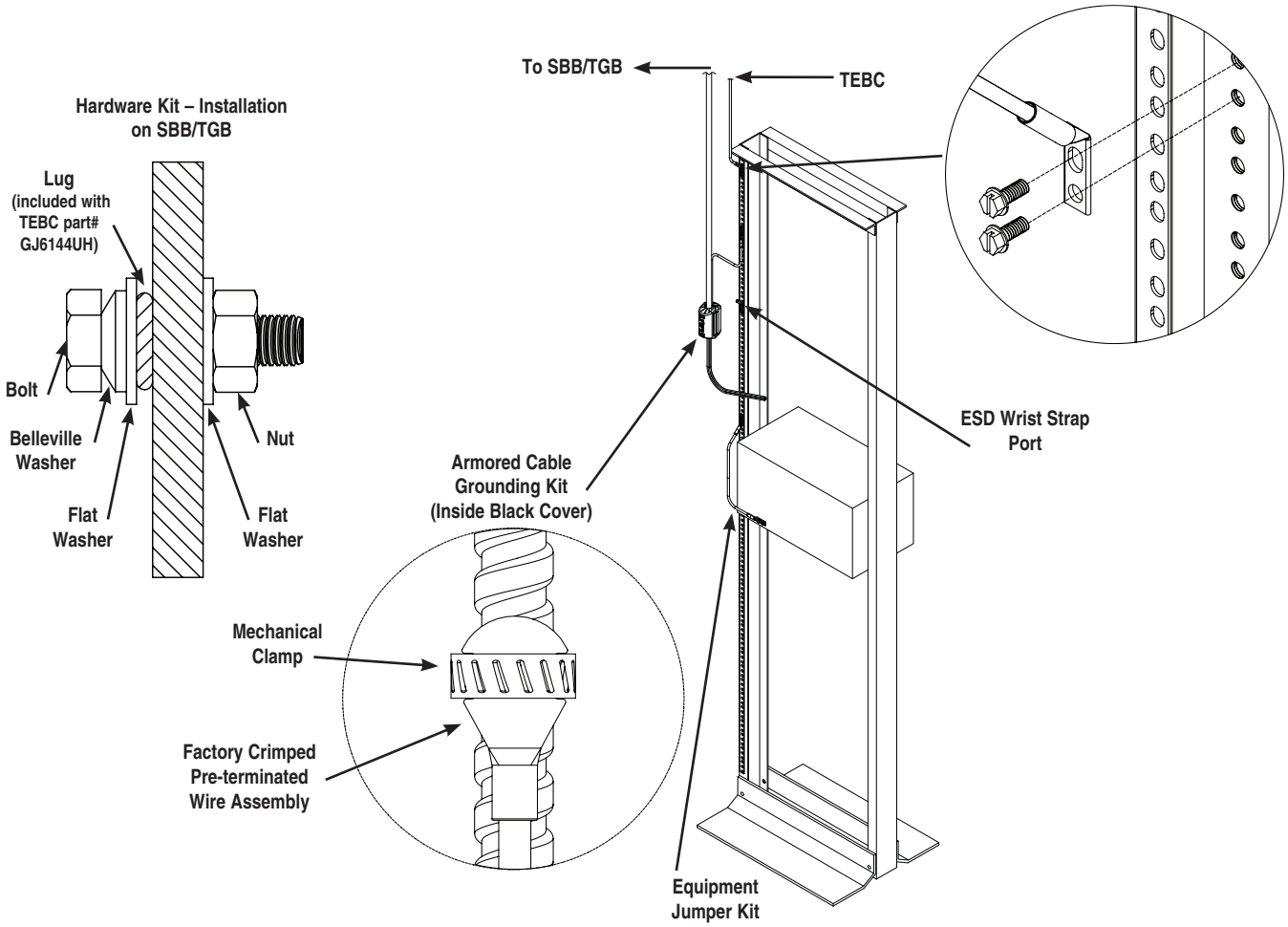
Related Products

Hardware Kits: include 2 bolts, 2 nuts, 4 flat washers, 2 Belleville washers for SBB/TGB and 2 thread-forming screws for racks	
1/4" kit with #12-24 and M6 screws:	HDW1/4-KT
3/8" kit with #12-24 and M6 screws:	HDW3/8-KT
1/4" kit with #10-32 and M5 screws:	HDW1/4-A-KT
3/8" kit with #10-32 and M5 screws:	HDW3/8-A-KT
Stainless Steel Bolts	
1/4-20	SSNTS1420-C
3/8-18	SSNTS3816-C
Stainless Steel Belleville Washers	
1/4"	SSCW14-C
3/8"	SSCW38-C
Stainless Steel Flat Washers	
1/4"	SSFW14-C
3/8"	SSFW38-C
Stainless Steel Nuts	
1/4-20	SSN1420-C
3/8-18	SSN3816-C
Abrasive Cleaning Pad	
4-1/2" x 6"	HANDPAD
ESD Port	
Two-hole ESD port with banana jack:	RGESD2-1
ESD Wrist Strap	
6' coil cord, banana plug, 1 megohm resistor:	RGESDWS
Equipment Jumper Kits: include .16 oz. of antioxidant and two each #12-24 x 1/2" and M5 x 12mm thread-forming screws	
#6 AWG jumper, 57" length, bent lug on grounding strip side:	RGEJ657PFY
#6 AWG jumper, 24" length, bent lug on grounding strip side to straight lug on equipment:	RGEJ624PFY

bill of materials (example):

The following sample bill of materials and installation drawings are provided to assist you with ordering and kit combinations to meet your application needs.

Description	Part Number	Qty
SBB/TGB Kit	GB2B0306TPI-1	1 per Telecommunications Room
TEBC Kit	GJ6144UH	1 per Rack/Cabinet
Hardware Kit	HDW1/4-KT	1 per Rack/Cabinet
Equipment Jumper Kit	RGEJ657PFY	1 per Equipment
ESD Port	RGESD2-1	2 per Rack/Cabinet (one front and one back)
ESD Wrist Strap	RGESDWS	2 per Rack/Cabinet (one front and one back)
Armored Fiber Cable Grounding Kit	ACG24K	1 per Armored Fiber Cable



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For more information

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SA-GRSP10
replaces SA-GRSP05
2/2016

LG Business Solutions

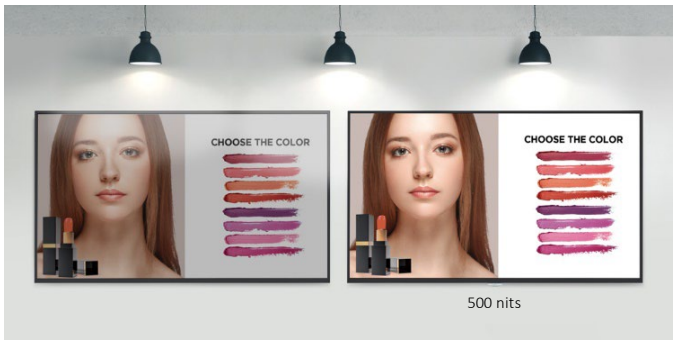
* All images in this datasheet are for illustrative purposes only.

UHD Signage UH5J-H

New High Haze UHD Standard Signage

- Proper Display Brightness
- webOS Smart Platform
- Mobile Content Management
- Meeting Room Solution

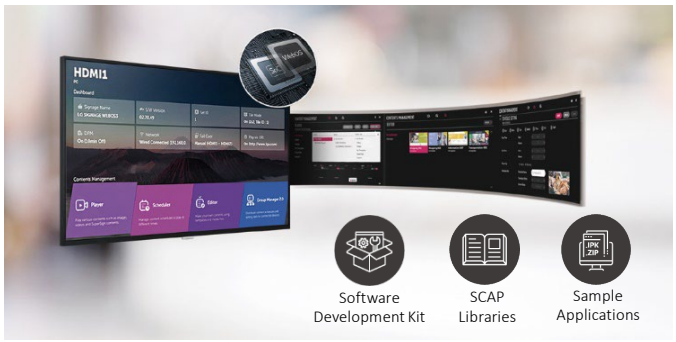
UH5J-H	
Screen Size	98" / 86" / 75" / 65" / 55" / 49" / 43"
Native Resolution	3,840 × 2,160 (UHD)
Bezel Color	Black
Brightness	500 nits (Typ.)
Bezel	98" / 75": 14.9 mm (Even bezel) 86": 14.3 mm (Even bezel) 65" / 55" / 49": 9.9 mm (T/R/L), 14.4 mm (B) 43": 8.4 mm (T/R/L), 14.4 mm (B)
Depth	98": 86.1 mm 86": 60.6 mm 75": 57.9 mm 65" / 55" / 49" / 43": 39.9 mm



Appropriate Display Brightness

With a brightness of 500 nits, the UH5J-H series clearly delivers content and can attract attention, making it suitable for displaying presentations and marketing communications in meeting rooms, retail spaces, airports, shopping malls and more.

* Actual images available may differ from the example images shown.

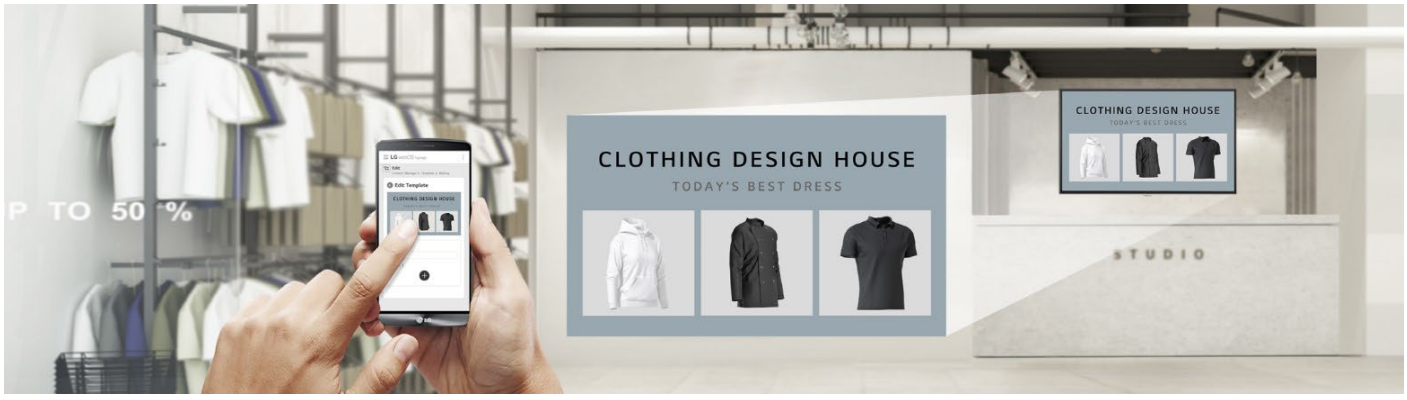


High-Performance with webOS

The built-in System on Chip can execute several tasks at once while providing smooth content playback without the need for a media player. Also, the LG webOS Signage platform provides an intuitive, TV-style remote controlled user interface that is easy to learn and consistent across many LG products.

Conformal Coating

In various places your signage may be unable to avoid exposure to environments containing dust or humidity which may hamper performance over time. The conformal coating on power board helps protect UH5J-H series circuit boards from external particles.



Mobile Content Management

Using the free, downloadable* signage app Promota, users can create custom templates from recommendations on the app to easily promote content on their signage. Visit https://www.promota.net for details.

* LG Promota is can be downloaded from the App Store and Google Play store.

IP5x Certified Design

The IP5x Certification ensures that the product is protected from dust, reducing the risk of performance degradation.

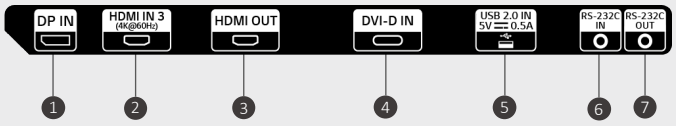
Compatible with AV Control System

The UH5J-H has been certified Crestron Connected® for high compatibility with professional AV controls to achieve virtually seamless integration and automated, network-based control.

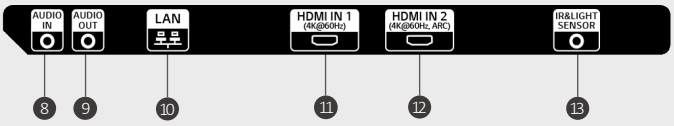
CONNECTIVITY

98”

Side

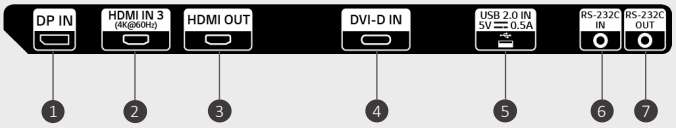


Bottom

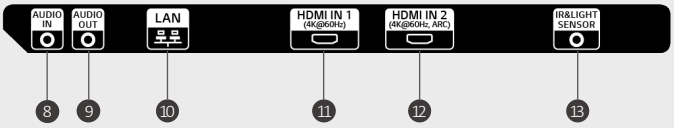


86” / 75”

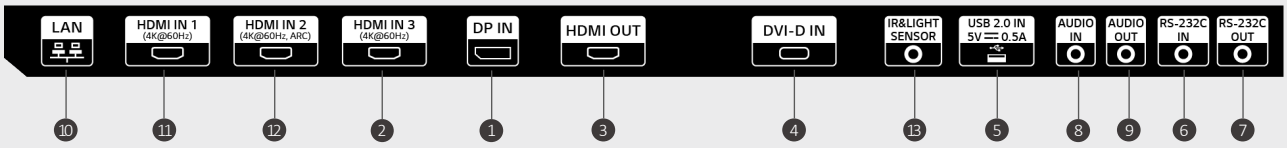
Side



Bottom



65” / 55” / 49” / 43”

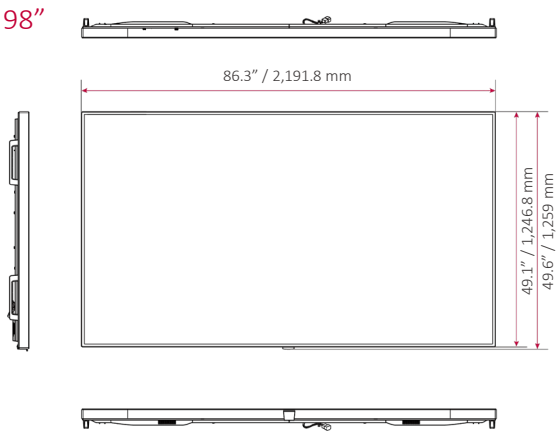


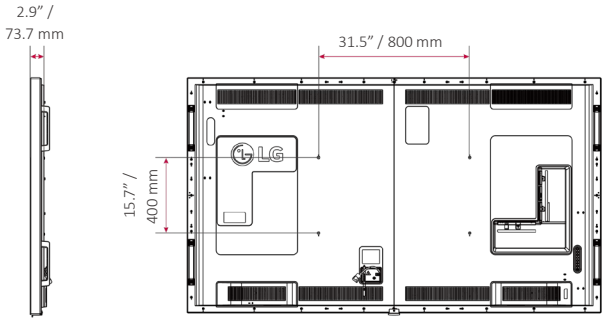
1. DP IN
2. HDMI IN 3
3. HDMI OUT
4. DVI-D IN
5. USB 2.0 IN
6. RS-232C IN
7. RS-232C OUT
8. AUDIO IN
9. AUDIO OUT
10. LAN
11. HDMI IN 1
12. HDMI IN 2
13. IR&LIGHT SENSOR

* Jack Panels may differ from the above image, so please contact LG sales team to verify before ordering.

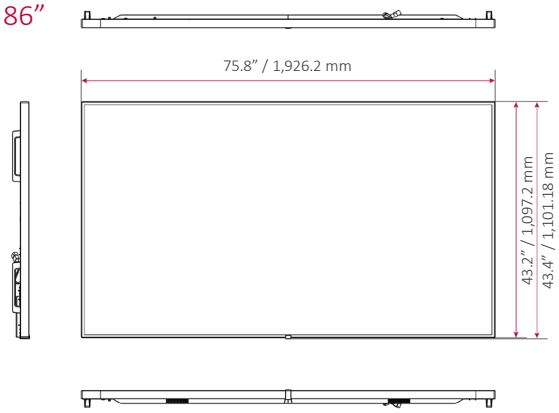
DIMENSIONS

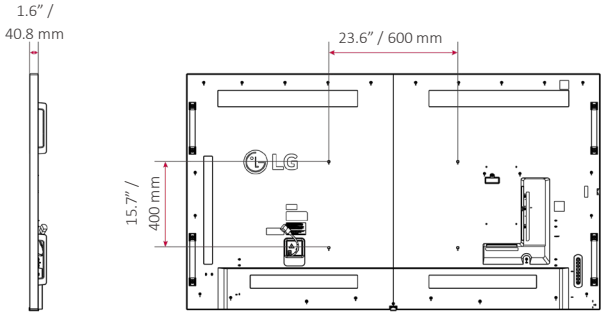
98”



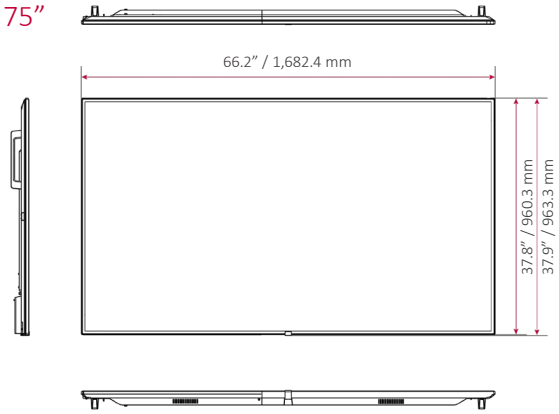


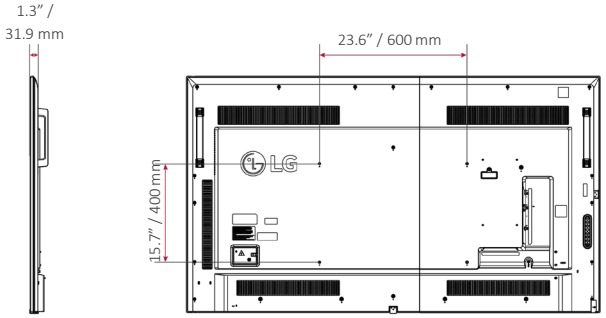
86”





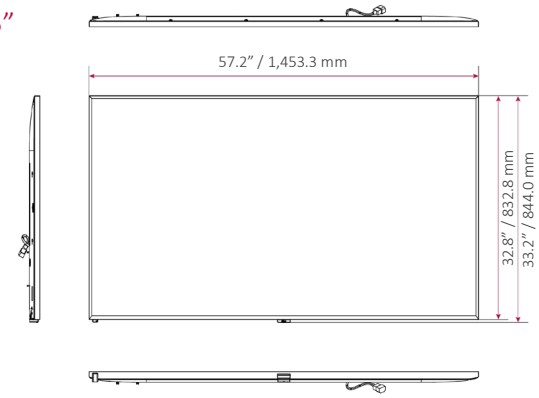
75”

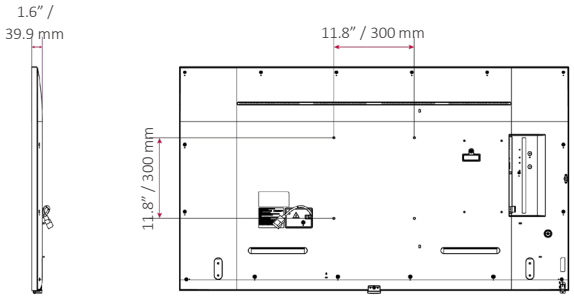




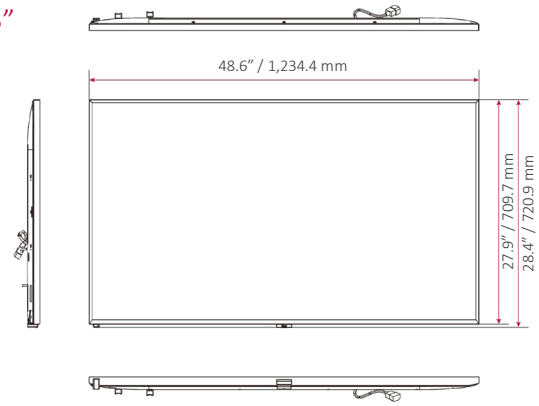
DIMENSIONS

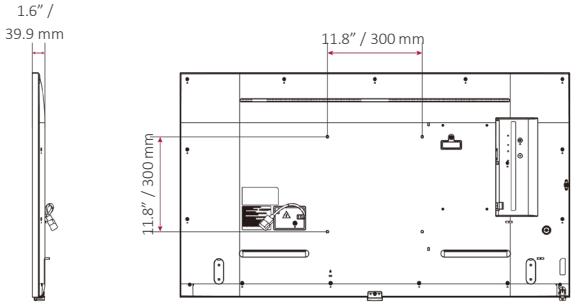
65”



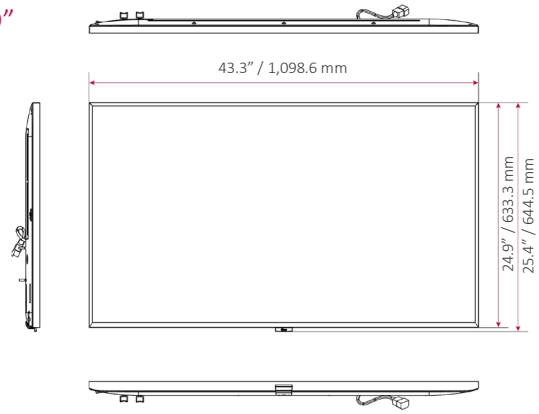


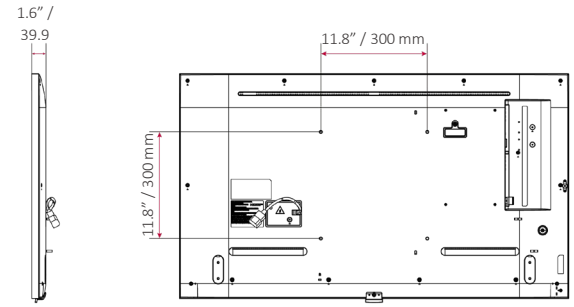
55”



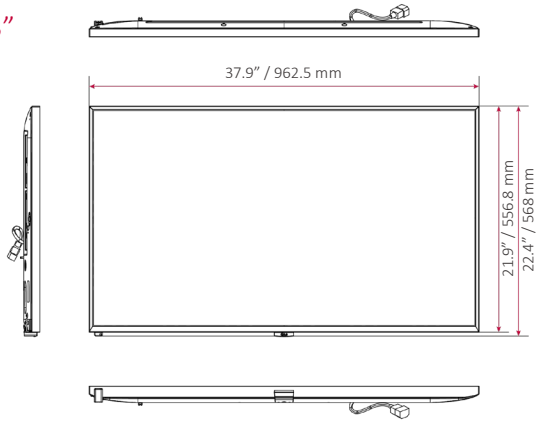


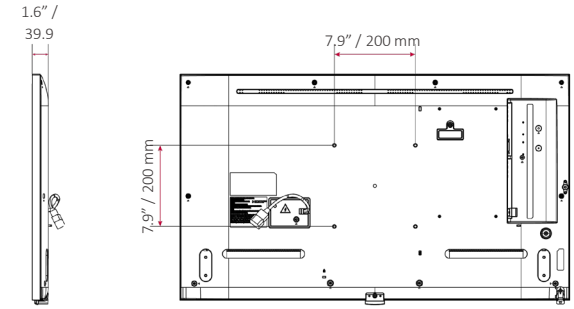
49”





43”





* Dimensions may differ from the above image, so please contact LG sales team to verify before ordering.

SPECIFICATIONS

		98UH5J-H	86UH5J-H	75UH5J-H	65UH5J-H	55UH5J-H	49UH5J-H	43UH5J-H
Panel	Screen Size	98"	86"	75"	65"	55"	49"	43"
	Panel Technology	IPS	IPS	IPS	IPS	IPS	IPS	IPS
	Back Light Type	Direct	Edge	Edge	Edge	Edge	Edge	Edge
	Aspect Ratio	16 : 9	16 : 9	16 : 9	16 : 9	16 : 9	16 : 9	16 : 9
	Native Resolution	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)
	Refresh Rate	60 Hz	120 Hz	120 Hz	60 Hz	60 Hz	60 Hz	60 Hz
	Brightness	500 nits (Typ.)	500 nits (Typ.)	500 nits (Typ.)	500 nits (Typ.)	500 nits (Typ.)	500 nits (Typ.)	500 nits (Typ.)
	Contrast Ratio	1,200 : 1	1,100 : 1	1,100 : 1	1,100 : 1	1,100 : 1	1,100 : 1	1,200 : 1
	Dynamic CR[1]	1,000,000 : 1	1,000,000 : 1	1,000,000 : 1	1,000,000 : 1	1,000,000 : 1	1,000,000 : 1	1,000,000 : 1
	Color Gamut	NTSC 72%	NTSC 72%	NTSC 72%	BT709 95%	BT709 95%	BT709 95%	BT709 95%
	Viewing Angle (H × V)	178° × 178°	178° × 178°	178° × 178°	178° × 178°	178° × 178°	178° × 178°	178° × 178°
	Color Depth	1.07 Billon Colors (10 bit)	1.07 Billon Colors (10 bit (D))	1.07 Billon Colors (10 bit (D))	1.07 Billon Colors (10 bit (D))	1.07 Billon Colors (10 bit (D))	1.07 Billon Colors (10 bit (D))	1.07 Billon Colors (8 bit + FRC)
	Response Time (G to G)	8 ms	8 ms	6 ms	8 ms	8 ms	8 ms	8 ms
	Surface Treatment (Haze)	28%	28%	28%	28%	28%	28%	25%
	Lifetime	Up to 50,000 Hrs.	Up to 50,000 Hrs.	Up to 50,000 Hrs.	Up to 50,000 Hrs.	Up to 50,000 Hrs.	Up to 50,000 Hrs.	Up to 50,000 Hrs.
	Operation Hours (Hours/Day)	24 / 7	24 / 7	24 / 7	24 / 7	24 / 7	24 / 7	24 / 7
	Portrait / Landscape	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
Connectivity	Input	HDMI (x2, HDCP 2.2/1.4), HDMI (HDCP 1.4), DP (HDCP 2.2/1.3), DVI-D (HDCP 1.4), Audio In, RS-232C In (4 Pin 3.5mm jack), RJ45 (LAN), IR In, USB 2.0 (x2, Type A)						
	Output	HDMI Out, Audio Out, External Control (RS-232C Out (4 Pin 3.5mm jack))						
Mechanical Specification	Bezel Color	Black	Black	Black	Black	Black	Black	Black
	Bezel Width	14.9 mm (Even Bezel)	14.3 mm (Even Bezel)	14.9 mm (Even Bezel)	9.9 mm (T/R/L), 14.4 mm (B)	9.9 mm (T/R/L), 14.4 mm (B)	9.9 mm (T/R/L), 14.4 mm (B)	8.4 mm (T/R/L), 14.4 mm (B)
	Weight	145.5 lbs. / 66 kg	108.0 lbs. / 49 kg	91.5 lbs. / 41.5 kg	62.2 lbs. / 28.2 kg	41.9 lbs. / 19 kg	34.0 lbs. / 15.4 kg	24.7 lbs. / 11.2 kg
	Weight with Stand	n/a	n/a	n/a	63.5 lbs. / 28.8 kg	19.6 lbs. / 19.6 kg	35.3 lbs. / 16 kg	26.0 lbs. / 11.8 kg
	Shipping Weight	218.3 lbs. / 99 kg	159.8 lbs. / 72.5 kg (With Pallet)	112.9 lbs. / 51.2 kg	77.2 lbs. / 35 kg	53.4 lbs. / 24.2 kg	41.4 lbs. / 18.8 kg	30.2 lbs. / 13.7 kg
	Dimensions (W × H × D) (without handle)	86.3 x 49.1 x 3.4 in. 2,191.8 × 1,246.8 × 86.1 mm (without LG Logo)	75.8 x 43.2 x 2.4 1,926.2 × 1,097.2 × 60.6 mm (without LG Logo)	66.2 x 37.8 x 2.3 in. 1,682.4 × 960.3 × 57.9 mm (without LG Logo)	57.2 x 33.2 x 1.6 in. 1,453.3 × 844 × 39.9 mm (with LG Logo)	48.6 x 28.4 x 1.6 in. 1,234.4 × 720.9 × 39.9 mm (with LG Logo)	43.3 x 25.4 x 1.6 in. 1,098.6 × 644.5 × 39.9 mm (with LG Logo)	37.9 x 22.4 x 1.6 in. 962.5 × 568 × 39.9 mm (with LG Logo)
	Dimensions with Stand (W × H × D)	n/a	n/a	n/a	57.2 x 35.2 11.4 in. 1,453.3 × 893.1 × 290.0 mm	48.6 x 30.3 x 11.4 in. 1,234.4 × 770.7 × 290.0 mm	43.3 x 27.3 x 11.4 1,098.6 × 694.3 × 290.0 mm	37.9 x 24.1 x 11.4 962.5 × 613.1 × 290.0 mm
	Shipping Dimensions (W × H × D)	92.2 x 54.6 x 16.5 in. 2,342 × 1,386 × 420 mm	80.2 x 49.2 x 11.2 in. 2,037 × 1,250 × 285 mm	71.5 x 44.3 x 9.0 in. 1,816 × 1,126 × 228 mm	63.0 x 43.1 x 6.9 in. 1,600 × 1,095 × 175 mm	53.5 x 32.9 x 6.9 in. 1,360 × 835 × 175 mm	47.1 x 30.5 x 6.4 in. 1,197 × 775 × 162 mm	41.7 x 26.0 x 6.0 in. 1,060 × 660 × 152 mm
	Handle	Yes	Yes	Yes	No	No	No	No
	VESA™ Standard Mount Interface	800 × 400 mm	600 × 400 mm	600 × 400 mm	300 × 300 mm	300 × 300 mm	300 × 300 mm	200 × 200 mm
Key Features	Internal Memory 16 GB, Built-in Wi-Fi, Sensor (Temperature Sensor, Auto Brightness Sensor, Acceleration (Gyro) Sensor), Local Key Operation, webOS 6.0, Embedded CMS (Local Contents Scheduling, Group Manager), USB Plug & Play, Fail Over, Background Image (Booting Logo Image, No Signal Image), Sync Mode (RS-232C Sync, Local Network Sync), Multi-screen (PIP, PBP (4)), Screen Share, Video Tag (4), Play via URL, Rotation (Screen Rotation, External Input Rotation), Gapless Playback, Tile Mode Setting (Max. 15 × 15), Setting Data Cloning, SNMP, ISM Method, Auto Set ID, Status Mailing, Control Manager, 3rd Party Compatibility (Crestron Connected®[2]), Power (Smart Energy Saving, PM Mode, Wake on LAN, Network Ready (Except 98"/86"/75")), Beacon, HDMI-CEC[3], SI Server Setting, webRTC, Pro:Idiom							
Environment Conditions	Operation Temperature	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C
	Operation Humidity	10% to 80%	10% to 80%	10% to 80%	10% to 80%	10% to 80%	10% to 80%	10% to 80%
Electrical	Power Supply	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz
	Power Type	Built-in Power	Built-in Power	Built-in Power	Built-in Power	Built-in Power	Built-in Power	Built-in Power
	Power Consumptions (Typ. / Max.)	420 W / 570 W	215 W / 280 W	180 W / 260 W	130 W / 190 W	110 W / 150 W	1000 W / 140 W	80 W / 120 W
	BTU (British Thermal Units)	1,433 BTU/Hr (Typ.), 1,945 BTU/Hr (Max.)	733.69 BTU/Hr (Typ.), 955.5 BTU/Hr (Max.)	614.25 BTU/Hr (Typ.), 887.25 BTU/Hr (Max.)	444 BTU/Hr (Typ.), 649 BTU/Hr (Max.)	376 BTU/Hr (Typ.), 512 BTU/Hr (Max.)	342 BTU/Hr (Typ.), 478 BTU/Hr (Max.)	273 BTU/Hr (Typ.), 410 BTU/Hr (Max.)
	Smart Energy Saving	294 W	150.5 W	126 W	91 W	77 W	70 W	56 W
	DPM	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W
	Power off	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W
Sound	Speaker	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Certifications	Safety	CB / NRTL	CB / NRTL	CB / NRTL	CB / NRTL	CB / NRTL	CB / NRTL	CB / NRTL
	EMC	FCC Class "A" / CE	FCC Class "A" / CE	FCC Class "A" / CE	FCC Class "A" / CE	FCC Class "A" / CE	FCC Class "A" / CE	FCC Class "A" / CE
	ErP / Energy Star	Yes (NewErP) / No (TDB)	Yes (NewErP) / No (TDB)	Yes (NewErP) / Yes (TDB)	Yes (NewErP) / Yes	Yes (NewErP) / Yes	Yes (NewErP) / Yes	Yes (NewErP) / Yes
OPS Compatibility	OPS Type Compatible	No	Yes	Yes	Yes	Yes	Yes	Yes
	OPS Power Built-in	No	No	No	No	No	No	No
LG Software Compatibility	SuperSign CMS, SuperSign Control / Control+, SuperSign WB, SuperSign Media Editor, Promota (Not Available for EU/CIS), Mobile CMS, LG ConnectedCare[4]							
Languages	English, French, German, Spanish, Italian, Korean, Chinese (Simplified), Chinese (Original), Portugues (Brazil), Swedish, Finnish, Norwegian, Danish, Russian, Japanese, Portugues (Europe), Dutch, Czech, Greek, Turkish, Arabic							
Accessories	Basic	Remote Controller, Power Cord, QSG, Regulation Book, Phone to RS-232C Gender						
	Optional	-	OPS Kit (KT-OPSF), LSW640A/B (Wall Mount)		Stand(ST-653T), Wall Bracket(LSW350B), OPS Kit(KT-OPSF)			
Special Feature	Overlay Touch Compatibility	No	No	No	No	No	No	No
	Tilt (Facedown)	n/a	n/a	n/a	Yes (Max. 30º)[5]	Yes (Max. 30º)[5]	Yes (Max. 30º)[5]	Yes (Max. 15º)[5]
	IP Rating	n/a	n/a	n/a	IP5X	IP5X	IP5X	IP5X

[1] The luminosity ratio of Full Black / Full White color on video input condition.
[2] Network based control.
[3] Compatibility may differ by equipment.
[4] The availability can differ by region.
[5] In conditions within 30ºC temperature, 50% humidity.

* Specifications are subject to change without notice. Please make sure to check the product manual for details about product usage.

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LG_SPEC-SHEET_UH5J-H_0323SK_LR.pdf

LG Business Solutions

AVARRO™

LARGE TILT MOUNT

NX-TL4290

EASY TO INSTALL WITH A LOW PROFILE TILTING DESIGN AND POST-INSTALL LEVELING. THE NX-TL4290 IS IDEAL FOR 42" - 90" PANELS WEIGHING UP TO 175 LBS.

SPECIFICATIONS:

- Fits 42"- 90" TVs up to 175lbs
- VESA 100 x 100 to 700 x 400 (W x H) (mm)
- Locking mechanism secures rails to wall plate
- Height adjustable for easy levelling
- Tilt up to 12° to reduce glare
- Simple to install and use
- Includes complete hardware kit
- Warranty: 5 years
- For commercial and residential applications

BOX DIMENSIONS:

PART#:	**NX-TL4290**
UPC:	**840049303119**
LENGTH:	**7.3"**
WIDTH:	**32.1"**
HEIGHT:	**2.4"**
WEIGHT:	**7.3 LBS**

For more information please call 1-833-574-9124
or email AVARRO@adiglobal.com

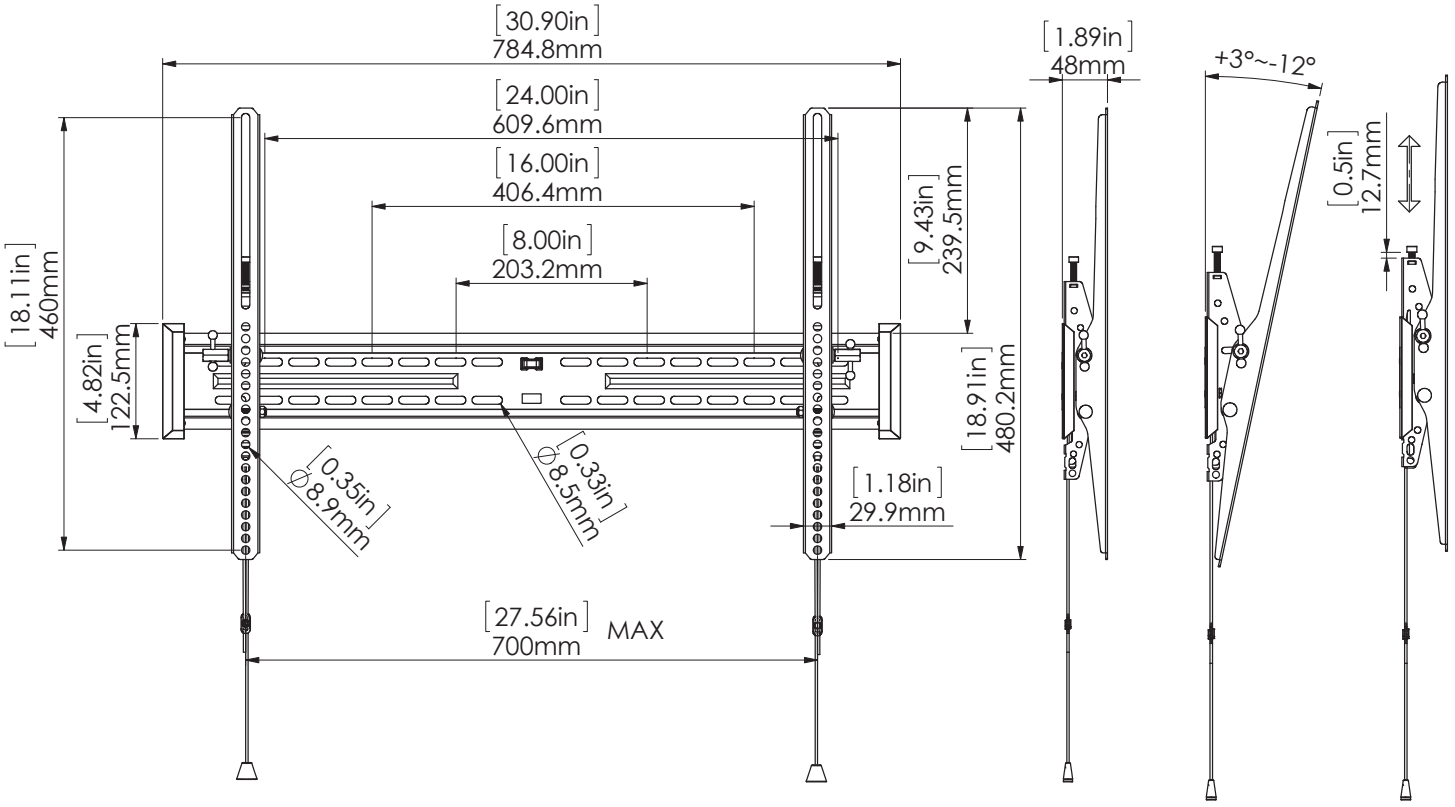
To learn more about AVARRO products visit
avarro.adiglobaldistribution.us

c UL us LISTED
20180731-E354445

RoHS COMPLIANT

TECHNICAL DRAWING

NX-TL4290



For more information please call 1-833-574-9124
or email AVARRO@adiglobal.com

To learn more about AVARRO products visit
avarro.adiglobaldistribution.us

WATT BOX

COMPARISON CHART

600 *SERIES*

400 *SERIES*

200 *SERIES*

SURGE & CONDITIONING

Model	WB-200-2	WB-200-CE-4	WB-400-8	WB-400-CE-10	WB-400-VCE-12	WB-600-VCE-10	WB-600-SVCE-12	WB-600CH-SVCE-12
Outlets	2	4	8	10	12	10	12	12
Power Cord Length	1.5 FT	4 FT	6FT	6FT	6FT	6FT	6FT	6FT
Rack Mountable	N	N	Y	Y	Y	Y	Y	Y
Energy Disipation	2160 Joules	2160 Joules	3240 Joules	3240 Joules	4320 Joules	5400 Joules	6480 Joules	6480 Joules
Fireproof MOV	Y	Y	Y	Y	Y	Y	Y	Y
Isolated Filter Banks	1	1	1	1	2	2	3	3
Coax Protection	No	1 In - 1 Out	No	2 In - 2 Out	2 In - 2 Out	2 In - 2 Out	2 In - 2 Out	2 in - 2 Out
Telephone/Network Protection	No	1 In - 1 Out	No	1 In - 1 Out	1 In - 1 Out	1 In - 1 Out	2 In - 2 Out	2 in - 2 Out
Safe Voltage	N	N	N	N	Y	Y	Y	Y
12V Trigger	N	N	N	N	N	In	In/Out	In/Out
Sequencing	N	N	N	N	N	N	Y	Y
Optional Faceplate Display	N	N	N	N	N	Y	Y	Y
Connected Equipment Warranty	$25,000	$25,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
UL Listed	Y	Y	Y	Y	Y	Y	Y	Y

* Specs subject to change without notice

PTZ3 UHD Camera – One Sheet & Tech Specs

Mastering the art of capture

The NewTek PTZ3 UHD is the best and easiest way of getting the highest quality video and audio onto any network and into any production. The PTZ3 UHD is the only NewTek 4Kp60 camera on the market that offers both professional audio and ultra-high-definition video – all built on the unshakeable foundation of NDI®.

Mastering Audio

For the first time in a NewTek UHD camera, Professional XLR audio input seamlessly runs with equipment such as microphones, mixers, amplifiers, and soundboards. The Professional XLR integration offers clean, balanced audio directly from the camera into the NDI network, so the audio maintains the highest fidelity for customers and integrators.

Mastering Video

To ensure users deliver high-quality images and video, the PTZ3 UHD takes pan/tilt/zoom quality to a new level with improved movement between camera presets. Ease-in and ease-out movements deliver seamless, smooth transitions for a natural, superior quality production without jittery or stuttering movements.

Mastering Connectivity

No other camera on the market offers this level of simplicity and control. Whether it's using a single cable for audio and video, PTZ control, tally and PoE for power or connecting via NDI, NewTek PTZ Cameras simply appear on the network and can immediately be built into any workflow with ease.

Constructed with NDI® at its core, the PTZ3 UHD guarantees the tightest integration with any NewTek live production system and any NDI® workflow – offering professional audio, pristine 4Kp60 and infinite production possibilities.

PTZ3 UHD Camera - Technical Specifications

Video Output	NDI|HX, 3G-SDI, HDMI	
Audio Output	NDI|HX, HDMI, SDI	
Video Formats	**NDI|HX**	3840*2160P60/59.94/50/30/29.97/25
		1920*1080P60/59.94/50/30/29.97/25/24
		1280*720P60/59.94/50/30/29.97/25
	HDMI	3840*2160P60/59.94/50/30/29.97/25
		1920*1080P60/59.94/50/30/29.97/25/24/23.98
		1920*1080I60/59.94/50
		1280*720P60/59.94/50/30/29.97/25
	SDI	1920*1080P60/59.94/50/30/29.97/25/24/23.98
		1920*1080I60/59.94/50
		1280*720P60/59.94/50/30/29.97/25
Zoom	30 x Optical & 2x digital zoom	
Sensor	Sony 1/1.8 inch 12MP sensor.	
ColorSpace	**8 bit**	NDI - 4:2:0
		HDMI & SDI - 4:2:2
Shutter Speed	1/30 to 1/10,000 sec	
Panning Angle	-170° to +170°	
Panning Speed	Max 120°/sec	
Tilting Angle	30° to +60°	
Tilting Speed	Max 80°/sec	
Aperture	F1.8 ~ F14	
Focal Length	6.91mm~214.64mm	
Horizontal Angle of View	60°(Far)-2°(Near)	
Min. Object Distance	1.5m (Wide/Tele)	
Min. Illumination	0.1 lux	
Encoding	H.264/H.265, NDI|HX & HEVC	

Audio Input	Mini XLR, 3.5mm stereo audio input (line)
Embedded Audio	NDI, HDMI,
Signal	Balanced (Mini XLR), Unbalanced (Line In)
Sample Rate	48KHz
Frequency	100Hz~20KHz
Total Harmonic distortion	-90dB
Tally	Supported

PTZ3 UHD Camera - Technical Specifications contd.

White Balance	Auto, Manual, Auto Tracking, One Push, Outdoor, Indoor
Exposure	Auto, Manual, Shutter Priority, Iris Priority, Brightness Priority
Focus	Auto, Manual, Iris Auto, Manual Shutter Auto, Manual
Anti-Flicker	Off/50Hz/60Hz
Gain Control	Auto, Manual
Control	NDI
User Interface	Web based or NewTek NDI® Studio Monitor applications for remote configuration, control, and monitoring

POE+	POE+ (IEEE 802.3 at)
Direct Power	DC12V
Power Consumption	12W
Operating Temperature	-10°C~50°C
Operating Humidity	20%~80%
Physical	Dimensions
	8.66 x 7.48 x 6.41 in (220 x 190 x 173 mm)
	Weight: 2.97lbs (1.35 kg)
Ceiling Mount	Included
Wall Mount	Included
Adapters	MiniXLR (f) to XLR(f) adapter included

NewTek™

TriCaster® TC410 Plus

Technical Specifications

Video Input	8 x simultaneous external video inputs, supporting any combination of compatible sources
Network Video Input	8 x IP video inputs via NDI, resolution-independent, with support for key and fill
SDI Video Input	4 x HD/SD-SDI connections supporting video input in any combination of standard formats, resolutions, and frame rates [1] • 1080p: 59.94, 50, 29.97, 25, 24, 23.976 • 1080i: 59.94, 50 • 720p: 59.94, 50, 29.97, 25, 24, 23.976 • 576i 25 • 480i 59.94 *[1]Available frame rates determined by session video standard (NTSC or PAL)*
PTZ	Support for Pan-Tilt-Zoom (PTZ) robotic cameras via serial and network protocols, including RS232, RS422, and IP, with integrated controls and preset system
Skype TX	Native support for Skype® video call input via Skype TX software integration
Network Video Output	4 x independent IP video mix outputs via NDI®
SDI Video Output	2 x independently configurable HD/SD video outputs, with support for up to 4 simultaneous external connections
Stream Output	2 x resolution-independent streaming video output, independently configurable, with simultaneous stream archive
Multiviewer Output	1 x DVI user interface with multiviewer 1 x HDMI multiviewer 1 x DisplayPort multiviewer
Mix/Effect Buses (M/E)	4 x M/E buses supporting video re-entry • 1 x Mix/Effect channel per bus with support for up to 4 sources • 4 x KEY layers per bus 1 x PREVIZ configuration and preview bus
DSK Channels	2 x DSK channels
Media	5 x media players • 2 x DDR • 2 x GFX • 1 x Sound
Media Buffers	15 x media buffers • 10 x animation buffers • 5 x graphic buffers
Keyers	Integrated LiveMatte® chroma and luma keying technology on all source channels and M/E buses • 8 x input keyers • 4 x media player keyers • 4 x M/E keyers • 1 x PREVIZ keyer • 15 x buffer keyers
COMPs	Integrated video composition engine on the switcher and each M/E bus to create, store, and apply layer configuration and DVE-style motion sequences • 16 x configurable COMP presets per bus
Virtual Sets	Integrated LiveSet® technology with 30+ live virtual sets and box effects included

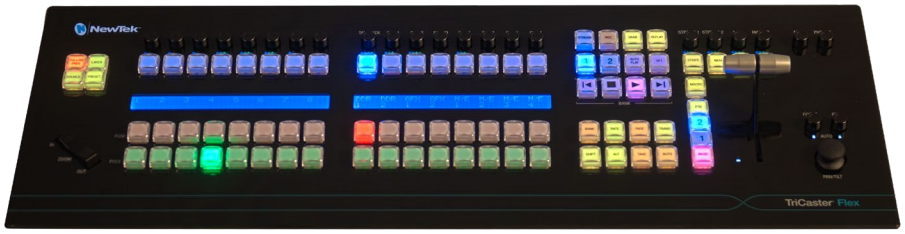
DataLink	Integrated DataLink® technology enabling real-time, automated data input from internal and external sources, including webpages, spreadsheets, scoreboards, databases, RSS feeds, watch files, XML, CSV, ASCII and more
Macros	Record, store, edit, and automate commands and user-configured operation sequences • Attach to control panel buttons, keyboard shortcuts, hotspots, MIDI, and X-keys® buttons or GPI triggers • Attach to internal events and state changes, including audio, media playback, tally, and specific switcher actions • Supports control via web-based interface
Recording	6 x configurable video recording channels via IsoCorder® technology • 4 x QuickTime® archival video recorders (XDCAM HD compatible, 4:2:2 encoding, 24-bit audio, with timecode)2 • 2 x H.264 local video recorder (multiple profiles) • Ability to trigger up to 6 additional recordings on select NDI-enabled devices • 1 x MP3 audio recorder 2 QuickTime Player not required for playback in common NLE applications
Storage	1 x 3TB internal drive • Capacity varies by format, resolution, and file specification • Supports recording to external storage via USB 3.0 • Supports shared storage integration and third-party partner solutions
Grab	Grab full-resolution, deinterlaced still images from external video sources and outputs
Export	Export video and image files to social media, FTP, local or external volumes, and network servers, with optional transcoding
Audio Mixer	Integrated multi-channel audio mixer with support for quad-channel audio, DSPs, 4 x 4 x 4 audio input channel routing
Local Audio Input	4 x SDI embedded 1 x Balanced XLR stereo pair (Line) 3 x Balanced 1/4" stereo pairs Line) Support for USB audio device input via compatible WDM audio drivers
Local Audio Output	4 x SDI embedded 1 x Balanced XLR stereo pair 1 x Balanced 1/4" stereo pair 1 x Stereo ¼" (phones)
Network Audio	Native support for network audio input and output via NDI® Embedded audio supported for all NDI® input and output video signals Integrated support3 for Dante® networking protocol from Audinate® Support for AES67 protocol via compatible WDM audio drivers 3 Requires Dante Virtual Soundcard license from Audinate (sold separately) 4Requires third-party virtual sound card license (sold separately)
Supported Media File Formats	Import, store, and play back multimedia files, with optional transcoding, including: • Video: AVI, DV, DVCPro, DVCProHD, FLV, F4V, H.263, H.264, MOV, MKV, MJPEG, MPEG, MP4, WMV, WebM, and more • Image: PSD, PNG, TGA, BMP, JPEG, JPEG-XR, JPEG2000, EXR, RAW, TIF, WebP, and more • Audio: AIFF, MP3, WAV, and more
Monitoring	Support for up to 3 multiviewer displays with configurable workspaces and viewports
Signal Monitoring	Integrated waveform and vectorscope, full field rate with digital calibration, color preview and support for ITU-R Rec. 709
Processing	Video: Floating Point YCbCr +A 4:4:4:4 Audio: Floating Point, 96 kHz
Throughput Latency	~1.0-1.5 frames
A/V Standards	HD-SDI video conforms to SMPTE 292M SD video conforms to SMPTE 259M and ITU-R BT.656 Analog audio levels conform to SMPTE RP-155
Tally	Support for hardware tally via HD15 GPI connector, network tally via NDI®, and Blackmagic Design® SDI tally standard
Genlock	Genlock input supporting SD (Bi-level) or HD (Tri-level) reference signals
GPI	Supports GPI signals via JLCooper Electronics eBox GPI interface
MIDI	Support for standard MIDI protocol enabling third-party device control System Drive 250GB SSD
NIC	2 x 1 Gigabit NIC
System Physical	2RU chassis with 400W PSU and multi-tiered hardware and software fail-safe • 19.0 x 3.5 x 19.57 in (48.3 x 8.9 x 49.7 cm) with rack ears attached

Subject to change without notice.

NewTek Flex Control Panel

The NewTek Flex Control Panel offers greater control than ever before. Offering better connectivity and better control – all with the incredible flexibility of NDI®.

NewTek Flex harnesses the power of the most complete production system on the planet in one control surface. For the first time NewTek introduces a Control Surface that offers video mixing, audio mixing, PTZ control, audio I/O, and talkback.



Better Connectivity

For years operators have been physically tethered to their video switcher where long cable runs and complex set-ups mean they have never had the flexibility to move their location. The Flex Control Panel is the first of its kind to simply connect to a network with NDI and instantly control any video switcher on that network. In addition – the Flex is built to work with any modern TriCaster. As at home controlling the mighty TriCaster 2 Elite as it is mastering the TriCaster Mini X – Flex offers operators all they need for their distributed productions.

Better Control

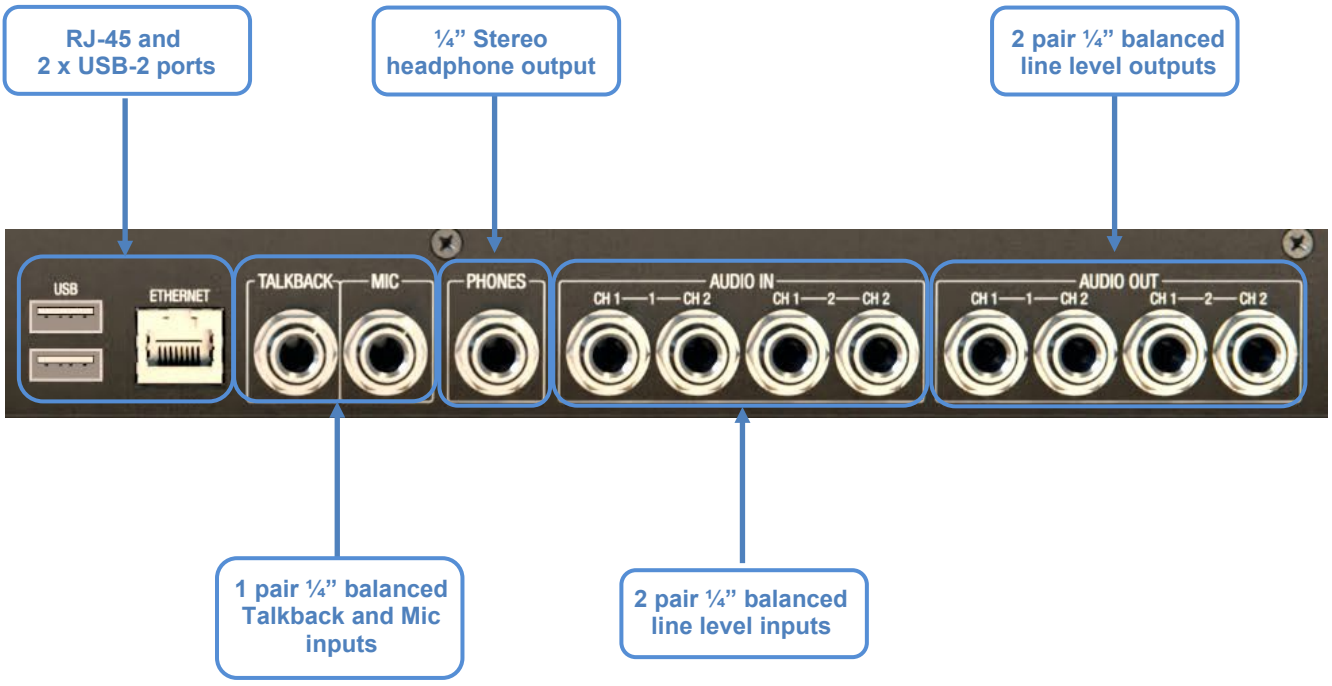
No other NewTek control panel offers audio and video mixing, PTZ Control and talkback – directly in one unit. With these controls built directly into the panel, it significantly reduces the margin for error for operators, offering greater precision and control than ever before. In addition, by offering audio I/O, Flex instantly expands the on-board I/O of any TriCaster allowing for more external sources to enter the NDI ecosystem directly from the panel.

In the studio or on the road, Flex simply scales with any production, offering precision control not seen in a NewTek control panel before.

NewTek Flex Control Panel – Specifications

Control Panel Features
16 direct crosspoints with Bank and stripe function. Row lighting color follows UI color for delegated bus
2 x 40 Character 2 row LCDs
PTZ Control Delegation and zoom rocker
Mini Joystick for Pan/Tilt control with Focus/Iris control with auto function
16 fader controls for audio In 1-8, Talkback, DDR 1-2, Sound, Record 1-4
4 fader controls for Stream 1, 2, Aux and Master out, Mic and Phones level (Push to Mute/Unmute, ALT-Push for Solo and VU meters)
Media Players & Macro Control
Stream, Capture & Replay
Transitions & T-Bar

NewTek Flex Control Panel – Back Panel Connectivity



ClickShare CX-50 2nd generation

Premium conferencing solution for high-impact rooms

- **Dual screen: people and content side by side on two displays**
- **Effortless switching between UC mode and BYOM experience**
- **Wired roomdock for 4K content sharing and alternative connectivity**
- **Carbon-neutral product**
- **100% secure, encrypted and cloud-managed**

ClickShare CX-50 2nd generation brings flexible wireless conferencing in high-impact meeting spaces and board rooms. When you walk into the meeting room, ClickShare automatically connects you to room devices like cameras, mics, speakers, sound bars and displays.

Start a meeting from your laptop within seconds, using your preferred video conferencing platform. Make hybrid meetings easy, with just one click on the ClickShare Button or the ClickShare App, both for employees and guests.

Product specifications	CLICKSHARE CX-50 2ND GENERATION
ClickShare Base Unit dimensions	
Dimensions (HxWxD)	39mm x 200mm x 202mm
Power supply	Standard 110/220 V AC plug or USB-C (back)
Power consumption	Operational: 74.5W (max) Standby: 0.27W -Networked standby: 3.7W
Weight	985 gr
General specifications	
Operating system	Windows 10 or higher macOS 11 (BigSur) and higher Android v11 and higher (ClickShare App) iOS 14 and higher (ClickShare App)
System requirements	For a smooth experience with Microsoft Teams or Zoom Minimum: Intel i3 dual-core processor / 8GB RAM / OS : Windows 10 latest build or Mojave latest build Recommended: Intel i5 4-core processor / 8GB RAM / OS: Windows 10 latest build or Mac OS latest build
Video outputs	4K UHD (3840*2160) @ 60Hz. HDMI™ 1.4b 4K UHD (3840*2160) @ 60Hz.USB-C DP ALT mode (back)
Video inputs	4k UHD (3840*2160) @30Hz.USB-C DP ALT mode (front)
Audio output	USB, jack, HDMI
Connections	Front side: 1x USB-C 3.1 Rear side: 1x USB-C 3.1, 2x USB -A 3.1, 1x Ethernet LAN 2.5Gbit, Audio analog line out on jack socket (3.5mm)
ClickShare Buttons	2
ClickShare App	Desktop & Mobile
Native protocols	Airplay, Google Cast, Miracast
Maximum number of simultaneous connections (with Buttons and/or App)	32
Noise Level	Max. 25dBA @ 0-30°C Max. 30dBA @ 30-40°C
Authentication protocol	WPA2-PSK in stand alone mode WPA2-PSK or IEEE 802.1X using the ClickShare Button in network integration mode
Wireless transmission protocol	IEEE 802.11 a/g/n/ac and IEEE 802.15.1
Reach	Max. 30m (100 ft) between ClickShare Button and ClickShare Base Unit
Frequency band	2.4 GHZ and 5 GHz (DFS channels supported in select number of countries)
Temperature range	Operating: 0°C to +40°C (+32°F to +104°F) Max: 35°C (95°F) at 3000m Storage: -20°C to +60°C (-4°F to +140°F)
Humidity	Storage: 0 to 90% relative humidity, non-condensing Operation: 0 to 85% relative humidity, non-condensing
Anti-theft system	Kensington lock
Certifications	FCC/CE
Touch screen support & Interactivity	Yes
Wireless conferencing	via App or Button
Local view	High quality
Network connection	LAN & WiFi (dual)
Management and reporting	Yes
Warranty	1 year standard. 5 years coverage upon registering via SmartCare

Last updated: 29 Aug 2024

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Engineered and Certified for AV over IP

Introducing the NETGEAR AV and IT M4350 Switches, engineered and certified for audio/video over IP with dedicated service and support. The M4350 brings all the simplicity from the M4250 AV Line packed in more Enterprise-class hardware with redundant power supplies and larger fabrics with 25G and 100G uplinks. The revolutionary NETGEAR AV user interface and Engage™ Controller contain pre-configured profiles for all major audio, video, and lighting protocols.

NETGEAR listens to and supports the Pro AV community

- IGMP Plus™ means AV-over-IP multicasting will work out of the box and not flood your network
- Auto-LAG and Auto-Trunk automatically configure the uplinks between multiple switches
- The Engage™ Controller manages all M4250, M4300, and M4350 switches for your AV installations
- NETGEAR Pro AV Design team to help with system design and implementation to ensure the project will work
- AVB, Dante, Q-SYS, AES67, NVX, AMX, Q-SYS, NDI 4, NDI 5, ZeeVee, Aurora Multimedia, Kramer, Atlona, LibAV, Visionary, SDVoE, and many others!
- SMPTE ST 2110 supported on select models, always with the same simplicity from the AV UI

Enterprise-class hardware

- From 1G to 2.5G, to 10G, to 25G, to 100G always within 40cm (15.7in) depth
- Controlled thermal and acoustics (intelligent fans configurable in Quiet Mode to minimize noise, or Cool Mode to minimize heat)

Other IT use cases

- Edge to core stackable platform, from 1 Gigabit to 100 Gigabit for midsize organizations
- Non-stop forwarding (NSF) provides advanced High Availability (HA) with hitless failover across the stack

Industry standard management

- Industry standard command line interface (CLI), main NETGEAR IT web interface (GUI)
- SNMP, sFlow and RSPAN - the entire feature set is available without license

Industry leading warranty

- NETGEAR M4350 series is covered under NETGEAR ProSAFE Limited Lifetime Hardware Warranty*
- 90 days of Technical Support via phone and email, Lifetime Technical Support through online chat and Lifetime Next Business Day hardware replacement

Hardware-at-a-Glance

			FRONT						REAR			MANAGEMENT	
Model Name	Form-Factor	Switching Fabric	1000BASE-T RJ45 ports	2.5GBASE-T RJ45 ports	10GBASE-T RJ45 ports	10GBASE-X SFP+ ports	25GBASE-X SFP28 ports	100GBASE-X QSFP28 ports	Internal PSU	Modular PSU Bays	Fans	Out-of-band Console	Model Number
M4350-24G4XF	**Full width** 1U rack mount 440x43.2x400mm	128 Gbps	**24 ports PoE+** 10M; 100M; 1G 648W (base) up to 720W	-	-	**4 ports** 1G; 10G	-	-	**1 x Fixed** 880W (C14) On/Off switch	1 slot	Fixed Front-to-back	Ethernet: Out-of-band 1G port (Back)	**GSM4328**
M4350-48G4XF	**Full width** 1U rack mount 440x43.2x400mm	176 Gbps	**48 ports PoE+** 10M; 100M; 1G 236W (base) up to 1,440W	-	-	**4 ports** 1G; 10G	-	-	**1 x Fixed** 550W (C14) On/Off switch	2 slots			**GSM4352**
M4350-44M4X4V	**Full width** 1U rack mount 440x43.2x400mm	500 Gbps	-	**44 ports PoE++***** 100M; 1G; 2.5G	**4 ports PoE++***** 100M; 1G; 2.5G; 5G; 10G	-	**4 ports** 1G; 10G; 25G (Ethernet Mode*) (Stacking: 25G**)	-	**1 x Fixed** 550W (C14) On/Off switch	2 slots			**MSM4352**
				<--- 194W (base), up to 3,314W ---->									
M4350-8X8F	**Half-width** 1- or 2-unit 1U rack mount 220x43.2x400mm	320 Gbps	-	-	**8 ports** 100M; 1G; 2.5G; 5G; 10G	**8 ports** 1G; 10G	-	-	**1 x Fixed** 240W (C14) On/Off switch	-		Console: USB-C (Front)	**XSM4316**
M4350-12X12F	**Half-width** 1- or 2-unit 1U rack mount 220x43.2x400mm	480 Gbps	-	-	**12 ports** 100M; 1G; 2.5G; 5G; 10G	**12 ports** 1G; 10G	-	-	**1 x Fixed** 240W (C14) On/Off switch	-		Storage: 2 x USB-A (Back)	**XSM4324**
M4350-24X4V	**Full width** 1U rack mount 440x43.2x400mm	680 Gbps	-	-	**24 ports PoE+** 100M; 1G; 2.5G; 5G; 10G 576W (base), up to 720W	-	**4 ports** 1G; 10G; 25G (Ethernet Mode*) (Stacking: 25G**	-	**1 x Fixed** 880W (C14) On/Off switch	1 slot			**XSM4328CV**
M4350-24F4V	**Full width** 1U rack mount 440x43.2x400mm	680 Gbps	-	-	-	**24 ports** 1G; 10G	**4 ports** 1G; 10G; 25G (Ethernet Mode*) (Stacking: 25G**)	-	**1 x Fixed** 240W (C14) On/Off switch	1 slot			**XSM4328FV**

* ETHERNET Mode: Each 4 x 25G block is connected to a 100G SERDES. As such, each 4-port block can only work at the same speed: 4x1G, or 4x10G, or 4x25G. Since 25G takes precedence, when one 25G module is inserted, other ports with 1G or 10G modules get down in the same 4-port block.

** STACKING Mode: Stacking link only works on the highest speed supported by a Stack port. A 25G port, when configured in Stack mode, only operates at 25G. It cannot operate at 10G. Similarly, a 100G port, when configured in Stack mode, only operates at 100G.

*** Ultra90 PoE++ 802.3bt is compatible with 802.3af PoE (15.4W), 802.3at PoE+ (30W) and 802.3bt (60W, 75W and 90W).

Hardware-at-a-Glance

			FRONT						REAR			MANAGEMENT	
Model Name	Form-Factor	Switching Fabric	1000BASE-T RJ45 ports	2.5GBASE-T RJ45 ports	10GBASE-T RJ45 ports	10GBASE-X SFP+ ports	25GBASE-X SFP28 ports	100GBASE-X QSFP28 ports	Internal PSU	Modular PSU Bays	Fans	Out-of-band Console	Model Number
M4350-36X4V	**Full width** 1U rack mount 440x43.2x400mm	920 Gbps	-	-	**36 ports PoE++***** 100M; 1G; 2.5G; 5G; 10G 280W (base), up to 1,760W	-	**4 ports** 1G; 10G; 25G (Ethernet Mode*) (Stacking: 25G**)	-	**1 x Fixed** 750W (C14) On/Off switch	1 slot	Fixed Front-to-back	Ethernet: Out-of-band 1G port (Back)	**XSM4340CV**
M4350-24X8F8V	**Full width** 1U rack mount 440x43.2x400mm	1.04 Tbps	-	-	**24 ports PoE++***** 100M; 1G; 2.5G; 5G; 10G 290W (base), up to 1,770W	**8 ports** 1G; 10G	**8 ports** 1G; 10G; 25G (Ethernet Mode*) (Stacking: 25G**)	-	**1 x Fixed** 750W (C14) On/Off switch	1 slot			**XSM4340V**
M4350-32F8V	**Full width** 1U rack mount 440x43.2x400mm	1.04 Tbps		-	-	**32 ports** 1G; 10G	**8 ports** 1G; 10G; 25G (Ethernet Mode*) (Stacking: 25G**)		**1 x Fixed** 420W (C14) On/Off switch	1 slot		Console: USB-C (Front)	**XSM4340FV**
M4350-16V4C	**Full width** 1U rack mount 440x43.2x400mm	1.6 Tbps	-	-	-	-	**16 ports** 1G; 10G; 25G (Ethernet Mode*) (Stacking: 25G**)	4 ports 40G; 100G (Stacking: 100G**)	**1 x Fixed** 420W (C14) On/Off switch	1 slot		Storage: 2 x USB-A (Back)	**VSM4320C**
M4350-40X4C	**Full width** 1U rack mount 440x43.2x400mm	1.6 Tbps	-	-	**40 ports PoE++***** 100M; 1G; 2.5G; 5G; 10G 196W (base), up to 1,676W	-	-	4 ports 40G; 100G (Stacking: 100G**)	**1 x Fixed** 750W (C14) On/Off switch	1 slot			**XSM4344C**

* ETHERNET Mode: Each 4 x 25G block is connected to a 100G SERDES. As such, each 4-port block can only work at the same speed: 4x1G, or 4x10G, or 4x25G. Since 25G takes precedence, when one 25G module is inserted, other ports with 1G or 10G modules get down in the same 4-port block.

** STACKING Mode: Stacking link only works on the highest speed supported by a Stack port. A 25G port, when configured in Stack mode, only operates at 25G. It cannot operate at 10G. Similarly, a 100G port, when configured in Stack mode, only operates at 100G.

*** Ultra90 PoE++ 802.3bt is compatible with 802.3af PoE (15.4W), 802.3at PoE+ (30W) and 802.3bt (60W, 75W and 90W).

MERIT X SERIES POWER CONDITIONERS

A Merit Series Power Conditioner is the perfect low-cost AC power solution for any rack mount system. Install an M-8x², M-8Lx, or M-8Dx in to the top slot of your rack, and the eight switched outlets in the rear panel will power up and protect all your equipment up to a 15-amp load. The M-8Lx and M-8Dx feature two slide out, swiveling light fixtures to provide discreet illumination of your equipment on stages, in studios, and in other dark places. A dimmer knob lets you adjust the lamp brightness to just the right level. The M-8Dx adds a bright red, three-digit LED voltmeter that displays incoming voltage. The M-8x² is designed for applications where lights are not required.

Merit M-8x² Power Conditioner

Noise Filtration | Surge Protection | Nine Total Outlets | 15 Amp Rating | "Protection OK" Indicator | Wall Wart Spacing

Merit M-8Lx Power Conditioner

Noise Filtration | Surge Protection | Nine Total Outlets | 15 Amp Rating | "Protection OK" Indicator | Wall Wart Spacing | Front Panel Pull-out Lights

Merit M-8Dx Power Conditioner

Noise Filtration | Surge Protection | Nine Total Outlets | 15 Amp Rating | "Protection OK" Indicator | Wall Wart Spacing | Front Panel Pull-out Lights | Digital Voltmeter

FURMAN

THE SOLUTION TO POWER YOUR APPLICATION...

INSTRUMENT RIGS

You've got a rack for your effects, preamps, tuner...You're going to plug that into the wall? One big spike and your rig is up in smoke. Furman's standard level surge/spike protection defends your gear from the spikes and surges that are so common at gigs and practice spots. With Furman's standard level RFI/EMI filtration, you'll get a quieter tone without pops, crackles, and the local radio station coming out of your amp. Plus, dual pull-out lamps (M-8Lx/M-8Dx) let you see your rack without turning the house lights on, while the digital voltmeter (M-8Dx) lets you monitor incoming voltage.

RECORDING

Can't track down where that noise is coming from? Your mix sounding flat? With Furman's standard level RFI/EMI filtration you'll lower the noise floor caused by the dirty AC power coming into your console or DAW. Furman's standard level surge and spike protection keeps your sensitive digital equipment from acting funny or burning up due to everyday spikes and surges. You can even monitor voltage changes, as the digital meter (M-8Dx) allows you to keep an eye on the incoming line voltage. With a 15A capacity and nine total outlets, it's enough to power your whole home studio.

DJ EQUIPMENT

Bars, clubs and other event venues have some of the worst power out there - from air compressors turning on and off to light shows pulling current loads up and down, the AC power can be a strain on the circuits in your rig. Furman's standard level protection and filtration keeps the bad stuff out and the digital voltmeter (M-8Dx) lets you monitor the incoming line voltage. The dual pull-out front panel lights (M-8Lx/M-8Dx) let you discreetly see your board and gear without distracting from the show on the dance floor.

PRO AUDIO

When you're out there gigging, you never know what kind of power you're going to get. The wear and tear on mobile rigs eventually takes it toll - that's why it's smart to plug into Furman's standard level protection and RFI/EMI filtration. It keeps your equipment safe and sounding clean, while the digital voltmeter (M-8Dx) lets you monitor incoming voltage. Whether you're setting up a show at the local club or powering up the church band for their next service, make sure you give them power they can trust.

MERIT X SERIES SPECIFICATIONS

Maximum Output Current
15 Amps

Line Cords
6 ft. captive, 14 AWG, with 3-conductor Edison Plug

Lamps (M-8Lx/M-8Dx)
Two 120V incandescent bulbs, 4 watts each

Operating Voltage
120VAC 60Hz

Spike Protection Mode
Line to neutral

Energy Dissipation
150 Joules

Peak Impulse Current
12,000 Amps

Maximum Continuous Operating Voltage
130 VAC RMS

Noise Attenuation (Transverse Mode)
M-8x²: Greater than 23db, 200Khz to 10MHz
M-8Lx: Greater than 26db, 200Khz to 10MHz
M-8Dx: Greater than 26db, 200Khz to 10MHz

Dimensions
1.75" H x 19" W x 3.75" D (M-8x²)
1.75" H x 19" W x 7.5" D (M-8Lx/M-8Dx)

Weight
M-8x²: 4.9 lbs. (2.2 kg)
M-8Lx/M-8Dx: 6 lbs. (2.7 kg)

Three Year Limited Warranty
Merit Series units are protected by a limited three year warranty covering defects in materials and workmanship.

Furman Sound, LLC 1690 Corporate Circle ▪ Petaluma, CA 94954 ▪ USA ▪ www.FurmanSound.com

Technical Data

Frequency Response
Mic Input to Line Output . . . . . +0/-1dB, 20Hz – 20kHz
Stereo Input to Master Output . . . . . +0.5/-0.5dB, 20Hz – 20kHz

T.H.D. and Noise
Mic Input (Min Gain) to Bus Output . . . . . 0.006% @ 1kHz
Mic Input (Max Gain) to Bus Output . . . . . 0.008% @ 1kHz
Residual noise, Master Output, no inputs routed, mix fader @0dB . . . . . <-88dBu
Mic Input E.I.N. (maximum gain) . . . . . -126dBu (150Ω source)
Mix noise, masters at unity . . . . . < -86dBu
1 input to mix at unity gain . . . . . -84dBu
CMRR mic @1kHz (max gain) . . . . . -80dBu

Crosstalk (@ 1kHz)
Channel ON attenuation . . . . . <120dB
Channel Fader attenuation . . . . . <120dB
Mic – Mic . . . . . -100dB @ 1kHz, -85dB @ 10kHz
Line – Line . . . . . -100dB @ 1kHz, -85dB @ 10kHz

Input Gain
Mic Gain . . . . . -5dB – 58dB integrated pad design 1dB steps
Line Trim . . . . . -10dB - +16dB

EQ
HI MID & LO MID . . . . . 22Hz – 20kHz, +/-15dB Q 6-0.3
Shelf (HF) . . . . . 800Hz – 20kHz, +/-15dB
Shelf (LF) . . . . . 20Hz – 500Hz, +/-15dB
HPF . . . . . 40Hz – 1kHz
GEQ . . . . . 31Hz – 16kHz 1/3 octave

Delay
User adjustable delay . . . . . 1 sample – 500ms

Digital I/O
Converter resolution 24-bit
DSP resolution . . . . . 40-bit floating point

Latency
Mic In to Line Out . . . . . <0.8 ms
Analogue in to AES out . . . . . <0.6 ms
AES in to Line Out . . . . . <0.8 ms
AES in to AES out . . . . . <0.5 ms
Stagebox Mic In to Stagebox . . . . . <0.9 ms

Input & Output Levels
Mic Input . . . . . +22dBu max
Line Input . . . . . +22dBu max
Mix Output . . . . . +21.5dBu max
Headphones (@150Ω) . . . . . 300mW (recommended impedance 32 to 200Ω)

Input & Output Impedances
Mic Input 2kΩ
Line Input . . . . . >10kΩ
AES Input 110Ω
Outputs . . . . . 150Ω (balanced), 75Ω (unbalanced)
Word Clock used as Output 50Ω
Word Clock used as Input 4k7Ω
AES Output 110Ω

Lamp Output
12v DC . . . . . 100mA max (per socket)

Power
Consumption (typical) . . . . . <130w Si Expression 3
AC Input voltage range . . . . . 88-264VAC auto sensing
AC Frequency range 47-63Hz

Operating Conditions
Operating Temperature Range . . . . . 5°C to 45°C
Humidity . . . . . 0%-90%, non condensing Ta=40°C (104°F)
Storage Temperature Range . . . . . -20°C to 60°C (-4°F to 140°F)

Weights and Dimensions (net) . . . . .

Si Expression 1
Dimensions (WxDxH) . . . . . .482mm/19" x 520mm/20.5" x 168mm/6.6"
Width with rack ears removed . . . . . 445mm/17.5"
Weight 11.8kg (26lbs)

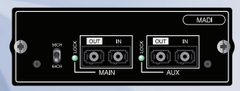
Si Expression 2
Dimensions (WxDxH) . . . . . .716mm/28.2" x 520mm/20.5" x 168mm/6.6"
Weight 15.5kg (34lbs)

Si Expression 3
Dimensions (WxDxH) . . . . . .928mm/36.5" x 520mm/20.5" x 168mm/6.6"
Weight 19.2kg (42lbs)

Soundcraft® ViSi CONNECT

Si Expression consoles feature a 64x64 expansion card slot on the rear panel. A full range of ViSi Connect expansion cards is available for multiple I/O formats. Soundcraft is committed to the continued development of the ViSi Connect expansion card range, developing new cards as new network protocols become available.

I/O Expansion Cards



Optical MADI

Dual Cat5 MADI

CobraNet™

Aviom A-Net®

AES/EBU

AES/EBU D-Type

BLU link

RockNet®

Multi Digital Card

Dante™

Soundcraft, Harman International Industries Ltd.,
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Soundcraft® by HARMAN

Soundcraft®

Si EXPRESSION™

DIGITAL LIVE SOUND CONSOLE

Powered by

lexicon DIGITAL FX
BSS by HARMAN GRAPHIC EQS
dbx by HARMAN DYNAMICS
STUDER by HARMAN ADVANCED DSP

Soundcraft® by HARMAN

Power mixing made easy

Beyond Analogue Control

FaderGlow™, One-Knob-One-Function and tOTEM

Most digital mixers claim to offer 'analogue-style' control. Si Expression goes beyond analogue. Combining One-Knob-One-Function control with Soundcraft's unique FaderGlow™ feature and tOTEM system for sends on faders, Soundcraft combines analogue workflow with digital flexibility. FaderGlow illuminates the fader track in different colours to provide at-a-glance status information on precisely what the fader is controlling– aux sends, FX sends or even the graphic EQ that's available on every bus. And 4 assignable fader layers means you can configure the mix exactly how you want it.

Assignable Fader Layers

FOH
Want your FX send right next to your lead vocal or snare? No problem.

Monitors
Now you can put your monitor masters next to the channels they affect.

Dual Purpose
Split the console surface for simultaneous FOH and monitor mixing.

You choose.
Si Expression is all about letting you mix your own way.

Colour touchscreen

Everything you need for easy patching, fader setup, show set-up, FX, and security. But with the One-Knob-One-Function layout of the Si Expression, you'll find the screen is rarely needed with the Si Expression's intuitive analogue-console-like workflow.

Quality Soundcraft Sound

Lots of mixer companies claim to have great 'British sound'. Soundcraft is British sound. Started in London more than 40 years ago and still designed and engineered in the UK, Soundcraft defined the term 'British sound' in live sound mixing consoles. Soundcraft Co-Founder Graham Blythe's acclaimed microphone preamps and 'British' equaliser still adorn the Si Expression with signature Soundcraft sound today.

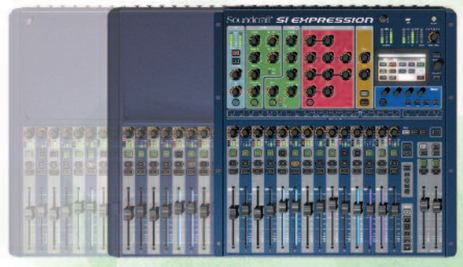
Massive Mix Power

Tons of I/O for stage and console

It's hard to believe that a console this small can pack in so much mixing power. All 3 Si Expression models give you a massive 66 inputs to mix and 35 busses, with all channels offering a full compliment of dynamics, EQ and flexible routing. And unlike other compact digital mixers, adding stageboxes (see over) adds to the I/O capacity without reducing it at the console.

Choose from 3 frame sizes

The features are identical – just pick the fader and local mic preamp count you need. The rack-mountable Si Expression 1 gives you 16 of each, while the Si Expression 2 and 3 deliver 24 and 32 faders and mic preamps respectively.



392 Rack Units

of big-name DSP - built in

lexicon · BSS by HARMAN · dbx by HARMAN · STUDER by HARMAN

Si Expression isn't just packed with DSP power. It's packed with DSP power from industry leading names in FX, dynamics, EQ and digital audio.

97	97	66	97	31	4
PEQs	COMPRESSORS	NOISE GATES	TIME DELAYS	GEQs	MONO - STEREO FX PROCESSORS

Soundcraft®
Si EXPRESSION™
DIGITAL LIVE SOUND CONSOLE

No other compact digital mixer gives you all these essential features

Soundcraft GB MIC PRES	66 INPUTS TO MIX	20 AUX BUSSES 6 STEREO	4 STEREO MATRICES	lexicon 4 STEREO LEXICON EFFECTS	MOTORISED FADERS	ASSIGNABLE FADER LAYERS	FADER GLOW	Soundcraft Vi Remote ENABLED	D.O.G.S ENABLED	HiQnet ENABLED	MULTI-TRACK RECORDING ENABLED

One Mixer Does it All

Perform

Si Expression doesn't just look good on paper. It performs brilliantly out there in the real world. Connect a Mini Stagebox 32 and get 32 analogue inputs, 8 analogue line outputs and 4 pairs of AES outputs on stage. The Mini Stagebox 16 provides 16 analogue inputs and 8 line outputs making a 16 x 8 I/O expansion. And unlike some digital mixers, connecting Soundcraft stageboxes adds genuine I/O capacity to the Si Expression without reducing I/O count from the mixer.

The 3U Mini Stagebox 32 and 2U Mini Stagebox 16 come with interface cards included.

Soundcraft® ViSi CONNECT

Connect to stageboxes and personal monitor systems, record live to a DAW or link to an audio network.

(See back page for a full list of ViSi Connect expansion cards)

Record

Just add a Multi Digital card from the ViSi Connect range and you're ready to make multitrack recordings direct to any digital audio workstation. Send 40 inputs and 40 outputs to and from your DAW for recording and playback to an Si Expression.

Multi Digital Expansion Card

Soundcraft® Si EXPRESSION™
DIGITAL LIVE SOUND CONSOLE

Monitor

The Si Expression makes mixing to monitors simple thanks to tOTEM™ (the one-touch easy mixing system). tOTEM™ provides instant access to your monitor mix busses by putting monitor sends on the motorised faders. Mixing to a monitor is as simple as pushing up a fader. For FOH and Monitor applications, the unique D.O.G.S (Dynamic Output Gain Stabilisation) system compensates for any gain adjustment when two consoles are sharing the same source, maintaining original system levels between mic in and direct out.

And ViSi Connect expansion cards make it easy to connect to personal monitoring systems such as dbx's PMC 16. It all makes for a more powerful and easy monitor desk solution.

BLU link Expansion card

Aviom A-Net® Expansion card

Mix Remote

Mix FOH from anywhere in the venue.
Mix monitors from the stage.

Soundcraft® ViSi REMOTE

The ViSi Remote iPad® app allows remote control of console features from anywhere in the venue, even enabling musicians to mix their own monitors on stage from multiple iPad® devices.

Network

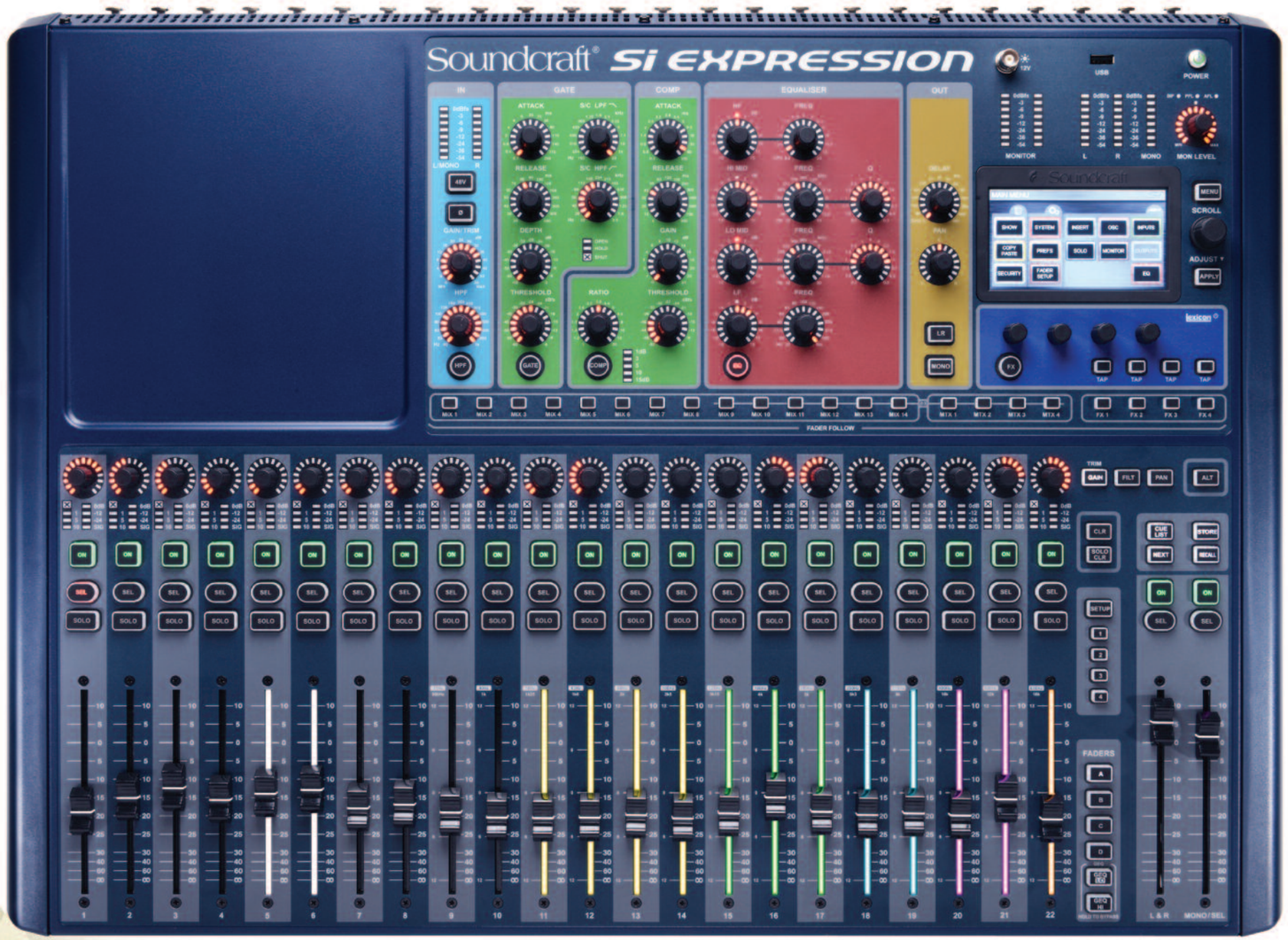
Si Expression integrates seamlessly at the heart of a sophisticated audio installation, with a full range of ViSi Connect expansion cards (see back page) available for the most popular network protocols.

RIEDEL RockNet
AVIOM A-Net
CobraNet®
BLU link
Dante™

iPad® is a registered trademark of Apple Inc.

Connectivity & Control

Soundcraft® Si EXPRESSION™
DIGITAL LIVE SOUND CONSOLE



Connectivity

- 16/24/32 recallable GB mic inputs with locking connectors and phantom power indicators
- 16 XLR analogue line outputs
- 4 Balanced 1/4" Jack mono line inputs
- AES In and out
- Word Clock
- MIDI In and Out
- HiQnet Ethernet port for HiQnet system integration and ViSi Remote System
- 64x64 ViSi Connect expansion slot (see back page)

Input Section

- 8 LED Input Meter
- 48v Phantom power switch
- Polarity reverse switch
- Input Gain/Trim Adjustment
- Variable High Pass Filter
- HPF engage switch

Gate

- Dedicated encoders for Attack, Release, Depth, Threshold and Sidechain Filters
- Gate open, hold and close status LED indicators
- Gate engage switch

Compression

- Dedicated encoders for Attack, Release, Gain, threshold and Ratio controls
- Compressor on every bus
- 5 Segment LED gain reduction indicator
- Compressor engage switch

4 Band British EQ

- Sweepable LF and HF shelf bands
- Fully parametric Hi Mid and Low Mid EQ bands
- EQ engage switch

Output Section

- Channel delay for time alignment on input and output bus, displayed as time or distance
- Variable time delay per channel or Bus (0-500ms)
- Pan control
- LR switch for assigning/un-assigning channels and busses to the L/R output
- Mono switch for routing to mono output (centre speaker, sub bass channel, etc.)

Lexicon Effects Section

- 4 integral Lexicon stereo effects engines
- 29 effect presets per engine with hall, plate and room reverbs, plus delays, modulations and pitch
- Up to 12 parameters for each preset accessed by touchscreen dialogue and 4 surface encoders
- Dedicated Tap tempo switches

The One Touch Easy Mixing Keys

- Dedicated tOTEM Keys for all 14 mix busses, 4 Matrix busses and 4 FX engines
- Mix to any of the mix busses by simply tapping a tOTEM key and pushing up the faders
- FaderGlow™ for visual colour feedback on what the faders are currently mixing: Yellow- Pre-fader Bus, Green- Post-Fader Bus, Blue- FX bus, Orange- Matrices

Global Mode Encoders and Channel Meters

- Instant access to important settings such as input gain/trim, High pass filter settings and Pan controls - adjust these features globally across all channels using dedicated global encoders
- 4 segment LED Input meter, 3 segment LED Gain reduction meter and Gate closed indicator across all channels on the surface

Surface Controls & Global Metering

- FaderGlow™ illuminates the fader track for at-a-glance display of current fader function: White- Linked channels, Pink- Stereo Inputs, Red- Graphic EQ
- 4 mute groups for muting groups of channels as one
- Snapshot control – 1000 cues can be stored and recalled from dedicated cue control buttons
- USB port for saving/loading shows and snapshots with USB memory sticks
- Colour touchscreen for patching, routing, show set-up and security settings
- 8 LED input and output meters (monitor L/R, master L/R, mono)
- Headphone output
- 12V lamp connector

CONNECTSERIES

-AMPLIFIER SPEC SHEET-

OUTPUT POWER	**CONNECT 88**	8 x 80 WRMS @ 4Ω, 8Ω, 70V, 100V (40W at 2Ω, 80W at 25V)
	CONNECT 168	8 x 160 WRMS @ 4Ω, 8Ω, 70V, 100V (80W at 2Ω, 160W at 25V)
	CONNECT 84	4 x 80 WRMS @ 4Ω, 8Ω, 70V, 100V (40W at 2Ω, 80W at 25V)
	CONNECT 164	4 x 160 WRMS @ 4Ω, 8Ω, 70V, 100V (80W at 2Ω, 160W at 25V)
	CONNECT 354	4 x 350 WRMS @ 4Ω, 8Ω, 70V, 100V (175W at 2Ω, 230W at 25V)
	CONNECT 704	4 x 700 WRMS @ 4Ω, 8Ω, 70V, 100V (350W at 2Ω, 330W at 25V)
	CONNECT352	2 x 350 WRMS @ 4Ω, 8Ω, 70V, 100V (175W at 2Ω, 230W at 25V)
	CONNECT 702	2 x 700 WRMS @ 4Ω, 8Ω, 70V, 100V (350W at 2Ω, 330W at 25V)
AUDIO SPEC	**Inputs**	4 Analog: Balanced Inputs with user selectable 26 dB and 34 dB input sensitivity
	THD+N	0.1% (20Hz to 20kHz)
	Frequency Response	+/- 0.5 dB @ 4Ω, 8Ω, 70V, 100V, -2.5dB @ 20kHz at 2Ω
	Signal to Noise Level	105dB (20Hz to 20kHz referenced to 8Ω)
	Crosstalk	70dB (20Hz to 20kHz)
	I/O Latency	1 ms DSP latency under any condition
	Load Impedance	LowZ down to 2 ohms, 70V direct, and 100V Direct per channel
	Output Classification	Class D with Proprietary Smart Power Bridge Technology allowing bridged output functionality without sacrificing an amplifier channel
	DC Offset	+/- 3mV
DSP	**DSP Architecture**	Analog Devices Sigma 96kHz DSP Processor with 32-bit Core with Sample Rate Converters
	Input Matrix	Routable matrix; any input to any output with primary and secondary input priority
	Crossovers	Up to 48 dB/Octave IIR Filters (Linkwitz Riley and Butterworth) and Bessel
	Parametric EQ	8 Band Parametric EQ per channel
	Output Delay	100ms per channel
	Output Protection	DC, VHF, and AC Mains Protection, Over-temp and Current Limiter, fan fault detection
	Limiting	Peak Voltage and RMS Voltage
	Load Monitoring	Realtime Load Monitoring and Pilot Tone Detection from Internal or External Sources
CONTROL, MONITORING, NETWORK	**Network Connectivity**	Wi-Fi or 100MB Ethernet with PoE or Built in Wi-Fi Access Point (IEEE 802.11 b/g/n WPA, WPA2, WEP)
	User Interface	Web Browser User Interface or 3rd Party API control Q-Sys
	Operating Systems	MAC, iOS, PC, Android
	Event Reporting	User Downloadable and Viewable Event and Fault log - POE allows for enhanced error monitoring
	External I/O	External I/O In: Toggles Remote On/Off | External I/O Out: Indicates Amplifier Health
	Cloud IoT	Cloud based IoT functionality
OPS DATA	**AC Mains**	100VAC - 240VAC +/- 15% 50Hz or 60Hz
	Temperature	Storage: -20°C to 90° C - Operating: 0°C to 60° C
	Power Supply	Universal Switch Mode Power Supply
	Safety Approvals	UL, CSA,CE, ETL, FCC, CCC, KETI, NOM , ROHS, PSE
PHYSICAL SPEC	**Dimensions (L x W x H)**	Product: 14.25" x 19" x 1U (362mm x 482mm x 1U) x 1U (362mm x 482mm x 1U) Shipping: 20" x 22.75" x 3.75" (508mm x 578mm x 95.25mm)
	Weight	Connect Series 352 & Connect Series 702: 10lbs / 3.4kg | Shipping: 17.4lbs / 7.9kg Connect Series 354 & Connect Series 704: 14lbs / 4kg | Shipping: 18.7lbs / 8.5kg Connect Series 84 & Connect Series 164: 12.05lbs / 5.46kg | Shipping: 16.35lbs / 7.41kg Connect Series 88 & Connect Series 168: 13.35lbs / 6.05kg | Shipping: 17.75lbs / 8.05kg
	Cooling	Front to Rear Variable Fan Speed Cooling | Fan Noise at idle is 50dB @ 1m | Fan Noise at 50% is 57dB @1m Fan Noise at full speed is 63dB @1m
	Connectors	Analog Input: 3 pin Amphenol Anytek, Output: 2 pin Amphenol Anytek, External IO: 3 pin Amphenol Anytek, Power in: IEC, Ethernet RJ45 In for Control, Primary and Secondary RJ45 in for Dante ***Note: 84, 164, 88, 168 do not have potentiometers on the rear panel

LEA Professional reserves the right to make any necessary changes to the specification. The LEA Professional Warranty is 6 years from date of purchase and product registration in the United States.

SCAN TO DOWNLOAD USER'S MANUAL

LEA

SLX-D
DIGITAL WIRELESS SYSTEMS

Your performance should never be in question. Whether presenting, educating, praising or entertaining, your relationship with your audience is singular. With SLX-D Digital Wireless you can stand confidently on a strong foundation and build the wireless installation to match ongoing demands, from day-long conference to nighttime performances.

ALWAYS COME THROUGH CLEAR
In front of an audience, clarity is simply essential. SLX-D provides crystal-clear digital audio quality with >118 dB dynamic range.

DROPOUTS ARE OUT
From the leader in digital wireless technology, SLX-D maintains stable signals with high efficiency for rock-solid, reliable performance.

KEEP THE SHOW GOING
Ready to perform for all-day conferences and nighttime performances—up to 8 hours of use from either 2 AA batteries (included) or optional Shure SB903 Li-ion rechargeable batteries and charging accessories.

APPLICATIONS

- Event, Presentation and Speech
- House of Worship
- Performance and Clubs

PRODUCT HIGHLIGHTS

- Extended 20 Hz to 20 kHz frequency range (microphone dependent)
- 118 dB dynamic range
- Digital predictive switching diversity
- 44 MHz tuning bandwidth (region dependent)
- 32 available channels per frequency band (region dependent)
- Up to 10 compatible systems per 6MHz TV band; 12 systems per 8 MHz band
- Easy pairing of transmitters and receivers over IR scan and sync
- Compatible with Shure Wireless Workbench® control software
- Remote control via ShurePlus™ Channels mobile app
- Up to 8 hours from 2 AA batteries or optional Shure SB903 rechargeable battery

SHURE

SHURE

MICROFLEX®
MICROPHONES

THERE'S NEVER BEEN A MORE FLEXIBLE CHOICE.

Work a room in more ways than ever with Shure Microflex microphones. Combining sleek, low profile aesthetics and a complete selection of microphones and mounting options, the Microflex line offers the highest standard of quality and efficiency for installed audio applications.

MICROFLEX GOOSENECK MICROPHONES

- Models in lengths from 12-62 cm (5-24 inches) fit a wide variety of applications from the podium to the conference table
- Interchangeable condenser cartridges with superior audio quality

MICROFLEX BOUNDARY MICROPHONES

- Multi-element, low-profile, or wireless microphone styles available
- Extremely versatile range of placement options for easy configuration and installation

MICROFLEX OVERHEAD MICROPHONES

- Compact and adjustable 10 cm (4") gooseneck
- Interchangeable condenser cartridges for accurate sound reproduction in any setting

MICROFLEX LAVALIER AND EARSET MICROPHONES

- For applications requiring low-profile discreet placement
- Use in wired or wireless applications

APPLICATIONS

- Conference Rooms
- Seminars
- Houses of Worship
- Theaters
- Courtrooms
- Lecterns

PRODUCT HIGHLIGHTS

- Wide selection for customized installations
- Wired or wireless models available
- Superior audio quality
- CommShield™ Technology for improved RF resistance
- Sleek, low-profile designs

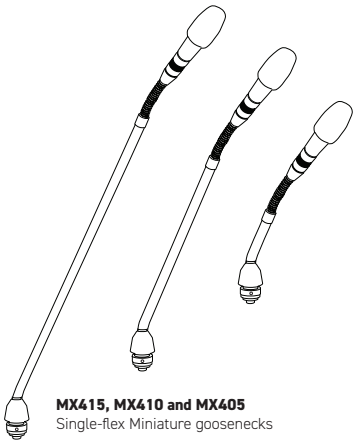
MX405, MX410, MX415 MODULAR GOOSENECK MICROPHONES

Flexible in more ways than one, Microflex Modular Gooseneck Microphones deliver unsurpassed style and performance for conference rooms and similar applications. Offering desktop or mounted bases, wired or wireless options, and even interchangeable cartridges, it's easy to get the perfect fit for your application. Fully compatible with Microflex Wireless Systems and ULX-D Systems.

Specifications

Type	Condenser (electret bias)
Frequency Response	50 Hz – 17 kHz
Polar Pattern	MX405/C, MX410/C, MX415/C: Cardioid MX405/S, MX410/S, MX415/S: Supercardioid MX405/MS Lobar Mini-Shotgun
Output Impedance	EIA rated at 150 Ω (170 Ω actual)
Output Configuration	Active balanced
Sensitivity at 1 kHz, open circuit voltage; 1 Pascal = 94 dB SPL	Cardioid: –35 dBV/Pa (18 mV) Supercardioid: –34 dBV/Pa (21 mV) Lobar: –33 dBV/Pa (22 mV)a
Maximum SPL 1 kHz at 1% THD, 1 kΩ load	Cardioid: 121 dB Supercardioid: 120 dB Lobar: 121 dB SPL
Equivalent Output Noise A-weighted	Cardioid: 28 dB SPL Supercardioid: 27 dB SPL Lobar: 36 dB
Signal-to-Noise Ratio referenced at 94 dB SPL at 1 kHz	Cardioid: 66 dB Supercardioid: 67 dB Lobar: 68 dB
Dynamic Range 1 kΩ load at 1 kHz	93 dB
Common Mode Rejection 10 Hz to 100 kHz	45 dB minimum
Preamplifier Output Clipping Level 1% THD	–8 dBV (0.4 V)
Polarity	3-Pin XLR: Positive sound pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of output XLR connector. 5-Pin XLR: Positive sound pressure on diaphragm produces positive voltage on pin 4 relative to pin 2 of output XLR connector.
Weight	MX405: 54 g MX410: 68 g MX415: 70 g MX400DP: 516 g MX400SMP (w/ Kit): 125 g
Logic Connections	LED IN: Active low (≤1.0 V), TTL compatible. Absolute maximum voltage: –0.7 V to 50 V. LOGIC OUT: Active low (≤1.0 V), sinks up to 20 mA, TTL compatible. Absolute maximum voltage: –0.7 V to 50 V (up to 50 V through 3 kΩ).
Mute Switch Attenuation	–50 dB minimum
Cable	MX400DP: 6 m attached cable with shielded audio pair terminated at a 3-pin male XLR and three unterminated conductors for logic control
Environmental Conditions	Operating temperature: –18 – 57 °C Storage temperature: –29 – 74 °C Relative humidity: 0 – 95%
Power Requirements	48 – 52 Vdc phantom, 8.0 mA

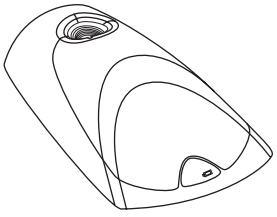
*for detailed dimensions please reference MX405/410/415 user guide



MX415, MX410 and MX405
Single-flex Miniature goosenecks

MX415DF and MX410DF
Dual-flex Miniature goosenecks

MX400SMP
Surface mount preamp



MX400DP
Wired desktop base (also available as MX890 wireless desktop base)

Available Models

The polar pattern of the cartridge is indicated by the model number suffix: C = Cardioid, S = Supercardioid, N = No Cartridge, MS = Lobar

MX405/N, MX405/C, MX405/S, MX405/MS	127 mm (5 inch) gooseneck, bi-color status indicator, includes surface mount preamp
MX405R/N, /C, /S, /MS	127 mm (5 inch) gooseneck, light ring, includes surface mount preamp
MX410/C, /S	254 mm (10 inch) gooseneck, bi-color status indicator, includes surface mount preamp
MX410R/N	254 mm (10 inch) gooseneck, light ring, includes surface mount preamp
MX415/C, /S	381 mm (15 inch) gooseneck, bi-color status indicator, includes surface mount preamp
MX415R/N	381 mm (15 inch) gooseneck, light ring, includes surface mount preamp
MX405LP/N, /C, /S, /MS	127 mm (5 inch) gooseneck, bi-color status indicator, less preamp
MX405RLP/N, /C, /S, /MS	127 mm (5 inch) gooseneck, light ring, less preamp
MX405WLP/N	127 mm (5 inch) gooseneck, bi-color status indicator, less preamp, white
MX405WRLP/N	127 mm (5 inch) gooseneck, light ring, less preamp, white
MX410LP/C, /S	254 mm (10 inch) gooseneck, cardioid, bi-color status indicator, less preamp
MX410RLP/N	254 mm (10 inch) gooseneck, light ring, less preamp
MX410LPDF/C, /S	254 mm (10 inch) gooseneck, bi-color status indicator, less preamp, dualflex
MX410RLPDF/C, /S	254 mm (10 inch) gooseneck, light ring, less preamp, dualflex

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MX405, MX410, MX415 MODULAR GOOSENECK MICROPHONES

Available Models (Continued)

The polar pattern of the cartridge is indicated by the model number suffix: C = Cardioid, S = Supercardioid, N = No Cartridge, MS = Lobar

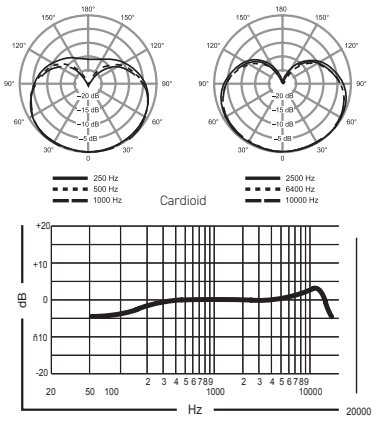
MX410RLPDF/N	254 mm (10 inch) gooseneck, light ring, less preamp, dualflex
MX410WLP/N	254 mm (10 inch) gooseneck, light ring, less preamp, Dualflex, white
MX415LP/C, /S	381 mm (15 inch) gooseneck, cardioid, bi-color status indicator, less preamp
MX415RLP/N	381 mm (15 inch) gooseneck, light ring, less preamp
MX415LPDF/C, /S	381 mm (15 inch) gooseneck, bi-color status indicator, less preamp, dualflex
MX415RLPDF/C, /S	381 mm (15 inch) gooseneck, light ring, less preamp, dualflex
MX415RLPDF/N	381 mm (15 inch) gooseneck, light ring, less preamp, dualflex

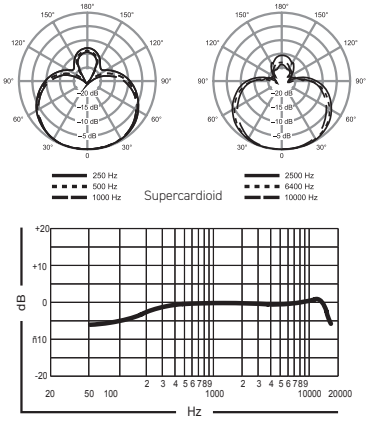
Optional Accessories and Replacement Parts

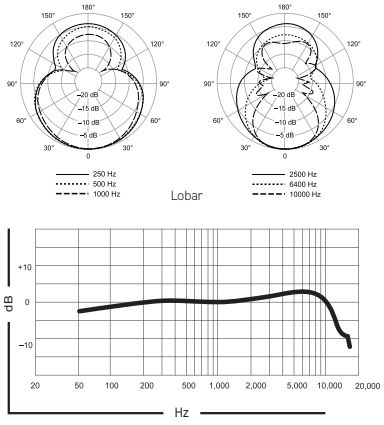
MX400SMP	Surface mount preamp	**R185B**	Black cardioid cartridge for all Microflex models	**A412MWS**	Metal locking windscreen
MX400DP	Wired desktop base. Includes 6.1 m attached cable	**R184B**	Black supercardioid cartridge for all Microflex models	**95A2487**	Tapered windscreen
R185W-A	White cardioid cartridge for all white Microflex models	**R183B**	Black Omnidirectional cartridge for all Microflex models	**R189B**	Black lobar mini-shotgun cartridge for black Microflex models
R189W-A	White Lobar cartridge for all white Microflex models	**R184W-A**	White Supercardioid cartridge for all white Microflex models	**R183W-A**	White Omnidirectional cartridge for all white Microflex models

Furnished Accessories

Models with included Preamp		**All Models**			
MX400SMP	Surface mount preamp	**RK513WS**	Black snap-fit foam windscreen (4 pcs.)	**A189WWS-A**	White flocked snap-fit foam minishotgun windscreen
65A405	Rubber isolation rings	**RK514**	White snap-fit foam windscreen (4 pcs.)	**A189BWS**	Black minishotgun windscreen
65A2190	Wing nut	**A410WWS-A**	White flocked snap-fit foam windscreen	**A189WWS**	White mini-shotgun windscreen
95A2529	5-pin XLR-F				
65A2166	Cap				







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MX412, MX418, MX424 STANDARD GOOSENECK MICROPHONES

Microflex Standard Gooseneck Microphones provide the added length and flexibility needed for speakers in environments like lecterns, pulpits, and courtrooms. Available in four models with a variety of lenghts and mounting styles to choose from, Microflex Gooseneck microphones feature high sensitivity and balanced, transformerless output for maximum resistance to electromagnetic hum and RF interference, even over long cable runs.

Specifications

Type	Condenser (electret bias)
Frequency Response	50 Hz – 17 kHz
Polar Pattern	MX412/C, MX418/C, MX424/C: Cardioid MX412/S, MX418/S, MX424/S: Supercardioid Omnidirectional cartridge available separately
Output Impedance	EIA rated at 150 Ω (170 Ω actual)
Sensitivity at 1 kHz, open circuit voltage; 1 Pascal = 94 dB SPL	Cardioid: –35 dBV/Pa (17.8 mV) Supercardioid: –33.5 dBV/Pa (21.1 mV) Omnidirectional: –27.5 (42.2 mV)
Maximum SPL 1 kHz at 1% THD, 1 kΩ load	Cardioid: 124.2 dB Supercardioid: 122.7 dB Omnidirectional: 116.7 dB
Equivalent Output Noise A-weighted	Cardioid: 28 dB SPL Supercardioid: 26.5 dB SPL Omnidirectional: 20.5 dB SPL
Signal-to-Noise Ratio referenced at 94 dB SPL at 1 kHz	Cardioid: 66 dB Supercardioid: 67.5 dB Omnidirectional: 73.5 dB
Dynamic Range 1 kΩ load at 1 kHz	96.2 dB 100 dB at 0 gain (internal modification)
Common Mode Rejection	45 dB minimum (10 Hz – 100 kHz)
Preamplifier Output Clipping Level 1% THD	–6 dBV (0.5 V)
Polarity	Positive sound pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of output XLR connector.
Mute Switch Attenuation	–50 dB minimum
Cable	MX412D and MX418D: The 3 m attached custom cable contains a shielded audio pair and three unshielded conductors for logic control. Overall diameter = 4 mm
Environmental Conditions	Operating temperature range: -18° – 57° C Relative humidity: 0 – 95%
Power Requirements	11 – 52 Vdc phantom, 8.0 mA

*for detailed dimensions please reference MX412/418/424 user guides

MX412, MX418 and MX424
Standard Gooseneck Microphones

Available Models

The polar pattern of the cartridge is indicated by the model number suffix: C = Cardioid, S = Supercardioid, N = No Cartridge

MX412/C, MX412/S, MX412/N	331 mm (13 inch) gooseneck, attached XLR preamp, shock mount, flange mount, snap-fit foam windsreen
MX418/C, MX418/S, MX418/N	473 mm (19 inch) gooseneck, attached XLR preamp, shock mount, flange mount, snap-fit foam windsreen
MX412S/C, MX412S/S, MX412S/N	334 mm (13 inch) gooseneck, attached XLR preamp, shock mount, flange mount, snap-fit foam windscreen, mute switch, LED Indicator
MX418S/C, MX418S/S, MX418S/N	473 mm (19 inch) gooseneck, attached XLR preamp, shock mount, flange mount, snap-fit foam windscreen, mute switch, LED indicator
MX412SE/C, MX412SE/S, MX412SE/N	305 mm (12 inch) gooseneck, in-line preamp, shock mount, flange mount, 3 m side-exit (or bottom-exit) cable, snap-fit foam windscreen
MX418SE/C, MX418SE/S, MX418SE/N	457 mm (18 inch) gooseneck, in-line preamp, shock mount, flange mount, 3 m side-exit (or bottom-exit) cable, snap-fit foam windscreen
MX412D/C, MX412D/S, MX412D/N	305 mm (12 inch) gooseneck, desktop base with 3 m cable, logic functions, programmable switch and LED indicator, snap-fit foam windscreen
MX418D/C, MX418D/S, MX418D/N	457 mm (18 inch) gooseneck, desktop base with 3 m cable, logic functions, programmable switch and LED indicator, snap-fit foam windscreen
MX424/C, MX424/S, MX424/N	623 mm (25 inch) gooseneck, attached XLR preamp, shock mount, flange mount, snap-fit foam windscreen

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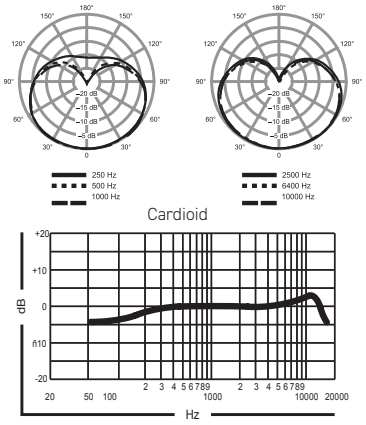
MX412, MX418, MX424 STANDARD GOOSENECK MICROPHONES

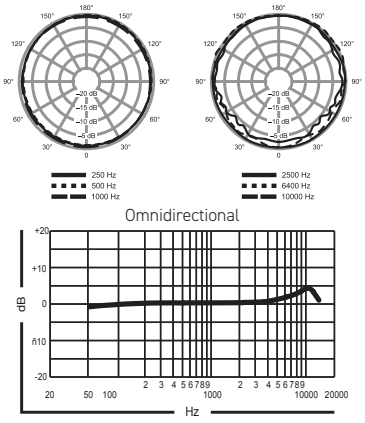
Furnished Accessories

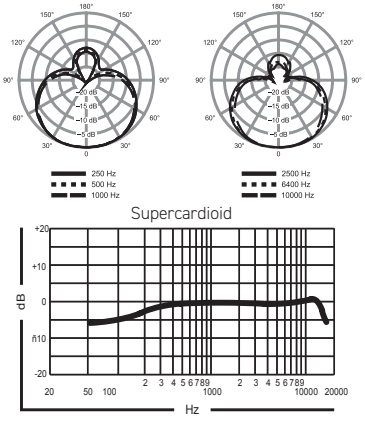
MX412, MX418, MX412S, MX418S, MX424 Models		MX412SE, MX418SE Models		MX412D, MX418D Models	
65B8264	Flange	**A12C**	Flange and nut	**RK412WS**	Snap-fit foam windscreen (1 furnished, 4 in replacement pack)
65B8265	Retainer	**80A476**	Clamp		
80A439	Isolation ring	**A400SM**	Shock mount		
RK412WS	Snap-fit foam windscreen (1 furnished, 4 in replacement pack)	**RK412WS**	Snap-fit foam windscreen (1 furnished, 4 in replacement pack)		
A400SM	Shock mount	**31B1762A**	Shock mount adapter		
80A67	Hex wrench #4				

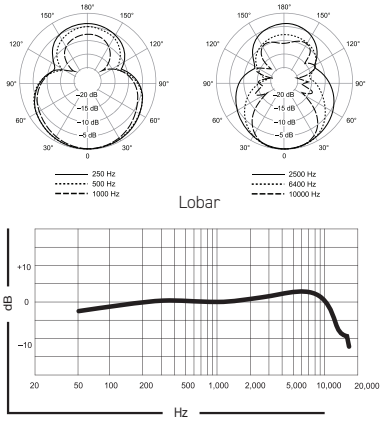
Optional Accessories and Replacement Parts

A412B	Desktop base	**C130**	Custom logic cable (specify length)	**R185B**	Black cardioid cartridge for all Microflex models
A412MWS	Metal locking windscreen	**RK100PK**	Replacement in-line preamplifier (SE models)	**R189B**	Black lobar mini-shotgun cartridge for Microflex models
A99WS	Foam ball windscreen	**R183B**	Black omnidirectional cartridge for all Microflex models		
A57F	Stand adapter	**R184B**	Black supercardioid cartridge for all Microflex models		









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Business Music Systems • Indoor/Outdoor • Background Music/Paging Systems • Foreground Music • A/V Sound Reinforcement

CONTROL® CONTRACTOR
LOUDSPEAKER SYSTEMS

JBL PROFESSIONAL

Installed Live Music Reinforcement • Recorded Music Playback

SPECIFICATIONS

CEILING SPEAKERS

Control 24C Micro Shallow-Depth Ceiling Speaker	
Components:	4.5" Woofer, .5" Tweeter
Frequency Range:	85 Hz – 25 kHz
Power Capacity:	30 Watts Continuous Program
	15 Watts Continuous Pink Noise
Sensitivity:	86 dB, 1W, 1m
Coverage:	150°
Nominal Impedance (C24C Micro):	8Ω
70V/100V Taps (C24CT Micro):	8W, 4W, & 2W, & 1W, (plus 0.5W at 70V)
Termination:	Screw-down barrier strip
Dimensions (H x Dia):	106 x 195 mm (4.2 x 7.7 in)

C24CT MicroPlus High Output Shallow-Depth Ceiling Speaker	
Components:	4" Woofer, .5" Titanium Tweeter
Frequency Range:	80 Hz – 25 kHz
Sensitivity:	85 dB, 1W, 1m
Coverage:	150°
70V/100V Taps:	25W & 12W, (plus 6W at 70V)
Termination:	Screw-down barrier strip
Dimensions (H x Dia):	106 x 195 mm (4.2 x 7.7 in)

Control 24C Compact Ceiling Speaker	
Components:	4" Woofer, .75" Titanium Tweeter
Frequency Range:	80 Hz – 20 kHz
Power Capacity:	80 Watts Continuous Program
	40 Watts Continuous Pink Noise
Sensitivity:	86 dB, 1W, 1m
Coverage:	130°
Nominal Impedance (C24C):	16Ω
70V/100V Taps (C24CT):	30W, 15W, & 7.5W, (plus 3.7W at 70V)
Termination:	Removable locking terminals in sealed compartment with cable strain relief
Dimensions (H x Dia):	200 x 195 mm (7.9 x 7.7 in)

Control 26C High Output Ceiling Speaker	
Components:	6.5" Woofer, .75" Titanium Tweeter
Frequency Range:	75 Hz – 20 kHz
Power Capacity:	150 Watts Continuous Program
	75 Watts Continuous Pink Noise
Sensitivity:	89 dB, 1W, 1m
Coverage:	110°
Nominal Impedance (C26C):	16Ω
70V/100V Taps (C26CT):	60W, 30W, & 15W, (plus 7.5W at 70V)
Termination:	Removable locking terminals in sealed compartment with cable strain relief
Dimensions (H x Dia):	210 x 252 mm (8.3 x 9.9 in)

Control 26-DT Driver Assembly	
Components:	8" Compatible Woofer, .75" Titanium Tweeter
Frequency Range:	70 Hz – 20 kHz
Sensitivity:	89 dB, 1W, 1m
Coverage:	90°
70V/100V Taps:	60W, 30W, & 15W, (plus 7.5W at 70V)
Termination:	Screw locking barrier strip
Dimensions (H x Dia):	Standard 8" driver mounting, 120 mm (4.8 in) deep

Control 19CS In-Ceiling Subwoofer	
Components:	8" Low Frequency Driver
Frequency Range:	42 Hz – 200 kHz
Power Capacity:	200 Watts Continuous Program
	100 Watts Continuous Pink Noise
Sensitivity:	95 dB, 1W, 1m
Nominal Impedance (C19CS):	8Ω
70V/100V Taps (C19CST):	60W, 30W, & 15W, (plus 7.5W at 70V)
Termination:	Removable locking terminals in sealed compartment with cable strain relief
Dimensions (H x Dia):	345 x 345 mm (13.6 x 13.6 in)

* Medium and Large Format Ceiling Speakers are not listed on this spec page.
Please refer to JBL's Control 200 and Control 300 brochures for specific models and specifications.

IN-WALL SPEAKERS

Control 126W	
Components:	6.5" Woofer, 1" Tweeter
Frequency Range:	38 Hz – 20 kHz
Power Capacity:	100 Watts Continuous Program
	50 Watts Continuous Pink Noise
Sensitivity:	88 dB, 1W, 1m
Nominal Impedance:	8Ω
Termination:	Screw-down Euroblock
Dimensions (H x W x D):	280 x 215 x 105 mm (11 x 8.5 x 4.1 in)

Control 128W	
Components:	8" Woofer, 1" Tweeter
Frequency Range:	30 Hz – 20 kHz
Power Capacity:	120 Watts Continuous Program
	60 Watts Continuous Pink Noise
Sensitivity:	90 dB, 1W, 1m
Nominal Impedance:	8Ω
Termination:	Screw-down Euroblock
Dimensions (H x W x D):	334 x 257 x 110 mm (13.1 x 10.1 x 4.3 in)

AVARRO™

CONFIGURED FLOOR LOADED ENCLOSED RACK SERIES

18U-27U-42U

FULLY ASSEMBLED RACK SYSTEMS FOR AUDIO, VISUAL OR NETWORKING EQUIPMENT. DESIGNED WITH HEAVY-GAUGE STEEL AND MULTIPLE FEATURES SUCH AS PRE-INSTALLED COOLING FANS, CASTERS, ADJUSTABLE FEET AND REMOVABLE SIDE PANELS.

SPECIFICATIONS:

- Fully welded steel construction
- Weight capacity up to a 1,322 lb., depending on model
- Includes removable locking side panels
- 2 top-mounted DC UL Listed fans
- Includes locking, reversible and tinted glass door and locking rear access panel
- 4 pre-installed swivel casters (front casters lock) and leveling feet
- Each rack includes pre-installed shelves and blank panels

For more information please call 1-833-574-9124
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RoHS COMPLIANT

TECHNICAL DATA

18U-27U-42U

RK-ER42U

RK-ER42U (42 Unit Space)

- Max Weight Capacity: 1,322lbs
- Dimensions of rack: 23.63" x 23.63" x 77.51"
- Box Dimensions: 25.5" x 25.75" x 86.89"
- Includes 7-2U vented shelves
- 9-2U blanks
- 2-5U vented shelves
- UPC: 840049305700

RK-ER27U

RK-ER27U (27 Unit Space)

- Max Weight Capacity: 900lbs
- Dimensions of rack: 23.63" x 23.63" x 51.26"
- Box Dimensions: 25.5" x 25.75" x 61"
- Includes 5-2U vented shelves and blanks
- UPC: 840049305694

RK-ER18U

RK-ER18U (18 Unit Space)

- Max Weight Capacity: 600lbs
- Dimensions of rack: 23.63" x 23.63" x 35.51"
- Box Dimensions: 25.5" x 25.75" x 45"
- Includes 3-2U vented shelves and blanks
- UPC: 840049305687

For more information please call 1-833-574-9124
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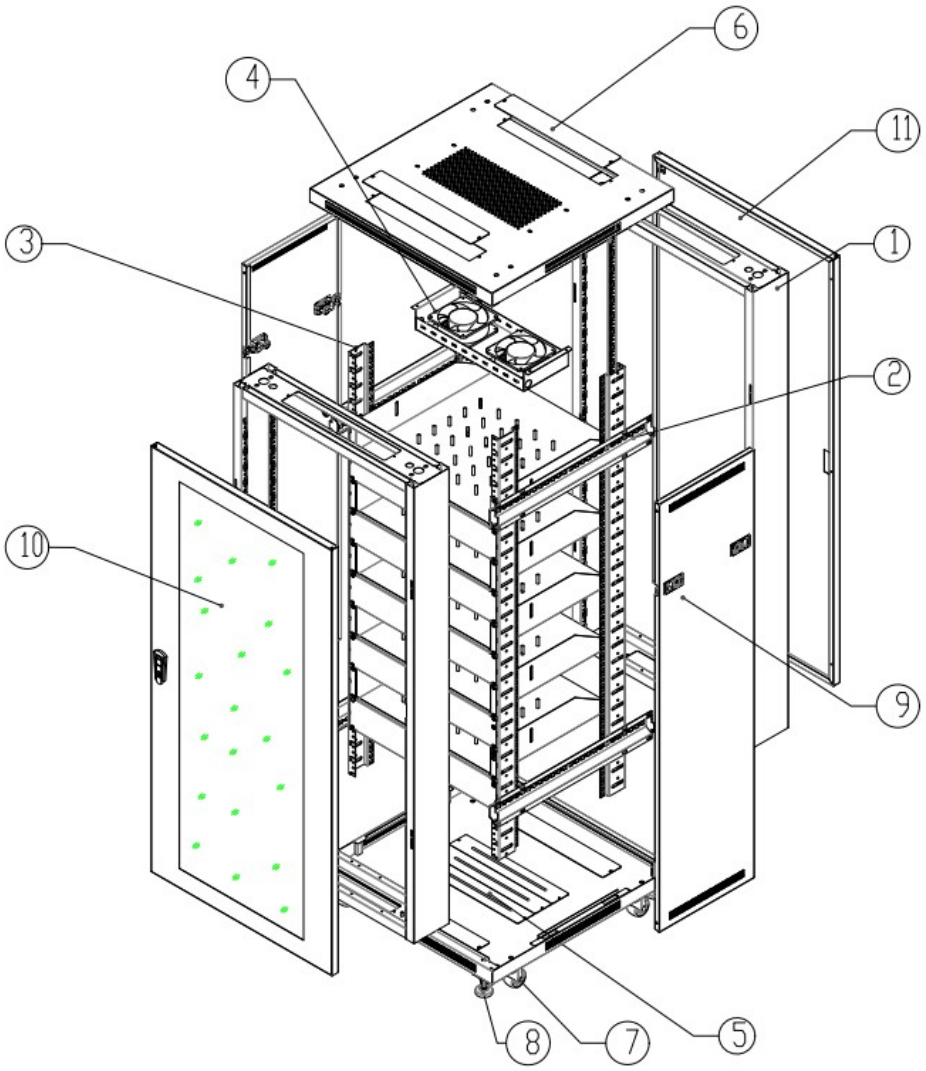
TECHNICAL DRAWING

18U-27U-42U

Expanded View and Parts



1 Frame
2 Mounting Bracket
3 Mounting Rail
4 UL Listed 2-Fan Tray
5 & 6 Cable Management Covers
7 Heavy Duty Casters (front casters lock)
8 Adjustable Feet
9 Removable Side Panels
10 Front, Tinted Glass Door
(Option to reverse door)
11 Back Door (Option to reverse door)

For more information please call 1-833-574-9124
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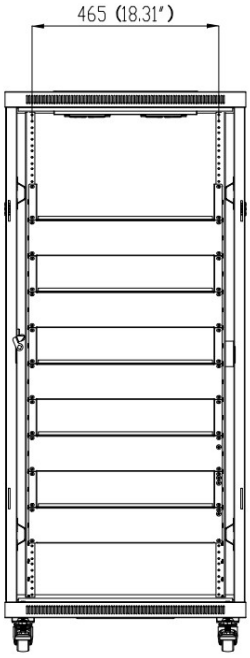
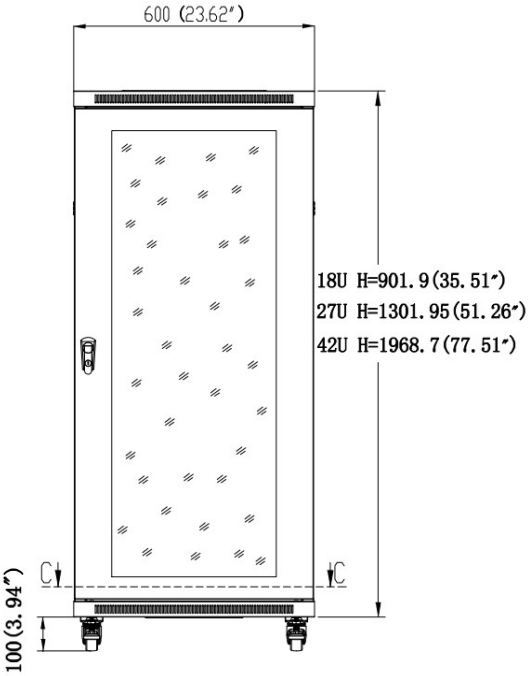
TECHNICAL DRAWING

18U-27U-42U

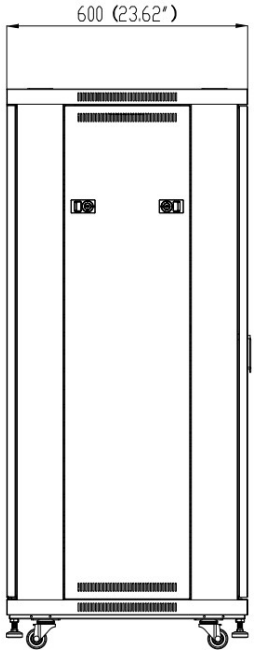
Dimensions



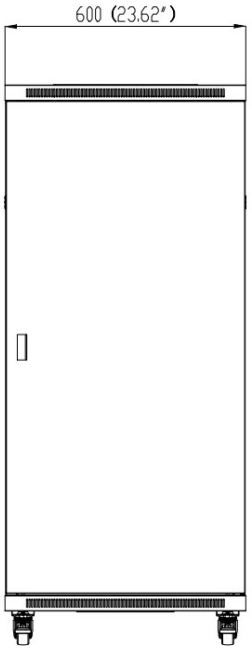
Front View,No Glass Door



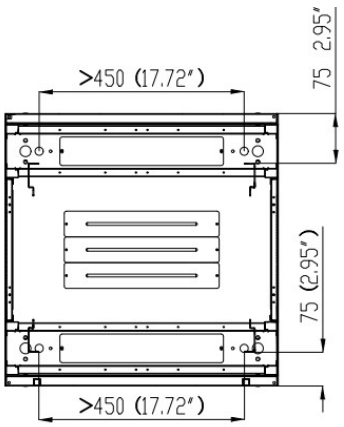
Front View



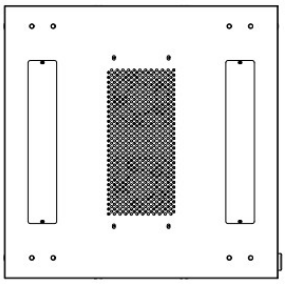
Left Side View



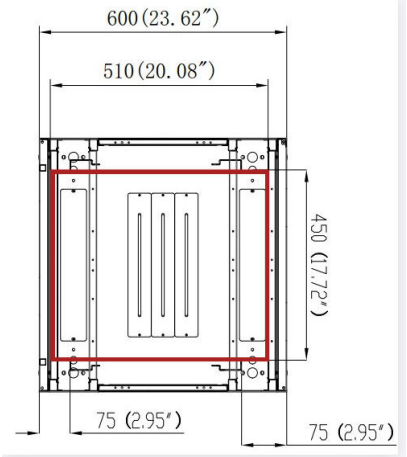
Back View



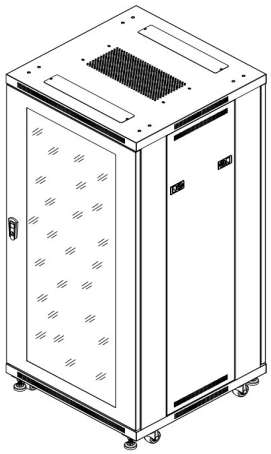
Bottom View



Top View



Usable Space Inside Rack in Red
dims of the usable space:450(17.72")width
510(20.08")depth



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Configuration:

LCS-120-01 Wi-Fi/RF Base System

Product Overview:

This system combines Wi-Fi and RF technology products to provide compliant audio coverage PLUS expanded coverage to everyone with a Smartphone or tablet.

Highlights:

- Extended Audio Reach
- Easy and Convenient
- Free Smartphone App

Includes:

One (1) LW-100P-02 LE 2 Channel (mono) Wi-Fi Server
One (1) LW-202 LE Venue Awareness Kit
One (1) LT-803-072-P1 Stationary 3-Channel Transmitter Package (72 MHz)
One (1) LPT-A107-B Dual RCA to Dual RCA Cable 6.6 ft. (2 M)
Two (2) LR-3200-072 Basic DSP Receiver (72 MHz)
Two (2) LA-401 Universal Ear Speaker
Two (2) LA-430 Intelligent Ear Phone/Neck Loop Lanyard
One (1) LA-423 4 Port USB Charger

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Mediasite Recorder

AUTOMATED VIDEO CAPTURE FOR AV-LIGHT SPACES

Ideal for technology-light teaching and learning spaces, the Mediasite Recorder makes day-to-day video and content capture possible for any room on campus or in the office. Mediasite Recorder's rock-solid reliability and automated capture-to-publish workflows guarantee you never miss a teaching, training or learning moment. All content is immediately published to your Mediasite Video Platform or Mediasite Video Cloud, providing you all the tools to manage, secure, share, search and analyze your video.

HIGH-QUALITY, DUAL-STREAM CAPTURE

- Record and synchronize video with any content from screencasts, whiteboards, light boards, visualizers and more
- Preserve every detail including annotations and mouse movements
- Guarantee the best possible video quality reaches every screen with adaptive bit rate streaming

AUTOMATED ERROR-FREE RECORDING

- Pre-schedule start/stop recording times or import existing timetables from scheduling or course management systems
- Give recording and publishing control to content creators through familiar room control touch screens

WEB MONITORING AND MANAGEMENT

- Local and remote confidence monitoring for audio, video and content quality
- Start/stop/pause recordings, adjust capture settings, manage publishing and more
- Ensure all Recorders are always up-to-date with web-based updates

COLLABORATIVE WEB EDITING

- Trim, cut and fade; add video intros/outros, chapters and watermarks; update/replace slides
- Safely revert to any previous version with a complete revision history and non-destructive editing
- Collaborate with others using review/edit/approve workflows to ensure quality

INTERACTIVE VIDEO

- Deepen learning with polls, ask-a-question, bookmarks, sharing, post-video surveys and related links
- Pinpoint exact video moments with SmartSearch or quickly navigate with slide previews and chapters
- Rearrange, resize or pop-out content to focus on what's most important
- Experience the same interactive playback on any device

mediasite

VIDEO & CONTENT CAPTURE

- Video on-demand capture only (optional live streaming add-on available)
- Supports NDI devices (up to two inputs)
- Records up to 2 simultaneous HD video/content sources
- 2 HDMI inputs supporting:
  - HD resolutions 1080p, 1080i, 720p (HD output as 720p – 1280x720 at 4.5 Mbps)
  - SD resolutions 576p, 576i, 480p, 480i
  - VESA resolutions
- NTSC/PAL

AUDIO CAPTURE

- HDMI embedded audio
- XLR balanced audio
- RCA unbalanced audio

VIDEO / AUDIO OUTPUTS

- DisplayPort output for Recorder configuration
- 3.5mm stereo speaker/headphone output

RECORDER AUTOMATION & CONTROL

- Mediasite Scheduler for automated recording
- Support schedule imports from R25/Schedule25, EMS™, Astra Schedule and Syllabus Plus
- Mediasite Monitor for remote management and confidence monitoring
- Crestron®, AMX™, Extron room control integration via TCP/IP and RS-232
- Optional USB-based push-button recording device/ indicator light

RECORDER DESIGN

- Rack-mountable to 1U 19" rack
- On-appliance solid state content storage
- Gigabit (10/100/1000 Mb/s) LAN
- LED status for recording, paused, idle, error
- Kensington Security Slot
- 1.75" (height) x 13.75" (width) x 9" (depth)
- Weight: 5 lbs
- Weight with external power supply and rack kit: 8.25 lbs

INCLUDED EQUIPMENT

- DC power adapter with power cable
- Audio breakout cable
- Rack-mount brackets

POWER REQUIREMENTS

- Power: 84W
- Input frequency: 50-60Hz
- AC voltage input: 100-240V
- Max heat dissipation: 326 BTU/h
- DC voltage output: 12V
- DC current output: 7A

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DELL Technologies

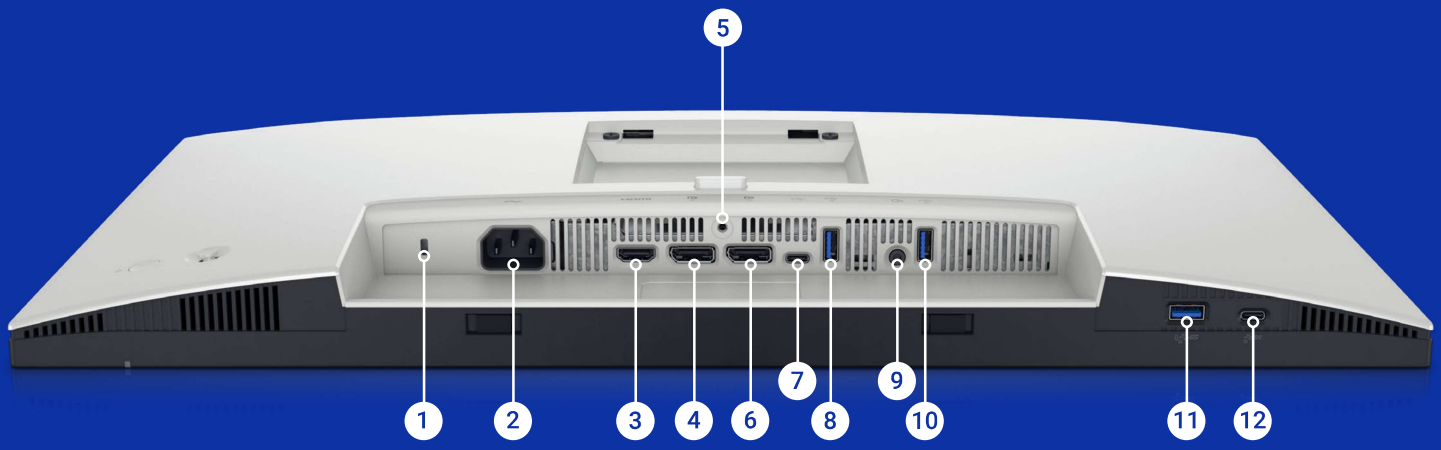
New level of visual comfort

Dell UltraSharp 24 Monitor | **U2424H**

The world's # 1 monitor company*

* Dell monitors are #1 Worldwide for 9 years! Source: IDC Worldwide Quarterly PC Monitor Tracker, Q2 2023. From 2014 to 2023.

Ports & Slots



1 Security lock slot[1]
2 Power connector
3 HDMI port version 1.4 (HDCP 1.4) (supports up to FHD 1920 x 1080 120 Hz TMDS as per specified in HDMI 1.4)
4 DisplayPort 1.4
5 Stand lock
6 DisplayPort 1.4 (out)
7 USB Type-C upstream port (data only, SuperSpeed USB 10Gbps, USB 3.2 Gen 2)
8 USB Type-A downstream port (SuperSpeed USB 10Gbps, USB 3.2 Gen 2)
9 Audio line out
10 USB Type-A downstream port (SuperSpeed USB 10Gbps, USB 3.2 Gen 2)
11 USB Type-A downstream port (SuperSpeed USB 10 Gbps, USB 3.2 Gen 2) with BC1.2 power charging
12 USB Type-C downstream port (SuperSpeed USB 10Gbps, USB 3.2 Gen 2) with power charging (15W)

1 Based on Kensington Security Slot™

FEATURE	TECHNICAL SPECIFICATION
MODEL	Dell UltraSharp 24 Monitor - U2424H
DIAGONAL VIEWING SIZE	604.70 mm (23.80 inches)
PRESET DISPLAY AREA (H X V)	527.04 mm x 296.46 mm (20.75" x 11.67")
PANEL TYPE	IPS
DISPLAY SCREEN COATING	Anti-Glare with 3H hardness
MAXIMUM PRESET RESOLUTION	1920 x 1080 at 120 Hz
VIEWING ANGLE	178° vertical / 178° horizontal
PIXEL PITCH	0.2745 mm x 0.2745 mm
PIXEL PER INCH (PPI)	92.53
CONTRAST RATIO	1000 to 1 (typical)
ASPECT RATIO	16:9
BACKLIGHT TECHNOLOGY	White LED edgelight system
BRIGHTNESS	250 cd/m² (typical)
RESPONSE TIME	8 ms (Normal) 5 ms (Fast)
AMBIENT LIGHT SENSOR	Yes, auto brightness and color temperature adjustmemt
CONNECTIVITY	• 1 x DisplayPort version 1.4 (DRR for Microsoft Windows) (HDCP 1.4)[1] • 1 x HDMI (HDCP 1.4)(supports up to FHD 1920 x 1080 120Hz as per specified in HDMI 1.4) • 1 x DisplayPort (Out) with MST (HDCP 1.4) • 1 x USB-C upstream port (data only, 10Gbps USB 3.2 Gen2) • 2 x super speed USB 10Gbps (USB 3.2 Gen2) downstream ports • 1 x audio line-out port Quick Access: • 1 x USB-C downstream port with charging capability at 15 W (maximum) • 1 x super speed USB 10Gbps (USB 3.2 Gen2) downstream port with BC1.2 charging capability at 2 A (maximum)
ADJUSTABILITY	Height adjustable (150 mm) Tilt (-5° to 21°) Swivel (-45° to 45°) Pivot (-90° to 90°)
PBP / PIP	No
KEYBOARD, VIDEO AND MOUSE (KVM)	No
DAISY CHAIN AVAILABILITY	Yes
AUDIO OUTPUT	1 x Audio line-out[2]
BUILT-IN SPEAKER	No

FEATURE	TECHNICAL SPECIFICATION
DELL DISPLAY MANAGER COMPATIBILITY	Yes, Easy Arrange, Other key features
SPECIFICATIONS - SERVICE / SUPPORT DETAILS	3-Year Advanced Exchange Service and Premium Panel Exchange
COLOR GAMUT	• DCI-P3 85% • sRGB 100% • BT.709 100% • 16.7 million colors • sRGB and BT.709: Delta E < 2 (average)
HEIGHT WITH STAND (COMPRESSED ~ EXTENDED)	364.00 mm ~ 496.53 mm (14.33" ~ 19.55")
WIDTH WITH STAND	538.64 mm (21.21")
DEPTH WITH STAND	181.75 mm (7.16")
HEIGHT WITHOUT STAND	311.21 mm (12.25")
WIDTH WITHOUT STAND	538.64 mm (21.21")
DEPTH WITHOUT STAND	49.10 mm (1.93")
WEIGHT (PANEL ONLY - FOR VESA MOUNT)	3.52 kg (7.76 lb)
WEIGHT (WITH STAND ASSEMBLY AND CABLES)	5.38 kg (11.86 lb)
WEIGHT (WITH PACKAGING)	7.92 kg (17.46 lb)
SECURITY	Security lock slot (cable lock sold separately) Anti-theft stand lock slot (to lock stand to monitor using screw)
COMPLIANT STANDARDS	• ENERGY STAR® certified monitor • EPEAT® registered where applicable. EPEAT registration varies by country. See www.epeat.net for registration status by country. • TCO Certified & TCO Certified Edge • RoHS Compliant • BFR/PVC Free monitor (excluding external cables). • Arsenic-Free glass and Mercury-Free for the panel only
FLAT PANEL MOUNT INTERFACE	VESA mounting holes (100 mm x 100 mm - behind attached VESA Cover)
TEMPERATURE RANGE	Operating: 0°C to 40°C (32°F to 104°F) Non-operating: -20°C to 60°C (-4°F to 140°F) - Storage and Shipping
HUMIDITY RANGE	Operating: 10% to 80% (non-condensing) Non-Operating: 5% to 90% (non-condensing) - Storage and Shipping
ALTITUDE	Operating: 5000 m (16404 ft) max Non-Operating: 12192 (40000 ft) max
VOLTAGE REQUIRED	100 VAC to 240 VAC / 50 Hz or 60 Hz ± 3 Hz / 1.5 A (typical)
POWER CONSUMPTION NORMAL OPERATION	0.3 W (Off mode)[3] 0.5 W (Standby mode)[3] 13.7 W (On mode)[3] 72.0 W (Max.)[4] 11.3 W (Pon)[5] 36.6 kWh (TEC)[5]
WHAT'S INCLUDED	Monitor, Stand Riser, Stand Base 1 x Power cable 1 x DP Cable (DP to DP) - 1.8 m 1 x USB-A to USB-C Gen 2 cable - 1 m Quick setup guide Safety, Environ mental and Regulatory Information Factory calibration report

1 DisplayPort 1.4/MST/DP audio is supported.
2 Headphone usage is not supported for the audio line out connector.
3 As defined in EU 2019/2021 and EU 2019/2013.
4 Max brightness and contrast setting with maximum power loading on all USB ports.
5 Pon: Power consumption of On Mode as defined in Energy Star 8.0. TEC: Total energy consumption in kWh as defined in Energy Star 8.0 version.

Steadfast reliability

As the No. 1 monitor company worldwide*, we take pride in our unyielding commitment to quality and the utmost in customer satisfaction.

Premium Panel Exchange

Dell Premium Panel Exchange[1] allows a free monitor replacement during the Limited Hardware Warranty[2] period even if only one bright pixel is found.

Advanced Exchange Service

This monitor comes with a 3-year Advanced Exchange Service[3] so that if a replacement becomes necessary, it will be shipped to you the next business day during your 3-year Limited Hardware Warranty.[2]

ProSupport

Upgrade to 24x7 specialized technical phone support with the Dell ProSupport option.[4]

* Dell monitors are #1 Worldwide for 9 years! Source: IDC Worldwide Quarterly PC Monitor Tracker, Q2 2023. From 2014 to 2023.

1 Applicable to Dell UltraSharp, P Series, and C Series desktop monitors.

2 For copy of Ltd Hardware Warranty, write to Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682 or see https://www.dell.com/warranty.

3 Advanced Exchange: Dell will send you a replacement monitor the next business day in most cases, if deemed necessary after phone/online diagnosis. Shipping times may vary by location and for monitors 55" and above. Fee charged for failure to return defective unit. See dell.com/servicecontracts/global.

4 Availability varies, please visit www.dell.com/support for details. In some countries, hours for in-region support may vary. Support after local business hours may be provided in a language other than the local language.

Technical specifications subject to change without prior notice. Product availability varies by country. Please contact your Dell representative for more information.

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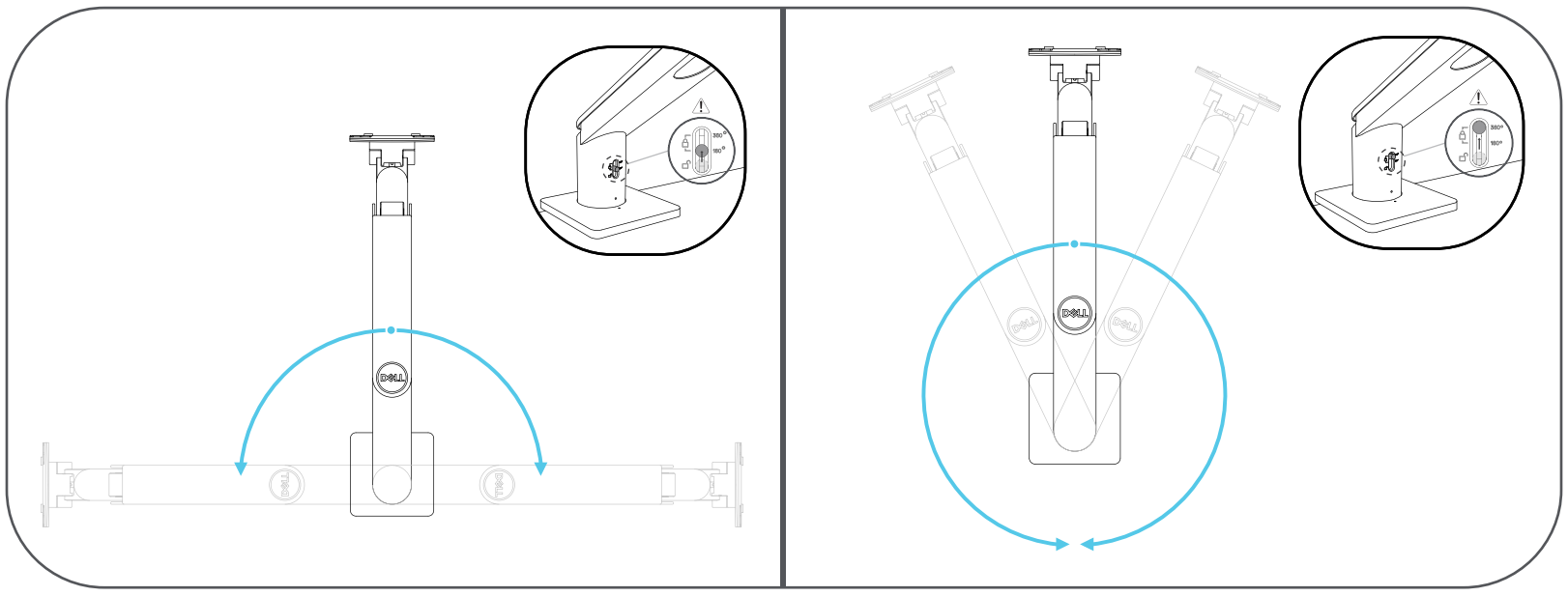
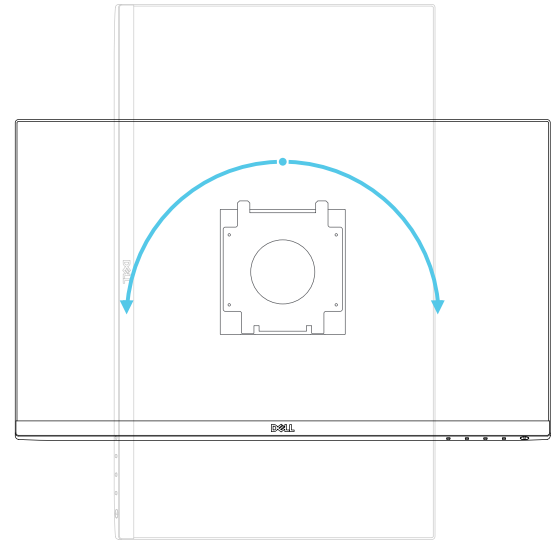
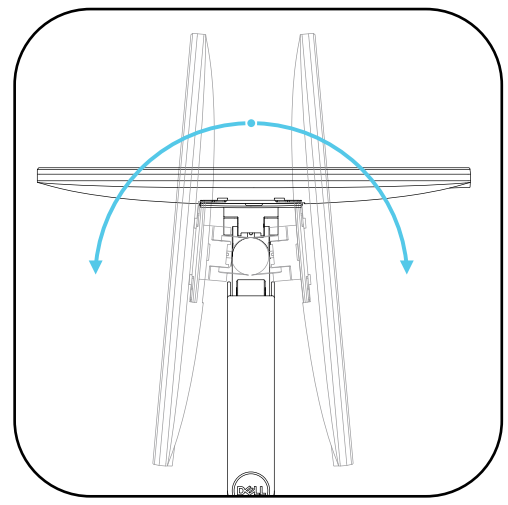
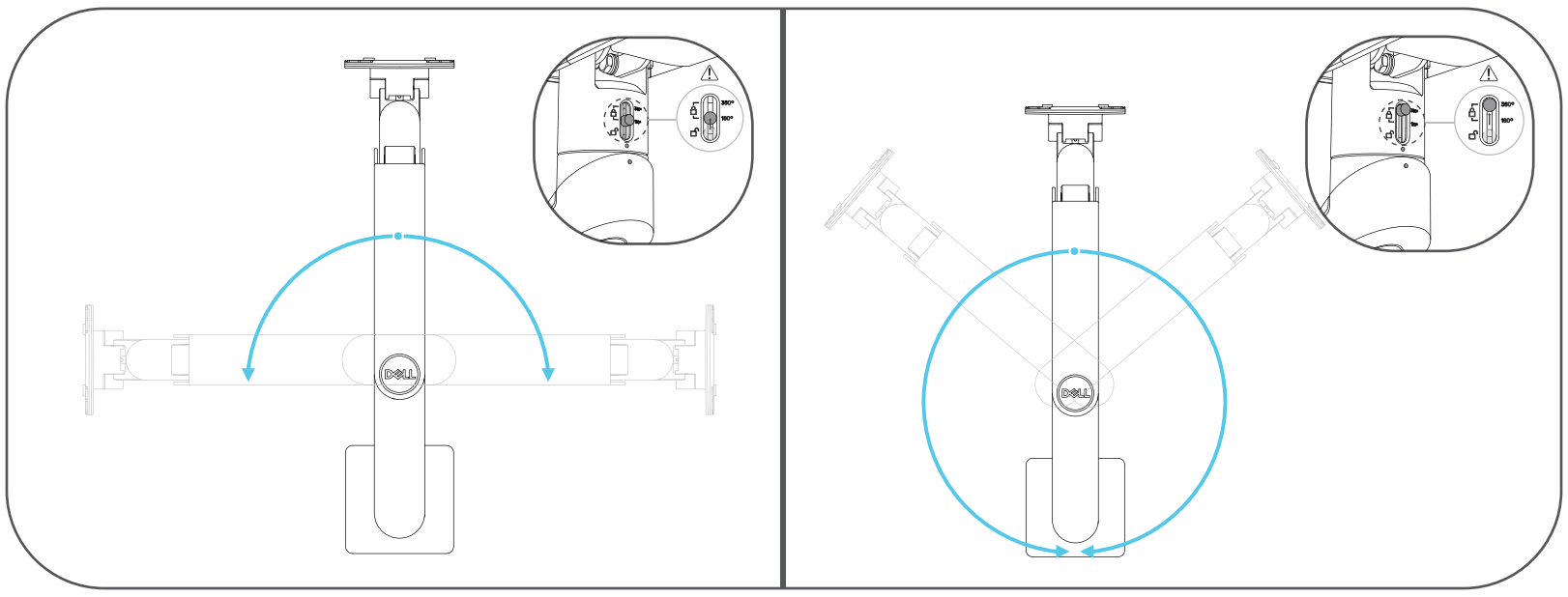
Dell Single Monitor Arm
MSA20

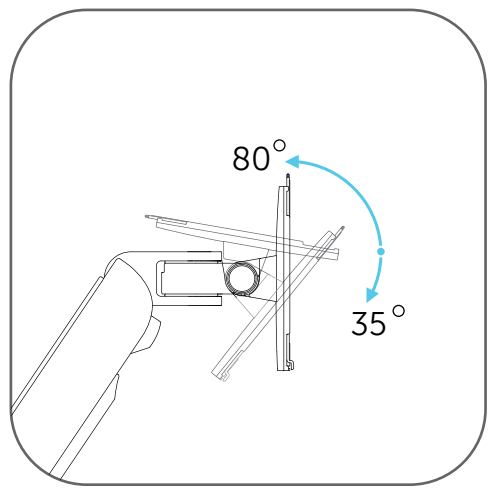
Range of Motion











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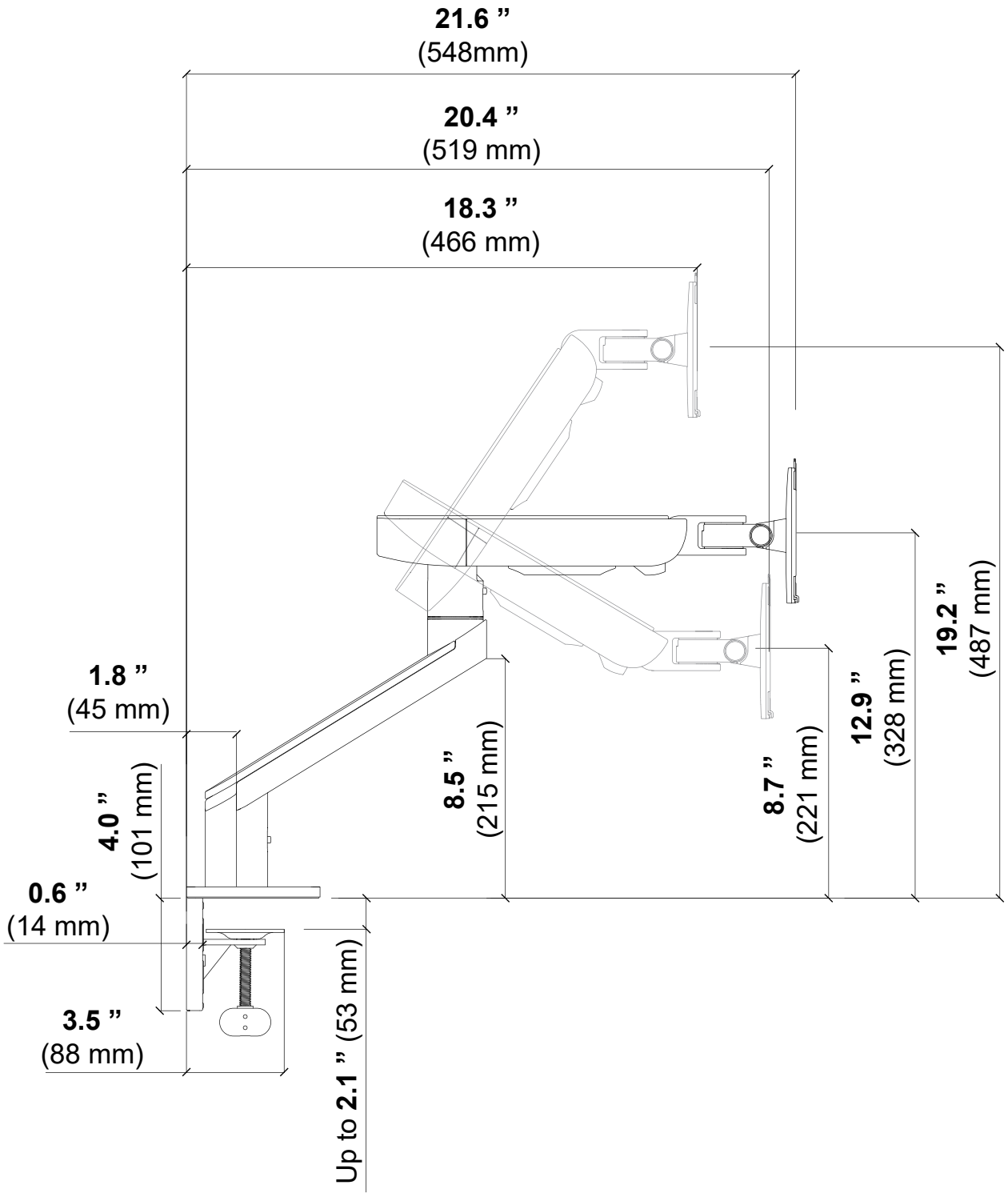
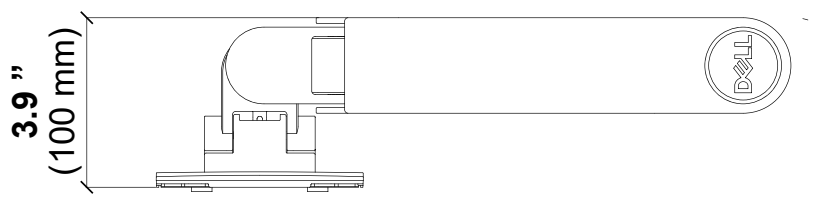
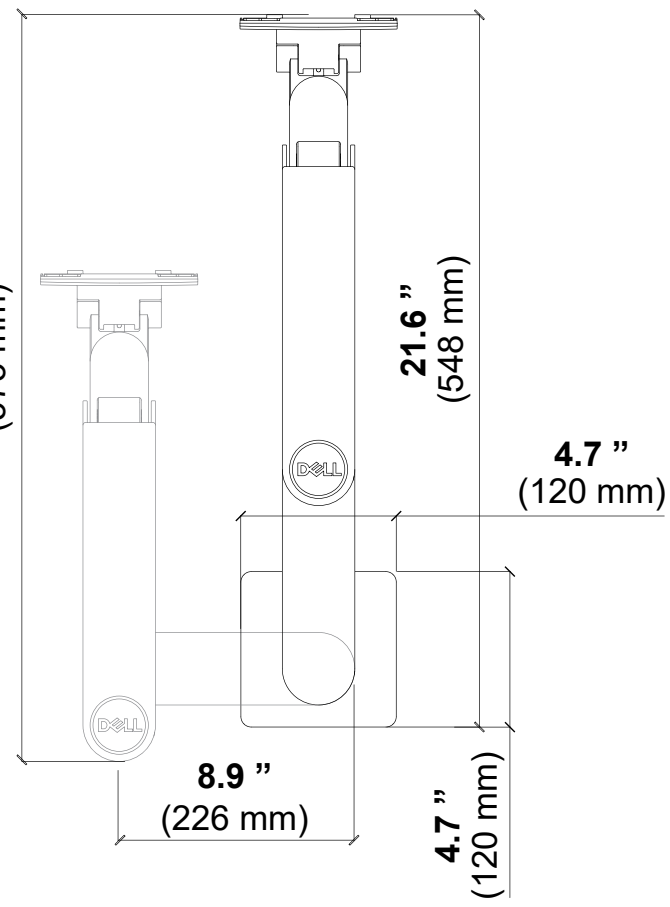
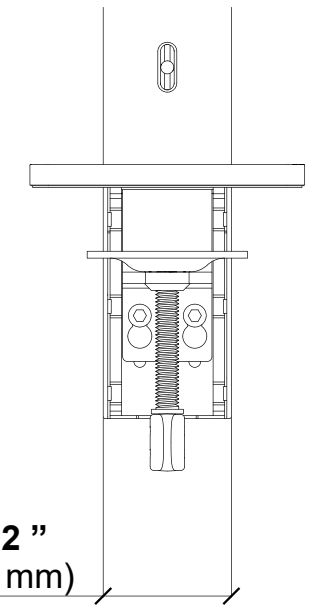


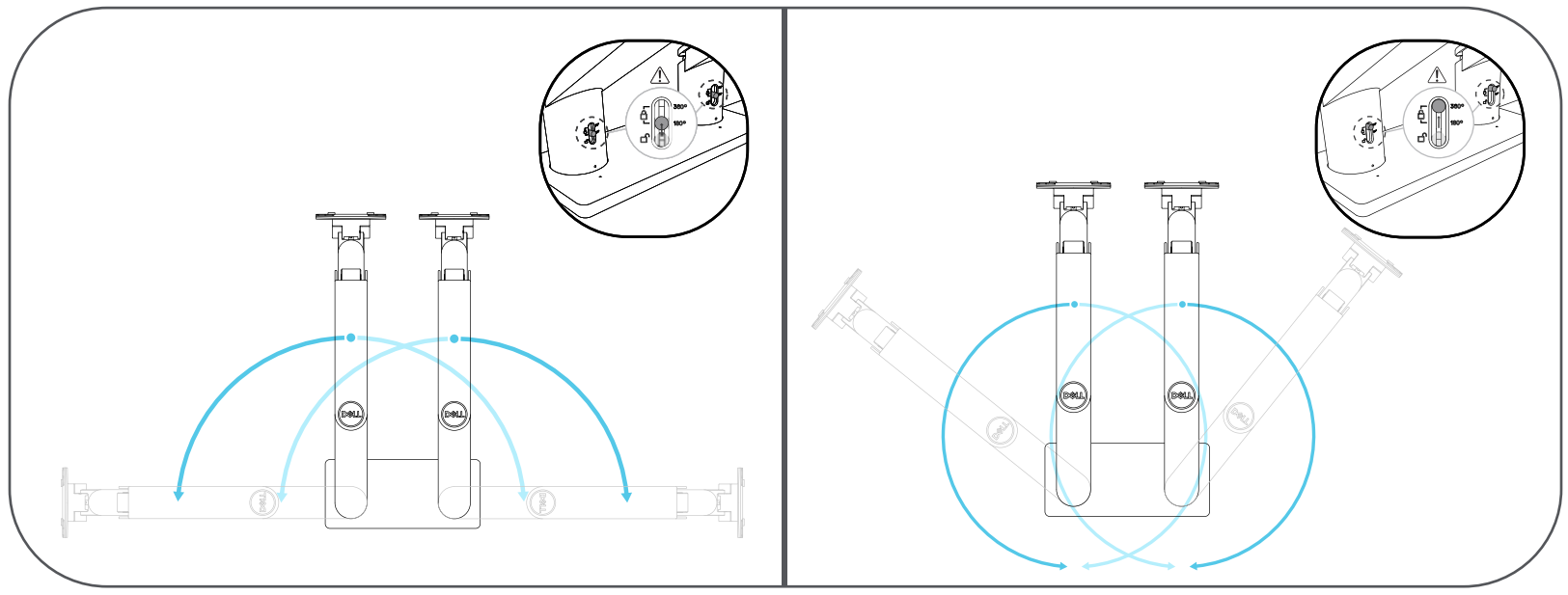


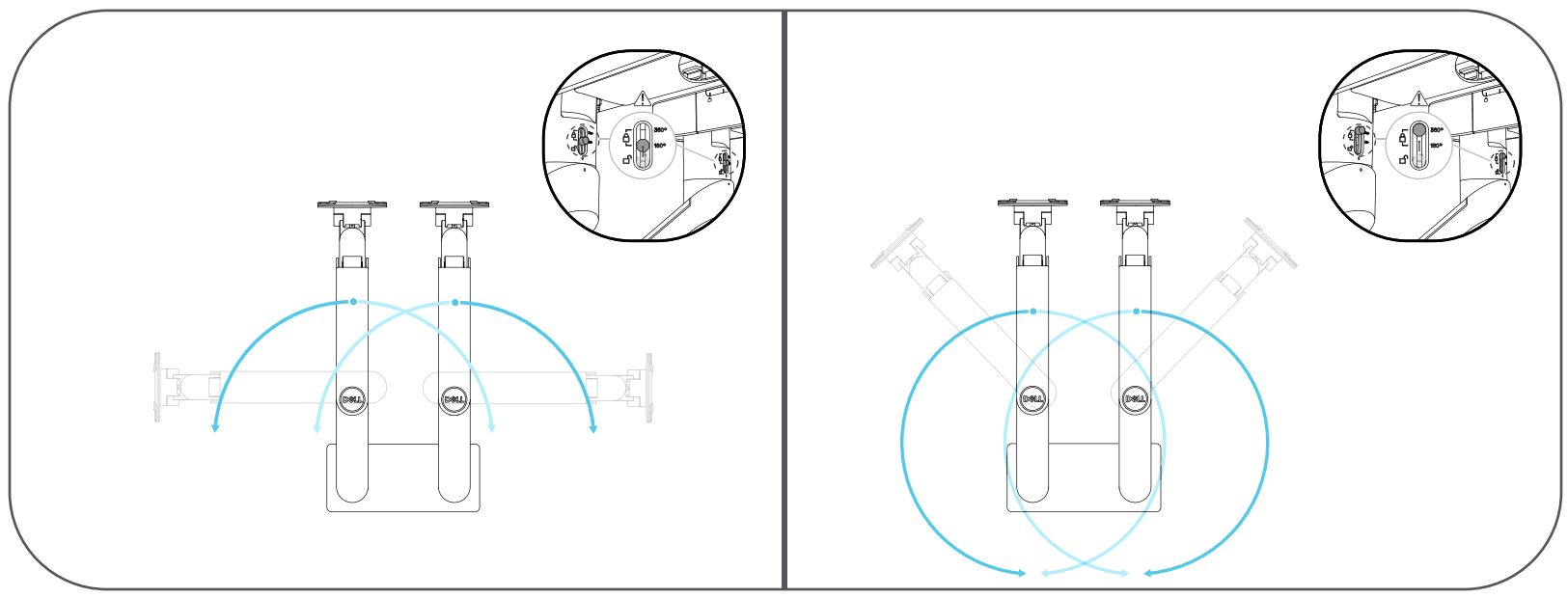


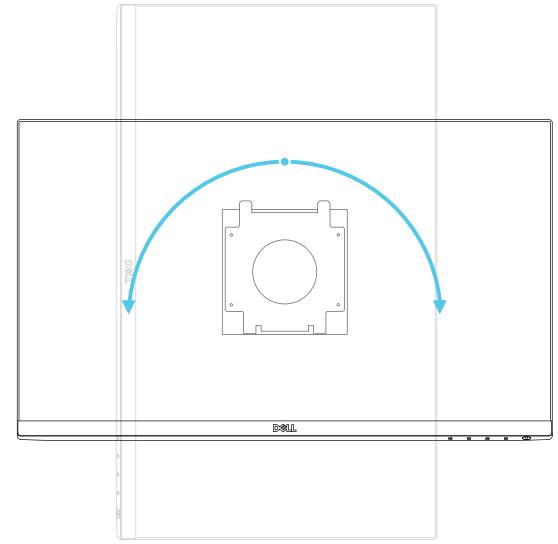


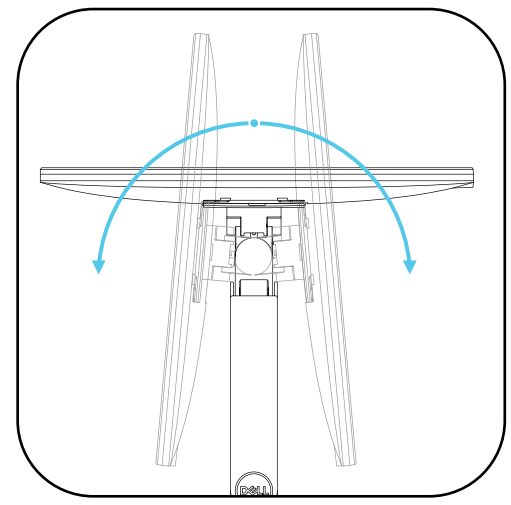
Dell Single Monitor Arm
MDA20

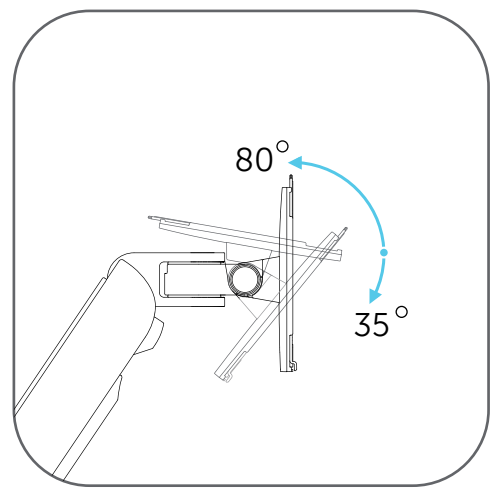
Range of Motion











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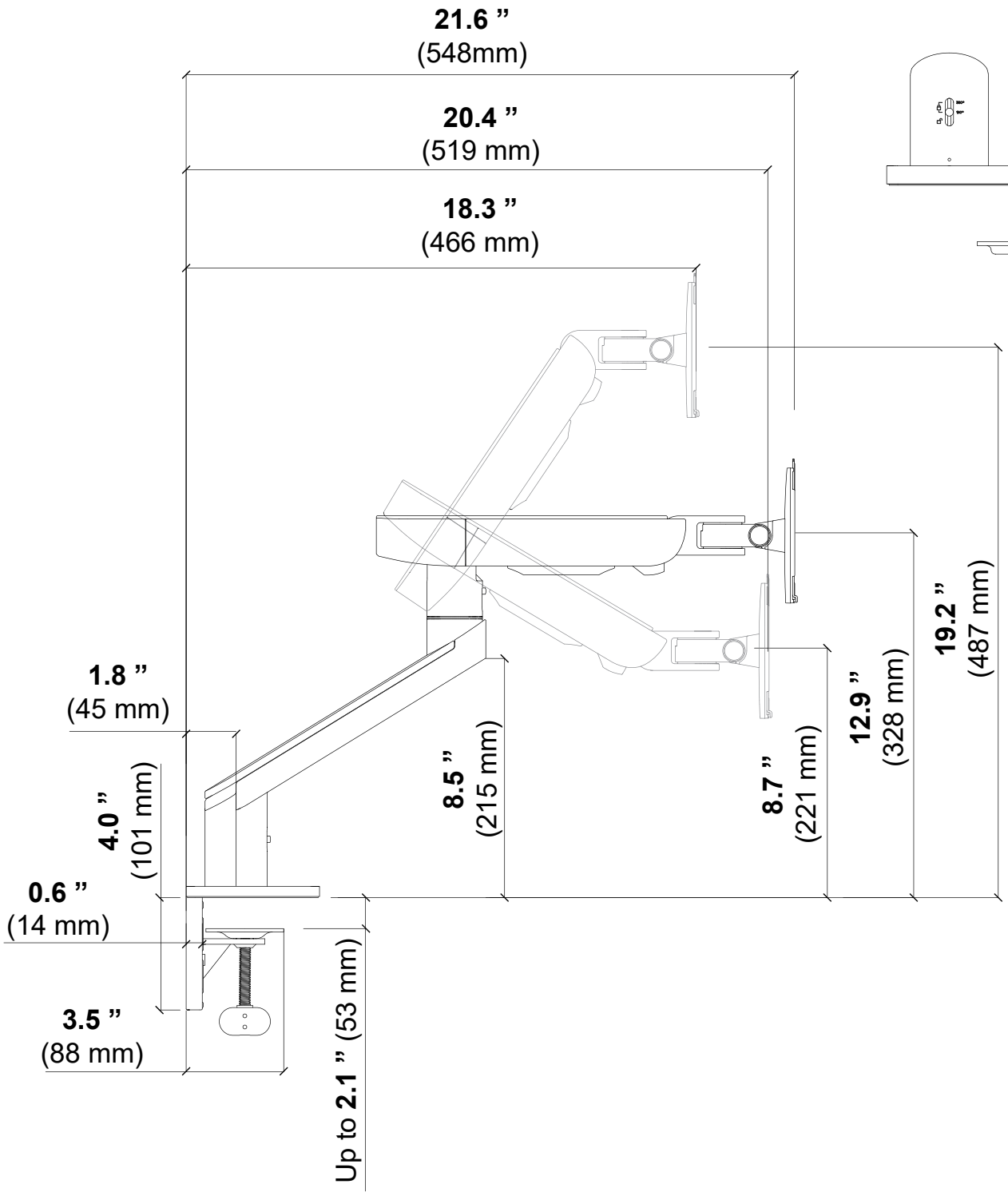
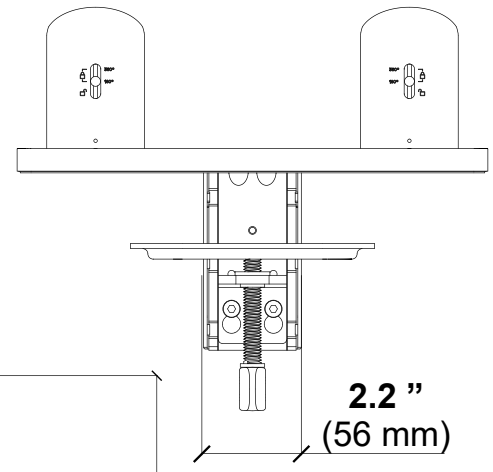
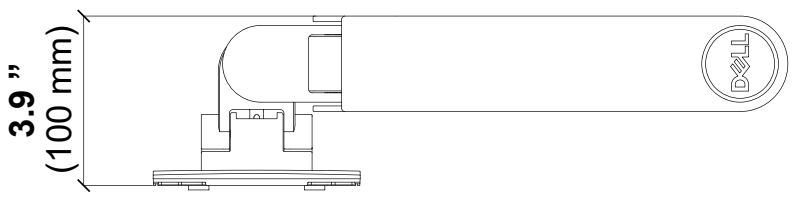
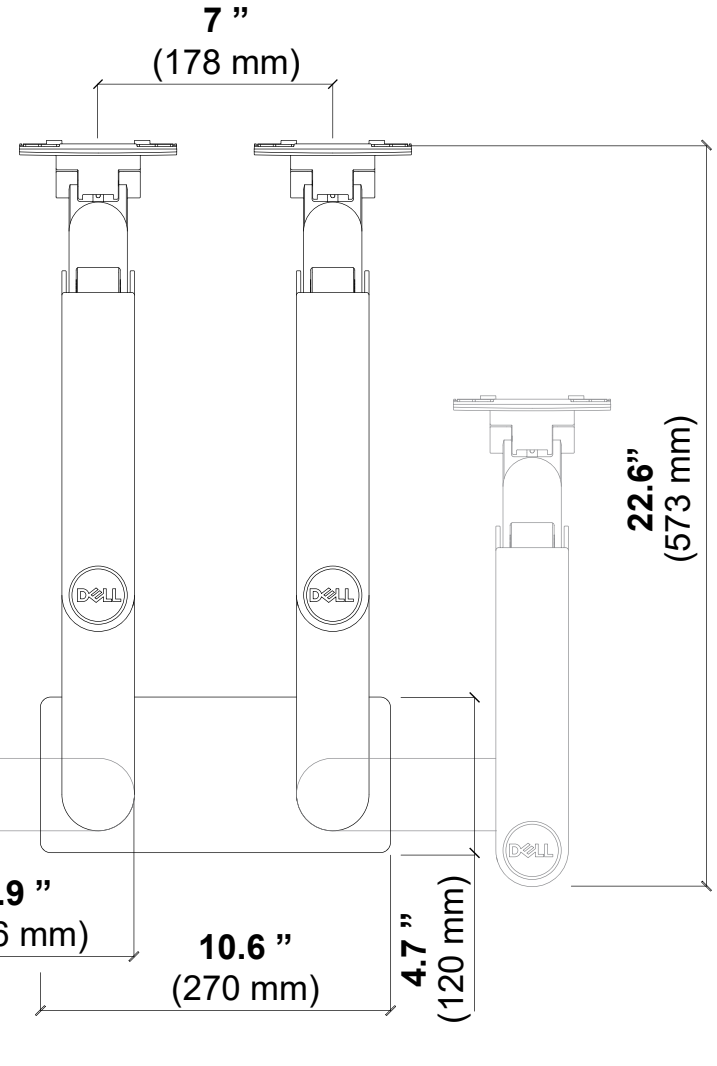








Dell OptiPlex 7020

Inspired Design

The OptiPlex 7020 business-class desktop delivers essential performance, security and manageability features to match your productivity needs. Available in the mini-tower and small form factor chassis, the OptiPlex 7020 will seamlessly integrate into any office setting.

Empower your staff

Built with the end-user in mind, OptiPlex 7020 provides the power and performance of 4th Generation Intel® Core™ processors, with Intel® integrated graphics and discrete graphics options that supply increased performance over previous generations. Rich collaborative features include wireless connectivity options, front microphone and headset mini-jacks for voice-over-IP, and Microsoft™ Lync Certification. Plus, OptiPlex 7020 comes with six native USB ports, and legacy PCI support on the mini-tower.

Security you can trust

OptiPlex 7020 is the **most secure commercial desktop in its class**, providing comprehensive encryption, advanced authentication and malware prevention from a single source. The flexibility of Dell's security offerings allow you to choose the level of data protection necessary for your business and budget.

Simplify life for IT

Tool-less serviceability combined with Dell automated technology for deploying, monitoring and updating systems reduces complexity and improves IT efficiency. For increased management of your Dell desktop fleet, integration with Dell KACE applications is available.

Built to last

OptiPlex 7020 desktops are designed and tested to assure long term reliability and durability in hard working environments. Under Dell's Highly Accelerated Life Cycle Testing (H.A.L.T) regimen, engineers verify the system's tolerance to heat, cold, vibration, shocks and drops.

We're here to help

By partnering with Dell for your business needs, you'll receive full lifecycle client management, from deployment to controlled transitions and end-of-life product recycling. Additionally, OptiPlex 7020 is available with award-winning Dell ProSupport™ for 24X7 access to experts who will keep your systems up and running.

Simply do more

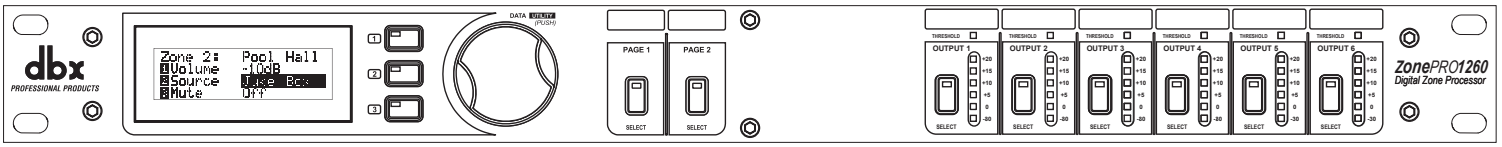
Dell offers a complete portfolio of accessories including wireless keyboards and mice, universal headsets, USB port covers, security locks and award winning monitors. And all accessories and software are covered under Dell ProSupport™.

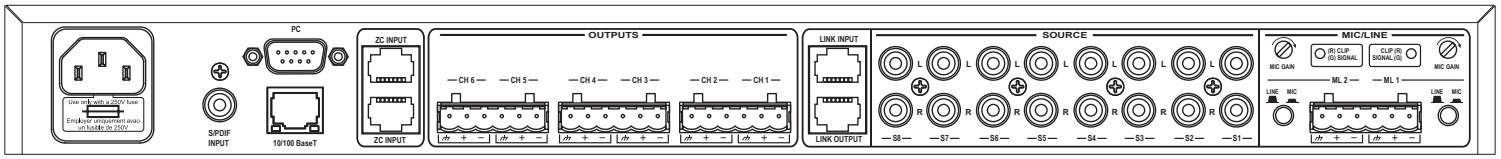
Order your configured OptiPlex 7020 through Dell Smart Selection and expect shipment within 24-48 hours.

OptiPlex 7020 MT/SFF Technical Specifications[1]			
Processors[1]	Intel® 4th generation Core™ i7/i5 Quad Core, and Core™ i3 Dual Core, PDC		
Chipset	Intel® Q87 Express Chipset		
Operating System Options[1]	Microsoft® Windows 8 Standard 64-bit, Microsoft ® Windows 8 Pro 64-bit Microsoft® Windows 7® Professional SP1 (32/64 bit) Ubuntu®		
Graphics[2]	Integrated Intel® HD Graphics 4600 (i5/i7); Integrated Intel® HD Graphics 4400 (i3); Integrated Intel® HD Graphics (PDC); supports optional discrete graphics solutions from AMD		
Memory[3]	Up to 4 DIMM slots; Non-ECC dual-channel 1600MHz DDR3 SDRAM, supports up to 16GB. Not all options available in every country nor in every configuration.		
Networking	Integrated Intel® I217LM Ethernet LAN 10/100/1000; supports optional wireless 802.11n card		
I/O Ports	4 External USB 3.0 ports (2 front, 2 rear) and 6 External USB 2.0 ports (2 front, 4 rear) and 1 Internal USB 2.0 (MT only); 1 RJ-45; 1 Serial; 1 VGA; 2 DisplayPort; 2 PS/2; 2 Line-in (stereo/microphone), 2 Line-out (headphone/speaker)		
Removable Media	Supports optional optical disc drives and media card reader options		
Hard Drives[4] Options	Hard Disk Drives: up to 1TB; Supports Hybrid and Solid State Drive No Hard Drive – Supports Dell Cloud Desktop diskless option		
Chassis		**Minitower (MT)**	**Small Form Factor (SFF)**
	Dimensions (H x W x D) Inches/(cm)	14.2 x 6.9 x 16.4 / (36.0 x 17.5 x 41.7)	11.4 x 3.7 x 12.3 / (29.0 x 9.3 x 31.2)
	Min. Weight (lbs/kg)	20.68 / 9.4	13.2 /6.0
	Number of Bays	2 internal 3.5” 2 external 5.25”	1 internal 3.5” 1 external 5.25” (slimline)
	Expansion Slots	1 full height PCIe x16 1 full height PCIe x16 (wired x 4) 1 full height PCIe x1 1 full height PCI	PCIe x16 PCIe x16 wired as x4
	Power Supply[5] Unit (PSU)	Standard 290W PSU Active PFC; 290W up to 90% Efficient PSU (80 PLUS Gold); 290W up to 85% Efficient PSU (80PLUS Bronze);ENERGY STAR 6.0 compliant, Active PFC	Standard 255W PSU Active PFC; 255W up to 90% Efficient PSU (80 PLUS Gold); 255W up to 85% Efficient PSU (80PLUS Bronze); ENERGY STAR 6.0 compliant, Active PFC
Recommended Accessories[1]	Monitors: Dell UltraSharp Monitors - Award-winning, high-performance with ultra wide viewing, from 21.5"-30; and Dell Professional series monitors available from 17"-24" Dell Single Monitor Arm and Dual Monitor Stand		
	Keyboards: Dell USB Entry Keyboard, Dell Multimedia Pro Keyboard, Dell Smart Card Keyboard		
	Mouse: Dell USB Optical Mouse, Dell Laser Mouse		
	Audio Speakers: Internal Dell 2.0 and 2.1 stereo speaker systems available; Dell sound bar for select flat-panel displays.		
	Dell Print Solutions: Black-and-White, Color and Multifunction Lasers for printing and document management		
Security	Trusted Platform Module[6] (TPM) 1.2, Dell Data Protection|SecurityTools, Dell Data Protection|Encryption, Chassis lock slot support, optional Chassis Intrusion Switch, Setup/BIOS Password, I/O Interface Security, optional Smart Card keyboards, Intel® Trusted Execution Technology, Intel® Identity Protection Technology, Intel® Ant-Theft Technology, KACE Security, Dell Secure Works, BIOS support for optional Computrace[7]		
Systems Management [8]	Intel® Standard Manageability; No Out of Band Systems Management		
Environmental & Regulatory Standards	Environmental Standards (eco-labels): ENERGY STAR 6.0, EPEAT Registered[10], CECP, WEEE, Japan Energy Law, South Korea E-standby, South Korea Eco-label (for SFF/USFF only), EU RoHS, China RoHS Other Environmental Options: Carbon Off-set; Asset Resale and Recovery Service. USFF BFR/PVC Free[9]		
Warranty and Service	Limited Hardware Warranty[11]; Standard 3-year Next Business Day On Site Service after Remote Diagnosis[12] (3-3-3); Optional 3-year Dell ProSupport™ for IT; 4 year and 5 year service and support options[13]		

1. Offering may vary by region. Some items may be available post-RTS. For complete details, refer to the Technical Guidebook published on dell.com.
2. System Memory and Graphics: Significant system memory may be used to support graphics, depending on system memory size and other factors.
3. 4GB or Greater System Memory Capability: A 64-bit operating system is required to support 4GB or more of system memory.
4. Hard Drive: GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and operating environment and will be less.
5. PSU: This form factor utilizes a more efficient Active Power Factor Correction (APFC) power supply. Dell recommends only Universal Power Supplies (UPS) based on Sine Wave output for APFC PSUs, not an approximation of a Sine Wave, Square Wave, or quasi-Square Wave (see UPS technical specifications). If you have questions, please contact the manufacturer to confirm the output type. Additionally, APFC not available in EMEA.
6. TPM is not available in all regions.
7. Computrace: Not a Dell offer. Certain conditions apply. For full details, see terms and conditions at www.lojackforlaptops.com.
8. Systems Management Options:
- Intel® Standard Manageability – Fully enabled at point of purchase, the Intel Standard Management option is a subset of the AMT features. ISM is not upgradeable to vPro technology post-purchase.
- No Out-of-Band Systems Management - This option entirely removes Intel out of band systems (OOB) management features. The system can still support in band management. OOB management support through AMT cannot be upgraded post-purchase.
9. Dell adopts the BFR/CFR/PVC-free definition as set forth in the "iNEMI Position Statement on the Definition of 'Low-Halogen' Electronics (BFR/CFR/PVC-Free). Some exceptions may apply in external peripherals and power cords."
10. Please refer to www.epeat.net for specific country registration rating and participation
11. Limited Hardware Warranty: For copy of Ltd Hardware Warranty, write Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682 or see www.dell.com/warranty.
12. Next Business Day Onsite Service after Remote Diagnosis: Remote Diagnosis is determination by online/phone technician of cause of issue; may involve customer access to inside of system and multiple or extended sessions. If issue is covered by Limited Hardware Warranty (www.dell.com/warranty) and not resolved remotely, technician and/or part will be dispatched, usually within 1 business day following completion of Remote Diagnosis. Availability varies. Other conditions apply.
13. Dell Services: Availability and terms of Dell Services vary by region. For more information, visit www.dell.com/servicedescriptions.

dbx ZonePRO™ 1260





OVERVIEW:

The ZonePRO 1260 offers fixed I/O, pre-configured architecture, configurable insert processing and optional duplication of audio channels to another ZonePRO device via a link bus.

The 1260 features a total of 12 inputs and six outputs. Inputs include two balanced mic/line switchable terminal block inputs, eight mono-summed pairs of unbalanced RCA inputs and one S/PDIF input for up to two digital channels. Hardware-controlled microphone gain allows adjustment of microphone gain per channel.

The 1260 device has a pre-configured architecture with input processing, a central matrix and output processing. Two input insert positions and one output insert position allow channel-specific insert processing to be configured. AutoWarmth®, a psychoacoustic function that maintains full frequency bandwidth even when the signal level has dropped, is permanently available on each output zone.

A link bus allows duplication of the first six audio channels to another ZonePRO device in applications where additional output zones are required.

The front panel of the 1260 features comprehensive signal metering, an informative LCD display and user-specified front panel control.

Additional system control is offered in the form of optional Zone Controllers. This collection of hardware wall-controllers represents a series of simple, elegant user interfaces for functions such as volume, source and preset control.

All ZonePRO devices can be controlled by third party control systems via RS-232 or Ethernet as applicable (see table for further information).

ZonePRO Designer—the configuration, control and monitoring software for the ZonePRO family of devices—offers control of the ZonePRO 1260 via Ethernet or RS-232. The Configuration Wizard within ZonePRO Designer guides users through the step-by-step configuration process of the 1260.

KEY FEATURES:

- 12 Inputs / 6 Outputs
  - 2 Balanced Mic/Line Inputs
  - 8 Unbalanced, Mono-Summed RCA Input Pairs
  - S/PDIF Input
- Microphone Gain per Channel
- Pre-Configured Architecture
- Two Configurable Input Insert Positions
- One Configurable Output Insert Position
- AutoWarmth® per Output Zone
- Link Bus
- Comprehensive Signal Metering
- Front Panel LCD
- User-Specified Front Panel Control
- Optional ZC Controllers
- Ethernet Control
- Serial Control
- Third Party Control
- Wizard-Driven Configuration

DBX PROFESSIONAL | 8760 S. Sandy Parkway | Sandy, UT 84070 U.S.A | Ph. +1 - 801-566-8800 | Fax +1 - 801-566-7662

ZonePRO™ 1260

TECHNICAL SPECIFICATIONS:

Front Panel LED Indicators:	
Per Output:	6 Independent Six-Segment Lightpipe Output Meters that range from -30 to +20 dBu, Threshold Meters
Other:	LCD Display provides information about Source Selection, Page Steering, Zone Volume and Mute
Analog Inputs:	12 Total (2) Switchable Mic or Line, (8) Unbalanced, Mono-Summed RCA Input Pairs, (1) S/PDIF Input
Type:	Euroblock (Mic/Line), RCA (Source)
Impedance (Euroblock):	>50kΩ Balanced, >25kΩ Unbalanced, RF Filtered
Impedance (RCA):	>25kΩ Unbalanced, RF Filtered
Max. Input Line Level:	+20dBu Mic/Line, +12dBu RCA
CMRR:	>40dB, typically >55dB @ 1kHz
Mic Pre Gain:	30 to 60dB
Mic Input Noise (E.I.N.):	<-118dBu, 22Hz-22kHz, 150Ω Source Impedance
Mic Phantom Power:	+15VDC
Analog Outputs:	6 Total
Type:	Electronically Balanced, RF Filtered Euroblock
Impedance:	120Ω Balanced, 60Ω Unbalanced
Max. Output Level:	+20dBu
A/D Performance:	
Type:	dbx Type IV™ Conversion System
Dynamic Range Line:	>113dB A-weighted, >110dB unweighted
Type IV Dynamic Range:	>119dB A-weighted, 22kHz BW: >117dB, unweighted, 22kHz BW
Sample Rate:	48kHz
D/A Performance:	
Dynamic Range:	112dB A-weighted, 109dB unweighted, 22kHz BW
System Performance:	
Dynamic Range:	>110dB A-weighted, >107dB unweighted, 22kHz BW
THD+N:	0.003% typical at +4dBu, 1kHz, 0dB gain
Frequency Response:	20Hz – 20kHz, +/- 0.5dB
Interchannel Crosstalk:	>80dB typical
Crosstalk input to output:	>80dB
Propagation Delay:	0.6 msec
Operating voltage:	100-240 VAC, 50/60Hz
Power Requirements:	27 Watts
BTU Rating:	<92.13 BTU
Physical Dimensions:	
Weight:	6.8 lbs / 3.1 kg Shipping Weight 8.8 lbs / 4 kg
Dimensions (H(U) x W x D):	1.75" (1U) x 19" x 7.75" (45mm x 483mm x 197mm)
Safety Agency Certifications:	UL 60065, IEC 60065, E 60065, EN 55013

	Inputs	Outputs	Front Panel Control	Mic Preamps	S/PDIF	Ethernet	Mix Functionality	ANC*
1260m	12	6	✓	6	✓	✓	✓	✓
1260	12	6	✓	2	✓	✓	✓	
1261m	12	6		6	✓	✓	✓	✓
1261	12	6		2	✓	✓	✓	
640m	6	4	✓	4		✓	✓	✓
640	6	4	✓	2				
641m	6	4		4		✓	✓	✓
641	6	4		2				

*Ambient Noise Compensation

DBX PROFESSIONAL | 8760 S. Sandy Parkway | Sandy, UT 84070 U.S.A | - Ph. +1 801-566-8800 | Fax +1 - 801-566-7662

ZC - Series

DriveRack® and ZonePRO™ Series Wall-Mounted Zone Controllers

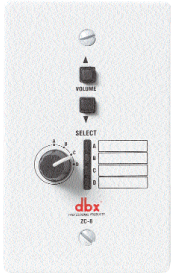
ZC-1

ZC-6

ZC-2

ZC-7

ZC-3



ZC-8

ZC-4

ZC-9

ZC-BOB

ZC-Fire

VISIONARY DESIGN

The Zone Controllers offer extended utility to the DriveRack®and ZonePRO families. The ten Zone Controllers use analog DC voltage to provide logic control ranging from zone source selection, volume and muting, to program or scene selection and fire safety muting. Wired with readily available and affordable CAT5 cable with universally accepted RJ-45 connectors at distances up to 1000 ft, the ZC Zone Controllers offer simple yet elegant solutions to the contractor.

REVOLUTIONARY ENGINEERING

The ZC-1 provides programmable remote volume control for the DriveRack 260, 220i and the ZonePRO products. The ZC-2 offers programmable volume and mute control for the DriveRack 220i, 260 and the ZonePRO products. The ZC-3 can function as a program selector for the DriveRack 260 and 220i; in addition it can be used for as a source selector, page steering control, or a scene selector for the ZonePRO products. The ZC-4 provides program change capability from contact closures for the DriveRack 220i and 260; it can also provide source selection, page steering, or scene selection for the ZonePro products. The ZC-6 is a programmable volume control for the ZonePRO products. The ZC-7 is a programmable push-to-talk page assignment controller for the ZonePRO devices. The ZC-8 provides both programmable source selection and volume control to the ZonePro products. The ZC-9 provides source selection for the ZonePRO 1260 and 1261. The ZC-BOB allows “home run” or parallel wiring to the DriveRack and ZonePro products. The ZC-FIRE is a dedicated fire safety interface for the ZonePRO products that allows selection of either system mute or scene selection upon being triggered by either a relay or control voltage from the fire safety system. For more information please visit www.driverack.com or www.dbxpro.com.

FEATURES

- ***Programmable Volume Control***
- ***Program or Scene Selection***
- ***Programmable Contact Closure Interface***
- ***Up to 1000 ft. on CAT 5 Cable***
- ***Programmable Push-To-Talk Paging***
- ***Programmable Source Selection***

8760 S. Sandy Pkwy.
Sandy, Utah 84070
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Fax (801) 568-7662
Int'l Fax (801) 568-7583
customer@dbxpro.com
http://www.dbxpro.com

A Harman International Company
18-0180-D 10/04

ZC-Series

DriveRack®and ZonePRO™ Series Wall-Mounted Zone Controllers

SPECIFICATIONS

Connections:
ZC-1, ZC-2, ZC-3, ZC6, ZC-7, ZC-8 and ZC-9
Connectors: (2) RJ-45
ZC-4 Connectors: (1) RJ-45, (1) 6-pin Phoenix
ZC-BOB Connectors: (7) RJ-45
ZC-FIRE: (2) RJ-45, (2) 2-pin Phoenix

Series Wiring:
Maximum Cable Length varies with number of Zone Controllers.
For Example, Three Zone Controllers: 600 ft.
Six Zone Controllers: 300 ft.

Parallel Wiring:
Using a ZC-BOB:
Up to Six Zone Controllers: 1000 ft.

Cable:
CAT5 or CAT5E with 28.6 Ohm/M (Ohm/1000 ft.) nominal DCR and rated VW-1 or higher.

Safety Agency Certifications:
UL 60065, IEC 60065, EN 55013, E60065

Architects' and Engineers' Specifications:

ZC-1
The remote device shall provide computer programmable rotary potentiometer volume control for the dbx DriveRack 260, 220i and ZonePro devices. The remote device shall have DIP switches allowing identification with connection to the processing device via CAT 5 cable on RJ-45 connectors. The device shall be a dbx ZC-1 remote controller.

ZC-2
The remote device shall provide computer programmable rotary potentiometer and push-button volume control and muting for the dbx DriveRack 260, 220i and ZonePro devices. The remote device shall have DIP switches allowing identification with connection to the processing device via CAT 5 cable on RJ-45 connectors. The device shall be a dbx ZC-2 remote controller.

ZC-3
The remote device shall provide programmable rotary switch program selection for the dbx DriveRack 220i and 260 devices. The remote device shall also provide rotary switch programmable source selection, page assignment, or scene selection for the dbx ZonePro devices. The remote device shall have DIP switches allowing identification with connection to the processing device via CAT 5 cable on RJ-45 connectors. The device shall be a dbx ZC-3 remote controller.

ZC-4
The remote device shall provide programmable program selection via contact closures for the dbx DriveRack 220i and 260 devices. The remote device shall also provide contact closure programmable source selection, page assignment, or scene selection for the dbx ZonePro devices. The remote device shall have DIP switches allowing identification with connection to the processing device via CAT 5 cable on RJ-45 connectors. The device shall be a dbx ZC-4 remote controller.

ZC-6
The remote device shall provide computer programmable push-button up/down volume control for the dbx ZonePro devices. The remote device shall have DIP switches allowing identification with connection to the processing device via CAT 5 cable on RJ-45 connectors. The device shall be a dbx ZC-6 remote controller.

ZC-7
The remote device shall provide programmable push-to-talk page assignment for the dbx ZonePro devices. The remote device shall have DIP switches allowing identification with connection to the processing device via CAT 5 cable on RJ-45 connectors. The device shall be a dbx ZC-7 remote controller.

ZC-8
The remote device shall provide both programmable push-button up/down volume control, and programmable rotary switch source selection for the dbx ZonePro devices. The remote device shall have DIP switches allowing identification with connection to the processing device via CAT 5 cable on RJ-45 connectors. The device shall be a dbx ZC-8 remote controller.

ZC-9
The remote device shall provide programmable source selection for the ZonePro 1260 and 1261 devices. The remote shall have DIP switches allowing identification with connection to the processing device via CAT 5 cable on RJ-45 connectors. The device shall be a dbx ZC-9 remote controller.

ZC-BOB
The remote device shall provide up to 6 RJ-45 input jacks for "Home Run" or parallel wiring configurations of the dbx ZC wall panel controllers, and one output RJ-45 jack for connection to the dbx DriveRack or ZonePro device. The device shall be a dbx ZC-BOB remote controller.

ZC-FIRE
The remote device shall provide either output muting or programmable scene selection for the dbx ZonePro devices. Connection to the fire safety system shall be either through a relay or directly to the control voltage output. The remote device shall have DIP switches allowing identification with connection to the processing device via CAT 5 cable on RJ-45 connectors. The device shall be a dbx ZC-FIRE remote controller.

dbx engineers are constantly working to improve the quality of our products.
Specifications are, therefore subject to change without notice.

FOR MORE INFORMATION CONTACT:
dbx Professional Products
8760 S. Sandy Pkwy.
Sandy, Utah 84070
Phone (801) 568-7660
Fax (801) 568-7662
customer@dbxpro.com
http://www.dbxpro.com

dbx® PROFESSIONAL PRODUCTS

The Professional's Choice In Signal Processing™

A Harman International Company

PERFORMANCE SERIES WIRELESS SPECIFICATIONS

	R41	R61
Frequency Range	522 MHz – 554 MHz / 554 MHz - 586 MHz	522 MHz – 586 MHz
Bandwidth	32 MHz	64 MHz
Compatible Systems	16 Compatible system operation	20 Compatible system operation
Switchable Frequencies	106 Preset frequencies	207 Preset frequencies
Manual Mode	n/a	2560 Frequencies (spaced 25 kHz apart)
Frequency Response	45 Hz – 18 kHz	45 Hz – 18 kHz
Compander System	2:1	2:1
Pilot Tone	32 kHz	32 kHz
Receiving System	Single tuner, diversity	Single tuner, true diversity
Signal-to-Noise Ratio	105 dB at 30 kHz deviation (A-weighted)	112 dB at 30 kHz deviation (A-weighted)
Total Harmonic Distortion	≤.7% (33 kHz deviation at 1 kHz)	≤.4% (33 kHz deviation at 1 kHz)
Sensitivity	5 dBµV (S/N 60 dB at 25 kHz deviation, A-weighted)	5 dBµV (S/N 60 dB at 25 kHz deviation, A-weighted)
Audio Output (AF=0)	Balanced: -12 dBv @ 25 kHz deviation, 600 ohm load 1/4": -18 dBv @ 25 kHz deviation, 10 kohm load	Balanced: -12 dBv @ 25 kHz deviation, 600 ohm load 1/4": -18 dBv @ 25 kHz deviation, 10 kohm load
Output Connectors	1/4", XLR	1/4", XLR
Audio Level Adjust	Balanced: -12 to +9 dBu Line: -24 to +4 dBu (adjustable in 3 dB-steps)	Balanced: -12 to +9 dBu Line: -24 to +4 dBu (adjustable in 6 dB-steps)
Range	300', (91 M)	450', (137 M)
Power Supply	100 - 240V / 50 - 60 Hz, 12V DC, 1A	100 - 240V / 50 - 60 Hz, 12V DC, 1A
Dimensions	205 mm (W) x 206 mm (D) x 44 mm (H) 406 mm (W) x 209 mm (D) x 44 mm (H) (R42)	205 mm (W) x 206 mm (D) x 44 mm (H) 406 mm (W) x 209 mm (D) x 44 mm (H) (R62)
Net Weight	1.92 lbs. / 870 g 4.4 lbs. / 2.0 kg (R42)	2.43 lbs. / 1.1 kg 4.65 lbs. / 2.12 kg (R62)

	H60	B60
RF Power Output	10 mW, 40 mW	10 mW, 40 mW
Frequency Bandwidth	64 MHz	64 MHz
Gain Controls	0 dB, -6 dB, -12 dB	0 db, -6 dB, -12 dB
Input Connector	n/a	3 pin mini-XLR
Batteries Included	2 AA 1.5 V	2 AA 1.5 V
Current Consumption	110 mA typical	110 mA typical
Battery Life	14 hours	14 hours
Input Impedance	n/a	Mic: 10 kohm, Line: 1 Mohm
Max Sound Pressure Level	>140 dB (depending on capsule)	128 dB to140 dB (depending on mic)
Dimensions	2.1" diameter body, 10.43" (L), 53 mm diameter body, 265 mm (L)	67 mm (W) x 90 mm (L) x 17 mm (D) 2.6" (W) x 3.5" (L) x .67" (D)
Net Weight	11.0 oz / 312 g (without battery)	3.0 oz / 85 g (without battery)

Specifications subject to change without notice.

AUDIX

ADS48 UHF Antenna Distribution System

OVERVIEW

The Audix ADS48 is a wide range UHF antenna distribution system that combines up to four wireless systems to be able to run off a single pair of antennas and power supply. The ADS48 has an internal switching power supply which eliminates the need for the individual DC power supplies normally needed for each receiver. RF signals are internally amplified in order to compensate for any loss that may result from splitting the signal.

SUPPLIED ACCESSORIES

1 x ADS48 Antenna Distribution Unit with rack mount
2 x Antennas - (see photo A below)
1 x IEC power cable
4 x Power Jumper Cables to provide power to individual receivers - (see photo B below)
8 x BNC-to-BNC Coaxial Cables for pass through connection for up to
4 additional receivers (single or dual) - (see photo C below)
2 x Coaxial cables for front mounting antennas - (see photo D below)

A

B

C

D

SPECIFICATIONS

Frequency Range	470 - 900 MHz
RF Output Level (Gain)	0 dB d + or – 3 dB
Input Impedance	50 Ohm
Output Impedance	50 Ohm
Power Voltage	100 – 240 V AC 50 / 60 Hz
Output DC Voltage	+12 V DC, 800 mA maximum
Antenna Input DC Voltage	8 V, 150 mA maximum
Dimensions	19" (W) x 2" (H) x 10" (D) 480 mm (W) x 45 mm (H) x 250 mm (D)
Net Weight	16 oz / 2.15 kg

SETTING UP THE DISTRIBUTION SYSTEM

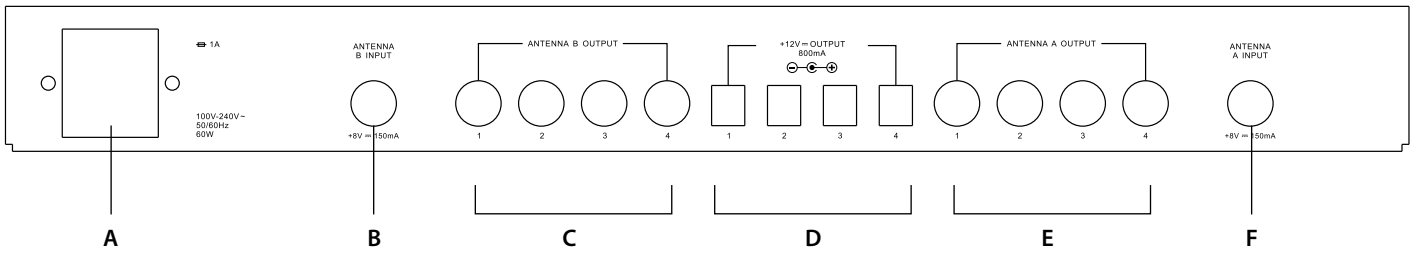
FRONT MOUNTING ANTENNAS (Do this step before installing in rack)

A. Remove the hex nut from the threaded end of the front mount antenna cable.

B. Insert the end of the front mounting cable through the back side of the rack hole. Note that the hole is slotted on one side – it can only go in one way. Screw on the hex nut to secure.

C. Attach the antenna cable on the left side to antenna A INPUT and the cable on the right side of the unit to antenna B INPUT. Install the ADS48 into the rack. (See B and F below)

BACK OF ADS48



CABLE INSTRUCTION FOR ANTENNA DISTRIBUTION FOR ADDITIONAL RECEIVERS: All cables are connected from the back side of the ADS48 to the back side of the additional receiver(s).

Using the BNC antenna coax cable, connect output Antenna A #1 from the ADS48 (see E above) to Antenna A on the Performance Series receiver and Antenna B #1 from the ADS48 (see C above) to Antenna B on the Performance Series receiver. Additional receivers are done in exactly the same way.

IMPORTANT: Antennas must be hooked up correctly A to A and B to B to work properly.

CABLE INSTRUCTION FOR POWER DISTRIBUTION: All cables are connected from the back side of the ADS48 to the back side of the additional receiver(s).

Using the power jumper cables plug one side of the cable into DC Output #1 on the ADS48 (see D above) and the other end to the DCV Input on the Performance Series receiver. Additional receivers will be done in the same sequence.

Power Cable: Plug the provided IEC power cable into the back of the ADS48 and then plug into electrical outlet. (see A above)

Power up the ADS48 via the power switch on the front. The light will indicate that the unit is powered up. The ADS48 acts as the master power unit for all receivers in the chain. Receivers will not power up without the master power switch being on.

PRODUCT REGISTRATION: Please register your product online at www.audixusa.com/docs_12/about/product_registration.shtml.

SERVICE AND WARRANTY: This microphone is under warranty for a period of 1 year to be free of defects in material and workmanship. In the event of a product failure due to materials or workmanship, Audix will repair or replace said product at no charge with proof of purchase. Audix does not pay or reimburse shipping costs for warranty repairs or returns. The warranty excludes any causes other than manufacturing defects, such as normal wear, abuse, environmental damage, shipping damage or failure to use or maintain the product per the supplied instructions. No Implied Warranties: All implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose are hereby excluded. The liability of Audix, if any, for damages relating to allegedly defective products shall be limited to the actual price paid by Dealer for such products and shall in no event include incidental or consequential damages of any kind. Should your microphone fail in any way, please contact the Audix Service department at 503.682.6933. A Return Authorization is required before returning any product. OTHER THAN THIS WARRANTY, AUDIX MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCTS, THE USE OF THE PRODUCTS, THE PERFORMANCE OF THE PRODUCTS. AUDIX SHALL NOT BE LIABLE FOR SPECIAL INCIDENTAL, CONSEQUENTIAL, INDIRECT OR SIMILAR DAMAGES ARISING FROM OR BASED ON THE SALE, USE, STORAGE OR DISPOSAL OF THE PRODUCTS, AUDIX'S SERVICE WORK, BREACH OF WARRANTY, BREACH OF CONTRACT. NEGLIGENCE, OR ANY OTHER THEORY OF LIABILITY, EVEN IF AUDIX HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

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503.682.6933 Fax: 503.682.7114
Audix Corporation 9400 SW Barber St. Wilsonville, OR 97070

AUDIX®

ver 1.1 07-19

RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

maxTX™ SERIES TWISTED PAIR
Model TX-TPR3A
Format-A Three-Pair Receiver

- Three -10 dBV Unbalanced or +4 dBu Balanced Outputs
- Phono Jack and Detachable Terminal Block Outputs
- Audio Outputs for All Three Pairs (A, B and C)
- Utilizes All Three Format-A Pairs
- Powered Locally or Remotely through RJ45 Jack
- Local Power Feeds all Modules Connected to INPUT
- Wiring Fault Protection by Automatic Resetting Fuse
- Local Power Input on Terminal Block or dc Power Jack
- Blue LED Indicates Module is Powered
- Studio-Quality Precision Active Balanced Circuitry

The TX-TPR3A is a three-pair audio receiving module compatible with RDL Format-A twisted pair products. It is built in the versatile Max-TX series enclosure. The durable adhesives provided with the TX-TPR3A permit permanent or removable mounting. The TX-TPR3A may be rack or surface mounted with optional TX™ series accessories.

APPLICATION: The TX-TPR3A is a three-pair audio receiving module compatible with RDL Format-A twisted pair products. Three outputs are provided corresponding to the three signal pairs A, B and C. The audio signal received on each pair of the RJ45 INPUT jack feeds the corresponding -10 dBV unbalanced RCA phono jack output and the +4 dBu balanced detachable terminal block output. A studio-quality buffer amplifier feeds the outputs at the correct operating level.

The TX-TPR3A features bridging inputs, allowing it to be connected to the LOOP OUT jack of other receivers. The bridging input circuits used in all FORMAT-A twisted pair receivers allow connection of up to 10 receiver outputs for each cable pair. The possibility of multiple receiver locations adds enormous flexibility in the design of audio routing systems using RDL FORMAT-A products. The TX-TPR3A may be powered directly from a 24 Vdc power supply using either the power jack or the detachable terminal block. Local power connected to the module is also fed to all modules connected to the INPUT RJ45 jack.

The TX-TPR3A may be remotely powered through the twisted pair cable from any other module, signal distributor or RDL power inserter connected to the same twisted pair cable. Module power is indicated by a front-panel LED.

RDL FORMAT-A features superior audio performance that rivals or exceeds shielded wiring. Design simplicity, ease of installation, unsurpassed flexibility, automatic fused power, exceptional hum rejection, low noise, and low distortion provide designers and installers the optimum choice in economical twisted pair products.

RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

FORMAT-A™

maxTX™ SERIES TWISTED PAIR
Model TX-TPR3A
Format-A Three-Pair Receiver

Installation/Operation

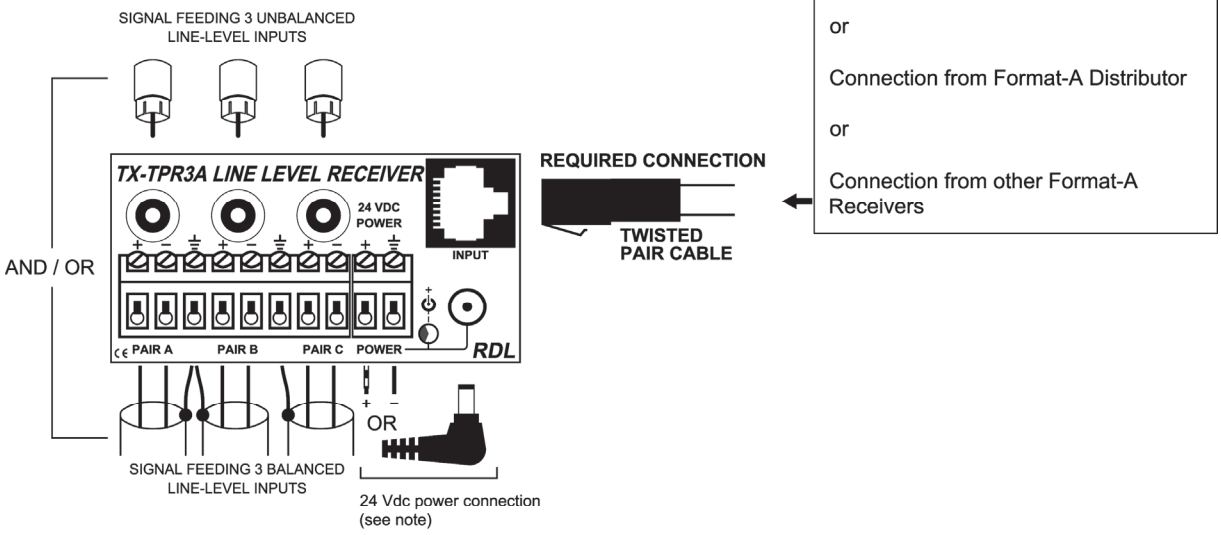
CE **EN55103-1 E1-E5; EN55103-2 E1-E4**
Typical Performance reflects product at publication time exclusive of EMC data, if any, supplied with product. Specifications are subject to change without notice.

STEP 1: Connect 24 Vdc to the **POWER** input (terminals or jack) if this module is not being powered through the twisted pair cable from another module, or if this module is located an excessive distance from the next powered module on the cable. Note: The front-panel power LED will be illuminated if this module is powered. If this module is powering other modules through the cable and if there is a wiring short, the short must be cleared then power must be turned off to this module for 10 seconds to reset the internal protection circuit.

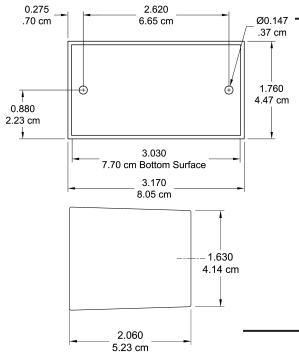
STEP 2: Connect the **UNBAL OUT** jacks to -10 dBV equipment inputs, and/or connect the **BAL OUT** terminals to +4 dBu equipment inputs.

STEP 3: Connect the **INPUT** twisted pair cable coming from Format-A senders or distributors and mount the module.

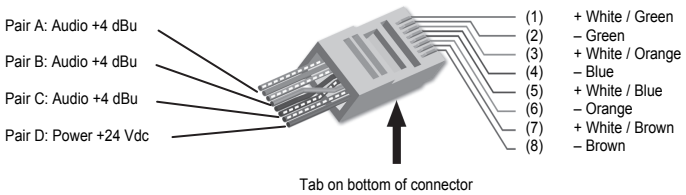
NOTE: All six audio outputs may be used simultaneously. Each Format-A pair A, B and C provides two associated outputs: one balanced, one unbalanced.



NOTE: Connect a 24 Vdc power supply to the module if power is not being supplied through a twisted pair cable from a connected module.



RJ45 Standard wiring



Tab on bottom of connector

RJ45 conductor colors shown are for 568A standard. The 568B standard may be used if the connectors at both ends of the cable are wired identically.

Safety Instructions/Consignes de sécurité/ Instrucciones de seguridad/Sicherheitshinweise:

EU Importer:
Importateur de l'UE:
Importador de la UE:
EU-Importeur:

RDL Europe B.V.
Joan Muyskenweg 124
1114 AN Amsterdam

TYPICAL PERFORMANCE

Input:	RDL TP Format-A
Input Connection:	RJ45
Format-A Signal Pairs Used (3):	A, B, C
Outputs (6):	150 Ω Balanced (3); 1 kΩ Unbalanced (3)
Output Connection:	Detachable Terminal Block (Bal); RCA (Unbal)
Output Level:	+4 dBu Bal., +22 dBu Max; -10 dBV Unbal.
Frequency Response:	10 Hz to 50 kHz (+/- 0.1 dB)
THD+N:	< 0.005%
Noise below +4 dBu:	< 90 dB
Crosstalk:	< 90 dB (1 kHz); < 75 dB (20 Hz to 20 kHz)
Headroom above +4 dBu:	> 18 dB
CMRR:	> 80 dB (50 Hz to 150 Hz)
Indicator:	Power In
Power Connections (3):	Power Jack; Detachable Terminal Block; RJ45
Power Requirement:	24 Vdc @ 65 mA plus connected loads
Maximum Load Current:	135 mA
Dimensions:	3.17" (8.05 cm) W; 1.76" (4.47 cm) H; 2.06" (5.23 cm) D

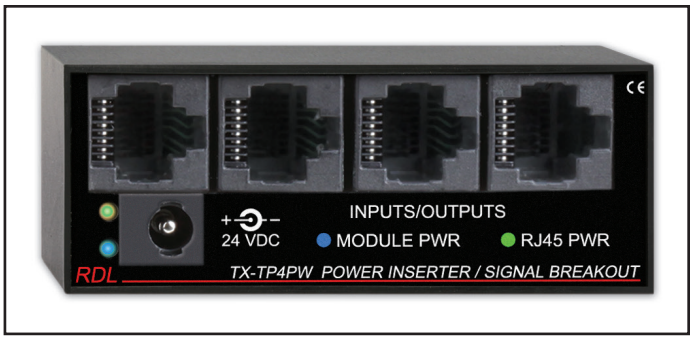
Radio Design Labs Technical Support Centers
U.S.A. (800) 933-1780, (928) 778-3554; Fax: (928) 778-3506
Europe [NH Amsterdam] (++31) 20-6238 983; Fax: (++31) 20-6225-287

RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

TX™ SERIES
Model TX-TP4PW
Power Inserter / Signal Breakout

- Power Remote Senders and Receivers from Convenient Location
- 24 Vdc Power Input on dc Power Jack
- Blue Power LED Shows Module is Receiving Power
- Green LED Indicates Correct dc Output Voltage on RJ45s
- Four Associated RJ45 Jacks Provide Power Output
- Pairs A, B and C are Connected Between all Four RJ45 Connectors
- Power up to Three High-Current Format-A Receivers



The TX-TP4PW is part of the group of versatile TX series products from Radio Design Labs. TX modules feature the superior engineering and components common to RDL products. The durable adhesives provided with the TX-TP4PW permit permanent or removable mounting. The TX-TP4PW may be rack or surface mounted with optional TX series accessories.

APPLICATION: The TX-TP4PW is a power inserter compatible with RDL twisted pair products. The TX-TP4PW is powered from a 24 Vdc power supply using a dc power jack. Four RJ45 jacks are provided to connect remote twisted pair senders and receivers. The audio signals on pairs A, B and C are connected between all four RJ45 connectors.

When one RJ45 receives signals from twisted pair senders, the remaining three RJ45 jacks can each connect to a separate twisted pair receiver. Three jacks are provided so that three home runs to twisted pair receivers are possible. This is particularly useful for powering three high current receivers that cannot be daisy chained, such as D-PSP1A Powered Speakers.

The TX-TP4PW may also connect to three home runs from separate Format-A senders. A sender set to feed Pair A connects to one RJ45 on the TX-TP4PW. Senders feeding pairs B and C connect to two other RJ45s. The fourth RJ45 becomes an output with signals on all pairs A, B and C. This is useful in installations where daisy chaining senders is not practical.

Power is provided to all modules connected to the RJ45 jacks. Signal pairs feed through the associated RJ45s. Output voltage is protected by an automatically resetting fuse. The output power LED facilitates identification of wiring faults. Module power is indicated by a front-panel LED.

RDL®
Radio Design Labs

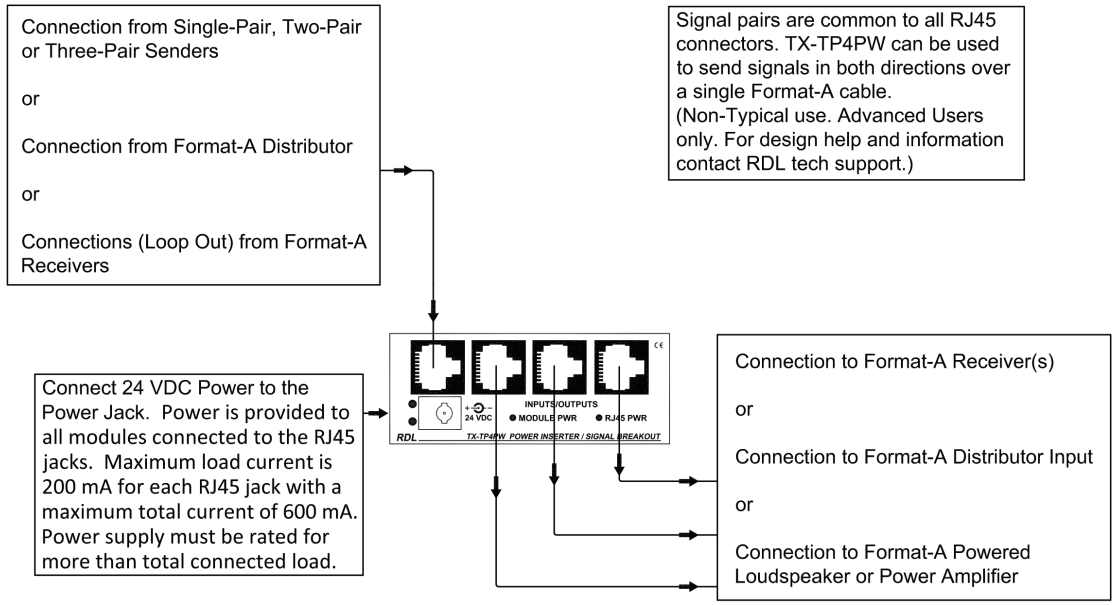
SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

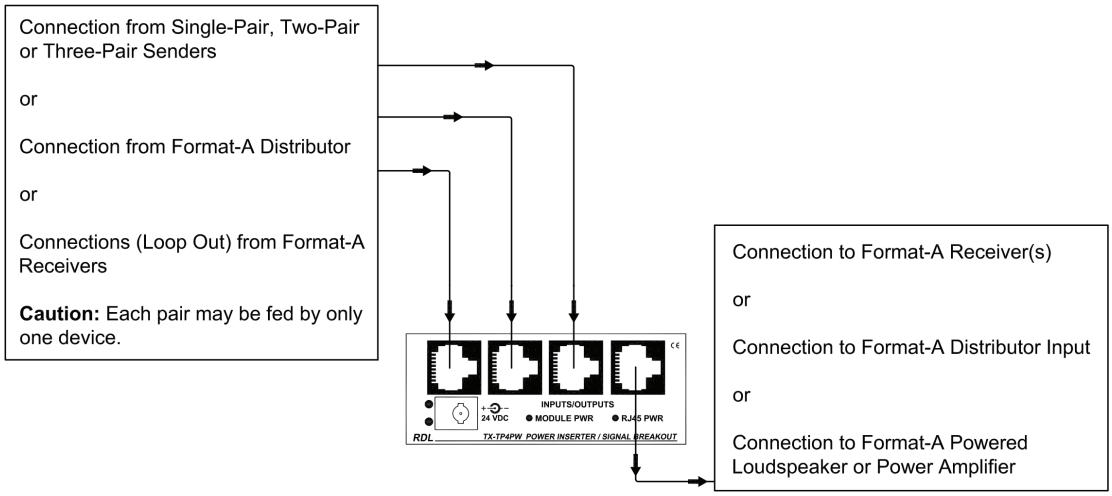
FORMAT-A™

Installation/Operation

EN55103-1 E1-E5; EN55103-2 E1-E4
Typical Performance reflects product at publication time exclusive of EMC data, if any, supplied with product. Specifications are subject to change without notice.

TX™ SERIES
Model TX-TP4PW
Power Inserter / Signal Breakout





TYPICAL PERFORMANCE

Outputs (4):	RJ45
Indicators (2):	Power In; Power Out
Power Connection:	Power Jack
Ambient Operating Environment:	0° C to 55° C
Maximum Load Current:	200 mA (each RJ45 output)
Power Requirement:	24 Vdc @ 15 mA plus connected loads
Dimensions:	3.0” (7.6 cm) W; 1.2” (3.0 cm) H; 1.4” (3.6 cm) D

Radio Design Labs Technical Support Centers
U.S.A. (800) 933-1780, (928) 778-3554; Fax: (928) 778-3506
Europe [NH Amsterdam] (++31) 20-6238 983; Fax: (++31) 20-6225-287

RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

TWISTED PAIR FORMAT-A
Models D SERIES-BT1A
Wall-Mounted Bluetooth® Audio Format-A Interface

- Bluetooth Audio Input for Installed Sound System
- Intuitive Single Button Pairing with LED Status Indication
- Special Software Not Required for Module Setup
- Customize the Module ID Name and Programming Password through the Bluetooth Connection
- Sends Received Bluetooth Audio to RDL Format-A Receivers
- Mono Summed or Stereo Audio Input Mode is Switch-Selectable on Rear Panel
- Rear-Panel Switch Selects which RJ45 Pair (A, B or C) is Fed in Mono Summed Mode
- Daisy-Chain up to Three D SERIES-BT1A modules to One Format-A Receiver in Mono Mode
- Remotely Powered through Twisted Pair Cable
- Signal and Power Pair Pass-Through on RJ45 Jacks

The D SERIES-BT1A is part of the group of versatile wall-mounted products from Radio Design Labs. The standard mounting case can be directly fastened in North American electrical boxes or in RDL International wall boxes.

APPLICATION: The D SERIES-BT1A modules are Bluetooth audio receiving modules compatible with RDL® Format-A twisted pair receivers. When paired with a compatible Bluetooth enabled device, the module receives stereo audio from the Bluetooth source. The stereo signal is sent through two Format-A pairs to any RDL Format-A receiver. A stereo/mono switch set by the installer permits summed mono audio to be sent over one switch-selected pair to the Format-A receiver.

If set for stereo operation, an additional Format-A source (set to Pair A) may be daisy chained with the D SERIES-BT1A to a three-pair Format-A receiver. If set for mono operation, up to three D SERIES-BT1A modules may be daisy chained to a single three-pair Format-A receiver. Connections between Format-A modules and Format-A receivers use standard CATx cable with RJ45 connectors.

The D SERIES-BT1A modules are powered from the Format-A receiver. The installer can customize the module name and programming password through the Bluetooth connection using a smartphone, computer or tablet terminal program. These modules feature studio-quality circuits and analog filters to provide audio performance exceeding expectations from consumer interface technologies. High performance, simplicity of operation and efficiency of installation make RDL the best value in professional Bluetooth interfaces.

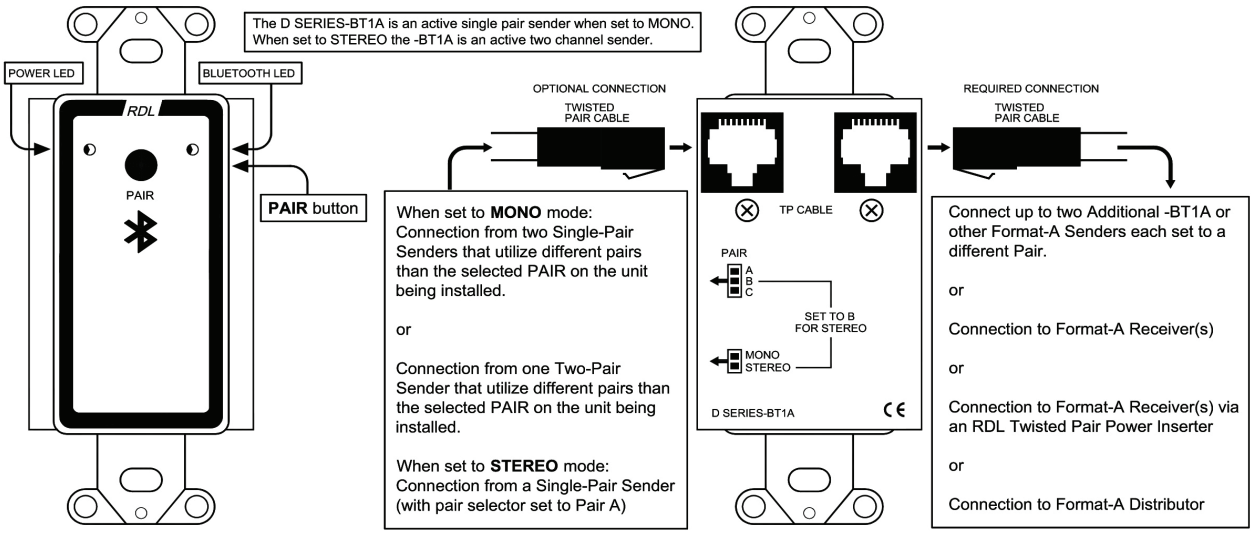
RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

TWISTED PAIR FORMAT-A
Models D SERIES-BT1A
Wall-Mounted Bluetooth® Audio Format-A Interface

Installation/Operation

Declaration of Conformity available from rdlnet.com.
Sole EMC specifications provided on product package.
Specifications are subject to change without notice.



Instructions for Bluetooth pairing

These instructions are based on the default RDL unit identification as RDL_BT_FA. If the RDL unit has been renamed by the installer, substitute the new name for RDL_BT_FA in the following steps.

PAIRING

1] Press and hold the PAIR button until the blue LED on the RDL unit illuminates, then release.

Note: The blue LED flashes as long as the unit is available for pairing. If the blue LED stops flashing before the pairing process is completed, restart these steps.

2] While the blue LED is flashing, locate RDL_BT_FA on your device's Bluetooth settings and click PAIR DEVICE, following screen prompts to complete the pairing process.

Note: The blue LED glows steady while the RDL unit is paired.

UN-PAIRING

The RDL unit will unpair automatically 30 seconds after the user device leaves the area. The user device may be manually disconnected by pressing and holding the PAIR button on the RDL unit.

RE-PAIRING

1] Press and hold the PAIR button until the blue LED on the RDL unit illuminates, then release.

2] While the blue LED is flashing, locate RDL_BT_FA under Previously Connected Devices on your device's Bluetooth settings and click RDL_BT_FA, following screen prompts to complete the re-pairing process.

Note: If the re-pairing fails, click Forget Device on the user device and pair the RDL unit as a new device.

Upon successful pairing, the user device applications for audio playback through a Bluetooth interface may be used.

TYPICAL PERFORMANCE

Output:	RDL Format-A (RJ45)
Format-A Input:	RJ45 LOOP IN
Format-A Signal Pair Used:	A, B, or C (summed mono mode, rear-panel switch-selectable); B and C (stereo mode, pair A pass through)
Frequency Response:	20 Hz to 20 kHz (± 0.5 dB)
THD+N:	< 0.1%
Noise below -20 dBFS:	< -70 dB
Crosstalk (channel to channel):	< 70 dB
Audio Operating Levels:	-20 dBFS = +4 dBu (balanced), nominal
Ambient Operating Environment:	0° C to 40° C
Power Requirement:	24 Vdc @ 100 mA (through RJ45)
Dimensions:	1.73" (4.39 cm) W; 4.11" (10.44 cm) H; 1.62" (4.11 cm) D
Package Type:	Cardboard Box
Package Dimensions:	3.625 x 4.625 x 2.125 in.
Shipping Weight:	0.45 lb.
WEEE weight:	0.29 lbs.
Tariff code:	8518.50.0000

Scan the QR code above or see the DD SERIES-BTN44 page at rdlnet.com for programming information.

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AVARRO™

CONFIGURED FLOOR LOADED ENCLOSED RACK SERIES

18U-27U-42U

FULLY ASSEMBLED RACK SYSTEMS FOR AUDIO, VISUAL OR NETWORKING EQUIPMENT. DESIGNED WITH HEAVY-GAUGE STEEL AND MULTIPLE FEATURES SUCH AS PRE-INSTALLED COOLING FANS, CASTERS, ADJUSTABLE FEET AND REMOVABLE SIDE PANELS.

SPECIFICATIONS:

- Fully welded steel construction
- Weight capacity up to a 1,322 lb., depending on model
- Includes removable locking side panels
- 2 top-mounted DC UL Listed fans
- Includes locking, reversible and tinted glass door and locking rear access panel
- 4 pre-installed swivel casters (front casters lock) and leveling feet
- Each rack includes pre-installed shelves and blank panels

For more information please call 1-833-574-9124
or email AVARRO@adiglobal.com

To learn more about AVARRO products visit
avarro.adiglobaldistribution.us

RoHS COMPLIANT

TECHNICAL DATA

18U-27U-42U

RK-ER42U

RK-ER42U (42 Unit Space)

- Max Weight Capacity: 1,322lbs
- Dimensions of rack: 23.63" x 23.63" x 77.51"
- Box Dimensions: 25.5" x 25.75" x 86.89"
- Includes 7-2U vented shelves
- 9-2U blanks
- 2-5U vented shelves
- UPC: 840049305700

RK-ER27U

RK-ER27U (27 Unit Space)

- Max Weight Capacity: 900lbs
- Dimensions of rack: 23.63" x 23.63" x 51.26"
- Box Dimensions: 25.5" x 25.75" x 61"
- Includes 5-2U vented shelves and blanks
- UPC: 840049305694

RK-ER18U

RK-ER18U (18 Unit Space)

- Max Weight Capacity: 600lbs
- Dimensions of rack: 23.63" x 23.63" x 35.51"
- Box Dimensions: 25.5" x 25.75" x 45"
- Includes 3-2U vented shelves and blanks
- UPC: 840049305687

For more information please call 1-833-574-9124
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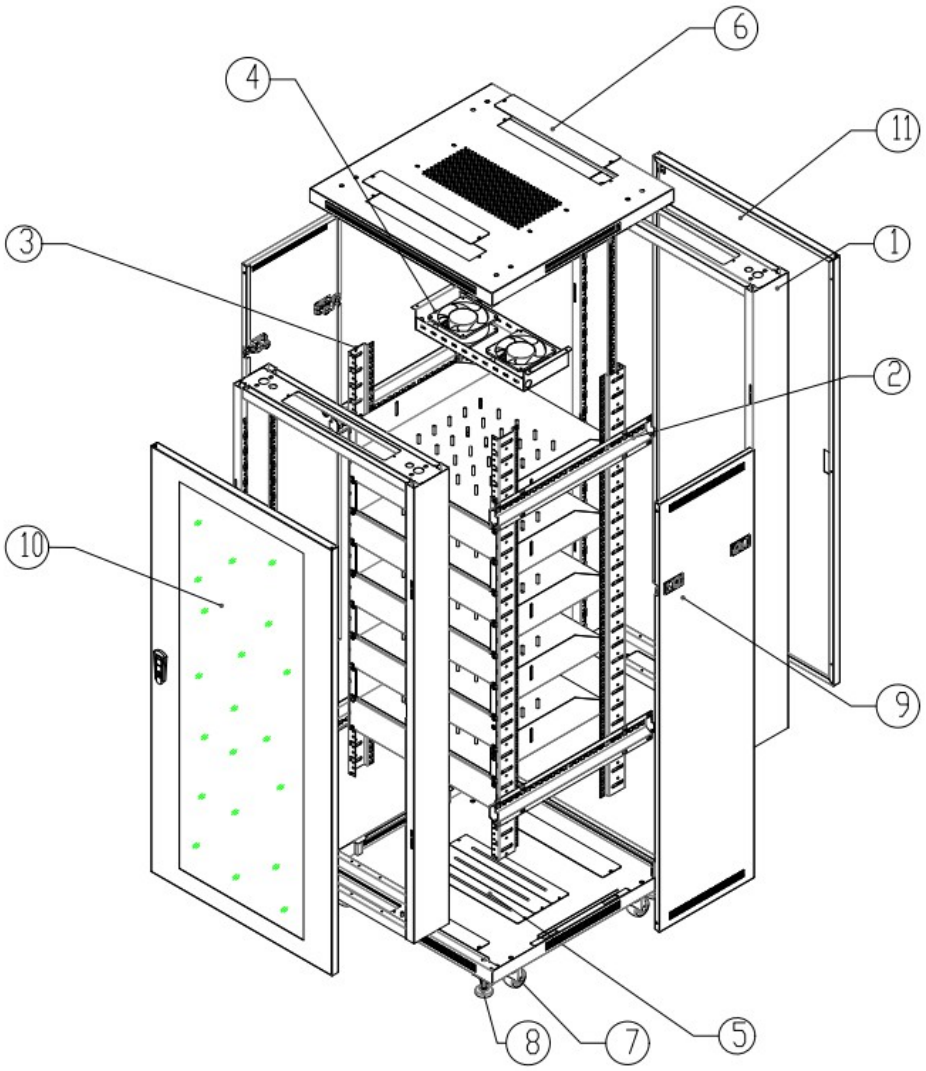
TECHNICAL DRAWING

18U-27U-42U

Expanded View and Parts



1 Frame
2 Mounting Bracket
3 Mounting Rail
4 UL Listed 2-Fan Tray
5 & 6 Cable Management Covers
7 Heavy Duty Casters (front casters lock)
8 Adjustable Feet
9 Removable Side Panels
10 Front, Tinted Glass Door
(Option to reverse door)
11 Back Door (Option to reverse door)

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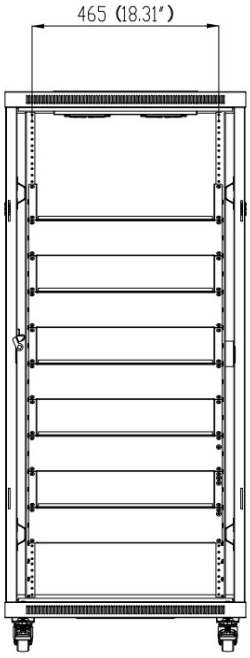
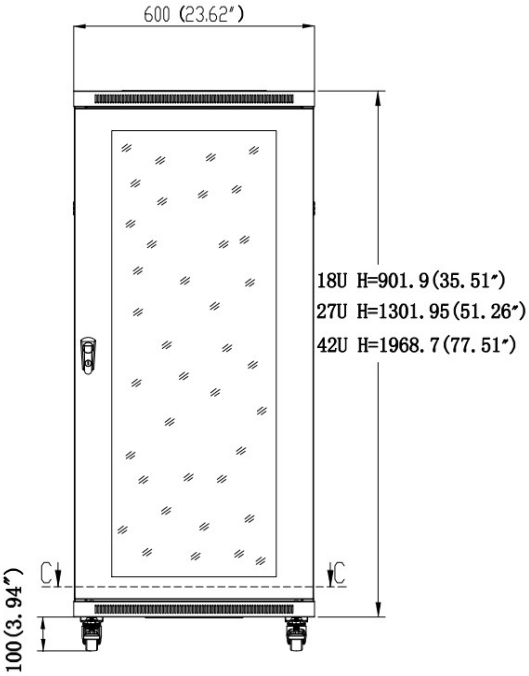
TECHNICAL DRAWING

18U-27U-42U

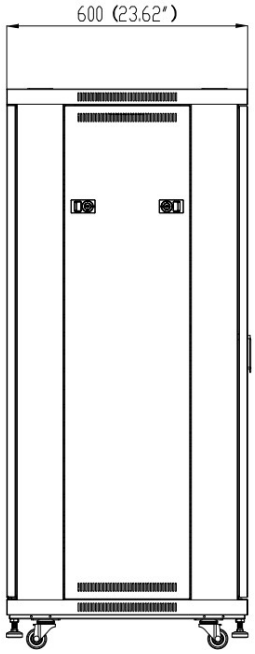
Dimensions



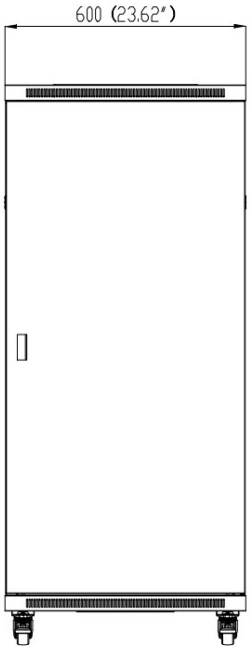
Front View,No Glass Door



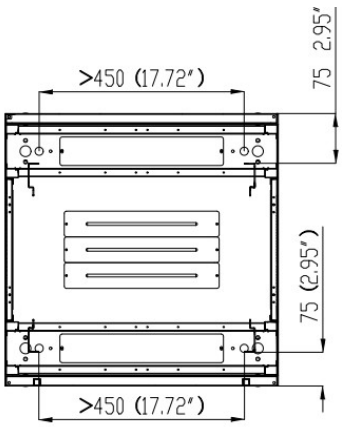
Front View



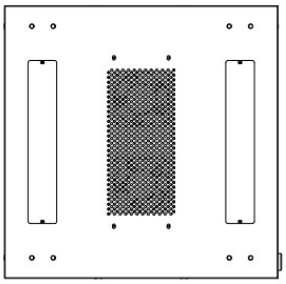
Left Side View



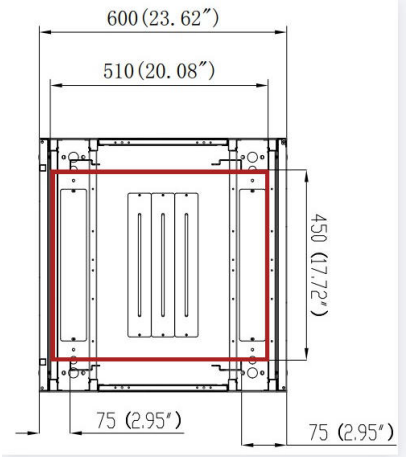
Back View



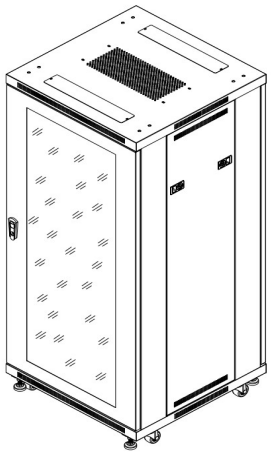
Bottom View



Top View



Usable Space Inside Rack in Red
dims of the usable space:450(17.72")width
510(20.08")depth



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TECHNICAL DATA

Bose Videobar VB1

all-in-one USB conferencing device

Product Overview

The Bose Videobar VB1 is an all-in-one USB conferencing device that brings premium audio and video to small meeting areas — from huddle spaces to medium-sized rooms. Be seen clearly. Be heard and understood fully. Six beam-steering microphones automatically focus on voices in the room and reject noise. A 4K ultra-HD camera with autoframing delivers crystal-clear video, helping remote participants feel like they're in the room. Proprietary Bose sound supports multimedia presentations, plays *Bluetooth*® audio, and ensures voices on the call sound natural. Single-cable connectivity means there's no need for separate audio and video cables at the table, reducing clutter. Whether it's a quick morning check-in or a full-afternoon workshop, the Bose Videobar VB1 helps you huddle up, see more, hear more, and work better.

Key Features

Bring the Bose experience to huddle spaces and medium-sized conference rooms with an all-in-one solution that requires minimal setup and delivers premium audio and video performance

Make conversation more natural with six beam-steering microphones that actively focus on voices and reject noise; and auto EQ that delivers optimized audio to all participants

Communicate and be seen more clearly — a 4K ultra-HD camera with autoframing allows everyone to see and understand the presenter, whiteboard, flipchart, or other in-room objects — and feel more like they're together in the same room

Bring enhanced video and audio performance to popular Unified Communications platforms such as Microsoft Teams, Google Meet, Zoom, and more

Support multimedia presentations with premium audio with Bose-proprietary transducers that deliver room-filling sound from a USB-connected laptop or wireless *Bluetooth* device

Clean up the conferencing experience with single-cable connectivity that eliminates clutter and an elegant low-profile design that complements the room and improves aesthetics

Mount easily in multiple ways with included table stand and wall-mount kit or optional mud ring and display mounting kit

Connect to existing network infrastructure, making installation and troubleshooting faster and allowing for remote updates, management, and monitoring

Configure easily with Bose Work Configuration software, available as an app or via web browser; and manage remotely with the Bose Work Management software which displays real-time status and allows for easy single-unit or system-wide changes

Control settings in real time from a smartphone using the Bose Work mobile app to easily adjust volume, mute, pan, tilt, zoom, zoom presets, and *Bluetooth* pairing

Easily connect a smartphone via *Bluetooth* connectivity to use as a standalone speakerphone or stream music

For additional specifications and application information, please visit PRO.BOSE.COM.
Specifications subject to change without notice. 1/2021

Bose Videobar VB1

all-in-one USB conferencing device

Technical Specifications

LOUDSPEAKER ARRAY	
Configuration	Stereo loudspeakers, ported enclosure
Amplifier Power	20 W per channel, < 0.3% distortion over frequency range
Frequency Response (–10 dB)	85 – 20,000 Hz
Maximum SPL @ 1 m	89 dB (IEC 60268-5, mono input, wall-mounted)
MICROPHONE ARRAY	
Configuration	6 microphones
Frequency Response (±3 dB)	20 – 15,000 Hz
Pickup Range	6.0 m (19.7 ft)
Technology	Static and adaptive dynamic beam-forming, 3 exclusion zones, stereo acoustic echo cancellation (AEC), digital noise suppression
CAMERA AND VIDEO	
Field of View (FOV)	123° diagonal × 115° horizontal × 81° vertical
Image Sensor	8 MP
Focus Distance	0.5 m (1.6 ft) to ∞
Lens	Up to 5x digital zoom, detachable camera privacy cover (included)
Positioning	Autoframing capability or manual pan-tilt-zoom (PTZ) with 3 configurable presets (Home, 1, 2)
Processing	Automatic white balance, automatic brightness, digital noise reduction
USB Device Video Class (UVC)	v1.1
Supported Video Resolutions	UHD 2160p (4K), 1080p, 720p, 960×480, 848×480, 640×480, 640×360, 432×240 (30 fps)
Video Encoding	H.264, M-JPEG
CONNECTIONS	
USB	USB Type-C® to host computer (with DisplayLink) (USB 3.0 UAC, UVC, HID)
Network	Wired: RJ-45, 1 Gbps Ethernet (IEEE 802.3) Wireless: Wi-Fi 802.11ac
Bluetooth	*Bluetooth* 4.2 HSP, A2DP, AVRCP, BLE
Display	HDMI 1.4b and 2.1 output (to display, from host computer)
Analog Audio	Stereo 3.5 mm (⅛ in) input
General Purpose	2-pin Euroblock general-purpose input
Power	Via external power supply with localized power cord (included) Input: 110 – 240 VAC, 50/60 Hz, 1.5 A max. Output: 24 VDC, 1.875 A
SOFTWARE APPLICATIONS	
Control/Configuration	Bose Work Configuration software (available for Windows and macOS or via web browser) Bose Work Management software (available for Windows) Bose Work mobile app (available for iOS and Android)
SYSTEM REQUIREMENTS	
Operating System	Windows 7, 8.1, or 10 macOS 10.10 or higher Chrome OS (Google Chromebook)

For additional specifications and application information, please visit PRO.BOSE.COM.
Specifications subject to change without notice. 1/2021

Bose Videobar VB1

all-in-one USB conferencing device

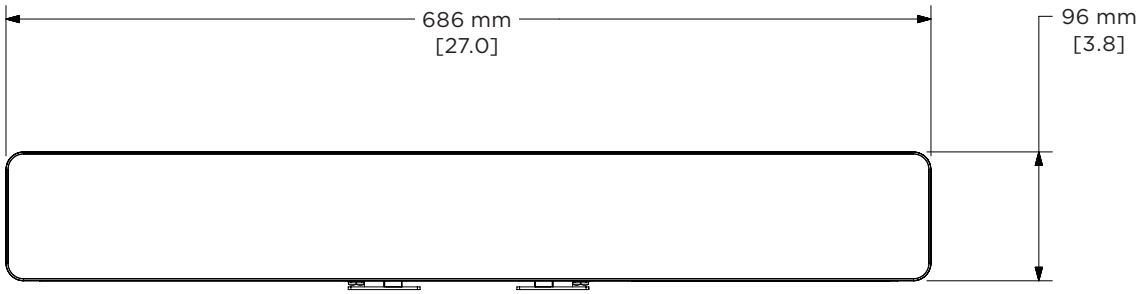
REGULATORY	
Safety	IEC/UL/EN 60065:2014/A11:2017, IEC/UL/EN 62368-1:2014/A11:2017
EMC	FCC Part 15B Class B, ICES-003 Class B, CISPR 13, EN55032 Class B, EN55035, EN61000-3-2, EN61000-3-3, BSMI CNS13439
Wi-Fi and *Bluetooth*	FCC Part 15C, RSS-GEN, RSS-247, RSS-102, EN300328, EN301893, EN301489
Environmental	RoHS
PHYSICAL	
Operating Temperature	0 °C to 40 °C (32 °F to 104 °F), 90% non-condensing humidity
Storage Temperature	-40 °C to 70 °C (-40 °F to 158 °F), 93% relative humidity
Mounting	Table stand with Kensington lock slot and mounting hardware (included) Wall-mount bracket with mounting hardware (included) Display mounting kit (optional) Mud ring (optional)
Product Dimensions (Width × Height × Depth)	686 mm × 48 mm × 96 mm (27.0 in × 1.9 in × 3.8 in)
Net Weight	2.5 kg (5.6 lb)
Shipping Weight	5.4 kg (12.0 lb)
Included Accessories	Bose Videobar VB1 HDMI 2.0 cable, 1.5 m (4.9 ft) USB-C® 2.0 cable, 5.0 m (16.5 ft) Infrared remote control with 2 AAA batteries Wall-mount bracket with mounting hardware Table stand with hardware Power supply with localized power cord Cable management kit with mounting hardware Camera privacy cover USB-A-to-C adapter 2-pin Euroblock connector Quick start guide, table-mount setup guide, wall-mount setup guide, safety instructions
Optional Accessories	Display mounting kit Right-angle USB 3.1 cable, 2.0 m (6.5 ft) Mud ring
PRODUCT CODES	
842415-1110	Videobar VB1 120V US
842415-2110	Videobar VB1 230V EU
842415-3110	Videobar VB1 100V JP
842415-4110	Videobar VB1 240V UK
842415-5110	Videobar VB1 240V AUS
842888-0010	Display Mounting Bracket
843944-0010	2m USB 3.1 Cable
861846-0010	Mudring

For additional specifications and application information, please visit PRO.BOSE.COM.
Specifications subject to change without notice. 1/2021

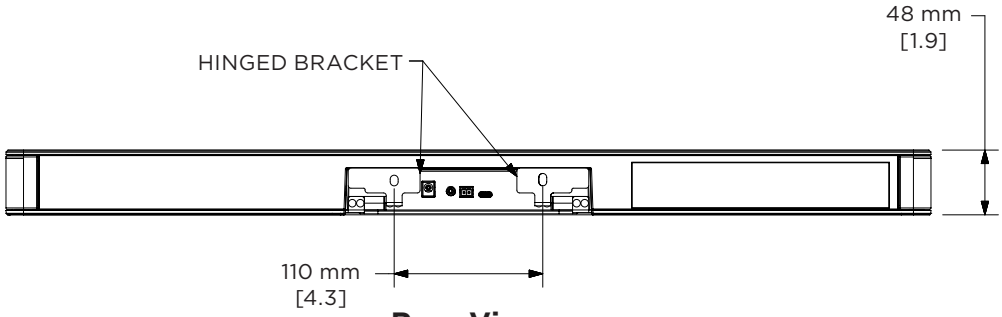
Bose Videobar VB1

all-in-one USB conferencing device

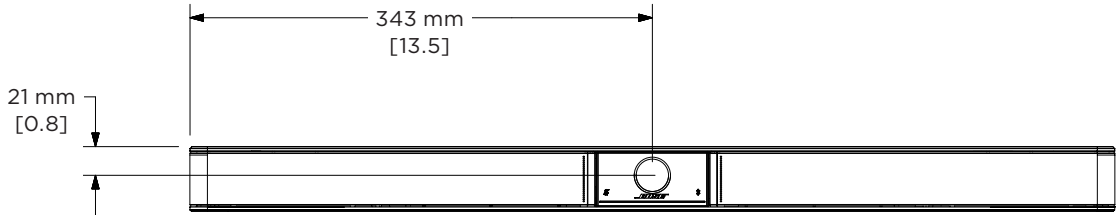
Dimensions



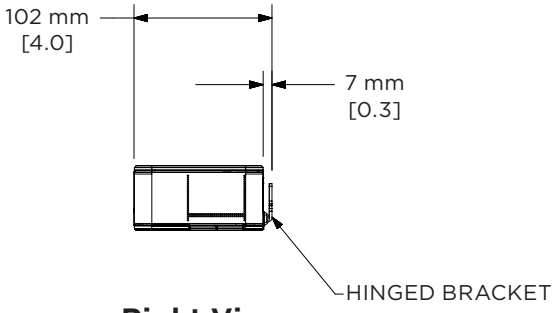
Top View



Rear View



Front View



Right View

DIMENSIONS APPLY TO BOTH SIDES

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For additional specifications and application information, please visit PRO.BOSE.COM.
Specifications subject to change without notice. 1/2021

ClickShare CX-20

Easy wireless conferencing for small meeting rooms and huddle spaces

- **Entry-level wireless conferencing model**
- **Run video meetings from your laptop**
- **Iconic ClickShare Button for employees and guests**
- **100% secure, encrypted and cloud-managed**

ClickShare CX-20 enables wireless conferencing in small meeting spaces. When you walk into the meeting room, ClickShare automatically connects you to room devices like cameras, mics, speakers, sound bars and displays.

Start a meeting from your laptop within seconds, using your preferred video conferencing platform. Make hybrid meetings easy, with just one click on the ClickShare Button or the ClickShare App, both for employees and guests.

Product specifications	CLICKSHARE CX-20
General specifications	
Operating system	Windows 10 and higher macOS 11 (BigSur) and higher Android v11 and higher (ClickShare App) iOS 14 and higher (ClickShare App)
System requirements	For a smooth experience with Microsoft Teams or Zoom Minimum: Intel i3 dual-core processor or AMD Ryzen 7 / 8GB RAM / OS: Windows 10 latest build or Mac OS Mojave latest build Recommended: Intel i5 4-core processor or AMD Ryzen 9 / 8GB RAM / OS: Windows 11 latest build or Mac OS latest build
Video outputs	4K UHD (3840*2160) @ 30Hz. HDMI™ 1.4b or USB-C DisplayPort 1.2 (only Gen2)
Audio output	USB, HDMI
USB	1 X USB-A, 1 X USB-C
ClickShare Buttons	1
ClickShare App	Desktop & Mobile
Native protocols	Airplay, Google Cast, Miracast
Maximum sources simultaneously on screen	1
Noise Level	Max. 25dBA @ 0-30°C Max. 30dBA @ 30-40°C
Authentication protocol	WPA2-PSK in stand alone mode WPA2-PSK or IEEE 802.1X using the ClickShare Button in network integration mode
Wireless transmission protocol	IEEE 802.11 a/g/n/ac and IEEE 802.15.1
Reach	Max. 30m (100 ft) between ClickShare Button and ClickShare Base Unit Frequency band 2.4 GHZ and 5 GHz (DFS)
Frequency band	2.4 GHZ and 5 GHz (DFS channels supported in select number of countries)
Connections	1x Ethernet LAN 1Gbit 1x USB-C 2.0 (front); 1x USB-A 2.0 (front) -only Gen2: 1x USB-C 3.0 (front); 1x USB-A 3.0 (front)
Temperature range	Operating: 0°C to +40°C (+32°F to +104°F) Max: 35°C (95°F) at 3000m Storage: -20°C to +60°C (-4°F to +140°F)
Humidity	Storage: 0 to 90% relative humidity, non-condensing Operation: 0 to 85% relative humidity, non-condensing
Anti-theft system	Kensington lock
Certifications	FCC/CE
Touch screen support & Interactivity	/
Wireless conferencing	via App or Button
Local view	Local view of the room display only
Network connection	LAN & WiFi
Management and reporting	Yes
Warranty	1 year standard. 5 years coverage upon registering via SmartCare
ClickShare Base Unit dimensions	
Dimensions (HxWxD)	34 mm x 135 mm x 135 mm
Power consumption	Operational: 5-10W, 24W Max
Power supply	Standard 110/220 V AC plug or USB-C (only Gen2)
Weight	900 gr

Last updated: 29 Aug 2024

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BrightSign

SPECIFICATIONS

MODEL	LS425	LS445	HD225	HD1025	XD235	XD1035	XT245	XT1145	XT2145	XC2055	XC4055
	AFFORDABLE PERFORMER		BUILT FOR INTERACTIVITY		OPTIMIZED FOR MOTION GRAPHICS		THE PERFECT COMBO OF POWER AND PERFORMANCE			THE MOST POWERFUL PLAYER IN SIGNAGE	
	HD BASIC I/O	4K BASIC I/O	STANDARD I/O	EXPANDED I/O	STANDARD I/O	EXPANDED I/O	STANDARD I/O	EXPANDED I/O	MULTIPLEX I/O	MULTIPLEX I/O	MULTIPLEX I/O
VIDEO & HTML5 ENGINE											
HTML5 Performance Level	Popular HTML widgets & graphic simple motion graphics		Modular 2D motion graphics	Interactive 2D motion graphics	Smooth full screen 2D WebGL motion	Responsive multi-touch 2D WebGL	3D WebGL & real time data visualization	Intense graphics, video and live TV	Dual HTML presentations driving 2 screens	Up to 8K 3D WebGL across 2 screens	2x the power of XC2055 across 4 screens
8K video decoding							X 10-bit at 60p	X 10-bit at 60p	X 10-bit at 60p	X 8-bit at 60p 10-bit at 30p	X 10-bit at 60p
4K video decoding		X 8-bit at 60p 10-bit at 30p	X 8-bit at 60p 10-bit at 30p	X 8-bit at 60p 10-bit at 30p	X 8-bit at 60p 10-bit at 30p	X 8-bit at 60p 10-bit at 30p	X 10-bit at 60p	X 10-bit at 60p	X 10-bit at 60p	X 10-bit at 60p	X 10-bit at 60p
Dual 4K video decoding							X	X	X	X	X
Quad 4K video decode											X
4K video rotation							X	X	X	X	X
HDR10, HLG & Rec.2020/BT.2020 support							X	X	X	X	X
Full HD at 60p video decoding	X	X	X	X	X	X	X	X	X	X	X
Dual HD at 60p video decode			X	X	X	X	X	X	X	X	X
HD video rotation			X (Single)	X (Single)	X (Single)	X (Single)	X	X	X	X	X
8K resolution images & graphics										X	X
4K resolution images & graphics							X	X	X	X	X
HD images & graphics	X	X	X	X	X	X	X	X	X	X	X
MEDIA FORMATS											
8K video codecs: H.265							X	X	X	X	X
8K Video Containers: .ts, .mov, .mp4, .mkv							X	X	X	X	X
4K Video codes: H.265, H.264		X H.265 at 60p & H.264 at 30p	X H.265 at 60p & H.264 at 30p	X H.265 at 60p & H.264 at 30p	X H.265 at 60p & H.264 at 30p	X H.265 at 60p & H.264 at 30p	X	X	X	X	X
4K Video Containers: .ts, .mov, .mp4, .mkv		X	X	X	X	X	X	X	X	X	X
Full HD Video Codecs: H.265, H.264 (MPEG-4, Part 10), MPEG-2	X	X	X	X	X	X	X	X	X	X	X
Full HD Video Containers: .ts, .mpg, .vob, .mov, .mp4, .m2ts	X	X	X	X	X	X	X	X	X	X	X
8K Video Resolutions: 7680x4320x23.97/24/25/29.97/30/50/59.94/60p							X	X	X	X	X
4K Video Resolutions: 4096x2160x23.97/24/25/29.97/30/50/59.94/60p 3840x2160x23.97/24/25/29.97/30/50/59.94/60p		X	X	X	X	X	X	X	X	X	X

MODEL	LS425	LS445	HD225	HD1025	XD235	XD1035	XT245	XT1145	XT2145	XC2055	XC4055
Full HD Resolutions: 1920x1080x23.97/24/25/29.97/30/50/59.94/60p	X	X	X	X	X	X	X	X	X	X	X
Supports additional & customizable resolutions: includes unique, non-standard aspect ratios at various frame rates	X	X	X	X	X	X	X	X	X	X	X
Images: BMP, JPEG, PNG	HD	HD	HD	HD	HD	HD	HD	HD	HD	HD/4K/8K	HD/4K/8K
Audio: MP2, MP3, AAC and WAV (AC3 is passed through)	X	X	X	X	X	X	X	X	X	X	X
HTML Support: HTML5, CSS, JavaScript, SVG, WebGL and Chromium compatible	X	X	X	X	X	X	X	X	X	X OpenGL	X OpenGL
HARDWARE INTERFACES											
HDMI Outputs	1	1	1	1	1	1	1	1	2	2	4
HDMI 1 Output:	X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.1a	X HDMI 2.1a	X HDMI 2.1a	X HDMI 2.1a	X HDMI 2.1a
HDMI 2 Output:									X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.0a
HDMI 3 Output:											X HDMI 2.0a
HDMI 4 Output:											X HDMI 2.0a
HDMI Input: (HDCP support coming soon in a future BrightSignOS update)								X HDMI 2.0a	X HDMI 2.0a		
Ethernet:	X 10/100	X 10/100	X Gigabit	X Gigabit	X Gigabit with POE+	X Gigabit with POE+	X Gigabit with POE+	X Gigabit with POE+	X Gigabit with POE+	X Gigabit	X Gigabit
USB-A: provides 5V/1A power to peripheral devices				X		X		X	X	X	X
USB-C: supports high-speed host mode & provides 5V/1A power to peripheral devices	X Supports GPIO, Serial & IRF	X Supports GPIO, Serial & IRF				X		X	X	X	X
GPIO: 12-pin Phoenix Connector with 8 bi-directional Ports			X	X	X	X	X	X	X	X	X
IR: 3.5mm In / Out			X	X	X	X	X	X	X	X	X
Serial: 3.5mm RS-232				X		X		X	X	X	X
Audio: 3.5mm Output (Analog or SPDIF)	X	X	X	X	X	X	X	X	X	X	X
Primary storage: External microSD card slot	X	X	X	X	X	X	X	X	X	X	X
Optional storage: M.2 PCIe Interface for NVME SSD Storage					X	X	X	X	X	X	X
Optional Wi-Fi/Bluetooth: E Key M.2 Interface for WD-105 module	X	X	X	X	X	X	X	X	X	X	X
Status LEDs	1	1	4	4	4	4	4	4	4	4	4
Reset & Service Buttons	X	X	X	X	X	X	X	X	X	X	X
Real Time Clock with 14-day life	X	X	X	X	X	X	X	X	X	X	X
Locking Power Connector	X	X	X	X	X	X	X	X	X	X	X
ACCESSORIES											
BP200 & BP900 USB Button Pads	X	X		X		X		X	X	X	X

MODEL	LS425	LS445	HD225	HD1025	XD235	XD1035	XT245	XT1145	XT2145	XC2055	XC4055
Micro SD Class 10 cards (various capacities)	X	X	X	X	X	X	X	X	X	X	X
256GB PCIE NVME M.2 SSD					X	X	X	X	X	X	X
WD-105 Dual Antenna Wireless/Bluetooth Module	X	X	X	X	X	X	X	X	X	X	X
BrightSign Mobile USB modem	X	X		X		X		X	X	X	X
CBL-USBC to USBA and 3.5mm Serial	X	X				X		X	X	X	X
GP800-C: USB C to GPIO 12-pin Cable Kit	X	X				X		X	X	X	X
SOFTWARE & SERVICES											
BrightSignOS™	X	X	X	X	X	X	X	X	X	X	X
Free BrightAuthor:connected or BrightAuthor software	X	X	X	X	X	X	X	X	X	X	X
Free bsn.Control Subscription	X	X	X	X	X	X	X	X	X	X	X
Optional bsn.Content Paid Subscription	X	X	X	X	X	X	X	X	X	X	X
Optional BrightSign Mobile Service	X	X		X		X		X	X	X	X
MISCELLANEOUS											
Anodized aluminum enclosure for extended operating temperatures			X	X	X	X	X	X	X		
Dimensions	126.6 x 141.84 x 19.41 mm (WxDxH)		205 x 185.9 x 19.2 mm (WxDxH)		205 x 185.9 x 19.2 mm (WxDxH)		238.62 x 185.90 x 19.19 (WxDxH)			253.2 x 232.12 x 48mm (WxDxH)	
Shipping Weight	TBD	TBD	1.3 kg	1.3 kg	1.3 kg	1.3 kg	TBD	TBD	TBD	3 kg	3 kg
Player Weight	0.18 kg	0.18 kg	0.59 kg	0.59 kg	0.59 kg	0.59 kg	0.68 kg	0.68 kg	0.68 kg	1.41 kg	1.41 kg
Power Supply	12V / 3A	12V / 3A	12V / 3A	12V / 3A	12V / 3A	12V / 3A	12V / 3A	12V / 3A	12V / 3A	19V / 4.7A	19V / 4.7A
Multi-Country Power & Regulatory Approvals	X	X	X	X	X	X	X	X	X	X	X
Built-in Wall Mounting Brackets	X	X	X	X	X	X	X	X	X	X	X

*2 year warranty, parts and labor, for units shipped from an EU or UK distribution center and to an EU or UK address.

AVARRO™

MEDIUM TILT MOUNT

NX-TM2460

EASY TO INSTALL WITH A LOW PROFILE TILTING DESIGN AND POST-INSTALL LEVELING. THE NX-TM2460 IS IDEAL FOR 24" - 60" PANELS WEIGHING UP TO 120 LBS.

SPECIFICATIONS:

- Fits 24" - 60" TVs up to 120lbs
- VESA 75 x 75 to 400 x 400 (W x H) (mm)
- Locking mechanism secures rails to wall plate
- Height adjustable for easy levelling
- Tilt up to 12° to reduce glare
- Simple to install and use
- Includes complete hardware kit
- Warranty: 5 years
- For commercial and residential applications

BOX DIMENSIONS:

PART#:	**NX-TM2460**
UPC:	**840049303102**
LENGTH:	**5.9"**
WIDTH:	**21.3"**
HEIGHT:	**2.4"**
WEIGHT:	**5.8 LBS**

For more information please call 1-833-574-9124
or email AVARRO@adiglobal.com

To learn more about AVARRO products visit
avarro.adiglobaldistribution.us

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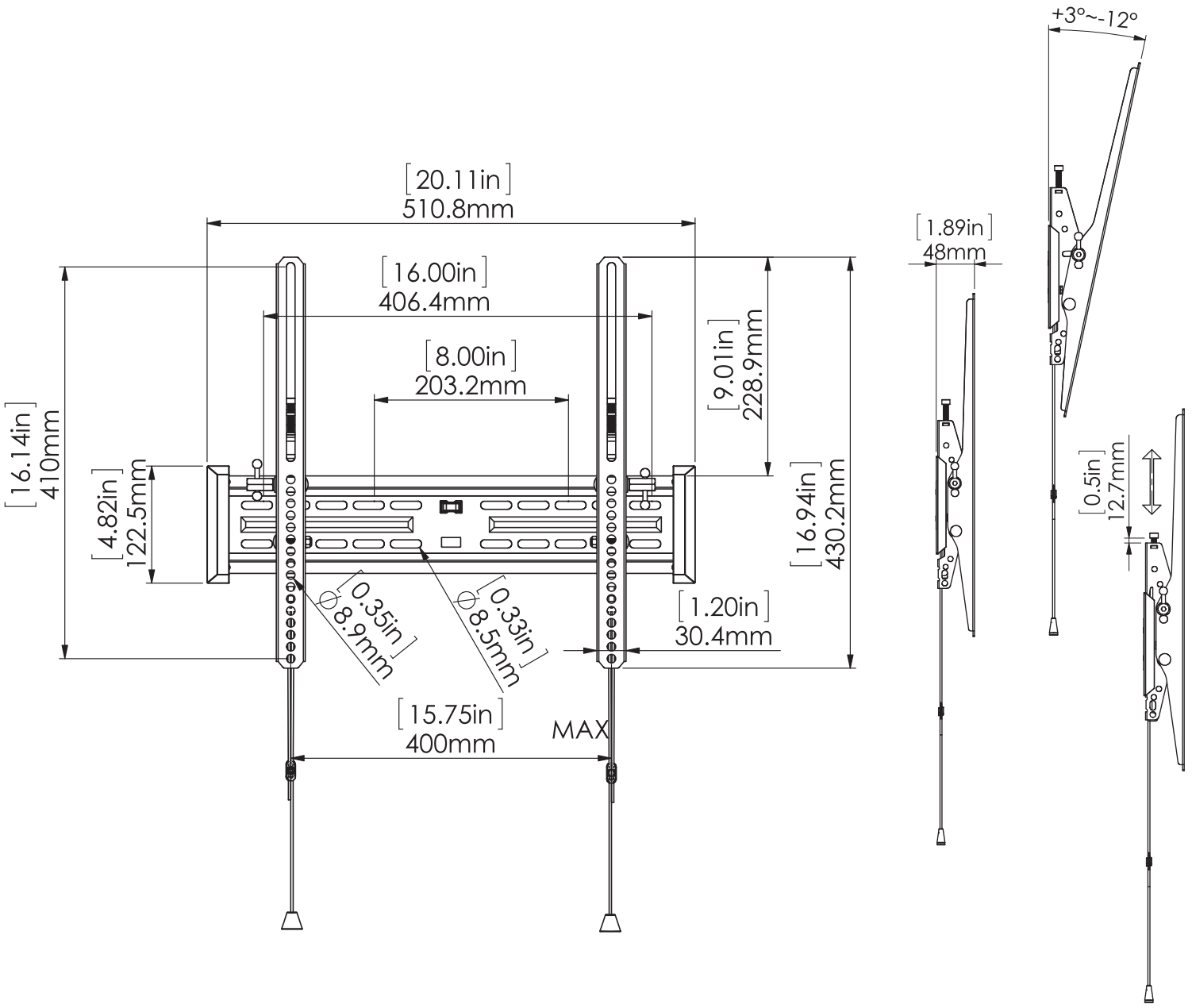
RoHS COMPLIANT

TECHNICAL DRAWING

NX-TM2460



For more information please call 1-833-574-9124
or email AVARRO@adiglobal.com

To learn more about AVARRO products visit
avarro.adiglobaldistribution.us

VS-211X

2x1 4K HDR HDMI Auto Switcher

| HDMI

VS−211X is a high−performance 2x1 automatic switcher for 4K HDR, HDMI video signals. Offering priority and last−connected switching options, it automatically switches according to the selected switching scheme based on active video signal detection

FEATURES

Plug & Play Auto Switcher - Automatically plays the switched source signal on the connected display according to user–configured preferences, such as priority or last−connected input. When the user manually switches, by pressing a button, the auto switching is overridden

HDMI Signal Switching - HDCP 2.3 compliant, Supporting deep color, x.v.Color™, CEC, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS−HD, 2K, 4K, and 3D as specified in HDMI 2.0

Multi-channel Audio Switching - Up to 32 channels of digital stereo uncompressed signals for supporting studio−grade surround sound

I-EDIDPro™ Kramer Intelligent EDID Processing™ - Intelligent EDID handling, processing, locking and pass−through algorithm ensures plug & play operation for HDMI source and display systems

Audio De-embedding - The digital audio signal passing−through to the HDMI output, is de–embedded, converted to an analog signal and sent to the stereo unbalanced analog audio output. This enables playing the audio on locally connected speakers, in parallel to playing it on the speakers connected to the AV acceptor device (such as TVs with speakers)

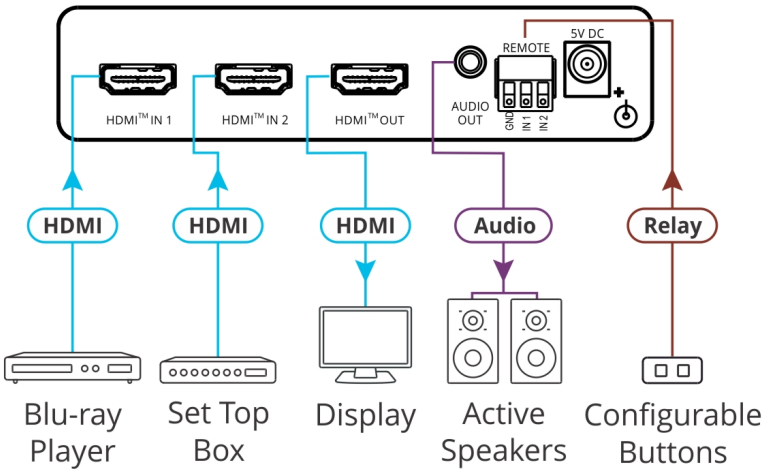
Simple Switching Operation - Local buttons or remotely connected contact–closure buttons for flexible user input selection and switching control

Cost-Effective Maintenance - Status LED indicators for HDMI ports facilitate easy local maintenance and troubleshooting. Local firmware upgrade ensures lasting, field−proven deployment

Easy Installation - Compact DigiTOOLS® fan−less enclosure for user−reachable table mounting, or side−by−side mounting of 3 units in a 1U rack space with the recommended rack adapter

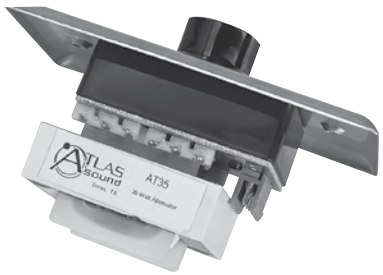
TECHNICAL SPECIFICATIONS

Inputs	2 HDMI: On a female HDMI connector
Outputs	1 HDMI: On a female HDMI connector
	1 Unbalanced Stereo Audio: On a 3.5mm mini jack
Ports	Remote Contact Closure: On a 3–pin terminal block connector
Video	Max Data Rate: 17.82GBPS (5.94Gbps per graphic channel)
	Max Resolution: 4K@60 (4:4:4)
	Compliance: HDR10 as specified in HDMI 2.0, HDCP 2.2
Power	Source: 5V DC, 2A
	Consumption: 500mA
User Interface	Controls: Input selection buttons. DIP–switches for configuring switching mode and EDID mode
Enclosure	Size: DigiTOOLS®
	Type: Aluminum
	Cooling: Convection ventilation
Environmental Conditions	Operating Temperature: 0° to +40°C (32° to 104°F)
	Storage Temperature: –40° to +70°C (–40° to 158°F)
	Humidity: 10% to 90%, RHL non–condensing
REGULATORY	Health, Safety, Environmental: RoHs, WEEE, CE
Product Dimensions	12.00cm x 7.15cm x 2.44cm (4.72" x 2.81" x 0.96") W, D, H
Product Weight	0.2kg (0.5lbs) approx
Shipping Dimensions	49.00cm x 18.60cm x 58.80cm (19.29" x 7.32" x 23.15") W, D, H
Shipping Weight	0.7kg (1.5lbs) approx

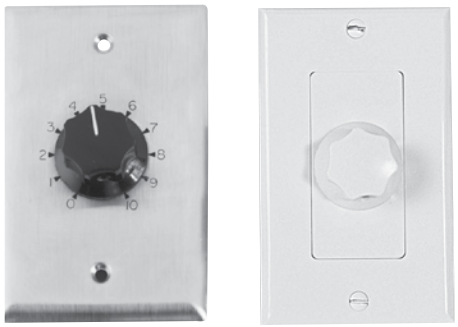

HDMI™ IN 1
HDMI™ IN 2
HDMI™ OUT
AUDIO OUT
REMOTE
GND
IR 1
IR 2
5V DC
HDMI
HDMI
HDMI
Audio
Relay
Blu-ray Player
Set Top Box
Display
Active Speakers
Configurable Buttons

Commercial Attenuators

AT Series, E408 Series

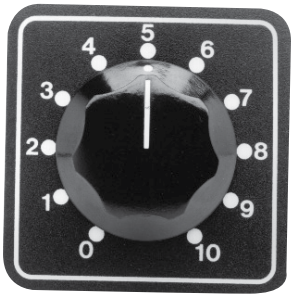


AT10 / AT35 / AT100 Series



AT10 / AT35 / AT100 Series Face Plate Options
Attenuators are available in Classic Stainless
or Decora(Decora available in Ivory or White)

E408-100



RM Series

Features

- Models Feature a Range of Attenuation Steps (1.5dB or 3dB Steps) as Well as Continuous to Meet Application and Budget Requirements
- Wall Plates are Stainless Steel with Stamped and Filled or Screen Printed Dial Scale, and a Skirted Black Knob (White and Ivory Plastic Plates with Matching Skirted Knobs Also Available in Decora Style-D Series Only)
- Popular Rack Mount Attenuator Versions are Available on the AT and E408 Series for Mounting on to Blank Panels in Equipment Cabinets
- All AT Models Mount into Most 1-Gang E.O. Boxes. (2¾" Deep)
- AT and E408 Series are UL Listed

Genenal Description

AT Series Industry Standard Auto Transformer. High-quality auto transformer series provides the advantages of excellent frequency response, low insertion loss and reliable performance for volume control application in 25V/70.7V systems. Attenuation is accomplished in ten make before break steps plus positive Off position. (No stop between maximum and Off position to prevent switch damage). Contacts are silver plated for noise-free operation. Features a removable terminal block. Includes stainless steel plate, with stamped and filled or screen printed dial scale and a skirted black knob. (White and ivory plastic plates with matching skirted knobs also available in Decora style-see AT model description chart).

E408 Auto Transformer with Precision Level Control. Specially designed for attenuation in masking and sound reinforcement systems where fine tuning of level control is required. Employs a ten-position, non-shorting rotary switch without stop. Attenuation rate is 1.5dB per step. (All other specifications are the same as the AT Series including the UL listing).

PA Series Priority Paging Option. Priority paging feature by-passes the effect of the attenuator to provide program level selection of individual emergency and paging signals at the amplifier. Option is available on all AT attenuators. The SPDT relay is operated with 24VDC at 10mA. Includes protective relay cover to ensure lasting trouble-free performance. Terminations to the relay and attenuator are made via a removable terminal block. (All other specifications except for dimensions are the same as selected AT models).

RM Series Rack Mount Option. For attenuation convenience of rack-mounted equipment in cabinets and consoles, the AT, E408 Series attenuators are available without mounting plate for rack panel installation. Attractive matte black polycarbonate dial scale overlay with adhesive backing replaces the mounting plate. Includes skirted black knob. Overlay size is 29 square (51mm). (To order, simply add RM after the selected attenuator model number. Example: AT10-RM or AT10-PARM.) (Dial scale overlays to retrofit existing installations are available, see Model HX23.)

Replacement Knobs

HX21-B

HX22-W

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PRO 2 SERIES
FULL SUN 1000 NIT
OUTDOOR TV

STRONGER BRIGHTER BETTER

Made to be one of the brightest and most durable TVs on the market, the SunBrite Pro 2 provides the ultimate viewing experience in active and high-traffic areas. From its incredibly brilliant tempered glass display to its weatherproof frame, the Pro 2 gives you a sleek looking TV that can handle the harshest environments.

CREATE AN OUTDOOR
EXPERIENCE TODAY

SunBriteTV.com

Super-Bright 4K Ultra HD with HDR

With TruVisionPro anti-glare technology and 1000 NITS of 4K Ultra HD with HDR clarity, you get a brilliant display on the brightest days. Indoor TVs only provide 100-300 NITS, which makes clear outdoor viewing impossible.

Built for Active Environments

With an impact-resistant display and EST technology to guard against isotropic blackout, the Pro 2 is perfect for active environments, including high-traffic bars and amusement parks, rambunctious poolside patios, and more.

Permanent Outdoor Installation

Featuring a weatherproof aluminum frame that keeps the elements out, and a weatherproof media bay with an innovative cable entry system, the Pro 2 provides year-round entertaining that's independently certified for safe outdoor use.

05052022 TS

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Model Dimensions Comparison

	SB-P2-49-4K	SB-P2-55-4K	SB-P2-65-4K
Color	Black	Black	Black/ Silver/ White
Backlight Compensation	1000 nits (cd/m2)	1000 nits (cd/m2)	1000 nits (cd/m2)
Audio Output Connectors	Built-in 10W x 2 audio amplifier Optical Toslink Analog 1/8" headphone jack (Variable)	Built-in 10W x 2 audio amplifier Optical Toslink Analog 1/8" headphone jack (Variable)	Built-in 10W x 2 audio amplifier Optical Toslink Analog 1/8" headphone jack (Variable)
VESA Mounting Pattern	100mm x 100mm, 200mm x 200mm	200mm x 200mm	200mm x 200mm
Finish	Powder-coated Aluminum	Powder-coated Aluminum	Powder-coated Aluminum
Power Consumption	100-240 VAC, 50-60 Hz 2.0 A Max (288 Watts/2.4a@120v)	100-240 VAC, 50-60 Hz 2.0 A Max (322 Watts/2.7a@120v)	100-240 VAC, 50-60 Hz 2.0 A Max (338 Watts/2.8a@120v)
HDMI Connections	2x (HDMI 2.0, HDCP 2.2, HDMI 1.4 & HDCP 1.4a)	2x (HDMI 2.0, HDCP 2.2, HDMI 1.4 & HDCP 1.4a)	2x (HDMI 2.0, HDCP 2.2, HDMI 1.4 & HDCP 1.4a)
HDBaseT Connections	1 x (RJ45 - single Cat5e/Cat6 cable)	1 x (RJ45 - single Cat5e/Cat6 cable)	1 x (RJ45 - single Cat5e/Cat6 cable)
Video Inputs	1x RF Antenna/CATV (ATSC/ QAM/NTSC) 1x YPbPr + L/R Audio 1x Composite + L/R Audio 1x 15-pin D-sub VGA + L/R Audio	1x RF Antenna/CATV (ATSC/ QAM/NTSC) 1x YPbPr + L/R Audio 1x Composite + L/R Audio 1x 15-pin D-sub VGA + L/R Audio	1x RF Antenna/CATV (ATSC/ QAM/NTSC) 1x YPbPr + L/R Audio 1x Composite + L/R Audio 1x 15-pin D-sub VGA + L/R Audio
Screen Resolution	3840 x 2160 UHD 4k HDR	3840 x 2160 UHD 4k HDR	3840 x 2160 UHD 4k HDR
Aspect Ratio	16:9	16:9	16:9
Screen Description	32-inch diagonal Color Active Matrix TFT LED LCD	43-inch diagonal Color Active Matrix TFT LED LCD	43-inch diagonal Color Active Matrix TFT LED LCD
Contrast Ratio	1100:1	1100:1	1100:1
Frame Rate	60 Hz	60 Hz	60 Hz
Viewing Angle	178° x 178°	178° x 178°	178° x 178°
Response Time	8 milliseconds	8 milliseconds	8 milliseconds
TV Formats	2160p,1080p, 1080i, 720p, 720i, 480p, 480i	2160p*,1080p, 1080i, 720p, 720i, 480p, 480i *using hdmi only	2160p*,1080p, 1080i, 720p, 720i, 480p, 480i *using hdmi only
Control Set	RS232 Serial, Discrete IR Control, Concealed rear IR Window, IP Control, OvrC	RS232 Serial, Discrete IR Control, Concealed rear IR Window, IP Control, OvrC	RS232 Serial, Discrete IR Control, Concealed rear IR Window, IP Control, OvrC
Included Speaker	None, but compatible with all SunBrite Soundbars sold separately	None, but compatible with all SunBrite Soundbars sold separately	None, but compatible with all SunBrite Soundbars sold separately
Operating Temperature	-24°-122°F	-24°-122°F	-24°-122°F
Non-Operating Temperature	-24°-140°F	-24°-140°F	-24°-140°F
Dimensions (W x H x D)	45.09" x 26.9" x 4.8"	50.53" x 29.71" x 5.45"	59.06" x 34.58" x 5.5"
Weight	84 lb	101 lb	127 lb

The TV Shield™ PRO

The Ultimate Indoor & Outdoor TV & Display Protection

Protective Enclosures Company™

TOUCH SCREEN AVAILABLE!

Enclosures for 40-85" TVs & Displays

PEC enclosures protect TVs & digital displays in 23,000+ residential & commercial locations in 38+ countries worldwide.

Weather Protection | **Damage Protection** | **Theft Protection**

Our professional series enclosures are the perfect solution for integrating a TV or digital display into almost any outdoor space.

Features:

- 4 size ranges for TVs/displays from 40 inches to an industry-first 85 inches
- 5 year warranty for guaranteed peace of mind
- PEC's proprietary "Quick Install™" System that saves time and money
- Protection equal to IP-55 standards (IP-65 equivalency for the available touch frame)
- Paintable powder coated steel backplate & lightweight aluminum housing
- Filtered ventilation system with thermostatically controlled fans
- All hardware & components are stainless steel or powder coated (using our advanced chemical pre-wash system) for ultimate durability against harsh threats like saltwater air
- Includes standard (no up-charge), shatter-resistant *anti-glare* front shields (which is much more durable than the safety glass used in other available enclosures)
- Front shield opens with hydraulic gas shocks for direct viewing & back input access
- One-of-a-kind patent-pending, proprietary, sleek, beveled "picture frame" design
- Internal full motion swivel mount with depth & height adjustment for perfect placement of screen & rear input accessibility
- Dual chambered key lock system for optimum protection (rather than a screw or padlock)
- Proprietary "ExactSeal™" Triple Sealing System for superior dirt & water intrusion prevention
- All ventilation & cable pass-through systems are protected against bug & water intrusion
- Interior space for installation & protection of cable boxes, media players, amplifiers, etc.
- Can be used with any external standard VESA mount (floor, ceiling, wall, pole, cart) & can be flush mounted against (not in) the wall (with professional installation & separate hardware)
- Built in 4 outlet commercial-grade power strip with 12 ft. cord (grounded to housing)
- Outdoor touch screen available - make any standard TV a weatherproof touch screen TV

Made in the USA

Made in the USA

1-800-331-2628 | www.thetvshield.com

A+ RATED by the Better Business Bureau

PATENTS

The TV Shield™ PRO

The Ultimate Indoor & Outdoor TV & Display Protection

models

TVSPRO4250
TVSPRO5560
TVSPRO6570
TVSPRO7580

Weatherproof TV & Display Enclosure

Fits 40-85" Televisions & Digital Monitors

The TV Shield *PRO*™ is a weatherproof, secure and robust "hybrid" enclosure made with a combination of lightweight aluminum and steel for ultimate strength and durability. Designed for use with any standard indoor TV or digital display, it is ideal for residential, commercial and professional markets. Developed for outdoor areas, The TV Shield *PRO*'s proprietary "Quick Install™" system is faster to install and maintain than other metal enclosures and effortlessly opens with gas shocks for easy access to the display and rear inputs. The entire unit is secured with dual high strength chambered key locks and comes with a thermostatically controlled and filtered air circulation system. The TV Shield *PRO*™ professional-grade TV and display enclosure includes standard anti-glare polycarbonate protective front shields or ultra-clear polycarbonate is available (rather than safety glass) and has larger size options up to an industry-first 85 inch enclosure.

ROBUST - The TV Shield *PRO's* standard anti-glare cover (shield) is manufactured using shatter-resistant polycarbonate. The rear case is built using highly durable, powder coated, steel and lightweight aluminum. The TV Shield *PRO*™ also offers some of the largest digital display and TV case sizes on the market (custom sizes are available).

SLEEK - Imagine a Ferrari with the durability of a Tank. The TV Shield *PRO*™ boasts strength, usability and aesthetic taste (and can even be painted custom colors), making it the most desirable high-end metal TV and digital signage case available.

UNIVERSAL - With the ability to fit almost any standard indoor TV or display, The TV Shield *PRO*™ can accommodate units from 40 inches up to 85 inches. Our proprietary patent-pending design mounts using any universal VESA mounting system.

FUNCTIONAL - The TV Shield *PRO*™ props open with gas shocks, allowing for easy access to the inside of the case. Even more innovative, this enclosure features a full motion internal mount, which allows for quick access to the back of the TV or display and rear inputs for maintenance. Whether in the open or closed position, you can enjoy watching television on your outdoor patio, pool deck or any residential or commercial setting.

MADE IN THE USA - The TV Shield *PRO*™ enclosure was designed, engineered and is manufactured by King Precision Solutions, in the USA, from top quality materials.

LIMITED PRODUCT WARRANTY

5 Year Limited Warranty on housing.
3 Year Limited Warranty on polycarbonate front cover/shield.
2 Year Limited Warranty on product failure or QC defects.

AVAILABLE ACCESSORIES

Fans
Heaters
Moisture Control Gel Case
Cleaners and Protectants
Outdoor Speakers
Mounts
Replacement Front Shields
Clear Front Shields

The TV Shield *PRO*™ 42-50" DIMENSIONS

- Fits Most 40" to 50" Displays
- MAX INTERIOR DIMENSIONS: 45.95" W x 27.95" H x 3.94" D
- EXTERIOR DIMENSIONS: 49.01" W x 31.01" H x 7.75" D
- WEIGHT: 88 LBS

The TV Shield *PRO*™ 55-60" DIMENSIONS

- Fits Most 51" to 60" Displays
- MAX INTERIOR DIMENSIONS: 55.95" W x 33.95" H x 3.94" D
- EXTERIOR DIMENSIONS: 59.01" W x 37.01" H x 7.75" D
- WEIGHT: 108 LBS

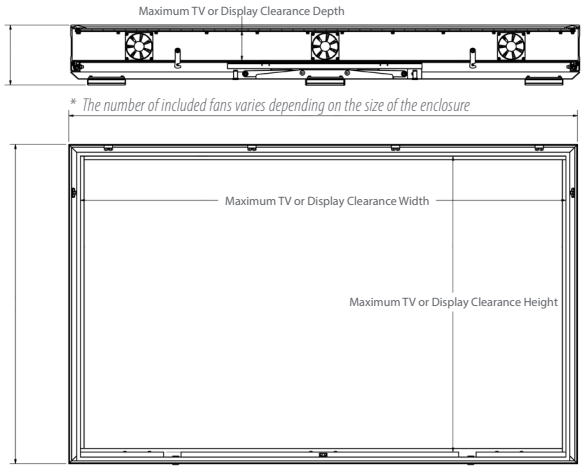
The TV Shield *PRO*™ 65-70" DIMENSIONS

- Fits Most 61" to 70" Displays
- MAX INTERIOR DIMENSIONS: 63.95" W x 38.95" H x 3.94" D
- EXTERIOR DIMENSIONS: 67.01" W x 42.01" H x 7.75" D
- WEIGHT: 128 LBS

The TV Shield *PRO*™ 75-85" DIMENSIONS

- Fits Most 71" to 85" Displays
- MAX INTERIOR DIMENSIONS: 74.95" W x 44.95" H x 3.94" D
- EXTERIOR DIMENSIONS: 78.01" W x 48.01" H x 7.75" D
- WEIGHT: 152 LBS

** Sizes are based on the outer frame dimensions of the TV or display. Please measure the outside dimensions of the unit, or the planned model, and compare to the inside dimensions listed to verify the appropriate fit.*



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AVARRO™

LARGE CEILING MOUNT

NX-SCM125

COMPLETE CEILING MOUNT FOR 37" -80" PANELS WEIGHING UP TO 125 LBS. THE NX-SCM125 IS AN IDEAL SOLUTION FOR SECURELY MOUNTING YOUR TV WITH UP TO 18 DEGREES OF TILT

SPECIFICATIONS:

- Fits 37"- 80" TVs up to 125lbs
- VESA 200 x 100 to 600 x 400 (W x H) (mm)
- Wire management with included pipe
- Tilt up to 18°
- Simple to install and use
- Includes complete hardware kit
- Warranty: 5 years
- For commercial and residential applications

BOX DIMENSIONS:

PART#:	**NX-SCM125**
UPC:	**840049303195**
LENGTH:	**17.2"**
WIDTH:	**33.1"**
HEIGHT:	**4.2"**
WEIGHT:	**16.0 LBS**

For more information please call 1-833-574-9124
or email AVARRO@adiglobal.com

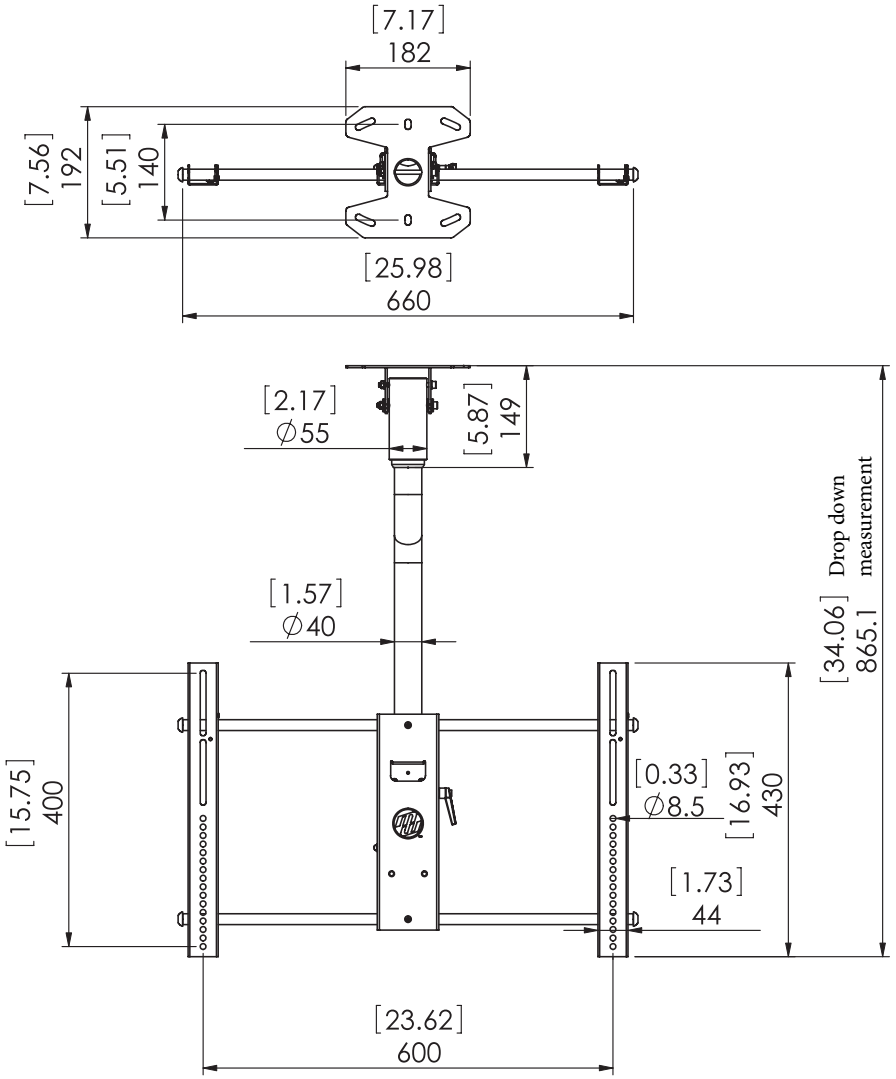
To learn more about AVARRO products visit
avarro.adiglobaldistribution.us

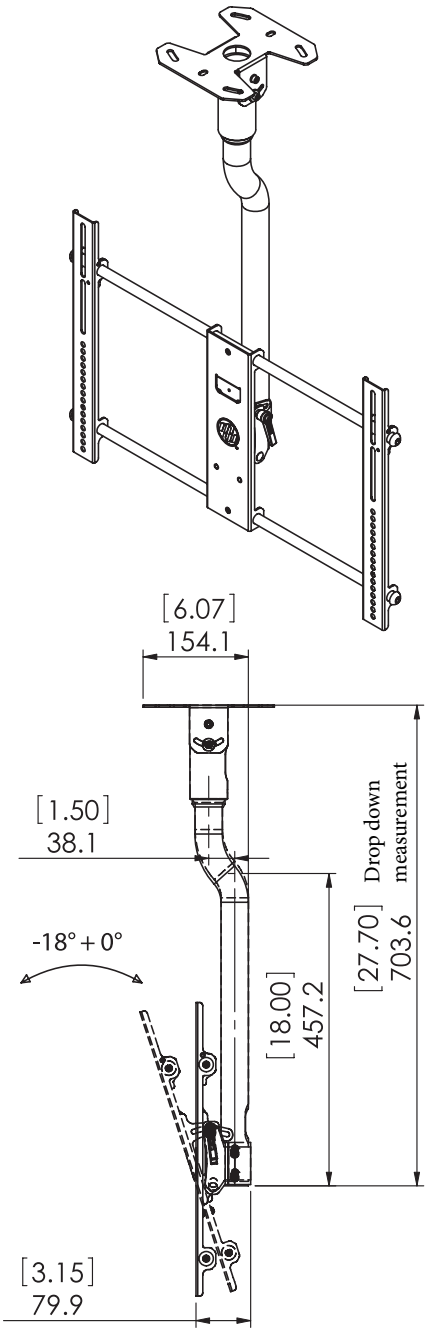
c UL us LISTED
20180731-E354445

RoHS COMPLIANT

TECHNICAL DRAWING

NX-SCM125





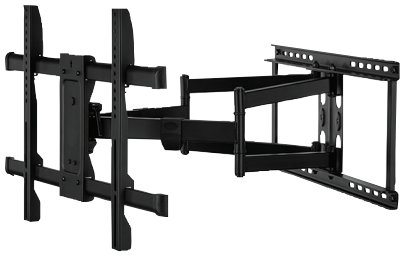
For more information please call 1-833-574-9124
or email AVARRO@adiglobal.com

To learn more about AVARRO products visit
avarro.adiglobaldistribution.us

AVARRO™

LARGE FULL MOTION MOUNT

NX-FML4390



TILT, PAN, SWIVEL AND PULL YOUR TV AWAY FROM THE WALL WITH THE NX-FML4390. IT FITS MOST 43"-90" UP TO 120LBS, IS EASY TO INSTALL AND HAS MANY GREAT FEATURES LIKE CABLE MANAGEMENT AND POST-INSTALLATION LEVELING.

SPECIFICATIONS:

- Fits 43"- 90" TVs up to 120lbs
- VESA 200 x 100 to 600 x 400 (W x H) (mm)
- Arm design provides ample throw and nests on wall
- Tilt, pan, and swivel for maximum viewing flexibility
- Extends 25" from wall when in use and retracts to 2.6" when not in use
- Includes complete hardware kit
- Warranty: 5 years
- For commercial and residential applications

BOX DIMENSIONS:

PART#:	**NX-FML4390**
UPC:	**840049303164**
LENGTH:	**12.9"**
WIDTH:	**29.9"**
HEIGHT:	**4.2"**
WEIGHT:	**25.6 LBS**

For more information please call 1-833-574-9124
or email AVARRO@adiglobal.com

To learn more about AVARRO products visit
avarro.adiglobaldistribution.us

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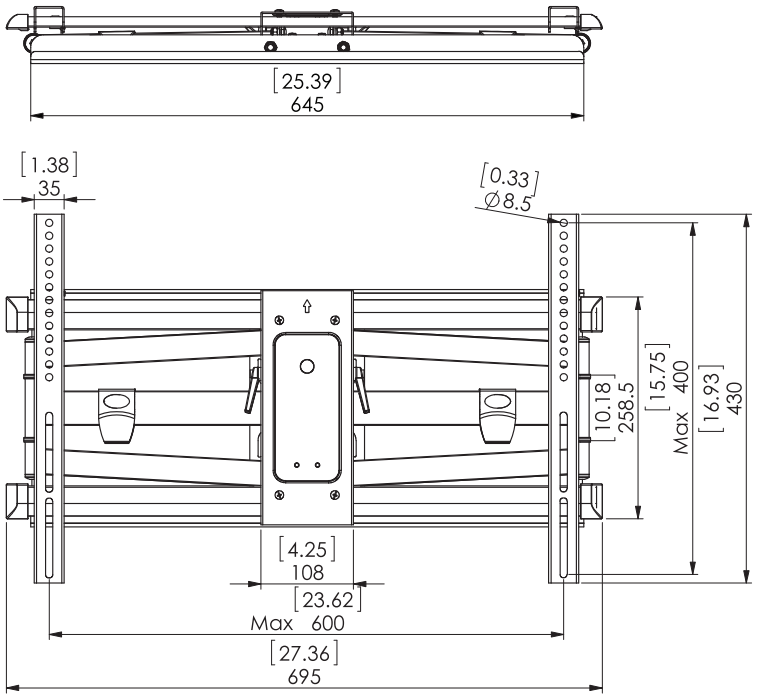
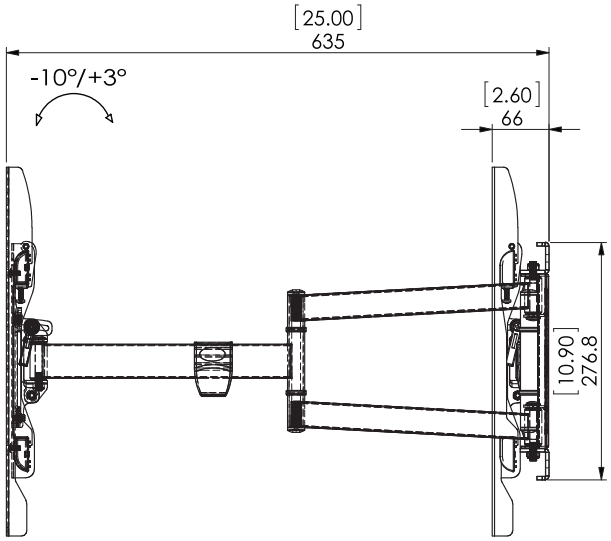
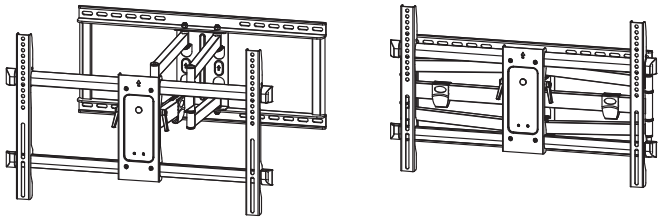
RoHS COMPLIANT

TECHNICAL DRAWING

NX-FML4390







For more information please call 1-833-574-9124
or email AVARRO@adiglobal.com

To learn more about AVARRO products visit
avarro.adiglobaldistribution.us

* All images in this datasheet are for illustrative purposes only.

TV Signage UR340C9 Series

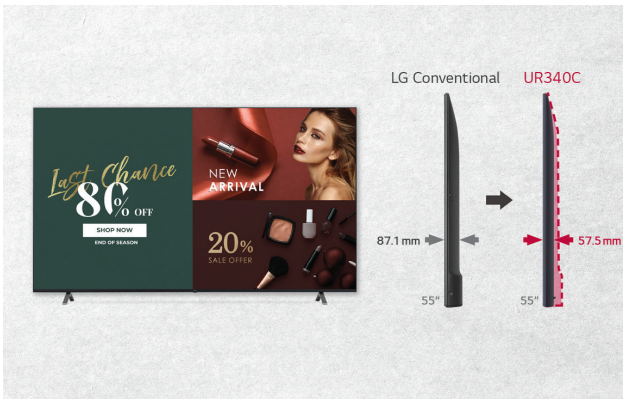
LG UHD Signage for Live TV & Promotional Messaging

- 4K Ultra HD Resolution
- Slim Design
- Non Wi-Fi Non Bluetooth
- Easy Management

UR340C9 Series	
Sizes	86” / 75” / 65” / 55” / 50” / 43”
Screen Resolution	3,840 x 2,160 (UHD)
Operation Time	16 Hours / 7 Days
Brightness	330 nits (86"/75") 400 nits (65"/55"/50") 300 nits (43")
Built-in Speakers	10 W + 10 W

Ultra HD Resolution Delivers Superb Picture Quality

Ultra HD resolution is four times FHD for content that is vivid and highly detailed. In addition, the UR340C series supports HDR10 to deliver more intense color reproduction and deeper black levels that can improve image contrast.



Elegant Slim Design

The space-saving UR340C series is thinner than LG conventional* models making installation a breeze. In addition, its sophisticated ashed blue color can enhance the décor of the environment in which it's installed.

* 'LG Conventional' refers to the LG US340C series.

Advanced Welcome Screen

To provide a more personalized and welcoming experience, the UR340C series welcome screen features a broader range of programable greeting messages. And if no input signal is present, preset content can be displayed, avoiding the conventional "No Signal" message.

Customized Time Scheduler

The UR340C series features a time scheduler that allows you to program when the display is powered on to conserve power and extend product life.

* All images are for illustrative purposes only

Display Power Management Support

For more efficient power management, Display Power Management (DPM) can be configured to be powered on only when a TV signal is present.

USB Data Cloning

USB data cloning improves the efficiency of managing multiple displays by allowing you to transfer the data of one display to the other UR340C series displays using a USB drive.

* USB is not provided by LG. FAT32 or NTFS formatting is recommended.

Crestron Connected® Certified

For more efficient meeting management, the UR340C series has been certified by Crestron Connected®, providing seamless integration and automated control* in Crestron Connected® meeting rooms.

* Network-based control

LG's SuperSign* Makes Signage Control More Efficient

LG's SuperSign control software allows you to manage up to 100 displays through a single account and server, giving you remote control over power, volume. Firmware updates are also supported.

* LG SuperSign Control needs to be purchased separately.

* All images are for illustrative purposes only

SPECIFICATIONS

MODEL		86UR340C9UD	75UR340C9UD	65UR340C9UD	55UR340C9UD	50UR340C9UD	43UR340C9UD
DISPLAY	Diagonal	86"	75"	65"	55"	50"	43"
	Resolution	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)
	Brightness	330 nits	330 nits	400 nits	400 nits	400 nits	300 nits
	Dynamic Contrast Ratio (Dynamic MCI (Hz))	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1
	Static (Panel) Contrast Ratio	1200:1	1200:1	1200:1	1300:1	5000:1	1200:1
	Response Time (G to G)	5 ms	8 ms	8 ms	14 ms	18 ms	8 ms
	Refresh Rate	120 Hz	60 Hz	60 Hz	60 Hz	60 Hz	60 Hz
	Life span	30,000 hours	30,000 hours	30,000 hours	30,000 hours	30,000 hours	30,000 hours
	HDR_HDR 10 Pro	Yes	Yes	Yes	Yes	Yes	Yes
	HDR_HLG	Yes	Yes	Yes	Yes	Yes	Yes
AUDIO	Built-in Speakers	10W + 10W	10W + 10W	10W + 10W	10W + 10W	10W + 10W	10W + 10W
	Speaker System	2.0 ch	2.0 ch	2.0 ch	2.0 ch	2.0 ch	2.0 ch
FEATURES	Broadcasting System	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC
	SW Clock (World Clock / Alarm)	Yes	Yes	Yes	Yes	Yes	Yes
	HDMI-ARC	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2
	USB Cloning	Yes	Yes	Yes	Yes	Yes	Yes
	WOL	Yes	Yes	Yes	Yes	Yes	Yes
	SNMP	Yes	Yes	Yes	Yes	Yes	Yes
	Self Diagnostics (USB)	Yes	Yes	Yes	Yes	Yes	Yes
	SI Compatible Protocol	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner
	HTNG-CEC	Yes	Yes	Yes	Yes	Yes	Yes
	Simplink (HDMI-CEC)	Yes (1.4)	Yes (1.4)	Yes (1.4)	Yes (1.4)	Yes (1.4)	Yes (1.4)
	IR Out	Yes (RS-232C)	Yes (RS-232C)	Yes (RS-232C)	Yes (RS-232C)	Yes (RS-232C)	Yes (RS-232C)
	Multi-code IR	Yes	Yes	Yes	Yes	Yes	Yes
	Hotel Mode / PDM / Installer Menu	Yes	Yes	Yes	Yes	Yes	Yes
	Lock mode	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)
	Welcome Video	Yes	Yes	Yes	Yes	Yes	Yes
	Welcome Screen (Splash Image)	Yes	Yes	Yes	Yes	Yes	Yes
	Insert Image	Yes	Yes	Yes	Yes	Yes	Yes
	RJP (remote jack pack) Compatibility	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)
	USB Auto playback	Yes	Yes	Yes	Yes	Yes	Yes
	Moving Picture Playback (SD/HD/Plus HD)	Yes	Yes	Yes	Yes	Yes	Yes
	Auto Off / Sleep Timer	Yes	Yes	Yes	Yes	Yes	Yes
	Energy Saving mode	Yes	Yes	Yes	Yes	Yes	Yes
	Motion Eye Care	Yes	Yes	Yes	Yes	Yes	Yes
	Crestron Compatibility	Yes	Yes	Yes	Yes	Yes	Yes
	DPM (Digital Power management)	Yes	Yes	Yes	Yes	Yes	Yes
	Time scheduler	Yes	Yes	Yes	Yes	Yes	Yes
	RTC (Real Time Clock)	Yes	Yes	Yes	Yes	Yes	Yes
	NTP sync timer	Yes (Clock Setup)	Yes (Clock Setup)	Yes (Clock Setup)	Yes (Clock Setup)	Yes (Clock Setup)	Yes (Clock Setup)
	SuperSign Control	Yes	Yes	Yes	Yes	Yes	Yes

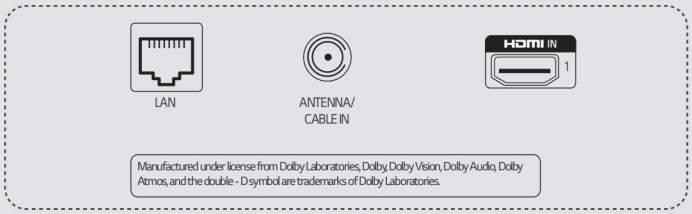
SPECIFICATIONS

MODEL		86UR340C9UD	75UR340C9UD	65UR340C9UD	55UR340C9UD	50UR340C9UD	43UR340C9UD
CONNECTIVITY	HDMI 2.0 In	Yes (x3)	Yes (x3)	Yes (x3)	Yes (x3)	Yes (x3)	Yes (x3)
	USB In	Yes	Yes	Yes	Yes	Yes	Yes
	RF In	Yes	Yes	Yes	Yes	Yes	Yes
	Digital Audio Out (Optical)	Yes	Yes	Yes	Yes	Yes	Yes
	RS-232C	3.5mm (4 pole)	3.5mm (4 pole)	3.5mm (4 pole)	3.5mm (4 pole)	3.5mm (4 pole)	3.5mm (4 pole)
	LG SVC only	3.5mm	3.5mm	3.5mm	3.5mm	3.5mm	3.5mm
	RJ45 (LAN)	Yes	Yes	Yes	Yes	Yes	Yes
MECHANICAL	Color	Navy Blue (Almost Black)	Navy Blue (Almost Black)	Navy Blue (Almost Black)	Navy Blue (Almost Black)	Navy Blue (Almost Black)	Navy Blue (Almost Black)
	VESA Compatible	600 x 400	400 x 400	300 x 300	300 x 300	200 x 200	200 x 200
	Kensington Lock	Yes	Yes	Yes	Yes	Yes	Yes
	Weight without Stand	99.6 lbs / 45.2 kg	69.2 lbs / 31.4 kg	47.4 lbs / 21.5 kg	30.9 lbs / 14.0 kg	25.8 lbs / 11.7 kg	19.4 lbs / 8.8 kg
	Weight with Stand	101.2 lbs / 45.9 kg	70.8 lbs / 32.1 kg	48.1 lbs / 21.8 kg	31.3 lbs / 14.2 kg	26.2 lbs / 11.9 kg	19.6 lbs / 8.9 kg
	Shipping Weight	128.8 lbs / 58.4 kg	91.5 lbs / 41.5 kg	61.3 lbs / 27.8 kg	41.9 lbs / 19.0 kg	32.2 lbs / 14.6 kg	24.3 lbs / 11.0 kg
	Size without Stand	75.9 x 43.5 x 2.4 in 1927 x 1104 x 59.9 mm	66.1 x 38.0 x 2.4 in 1678 x 964 x 59.9 mm	57.2 x 33.0 x 2.3 in 1454 x 838 x 57.7 mm	48.6 x 28.1 x 2.3 in 1235 x 715 x 57.5 mm	44.1 x 25.6 x 2.2 in 1121 x 651 x 57.1 mm	38.1 x 22.2 x 2.2 in 967 x 564 x 57.1 mm
	Size with Stand	75.9 x 45.9 x 14.3 in 1927 x 1167 x 362 mm	66.1 x 40.4 x 14.3 in 1678 x 1027 x 362 mm	57.2 x 35.4 x 10.7 in 1454 x 899 x 271 mm	48.6 x 30.4 x 9.1 in 1235 x 772 x 232 mm	44.1 x 27.9 x 9.1 in 1121 x 708 x 232 mm	38.1 x 24.5 x 8.5 in 967 x 622 x 216 mm
	Size in Shipping	83.3 x 47.8 x 9.0 in 2115 x 1215 x 228 mm	74.0 x 43.9 x 7.9 in 1880 x 1115 x 200 mm	63.0 x 38.2 x 6.8 in 1600 x 970 x 172 mm	53.5 x 31.9 x 6.4 in 1360 x 810 x 162 mm	47.8 x 30.5 x 6.0 in 1215 x 775 x 152 mm	41.5 x 26.0 x 5.6 in 1055 x 660 x 142 mm
	Bezel Width (L/R/T/B): On Bezel	15.9 / 15.9 / 15.9 / 19.9 mm	13.9 / 13.9 / 13.9 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm
	Bezel Width (L/R/T/B): Off Bezel	6.9 / 6.9 / 6.9 / 18.4 mm	7.9 / 7.9 / 7.9 / 18.4 mm	6.8 / 6.8 / 6.8 / 18.4 mm	6.9 / 6.9 / 6.9 / 18.4 mm	7.3 / 7.3 / 7.8 / 18.4 mm	6.9 / 6.9 / 6.9 / 18.4 mm
POWER	Power Supply (Voltage, Hz)	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz
	Max Power Consumption	339 W	228 W	174.4 W	165 W	144.8 W	119.6 W
	Typical Power Consumption	313 W	202 W	148.3 W	135.3 W	118.8 W	97.2 W
	Standby Power Consumption	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W
WARRANTY & OTHER	Warranty	3 Year Limited	3 Year Limited	3 Year Limited	3 Year Limited	3 Year Limited	3 Year Limited
	UPC	195174023747	195174023761	195174023785	195174023808	195174023822	195174023846
	Assembled In	Mexico	Mexico	Mexico	Mexico	Mexico	Mexico
	FCC (Regulatory)	Yes	Yes	Yes	Yes	Yes	Yes
	UL (Certification)	Yes	Yes	Yes	Yes	Yes	Yes
	EPEAT (Environmental)	Yes	Yes	Yes	Yes	Yes	Yes
	ISTA6 (Packaging)	Yes	Yes	Yes	Yes	Yes	Yes
	Accessories	Chromecast anti-theft cover (optional), RS232 9-pin to 3.5mm adapter, 2m power cable (attached), remote control (L-Con)		Chromecast anti-theft cover (optional), RS232 9-pin to 3.5mm adapter, 1.8m power cable (detached), remote control (L-Con)			

CONNECTIVITY -
86” / 75" / 65" / 55" / 50" / 43”

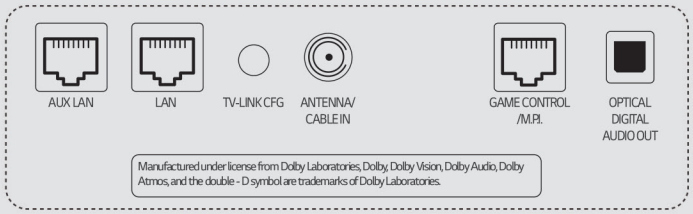
86”

Rear



75”

Rear

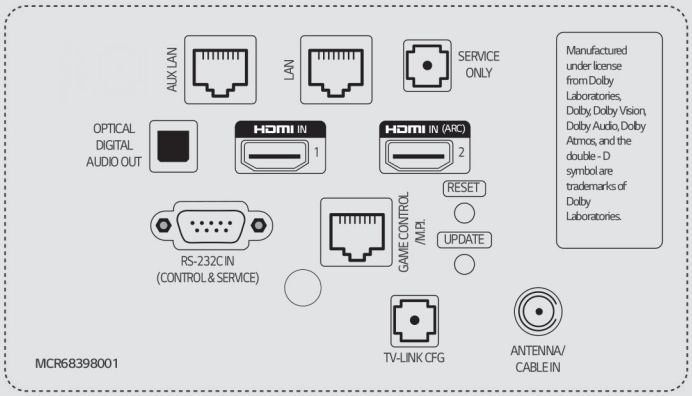


86”

Side

65” / 55” / 50” / 43”

Rear



75” / 65” / 55” / 50” / 43”

Side

HDMI HIGH-DEFINITION MULTIMEDIA INTERFACE

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LG Business Solutions

THANK YOU!

□ hite Lake Charter Township Low □oltage □ A□ Proposal – Public Safety □uilding

Re□uest For Proposal (RFP)

ATTN: Supervisor's Office - Trish Pergament
White Lake Township
7525 Highland Road
White Lake, MI 48383

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SECTION 1:

LETTER OF INTEREST

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073-1020

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383-2938

Subject: Letter of Interest for Low Voltage Installation & Audiovisual Procurement for Department of Public Safety

To Whom It May Concern:

Thank you very much for the opportunity to submit Metro Detroit Integrated Systems' (MDIS) proposal for the Low Voltage Installation and Audiovisual Work for White Lake Charter Township's new Department of Public Safety building.

This letter serves as an unequivocal expression of MDIS's interest in performing the low voltage and audiovisual work outlined in Exhibits C and D of the RFP for the new Department of Public Safety building. We are truly honored by the opportunity to contribute to a facility that will serve as the backbone for White Lake Charter Township's Police and Fire Departments. These brave and selfless first responders are the cornerstone of the community's safety and well-being, and it would be a privilege to support their critical work by playing a part in this project.

MDIS affirms that we have thoroughly reviewed the designs and specifications set forth in the RFP and that we understand the scope, complexity, and technical requirements of this project. MDIS is wholly confident in our ability to execute the requested services efficiently and effectively for White Lake Charter Township. MDIS is fully committed to meeting all the requirements outlined in the RFP and assures you of our competency, skills, and extensive experience in similar projects.

Furthermore, MDIS makes the following certifications:

1. All information provided in our submission is true, accurate, and complete.
2. MDIS understands and accepts that White Lake Charter Township reserves the right to select the solution that best fits its needs, which may include selecting multiple vendors, a non-lowest bidder, or no vendor at all.
3. MDIS warrants that it has no conflicts of interest that would impede White Lake Charter Township's impartial selection process.

4. MDIS will not charge White Lake Charter Township any sales tax, acknowledging the Township's tax-exempt status, and will rely on receiving a certificate of tax exemption upon award.
5. MDIS shall provide White Lake Charter Township a complete one-year warranty covering all systems, equipment, and workmanship from the date of occupancy. MDIS stands fully behind the quality of its design, equipment, installation, configuration, and training services.
6. MDIS understands that the final product and all related materials will become the sole property of White Lake Charter Township.
7. MDIS will provide the required Certificates of Insurance (COIs) in compliance with White Lake Charter Township's specifications for this project.
8. MDIS shall indemnify, defend, and hold harmless White Lake Charter Township, its officials, employees, and agents from all claims, damages, or expenses arising from MDIS's performance of work under the contract. This indemnification is primary and in addition to any required insurance coverage.
9. MDIS will secure a Performance Bond to White Lake Charter Township covering the full project value, as additional assurance for our timely and complete execution of the work.
10. MDIS certifies that it is in full compliance with the Iran Sanctions Act (Michigan Public Act 517 of 2012). We confirm that neither MDIS nor any of its parent companies, subsidiaries, or affiliates are in any way affiliated with Iran.
11. MDIS affirms that the proposed compensation outlined in our submission is sufficient for us to execute all phases of the required services.
12. MDIS confirms that our proposals will remain valid for a period of six months from the RFP submission deadline.

MDIS is ready to provide clarifications, revisions, or additional information as needed. Should you have any questions during the evaluation of our proposal, please do not hesitate to reach out, and we will happily assist you however we can.

Thank you for the privilege of submitting our proposal and for considering MDIS for this important project. We are enthusiastic about the opportunity to contribute to White Lake Charter Township's new Department of Public Safety building and look forward to the prospect of working together.

Warm regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals, Metro Detroit Integrated Systems, LLC

SECTION 2:

INTRODUCTION

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383

Subject: Introduction to Metro Detroit Integrated Systems, LLC

Metro Detroit Integrated Systems (MDIS) is a **full**-service low voltage and technology systems integration firm that is headquartered in Royal Oak, Michigan. MDIS specializes in the design, prewiring, installation, configuration, training, and support of advanced, turn-key low voltage systems for municipalities and other businesses.

Founded in 2013, for over 11 years, MDIS has partnered with municipalities and businesses to deliver reliable, high-quality solutions designed to meet both current and future needs. At MDIS, we are driven by a commitment to uncompromising excellence. Our philosophy is simple: do it right the first time. We take immense pride in our meticulous installations, utilizing only high-end, proven equipment to ensure every project meets the highest standards of reliability and performance. From keeping all wiring "*sexy*" and organized, to carefully planning for long-term serviceability and scalability, at MDIS we have a culture of going the extra mile to deliver systems that stand the test of time. These principles have made MDIS a trusted partner of over 1,000 municipal and business customers, and have earned us a reputation for being a strong, dependable, and forward-thinking low-voltage firm. When you work with MDIS, you're not just getting a system for today's needs—you're aligning yourself with a partner that's ready to grow and evolve with you.

MDIS's Core Services Include:

- **Data and Fiber Optic Cabling**: Designing and installing large-scale structured cabling systems for robust and efficient network infrastructures.
- **Audiovisual Systems**: Implementing advanced audio and video solutions for conference rooms, live broadcasting, multi-room audio setups, and digital signage.
- **Automation and Control**: Providing custom automation solutions that simplify the control of complex environments.
- **Paging and Intercom Systems**: Installing reliable communication systems for seamless information dissemination.
- **Wi-Fi Networking**: Designing and deploying wireless networks for consistent, high-performance connectivity.

- **Access Control and Video Intercom Systems**: Enhancing security with advanced access control measures and intercom installations.
- **CCTV Surveillance**: Offering high-definition analog and IP camera systems with DVR/NVR recording and remote monitoring capabilities.

At MDIS, we manage all our installations in-house, maintaining a high level of control over project execution. Our team is comprised of 20 experienced professionals who approach every project with precision and dedication, whether it's data cabling, fiber optic pathways, advanced security solutions, or audiovisual systems. At MDIS, we have a strong company culture based on a belief that every detail matters, and our work reflects our passion for delivering lasting solutions that help communities and organizations thrive.

We are genuinely excited about the opportunity to bring our expertise to White Lake Charter Township's Civic Center projects. We are confident that our approach, paired with our proven track record, will help create two state-of-the-art facilities that will serve your community for many years to come.

Warm regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals
Metro Detroit Integrated Systems, LLC

SECTION 3:

WORK PROGRAM

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383

Subject: Work Program for White Lake Department of Public Safety

To Whom It May Concern:

Metro Detroit Integrated Systems (MDIS) is pleased to present our comprehensive work program for the structured cabling, audiovisual, and paging system installation package at the White Lake Department of Public Safety building. This framework represents a tried-and-true approach that MDIS has successfully deployed in thousands of low voltage installations across government and commercial projects. We have tailored this plan specifically to align with the unique needs of your Department of Public Safety, ensuring a clear understanding of the timeframe, milestones, and phases to guide the project to completion.

Project Initiation (ASAP)

- Performance Bond Conversion: Upon notification of the award, MDIS will convert the bid bond into a performance bond.
- Kickoff Meetings: Conduct numerous internal and external meetings with stakeholders to align on project scope, deliverables, and expectations.
- Sales Orders and Project Creation: Initiate sales orders and establish project frameworks with design and coordination teams.

Planning Phase (2 Weeks)

- Design and Coordination: Develop connection diagrams, punch lists, rack drawings, labeling schemes, and IP schemes internally, and in collaboration with township representatives, architects, electrical contractors, and VC3.
- Site Walkthroughs: Conduct comprehensive walkthroughs to assess current conditions and finalize logistical plans.
- Permitting: Obtain all required permits prior to commencing work.

Procurement Phase (6-8 Weeks)

- Equipment Review and Ordering: Confirm compatibility and accuracy of all equipment, ensuring budget compliance and adherence to design specifications.

Standard items will be ordered within 1-2 weeks; specialized items may require up to 6-8 weeks.

- Warehousing and Staging: Stage equipment at MDIS's secure warehouse.

Rough-In Phase (3 Weeks)

- Site Preparation: Plan and install cabling pathways, cable trays, and equipment enclosures, coordinating closely with other trades to avoid conflicts.
- Grounding and Bonding: Install 6AWG grounding cables and jumpers to ensure optimal equipment performance and protection against power fluctuations.

Pre-Wiring and Termination (6-8 Weeks)

- Cabling & Pre-Wiring: Pull, label, and route low-voltage cables (e.g., data, control, power, bundled access control, speaker) from IDF/MDF areas to endpoints. MDIS will follow BICSI-compliant wiring standards and create a detailed cable ID scheme for maintenance and servicing.
- Cable Termination: Terminate Cat6 cabling in wall plates, keystone jacks, and patch panels, labeling both ends with vinyl ID tags for easy identification.
- Fiber Installation: Install, splice, and certify fiber optic cabling for speed, reliability, and scalability.

Equipment Installation (6-8 Weeks)

- Initial Equipment Installation: Install cable management systems, patch panels, wall plates, speakers, mounts, and equipment racks.
- Paging System: Install and configure the building-wide paging system, ensuring seamless integration with the communication infrastructure.
- Audiovisual Systems: Install high-value audiovisual equipment such as TVs, speakers, microphones, broadcasting cameras, and touch panels. Each device will be mounted, connected, and preliminarily tested.

Configuration and Testing (2 Weeks)

- System Configuration: Program and configure all systems to meet RFP requirements and ensure seamless integration.
- Testing: Conduct in-depth tests of all installed systems, verifying performance and quality. Any identified issues will be promptly addressed.

Certification, Documentation, and Handoff (2-3 Weeks)

- Certification Testing: Perform compliance testing for all cabling and systems, submitting results to secure a manufacturer lifetime cabling warranty.

- As-Built Documentation: Provide comprehensive as-built drawings, IP address logs, test results, and user manuals for client reference.
- User Training: Deliver training sessions to designated personnel so they can operate and maintain the systems confidently going forward.

MDIS Warranty (1 Year from Occupancy)

- Workmanship Guarantee: Provide a one-year warranty on all workmanship, with options for extended service agreements upon request.

We are enthusiastic about the opportunity to contribute to this project and are confident in our ability to deliver timely and quality results.

This timeline serves as a preliminary plan, providing a structured framework for how MDIS intends to execute the scope of work efficiently and effectively. While it reflects our current understanding of the project requirements, it is subject to adjustments based on construction progress, coordination with other trades, and unforeseen variables. MDIS remains committed to maintaining open communication with all stakeholders and will promptly address any necessary updates to ensure the project stays on track and aligned with White Lake Township's goals.

Should you require additional information or clarification, please do not hesitate to contact us.

Warm regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals
Metro Detroit Integrated Systems, LLC

SECTION 4:

CONSULTANT PERSONNEL

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383

Subject: Key Personnel List for Charter Township of White Lake Civic Center Projects

To Whom It May Concern:

Metro Detroit Integrated Systems (MDIS) is pleased to provide a comprehensive list of key personnel who will oversee and execute the scope of work for this project. Our team is structured to ensure a seamless blend of leadership and technical execution.

While the individuals listed below represent the managers and team leads for the project, additional tradespersons will work under their direct supervision to perform manual labor-intensive tasks, such as cabling, mounting, and equipment installation. All tradespersons are trained in-house to uphold MDIS's rigorous standards and are closely supervised to ensure the highest quality of work.

Administrative Team:

Eric William Hubers
- **Role**: President & CEO, Principal
- **Experience**: 15+ Years
- **Employment Status**: Full Time
- **Education**:
  - Oakland University
  - Media Dynamics (2009, Toronto): Comprehensive training in AV system design, integration, and installation
- **Certifications**:
  - CEDIA Level II Technology Professional
  - MECP Certified

Alexander Michael Hubers, Esq.
- **Role**: CFO & CLO, Principal
- **Experience**: 7+ Years in Accounting, Legal, and Business Strategy
- **Employment Status**: Full Time
- **Education**:
  - Doctor of Law (JD), University of Michigan Law School
  - Bachelor of Business Administration (BBA), Accounting and Finance, University of Michigan - Stephen M. Ross School of Business

Jason W. Hanse

- **Role**: Sales - Account Manager
- **Experience**: 6+ Years
- **Employment Status**: Full Time
- **Education**:
  - Bachelors in Business Management, Calvin College

Jeffrey H. Robinson

- **Role**: General Manager (Purchasing, HR, Warehouse)
- **Experience**: 10+ Years
- **Employment Status**: Full Time
- **Education**:
  - Western Michigan University

Karyl Duffy

- **Role**: Accounting (Invoicing, Accounts Receivable, & Bookkeeping)
- **Experience**: 29 Years
- **Employment Status**: Full Time
- **Education**:
  - Bachelor of Science in Business Accounting, University of Phoenix

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Operations Team:

Aaron Gates

- **Role**: Project Manager
- **Experience**: 9+ Years
- **Employment Status**: Full Time
- **Certifications**:
  - PMP Certification for Project Management
  - NetSuite Project Management Training
  - CEDIA Certified Level I
  - Panduit Certified Installer

Justin Van Hecker

- **Role**: Foreman
- **Experience**: 8+ Years
- **Employment Status**: Full Time
- **Certifications**:
  - Axis Certified Professional
  - CEDIA Certified Level I
  - BICSI Certified Installer
  - Panduit Certified Installer

Kevin Stansky

- **Role**: Sr. Lead AV Integrator/Programmer
- **Experience**: 6+ Years
- **Employment Status**: Full Time
- **Education**: Graduate of College for Creative Studies
- **Certifications**:
  - QSYS Certified Technician
  - Atlona Certified Technician

- Unifi Level III Advanced Training
- ClearOne DSP Certified
- Harman Audio Architect Specialist

Mason Waldrip

- **Role**: Sound Engineer / AV Integrator
- **Experience**: 2+ Years
- **Employment Status**: Full Time
- **Education**: BS in Audio Production & Technology, Michigan Technological University
- **Certifications**:
  - Dante Level 2 Certified
  - QSYS Certified Technician
  - Atlona Certified Technician
  - ClearOne DSP Certified
  - Harman Audio Architect Specialist
- **Expertise**: Sound system design, live sound, AutoCAD, and mixing

John Burnell III

- **Role**: Advanced Network Specialist & Support Specialist
- **Experience**: 5+ Years
- **Employment Status**: Full Time
- **Certifications**:
  - Unifi Level III Advanced Training
  - Avigilon Certified Professional
  - Axis Communications Certified Installer
  - ICT GX Certified Professional
  - Bosch Certified Professional

Blake Van Tiem

- **Role**: Installations Team Lead
- **Experience**: 4+ Years
- **Employment Status**: Full Time
- **Certifications**:
  - CEDIA Certified Level I
  - Axis Certified Professional

With the aforementioned team, MDIS will ensure that all tasks needed for the Charter Township of White Lake Civic Center Projects —both managerial and operations— are handled with precision and professionalism. Should you require any additional information or further clarification, please do not hesitate to reach out.

Warm regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals
Metro Detroit Integrated Systems, LLC

SECTION 5:

LIST OF CLIENTS

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383

Subject: List of Client References for Charter Township of White Lake

To Whom It May Concern:

Metro Detroit Integrated Systems (MDIS) is pleased to provide a list of client references. Below, you'll find a list of a few of our clients and examples of MDIS's recently completed and ongoing government/municipality projects, highlighting our expertise in delivering comparable services. These projects showcase our firm's capabilities in providing innovative low-voltage solutions, including structured cabling, security/access control, paging/sound masking, digital signage, and complex audio-visual systems. They also demonstrate our ability to meet the unique needs of government and municipal clients through meticulous planning, professionalism, and the integration of cutting-edge technology. Included is a list of clients, a brief scope of work detailing services performed, total revenue of the projects, and points of contact.

CITY OF HAMTRAMCK

Project Dollar Amount: $287,772.00
Project Completed: 2023
Services Provided: Multi-site CCTV, Access Control, Intercom, Jail Cell Monitoring, Cabling Projects, and Dispatch AV Installation.

MDIS has established itself as a reliable partner for the City of Hamtramck, offering a comprehensive range of services to enhance safety and security. In this project, MDIS installed over 70+ Axis Communications IP surveillance cameras at key locations such as Hamtramck City Hall, PD, Parks, Fire Department, and remote ballot box camera locations, ensuring thorough coverage and effective monitoring capabilities. The team also integrated a total of 43 Access Control Doors at multiple sites with cutting-edge IP access control and intercom solutions, enhancing security with secure entry systems, access control cards, and fobs. Additionally, MDIS successfully planned, subcontracted, and facilitated the installation of multiple motorized commercial gates, high-voltage electrical systems, concrete camera pole and pedestal installations, asphalt paving/repair, and directional boring, as required by our customers for these projects completed in 2023. This ensured the smooth facilitation of these challenging services on their behalf and seamless integration of these systems with our IP Access Control and

Card Readers/IP Intercom. Furthermore, MDIS executed installations of Cat 6 structured cabling projects to establish reliable infrastructure supporting various systems and operations. Demonstrating our commitment to meeting diverse needs, MDIS supplied and installed specialized equipment, including microphones, audio systems, on-air lights for broadcasting needs, and microphone toggle switch solutions for the Treasurer's Office. Furthermore, MDIS designed and implemented a unique jail cell monitoring alert system, incorporating Axis strobe lights, proximity sensors, and officer alerts to ensure regular inmate checks for their safety. These initiatives highlight MDIS's dedication to delivering innovative solutions tailored to the city's specific requirements.

Contact:

Max Garbarino J.D.
City Manager
City of Hamtramck
1st Floor, 3401 Evaline Street
Hamtramck, MI 48212
Desk: (313) 800-5233 extension 327
Cell: (313) 721-1494
Email: mgarbarino@hamtramckcity.com

CITY OF ECORSE

Project Dollar Amount: $269,014.77
Project Completed: 2022
Services Provided: Multi-Site CCTV & Access Control, Intercom, License Plate Capture Cameras, Cat 6 Cabling & WiFi Upgrades, and Dispatch AV Installation.

MDIS successfully completed several major projects with the City of Ecorse during the latter part of the COVID-19 pandemic, navigating health and hygiene protocols while finishing projects under budget and ahead of schedule. MDIS provided a range of IP solutions to enhance safety and surveillance, including installing Axis CCTV Surveillance and access control systems at key city sites like City Hall, Court, PD, Fire, Library, Water Pump Sites, Parks & more. MDIS also implemented surveillance at Dingell Park, installed CCTV at Bernard Popp Park, and provided additional Axis Communications equipment licenses. Additional cameras were installed at the Senior & Community Center, Public Library, and boat ramp along the Detroit River bordering Canada, improving surveillance coverage. These solutions used a mix of on-premise and remote servers, existing network and fiber backbone, and wireless bridging technology. MDIS also assisted with structured cabling, uplink, and rack overhauls at multiple MDF and IDF locations in the building, adhering to local codes and minimizing disruptions to operations by closely collaborating with city staff. These efforts highlight MDIS's commitment to delivering innovative solutions tailored to the City of Ecorse's specific needs.

Contact:

David Sapp
IT Director for the City of Ecorse
Phone: 313-436-4006
Email: dsapp@ecorsemi.gov
Address: 3869 W Jefferson Ave, Ecorse, MI 48229

CITY OF CENTER LINE

Project Dollar Amount: $210,769.90
Project Completed: 2022
Services Provided: Live Broadcasting and Distributed AV System in Courtroom, Citywide CCTV, Access Control, Intercom, Jail Cell Monitoring, Cabling Projects, and Dispatch AV Installation.

MDIS collaborated with the City of Center Line on significant courtroom AV upgrades and distributed IP video setup and control. We installed multiple HD PTZ video conferencing cameras, Shure wired/wireless microphones with Shure antenna distribution systems for local speech reinforcement, beamforming ceiling-mounted microphones, commercial confidence monitors for courtroom staff to review case information and camera angles, Barco USB-C wireless casting, and an Atlona IP automation system. These systems are CLEMIS-compliant, recording audio and video for review and record-keeping, with MDIS providing setup instructions and training. This project enabled the City to continue operations and court cases during COVID-19, all within budget.

Additionally, MDIS collaborated with the City's Police Chief to design a comprehensive RFP for a city-wide IP video surveillance system. Awarded to MDIS, this project involved installing dozens of strategically placed IP cameras, fisheye cameras, multisensory cameras, and LPR cameras, feeding back to the City's PD and City Hall from various locations. The installation required WAN internet, wireless bridging, and the city's fiber backbone, necessitating planning and coordination of various tasks. Despite not being the cheapest option, MDIS won the bid because the city believed MDIS best met their needs and provided the best value. We are honored to continue working with Center Line as their AV and security needs evolve.

Contact:
John Turpin
jturpin@centerline.gov
City of Center Line
7070 E. 10 Mile Rd.
Center Line, MI 48015
Direct: 586-718-8632
Office: 586-757-6800

CHARTER TOWNSHIP OF REDFORD

Project Dollar Amount: $634,078.85
Project Timeline: Started 2024 – Current (Work I*n Progress)*
Services Provided: Axis Communications Security Cameras, ICT Protege Access Control, Alarm Systems, Panduit Structured Cabling, Unifi Enterprise Network, Harman Distributed Audio, Sharp NEC Display Solutions, and QSYS Control/Automation Solutions.

MDIS is proud to have been awarded the 'entire low-voltage package' for the new $25 million Wellness and Community Center in Redford Township. This state-of-the-art facility will include basketball courts, an overhead mezzanine running track, gym areas, an auditorium, pools, and much more—becoming a key resource for the community.

MDIS is responsible for everything from the resale and warranty of all equipment to prewiring all low-voltage systems, physical installation, cabling, programming/configuration, and documentation. For this project, we're installing 52 Axis Communications IP security cameras, 38 ICT Protege access control doors with electrified hinges and motorized commercial mortise door handles, a building-wide QSYS paging system, 600+ Cat6/6A data drops with Panduit structured cabling, APC Lithium UPS battery backup solutions, and Chatsworth racks, cabinets, and cable tray systems.

Additionally, MDIS is installing 25 Sharp NEC 4K 500-NIT commercial 24/7 displays on a mix of fixed, tilt, and articulating mounts throughout the building. These will serve as security camera viewing monitors, digital signage screens, displays for cable TV in fitness areas, and BYOD (Bring Your Own Device) entertainment in community rooms. The administrative meeting room areas will be set up with Microsoft Teams video conferencing systems to improve communication.

In total, we're installing 86 commercial 70V speakers from JBL/Harman, including a variety of styles and colors to blend seamlessly with the building's decor—ceiling, pendant, and line array models. These will power distributed audio-visual systems integrated with QSYS control and automation solutions. The auditorium will feature dual motorized projector screens, projectors, multiple pairs of line array speaker systems, and a QSYS automation system to control the entire complex, with a divisible space setup managed through touchscreens.

All of this work, except for the alarm system, is being handled in-house by MDIS's skilled team. The alarm system for the building—covering panic buttons, motion sensors, and all doors and windows—is being installed by a trusted subcontractor, ensuring full compliance with the RFP.

The Charter Township of Redford has been a longstanding customer of MDIS. Over the past decade, we've successfully completed dozens of projects together at over 11 different sites. We've built a close, ongoing working relationship, consistently delivering innovative solutions that meet the township's unique needs.

Contact:
Adam D. Bonarek, MBA
Director of Operations and Finance
Charter Township of Redford
12121 Hemingway Street
Redford, MI 48239
Direct #: (313) 387-2769
Main #: (313) 387-2760
Email: abonarek@redfordtwp.com

*****MORE REFERENCES AVAILABLE UPON REQUEST*****

This list of clients and project examples exemplifies MDIS's unique skill sets and capabilities in successfully completing a wide array of CCTV, access control, data cabling, and complex audio-visual projects and solutions for municipal customers.

We are eager for the opportunity to contribute to the Charter Township of White Lake's Civic Center projects, and please reach out with any questions.

Warm Regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals
Metro Detroit Integrated Systems, LLC

SECTION 6:

TIMEFRAME FLOW CHART

Metro Detroit Integrated Systems, LLC (DBA: MDIS, LLC)
4921 Leafdale Blvd.
Royal Oak, MI 48073

Thursday, November 14, 2024

White Lake Charter Township
7525 Highland Road
White Lake, MI 48383

Subject: Timeframe Flow Chart for Charter Township of White Lake Department of Public Safety building

To Whom It May Concern:

Metro Detroit Integrated Systems (MDIS) is pleased to present a tentative timeframe flow chart for the White Lake Township's Department of Public Safety project.

This Gantt chart provides an estimated project timeline, assuming a start date at the start of Q2 in 2025. It aligns with the "Work Program" section provided earlier and serves as a visual representation of the project's phases and milestones.

This timeline is subject to change based on potential delays from other trades or adjustments in the overall construction schedule. MDIS remains highly flexible and adaptable to ensure project success. If acceleration is required, we can allocate additional personnel to expedite specific phases. Conversely, if delays occur, our team is ready to pause and adjust, maintaining alignment with the larger construction effort.

PLEASE REFERENCE THE GAANT CHART ON THE FOLLOWING PAGE

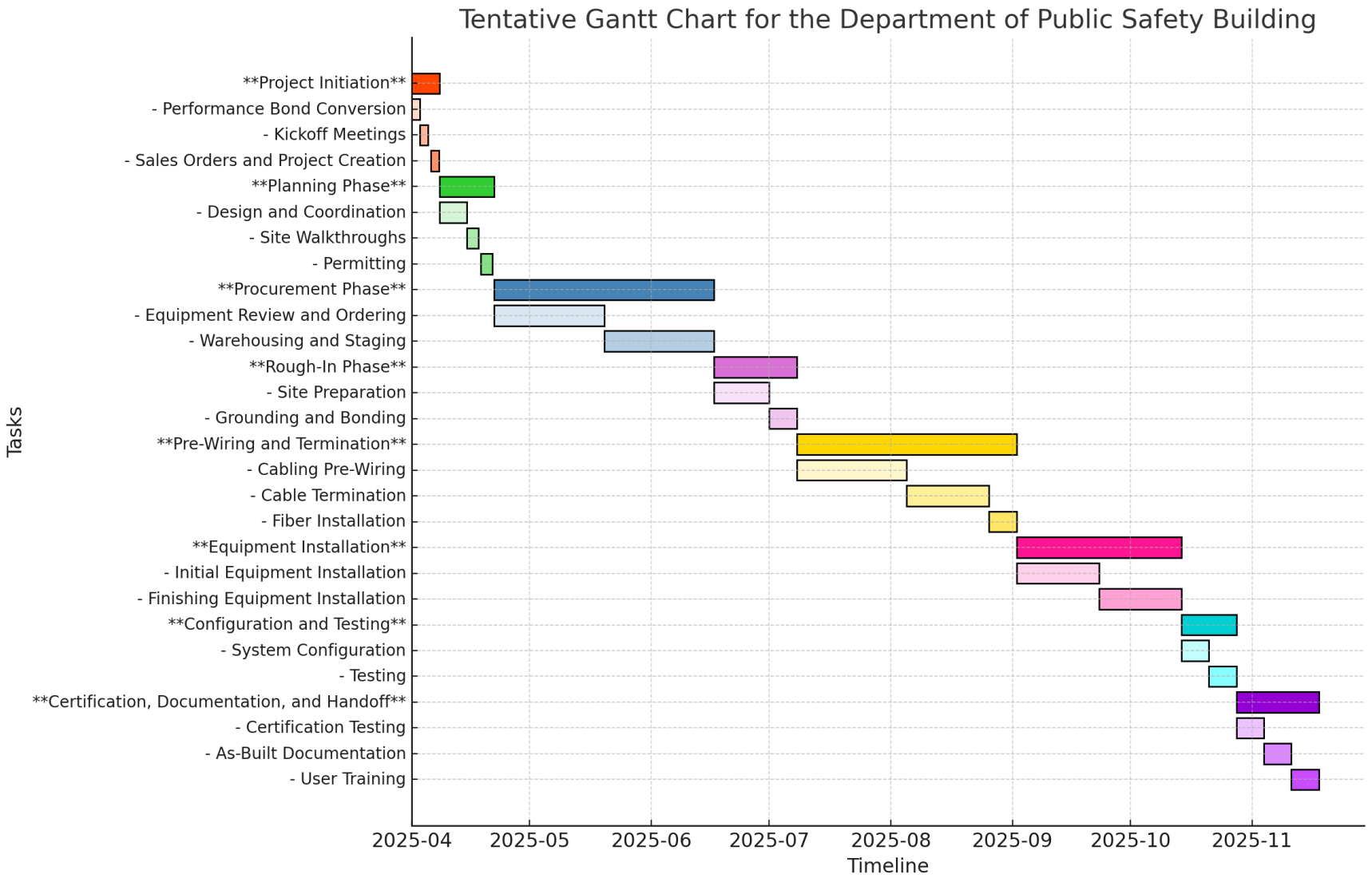
As experienced professionals, MDIS is well-versed in working within general contracting frameworks and ensuring smooth coordination with other trades. We take pride in delivering quality work that integrates seamlessly into larger construction timelines.

If you have any questions, need further information, or require any adjustments, please don't hesitate to contact us. We are always happy to assist and ensure the project's success.

Warm regards,

Eric W. Hubers & Alex M. Hubers

Eric William Hubers & Alexander Michael Hubers, Esq.
Principals
Metro Detroit Integrated Systems, LLC



1-Year Warranty: Effective from White Lake Township's occupancy of the space

SECTION 7:

ESTIMATED COSTS

We have prepared a quote for you

Low Voltage & AV Proposal – Public Safety Building

Quote # JWH002775 Version 1

Prepared for:

White Lake Township

P: (248) 289-8500 E: jhanse@mdisnow.com W: www.mdisnow.com

i) STRUCTURED CABLING (1) GENERAL OVERVIEW - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(2) PARTS TO INCLUDE - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
XG64212BS000L	Panduit - XG64212BS000L - Panduit FlexFusion Rack - Server Cabinet - 42U Rack Height - Black	$3,754.65	1	$3,754.65	True
R2P	Panduit 2-Post Rack, 45RU, #12-24 Threaded E-Rails, Aluminum, Black	$194.12	1	$194.12	True
	Data Network & Wireless Access Point Cabling (Category 6) (BLUE)				
7131800	GenSPEED 6 Cat 6 Cable, CMP, U/UTP, Blue	$356.25	75	$26,718.75	True
NK688MBU	Panduit Netkey UTP RJ45 Cat 6 Punchdown Keystone Jack Module Blue	$4.56	468	$2,134.08	True
UTP28SP1BU	Panduit Cat 6 28 AWG UTP Copper Patch Cord 1 ft Blue	$8.44	234	$1,974.96	True
UTP28SP10BU	Panduit Cat 6 28 AWG UTP Copper Patch Cord 10 ft Blue	$19.78	234	$4,628.52	True
	VoIP Phone Cabling (Category 6) (WHITE)				
7131801	GenSPEED Cat 6 Cable, CMP, U/UTP, White	$356.25	27	$9,618.75	True
NK688MIW	Panduit UTP RJ45 Cat 6 Keystone Punchdown Jack Module WH	$4.56	176	$802.56	True
UTP28SP1	Panduit NetKey Category 6 F/UTP Patch Network Cable - 1 ft Category 6 Network Cable White	$8.44	88	$742.72	True
UTP28SP10	Panduit NetKey Category 6 F/UTP Patch Network Cable - 10 ft Category 6 Network Cable White	$19.78	88	$1,740.64	True
	Fire Department Category 6 Cabling Sensors / Alerting System (YELLOW)				
7131802	GenSPEED 6 Cat 6 Cable, CMP, U/UTP, Yellow	$356.25	9	$3,206.25	True
NK688MYL	Panduit Network Connector - 1 Pack - 1 x RJ-45 Network Male - Yellow	$4.56	54	$246.24	True

(2) PARTS TO INCLUDE - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
UTP28SP1YL	Panduit Cat 6 28 AWG UTP Copper Patch Cord 1 ft Yellow	$8.44	54	$455.76	True
	CCTV & Access Control Cabling (Category 6) (ORANGE)				
7131805	GenSPEED 6 Cat 6 Cable, CMP, U/UTP, Orange	$356.25	18	$6,412.50	True
NK688MOR	Panduit Network Connector - 1 Pack - 1 x RJ-45 Network Male - Orange	$4.56	58	$264.48	True
UTP28SP1OR	Panduit Cat 6 28 AWG UTP Copper Patch Cord 1 ft Orange	$8.44	116	$979.04	True
258330804	Paige Electric 258330804 GameChanger CAT6 OSP Direct Burial Cable, 22/4 Solid BC, UTP, CM-LS, LSZH FR PE Jacket, 1000' (304.8m) Reel, Black	$1,111.19	2	$2,222.38	True
	Audiovisual Network Cabling (Category 6) (PURPLE)				
7131809	GenSPEED 6 Cat 6 Cable, CMP, U/UTP, Purple	$356.25	5	$1,781.25	True
NK688MVL	Panduit Network Connector - 1 Pack - 1 x RJ-45 Network Male - Violet	$4.56	30	$136.80	True
UTP28SP1VL	Panduit Cat 6 28 AWG UTP Copper Patch Cord 1 ft Violet	$8.44	15	$126.60	True
	MISC CABLING: CABLE FOR CARD READERS, DB, DC, COAXIAL, HDMI				
ZX-HDMICP06	Vanco HDMICP06 6ft. Certified Premium High Speed HDMI Cable	$16.64	52	$865.28	True
ZX-HDMICP30	Vanco HMDICP30 Certified Premium High Speed HMDI Cables	$68.74	26	$1,787.24	True
WPAQC369	Belden 22/6 Solid Bare Copper Conductor, Foil Shielded, with an Aquaseal tape and Overall Jacket	$646.38	21	$13,573.98	True
224GY1000	Belden 18/2 Stranded Bare Copper Conductors, Unshielded With An Overall Jacket	$222.35	12	$2,668.20	True
244GY1000	Belden 18/4 Stranded Bare Copper Conductors, Unshielded With An Overall Jacket	$412.85	11	$4,541.35	True
4112704/10	Commscope WHRL RG6 QD 1000 RG 6 Type Quad Shield Plenum Video Coaxial Cable, White Jacket, 1000 FT (305 m) reel	$519.36	22	$11,425.92	True

(2) PARTS TO INCLUDE - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
LMR-400	LMR-400 Flexible Low Loss Communications Coax Cable, Outdoor, Black PE Jacket	$1.76	350	$616.00	True
	Accessories (Faceplates, Organizers, Misc Keystones, Patch Panels)				
NK1FWHY	Panduit NetKey® Flush Mount Faceplate, 1-Port	$1.56	86	$134.16	True
NK2FWHY	Panduit NetKey® Flush Mount Faceplate, 2-Port	$1.62	72	$116.64	True
NK4FWHY	Panduit NetKey® Flush Mount Faceplate, 4-Port	$2.35	60	$141.00	True
WMPSE	Panduit PatchLink™ Horizontal Dual-Sided Manager, 1RU, 8.9 in. Depth	$85.36	17	$1,451.12	True
NKFP24Y	Panduit Modular Patch Panel - 24 - 24 Port(s) - 1U High	$49.21	17	$836.57	True
NKFIG	Panduit Coaxial Antenna Connector - 1 Pack - F Connector Antenna	$2.88	60	$172.80	True
NKHDMIWH	Panduit NetKey HDMI Audio/Video Cable - 1 Pack - 1 x HDMI (Type A) HDMI 1.4 Digital Audio/Video Female - 1 x HDMI	$38.25	52	$1,989.00	True
NKBMWH-X	NetKey Blank Keystone Module 1 Port White	$3.25	59	$191.75	True
100660172	Poly Pull Line with Orange Tracer 6500-Foot	$56.22	1	$56.22	True
P12E22G	Panduit™ G6 Monitored Switched PDU features (12) 5 -20R outlets. It is a 20 amp, 120 V, single phase PDU	$1,887.49	2	$3,774.98	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$112,483.26**

(2) PARTS TO INCLUDE - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Pre-wiring & Installation	**MDIS will be installing a Panduit GenSPEED Data Cabling system, that will come with a 25-Year Cabling Equipment Warranty.** MDIS will provide a comprehensive data cabling installation for the new Public Safety Building. Our team is committed to delivering a high-quality, organized, and efficient cabling solution. MDIS is going to color code our cabling, and keystones, based on the purpose of the wire.	$76,500.00	False

(2) PARTS TO INCLUDE - INSTALLATION

Category	Installation Description	Amount	Is Taxable
	• **Data & Access Points:** We will install blue Category 6 cabling for access points (234 cables). • **VoIP Phones:** White Category 6 cabling will be used for data connections (88 cables). • **Fire Department Sensors / Alarms:** Yellow Category 6 cabling will be utilized (27 cables), 18/2 AWG cabling will be White, Gray, or Black for (27 cables). • **CCTV & Access Control:** Orange Category 6 cabling will be used for security purposes (58 cables). "Gamechanger" burial-rated cabling will be installed for further distance runs. 18/4, 18/2, and 22/6 cabling will be ran to (100) locations. • **Audiovisual:** Purple/violet Category 6 cabling will be used for audiovisual connections that require local system data cabling. • **Low Voltage 18 AWG and similar:** White, Gray, and/or Black cabling will be utilized and standardized per system application. We will deploy color-coordinated keystones and appropriately sized wall-plates for a cohesive and professional appearance. Our installation will include Keystone Patch Panels and Panduit Horizontal Cable Organizers to ensure a well-organized and accessible setup. We plan to use Panduit Patch Panels for efficient cable management. MDIS will provide matching patch cables to complement our color scheme at device and patch panel sides. MDIS will use the Cable Trays, Ladder Racks, J-Hooks, and related pathway hardware to run all cabling in a clean, organized, and professional installation. ***MDIS is NOT responsible for providing Network Switches, Access Points, Gateways, Firewalls, Modems, Servers*** ***MDIS is NOT responsible for installing "Conduit Sweeps" or "Floor Cores" for data cabling.*** ***MDIS is NOT responsible for installing the underground pathway to the parking lot intercom / key-card readers, however we will coordinate with trenching company and advise on needs if applicable.*** ***VC3 will be responsible for providing ALL network switches for this project. VC3 will also be responsible for patching all drops into their designated switch ports. VC3 will also be responsible for configuring the new network and wireless access network for this facility. Any of this equipment or labor expected to be performed by MDIS outside of the described RFP / MDIS proposal will need to be approved in a Change Order**		

(2) PARTS TO INCLUDE - INSTALLATION

Category	Installation Description	Amount	Is Taxable
	before moving forward*		

Subtotal: **$76,500.00**

(12) CERTIFICATION TESTING - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
MISCELLANOUS	MISCELLANEOUS - Fluke DSX 5000 - Certification Tool Utilization (Copper & Fiber Modules)	$0.00	1	$0.00	True

Subtotal: **$0.00**

(3) APPROVED PARTS MANUFACTURERS - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(4) RELATED WORK - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(5) COLOR CODING FOR CABLING & KEYSTONES - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(6) DOCUMENTS - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(7) PATHWAYS FOR COMMUNICATIONS SYSTEMS - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
BCH32	Eaton BCH32 B-Line Series 2" CBL J-Hook with Retainer, Stainless Steel	$3.12	260	$811.20	True
BCH64	Eaton BCH64 B-Line Series Single Cable Hook, 4", Steel, Pre-Galvanized	$5.94	130	$772.20	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$1,583.40**

(7) PATHWAYS FOR COMMUNICATIONS SYSTEMS - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS technicians to install Eaton BCH32 B-Line Series 2" CBL J-Hook with Retainer, Stainless Steel throughout the facility, ensuring that all low voltage cabling ran by MDIS technicians is secured in a professional IT standard and cabling pathway hardware requirements by manufacturer. MDIS to install 4" Trunk pathway hardware. MDIS to install fire pathway kits where required by code.	$10,710.00	False

Subtotal: **$10,710.00**

(8) CABLE TRAY & CEILING/WALL SUPPORT FOR (MDF) SERVER ROOM AND (IDF) AREAS - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
10250-E12	Chatsworth Products Universal Cable Runway (BLACK)	$180.62	6	$1,083.72	True
12362-712	Chatsworth Products Cable Runway Center Support Kit (BLACK)	$67.51	8	$540.08	True

(8) CABLE TRAY & CEILING/WALL SUPPORT FOR (MDF) SERVER ROOM AND (IDF) AREAS - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
11746-712	Chatsworth Products Triangular Support Bracket for cable runway (BLACK)	$64.66	10	$646.60	True
EZDP44S2	Fire-rated Pathway Kit, Includes Device, Wall Plates And Labels	$474.89	10	$4,748.90	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$7,019.30**

(8) CABLE TRAY & CEILING/WALL SUPPORT FOR (MDF) SERVER ROOM AND (IDF) AREAS - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS to install cable runway in the MDF and related indicated areas. MDIS to install related supporting hardware for the cable pathways and install fire pathway kits where required by code.	$4,590.00	False

Subtotal: **$4,590.00**

(9) GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
GB2B0312TPI-1	Panduit Grounding Busbar, Copper	$168.74	2	$337.48	True
RGRKCBNJY	Panduit Rack Mounted Grounding Busbar	$308.68	4	$1,234.72	True
ACGK	Panduit Structured Ground Armored Cable Grounding Kit	$15.99	2	$31.98	True
GPC2-1-Q	Panduit Bronze Pipe Clamp	$12.50	2	$25.00	True
MISCELLANEOUS	MISCELLANEOUS (Bonding Accessories, Antioxidant Joint Compound, Pedestal Clams, AWG #6 Green Wire)	$750.00	1	$750.00	False

Subtotal: **$2,379.18**

(9) GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	Conductor connections to the TMGB or TGB shall be made with two-hole bolt-on, double irreversible compression lugs sized to fit the busbar and the conductors. Each lug shall be attached with stainless steel hardware after preparing the bond according to manufacturer recommendations and treating the bonding surface on the busbar with antioxidant to help prevent corrosion at the bond. The wall-mount busbar shall be bonded to ground as part of the overall Telecommunications Bonding and Grounding System. MDIS to connect the TMGB to the building main ground using minimum of a #4 or larger insulated copper wire per the electrical diagram riser. MDIS to connect the TGB to the TER TMGB with a minimum of a #6 or larger insulated copper wire and to the electrical panel serving the room per the electrical diagram riser. MDIS will ground the cable runway to the TMGB using #6 or larger insulated copper wire. Abrade the finish on the cable runway where the ground wire is attached, and bond all cable runway junctions.	$3,825.00	False

Subtotal: **$3,825.00**

(10) QUALITY ASSURANCE - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(11) LABELING - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

(12) CERTIFICATION TESTING - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Certification Testing	MDIS technicians to certify all strands of Single Mode OS2 cabling using a Fluke Networks Fiber Cabling Certification device and MDIS will provide a detailed certification report provided to the customer. MDIS will provide 25-year warranty on the Corning Fiber-optic cabling to customer. MDIS to perform Optical Time Domain Reflectometer (OTDR) testing on all installed fibers to verify continuity, signal loss, and overall performance. MDIS to provide detailed as-built drawings, test results, and maintenance documentation in PDF format upon completion of the installation.	$3,825.00	False

Subtotal: **$3,825.00**

(13) CABLING WARRANTY - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (1) Lower Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(a) EXERCISE 103				
CE-65UR340C9	LG Pro 65UR340C9UD 65" UR340C Series Ultra HD Commercial TV	$1,183.74	3	$3,551.22	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	3	$187.47	True
WT-WB200CE4	WattBox WB-200-CE-4 Power Conditioner with Coax and Ethernet Protection, 4-Outlet, 4' Cord	$86.24	3	$258.72	True
	(b) BRIEFING 112				
CE-75UR340C9	LG Pro 75UR340C9UD 75" 3840 2160 Ultra HD Commercial Lite LED backlit LCD TV	$1,679.99	2	$3,359.98	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	2	$142.48	True
ClickShare C-5	Barco ClickShare C-5 Gen 2 Wireless Conferencing System	$894.74	1	$894.74	True

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (1) Lower Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	2	$40.12	True
KR-VS211X	Kramer 20-80549090 VS-211X 2x1 HDMI Switcher, 4K60 4:4:4	$319.05	1	$319.05	True
ZX-HD4KAE	Vanco HD4KAE 4K HMDI Audio Extractor, 18Gbps, HDCP 2.2 Compliant	$154.40	1	$154.40	True
JF-CSMA2120	JBL Professional CSMA 2120 8-Input, 2-Output Commercial Mixer-Amplifier 120Wx1 at 70V	$841.24	1	$841.24	True
JF-C26CTWH	JBL Professional Control 26CT 6-1/2" Ceiling Loudspeaker Transducer Assembly, Pair, White	$373.80	2	$747.60	True
JF-CSRVWHT	JBL Professional CSR-V Wall Mounted Volume Controller for CSM Mixers, White	$77.49	1	$77.49	True
FU-M8LX	Furman M-8LX Merit Series Power Conditioner and Filter with Lights, 15A 130V, Outlets	$110.05	1	$110.05	True
RK-ERW12U	12 Unit Wall Mount Equipment Rack, Assembled	$374.99	1	$374.99	True
224GY1000	Belden 18/2 Stranded Bare Copper Conductors, Unshielded With An Overall Jacket	$222.35	12	$2,668.20	True
NO-UD2	Middle Atlantic U2 Series Utility Rack Shelf, 14.75" Deep, RU, Black	$69.99	1	$69.99	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$13,797.74**

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (1) Lower Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
(a) EXERCISE 103			
Installation	MDIS to install (3) 65" Commercially-rated TV's on their indicated mounting hardware.	$1,530.00	False
(b) BRIEFING 112			

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (1) Lower Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS to install (2) 75" Commercially-rated TV's on their indicated mounting hardware. MDIS to install a wireless Barco Clickshare for content casting. MDIS to install a Kramer autoswitcher for the front TV second input source. MDIS to install a JBL commercial Mixer/amplifier, volume control & (2) pairs of JBL speakers. MDIS to install a power conditioner, all related cabling, and a 12U rack to house the control equipment.	$4,590.00	False

Subtotal: **$6,120.00**

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (2) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(a) PUBLIC LOBBY 241				
CE-65UH5JH	LG Pro 65UH5J-H 65" High Haze UHD Standard Signage	$2,016.24	2	$4,032.48	True
BS-LS445	BrightSign LS445 4K Player	$401.24	2	$802.48	True
BS-SDHC-16C10-1	BrightSign Approved Micro SD Cards, 16GB	$34.72	2	$69.44	True
NX-TM2460	Medium Tilt Low-Profile Mount for 24"-60" Displays	$62.49	2	$124.98	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	2	$40.12	True
	(b) COMMUNITY ROOM 242				
61-VPLPHZ61	Sony Pro VPLPHZ61 LCD Laser Projector 7000 lm, WUXGA Resolution	$3,191.24	2	$6,382.48	True
CJ-KITES006W	Chief KITES006W Projector Ceiling Mount Kit, Includes RPMAUW, CMS440 and CMS006W, White	$384.04	2	$768.08	True
HI-84326LS	Da-Lite 84326LS Advantage, 106" Motorized Projector Screen - Flush Mount	$2,662.49	2	$5,324.98	True
MISCELLANEOUS	Freight Cost	$312.50	1	$312.50	True
CE-65UR340C9	LG Pro 65UR340C9UD 65" UR340C Series Ultra HD Commercial TV	$1,183.74	2	$2,367.48	True

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (2) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
NX-TL4290	Commercial Wall Mount for TV, Flat Panel Display - Black - Height Adjustable - 30" to 90" Screen Support - 175 lb Load Capacity - 100 x 100, 700 x 400 - VESA Mount Compatible	$71.24	2	$142.48	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	4	$80.24	True
9L-ATVGWHW10	Atlona Hardware Gateway for AV Control and Management plus Room Scheduling	$1,875.16	1	$1,875.16	True
9L-ATOMEPS62	Atlona AT-OME-PS62 6x2 Matrix Presentation Switcher with USB	$3,312.89	1	$3,312.89	True
9L-ATOMETX11	Atlona AT-OME-TX11-WP HDBaseT Transmitter for HDMI and Power	$316.69	2	$633.38	True
9L-ATOMERX11	Atlona AT-OME-RX11 HDBaseT Receiver for HDMI with Audio	$506.69	1	$506.69	True
9L-ATVTP100W	Atlona AT-VTP-1000VL-WH Velocity System 10" VESA Mount Touch Panel with LED Includes Wall Mount Kit	$1,589.99	1	$1,589.99	True
9L-VCCRLYKIT	Atlona IP to Relay Sensor Signal Converter for Velocity Control System	$206.24	2	$412.48	True
C0-91032008	ClearOne CONVERGE Pro 48VT Professional Audio DSP Platform	$2,912.68	1	$2,912.68	True
ZX-EVSP4K12	Evolution EVSP4K12 Premium 4K HMDI 1x2 Splitter	$118.09	2	$236.18	True
LD-CNNCT164	LEA Professional CONNECT 164 Network Connect 19" 4-Channel Amplifier, 160W per Channel	$1,377.50	1	$1,377.50	True
JF-C26CTWH	JBL Professional Control 26CT 6-1/2" Ceiling Loudspeaker Transducer Assembly, Pair, White	$373.80	6	$2,242.80	True
RA-AP42OM2A	Audix AP42OM2A R42 Wireless System with Handheld Mics and OM2 Capsules	$852.49	2	$1,704.98	True
RA-ADS48	Audix ADS48 UHF Antenna Distribution System with Rack Mount	$474.99	1	$474.99	True
RL-TXTPR3A	RDL TX Series Active Three Pair Receiver	$199.99	1	$199.99	True
RL-DBT1A	RDL D-BT1A Wall-Mounted Bluetooth Audio Format, Interface, White	$358.74	1	$358.74	True

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (2) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
RL-TXTP4PW	RDL TX-TP4PW TX Series Power Inserter Signal Breakout with RJ45 Jacks for Twisted Pair Senders and Receivers	$102.81	1	$102.81	True
FU-M8LX	Furman M-8LX Merit Series Power Conditioner and Filter with Lights, 15A 130V, Outlets	$110.05	1	$110.05	True
ClickShare C-5	Barco ClickShare C-5 Gen 2 Wireless Conferencing System	$894.74	1	$894.74	True
RK-ER18U	18 Unit Equipment Rack, Assembled - For Networking & AV- 18U Rack Height - Floor Standing Enclosed Cabinet - Tempered Glass, Steel - 600 lb Maximum Weight Capacity	$624.99	1	$624.99	True
WP-4346AFBK1	West Penn 4346AFBK1000 23/4 AWG Shielded CAT6A Cable, 1000', Black	$443.74	1	$443.74	True
NO-UD3	Middle Atlantic UD3 UD Series Utility Rack Drawer, RU, Black	$156.25	1	$156.25	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	4	$80.24	True
W9-GSM4230P0	Netgear GSM4230P M4250-26G4F-PoE+ AV Line 24x1G PoE+ 300W 2x1G and 4xSFP Managed Switch	$1,180.11	1	$1,180.11	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False
	(c) DISPATCH 250				
QZ-QB65C	Samsung QB65C 65" QBC Series 4K Signage Display	$1,263.65	10	$12,636.50	True
QP-DSVW765LQ	Peerless-AV DS-VW765-LQR SmartMount Full-Service Video Wall Mount with Quick Release, Landscape for 46" to 65" Displays	$478.74	10	$4,787.40	True
ZX-EVOIPRX1	Evolution EVOIPRX1 EVO-IP Receiver	$532.94	10	$5,329.40	True
ZX-EVOIPTX1	Evolution EVOIPTX1 4K EVO-IP Transmitter	$540.70	12	$6,488.40	True
WT-150IPW1B2	WattBox WB-150-IPW-1B-2 150 Series IP Power Outlets (Ultra Compact), 1 Controlled Bank, 2 Outlets (Wi-Fi or Wired)	$165.59	5	$827.95	True
W9-GSM4230P0	Netgear GSM4230P M4250-26G4F-PoE+ AV Line 24x1G PoE+ 300W 2x1G and 4xSFP Managed Switch	$1,180.11	2	$2,360.22	True

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (2) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
ZX-EVOIPCTL1	Evolution EVOIPCTL1 EVO-IP Control Box, HDMI Output, USB Ports, Upscale to 4K at 30Hz or Downscale to 720p, Video Wall Mode Supports up to 25 Displays	$406.89	1	$406.89	True
	DISPATCH PC SOFTWARE DISTRIBUTION TO (3) PD DISPLAYS				
ZX-EVOIPRX1	Evolution EVOIPRX1 EVO-IP Receiver	$532.94	3	$1,598.82	True
ZX-EVOIPTX1	Evolution EVOIPTX1 4K EVO-IP Transmitter	$540.70	1	$540.70	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$76,855.40**

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (2) Upper Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
(a) PUBLIC LOBBY 241			
Installation	In (a) PUBLIC LOBBY 241, MDIS to install (3) 65" Commercially-rated TV's on their indicated mounting hardware. MDIS to install and configure the (2) BrightSign Digital Media Players. MDIS to install the surge protectors.	$3,060.00	False
(b) COMMUNITY ROOM 242			

ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (2) Upper Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	In (b) COMMUNITY ROOM 242, MDIS will install (2) Sony Professional 7000 Lumen projectors with (2) 100” motorized Da-Lite Projector Screens. MDIS to install (2) 65” LG Professional confidence monitors in the back of the room. MDIS to install all components on their mounting hardware and connect related cabling. MDIS to install an Atlona Control Automation system to turn the system on/off, select sources, control volume, and start room scenarios. MDIS to install ClearOne DSP for audio routing. MDIS to install LEA amplifier to power the (12) JBL ceiling speakers. MDIS to install an Audix Wireless Microphone system. MDIS to install Bluetooth wall-plates and related hardware. MDIS to install all low voltage cabling, A/V switch, power conditioner, and 18U rack enclosures as listed for this room. MDIS to configure room scenarios, and Atlona control equipment for this space. MDIS to provide training for the room controls and functionality.	$19,125.00	False
(c) DISPATCH 250			
Installation	In (c) DISPATCH 250, MDIS will install (10) Samsung QB65C 65” 4K Displays in a 5x2 Video wall orientation with Peerless Full-service mounting hardware. MDIS to install Vanco Evolution MoIP system to allow for flexible content capability onto all (10) installed TV’s. MDIS to install control interface, surge protection, A/V network switch, and connect all related cabling into this system. MDIS to provide all configuration, and training for this room.	$7,650.00	False

Subtotal: **$29,835.00**

iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(a) PATROL SGTS 115				
CE-65UR340C9	LG Pro 65UR340C9UD 65" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True

iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(b) PATROL LT 117				
CE-65UR340C9	LG Pro 65UR340C9UD 65" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
	(c) HUB ZONE 123				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$941.24	1	$941.24	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$3,582.62**

iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
(a) PATROL SGTS 115			
Installation	MDIS to install (1) 65" Commercially-rated TV on its indicated mounting hardware. MDIS to install the surge protector and connect cabling to show an internally generated dashboard from DISPATCH ROOM 250	$382.50	False
(b) PATROL LT 117			
Installation	MDIS to install (1) 65" Commercially-rated TV on its indicated mounting hardware. MDIS to install the surge protector and connect HDMI cable to allow for local source of lower HDMI cable.	$382.50	False
(c) HUB ZONE 123			

iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS to install (1) 55" Commercially-rated TV on its indicated mounting hardware. MDIS to install the surge protector and connect HDMI cable to allow for local source of lower HDMI cable. MDIS to also connect cabling to show an internally generated dashboard from DISPATCH ROOM 25	$382.50	False

Subtotal: **$1,147.50**

(2) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(a) APPARATUS BAY 200 - NOT APPLICABLE **(b) FIRE CHIEF 212 - NOT APPLICABLE**				
	(c) FIRE MARSHALL 213 - NOT APPLICABLE **(d) ADMIN 214 - NOT APPLICABLE**				
	(e) ADMIN HALLWAY 215 - NOT APPLICABLE **(f) CONFERENCE ROOM 219 - NOT APPLICABLE** **(g) SLEEP ROOM 221 - NOT APPLICABLE**				
	(h) SLEEP ROOM 222 - NOT APPLICABLE **(i) SLEEP ROOM 223 - NOT APPLICABLE**				
	(j) SLEEP ROOM 224 - NOT APPLICABLE **(k) WATCH ROOM 230**				
KR-VM2HXLVM2	Kramer 90-70745190 VM-2HXL 1:2 HDMI Distribution Amplifier	$203.36	1	$203.36	True
	(l) SHIFT COMMANDER OFFICE 231 - NOT APPLICABLE **(m) COMMANDER SLEEP ROOM 232 - NOT APPLICABLE** **(n) KITCHEN/DAY ROOM 234 - NOT APPLICABLE**				

(2) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(o) ADMIN LT 248				
CE-55UR340C9	LG Pro 55UR340C9UD 55" UR340C Series Ultra HD Commercial TV	$941.24	1	$941.24	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
	(p) CONFERENCE ROOM 256				
CE-65UR340C9	LG Pro 65UR340C9UD 65" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
ClickShare C-5	Barco ClickShare C-5 Gen 2 Wireless Conferencing System	$894.74	1	$894.74	True
	(q) FUTURE OFFICER 260 - NOT APPLICABLE **(r) SOCIAL WORKER 264 - NOT APPLICABLE** **(s) FUTURE OFFICER 266 - NOT APPLICABLE**				
	(t) POLICE ADMIN 265				
CE-75UR340C9	LG Pro 75UR340C9UD 75" 3840 2160 Ultra HD Commercial Lite LED backlit LCD TV	$1,679.99	1	$1,679.99	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
	(u) POLICE CHIEF 267				
CE-65UR340C9	LG Pro 65UR340C9UD 65" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
	(v) SRO 271 - NOT APPLICABLE **(w) DETECTIVE 272 - NOT APPLICABLE**				

(2) Upper Level - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	(y) DETECTIVE LT 274 - NOT APPLICABLE				
	(x) DETECTIVE 273 - NOT APPLICABLE **(y) DETECTIVE LT 274**				
CE-65UR340C9	LG Pro 65UR340C9UD 65" UR340C Series Ultra HD Commercial TV	$1,183.74	1	$1,183.74	True
NX-TL4290	Large Tilt Mount for 42"-90" Displays, 175 lb UL/ULC	$71.24	1	$71.24	True
WT-WB2001WT	WattBox WB-200-1WT 1-Outlet Surge Protector Wall Tap	$20.06	1	$20.06	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$7,727.05**

(2) Upper Level - Installation

Category	Installation Description	Amount	Is Taxable
(a) APPARATUS BAY 200 - NOT APPLICABLE **(b) FIRE CHIEF 212 - NOT APPLICABLE**			
(c) FIRE MARSHALL 213 - NOT APPLICABLE **(d) ADMIN 214 - NOT APPLICABLE**			
(e) ADMIN HALLWAY 215 - NOT APPLICABLE			

(2) Upper Level - Installation

Category	Installation Description	Amount	Is Taxable
(f) CONFERENCE ROOM 219 - NOT APPLICABLE			
(g) SLEEP ROOM 221 - NOT APPLICABLE			
(h) SLEEP ROOM 222 - NOT APPLICABLE			
(i) SLEEP ROOM 223 - NOT APPLICABLE			
(j) SLEEP ROOM 224 - NOT APPLICABLE			
(k) WATCH ROOM 230			
Installation	MDIS to install and connect HDMI cabling to a Kramer 1x2 HDMI splitter that will connect to the (2) TV's.	$170.00	False
(l) SHIFT COMMANDER OFFICE 231 - NOT APPLICABLE			
(m) COMMANDER SLEEP ROOM 232 - NOT APPLICABLE			

(2) Upper Level - Installation

Category	Installation Description	Amount	Is Taxable
(n) KITCHEN/DAY ROOM 234 - NOT APPLICABLE **(o) ADMIN LT 248 - NOT APPLICABLE** **(p) CONFERENCE ROOM 256**			
Installation	MDIS to install surge protector and install a Barco Clickshare C-5.	$170.00	False
(q) FUTURE OFFICER 260 - NOT APPLICABLE			
(r) SOCIAL WORKER 264 - NOT APPLICABLE			
(s) FUTURE OFFICER 266 - NOT APPLICABLE **(t) POLICE ADMIN 265**			
Installation	MDIS to install (1) 75” LG Commercial TV on the Tilt mount. MDIS to install surge protector.	$382.50	False
(u) POLICE CHIEF 267			

(2) Upper Level - Installation

Category	Installation Description	Amount	Is Taxable
Installation	MDIS to install (1) LG 65” Commercial TV on the Tilt mount. MDIS to install surge protector.	$382.50	False
(v) SRO 271 - NOT APPLICABLE **(w) DETECTIVE 272 - NOT APPLICABLE** **(y) DETECTIVE LT 274 - NOT APPLICABLE** **(x) DETECTIVE 273 - NOT APPLICABLE** **(y) DETECTIVE LT 274**			
Installation	MDIS to install (1) LG 65” Commercial TV on the Tilt mount. MDIS to install surge protector.	$382.50	False

Subtotal: **$1,487.50**

iv) POLICE DEPARTMENT PAGING SOLUTION (a) PAGING SYSTEM - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
NQ-SYSCTRL	Nyquist IP Paging System - System Controller - H/W Only	$1,230.42	1	$1,230.42	True
NQ-RMK03	Bogen NQ-RMK03 Nyquist 1U/2U Rack Mount Kit Type -3 Single MMPA, SYSCTRL	$49.30	1	$49.30	True
BO-NQT1100	Bogen NQ-T1100 Nyquist Ip Paging System - Admin IP Phone - Color Touch Display	$562.50	1	$562.50	True

iv) POLICE DEPARTMENT PAGING SOLUTION (a) PAGING SYSTEM - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
NQ-C4000-B2	Bogen NQ-C4000-B2 Nyquist C4000 Series System Software License, Bundle 2, 9 Zones, 10 CCLs, and 3-Years Software Updates (Continued updates beyond 3 -Years is sold separate)	$2,510.39	1	$2,510.39	True
BO-NQC4PBXI	Bogen NQ-C4000PBXI Nyquist C4000 Series PBX Integration Services, Tech Support Assist with SIP, FXO, FXS Integrations	$418.75	1	$418.75	True
BO-NQPA120	Bogen NQ-PA120 Nyquist 1-Channel Public Address Mixer Amplifiers, 120W	$917.49	1	$917.49	True
BO-NQRMK03	Bogen Nyquist 1U-2U Rack Mount Kit Type-3	$49.30	1	$49.30	True
BO-WB1EZ	Bogen WB1EZ Easy Design Wall Baffle Speaker	$61.50	8	$492.00	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$6,230.15**

iv) POLICE DEPARTMENT PAGING SOLUTION (a) PAGING SYSTEM - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Installation	MDIS to install a complete commercial paging system. The primary purpose of this system is to allow for the police department or other verified users to be able to page, play presets, and tie into emergency alert systems over the (8) wall-baffle speakers. MDIS will supply control equipment, signal generation & processing, amplification, speakers, cabling, software, as well as labor for system installation & configuration. The system will be driven by a 70 Volt amplifier; exact speaker placement will match the locations on the schematic drawing as marked. The control equipment will be installed within the designated IT room. MDIS to connect networkable equipment to MSP provided separate VLAN. All cabling and devices in plenum spaces will meet code requirements. All equipment will be installed in compliance with the manufacturer's recommendations. MDIS will provide training to White Lake Township staff on how to control the system and connect to it.	$7,650.00	False

Subtotal: **$7,650.00**

b) BUILDING-TO-BUILDING FIBER OPTIC INFRASTRUCTURE - EQUIPMENT

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
012ESP-T4101DA3	Corning 12F, OS2, Loose Tube, Plenum, Interlock Armor, Indoor/Outdoor, Gel-Free, Black Jacket	$5.85	1000	$5,850.00	True
FWME4	Panduit Opticom Wall Mount Fiber Enclosure Black 4 Ports	$177.26	2	$354.52	True
FHS9N-12-10P	Panduit HD Flex LC Splice Cassette OS2 12 Fiber Discrete Pigtail	$590.85	6	$3,545.10	True
FLEX1U12	Panduit HD Flex Fiber Enclosure 1 RU 12 Ports Black	$776.19	2	$1,552.38	True
F92ERLNLNSNM001	Panduit Opti-Core Fiber Patchcord, OS1/2 2-Fiber, 1.6mm Jacket, Riser, LC-LC Duplex, Yellow, 1 Meters	$52.71	24	$1,265.04	True
MISCELLANEOUS	MISCELLANEOUS	$0.00	1	$0.00	False

Subtotal: **$12,567.04**

b) BUILDING-TO-BUILDING FIBER OPTIC INFRASTRUCTURE - INSTALLATION

Category	Installation Description	Amount	Is Taxable
Pre-wiring, Installation & Fusion Splicing	Create and pre-wire a fiber optic cabling pathway from the Main Distribution Frame (MDF) in the White Lake Township Hall, to the MDF in the White Lake Public Safety Building. MDIS is to utilize the 4" conduit pathway underground that is to be installed by the electrical contractor. There is to be a fiber break-out box on the interior of each building as indicated on the low voltage drawings. MDIS to pre-wire Corning 12-strand Plenum Indoor/Outdoor Armored Fiber. MDIS to install Panduit Break-out boxes, Panduit Fiber Cassettes, Panduit 1U Fiber Enclosures, and related fiber patch cables to connect the indicated buildings together. MDIS technicians will ensure that a service coil is left at each fusion splicing point.	$5,355.00	False

Subtotal: **$5,355.00**

c) WARRANTY AND DISCLAIMER FOR SYSTEM DESIGN WORK - NOT APPLICABLE

Part Number	Product Description	Unit Price	Quantity	Amount	Is Taxable
	NOT APPLICABLE				

PUBLIC SAFETY BOND COST

Category	Installation Description	Amount	Is Taxable
PUBLIC SAFETY BOND COST	**PUBLIC SAFETY BOND COST - 3%**	$11,858.1042	False

Subtotal: **$11,858.10**

MDIS INSTALLATION WARRANTY

Category	Installation Description	Amount	Is Taxable
MDIS_ESP_12MO	**MDIS Extended Service Plan** This MDIS Extended Service Plan specifically addresses issues directly tied to this Sales Order, ensuring that all necessary MDIS Service Labor charges are covered. Please note that it does not include the cost of replacement equipment, typically protected by separate factory warranties. However, it provides full coverage for all MDIS Labor required for processes such as RMA facilitations/exchanges of equipment, troubleshooting, and the installation of replacement hardware or equipment. ***Please inquire with your sales representative regarding the potential to extend this MDIS ESP up to 60 Months, allowing you to extend your MDIS Service Labor coverage on this Sales Order for an even longer period.***	$0.00	False

P: (248) 289-8500 E: jhanse@mdisnow.com W: www.mdisnow.com

Low Voltage & AV Proposal – Public Safety Building

Prepared by:

Metro Detroit Integrated Systems

Jason W. Hanse
(248) 565-3234
Fax (248) 289-8500
jhanse@mdisnow.com

Prepared for:

White Lake Township

7525 Highland Road
White Lake, MI 48383
Patricia Pergament
(248) 698-3300
ppergament@whitelaketwp.com

Quote Information:

Quote #: JWH002775

Version: 1
Delivery Date: 11/18/2024
Expiration Date: 05/18/2025

Quote Summary

Description	Amount
(2) PARTS TO INCLUDE - EQUIPMENT	$112,483.26
(2) PARTS TO INCLUDE - INSTALLATION	$76,500.00
(12) CERTIFICATION TESTING - EQUIPMENT	$0.00
(7) PATHWAYS FOR COMMUNICATIONS SYSTEMS - EQUIPMENT	$1,583.40
(7) PATHWAYS FOR COMMUNICATIONS SYSTEMS - INSTALLATION	$10,710.00
(8) CABLE TRAY & CEILING/WALL SUPPORT FOR (MDF) SERVER ROOM AND (IDF) AREAS - EQUIPMENT	$7,019.30
(8) CABLE TRAY & CEILING/WALL SUPPORT FOR (MDF) SERVER ROOM AND (IDF) AREAS - INSTALLATION	$4,590.00
(9) GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS - EQUIPMENT	$2,379.18
(9) GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS - INSTALLATION	$3,825.00
(12) CERTIFICATION TESTING - INSTALLATION	$3,825.00
ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (1) Lower Level - EQUIPMENT	$13,797.74
ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (1) Lower Level - INSTALLATION	$6,120.00
ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (2) Upper Level - EQUIPMENT	$76,855.40
ii) GATHERING/MEETING ROOM(S) AUDIOVISUAL (2) Upper Level - INSTALLATION	$29,835.00
iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - EQUIPMENT	$3,582.62
iii) SMALL SPACES AUDIOVISUAL (1) Lower Level - INSTALLATION	$1,147.50

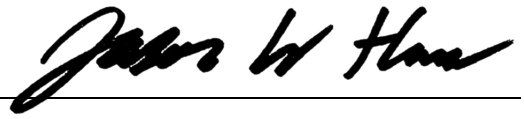
P: (248) 289-8500 E: jhanse@mdisnow.com W: www.mdisnow.com

Quote Summary

Description	Amount
(2) Upper Level - EQUIPMENT	$7,727.05
(2) Upper Level - Installation	$1,487.50
iv) POLICE DEPARTMENT PAGING SOLUTION (a) PAGING SYSTEM - EQUIPMENT	$6,230.15
iv) POLICE DEPARTMENT PAGING SOLUTION (a) PAGING SYSTEM - INSTALLATION	$7,650.00
b) BUILDING-TO-BUILDING FIBER OPTIC INFRASTRUCTURE - EQUIPMENT	$12,567.04
b) BUILDING-TO-BUILDING FIBER OPTIC INFRASTRUCTURE - INSTALLATION	$5,355.00
PUBLIC SAFETY BOND COST	$11,858.10
Total:	**$407,128.24**

Interest at 1.25% per month will be charged on overdue balances
25% restock fee
No returns on special order items
Additional add-ons will be billed as parts & labor @ $150.00/hr

Metro Detroit Integrated Systems

Signature: 

Name: Jason Hanse

Title: Account Manager

Date: 11/18/2024

White Lake Township

Signature:

Name: Patricia Pergament

Date:

P: (248) 289-8500 E: jhanse@mdisnow.com W: www.mdisnow.com

Appendix

Terms & Conditions

Payment Terms

- **See detailed document outlining MDIS's Payment Terms - "*The 50/50/50/50"***

Terms & Conditions

- Interest at 1.25% per month will be charged on overdue balances.
- 25% restock fee may apply.
- No returns on special order items.
- Additional add-ons will be billed as parts and labor @ $150 hour.
- Quote sub components are interdependent and not severable without approval by MDIS.

Note to Recipient

- Please mail all payments to **4921 Leafdale Blvd. Royal Oak, MI 48073-1020**
- 3.5% Processing Fee will be added if paying by credit card.
- Thank you for choosing MDIS!

SECTION 8:

PAYMENT TERMS

MDIS Payment Terms - *"The 50/50/50/50"*

MDIS shall, as a condition precedent to its right to receive any payment, submit to the Charter Township of White Lake an application for payment along with all necessary receipts, vouchers, and other documentation to establish payment for labor and materials and to confirm the absence of any liens or other claims on the property, work, or funds related to the Work.

Required documentation may include:

1. MDIS's sworn statement.
2. MDIS's partial or final waiver of lien.

PAYMENT SHALL FOLLOW THE TERMS OUTLINED BELOW:

For **Equipment:**

- The **first 50%** of the total equipment cost shall be due upon contract execution. This deposit enables MDIS to procure and allocate the necessary materials to begin the project.
- The **final 50%** shall be due upon MDIS's receipt of and secure storage of all equipment, supported by documentation such as proof of insurance, receipts, bills of lading, photographs, and other items necessary to confirm delivery and proper storage.

For **Labor**:

- The **first 50%** of the total labor cost shall be due thirty (30) days prior to the start of onsite installation.
- The **final 50%** shall be due upon project completion, which includes the successful resolution of any punch list items, delivery of as-built documentation, training provided to the owner, and receipt of the Owner's written approval confirming system handoff.

FULL CREDIT FOR MDIS DESIGN SERVICES *(IF APPLICABLE)*

Clients who have purchased MDIS design services, will be eligible for **FULL 100% CREDIT FOR ALL DESIGN SERVICES RENDERED**, applied as a discount to their final invoice, if the project is awarded to MDIS.

CONDITIONS FOR PAYMENT:

Payment by the Charter Township of White Lake shall be contingent upon:

- Submission of required documentation, including lien waivers, as outlined above.
- Inspections conducted to verify the Work has been completed according to contract specifications.
- Approval of Work by the Owner.

Payments do not constitute a waiver of any defects or relieve MDIS from their obligation to correct defective Work. Issuance of the final payment does not waive the Township's rights to address any defects or incomplete Work discovered after payment.

The final payment for Work shall be made only after:

1. MDIS has fully performed all obligations under the contract.
2. All Work has been inspected and approved by the Charter Township of White Lake.
3. All required waivers and documentation have been submitted.

RIGHT TO WITHHOLD PAYMENTS:

The Charter Township of White Lake reserves the right to withhold any payment if reasonably necessary to address:

- Defective or non-conforming Work.
- Claims, liens, or disputes with subcontractors or third parties.
- Damage or liabilities caused by MDIS.
- MDIS's failure to meet contractual obligations.

Funds withheld may be applied to offset costs, damages, or liabilities incurred by the Township as a result of MDIS's actions or omissions.

SECTION 9:

REQUIRED INSURANCE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 11/14/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Shelly Lockaby	
The Salvati Insurance Group, Inc. 42370 Van Dyke Avenue Suite 711 Sterling Heights MI 48314	PHONE (A/C, No, Ext): (248) 720-1130	FAX (A/C, No): (586) 863-1979
	E-MAIL ADDRESS: slockaby tsig1.com	

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Michigan Millers Insurance Company	14508
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED

Metro Detroit Integrated Systems LLC Dba Mdis
4921 Leafdale Blvd
Royal Oak MI 48073

COVERAGES **CERTIFICATE NUMBER:** Master 24-25 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY X PRO-JECT LOC OTHER:	Y		C0127835	10/03/2024	10/03/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	1,000,000 100,000 5,000 1,000,000 2,000,000 2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY HIRED AUTOS ONLY SCHEDULED AUTOS NON-OWNED AUTOS ONLY			V0106156	10/03/2024	10/03/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Uninsured motorist	1,000,000 1,000,000
A	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION 10,000	Y		V0106156	10/03/2024	10/03/2025	EACH OCCURRENCE AGGREGATE	5,000,000 5,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N: N / N/A		W0118538	10/03/2024	10/03/2025	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 500,000 500,000 500,000
A	Property Insurance			C0127835	10/03/2024	10/03/2025	BPP Equipment	266,772 493,550

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Project: White Lake Public Services Building
10911 Elizabeth Lake Rd
White Lake, MI 48383
White Lake Township, MI 48383, all elected
and appointed officials, all employees and volunteers, agents, all boards, commissions,
and/or authorities and board members, including employees and volunteers thereof are Additional Insured on a primary and non-contributory basis to any other insurance the Client may have. Thirty (30) days, Ten (10) days for non-payment of premium, Advance Written Notice of Cancellation, Non-Renewal,

CERTIFICATE HOLDER

White Lake Township
7525 Highland Road
White Lake MI 48383

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – SCHEDULED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name of Person or Organization:
ANY PERSON OR ORGANIZATION THAT YOU ARE REQUIRED TO ADD AS ADDITIONAL INSURED TO THIS POLICY BY WRITTEN CONTRACT OR AGREEMENT

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

Who Is An Insured (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of your ongoing operations performed for that insured.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – COMPLETED OPERATIONS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)	Location And Description Of Completed Operations
ANY PERSON OR ORGANIZATION THAT YOU ARE REQUIRED TO ADD AS ADD'L INS TO THIS POLICY BY WRITTEN CONTRACT OR AGRMT	
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. **Section II – Who Is An Insured** is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work" at the location designated and described in the Schedule of this endorsement performed for that additional insured and included in the "products-completed operations hazard".

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

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Wolters Kluwer Financial Services | Uniform Forms™

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

CHANGES - AMENDMENT OF CANCELLATION PROVISIONS

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE PART
COMMERCIAL GENERAL LIABILITY COVERAGE PART
COMMERCIAL INLAND MARINE COVERAGE PART
LIQUOR LIABILITY COVERAGE PART
COMMERCIAL LIABILITY UMBRELLA COVERAGE PART
COMMERCIAL PROPERTY COVERAGE PART
COMMERCIAL UMBRELLA LIABILITY PART

In the event of cancellation of this policy, we agree to mail prior written notice of cancellation to:

SCHEDULE

1. Name: White Lake Township ATTN: Patricia Pergament.

2. Address: 7525 Highland Road
White Lake, MI 48383

We reserve the right to cancel the policy as permitted by policy terms and conditions. We will give the same advance notice of cancellation to the person(s) or organization(s) shown in the schedule above as we give to the Named Insured shown in the Declarations unless indicated differently below.

30 Number of days except for non-payment of premium. Policy terms and conditions apply for non-payment of premium.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

COMMERCIAL GENERAL LIABILITY PAK

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE FORM (CG 00 01)

SUMMARY OF COVERAGES

Description	Limit of Insurance	Page
Additional Insured - Broad Form Vendors	Included	4
Additional Insured - Lessor of Leased Equipment	Included	4
Additional Insured - Managers or Lessors of Premises	Included	4
Additional Insured - State or Political Subdivisions - Permits	Included	4
Additional Insured - Volunteers	Included	5
Additional Insureds by Written Contract	Included	3
Broad Form Named Insured	Included	3
Broad Form Property Damage	$25,000 Per Occurrence	2
Broad Knowledge / Notice of Occurrence	Included	6
Damage To Premises Rented to You	$300,000 Any One Premises	2
Incidental Medical Malpractice Liability	Included	6
Liberalization	Included	7
Medical and Dental Payments	$10,000 Medical Expense Limit	2
Mental Anguish	Included	6
Mobile Equipment	Included	6
Newly Acquired Organizations	Included	3
Non-Owned Watercraft	51 feet	1
Personal Injury and Advertising Injury Redefined	Included	7
Property Damage Liability - Borrowed Equipment	$25,000 Occurrence / $50,000 Aggregate	3
Property Damage Liability - Elevator and Sidetrack Agreement	Included	2
Supplementary Payments Increased Limits		
Bail Bonds	$2,500	2
Loss of Earnings per Day	$1,000	2
Waiver of Transfer of Rights Of Recovery Against Others to Us	Included	6

The terms and conditions of this policy are amended as indicated below:

I. Non-Owned Watercraft

SECTION I - COVERAGES, COVERAGE A. BODILY INJURY AND PROPERTY DAMAGE, Exclusion **2.g.(2)** is revised as follows:

This exclusion does not apply to:

(2) A watercraft you do not own that is:

(a) Less than 51 feet long; and

(b) Not being used to carry persons or property for a charge;

This provision applies to any person, who with your expressed or implied consent, either uses or is responsible for the use of the watercraft.

This provision does not apply if the insured has any other insurance for "bodily injury" or "property damage" liability that would also be covered under this provision, whether the other insurance is primary, excess, contingent or on any other basis. In that case, this provision does not provide any insurance.

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II. Damage To Premises Rented To You

Under **SECTION I - COVERAGES, COVERAGE A. BODILY INJURY AND PROPERTY DAMAGE,** the last paragraph of **2.** is deleted and replaced with the following:

Exclusions **c.** through **n.** do not apply to "Property Damage" to the premises while rented to you or temporarily occupied by you with permission of the owner. A separate Damage To Premises Rented To You Limit of Insurance applies to this coverage which is the greater of:

a. The Damage To Premises Rented To You Limit for Each Occurrence shown in the Declarations; or
b. $300,000

Under **Section III - LIMITS OF INSURANCE,** paragraph **6.** does not apply.

III. Supplementary Payments

SECTION I - COVERAGES, SUPPLEMENTARY PAYMENTS - COVERAGES A & B, is revised as follows:

1. In paragraph **2.**, the limit of $250 for bail bonds is increased to $2,500.
2. In paragraph **4.**, the limit of $250 for daily loss of earnings is increased to $1,000.

IV. Medical And Dental Payments

Under **SECTION I - COVERAGES, COVERAGE C. MEDICAL PAYMENTS,** if **COVERAGE C. MEDICAL PAYMENTS,** is not otherwise excluded from this Coverage Part:

1. The Medical Payments Limit is changed to the greater of:

a. $10,000; or
b. The Medical Expenses Limit shown in the Declarations of this Coverage Part.

2. The provision, in **C. 1.a.(2)** that the expenses must be incurred and reported to us within one year of the date of the accident, is increased to three years.

V. Broad Form Property Damage

Under **SECTION I - COVERAGE A**, Exclusion **2.j.** is amended as follows:

1. Paragraph **(3)** does not apply.
2. Paragraphs **(4)** and **(6)** do not apply to customer's property at your described premises.

We do not cover any property:

1. Subject to motor vehicle registration; or
2. While being used to perform construction operations.

Our limit for any one "occurrence" under this coverage provision is $25,000.

The insurance afforded by reason of this provision is excess over any valid and collectible property insurance (including any deductible) available to the insured, and **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS 4.** Other Insurance is changed accordingly.

VI. Property Damage Liability - Elevators And Sidetrack Agreements

The following is added under **SECTION I - COVERAGES, COVERAGE A. BODILY INJURY AND PROPERTY DAMAGE LIABILITY:**

1. Exclusions **j. (3), (4)** and **(6)** do not apply to the use of elevators.
2. Exclusion **k.** does not apply to:

a. The use of elevators; or
b. Liability assumed under a sidetrack agreement.

The insurance afforded by reason of this provision is excess over any valid and collectible property insurance (including any deductible) available to the insured, and **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS 4. Other Insurance** is changed accordingly.

VII. Property Damage Liability - Borrowed Equipment

The following is added to Exclusion **j.** under **Coverage A.** (Section I):

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Paragraph **(4)** of this exclusion does not apply to equipment which you borrow unless the "property damage" occurs while such equipment is being used by an insured at a job site.

Subject to all of the terms of **SECTION III - LIMITS OF INSURANCE**, the maximum limit in any one occurrence is $25,000 and an annual aggregate of $50,000.

This insurance afforded by reason of this provision is excess over any valid and collectible property insurance (including any deductible) available to you, and **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS 4.** Other Insurance is changed accordingly.

VIII. Broad Form Named Insured

The following is added under **SECTION II - WHO IS AN INSURED**:

1.e. An organization other than a partnership, joint venture or limited liability company, any of your subsidiary companies or any company over which you exercise control and actively manage and to which other insurance does not apply are an insured.

IX. Newly Acquired Organizations

Under **SECTION II - WHO IS AN INSURED**, **4**. is deleted and replaced with the following:

1. If you are an organization other than a partnership, joint venture, or limited liability company, any organization you newly acquire or form over which you maintain ownership or majority interest, exercise control and actively manage and to which no other similar insurance is available is a named insured. However:

a. Coverage A does not apply to "bodily injury" or "property damage" that occurred before you acquired or formed the organization; and
b. Coverage B does not apply to "personal and advertising injury" arising out of an offense committed before you acquired or formed the organization.

X. Additional Insureds By Written Contract

A. SECTION II - WHO IS AN INSURED is amended to include as an additional insured any person or organization that you are required to add as an additional insured to this policy by a written contract or written agreement that is:

1. Currently in effect or becoming effective during the term of this policy; and
2. Executed prior to the "bodily injury", "property damage", "personal and advertising injury".

B. The insurance provided to the additional insured applies as follows:

1. That person or organization is only an additional insured with respect to liability caused by your negligent acts or omissions at or from:

(a) Premises you own, rent, lease, or occupy or
(b) Your ongoing operations performed for the additional insured at the job indicated by written contract or agreement.

2. The limits of insurance applicable to the additional insured are those specified in the written contract or agreement or in the Declarations of this policy whichever is less. These limits of insurance are inclusive of and not in addition to the limits shown in the Declarations.

C. Section IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, under 4. other insurance, is amended as follows:

The following is added to this provision:

1. Regardless of whether other insurance is available to an additional insured on a primary basis, this insurance will be primary and noncontributory if a written contract between you and the additional insured specifically requires that this insurance is primary.

D. With respect to the insurance afforded these additional insureds, the following additional insured exclusion applies:

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1. If the additional insured is an architect, engineer, or surveyor, this insurance does not apply to "bodily injury", "property damage", "personal and advertising injury" arising out of the rendering of or the failure to render any professional services by or for you, including:

   (a) The preparing, approving, or failing to prepare or approve maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings, designs or specifications; or
   (b) Supervisory, inspection, architectural or engineering activities.

2. The insurance afforded the additional insured does not apply to:

   (a) "Bodily injury" or "property damage" occurring after:

      (1) All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on the behalf of the additional insured(s) at the site of the covered operations has been completed; or
      (2) That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than the contractor or subcontractor engaged in performing operations for a principal as part of the same project.

XI. Additional Insured - State or Political Subdivisions - Permits

The following is added to **SECTION II - WHO IS AN INSURED:**

1. Any state or political subdivision which has issued a permit to you, subject to the following provisions:

   a. This insurance applies only with respect to operations performed by you or on your behalf for which the state, governmental agency or political subdivision has issued a permit or authorization.
   b. This insurance does not apply to:

      (1) "Bodily injury", "property damage", "personal and advertising injury" arising out of operations performed for the federal government, state or municipality; or
      (2) "Bodily injury' or "property damage" included within the "products-completed operations hazard".

XII. Additional Insured - Managers Or Lessors of Premises

The following is added to **SECTION II - WHO IS AN INSURED:**

1. Any manager or lessor of premises shown in the Declarations is also an insured, but only with respect to liability arising out of the ownership, maintenance or use of that part of the premises leased to you and shown in the Declarations and subject to the following additional exclusions:

The following exclusions are added:

1. This insurance does not apply to:

   a. Any "occurrence" which takes place after you cease to be a tenant in that premises.
   b. Structural alterations, new construction or demolition operations performed by or on behalf of any manager or lessor of premises shown in the Declarations.

XIII. Additional Insured - Lessor of Leased Equipment

The following is added to **SECTION II - WHO IS AN INSURED:**

1. The person(s) or organization(s) who leases equipment to you for use in your business is also an insured, but only with respect to liability for "bodily injury", "property damage", "personal and advertising injury" caused, in whole or in part, by your maintenance, operation or use of equipment leased to you by such person(s) or organization(s).

With respect to the insurance afforded to these additional insureds, this insurance does not apply to any "occurrence" which takes place after the equipment lease expires.

XIV. Additional Insured - Broad Form Vendors

The following is added to **SECTION II - WHO IS AN INSURED:**

1. Any person(s) or organization(s) (referred to below as vendor) with whom you agreed, because of a written contract or agreement to provide insurance is also an additional insured, but only with respect to "bodily injury" or "property damage" arising out of "your products" which are distributed or sold in the regular course of a vendor's business, subject to the following additional exclusions:

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a. The insurance afforded the vendor does not apply to:

(1) "Bodily injury" or "property damage" for which the vendor is obligated to pay damages by reason of the assumption of liability in a contract or agreement. This exclusion does not apply to liability for damages that the vendor would have in the absence of the contract or agreement;
(2) Any express warranty unauthorized by you;
(3) Any physical or chemical change in the product made intentionally by the vendor;
(4) Repackaging, except when unpacked solely for the purpose of inspection; demonstration, testing, or the substitution of parts under instructions from the manufacturer, and then repackaged in the original container;
(5) Any failure to make such inspections, adjustments, tests, or servicing as the vendor has agreed to make or normally undertakes to make in the usual course of business, in connection with the distribution or sale of the products;
(6) Demonstration, installation, servicing or repair operations, except such operations performed at the vendor's premises in connection with the sale of the product.
(7) Products which, after distribution or sale by you, have been labeled or relabeled or used as a container, part or ingredient of any other thing or substance by or for the vendor; or
(8) "Bodily injury" or "property damage" arising out of the sole negligence of the vendor for its own acts or omissions or those of its employees or anyone else acting on its behalf. However, this exclusion does not apply to:
(a) The exceptions contained in Sub-Paragraphs **(4)** or **(6)**; or
(b) Such inspections, adjustments, tests or servicing as the vendor has agreed to make or normally undertakes to make in the usual course of business, in connection with the distribution or sale of the products.

b. This insurance does not apply to any insured person or organization, from whom you have acquired such products, or any ingredient, part or container, entering into, accompanying or containing such products.
c. This provision does not apply to any vendor included as an insured by an endorsement issued by us and made part of the Coverage Part.
d. This provision does not apply if "bodily injury" or "property damage" included within the "products-complete hazards" is excluded either by the provisions of the Coverage Part or by endorsement.

XV. Additional Insured - Volunteers

A. Under **SECTION II - WHO IS AN INSURED** is amended to include as an insured any person(s) who are "volunteer worker(s)" for you only while performing duties related to the conduct of your business.

However, no "volunteer worker(s)" are insureds for:

(1) "Bodily injury," "property damage," "personal and advertising injury" arising out of rendering or the failure to render professional services by a "volunteer worker".
(2) "Bodily injury", "personal and advertising injury":
(a) To you, to your partners or members (if you are a partnership or joint venture), to your members (if you are a limited liability company), to a "employee" while in the course of his or her employment or performing duties related to the conduct of your business, or to other "volunteer worker(s)" while performing duties related to the conduct of your business;
(b) To the spouse, child, parent, brother or sister of that "employee" or "volunteer worker" as a consequence of paragraph **(2)(a)** above; or
(c) For which there is any obligation to share damages with or repay someone else who must pay damages because of the injury described in Paragraphs **(2)(a)** or **(b)** above.
(3) "Property damage" to property:
(a) Owned, occupied or used by,
(b) Rented to, in the care, custody or control of, or over which physical control is being exercised for any purpose by you, any of your "employees", "volunteer workers", any partner or member (if you are a partnership or joint venture), any member (if you are a limited liability company).

B. Exclusion **2. a.** of **Coverage C** (Section I) is replaced by the following:

2. a. To any insured, except "volunteer workers".

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C. "Volunteer worker(s)" means a person(s) who is not your "employee", and who donates his or her work and acts at the direction of and within the scope of duties determined by you, and is not paid a fee, salary or other compensation by you or anyone else for their work performed for you.

XVI. Incidental Medical Malpractice Liability

SECTION II - WHO IS AN INSURED is amended to add the following paragraph:

However, Part **2.a.(1)(d)** does not apply to employed nurses or other employees, excluding physicians or medical doctors, who provide incidental health care services within the scope of their employment by you.

XVII. Broad Knowledge/Notice Of Occurrence

The following is added under **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS:**

The requirement in condition **2.a.** that you must see to it that we are notified of an "occurrence" or offense applies only when the "occurrence" or offense is known to:

1. You, if you are an individual;
2. A partner, if you are a partnership;
3. A member, if you are a joint venture;
4. An "Executive Officer" or insurance manager, if you are a corporation; or
5. A member, if you are a limited liability company.

The requirement in condition **2.b.** that you must see to it that we receive notice of a claim or "suit" will not be considered breached unless the breach occurs after such claim or "suit" is known to:

1. You, if you are an individual;
2. A partner, if you are a partnership;
3. A member, if you are a joint venture;
4. An "Executive Officer" or insurance manager, if you are a corporation; or
5. A member, if you are a limited liability company.

If you report an accident to your Workers' Compensation insurance carrier which later develops into a liability occurrence, coverage for which is provided by this policy, failure to report such occurrence to us at the time of the accident shall not be a violation of the notification of loss condition in this policy (**Condition 2. in Section IV**). It is understood and agreed, however, that you shall give notification of such occurrence to us as soon as you are made aware of the fact that the particular accident has developed into a liability claim.

XVIII. Waiver Of Transfer Of Rights Of Recovery Against Others To Us

Under **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS,** the paragraph **8. Transfer of Rights of Recovery Against Others To Us** condition is amended by the addition of the following:

We waive any right of recovery we may have against a person or organization because of payments we make for injury or damage arising out of your ongoing operations or "your work" done under a contract with that person or organization and include in the "products - completed operations hazard" when you have waived such right of recovery under a written contract with that person or organization. Such written contract must be:

1. Currently in effect or becoming effective during the term of this policy; and
2. Executed prior to the "bodily injury", "property damage", "personal and advertising injury"; or
3. Executed after "bodily injury", "property damage", "personal and advertising injury" if:
   a. The terms and conditions of the written contract or written agreement had been agreed upon prior to the "bodily injury", "property damage", "personal and advertising injury"; and
   b. The insured can definitively establish that the terms and conditions of the written contract or written agreement ultimately executed are the same as those which had been agreed upon prior to the "bodily injury", "property damage", "personal and advertising injury".

XIX. Mental Anguish

The definition of "bodily injury" in **SECTION V - DEFINITIONS** is replaced by the following:

3. "Bodily injury" means bodily injury, sickness or disease sustained by a person, including mental anguish or death resulting from any of these at any time.

XX. Mobile Equipment

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The following is added under **SECTION V - DEFINITIONS, 12. "Mobile Equipment":**

Paragraph **f.(1)** does not apply to self-propelled vehicles of less than 1,000 pounds gross vehicle weight.

XXI. Personal and Advertising Injury

SECTION V - DEFINITIONS, "Personal and advertising injury" **d.** & **e** are deleted and replaced by the following:

d. Oral or written publication, in any manner, of material that slanders or libels a person or organization or disparages a person's or organization's goods, products or services;
e. Oral or written publication, in any manner, of material that violates a person's right of privacy;

XXII. Liberalization

With respect to coverage provided by this endorsement, if we adopt any revisions that would broaden the coverage under this endorsement without additional premium, the broadened coverage will apply to this policy. It will apply when the change becomes effective in your state.

All policy provisions not in conflict with this endorsement shall continue to apply. This endorsement is a valid part of the policy when the form number is shown on the declarations.

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THE Salvati INSURANCE GROUP

Toll Free: (888) 644-6398
Fax: (586) 863-1979
Email: Thomas@Salvati-Insurance.com
Website: www.Salvati-Insurance.com

November 14, 2024

RE: Metro Detroit Integrated Systems LLC

4921 Leafdale Blvd

Royal Oak MI 48073

Please be advised that the above reference insured has been a client for approximately 10 years in excellent standing with no issues or concerns. I see no issues with them complying with Exhibit E and the policy has been endorsed accordingly per the contract terms regarding the below projects:

White Lake Township Hall Building:

2025 Civic Center Drive

White Lake Township, MI 48383

White Lake Public Services Building:

10911 Elizabeth Lake Rd

White Lake, MI 48383

Feel free to contact me with any questions.

Sincerely,

Shelly Lockaby
Account Manager
248-720-1130
slockaby@tsig1.com

SECTION 10:

BID BOND

Bond No. N/A

BID BOND

The American Institute of Architects,
AIA Document No. A310 (February, 1970 Edition)

KNOW ALL MEN BY THESE PRESENTS, that we Metro Detroit Integrated Systems, LLC
4921 Leafdale Blvd.
Royal Oak, MI 48073

as Principal hereinafter called the Principal, and Old Republic Insurance Company

a corporation duly organized under the laws of the state of Pennsylvania as Surety, hereinafter called the Surety, are held and firmly bound unto White Lake Township
7525 Highland Road
White Lake, MI 48383

as Obligee, hereinafter called the Obligee, in the sum of Five Percent of the Attached Bid**********
****

Dollars ($ 5% of attached bid***), for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for White Lake Public Safety Building
Low Voltage: Data/Fiber Cabling & Audio-Visual Services

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this 18th day of November , 2024

Witness

Metro Detroit Integrated Systems, LLC
Principal (Seal)

By: _____
Name/Title

Witness

Old Republic Insurance Company
Surety (Seal)

By: Cheryl Hughes
Cheryl Hughes
Attorney-in-Fact

ORSC 21328 (5/97)

OLD REPUBLIC INSURANCE COMPANY

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That OLD REPUBLIC INSURANCE COMPANY, a Pennsylvania stock insurance corporation, does make, constitute and appoint:

BARRY W. BERMAN CHERYL HUGHES

of NOVI, MI

its true and lawful Attorney(s)-in-Fact, with full power and authority for and on behalf of the Company as surety, to execute and deliver and affix the seal of the Company thereto (if a seal is required), bonds, undertakings, recognizances or other written obligations in the nature thereof, (other than self-insurance workers compensation bonds guaranteeing payment of benefits, or black lung bonds), as follows:

ALL WRITTEN INSTRUMENTS

and to bind OLD REPUBLIC INSURANCE COMPANY thereby, and all of the acts of said Attorneys-in-Fact, pursuant to these presents, are ratified and confirmed. This appointment is made under and by authority of the board of directors at a meeting held on December 10, 2019. This Power of Attorney is signed and sealed by facsimile under and by the authority of the following resolutions adopted by the board of directors of the OLD REPUBLIC INSURANCE COMPANY on December 10, 2019.

RESOLVED FURTHER, that the chairman, president or any vice president of the Company's surety division, in conjunction with the secretary or any assistant secretary of the Company, be and hereby are authorized and directed to execute and deliver, to such persons as such officers of the Company may deem appropriate, Powers of Attorney in the form presented to and attached to the minutes of this meeting, authorizing such persons to execute and deliver and affix the seal of the Company to bonds, undertakings, recognizances, and suretyship obligations of all kinds, other than bail bonds, bank depository bonds, mortgage deficiency bonds, mortgage guaranty bonds, guarantees of installment paper and not guaranty bonds. The said officers may revoke any Power of Attorney previously granted to any such person.

RESOLVED FURTHER that any bond, undertaking, recognizance, or suretyship obligation shall be valid and binding upon the Company

(i) when signed by chairmen, president or any vice president of the Company's surety division and attested and sealed (if a seal be required) by any secretary or assistant secretary; or

(ii) when signed by a duly authorized Attorney-in-Fact and sealed with the seal of the Company (if a seal be required).

RESOLVED FURTHER, that the signature of any officer designated above, and the seal of the Company, may be affixed by facsimile to any Power of Attorney or certification thereof authorizing the execution and delivery of any bond, undertaking, recognizance, or other suretyship obligations of the Company, and such signature and seal when so used shall have the same force and effect as though manually affixed.

IN WITNESS WHEREOF, OLD REPUBLIC INSURANCE COMPANY has caused these presents to be signed by its proper officer, and its corporate seal to be affixed this 3rd day of October, 2023.

OLD REPUBLIC INSURANCE COMPANY

Karen J. Haffner
Assistant Secretary

Alan Pavlic
Vice President

STATE OF WISCONSIN, COUNTY OF WAUKESHA - SS

On this 3rd day of October, 2023, personally came before me, Alan Pavlic and Karen J. Haffner, to me known to be the individuals and officers of the OLD REPUBLIC INSURANCE COMPANY who executed the above instrument, and they each acknowledged the execution of the same, and being by me duly sworn, did severally depose and say: that they are the said officers of the corporation aforesaid, and that the seal affixed to the above instrument is the seal of the corporation, and that said corporate seal and their signatures as such officers were duly affixed and subscribed to the said instrument by the authority of the board of directors of said organization.

Kathryn R. Pearson
Notary Public

My Commission Expires: September 28, 2026

(Expiration of notary's commission does not invalidate this instrument)

CERTIFICATE

I, the undersigned, assistant secretary of the OLD REPUBLIC INSURANCE COMPANY, a Pennsylvania corporation, CERTIFY that the foregoing and attached Power of Attorney remains in full force and has not been revoked; and furthermore, that the Resolutions of the board of directors set forth in the Power of Attorney, are now in force.

Signed and sealed at the City of Brookfield, WI this 18th day of November, 2024.

Karen J. Haffner
Assistant Secretary

46-5186

ORSC 11008 (6-93)

CONSTRUCTION BONDING SPECIALISTS, LLC.

CBS – Construction Bonding Specialists, LLC
29445 Beck Road, Suite A-209, Wixom, MI 48393
Phone No. (248) 349-6227 Fax: (248) 348-6762

RETURN TO: Barry Berman
Construction Bonding Specialists, LLC.
Fax: (248) 348-6762

BID RESULTS FORM

Please complete and return (fax or mail) to Construction Bonding Specialists, LLC within seven (7) days of the bid opening to release the bid bond. ***Release of the bid bond will also constitute release of the associated collateral and bonding capacity availability*****.**

BOND NO: N/A

CONTRACTOR NAME: Metro Detroit Integrated Systems, LLC

PROJECT NAME: White Lake Public Safety Building - Low Voltage: Data/Fiber Cabling & Audio-Visual Services

OBLIGEE: White Lake Township

DATE OF BID: 11/18/2024

THREE LOWEST BIDDERS:

1._____ BID AMOUNT: $_____
2._____ BID AMOUNT: $_____
3._____ BID AMOUNT: $_____

Contractor's Bid Amount: $_____

Form Completed By: _____
Company Name: _____
Date: _____

SECTION 11:

PRODUCT DATASHEETS

FlexFusion™ Cabinets

PANDUIT®
SPECIFICATION SHEET

specifications

FlexFusion Cabinets shall consist of a welded and assembled steel frame construction available in 600mm, 700mm, and 800mm widths, 1070mm and 1200mm depths and 42 RU, 45 RU, 48 RU, and 52 RU heights. The top of cabinet shall be available with either molded edge protection and snap-in covers for CoolBoot® Grommet Cable Seal or brush cable seal and rear lift-up lid for PDU cable lay-in. Fully adjustable front and rear cage nut equipment rails. Available options includes front single hinged door and rear split-hinged doors with 80% open perforation, horizontally split side panels, cable management fingers, vertical cable manager bracket, PDU mounting bracket and casters. The entire cabinet shall be electrically bonded without the use of bonding wires. Cabinet shall have a 1591kg (3500 lbs.) static load rating and 1136kg (2500 lbs.) rolling load rating.

PANDUIT FlexFusion™

technical information

Available cabinet sizes:	Height	42, 45, 48, or 52 RU
	Width (mm)	600, 700, or 800
	Depth (mm)	1070 or 1200
Material:	Steel with durable Black or White polyester epoxy powder coat finish	
Compliance:	EIA/ECA-310-E, TIA/EIA-942, UL2416	
Packaging:	Cabinets ships assembled, one per pallet	

key features and benefits

Performance	Best-in-class static load rating of 3,500 lbs. and 2,500 lbs. rolling load is the result of a sturdy and robust cabinet design that safely allows housing of heavier and high-density equipment. 80% open perforated doors assures maximum airflow thru the cabinet for high thermal application.
Rapid Deployment	Easy to adjust equipment rails with choice of time saving tool-less or standard hardware fastener, tool-less vertical cable manager bracket, and tool-less top cap rear entry allows for a faster cabinet installation time than other cabinets
Versatility	Cabinet is available in wide range of sizes and options for hot aisle/cold aisle or thermal containment deployment
Scalability	Configure to order platform to achieve the cabinet to your specification and save time and reduce Capex in your network deployment
Bonding	Cabinets and accessories are integrally bonded without the use of grounding wires to provide a safe and reliable network while reducing installation costs
Durable coating	Cabinets are powder coated in a durable, low maintenance polyester epoxy paint available in Black (RAL9005) or White (RAL9003)

applications

FlexFusion Cabinets are ideal for network or server equipment that provides maximum flexibility and the capacity to manage high cable density in data center, enterprise or co-location deployment. Safely houses 19" rack mount IT equipment in an indoor environment, provides extensive cable management options and thermal efficient cabinet.

cabinet options

Features	Options to Choose From
Equipment Rails (cage nut)	Tool-less or hardware fastener
Top Cap Seal	Brush Seal or CoolBoot® Cover
Doors	Single Hinged Front/Split-Hinged Rear or None
Door Lock	Mechanical Keyed, 3-Digit Combo Keyed, SmartZone™ G5 Security Handle, HID w/Humidity Sensor, or HID/Keypad w/Humidity Sensor*
PDU Mounting Bracket	Left Side, Right Side, Both Sides, or None
Cable Management Fingers	Short (4"), Long (6"), or None
Vertical Cable Management Bracket	Left Side, Right Side, Both Sides, or None
Casters	Yes or No
PDU Included	Choice of several G5 PDU or None
Temperature and Door Sensor**	Yes or No
Side Panel Sensor**	Yes or No

*Requires Intelligent G5 PDU to control.

**Requires electronic handle.

Visit www.panduit.com/configure-cabinet to configure your FlexFusion™ Cabinet

configured cabinet

Series	Width	Height	Depth	Side Panels	Color	Cabinet Type	Configured Part Designator Based on Selected Options
XG	6 = 600mm 7 = 700mm 8 = 800mm	42 = 42 RU 45 = 45 RU 48 = 48 RU 52 = 52 RU	1 = 1070mm 2 = 1200mm	1 = Left Side Only 2 = Both Sides 3 = Right Side Only 9 = No Side Panels	B = Black W = White	S = Standard	xxxx

cabinet part number sample

Part Number	Width (mm)	Height (RU)	Depth (mm)	Side Panels	Color	Top Cap Type	Doors	PDU Mounting Bracket	Cable Management Fingers	Vertical Cable Manager Bracket	Casters	PDU Included
XG64212BS0001	600	42	1070	Both Sides	Black	Brush Seal	Yes	Left Side	No	No	Yes	No
XG64512BS0001	600	45	1070	Both Sides	Black	Brush Seal	Yes	Left Side	No	No	Yes	No
XG64822WS0003	600	48	1200	Both Sides	White	CoolBoot® Cover	Yes	Left Side	No	No	Yes	No
XG74519BS0002	700	45	1070	None	Black	Brush Seal	Yes	Left Side	Yes	No	Yes	No
XG74522BS0004	700	45	1200	Both Sides	Black	CoolBoot® Cover	Yes	Left Side	Yes	No	Yes	No
XG74822WS0001	700	48	1200	Both Sides	White	Brush Seal	Yes	Left Side	No	No	Yes	No
XG84212WS0003	800	42	1070	Both Sides	White	CoolBoot® Cover	Yes	Left Side	No	No	Yes	No
XG84522BS0005	800	45	1200	Both Sides	Black	Brush Seal	Yes	Both Sides	Yes	Left Side	Yes	No
XG84829BS0006	800	48	1200	None	Black	CoolBoot® Cover	Yes	Both Sides	Yes	Left Side	Yes	No

accessories

Replacement Door

Series	Type	Width	Height	Color
XG-DR	SH = Single Hinged Perforated SP = Split-Hinged Perforated	6 = 600mm 7 = 700mm 8 = 800mm	42 = 42 RU 45 = 45 RU 48 = 48 RU 52 = 52 RU	B = Black W = White

Examples:
XG-DRSH642W is a single door kit for 600mm wide, 42 RU, White cabinet.
XG-DRSH845B is a single door kit for 800mm wide, 45 RU, Black cabinet.
XG-DRSP845B is a split-hinged door kit for 800mm wide, 45 RU, Black cabinet.

Side Panels

Series	Type	Height	Depth	Color
XG-SP	FS = Full Set, 1 side	42 = 42 RU 45 = 45 RU 48 = 48 RU 52 = 52 RU	1 = 1070mm 2 = 1200mm	B = Black W = White

Examples:
XG-SPFS421W is a side panel kit for 42 RU, 1070mm deep, White cabinet.
XG-SPFS452B is a side panel kit for 45 RU, 1200mm deep, Black cabinet.
XG-SPFS482W is a side panel kit for 48 RU, 1200mm deep, White cabinet.

PDU Mounting Bracket

Part Number	Color
XG-PBRB	B = Black
XG-PBRW	W = White

Vertical Cable Management Panel

Series	Height	Color
XG-VCM	42 = 42 RU 45 = 45 RU 48 = 48 RU 52 = 52 RU	B = Black W = White

Examples:
XG-VCM42B is a vertical cable management panel for 42 RU, Black cabinet.
XG-VCM45B is a vertical cable management panel for 45 RU, Black cabinet.
XG-VCM48W is a vertical cable management panel for 48 RU, White cabinet.

Cable Management Finger

Series	Length	Cabinet Height	Color
XG-FM	S = Short (4 in.) L = Long (6 in.)	45 = 42 and 45 RU 48 = 48 RU 52 = 52 RU	B = Black W = White

Examples:
XG-FMS45B is a cable management finger kit for 42 RU and 45 RU, 4 in. long, Black color.
XG-FML45B is a cable management finger kit for 42 RU and 45 RU, 6 in. long, Black color.
XG-FML48W is a cable management finger kit for 48 RU, 6 in. long, White color.

Air Dam Seal Kit

Series	Width	Color
XG-ADS	6 = 600mm 7 = 700mm 8 = 800mm	B = Black W = White

Examples:
XG-ADS7W is a air dam seal kit for 700mm wide, White color cabinet.
XG-ADS8B is a air dam seal kit for 800mm wide, Black color cabinet.

Front to Back Cable Management Trough

Part Number	Color
XG-FTBB	B = Black
XG-FTBW	W = White

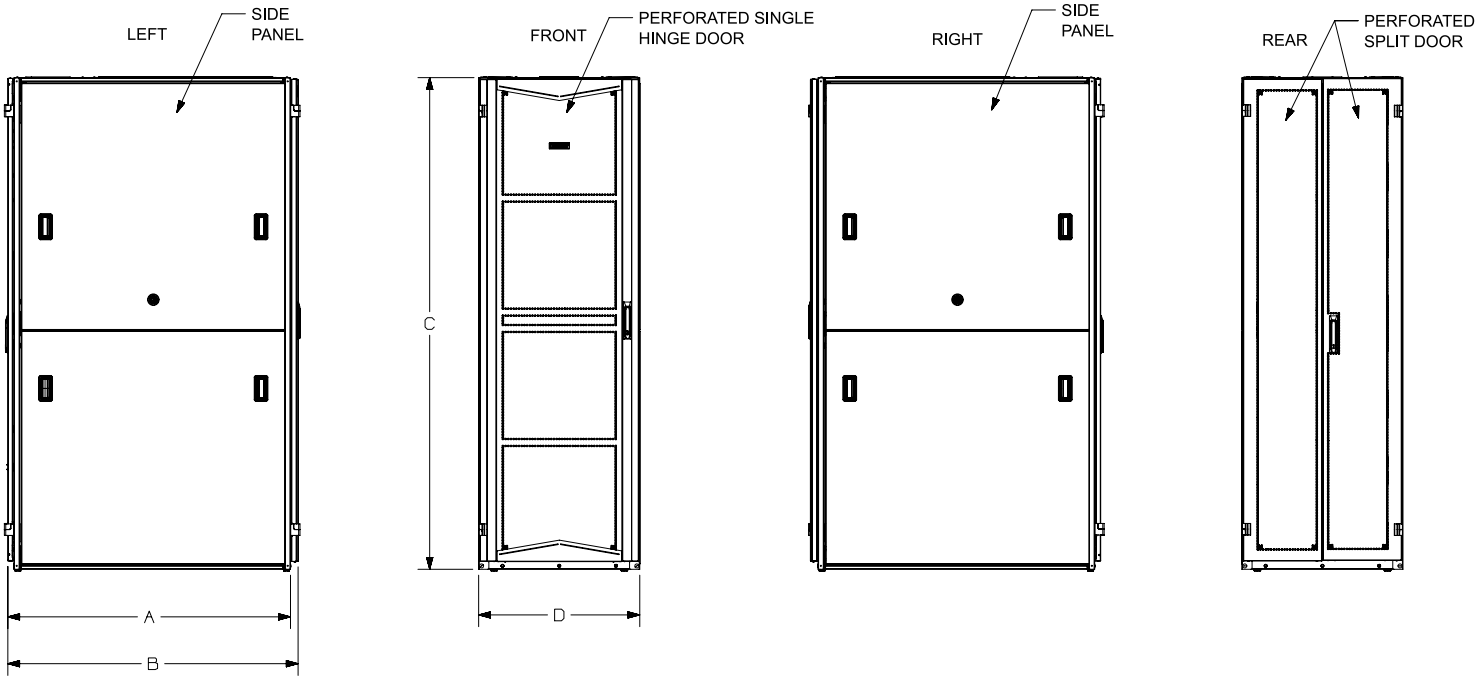
This kit is for either 700 or 800mm wide cabinets.

FlexFusion™ Cabinets

All cabinets include:

- Adjustable front and rear equipment rails
- Rail position markers
- Heavy-duty leveling legs
- Ganging brackets
- Standard floor mounting brackets
- 25 each M6 cage nuts and screws

cabinet dimensions



Dimension A	Dimension B	Dimension C*	Dimension D
1070mm (42.0")	1104mm (43.5")	42 RU - 2022mm (79.6") 45 RU - 2157mm (84.9") 48 RU - 2289mm (90.1") 52 RU - 2443mm (96.2")	600mm (23.6") 700mm (27.5") 800mm (31.4")
1200mm (48.0")	1254mm (49.4")		

*Cabinet height includes caster. Height of cabinet without caster and leveling legs fully retracted is 24mm (0.94") less.
**Casters are not included on 52 RU height cabinets. 52 RU height dimensions is without caster.

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For a copy of Panduit product warranties, log on to www.panduit.com/warranty

For more information
Visit us at www.panduit.com/flexfusion
Contact Customer Service by email: cs@panduit.com
or by phone: 800.777.3300

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RKSP195--WW-ENG
8/2022

2-Post Standard Equipment Rack

PANDUIT®
SPECIFICATION SHEET

specifications

The data equipment rack shall meet EIA-310E standards and be constructed of extruded aluminum or steel capable of accepting 19" wide EIA equipment. The telecommunications rack shall be constructed of extruded aluminum and capable of accepting 23" wide telecommunications equipment. Rack construction method shall ensure an electrically-bonded structure for ease of grounding. The 3" channel rack shall be UL listed for 1000 lbs. load rating and the 6" channel rack shall be UL listed for 1500 lbs. load rating. The equipment mounting rails shall be double-sided #12-24 EIA universal mounting hole spacing. The equipment mounting rails shall include printed rack space identification on the front and back and be numbered up. The channel of the rack shall be capable of mounting NetRunner™ or PatchRunner™ 2 Vertical Cable Managers. 24 #12-24 mounting screws shall be included with the rack.

technical information

Dimension:	Part Number	RU	Height In. (mm)	Width In. (mm)	Depth In. (mm)
	R2P^	45	84.0 (2134)	20.3 (514)	3.0 (76)
	R2P48	24	48.0 (1219)	20.3 (514)	3.0 (76)
	R2P79	42	79.0 (2007)	20.3 (514)	3.0 (76)
	R2P96	52	96.1 (2441)	20.3 (514)	3.0 (76)
	R2PW	45	84.0 (2134)	24.5 (616)	3.0 (76)
	R2PS	45	84.0 (2134)	20.3 (514)	3.0 (76)
	R2P6S	45	84.0 (2134)	20.3 (514)	6.0 (152)
	R2P6S96	52	96.1 (2441)	20.3 (514)	6.0 (152)
Packaging:	Includes right and left mounting rack channels, top and bottom brackets, assembly hardware with paint piercing washers and anti-oxidizing paste for complete rack bonding				

key features and benefits

Rack spaces:	The 8' rack with 52 RUs allows more equipment in the same footprint to maximize real estate for lowest cost of ownership
Extruded aluminum construction:	Designed to be lightweight and durable for easier deployment and reduced transportation costs; UL listed for 1000 lbs.
Heavy duty steel construction:	6" channel rack designed for higher weight capacity for large equipment; UL listed for 1500 lbs.
Printed rack space identification:	Allows for quick location of rack mounted equipment for faster installation and less rework; see individual customer drawings for specific rack RU numbering
Paint piercing washers:	Fully electrically bonds rack components to simplify grounding process for improved network reliability
Double-sided #12-24 mounting holes:	Provides ability to mount equipment on both sides of the rack channel for improved system flexibility
Multiple mounting hole locations:	Provides flexibility to mount to floor using any of three hole locations. Note: Utilizing holes closest to the vertical uprights will minimize deflection
J-bolt accessibility:	J-bolt can be attached to top bracket without violating top RU space for added stability

applications

2-Post standard equipment rack provides a reliable foundation for mounting telecommunication and data center equipment. The rack can be used to manage high performance copper and fiber patch cables. This modular rack system is compatible with horizontal and vertical cable managers. The 2-Post standard equipment rack is part of a complete rack and cable management system that manages, protects, and showcases your network investment.

www.panduit.com

3" Channel Racks – #12-24 threaded rail, Aluminum	
84"H x 19"W:	R2P^
48"H x 19"W:	R2P48
79"H x 19"W:	R2P79
96"H x 19"W:	R2P96
84"H x 23"W:	R2PW
3" Channel Racks – #12-24 threaded rail, Steel	
84"H x 19"W:	R2PS
6" Channel Racks – #12-24 threaded rail, Steel	
84"H x 19"W:	R2P6S
96"H x 19"W:	R2P6S96
2-Post Rack Accessories for 19" Racks – Front Mount Shelves	
1.7"H x 19.0"W x 15.2"D:	SRM19FM1
3.5"H x 19.0" W x 15.2"D:	SRM19FM2
Cantilevered Shelf Vented 5.2"H x 19.2"W x 12.5"D:	SRM19CMV3
Cantilevered Shelf 5.2"H x 19.0"W x 12.5"D:	SRM19CM3
Adjustable Shelf	
19.0"W x 18.0"D:	SRM19X18A
19.0"W x 25.0"D:	SRM19X25A
Power Distribution Unit (PDU) Mounting Bracket	
2-Post rack (PDU) bracket (set of 2):	R2PPDUB^
Additional Hardware	
100 #12-24 screws:	S1224-C
Rack anchor kit for concrete floor:	RFAKIT
Rack anchor kit for raised floor:	RFA3KIT
NetRunner Vertical Cable Managers – 7' Front and Rear	
45 RU, 4" x 5":	WMPV45E
45 RU, 6" x 6":	WMPVHC45E
Front Only	
45 RU, 4" x 5":	WMPVF45E
45 RU, 6" x 6":	WMPVHCF45E
PatchRunner 2 Vertical Cable Managers with Doors - 7'	
Dual-sided with two doors:	PR2VD**+^
Dual-sided with one door:	PR2VSD**+^
Single-sided with one door:	PR2VFD**+^

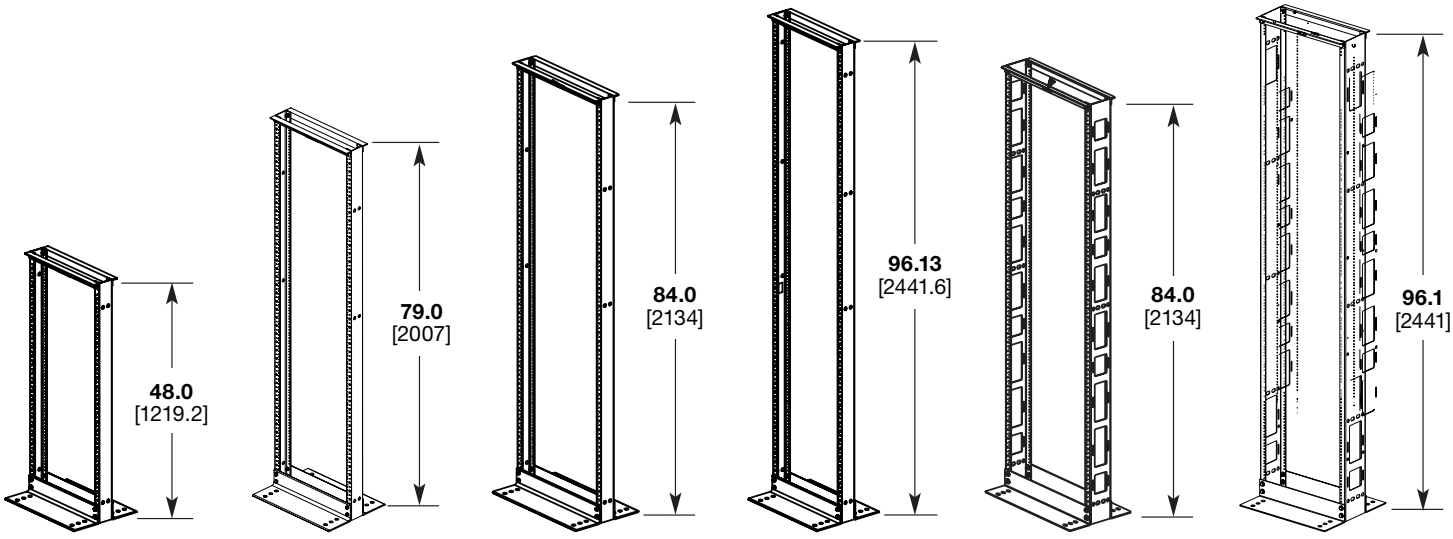
+For parts 6.5' tall, add "79" to the end of the part number. For part numbers 8' tall, add "96" to the end of the part number. Ex: R2P96

^For part numbers in white, add "WH" to end of part number. Ex: R2PWH

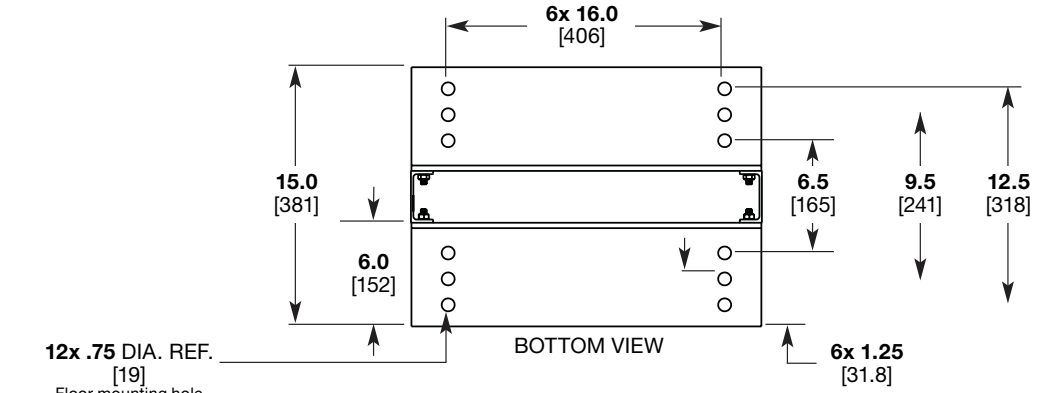
**For part widths, add 06 (6"), 08 (8"), 10 (10"), or 12 (12"). Ex: PR2VD0696WH

6.5' tall parts are only available in 06 and 12 widths

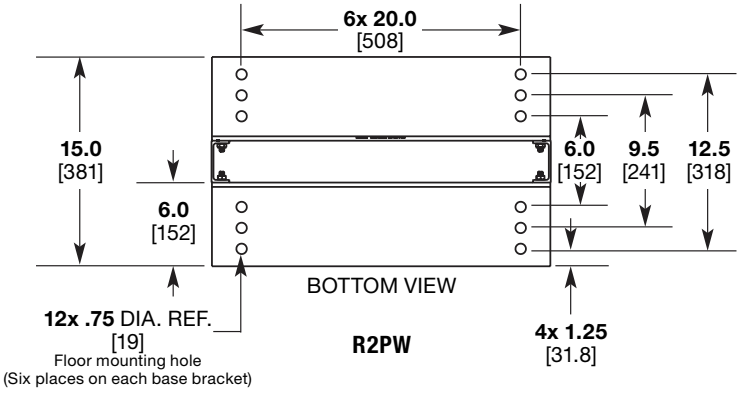
2-Post Standard Equipment Rack



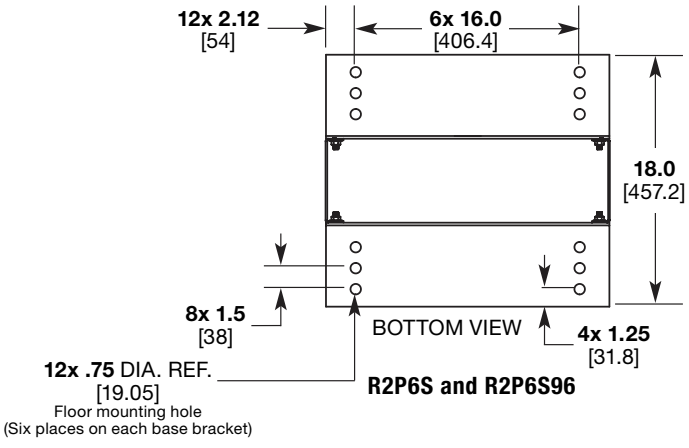
R2P48 **R2P79** **R2P, R2PW, R2PWH, and R2PS** **R2P96** **R2P6S** **R2P6S96**



R2P48, R2P79, R2P, R2P96, and R2PS



R2PW



R2P6S and R2P6S96

Dimensions are in inches. [Dimensions in **brackets** are metric].

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or by phone: 800.777.3300

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RKSP143-WW-ENG
6/2023

GenSPEED® 6 Category 6 Cable
Standards-Compliant Extended Frequency

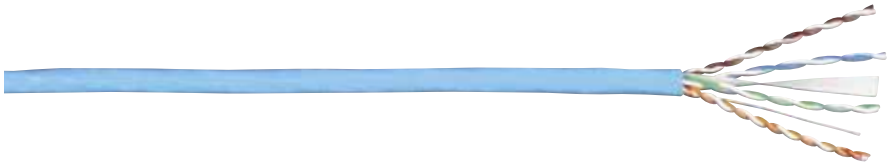
Features and Benefits
- Unique separator design engineered for consistent electrical performance
- Performance guaranteed to 350 MHz
- TRU-Mark® print legend contains footage markings from 1000' to 0'
- Third-party verified for guaranteed performance
- Made in U.S.A.

Applications
- IEEE 802.3: 1000 BASE-T, 100 BASE-TX, 10 BASE-T, PoE, PoE+
- ANSI/TIA 854: 1000 BASE-TX
- CDDI, Token Ring, ATM
- Digital Video
- Broadband and Baseband Analog Video

Standard Compliances
- ANSI/TIA 568-C.2
- NEC/CEC Type CMR (UL 1666) for Non-Plenum
- NEC/CEC Type CMP (NFPA 262) for Plenum
- UL 444
- RoHS Compliant Directive 2011/65/EU
- ANSI/TIA 862 (Building Automation)
- ICEA S-116-732
- ICEA S-102-700
- ISO/IEC 11801 Ed. 2.0 (Class E)

LISTED VERIFIED TIA 568-C.2 RoHS Compliant Directive 2011/65/EU Made in U.S.A.

Data subject to change without notice.



CONSTRUCTION

Conductors
- 23 AWG solid bare annealed copper

Insulation
- Non-Plenum: Polyolefin
- Plenum: Fluoropolymer

Color Code
- Pair 1: Blue-White/Blue
- Pair 2: Orange-White/Orange
- Pair 3: Green-White/Green
- Pair 4: Brown-White/Brown

Separator
- Divider

Rip Cord
- Applied longitudinally under jacket

Jacket
- Non-Plenum: Flame-Retardant PVC
- Plenum: Low-Smoke, Flame-Retardant PVC

PHYSICAL DATA

	CMR (Non-Plenum)	CMP (Plenum)
Nominal Cable Diameter (in)	0.220	0.205
Nominal Cable Weight (lbs/1000 ft)	24	25
Minimum Bend Radius (in)	1.0	1.0
Maximum Pulling Force (lbs)	32	32
Temperature Rating (˚C)		
Installation:	0 to +60	0 to +60
Operation:	-20 to +75	-20 to +75

PART NUMBERS

Standard packaging: 1000' Pull-Pac® II

	Pull-Pac® II		Spool-Pac®		Spool	
Jacket Color	CMR (Non-Plenum)	CMP (Plenum)	CMR (Non-Plenum)	CMP (Plenum)	CMR (Non-Plenum)	CMP (Plenum)
Blue	**7133800**	**7131800**	**7133840**	**7131840**	**7133860**	**7131860**
White	**7133801**	**7131801**	**7133841**	**7131841**	**7133861**	**7131861**
Yellow	**7133802**	**7131802**	**7133842**	**7131842**	**7133862**	**7131862**
Gray	**7133803**	**7131803**	**7133843**	**7131843**	**7133863**	**7131863**
Red	**7133804**	**7131804**	**7133844**	**7131844**	**7133864**	**7131864**
Orange	**7133805**	**7131805**	**7133845**	**7131845**	**7133865**	**7131865**
Green	**7133806**	**7131806**	**7133846**	**7131846**	**7133866**	**7131866**
Black	**7133807**	**7131807**	**7133847**	**7131847**	**7133867**	**7131867**
Pink	**7133808**	**7131808**	**7133848**	**7131848**	**7133868**	**7131868**
Purple	**7133809**	**7131809**	**7133859**	**7131859**	**7133869**	**7131869**

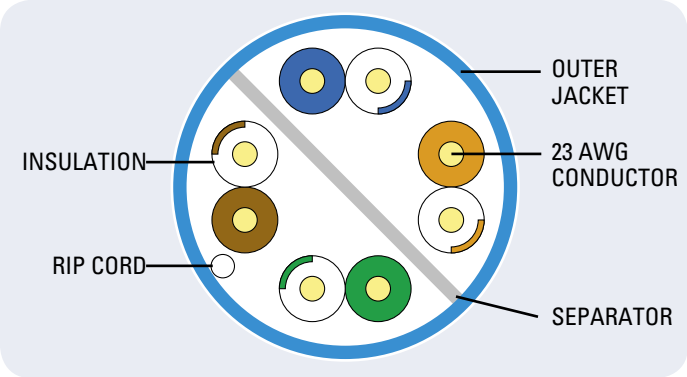
Note: Bulk reels are available as a special request with a maximum allowable length of 3000 feet per reel. Minimum run and lead time may apply.
Non-stock items may be subject to minimum order quantities.

ELECTRICAL PERFORMANCE

Frequency MHz	PSACR* (min)	ACR* (min)	Insertion Loss (max)	PSNEXT (min)	NEXT (min)	PSACRF (min)	ACRF (min)	Return Loss (min)	TCL (min)	ELTCTL (min)
1	70.3	72.3	2.0	72.3	74.3	64.8	67.8	20.0	40.0	35.0
4	59.3	61.5	3.8	63.3	65.3	52.8	55.7	23.0	40.0	23.0
10	51.3	53.3	6.0	57.3	59.3	44.8	47.8	25.0	40.0	15.0
16	46.7	48.7	7.6	54.2	56.2	40.7	43.7	25.0	38.0	10.9
20	44.3	46.3	8.5	52.8	54.8	38.8	41.7	25.0	37.0	9.0
31.25	39.2	41.2	10.7	49.9	51.9	34.9	37.9	23.6	35.1	—
62.5	29.9	32.0	15.4	45.4	47.4	28.9	31.8	21.5	32.0	—
100	22.5	24.5	19.8	42.3	44.3	24.8	27.8	20.1	30.0	—
150	14.9	16.9	24.7	39.7	41.7	21.3	24.3	18.9	28.2	—
200	8.8	10.8	29.0	37.8	39.8	18.8	21.8	18.0	27.0	—
250	3.5	5.5	32.8	36.3	38.3	16.8	19.8	17.3	26.0	—
350	—	—	39.8	34.1	36.1	13.9	16.9	16.3	—	—
400	—	—	43.0	33.3	35.3	12.8	15.8	15.9	—	—
500	—	—	48.9	31.8	33.8	10.8	13.8	15.2	—	—

Note: Values are expressed in dB per 100 m (328 ft.) length @ 20°C. Results beyond 350 MHz are for reference only.
*PSACR & ACR not specified in ANSI/TIA 568-C.2

GenSPEED® 6 CATEGORY 6 CROSS-SECTION



ELECTRICAL CHARACTERISTICS

	Max.	Nom.
DC Resistance Ohms/100 m (328 ft) @ 20˚C	9.38	7.50
DC Resistance Unbalance Individual Pair %	4.00	< 1
Delay Skew ns/100 m	45	CMP: 30 CMR: 35
Nom. Velocity of Propagation % Speed of Light	CMP: 70 CMR: 68	
Characteristic Impedance Frequency (f): 1-350 MHz	Ohms 100 ± 15	

NetKey® Category 6 Punchdown Jack Modules

PANDUIT®
SPECIFICATION SHEET

SPECIFICATIONS

Category 6/Class E, 8-position keystone jack module terminates unshielded twisted 4-pair, 22 – 26 AWG, 100 ohm cable. Punchdown tool properly terminates each conductor for optimum performance. Universal label is color coded T568A and T568B wiring schemes.

TECHNICAL INFORMATION

Category 6/Class E channel and component performance:	Exceeds ANSI/TIA-568.2-D Category 6 and ISO 11801 Class E channel requirements at swept frequencies up to 250 MHz Exceeds ANSI/TIA-568.2-D and ISO 11801 Category 6 component requirements at swept frequencies up to 250 MHz
FCC and ANSI compliance:	Meets ANSI/TIA-1096-A; contacts plated with 50 microinches of gold for superior performance
IEC compliance:	Meets IEC 60603-7 and IEC 60512-99-002
PoE and PoH compliance:	Meets IEEE 802.3af/802.3at and 802.3bt type 3 and type 4 Supports Power over HDBaseT up to 100 watts
c(UL)us Listed:	UL 1863 (Use as communications circuit accessory); CSA standard C22.2 UL 2043 (Suitable for use in air-handling spaces)
Operating temperature:	14°F to 167°F (-10°C to 75°C)
RoHS compliance:	Compliant

KEY FEATURES AND BENEFITS

100% performance tested:	Confidence that each jack module delivers the specified performance
110 style punchdown termination:	Utilizes industry standard termination style and includes a wire retention cap
Modular:	Universal keystone jack modules snap in and out of all NetKey Faceplates, Modular Patch Panels, and Surface Mount Boxes for fast moves, adds, and changes
Individually serialized:	Marked with quality control number for traceability
Bulk packaging (optional):	25 jacks packaged in one easy to open container, eliminating the time to open each individual package and reducing on-site waste; ideal for high volume installations

APPLICATIONS

Applications include:

- Ethernet 10BASE-T, 100BASE-T (Fast Ethernet), and 1000BASE-T (Gigabit Ethernet)
- Voice over Internet Protocol (VoIP)

NetKey Category 6 Jack Modules	
Module:	NK688M*
Bulk Pack of 25 Modules:	NK688M*-Q
NetKey Patch Panels with Labels	
24-port, 1 RU:	NKFP24Y
48-port, 2 RU:	NKFP48Y
Termination and Cable Prep Tools	
Punchdown Tool:	PDT110‡
Punchdown Base:	NKSPB
JackRapid+ Termination Tool:	JR-PAN-2‡‡
Cable Snipping Tool:	CWST
Cable Stripping Tool:	CJAST
Replacement retention caps:	DRWCIW-24

*Colors: IW (Off White), EI (Electric Ivory), IG (International Gray), WH (White), BL (Black), OR (Orange), RD (Red), BU (Blue), GR (Green), AW (Arctic White), VL (Violet), or YL (Yellow)

‡Terminates the NetKey Keystone Punchdown Jack Module and NetKey Patch Panel.

‡‡Terminates the NetKey Keystone Punchdown Jack Module. Fluke JackRapid Termination Tool available through distribution

To locate the local office, visit **www.flukenetworks.com/contact**

+JackRapid is a trademark of Fluke Networks

-Q indicates bulk packages of 25 pieces to reduce single-use plastic

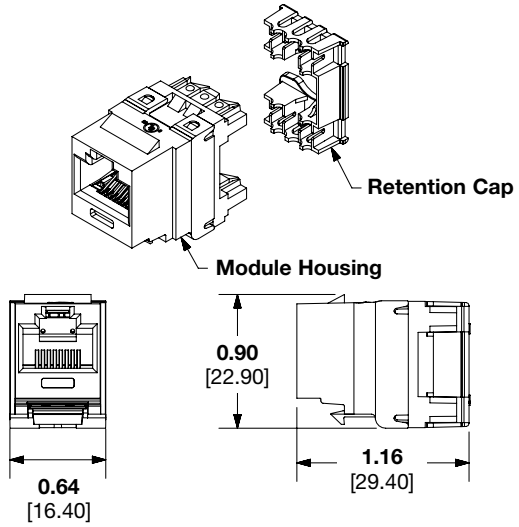
TEST RESULTS

Mechanical Test	Test Method	Measurement	Typical Test Results
Normal	ANSI/TIA-1096-A	Load (grams)	>100
Vibration	IEC 512-6d	Circuit Resistance (mOhms)	< 40
Shock	IEC 512-6c	Contact Disturbance (microsecond)	< 5
Durability	IEC 512-6a	Circuit Resistance (mOhms)	< 20
Mating/Un-mating	IEC 512-6b	Mating Force (N)	< 20
		Un-mating Force (N)	< 20
Termination Cycles	IEC 352	Number of Cycles	> 20
Mating Cycles	IEC 60603-7	Number of Plug Insertions	>2500

Electrical Test	Test Method	Measurement	Typical Test Results
Low Level Circuit Resistance	IEC 512-2a	Resistance (mOhms)	< 20
Dielectric Withstand Voltage	IEC 512-4a	1000 VAC, 1 minute	Passed
Insulation Resistance	IEC 512-3a	Resistance (MOhms)	>500

Mechanical Test	Test Method	Measurement	Typical Test Results
Temperature Life	IEC 512-9b	Circuit Resistance (mOhms)	< 40
Humidity	IEC 512-11c		
Thermal Shock	IEC 512-11d		
Climatic Sequence	IEC 512-11a		
Flowing Mixed Gas Corrosion	IEC 512-11g		

ENGINEERING DRAWINGS



Dimensions are in inches. [Dimensions in brackets are metric].

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COSP588-WW-ENG
7/2024

TX6™ Performance 28 AWG UTP Patch Cords

PANDUIT®
SPECIFICATION SHEET

SPECIFICATIONS

Category 6/Class E, UTP, small diameter patch cords shall be constructed of 28 AWG, unshielded, twisted pair, stranded copper (dual-rated CM/LSZH) cable with high performance RJ45 modular plugs. Patch cords shall be offered in multiple lengths and colors for design flexibility.

Category 6 28 AWG Patch Cords	
Feet lengths:	UTP28SP*^
Meter lengths:	UTP28SP**M^
Inches lengths:	UTP28SP***^

*Foot lengths: 1 - 50 feet (every 1 foot)
55 - 130 feet (every 5 feet)

**Meter lengths: 0.5 - 10 meters (every 0.5 meters)
11 - 20 meters (every 1 meters)
15 - 40 meters (every 5 meters)

***Inch lengths: 6 and 8 inches

^Colors other than Off White: BU (Blue), BL (Black), GR (Green), RD (Red), OR (Orange), YL (Yellow), GY (Gray), or VL (Violet)

◊Lengths 1 meter to 15 meters or 6 inches to 49 feet are guaranteed to meet TIA and ISO component and channel requirements. Lengths greater than 1 5 meters or 49 feet are guaranteed to meet ISO component and both TIA and ISO channel requirements.

TECHNICAL INFORMATION

Category 6/Class E channel and component performance:	Exceeds all ANSI/TIA-568V.2-D Category 6 and ISO 11801 Class E electrical performance requirements for frequencies up to 250 MHz◊ Note: 28 AWG patch cords have attenuation de-rating value of 1.9. Supports 96 meter channels that include 90 meter permanent links. Supports 93 meter channels with 10 meters of patch cords included in the channe
FCC and ANSI compliance:	Meets ANSI/TIA-1096-A (formerly FCC Part 68)
IEC compliance:	Meets IEC 60603-7
PoE compliance:	Supports IEEE 802.3af/802.3at (48 cables in a bundle) and 802.3bt type 3 and type 4 (24 cables in a bundle) PoE applications
c(UL)us compliance:	UL 1863 and CAN/CSA-C22.2 (UL File E129886)
RoHS compliance:	Compliant
Cable diameter:	0.15 in. (3.8mm) nominal
Operating temperature:	14°F-167°F (-10°C-75°C)
Storage temperature:	-40°F-158°F (-40°C-70°C)
Plug housing:	UL94V-0 rated clear Polycarbonate
Contacts:	Gold plated phosphor bronze: contacts plated with 50 microinches of gold for superior performance
Flammability rating:	CM/LSZH dual-rated

KEY FEATURES AND BENEFITS

100% Performance tested for wire map, NEXT, and return loss:	Confidence that each patch cord delivers critical electrical component-level performance. Centered de-embedded plug performs in center of ANSI/ TIA-568.2-D Category 5e component range, ensuring interoperability and optimum performance
Smaller diameter, flexible cable design:	Tight bend radius enables improved cable routing and management in high density applications. Smaller cable diameter allows twice the number of cords to be routed through cable managers and pathways compared to traditional Category 5e patch cords. Reduced cable diameter facilitates improved air flow, cooling, resulting in lower operating costs than traditional Category 5e patch cords
Integral pair manager:	Immediate compatibility with the most common Mini-Com UTP and shielded jacks
Patented tangle-free latch:	Prevents snags and provides easy release, saving time on frequent moves, adds, and changes
Robust construction:	Plug contact plated with 50 microinches of gold and rated to 2500 mating cycles
Flexible stranded cable:	U/UTP stranded 28 AWG copper cable with a nominal diameter of 0.149 in. (3.8mm) allows for high density installations and superior panel cable management

PANDUIT RAPIDID enabled

TX6™ Performance 28 AWG UTP Patch Cords are pre-labeled with the RapidID™ Network Mapping System to enable faster tracing, placing, and network documentation.

Learn more: www.panduit.com/rapid-id

TAA Compliant

All listed part numbers are compliant with the U.S. Trade Agreements Act (TAA) for purchases shipped to customers in the United States.

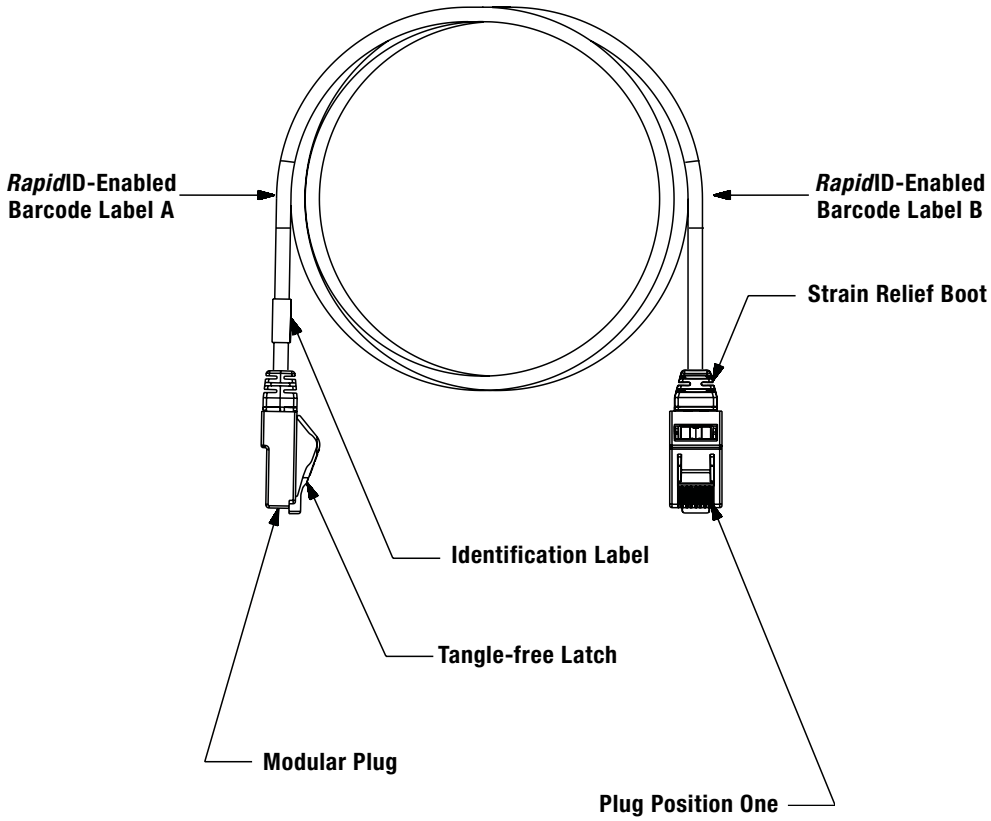
TX6™ Performance 28 AWG UTP Patch Cords

APPLICATIONS

Category 6 Performance 28 AWG UTP Patch Cords support the following applications:

- 1000BASE-T (Gigabit Ethernet), 100BASE-T (Fast Ethernet)
- 155 Mb/s ATM, 622 Mb/s ATM, 1.2 Gb/s ATM
- Digital video and broadband/baseband analog video
- Voice/data systems
- Voice over Internet Protocol (VoIP)

ENGINEERING DRAWING



Recycle at end of life

T568B Wiring Scheme	
Plug Position	**Cable Wire**
1	White/Orange
2	Orange
3	White/Green
4	Blue
5	White/Blue
6	Green
7	White/Brown
8	Brown

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COSP229-WW-ENG
7/2024

TIMES MICROWAVE SYSTEMS

LMR®-400
Flexible Low Loss Communications Coax

Ideal for...

- Drop-in replacement for RG-8/9913 Air-Dielectric type Cable
- Jumper Assemblies in Wireless Communications Systems
- Short Antenna Feeder runs
- Any application (e.g. WLL, GPS, LMR, WLAN, WISP, WiMax, SCADA, Mobile Antennas) requiring an easily routed, low loss RF cable
- **NEW!** Times Protect® LP-18-400 protector-series

Part Description				Stock
Part Number	Application	Jacket	Color	Code
LMR-400	Outdoor	PE	Black	54001
LMR-400-DB	Outdoor/Watertight	PE	Black	54091
LMR-400-FR	Indoor/Outdoor Riser CMR	FRPE	Black	54030
LMR-400-FR-PVC	Indoor/Outdoor Riser CMR	FRPVC	Black	54073
LMR-400-PVC	General Purpose	PVC	Black	54218
LMR-400-PVC-W	General Purpose	PVC	White	54204

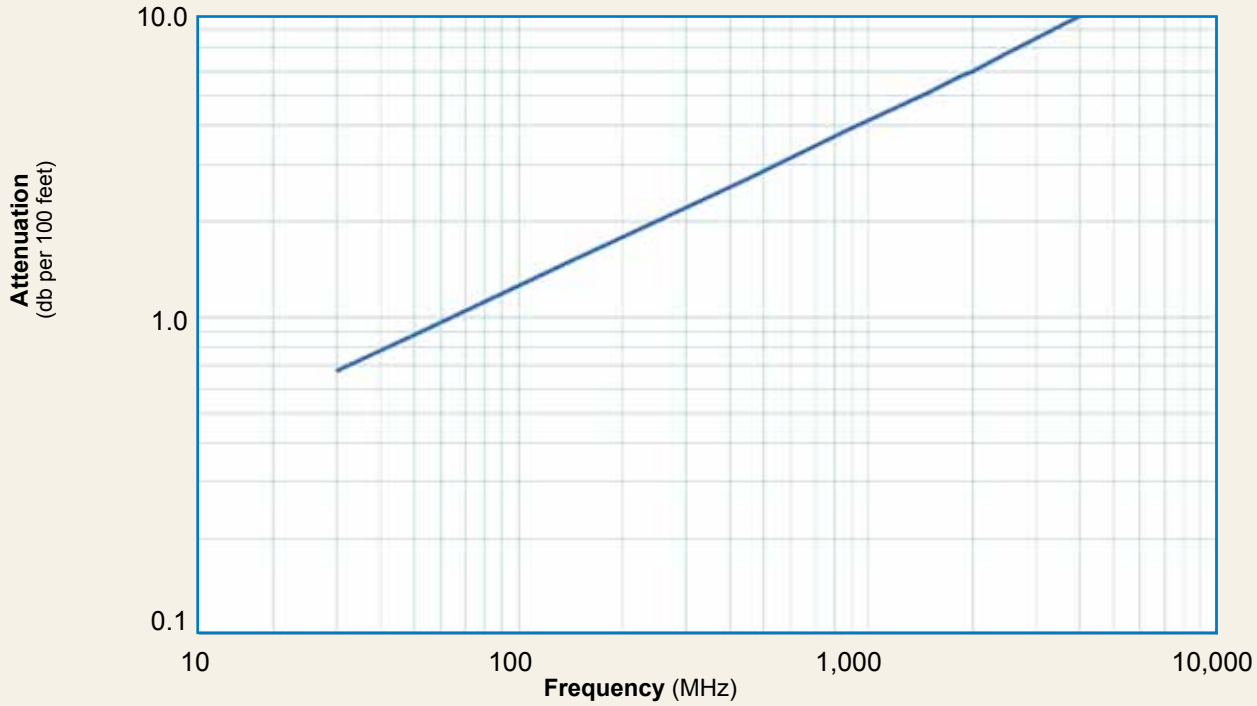
Construction Specifications			
Description	Material	In.	(mm)
Inner Conductor	Solid BCCAI	0.108	(2.74)
Dielectric	Foam PE	0.285	(7.24)
Outer Conductor	Aluminum Tape	0.291	(7.39)
Overall Braid	Tinned Copper	0.320	(8.13)
Jacket	(see table)	0.405	(10.29)

Environmental Specifications		
Performance Property	°F	°C
Installation Temperature Range	-40/+185	-40/+85
Storage Temperature Range	-94/+185	-70/+85
Operating Temperature Range	-40/+185	-40/+85

Mechanical Specifications			
Performance Property	Units	US	(metric)
Bend Radius: installation	in. (mm)	1.00	(25.4)
Bend Radius: repeated	in. (mm)	4.0	(101.6)
Bending Moment	ft-lb (N-m)	0.5	(0.68)
Weight	lb/ft (kg/m)	0.068	(0.10)
Tensile Strength	lb (kg)	160	(72.6)
Flat Plate Crush	lb/in. (kg/mm)	40	(0.71)

Electrical Specifications			
Performance Property	Units	US	(metric)
Velocity of Propagation	%	84	
Dielectric Constant	NA	1.38	
Time Delay	nS/ft (nS/m)	1.20	(3.92)
Impedance	ohms	50	
Capacitance	pF/ft (pF/m)	23.9	(78.4)
Inductance	uH/ft (uH/m)	0.060	(0.20)
Shielding Effectiveness	dB	>90	
DC Resistance			
Inner Conductor	ohms/1000ft (/km)	1.39	(4.6)
Outer Conductor	ohms/1000ft (/km)	1.65	(5.4)
Voltage Withstand	Volts DC	2500	
Jacket Spark	Volts RMS	8000	
Peak Power	kW	16	

Attenuation vs. Frequency (typical)



Frequency (MHz)	30	50	150	220	450	900	1500	1800	2000	2500	5800	8000
Attenuation dB/100 ft	0.7	0.9	1.5	1.9	2.7	3.9	5.1	5.7	6.0	6.8	10.8	13.0
Attenuation dB/100 m	2.2	2.9	5.0	6.1	8.9	12.8	16.8	18.6	19.6	22.2	35.5	42.7
Avg. Power kW	3.33	2.57	1.47	1.20	0.83	0.58	0.44	0.40	0.37	0.33	0.21	0.17

Calculate Attenuation =
(0.122290) •$\sqrt{\text{FMHz}}$ + (0.000260) • FMHz (interactive calculator available at http://www.timesmicrowave.com/cable_calculators)

Attenuation:
VSWR=1.0 ; Ambient = +25°C (77°F)

Power:
VSWR=1.0; Ambient = +40°C; Inner Conductor = 100°C (212°F); Sea Level; dry air; atmospheric pressure; no solar loading

TIMES MICROWAVE SYSTEMS

LMR®-400
Flexible Low Loss Communications

Connectors

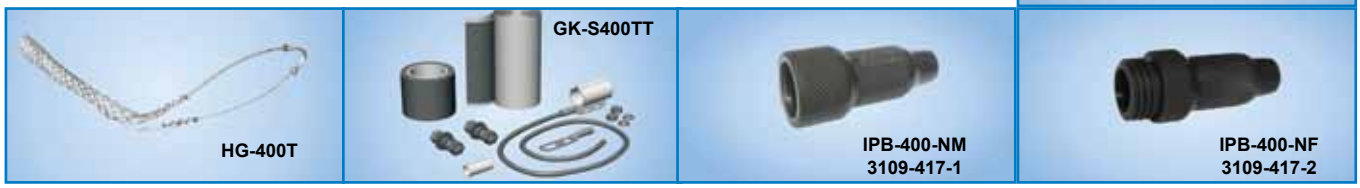
Interface	Description	Part Number	Stock Code	VSWR** Freq. (GHz)		Coupling Nut	Inner Contact Attach	Outer Contact Attach	Finish* Body /Pin	Length in	Length (mm)	Width in	Width (mm)	Weight lb	Weight (g)
1. 4.1-9.5 mini DIN Female	Straight Jack	EZ-400-4195F-X	3190-2968	<1.25:1	(6)	Hex	Spring Finger	Crimp	A/G	1.8	(45.0)	0.55	(14.0)	0.074	(33.6)
2. 4.1-9.5 mini DIN Female	Straight Plug	EZ-400-4195M-X	3190-2969	<1.25:1	(6)	Hex	Spring Finger	Crimp	A/G	1.5	(38.1)	0.89	(22.6)	0.103	(46.8)
3. 716 DIN Female	Straight Jack	TC-400-716-FC	3190-376	<1.25:1	(2.5)	N/A	Solder	Clamp	S/S	1.6	(41)	1.13	(28.7)	0.281	(127.5)
4. 7-16 DIN	Right Angle	TC-400-716M-RA-D	3190-2598	<1.35:1	(6)	Hex	Solder	Crimp	A/S	1.7	(43..20	1.98	(50.3)	0.374	(169.5)
5. 7-16 DIN Male	Straight Plug	EZ-400-716M-X	3190-2524	<1.25:1	(6)	Hex	Spring Finger	Crimp	A/G	1.6	(39.5)	1.38	(35)	0.277	(126.0)
6. 7-16 DIN Male	Straight Plug	TC-400-716M-X	3190-2597	<1.25:1	(6)	Hex	Solder	Crimp	A/S	1.6	(39.5)	1.42	(36.0)	0.320	(145.0)
7. 7-16 DIN Male	Straight Plug	TC-400-716-MC	3190-279	<1.25:1	(2.5)	Hex	Solder	Clamp	S/S	1.4	(36)	1.40	(35.6)	0.268	(121.6)
8. 7-16 DIN Male	Right Angle	TC-400-716MC-RA	3190-1671	<1.25:1	(<3)	Hex	Solder	Clamp	A/S	2.4	(61.5)	1.88	(47.8)	0.35	(159)
9. 7-16 DIN Male	Right Angle	EZ-400-716M-RA-X	3190-2545	<1.35:1	(6)	Hex	Spring Finger	Crimp	A/G	1.6	(41.7)	1.75	(44.3)	0.374	(0.17)
10. BNC Male	Straight Plug	TC-400-BM-X	3190-6232	<1.30:1	(4)	Knurl	Solder	Crimp	A/G	1.8	(46.8)	0.60	(14.5)	0.630	(28.6)
11. BNC Male	Straight Plug	EZ-400-BM-X	3190-2852	<1.35:1	(2)	Knurl	Spring Finger	Crimp	A/G	1.7	(42.7)	0.56	(14.2)	0.066	(29.9)
12. BNC Male	Right Angle	EZ-400-BM-RA-X	3190-2847	<1.35:1	(2)	Knurl	Spring Finger	Crimp	A/G	1.9	(48.0)	1.32	(33.5)	0.097	(44.0)
13. HN Male	Straight Plug	TC-400-HNM	3190-923	<1.25:	(<1)	Knurl	Solder	Clamp	S/G	2.3	(59.2)	0.88	(22.4)	0.25	(113.4)
14. HN Male	Right Angle	TC-400-HNM-RA	3190-2541	<1.25:1	(2.5)	Hex	Solder	Crimp	A/G	1.6	(41.4)	1.56	(39.6)	0.198	(90.0)
15. UHF Male	Straight Plug	EZ-400-UM	3190-997	<1.25:1	(2.5)	Knurl	Spring Finger	Crimp	N/G	1.8	(48)	0.80	(20.3)	0.076	(34.4)
16. Mini-UHF	Straight Plug	TC-400-MUHF	3190-520	<1.25:1	(2.5)	Knurl	Solder	Crimp	N/G	1.1	(28)	0.50	(12.7)	0.020	(9.1)
17. N Female	Straight Jack	TC-400-NFC	3190-299	<1.25:1	(2.5)	N/A	Solder	Clamp	N/S	1.6	(41)	0.75	(19.1)	0.119	(54.0)
18. N Female	Straight Jack	EZ-400-NF-X	3190-2818	<1.25:1	(2.5)	N/A	Spring Finger	Crimp	N/G	1.8	(45)	0.66	(16.8)	0.105	(47.6)
19. N Female	Straight Jack	TC-400-NF-X	3190-2815	<1.25:1	(2.5)	N/A	Solder	Crimp	N/G	1.8	(45)	0.66	(16.8)	0.105	(47.6)
20. N Female	Bulkhead Jack	EZ-400-NF-BH	3190-518#	<1.25:1	(2.5)	N/A	Spring Finger	Crimp	N/G	1.8	(46)	0.88	(22.4)	0.102	(46.3)
21. N Female	Bulkhead Jack	TC-400-NFC-BH (A)	3190-872	<1.25:1	(2.5)	N/A	Solder	Clamp	A/G	1.8	(46)	0.88	(22.4)	0.145	(65.8)
22. N Male	Straight Plug	SC-400-NM	3190-1454	<1.25:1	(2.5)	Knurl	Solder	Crimp	N/G	1.5	(38)	0.75	(19.1)	0.090	(40.8)
23. N Male	Straight Plug	TC-400-NMC	3190-6077	<1.25:1	(2.5)	Knurl	Solder	Clamp	N/G	1.5	(38)	0.70	(17.8)	0.121	(54.9)
24. N Male	Straight Plug	EZ-400-NMC-2-D	3190-2640	<1.25:1	(2.5)	Hex/Knurl	Spring Finger	Clamp	N/G	1.5	(38)	0.75	(19.1)	0.121	(54.9)
25. N Male	Straight Plug	EZ-400-NMH-X	3190-2590	<1.25:1	(10)	Hex/Knurl	Spring Finger	Crimp	A/G	1.5	(38)	0.89	(22.6)	0.103	(46.8)
26. N Male	Straight Plug	TC-400-NMH-X	3190-2626	<1.25:1	(10)	Hex/Knurl	Solder	Crimp	A/G	1.5	(38)	0.89	(22.6)	0.113	(51.3)
27. N Male	Right Angle	EZ-400-NMH-RA-X	3190-2638	<1.35:1	(6)	Hex/Knurl	Spring Finger	Crimp	A/G	1.87	(47)	1.42	(36.0)	0.177	(80.2)
28. N Male	Right Angle	TC-400-NMH-RA-SS	3190-1668	<1.25:1	(2.5)	Hex	Solder	Crimp	SS/G	1.5	(38.1)	0.89	(2.6)	0.130	(59.0)
29. N Male	Right Angle	TC-400-NMH-RA-D	3190-2293#	<1.35:1	(6)	Hex/Knurl	Solder	Crimp	A/G	1.8	(46)	1.25	(31.8)	0.130	(59.0)
30. N Male	Right Angle	TC-400-NMC-RA (A)	3190-870	<1.35:1	(2.5)	Hex	Solder	Clamp	A/G	1.8	(46)	1.25	(31.8)	0.150	(68.0)
31. N Male	Reverse Polarity	TC-400-NM-RP	3190-960	<1.25:1	(2.5)	Knurl	Solder	Crimp	N/G	1.5	(38)	0.75	(19.1)	0.090	(40.8)
32. QN Male	Straight Plug	EZ-400-QNM-X	3190-2979	<1.25:1	(6)	Hex	Spring Finger	Crimp	A/G	1.5	(38)	0.89	(22.6)	0.103	(46.8)
33. QN Male	Staright Plug	TC-400-QNM-X	3190-6212	<1.25:1	(6)	Hex	Solder	Crimp	A/G	2.0	(50.2)	0.74	(18.9)	0.103	(46.8)
34. QN Male	Right Angle	EZ-400-QNM-RA-X	3190-2981	<1.25:1	(6)	Hex	Spring Finger	Crimp	A/G	1.9	(47.0)	1.42	(36.0)	0.177	(80.2)
35. QN Female	Straight Jack	EZ-400-QNF-X	3190-2980	<1.25:1	(6)	N/A	Spring Finger	Crimp	A/G	1.8	(45.0)	0.66	(16.8)	0.105	(47.6)
36. SMA Male	Straight Plug	TC-400-SM-X	3190-3046	<1.25:1	(8)	Hex	Solder	Crimp	N/G	1.2	(29)	0.50	(12.7)	0.032	(14.5)
37. SMA Female	Straight Jack	TC-400-SF-X	3190-6174	<1.35:1	(6)	N/A	Solder	Crimp	A/G	1.2	(29.7)	0.50	(12.7)	0.026	(12.0)
38. TNC Female	Reverse Polarity	TC-400-TF-RP	3190-1063	<1.25:1	(2.5)	N/A	Solder	Crimp	N/G	1.8	(46)	0.55	(14.0)	0.074	(33.6)
39. TNC Female	Reverse Polarity	EZ-400-TF-RP	3190-795	<1.25:1	(2.5)	N/A	Spring Finger	Crimp	A/G	1.8	(46)	0.55	(14.0)	0.074	(33.6)
40. TNC Female	Straight Jack	EZ-400-TF-X	3190-3049	<1.25:1	(6)	N/A	Spring Finger	Crimp	A/G	1.8	(45)	0.55	(14.0)	0.074	(33.6)
41. TNC Female	Straight Jack	TC-400-TF-X	3190-3051	<1.25:1	(6)	N/A	Solder	Crimp	A/G	1.8	(45.0)	0.55	(14.0)	0.074	(33.6)
42. TNC Male	Straight Plug	TC-400-TM-X	3190-2532	<1.25:1	(6)	Hex/Knurl	Solder	Crimp	A/G	1.9	(48)	0.67	(17.5)	0.075	(34.3)
43. TNC Male	Straight Plug	EZ-400-TM-X	3190-2533	<1.25:1	(6)	Hex/Knurl	Spring Finger	Crimp	A/G	1.9	(48)	0.67	(17.5)	0.075	(34.3)
44. TNC Male	Reverse Polarity	TC-400-TM-RP	3190-1062	<1.25:1	(2.5)	Knurl	Solder	Crimp	N/G	1.7	(43)	0.59	(15.0)	0.074	(33.6)
45. TNC Male	Reverse Polarity	EZ-400-TM-RP	3190-794	<1.25:1	(2.5)	Knurl	Spring Finger	Crimp	A/G	1.7	(43)	0.59	(15.0)	0.074	(33.6)
46. TNC Male	Right Angle	TC-400-TM-RA-D	3190-2671	<1.35:1	(6)	Hex/Knurl	Solder	Crimp	A/G	1.4	(35)	1.41	(35.8)	0.130	(59.0)
47. TNC Male	Right Angle	EZ-400-TM-RA-X	3190-2800	<1.24:1	(6)	Hex	Spring Finger	Crimp	A/G	2.0	(50.0)	0.62	(15.7)	0.130	(59.0)
48. TNC Male	Right Angle RP	TC-400-TM-RP-RA-D	3190-6147	<1.35:1	(6)	Hex	Solder	Crimp	A/G	1.4	(36.0)	1.20	(30.3)	0.130	(59.0)

* Finish metals: N=Nickel, S=Silver, G=Gold, SS=Stainless Steel, A=Alballoy **VSWR spec based on 3 foot cable with a connector *Available in bulk pack

1-2
EZ-400-4195F-X /3190-2968
TC-400-4195M-X / 3190-2969
3
TC-400-716FC
3190-376
4
TC-400-716M-RA-D
3190-2598
5
EZ-400-716M-X
3190-2524
6
TC-400-716M-X
3190-2597
7
TC-400-716MC
3190-279
8
TC-400-716MC-RA
3190-1671
9
EZ-400-716M-RA-X
3190-2545
10
TC-400-BM-X
3190-6232
11
EZ-400-BM-X
3190-2852
12
EZ-400-BM-RA-X
3190-2847
13
TC-400-HNM
3190-923
14
TC-400-HNM-RA
3190-2541
15
EZ-400-UM
3190-997
16
TC-400-MUHF
3190-520
17
TC-400-NFC
3190-299
18
EZ-400-NF-X
3190-2818
19
TC-400-NF-X
3190-2815
20
EZ-400-NF-BH
3190-518
21
TC-400-NFC-BH (A)
3190-872
22
SC-400-NM
3190-1454
23
TC-400-NMC
3190-6077
24
EZ-400-NMC-2-D
3190-2640
25
EZ-400-NMH-X
3190-2590
26
TC-400-NMH-X
3190-2626
27
EZ-400-NMH-RA-X
3190-2638

TIMES MICROWAVE SYSTEMS

Hardware



Type	Part Number	Stock Code	Description
Hoisting Grip	HG-400T	HG-400T	Laced Type (each)
Ground Kit	GK-S400TT	GK-S400TT	Standard Ground Kit (each)
Weather Proof Boots	3109-417-1	IPB-400 NM	LMR-400 Male IP boot suitable for type N, TNC, BNC, 4310, 4195
Weather Proof Boots	3109-417-2	IPB-400 NM	LMR-400 Female IP boots suitable for type N, TNC, BNC, 4310, 4195
Weather Seal Strain Relief Boots	3109-394	WSB-400	Weather seal strain relief boots (10 pk) for use with most popular LMR-400-X series connectors

Install Tools

Type	Part Number	Stock Code	Description
Crimp Tool	CT-U	3192-181	Crimp Handle
Crimp Dies	Y1719	3190-202	.429" Hex Dies
Crimp Tool	CT-400/300	3190-666	Crimp tool for LMR 400 connectors
Crimp Rings	CR-400	3190-830	Crimp rings for TC/EZ-400 connectors (package of 10)
Strip Tool	ST-400C-2	3190-1972	Prep tool for EZ-400-NMC-2 two piece clamp style connector
Strip Tool	CST-400	3192-004	Combination prep tool for LMR-400 crimp and clamp style connectors
Mid-Span Strip Tool	GST-400	3190-2174	For ground strap attachment
Replacement Blades	RB-456	3190-421	Replacement blades for Strip Tool
Deburr Tool	DBT-U	3192-001	Removes center conductor rough edges
Cutting Tool	CCT-02	3192-165	Cable end flush cut tool
Replacement Blade	RB-02	3192-166	Replacement blade for cutting tool
Tool Kit	TK-400EZ	3190-1601	Tool kit for LMR-400 Crimp Connectors (includes CCT-02, CST-400, CT-400/300, Tool Pouch)
Replacement Blade Kit	RB-CST	3192-086	Replacement blade kit for all CST strip tools

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Certified Premium High Speed HDMI® Cables with Ethernet

- Enables transmission of High Dynamic Range (HDR) video
- Full 18Gbps bandwidth
- UltraHD, 4K@60 2160p
- EMI tested to ensure cables minimize interference with wireless signals
- Up to 32 audio channels with ARC for a multi-dimensional immersive audio experience
- Support for the wide angle theatrical 21:9 video aspect ratio
- Certified Premium HDMI ensures installations are ready for today's 4K/UltraHD environment and are future-proofed
- UL Listed, CL3 Rated

PART NUMBER	LENGTH	AWG	O.D.
HDMICP01	1 ft	28	7.3 mm
HDMICP03	3 ft	28	7.3 mm
HDMICP06	6 ft	28	7.3 mm
HDMICP10	10 ft	28	7.3 mm
HDMICP12	12 ft	28	7.3 mm
HDMICP15	15 ft	26	8.8 mm
HDMICP20	20 ft	24	10.5 mm
HDMICP25	25 ft	24	10.5 mm
HDMICP30	30 ft	24	10.5 mm

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PREMIUM
Certified Cable

BCDFG123456
www.HDMI.org

Each cable features a unique anti-counterfeiting authentication label

vanco1.com

Technical Data Sheet
Aquaseal® Communication Cables

WEST PENN WIRE

2833 West Chestnut Street
Washington, PA 15301
Toll Free: (800) 245-4964
Fax: (724) 222-6420
www.westpenn-wpw.com

Aquaseal cables

PART NUMBER: **AQC369**

DESCRIPTION: 22/6 Solid bare copper conductor, unshielded/shielded, with an Aquaseal tape and overall jacket.

NEC RATING: CM or CL3, NEC Article 800 and 725

APPROVALS: (UL) C(UL) Listed, (ETL)us Listed

APPLICATION: Materials suitable for outdoor use, and indoor trays, allows a variety of uses for (Intercom, Security, Sound, Audio, Background music)

Construction Parameters:

Conductor	22 AWG Bare Copper
Stranding	Solid
Insulation Material	PVC
Insulation Thickness	0.010" Nom.
Number of Conductors (2 Shielded)(4 Unshielded)	6
Shield	100% Aluminum Polyester Foil
Drain	Solid Tinned Copper
Water-Blocking Tape	Internal and Overall 2 ply water swellable tape
Jacket Material	Sunlight/Moisture Resistance PVC
Jacket Thickness	0.025" Nom.
Overall Cable Diameter	0.240" Nom.
Approximate Cable Weight	30 Lbs/1M' Nom.
Flame Rating	UL 1685 Vertical Tray

Electrical & Environmental Properties:

Temperature Rating	-20deg C to 60deg C
Operating Voltage	300 V RMS
Max.Capacitance Between Conductors @ 1 KHz	54 pf/ft Nom.
Capacitance Between Conductors to Shield @ 1 KHz	97 pf/ft Nom.
DC Resistance per Conductor @ 20deg C	17.5 Ohms/1M' Nom.
Insulation Colors	Black, Red, White, Green, Brown, Blue
Jacket Color	Gray
RoHS Compliant	--
TIA455-82B Water Infiltration Test Compliant	Yes
UL 444 & 13 Compliant	Yes

Mechanical Properties:

Max. Recommended Pull Tension	69 lbs.
Min. Bend Radius (Install)	2.4”

Specification Issue Date: 7/06

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Technical Data Sheet
Communication Cables

WEST PENN WIRE

2833 West Chestnut Street
Washington, PA 15301
Toll Free: (800) 245-4964
Fax: (724) 222-6420
www.westpenn-wpw.com

PART NUMBER: **224**

DESCRIPTION: 18/2 STRANDED BARE COPPER CONDUCTORS, UNSHIELDED WITH AN OVERALL JACKET

NEC RATING: CMR, NEC Article 800

APPROVALS: (UL) C(UL) Listed or c(ETL)us Listed

APPLICATION: Indoor for: Intercom, Security, Sound, Audio, Background Music, and Power Limited Control Circuits

Construction Parameters:

Conductor	18 AWG Bare Copper
Stranding	7x26
Insulation Material	PVC
Insulation Thickness	0.008" Nom.
Number of Conductors	2
Shield	None
Drain	None
Jacket Material	PVC
Jacket Thickness	0.017" Nom.
Overall Cable Diameter	0.156" Nom.
Approximate Cable Weight	16.1 Lbs/1M' Nom.
Flame Rating	UL 1666 Riser Flame Test

Electrical & Environmental Properties:

Temperature Rating	-20°C To +60°C
Operating Voltage	300 V RMS
Max.Capacitance Between Conductors @ 1 KHz	30 pf/ft Nom.
DC Resistance per Conductor @ 20deg C	6.2 Ohms/1M' Nom.
Insulation Colors	Black ,Red
Jacket Color	Gray, Black, Brown, White
RoHS Compliant	Yes

Mechanical Properties:

Max. Recommended Pull Tension	42 lbs.
Min. Bend Radius (Install)	1.6”

ADVANTAGE BOX MADE IN USA

Specification Issue Date: 7/06

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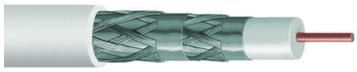
4112704/10 | 2227V WHRL RG6 QD 1000



RG 6 Type Quad Shield Plenum Video Coaxial Cable, white jacket, 1000 ft (305 m) reel

Product Classification

Regional Availability	Asia | Australia/New Zealand | EMEA | Latin America | North America
Portfolio	CommScope®
Product Type	Coaxial video cable

General Specifications

Product Number	2227V
Cable Type	Series 6
Center Conductor Type	Solid
Construction Type	Non-armored
Jacket Color	White
Supported Application	Video

Dimensions

Cable Length	304.8 m | 1000 ft
Diameter Over Center Conductor, specific	0.0403 in per 1 strand
Diameter Over Dielectric	4.318 mm | 0.17 in
Diameter Over Inner Shield (Braid)	5.131 mm | 0.202 in
Diameter Over Jacket, nominal	6.604 mm | 0.26 in
Diameter Over Jacket Tolerance	±0.006 in
Diameter Over Outer Shield (Braid)	5.74 mm | 0.226 in
Jacket Thickness	0.406 mm | 0.016 in
Jacket Thickness, minimum spot	0.33 mm | 0.013 in
Center Conductor Gauge	18 AWG
Inner Shield (Braid) Gauge	34 AWG
Outer Shield (Braid) Gauge	34 AWG

Electrical Specifications

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Capacitance	50.853 pF/m | 15.5 pF/ft
Characteristic Impedance	75 ohm
Characteristic Impedance Tolerance	±3 ohm
Conductor dc Resistance	93.832 ohms/km | 28.6 ohms/kft
Dielectric Strength, conductor to shield	2000 Vdc
Jacket Spark Test Voltage	2500 Vac
Nominal Velocity of Propagation (NVP)	84 %
Shield dc Resistance	17.388 ohms/km | 5.3 ohms/kft
Structural Return Loss	15 dB @ 1000–3000 MHz | 20 dB @ 5–1000 MHz
Structural Return Loss Test Method	100% Swept Tested

Attenuation

Frequency (MHz)	Attenuation (dB/100 ft)
1.0	0.38
10.0	0.7
50.0	1.48
100.0	2.01
200.0	2.86
400.0	4.23
700.0	5.96
900.0	6.96
1000.0	7.45
1200.0	8.25
1450.0	9.34
1800.0	10.69
2200.0	11.54
2500.0	11.7
3000.0	13.07

Material Specifications

Center Conductor Material	Copper-clad steel wire
Dielectric Material	Foam FEP
Jacket Material	PVC
Inner Shield (Braid) Coverage	60 %

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Inner Shield (Braid) Material	Aluminum
Inner Shield (Tape) Material	Aluminum/Poly
Outer Shield (Braid) Coverage	40 %
Outer Shield (Braid) Material	Aluminum
Outer Shield (Tape) Material	Aluminum/Poly, non-bonded

Mechanical Specifications

Minimum Bend Radius, loaded, times	20 times
Minimum Bend Radius, unloaded, times	10 times

Environmental Specifications

Environmental Space	Plenum
Temperature Rating, UL	75 °C | 167 °F
Flame Test Method	CMP
Safety Standard	ETL | cETL

Packaging and Weights

Cable weight	43.157 kg/km | 29 lb/kft
Packaging Type	Reel

Regulatory Compliance/Certifications

Agency	Classification
CHINA-ROHS	Below maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
REACH-SVHC	Compliant as per SVHC revision on www.commscope.com/ProductCompliance
ROHS	Compliant
UK-ROHS	Compliant

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NetKey® Faceplates

PANDUIT®
DATA SHEET

specifications

NetKey faceplates shall be available in 1, 2, 3, 4, and 6-port single gang for vertical applications and 2-port and 4-port single gang for horizontal applications. Faceplates shall accept all NetKey modules for UTP, STP, fiber-optic, and audio/video applications. Faceplates shall be available in a flush or sloped design, and available with or without labels. Sloped design shall increase wall depth to improve the bend radius control.

technical information

Mounting options:	Screw holes with retention tabs, spaced for single gang openings; compatible with wall board adapter
Packaging:	Supplied with two 1" long, #6 – 32 slotted head screws; select styles include labels and label covers; faceplates without labels include matching mounting screws to match the faceplate; faceplates packaged one per bag, ten per box.

key features and benefits

Modular	Accepts all NetKey modules which snap in and out for easy moves, adds, and changes
Identification	Choice of adhesive labeling or dedicated label pocket for easy identification
Various port densities	Provides design flexibility
Sloped design	Allows proper bend radius control

applications

NetKey faceplates mount to any standard size single gang junction box and can also mount to a wall board adapter or raceway mounting brackets. When using NetKey faceplates with surface raceway, color matching is guaranteed. NetKey faceplates with label and label cover offer a quick and easy way to identify the ports. Mounting screw colors match the faceplate for a clean, consistent look.

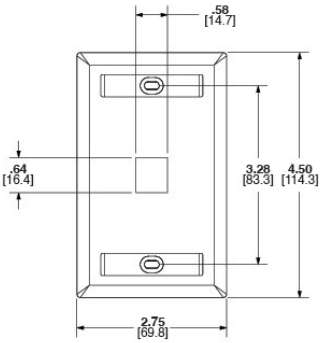
Dedicated sloped faceplates provide additional room for bend radius control to help comply with standards.

Vertical Sloped Faceplates with Labels Slots	
4-port:	NK4VSFIW
Vertical Faceplates with Labels	
1-port:	NK1FIWY
2-port:	NK2FIWY
4-port:	NK4FIWY
6-port:	NK6FIWY
Vertical Faceplates without Labels	
1-port:	NK1FNIW
2-port:	NK2FNIW
3-port:	NK3FNIW
4-port:	NK4FNIW
Horizontal Faceplates Sloped with Labels	
2-port:	NK2HSFIWY
4-port:	NK4HSFIWY
Double Gang Faceplate	
10-port:	NK8FIW
Wall Board Adapter	
Single gang:	MWBA1

Go to **www.panduit.com** for additional color options.

NetKey® Faceplates

NK1F**Y



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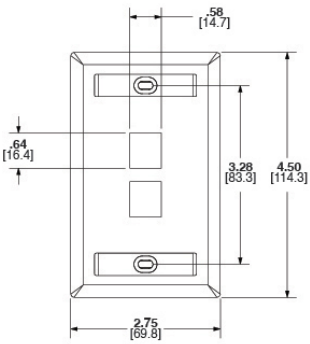

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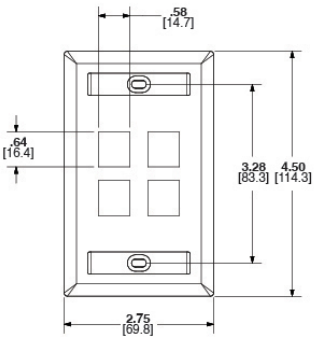

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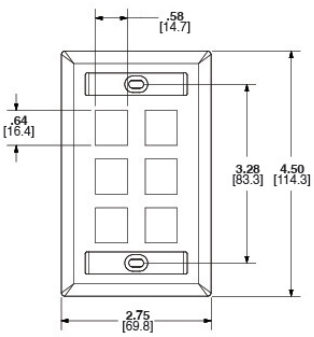

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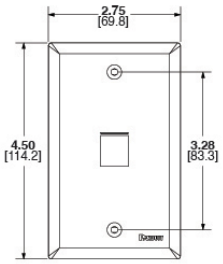

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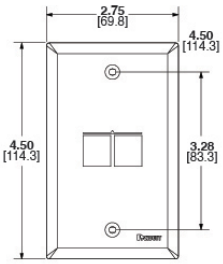

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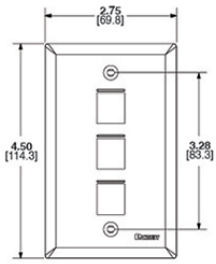

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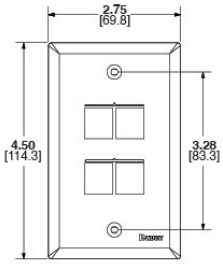

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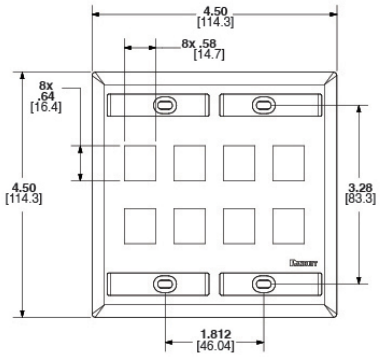

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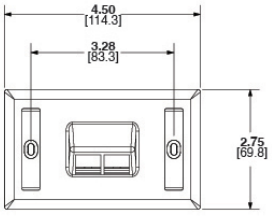

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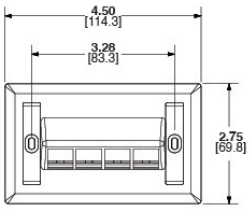

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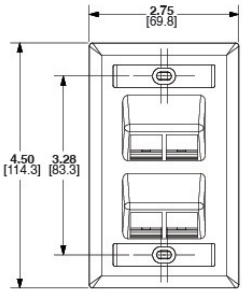

Dimensions are in inches. [Dimensions in **brackets** are metric].

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NKDS70--WW-ENG
10/2022

PatchLink™ Horizontal Cable Managers

PANDUIT®

SPECIFICATION SHEET

specifications

Horizontal cable managers shall be capable of managing cables on the front and rear of any 19" EIA rack. The manager shall consist of a 1-piece construction that is molded out of plastic. Horizontal managers shall have pass through holes that incorporate integral bend radius control as well as fingers with rounded edges. The manager shall have rigid end fingers that incorporate integral bend radius control. Hinged covers shall allow access to the cable pathway without having to completely remove the cover from the manager.

technical information

Dimensions:	WMPH2E:	3.5"H x 19.0"W x 8.9"D (88.9mm x 482.6mm x 225.5mm)
	WMPHF2E:	3.5"H x 19.0"W x 3.7"D (88.9mm x 482.6mm x 93.7mm)
	WMP1E:	3.5"H x 19.0"W x 8.9"D (88.9mm x 482.6mm x 225.5mm)
	WMPF1E:	3.5"H x 19.0"W x 3.7"D (88.9mm x 482.6mm x 93.7mm)
	WMPSE:	1.7"H x 19.0"W x 8.9"D (44.1mm x 482.6mm x 225.5mm)
	WMPFSE:	1.7"H x 19.0"W x 3.7"D (44.1mm x 482.6mm x 93.7mm)
	WMPLSE:	1.7"H x 19.0"W x 7.9"D (44.1mm x 482.6mm x 200.1mm)
	WMPLFSE:	1.7"H x 19.0"W x 2.7"D (44.1mm x 482.6mm x 69.1mm)
Packaging:	Cable managers include hinged cover(s), mounting hardware, and wire retainers	

key features and benefits

Integral bend radius control	Maintains bend radii as cables transition to and from horizontal and vertical pathways
Dual hinged cover	Opens upward or downward to provide easy access to cables in horizontal pathway without having to completely remove cover
Increased finger spacing	Provides larger area for high performance Category 6 cables
One piece, plastic construction	Provides durability and easy installation
Flexible fingers	Provide for easy installation and organizes cables simplifying moves, adds, and changes
Rounded edges on fingers	Protect cables from snags and damage to cable
Cable pass through holes	Provide ease of installation and cable maintenance
Wire retainers	Snap on finger to keep cables in place during moves, adds, and changes

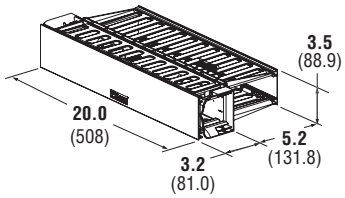
applications

Panduit® PatchLink™ Horizontal Cable Managers provide a neat and efficient way to manage patch cables on any EIA 19" rack. They can be used in multimedia applications to manage copper, fiber optic, and coax cables. Flexible fingers organize the patch cords simplifying moves, adds, and changes while the integral bend radius control and "closed" design protects the patch cables in the pathway. All of these features combine to provide the user with a horizontal cable management solution that simplifies cable routing in a finished, professional appearance. When used with the Panduit® Mini-Com® patch panels, patch cords, vertical cable managers, and racks, the user receives a total system that satisfies functional and aesthetic requirements for telecommunications rooms.

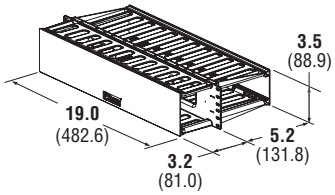
2 Rack Space Manager, Front and Rear	
3"x 3" front, 19" cover:	WMPH2E
3"x 3" front, 17" cover:	WMP1E
WMP1E 5-pack:	WMP1E-V
2 Rack Space Manager, Front Only	
3"x 3" front, 19" cover:	WMPHF2E
3"x 3" front, 17" cover:	WMPF1E
WMPF1E 10-pack:	WMPF1E-X
1 Rack Space Manager, Front and Rear	
1.7" H x 3" D front:	WMPSE
WMPSE 10-pack:	WMPSE-X
1.7" H x 2" D front:	WMPLSE
1 Rack Space Manager, Front Only	
1.7" H x 3" D front:	WMPFSE
WMPFSE 20-pack:	WMPFSE-E
1.7" H x 2" D front:	WMPLFSE
Racks	
19" EIA standard:	CMR19X84
4 post rack 7' 30" depth with #12-24 threaded rails:	R4P
4 post rack 7' 30" depth with cage nut rails:	R4PCN
4 post rack 7' 23" depth with #12-24 threaded rails:	R4P23
4 post rack 7' 23" depth with cage nut rails:	R4P23CN
4 post rack 7' 36" depth with #12-24 threaded rails:	R4P36
4 post rack 7' 36" depth with cage nut rails:	R4P36CN
4 post rack 7' 42" depth with #12-24 threaded rails:	R4P42
4 post rack 7' 42" depth with cage nut rails:	R4P42CN
Panel Extender Brackets	
1 RU:	PEB1
2 RU:	PEB2
22 RU:	PEB22
44 RU:	PEB44

PatchLink™ Horizontal Cable Managers

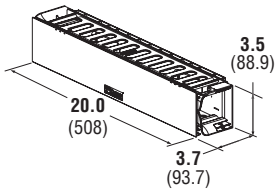
WMPH2E
with CMSRC2 Clips



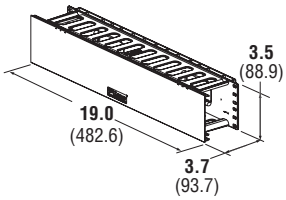
WMP1E



WMPHF2E
with CMSRC2 Clips



WMPF1E



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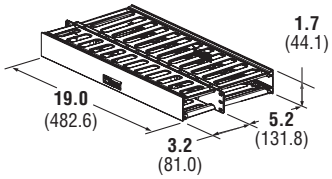
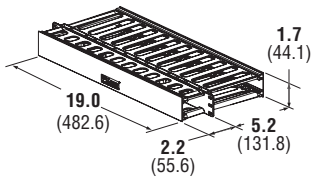
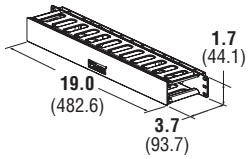


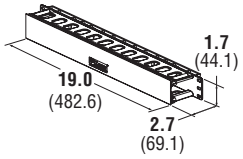
WMPLSE



WMPFSE



WMPLFSE



All managers have 17" long front covers except for the WMPH2E and WMPHF2E, which have19 3/8" long front covers for complete coverage to vertical managers.

Cable Capacity Chart

Part Number	Category 6 (0.250")		Category 5e (0.187")	
	Front	Back	Front	Back
WMP1E	48	48	72	72
WMPF1E	48	–	72	–
WMPFSE	16	–	24	–
WMPH2E	48	48	72	72
WMPHF2E	48	–	72	–
WMPLFSE	12	–	16	–
WMPLSE	12	12	16	16
WMPSE	16	16	24	24

Dimensions are in inches. (Dimensions in parenthesis are metric.)

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WW-RKSP46
Replaces SA-RKSP04
2/2010

NetKey® Modular Patch Panels with Faceplates

PANDUIT®
DATA SHEET

specifications

Modular patch panels shall consist of a metal panel with molded snap-in faceplates which can be front releasable. Patch panels shall accept all NetKey Modules for UTP, fiber, or A/V applications and shall mount to standard 19" racks. Patch panels shall be available in 24 and 48-port standard density. Angled patch panels shall be designed at an optimum angle to help route the cable.

technical information

Mounting options:	Mounts to standard EIA 19" racks or 23" racks with optional extender brackets
Material:	Stamping is CRS and faceplate is ABS
Packaging:	Packaged with appropriate pre-installed snap-in faceplates, a set of mounting screws (#12-24), and label/label cover where applicable

key features and benefits

Removable faceplates:	Allow front accessibility to installed modules for easy moves, adds, and changes
Modular:	Accepts all NetKey Modules to mix and match media types in the same panel
Angled design:	Allows cable to flow to each side of the rack and minimizes the need for horizontal cable managers by enabling patch cords to be routed directly into vertical cable managers which leads to increased closet density
Optional label:	Available with and without labels to accommodate various needs
Optional strain relief bars:	Help support and manage cables
Optional filler panels:	Fill unused rack openings to provide a clean and consistent look

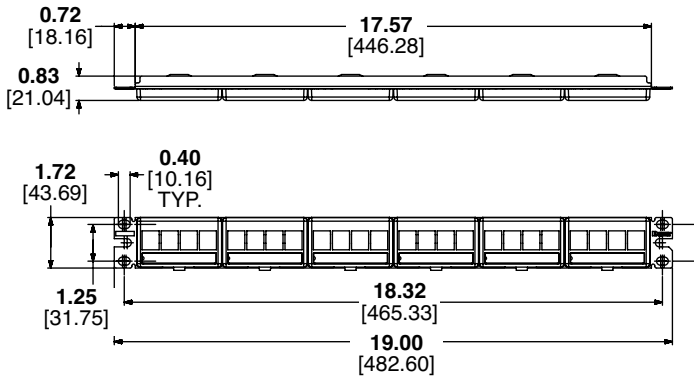
applications

NetKey Modular Patch Panels are ideal for multi-media applications. They accept all NetKey Modules which can be accessed through the front of the panel to snap in and out for easy adjustments. Various styles and port densities available to fit most needs with a labeling feature available on select styles. Angled patch panels are available for applications where rack space is limited. The design allows cable to flow to each side of the rack, minimizing the need for horizontal cable managers and increasing the density of the rack space.

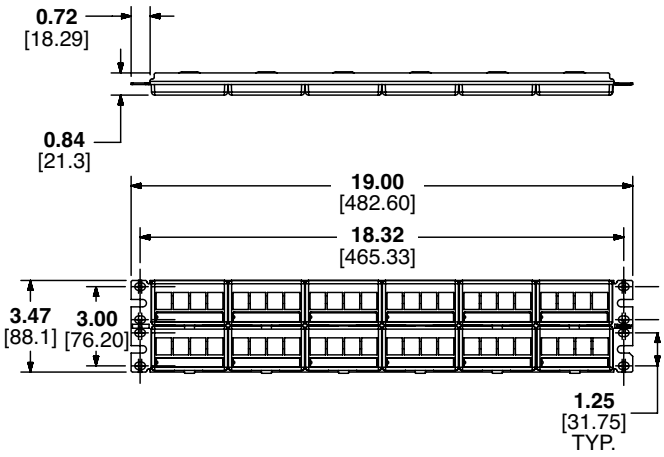
Patch Panels with Labels	
24-port, 1 RU, includes six NK4MFL labeled faceplates:	NKFPL24
48-port, 2 RU, includes twelve NK4MFL labeled faceplates:	NKFPL48
Patch Panels without Labels	
24-port, 1 RU, includes six NK4MF faceplates:	NKFP24Y
48-port, 2 RU, includes twelve NK4MF faceplates:	NKFP48Y
Angled Patch Panels without Labels	
24-port, 1 RU, includes six NK4MF faceplates:	NKFPA24
48-port, 2 RU, includes twelve NK4MF faceplates:	NKFPA48
Angled Patch Panel with Labels	
24-port, 1 RU, includes six NK4MFL labeled faceplates:	NKFPAL24
Strain Relief Bars	
Straight:	SRBS19BL-XY
Extended, 2":	SRB19BLY
With hook and loop ties:	SRBM19BLY
With adjustable clips:	SRBWCY
Deep, 5":	SRB19D5BL
Deep, 7":	SRB19D7BL
Multi-depth:	SRB19MDBL
Extender Brackets	
1 RU:	PEB1
2 RU:	PEB2

NetKey® Modular Patch Panels with Faceplates

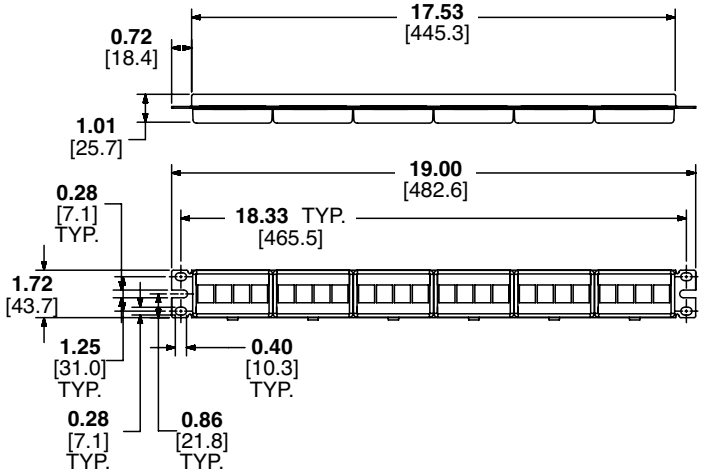
NKFPL24



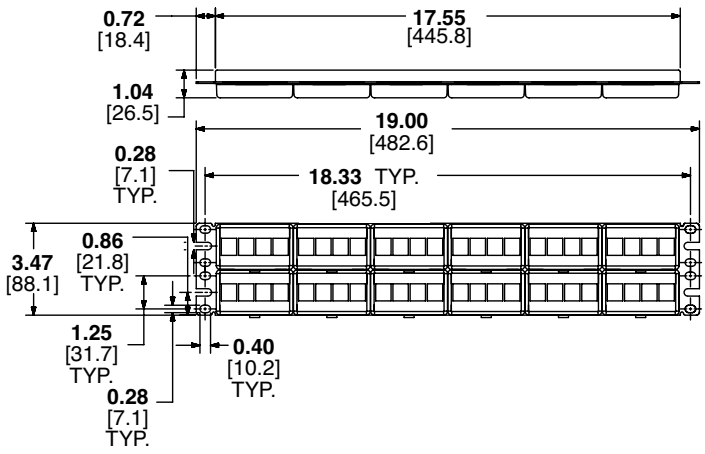
NKFPL48



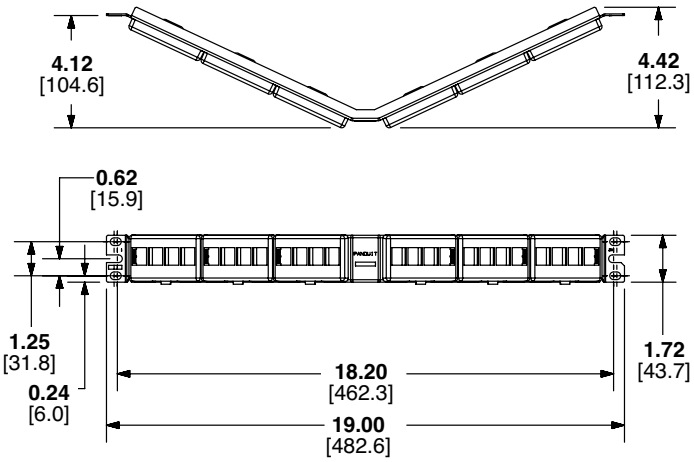
NKFP24Y



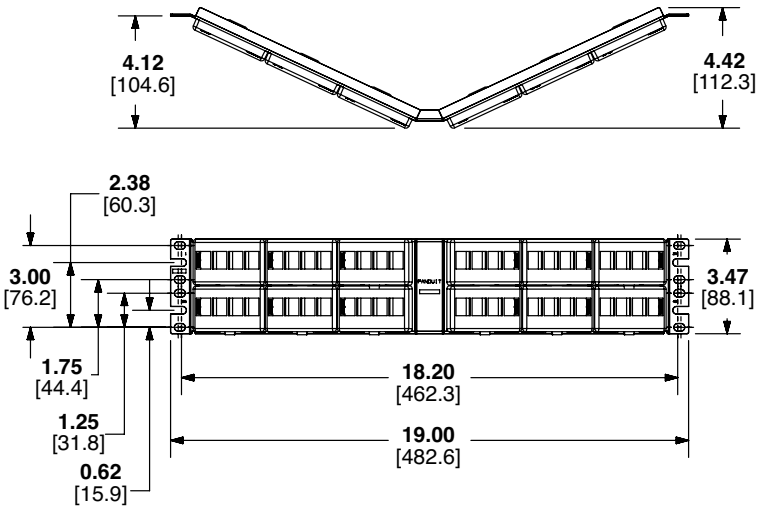
NKFP48Y



NKFPA24



NKFPA48



Dimensions are in inches. [Dimensions in **brackets** are metric].

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Contact Customer Service by email: cs@panduit.com
or by phone: 800.777.3300

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NKDS68-WW-ENG
3/2023

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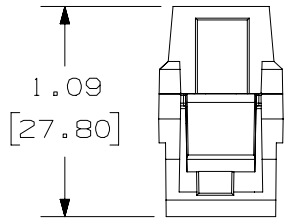
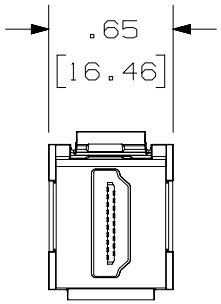
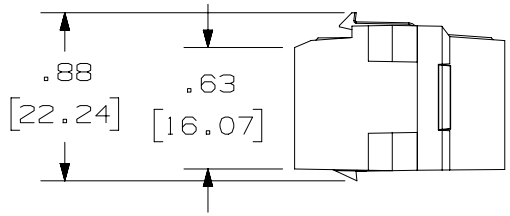
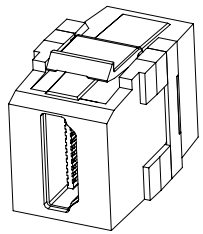
NOTES:
1. VISIT OUR ON-LINE CATALOG AT WWW.PANDUIT.COM FOR A LIST OF CURRENT PARTS APPLICABLE FOR USE WITH THIS PRODUCT.
2. DIMENSIONS IN [ ] ARE METRIC.
3. WEIGHT: 0.02 LB/EACH PC
   19.17 g/ EACH PC
4. PART INCLUDES:
   1- CONNECTOR - COPPER, LDPE
   2- HOUSING ABS
4. PART IS RoHS COMPLIANT









PART NUMBER

NKHDMI**

TITLE

NETKEY HDMI 2.0 TYPE "A"
FEMALE TO FEMALE COUPLER

CUSTOMER DRAWING

ITEM REVISION NAME: M03197AB/04

DATASET FILE NAME: M03197AB_DC13/04B

THIRD ANGLE PROJECTION

MATERIAL: SEE NOTE 4

DRAWING NUMBER: 03197-13

DRAWN BY	DATE	CHK	SCALE	SIZE
MDJR	8-18-09	HMK	FULL	A

SHEET 1 OF 1

REV	DATE	BY	CHK	APR	DESCRIPTION	ECN
2	2-4-20	BJN	VJV	MMR	UPDATED TITLE	03197-13
1	5-28-19	BJN	VJV	MMR	UPDATED TITLE BLOCK & NOTES, TITLE NOW 2.0, WAS 1.3 REVISED & REDRAWN PREVVIOUS REVS REMVD FOR CLARITY	03197-13

A-SIZE CUSTOMER

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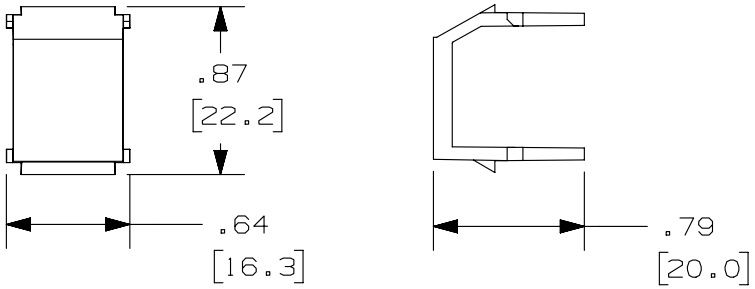
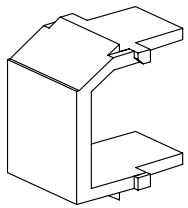
PANDUIT P/N	WEIGHT
NKBM**-X	.22 LB/10 PCS (102 g/10 PCS)
IAPNKBMWH-X	

NOTES:

1. SEE CURRENT CATALOG FOR ADDITIONAL PART SUFFIXES TO INDICATE COLOR AND OR PACKAGE QUANTITY.
2. DIMENSIONS IN PARENTHESES ARE IN METRIC.





REV	DATE	BY	CHK	APR	DESCRIPTION	ECN
3	5-16-14	MDJR	REFR	JCK	A. UPDATED TITLE BLOCK. PREVIOUS REVISIONS OMITTED FOR CLARITY.	38361-09

PART NUMBER: SEE TABLE

TITLE: NETKEY BLANK MODULE

CUSTOMER DRAWING

ITEM REVISION NAME: D38361BI/00

DATASET FILE NAME: D38361BI_DC09/00D

UNLESS OTHERWISE SPECIFIED, DIMENSIONAL TOLERANCES ARE: IN [mm]

.X ± .XXX ± .010 [.3]

.XX ± .03[.8] ANGLES ±

THIRD ANGLE PROJECTION

MATERIAL: ABS

DRAWING NUMBER: 38361-09

DRAWN BY	DATE	CHK	SCALE	SHT 1 OF 1	SIZE
JHNU	11-30-01	HIW	NONE		A

D10100DA/14

Poly Pull Line with Orange Tracer 6500-Foot

The Poly Pull Line with Orange Tracer provides a high-quality solution for wire pulling. Its unique orange tracer line makes identification easier. When used with other products from Klein Tools' complete line of wire pulling and conduit tools, professionals can get the job done quicker while saving time, effort and materials.

Specifications

Application:	Light Duty Cable or Rope Pulling	**Special Features:**	Rot and Mildew Resistant Line
Container:	Five-Gallon Bucket	**Overall Length:**	6500' (2 km)
Tensile Strength:	210 lb (95.2 kg)	**Material:**	Polypropylene
Weight:	11.0 lb (5.0 kg)	**Color:**	Orange/White

G6 Intelligent Power Distribution Unit (iPDU) USGv6 Certified

PANDUIT®
SPECIFICATION SHEET

OVERVIEW

The best just got better. The G6 iPDU is more than a power distribution unit and energy monitoring device. These iPDUs monitor the data center power and environment (at the rack or cabinet level), by continuously scanning for electrical circuit overloads, and physical environmental conditions that place critical IT equipment at risk. The iPDUs provide comprehensive, accurate, energy measurement data to efficiently use power resources, make informed capacity planning decisions, improve uptime, measure PUE (power usage effectiveness), and drive green data center initiatives to save energy and money.

Making the right choice in IT equipment is essential for a safe, efficient data center operation. Panduit's full range of G6 iPDUs, environmental sensors, and dual locking power cords are the key to fulfilling mission-critical data center needs.

TECHNICAL INFORMATION

		Width In. (mm)	Depth In. (mm)	Height In. (mm)
Dimensions:	**0U HALF:**	2 (52)	2.1 (53)	36.1 (917)
	0U MID:	2 (52)	2.1 (53)	58.6 (1490)
	0U FULL:	2 (52)	2.1 (53)	69 (1750)
	0U FULL Wide:	3.3 (85)	2.1 (53)	69 (1750)
Mounting:	Vertical units provide up to 48 outlets without encroaching on the EIA space.			

KEY FEATURES AND BENEFITS

Combination outlets[1]:	Combination outlets provide the ultimate in flexibility by allowing a customer to use an outlet as either an C13/C15 outlet or a C13/C15/C19/C21 outlet respectively. All combination outlets also accept the Panduit dual locking power cords to eliminate accidental disconnects.
Dual rated PDUs:	Simplify your supply chain by selecting a Dual Rated PDU. Dual rated PDUs have ratings and NRTL approvals for both North American & EMEA on the same part number.
HotSwappable controller:	Replace the controller and display module without having to power down the rack
Redundant network access:	Specifically designed for Landlord/Tenant (Co-Lo's) allowing for remote access of real-time, vital statistics and operating information on two separate, secure networks
Hardened security:	NMP v3, TLS, Encrypted Security; allows for Panduit PDUs to pass standard popular industry certified security scans. USGv6 Certified IPV6 Stack
Dual 1GB Ethernet:	Reduces deployment time by auto-negotiating with data center level network switches and can daisy chain up to 32 iPDUs on a single IP address using only one network switch port
Plug & play sensors:	Digital sensors not only allow for multiple sensors on the same bus; but also identify themselves to the controller to simplify setup and commissioning
Multi-color PDUs:	Different color PDUs simplify power feed identification in redundant power schemes
Mobile & desktop friendly web GUI:	Enhanced web interface that detects the type of device that you are on (laptop, tablet or smart phone); and automatically adjusts the screen for an optimal experience
Mobile and desktop friendly web GUI:	Enhanced web interface that detects the type of device the user is on (laptop, tablet, or smart phone), and automatically adjusts the screen for an optimal experience
Outlet density:	Meets demands of densely packed IT equipment in rack or cabinet space
Form factor:	Optimal form factor enables efficient rack space utilization and airflow
Operating temperature:	60°C ambient at full load for operational reliability in high temperature areas
Cable retention:	Innovative cable tie accepting outlets allow for secure cord retention (C13 & C19 only) using a cable tie for addedsafety and security. (Panduit part number: PLT2I-C0)
Circuit breakers:	Protects data center equipment for increased reliability by interrupting potentially hazardous circuit over-current conditions*
Color coded circuits[2]	Easily identify phase to outlet banks to aid in fault isolation or load balancing
External chassis ground:	Meets NEC requirements and installation guidelines for IT equipment
Load balancing:	Monitored through visual display on oLED (for three-phase units only)
Multiple input plug options:	A full breadth offering to seamlessly interoperate with existing building power wiring schemes
Multiple mounting options:	Enables simple out of the box commissioning and flexibility with Panduit cabinets and industry standard mounting features enabling installation into third party cabinets
Mounting buttons:	Allows tool-less mounting of rack PDUs for faster installations on vertical 0U units
Supported metering:	Frequency, VA, PF, plus aggregate and per phase Amperage, Voltage, Wattage, and Kilowatts per hour

1 Applies to products outfitted with combination outlets
2 Applies to products outfitted with circuit breakers

G6 Intelligent Power Distribution Unit (iPDU) USGv6 Certified

iPDU PRODUCT FAMILIES

MI series:	Rack PDUs that have the ability for aggregate power monitoring to quickly identify potential power issues, and reclaim available or under-utilized power capacity.
MS series:	Rack PDUs that have the ability for aggregate power monitoring and outlet level switching capabilities for individual outlets or a group of outlets. Enabling power sequencing, rebooting equipment or restrict unauthorized use of individual outlets.
MPO series:	Rack PDUs that have the ability for outlet level (and aggregate) power monitoring to quickly identify potential power issues, and reclaim available or under-utilized power capacity at the outlet level enabling the redeployment or decommissioning of individual servers to reclaim available or under-utilized power capacity.
MSPO series:	Rack PDUs that have the ability for outlet level (and aggregate) power monitoring and outlet level switching capabilities for individual outlets or a group of outlets. Power monitoring at the individual outlet level provides actionable management data on the power consumption of each connected IT device enabling the redeployment or decommissioning of individual servers to reclaim available or under-utilized power capacity. Ideal for remote power reset, and cabinet power on sequencing and restrict unauthorized use of individual outlets.

ELECTRICAL SPECIFICATIONS

Input voltage:	**North America** • Single-Phase 120 V • Single-Phase 208 V • Three-Phase Delta 208 V • Three-Phase Wye 120/208 V • Three-Phase Wye 415 V • Three-phase WYE 240/415 V	**International models** • Single-Phase 240 V • Three-Phase Wye 240/415 V (for Japan 415 V only) • Three-Phase Delta 208 V
Input current (per phase):	**North America** • 15A, 20A, 30A, 50A, 60A	**International models** • 16A, 32A, 63A
Input power:	**North America** • 1.4 - 34.5 (kVA)	**International models** • 3.7 - 44.4 (kVA)
Input frequency:	50/60 Hz	
Output voltage:	120 - 240 VAC	
Maximum output current: (outlet)	IEC C13: 10A IEC C19: 16A NEMA 5-20R: 16A	
Overload protection (where applicable):	Circuit Breakers, hydraulic magnetic	

10 kAIC Circuit Breakers for all 415 V models for North America

GENERAL SPECIFICATIONS

Temperature (operating):	50°F to 140°F (10°C to 60°C)		
Temperature (storage):	-4°F to 140°F (-20°C to 60°C)		
Relative humidity (operating):	10% to 90% non-condensing		
Relative humidity (non-operating):	5% to 95% RH		
Relative humidity (storage):	5% to 95%		
Elevation (operating):	0 to 10,000 ft. (0 to 3000m)		
Elevation (storage):	0 to 30,000 ft. (0 to 9144m)		
Conformance (standards):	USA & Canada3 - UL, CB Test Approved File number: E218078 Mexico: NOM Approved[3] Europe - CE/UKCA Approved[3] Australia - RCM Approved[3] Brazil: Approved	Chile: Approved Peru: Approved Uruguay: Approved Costa Rica: Approved United Arab Emirates (UAE): Approved	India: Approved China: Approved Hong Kong: Approved Singapore: Approved Indonesia: Approved Philippines: Approved
Environmental compliances:	RoHS & REACH		

3 Applies to select products

CABINET COMPATIBILITY

Intelligent PDUs can be easily installed into Panduit (or third-party cabinets) by utilizing the installed mounting buttons (18.4mm diameter). Where necessary, a small diameter (14.5mm) mounting button is available (sold separately, P/N: MA018). Panduit PDUs feature threaded inserts on the back and both sides for the ultimate in mounting flexibility. They safely and efficiently manage and distribute power to multiple devices through a single input power connector, per PDU, to enhance scalability of network build outs.

G6 Intelligent Power Distribution Unit (iPDU) USGv6 Certified

PRODUCT SPECIFICATIONS

MI SERIES

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
100-240VAC, 1 PHASE	**P42D06G**	EMEA	32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	42	(36)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P38D25G	NA	30	0U FULL	NEMA L6-30P	2	5	38	(32)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24D03G	EMEA	32	0U MID	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P34D41G	EMEA	32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	34	(28)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24D40G	EMEA	16	0U MID	IEC 60309 2P+E 6h 16A (IP44)	0	3.7	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P24D24G	NA	20	0U MID	NEMA L6-20P	0	3.3	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P24D07G	NA	30	0U MID	NEMA L6-30P	2	5	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P24D23G	NA	30	0U MID	NEMA L5-30P	2	2.9	24	(24)5-20R	2 (52)	2.1 (53)	69 (1750)
	P36D26G	NA	50	0U FULL	CS8265	3	8.3	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P16D20G	NA	15	0U HALF	NEMA 5-15P	0	1.4	16	(16)5-20R	2 (52)	2.1 (53)	69 (1750)
208 VAC, 3 PHASE	**P38D28G**	NA	30	0U FULL	NEMA L21-30P	3	8.6	38	(30)C13 (6)C19 (2)5-20R	2 (52)	2.1 (53)	69 (1750)
	P36D08G	NA	30	0U FULL	NEMA L15-30P	3	8.6	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24D34G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	24	(12)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P36D29G	NA	50	0U FULL	CS8365	3	10	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P30D02G	NA	30	0U FULL	NEMA L21-30P	3	8.6	30	(18)C13 (6)C19 (6)5-20R	2 (52)	2.1 (53)	69 (1750)
	P24D01G	NA	30	0U MID	NEMA L21-30P	3	8.6	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P48D21G	NA	30	0U FULL	NEMA L21-30P	3	8.6	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P48D22G	NA	30	0U FULL	NEMA L15-30P	3	8.6	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42D20G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42D22G	NA	50	0U FULL	CS8365	6	14.4	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P36D30G	NA	50	0U FULL	CS8365	6	14.4	36	(24)C13 (12)C19	2.2 (55)	3.1 (80)	70 (1780)
	P36D31G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	36	(24)C13 (12)C19	2.2 (55)	3.1 (80)	70 (1780)

PRODUCT SPECIFICATIONS (CONTINUED)

MI SERIES

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
230/415 VAC, 3 PHASE	**P42D04G**	EMEA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	42	(30)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P30D05G	EMEA	16	0U MID	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	30	(24)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24D43G	EMEA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	24	(12)C13 (12)C19	2.2 (55)	2.1 (53)	69 (1750)
	P42D07G	NA	30	0U FULL +	NEMA L22-30P	6	17.3	42	(36)C13 (6)C19	2 (51)	2.1 (53)	69 (1750)
	P48D20G	NA/ EMEA	30/ 32	0U FULL	IEC 60309 3P+N+E 6h 30A/32A (IP44)	6	17.3/ 22.0	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (55)	3.1 (80)	70 (1780)
	P48D23G	NA/ EMEA	20/ 16	0U MID	IEC 60309 3P+N+E 6h 20A/16A (IP44)	0	11.5/ 11.0	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42D21G	NA/ EMEA	60/ 63	0U FULL	IEC 60309 3P+N+E 6h 60A/63A (IP44)	12	43.5/ 34.6	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)

MS SERIES

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
100-240VAC, 1 PHASE	**P32E06G**	NA/ EMEA	30 /32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	5.8/ 7.4	32	(24)C13 (8)C19	2 (52)	2.1 (53)	69 (1750)
	P24E28G	NA	30	0U FULL	NEMA L6-30P	2	5	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P24E04G	EMEA	16	0U Mid	IEC 60309 2P+E 6h 16A (IP44)	0	3.7	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P18E23G	NA	30	0U MID	NEMA L5-30P	2	2.9	18	(18)5-20R	2 (52)	2.1 (53)	69 (1750)
	P12E22G	NA	20	0U HALF	NEMA L5-20P	0	1.9	12	(12)5-20R	2 (52)	2.1 (53)	69 (1750)
	P16E27G	EMEA	16	0U HALF	IEC 60309 2P+E 6h 16A (IP44)	0	3.7	16	(12)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P16E24G	NA	20	0U HALF	NEMA L6-20P	0	3.3	16	(12)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P44E07G	EMEA	32	0U FULL - Wide	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	44	(38)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P12E21G	NA	20	0U HALF	NEMA 5-20P	0	1.9	12	(12)5-20R	2 (52)	2.1 (53)	69 (1750)
	P12E20G	NA	15	0U HALF	NEMA 5-15P	0	1.4	12	(12)5-20R	2 (52)	2.1 (53)	69 (1750)

PRODUCT SPECIFICATIONS (CONTINUED)

MS SERIES (CONTINUED)

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
208 VAC, 3 PHASE	**P24E32G**	NA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	24	(12)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P36E35G	NA	16	0U MID	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P36E12G	NA	16	0U FULL	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P36E34G	NA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24E29G	NA	30	0U FULL +	NEMA L22-30P	6	17.3	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24E30G	NA	30/ 32	0U FULL	IEC 60309 3P+N+E 6h 30A/32A (IP44)	6	17.3/ 22.0	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P48E21G	NA	20/ 16	0U MID	IEC 60309 3P+N+E 6h 20A/16A (IP44)	0	11.5/ 11.0	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P48E22G	NA	60/ 63	0U FULL	IEC 60309 3P+N+E 6h 60A/63A (IP44)	12	43.5/ 34.6	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42E24G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42E26G	NA	50	0U FULL	CS8365	6	14.4	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
230/415 VAC, 3 PHASE	**P24E02G**	EMEA	16	0U FULL	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24E03G	EMEA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	24	(12)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P36E08G	EMEA	16	0U FULL	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P48E20G	NA/ EMEA	30/ 32	0U FULL	IEC 60309 3P+N+E 6h 30A/32A (IP44)	6	17.3/ 22.0	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P48E23G	NA/ EMEA	20/ 16	0U MID	IEC 60309 3P+N+E 6h 20A/16A (IP44)	0	11.5/ 11.0	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P48E25G	NA/ EMEA	60/ 63	0U FULL	IEC 60309 3P+N+E 6h 60A/63A (IP44)	12	43.5/ 34.6	48	(24)C13/C15 (24)C13/15/C19/C21	3.3 (85)	3 (75)	70 (1780)

PRODUCT SPECIFICATIONS (CONTINUED)

MPO SERIES

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
100-240VAC, 1 PHASE	**P32F10G**	EMEA	32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	32	(24)C13 (8)C19	2 (52)	2.1 (53)	69 (1750)
	P36F15G	NA	30	0U FULL	NEMA L6-30P	2	5	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24F01G	NA	30	0U FULL	NEMA L6-30P	2	5	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
230/415 VAC, 3 PHASE	**P36F13G**	EMEA	32	0U FULL - Wide	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	36	(24)C13 (12)C19	3.3 (85)	2.1 (53)	69 (1750)
	P36F12G	EMEA	16	0U FULL	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)

MSPO SERIES

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
100-240VAC, 1 PHASE	**P36G18G**	NA	30	0U FULL	NEMA L6-30P	2	5	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24G01G	NA	30	0U FULL	NEMA L6-30P	2	5	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P24G06G	EMEA	32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	24	(20)C13 (4)C19	2 (52)	2.1 (53)	69 (1750)
	P32G13G	EMEA	32	0U FULL	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	32	(24)C13 (8)C19	2 (52)	2.1 (53)	69 (1750)
	P44G14G	EMEA	32	0U FULL - Wide	IEC 60309 2P+E 6h 32A (IP44)	2	7.4	44	(38)C13 (6)C19	3.3 (85)	2.1 (53)	69 (1750)

PRODUCT SPECIFICATIONS (CONTINUED)

MSPO SERIES (CONTINUED)

	Panduit Part Number	Region	Input Current per Phase	Form Factor	Input Plug Type	Circuit Breakers	Apparent Power (kVA)	Outlet Count	Outlet Configuration	Width inches (mm)	Depth inches (mm) at Outlet position"	Height inches (mm)
208 VAC, 3 PHASE	**P36G20G**	NA	50	0U FULL	CS8365	3	10	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24G03G	NA	30	0U FULL	NEMA L21-30P	3	8.6	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P36G19G	NA	30	0U FULL	NEMA L21-30P	3	8.6	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P24G05G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	24	(12)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P24G02G	NA	30	0U FULL	NEMA L15-30P	3	8.6	24	(18)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P48G31G	NA	30	0U FULL	NEMA L21-30P	3	8.6	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P48G32G	NA	30	0U FULL	NEMA L15-30P	3	8.6	48	(24)C13/C15 (24)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42G20G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	42	(21)C13/C15 (21)C13/15/C19/C21	2.2 (56)	3 (75)	70 (1780)
	P42G22G	NA	50	0U FULL	CS8365	6	14.4	42	(21)C13/C15 (21)C13/15/C19/C21	2.2((56)	3 (75)	70 (1780)
	P36G30G	NA	50	0U FULL	CS8365	6	14.4	36	(24)C13 (12)C19	2.3 (58)	2.9 (75)	66 (1679)
	P36G31G	NA	60	0U FULL	IEC 60309 3P+E 9h 60A (IP44)	6	17.3	36	(24)C13 (12)C19	2.3 (58)	2.9 (75)	66 (1679)
230/415 VAC, 3 PHASE	**P36G16G**	EMEA	32	0U FULL - Wide	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	36	(24)C13 (12)C19	3.3 (85)	2.1 (53)	69 (1750)
	P48G04G	NA	30	0U FULL - Wide +	NEMA L22-30P	6	17.3	48	(48)C13	3.3 (85)	2.1 (53)	69 (1750)
	P24G08G	EMEA	32	0U FULL	IEC 60309 3P+N+E 6h 32A (IP44)	6	22	24	(12)C13 (12)C19	2 (52)	2.1 (53)	69 (1750)
	P36G15G	EMEA	16	0U FULL	IEC 60309 3P+N+E 6h 16A (IP44)	0	11	36	(30)C13 (6)C19	2 (52)	2.1 (53)	69 (1750)
	P36G33G	NA/ EMEA	30/ 32	0U FULL	IEC 60309 3P+N+E 6h 30A/32A (IP44)	6	17.3/ 22.0	36	(24)C13 (12)C19	2.3 (58)	2.9 (75)	66 (1679)
	P48G30G	NA/ EMEA	30/ 32	0U FULL	IEC 60309 3P+N+E 6h 30A/32A (IP44)	6	17.3/ 22.0	48	(24)C13/15/C19/C21 (24)C13/C15	2.2 (56)	3 (75)	70 (1780)
	P48G33G	NA/ EMEA	20/ 16	0U MID	IEC 60309 3P+N+E 6h 20A/16A (IP44)	0	11.5/ 11.0	48	(24)C13/15/C19/C21 (24)C13/C15	2.2 (56)	3 (75)	70 (1780)
	P42G21G	NA/ EMEA	60/ 63	0U FULL	IEC 60309 3P+N+E 6h 60A/63A (IP44)	12	34.5/ 44.4	42	(21)C13/15/C19/C21 (21)C13/C15	2.2 (56)	3 (75)	70 (1780)
	P36G32G	NA/ EMEA	20/ 16	0U FULL	IEC 60309 3P+N+E 6h 20A/16A (IP44)	3	11.5/ 11.0	36	(24)C13 (12)C19	2.3 (58)	2.9 (75)	66 (1679)

For more information
and support, visit
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PANDUIT®

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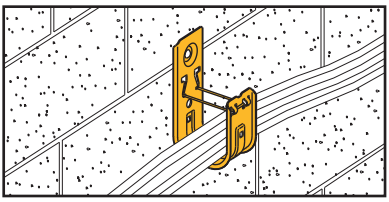
7/2024



Cable Hooks

- Supports Cat. 5/5e/6/6A fiber optic, innerduct and low voltage cabling requirements.
- Qwik-Latch™ cable retainers included with hooks.
- Static Load Capacity: 30 Lbs.
- Finish: Pre-Galvanized

BCH12

Open

Closed

BCH21

BCH32

BCH64

UPC/Part Number	Catalog Number	Hook Size	Capacity Up To	Box Qty.
782051 28060	**BCH12**	3/4"	16 4-Pair UTP Cat 5e or 2-Strand Fiber Optic Cable or 10 CAT6	50
781011 04713	**BCH21**	1 5/16"	50 4-Pair UTP Cat 5e or 2-Strand Fiber Optic Cable or 32 CAT6	50
781011 04717	**BCH32**	2"	80 4-Pair UTP Cat 5e or 2-Strand Fiber Optic Cable or 50 CAT6	50
781011 04721	**BCH64**	4"	300 4-Pair UTP Cat 5e or 2-Strand Fiber Optic Cable or 185 CAT6	25

Patent #5961081

For special finish colors see page 151

(See pages 234-235 for technical data.)

Read safety/installation instruction sheets in packages before use.

Painted Cable Hooks

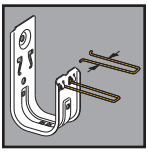
- Powder coated cable hooks are available in a range of colors to help meet your cable identification requirements.
- Standard riveted assemblies are available with painted cable hooks.
- Part numbers can be made by adding the paint color suffix after the cable hook part number.
- Minimum order quantity 500 pieces.
- Standard lead time is 5-10 working days.

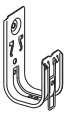
Bright White - BW	Green - GR
Brown - BR	Orange - OR
Computer White - CW	Regal Red - RR
Equipment Blue - BL	Safety Yellow - YL
Flat Black - FB	Telcom Gray - TG

Part # Example:
Painted Cable Hook Part Number - BCH32BW
Painted Cable Hook Assembly - BCH32BW-U24

Replacement Cable Retainers

- Exclusive Qwik-Latch™ retainers are included on all cable hook purchases.
- Provides secure containment of cables and offers quick open/close feature to add or remove cables.
- Finish: Pre-galvanized





Retainer in open position

Push retainer down to lock

UPC/Part Number	Catalog Number	Cable Retainer For Hook Size	Box Qty.
781011 04847	**BCHR21**	$1\frac{5}{16}$”	50
781011 04848	**BCHR32**	2”	50
781011 04849	**BCHR64**	4”	50

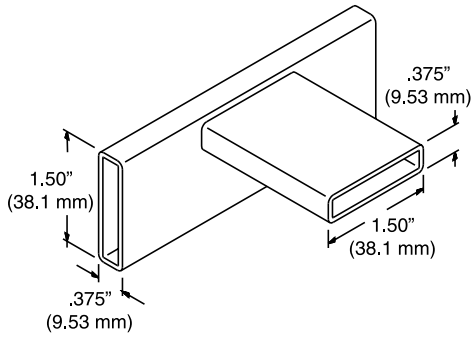
Patent #5961081

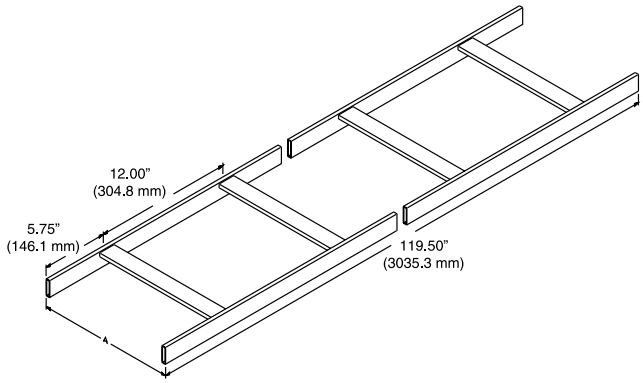
Read safety/installation instruction sheets in packages before use.

CHATSWORTH PRODUCTS

PRODUCT SPEC SHEET

Universal Cable Runway





Universal Cable Runway

Our most popular cable runway is designed for value conscious customers. The Universal Cable Runway offers the industry standard features you've come to expect. With the runway supported every 5' (1.5 m), maximum load with minimal deflection is 132 lb/ft (59.9 kg).

- Made of 3/8" x 1-1/2" x .065" (9.53 mm x 38 mm x 1.65 mm) wall rectangular steel tubing
- Cross members welded at 12" (300 mm) intervals
- Individually boxed to prevent scratches and damage
- Standard length is 9'-11 1/2"/119.5" (3035 mm)
- Installation Best Practices includes Runway Elevation Kit
- U.L. classified for suitability as an equipment grounding conductor (must remove paint from side stringers or use grounding strap
- 11301 Butt-Splice Kit Installation Instructions chatsworth.com

NOTE: CPI 10250, 11252, 11275 and 14300 cable runway systems are listed under UL E138966 and tested to the requirements in the Standard for Safety for Metal Cable Tray Systems, NEMA VE 1-2017 and ANSI/NFPA 70.

ORDERING INFORMATION

Part Number	Width (Dim. A) in (mm)	Shipping Weight lb (kg)
10250-X04	4 (100)	18 (8.2)
10250-X06	6 (150)	19 (8.6)
10250-X09	9 (230)	20 (9.1)
10250-X12	12 (300)	25 (11.3)
10250-X15	15 (380)	27 (12.2)
10250-X18	18 (460)	29 (13.2)
10250-X24	24 (610)	32 (14.5)
10250-X31	30 (760)	35 (15.7)
10250-X37	36 (910)	38 (17.2)

X=color; 1=Gray, 7=Black, E=Glacier White.

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Cable Runway Load-Span Table

Maximum load with minimal deflection is 132 lb/ft when the runway is supported every 5′.

Load-Span Table, CPI Cable Runway

Safety Factor	Span (ft)	4	5	6	7	8	9
1.5	Maximum Load (lb/ft) Defection (in)	206 0.41	132 0.64	92 0.92	67 1.25	52 1.62	41 2.03
2.0	Maximum Load (lb/ft) Defection (in)	154 0.31	99 0.48	69 0.68	50 0.93	39 1.21	31 1.531
	K factor	0.002	0.005	0.010	0.019	0.032	0.050

CPI recommends supporting cable runway runs every 5 feet.

To calculate deflection for loads lighter than maximum loads listed in table, .multiply load for which deflection is desired by K factor listed in table for cable runway support span utilized.

Example: To calculate maximum deflection using a safety factor of 1.5 for a length of cable runway supported every 5' and loaded with 80 pounds per foot:

Defection = (80) (0.005) = 0.40"

NOTE: CPI 10250, 11252, 11275 and 14300 cable runway systems are listed under UL E138966 and tested to the requirements in the Standard for Safety for Metal Cable Tray Systems, NEMA VE 1-2017 and ANSI/NFPA 70.

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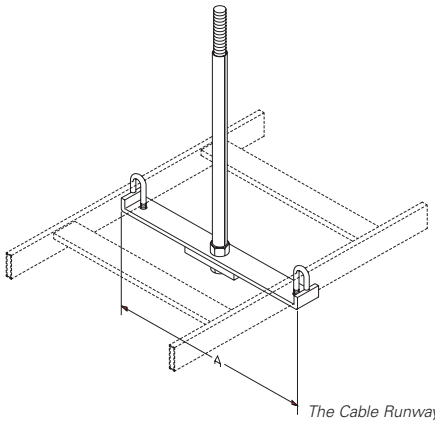
Cable Runway Center Support Kit



The Cable Runway Center Support Kit is available in sizes to support 6" to 24"W (150 mm to 610 mm) cable runway. Not included: Threaded Rod (P/N 11440-00X) and Ceiling Support Bracket (P/N 11406-002).

Cable Runway Center Support Kit

This kit has been designed to make installation of cable runway in the ceiling even easier by using just a single point of attachment. The center attachment design not only makes installation easy, but also provides quick and simple cable routing with no need to thread the cable between the runway supports. The support kit securely attaches to the cable runway stringer, eliminating possible dislocations.

- Made of steel
- Provides an "open" support system with quick and simple cable routing
- Threaded rod cover protects cable insulation from damage
- Compatible with Adjustable Cable Runway

Kit includes:
- (1) support bracket
- (1) reinforcement bar
- (2) 5/8-11 hex nuts;
- (1) 5/8 split lock washers
- (1) 12"L (300 mm) threaded rod cover
- (1) J-bolt kit (2 J-bolts; 2 nuts; 2 washers)

ORDERING INFORMATION

Part Number	Description Width - in (mm)	Dim. A in (mm)	Shipping Weight lb (kg)
12362-X06	6 (150)	6.56 (166.6)	2 (0.9)
12362-X12	12 (300)	12.56 (319.0)	2 (0.9)
12362-X15	15 (380)	16.20 (411.5)	3 (1.4)
12362-X18	18 (460)	19.20 (487.7)	4 (1.8)
12362-X24	24 (610)	25.20 (640.1)	5 (2.3)

X=color: 0=Gold, 1=Gray, 7=Black, E=Glacier White. Gold and Glacier White kits have gold colored hardware. Gray and Black kits have black colored hardware.

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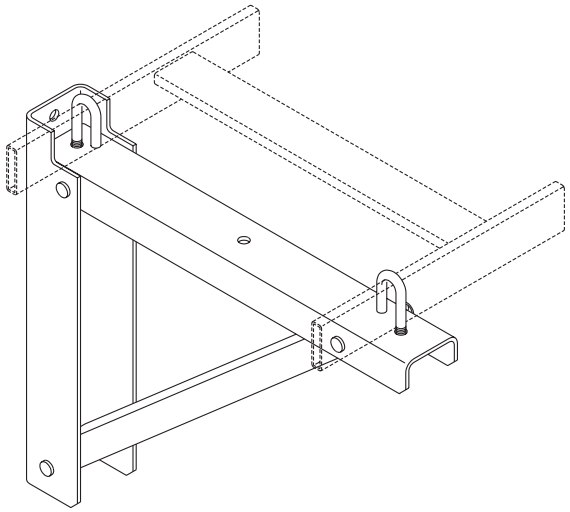
CHATSWORTH PRODUCTS

PRODUCT SPEC SHEET

Triangular Support Bracket, Steel



Triangular Support Bracket, Steel
Triangular Support Bracket provides wall support for Cable Runway. Made of cold rolled steel. Load rating is 400 lb (181.4 kg).for cable runway.
• Compatible with Adjustable Cable Runway

Kit includes:
• (1) vertical wall-mounting bracket
• (1) runway support channel
• (1) angle support channel
• (3) clevis pins (5/16" diameter) & cotter pins
• (2) 5/16-18 x 2 1/4" J-bolts
• (2) 5/16-18 hex nuts & 5/16 lock washers

ORDERING INFORMATION

Part Number	Runway Widths in (mm)	Shipping Weight lb (kg)
11746-X12	4-12 (100-300)	5 (2.3)
11746-X18	9-18 (230-460)	8 (3.6)
11746-X24	9-24 (230-610)	9 (4.1)

X=color: 0=Gold, 1=Gray,7=Black, E=Glacier White. Gold and Glacier White kits have gold colored hardware. Gray and Black kits have black colored hardware.

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EZ-PATH® SERIES 44+ FIRE RATED PATHWAY

APPLICATIONS

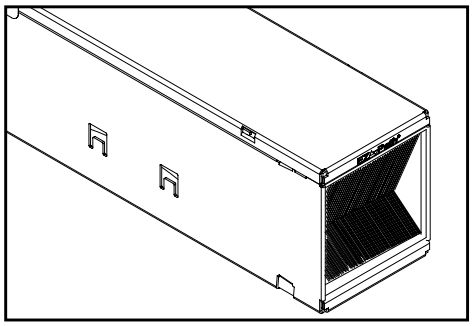
EZ-PATH® Series 44+ Fire Rated Pathway is designed for easy installation in floors and walls. Tested and approved cable capacities range from 0 to 100% visual fill. EZ-PATH® Series 44+ Fire Rated Pathway when installed with available single wall plates is designed for new cable installations. In these installations, the device does not require mechanical attachment to either the wall or the wall framing and must be installed after the wallboard has been installed. Split floor plates and multi-gang wall and floor brackets permit installation around previously installed cables if so desired. These installations require mechanical attachment to the barrier. A list of available accessories along with their intended use is shown on page 2 under available components.

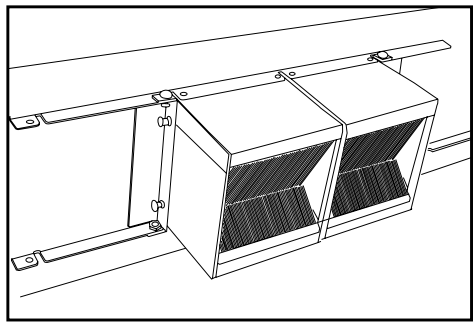
EZ-PATH® Series 44+ Fire Rated Pathway Fire Rated Pathway provides exceptional cable capacity. A single unit installed in a wall exceeds the cable carrying capacity of a 6" (152 mm) sleeve utilizing typical putty firestop systems (35% cable loading). Multiple ganged pathways utilizing available wall bracket kits provide additional capacity or segregation of cables by use, type, installer or vendor as desired.

PRODUCT DESCRIPTION

The EZ-PATH® Series 44+ Fire Rated Pathway is a pathway device designed to allow cables to penetrate fire-rated walls and floors without the need for firestopping. This device features a built-in fire and smoke sealing system that automatically adjusts to the amount of cables installed. Once installed in a fire barrier, cables can be easily added or removed at any time without the need to remove or reinstall firestopping materials.

The EZ-PATH® Series 44+ Fire Rated Pathway consists of an enclosed heavy gauge galvanized steel pathway lined with intumescent material engineered for rapid expansion when exposed to fire or high temperatures, quickly sealing the pathway and preventing the passage of flames and smoke. EZ-PATH® Series 44+ Fire Rated Pathway is painted safety orange for easy identification. Its compact square profile allows a maximum number of cables to be installed in a relatively small area. The pathway measures approximately 4" x 4 5/8" and is 14" long (102 x 118 x 356 mm) and can be increased by 6" (152mm) for every Series 44+ Extension module (EZD44ES) installed..





PERFORMANCE

EZ-Path® Series 44+ Fire Rated Pathway is UL Tested and Classified in accordance with ASTM E814 (UL1479) & CAN/ULC-S115. Systems are available for common floor and wall constructions with ratings up to and including 4 hours.

SPECIFICATIONS

All data, video, and communications cable bundles shall utilize an enclosed fire rated pathway device wherever said cables penetrate rated walls and floors. The fire-rated pathway shall contain a built-in fire sealing system sufficient to maintain the hourly fire rating of the barrier being penetrated. The self-contained sealing system shall automatically adjust to the installed cable loading and shall permit cables to be installed, removed, or retrofitted without the need to remove or reinstall firestop materials. The pathway shall be UL Classified and/or FM Systems Approved and tested to the requirements of ASTM E814 (UL1479) & CAN/ULC-S115.

SPECIFIED DIVISIONS

DIV. 7	07 84 00	Penetration Firestopping
DIV. 26	26 00 00	Electrical
DIV. 27	27 00 00	Communications

FEATURES & BENEFITS

- Easy to install.
- No firestopping required.
- Firestopped at all stages of use.
- UL Tested - Low Leakage!
- Acoustically Tested
- UL Classified for the complete range of its capacity.
- Interlocking design for easy gang installations.
- Permits cable segregation by use, type, vendor.
- More than TWICE the capacity of Standard EZ-Path 33.

FIRESTOP DEVICE CERTIFIED FOR USE IN THROUGH-PENETRATION FIRESTOP SYSTEMS SEE UL ONLINE CERTIFICATIONS DIRECTORY.

INSTALLATION INSTRUCTIONS

EZ-Path® Series 44+ Fire Rated Pathway is designed for use in all common constructions. Single pathways and mounting hardware may be purchased separately or in complete kits. For multi-gang installations, pathways and appropriate mounting hardware must be purchased separately. Single pathways may be installed in either square or round openings. Ganged pathways are designed to be installed in either square or rectangular openings appropriately sized for the number of units desired (See Installation Instructions). In gypsum board walls where pathways are ganged, wall plates must be secured to the wall's internal studs.

Technical Service 1-800-992-1180
www.stifirestop.com

CABLE INSTALLATION

Cables may easily be added or removed at any time without removing or reinstalling the fire seal. Cables may be added individually or in bundles. Wrapping ends with a low-friction tape facilitates cable insertion. Avoid any sharp or exposed conductors that can potentially damage interior pads. A self-adjusting cable throat automatically adjusts to accommodate the cable bundle as it passes through the pathway. Installation of a pulling line will facilitate future cabling additions.

MAINTENANCE

No maintenance of the pathway is normally required.

TECHNICAL SERVICE

Technical information including Product Data Sheets, Installation Instructions, applicable UL Classified Systems, Certificates of Conformance, and suggested specifications are available at the company's web site (www.stifirestop.com). For all other information, contact the manufacturer directly by dialing (800) 992-1180.

PRECAUTIONARY INFORMATION

The use of this device is subject to local, regional and national codes. Consult the local Building Code Official or Authority Having Jurisdiction regarding any regional or local requirements that might influence the selection or use of this product.

AVAILABILITY

See Ordering Information below. EZ-PATH® Fire-Rated Pathway Products are available from designated authorized STI distributors. Consult the factory or visit the web site (www.stifirestop.com) for the names and locations of the nearest sales representatives or distributors.

ORDERING INFORMATION

Catalog Number	Description
EZDP44S2	EZ-Path Series 44+ Fire-Rated Pathway Kit Full Kit with device, wall plates & labels
EZDP144FKS2	EZ-Path Series 44+ Fire-Rated Pathway Floor Kit Full Kit with device, floor plate & labels
EZP144W	One Pair (2) 44 single wall plate pack
EZP544W	EZ-Path Series 44+ 5 gang wall plate brackets
EZP144F	EZ-Path Series 44+ Split floor plate pack
EZD44S2	EZ-Path Series 44+ Device
EZD44ES	EZ-Path Series 44+ Extension Module
EZDG444S2	Single Bank Floor Grid - Four (4) Devices with floor frame
EZDG844S2	Multi-slot Frame Kit for 8 Pathways - (Includes eight (8) Series 44 devices with EZG844)
EZDG1644S2	Multi-slot Frame Kit for 16 Pathways - (Includes sixteen (16) Series 44 devices with EZG1644)
EZG444	Multi-Slot Frame for Four (4) Pathways
EZG444CP	Splice Plate for Floor Grid
EZG844	Multi-Slot Frame for Eight (8) Pathways
EZG1644	Multi-Slot Frame for Sixteen (16) Pathways
EZP144RS	(Retrofit Wall Plate Pack)
EZDP144RS2	(EZ-Path Series 44+ Fire-Rated Pathway Retrofit Kit Full Kit with device, wall plates & labels

PHYSICAL PROPERTIES

Dimensions:	4" w x 4 5/8"H x 14" L (102 x 118 x 356 mm)
Shell Composition:	0.059" (1.5 mm) thick galv. steel
Cable Loading Area:	3 3/8" x 3 3/4" (86 x 95 mm)
Allowable Cable Fill:	0 to 100% visual fill
Fire Ratings:	1, 2, 3 or 4 hours
Expansion Begins:	350°F (177°C)
Volume Expansion:	800%
Sample Cable Volume:	210 (Cat6 0.236" OD)
In-Service Temperature:	Not to exceed 120°F (49°C)
Shelf Life:	No Limit

IMPORTANT NOTICE: All statements, technical information, and recommendations contained herein are based upon testing believed to be reliable, but the accuracy and completeness thereof is not guaranteed.

LIMITED WARRANTY: STI warrants that its products will be free of defects for one year from the date of purchase. In the event a product does not conform to this warranty, the sole and exclusive remedy is, at STI's option, replacement of the product or refund of the purchase price. The warranty provided herein shall be void and of no effect in the event that the product is not installed in accordance with STI's published instructions, listed systems and applicable building and safety codes. THIS WARRANTY IS IN LIEU OF ALL OTHER REPRESENTATIONS AND EXPRESSED OR IMPLIED WARRANTIES (including the implied warranties of merchantability or fitness for a particular use) AND UNDER NO CIRCUMSTANCES SHALL STI BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING, WITHOUT LIMITATION, ANY LOSS OF REVENUE, PROFIT OR USE. Prior to use, the user shall determine the suitability of the product for its intended use, and the user assumes all risks and liability for subsequent use. No person other than an officer of STI is authorized to bind STI to any other warranty for any product for which this warranty is issued.

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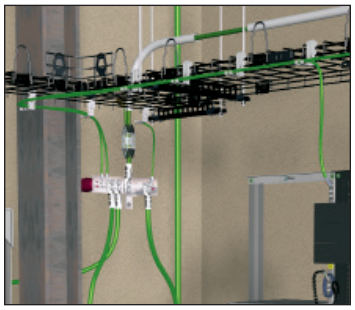
StructuredGround™ Telecommunications Room Grounding and Bonding Kits for TIA-607-C Compliance

PANDUIT®

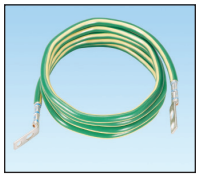
SPECIFICATION SHEET

specifications

Grounding and bonding kits shall bond each rack to Secondary Bonding Busbar (SBB) also known as Telecommunications Grounding Busbar (TGB) using Telecommunications Equipment Bonding Conductor (TEBC). Hardware kit shall bolt TEBC to SBB/TGB with 1/4" stainless steel hardware. Each bolt requires a nut, flat washer on both sides, and a Belleville washer on the bolt side of the stack up. TEBC shall be bolted to rack with #12-24 thread-forming screws. Abrasive cleaning pad shall remove oxidation from lug and mounting surfaces. Copper to copper joint compound shall also be utilized to prep lug mounting surfaces. The front and back of each rack requires one ESD Port Kit and ESD wrist strap. Bond SBB/TGB to electrical panel serving equipment in telecommunications room.



kit information

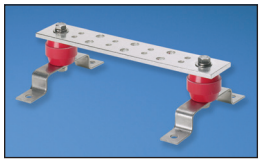


TEBC Kits:
Pre-terminated jumper on both ends – #6 AWG jumper with 45° bent lug on rack side to straight lug on SBB/TGB.

Part Number	Length In.
GJ672UH	72
GJ696UH	96
GJ6120UH	120
GJ6144UH	144
GJ6168UH	168
GJ6192UH	192
GJ6216UH	216
GJ6240UH	240
GJ6264UH	264
GJ6288UH	288

TEBC Kits:
Pre-terminated jumper on one end only – #6 AWG jumper with 45° bent lug for bonding to rack.

Part Number	Length In.
GJS660U	60
GJS696U	96
GJS6120U	120
GJS6180U	180



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SBB/TGB Kits:
Pre-assembled with brackets and insulators – bar size 1/4" x 2".

Part Number	Bar Length In.	1/4" Stud Hole with 5/8" Hole Spacing	3/8" Stud Hole with 1" Hole Spacing
GB2B0304TPI-1	10	4	3
GB2B0306TPI-1	12	6	3
GB2B0312TPI-1	20	12	3

Compression Lugs for SBB/TGB:
Two-hole straight tongue compression lug with window.

Part Number	Copper Conductor Size	Stud Hole Size In.	Stud Hole Spacing In.
LCC6-14JAW-L	#6 AWG	1/4	0.50 – 0.63
LCC2-14AW-Q	#2 AWG	1/4	0.63
LCC1/0-14AW-X	1/0 AWG	1/4	0.63
LCC3/0-38DW-X	3/0 AWG	3/8	1.00
LCC4/0-38DW-X	4/0 AWG	3/8	1.00

Armored Fiber Cable Grounding Kits:
Pre-terminated jumper on both ends – straight lug and terminal. Provided with mechanical clamp and cover for terminal and two each #12-24 and M6 hex head thread-forming screws.

Part Number	Armored Cable Diameter In.	Grounding Cable Length In.
ACG24K	Up to 0.84	24
ACG24K-500	0.84 to 1.03	24

applications

StructuredGround™ Telecommunications Room Grounding and Bonding Kits deliver a complete grounding solution, designed to exceed industry standards for ensured electrical continuity and ease of installation. Bonding of rack and equipment to SBB/TGB and proper ESD protection is critical to the reliability and safety needs of the physical infrastructure. Integrated technology from Panduit addresses comprehensive grounding and bonding needs to protect systems, equipment, and personnel for optimum availability of services and lower operational costs. As solution architecture, a range of installation tooling, design software, and services complement StructuredGround™ Grounding System.

For the complete StructuredGround™ Grounding System offering, refer to www.panduit.com/dcgrounding.

www.panduit.com

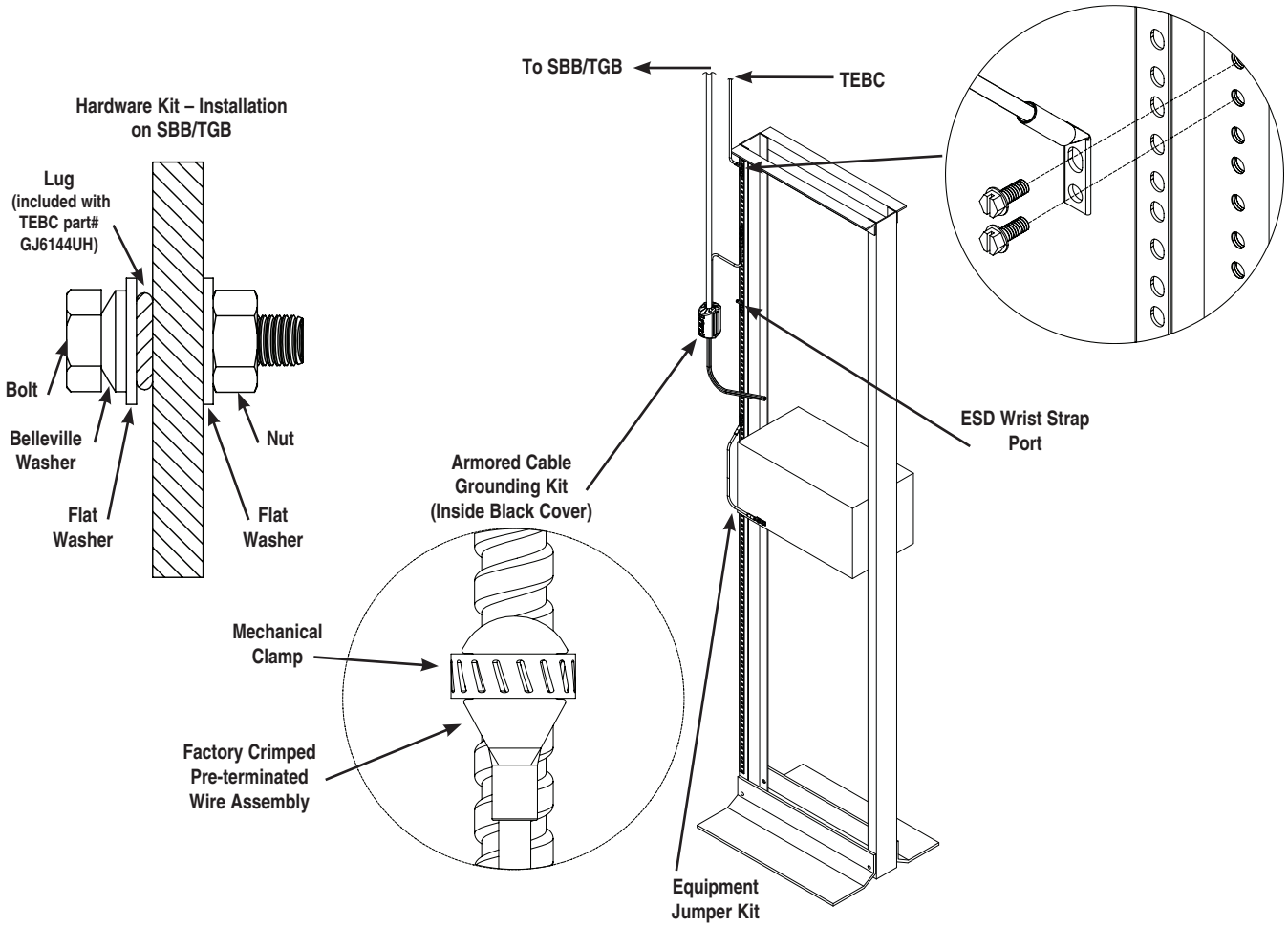
Related Products

Hardware Kits: include 2 bolts, 2 nuts, 4 flat washers, 2 Belleville washers for SBB/TGB and 2 thread-forming screws for racks	
1/4" kit with #12-24 and M6 screws:	HDW1/4-KT
3/8" kit with #12-24 and M6 screws:	HDW3/8-KT
1/4" kit with #10-32 and M5 screws:	HDW1/4-A-KT
3/8" kit with #10-32 and M5 screws:	HDW3/8-A-KT
Stainless Steel Bolts	
1/4-20	SSNTS1420-C
3/8-18	SSNTS3816-C
Stainless Steel Belleville Washers	
1/4"	SSCW14-C
3/8"	SSCW38-C
Stainless Steel Flat Washers	
1/4"	SSFW14-C
3/8"	SSFW38-C
Stainless Steel Nuts	
1/4-20	SSN1420-C
3/8-18	SSN3816-C
Abrasive Cleaning Pad	
4-1/2" x 6"	HANDPAD
ESD Port	
Two-hole ESD port with banana jack:	RGESD2-1
ESD Wrist Strap	
6' coil cord, banana plug, 1 megohm resistor:	RGESDWS
Equipment Jumper Kits: include .16 oz. of antioxidant and two each #12-24 x 1/2" and M5 x 12mm thread-forming screws	
#6 AWG jumper, 57" length, bent lug on grounding strip side:	RGEJ657PFY
#6 AWG jumper, 24" length, bent lug on grounding strip side to straight lug on equipment:	RGEJ624PFY

bill of materials (example):

The following sample bill of materials and installation drawings are provided to assist you with ordering and kit combinations to meet your application needs.

Description	Part Number	Qty
SBB/TGB Kit	GB2B0306TPI-1	1 per Telecommunications Room
TEBC Kit	GJ6144UH	1 per Rack/Cabinet
Hardware Kit	HDW1/4-KT	1 per Rack/Cabinet
Equipment Jumper Kit	RGEJ657PFY	1 per Equipment
ESD Port	RGESD2-1	2 per Rack/Cabinet (one front and one back)
ESD Wrist Strap	RGESDWS	2 per Rack/Cabinet (one front and one back)
Armored Fiber Cable Grounding Kit	ACG24K	1 per Armored Fiber Cable



For the complete StructuredGround™ Grounding System offering, refer to www.panduit.com/dcgrounding.

WORLDWIDE SUBSIDIARIES AND SALES OFFICES

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SA-GRSP10
replaces SA-GRSP05
2/2016

* All images in this datasheet are for illustrative purposes only.

TV Signage UR340C9 Series

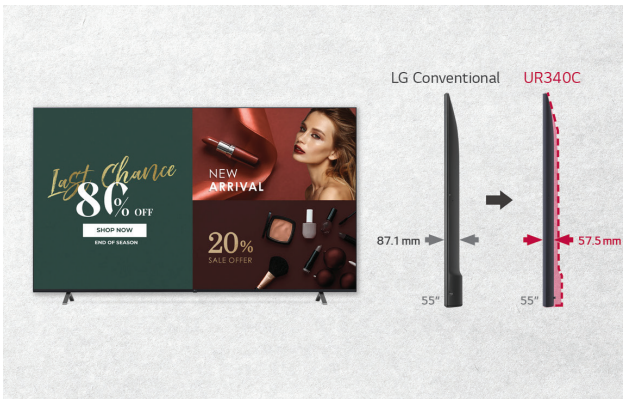
LG UHD Signage for Live TV & Promotional Messaging

- 4K Ultra HD Resolution
- Slim Design
- Non Wi-Fi Non Bluetooth
- Easy Management

UR340C9 Series	
Sizes	86” / 75” / 65” / 55” / 50” / 43”
Screen Resolution	3,840 x 2,160 (UHD)
Operation Time	16 Hours / 7 Days
Brightness	330 nits (86"/75") 400 nits (65"/55"/50") 300 nits (43")
Built-in Speakers	10 W + 10 W

Ultra HD Resolution Delivers Superb Picture Quality

Ultra HD resolution is four times FHD for content that is vivid and highly detailed. In addition, the UR340C series supports HDR10 to deliver more intense color reproduction and deeper black levels that can improve image contrast.



Elegant Slim Design

The space-saving UR340C series is thinner than LG conventional* models making installation a breeze. In addition, its sophisticated ashed blue color can enhance the décor of the environment in which it's installed.

* 'LG Conventional' refers to the LG US340C series.

Advanced Welcome Screen

To provide a more personalized and welcoming experience, the UR340C series welcome screen features a broader range of programable greeting messages. And if no input signal is present, preset content can be displayed, avoiding the conventional "No Signal" message.

Customized Time Scheduler

The UR340C series features a time scheduler that allows you to program when the display is powered on to conserve power and extend product life.

* All images are for illustrative purposes only

Display Power Management Support

For more efficient power management, Display Power Management (DPM) can be configured to be powered on only when a TV signal is present.

USB Data Cloning

USB data cloning improves the efficiency of managing multiple displays by allowing you to transfer the data of one display to the other UR340C series displays using a USB drive.

* USB is not provided by LG. FAT32 or NTFS formatting is recommended.

Crestron Connected® Certified

For more efficient meeting management, the UR340C series has been certified by Crestron Connected®, providing seamless integration and automated control* in Crestron Connected® meeting rooms.

* Network-based control

LG's SuperSign* Makes Signage Control More Efficient

LG's SuperSign control software allows you to manage up to 100 displays through a single account and server, giving you remote control over power, volume. Firmware updates are also supported.

* LG SuperSign Control needs to be purchased separately.

* All images are for illustrative purposes only

SPECIFICATIONS

MODEL		86UR340C9UD	75UR340C9UD	65UR340C9UD	55UR340C9UD	50UR340C9UD	43UR340C9UD
DISPLAY	Diagonal	86"	75"	65"	55"	50"	43"
	Resolution	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)	3840 X 2160 (UHD)
	Brightness	330 nits	330 nits	400 nits	400 nits	400 nits	300 nits
	Dynamic Contrast Ratio (Dynamic MCI (Hz))	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1	1,000,000:1
	Static (Panel) Contrast Ratio	1200:1	1200:1	1200:1	1300:1	5000:1	1200:1
	Response Time (G to G)	5 ms	8 ms	8 ms	14 ms	18 ms	8 ms
	Refresh Rate	120 Hz	60 Hz	60 Hz	60 Hz	60 Hz	60 Hz
	Life span	30,000 hours	30,000 hours	30,000 hours	30,000 hours	30,000 hours	30,000 hours
	HDR_HDR 10 Pro	Yes	Yes	Yes	Yes	Yes	Yes
	HDR_HLG	Yes	Yes	Yes	Yes	Yes	Yes
AUDIO	Built-in Speakers	10W + 10W	10W + 10W	10W + 10W	10W + 10W	10W + 10W	10W + 10W
	Speaker System	2.0 ch	2.0 ch	2.0 ch	2.0 ch	2.0 ch	2.0 ch
FEATURES	Broadcasting System	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC	ATSC, Clear QAM, Analog NTSC
	SW Clock (World Clock / Alarm)	Yes	Yes	Yes	Yes	Yes	Yes
	HDMI-ARC	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2	ARC, HDMI2
	USB Cloning	Yes	Yes	Yes	Yes	Yes	Yes
	WOL	Yes	Yes	Yes	Yes	Yes	Yes
	SNMP	Yes	Yes	Yes	Yes	Yes	Yes
	Self Diagnostics (USB)	Yes	Yes	Yes	Yes	Yes	Yes
	SI Compatible Protocol	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner	TVLink Tuner
	HTNG-CEC	Yes	Yes	Yes	Yes	Yes	Yes
	Simplink (HDMI-CEC)	Yes (1.4)	Yes (1.4)	Yes (1.4)	Yes (1.4)	Yes (1.4)	Yes (1.4)
	IR Out	Yes (RS-232C)	Yes (RS-232C)	Yes (RS-232C)	Yes (RS-232C)	Yes (RS-232C)	Yes (RS-232C)
	Multi-code IR	Yes	Yes	Yes	Yes	Yes	Yes
	Hotel Mode / PDM / Installer Menu	Yes	Yes	Yes	Yes	Yes	Yes
	Lock mode	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)	Yes (Limited)
	Welcome Video	Yes	Yes	Yes	Yes	Yes	Yes
	Welcome Screen (Splash Image)	Yes	Yes	Yes	Yes	Yes	Yes
	Insert Image	Yes	Yes	Yes	Yes	Yes	Yes
	RJP (remote jack pack) Compatibility	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)	Teleadapt/Guestlink (HDMI CEC)
	USB Auto playback	Yes	Yes	Yes	Yes	Yes	Yes
	Moving Picture Playback (SD/HD/Plus HD)	Yes	Yes	Yes	Yes	Yes	Yes
	Auto Off / Sleep Timer	Yes	Yes	Yes	Yes	Yes	Yes
	Energy Saving mode	Yes	Yes	Yes	Yes	Yes	Yes
	Motion Eye Care	Yes	Yes	Yes	Yes	Yes	Yes
	Crestron Compatibility	Yes	Yes	Yes	Yes	Yes	Yes
	DPM (Digital Power management)	Yes	Yes	Yes	Yes	Yes	Yes
	Time scheduler	Yes	Yes	Yes	Yes	Yes	Yes
	RTC (Real Time Clock)	Yes	Yes	Yes	Yes	Yes	Yes
	NTP sync timer	Yes (Clock Setup)	Yes (Clock Setup)	Yes (Clock Setup)	Yes (Clock Setup)	Yes (Clock Setup)	Yes (Clock Setup)
	SuperSign Control	Yes	Yes	Yes	Yes	Yes	Yes

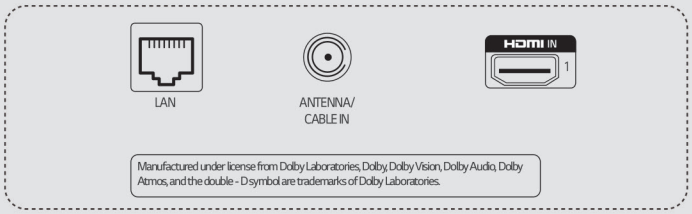
SPECIFICATIONS

MODEL		86UR340C9UD	75UR340C9UD	65UR340C9UD	55UR340C9UD	50UR340C9UD	43UR340C9UD
CONNECTIVITY	HDMI 2.0 In	Yes (x3)	Yes (x3)	Yes (x3)	Yes (x3)	Yes (x3)	Yes (x3)
	USB In	Yes	Yes	Yes	Yes	Yes	Yes
	RF In	Yes	Yes	Yes	Yes	Yes	Yes
	Digital Audio Out (Optical)	Yes	Yes	Yes	Yes	Yes	Yes
	RS-232C	3.5mm (4 pole)	3.5mm (4 pole)	3.5mm (4 pole)	3.5mm (4 pole)	3.5mm (4 pole)	3.5mm (4 pole)
	LG SVC only	3.5mm	3.5mm	3.5mm	3.5mm	3.5mm	3.5mm
	RJ45 (LAN)	Yes	Yes	Yes	Yes	Yes	Yes
MECHANICAL	Color	Navy Blue (Almost Black)	Navy Blue (Almost Black)	Navy Blue (Almost Black)	Navy Blue (Almost Black)	Navy Blue (Almost Black)	Navy Blue (Almost Black)
	VESA Compatible	600 x 400	400 x 400	300 x 300	300 x 300	200 x 200	200 x 200
	Kensington Lock	Yes	Yes	Yes	Yes	Yes	Yes
	Weight without Stand	99.6 lbs / 45.2 kg	69.2 lbs / 31.4 kg	47.4 lbs / 21.5 kg	30.9 lbs / 14.0 kg	25.8 lbs / 11.7 kg	19.4 lbs / 8.8 kg
	Weight with Stand	101.2 lbs / 45.9 kg	70.8 lbs / 32.1 kg	48.1 lbs / 21.8 kg	31.3 lbs / 14.2 kg	26.2 lbs / 11.9 kg	19.6 lbs / 8.9 kg
	Shipping Weight	128.8 lbs / 58.4 kg	91.5 lbs / 41.5 kg	61.3 lbs / 27.8 kg	41.9 lbs / 19.0 kg	32.2 lbs / 14.6 kg	24.3 lbs / 11.0 kg
	Size without Stand	75.9 x 43.5 x 2.4 in 1927 x 1104 x 59.9 mm	66.1 x 38.0 x 2.4 in 1678 x 964 x 59.9 mm	57.2 x 33.0 x 2.3 in 1454 x 838 x 57.7 mm	48.6 x 28.1 x 2.3 in 1235 x 715 x 57.5 mm	44.1 x 25.6 x 2.2 in 1121 x 651 x 57.1 mm	38.1 x 22.2 x 2.2 in 967 x 564 x 57.1 mm
	Size with Stand	75.9 x 45.9 x 14.3 in 1927 x 1167 x 362 mm	66.1 x 40.4 x 14.3 in 1678 x 1027 x 362 mm	57.2 x 35.4 x 10.7 in 1454 x 899 x 271 mm	48.6 x 30.4 x 9.1 in 1235 x 772 x 232 mm	44.1 x 27.9 x 9.1 in 1121 x 708 x 232 mm	38.1 x 24.5 x 8.5 in 967 x 622 x 216 mm
	Size in Shipping	83.3 x 47.8 x 9.0 in 2115 x 1215 x 228 mm	74.0 x 43.9 x 7.9 in 1880 x 1115 x 200 mm	63.0 x 38.2 x 6.8 in 1600 x 970 x 172 mm	53.5 x 31.9 x 6.4 in 1360 x 810 x 162 mm	47.8 x 30.5 x 6.0 in 1215 x 775 x 152 mm	41.5 x 26.0 x 5.6 in 1055 x 660 x 142 mm
	Bezel Width (L/R/T/B): On Bezel	15.9 / 15.9 / 15.9 / 19.9 mm	13.9 / 13.9 / 13.9 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm	12.8 / 12.8 / 12.8 / 19.9 mm
	Bezel Width (L/R/T/B): Off Bezel	6.9 / 6.9 / 6.9 / 18.4 mm	7.9 / 7.9 / 7.9 / 18.4 mm	6.8 / 6.8 / 6.8 / 18.4 mm	6.9 / 6.9 / 6.9 / 18.4 mm	7.3 / 7.3 / 7.8 / 18.4 mm	6.9 / 6.9 / 6.9 / 18.4 mm
POWER	Power Supply (Voltage, Hz)	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz	120 Vac, 50/60 Hz
	Max Power Consumption	339 W	228 W	174.4 W	165 W	144.8 W	119.6 W
	Typical Power Consumption	313 W	202 W	148.3 W	135.3 W	118.8 W	97.2 W
	Standby Power Consumption	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W	Less than 0.5W
WARRANTY & OTHER	Warranty	3 Year Limited	3 Year Limited	3 Year Limited	3 Year Limited	3 Year Limited	3 Year Limited
	UPC	195174023747	195174023761	195174023785	195174023808	195174023822	195174023846
	Assembled In	Mexico	Mexico	Mexico	Mexico	Mexico	Mexico
	FCC (Regulatory)	Yes	Yes	Yes	Yes	Yes	Yes
	UL (Certification)	Yes	Yes	Yes	Yes	Yes	Yes
	EPEAT (Environmental)	Yes	Yes	Yes	Yes	Yes	Yes
	ISTA6 (Packaging)	Yes	Yes	Yes	Yes	Yes	Yes
	Accessories	Chromecast anti-theft cover (optional), RS232 9-pin to 3.5mm adapter, 2m power cable (attached), remote control (L-Con)		Chromecast anti-theft cover (optional), RS232 9-pin to 3.5mm adapter, 1.8m power cable (detached), remote control (L-Con)			

CONNECTIVITY -
86” / 75" / 65" / 55" / 50" / 43”

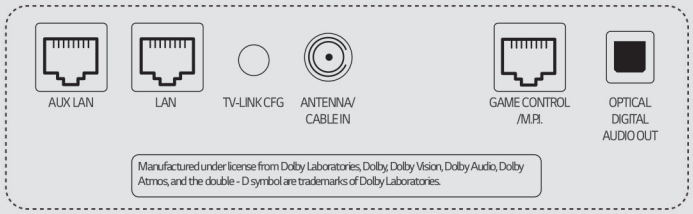
86”

Rear



75”

Rear

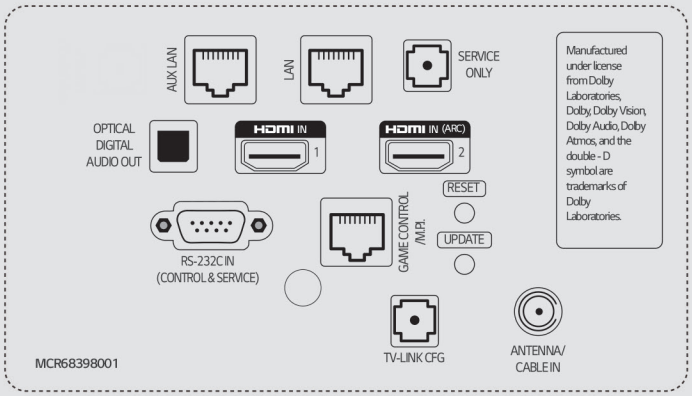


86”

Side

65” / 55” / 50” / 43”

Rear



75” / 65” / 55” / 50” / 43”

Side

HDMI HIGH-DEFINITION MULTIMEDIA INTERFACE

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LG Business Solutions

AVARRO™

MEDIUM TILT MOUNT

NX-TM2460

EASY TO INSTALL WITH A LOW PROFILE TILTING DESIGN AND POST-INSTALL LEVELING. THE NX-TM2460 IS IDEAL FOR 24" - 60" PANELS WEIGHING UP TO 120 LBS.

SPECIFICATIONS:

- Fits 24" - 60" TVs up to 120lbs
- VESA 75 x 75 to 400 x 400 (W x H) (mm)
- Locking mechanism secures rails to wall plate
- Height adjustable for easy levelling
- Tilt up to 12° to reduce glare
- Simple to install and use
- Includes complete hardware kit
- Warranty: 5 years
- For commercial and residential applications

BOX DIMENSIONS:

PART#:	**NX-TM2460**
UPC:	**840049303102**
LENGTH:	**5.9"**
WIDTH:	**21.3"**
HEIGHT:	**2.4"**
WEIGHT:	**5.8 LBS**

For more information please call 1-833-574-9124
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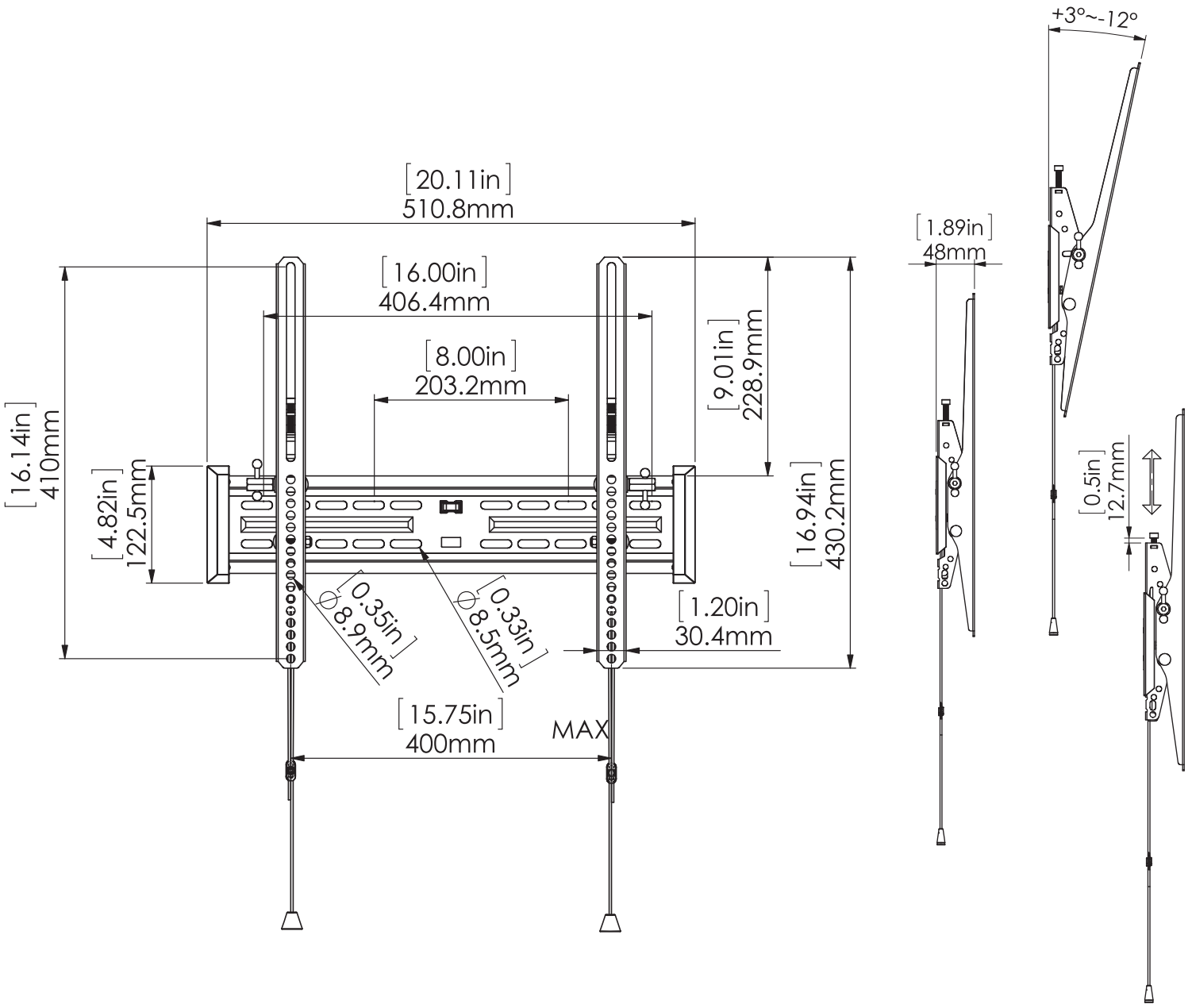
RoHS COMPLIANT

TECHNICAL DRAWING

NX-TM2460



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LARGE TILT MOUNT

NX-TL4290

EASY TO INSTALL WITH A LOW PROFILE TILTING DESIGN AND POST-INSTALL LEVELING. THE NX-TL4290 IS IDEAL FOR 42" - 90" PANELS WEIGHING UP TO 175 LBS.

SPECIFICATIONS:

- Fits 42"- 90" TVs up to 175lbs
- VESA 100 x 100 to 700 x 400 (W x H) (mm)
- Locking mechanism secures rails to wall plate
- Height adjustable for easy levelling
- Tilt up to 12° to reduce glare
- Simple to install and use
- Includes complete hardware kit
- Warranty: 5 years
- For commercial and residential applications

BOX DIMENSIONS:

PART#:	**NX-TL4290**
UPC:	**840049303119**
LENGTH:	**7.3"**
WIDTH:	**32.1"**
HEIGHT:	**2.4"**
WEIGHT:	**7.3 LBS**

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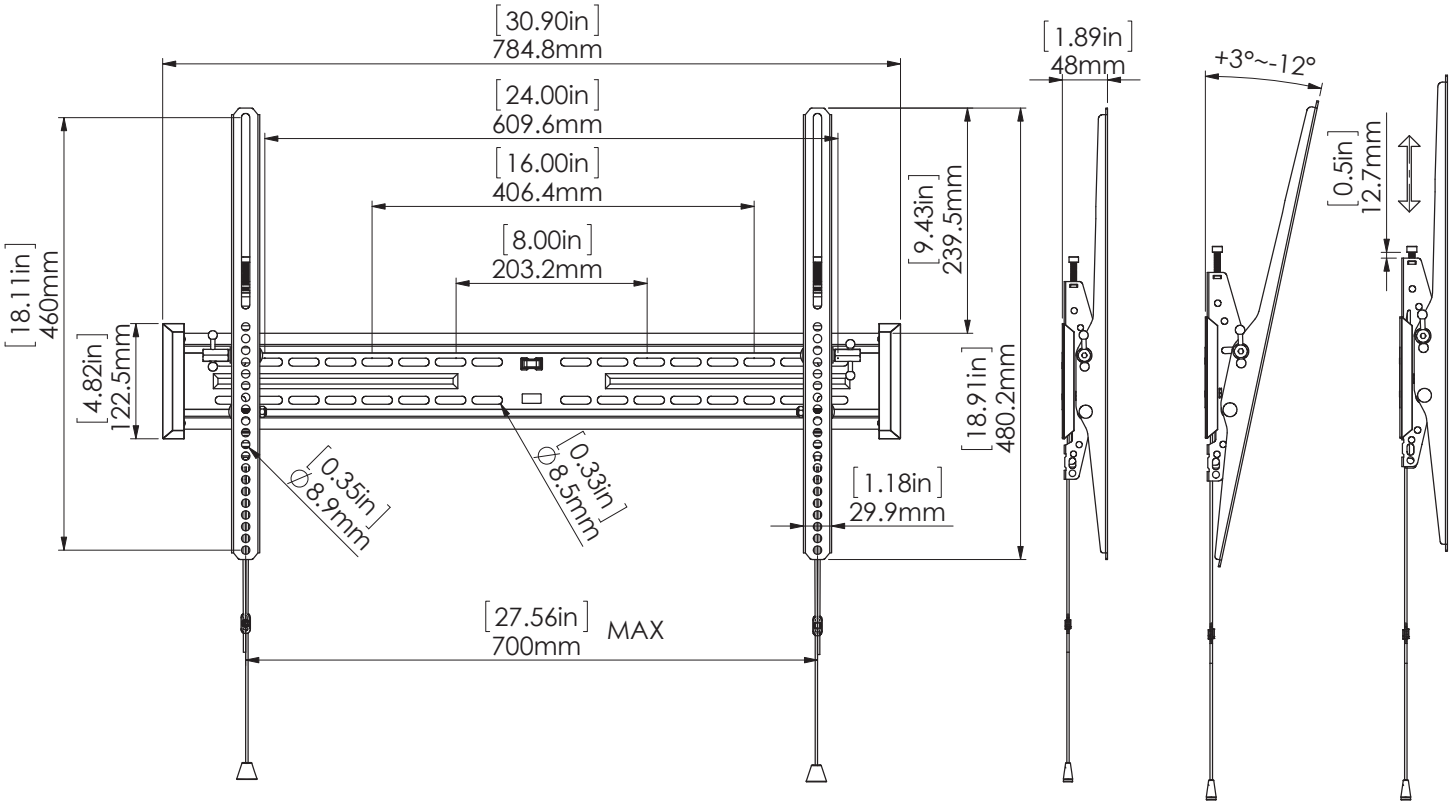
RoHS COMPLIANT

TECHNICAL DRAWING

NX-TL4290



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ClickShare C-5

Simple, one-click wireless presentation for huddle spaces

- **Entry-level wireless presentation model**
- **Content sharing with the ClickShare App and native BYOD**
- **100% secure, encrypted and cloud managed**

Product specifications	CLICKSHARE C-5
General specifications	
Operating system	Windows 10 and higher macOS 11 (BigSur) and higher Android v9 and higher (ClickShare App)* iOS 12 and higher (ClickShare App)*
System requirements	For a smooth experience with Microsoft Teams or Zoom Minimum: Intel i3 dual-core processor or AMD Ryzen 7 / 8GB RAM / OS: Windows 10 latest build or Mac OS Mojave latest build Recommended: Intel i5 4-core processor or AMD Ryzen 9 / 8GB RAM / OS: Windows 11 latest build or Mac OS latest build
Video outputs	4K UHD (3840*2160) @ 30Hz. HDMI™ 1.4b or USB-C DisplayPort 1.2 (only Gen2)
Audio output	HDMI
USB	1 X USB-A, 1 X USB-C
ClickShare Buttons	0
ClickShare App	Desktop & Mobile
Native protocols	Airplay, Google Cast, Miracast
Maximum sources simultaneously on screen	1
Noise Level	Max. 25dBA @ 0-30°C Max. 30dBA @ 30-40°C
Authentication protocol	WPA2-PSK in stand alone mode WPA2-PSK or IEEE 802.1X using the ClickShare Button in network integration mode
Wireless transmission protocol	IEEE 802.11 a/g/n/ac and IEEE 802.15.1
Reach	Adjustable with signal strength modulation; max. 30m (100 ft) between ClickShare Button and ClickShare Base Unit Frequency band 2.4 GHZ and 5 GHz
Frequency band	2.4 GHZ and 5 GHz (DFS channels supported in select number of countries)
Connections	1x Ethernet LAN 1Gbi 1x USB-C 2.0 (front); 1x USB-A 2.0 (front) -only Gen2: 1x USB-C 3.0 (front); 1x USB-A 3.0 (front)
Temperature range	Operating: 0°C to +40°C (+32°F to +104°F) Max: 35°C (95°F) at 3000m Storage: -20°C to +60°C (-4°F to +140°F)
Humidity	Storage: 0 to 90% relative humidity, non-condensing Operation: 0 to 85% relative humidity, non-condensing
Anti-theft system	Kensington lock
Certifications	FCC/CE
Touch screen support & Interactivity	/
Room Dock (peripheral support)	No
Local view	Local view of the room display only
Network connection	LAN & WiFi
Management and reporting	Yes
Warranty	1 year standard. 5 years coverage upon registering via SmartCare
*	* depends on configuration, available in future firmware updates
ClickShare Base Unit dimensions	
Dimensions (HxWxD)	34 mm x 135 mm x 135 mm
Power consumption	Operational: 5-10W, 24W Max
Power supply	Standard 110/220 V AC plug or USB-C (only Gen2)
Weight	900 gr

Last updated: 17 Oct 2024

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VS-211X

2x1 4K HDR HDMI Auto Switcher

| HDMI

VS−211X is a high−performance 2x1 automatic switcher for 4K HDR, HDMI video signals. Offering priority and last−connected switching options, it automatically switches according to the selected switching scheme based on active video signal detection

FEATURES

Plug & Play Auto Switcher - Automatically plays the switched source signal on the connected display according to user–configured preferences, such as priority or last−connected input. When the user manually switches, by pressing a button, the auto switching is overridden

HDMI Signal Switching - HDCP 2.3 compliant, Supporting deep color, x.v.Color™, CEC, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS−HD, 2K, 4K, and 3D as specified in HDMI 2.0

Multi-channel Audio Switching - Up to 32 channels of digital stereo uncompressed signals for supporting studio−grade surround sound

I-EDIDPro™ Kramer Intelligent EDID Processing™ - Intelligent EDID handling, processing, locking and pass−through algorithm ensures plug & play operation for HDMI source and display systems

Audio De-embedding - The digital audio signal passing−through to the HDMI output, is de–embedded, converted to an analog signal and sent to the stereo unbalanced analog audio output. This enables playing the audio on locally connected speakers, in parallel to playing it on the speakers connected to the AV acceptor device (such as TVs with speakers)

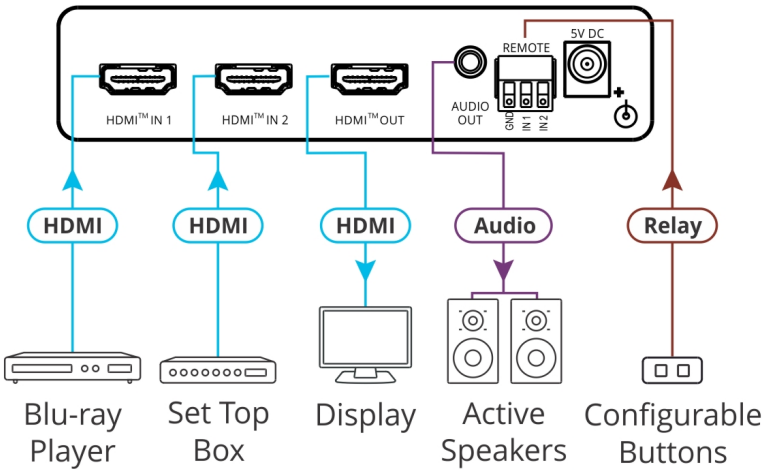
Simple Switching Operation - Local buttons or remotely connected contact–closure buttons for flexible user input selection and switching control

Cost-Effective Maintenance - Status LED indicators for HDMI ports facilitate easy local maintenance and troubleshooting. Local firmware upgrade ensures lasting, field−proven deployment

Easy Installation - Compact DigiTOOLS® fan−less enclosure for user−reachable table mounting, or side−by−side mounting of 3 units in a 1U rack space with the recommended rack adapter

TECHNICAL SPECIFICATIONS

Inputs	2 HDMI: On a female HDMI connector
Outputs	1 HDMI: On a female HDMI connector
	1 Unbalanced Stereo Audio: On a 3.5mm mini jack
Ports	Remote Contact Closure: On a 3–pin terminal block connector
Video	Max Data Rate: 17.82GBPS (5.94Gbps per graphic channel)
	Max Resolution: 4K@60 (4:4:4)
	Compliance: HDR10 as specified in HDMI 2.0, HDCP 2.2
Power	Source: 5V DC, 2A
	Consumption: 500mA
User Interface	Controls: Input selection buttons. DIP–switches for configuring switching mode and EDID mode
Enclosure	Size: DigiTOOLS®
	Type: Aluminum
	Cooling: Convection ventilation
Environmental Conditions	Operating Temperature: 0° to +40°C (32° to 104°F)
	Storage Temperature: –40° to +70°C (–40° to 158°F)
	Humidity: 10% to 90%, RHL non–condensing
REGULATORY	Health, Safety, Environmental: RoHs, WEEE, CE
Product Dimensions	12.00cm x 7.15cm x 2.44cm (4.72" x 2.81" x 0.96") W, D, H
Product Weight	0.2kg (0.5lbs) approx
Shipping Dimensions	49.00cm x 18.60cm x 58.80cm (19.29" x 7.32" x 23.15") W, D, H
Shipping Weight	0.7kg (1.5lbs) approx


HDMI™ IN 1
HDMI™ IN 2
HDMI™ OUT
AUDIO OUT
REMOTE
GND
IR 1
IR 2
5V DC
HDMI
HDMI
HDMI
Audio
Relay
Blu-ray Player
Set Top Box
Display
Active Speakers
Configurable Buttons

4K HDMI® Audio Extractor

DEAR CUSTOMER

Thank you for purchasing this product.
For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

FEATURES

- Extracts audio signals from an HDMI source
- Passes 4K @ 60Hz and 4:4:4 chroma subsampling
- Supports HDR (High Dynamic Range)
- Supports Full 18 Gpbs Bandwidth
- HDCP 2.2 compliant
- Allows simultaneous output of HDMI audio, multi-channel optical (SPDIF), and L/R analog audio in 2CH mode
- Optical audio supports LPCM 2CH, Dolby Digital 2/5.1CH, DTS 2/5.1CH
- Supports uncompressed audio LPCM (Linear Pulse Code Modulation)
- Supports compressed audio DTS Digital, Dolby Digital (DTS-HD and Dolby True HD)
- Power Supply: 5V DC, UL Listed
- Dimensions: 2.75" W x .75" H x 2.378"

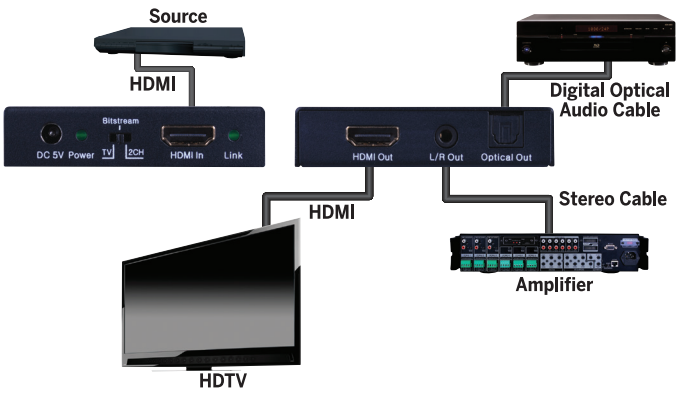
PACKAGE CONTENTS

Before attempting to use this unit, please check the packaging and make sure the following items are contained in the shipping carton:

1. Main unit (4K HDMI® Audio Extractor)
2. 5V DC Power Supply
3. User's Manual

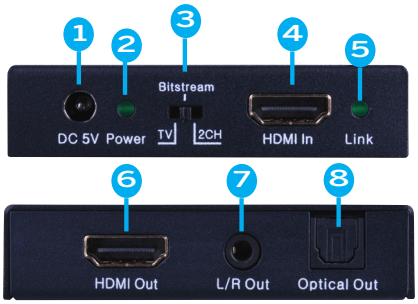
CONNECT AND OPERATE

1. Connect the input of this product to HDMI Source.
2. Connect the output of this product to HDMI Display.
3. Connect SPDIF or Stereo port to Amplifier Receiver
4. Select the Audio output you want through moving the switch to TV, BITSTREAM, or 2CH position.
5. Insert the DC side of 5V power supply into the unit and then connect the AC side of the power supply into the wall outlet.



SPECIFICATIONS

HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2 and HDCP 1.4
Video Bandwidth	18 Gbps
Video Resolutions	up to 4K2K@50/60Hz(YUV4:4:4)
Color Space	RGB, YCbCr 4:4:4, YCbCr 4:2:2
Color Depth	10-bit, 12-bit
HDMI Audio (Pass-through)	LPCM 2/5.1/7.1CH, Dolby Digital, DTS 5.1, Dolby Digital+, Dolby TrueHD, DTS-HD Master Audio, Dolby Atmos, DTS:X
Optical Audio Formats	LPCM 2CH, LPCM 5.1, Dolby Digital 2/5.1CH, DTS 2/5.1CH
L/R Audio Formats	Analog Stereo 2CH
ESD Protection	Human body model — ±8kV (air-gap dis-charge) & ±4kV (contact discharge)
Dimensions	2.75" W x .75" H x 2.378"
Weight	130g
Power Supply	Input: AC100 - 240V 50/60Hz
Output:	DC 5V/1A (US/EU standards, CE/FCC/UL certified)
Power Consumption	1W (Max)
Operation Tempera-ture	32 - 104°F / 0 - 40°C
Storage temperature	-4 - 140°F / -20 - 60°C
Relative Humidity	20 - 90% RH (no condensation)



PANEL DESCRIPTION

1. DC/5V: Connect this port to power adapter.
2. Power LED: System Power Indicator
3. TV/Bitstream/2CH Switch: Allows user to select the desired audio format
4. HDMI In: Connect to HDMI source device
5. Link LED: HDMI input signal indicator
6. HDMI Out: Connect this port to HDMI Display.
7. L/R Out: Connect to amplifier or TV L/R audio input port
8. Optical Out: Connect to audio amplifier or sound bar optical audio port

Nature loves us. You will too.

JBL Commercial is committed to making the world a better-sounding place, while leaving a smaller footprint behind.

That's why we manufacture our new line of high-performance 1U mixer-amplifiers under HARMAN's GreenEdge™ environmental initiative. Plus, the entire line features a fanless, space-saving design.

It also delivers unsurpassed reliability, thermal management and power efficiency, thanks to Crown's exclusive DriveCore™ Technology.

Being "green" never sounded so good.

JBL® COMMERCIAL MIXER-AMPLIFIERS

JBL® Commercial Mixer-Amplifiers

Ideal for commercial and industrial use, our new line of lightweight mixer-amps leverages high-efficiency DriveCore™ Technology and GreenEdge™ environmentally conscious manufacturing so they quickly pay for themselves in energy savings.

With a sleek industrial look and a clean front panel featuring only volume controls for each channel, they offer you an easy-to-use professional tool with uncompromised performance.

Standard Features

- Fanless, space-saving 1U design
- Illuminated rings make them easy to see and operate
- Euro-block type mic/line input and output connectors
- Independent bass and treble controls for each output channel
- Supports 70V and 100V distributed audio systems without needing a separate transformer
- Remote volume control capability using JBL CSR-V module and standard Ethernet cable
- Phantom power
- Priority muting
- Configurable output routing
- Universal power supply accepts AC voltages from 100 to 240 VAC, 50/60Hz
- Three-year, no-fault fully transferable warranty

SPECIFICATIONS

	CSMA180	CSMA1120	CSMA240	CSMA280	CSMA2120
POWER OUTPUT	80W	120W	40W	80W	120W
INPUTS	4	4	8	8	8
OUTPUTS	1	1	2	2	2
INPUT SENSITIVITY	.775Vrms for 8Ω	.775Vrms for 8Ω	.775Vrms for 8Ω	.775Vrms for 8Ω	.775Vrms for 8Ω
PHANTOM POWER	27VDC	27VDC	27VDC	27VDC	27VDC
PRIORITY MUTING	Yes	Yes	Yes	Yes	Yes
CONFIGURABLE OUTPUT ROUTING	No	No	Yes	Yes	Yes
AC LINE VOLTAGE	100-240V, 50/60 Hz	100-240V, 50/60 Hz	100-240V, 50/60 Hz	100-240V, 50/60 Hz	100-240V, 50/60 Hz
DIMENSIONS (HxWxD)	1.7" x 8.6" x 11.9" (43.3mm x 218.5mm x 303.4mm)	1.7" x 8.6" x 11.9" (43.3mm x 218.5mm x 303.4mm)	1.7" x 17.2" x 11.9" (43.3mm x 436.9mm x 303.4mm)	1.7" x 17.2" x 11.9" (43.3mm x 436.9mm x 303.4mm)	1.7" x 17.2" x 11.9" (43.3mm x 436.9mm x 303.4mm)
SHIPPING WEIGHT	9.9 Lbs (4.5 kg)	10.1 Lbs (4.6 kg)	13.9 Lbs (6.3 kg)	15.2 Lbs (6.9 kg)	15.5 Lbs (7.0 kg)
INCLUDED ACCESSORIES	Rack mounting kit	Rack mounting kit	Rack mounting kit	Rack mounting kit	Rack mounting kit

DriveCore™ Technology

Combining hundreds of parts into one fingertip-sized chip, DriveCore provides:

- More operating efficiency and reliability by using fewer parts
- Significantly reduced power consumption
- Greater accuracy and best-in-class signal-to-noise performance
- A proprietary hybrid analog-digital integrated circuit

GreenEdge™ by HARMAN

Manufactured under HARMAN's GreenEdge™ initiative, JBL Commercial mixer/amps:

- Conform to lead-free ROHS standards
- Use recycled copper, aluminum, and steel from factory processes
- Are lighter in weight leading to less freight and reduced emissions
- Require less power and produce less heat
- Include a low-energy powder coat that uses 33% less energy

jblcommercialproducts.com

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Specifications subject to change without prior notice. Latest information available at jblcommercialproducts.com

crown by HARMAN GreenEdge by HARMAN DRIVECORE™ JBL COMMERCIAL by HARMAN

Business Music Systems • Indoor/Outdoor • Background Music/Paging Systems • Foreground Music • A/V Sound Reinforcement

CONTROL® CONTRACTOR
LOUDSPEAKER SYSTEMS

JBL PROFESSIONAL

Installed Live Music Reinforcement • Recorded Music Playback

SPECIFICATIONS

CEILING SPEAKERS

Control 24C Micro Shallow-Depth Ceiling Speaker	
Components:	4.5" Woofer, .5" Tweeter
Frequency Range:	85 Hz – 25 kHz
Power Capacity:	30 Watts Continuous Program
	15 Watts Continuous Pink Noise
Sensitivity:	86 dB, 1W, 1m
Coverage:	150°
Nominal Impedance (C24C Micro):	8Ω
70V/100V Taps (C24CT Micro):	8W, 4W, & 2W, & 1W, (plus 0.5W at 70V)
Termination:	Screw-down barrier strip
Dimensions (H x Dia):	106 x 195 mm (4.2 x 7.7 in)

C24CT MicroPlus High Output Shallow-Depth Ceiling Speaker	
Components:	4" Woofer, .5" Titanium Tweeter
Frequency Range:	80 Hz – 25 kHz
Sensitivity:	85 dB, 1W, 1m
Coverage:	150°
70V/100V Taps:	25W & 12W, (plus 6W at 70V)
Termination:	Screw-down barrier strip
Dimensions (H x Dia):	106 x 195 mm (4.2 x 7.7 in)

Control 24C Compact Ceiling Speaker	
Components:	4" Woofer, .75" Titanium Tweeter
Frequency Range:	80 Hz – 20 kHz
Power Capacity:	80 Watts Continuous Program
	40 Watts Continuous Pink Noise
Sensitivity:	86 dB, 1W, 1m
Coverage:	130°
Nominal Impedance (C24C):	16Ω
70V/100V Taps (C24CT):	30W, 15W, & 7.5W, (plus 3.7W at 70V)
Termination:	Removable locking terminals in sealed compartment with cable strain relief
Dimensions (H x Dia):	200 x 195 mm (7.9 x 7.7 in)

Control 26C High Output Ceiling Speaker	
Components:	6.5" Woofer, .75" Titanium Tweeter
Frequency Range:	75 Hz – 20 kHz
Power Capacity:	150 Watts Continuous Program
	75 Watts Continuous Pink Noise
Sensitivity:	89 dB, 1W, 1m
Coverage:	110°
Nominal Impedance (C26C):	16Ω
70V/100V Taps (C26CT):	60W, 30W, & 15W, (plus 7.5W at 70V)
Termination:	Removable locking terminals in sealed compartment with cable strain relief
Dimensions (H x Dia):	210 x 252 mm (8.3 x 9.9 in)

Control 26-DT Driver Assembly	
Components:	8" Compatible Woofer, .75" Titanium Tweeter
Frequency Range:	70 Hz – 20 kHz
Sensitivity:	89 dB, 1W, 1m
Coverage:	90°
70V/100V Taps:	60W, 30W, & 15W, (plus 7.5W at 70V)
Termination:	Screw locking barrier strip
Dimensions (H x Dia):	Standard 8" driver mounting, 120 mm (4.8 in) deep

Control 19CS In-Ceiling Subwoofer	
Components:	8" Low Frequency Driver
Frequency Range:	42 Hz – 200 kHz
Power Capacity:	200 Watts Continuous Program
	100 Watts Continuous Pink Noise
Sensitivity:	95 dB, 1W, 1m
Nominal Impedance (C19CS):	8Ω
70V/100V Taps (C19CST):	60W, 30W, & 15W, (plus 7.5W at 70V)
Termination:	Removable locking terminals in sealed compartment with cable strain relief
Dimensions (H x Dia):	345 x 345 mm (13.6 x 13.6 in)

* Medium and Large Format Ceiling Speakers are not listed on this spec page.
Please refer to JBL's Control 200 and Control 300 brochures for specific models and specifications.

IN-WALL SPEAKERS

Control 126W	
Components:	6.5" Woofer, 1" Tweeter
Frequency Range:	38 Hz – 20 kHz
Power Capacity:	100 Watts Continuous Program
	50 Watts Continuous Pink Noise
Sensitivity:	88 dB, 1W, 1m
Nominal Impedance:	8Ω
Termination:	Screw-down Euroblock
Dimensions (H x W x D):	280 x 215 x 105 mm (11 x 8.5 x 4.1 in)

Control 128W	
Components:	8" Woofer, 1" Tweeter
Frequency Range:	30 Hz – 20 kHz
Power Capacity:	120 Watts Continuous Program
	60 Watts Continuous Pink Noise
Sensitivity:	90 dB, 1W, 1m
Nominal Impedance:	8Ω
Termination:	Screw-down Euroblock
Dimensions (H x W x D):	334 x 257 x 110 mm (13.1 x 10.1 x 4.3 in)

MERIT X SERIES POWER CONDITIONERS

A Merit Series Power Conditioner is the perfect low-cost AC power solution for any rack mount system. Install an M-8x², M-8Lx, or M-8Dx in to the top slot of your rack, and the eight switched outlets in the rear panel will power up and protect all your equipment up to a 15-amp load. The M-8Lx and M-8Dx feature two slide out, swiveling light fixtures to provide discreet illumination of your equipment on stages, in studios, and in other dark places. A dimmer knob lets you adjust the lamp brightness to just the right level. The M-8Dx adds a bright red, three-digit LED voltmeter that displays incoming voltage. The M-8x² is designed for applications where lights are not required.

Merit M-8x² Power Conditioner

Noise Filtration | Surge Protection | Nine Total Outlets | 15 Amp Rating | "Protection OK" Indicator | Wall Wart Spacing

Merit M-8Lx Power Conditioner

Noise Filtration | Surge Protection | Nine Total Outlets | 15 Amp Rating | "Protection OK" Indicator | Wall Wart Spacing | Front Panel Pull-out Lights

Merit M-8Dx Power Conditioner

Noise Filtration | Surge Protection | Nine Total Outlets | 15 Amp Rating | "Protection OK" Indicator | Wall Wart Spacing | Front Panel Pull-out Lights | Digital Voltmeter

FURMAN

THE SOLUTION TO POWER YOUR APPLICATION...

INSTRUMENT RIGS

You've got a rack for your effects, preamps, tuner...You're going to plug that into the wall? One big spike and your rig is up in smoke. Furman's standard level surge/spike protection defends your gear from the spikes and surges that are so common at gigs and practice spots. With Furman's standard level RFI/EMI filtration, you'll get a quieter tone without pops, crackles, and the local radio station coming out of your amp. Plus, dual pull-out lamps (M-8Lx/M-8Dx) let you see your rack without turning the house lights on, while the digital voltmeter (M-8Dx) lets you monitor incoming voltage.

RECORDING

Can't track down where that noise is coming from? Your mix sounding flat? With Furman's standard level RFI/EMI filtration you'll lower the noise floor caused by the dirty AC power coming into your console or DAW. Furman's standard level surge and spike protection keeps your sensitive digital equipment from acting funny or burning up due to everyday spikes and surges. You can even monitor voltage changes, as the digital meter (M-8Dx) allows you to keep an eye on the incoming line voltage. With a 15A capacity and nine total outlets, it's enough to power your whole home studio.

DJ EQUIPMENT

Bars, clubs and other event venues have some of the worst power out there - from air compressors turning on and off to light shows pulling current loads up and down, the AC power can be a strain on the circuits in your rig. Furman's standard level protection and filtration keeps the bad stuff out and the digital voltmeter (M-8Dx) lets you monitor the incoming line voltage. The dual pull-out front panel lights (M-8Lx/M-8Dx) let you discreetly see your board and gear without distracting from the show on the dance floor.

PRO AUDIO

When you're out there gigging, you never know what kind of power you're going to get. The wear and tear on mobile rigs eventually takes it toll - that's why it's smart to plug into Furman's standard level protection and RFI/EMI filtration. It keeps your equipment safe and sounding clean, while the digital voltmeter (M-8Dx) lets you monitor incoming voltage. Whether you're setting up a show at the local club or powering up the church band for their next service, make sure you give them power they can trust.

MERIT X SERIES SPECIFICATIONS

Maximum Output Current
15 Amps

Line Cords
6 ft. captive, 14 AWG, with 3-conductor Edison Plug

Lamps (M-8Lx/M-8Dx)
Two 120V incandescent bulbs, 4 watts each

Operating Voltage
120VAC 60Hz

Spike Protection Mode
Line to neutral

Energy Dissipation
150 Joules

Peak Impulse Current
12,000 Amps

Maximum Continuous Operating Voltage
130 VAC RMS

Noise Attenuation (Transverse Mode)
M-8x²: Greater than 23db, 200Khz to 10MHz
M-8Lx: Greater than 26db, 200Khz to 10MHz
M-8Dx: Greater than 26db, 200Khz to 10MHz

Dimensions
1.75" H x 19" W x 3.75" D (M-8x²)
1.75" H x 19" W x 7.5" D (M-8Lx/M-8Dx)

Weight
M-8x²: 4.9 lbs. (2.2 kg)
M-8Lx/M-8Dx: 6 lbs. (2.7 kg)

Three Year Limited Warranty
Merit Series units are protected by a limited three year warranty covering defects in materials and workmanship.

Furman Sound, LLC 1690 Corporate Circle ▪ Petaluma, CA 94954 ▪ USA ▪ www.FurmanSound.com

AVARRO™

CONFIGURED WALL MOUNTED ENCLOSED RACK SERIES

6U-12U

FULLY ASSEMBLED RACK SYSTEMS TO MANAGE COMPONENTS FOR NETWORKING, AUTOMATION, HI-FI AND HOME THEATER APPLICATIONS. DESIGNED WITH HEAVY-GAUGE STEEL AND MULTIPLE FEATURES SUCH AS REMOVEABLE SIDE PANELS AND REVERSIBLE LOCKING HINGED DOORS

SPECIFICATIONS:

- Fully welded steel construction
- Weight capacity up to a 132lb.
- Removable locking side panels (locks not included)
- Lockable tempered-glass door (option to reverse door)
- Vented top and bottom
- Heavy-duty hinges support rack and equipment
- Swing-out rack opens to the left
- Rear cable-routing knockouts

For more information please call 1-833-574-9124
or email AVARRO@adiglobal.com

To learn more about AVARRO products visit
avarro.adiglobaldistribution.us

RoHS COMPLIANT

TECHNICAL DATA

6U-12U

RK-ERW6U (6 Unit Space)

- Max Weight Capacity: 132lbs
- Dimensions of rack: 23.63" x 23.63" x 14.65"
- Box Dimensions: 26.38" x 26.38" x 22.05"
- UPC: 840049305663

RK-ERW12U (12 Unit Space)

- Max Weight Capacity: 132lbs
- Dimensions of rack: 23.63" x 23.63" x 25.16"
- Box Dimensions: 26.38" x 26.38" x 32.68"
- UPC: 840049305670

For more information please call 1-833-574-9124
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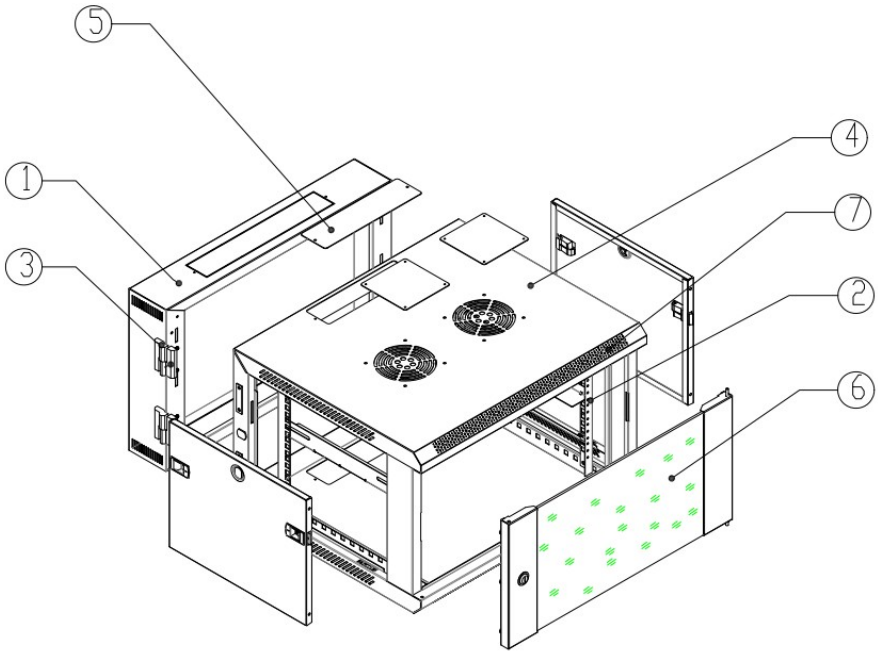
TECHNICAL DRAWING

6U-12U

Expanded View and Parts



1 Frame (side that mounts to wall)
2 Mounting Rail
3 Hinges
4 Swing-out rack opens to the left
5 Cable Management Cover
6 Front Glass Door (option to reverse door)
7 Vented Top and Bottom (fans not included)

For more information please call 1-833-574-9124
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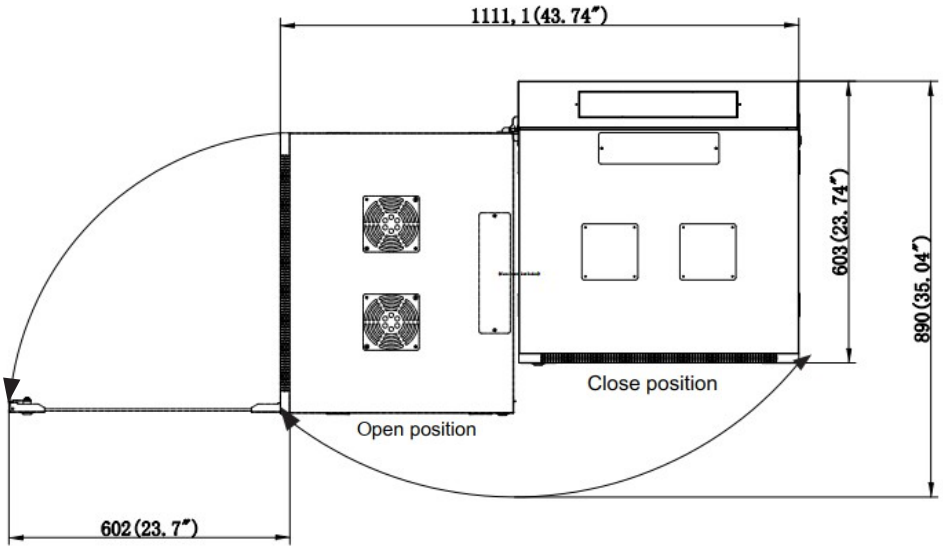
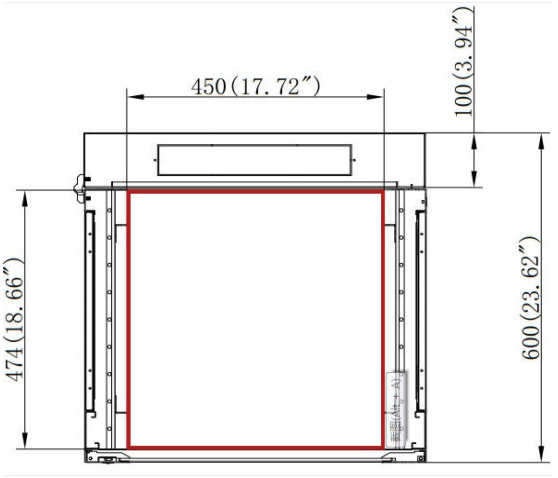
TECHNICAL DRAWING

6U-12U

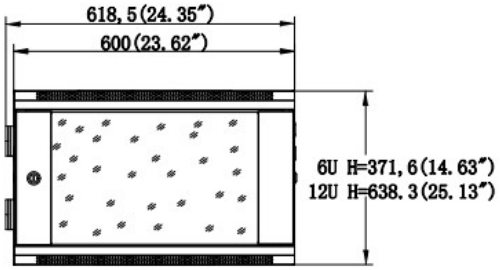
Dimensions

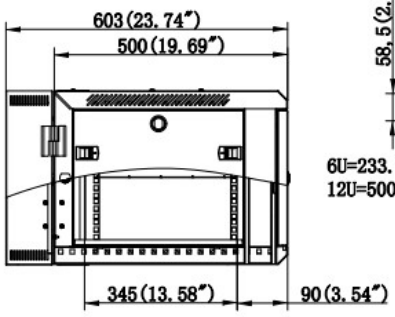


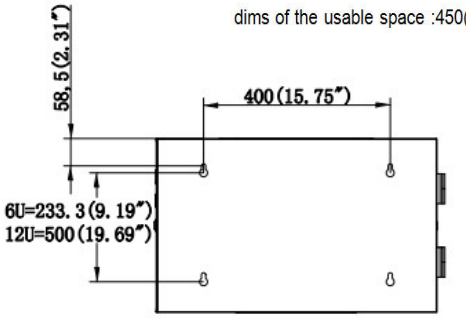


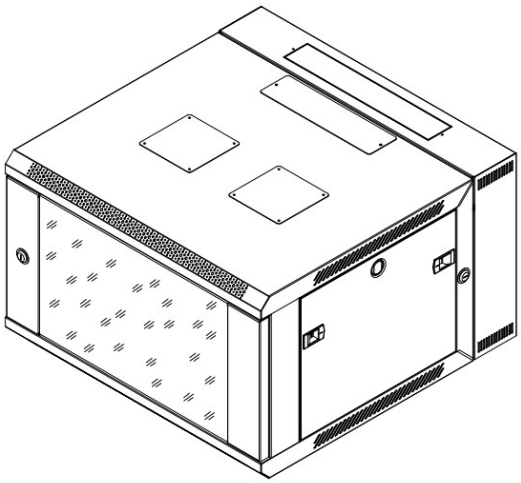
Usable Space Inside Rack in Red

dims of the usable space :450(17.72")width,474(18.66")depth









For more information please call 1-833-574-9124
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LG Business Solutions

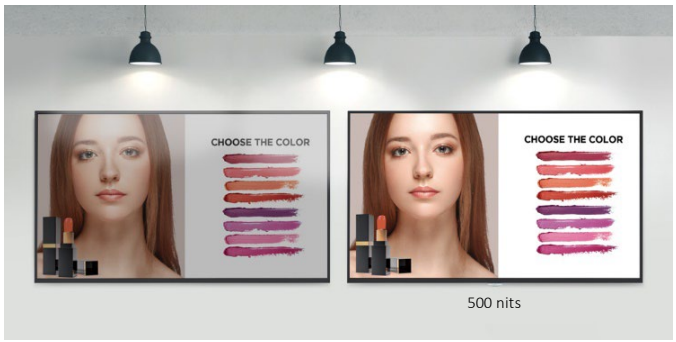
* All images in this datasheet are for illustrative purposes only.

UHD Signage UH5J-H

New High Haze UHD Standard Signage

- Proper Display Brightness
- webOS Smart Platform
- Mobile Content Management
- Meeting Room Solution

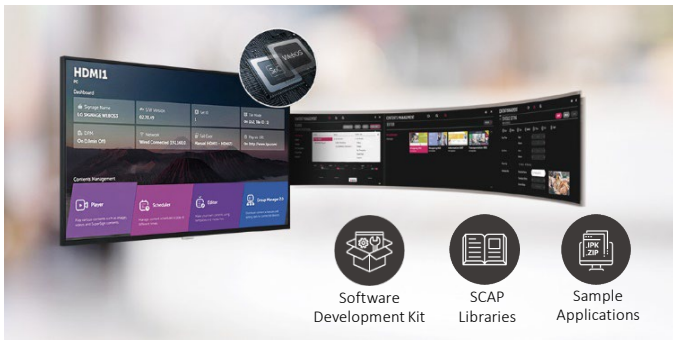
UH5J-H	
Screen Size	98" / 86" / 75" / 65" / 55" / 49" / 43"
Native Resolution	3,840 × 2,160 (UHD)
Bezel Color	Black
Brightness	500 nits (Typ.)
Bezel	98" / 75": 14.9 mm (Even bezel) 86": 14.3 mm (Even bezel) 65" / 55" / 49": 9.9 mm (T/R/L), 14.4 mm (B) 43": 8.4 mm (T/R/L), 14.4 mm (B)
Depth	98": 86.1 mm 86": 60.6 mm 75": 57.9 mm 65" / 55" / 49" / 43": 39.9 mm



Appropriate Display Brightness

With a brightness of 500 nits, the UH5J-H series clearly delivers content and can attract attention, making it suitable for displaying presentations and marketing communications in meeting rooms, retail spaces, airports, shopping malls and more.

* Actual images available may differ from the example images shown.

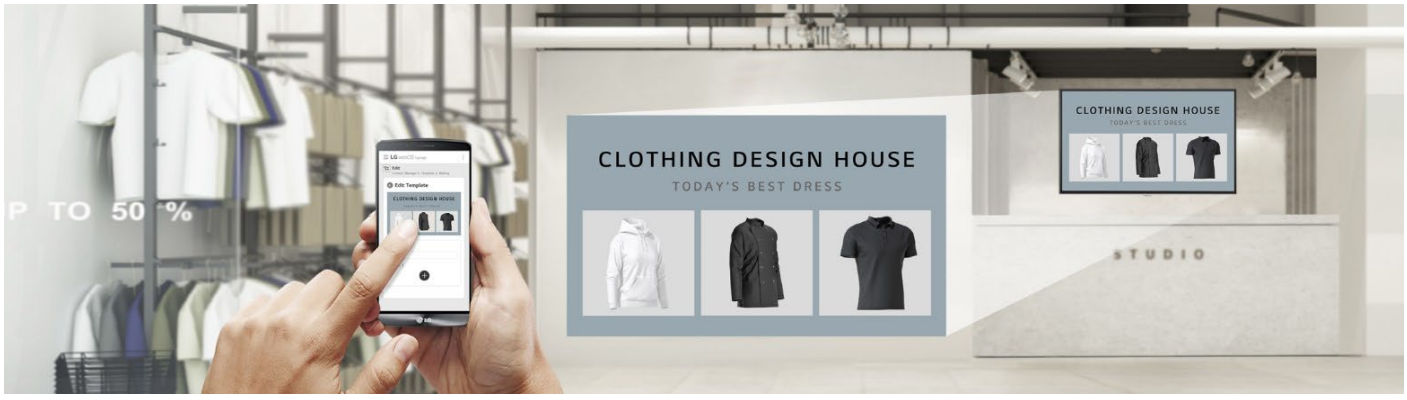


High-Performance with webOS

The built-in System on Chip can execute several tasks at once while providing smooth content playback without the need for a media player. Also, the LG webOS Signage platform provides an intuitive, TV-style remote controlled user interface that is easy to learn and consistent across many LG products.

Conformal Coating

In various places your signage may be unable to avoid exposure to environments containing dust or humidity which may hamper performance over time. The conformal coating on power board helps protect UH5J-H series circuit boards from external particles.



Mobile Content Management

Using the free, downloadable* signage app Promota, users can create custom templates from recommendations on the app to easily promote content on their signage. Visit https://www.promota.net for details.

* LG Promota is can be downloaded from the App Store and Google Play store.

IP5x Certified Design

The IP5x Certification ensures that the product is protected from dust, reducing the risk of performance degradation.

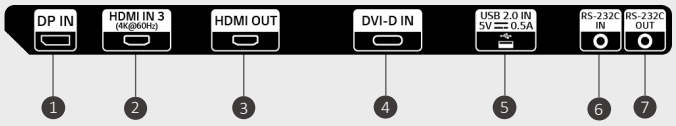
Compatible with AV Control System

The UH5J-H has been certified Crestron Connected® for high compatibility with professional AV controls to achieve virtually seamless integration and automated, network-based control.

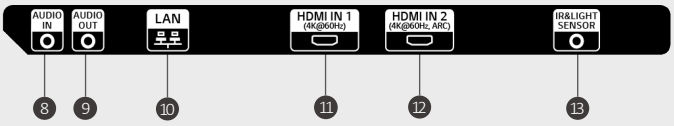
CONNECTIVITY

98”

Side

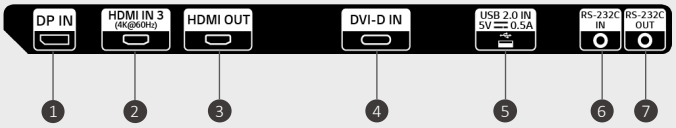


Bottom

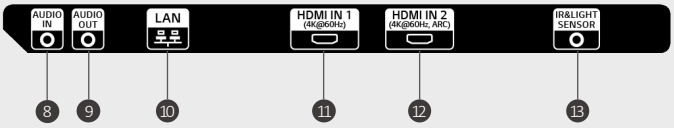


86” / 75”

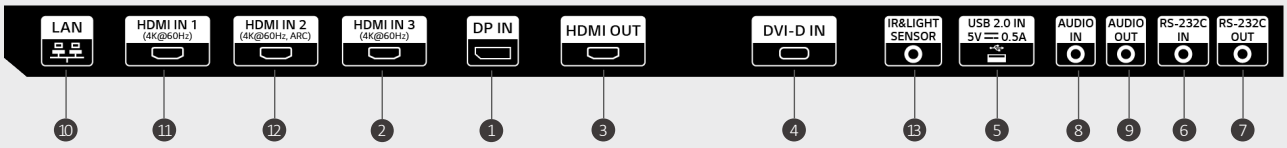
Side



Bottom



65” / 55” / 49” / 43”

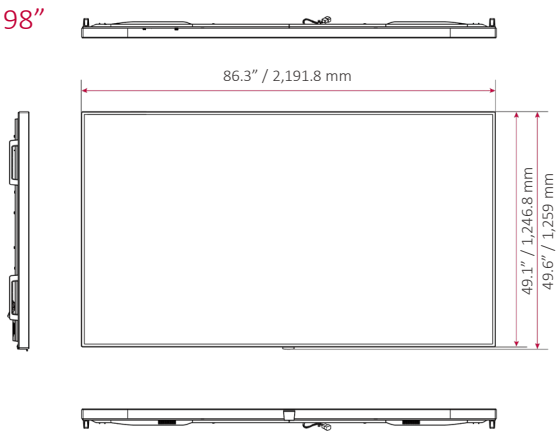


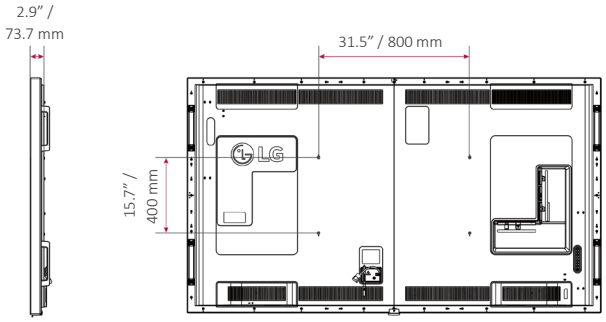
1. DP IN
2. HDMI IN 3
3. HDMI OUT
4. DVI-D IN
5. USB 2.0 IN
6. RS-232C IN
7. RS-232C OUT
8. AUDIO IN
9. AUDIO OUT
10. LAN
11. HDMI IN 1
12. HDMI IN 2
13. IR&LIGHT SENSOR

* Jack Panels may differ from the above image, so please contact LG sales team to verify before ordering.

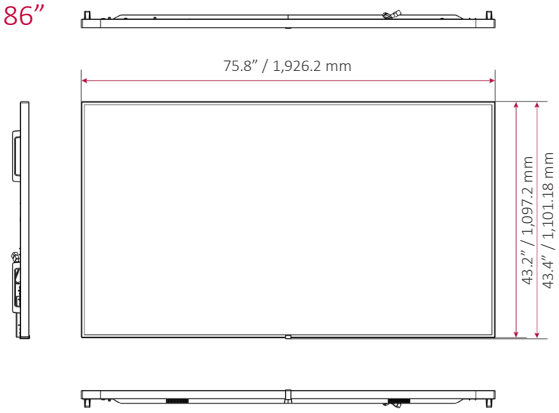
DIMENSIONS

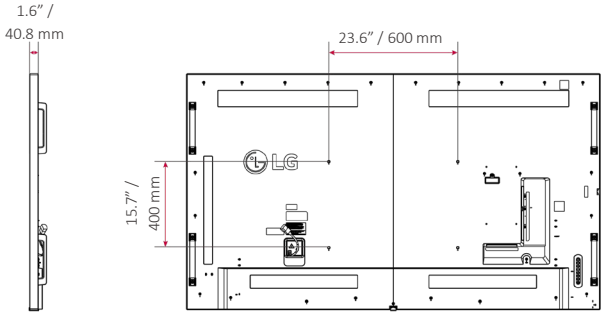
98”



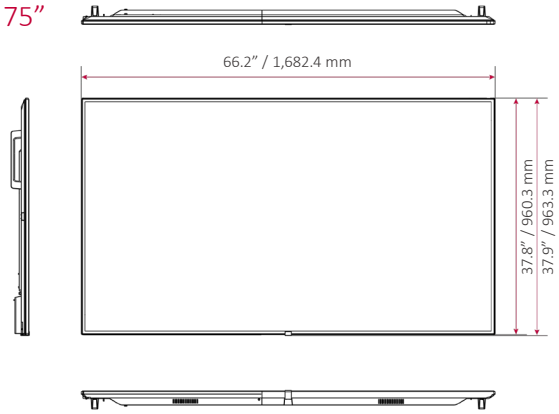


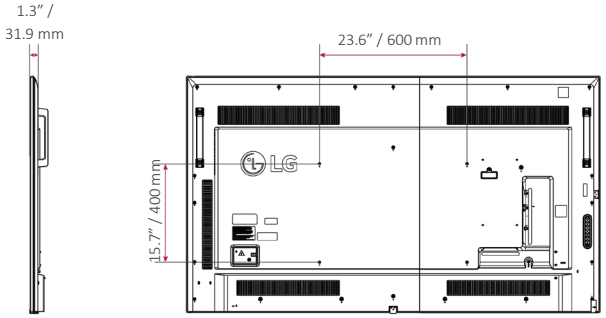
86”





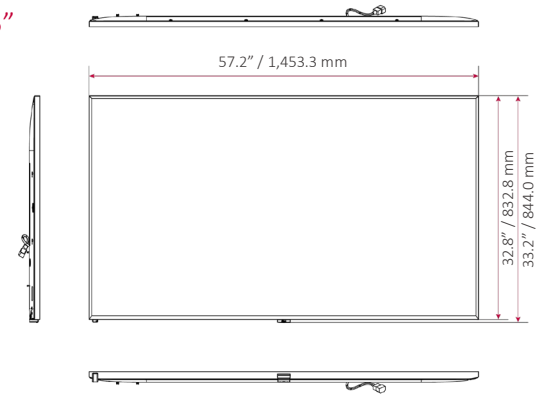
75”

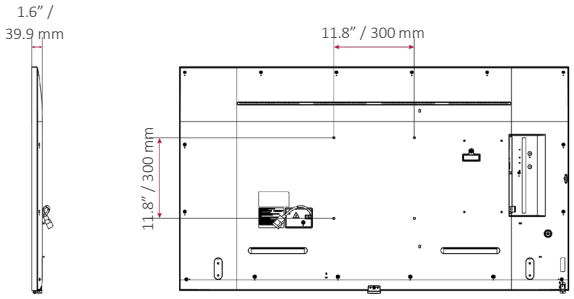




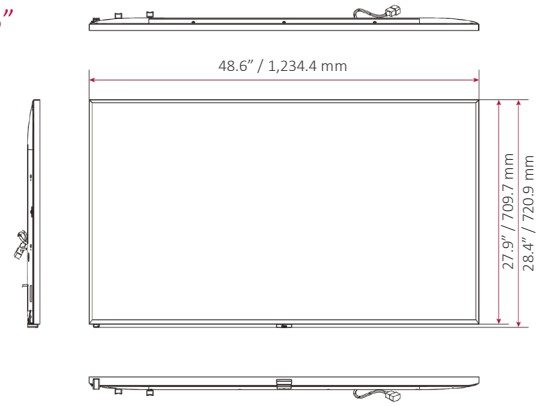
DIMENSIONS

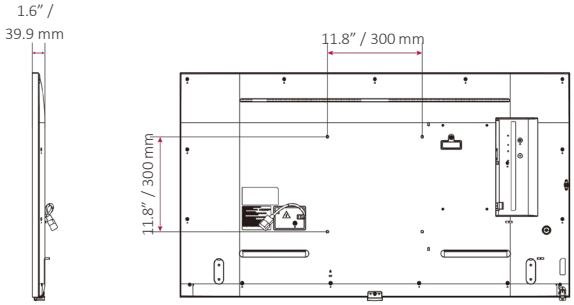
65”



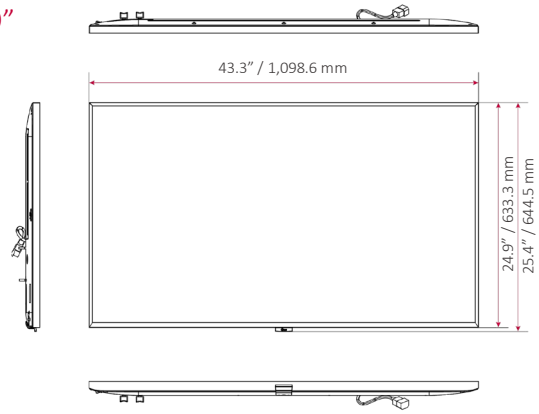


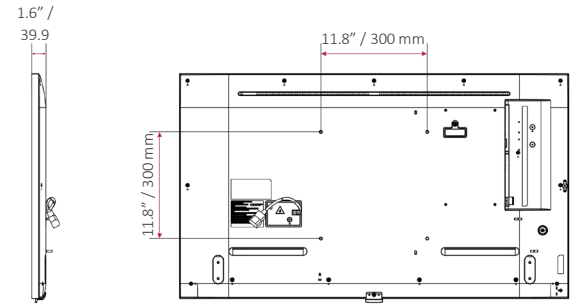
55”



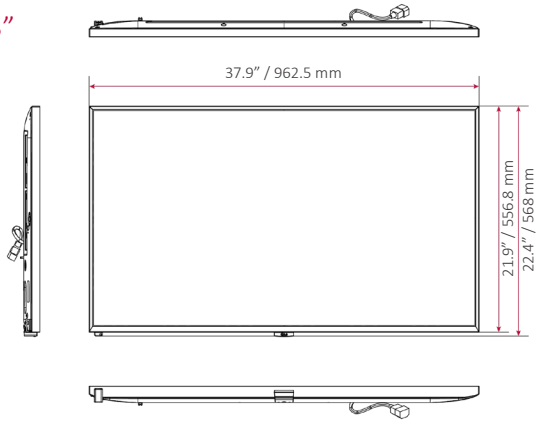


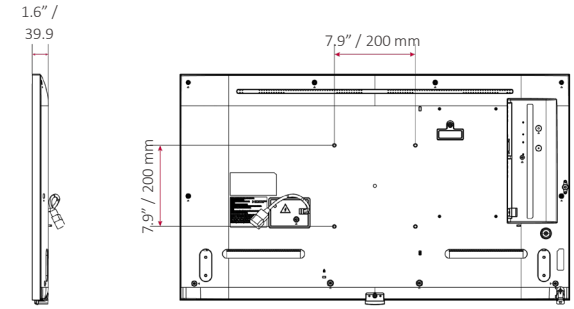
49”





43”





* Dimensions may differ from the above image, so please contact LG sales team to verify before ordering.

SPECIFICATIONS

		98UH5J-H	86UH5J-H	75UH5J-H	65UH5J-H	55UH5J-H	49UH5J-H	43UH5J-H
Panel	Screen Size	98"	86"	75"	65"	55"	49"	43"
	Panel Technology	IPS	IPS	IPS	IPS	IPS	IPS	IPS
	Back Light Type	Direct	Edge	Edge	Edge	Edge	Edge	Edge
	Aspect Ratio	16 : 9	16 : 9	16 : 9	16 : 9	16 : 9	16 : 9	16 : 9
	Native Resolution	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)	3,840 × 2,160 (UHD)
	Refresh Rate	60 Hz	120 Hz	120 Hz	60 Hz	60 Hz	60 Hz	60 Hz
	Brightness	500 nits (Typ.)	500 nits (Typ.)	500 nits (Typ.)	500 nits (Typ.)	500 nits (Typ.)	500 nits (Typ.)	500 nits (Typ.)
	Contrast Ratio	1,200 : 1	1,100 : 1	1,100 : 1	1,100 : 1	1,100 : 1	1,100 : 1	1,200 : 1
	Dynamic CR[1]	1,000,000 : 1	1,000,000 : 1	1,000,000 : 1	1,000,000 : 1	1,000,000 : 1	1,000,000 : 1	1,000,000 : 1
	Color Gamut	NTSC 72%	NTSC 72%	NTSC 72%	BT709 95%	BT709 95%	BT709 95%	BT709 95%
	Viewing Angle (H × V)	178° × 178°	178° × 178°	178° × 178°	178° × 178°	178° × 178°	178° × 178°	178° × 178°
	Color Depth	1.07 Billon Colors (10 bit)	1.07 Billon Colors (10 bit (D))	1.07 Billon Colors (10 bit (D))	1.07 Billon Colors (10 bit (D))	1.07 Billon Colors (10 bit (D))	1.07 Billon Colors (10 bit (D))	1.07 Billon Colors (8 bit + FRC)
	Response Time (G to G)	8 ms	8 ms	6 ms	8 ms	8 ms	8 ms	8 ms
	Surface Treatment (Haze)	28%	28%	28%	28%	28%	28%	25%
	Lifetime	Up to 50,000 Hrs.	Up to 50,000 Hrs.	Up to 50,000 Hrs.	Up to 50,000 Hrs.	Up to 50,000 Hrs.	Up to 50,000 Hrs.	Up to 50,000 Hrs.
	Operation Hours (Hours/Day)	24 / 7	24 / 7	24 / 7	24 / 7	24 / 7	24 / 7	24 / 7
	Portrait / Landscape	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
Connectivity	Input	HDMI (x2, HDCP 2.2/1.4), HDMI (HDCP 1.4), DP (HDCP 2.2/1.3), DVI-D (HDCP 1.4), Audio In, RS-232C In (4 Pin 3.5mm jack), RJ45 (LAN), IR In, USB 2.0 (x2, Type A)						
	Output	HDMI Out, Audio Out, External Control (RS-232C Out (4 Pin 3.5mm jack))						
Mechanical Specification	Bezel Color	Black	Black	Black	Black	Black	Black	Black
	Bezel Width	14.9 mm (Even Bezel)	14.3 mm (Even Bezel)	14.9 mm (Even Bezel)	9.9 mm (T/R/L), 14.4 mm (B)	9.9 mm (T/R/L), 14.4 mm (B)	9.9 mm (T/R/L), 14.4 mm (B)	8.4 mm (T/R/L), 14.4 mm (B)
	Weight	145.5 lbs. / 66 kg	108.0 lbs. / 49 kg	91.5 lbs. / 41.5 kg	62.2 lbs. / 28.2 kg	41.9 lbs. / 19 kg	34.0 lbs. / 15.4 kg	24.7 lbs. / 11.2 kg
	Weight with Stand	n/a	n/a	n/a	63.5 lbs. / 28.8 kg	19.6 lbs. / 19.6 kg	35.3 lbs. / 16 kg	26.0 lbs. / 11.8 kg
	Shipping Weight	218.3 lbs. / 99 kg	159.8 lbs. / 72.5 kg (With Pallet)	112.9 lbs. / 51.2 kg	77.2 lbs. / 35 kg	53.4 lbs. / 24.2 kg	41.4 lbs. / 18.8 kg	30.2 lbs. / 13.7 kg
	Dimensions (W × H × D) (without handle)	86.3 x 49.1 x 3.4 in. 2,191.8 × 1,246.8 × 86.1 mm (without LG Logo)	75.8 x 43.2 x 2.4 1,926.2 × 1,097.2 × 60.6 mm (without LG Logo)	66.2 x 37.8 x 2.3 in. 1,682.4 × 960.3 × 57.9 mm (without LG Logo)	57.2 x 33.2 x 1.6 in. 1,453.3 × 844 × 39.9 mm (with LG Logo)	48.6 x 28.4 x 1.6 in. 1,234.4 × 720.9 × 39.9 mm (with LG Logo)	43.3 x 25.4 x 1.6 in. 1,098.6 × 644.5 × 39.9 mm (with LG Logo)	37.9 x 22.4 x 1.6 in. 962.5 × 568 × 39.9 mm (with LG Logo)
	Dimensions with Stand (W × H × D)	n/a	n/a	n/a	57.2 x 35.2 11.4 in. 1,453.3 × 893.1 × 290.0 mm	48.6 x 30.3 x 11.4 in. 1,234.4 × 770.7 × 290.0 mm	43.3 x 27.3 x 11.4 1,098.6 × 694.3 × 290.0 mm	37.9 x 24.1 x 11.4 962.5 × 613.1 × 290.0 mm
	Shipping Dimensions (W × H × D)	92.2 x 54.6 x 16.5 in. 2,342 × 1,386 × 420 mm	80.2 x 49.2 x 11.2 in. 2,037 × 1,250 × 285 mm	71.5 x 44.3 x 9.0 in. 1,816 × 1,126 × 228 mm	63.0 x 43.1 x 6.9 in. 1,600 × 1,095 × 175 mm	53.5 x 32.9 x 6.9 in. 1,360 × 835 × 175 mm	47.1 x 30.5 x 6.4 in. 1,197 × 775 × 162 mm	41.7 x 26.0 x 6.0 in. 1,060 × 660 × 152 mm
	Handle	Yes	Yes	Yes	No	No	No	No
	VESA™ Standard Mount Interface	800 × 400 mm	600 × 400 mm	600 × 400 mm	300 × 300 mm	300 × 300 mm	300 × 300 mm	200 × 200 mm
Key Features	Internal Memory 16 GB, Built-in Wi-Fi, Sensor (Temperature Sensor, Auto Brightness Sensor, Acceleration (Gyro) Sensor), Local Key Operation, webOS 6.0, Embedded CMS (Local Contents Scheduling, Group Manager), USB Plug & Play, Fail Over, Background Image (Booting Logo Image, No Signal Image), Sync Mode (RS-232C Sync, Local Network Sync), Multi-screen (PIP, PBP (4)), Screen Share, Video Tag (4), Play via URL, Rotation (Screen Rotation, External Input Rotation), Gapless Playback, Tile Mode Setting (Max. 15 × 15), Setting Data Cloning, SNMP, ISM Method, Auto Set ID, Status Mailing, Control Manager, 3rd Party Compatibility (Crestron Connected®[2]), Power (Smart Energy Saving, PM Mode, Wake on LAN, Network Ready (Except 98"/86"/75")), Beacon, HDMI-CEC[3], SI Server Setting, webRTC, Pro:Idiom							
Environment Conditions	Operation Temperature	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C	32°F to 104°F 0°C to 40°C
	Operation Humidity	10% to 80%	10% to 80%	10% to 80%	10% to 80%	10% to 80%	10% to 80%	10% to 80%
Electrical	Power Supply	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz
	Power Type	Built-in Power	Built-in Power	Built-in Power	Built-in Power	Built-in Power	Built-in Power	Built-in Power
	Power Consumptions (Typ. / Max.)	420 W / 570 W	215 W / 280 W	180 W / 260 W	130 W / 190 W	110 W / 150 W	1000 W / 140 W	80 W / 120 W
	BTU (British Thermal Units)	1,433 BTU/Hr (Typ.), 1,945 BTU/Hr (Max.)	733.69 BTU/Hr (Typ.), 955.5 BTU/Hr (Max.)	614.25 BTU/Hr (Typ.), 887.25 BTU/Hr (Max.)	444 BTU/Hr (Typ.), 649 BTU/Hr (Max.)	376 BTU/Hr (Typ.), 512 BTU/Hr (Max.)	342 BTU/Hr (Typ.), 478 BTU/Hr (Max.)	273 BTU/Hr (Typ.), 410 BTU/Hr (Max.)
	Smart Energy Saving	294 W	150.5 W	126 W	91 W	77 W	70 W	56 W
	DPM	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W
	Power off	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W
Sound	Speaker	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Certifications	Safety	CB / NRTL	CB / NRTL	CB / NRTL	CB / NRTL	CB / NRTL	CB / NRTL	CB / NRTL
	EMC	FCC Class "A" / CE	FCC Class "A" / CE	FCC Class "A" / CE	FCC Class "A" / CE	FCC Class "A" / CE	FCC Class "A" / CE	FCC Class "A" / CE
	ErP / Energy Star	Yes (NewErP) / No (TDB)	Yes (NewErP) / No (TDB)	Yes (NewErP) / Yes (TDB)	Yes (NewErP) / Yes	Yes (NewErP) / Yes	Yes (NewErP) / Yes	Yes (NewErP) / Yes
OPS Compatibility	OPS Type Compatible	No	Yes	Yes	Yes	Yes	Yes	Yes
	OPS Power Built-in	No	No	No	No	No	No	No
LG Software Compatibility	SuperSign CMS, SuperSign Control / Control+, SuperSign WB, SuperSign Media Editor, Promota (Not Available for EU/CIS), Mobile CMS, LG ConnectedCare[4]							
Languages	English, French, German, Spanish, Italian, Korean, Chinese (Simplified), Chinese (Original), Portugues (Brazil), Swedish, Finnish, Norwegian, Danish, Russian, Japanese, Portugues (Europe), Dutch, Czech, Greek, Turkish, Arabic							
Accessories	Basic	Remote Controller, Power Cord, QSG, Regulation Book, Phone to RS-232C Gender						
	Optional	-	OPS Kit (KT-OPSF), LSW640A/B (Wall Mount)		Stand(ST-653T), Wall Bracket(LSW350B), OPS Kit(KT-OPSF)			
Special Feature	Overlay Touch Compatibility	No	No	No	No	No	No	No
	Tilt (Facedown)	n/a	n/a	n/a	Yes (Max. 30º)[5]	Yes (Max. 30º)[5]	Yes (Max. 30º)[5]	Yes (Max. 15º)[5]
	IP Rating	n/a	n/a	n/a	IP5X	IP5X	IP5X	IP5X

[1] The luminosity ratio of Full Black / Full White color on video input condition.
[2] Network based control.
[3] Compatibility may differ by equipment.
[4] The availability can differ by region.
[5] In conditions within 30ºC temperature, 50% humidity.

* Specifications are subject to change without notice. Please make sure to check the product manual for details about product usage.

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LG_SPEC-SHEET_UH5J-H_0323SK_LR.pdf

LG Business Solutions

BrightSign

SPECIFICATIONS

MODEL	LS425	LS445	HD225	HD1025	XD235	XD1035	XT245	XT1145	XT2145	XC2055	XC4055
	AFFORDABLE PERFORMER		BUILT FOR INTERACTIVITY		OPTIMIZED FOR MOTION GRAPHICS		THE PERFECT COMBO OF POWER AND PERFORMANCE			THE MOST POWERFUL PLAYER IN SIGNAGE	
	HD BASIC I/O	4K BASIC I/O	STANDARD I/O	EXPANDED I/O	STANDARD I/O	EXPANDED I/O	STANDARD I/O	EXPANDED I/O	MULTIPLEX I/O	MULTIPLEX I/O	MULTIPLEX I/O
VIDEO & HTML5 ENGINE											
HTML5 Performance Level	Popular HTML widgets & graphic simple motion graphics		Modular 2D motion graphics	Interactive 2D motion graphics	Smooth full screen 2D WebGL motion	Responsive multi-touch 2D WebGL	3D WebGL & real time data visualization	Intense graphics, video and live TV	Dual HTML presentations driving 2 screens	Up to 8K 3D WebGL across 2 screens	2x the power of XC2055 across 4 screens
8K video decoding							X 10-bit at 60p	X 10-bit at 60p	X 10-bit at 60p	X 8-bit at 60p 10-bit at 30p	X 10-bit at 60p
4K video decoding		X 8-bit at 60p 10-bit at 30p	X 8-bit at 60p 10-bit at 30p	X 8-bit at 60p 10-bit at 30p	X 8-bit at 60p 10-bit at 30p	X 8-bit at 60p 10-bit at 30p	X 10-bit at 60p	X 10-bit at 60p	X 10-bit at 60p	X 10-bit at 60p	X 10-bit at 60p
Dual 4K video decoding							X	X	X	X	X
Quad 4K video decode											X
4K video rotation							X	X	X	X	X
HDR10, HLG & Rec.2020/BT.2020 support							X	X	X	X	X
Full HD at 60p video decoding	X	X	X	X	X	X	X	X	X	X	X
Dual HD at 60p video decode			X	X	X	X	X	X	X	X	X
HD video rotation			X (Single)	X (Single)	X (Single)	X (Single)	X	X	X	X	X
8K resolution images & graphics										X	X
4K resolution images & graphics							X	X	X	X	X
HD images & graphics	X	X	X	X	X	X	X	X	X	X	X
MEDIA FORMATS											
8K video codecs: H.265							X	X	X	X	X
8K Video Containers: .ts, .mov, .mp4, .mkv							X	X	X	X	X
4K Video codes: H.265, H.264		X H.265 at 60p & H.264 at 30p	X H.265 at 60p & H.264 at 30p	X H.265 at 60p & H.264 at 30p	X H.265 at 60p & H.264 at 30p	X H.265 at 60p & H.264 at 30p	X	X	X	X	X
4K Video Containers: .ts, .mov, .mp4, .mkv		X	X	X	X	X	X	X	X	X	X
Full HD Video Codecs: H.265, H.264 (MPEG-4, Part 10), MPEG-2	X	X	X	X	X	X	X	X	X	X	X
Full HD Video Containers: .ts, .mpg, .vob, .mov, .mp4, .m2ts	X	X	X	X	X	X	X	X	X	X	X
8K Video Resolutions: 7680x4320x23.97/24/25/29.97/30/50/59.94/60p							X	X	X	X	X
4K Video Resolutions: 4096x2160x23.97/24/25/29.97/30/50/59.94/60p 3840x2160x23.97/24/25/29.97/30/50/59.94/60p		X	X	X	X	X	X	X	X	X	X

MODEL	LS425	LS445	HD225	HD1025	XD235	XD1035	XT245	XT1145	XT2145	XC2055	XC4055
Full HD Resolutions: 1920x1080x23.97/24/25/29.97/30/50/59.94/60p	X	X	X	X	X	X	X	X	X	X	X
Supports additional & customizable resolutions: includes unique, non-standard aspect ratios at various frame rates	X	X	X	X	X	X	X	X	X	X	X
Images: BMP, JPEG, PNG	HD	HD	HD	HD	HD	HD	HD	HD	HD	HD/4K/8K	HD/4K/8K
Audio: MP2, MP3, AAC and WAV (AC3 is passed through)	X	X	X	X	X	X	X	X	X	X	X
HTML Support: HTML5, CSS, JavaScript, SVG, WebGL and Chromium compatible	X	X	X	X	X	X	X	X	X	X OpenGL	X OpenGL
HARDWARE INTERFACES											
HDMI Outputs	1	1	1	1	1	1	1	1	2	2	4
HDMI 1 Output:	X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.1a	X HDMI 2.1a	X HDMI 2.1a	X HDMI 2.1a	X HDMI 2.1a
HDMI 2 Output:									X HDMI 2.0a	X HDMI 2.0a	X HDMI 2.0a
HDMI 3 Output:											X HDMI 2.0a
HDMI 4 Output:											X HDMI 2.0a
HDMI Input: (HDCP support coming soon in a future BrightSignOS update)								X HDMI 2.0a	X HDMI 2.0a		
Ethernet:	X 10/100	X 10/100	X Gigabit	X Gigabit	X Gigabit with POE+	X Gigabit with POE+	X Gigabit with POE+	X Gigabit with POE+	X Gigabit with POE+	X Gigabit	X Gigabit
USB-A: provides 5V/1A power to peripheral devices				X		X		X	X	X	X
USB-C: supports high-speed host mode & provides 5V/1A power to peripheral devices	X Supports GPIO, Serial & IRF	X Supports GPIO, Serial & IRF				X		X	X	X	X
GPIO: 12-pin Phoenix Connector with 8 bi-directional Ports			X	X	X	X	X	X	X	X	X
IR: 3.5mm In / Out			X	X	X	X	X	X	X	X	X
Serial: 3.5mm RS-232				X		X		X	X	X	X
Audio: 3.5mm Output (Analog or SPDIF)	X	X	X	X	X	X	X	X	X	X	X
Primary storage: External microSD card slot	X	X	X	X	X	X	X	X	X	X	X
Optional storage: M.2 PCIe Interface for NVME SSD Storage					X	X	X	X	X	X	X
Optional Wi-Fi/Bluetooth: E Key M.2 Interface for WD-105 module	X	X	X	X	X	X	X	X	X	X	X
Status LEDs	1	1	4	4	4	4	4	4	4	4	4
Reset & Service Buttons	X	X	X	X	X	X	X	X	X	X	X
Real Time Clock with 14-day life	X	X	X	X	X	X	X	X	X	X	X
Locking Power Connector	X	X	X	X	X	X	X	X	X	X	X
ACCESSORIES											
BP200 & BP900 USB Button Pads	X	X		X		X		X	X	X	X

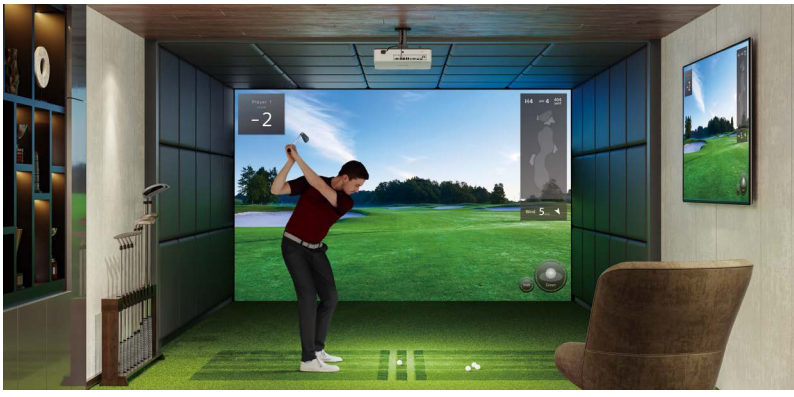
MODEL	LS425	LS445	HD225	HD1025	XD235	XD1035	XT245	XT1145	XT2145	XC2055	XC4055
Micro SD Class 10 cards (various capacities)	X	X	X	X	X	X	X	X	X	X	X
256GB PCIE NVME M.2 SSD					X	X	X	X	X	X	X
WD-105 Dual Antenna Wireless/Bluetooth Module	X	X	X	X	X	X	X	X	X	X	X
BrightSign Mobile USB modem	X	X		X		X		X	X	X	X
CBL-USBC to USBA and 3.5mm Serial	X	X				X		X	X	X	X
GP800-C: USB C to GPIO 12-pin Cable Kit	X	X				X		X	X	X	X
SOFTWARE & SERVICES											
BrightSignOS™	X	X	X	X	X	X	X	X	X	X	X
Free BrightAuthor:connected or BrightAuthor software	X	X	X	X	X	X	X	X	X	X	X
Free bsn.Control Subscription	X	X	X	X	X	X	X	X	X	X	X
Optional bsn.Content Paid Subscription	X	X	X	X	X	X	X	X	X	X	X
Optional BrightSign Mobile Service	X	X		X		X		X	X	X	X
MISCELLANEOUS											
Anodized aluminum enclosure for extended operating temperatures			X	X	X	X	X	X	X		
Dimensions	126.6 x 141.84 x 19.41 mm (WxDxH)		205 x 185.9 x 19.2 mm (WxDxH)		205 x 185.9 x 19.2 mm (WxDxH)		238.62 x 185.90 x 19.19 (WxDxH)			253.2 x 232.12 x 48mm (WxDxH)	
Shipping Weight	TBD	TBD	1.3 kg	1.3 kg	1.3 kg	1.3 kg	TBD	TBD	TBD	3 kg	3 kg
Player Weight	0.18 kg	0.18 kg	0.59 kg	0.59 kg	0.59 kg	0.59 kg	0.68 kg	0.68 kg	0.68 kg	1.41 kg	1.41 kg
Power Supply	12V / 3A	12V / 3A	12V / 3A	12V / 3A	12V / 3A	12V / 3A	12V / 3A	12V / 3A	12V / 3A	19V / 4.7A	19V / 4.7A
Multi-Country Power & Regulatory Approvals	X	X	X	X	X	X	X	X	X	X	X
Built-in Wall Mounting Brackets	X	X	X	X	X	X	X	X	X	X	X

*2 year warranty, parts and labor, for units shipped from an EU or UK distribution center and to an EU or UK address.

SONY

VPL-PHZ61/51

3LCD Laser projectors



Beautifully slim and light with the smallest body in its class, the VPL-PHZ61/51 laser projectors combine outstanding picture performance with up to 7,000lm* center brightness and impressive reliability. With flexible installation options, minimal maintenance, and 4K 60P input support, these projectors are an ideal choice for today's integrated AV environments. *VPL-PHZ61

WUXGA

PHZ61 : 7,000lm (Center) **6,400lm**

PHZ51 : 5,800lm (Center) **5,300lm**

3LCD

BrightEra™ Long Lasting Optics

Z-Phosphor LASER LIGHT SOURCE

4K HDBT™

pro.sony/projectors

Bold, rich color even in brightly lit rooms

Clearer images and text

Reality Creation uses powerful algorithms that boost image resolution closer to 4K-like quality. Reality Text improves visibility of characters: great for conference rooms, university seminar rooms and large classrooms.

For images

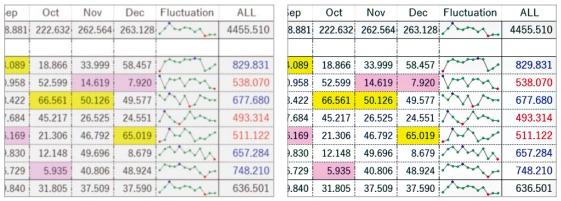
Reality Creation OFF

Reality Creation ON

Clearer image with more depth

Simulated images

For presentation materials



Reality Text OFF

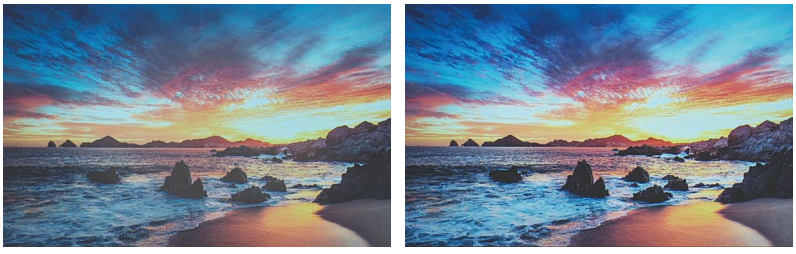
Reality Text ON

Clearer letters and lines with enhance legibility

Simulated images

Bright, beautiful colors

Bright View is Sony's unique processing technology that brightens images while maintaining rich color – even in brightly-lit business and educational environments.



Bright View OFF

Bright View ON

Simulated images

Enhanced viewing experience

Sony's Intelligent Settings feature optimizes brightness, cooling system, and other projector settings to suit four usage environments. In addition, with Ambiance, our new built-in ambient light sensor, the projector measures a room's brightness and automatically adjusts color gain, Bright View mode, and Reality Creation settings to match the environment and enhance the viewing experience.

Ambiance includes an ambient light sensor

Location selection in Intelligent Settings

Meeting/Classroom

Clarity first

Museum

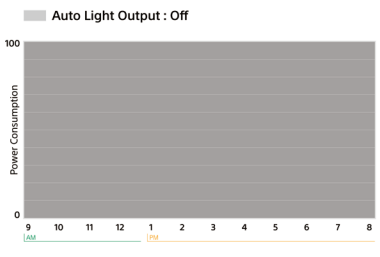
Color accuracy first

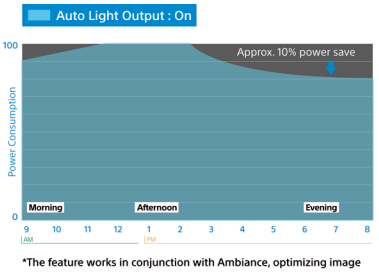
Entertainment

Vivid color first

Enjoy optimum pictures while saving energy

The VPL-PHZ61/51 make sound business sense, helping you reduce running costs in corporate and educational environments. A new Auto Light Output feature works in conjunction with Ambiance, optimizing image quality and maintaining high visibility while reducing power consumption.





*The feature works in conjunction with Ambiance, optimizing image quality and maintaining high visibility while reducing power consumption.

4K 60P input support

Support for 4K 60P input signals makes life simpler when you're using the VPL-PHZ61/51 in multi-screen set-ups with flat panel sub-screens. Just split the same 4K signal to drive all your display devices with no conversion needed. There's also a high-performance image scaler that effortlessly converts 4K input signals to WUXGA resolution while achieving close to 4K image quality. Now optimized for 4K60P signals, Reality Creation is Sony's unique picture enhancement feature that gives projected images even greater crispness and depth. There's also support for devices with content protection such as 4K UHD players.

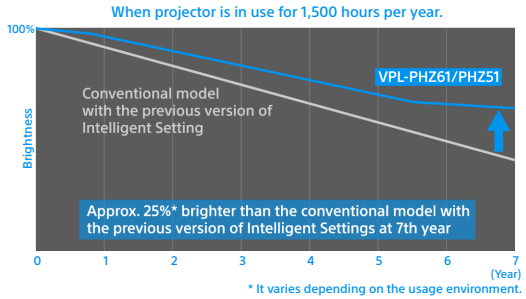
Smart, installation friendly design

Enjoy flexible installation options with a generous +55% vertical lens shift range, making it easy to achieve perfectly-proportioned pictures without long pole mounts or keystone correction when the projector is ceiling mounted. We've also widened the throw ratio range, simplifying replacement of a previously installed projector without the hassle of re-positioning an existing ceiling mount.

Brighter for longer with less maintenance

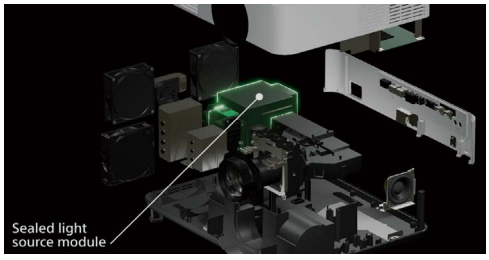
Designed with intelligence

Intelligent Settings simplifies installation and maximizes performance based on usage, image detail, color richness and fidelity, light output, cooling level and output noise. The Meeting/Classroom function controls laser output to keep brightness as high as possible for years of real-world use.



Keep dust out of the picture

The projector's laser light source is sealed to prevent dust accumulation and eliminate reduced brightness. The dedicated cooling duct structure for the projector's 3LCD panels is covered with an air filter to prevent dust from entering.



Hassle-free filter care

Focus on great-looking images instead of time-consuming maintenance. A new filter material makes routine filter changes unnecessary for general use in classrooms and meeting rooms.* For heavier use in dusty environments there's a new clogging sensor to advise when filter replacement is needed.

* Dust density < 0.03mg/m3 and operating time < 10,500 hours. (1,500 hours/yearover 7 years.)

Other Features

Data Cloning

Settings for one projector can be copied to other projectors using a USB memory drive. This greatly simplifies installation and set-up of multiple projectors.

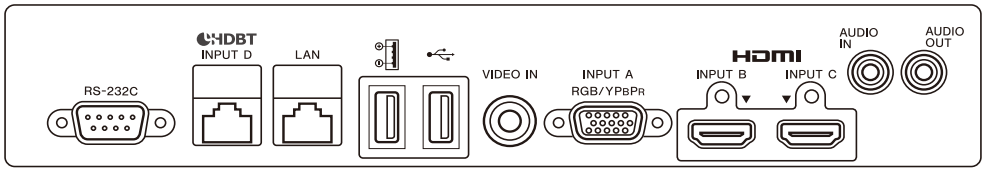
Auto Input Select

The Auto Input Select feature automatically selects an active signal input, so there's no need to change input each time a device is connected to the projector.

Auto Power on

Connect the VPL-PHZ61/51 to a switched-on computer, and the projector turns on automatically, without having to operate the power button.

Connector Panels

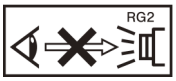


Specifications

		VPL-PHZ61	VPL-PHZ51
Display system		3 LCD system	
Display device	Size of effective display area	0.64" (16.3 mm) x 3 BrightEra LCD Panel, Aspect ratio: 16:10	
	Number of pixels	6,912,000 (1920 x 1200 x 3) pixels	
Projection lens	Zoom	Manual (Approx. x 1.6)	
	Focus	Manual	
	Lens shift	Manual, Vertical: -35% to +55%, Horizontal: +/- 15%	
	Throw ratio	1.23:1 to 1.97:1	
Light source		Laser diode	
Filter cleaning maintenance / replacement cycle (Max.)*1		Auto detecting (by clogging sensor)	
Screen size		40'' to 300'' (1.02 m to 7.62 m) (measured diagonally)	
Light output (Mode: Standard / Middle)*2		6,400 lm*3, 7,000 lm (Center)*4 / 4,700 lm	5,300 lm*3, 5,800 lm (Center)*4 / 4,000 lm
Color light output (Mode: Standard / Middle)*2		6,400 lm / 4,700 lm	5,300 lm / 4,000 lm
Contrast ratio (full white / full black)*2		∞ : 1	
Speaker		16 W	
Displayable scanning frequency	Horizontal	15 kHz to 92 kHz	
	Vertical	24 Hz to 92 Hz	
Accepted signal resolution	Computer signal input	Maximum signal resolution: 1920 x 1200 *5	
	Video signal input	NTSC, PAL, SECAM, 480/60i, 576/50i, 480/60p, 576/50p, 720/60p, 720/50p, 1080/60i, 1080/50i, 1080/60p, 1080/50p, 3840/60p, 3840/30p, 3840/25p, 3840/24p, 4096/60p, 4096/30p, 4096/25p, 4096/24p	
Keystone correction (Max.)		Horizontal: +/- 30 degrees Vertical: +/- 30 degrees	
OSD language		27-language (English, French, German, Italian, Spanish, Portuguese, Japanese, Chinese, Korean, Russian, Dutch, Norwegian, Swedish, Thai, Arabic, Turkish, Polish, Vietnamese, Farsi, Finnish, Indonesian, Hungary, Gleek,Czech,Slovakia,Romania)	
Input / Output (Computer / Video / Audio / Control)	INPUT A	RGB / Y PB PR input connector:Mini D-sub 15 pin (female), Audio input connector: Stereo mini jack	
	INPUT B	HDMI input connector: HDMI 19-pin, Digital RGB/Y PB PR, HDCP support, Audio input connector: HDMI audio support	
	INPUT C	HDMI input connector: HDMI 19-pin, Digital RGB/Y PB PR, HDCP support, Audio input connector: HDMI audio support	
	INPUT D	HDBaseT interface connector: RJ45, 4 play (Video, Audio, LAN, Control)	
	VIDEO IN	Video input connector: Phono jack (Composite), Audio input connector: Shared with INPUT A	
	OUTPUT	Audio output connector: Stereo mini jack	
	REMOTE	D-sub 9-pin (male) / RS232C	
	LAN	RJ45, 10BASE-T / 100BASE-TX	
	USB	TYPE-A x 1 (for F/W update) , TYPEA for Power supply	
Acoustic Noise (Mode: Standard / Middle)*2		37 dB / 34 dB	35 dB / 32 dB
Operating temperature (Operating humidity)		0°C to 40°C (32°F to 104°F) / 20% to 80% (no condensation)	
Storage temperature (Storage humidity)		-10°C to +60°C (14°F to +140°F) / 20% to 80% (no condensation)	
Power requirements		AC 100 V to 240 V, 4.7 A to 2.0 A, 50 Hz / 60 Hz	
Power consumption (Mode: Standard)	AC 100 V to 120 V	463 W	
	AC 220 V to 240 V	434 W	
Power Consumption (Standby Mode)	AC 100 V to 120 V	0.5 W (when "Standby mode" is set to "Low")	
	AC 220 V to 240 V	0.5 W (when "Standby mode" is set to "Low")	
Power Consumption (Networked Standby Mode)	AC 100 V to 120 V	1 W (LAN), 21 W (ALL Terminals and Networks Connected / exclude USB Device and speaker off,when "Standby Mode" is set to "Standard")	
	AC 220 V to 240 V	1 W (LAN), 21 W (ALL Terminals and Networks Connected / exclude USB Device and speaker off,when "Standby Mode" is set to "Standard")	
Standby Mode / Networked Standby Mode Activated		Approx. 2 minutes	
Dimensions (W x H x D) (without dust filter, protrusions)		Approx. W 422 x H 100 x D 333 mm (16 5/8 x 3 15/16 x 13 1/8 inches)	
Mass		Approx. 7.0 kg (15 lb)	Approx. 6.8 kg (15 lb)
Supplied accessories		RM-PJ8 Remote Commander (1), Lithium battery (CR2025) (1), AC Power Cord (1), Setup Guide (1)	

*1 This figure is the expected maintenance time, not a guaranteed time. The actual value depends on the environment and how the projector is used.
*2 The figures are approximate. They vary depending on the environment or how the projector is used.
*3 The value is in accordance with ISO 21118, and may differ depending on the actual unit. Brightness and contrast vary depending on use conditions and environments.
*4 The value is light output measured at center area of screen in Standard mode, and average of all products shipped.
*5 Available for VESA Reduced Blanking signal.

For other countries/regions
IEC 60825-1:2014 CLASS 1 LASER PRODUCT



As with any bright light source, do not stare into the beam, RG2 IEC 62471-5:2015.

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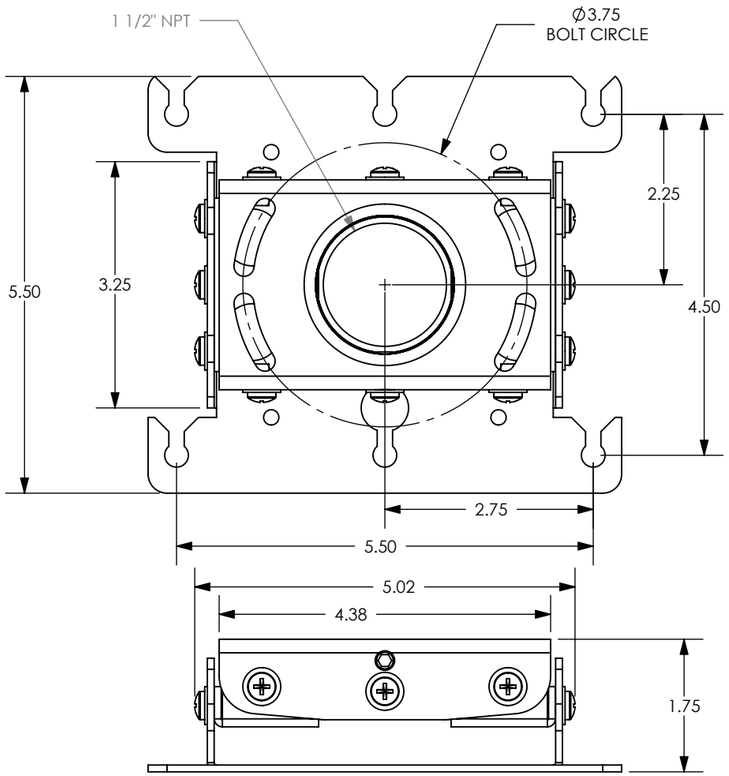

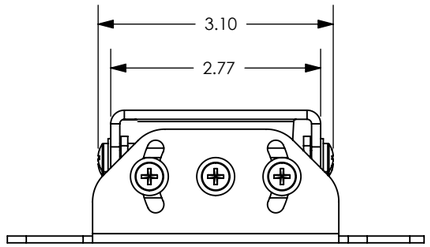

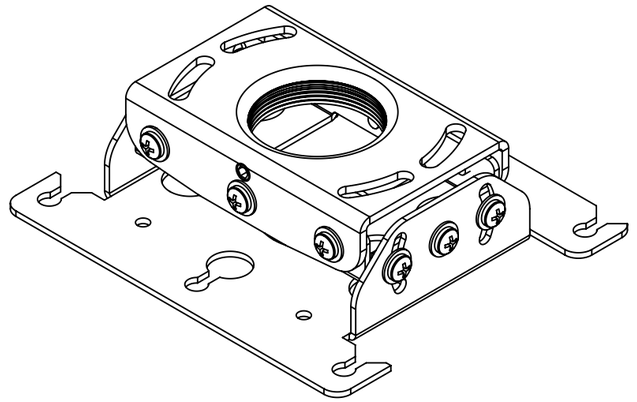

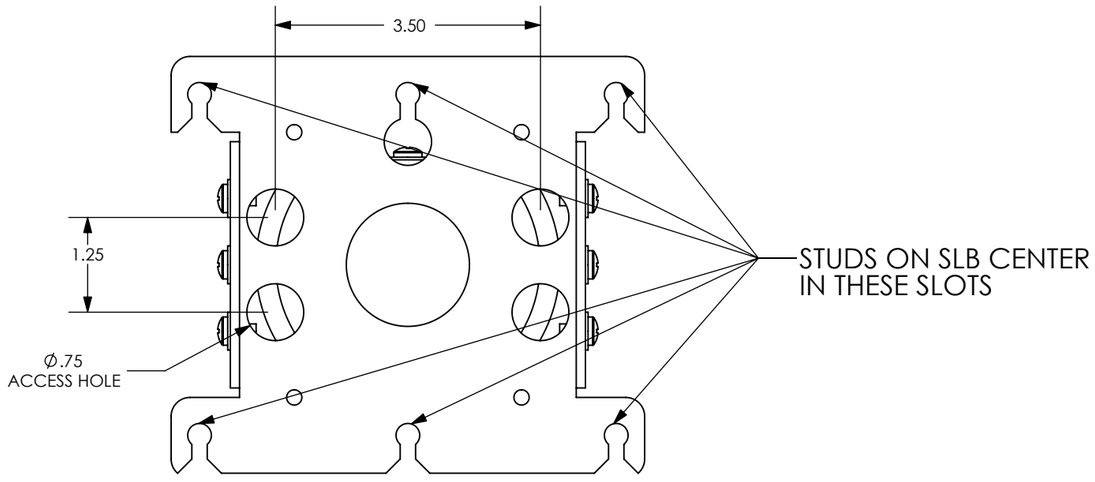

NOTE: CUSTOM INTERAFCE BRACKET NOT SHOWN. THE CUSTOM INTERFACE BRACKET NEEDED FOR YOUR PROJECTOR WILL ADD DEPTH TO SINTALLATION AND WILL AFFECT LOCATION OF PROJECTOR ON MOUNT.

SEE SLB-XXXX DRAWING ALSO.

CHIEF MANUFACTURING INC.
MOUNT ORDER NUMBER IS RPA-000
PHONE: 1-800-582-6480

SHEET SCALE = 1:2

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PHONE: 952-894-6280
FAX: 877-894-6918

TITLE
CUSTOMER PRINT
RPA-000

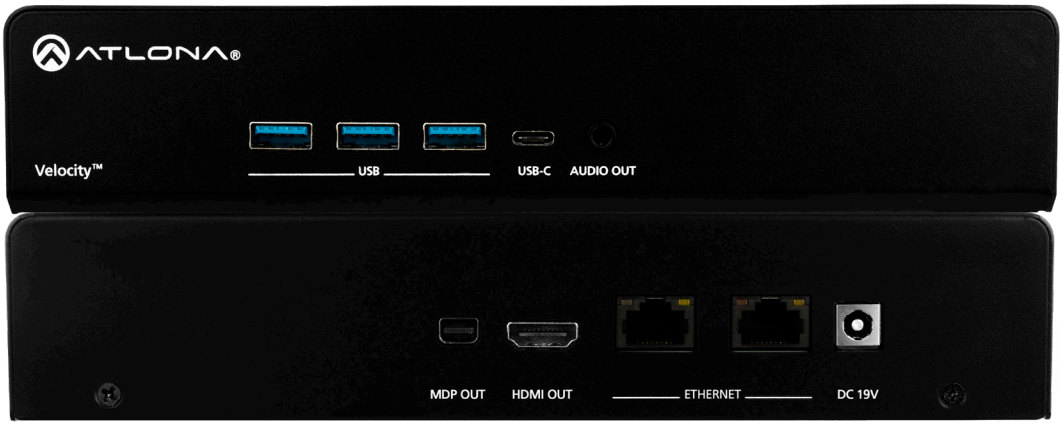
SIZE B | DWG. NO. **RPA-000**

RPA-000

Velocity™

Hardware Gateway for AV Control

and Management plus Room Scheduling



Introduction

The Atlona AT-VGW-HW-3, AT-VGW-HW-10, and AT-VGW-HW-20 are Atlona Velocity™ System server gateways for AV system control, plus room scheduling and AV asset management. These gateways feature a compact enclosure that easily installs into a rack. With a simple network connection and web browser access, an integrator, tech manager, or technician can quickly begin configuration and deployment of AV control systems, room scheduling touch panels, and AV devices such as matrix switchers. Velocity VGW-HW server gateways support industry-standard, secure data communications, and feature dual Gigabit Ethernet ports for isolating an AV device LAN from a facility or corporate network. An innovative, network-based system architecture allows full redundancy and failover with two gateways in operation, maximizing AV system reliability while preventing downtime in mission-critical applications.

Unit Capabilities

SKU	AV Control	Room Scheduling	IP Device Capacity
AT-VGW-HW-3	Up to 3 rooms	Up to 6 rooms	250 simultaneous IP connections
AT-VGW-HW-10	Up to 10 rooms	Up to 20 rooms	250 simultaneous IP connections
AT-VGW-HW-20	Up to 20 rooms	Up to 40 rooms	500 simultaneous IP connections

A room can include AV control, room scheduling, or both. For example, with the AT-VGW-HW-10 there can be a total of 6 rooms with AV control only, 4 rooms for control and scheduling, and 16 rooms with scheduling only.

Key Features

Velocity AV system control

- Flexible scalability for integrating one or several AV systems over a network.
- Fast, agile, and highly intuitive control system configuration – set up a room AV system in minutes.
- Configurations can easily be duplicated across devices, rooms, and sites.
- Make control system modifications in just minutes, including AV equipment changes
- Control system redundancy with automatic failover, available via primary and backup VGW-HW processors
- Velocity Command Converters available for IP conversion to RS-232, IR, and relay / sensor; IP to RS-232 available through Atlona AV devices

Velocity room scheduling

- Easy to install and configure for integrators.
- Compatible with G Suite™ and Microsoft® Office 365™.
- Simple to access for meeting participants though Velocity touch panels
- User-friendly GUI for viewing meeting room availability status, browsing for available rooms, and scheduling a meeting or event time
- Ability to extend meetings and initiate ad hoc meeting sessions
- Can be configured with AV system control to automatically trigger AV functions and macros whenever a meeting begins or ends

Velocity Cloud Lite remote configuration and management

- Online resource for creating and centrally managing Velocity control and room scheduling systems for multiple clients and sites.
- Remotely configure a new Velocity control system from scratch, or modify an existing system in minutes.
- Continuous system monitoring – quickly assess system and device status
- Automate Velocity system backups to the cloud at defined intervals
- Easy system restoration by accessing any time-stamped backup

Atlona Management System (AMS)

- Centralized, network-based configuration and management of Atlona IP-controllable products and systems.
- Manage configuration and firmware updates for AV devices spanning a facility, building, enterprise, or residence.
- Automatically discovers Atlona devices on the network and adds them to the system configuration
- Organize Atlona device installations by room, floor, building, and site or campus
- Back up device configurations, duplicate configurations to identical Atlona products on the network, and restore configurations when devices are replaced
- Pre-configure Atlona devices prior to on-site installation and commissioning
- Manage firmware updates including the ability the push to multiple devices at once, and schedule updates at a convenient date and time
- Continuous system monitoring – quickly assess system and device status

Features

Hardware server gateways for AV system control, room scheduling, and AV asset management

Access from a web browser for setup and management

Simplify system or device configuration, deployment, and management with the interactions, flow, and visual elements of a web or mobile app GUI

Create role-based accounts for integrator, client, and AV/IT staff members, each with clearly defined access privileges

Dual Gigabit Ethernet ports for isolating a dedicated AV LAN from the facility or corporate network

Supports industry-standard, secure data communications through HTTP/2, HTTPS, SSH, SFTP, and WebSockets with TLS and AES-128 encryption

USB 3.0 and USB-C ports, plus HDMI® and Mini DisplayPort outputs for future expansion

Rack-mountable 1U, half rack width enclosure

Includes installation guide, rack mounting brackets, and external universal power supply

Specifications

Control Software
Built-in web portal for system configuration and management; remote web access available through Velocity Cloud

IP	
NIC	Two Network Interface Controllers (NIC) – supports segregated AV and facility LANs
Ports	2 x RJ45 ports, one to each NIC
Standards and Protocols	DHCP, HTTP, HTTPS, SFTP, SMTP, SNMP, SSH, TCP, UDP, IEEE 802.1x
Ethernet Speed	10/100/1000 Mbps
Addressing	DHCP, static

Environmental	Fahrenheit	Celsius
Operating	32 to 122	0 to 50
Storage	-4 to 140	-20 to 60
Humidity (RH)	20% to 60%, non-condensing	

Power		
Consumption	40W (min) to 55W (max)	
Supply	Input: AC100~240V 50/60Hz Output: DC 19V / 3.42A	

Dimensions (H x W x D)	Inches	Millimeters
Unit	1.73 x 8.64 x 4.48	44 x 219.5 x 114
Power Supply	1.25 x 1.88 x 4.25	31.75 x 47.63 x 107.95

Weight	Pounds	Kilograms
Device	1.9	0.86

Compliance	
TAA	No

Certification		
Device	CE, FCC, RoHS, VGW-HW-20: CB (safety)	
Supply	KC, UL, ETL, RCM, CE, FCC, TUV Safety, CCC, EAC, BSMI, PSE	

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20300-R4

Omega™

4K/UHD 6x2 Matrix Switcher

for HDMI, USB-C, and HDBaseT with USB

Introduction

The Atlona **AT-OME-PS62** is a 6x2 matrix presentation switcher with HDMI, USB-C, and HDBaseT inputs, plus HDMI and HDBaseT outputs. Part of the Omega™ Series of integration products for modern AV communications and collaboration, the OME-PS62 features HDBaseT extension for video up to 4K/60 4:2:0, plus embedded audio, control, Ethernet, and USB over distances up to 330 feet (100 meters). The HDMI and USB-C ports support video up to UHD/60 4:4:4. The OME-PS62 is HDCP 2.2 compliant and features 4K/60 4:4:4 upscaling and downscaling for the HDMI output. The integrated USB extension addresses the challenge of connecting between USB devices at remote locations, and is ideal for software video conferencing and touch or interactive displays. The OME-PS62 includes USB 3.0 and USB-C interfaces for three host PCs, plus two peripheral devices such as a camera, microphone, speaker phone, or keyboard and mouse. The OME-PS62 is ideal for a wide range of 4K presentation applications with Omega Series transmitters and receivers.

Applications

- **Meeting rooms and conference rooms**
  The OME-PS62 can serve as an AV integration centerpiece in a credenza, with interfacing into sources in the rack, plus remote AV and USB connectivity from wall, table, and display locations.
- **Video conferencing and USB data**
  With compatible Omega Series endpoints, this presentation switcher provides interfacing for local and remote USB devices for soft codec conferencing, with video and USB switched together between host PCs. As a matrix switcher with scaling, the OME-PS62 is also ideal for hardware-based video conferencing, with the ability to route and optimize any source content to the codec far-end.
- **Auditoriums and lecture halls**
  The HDBaseT output of the OME-PS62 can be used to extend 4K video to a projector, while the HDMI output serves to optimize for a 1080p or 4K confidence monitor. Also available is a microphone input and mixing with program audio.
- **Active learning classrooms**
  In education applications, the OME-PS62 can be installed below each student table, with the HDMI output feeding a local display, and the HDBaseT output used to send content to the main classroom AV switcher and display.
- **Lecture capture**
  The secondary, HDMI output can also be used to feed into a lecture capture or streaming video system, with video scaled as appropriate for the application.

Key Features

6×2 AV matrix switcher with HDBaseT, HDMI, and USB-C inputs

- Features two HDBaseT and three HDMI inputs, plus a USB-C input.
- Delivers flexible BYOD capability, as well as integration versatility for local and remote AV sources.

USB-C input for AV, data, and device charging

- Provides immediate compatibility with laptops and tablets with USB-C ports supporting AV output.
- Allows clutter-free, single cable connectivity to a PC for video conferencing and collaboration.

HDBaseT and HDMI outputs with selectable AV switching modes

- Enables simple configuration and effortless user operation, tailored to the specific AV application.
- Three selectable switching modes, including mirrored HDMI and HDBaseT outputs, matrixed outputs (default), and a special mode with one input fixed to one of the outputs.

4K/UHD downscaling and upscaling for HDMI output

- Preserves color and spatial detail when down-converting 4K content to 1080p or vice versa. Ideal for presentation applications where content is to be viewed on 4K and HD displays.
- Also ideal for downscaling to 1080p for hardware video conferencing codecs and lecture capture systems.

USB 3.0 interface and extension up to 330 feet (100 meters)

- Two USB type B interfaces for connection to a host PC, plus two USB type A ports for peripheral devices such as cameras, soundbars, or touch displays. USB-C input is also available for data connection to a host PC or USB peripheral.
- Provides an ideal USB integration solution for software video conferencing and other applications. A maximum data rate of 120 Mbps is supported over HDBaseT.

Comprehensive audio integration features

- Audio embedding and de-embedding, microphone/line level input with 48 volt phantom power and automatic ducking, audio output matrix mixing, and volume, mute, and five-band EQ for each output.
- Integrated audio processing and optimization features without the need for additional equipment.

Power over Ethernet (PoE) for transmitters and receivers

- Supplies industry standard IEEE 802.3af PoE over HDBaseT to Omega Series and other compatible transmitters and receivers.
- Allows convenient endpoint installation at remote locations without the need for local AC power.

Display control

- Supports CEC and bidirectional RS-232 to control local and remote displays.
- Bidirectional conversion of control data from TCP/IP to and from RS-232.

Specifications

Video		
Signal Type	Input: HDMI and DisplayPort Alternate Mode (USB-C)	
	Output: HDMI and HDBaseT	
Copy Protection	HDCP 2.2 / 1.4	
Pixel Clock	300MHz	
UHD/HD/SD	4096x2160@60[(1)]/50/30/25/24Hz 3840×2160@60[(1)]/50/30/25/24Hz 1080p@60/59.9/50/30/29.97/25/24/23.98Hz 1080i@30/29.97/25Hz	720p@60/59.94/50Hz 576p@50Hz 576i@25Hz 480p@60/59.96Hz 480i@30Hz
VESA All resolutions are 60Hz	2560×1600 1920×1200 1680×1050 1600×1200 1440×900 1400×1050 1280×1024	1280×800 1366×768 1360×768 1152×864 1024×768 800×600 640×480
Scaler Up/Down	4096x2160p60 4096x2160p50 4096x2160p30 4096x2160p25 4096x2160p24 3840x2160p60 3840x2160p50 3840x2160p30 3840x2160p25 3840x2160p24 1920x1080p60 (default) 1920x1080p50	1920x1080p25 1920x1080p24 1280x720p60 1280x720p50 2048x1080 1920x1200 1600x1200 1360x768 1280x800 1280x768 1024x768
Color Space	YUV, RGB	
Chroma Subsampling	HDMI and HDBaseT: 4:4:4, 4:2:2, 4:2:0 USB-C: 4:4:4 only	
Color Depth	8-bit, 10-bit, 12-bit	
HDR	HDR10, Hybrid-Log Gamma (HLG), and Dolby® Vision™ @ 60Hz; HDMI and USB-C ports only	

Audio			
HDMI / HDBaseT Inputs	PCM 2.0 LPCM 5.1 LPCM 7.1	Dolby® Digital Dolby Digital Plus™ Dolby TrueHD Dolby Atmos®	DTS® Digital Surround™ DTS-HD Master Audio™ DTS:X®
HDMI / HDBaseT Outputs	PCM 2.0	Dolby® Digital Dolby Digital Plus™ Dolby TrueHD Dolby Atmos®	DTS® Digital Surround™ DTS-HD Master Audio™ DTS:X®
Bit Depth	24 bits		
Analog Audio			
Format	Stereo 2-Channel		
Balanced Output	+4 dBu nominal gain, +20 dB headroom		
Frequency Response	20 Hz to 20 kHz, ± 0.5 dB		
Impedance	150 Ω		
Stereo channel separation	> 90 dB		
THD+N	< 0.004% at 20 Hz to 20 kHz		
SNR	> 103.7 dB at 1 kHz, zero clipping @ 0 dBFS, unweighted		
EQ	5 band, 63Hz, 85Hz, 250Hz, 1kHz, 4kHz		
MIC			
Phantom Power	48V, enable and disable through webGUI / 3-pin MIC option		
Ducking	Selectable on/off		
Trigger level	Selectable, -60 to -10 dB		
Attack Time	Selectable, 1 to 5000 ms		
Release Time	Selectable, 1 to 5000 ms		
Sample Rate	32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz		

USB	
Compliance	Local - 3.0 HDBaseT - 2.0
Maximum Data Rate	120 Mbps
USB-C	Supports Audio, Video, and device & host data
Internal Hubs	1 USB hub when connected to USB type B host port, 2 cascaded USB hubs when connected to USB-C port

Ethernet	
Port	1 x RJ45
Standards and Protocols	HTTPS, Telnet, mDNS, SSL, IEEE 802.1x
Speeds	10/100/1000 Mbps
Addressing	DHCP, Static – selectable through rear panel, IP & RS-232 commands, and built-in web server

RS-232	
Port	2 x 3-pin captive screw
Use	Unit and external device control and configuration
Baud Rates	2400, 4800, 9600, 19200, 38400, 57600, 115200
Data flow	Bi-directional

Omega™ 4K/UHD

HDMI Over HDBaseT Receiver

with Ethernet, Control, PoE, and Audio De-Embedding

Introduction

The Atlona AT-OME-RX11 is an HDBaseT receiver for video up to 4K/60 4:2:0, plus embedded audio, control, and Ethernet over distances up to 330 feet (100 meters). Part of the Omega™ Series of integration products for modern AV communications and collaboration, the OME-RX11 is HDCP 2.2 compliant and receives RS-232 and IP control signals. Additionally, this receiver features two-channel audio de-embedding to a balanced analog audio output. The OME-RX11 is locally powered, and can deliver Power over Ethernet (PoE) over HDBaseT to an Atlona Omega Series, HDVS-200 Series, or AT-UHD-EX-100CE-TX-PD transmitter.

The OME-RX11 incorporates many popular integration convenience features, while delivering excellent performance and value for 4K presentation applications. The Ethernet port on the OME-RX11 is for IP pass-through with the transmitter.

Applications

- **Complete system integration**
  The OME-RX11 and an Omega Series switcher together provide a comprehensive and cost-effective integration solution for meeting rooms and other AV presentation spaces..
- **Larger system applications**
  The OME-RX11 offers a new option for legacy Atlona transmitters and switchers with HDBaseT outputs, to provide audio de-embedding for feeding into an amplifier and speakers.

Key Features

Video, audio, power, and data over category cable utilizing HDBaseT technology

- Receives up to 330 feet (100 meters) @ 1080p with CAT5e/6 or 4K/UHD using CAT6a/7 cable.
- Uses easy-to-integrate category cable for low-cost, reliable system installation.

4K/UHD capability @ 60 Hz with 4:2:0 chroma subsampling

- Compatible with sources up to 4K/60 4:2:0 and 4K/30 4:4:4.
- Supports HDMI data rates up to 10 Gbps from PCs, media players, and Ultra HD Blu-ray players.

HDCP 2.2 compliant

- Adheres to latest specification for High-bandwidth Digital Content Protection.
- Allows protected content stream to pass between authenticated devices.

Local AC powering – PoE (Power over Ethernet) source

- Supplies industry standard IEEE 802.3af PoE over HDBaseT to an Omega Series, HDVS-200 Series, or AT-UHD-EX-100CE-TX-PD transmitter.
- Allows convenient transmitter installation at any remote location, without the need for local AC power.

Audio de-embedding

- De-embeds two channel PCM audio to a balanced, analog audio output.
- Deliver audio to an amplifier and speakers for sound reinforcement.

Front panel power and signal status LEDs

- LED indicators provide power and HDBaseT link status information.
- Provides convenient setup and troubleshooting.

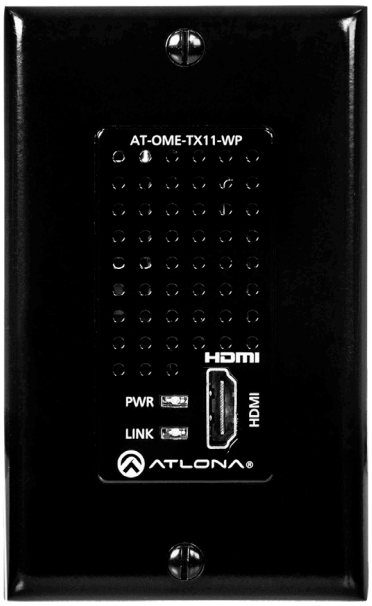
Low-profile, 1.02 inch (26 mm) high enclosure

- Easy installation into confined spaces below tables, in furniture, and behind or above displays.
- Includes mounting hardware for installation onto surfaces.

Omega 4K/UHD

Wallplate Transmitter

for HDMI



Introduction

The Atlona **AT-OME-TX11-WP** is an HDBaseT transmitter for video up to 4K/60 4:2:0, plus embedded audio over distances up to 330 feet (100 meters). It features a US one-gang, wallplate form factor, and includes interchangeable black and white wallplates and faceplates. Part of the Omega™ Series of integration products for modern AV communications and collaboration, the OME-TX11-WP is HDCP 2.2 compliant and is remotely powered over HDBaseT. This transmitter is ideal for use with Omega Series receivers as well as switchers with HDBaseT inputs.

Applications

- **Collaboration and gathering spaces**
  The OME-TX11-WP and OME-RX11 together serve as a basic but effective AV solution with a convenient wall or table HDMI connection for a presenter. The de-embedded audio output at the OME-RX11 offers the opportunity to add sound reinforcement.
- **Classrooms and auditoriums**
  This wallplate transmitter can provide an auxiliary HDMI input into the main switching system, such as the OME-PS62 presentation switcher. The OME-TX11-WP can be installed wherever designated for a student to connect a laptop and share content with the class.

Key Features

US one-gang enclosure for wallplate openings – interchangeable black or white trim kits

- Allows inconspicuous installation on a wall, in furniture, or in a floor box. Includes black and white wallplates and faceplates.
- Meets end user requirements for conveniently accessible yet discreet AV connectivity.

Video, audio, and power over category cable utilizing HDBaseT technology

- Transmits 4K/UHD video up to 330 feet (100 meters) with CAT6/6a/7 cable, or up to 295 feet (90 meters) using CAT5e cable.
- Uses easy-to-integrate category cable for low-cost, reliable system installation.

4K/UHD capability @ 60 Hz with 4:2:0 chroma subsampling

- Compatible with sources up to 4K/60 4:2:0 and 4K/30 4:4:4.
- Supports HDMI data rates up to 10 Gbps from PCs, media players, and Ultra HD Blu-ray players.

HDCP 2.2 compliant

- Adheres to latest specification for High-bandwidth Digital Content Protection.
- Allows protected content stream to pass between authenticated devices.

Remote powering over HDBaseT

- Industry standard IEEE 802.3af PoE is supplied by an Atlona receiver or switcher over HDBaseT.
- Allows convenient wall, floor box, or furniture installation without the need for local AC power.

10” Touch Panel for Velocity™ Control System

Introduction

The Atlona AT-VTP-1000VL is a Velocity System 10” touch panel with integrated surround LED lighting. It features contemporary, refined styling with 1280×800 native resolution, and a capacitive glass surface that supports multi-touch. The large 10” touch panel provides additional space for more complex user control of video walls, high density matrix switchers, audio DSP’s, or other applications that have greater control function requirements. Bright LED lighting surrounding the edge of the panel is ideal for providing a visual representation of room status in scheduling applications or for adding emphasis to AV control functions. The panel ships with a dual-purpose one-gang wall/glass mount kit, that is a standard VESA 75 pattern to provide compatibly with a wide variety of other options. The VTP-1000VL features Power over Ethernet (PoE), enabling a single network connection for data and power. Setting up the touch panel is easy, with room scheduling and AV control GUIs automatically uploaded from the Velocity System hardware or software server gateway during system configuration.

Applications

- Ideal for large meeting rooms, board rooms, lecture hall, or video wall locations where more complex control functionality is required
- Ideal for lobbies, hallways, or outside of any meeting space that requires a quick and easy visual means of displaying room availability.

Key Features

10” touch panel

- More graphical user interface area.
- Supports complex applications that require a greater number of user controls.

Room scheduling and AV control touch panels

- Single, flexible touch panel platform that can be used for a variety of applications.
- Only need to stock a single panel to satisfy multiple requirements.

Surround LED lighting

- Lights on the entire outer frame of the touch panel can be configured for room scheduling or AV control functions.
- LED’s can be easily seen from the side in either landscape or portrait orientation.

Fast streamlined setup

- Automatic network discovery and configuration by a Velocity System Gateway.
- Room scheduling and AV control GUIs are automatically loaded by a single configuration tool.

Contemporary styling

- Refined aesthetics.
- Modern appearance matches any environment.

Flexible mounting

- Dual-purpose one-gang wall/glass mount kit included.
- Standard VESA 75 pattern for compatibility with third party mounts.
- Optional AT-VTP-VTM tabletop mounting kit for placement on a meeting table or lectern.

PoE

- Remotely powered via Power over Ethernet.
- Single cable network connection for data and power.

IP to Relay
Sensor Signal Converter for Velocity™ Control System

Introduction

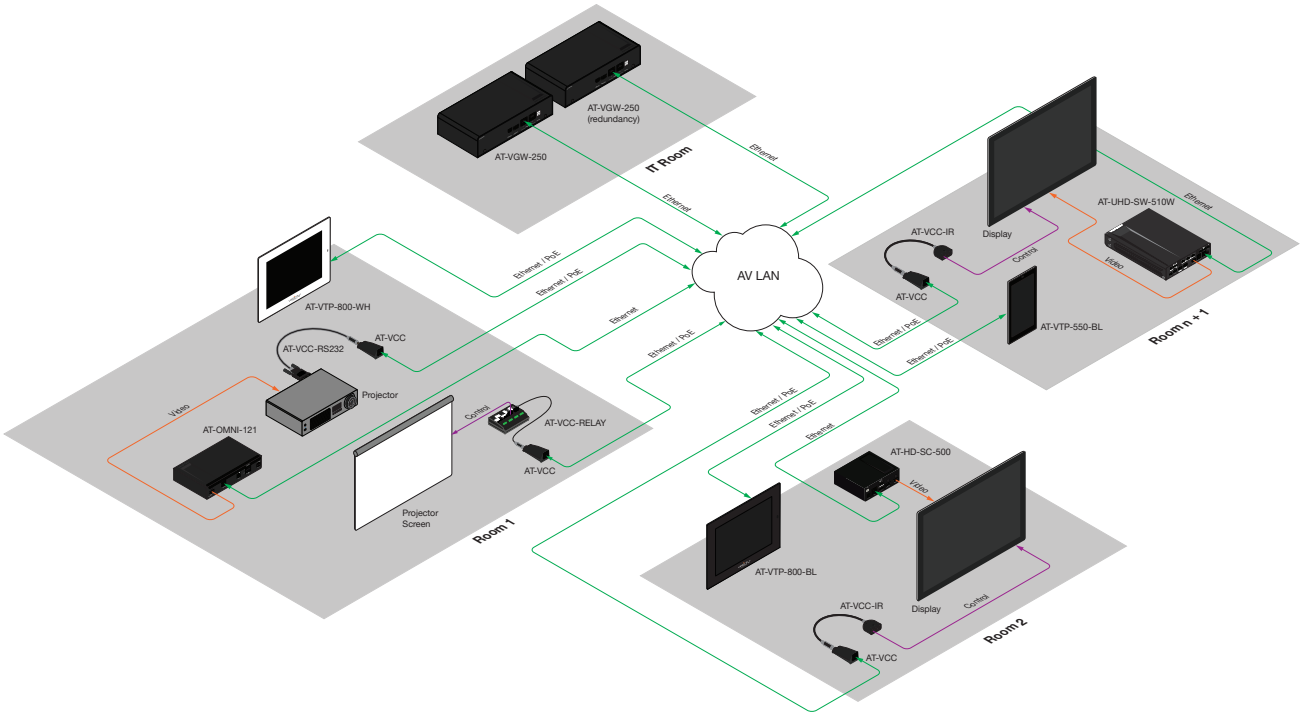
The Atlona **AT-VCC-RELAY-KIT** is an accessory for the Atlona Velocity™ Control System that provides conversion between IP control commands and relay / sensor signals. This Velocity Control Converter is very compact and can be placed anywhere a device requires control and is not IP-capable. The VCC-RELAY-KIT is remotely powered through Power over Ethernet (PoE), or locally from a USB power source. The primary unit installs onto any surface via a convenient mounting dock. A simple “click” locks it into place for a secure, reliable installation. The control port module supports DIN rail installation, and features four relay outputs plus four sensor inputs. The inputs and outputs are both configurable for various operating modes.

Key Features

- Provides conversion between IP and relay / sensor control signals for the Velocity Control System
- Compact form factor – inconspicuous and easily concealable
- Easy to set up and configure using the Velocity Control Suite
- Remotely powered via PoE (Power over Ethernet)
- Also can be powered through USB from a nearby USB power source
- Primary unit installs onto any surface via a convenient mounting dock – simple “click” locks device into place
- Control port module includes four relay outputs and four sensor inputs
- Relay outputs configurable to support common relay types – Single Pole Single Throw (SPST), Single Pole Double Throw (SPDT), and Double Pole Double Throw (DPDT)
- Sensor inputs can be configured to support voltage or contact closure sensing
- Push-in terminal blocks for relay and sensor connections
- 4.5 foot (1.4 meter) cable
- Control port module supports DIN rail installation
- Award-winning 10 year limited product warranty

IP to Relay
Sensor Signal Converter for Velocity™ Control System

Connection Diagram



Specifications

Ports	
Network Connection	RJ-45, 100/10 Mbps Ethernet Protocol
Relays	4 x SPST with transient voltage suppression 24 V AC/DC or 0.5 A NO contact
Relay Configurations	Single Pole Single Throw (SPST) Single Pole Double Throw (SPDT) Double Pole Double Throw (DPDT)
Sense Modes	Voltage: AC/DC voltages ± 3 V to ± 24 V (RMS) Contact Closure: Use for input from devices or feedback from external relays

Power	
USB	Micro-B
PoE	802.3af-compliant

Dimensions	Inches	Millimeters
H x W x D (AT-VCC-RELAY)	0.90 x 3.24 x 2.00	22.86 x 82.29 x 50.80
H x W x D (AT-VCC)	0.82 x 1.22 x 2.58	20.82 x 30.98 x 65.53

Weight	Pounds	Kilograms
AT-VCC-RELAY	0.15	0.06
AT-VCC	0.05	0.02

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Great Ideas Need to Be Heard

CONVERGE® Pro 2 48VT
Professional Audio DSP Mixer

CONVERGE Pro 2 is the industry's most advanced professional audio DSP platform for conferencing and sound reinforcement applications. It outperforms in any size room, audio environment, and application.

The 48VT model mixer has 4 inputs with AEC, 8 outputs, built-in VoIP/Skype for Business interface, Telco, USB audio; GPIO, RS232, IP control interfaces; and P-Link and C-Link expansion buses.

CONVERGE Pro 2 is optimized to work with the new Beamforming Mic Array 2 and DIALOG® 20 2-Channel Wireless Microphone System through its native connection.

Powerful Architecture

+ 4 Mic/Line inputs with AEC
+ Built-in VoIP: 5 lines
+ Built-in Skype for Business Client
+ Built-in Telco with ClearEffect™ processing
+ Separate ports for VoIP/Skype for Business and Ethernet
+ Built-in USB for PC-based conferencing
+ Reduced footprint and power consumption

Audio Signal Processing

+ ClearPath™ architecture for guided work-flow and processing
+ N ext-gen Acoustic Echo Cancellation processing
+ Distributed Echo Cancellation® on every mic input
+ Noise Cancellation with Adaptive-Ambience
+ Acoustic Intelligence with faster convergence
+ DARE™ feedback elimination
+ Advanced microphone gating

Scalable Connectivity

+ Standalone and daisy-chained system
+ Stack up units up to 144 Mic/Line inputs
+ Expansion bus "C-Link" with 64 channels
+ "P-Link" bus to connect peripheral devices

Applications

+ POTS conferencing
+ VoIP conferencing
+ PC-based conferencing & Unified Communications
+ Microsoft Skype for Business audio conferencing

Configuration & Management

+ New CONSOLE® software
+ Auto-discovery of devices
+ MatrixView™ for entire system
+ FlowView™ for visualized audio signal paths
+ System monitoring and troubleshooting

Flexible Control Options

+ Dialer app for Windows, Mac, iOS, Android
+ Touch Panel Controller with tabletop and wall mount options
+ 3rd-party control modules

APPLICATIONS

Boardrooms

Conference Rooms

Huddle Rooms

Training Rooms

Lecture Halls

Courtrooms

Auditoriums

Telemedicine Facilities

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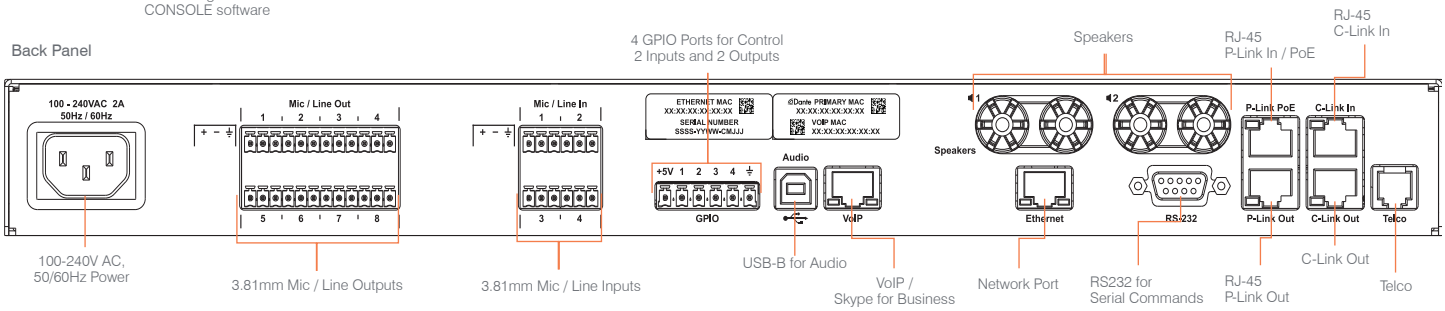
CONVERGE Pro 2 48VT

Front Panel

Back Panel



	Conferencing														Sound Reinforcement	
CONVERGE Pro 2	128	128D	128T	128TD	128V	128VD	128VT	128VTD	48T	48V	**48VT**	48VTD	120	012	128SR	128SRD
System																
Mic/Line inputs	12	12	12	12	12	12	12	12	4	4	4	4	12	X	12	12
Mic/Line outputs	8	8	8	8	8	8	8	8	8	8	8	8	X	12	8	8
AEC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X
C-link expansion bus	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
P-link peripheral bus	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
USB audio interface	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethernet, RS-232, GPIO interface	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Applications																
Built-in USB for PC-based conferencing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X
Built-in Telco for teleconferencing	X	X	✓	✓	X	X	✓	✓	✓	X	✓	✓	X	X	X	X
Built-in VoIP for VoIP conferencing	X	X	X	X	✓	✓	✓	✓	X	✓	✓	✓	X	X	X	X
Microsoft Skype for Business audio conferencing	X	X	X	X	✓	✓	✓	✓	X	✓	✓	✓	X	X	X	X
Sound Reinforcement applications	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Built-in Dante for audio networking	X	✓	X	✓	X	✓	X	✓	X	X	X	✓	X	X	X	✓
Peripheral Devices																
Beamforming Mic Array 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X
DIALOG® 20 - Wireless Mic System	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GPIO Expander	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
USB Expander	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Configuration, Management & Control																
New CONSOLE® software	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dialer app - Win, Mac, iOS, Android	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Touch Panel Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Third-party control modules	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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CONVERGE Pro 2 48VT

PRODUCT SPECIFICATIONS

Unless otherwise specified, all measurements are performed with a 20Hz to 22kHz BW (no-weighting).

MIC/LINE INPUTS & OUTPUTS

Inputs: Balanced audio inputs, 3.81mm Orange color Phoenix/Euroblock type male header, Push-on mini-terminal block

Outputs: Balanced audio outputs, 3.81mm Black color Phoenix/Euroblock type male header, Push-on mini-terminal block

Frequency Response:
20Hz – 22kHz @ +4dBu, +/- 0.5dBu

EIN (Equivalent Input Noise):
20kHz BW, max gain, Rs = 150Ω, -126dBu

THD + N (Total Harmonic Distortion + Noise):
- 20Hz – 22kHz @ +4dBu, line level, 0.006%
- 20Hz – 22kHz @ -56dBu, mic level, <0.04%

Dynamic Range:
20Hz – 20kHz @ 0dB, >105dB

Crosstalk (Mic/Line):
Channel to Channel, stimulus at 20dBu to receptor at -56dBu, 1kHz, < -98dB

Input Impedance:
Balanced (line to ground), 2.2kΩ, 1%

Nominal Input Level:
Adjustable -56dB to 0dB, 7dB step coarse gain

Maximum Input Level: -65dBu to 20dBu

Phantom Power: 48V, Impedance 6.81kΩ

Output Impedance:
Balanced (line to ground), 95Ω, 1%

Output Level:
0dBu (Nominal), 20dBu (Max), -40dBu (Selectable)

USB AUDIO

Port Type: USB-B connector

Audio: Digital Audio, 2 x 2 bidirectional channels

Sample Rate: 48kHz

Sample Bit Depth: 24-Bit

Compatible:
- USB 2.0
- USB 3.0

TELEPHONE

Port Type: RJ11

Frequency Response:
- Mic/Line Input to Telephone Out: 250Hz – 3.4kHz , +/- 2dB, 4dBu
- Telephone In to Mic/Line Out: 250Hz – 3.4kHz, +/- 2dB, -15dBu

THD + N:
- Mic/Line Input to Telephone Out: <0.1% @ 4dBu
- Telephone In to Mic/Line Out: <0.3% @ -15dBu

Dynamic Range:
- Mic/Line Input to Telephone Out: >67dBu
- Telephone In to Mic/Line Out: >87dBu

REN: Ringer Equivalent Number 0.2

Transhybrid Balance: 30dB (1kHz, all AC terminations)

VOIP

Port Type:
RJ-45, 10/100Mbps Ethernet Network, Auto Negotiation

Audio:
5 Lines

Number of Lines	Maximum Number of Calls/Line
1	5
2	5
3	4
4	3
5	2

Codec:
- G.711 uLaw
- G.711 ALaw
- G.722

Skype for Business (S4B):
- Microsoft Skype for Business support (1 client)
- Choose either regular VoIP or S4B through configuration

ETHERNET

Port Type:
RJ-45, 10/100Mbps Ethernet Network, Auto Negotiation

IP address: IPv4 (IPv6 upgradeable through future s/w, f/w upgrade)

AMPLIFIER OUTPUT

Speaker Output Port: Dual binding posts

Audio: 2 Channels

Output Power: 10W Max, 8Ω load

Frequency Response:
20Hz – 22kHz @ +10dBu, +/- 0.5dBu

THD + N: 20Hz – 22kHz @ +10dBu, 1W, <0.3%

Dynamic Range:
20Hz – 22kHz @ 20dB, >102dB, with 20kHz digital low pass filter

Crosstalk:
Channel to Channel, stimulus at 20dBu, 10W output to receptor 8Ω load, 20Hz – 22kHz, < -70dB

C-LINK EXPANSION BUS

Ports Type: RJ-45 (Cat5e or Cat6)

C-Link In & Out: Proprietary Expansion Bus

Audio: 64 Expansion channels

Cable: Solid core, factory terminated Cat 5e or 6 cable

Distance: Up to 150' (45M)

P-LINK PERIPHERAL BUS

Ports Type: RJ-45 (Cat5e or Cat6)

P-Link In & Out: Proprietary Peripheral Bus

PoE In:
- P-Link In Port
- PoE 802.3af Mode B, Midspan
- Power on "spare pairs" 4,5 and 7,8
- Input voltage range: 48V to 56V

Audio: Up to 3 Beamforming Microphone Array 2 units + up to 3 DIALOG 20 Wireless Receiver units + Up to 3 USB Expander units + Up to 3 GPIO Expander units

Cable: Solid core, factory terminated Cat 5e or 6 cable

Distance: Up to 200' (60M)

Long Distance P-Link:
- Increases P-Link distance from 200 Ft to 650 Ft
- 650 Ft (200M) maximum cable distance between any two units
- Cat6, 550 MHz, 23 AWG, solid conductor cable
- Do not use Copper Clad Aluminum (CCA) cable
- Available only for BFM2 peripheral units
- 48V PoE Midspan Mode B power injector for 1 BFM2 unit
- 56V PoE Midspan Mode B power injector for 3 BFM2 units

RS232

Port Type: DB9 Female

Settings: 9600/19200/38400/57600/115200 Baud; Serial Echo; Flow Control

Support: Serial commands

GPIO

Port Type:
5.08mm Green color Phoenix/Euroblock type male header

Support: Control, Status, Variable Voltage Control

Power Pin: 5V DC @ 350mA Power Source

Pin 1 to 4:
- Open Collector Outputs: 40VDC @ 250mA
- Active Outputs (Source/Sink): 5VDC @25mA
- Logic Inputs: 40.2kΩ pull up
- Variable Voltage Control Inputs: 5VDC max

Ground Pin: GND

USB CONTROL

Port Type: USB-B connector

Location: Front Panel

Compatible:
- USB 2.0
- USB 3.0

LEDs

Location: Front Panel

Status LED:
- Off: Unit still initializing
- Blue - Fast Blinking: Stack Syncing in progress
- Blue - Slow Blinking: Unit not configured
- Blue - Solid: Configured unit
- Red - Fast Blinking: Stack Sync error

Locate LED:
Blue - Blinking: Unit "Locate" command received

Power LED:
Blue - Solid: Unit is powered on

TOUCH SENSOR

Sensor Type: Capacitive Touch Button

Location: Front Panel

POWER & THERMAL

Port Type: AC Inlet

Mains Voltage: 100-240V AC, 50/60Hz

Power Consumption: 50 Watts Typical

Thermal: 170 BTU/Hr Typical

Operating Temperature:
14°F (-10°C) to 104°F (40°C) Ambient Temperature

DIMENSION & WEIGHT

RU size: 1 RU

Width x Depth x Height:
1. Without rack-ears: 17"W x 10.73"D x 1.72"H (43.2cmW x 27.3cmD x 4.4cmH)
2. With rack-ears: 19"W x 10.73"D x 1.72"H (48.3cmW x 27.3cmD x 4.4cmH)

Unit Weight: 9.3 lbs (4.2 kg) (Approximately)

Shipping Weight: 13.8 lbs (6.3 kg) (Approximately)

PACKAGE

Power Cord: 6' (1.8M), Grounded, Qty 1

Input Connectors:
Terminal Block Connector, 3 Position (Orange), Qty 12

Output Connectors:
Terminal Block Connector, 3 Position (Black), Qty 8

GPIO Connector:
Terminal Block Connector, 6 Position (Green), Qty 1

C-Link Cable:
RJ-45 To RJ-45 Cable, 18" (45.7cm), Qty 1

VoIP Cable: RJ-45 To RJ-45, 7' (2M), Qty 1

USB Cable: USB Type A to Type B, 6' (1.8M), Qty 1

Rack Ears: Pre-installed, Qty 2

Screw/Washer Kit: Rack Decor, Qty 4

PART NUMBERS

Part Number	Product
910-3200-001	CONVERGE Pro 2 128
910-3200-001-D	CONVERGE Pro 2 128D
910-3200-002	CONVERGE Pro 2 128T
910-3200-002-D	CONVERGE Pro 2 128TD
910-3200-003	CONVERGE Pro 2 128V
910-3200-003-D	CONVERGE Pro 2 128VD
910-3200-009	CONVERGE Pro 2 128VT
910-3200-009-D	CONVERGE Pro 2 128VTD
910-3200-005	CONVERGE Pro 2 48T
910-3200-006	CONVERGE Pro 2 48V
910-3200-008	**CONVERGE Pro 2 48VT**
910-3200-008-D	CONVERGE Pro 2 48VTD
910-3200-004	CONVERGE Pro 2 120
910-3200-007	CONVERGE Pro 2 012
910-3200-101	CONVERGE Pro 2 128SR
910-3200-101-D	CONVERGE Pro 2 128SRD

SALES AND INQUIRIES

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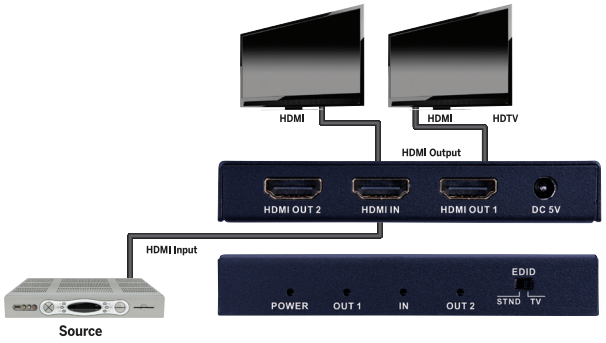
EVOLUTION

Premium 4K HDMI® Splitters

Premium 4K HDMI® 1x2 Splitter

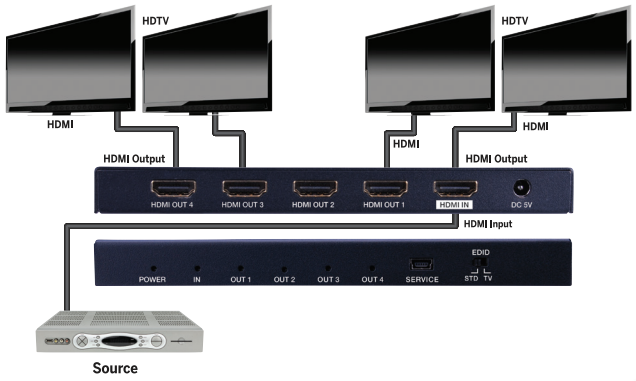
- Transmits audio and video from a single source to 2 HDMI outputs up to 4K2K (2160p) Ultra High Definition resolution without any loss of quality or resolution
- Supports video formats up to 4K2K@60Hz with 12bit YCBCR 4:4:4 and HDR



Part Number: EVSP4K12

Premium 4K HDMI® 1x4 Splitter

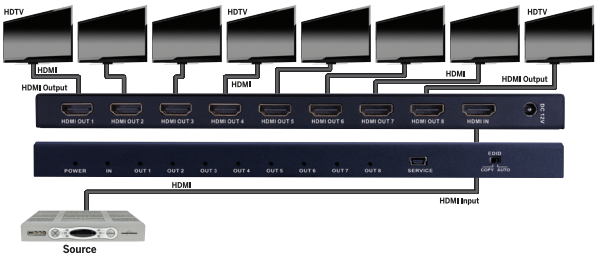
- Transmits audio and video from a single source to 4 HDMI outputs up to 4K2K (2160p) Ultra High Definition resolution without any loss of quality or resolution
- Supports video formats up to 4K2K@60Hz with 12bit YCBCR 4:4:4 and HDR



Part Number: EVSP4K14

Premium 4K HDMI® 1x8 Splitter

- Transmits audio and video from a single source to 8 HDMI outputs up to 4K2K (2160p) Ultra High Definition resolution without any loss of quality or resolution
- Supports video formats up to 4K2K@60Hz with 12bit YCBCR 4:4:4 and HDR



Part Number: EVSP4K18

A BRAND OF VANCO
ADVANCING...CONNECTIVITY

LEARN MORE AT VANCO1.COM

CONNECTSERIES

-AMPLIFIER SPEC SHEET-

OUTPUT POWER	**CONNECT 88**	8 x 80 WRMS @ 4Ω, 8Ω, 70V, 100V (40W at 2Ω, 80W at 25V)
	CONNECT 168	8 x 160 WRMS @ 4Ω, 8Ω, 70V, 100V (80W at 2Ω, 160W at 25V)
	CONNECT 84	4 x 80 WRMS @ 4Ω, 8Ω, 70V, 100V (40W at 2Ω, 80W at 25V)
	CONNECT 164	4 x 160 WRMS @ 4Ω, 8Ω, 70V, 100V (80W at 2Ω, 160W at 25V)
	CONNECT 354	4 x 350 WRMS @ 4Ω, 8Ω, 70V, 100V (175W at 2Ω, 230W at 25V)
	CONNECT 704	4 x 700 WRMS @ 4Ω, 8Ω, 70V, 100V (350W at 2Ω, 330W at 25V)
	CONNECT352	2 x 350 WRMS @ 4Ω, 8Ω, 70V, 100V (175W at 2Ω, 230W at 25V)
	CONNECT 702	2 x 700 WRMS @ 4Ω, 8Ω, 70V, 100V (350W at 2Ω, 330W at 25V)
AUDIO SPEC	**Inputs**	4 Analog: Balanced Inputs with user selectable 26 dB and 34 dB input sensitivity
	THD+N	0.1% (20Hz to 20kHz)
	Frequency Response	+/- 0.5 dB @ 4Ω, 8Ω, 70V, 100V, -2.5dB @ 20kHz at 2Ω
	Signal to Noise Level	105dB (20Hz to 20kHz referenced to 8Ω)
	Crosstalk	70dB (20Hz to 20kHz)
	I/O Latency	1 ms DSP latency under any condition
	Load Impedance	LowZ down to 2 ohms, 70V direct, and 100V Direct per channel
	Output Classification	Class D with Proprietary Smart Power Bridge Technology allowing bridged output functionality without sacrificing an amplifier channel
	DC Offset	+/- 3mV
DSP	**DSP Architecture**	Analog Devices Sigma 96kHz DSP Processor with 32-bit Core with Sample Rate Converters
	Input Matrix	Routable matrix; any input to any output with primary and secondary input priority
	Crossovers	Up to 48 dB/Octave IIR Filters (Linkwitz Riley and Butterworth) and Bessel
	Parametric EQ	8 Band Parametric EQ per channel
	Output Delay	100ms per channel
	Output Protection	DC, VHF, and AC Mains Protection, Over-temp and Current Limiter, fan fault detection
	Limiting	Peak Voltage and RMS Voltage
	Load Monitoring	Realtime Load Monitoring and Pilot Tone Detection from Internal or External Sources
CONTROL, MONITORING, NETWORK	**Network Connectivity**	Wi-Fi or 100MB Ethernet with PoE or Built in Wi-Fi Access Point (IEEE 802.11 b/g/n WPA, WPA2, WEP)
	User Interface	Web Browser User Interface or 3rd Party API control Q-Sys
	Operating Systems	MAC, iOS, PC, Android
	Event Reporting	User Downloadable and Viewable Event and Fault log - POE allows for enhanced error monitoring
	External I/O	External I/O In: Toggles Remote On/Off | External I/O Out: Indicates Amplifier Health
	Cloud IoT	Cloud based IoT functionality
OPS DATA	**AC Mains**	100VAC - 240VAC +/- 15% 50Hz or 60Hz
	Temperature	Storage: -20°C to 90° C - Operating: 0°C to 60° C
	Power Supply	Universal Switch Mode Power Supply
	Safety Approvals	UL, CSA,CE, ETL, FCC, CCC, KETI, NOM , ROHS, PSE
PHYSICAL SPEC	**Dimensions (L x W x H)**	Product: 14.25" x 19" x 1U (362mm x 482mm x 1U) x 1U (362mm x 482mm x 1U) Shipping: 20" x 22.75" x 3.75" (508mm x 578mm x 95.25mm)
	Weight	Connect Series 352 & Connect Series 702: 10lbs / 3.4kg | Shipping: 17.4lbs / 7.9kg Connect Series 354 & Connect Series 704: 14lbs / 4kg | Shipping: 18.7lbs / 8.5kg Connect Series 84 & Connect Series 164: 12.05lbs / 5.46kg | Shipping: 16.35lbs / 7.41kg Connect Series 88 & Connect Series 168: 13.35lbs / 6.05kg | Shipping: 17.75lbs / 8.05kg
	Cooling	Front to Rear Variable Fan Speed Cooling | Fan Noise at idle is 50dB @ 1m | Fan Noise at 50% is 57dB @1m Fan Noise at full speed is 63dB @1m
	Connectors	Analog Input: 3 pin Amphenol Anytek, Output: 2 pin Amphenol Anytek, External IO: 3 pin Amphenol Anytek, Power in: IEC, Ethernet RJ45 In for Control, Primary and Secondary RJ45 in for Dante ***Note: 84, 164, 88, 168 do not have potentiometers on the rear panel

LEA Professional reserves the right to make any necessary changes to the specification. The LEA Professional Warranty is 6 years from date of purchase and product registration in the United States.

SCAN TO DOWNLOAD USER'S MANUAL

LEA

PERFORMANCE SERIES WIRELESS SPECIFICATIONS

	R41	R61
Frequency Range	522 MHz – 554 MHz / 554 MHz - 586 MHz	522 MHz – 586 MHz
Bandwidth	32 MHz	64 MHz
Compatible Systems	16 Compatible system operation	20 Compatible system operation
Switchable Frequencies	106 Preset frequencies	207 Preset frequencies
Manual Mode	n/a	2560 Frequencies (spaced 25 kHz apart)
Frequency Response	45 Hz – 18 kHz	45 Hz – 18 kHz
Compander System	2:1	2:1
Pilot Tone	32 kHz	32 kHz
Receiving System	Single tuner, diversity	Single tuner, true diversity
Signal-to-Noise Ratio	105 dB at 30 kHz deviation (A-weighted)	112 dB at 30 kHz deviation (A-weighted)
Total Harmonic Distortion	≤.7% (33 kHz deviation at 1 kHz)	≤.4% (33 kHz deviation at 1 kHz)
Sensitivity	5 dBµV (S/N 60 dB at 25 kHz deviation, A-weighted)	5 dBµV (S/N 60 dB at 25 kHz deviation, A-weighted)
Audio Output (AF=0)	Balanced: -12 dBv @ 25 kHz deviation, 600 ohm load 1/4": -18 dBv @ 25 kHz deviation, 10 kohm load	Balanced: -12 dBv @ 25 kHz deviation, 600 ohm load 1/4": -18 dBv @ 25 kHz deviation, 10 kohm load
Output Connectors	1/4", XLR	1/4", XLR
Audio Level Adjust	Balanced: -12 to +9 dBu Line: -24 to +4 dBu (adjustable in 3 dB-steps)	Balanced: -12 to +9 dBu Line: -24 to +4 dBu (adjustable in 6 dB-steps)
Range	300', (91 M)	450', (137 M)
Power Supply	100 - 240V / 50 - 60 Hz, 12V DC, 1A	100 - 240V / 50 - 60 Hz, 12V DC, 1A
Dimensions	205 mm (W) x 206 mm (D) x 44 mm (H) 406 mm (W) x 209 mm (D) x 44 mm (H) (R42)	205 mm (W) x 206 mm (D) x 44 mm (H) 406 mm (W) x 209 mm (D) x 44 mm (H) (R62)
Net Weight	1.92 lbs. / 870 g 4.4 lbs. / 2.0 kg (R42)	2.43 lbs. / 1.1 kg 4.65 lbs. / 2.12 kg (R62)

	H60	B60
RF Power Output	10 mW, 40 mW	10 mW, 40 mW
Frequency Bandwidth	64 MHz	64 MHz
Gain Controls	0 dB, -6 dB, -12 dB	0 db, -6 dB, -12 dB
Input Connector	n/a	3 pin mini-XLR
Batteries Included	2 AA 1.5 V	2 AA 1.5 V
Current Consumption	110 mA typical	110 mA typical
Battery Life	14 hours	14 hours
Input Impedance	n/a	Mic: 10 kohm, Line: 1 Mohm
Max Sound Pressure Level	>140 dB (depending on capsule)	128 dB to140 dB (depending on mic)
Dimensions	2.1" diameter body, 10.43" (L), 53 mm diameter body, 265 mm (L)	67 mm (W) x 90 mm (L) x 17 mm (D) 2.6" (W) x 3.5" (L) x .67" (D)
Net Weight	11.0 oz / 312 g (without battery)	3.0 oz / 85 g (without battery)

Specifications subject to change without notice.

AUDIX

ADS48 UHF Antenna Distribution System

OVERVIEW

The Audix ADS48 is a wide range UHF antenna distribution system that combines up to four wireless systems to be able to run off a single pair of antennas and power supply. The ADS48 has an internal switching power supply which eliminates the need for the individual DC power supplies normally needed for each receiver. RF signals are internally amplified in order to compensate for any loss that may result from splitting the signal.

SUPPLIED ACCESSORIES

1 x ADS48 Antenna Distribution Unit with rack mount
2 x Antennas - (see photo A below)
1 x IEC power cable
4 x Power Jumper Cables to provide power to individual receivers - (see photo B below)
8 x BNC-to-BNC Coaxial Cables for pass through connection for up to
4 additional receivers (single or dual) - (see photo C below)
2 x Coaxial cables for front mounting antennas - (see photo D below)

A

B

C

D

SPECIFICATIONS

Frequency Range	470 - 900 MHz
RF Output Level (Gain)	0 dB d + or – 3 dB
Input Impedance	50 Ohm
Output Impedance	50 Ohm
Power Voltage	100 – 240 V AC 50 / 60 Hz
Output DC Voltage	+12 V DC, 800 mA maximum
Antenna Input DC Voltage	8 V, 150 mA maximum
Dimensions	19" (W) x 2" (H) x 10" (D) 480 mm (W) x 45 mm (H) x 250 mm (D)
Net Weight	16 oz / 2.15 kg

SETTING UP THE DISTRIBUTION SYSTEM

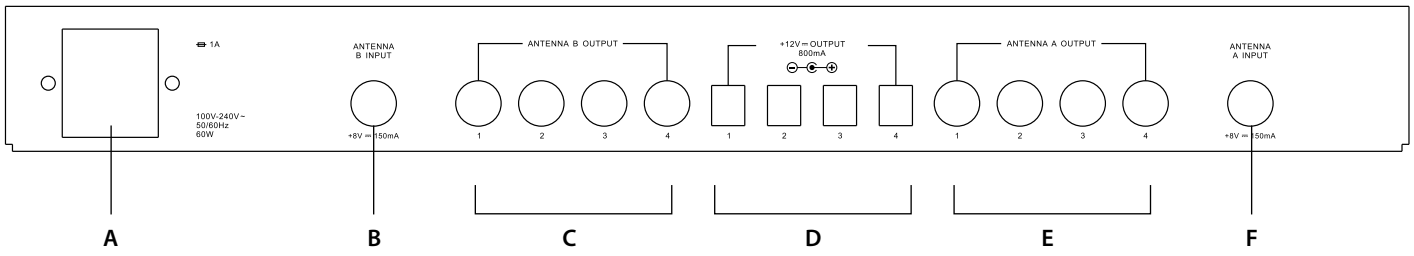
FRONT MOUNTING ANTENNAS (Do this step before installing in rack)

A. Remove the hex nut from the threaded end of the front mount antenna cable.

B. Insert the end of the front mounting cable through the back side of the rack hole. Note that the hole is slotted on one side – it can only go in one way. Screw on the hex nut to secure.

C. Attach the antenna cable on the left side to antenna A INPUT and the cable on the right side of the unit to antenna B INPUT. Install the ADS48 into the rack. (See B and F below)

BACK OF ADS48



CABLE INSTRUCTION FOR ANTENNA DISTRIBUTION FOR ADDITIONAL RECEIVERS: All cables are connected from the back side of the ADS48 to the back side of the additional receiver(s).

Using the BNC antenna coax cable, connect output Antenna A #1 from the ADS48 (see E above) to Antenna A on the Performance Series receiver and Antenna B #1 from the ADS48 (see C above) to Antenna B on the Performance Series receiver. Additional receivers are done in exactly the same way.

IMPORTANT: Antennas must be hooked up correctly A to A and B to B to work properly.

CABLE INSTRUCTION FOR POWER DISTRIBUTION: All cables are connected from the back side of the ADS48 to the back side of the additional receiver(s).

Using the power jumper cables plug one side of the cable into DC Output #1 on the ADS48 (see D above) and the other end to the DCV Input on the Performance Series receiver. Additional receivers will be done in the same sequence.

Power Cable: Plug the provided IEC power cable into the back of the ADS48 and then plug into electrical outlet. (see A above)

Power up the ADS48 via the power switch on the front. The light will indicate that the unit is powered up. The ADS48 acts as the master power unit for all receivers in the chain. Receivers will not power up without the master power switch being on.

PRODUCT REGISTRATION: Please register your product online at www.audixusa.com/docs_12/about/product_registration.shtml.

SERVICE AND WARRANTY: This microphone is under warranty for a period of 1 year to be free of defects in material and workmanship. In the event of a product failure due to materials or workmanship, Audix will repair or replace said product at no charge with proof of purchase. Audix does not pay or reimburse shipping costs for warranty repairs or returns. The warranty excludes any causes other than manufacturing defects, such as normal wear, abuse, environmental damage, shipping damage or failure to use or maintain the product per the supplied instructions. No Implied Warranties: All implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose are hereby excluded. The liability of Audix, if any, for damages relating to allegedly defective products shall be limited to the actual price paid by Dealer for such products and shall in no event include incidental or consequential damages of any kind. Should your microphone fail in any way, please contact the Audix Service department at 503.682.6933. A Return Authorization is required before returning any product. OTHER THAN THIS WARRANTY, AUDIX MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCTS, THE USE OF THE PRODUCTS, THE PERFORMANCE OF THE PRODUCTS. AUDIX SHALL NOT BE LIABLE FOR SPECIAL INCIDENTAL, CONSEQUENTIAL, INDIRECT OR SIMILAR DAMAGES ARISING FROM OR BASED ON THE SALE, USE, STORAGE OR DISPOSAL OF THE PRODUCTS, AUDIX'S SERVICE WORK, BREACH OF WARRANTY, BREACH OF CONTRACT. NEGLIGENCE, OR ANY OTHER THEORY OF LIABILITY, EVEN IF AUDIX HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

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AUDIX®

ver 1.1 07-19

RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

maxTX™ SERIES TWISTED PAIR
Model TX-TPR3A
Format-A Three-Pair Receiver

- Three -10 dBV Unbalanced or +4 dBu Balanced Outputs
- Phono Jack and Detachable Terminal Block Outputs
- Audio Outputs for All Three Pairs (A, B and C)
- Utilizes All Three Format-A Pairs
- Powered Locally or Remotely through RJ45 Jack
- Local Power Feeds all Modules Connected to INPUT
- Wiring Fault Protection by Automatic Resetting Fuse
- Local Power Input on Terminal Block or dc Power Jack
- Blue LED Indicates Module is Powered
- Studio-Quality Precision Active Balanced Circuitry

The TX-TPR3A is a three-pair audio receiving module compatible with RDL Format-A twisted pair products. It is built in the versatile Max-TX series enclosure. The durable adhesives provided with the TX-TPR3A permit permanent or removable mounting. The TX-TPR3A may be rack or surface mounted with optional TX™ series accessories.

APPLICATION: The TX-TPR3A is a three-pair audio receiving module compatible with RDL Format-A twisted pair products. Three outputs are provided corresponding to the three signal pairs A, B and C. The audio signal received on each pair of the RJ45 INPUT jack feeds the corresponding -10 dBV unbalanced RCA phono jack output and the +4 dBu balanced detachable terminal block output. A studio-quality buffer amplifier feeds the outputs at the correct operating level.

The TX-TPR3A features bridging inputs, allowing it to be connected to the LOOP OUT jack of other receivers. The bridging input circuits used in all FORMAT-A twisted pair receivers allow connection of up to 10 receiver outputs for each cable pair. The possibility of multiple receiver locations adds enormous flexibility in the design of audio routing systems using RDL FORMAT-A products. The TX-TPR3A may be powered directly from a 24 Vdc power supply using either the power jack or the detachable terminal block. Local power connected to the module is also fed to all modules connected to the INPUT RJ45 jack.

The TX-TPR3A may be remotely powered through the twisted pair cable from any other module, signal distributor or RDL power inserter connected to the same twisted pair cable. Module power is indicated by a front-panel LED.

RDL FORMAT-A features superior audio performance that rivals or exceeds shielded wiring. Design simplicity, ease of installation, unsurpassed flexibility, automatic fused power, exceptional hum rejection, low noise, and low distortion provide designers and installers the optimum choice in economical twisted pair products.

RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

FORMAT-A™

maxTX™ SERIES TWISTED PAIR
Model TX-TPR3A
Format-A Three-Pair Receiver

Installation/Operation

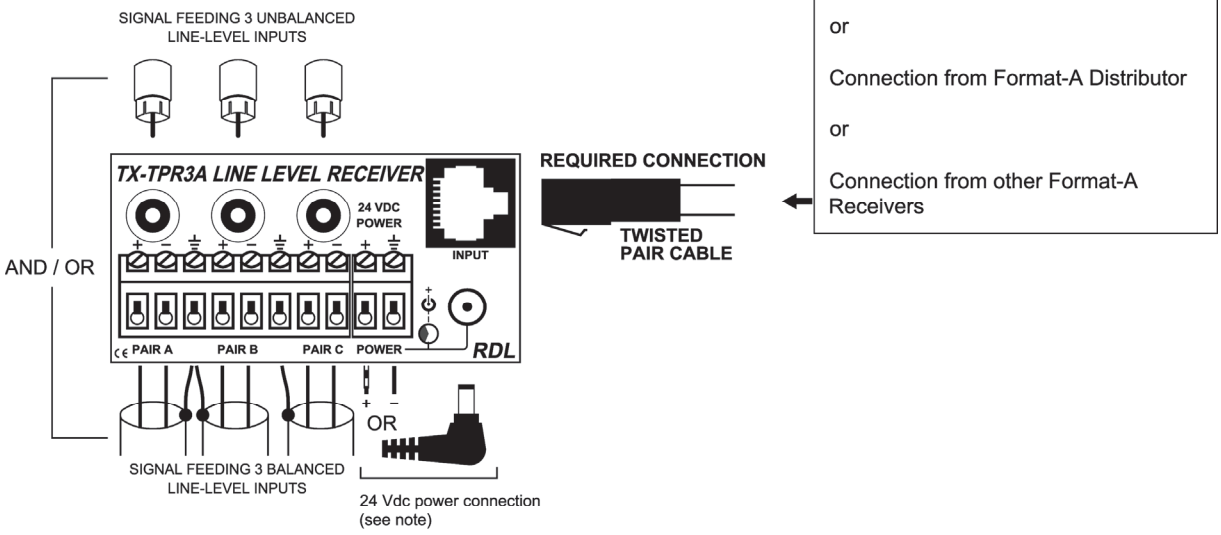
CE **EN55103-1 E1-E5; EN55103-2 E1-E4**
Typical Performance reflects product at publication time exclusive of EMC data, if any, supplied with product. Specifications are subject to change without notice.

STEP 1: Connect 24 Vdc to the **POWER** input (terminals or jack) if this module is not being powered through the twisted pair cable from another module, or if this module is located an excessive distance from the next powered module on the cable. Note: The front-panel power LED will be illuminated if this module is powered. If this module is powering other modules through the cable and if there is a wiring short, the short must be cleared then power must be turned off to this module for 10 seconds to reset the internal protection circuit.

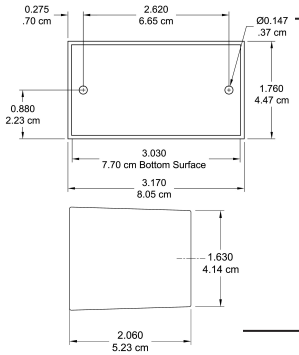
STEP 2: Connect the **UNBAL OUT** jacks to -10 dBV equipment inputs, and/or connect the **BAL OUT** terminals to +4 dBu equipment inputs.

STEP 3: Connect the **INPUT** twisted pair cable coming from Format-A senders or distributors and mount the module.

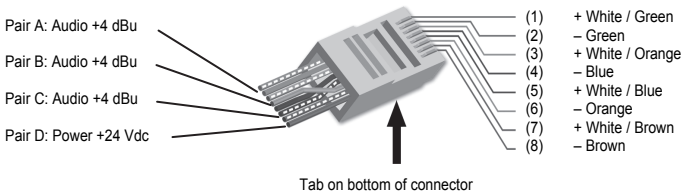
NOTE: All six audio outputs may be used simultaneously. Each Format-A pair A, B and C provides two associated outputs: one balanced, one unbalanced.



NOTE: Connect a 24 Vdc power supply to the module if power is not being supplied through a twisted pair cable from a connected module.



RJ45 Standard wiring



Tab on bottom of connector

RJ45 conductor colors shown are for 568A standard. The 568B standard may be used if the connectors at both ends of the cable are wired identically.

Safety Instructions/Consignes de sécurité/ Instrucciones de seguridad/Sicherheitshinweise:

EU Importer:
Importateur de l'UE:
Importador de la UE:
EU-Importeur:

RDL Europe B.V.
Joan Muyskenweg 124
1114 AN Amsterdam

TYPICAL PERFORMANCE

Input:	RDL TP Format-A
Input Connection:	RJ45
Format-A Signal Pairs Used (3):	A, B, C
Outputs (6):	150 Ω Balanced (3); 1 kΩ Unbalanced (3)
Output Connection:	Detachable Terminal Block (Bal); RCA (Unbal)
Output Level:	+4 dBu Bal., +22 dBu Max; -10 dBV Unbal.
Frequency Response:	10 Hz to 50 kHz (+/- 0.1 dB)
THD+N:	< 0.005%
Noise below +4 dBu:	< 90 dB
Crosstalk:	< 90 dB (1 kHz); < 75 dB (20 Hz to 20 kHz)
Headroom above +4 dBu:	> 18 dB
CMRR:	> 80 dB (50 Hz to 150 Hz)
Indicator:	Power In
Power Connections (3):	Power Jack; Detachable Terminal Block; RJ45
Power Requirement:	24 Vdc @ 65 mA plus connected loads
Maximum Load Current:	135 mA
Dimensions:	3.17" (8.05 cm) W; 1.76" (4.47 cm) H; 2.06" (5.23 cm) D

Radio Design Labs Technical Support Centers
U.S.A. (800) 933-1780, (928) 778-3554; Fax: (928) 778-3506
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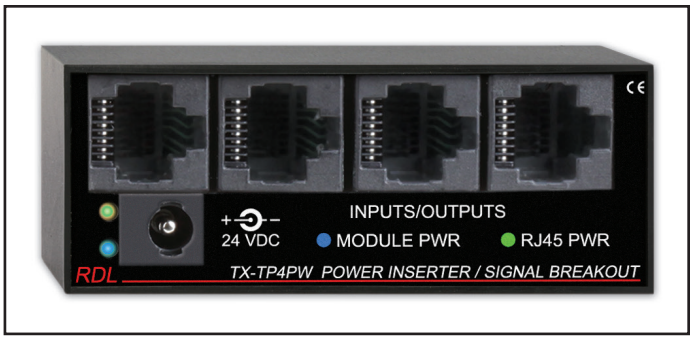
RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

TX™ SERIES
Model TX-TP4PW
Power Inserter / Signal Breakout

- Power Remote Senders and Receivers from Convenient Location
- 24 Vdc Power Input on dc Power Jack
- Blue Power LED Shows Module is Receiving Power
- Green LED Indicates Correct dc Output Voltage on RJ45s
- Four Associated RJ45 Jacks Provide Power Output
- Pairs A, B and C are Connected Between all Four RJ45 Connectors
- Power up to Three High-Current Format-A Receivers



The TX-TP4PW is part of the group of versatile TX series products from Radio Design Labs. TX modules feature the superior engineering and components common to RDL products. The durable adhesives provided with the TX-TP4PW permit permanent or removable mounting. The TX-TP4PW may be rack or surface mounted with optional TX series accessories.

APPLICATION: The TX-TP4PW is a power inserter compatible with RDL twisted pair products. The TX-TP4PW is powered from a 24 Vdc power supply using a dc power jack. Four RJ45 jacks are provided to connect remote twisted pair senders and receivers. The audio signals on pairs A, B and C are connected between all four RJ45 connectors.

When one RJ45 receives signals from twisted pair senders, the remaining three RJ45 jacks can each connect to a separate twisted pair receiver. Three jacks are provided so that three home runs to twisted pair receivers are possible. This is particularly useful for powering three high current receivers that cannot be daisy chained, such as D-PSP1A Powered Speakers.

The TX-TP4PW may also connect to three home runs from separate Format-A senders. A sender set to feed Pair A connects to one RJ45 on the TX-TP4PW. Senders feeding pairs B and C connect to two other RJ45s. The fourth RJ45 becomes an output with signals on all pairs A, B and C. This is useful in installations where daisy chaining senders is not practical.

Power is provided to all modules connected to the RJ45 jacks. Signal pairs feed through the associated RJ45s. Output voltage is protected by an automatically resetting fuse. The output power LED facilitates identification of wiring faults. Module power is indicated by a front-panel LED.

RDL®
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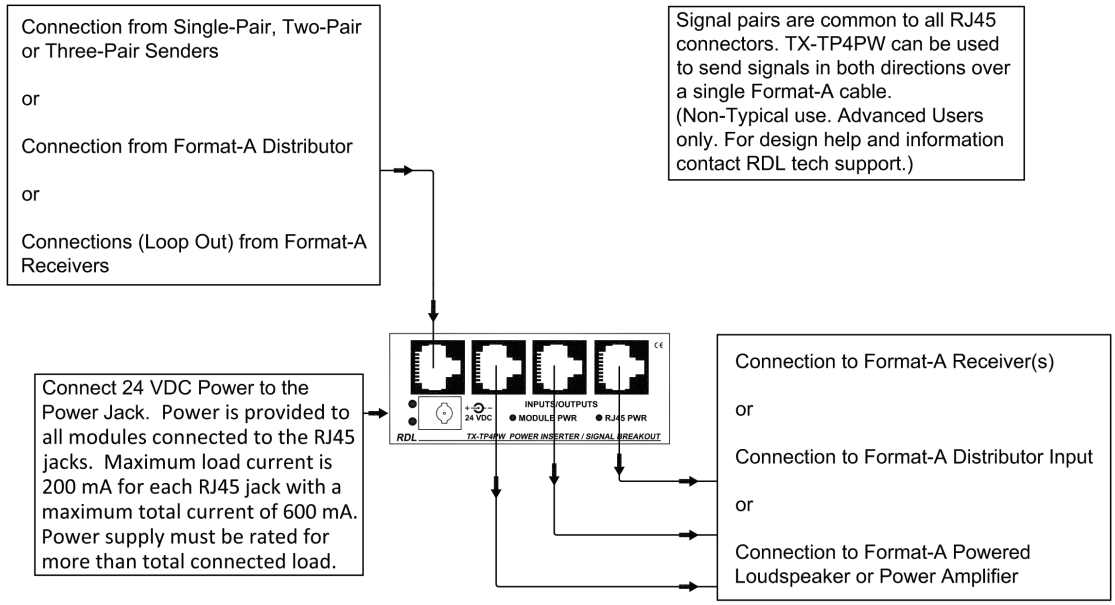
SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

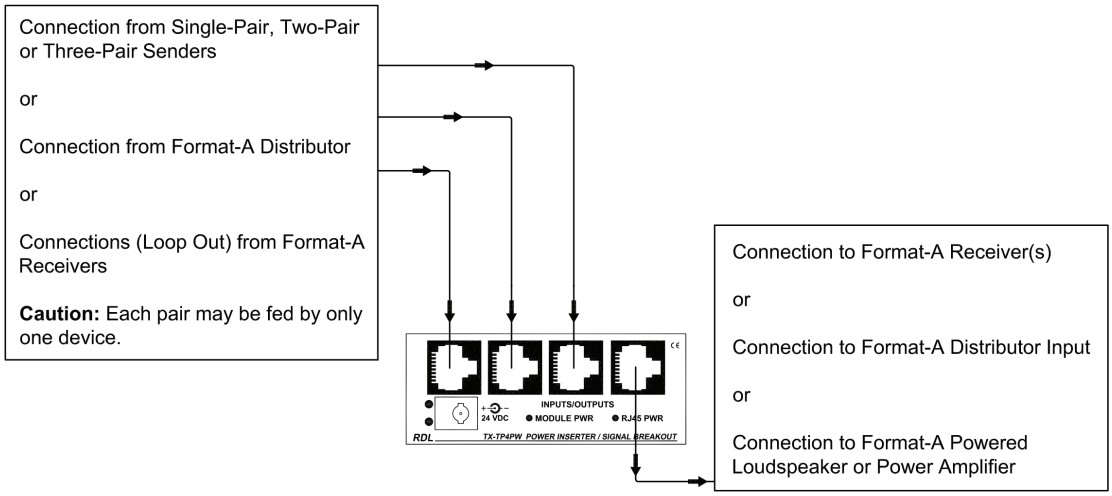
FORMAT-A™

Installation/Operation

EN55103-1 E1-E5; EN55103-2 E1-E4
Typical Performance reflects product at publication time exclusive of EMC data, if any, supplied with product. Specifications are subject to change without notice.

TX™ SERIES
Model TX-TP4PW
Power Inserter / Signal Breakout





TYPICAL PERFORMANCE

Outputs (4):	RJ45
Indicators (2):	Power In; Power Out
Power Connection:	Power Jack
Ambient Operating Environment:	0° C to 55° C
Maximum Load Current:	200 mA (each RJ45 output)
Power Requirement:	24 Vdc @ 15 mA plus connected loads
Dimensions:	3.0” (7.6 cm) W; 1.2” (3.0 cm) H; 1.4” (3.6 cm) D

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RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

TWISTED PAIR FORMAT-A
Models D SERIES-BT1A
Wall-Mounted Bluetooth® Audio Format-A Interface

- Bluetooth Audio Input for Installed Sound System
- Intuitive Single Button Pairing with LED Status Indication
- Special Software Not Required for Module Setup
- Customize the Module ID Name and Programming Password through the Bluetooth Connection
- Sends Received Bluetooth Audio to RDL Format-A Receivers
- Mono Summed or Stereo Audio Input Mode is Switch-Selectable on Rear Panel
- Rear-Panel Switch Selects which RJ45 Pair (A, B or C) is Fed in Mono Summed Mode
- Daisy-Chain up to Three D SERIES-BT1A modules to One Format-A Receiver in Mono Mode
- Remotely Powered through Twisted Pair Cable
- Signal and Power Pair Pass-Through on RJ45 Jacks

The D SERIES-BT1A is part of the group of versatile wall-mounted products from Radio Design Labs. The standard mounting case can be directly fastened in North American electrical boxes or in RDL International wall boxes.

APPLICATION: The D SERIES-BT1A modules are Bluetooth audio receiving modules compatible with RDL® Format-A twisted pair receivers. When paired with a compatible Bluetooth enabled device, the module receives stereo audio from the Bluetooth source. The stereo signal is sent through two Format-A pairs to any RDL Format-A receiver. A stereo/mono switch set by the installer permits summed mono audio to be sent over one switch-selected pair to the Format-A receiver.

If set for stereo operation, an additional Format-A source (set to Pair A) may be daisy chained with the D SERIES-BT1A to a three-pair Format-A receiver. If set for mono operation, up to three D SERIES-BT1A modules may be daisy chained to a single three-pair Format-A receiver. Connections between Format-A modules and Format-A receivers use standard CATx cable with RJ45 connectors.

The D SERIES-BT1A modules are powered from the Format-A receiver. The installer can customize the module name and programming password through the Bluetooth connection using a smartphone, computer or tablet terminal program. These modules feature studio-quality circuits and analog filters to provide audio performance exceeding expectations from consumer interface technologies. High performance, simplicity of operation and efficiency of installation make RDL the best value in professional Bluetooth interfaces.

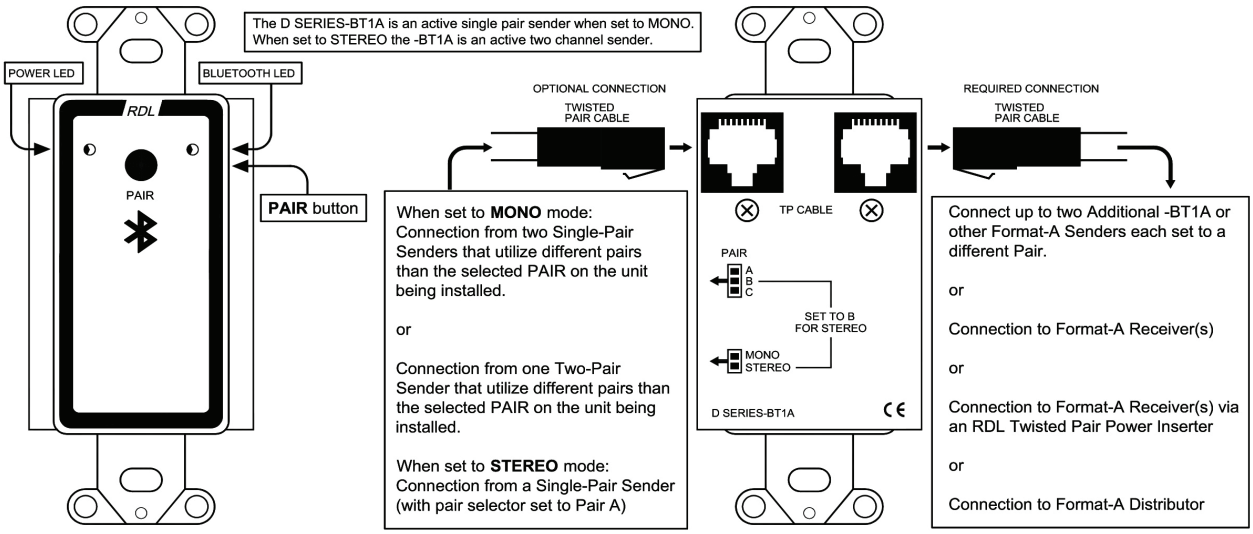
RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

TWISTED PAIR FORMAT-A
Models D SERIES-BT1A
Wall-Mounted Bluetooth® Audio Format-A Interface

Installation/Operation

Declaration of Conformity available from rdlnet.com.
Sole EMC specifications provided on product package.
Specifications are subject to change without notice.



Instructions for Bluetooth pairing

These instructions are based on the default RDL unit identification as RDL_BT_FA. If the RDL unit has been renamed by the installer, substitute the new name for RDL_BT_FA in the following steps.

PAIRING

1] Press and hold the PAIR button until the blue LED on the RDL unit illuminates, then release.

Note: The blue LED flashes as long as the unit is available for pairing. If the blue LED stops flashing before the pairing process is completed, restart these steps.

2] While the blue LED is flashing, locate RDL_BT_FA on your device's Bluetooth settings and click PAIR DEVICE, following screen prompts to complete the pairing process.

Note: The blue LED glows steady while the RDL unit is paired.

UN-PAIRING

The RDL unit will unpair automatically 30 seconds after the user device leaves the area. The user device may be manually disconnected by pressing and holding the PAIR button on the RDL unit.

RE-PAIRING

1] Press and hold the PAIR button until the blue LED on the RDL unit illuminates, then release.

2] While the blue LED is flashing, locate RDL_BT_FA under Previously Connected Devices on your device's Bluetooth settings and click RDL_BT_FA, following screen prompts to complete the re-pairing process.

Note: If the re-pairing fails, click Forget Device on the user device and pair the RDL unit as a new device.

Upon successful pairing, the user device applications for audio playback through a Bluetooth interface may be used.

TYPICAL PERFORMANCE

Output:	RDL Format-A (RJ45)
Format-A Input:	RJ45 LOOP IN
Format-A Signal Pair Used:	A, B, or C (summed mono mode, rear-panel switch-selectable); B and C (stereo mode, pair A pass through)
Frequency Response:	20 Hz to 20 kHz (± 0.5 dB)
THD+N:	< 0.1%
Noise below -20 dBFS:	< -70 dB
Crosstalk (channel to channel):	< 70 dB
Audio Operating Levels:	-20 dBFS = +4 dBu (balanced), nominal
Ambient Operating Environment:	0° C to 40° C
Power Requirement:	24 Vdc @ 100 mA (through RJ45)
Dimensions:	1.73" (4.39 cm) W; 4.11" (10.44 cm) H; 1.62" (4.11 cm) D
Package Type:	Cardboard Box
Package Dimensions:	3.625 x 4.625 x 2.125 in.
Shipping Weight:	0.45 lb.
WEEE weight:	0.29 lbs.
Tariff code:	8518.50.0000

Scan the QR code above or see the DD SERIES-BTN44 page at rdlnet.com for programming information.

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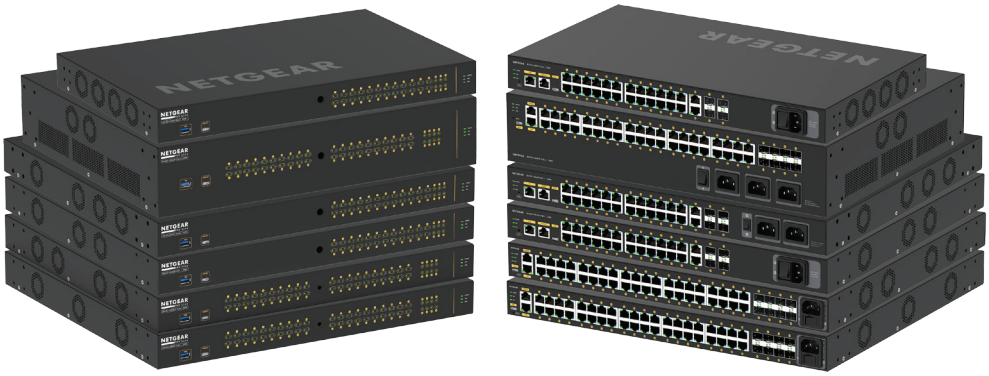
NETGEAR®

AV Line

Datasheet | **M4250 series**

AV Line Managed Switches



Switching Engineered for AV over IP

Introducing the NETGEAR AV Line of M4250 Switches, developed and engineered for audio/video professionals with dedicated service and support. M4250 has been built from the ground up for the growing AV over IP market, combining years of networking expertise in AV with M4300 and M4500 series with best practices from leading experts in the professional AV market. AV codecs generally use 1Gbps or 10Gbps per stream and the AV Line of M4250 targets the widespread 1Gbps codecs.

PoE+, Ultra90 PoE++ and rear-facing ports ensure a clean integration in AV racks. M4250 switches come pre-configured for standard audio and video signals. When requirements are more specific, an AV user interface offers customization with port-based profiles. For audio, Dante, Q-SYS, AES67, and AVB profiles are available. For video the M4250 offers profiles for NVX, AMX, Q-SYS, NDI, Dante etc. as well as audio/video/control mixed profiles. When multiple switches are used, NETGEAR IGMP Plus™ brings automation for you to just connect them together, or with M4300 and M4500 switches.

Highlights

Extended AV features

- Dedicated AV web-based GUI interface for more specific AV installations
- Color-based AV profiles can be applied to the different ports
- Dante, Q-SYS, AES67 and AVB audio profiles
- NVX, SVSI, Q-SYS, NDI and Dante video profiles
- Audio / video / control mixed profiles
- Automatic switch interconnect with NETGEAR Auto-Trunk, Auto-LAG and IGMP Plus
- Common Layer 2 and Layer 3 switching engine across all M4250 models
- Built-in IT web GUI, console, telnet and SSH consistent with other NETGEAR M4300 and M4500 series
- Feature set includes static, RIP and PIM routing, DHCP Server and PTPv2

Audio Video Bridging (AVB) services

- AVB is one of the many features designed into the M4250 product line
- AVB is an industry standard for transporting content over a network
- AVB is used most often when very low latency is required such as in live performances when lip sync is critical

Other IT use cases

- Standard or recessed mounting with all ports in the back, or all ports in the front
- Fully featured L2/L3/L4 platform for midsize Enterprise campus networks, IoT and IPTV

Industry standard management

- Industry standard command line interface (CLI), main NETGEAR IT web interface (GUI), SNMP, sFlow and RSPAN
- The NETGEAR Engage™ Controller manages all M4250, M4300, M4350, and M4500 switches for your AV installations.

Industry leading warranty

- NETGEAR M4250 series is covered under NETGEAR ProSAFE Limited Lifetime Hardware Warranty*
- 90 days of Technical Support via phone and email, Lifetime Technical Support through online chat and Lifetime Next Business Day hardware replacement

Hardware-at-a-Glance

			REAR (REVERSIBLE)*					LEDs	MANAGEMENT	
Model Name	Form-Factor	Switching Fabric	10/100/1000 BASE-T RJ45 ports	100/1000/2.5G BASE-T RJ45 ports	1000BASE-X SFP ports	1000/10G BASE-X SFP+ ports	PSU	Status Information	Out-of-band Console	Model Number
M4250-9G1F-PoE+	Desktop 210 x 40 x 140mm	20 Gbps	8 ports PoE+ (110W) 1 additional port	-	1 port SFP 1G	-	1 x External Power Adapter (130W)	In Front: Power LED PoE Max LED Fan LED (GSM4210PX only)	Ethernet: 1G Out-of-band (Rear) Console: USB-C (Front) Storage: USB-A (Rear)	GSM4210PD
M4250-8G2XF-PoE+	Desktop 210 x 40 x 140mm	56 Gbps	8 ports PoE+ (220W)	-	-	2 ports SFP+ 1G; 10G	1 x External Power Adapter (254W)			GSM4210PX
M4250-10G2F-PoE+	1U rackmount 440 x 43.2 x 200mm	24 Gbps	8 ports PoE+ (125W) 2 additional ports	-	2 ports SFP 1G	-	1 x Fixed (C14) On/off switch	Available both in front and in the rear: Power LED PoE Max LED (PoE models) Fan LED Port LEDs	Ethernet: 1G Out-of-band (Rear) Console: RJ45 RS232 (Rear) Console: USB-C (Rear) Storage: USB-A (Front) LED Ext: USB-C (Front)	GSM4212P
M4250-10G2XF-PoE+	1U rackmount 440 x 43.2 x 200mm	60 Gbps	8 ports PoE+ (240W) 2 additional ports	-	-	2 ports SFP+ 1G, 10G	1 x Fixed (C14) On/off switch			GSM4212PX
M4250-10G2XF-PoE++	1U rackmount 440 x 43.2 x 257mm	60 Gbps	8 ports PoE++** (720W) 2 additional ports	-	-	2 ports SFP+ 1G, 10G	1 x Fixed (C14) On/off switch			GSM4212UX
M4250-26G4F-PoE+	1U rackmount 440x43.2x257mm	60 Gbps	24 ports PoE+ (300W) 2 additional ports	-	4 ports SFP 1G		1 x Fixed (C14) On/Off switch			GSM4230P
M4250-26G4F-PoE++	1U rackmount 440x43.2x400mm	60 Gbps	24 ports PoE++ (1,440W)** (1 PSU/720W; 2 PSU/1,440W) 2 additional ports	-	4 ports SFP 1G		2 x Fixed (C14) On/Off switch			GSM4230UP
M4250-26G4XF-PoE+	1U rackmount 440x43.2x400mm	132 Gbps	24 ports PoE+ (480W) 2 additional ports	-	-	4 ports SFP+ 1G; 10G	1 x Fixed (C14) On/Off switch			GSM4230PX
M4250-40G8F-PoE+	1U rackmount 440x43.2x400mm	96 Gbps	40 ports PoE+ (480W)	-	8 ports SFP 1G		1 x Fixed (C14) On/Off switch			GSM4248P
M4250-40G8XF-PoE+	1U rackmount 440x43.2x400mm	240 Gbps	40 ports PoE+ (960W)	-	-	8 ports SFP+ 1G; 10G	1 x Fixed (C14) On/Off switch			GSM4248PX
M4250-40G8XF-PoE++	2U rackmount 440x86.4x350mm	240 Gbps	40 ports PoE++ (2,880W)** (1 PSU/720W; 2 PSU/1,650W; 3 PSU/2,880W)	-	-	8 ports SFP+ 1G; 10G	3 x Fixed (C14) On/Off switch			GSM4248UX
M4250-12M2XF	1U rackmount 440x43.2x100mm	100 Gbps	-	12 ports 100M, 1G, 2.5G	-	2 ports SFP+ 1G, 10G	1 x Fixed (C14) On/Off switch			MSM4214X
M4250-16XF	1U rackmount 440x43.2x200mm	320 Gbps	-	-	-	16 ports SFP+ 10G only (First 12 ports support 1G)	1 x Fixed (C14) On/Off switch			XSM4216F

* Reversed mounting is possible when ports are desired on the front of the rack by using the standard rackmount ears, or the included alternate rackmount ears to mount the switch recessed by 2-Inches to allow for the cabling.

** Ultra90 PoE++ 802.3bt is compatible with 802.3af PoE (15.4W), 802.3at PoE+ (30W) and 802.3bt (60W, 75W and 90W).

GSM4210PX
GSM4210PD

Acoustic-at-a-Glance

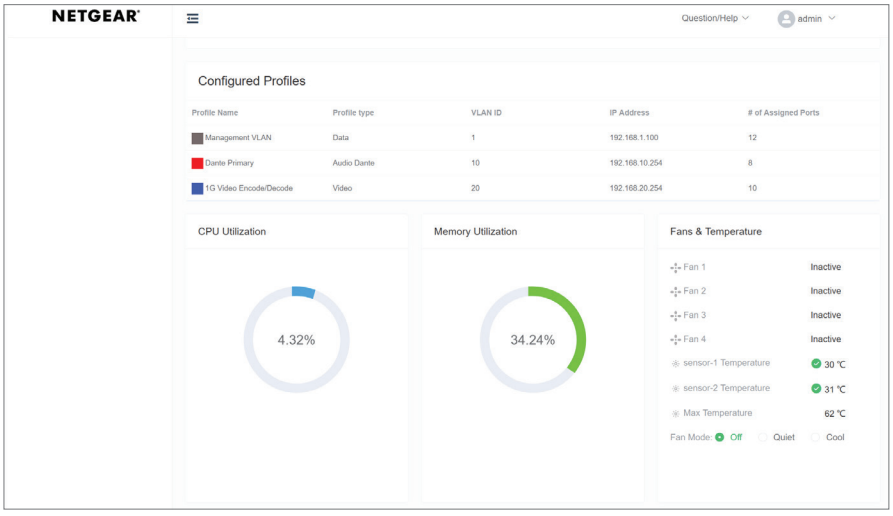
	FAN OFF MODE Setting / maximum loading*					QUIET MODE Setting at 25°C ambient**					COOL MODE Setting at 25°C ambient**			
Model Name	Fanless State	Ambient	Sensor	PoE Power Load	Conditions	PoE Power Load	Fan Duty	Sensor	Case Temp (Top)	Acoustic	Fan Duty	Case Temp (Top)	Acoustic	Model Number
M4250-9G1F-PoE+	The switch is fanless	25°C	50°C	110W	All ports can be used	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GSM4210PD
M4250-8G2XF-PoE+	0dBA / 37.4°C Case Temp	25°C	S1&2 <= 60°C S3 <= 58°C	180W	RJ45 ports only (no SFP+)	220W	10	<= 60°C	33.6°C	19.3dBA	100	28.8°C	35.3dBA	GSM4210PX
M4250-10G2F-PoE+	0dBA / 41.8°C Case Temp	25°C	<= 42°C	80W	All ports can be used	125W	25	<= 36°C	35.9°C	27.38dBA	100	27.2°C	55dBA	GSM4212P
M4250-10G2XF-PoE+	0dBA / 39.6°C Case Temp	25°C	<= 44°C	90W	All ports can be used	240W	25	<= 37°C	40.6°C	27.4dBA	100	30.9°C	56dBA	GSM4212PX
M4250-10G2XF-PoE++	0dBA / 44.6°C Case Temp	25°C	<= 67°C	45W	All ports can be used	0-250W	25	<= 49°C	42.9°C	34.57dBA	100	41.8°C	66.23dBA	GSM4212UX
						250-380W	30	<= 49°C	43.3°C	40dBA				
						380W-500W	35	<= 49°C	44.9°C	44.22dBA				
						500W-720W	40	<= 49°C	52.1°C	47.19dBA				
M4250-26G4F-PoE+	0dBA / 40.5°C Case Temp	25°C	S1<= 43°C S2<= 47°C	45W	8 ports PoE (no SFP)	0-200W	25	S1<= 43°C S2<=47°C	43.5°C	28dBA	100	36.7°C	57dBA	GSM4230P
						200W-300W	30	S1<= 44°C S2<=48°C	51.3°C	34dBA				
M4250-26G4F-PoE++	Not Supported					0-280W	20	S1<= 37°C S2<=39°C	52.9°C	28dBA	100	720W 36.7°C 1,440W 46°C	69dBA	GSM4230UP
						280W-360W	25	S1<= 38°C S2<=40°C	57.4°C	36dBA				
						360W-420W	30	S1<= 39°C S2<=41°C	54.4°C	41dBA				
						420W-480W	35	S1<= 40°C S2<=42°C	53.3°C	47dBA				
						480W-540W	40	S1<= 41°C S2<=43°C	52.3°C	50dBA				
						540W-600W	45	S1<= 42°C S2<=44°C	54.4°C	54dBA				
						600W-660W	50	S1<= 43°C S2<=45°C	53.6°C	57dBA				
						660W-1,440W	55	S1<= 44°C S2<=46°C	55.7°C	60dBA				
M4250-26G4XF-PoE+	0dBA / 43.4°C Case Temp	25°C	S1<= 41°C S2<= 46°C	45W	8 ports PoE (no SFP+)	0-350W	20	S1<= 41°C S2<=46°C	39.3°C	25dBA	100	32.3°C	67dBA	GSM4230PX
						350W-480W	30	S1<= 42°C S2<=47°C	36.8°C	42dBA				
M4250-40G8F-PoE+	0dBA / 45.2°C Case Temp	25°C	S1<= 37°C S2<= 50°C	30W	8 ports PoE (No SFP)	0-150W	20	S1<= 37°C S2<=50°C	43.1°C	30dBA	100	35.4°C	68dBA	GSM4248P
						150W-200W	25	S1<= 38°C	42.1°C	36dBA				
						200W-340W	30	S1<= 39°C S2<=51°C	44°C	40dBA				
						340W-480W	35	S1<= 40°C	47.6°C	47dBA				

Acoustic-at-a-Glance

	FAN OFF MODE Setting / maximum loading*					QUIET MODE Setting at 25°C ambient**					COOL MODE Setting at 25°C ambient**			
Model Name	Fanless State	Ambient	Sensor	PoE Power Load	Conditions	PoE Power Load	Fan Duty	Sensor	Case Temp (Top)	Acoustic	Fan Duty	Case Temp (Top)	Acoustic	Model Number
M4250-40G8XF-PoE+	Not Supported					0-400W	20	S1<= 33°C S2<=46°C	54.2°C	29dBA	100	36.1°C	69dBA	GSM4248PX
						400W-480W	25	S1<= 34°C S2<=47°C	42.8°C	35dBA				
						480W-560W	30	S1<= 35°C S2<=48°C	41.9°C	41dBA				
						560W-640W	35	S1<= 36°C S2<=49°C	42.1°C	48dBA				
						640W-720W	40	S1<= 37°C S2<=50°C	40.9°C	51dBA				
						720W-800W	45	S1<= 38°C S2<=51°C	40.7°C	54dBA				
						800W-880W	50	S1<= 39°C S2<=52°C	40.4°C	57dBA				
						880W-960W	55	S1<= 40°C S2<=53°C	40.5°C	59dBA				
M4250-40G8XF-PoE++	Not Supported					0-160W	20	S1<= 37°C S2<=49°C	41.3°C	30dBA	100	720W 31.4°C 1,650W 33.5°C 2,880W 35.4°C	71dBA	GSM4248UX
						160W-240W	25	S1<= 38°C	38.8°C	36dBA				
						240W-320W	30	S1<= 39°C S2<=50°C	36.4°C	42dBA				
						320W-400W	35	S1<= 40°C	35.3°C	49dBA				
						400W-480W	40	S1<= 41°C S2<=51°C	34.4°C	51dBA				
						480W-560W	45	S1<= 42°C	34.3°C	55dBA				
						560W-640W	50	S1<= 43°C S2<=52°C	35.1°C	57dBA				
						660W-2,880W	55	S1<= 44°C	36.5°C	60dBA				
M4250-12M2XF	0dBA / 56°C Case Temp	25°C	<= 64°C	-	8 ports 2.5G (no SFP+)	-	25	<= 58°C	53.5°C	28.5dBA	100	33.2°C	55dBA	MSM4214X
M4250-16XF	0dBA / 41.3°C Case Temp	25°C	<= 78°C	-	8 ports SFP+	-	25	<= 67°C	41.6°C	27.44dBA	100	30.3°C	57dBA	XSM4216F

* Software-controlled fan adjustments enable the fans to be turned off when ambient temperature and PoE loads are appropriate for a totally fanless operation.

** dBA values are SPL (Sound Pressure Level) values, testing following the ISO-7779 standard. Bystander Mode. Chamber Temp 25°C during testing. Full, 100%, Data and PoE loaded. Worst case.



SAMSUNG

Crystal UHD Signage

QBC series

Slim design.
Stunning performance.

Introducing the QBC series, the slimmest display in the Samsung's UHD signage offerings. This products deliver an unparalleled slim design that fits into any business, while delivering the visual quality to make a big impact. The sleek form factor is easily installed to fit any room design and delivers stunning visual performance. Dynamic Crystal Color and Quantum Processor Lite 4K delivering consistent, lifelike colors to any content. This is not just a display for simple advertising. It's a display that brings the solutions, tools, and picture quality to grow to your business, no matter what industry you're in.

Key features

Ultra Slim Depth

The unparalleled ultra-slim thickness of 28.5mm makes it the thinnest option in Samsung's UHD Signage series. It comes with the Slim Fit Wall Mount, which allows you to install it neatly and easily in any environment.

Even Bezels and Centered VESA Holes

The bezels are even on all four sides of the display for a consistent look, while the central VESA mounting holes ensure secure mounting and easy adjustability to portrait mode.

Dynamic Crystal Color

One billion shades of color let you see every subtlety with lifelike color variations. Images are clear and consistent thanks to Samsung's industry leading video processing and upscaling technology.

Smart Calibration

Guarantee complete brand consistency across every location. Using the Samsung mobile app, calibrate displays to showcase brand logos and other collateral in the exact colors required.

Energy Star / EPEAT Bronze

Samsung is making diverse efforts to reduce our environmental impact in smart signage, and encouraging users to pursue a more sustainable life.

Specifications

Model			QB43C	QB50C	QB55C	QB65C	QB75C	QB85C
Display Panel	Diagonal Size	Class	43	50	55	65	75	85
		Measured	42.5	48.5	54.6	64.5	74.5	84.5
	Resolution		3,840 x 2,160 (16:9)	3,840 x 2,160 (16:9)	3,840 x 2,160 (16:9)	3,840 x 2,160 (16:9)	3,840 x 2,160 (16:9)	3,840 x 2,160 (16:9)
	Brightness (Typ.)		350 nit	350 nit	350 nit	350 nit	350 nit	350 nit
	Orientation		Landscape/Portrait	Landscape/Portrait	Landscape/Portrait	Landscape/Portrait	Landscape/Portrait	Landscape/Portrait
	Haze		2%	3%	2%	2%	2%	2%
	Contrast Ratio (Typ.)		4,000:1	4,000:1	4,000:1	4,000:1	4,000:1	4,000:1
	Type		VA	VA	VA	VA	VA	VA
	Active Display Area		941.184 (H) x 529.416 (V)	1,095.84 (H) x 616.41 (V)	1,209.6 (H) x 680.4 (V)	1,428.48 (H) x 803.52 (V)	1,650.24 (H) x 928.26 (V)	1,872.0 (H) x 1053.01 (V)
	Pixel Pitch (mm)		0.245 x 0.245	0.285 x 0.285	0.315 x 0.315	0.372 x 0.372	0.429 x 0.429	0.487 x 0.487
	Color Gamut		NTSC 72%	NTSC 72%	NTSC 72%	NTSC 72%	NTSC 72%	NTSC 72%
	Operation Hour		16/7	16/7	16/7	16/7	16/7	16/7
Connectivity / Sound	Input	Video	HDMI 2.0 (3)	HDMI 2.0 (3)	HDMI 2.0 (3)	HDMI 2.0 (3)	HDMI 2.0 (3)	HDMI 2.0 (3)
		Audio	N/A	N/A	N/A	N/A	N/A	N/A
		USB	USB 2.0 x 2	USB 2.0 x 2	USB 2.0 x 2	USB 2.0 x 2	USB 2.0 x 2	USB 2.0 x 2
		Tuner	N/A	N/A	N/A	N/A	N/A	N/A
	Output	Video	N/A	N/A	N/A	N/A	N/A	N/A
		Audio	Stereo mini Jack	Stereo mini Jack	Stereo mini Jack	Stereo mini Jack	Stereo mini Jack	Stereo mini Jack
		USB	N/A	N/A	N/A	N/A	N/A	N/A
	WiFi / BT		O/O	O/O	O/O	O/O	O/O	O / O
	External Control		RS232C (In/Out), RJ45	RS232C (In/Out), RJ45	RS232C (In/Out), RJ45	RS232C (In/Out), RJ45	RS232C (In/Out), RJ45	RS232C (In/Out), RJ45
	Speaker		10W 2ch	10W 2ch	10W 2ch	10W 2ch	10W 2ch	10W 2ch
Mechanical Spec	Dimension (mm / in.)	Set	969.5 x 557.8 x 28.5 mm / 38.2 x 22 x 1.1 in.	1,124.1 x 644.8 x 28.5 mm / 44.3 x 25.4 x 1.1 in.	1,237.9 x 708.8 x 28.5 mm / 48.7 x 27.9 x 1.1 in.	1,456.8 x 831.9 x 28.5 mm / 57.4 x 32.8 x 1.1 in.	1,682.3 x 960.4 x 28.5 mm / 66.2 x 37.8 x 1.1 in.	1,904.3 x 1,085.3 x 28.5 mm / 75 x42.7 x 1.1 in.
		Package	1,093 x 667 x 126 mm / 43 x 26.3 x 5 in.	1,246 x 761 x 131 mm / 49 x 30 x 5.2 in.	1,403 x 835 x 148 mm / 55.2 x 32.9 x 5.8 in.	1,616 x 945 x 164 mm / 63.6 x 37.2 x 6.5 in.	1,839 x 1,113 x 180 mm / 72.4 x 43.8 x 7 in.	2,077 x 1,222 x 210 mm / 81.8 x 48.1 x 8.3 in.
	Weight (kg / lbs.)	Set	8.8 kg / 19.4 lbs.	11.8 kg / 26 lbs.	15.7 kg / 34.6 lbs.	21.5 kg / 47.4 lbs.	33.4 kg / 73.6 lbs.	41.9 kg / 92.4 lbs.
		Package	11.3 kg / 24.9 lbs.	14.9 kg / 32.8 lbs.	19.9 kg / 43.9 lbs.	28.6 kg / 63 lbs.	44.1 kg / 97.2 lbs.	53.9 kg / 118.8 lbs.
	VESA Mount		200 x 200	200 x 200	200 x 200	400 x 300	400 x 400	400 x 400
	VESA Mount Screw (Min~Max)		M8, 12~14mm	M8, 12~14mm	M8, 12~14mm	M8, 12~14mm	M8, 12~14mm	M8, 12~14mm
	Bezel Width (mm)		11.5 (Even)	11.5 (Even)	11.5 (Even)	11.5 (Even)	13.4 (Even)	13.9 (Even)
Features	Key		UHD Signage with Built-in MagicInfoS10, SSSP10.0	UHD Signage with Built-in MagicInfoS10, SSSP10.0	UHD Signage with Built-in MagicInfoS10, SSSP10.0	UHD Signage with Built-in MagicInfoS10, SSSP10.0	UHD Signage with Built-in MagicInfoS10, SSSP10.0	UHD Signage with Built-in MagicInfoS10, SSSP10.0
	Internal Player	Operating System	Tizen 7.0	Tizen 7.0	Tizen 7.0	Tizen 7.0	Tizen 7.0	Tizen 7.0
		Processor	CA53 1.3GHz Quad-Core	CA53 1.3GHz Quad-Core	CA53 1.3GHz Quad-Core	CA53 1.3GHz Quad-Core	CA53 1.3GHz Quad-Core	CA53 1.3GHz Quad-Core
		Storage (FDM)	8GB (3GB available)	8GB (3GB available)	8GB (3GB available)	8GB (3GB available)	8GB (3GB available)	8GB (3GB available)
	Special	H/W	2nd Gen. B2B Design Center IR Temperature Sensor Ambient Sensor Auto Level Wi-Fi (2.4/5.0GHz dual) and BT	2nd Gen. B2B Design Center IR Temperature Sensor Ambient Sensor Auto Level Wi-Fi (2.4/5.0GHz dual) and BT	2nd Gen. B2B Design Center IR Temperature Sensor Ambient Sensor Auto Level Wi-Fi (2.4/5.0GHz dual) and BT	2nd Gen. B2B Design Center IR Temperature Sensor Ambient Sensor Auto Level Wi-Fi (2.4/5.0GHz dual) and BT	2nd Gen. B2B Design Center IR Temperature Sensor Ambient Sensor Auto Level Wi-Fi (2.4/5.0GHz dual) and BT	2nd Gen. B2B Design Center IR Temperature Sensor Ambient Sensor Auto Level Wi-Fi (2.4/5.0GHz dual) and BT
		S/W	Signage New Home Workspace (Microsoft365/VMWare/RDP) Custom Home Auto Source Switching & Recovery Dicom Simulation Mode Director Mode Upgradable Web-Engine Tizen Enterprise Platform Video Conference Solution Smart Calibration (Basic)	Signage New Home Workspace (Microsoft365/VMWare/RDP) Custom Home Auto Source Switching & Recovery Dicom Simulation Mode Director Mode Upgradable Web-Engine Tizen Enterprise Platform Video Conference Solution Smart Calibration (Basic)	Signage New Home Workspace (Microsoft365/VMWare/RDP) Custom Home Auto Source Switching & Recovery Dicom Simulation Mode Director Mode Upgradable Web-Engine Tizen Enterprise Platform Video Conference Solution Smart Calibration (Basic)	Signage New Home Workspace (Microsoft365/VMWare/RDP) Custom Home Auto Source Switching & Recovery Dicom Simulation Mode Director Mode Upgradable Web-Engine Tizen Enterprise Platform Video Conference Solution Smart Calibration (Basic)	Signage New Home Workspace (Microsoft365/VMWare/RDP) Custom Home Auto Source Switching & Recovery Dicom Simulation Mode Director Mode Upgradable Web-Engine Tizen Enterprise Platform Video Conference Solution Smart Calibration (Basic)	Signage New Home Workspace (Microsoft365/VMWare/RDP) Custom Home Auto Source Switching & Recovery Dicom Simulation Mode Director Mode Upgradable Web-Engine Tizen Enterprise Platform Video Conference Solution Smart Calibration (Basic)
Certification	Safety		60950-1/62368-1	60950-1/62368-1	60950-1/62368-1	60950-1 / 62368-1	60950-1/62368-1	60950-1/62368-1
	EMC		Class B	Class B	Class B	Class B	Class B	Class A
	Environment		ENERGY STAR 8.0, EPEAT	ENERGY STAR 8.0, EPEAT	ENERGY STAR 8.0, EPEAT	ENERGY STAR 8.0, EPEAT	ENERGY STAR 8.0, EPEAT	ENERGY STAR 8.0, EPEAT
	IP Rating		IP5x	IP5x	IP5x	IP5x	IP5x	IP5x
	Security		802.1 x (WPA2 Enterprise): EAP-TLS, EAP-TTLS, EAP-PEAP	802.1 x (WPA2 Enterprise): EAP-TLS, EAP-TTLS, EAP-PEAP	802.1 x (WPA2 Enterprise): EAP-TLS, EAP-TTLS, EAP-PEAP	802.1 x (WPA2 Enterprise): EAP-TLS, EAP-TTLS, EAP-PEAP	802.1 x (WPA2 Enterprise): EAP-TLS, EAP-TTLS, EAP-PEAP	802.1 x (WPA2 Enterprise): EAP-TLS, EAP-TTLS, EAP-PEAP
Power	Power Supply		AC 100 - 240 V, 50/60 Hz	AC 100 - 240 V, 50/60 Hz	AC 100 - 240 V, 50/60 Hz	AC 100 - 240 V, 50/60 Hz	AC 100 - 240 V, 50/60 Hz	AC 100 - 240 V, 50/60 Hz
	Power Consumption	Max [W/h]	TBD	TBD	TBD	TBD	TBD	TBD
		Typical [W/h]	TBD	TBD	TBD	TBD	TBD	TBD
		Sleep mode	less than 0.5W	less than 0.5W	less than 0.5W	less than 0.5W	less than 0.5W	less than 0.5W
Operating Condition	Temperature		0°C~ 40°C	0°C~ 40°C	0°C~ 40°C	0°C~ 40°C	0°C~ 40°C	0°C~ 40°C
	Relative Humidity		10~80%	10~80%	10~80%	10~80%	10~80%	10~80%
Accessories	Included		Quick Setup Guide, Warranty Card, Power Cord RS232C (In) Gender Remote Controller and Batteries	Quick Setup Guide, Warranty Card, Power Cord RS232C (In) Gender Remote Controller and Batteries	Quick Setup Guide, Warranty Card, Power Cord RS232C (In) Gender Remote Controller and Batteries	Quick Setup Guide, Warranty Card, Power Cord RS232C (In) Gender Remote Controller and Batteries	Quick Setup Guide, Warranty Card, Power Cord RS232C (In) Gender Remote Controller and Batteries	Quick Setup Guide, Warranty Card, Power Cord RS232C (In) Gender Remote Controller and Batteries
	Optional	Stand	STN-L4355C	STN-L4355C	STN-L4355C	STN-L6585C	STN-L6585C	STN-L6585C
		Mount	WMN-B50SC	WMN-B50SC	WMN-B50SC	WMN-B50SC	WMN-B50SC	N/A
		Specialty	TBD	TBD	TBD	TBD	TBD	TBD

*Specs are preliminary.

Learn More samsung.com/display samsung.com/business insights.samsung.com

Product Support 1-866-SAM4BIZ

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SAMSUNG

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DS-VW765-LQR

Mounting Pattern
200 x 200 up to
700 x 400mm

Max Load
125lb
(56.8kg)

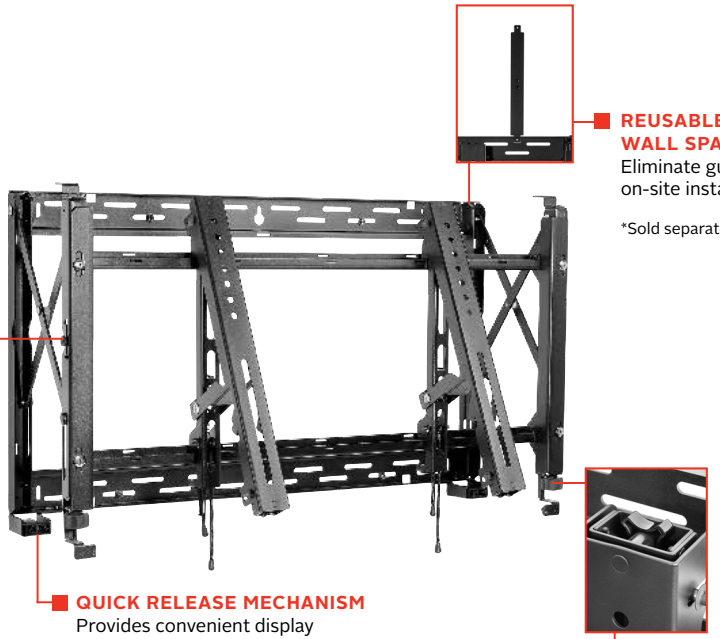
SMARTMOUNT®

Full-Service Video Wall Mount with Quick Release - Landscape

FOR 46" TO 65" DISPLAYS

Video walls should be easy to configure, quick to install, and a snap to maintain. The SmartMount® Full-Service Video Wall Mount with a Quick Release is designed for quick service access in recessed video wall applications. This mount provides versatility demanded by installers. With quick release functionality, users have the ability to articulate the display from the wall by gently pressing on the front of the display. The DS-VW765-LQR offers tool-less micro-adjustment and provides easy-access to any display. The custom wall plate spacers eliminate guesswork and on-site installation calculations, reducing installation time and cost.

- Quick release can be disabled with a locking screw to prevent unintentional pop-outs
- Modular mount for unlimited video wall display configurations
- Pull-out/prop-open mechanism provides quick service access
- Integrated cable management tie-backs make display-to-display cabling simple



REUSABLE CUSTOM WALL SPACERS*
Eliminate guesswork and on-site installation calculations

*Sold separately

QUICK RELEASE MECHANISM
Provides convenient display access in recessed applications

ADJUSTABLE CARRIAGE EXTENSION FORCE
Adjustable to the weight of the display, allowing the quick release mechanism to activate with gentle force

NO TOOLS REQUIRED FOR MICRO-ADJUSTMENT
Simple, tool-less micro-adjustments at 8 points seamlessly align the displays

RoHS TAA COMPLIANT

Please visit peerless-av.com/en-us/patents for patent information.

info@peerless-av.com
peerless-av.com

peerless-AV®
Driving Technology Through Innovation

Model Numbers

WARRANTY: Limited 5-year

DS-VW765-LQR	SmartMount® Full Service Video Wall Mount with Quick Release - Landscape for 46"-65" Displays

Product Specifications

	DIMENSIONS (W x H x D)	PRODUCT WEIGHT	LOAD CAPACITY	FINISH	AVAILABLE COLORS
DS-VW765-LQR	35.59" x 21.37" x 3.08"-3.83" (904 x 543 x 78-97mm)	32.6lb (14.8kg)	125lb (56.8kg)	Textured	Black

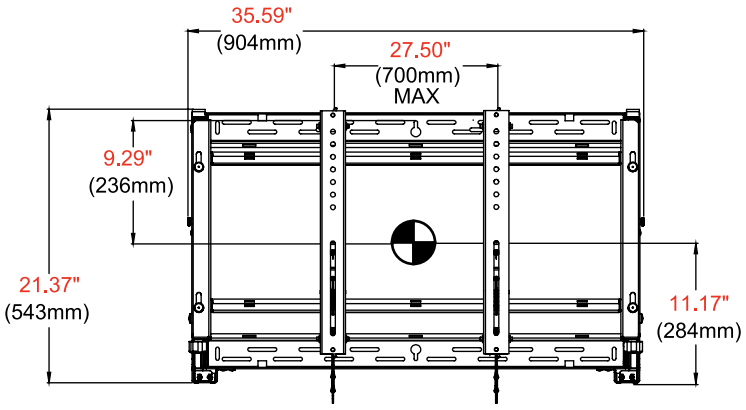
Package Specifications

	PACKAGE SIZE (W x H x D)	PACKAGE SHIP WEIGHT	PACKAGE UPC CODE	PACKAGE CONTENTS	UNITS IN PACKAGE
DS-VW765-LQR	37.13" x 23.38" x 4.25" (943 x 594 x 108mm)	39lb (17.6kg)	735029300847	Wall Mount Assembly, Mounting Attachment Rails & Fasteners	1

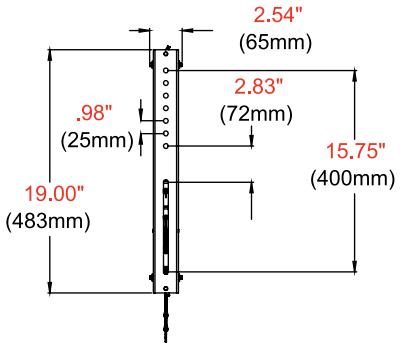
Accessories

DS-VWS###:	Wall Plate Alignment Spacers
DS-ACC770:	Media Player Mounting Bracket
ACC-DHK:	Display Handling Kit
ACC-DHP6:	Display Handling Kit Replacement Pads - 6pk
PLP-V models:	Dedicated Adaptor Plates

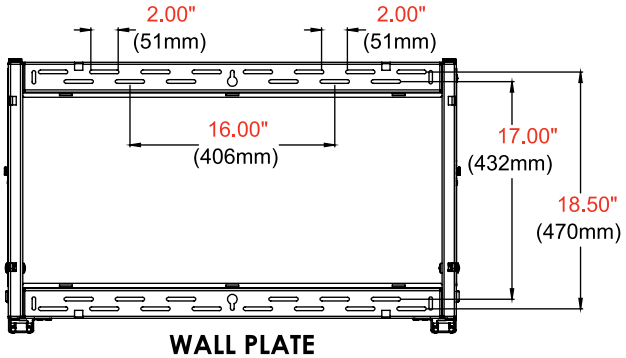
All dimensions = inch (mm)



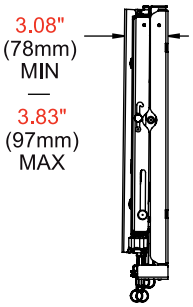
FRONT VIEW



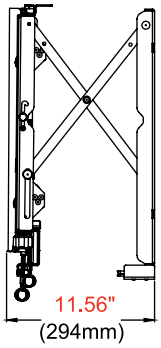
ADAPTER BRACKET



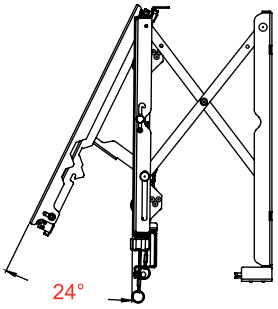
WALL PLATE



SIDE VIEW



SIDE VIEW EXTENDED



COMPONENT ACCESS

Architect Specifications

The SmartMount® Full-Service Video Wall Mount with Quick Release - Landscape shall be a Peerless-AV model DS-VW765-LQR and shall be located where indicated on the plans. Assembly and installation shall be done according to instructions provided by the manufacturer.

Visit **peerless-av.com** to see the complete line of AV solutions from Peerless-AV, including outdoor displays, kiosks, display mounts, projector mounts, carts/stands, and a full assortment of accessories.

Peerless-AV
2300 White Oak Circle
Aurora, IL 60502 USA

(800) 865-2112
(630) 375-5100
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Fax: +52 (81) 8384-8360

peerless-AV®
Driving Technology Through Innovation

LIT-1167 rev. 9

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EVO-IP HDMI® OVER IP SYSTEM

The EVO-IP HDMI over IP system delivers the ability to manage, transmit, and receive audio/video signals and control hundreds of devices over a local network. EVO-IP is fully customizable, easy to design, integrate and install. It transmits virtually lossless 4K@60Hz, 4:4:4, HDR, HDCP 2.2 video, audio, and IR/RS232 control as a point-to-point, splitter, switch, matrix and/or video wall solution. Each product is sold separately.

Transmitter (part # EVOIPTX1)

Receiver (part # EVOIPRX1)

Control Box (part # EVOIPCTL1)

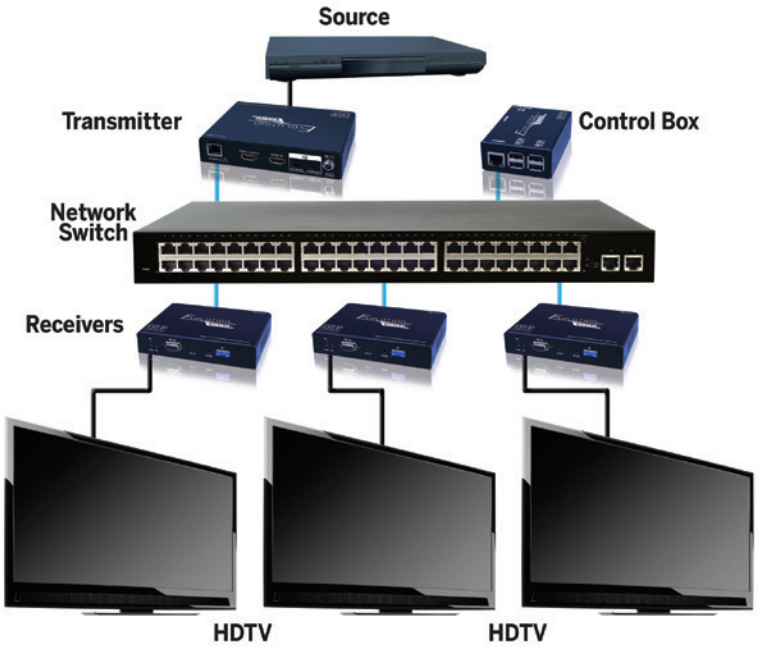
EVO-IP HDMI® OVER IP CONTROL BOX

- Easy GUI automatically detects new devices in the system
- Customizable labels and names of sources and displays
- Setup through the GUI can be done without a computer
- HDMI Output for easy access to network information
- USB Ports Reserved for Future Use
- Upscale to 4K@30Hz or downscale to 720p
- EDID preset/learning
- Video Wall mode supports configurations up to 25 displays
- OSD mode to display text, pictures, or logos on the screen
- Great for digital signage
- Connects to the cloud to schedule events or to troubleshoot a situation remotely
- Able to be controlled with Alexa enabled products
- Dimensions: 3.4" W x 3" H x 1" D

PACKAGE CONTENTS

EVOIPCTL1 Control Box
5V Power supply
Set of mounting ears/screws
Product Manual

PART NO.	PKG.
EVOIPCTL1	Pkgd



HDMI® OVER IP SYSTEM

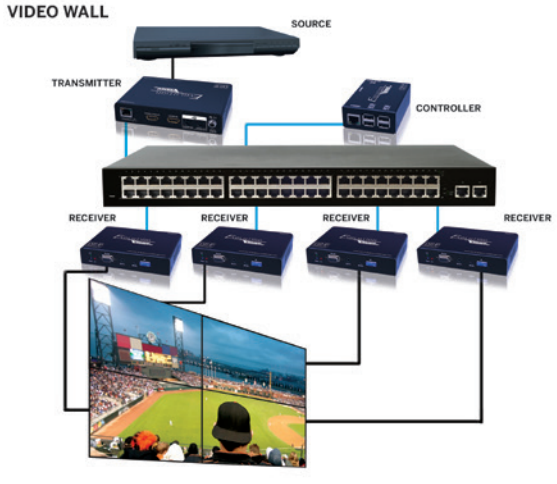
EVO-IP HDMI® OVER IP TRANSMITTER

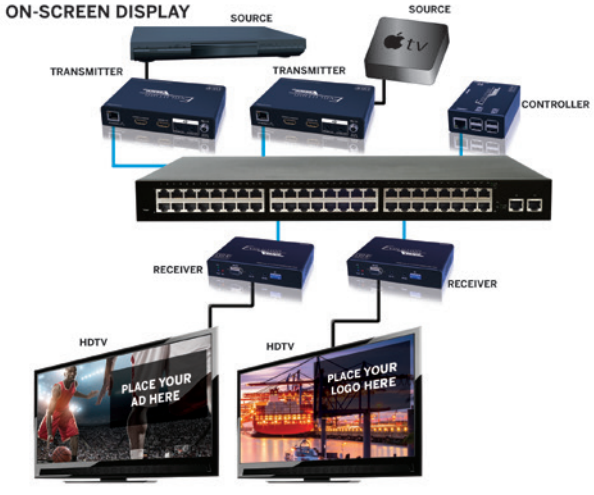
- Supports 4K@60Hz, 4:4:4 chroma
- System can support over 1000 transmitters and receivers
- HDR10 and Dolby Vision compatible
- Dolby/DTS/PCM audio formats supported
- HDCP 2.2/1.4
- POE or can be powered using provided power supply
- Manual dip switch configurable for a truly IP-Less installation
- Easy GUI automatically detects new devices in the system
- Customizable labels and names of sources and displays
- Setup through the GUI can be done without a computer
- Analog and Digital audio breakouts on TX and RX
- HDMI Loop-out for cascading or monitoring
- Upscale to 4K@30Hz or downscale to 720p
- EDID preset/learning
- Video Wall mode supports configurations up to 25 displays
- OSD mode to display text, pictures, or logos on the screen
- Great for digital signage
- Connects to the cloud to schedule events or to troubleshoot a situation remotely
- Able to be controlled with Alexa enabled products
- Dimensions: 5.5" W x 3.8" H x 1" D

PACKAGE CONTENTS

EVOIPTX1 Transmitter
5V Power supply
Set of mounting ears/screws
Product Manual

PART NO.	PKG.
EVOIPTX1	Pkgd





EVO-IP HDMI® OVER IP RECEIVER

- Supports 4K@60Hz, 4:4:4 chroma
- System can support over 1000 transmitters and receivers
- HDR10 and Dolby Vision compatible
- Dolby/DTS/PCM audio formats supported
- HDCP 2.2/1.4
- POE or can be powered using provided power supply
- Manual dip switch configurable for a truly IP-Less installation
- Easy GUI automatically detects new devices in the system
- Customizable labels and names of sources and displays
- Setup through the GUI can be done without a computer
- Analog and Digital audio breakouts on TX and RX
- Upscale to 4K@30Hz or downscale to 720p
- EDID preset/learning
- Video Wall mode supports configurations up to 25 displays
- OSD mode to display text, pictures, or logos on the screen
- Great for digital signage
- Connects to the cloud to schedule events or to troubleshoot a situation remotely
- Able to be controlled with Alexa enabled products
- Dimensions: 5.5" W x 3.8" H x 1" D

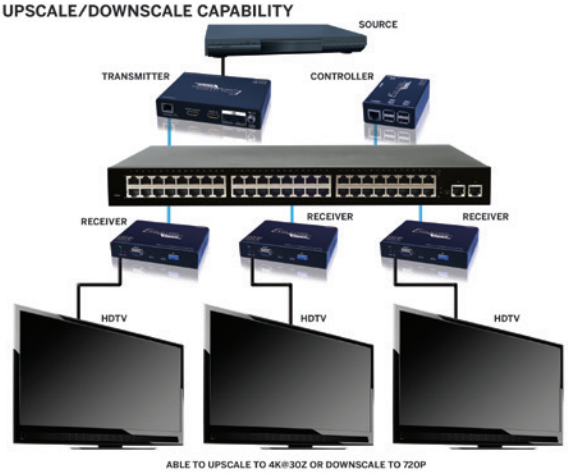
PACKAGE CONTENTS

EVOIPRX1 Receiver
5V Power supply
Set of mounting ears/screws
Product Manual

PART NO.	PKG.
EVOIPRX1	Pkgd

MATRIX MODE

UPSCALE/DOWNSCALE CAPABILITY



ABLE TO UPSCALE TO 4K@30Z OR DOWNSCALE TO 720P

WATT BOX

COMPARISON CHART

600 *SERIES*

400 *SERIES*

200 *SERIES*

SURGE & CONDITIONING

Model	WB-200-2	WB-200-CE-4	WB-400-8	WB-400-CE-10	WB-400-VCE-12	WB-600-VCE-10	WB-600-SVCE-12	WB-600CH-SVCE-12
Outlets	2	4	8	10	12	10	12	12
Power Cord Length	1.5 FT	4 FT	6FT	6FT	6FT	6FT	6FT	6FT
Rack Mountable	N	N	Y	Y	Y	Y	Y	Y
Energy Disipation	2160 Joules	2160 Joules	3240 Joules	3240 Joules	4320 Joules	5400 Joules	6480 Joules	6480 Joules
Fireproof MOV	Y	Y	Y	Y	Y	Y	Y	Y
Isolated Filter Banks	1	1	1	1	2	2	3	3
Coax Protection	No	1 In - 1 Out	No	2 In - 2 Out	2 In - 2 Out	2 In - 2 Out	2 In - 2 Out	2 in - 2 Out
Telephone/Network Protection	No	1 In - 1 Out	No	1 In - 1 Out	1 In - 1 Out	1 In - 1 Out	2 In - 2 Out	2 in - 2 Out
Safe Voltage	N	N	N	N	Y	Y	Y	Y
12V Trigger	N	N	N	N	N	In	In/Out	In/Out
Sequencing	N	N	N	N	N	N	Y	Y
Optional Faceplate Display	N	N	N	N	N	Y	Y	Y
Connected Equipment Warranty	$25,000	$25,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
UL Listed	Y	Y	Y	Y	Y	Y	Y	Y

* Specs subject to change without notice

VM-2Hxl

1:2 HDMI Distribution Amplifier

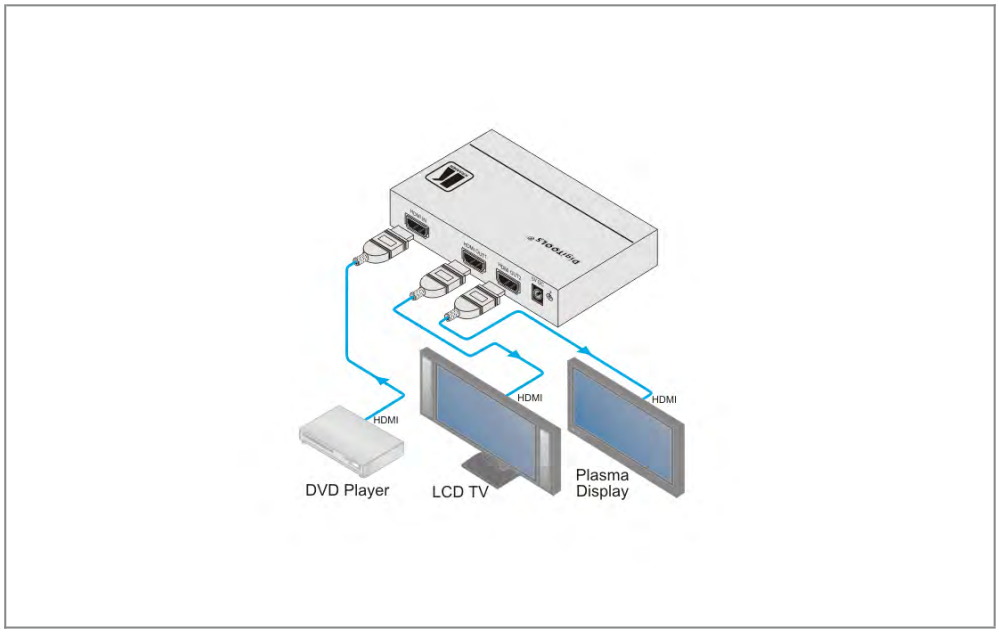
The VM-2Hxl is a distribution amplifier for HDMI signals. The unit reclocks and equalizes the signal and distributes it to two identical outputs.

FEATURES

- Max. Data Rate - 6.75Gbps (2.25Gbps per graphic channel).
- HDTV Compatible.
- HDCP Compliant.
- HDMI Support - Deep Color, x.v.Color™, Lip Sync, CEC.
- 3D Pass-Through.
- I-EDIDPro™ Kramer Intelligent EDID Processing™ - Intelligent EDID handling & processing algorithm ensures Plug and Play operation for HDMI systems.
- Kramer Equalization & re-Klocking™ Technology - Rebuilds the digital signal integrity to travel longer distances.
- Active Output LED.
- Compact DigiTOOLS® - 3 units can be rack mounted side−by−side in a 1U rack space with the optional RK−3T rack adapter.

TECHNICAL SPECIFICATIONS

INPUT:	1 HDMI connector.
OUTPUTS:	2 HDMI connectors.
MAX. DATA RATE:	6.75Gbps (2.25Gbps per graphic channel).
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP.
CONTROLS:	EDID SETUP button, input select button.
INDICATOR LEDs:	IN 1, IN 2, OUT 1, OUT 2, and ON LEDs.
POWER CONSUMPTION:	5V DC, 910mA.
DIMENSIONS:	12cm x 7.2cm x 2.4cm (4.7" x 2.8" 1.0") W, D, H.
WEIGHT:	0.3kg (0.67lbs) approx.
INCLUDED ACCESSORIES:	Power supply, bracket installation kit.
OPTIONS:	RK−3T 19" rack adapter.



NYQUIST
SYSTEM CONTROLLER
Model NQ-SYSCTRL

DESCRIPTION

Bogen's Nyquist System Controller offers contractors a cost-effective means to deploy Nyquist based solutions using a state-of-the-art processing platform preinstalled with the Nyquist application server software. The Nyquist System Controller facilitates quick installs and offers high-performance operation for even the largest Nyquist system configurations. Developed with commercial sound in mind, the Nyquist System Controller can simultaneously distribute a virtually unlimited number of audio streams anywhere across the network, making it perfect for background music applications.

The Nyquist System Controller can manage applications that require nearly any mix of multi-zone paging, intercom calling, or background music distribution at businesses, restaurants, retail stores, industrial facilities, and many other venues.

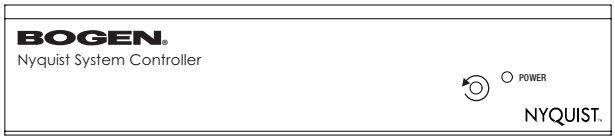
Nyquist systems also support a licensable option for using a secondary System Controller to provide Automatic Failover capability in cases where the primary System Controller fails or goes offline for whatever reason. When this occurs, the secondary System Controller automatically takes over and returns the system to normal service.

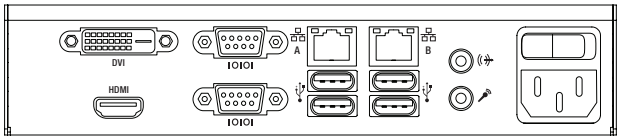
FEATURES

- **Configuration and management via a web-based graphical user interface (GUI)**
- **Remote access from almost any PC/MAC, tablet, or mobile device**
- **Continuous monitoring of stations and appliances to ensure system operation**
- **Front panel power LED**
- **SIP tie-line and trunking support for connection to external phone systems or VoIP service providers**
- **Station and zone capacity for any Nyquist application (determined by system license)**
- **Talkback capability in any zone**
- **Multicast support for all zone paging and audio distribution**
- **Paging and announcement support across multiple facilities**
- **Pre-recorded and (optional) text-to-speech announcements**
- **Built-in streaming Internet radio and access to subscription-based music services**
- **Automatic Failover option available (requires a second System Controller and software license)**
- **Simultaneously distribute a virtually unlimited number of audio streams**
- **Music automatically added to music library from USB port**
- **Network-based audio that can be sourced (input) from any number of Nyquist appliances (NQ-P0100, NQ-GA20P2, etc.)**
- **Ample storage for music files, recorded announcements, and call recordings**
- **G722 and OPUS audio codec support to deliver superior HD audio quality**
- **Event scheduling of tones and audio distribution to all or select paging zones**
- **Emergency notifications that have higher priority over normal audio events**
- **Convection air cooled, fanless design for quiet, maintenance free operation**
- **Wall-, Rack, or Shelf-mountable – 1 RU package**
- **19" Rack Mount Kit (NQ-RMK03; sold separately)**

A & E SPECIFICATIONS

The Bogen System Controller shall be the Nyquist NQ-SYSCTRL for commercial paging needs. It is designed specifically for the high degree of scalability and flexibility required in commercial paging and audio distribution applications. The System Controller interfaces with the customer's data network to leverage the ultimate level of scalability for single or multiple locations and system sizes ranging from two to tens of thousands of stations. The System Controller shall be capable of being configured via the web-based GUI from virtually any PC/MAC, tablet, or mobile device. The System Controller shall continually monitor the Nyquist devices connected to the system and shall report via email when a device stops functioning correctly. The System Controller must support SIP tie-line and trunking support for connection to external phone systems. The System Controller shall use G722 and OPUS audio codec support to deliver superior HD audio quality. The NQ-SYSCTRL shall be capable of providing pre-recorded and (optional) text-to-speech announcements. The System Controller shall be capable of simultaneously distributing a virtually unlimited number of audio streams anywhere across the data network. The NQ-SYSCTRL shall be capable of being paired with a secondary NQ-SYSCTRL to provide Automatic Failover capability when licensed appropriately. The System Controller is a convection air cooled, fanless design for quiet, maintenance free operation. System Controllers that don't provide the these features shall not be considered equivalent.





TECHNICAL SPECIFICATIONS

	NQ-SYSCTRL
Video Display	HDMI, DVI-D
Network Support	Dual 10/100/1000 Mbps NICs
Protocol Support	HTTPS, UDP, RTP, FTP, TFTP, SSH, SIP2, Unicast, Multicast
Codec Support	G711, G719, G722, G723, G726, G729, OPUS, Speex, a-law, μ-law, SIREN7, SIREN14, ADPCM
Connectors: Power	10A Line Cord C14 IEC Inlet
Line/MIC Input	3.5mm Line Out / 3.5mm Mic In (RESERVED FOR FUTURE USE)
Network	2 x RJ45
Misc. Outputs	4 x USB 3.0 ports, 2 x Serial ports (1 x RS232, 1 x RS232/422/485)
AC Input Voltage Range	100 VAC to 240 VAC 50/60 Hz
Maximum AC Current	1.5A
Indicators	Power LED (front) / Network LEDs (rear)
Operating Temperature Range	0° C to +60° C
Certifications	Safety: CAN/CSA C22.2 No. 62368-1:2014; UL62368-1:2014; EN 62368-1:2014 EMC: FCC Part 15b Class A; ICES-003, Issue 6: 2016; EN 55032:2012; EN 55035:2017
Physical Dimensions:	1/2 Rack Width x 1RU
Single Rack Space (1RU)	8.0" W x 1.70" H x 10.25" D (Depth includes Phoenix connectors; width is without rack mount brackets attached; height excludes rubber mounting feet)

Limited Warranty, Exclusion of Certain Damages

The **NQ-SYSCTRL** is warranted to be free from defects in materials and workmanship for two (2) years from the date of sale to the original purchaser. Any part of the product covered by this warranty that, with normal installation and use, becomes defective (as confirmed by Bogen upon inspection) during the warranty period will be repaired or replaced by Bogen, at Bogen's option, with new or refurbished product, provided the product is shipped insured and prepaid to: Bogen Factory Service Department: 4570 Shelby Air Drive, Suite 11, Memphis, TN 38118, USA. Repaired or replacement product(s) will be returned to you freight prepaid. This warranty does not extend to any of our products that have been subjected to abuse, misuse, improper storage, neglect, accident, improper installation or have been modified or repaired or altered in any manner whatsoever, or where the serial number or date code has been removed or defaced.

THE FOREGOING LIMITED WARRANTY IS BOGEN'S SOLE AND EXCLUSIVE WARRANTY AND THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY. BOGEN MAKES NO OTHER WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED AND EXCLUDED TO THE MAXIMUM EXTENT ALLOWABLE BY LAW. Bogen's liability arising out of the manufacture, sale or supplying of products or their use or disposition, whether based upon warranty, contract, tort or otherwise, shall be limited to the price of the product. **IN NO EVENT SHALL BOGEN BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, LOSS OF DATA OR LOSS OF USE DAMAGES) ARISING OUT OF THE MANUFACTURE, SALE OR SUPPLYING OF PRODUCTS, EVEN IF BOGEN HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR LOSSES.** Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

Products that are out of warranty will also be repaired by Bogen Factory Service Department -- same address as above or call 201-934-8500, at owner's expense. Returned products which do not qualify for warranty service, may be repaired or replaced at Bogen's option with a previously repaired or refurbished items. The parts and labor involved in these repairs are warranted for 90 days when repaired by the Bogen Factory Service Department. All parts and labor charges as well as shipping charges will be at the owner's expense.

All returns require a Return Authorization number. For most efficient warranty or repair service, please include a description of the failure.

07/2018

POWERED BY NYQUIST™ The **C4000 Series** is built upon Bogen's award-winning Nyquist software-based IP communications platform, which provides users with unparalleled flexibility and scalability, whatever their application.

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BOGEN

BOGEN VoIP ADMIN PHONE– COLOR TOUCH DISPLAY

Model NQ-T1100

DESCRIPTION

The Bogen NQ-T1100 VoIP phone (by Yealink) offers a large 7" color touch screen that makes navigating Nyquist E7000 System* features and menus swift, easy and convenient. The NQ-T1100 employs Yealink's Optima HD Voice technology and a wide-band codec for unparalleled audio clarity.

*Note: The NQ-T1100 is designed specifically for use with the Nyquist E7000 Series solution only.

KEY FEATURES & BENEFITS

HD Audio

Optima HD Voice technology combines cutting-edge hardware and software with wideband technology for maximum acoustic performance, allowing the NQ-T1100 to deliver higher HD audio quality than other VoIP phones in a high traffic network environment. And its hearing aid compatible (HAC) handset helps individuals with hearing loss to experience voices more clearly.

Easy Customization and High Expandability

The NQ-T1100 has a seven-inch, 800 x 480-pixel, backlit-color touch screen, which enables a rich visual presentation and easy navigation. A built-in USB 2.0 port can also be used for Bluetooth headset connectivity. The phone has 29 one-touch DSS keys which can be programmed to various features.

Efficient Installation and Provisioning

The NQ-T1100 supports auto-provisioning to help deliver 'zero touch provisioning' – eliminating any complex manual settings – making the NQ-T1100 simple to deploy, easy to maintain and upgrade..

Secure Transport and Interoperability

The NQ-T1100 uses SIP over Transport Layer Security (TLS/SSL), which is the latest network security technology.

ADDITIONAL FEATURES

Audio Features

- HD voice: HD handset, HD speaker
- Hearing aid compatible (HAC) handset
- Codecs: Opus, G.722, G.711(A/μ), G.723.1, G.729AB, G.726, iLBC
- DTMF: In-band, Out-of-band (RFC 2833) and SIP INFO Full-duplex hands-free speakerphone with AEC

Feature Keys

- 29 one-touch DSS keys
- 7 features keys: message, headset, hold, mute, transfer, redial, hands-free speakerphone
- 6 navigation keys
- Volume control keys
- Illuminated mute, headset and hands-free speaker phone key

Phone Features

- Call hold, mute, DND
- One-touch speed dial, hotline
- Call forward, call waiting, call transfer
- Group listening, SMS, emergency call
- Redial, auto answer
- Local 3-way conferencing
- 3-way conferencing
- Call park, call pickup
- Ring tone selection/import/delete
- Set date time manually or automatically
- RTCP-XR (RFC3611), VQ-RTCPXR (RFC6035)
- USB port (2.0 compliant) for optional Bluetooth headset Enhanced DSS key

POWERED BY NYQUIST

The **E7000 Series** is built upon Bogen's award-winning Nyquist software-based IP communications platform, which provides users with unparalleled flexibility and scalability, whatever their application.

ADDITIONAL FEATURES

Directory
- Local phonebook holds up to 1000 entries
- Black list
- Nyquist XML remote phonebook
- Smart dialing
- Phonebook search/import/export
- Call history: dialed/received/missed/forwarded
- Display and Indicator
- 7" 800 x 480-pixel color touch screen with backlight
- 24-bit depth color
- LED for call and message waiting indication
- Background wallpaper
- Intuitive user interface with icons and soft keys
- Caller ID with name, number and photo
- Screensaver
- Power saving mode

Interface
- 2 x RJ-45 Gigabit Ethernet ports
- Power over Ethernet (IEEE 802.3af), Class-3
- 1 x USB port (2.0 compliant)
- 1 x RJ9 handset port
- 1 x RJ9 headset port
- 1 x RJ12 EXT expansion port (Not used)

Management
- Configuration: browser/phone/auto-provision
- Auto-provision via Nyquist server for mass deployment
- Phone lock for personal privacy protection
- Reset to factory, reboot
- Package tracing export, system log

Network and Security
- SIP v1 (RFC2543), v2 (RFC3261)
- NAT traversal: STUN mode
- Proxy mode and peer-to-peer SIP link mode
- IP assignment: static/DHCP/PPPoE
- HTTP/HTTPS web server
- Time and date synchronization using SNTP
- UDP/TCP/DNS-SRV (RFC 3263)
- QoS: 802.1p/Q tagging (VLAN), Layer 3 ToS/DSCP
- SRTP for voice
- Transport Layer Security (TLS)
- HTTPS certificate manager
- OpenVPN, IEEE802.1X
- IPv6
- LLDP/CDP/DHCP VLAN
- ICE

Other Physical Features
- Wall-mountable (optional)
- External AC adapter (optional):
  – AC 100-240V input and DC 5V/2A output
- Power consumption (Optional AC adapter): 2.23-7.29W
- Power consumption (PoE): 3.19-10.78W
- Dimensions: 266mm W x 226mm D x 185mm H x 54mm T
- Operating humidity: 10% - 95%
- Operating temperature: -10°C - 50°C

Package Contents
- Bogen NQ-T1100 VoIP phone base unit
- Handset with handset cord
- Ethernet Cable (2m CAT5E UTP Cable)
- Attachable Stand
- Quick Start Guide

A & E SPECIFICATIONS

The Nyquist VoIP Admin Phone (NQ-T1100) with Color Touch display panel shall show the time of date, the station numbers, and the call-in priority of staff stations that are calling in. Depending upon the system CoS programming, a VoIP Admin Phone can display menus to activate Zone Paging, All-Call Paging, Emergency All-Call Paging, alarm signals, audio files, and external functions. The Staff phone has been designed with two RJ-45 Gigabit Ethernet ports one for connection to a PoE port on the LAN and one pass through for connecting a PC or other networked device. The phone can be desk or wall mountable with included bracket. Systems that do not provide these capabilities as a minimum will not be considered equal.

Limited Warranty, Exclusion of Certain Damages

The **NQ-T1100** is warranted to be free from defects in materials and workmanship for five (5) years from the date of sale to the original purchaser. Any part of the product covered by this warranty that, with normal installation and use, becomes defective (as confirmed by Bogen upon inspection) during the warranty period will be repaired or replaced by Bogen, at Bogen's option, with new or refurbished product, provided the product is shipped insured and prepaid to: Bogen Factory Service Department: 4570 Shelby Air Drive, Suite 11, Memphis, TN 38118, USA. Repaired or replacement product(s) will be returned to you freight prepaid. This warranty does not extend to any of our products that have been subjected to abuse, misuse, improper storage, neglect, accident, improper installation or have been modified or repaired or altered in any manner whatsoever, or where the serial number or date code has been removed or defaced.

THE FOREGOING LIMITED WARRANTY IS BOGEN'S SOLE AND EXCLUSIVE WARRANTY AND THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY. BOGEN MAKES NO OTHER WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED AND EXCLUDED TO THE MAXIMUM EXTENT ALLOWABLE BY LAW. Bogen's liability arising out of the manufacture, sale or supplying of products or their use or disposition, whether based upon warranty, contract, tort or otherwise, shall be limited to the price of the product. **IN NO EVENT SHALL BOGEN BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, LOSS OF DATA OR LOSS OF USE DAMAGES) ARISING OUT OF THE MANUFACTURE, SALE OR SUPPLYING OF PRODUCTS, EVEN IF BOGEN HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR LOSSES.** Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

Products that are out of warranty will also be repaired by Bogen Factory Service Department -- same address as above or call 201-934-8500, at owner's expense. Returned products which do not qualify for warranty service, may be repaired or replaced at Bogen's option with a previously repaired or refurbished items. The parts and labor involved in these repairs are warranted for 90 days when repaired by the Bogen Factory Service Department. All parts and labor charges as well as shipping charges will be at the owner's expense.

All returns require a Return Authorization number. For most efficient warranty or repair service, please include a description of the failure.

02/2021

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C4000 SERIES | Software-based Commercial Paging Solutions

IP-BASED PAGING AND AUDIO DISTRIBUTION SOLUTION

The C4000 Series is a software-based solution for commercial paging, music distribution, and sound masking applications that demand a high degree of scalability and flexibility. The heart of the C4000 solution is a powerful, state-of-the-art system controller with an easy to use Web-based Graphical User Interface (GUI) that is accessible from any PC, tablet, or mobile device. Built-in, commercially licensed, Internet radio-based streaming audio services are perfect for background music applications. Feature-rich, purpose-built appliances provide audio mixing, amplification, and distribution, as well as the ability to easily integrate with third-party devices and systems, such as PBXs, security, access control, and fire alarm.

The C4000 Series can be scaled to support a wide mix of audio sources, end points, and zones. The C4000 software can be easily upgraded over time to add new features and capabilities to address ever-changing customer needs, environments, and technology.

C4000 is perfect for:

- Offices
- Retail
- Restaurant and Bars
- Warehouses
- Industrial and Manufacturing Facilities
- Healthcare
- Public and Private Institutions
- Transportation Hubs
- Houses of Worship

NQ-SYSCTRL - *NYQUIST System Controller*

Features and Capabilities:

- System Controller with optional Automatic Failover capability
- Support for a wide-array of networked appliances and endpoints
- Embedded pro-audio DSP capabilities in all amplifiers and mixers
- Internet-based streaming radio & music services
- Optional sound masking capability to help increase productivity & performance, as well as improve work-place comfort by delivering a substantial reduction of conversational & audio distractions
- Wall Baffle Combo Clock / Speaker / Message Display with LED Flasher facilitates user-programmable messages for standard or emergency announcements, along with two-way intercom communications
- Text-to-Speech based announcements
- Powerful automated Routines & Routines API to support crisis plans and third-party integrations
- Scheduled volume changes via Routines
- Easy System Configuration via various setup wizards, including Nyquist Appliance Discovery and Network Settings Configuration

NQ-S1810WBC - *Nyquist VoIP Wall Baffle Combo Speaker*

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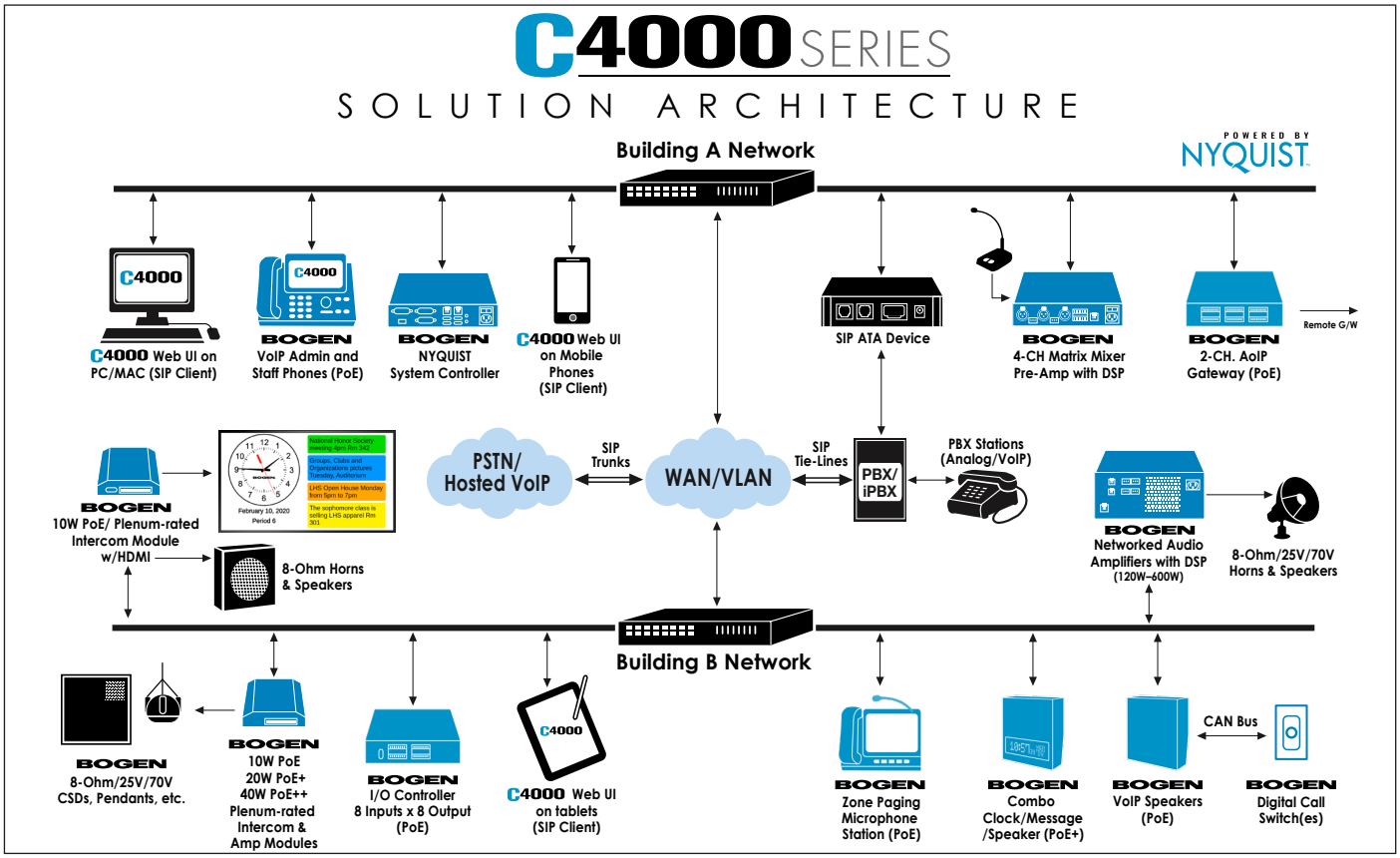
C4000 SERIES

C4000 Series Compatible Appliances

NQ-A2060-G2 *Audio Power Amplifier (60W, 2-CH model)*
NQ-A2120-G2 *Audio Power Amplifier (120W, 2-CH model)*
NQ-A2300-G2 *Audio Power Amplifier (300W, 2-CH model)*
NQ-A4060-G2 *Audio Power Amplifier (60W, 4-CH model)*
NQ-A4120-G2 *Audio Power Amplifier (120W, 4-CH model)*
NQ-A4300-G2 *Audio Power Amplifier (300W, 4-CH model)*
NQ-E7010 *Input/Output Controller*
NQ-E7020-G2 *Digital Call Switch*
NQ-GA10P *10W Plenum-Rated Intercom Module*
NQ-GA10PV *10W Plenum-Rated Intercom Module (w/HDMI video-out)*
NQ-GA20P2 *20W Plenum-Rated Integrated Amplifier*
NQ-P0100 *Matrix Mixer Pre-Amplifier*
NQ-PA120 *Public Address Mixer/Amplifier (120W model)*
NQ-PA240 *Public Address Mixer/Amplifier (240W model)*
NQ-PA600 *Public Address Mixer/Amplifier (600W model)*
NQ-S1810-SCG *VoIP Ceiling/Wall Baffle Speakers*
NQ-S1810-VF *VoIP Ceiling/Wall Baffle Speakers*
NQ-S1810CT-T1 *VoIP Ceiling Speaker*
NQ-S1810WT-G3 *VoIP Wall Baffle Speaker*
NQ-T1100 *Nyquist Color Touch Display VoIP Admin Phone*
NQ-T2000 *VoIP Staff Phone (Color Display)*
NQ-ZPMS *Nyquist Zone Paging Microphone Station*
NQ-S1810WBC *NNyquist VoIP Wall Baffle Combo Speaker*
NQ-GA400P *Nyquist 2-Channel AoIP Gateway*
NQ-GA40P3 *Nyquist Plenum-Rated Integrated Amplifier*
NQ-EDP01 *Nyquist IP Entry Door Phone*



NYQUIST™ The C4000 Series is built upon Bogen's award-winning Nyquist software-based IP communications platform, which provides users with unparalleled flexibility and scalability, whatever their application.

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BOGEN

1-CHANNEL PUBLIC ADDRESS MIXER/AMPLIFIERS

Models NQ-PA120, NQ-PA240, NQ-PA600

Models NQ-PA120 & NQ-PA240

Model NQ-PA600

DESCRIPTION

Bogen's Nyquist networked Public Address Mixer/Amplifier (PAMA) series offers cost-effective performance for permanent installations and commercial sound and is designed to meet the rigorous requirements of today's sophisticated sound systems. Developed with the commercial sound contractor in mind, the PAMA series provides unparalleled flexibility and versatility without the need for add-on modules. It includes an embedded pro-audio DSP for extensive and comprehensive signal processing – allowing users to skillfully manage and mix multiple audio input channels. The resulting audio signal mix can be directed to the PAMA's speaker out or line out, or streamed over the Nyquist network where it can be used for audio distribution to one or more zones.

The Nyquist NQ-PAxxx are now capable of Standalone Operation that allows for use of these appliances for AoIP applications such as a SIP endpoint to act as a paging mixer/amplifier for an existing PBX/VoIP phone system, or a paging mixer/amplifier on an existing PBX/analog phone system. Additionally, the NQ-PAxxx audio power amplifiers to be used in standalone audio applications where a networked amplifier is desired for remote volume, mixing and DSP control from a web browser-enabled device.

When used in a Nyquist 7000 ecosystem, zone-based program audio selection and volume levels can be remotely adjusted using Nyquist's web-based Zone Volume and Audio Distribution Control, which has been specially designed for use with low-cost tablets.

The PAMAs fit a wide range of commercial audio applications that require multi-zone paging and/or background music distribution at businesses, restaurants, retail stores, industrial facilities, and many other venues. These PAMAs are available in 120-, 240-, and 600-watt models, each with the same features to provide power and performance no matter how large or small the application. In addition to their extensive flexibility, the Nyquist networked PAMAs use the latest in Class D amplifier technology and provide unparalleled sonic quality, exceptional reliability, and reduced heat output for increased operating efficiency.

FEATURES

- **4 MIC/Line Inputs**
  - CH1-CH4 configurable balanced/unbalanced inputs via 2 XLR and 4 screw-terminal connections
  - CH4 can be configured to support Push-to-Talk Mic applications
  - Mic inputs can be configured to supply Phantom Power when needed
- **Web-based DSP control**
  - 16-band Graphic Equalizer
  - Signal Present and Clip Monitor
  - Adjustable High Pass, Low Pass, and Bandpass Filters
  - Noise Gate
  - Compressor/Limiter
  - 7-band Parametric Equalizer
  - Delay / Peak Limiter
  - Speaker Presets / RMS Limiter / Status
- **Standalone Operation**
- **Standalone SIP Endpoint Support**
- **8 ohm/70V output; 600 ohm balanced line output**
- **Nyquist network-based audio input (paging, audio distribution)**
- **Mixed signal can be routed to Line or Speaker Out or over the Nyquist network**
- **Safety: CAN/CSA C22.2 No. 62368-1:2014; UL62368-1:2014; EN 62368-1:2014**
- **EMC: FCC Part 15b Class A; ICES-003, Issue 6: 2016; EN 55032:2012; EN 55035:2017**
- **1/2 Rack Width – Wall-, Rack-, or Shelf-mountable: 8.0" W x 1.70" H x 8.6" D (2" H with rubber feet installed)**
- **19" Rack Mount Kit (NQ-RMK03; sold separately)**

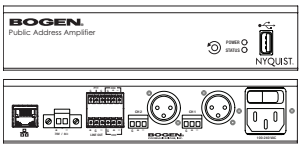
A & E SPECIFICATIONS

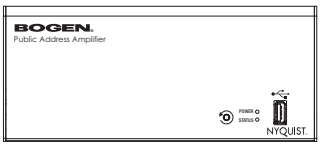
The **Nyquist based Public Address Mixer/Amplifier (PAMA) series** shall be a model _____, rated at ____ watts RMS (NQ-PA120/120 watts, NQ-PA240/240 watts, and NQ-PA600/600 watts) with 8 ohm / 70V operation. The PAMA shall support the following: four (4) software selectable Mic or Line Input channels via two (2) XLR connectors and four (4) sets of Phoenix-style screw-terminals; one input channel shall be capable of being configured to support a Push-to-Talk microphone (e.g., Bogen DDU-250). The amplifier power output shall provide a frequency response from 20 Hz - 20 kHz < 0.03% THD+N at rated power with distortion of less than 0.03%. The PAMA shall support the following features: line-level output to drive input on a local amplifier; one (1) USB 2.0 host port (Type-A connector) for future use; two (2) x RGB "full spectrum" LED indicators for Power and Status. To access the higher-level functions of the PAMA it is designed with a 10/100 network connection that allows installers and users to access the Graphical User Interface setup and operate the Digital Signal Processing controls: 16-band Graphic Equalizer; Signal Present and Clip Monitor; Adjustable High Pass, Low Pass, and Bandpass Filters; Noise Gate; Compressor/Limiter; Delay; Peak Limiter; Speaker Presets; RMS Limiter; Status; and 7-band Parametric Equalizer. The PAMA has been designed without physical sliders and knobs so that unauthorized users cannot tamper with the settings. Program selection and audio levels shall be remotely adjustable using a web-based Zone Volume and Audio Distribution Control. Any Public Address Mixer/Amplifier with physical sliders and knobs used to adjust settings shall not be considered equal. The PAMA shall be powered by Universal Mains supply (100VAC - 240VAC) and shall be wall-, shelf- or rack-mountable and include the required wall mounting bracket hardware. Public Address Mixer/Amplifiers that don't provide these features shall not be considered equivalent.

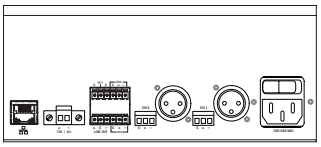
POWERED BY NYQUIST

The **C4000 Series** is built upon Bogen's award-winning Nyquist software-based IP communications platform, which provides users with unparalleled flexibility and scalability, whatever their application.

Models
NQ-PA120, NQ-PA240
Front/Rear Panels







Models NQ-PA600 Front/Rear Panels

TECHNICAL SPECIFICATIONS

		NQ-PA120	NQ-PA240	NQ-PA600
Power Output		120W @ 70V/8 ohms	240W @ 70V/8 ohms	600W @ 70V/8 ohms
Line-In Sensitivity (Gain min./max.)		Continuously variable from 2V to 0.1V RMS		
MIC-In Sensitivity (Gain min./max.)		Continuously variable from 0.1V to 0.006V RMS		
MIC Equivalent Input Noise (EIN)		100 dB		
Line Out Bandwidth		20 Hz - 20 kHz < 0.03% THD+N		
Line Out		600-ohm electronically balanced, via 3-pin Phoenix on 6-pin Phoenix Plug/Header		
S/N Ratio (20 kHz BW)		97 dB		
Power Output Bandwidth		20 Hz- 20 kHz < .03% THD+N		
THD+N @ 1 kHz rated power		< 0.03%		
Rated Load Impedance		8 ohms		
Frequency Response @ 1 Watt		20 Hz - 20 kHz +/- 0.25 dB		
Amplifier Class of Operation		Class D		
Connectors	**Power**	10A Line Cord C14 IEC Inlet		
	Inputs	Channels 1, 2 Balanced 3-pin Phoenix Plugs/Headers and Balanced 3-pin Neutrik XLRs; Channel 3 Balanced 3-pin Phoenix on 6-pin Phoenix Plug/Header; Channel 4 Balanced 3-pin Phoenix only via 6-pin Phoenix Plug/Header; RJ45; USB 2.0 Type A		
	Outputs	Power Amplifier: 2-pin 'touch proof' Phoenix Plug/Header Line Out balanced via 3-pin Phoenix on 6-pin Phoenix Plug/Header; streaming out via Nyquist network		
AC Input Voltage Range		85 VAC to 265 VAC 50/60 Hz		
Maximum AC Current		2A	3A	7A
Indicators		Status & Power LEDs (front) / Network LEDs (rear)		
Operating Temperature Range		-15 C to +40 C		
Thermal Emissions (Full Power)		90 BTU/hr.	135 BTU/hr.	225 BTU/hr.
Cooling		Convection		
Protection		RF, DC, Low Frequency, Thermal, Low Impedance, Short Circuit, Clip Limiting		
DSP Based Audio Features		16-band Graphic Equalizer; Signal Present and Clip Monitor; Adjustable High Pass, Low Pass, and Bandpass Filters; Noise Gate; Compressor/Limiter; 7-band Parametric Equalizer		
Special Features		Sleep Mode (defeatable), Power Factor Correction (PFC), 89% Amplifier Efficiency, On/Off Muting, Bridge Mode Switch, Channel 4 PTT (Push-to-Talk)		
Networking		Cat5 or better 10/100 network connectivity to Bogen's Nyquist network		
Certifications		CE and FCC Part 15b Class A; ICES-003, Issue 6: 2016; EN 55032:2012; EN 55035:2017		
Product Weight		5.2 lbs.		8.3 lbs.
Physical Dimensions:		1/2 Rack Width x 1RU*		1/2 Rack Width x 2RU**
***Single Rack Space (1RU)**		8.00" W x 1.70" H x 13.48" D (Depth includes Phoenix connectors; width is without rack mount brackets attached; height excludes rubber mounting feet)		
****Double Rack Space (2RU)**		8.00" W x 3.43" H x 13.48" D (Depth includes Phoenix connectors; width is without rack mount brackets attached; height excludes rubber mounting feet)		

Limited Warranty, Exclusion of Certain Damages

The **NQ-PA120, NQ-PA240, and NQ-PA600** are warranted to be free from defects in materials and workmanship for five (5) years from the date of sale to the original purchaser. Any part of the product covered by this warranty that, with normal installation and use, becomes defective (as confirmed by Bogen upon inspection) during the warranty period will be repaired or replaced by Bogen, at Bogen's option, with new or refurbished product, provided the product is shipped insured and prepaid to: Bogen Factory Service Department: 4570 Shelby Air Drive, Suite 11, Memphis, TN 38118, USA. Repaired or replacement product(s) will be returned to you freight prepaid. This warranty does not extend to any of our products that have been subjected to abuse, misuse, improper storage, neglect, accident, improper installation or have been modified or repaired or altered in any manner whatsoever, or where the serial number or date code has been removed or defaced.

THE FOREGOING LIMITED WARRANTY IS BOGEN'S SOLE AND EXCLUSIVE WARRANTY AND THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY. BOGEN MAKES NO OTHER WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED AND EXCLUDED TO THE MAXIMUM EXTENT ALLOWABLE BY LAW. Bogen's liability arising out of the manufacture, sale or supplying of products or their use or disposition, whether based upon warranty, contract, tort or otherwise, shall be limited to the price of the product. **IN NO EVENT SHALL BOGEN BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, LOSS OF DATA OR LOSS OF USE DAMAGES) ARISING OUT OF THE MANUFACTURE, SALE OR SUPPLYING OF PRODUCTS, EVEN IF BOGEN HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR LOSSES.** Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

Products that are out of warranty will also be repaired by Bogen Factory Service Department -- same address as above or call 201-934-8500, at owner's expense. Returned products which do not qualify for warranty service, may be repaired or replaced at Bogen's option with a previously repaired or refurbished items. The parts and labor involved in these repairs are warranted for 90 days when repaired by the Bogen Factory Service Department. All parts and labor charges as well as shipping charges will be at the owner's expense.

All returns require a Return Authorization number. For most efficient warranty or repair service, please include a description of the failure.

09/2017

BOGEN® COMMUNICATIONS, INC.

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Easy Design™ Wall Baffle Speaker

Model WB1EZ

Description

The Bogen WB1EZ Wall Baffle Speaker is an 8" cone speaker enclosed in a simulated walnut-finished wooden enclosure with a black grille cloth on front. The WB1EZ is a 1-watt single-tap speaker with recessed volume control designed for use in 70V amplifier systems.

Designed for easy wall-mount installation, the WB1EZ comes pre-assembled.

Features

- Features screw terminal connections for fast wire lead connection
- 1W single-tap design
- Works with 70V amplifier outputs
- High intelligibility and efficiency
- Simulated walnut vinyl finish
- Designed for easy wall-mount installation
- 8" cone speaker
- Wooden cabinet
- Recessed volume control

Technical Specifications

Power Rating (RMS):	1-watt, continuous
Frequency Response:	50 Hz to 12 kHz
Impedance:	4900 ohms (for use on 70V amplifier outputs)
Sound Pressure Level:	95 dB at 4 ft. with a 1-watt input on axis
Dimensions:	9-½" W x 9-½" H x 5-¼" D (3-¼" D @ bottom)
Shipping Weight:	19 lb.
Finish:	Simulated walnut vinyl

Architect and Engineer Specifications*

The surface mounting loudspeaker shall be a Bogen Model WB1EZ, or equivalent, 8" cone-type loudspeaker having a frequency response of at least 50 Hz to 12 kHz. The on axis sound pressure level shall be 95 dB, at least four feet with one-watt input. The loudspeaker shall have a six-ounce ceramic magnet and a ¾" voice coil.

The loudspeaker shall be assembled in a wall baffle for surface-mounting, angled for additional downward sound dispersion. The baffle shall be constructed of ⅜" particle board, glued and covered in simulated walnut vinyl. Glue blocks shall be used to reinforce all side corner joints. The speaker opening shall be covered with a black grille cloth.

Overall dimensions shall be 9-½" W x 9-½" H x 5-¼" D [top] (3-¼" D base).

* Architect and Engineer Specifications are available on CD and online in a Word document to assist you with preparing your bids.

Specifications subject to change without notice.
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Part No. 54-7886-01B Printed in U.S.A. 0303

BOGEN® COMMUNICATIONS, INC.

www.bogen.com

FREEDM® Loose Tube, Gel-Free, Interlocking Armored Cable, Plenum 12 F, Single-mode (OS2)

CORNING

Part Number:
012ESP-T4101DA3

Corning FREEDM® loose tube gel-free interlocking armored cables are flame-retardant, indoor/outdoor, plenum-rated cables for interbuilding and intrabuilding backbones in aerial, duct and riser applications. Encased in a spirally wrapped, aluminum interlocking armor for ruggedness and superior crush resistance, these cables are ideal for industrial and heavy traffic areas and installations requiring extra protection for optical cables and for high-fiber-count trunking applications in areas with limited conduit or vault space. The plenum rating precludes the need for a transition splice when entering the building. These cables are available in fiber counts up to 72 fibers and are protected against water penetration by innovative waterblocking materials. These materials swell to absorb water without the use of messy gels to provide more efficient and craft-friendly cable preparation, making cable access easier and simplifies the use of buffer tube fan-out kits. The buffer tubes and fibers in each tube are color coded for quick, easy identification. The SZ-stranded, loose tube design isolates fibers from installation, environmental rigors and allows for easy midspan access. Available in 50 µm, 62.5 µm, single-mode and hybrid, the cable design is National Electrical Code® (NEC®) listed.

Features and Benefits

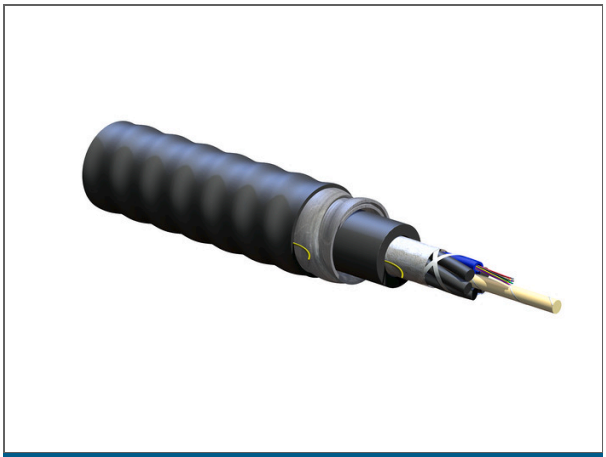
Gel-free waterblocking technology
Craft-friendly cable preparation

Loose tube design
Stable performance and compatibility with all common fiber types

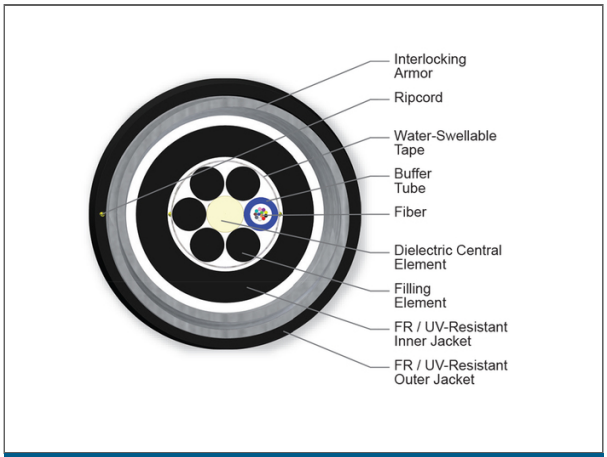
Color-coded tubes and fibers
Quick and easy identification

Flexible interlocking armor
Up to seven times the crush protection compared to non-armored cables

Common installations
Outdoor aerial and duct



FREEDM® Loose Tube, Gel-Free, Interlocking Armored Cable, Plenum, 12 F, Single-mode (OS2)



FREEDM® Loose Tube, Gel-Free, Interlocking Armored Cable, Plenum, 12 F, Single-mode (OS2)

FREEDM® Loose Tube, Gel-Free, Interlocking Armored Cable, Plenum 12 F, Single-mode (OS2)

CORNING

Specifications

General Specifications	
Cable Type	Loose Tube
Environment	Indoor/Outdoor
Product Type	Interlocking Armor
Fiber Category	Single-mode (OS2)
Flame Rating	Plenum (OFCP)
Application	Aerial, Direct Buried, Duct, General purpose, Horizontal
Cable geometry	Round

Standards	
RoHS	Free of hazardous substances according to RoHS 2011/65/EU
Approvals and Listings	National Electrical Code® (NEC®) OFNP
Common Installations	Outdoor aerial and duct, indoor vertical riser and general purpose horizontal according to National Electrical Code® (NEC®) Article 770
Design and Test Criteria	ANSI/ICEA S-104-696, CSA FT-6

Environmental Conditions	
Temperature Range, Installation	0 °C to 60 °C (32 °F to 140 °F)
Temperature Range, Operation	-40 °C to 70 °C (-40 °F to 158 °F)
Temperature Range, Storage	-40 °C to 70 °C (-40 °F to 158 °F)

Cable Design	
Central Element	Dielectric
Fiber Count	12
Number of Ripcords	2
Outer Jacket Color	Black
Outer Jacket Material	Flame-Retardant, UV-Resistant

FREEDM® Loose Tube, Gel-Free, Interlocking Armored Cable, Plenum 12 F, Single-mode (OS2)

CORNING

Cable Design	
Tensile Strength Elements and/or Armoring - Layer 1	Interlocking Armor
Buffer Tube Color	Blue
Buffer Tube Diameter	3 mm (0.12 in)
Inner Jacket Material	Flame-Retardant, UV-Resistant
Number of Active Tubes	1
Number of Filling Elements	5
Number of Tube Positions	6
Tape	Water-swellable
Fiber Coloring	Blue, Orange, Green, Brown, Slate, White, Red, Black, Yellow, Violet, Rose, Aqua
Fibers per Tube	12
Color Code Standards	Telcordia

Mechanical Specifications	
Max. Tensile Strength, Long-Term	400 N (89.92 lbf)
Max. Tensile Strength, Short-Term	1350 N (303.49 lbf)
Min. Bend Radius Installation	226.5 mm (8.92 in)
Min. Bend Radius Operation	151 mm (5.94 in)
Nominal Outer Diameter	15.1 mm (0.59 in)

Optical Characteristics	
Fiber Code	E
Fiber Name	Single-mode (OS2)
Fiber Type	Single-mode
Performance Option Code	01
Maximum Attenuation	0.4 dB/km / 0.4 dB/km / 0.3 dB/km
Wavelengths	1310 nm / 1383 nm / 1550 nm
Fiber Category	G.652.D

FREEDM® Loose Tube, Gel-Free, Interlocking Armored Cable, Plenum 12 F, Single-mode (OS2)

CORNING

Dimensions	
Cable Weight	1924 kg/km (1292.87 lb/1000 ft)
Length	0 mm (0 in)

RoHS COMPLIANT

Corning Optical Communications LLC • 4200 Corning Place • Charlotte, NC • 28216 • United States
800-743-2675 • FAX: 828-325-5060 • International: +1-828-901-5000 • www.corning.com/opcomm

Opticom® Wall Mount Enclosures

PANDUIT®
SPECIFICATION SHEET

specifications

Wall mount enclosures shall be constructed of steel material. Enclosures shall provide cable bend radius protection. Enclosures offer optional discrete locking capability between service and user segments.

technical information

Dimensions:	FWME2: WxHxD=12 x 10.18 x 2.32 in. (304.8 x 258.6 x 59.1mm) FWME4: WxHxD=16.11 x 12.25 x 3.52 in. (409.2 x 311.0 x 89.4mm) FWME8: WxHxD=16.11 x 20.25 x 3.52 in. (409.2 x 514.2 x 89.4mm)
Splicing tray and holder capacity:	FWME2: Holds (1) FSTHS which accommodates up to (2) FSTK for 12 fibers, Holds (1) FSC24 for 24 fibers FWME4: Holds (1) FST6H4 which accommodates up to (4) FST6 FWME8: Holds (2) FST6H4 which accommodates up to (4) FST6 each
HD Flex™ Cassette and holder capacity:	FWME2: Not usable FWME4: Holds (4) FLEX-OPTI-1RU holders which accommodates (2) HD Flex™ cassettes each FWME8: Holds (8) FLEX-OPTI-1RU holders which accommodates (2) HD Flex™ cassettes each
Packaging:	Includes accessory kit and labels

key features and benefits

Improved strain relief clip	Easier to install and align fiber with grommet
Spooling area	Manages and organizes fiber slack
Rubber grommet	Offers dust/debris protection and helps secure cable to enclosure
Improved latch	Provides improved closure
Optional keyed lock	Provides added security
Works with most Mini-Com® LC, SC, and ST modules and Opticom®, HD Flex™ cassettes	Offers flexibility for a variety of applications
Flush mounted latch	Minimizes box depth from wall
Optional splicing tray and holder	Allows splicing within patching enclosures

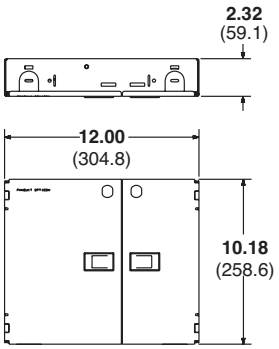
applications

Opticom® Wall Mount Enclosures are designed to manage and organize fiber distribution in areas where space is limited. They can also be used to manage cable from outside the facility. Enclosures can be used as an interconnect or cross-connect in any telecommunications room and can use any standard FAP or FMP series adapter panel. Opticom® Enclosures are completely modular and can manage both fiber and copper cables.

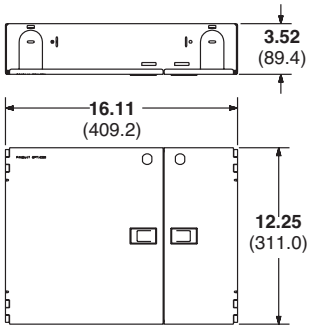
Opticom® Wall Mount Enclosures	
Max 48 fibers (2 FAP): Max 24 fibers (1 FSC24):	FWME2
Max 96 fibers (4 FAP): Max 48 fibers (4 FST6):	FWME4
Max 192 fibers (8 FAP): Max 96 fibers (8 FST6):	FWME8
Adapter Panels	
Blank panel:	FAPB
LC Adapter Panels	
6 duplex LC:	FAP6WAQDLCZ
12 duplex LC:	FAP12WAQDLCZ
SC Adapter Panels	
3 duplex SC:	FAP3WBUDSCZ
6 duplex SC:	FAP6WBUDSCZ
Splice Tray	
FWME4, FWME8 Holder:	FST6H4
Splice tray:	FST6
FWME2 Holder:	FSTHS
Splice tray:	FSTK
Door Locks	
User side:	FELU
Service side:	FELS

Opticom® Wall Mount Enclosures

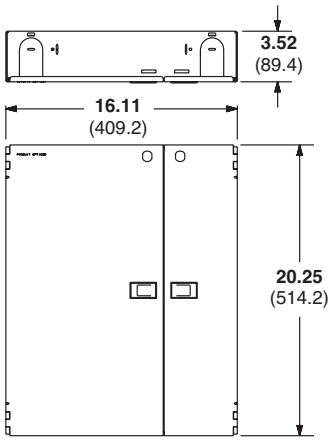
Wall Mount Enclosures



FWME2

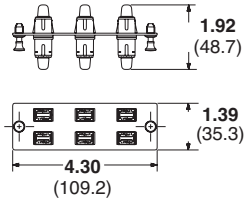


FWME4

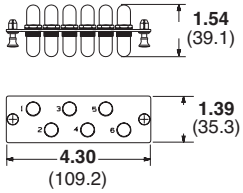


FWME8

Adapter Panels

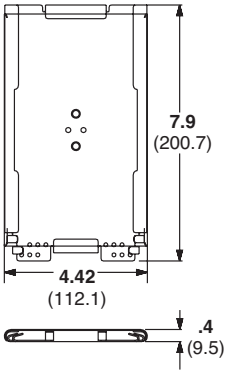


FAP6WBUDSCZ

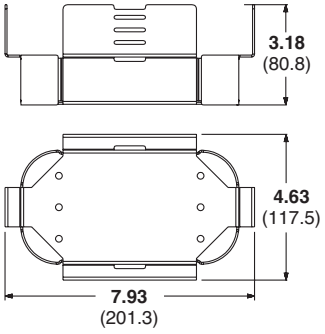


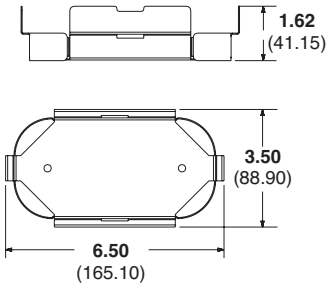
FAP6WST

Splice Trays

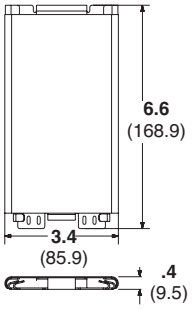


FST6





FSTHS



FSTK

Dimensions are in inches. (Dimensions in parenthesis are metric).

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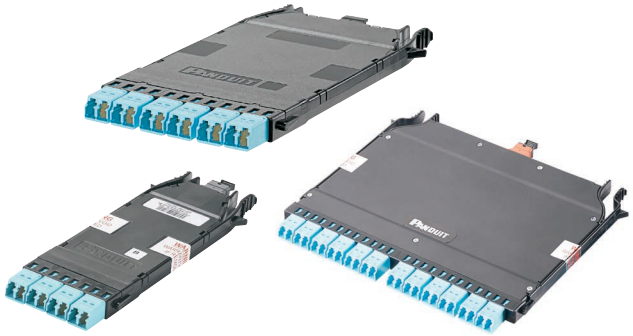
FBSP108--WW-ENG
7/2023

HD Flex™ Fiber Optic Cassettes

PANDUIT®
SPECIFICATION SHEET

technical information

HD Flex Fiber Optic Cassettes offer a wide array of deployment options to support both Ethernet and Fibre Channel networks. Cassettes are available in 4-port, 6-port, and 12-port configurations with several connector options on the front and back of the cassettes. Splice cassettes and adapter/coupler modules are also available.



applications

Allows system designers to tailor configuration, reach and breakout construction to application requirements; to minimize waste, optimize cable management, speed deployment, and improve flexibility and manageability for lower installation costs.

construction

Fiber types:	Multimode:	OM3 50/125µm OM4 50/125µm OM4+ Sig Core 50/125µm
	Singlemode:	OS2 9/125µm
Front connectivity:	LC, LC/APC Duplex Adapters (Shuttered) SC, SC/APC Duplex Adapters MPO Adapters (Key-up to Key-up, Key-up to Key-down)	
Rear connectivity:	MPO Adapter with MPO male connector MPO Adapters (Key-up to Key-up Method B, Key-up to Key-down Method A) 12-fiber and 24-fiber for splicing (ribbon, 250µm)	

environmental properties

Operating temperature:	0°C – 70°C (32°F – 158°F)
Storage and shipping temperature:	-40°C – 70°C (-40°F – 158°F)
Installation temperature:	0°C – 60°C (32°F – 140°F)

performance properties

Insertion loss:	Multimode:	Optimized Cassette and Breakout Cassette: 0.5dB Ultra Low Loss Cassette and Breakout Cassette: 0.35dB Optimized Loss Splice Cassette: 0.15dB plus splice loss Ultra Low Loss Splice Cassette: 0.10dB plus splice loss
	Singlemode:	Standard (1) 24F MPO Cassette: 1.2dB Standard Cassette and Breakout Cassette: 0.75dB Standard Loss Splice Cassette: 0.35dB plus splice loss
Return loss: (per fiber)	Multimode: Singlemode:	>26dB (LC) >55dB (LC) >65dB (LC/APC)
Connector durability:	Connectors meeting ANSI/TIA-586C.3 Durability: 500 mating cycles	
Fiber count:	24 (cassette and tethered cassette) 24 (splice cassettes) 24 discrete splice, 48 ribbon splice (splice only)	
Split sleeve material:	Zirconia ceramic	

standards

Meets or exceeds:	ISO/IEC 11801, ANSI/TIA-568-C.3, TIA-604-5 (FOCIS-5), TIA-604-10 (FOCIS-10), RoHS Compliant

HD Flex™ Fiber Enclosures

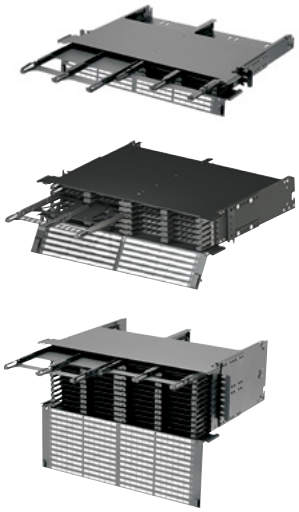
PANDUIT®
SPECIFICATION SHEET

specifications

The HD Flex enclosure shall house, organize, manage and protect fiber optic trunk cables, terminations, splices, connectors and patch cords as well as accommodate all HD Flex cassettes and fiber adapter panels (FAP). The HD Flex Enclosures provide front access with drawers that slide out into two locked positions, regardless of how many enclosures are stacked together. The Enclosure trays have a unique split tray feature that allows for half of the tray to operate independently, which is an ideal option for maintainability as well as redundant networks.

The Enclosures allow cassettes and FAPs to be installed by dropping them into the front of the enclosure tray or sliding them into the rear of the enclosure tray. This allows each individual cassette or FAP to be removed with minimal disruption to other cassettes or FAPs.

The Enclosures are constructed of steel material and can be ordered in either 4-port, 6-port or 12-port configurations that accept combinations of either 4-port, 6-port cassettes and 12-port cassettes respectively.



technical information

Mounting:	Integral mounting flange for installation in 19" wide EIA-310 racks
Material:	Steel and plastic

key features and benefits

Modular design accepts up to 12 HD Flex Fiber Cassettes or Fiber Adapter Panels per rack unit	Provides higher patch field density in fewer rack units saving valuable rack space
Compatible with all HD Flex Fiber Cassettes and Fiber Adapter Panels	Provides versatility and flexibility with a fully modular solution for a variety of pre-terminated installations
Rack/Cabinet Rail Mounting Cable Management Bracket	Provides template for additional mounting of cables, moving cable from back of enclosure to side of enclosure resulting in easy access to connections for improved serviceability
Front and Rear Accessible Enclosure Tray	Allows access to connections from front or rear of rack/cabinet facilitating easy moves, adds and changes without disruption of network connections
Front Drop In and Rear Slide Out Mounting of Cassettes and Fiber Adapter Panels	Allows access to cassettes without fully sliding out cable management plate
Split Enclosure Tray	Allows each half of tray to operate independently providing improved reliability and serviceability of redundant network connections
Multi-positional Enclosure Tray	Allows tray to be locked in two extended positions resulting in improved access when patching and maintaining network connections
Convertible between 4-port, 6-port and 12-port Cassettes and Fiber Adapter Panels	Accommodates current and future optical connectivity options, duplex, and parallel fiber

applications

HD Flex Fiber Optic Enclosures provide a system for managing fiber terminations, connections, and patching in all types of applications. The enclosures are a component of the HD Flex Fiber Cabling System. They are ideal for fast, flexible and reliable patch field solutions within main, horizontal and/or equipment distribution areas (MDA, HDA and EDA).

HD Flex Fiber Enclosures*	
1 RU 4-port enclosure:	FLEX1U04
1 RU 6-port enclosure:	FLEX1U06
1 RU 12-port enclosure:	FLEX1U12
2 RU 4-port enclosure:	FLEX2U04
2 RU 6-port enclosure:	FLEX2U06
2 RU 12-port enclosure:	FLEX2U12
4 RU 4-port enclosure:	FLEX4U04
4 RU 6-port enclosure:	FLEX4U06
4 RU 12-port enclosure:	FLEX4U12
HD Flex Trunk Slack Plates+*	
1RU:	FLEX-PLATE1U
2RU:	FLEX-PLATE2U
4RU:	FLEX-PLATE4U
HD Flex Enclosure Trunk Slack Plate and Cover Kits^#	
1RU:	FLEX-PLATE1UR
2RU:	FLEX-PLATE2UR
4RU:	FLEX-PLATE4UR
HD Flex Trunk Cable Managers	
Universal Trunk Managers 12-fiber transition capacity:	FLEX-CM12S
18-fiber transition capacity:	FLEX-CM18S
PatchRunner™ Trunk Managers 12-fiber transition capacity:	FLEX-CM12C
18-fiber transition capacity:	FLEX-CM18C
HD Flex Rail Kits	
4-port Rail:	FLEX-RAIL04EN
6-port Rail:	FLEX-RAIL06EN
HD Flex Trunk Transition Clips	
12-fiber capacity:	FLEX-CLIP12
18-fiber capacity:	FLEX-CLIP18
HD Flex Blanking Panels	
4-port Filler Panel:	FHSBBL04W
6-port Filler Panel:	FHSBBL06W

* Add WH at end of the part number for white.

\+ These plates are standalone and are not compatible with covers. If a cover is required then the kits with a plate and cover should be ordered.

^ The plate and cover kits are ordered to protect the trunk cables. The covers are not sold separately.

\# Add W at the end of the part number for white

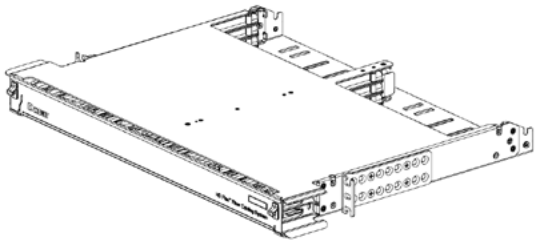
HD Flex Fiber Enclosure

fiber capacity

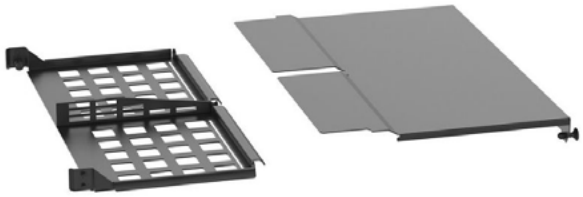
Description	Enclosure		
	1 RU	2 RU	4 RU
Cassettes: MPO to Duplex LC	144	288	576
FAP: 12F MPO	864	1728	3456
FAP: 24F MPO	1728	3456	6912

For dimensions, please go to **www.panduit.com**/hdflex for the part drawings.

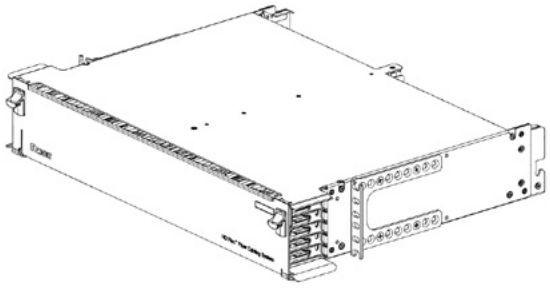
hd flex fiber enclosure



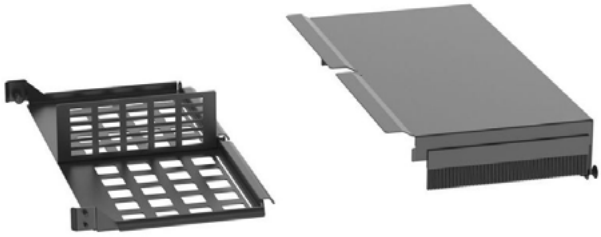
FLEX1U04, FLEX1U06, FLEX1U12



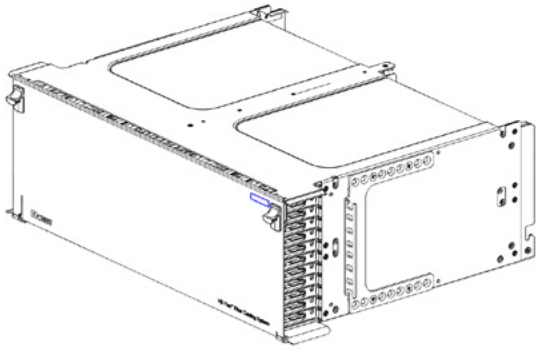
FLEX-PLATE1UR



FLEX2U04, FLEX2U06, FLEX2U12



FLEX-PLATE2UR



FLEX4U04, FLEX4U06, FLEX4U12

FLEX-PLATE4UR

WORLDWIDE SUBSIDIARIES AND SALES OFFICES

PANDUIT US/CANADA
Phone: 800.777.3300

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London, UK
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PANDUIT SINGAPORE PTE. LTD.
Republic of Singapore
Phone: 65.6305.7575

PANDUIT JAPAN
Tokyo, Japan
Phone: 81.3.6863.6000

PANDUIT LATIN AMERICA
Guadalajara, Mexico
Phone: 52.33.3777.6000

PANDUIT AUSTRALIA PTY. LTD.
Victoria, Australia
Phone: 61.3.9794.9020

For a copy of Panduit product warranties, log on to www.panduit.com/warranty

For more information
Visit us at www.panduit.com
Contact Customer Service by email: cs@panduit.com
or by phone: 800.777.3300

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FBSP92-WW-ENG
04/2023

Opti-Core® Push-Pull LC Duplex Fiber Optic Patch Cords

PANDUIT®

SPECIFICATION SHEET

technical information

Push-Pull LC Duplex Fiber Optic Patch Cords containing the custom push-pull strain relief boot and duplex clip, allow users easy accessibility when deploying very high density LC patch fields in data center applications. Available in riser (OFNR), and low smoke zero halogen (LSZH) rated jacket materials to comply with local cabling ordinances and OM4, OM3 or OS1/OS2 fiber types to meet the demands of today's highest speed applications.

application

Provide interconnect and cross-connect of applications in entrance facilities, telecommunication rooms, data centers, at the desk and network applications to interconnect pre-terminated cassettes in main distribution, horizontal distribution, and equipment distribution areas.

construction

Fiber count:	Duplex (2-fiber) jacketed zipcord
Cable jacket ratings:	Riser (OFNR) Low Smoke Zero Halogen (LSZH) per: IEC 60332-1-2, IEC 60332-3-24, IEC 60754-1, IEC 60754-2, IEC 61034-2
Fiber types:	Singlemode: OS1/OS2 9/125µm Multimode: OM3 50/125µm OM4 50/125µm
Connector types, End 'A':	Duplex LC
Connector types, End 'B':	Duplex LC
Jacket color:	OS1/OS2: Yellow OM3: Aqua OM4: Aqua

physical properties

Cable outside diameter (OD):	1.6mm duplex
Bend Radius (min) Short-Term:	16mm
Bend Radius (min) Long-Term:	32mm
Connector cable retention:	50N (4.24lb) @ 0° 19.4N (4.4lb)@ 90°
Connector durability:	500 cycles

optical properties

Connector insertion loss:	Standard: 0.25dB max (OM3 and OM4) 0.35dB max (OS2) Optimized: 0.15dB max (OM3 and OM4) Ultra: 0.10dB max (OM4)
Connector return loss:	26dB min (OM3 and OM4) 55dB min (OS1/OS2)

environmental properties

Storage and wshipping temperature:	-40°C to 70°C
Operating and installation temperature:	-10°C to 60°C

standards

Meets or exceeds ISO/IEC 11801, TIA-568-C.3, TIA-604-10 (FOCIS-10)

Restriction of Hazardous Substances (RoHS) Compliance:	All patch cord components meet the requirement of Directive 2002/95/EC

Opti-Core® Push-Pull LC Duplex Fiber Optic Patch Cords

part number configurator

Example: FX2ERQ1Q1SNM005 = Fiber, OM3, 2-fiber, 1.6mm cable, riser rated, LC push-pull connector to LC push-pull connector, standard IL, 5 meters

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Example	F	X	2	E	R	Q	1	Q	1	S	N	M	0	0	5

1 – Fiber Product
F = Fiber

2 – Fiber Type
X = OM3 50/125µm
Z = OM4 50/125µm
9 = OS1/OS2 9/125µm

3 – Fiber Count
2 = 2-fiber

4 – Cable Type
E = 1.6mm

5 – Jacket Type
L = LSZH (Low Smoke Zero Halogen)
R = OFNR (Riser)

6 – Connector Type
Q = LC Push-Pull connector

7 – Connector Variant
1 = 1st Gen (Low Profile Duplex LC)

8 – Connector Type
Q = LC Push-Pull connector

9 – Connector Variant
1 = 1st Gen (Low Profile Duplex LC)

10 – Performance/Construction
S = Standard IL/Straight Through (A-B)
O = Optimized IL/Straight Through (A-B)
N = Ultra IL/Straight Through (A-B)

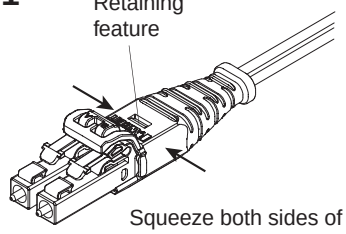
11 – Connector Variant
N = No variant

12 – Unit of Length
M = Meters
F = Feet

13, 14, 15 – Length
001 - 050 in 1 meter increments
1/2 meter increments available between 1 and 10 meters, ex 3.5
Foot-length increments available from 1 to 25 feet in Riser-rated jacket only

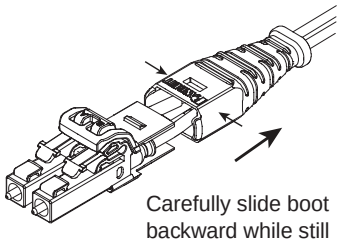
polarity changeover

1



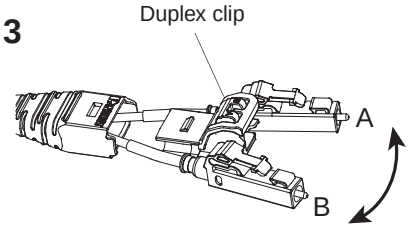
Squeeze both sides of the boot. Squeezing sides lifts boot over retaining feature.

2



Carefully slide boot backward while still squeezing sides.

3



Remove both connectors from duplex clip and switch positions of A/B. Only perform this change on one end of the patch cord.

Other options are available as follows; contact Panduit for part number.
Fiber type: OM4+ Signature Core™
Performance/Construction: Optimized IL – Straight Through (A-B), Optimized IL – Flipped (A-A), Standard IL – Flipped (A-A)

WORLDWIDE SUBSIDIARIES AND SALES OFFICES

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cs-cdn@panduit.com
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cs-aus@panduit.com
Phone: 61.3.9794.9020

For a copy of Panduit product warranties, log on to www.panduit.com/warranty

For more information

Visit us at www.panduit.com

Contact Customer Service by email: cs@panduit.com or by phone: 800.777.3300

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FBSP90--WW-ENG
2/2015

THANK YOU!

Motor City Electric Technologies

Submitted to White Lake Township

January 29, 2025

White Lake Township Hall

Low Voltage & AV Proposal – Township Hall

White Lake Township, Michigan

9440 Grinnell St.
Detroit, MI 48213-1151
Phone: 313.921.5300
www.mceco.com

INTRODUCTION

On behalf of the entire Motor City Electric Technologies (MCET) and Bluewater Technologies (BWT) staff, I would like to thank you for your interest in our products and services. MCET and BWT have been servicing our customers for over thirty years by specializing in all facets of the Technologies and Audio/Visual industry. Our philosophy is to build successful, long-lasting relationships with our customers.

With our years of experience in Technologies, AV design, and installation industry, MCET and BWT are confident that we can provide White Lake Township with a more effective and user-friendly Low Voltage and AV solution, while maintaining a similar budget to what is outlined in the current bid. Our proposal aims to enhance the overall functionality and ease of use for the township's Low Voltage and AV systems, ensuring it is intuitive for all users.

Beyond providing a user-friendly design, our solution will also focus on improving the long-term reliability of the AV systems. By utilizing more robust components and streamlined systems, we can offer a setup that reduces the complexity of future maintenance and service needs, saving time and costs in the future. We would appreciate the opportunity to work with you on a Design/Assist proposal that would allow us to develop a tailored AV solution that delivers the highest possible quality for all rooms, at a competitive price point. Our goal is to ensure that the township of White Lake receives the best possible AV experience, now and in the years to come.

We look forward to the possibility of collaborating on this project and are excited about the potential to serve the township's needs.

MCET COMPANY HISTORY & INFORMATION

As one of the largest contractors in the nation, Motor City Electric Co. (MCE) was founded in 1952 and has continued to grow its position as an electrical contractor in the Midwest. MCE has nine focused divisions, including Automotive and Process, Commercial, Industrial, Specialty Industries, Service and Emergency, Public Works and Steel, Technologies, Utilities and Excavation.

Motor City Electric Technologies, formally the Cadre Corporation, was created in 1993 and is the technology, integration, and engineering subsidiary of Motor City Electric Co. MCET is an Information Technology, Controls Engineering and Low Voltage integrator/installer that provides professional and technical services in all aspects of Information Technology, from system design to comprehensive maintenance and installation services. MCET’s staff of experienced designers, project managers, engineers, estimators, technicians, and installers are your sole source for structured cable, voice & data, life safety systems, video surveillance & card access systems, audio/visual solutions, and Information Technology communication systems, whether wired or wireless.

As a member of the IBEW and NECA, MCET currently employs more than fifty (50) IBEW Local 58 Union Sound and Communication Technicians with an average length of employment of 7 years and has an office support staff of over twenty-five employees comprised of CAD Operators, Engineers, Designers, Programmers and Project Managers.

BLUEWATER TECHNOLOGIES COMPANY PROFILE

Bluewater Technologies is a privately held, woman-owned, S-corporation founded in metro-Detroit in 1985. The company began by providing simple AV equipment rentals for local businesses and organizations, then rapidly evolved in response to changes in technology and the demands of customers. Currently, Bluewater provides a full range of technology, fabrication, software and creative services for Meetings & Events, Workplace Technology, Retail Experience and Environments & Exhibitions, and ranks among the top 15 Systems Integrators nationally. From TVs and VCRs on carts in the '80s, to high-end projection systems and LED video walls in the '90s, to the technology-fueled experiences of the 2000s, Bluewater has always pushed the boundaries of innovative technology and maintained a focus on excellence.

As a privately held company, Bluewater does not share financial information. However, we can confirm that we are financially stable and profitable. If additional details are required, please contact Eric Butler, CFO at ebutler@bluewatertech.com.

Organizational Structure

Bluewater serves our diverse portfolio of clients through four locations: Our company headquarters in Wixom, MI, offices in Grand Rapids, a production facility in Mesick, MI, and an office in Indianapolis, IN. We currently employ a staff of 175 throughout these locations.

WORK PROGRAM

Scope Requirement: - MCET will provide and install the required low voltage system (voice, data, cable infrastructure, fiber backbone, terminations, testing, and certification) as required in the RFP. MCET and our strategic Audio-Visual partner Bluewater Technologies (BWT). will provide the installation of the required Audio Video systems, commissioning and testing as required in the RFP. As part of the Scope of Work, The MCET Team will provide the necessary project management, project engineering, technical implementation support, training, and other professional services for the implementation of the project. Our team will ensure the timely and satisfactory completion of each site / facility location as outlined in the RFP.

Closeout Procedure - MCET will provide O&M manuals, drawings, documentation, test documentation, warranty documentation, and training.

MCET EXECUTIVE TEAM AND STAFF

Management Team

David M. Krausman (RCDD), Vice President of Motor City Electric Technologies, leads our management team. David joined MCET in 2003 with 25 years of experience in the technology industry.

Justine Fleming (RCDD), General Manager of Motor City Electric Technologies, joined MCET in 1996 with 30 years of experience in the technology industry.

Scott Sutherland, Senior Estimator of Motor City Electric Technologies, joined MCET in 2001 with 35 years of experience in the technology industry.

Mahria Boone, (CCENT, CCNA, and iBwave certification), RF Design Engineer/Network Technician of Motor City Electric Technologies, joined MCET in 2004 with 24 years of experience in the industry.

Marc Spontack, Security Engineer/Project Manager of Motor City Electric Technologies, joined MCET in 2012 with 28 years of experience in the technology industry.

Jonathan Buchler, Project Manager of Motor City Electric Technologies, joined MCET in 2019 with 20 years of experience in the technology industry.

Ronald Kitchen, Project Manager of Motor City Electric Technologies, joined MCET in 2021 with 35 years of experience in the technology industry.

Danial Jipping, Project Manager of Motor City Electric Technologies, joined MCET in 2020 with 5 years of experience in the technology industry.

Trey Ebinger (PMP, RCDD), Project Manager Motor City Electric Technologies, joined MCET in 2020 with 5 years of experience in the technology industry.

Project Management Team

Our project management team brings with them 20 years of experience in the technology industry managing various size projects including but limit to educational, commercial, municipal, manufacture, distribution, transportation, utilities, industrial, distribution, and large public venues. The MCET project management team carries BICSI and RCDD certification and accreditation.

Capabilities

Motor City Electric Technologies offers complete technology contracting services from design and installation to operations, maintenance, and service. Types of work provided include but limit to cellular phone registration systems, emergency radio response systems, wireless systems, security systems, communications, controls, data centers, fiber optic, sound and video, telecommunications infrastructure, transportation systems, networks, programing, configuration, and system testing.

Client industries include commercial, automotive, casinos, governments and municipalities, medical/hospitals, hotels, service industry, manufacturers, schools, universities, arenas/stadiums, utilities, and fresh water/wastewater treatment plants.

Engineering and Design Services

Our engineering team utilizes state-of-the-art software tools to assist with BIM, Revit, 3D modeling, and other workflow processes for our engineering and design work and for coordination with our trade colleagues. This includes tools from AutoCAD, including:

- Autodesk Design Suite
- Revit
- AutoCAD
- BIM 360
- iBwave Level 3

Technicians and Installers Team

Motor City Electric Technologies technicians and installer teams bring with them over 20 years of experience in the technology industry and our signatory to IBEW. MCET is dedicated to keeping our teams up to date on the latest certifications, industry standards, including but limit to cross and specialized system training to provide a well divers installation field team. Our installation varies anywhere from structures cabling, security systems, network systems, wireless, public safety, and cellular reinforcement systems.

Technician Staff Certifications Consist of:

- RCDD and BICSI certified technician
- BICSI certified Technicians
- CCNA certified network technicians

Service Group

Motor City Electric Technologies provides service technician equipped service vehicles dedicated to non-emergency (Next business day) and emergency (24/7, 4-Hour Response) dispatch. We provide project oriented spare critical equipment to ensure all emergency responses can be handled without major disruption.

Quality

Motor City Electric Technologies is ISO 9001:2015 certified, but for our team members, taking pride in our work is a greater measure of quality performance. That means doing it right, checking to make sure that it is right, and making sure that the customer is satisfied with the results.

Safety

Motor City Electric Technologies provides safety training to its employees on a regular basis. From the National Electric Code (NEC), National Fire Protection Association codes (NFPA), and OSHA standards to first aid, CPR, equipment operation, hazardous materials to ensure workplace safety.

CLIENTS REFERENCES

Project:	Brose Headquarters, Multiple Projects
Company Name:	Brose North America Inc.
Contact Name:	Gerardo Calderon
Phone Number:	(956) 832-2260
Email Address:	Gerardo.Calderon@brose.com

Project:	Oakland University - Engineering Center Low Voltage Installation
Company Name:	Oakland University
Contact Name:	Sue Riley, Senior Project Manager
Phone Number:	(248) 370-4613
Email Address:	riley23@oakland.edu

Project: Macomb Community College – Multiple Projects
Company Name: Macomb Community College
Contact Name: Bernie Jacobs, Manager of Construction & Engineering
Phone Number: (586) 445-7019
Email Address: jacobsb@macomb.edu

Project: Little Caesars Arena
Company Name: Barton Malow – Hunt – White
Contact Name: Sean Hollister
Phone Number: (248) 436-5000
Email Address: shollister@bmhwteam.com

Project: City of Royal Oak
Company Name: Convergent Technology Partners
Contact Name: Eric Helsel
Phone Number: (810) 223-0531
Email Address: ehelsel@ctpartners.net

PROJECT PROFILE

Wayne County Criminal Justice Center

Scope: Wayne Count Criminal Justice Center Project encompasses four buildings. It has adult and juvenile detention facilities (525,000 square-feet and 129,000 square-feet respectively), a 263,000 square-foot courthouse, and a 155,000 square-foot sheriff's office. MCET was responsible for the installation of voice/data, security, IPTV, public safety network, and wireless access points.

Over the course of the project, MCET will install 321 wireless access points, 992 cameras, 487 IPTVs, 185 PSN devices, and 1,976 access control doors. Additionally, MCET will install 1,094,573 feet of copper cable and 37,806 feet of fiber cable throughout the Wayne County Criminal Justice Center.

Customer: Wayne County

Target Completion Date: 2023

Value: $10.5 Million

Little Caesars Enterprises, Inc.
Little Caesars Headquarters

Scope: This newly constructed nine-story, 234,000 square foot, Little Caesars Global Resource Center at the corner of Woodward Avenue and Columbia Street in The District Detroit features a one-of-its-kind Passive Optical Network (PON) powered by digital electricity (DE). The installation is a Corning ONE based solution with single mode fiber to the edge. The implementation is designed with four (4) optical line terminals, seven (7) software defined data planes, one (1) top of rack switch operating over nine hundred (900) optical line terminals allowing up to four thousand (4,000) user ports. This passive optical network

supports six hundred (600) users, one hundred and sixty (160) security cameras, one hundred fifty (150) wireless access points with a building wide audio video solution supporting one hundred ten (110) Crestron Nvx's, one hundred fifty (150) flat panel display, ten (10) video projectors, two (2) interactive video walls.

This innovative technology provides the owner with all the network connections they are accustomed to with a less expensive network operational cost. The design eliminates the use of Ethernet switches in the network and reduces the overall network infrastructure. While future proofing the cabling infrastructure, this allows the network maintenance to become centralized and easier to manage.

Customer: Brinker Christman A Joint Venture

Completed: 2019

Value: $5 Million

Olympia Development
Little Caesars Arena

Scope: This newly constructed 800,000 square-foot arena is home to the Detroit Red Wings and Detroit Pistons. MCET was responsible for the installation of the voice/data, broadcast, intercom, LED televisions and lower bowl audio systems. Over the course of the project, MCET installed more than 2.5 Million feet of Category 6A Ethernet cable, 500,000 feet of jacketed fiber optic cable (8.4 Million feet or 1,590 Miles by the strand), and 2 Million feet of Broadcast audio/video cable. This project also included the installation of over 1,300 high-definition televisions and 900 wireless access points.

Customer: Barton Malow – Hunt – White

Completed: 2017

Value: $20 Million

Oakland and University
Engineering Center

Scope: As the home for the School of Engineering and Computer Science, this 6-story 127,000 square-foot facility features state-of-the-art classrooms and research space. MCET installed over 2,700 Category 6A voice/data drops as well as the audio/visual, access controls, CCTV and building management systems. A redundant diverse fiber optic communication backbone was installed at the university data center as part of this project.

Customer: Oakland University

Completed: 2015

Value: $4 Million

Macomb County Department of Roads
Communications and Technology Center (COMTEC)

Scope: A 25,000 square foot state-of-the-art facility that provides 24/7 situational awareness for residents, businesses and first responders. The facility houses the Macomb County Sheriff's Office Centralized Dispatch, the Road Department Traffic Operations Center, the Information Technology Department and Data Center, and the Emergency Management & Communications Department. For this project, MCET installed the supporting audio/visual equipment and structured cabling to support a 20' x 50' video wall, eight traffic-monitoring stations, twenty-five E911 dispatch stations, the County-wide Emergency Operations Center, a centralized data center, and a computer lab/training facility.

Customer: Michigan Department of Transportation / Macomb County Dept. of Roads

Completed: 2013

Value: $3.3 Million

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As a privately held company, Bluewater does not share financial information. However, we can confirm that we are financially stable and profitable. If additional details are required, please contact Eric Butler, CFO at ebutler@bluewatertech.com.

Organizational Structure

Bluewater serves our diverse portfolio of clients through four locations: Our company headquarters in Wixom, MI, offices in Grand Rapids, a production facility in Mesick, MI, and an office in Indianapolis, IN. We currently employ a staff of 175 throughout these locations.

Officers and Executives

Suzanne Schoeneberger - President & Owner – Wixom
John Tracy – CEO – Wixom
Eric Butler - CFO - Wixom
Nanette Studebaker – COO - Wixom
Nick Marino – VP, Sales - Integration - Wixom
Brittney Bemb – VP, Integration Operations – Wixom

BWT EXECUTIVE TEAM

Nick Marino – Vice President Sales, Integration Nick has been with Bluewater for over 15 years. He joined the company as a senior account executive in 2009 and has since been promoted from the Director of Sales to the Vice President of Sales leading the Integration sales team. Nick has led some of Bluewater's largest projects such as Macomb County Comtec, Buffalo Wild Wings, BAE Systems, The Taubman Company and Little Caesars Arena. Prior to joining Bluewater, Nick was the National Sales Manager at Sport View Technologies for over 5 years.

Brittney Bemb – Vice President of Operations, Integration MBA, PMP Brittney has over 15 years of project management experience from live event and software management to platform integration and AV Project Management. In her career, she has successfully managed over 1,500 projects ranging from $2,000 to $3.5 million in value. Brittney changed course in 2015 from managing projects to following her path as a teacher and mentor to become the Director of Bluewater's PMO and Experiential teams. As demand in the industry shifted, Brittney did the same to help Bluewater launch new processes, tools, and platforms to better serve their clients and team members as the Director of Operational Excellence. As a Bluewater team member for 11 years, Brittney now acts as the Vice President of Operations - Integration. She works to drive consistent improvement in quality standards and efficiency to provide the best solutions and experience for Bluewater's clients.

Derek Monette – Director of Operations Derek began his career in the commercial AV industry after graduating from Central Michigan University in 2007. He started as a Field Technician before transitioning to Project Management and joined Bluewater as a Project Manager in 2013. In 2017, Derek moved to the Engineering team, eventually leading it until 2022, when he took on the role of Director of Operations. With expertise in project management and engineering, Derek ensures operational excellence across Bluewater.

Ben Lindsey - Quality Assurance Manager, CTS Ben has been an invaluable member of the Bluewater team since 2000, bringing in over two decades of expertise. Starting with bench-level equipment repair for top manufacturers like NEC, Sony, and Biamp, Ben quickly expanded his role to fieldwork and system support. From 2008 to 2018, he became a go-to expert for programming installations, integrating complex systems like Crestron, AMX, and Extron. Ben's deep technical knowledge and leadership skills led him to manage several key teams, including Programmers, Managed Service Technicians, and Engineering. Currently, he serves as Bluewater's Quality Assurance Manager, ensuring every project meets the highest standards. Throughout his career, Ben has been dedicated to supporting his teammates at every phase of the project life cycle, making him a vital resource for both technical and strategic success.

Lisa Page – Project Management Lead Lisa has been with Bluewater for two years, starting as a Project Manager and quickly advancing to Project Management Lead. She began her project management career in architectural construction, overseeing projects from design through fabrication and installation. With a solid foundation in both construction and AV, Lisa is known for her exceptional problem-solving abilities and ensures that both her clients and team have everything they need for a successful project. Her talent for listening, clear communication, and relentless determination makes her a trusted leader who consistently delivers exceptional results.

Melissa Phillips – Account Manager Melissa has been an integral part of our team for the past eight years, consistently demonstrating her dedication and expertise as an Account Manager. Known for her meticulous attention to detail and client-focused approach, Melissa excels in understanding and addressing the unique needs of each client, ensuring their satisfaction and success. As a team player, she collaborates seamlessly with her colleagues, fostering a cooperative and productive work environment. Her commitment to building strong client relationships and ensuring that we are a dependable partner for their solutions has been pivotal to our company's growth and reputation. Melissa's unwavering dedication to her clients and her ability to deliver tailored solutions make her a valued asset to our team and a trusted advisor to our clients.

Woody Booth – Senior Project Manager With over 25 years in the commercial audio-visual industry, Woody started at Bluewater as a Lead Installation Technician and later became the Installation Manager and Estimator. Over the past 17 years, he has excelled as a Project Manager and Estimator, handling Bluewater's largest installation projects for high-profile clients like GM, Ford, and Quicken Loans. Woody specializes in large-scale, new construction installations, notably managing multi-million-dollar projects in downtown Detroit. His detailed, client-focused approach ensures on-time project completion and outstanding client experiences, also providing critical support in large project estimates.

Steve Insley – Director of Managed Services and Install Steve has over 11 years of experience in the AV industry, progressing from Installation Supervisor to Integration Operations Manager and now Manager of Operations and Managed Services. He also brings over 10 years of expertise in voice, data, and structured cabling. Steve works closely with all members of Bluewater's integration and service teams, ensuring seamless collaboration and operational excellence. His professional certifications include Crestron DMC-D-4K, and Extron EAVA, demonstrating his commitment to industry standards and quality.

Drew Kergan – Field Engineer, CTS-I Drew began his career in the audio-video industry working in residential AV from 1997 to 1999 before joining Bluewater in 1999. He quickly advanced to Lead Technician, playing a pivotal role in transitioning projects from analog to digital systems. As one of the most knowledgeable technicians in the industry, Drew holds a CTS-I certification and is highly sought after for his expertise. Known for handling tough on-site situations with ease, he excels at keeping clients informed and satisfied through clear communication and well-defined next steps. His ability to work seamlessly with all trades ensures the success of even the most challenging projects, making him an invaluable asset to the Bluewater team.

Jeff Hynes – Programmer, CTS-I Jeff has been a key contributor to Bluewater since 2011, progressing from Field Engineer to a highly skilled AV Systems Programmer. Specializing in Crestron programming, Jeff has extensive experience working with top manufacturers like Q-sys, Extron, and Biamp. His certifications include Crestron Certified Programmer and Avixa's CTS-I, along with numerous other programming credentials that highlight his expertise in advanced technologies. Jeff's deep technical knowledge enables him to design, program, and implement complex AV systems, providing innovative solutions tailored to meet clients' needs.

PROJECT PROFILES

Little Caesars Enterprises' World Headquarters - Detroit, MI
PROJECT VALUE: $2.8 MILLION - Completed 2019

In conjunction with MCET, Bluewater provided a turn-key AV solution for the entire Little Caesars Enterprises' World Headquarters. This included a video/IP solution that provides the ultimate in flexibility by providing the ability to provide any source to any designation. Additionally, BW furnished and installed 50+ conference rooms, huddle rooms, boardrooms, and collaboration spaces that ranged from extremely basic with wireless and wired collaboration to a display to spaces with much more functionality including wireless/wired collaboration for presentations, video, and audio conferencing, multi touch capability and fully integrated control that controls all aspects of the space.

In addition to the conference room spaces, Bluewater furnished and installed Direct View LED in an open space for presentation and digital signage capabilities, a test kitchen, a Little Caesars replicated site, Focus/ Observation area, divisible training room for individual training session with 4 spaces or the ability to open up for a much larger group, a gym, a terrace with mobile systems for presentation overflow, and entry way projection mapped floor and sound masking throughout the entire 9 floor building. Bluewater worked with the architect, the designer and consultant to specify and install equipment and provide 2 years of post-install support.

Lastly, Bluewater designed and built the studio for LCE that relies on green screen technology and is in the process of designing a new XR studio in the same space.

United Shore Mortgage - Pontiac, MI:
PROJECT VALUE $ 2.2 MILLION

Bluewater provided all digital signage and conference room technology throughout United Shore's new state-of-the-art headquarters in Pontiac, MI. Spaces include: the lobby's custom LED welcome signage, the auditorium, which will boast rear projectors, new audio, and Crestron control; the fitness center and full basketball court, with audio and monitors throughout; and 11 training rooms, all of which have a presentation area, control, and audio. Bluewater gave the same treatment to the cafeteria, security room, conference rooms, and the common areas throughout all three floors. In total, Bluewater installed over 175 displays and dozens of speakers throughout the building. The finished product is a completely tech-savvy office for the modern worker. We are grateful to be recognized as one of SCN's 2018 Installs of the Year for this project.

Penske Entertainment - Indianapolis Motor Speedway – Indianapolis, IN
PROJECT VALUE: $5+ Million since 2020. Projects on-going.

Bluewater has installed and/or is repairing and supporting all LED boards out at Indianapolis Motor Speedway since 2020. We also provide LED and AV technicians for on-site race support. We have also worked with Penske Entertainment on providing installation and support of their conference room technologies. Recent changes started in 2020 with the 100' x 20' 6mm Pagoda board. 2023- Updated scoring Pylon from 16mm pixel pitch to a brighter 10mm pixel pitch. 2023-New Start/Finish line 10mm LED board and Infield 10mm board. 2024 work includes 12 new 3mm infield mound boards, Turn 7,

outside Turn 1 and 4 10mm LED boards. We are currently managing 63 individual LED displays. LED displays are ABSEN and KWAV

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Salesforce Tower – Indianapolis, IN

PROJECT VALUE: $3 Million - Completed 2019

Bluewater was chosen by Salesforce as the most qualified AV integrator to install and support their 100 conference rooms across 14 floors in Salesforce Tower. There were 3 bid phases and Bluewater won each phase based on consistent workmanship, attention to detail and LIVE support. Their top floor "The Ohana Floor" was $750k by itself and Bluewater supports their Townhall meetings that take place there. Technology includes Crestron, QSC, Shure, Biamp, Samsung.

PROJECT TIME FRAME FLOW CHART

Gant Chart will be provided upon award.

Motor City Electric Technologies Inc.
ISO 9001:2015

9440 Grinnell St.
Detroit, MI 48213-1151
Phone: 313.921.5300
www.mceco.com

January 29, 2025

Ms. Trish Pergament
White Lake Township
7525 Highland Road
White Lake, MI 48383

Subject: White Lake Township Hall
Township Hall Low Voltage & AV Design Work
Motor City Electric Technologies Inc. Proposal No. 25-0640 Township Hall

Dear Ms. Pergament:

Motor City Electric Technologies Inc. is pleased to offer our proposal for the above-referenced project located in White Lake Township Hall, Michigan.

Price Breakout for Exhibit A - Township Hall - Low Voltage & AV Design Work and Exhibit B - Township Hall - Low Voltage & AV are provided below.

Our proposal is based on the following:

- Low Voltage & AV - New Civic Center Buildings - White Lake Township 10-25-24 Final
- White Lake Township Hall Building Low Voltage Design Work Specifications (V4)
- White Lake Township Hall Low Voltage Drawings
- White Lake Township Bldg. Drawings Issued for Construction 2024-08-23.
- Public Safety Bldg. Project Manual

SCOPE OF SERVICES

Motor City Electric Technologies Inc. will provide the following services:

IT Room 137

- Furnish and install 12” ladder rack and ladder rack dropouts.
- Furnish and install one (1) 42U server cabinet per specification and one (1) metered PDU.
- Furnish and install one (1) 45U 2-post relay rack, two (2) vertical wire managers, and one (1) metered PDU.
- Furnish and install one (1) telecommunications ground bar.
- Ground server cabinet, relay rack, and ladder rack to the telecommunications ground bar.
- Furnish and install 24-port modular patch panels with category 6 jacks and F-type inserts for each terminated cable.
- Furnish and install the required 1U horizontal wire managers.
- Furnish and install one (1) rack mount enclosure and required LC single mode fiber adapter plate.
- Furnish and install category 6 1-foot patch cords for each patch panel termination.
- Furnish and install RG6 coaxial 1-foot patch cords for each patch panel termination.
- Furnish and install EZ path sleeves per the specification.

IDF

- Furnish and install one (1) wall mount fiber splice cabinet.

Fiber Backbone

- Furnish and install one (1) 12-strand single mode armored plenum fiber from the IDF wall mount fiber splice cabinet to IT room 137 fiber enclosure. Fiber will be fusion spliced to the outdoor fiber from the Public Safety Building and the IDF and fusion spliced to fiber pigtails the fiber enclosure in IT room 137.
- OTDR directional test fiber, certify per the specification and provided documentation.

Low Voltage Outlets

- Furnish and install the non-continuous support for the new category 6 cable and fiber pathways.
- Furnish and install the required faceplate and surface mount per the low voltage drawing outlet locations.
- Furnish and install category 6 RJ45 jacks in various colors for the data, voice, wireless access point, cameras, and audio-video low voltage drawing outlet locations.
- Furnish and install category 6 RJ45 shielded jacks in various colors for the data, voice, wireless access point, cameras, audio-video low voltage drawing outlet locations.
- Furnish and install F-type coaxial inserts per the low voltage drawing outlet locations.
- Furnish and install HDMI inserts per the low voltage drawing outlet locations.
- Furnish and install category 6 plenum cable in various colors from each jack location to IT room 137 and terminate cable at each end.
- Furnish and install category 6 plenum shieled cable from each jack location to room 002 and terminate cable at each end.
- Furnish and install RG6 plenum coaxial cable from each F-type insert location to IT room 137 and terminate cable at each end.
- Label, test, and certify category 6 cable per specification and provided documentation.

Access Control Cabling

- Furnish and install 22 AWG/6 conductor plenum rated cable from the card reader locations to IT room 137 and coil cable at each end for future installation.
- Furnish and install 18 AWG/4 conductor plenum rated cable from the door contact locations to IT room 137 and coil cable at each end for future installation.
- Furnish and install 18 AWG/2 conductor plenum rated cable from the duress button locations to IT room 137 and coil cable at each end for future installation.
- Furnish and install 18 AWG/4 conductor plenum rated cable from the electrified lock locations to IT room 137 and coil cable at each end for future installation.

Additional Items

- Man lift (as required.)
- Necessary cable supports for structured cabling system.
- As-builts
- Fire-Stopping
- Permits

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AV Design Work

- Furnish and install AV systems per the specification and drawings in the following areas.
  - Board Room 001
  - Activity Space 031, 032, 033, 034, 035
  - Conference Room 003
  - Lobby 011
  - Lounge/Reception 016
  - Deputy Supervisor 105
  - Deputy Supervisor 106
  - Conference Room 108
  - Lobby 111
  - Conference Room 116
  - Clerk Room 132
  - Deputy Clerk Room 133
  - Deputy Treasurer Room 151
  - Treasurer Room 152
  - Planning Director 163
  - DPS Director 173
  - Reception 120
  - Reception 130
  - Reception 160
  - Employee Wellness Center 190
  - Exterior Displays

Clarifications

1. Who is managing the Digital Signage Players? Does a CMS platform need to be specified or is there one desired? We did not provide a quote for a CMS platform.
2. Lobby 011 the amp specified does not auto switch audio signals. This will be all manually switched and controlled at the amp by the end user.
3. 8" Altona Panel has been discontinued. We have provided funds for a 10" Velocity Panel
4. All owner furnished equipment and furniture shall be available prior to install.

Exclusions

Our proposal excludes the following:

- Low voltages and AV Conduits, back boxes, floor boxes, floor cores, power.
- Backerboards for TV monitors
- Door hardware
- Overtime.
- Dumpsters.
- Winter Conditions.
- Ground man
- BIM and BIM coordination
- Parking
- Access control, Surveillance, intrusion detection systems and installation
- Intercom Master Stations and Intercoms and installation.

- Network Switches, Wireless Access Points and UPS
- Copper patch cord and installation at the device outlets.
- Cutouts in furniture for popup or cable cubby interfaces.

BASE PRICE

The Total Sum as specified herein by Motor City Electric Technologies Inc. is Four Hundred Fifty-Six Thousand, Nine Hundred Thirty-Five and 00/100 (**$456,935.00**) Dollars. Note: Excludes Taxes.

Add for Payment & Performance Bond **Add: $ 3,705.00**

PRICE BREAKOUT

EXHIBIT A

Exhibit A - Township Hall - Low Voltage & AV Design Work **Exhibit A Price: $ 186,350.00**

Add for Payment & Performance Bond: $ 1,510.00

EXHIBIT B

Exhibit B - Township Hall - Low Voltage & AV Design Work **Exhibit B Price: $ 270,585.00**

Add for Payment & Performance Bond: $ 2,195.00

Complete Bill of Materials and Unit Pricing Provided Below for Exhibit A & Exhibit B

SCHEDULE

In accordance with the above, it is Motor City Electric Technologies' intention to begin work on this project upon receipt of the order and project schedule, with the completion of all work within a mutually agreed upon time frame.

TERMS AND CONDITIONS

1. All prices shall remain in effect subject to your acceptance until July 29, 2025.

2. Our terms of payment are thirty (30) days net from the date of invoice. We will invoice the last working day of each month for all work performed that month.

3. Our labor is based on IBEW, Sound, and Communication rates, Monday thru Friday, 8-hour days, (First Shift).

4. Our installation price does not include the following:
   - Shift or Overtime

5. Our price does not include MBE involvement.

6. Any delays due to additional changes to the system and/or omissions of others will be charged as additional work.

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7. Motor City Electric Technologies will not be responsible for the correctness or accuracy of any information supplied by others or the subsequent errors resulting from such incorrect information.

8. Motor City Electric Technologies will not be held liable for any schedule delays due to drawing approval delays and/or errors or omissions of others.

9. Back charges for any field additions, deletions, modifications, or "corrections" authorized and implemented without our knowledge and consent will not be accepted.

10. Standard manufacturer warranties apply unless otherwise stated.

11. This proposal is not a firm offer and shall not bind MCET to enter into an agreement for the work described. Any agreement must be based upon terms acceptable to MCET.

Thank you for the opportunity to quote these services. Should you have any questions regarding our proposal, please do not hesitate to call.

Sincerely,

Scott Sutherland

Scott Sutherland
Estimator
Motor City Electric Technologies Inc.
(313) 957-3611
E-mail: ssutherland@mce-tech.com

Exhibit A - Township Hall - Low Voltage & AV Design Work

White Lake Township Building Low Voltage

Qty	Description	Unit Price	Extended Price
33000	BERK-TEK 10032094 LANMARK-1000 CATEGORY 6 U/UTP PLENUM CABLE, 4-PAIR, BLUE	$ 0.37	$ 12,168.75
148	LEVITON 61110-RL6 EXTREME CATEGORY 6 QUICKPORT JACK, BLUE	$ 6.44	$ 952.75
137	LEVITON 42080-4WS QUICKPORT 4-PORT SINGLE-GANG QUICKPORT WALLPLATE, WHITE	$ 1.88	$ 256.88
295	LEVITON 41084-BW QUICKPORT BLANK QUICKPORT INSERT, WHITE	$ 0.25	$ 73.75
265	TERM - EQPMT ROOM 4 PR (DATA)	$ -	$ -
265	CABLE TEST - 4 PR (DATA)	$ -	$ -
323	PANDUIT S100X150YAJ 1" X 1.5" POLYESTER SELF-LAMINATING LABEL - OUTLET	$ 0.13	$ 40.38
279	PANDUIT S100X150YAJ 1" X 1.5" POLYESTER SELF-LAMINATING LABEL - PATCH PANEL	$ 0.13	$ 34.88
556	PANDUIT S200X225YAJ 2" X 2.25" POLYESTER SELF-LAMINATNG LABEL - CABLE	$ 0.25	$ 139.00
148	LEVITON 61110-RL6 EXTREME CATEGORY 6 QUICKPORT JACK, BLUE PP	$ 6.44	$ 952.75
163	LEVITON 6D460-1L EXTREME CATEGORY 6 SLIMLINE BOOT PATCH CORD, 1-FT, BLUE	$ 3.94	$ 641.81
16000	BERK-TEK 10032092 LANMARK-1000 CATEGORY 6 U/UTP PLENUM CABLE, 4-PAIR, WHITE	$ 0.37	$ 5,900.00
72	LEVITON 61110-RW6 EXTREME CATEGORY 6 QUICKPORT JACK, WHITE	$ 6.44	$ 463.50
72	LEVITON 61110-RW6 EXTREME CATEGORY 6 QUICKPORT JACK, WHITE, PP	$ 6.44	$ 463.50
72	LEVITON 6D460-1W EXTREME CATEGORY 6 SLIMLINE BOOT PATCH CORD, 1-FT, WHITE	$ 3.94	$ 283.50
4000	BELDEN 9116P RG6 18 SOL CCS FFPE DUOFOIL+ 60% AL BRD SHD FLRT JKT CMP 75 OHM	$ 1.00	$ 4,000.00
44	LEVITON 40834-W HDMI FEED-THROUGH COUPLER CONNECTOR, WHITE	$ 14.81	$ 651.75
14	LEVITON 40831-FWG QUICKPORT F-TYPE INSERT GOLD-PLATED FEED-THROUGH, WHITE	$ 3.50	$ 49.00
28	BELDEN FSNS6U PROSNS UNIVERSAL F-MALE RG-6 COAX SNAP-N-SEAL CONNECTOR	$ 1.81	$ 50.75
14	LEVITON 40831-FWG QUICKPORT F-TYPE INSERT GOLD-PLATED FEED-THROUGH, WHITE PP	$ 3.50	$ 49.00
14	RG6 18 AWG 75 OHM QUAD SHIELDED F-F CONNECT COAXIAL JUMPER, 1-FT	$ 9.94	$ 139.13
55	LEVITON 41089-1WP QUICKPORT 1-PORT QUICKPORT SURFACEMOUNT BOX, WHITE	$ 2.38	$ 130.63
15	INSTALL CUSTOMER SUPPLIED WIRELSS ACCESS POINT	$ -	$ -
9000	BERK-TEK 10033997 LANMARK-1000 CATEGORY 6 U/UTP PLENUM CABLE, 4-PAIR, ORANGE	$ 0.37	$ 3,318.75
40	LEVITON 61110-RO6 EXTREME CATEGORY 6 QUICKPORT JACK, ORANGE	$ 6.44	$ 257.50
40	LEVITON 61110-RO6 EXTREME CATEGORY 6 QUICKPORT JACK, ORANGE PP	$ 6.44	$ 257.50
40	LEVITON 6D460-1X EXTREME CATEGORY 6 SLIMLINE BOOT PATCH CORD, 1-FT, ORANGE	$ 3.94	$ 157.50
5	LEVITON 61SJK-008-RL6 ATLAS-X1 RJ45 SHIELDED CATEGORY 6 MODULE JACK, BLUE	$ 10.00	$ 50.00
5	LEVITON 61SJK-008-RL6 ATLAS-X1 RJ45 SHIELDED CATEGORY 6 MODULE JACK, BLUE PP	$ 10.00	$ 50.00
2000	BERK-TEK 10091131 LANMARK 6 SHLD CATEGORY 6 4 PAIR F/UTP PLENUM CABLE, BLACK	$ 0.73	$ 1,450.00
5	LEVITON H6A10-1E CATEGORY 6A SLIMLINE SHIELDED PATCH CORD, 1-FT BLACK	$ 18.75	$ 93.75
700	CADDY CAT64HP 4" J-HOOK	$ 5.94	$ 4,156.25
700	STEEL CITY 500-SC BEAM CLAMP	$ 2.56	$ 1,793.75
14	LEVITON 43115-075 75' VELCRO BULK ROLL CABLE TIE, BLACK	$ 75.00	$ 1,050.00
1	GREAT LAKES 7901ES-2442-B ES CABINET 79"H X 24"W X 42"D, 42 RMU, BLACK	$ 2,162.50	$ 2,162.50
1	GREAT LAKES 7903E-24-B ES CABINET 79”H X 24"W SOLID DOORS, BLACK	$ 337.50	$ 337.50
1	GREAT LAKES 7902E-MC24SL-B ES CABINET 79"H X 24"W MESH DOORS, BLACK	$ 768.75	$ 768.75
1	GREAT LAKES 7910-36ELS-B ES CABINET 79"H SIDE PANELS, BLACK	$ 431.25	$ 431.25
1	GREAT LAKES ES/EZ 225 ES CABINET 225 CFM FAN TOP, BLACK	$ 425.00	$ 425.00
1	GREAT LAKES FTC103 THERMOSTAT VARIABLE FAN CONTRREL	$ 312.50	$ 312.50
2	APC AP8830 NETSHELTER RACK PDU 2G METERED ZEROU 20A,100-120V 24 5-20R	$ 862.50	$ 1,725.00
1	CHATSWORTH 55053-715 2-POST STANDARD RELAY RACK 19'W X 8'H X 3'D, BLACK	$ 443.75	$ 443.75
1	CHATSWORTH 10595-712 3" CHANNEL RACK TO RUNWAY MOUNTING PLATE	$ 68.75	$ 68.75
1	CHASTWORTH 40604-003, CONCRETE FLOOR INSTALLATION KIT	$ 15.00	$ 15.00
2	CHATSWORTH 10605-019 19" RACK INSULATOR KIT	$ 93.75	$ 187.50
2	CHATSWORTH 11374-715 SINGLESIDED VERTICAL WIRE MANANGER 6'W X 8'H X 6.38'D, BLACK	$ 581.25	$ 1,162.50
2	CHATSWORTH 10622-020 WALL-MOUNT BUSBAR KIT, 4"H X 20"W X 0.25"D	$ 250.00	$ 500.00
3	ORTRONICS GBH19KIT CABINET 19" HORIZONTAL RACK GROUND BAR	$ 131.25	$ 393.75
100	ALLWIRE THHN6STR-GN #6 AWG GREEN SHEATH GROUND WIRE	$ 1.14	$ 114.38

8	PANDUIT LCC6-14D-L LONG BARREL 2-HOLE #6 AWG 1/4 LUG, COPPER	$ 2.63	$ 21.00
3	CHATSWORTH 10250-712 UNIVERSAL CABLE RUNWAY 12"W X 1.5"H X9.96'L (BLACK)	$ 131.25	$ 393.75
4	CHATSWORTH 11421-712 CABLE RUNWAY 12" WALL ANGLE SUPPORT KIT, (BLACK)	$ 30.00	$ 120.00
3	CHATSWORTH 11301-701 CABLE RUNWAY BUTT-SPLICE KIT, .038"W X 1.5"H X 5"L, BLACK	$ 13.75	$ 41.25
2	CHATSWORTH 112101-701 CABLE RUNWAY RADIUS DROP, STRINGER ADJUSTABLE, BLACK	$ 46.25	$ 92.50
6	CHATSWORTH 10607-002 CABLE RUNWAY SLOTTED SUPPORT BRACKETS, 3/8"	$ 8.13	$ 48.75
1	B-LINE 1 5/8" X 1 5/8", 9/16" X 1 1/8" CHANNEL SLOTTED STRUT, 12 GA, GRN -10 FT	$ 182.50	$ 182.50
6	COOPER B-LINE 1/2' X 120"ALL THREAD ROD 10FT	$ 48.75	$ 292.50
6	1/2" CHANNEL SPRING NUT	$ 1.25	$ 7.50
6	1/2' HEX NUT	$ 0.25	$ 1.50
6	1/2' FLAT WASHER	$ 0.13	$ 0.75
6	1/2' LOCK WASHER	$ 0.13	$ 0.75
2	CHATSWORTH PRODUCTS INC 40164-001, CABLE RUNWAY GROUNDING STRAP KIT	$ 28.75	$ 57.50
16	LEVITON 49255-L24 FLAT QUICKPORT 24-PORT, 1U PATCH PANEL W/CABLE MANAGEMENT BAR	$ 71.25	$ 1,140.00
18	CHATSWORTH 30130-719 1U SINGLESIDE UNIVERSAL HORIZ MGR 19.25'W X 1.72"H X 4.96"D	$ 68.75	$ 1,237.50
1	CORNING CCH-02U 2U RACK MOUNT CCH HOUSING, ACCEPTS 4 CCH PANELS, BLACK	$ 275.00	$ 275.00
4	STI EZDP44S2 EZ-PATCH FIRE-RATED PATHWAY KIT W/WALL PLATE 4"W X 4-5/8"H X 14"L	$ 418.75	$ 1,675.00
300	CORNING 012E88-31131-A3 12-STRAND SM (OS2) MIC INDOOR TB, PLENUM ARMORED FIBER	$ 1.59	$ 478.13
2	CORNING CCH-CP12-A9-P03RH CCH PIGTAIL MODULE, 12-FIBER LC DUPLEX, SM (OS2)	$ 475.00	$ 950.00
2	CORNING M67-048 12 FIBER SPLICE TRAY	$ 43.75	$ 87.50
24	CORNING 2806031-1 60MM FIBER PROTECTION SLEEVES	$ 1.06	$ 25.50
24	FO CABLE SPLICE- FUSION	$ -	$ -
12	CABLE TEST - OTDR FIBRE TRACE	$ -	$ -
12000	BELDEN 6504FE 877U1000 6C/22 AWG SHIELDED STRANDED CMP CABLE, NATURAL	$ 0.27	$ 3,225.00
5000	BELDEN 6302UE 877U1000 4C/18 AWG UNSHIELDED STRANDED CMP CABLE, NATURAL	$ 0.39	$ 1,968.75
4000	BELDEN 6300UE 877U1000 2C/18 AWG UNSHIELDED STRANDED CMP CABLE, NATURAL	$ 0.29	$ 1,150.00
55	HILTI FS-ONE HIGH PERORMANCE FIRE STOP SEALANT	$ 31.25	$ 1,718.75
1	CORNING EDC-06P-NH WALL MOUNT ENVIROMENTAL DISTRIBUTION CENTER, HOLDS 6 PANELS	$ 500.00	$ 500.00
1	MISC MATERILS	$ 2,954.00	$ 2,954.00

Material Total		**$ 67,770.19**
Install labor		**$95,880.00**
Equipment		**$1,470.00**
Permits		**$1,280.00**
PM & DJE		**$19,950.00**
Grand Total		**$186,350.19**

Add Cost for Payment and Performance Bond		**$1,510.00**

Exhibit B - Township Hall - Low Voltage & AV Design Work

White Lake Township Building AV

Quote: 226264 – Board Room 001

Qty	Description	Unit Price	Extended Price
	Video System		
3	85" - QMC Series LED-backlit LCD display - digital signage	$4,481.48	$13,444.45
3	Micro-Adjust Tilt Wall Mount, Large	$254.78	$764.34
3	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$548.21
2	Dell U-Series 32-Inch 4K UHD 2160p Screen LED-Lit Monitor (U3219Q), Black	$547.08	$1,094.15
3	NDI|HX PTZ3 Camera - Black	$2,230.27	$6,690.80
1	TriCaster TC410 Plus	$10,994.76	$10,994.76
1	TriCaster Flex NDI 16 button crosspoint control panel	$9,947.14	$9,947.14
1	ProTek Prime for TriCaster TC410 Plus	$460.95	$460.95
1	4 Hour Professional Services Plan	$984.47	$984.47
8	Viz Connect Solo HDMI 4K Bi-Directional mini converter. HDMI 2.0 connection to or from NDI High Bandwidth, note: not compatible with NDI|HX Streams.	$926.56	$7,412.45
1	ClickShare CX-50 Gen 2	$3,012.49	$3,012.49
2	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$65.16
1	OptiPlex Micro Form Factor	$767.09	$767.09
	Audio System		
16	Compact Full-Range Pendant Spkr w 5-1/4"	$208.36	$3,333.78
1	2 Channel x 700 watt At 4ohms, 8ohms, 70V and 100V per channel	$1,462.55	$1,462.55
1	Si Expression 2 Digital Mixer	$3,128.89	$3,128.89
12	15" Shock-Mounted Gooseneck, No Capsule, with LED ring, includes surface mount preamplifier	$229.31	$2,751.76
12	Shure A400MB mute button accessory	$225.82	$2,709.90
1	Handheld Transmitter with SM58 Capsule	$231.64	$231.64
2	Dual Channel Receiver	$692.59	$1,385.18
1	Listen Tech/LCS-120-01-D WI-FI/RF BASE SYSTEM (Dante)	$1,982.14	$1,982.14
	Control System		
1	M4350-24X4V MANAGED SWITCH	$3,727.33	$3,727.33
	Headend Equipment Rack		
1	35SP/25D CONFIG AV RACK	$1,731.48	$1,731.48
2	Advanced Rack mount power conditioner	$116.40	$232.80
1	16/2 Plenum Black	$259.69	$259.69
2	Cat 6A F/UTP CMP - Small O.D 500Mhz	$1,385.88	$2,771.77
1	22/2 w/ shield wire per Foot	$238.63	$238.63

1	Cables Connectors Hardware	$2,328.04	$2,328.04
1	Shipping Charges	$4,106.70	$4,106.70
	Total:		**$88,568.75**

Quote #226266 - Activity Space 031, 032, 033, 034, 035

Qty	Description		Extended Price
	Audio System 031		
1	Wall-Mounted Bluetooth® Audio Format-A Interface - WHITE	$378.31	$378.31
1	WIRELESS, R41, HANDHELD, W/OM2 CAPSULE	$442.32	$442.32
4	6.5"CEILING SPKR W/X-FRMER (2PR Per CTN)	$175.36	$701.44
1	Program Selector Zone Controller	$60.69	$60.69
1	Wall Mounted Controller/Interface	$56.61	$56.61
	Audio System 032		
1	Wall-Mounted Bluetooth® Audio Format-A Interface - WHITE	$378.31	$378.31
1	WIRELESS, R41, HANDHELD, W/OM2 CAPSULE	$442.32	$442.32
4	6.5"CEILING SPKR W/X-FRMER (2PR Per CTN)	$175.36	$701.44
1	Program Selector Zone Controller	$60.69	$60.69
1	Wall Mounted Controller/Interface	$56.61	$56.61
	Audio System 033		
1	Wall-Mounted Bluetooth® Audio Format-A Interface - WHITE	$378.31	$378.31
1	WIRELESS, R41, HANDHELD, W/OM2 CAPSULE	$442.32	$442.32
8	6.5"CEILING SPKR W/X-FRMER (2PR Per CTN)	$175.36	$1,402.89
1	Program Selector Zone Controller	$60.69	$60.69
1	Wall Mounted Controller/Interface	$56.61	$56.61
	Audio System 034		
1	Wall-Mounted Bluetooth® Audio Format-A Interface - WHITE	$378.31	$378.31
1	WIRELESS, R41, HANDHELD, W/OM2 CAPSULE	$442.32	$442.32
4	6.5"CEILING SPKR W/X-FRMER (2PR Per CTN)	$175.36	$701.44
1	Program Selector Zone Controller	$60.69	$60.69
1	Wall Mounted Controller/Interface	$56.61	$56.61
	Audio System 035		
1	Wall-Mounted Bluetooth® Audio Format-A Interface - WHITE	$378.31	$378.31
1	WIRELESS, R41, HANDHELD, W/OM2 CAPSULE	$442.32	$442.32
4	6.5"CEILING SPKR W/X-FRMER (2PR Per CTN)	$175.36	$701.44
1	Program Selector Zone Controller	$60.69	$60.69
1	Wall Mounted Controller/Interface	$56.61	$56.61
	Headend Equipment and Rack		
1	18U/24"DEEP, CONFIGURED RK	$853.81	$853.81

1	3SP ANODIZED DRAWER	$185.08	$185.08
1	Advanced Rack mount power conditioner	$116.40	$116.40
1	DSP Platform Mixer/Processor	$888.15	$888.15
2	ZC-BOB Breakout Box for DriveRack and ZonePro	$85.89	$171.79
1	8 Channel x 160 watt At 4ohms, 8ohms, 70V and 100V per channel	$2,549.19	$2,549.19
1	New Tek Spark Plus I/O HDMI IP Video Converters	$926.56	$926.56
2	Combines4;2Channel Systems;8Channels w/1 Set of Antennas;1 Power Supply	$488.88	$977.76
1	HANDHELD W / CAPS ASSEMBLY, OM2	$252.58	$252.58
2	Active Three-Pair Receiver - Twisted Pair Format-A - XLR and stereo phono outputs - Black	$242.03	$484.06
2	24VDC Switching Power Supply	$32.31	$64.62
2	Power Inserter / Signal Breakout	$103.59	$207.18
2	24VDC Switching Power Supply	$32.31	$64.62
1	16/2 Plenum Black	$259.69	$259.69
1	Cat 6A F/UTP CMP - Small O.D 500Mhz	$1,385.88	$1,385.88
1	Cables Connectors Hardware	$1,164.02	$1,164.02
1	Shipping Charges	$867.95	$867.95
	Total:		**$20,317.63**

Quote #226272 - Conference Room 003

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	Barco ClickShare Bar Pro	$3,414.08	$3,414.08
1	Barco Clickshare Bar TV Mount	$111.75	$111.75
1	HD Pro P/35	$285.18	$285.18
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	SNN Straight Security Tether	$10.80	$10.80
1	Cables Connectors Hardware	$116.40	$116.40
1	Shipping Charges	$235.16	$235.16
	Total:		**$5,054.76**

Quote #226274 - Lobby 011

Qty	Description		Extended Price
	Video System		

1	65In BED Series Commercial TV Crystal UHD Display, 300nit	$651.85	$651.85
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	Viz Connect Solo HDMI 4K Bi-Directional mini converter.	$926.56	$926.56
1	H.265, True 4K, dual video decode, enterprise HTML5 player	$558.73	$558.73
1	64GB Class 10 Micro SD Memory Card	$45.79	$45.79
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$24.60
	Audio System		
2	6.5"CEILING SPKR W/X-FRMER (2PR Per CTN)	$175.36	$350.72
1	60W Amplifier, 4/8 Ohm x2, 24V/70V/100V x1, Plenum Rated	$405.08	$405.08
1	Cables Connectors Hardware	$174.61	$174.61
1	Shipping Charges	$166.71	$166.71
	Total:		**$3,675.52**

Quote #226275 - Lounge/Reception 016

Qty	Description		Extended Price
	Video System		
2	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$1,022.02
2	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$325.12
2	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$365.47
2	H.265, True 4K, dual video decode, enterprise HTML5 player	$558.73	$1,117.45
2	64GB Class 10 Micro SD Memory Card	$45.79	$91.58
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$24.60
1	Cables Connectors Hardware	$58.21	$58.21
1	Shipping Charges	$148.58	$148.58
	Total:		**$3,178.61**

Quote #226276 - Deputy Supervisor 105

Qty	Description	#VALUE!	Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79

1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cable Connectors and Hardware	$58.21	$58.21
1	Shipping Charges	$46.65	$46.65
	Total:		**$1,038.03**

Quote #226277 - Deputy Supervisor 106

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Full-Service Video Wall Mount w/ Quick Release - landscape - Black	$449.31	$449.31
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	Barco Clickshare Bar Pro	$3,414.08	$3,414.08
1	Barco Clickshare Bar TV Mount	$111.75	$111.75
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	SNN Straight Security Tether	$10.80	$10.80
1	Cables Connectors Hardware	$116.40	$116.40
1	Shipping Charges	$237.83	$237.83
	Total:		**$5,110.79**

Quote #226278 - Conference Room 108

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	Barco Clickshare Bar Pro	$3,414.08	$3,414.08
1	Barco Clickshare Bar TV Mount	$111.75	$111.75
1	HD Pro P/35	$285.18	$285.18
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	SNN Straight Security Tether	$10.80	$10.80
1	Cables Connectors Hardware	$116.40	$116.40
1	Shipping Charges	$235.16	$235.16

	Total:		**$5,054.76**

Quote #226279 - Lobby 111

Qty	Description		Extended Price
	Video System		
2	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$1,022.02
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	SINGLE CEILING MOUNT, LARGE, BLACK, TAA	$335.06	$335.06
1	ADJ. PIPE 48" TO 72"	$140.66	$140.66
1	UNISTRUT ADAPTER	$48.43	$48.43
2	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$365.47
2	H.265, True 4K, dual video decode, enterprise HTML5 player	$558.73	$1,117.45
2	64GB Class 10 Micro SD Memory Card	$45.79	$91.58
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$24.60
1	Cables Connectors Hardware	$582.02	$582.02
1	Shipping Charges	$166.68	$166.68
	Total:		**$4,082.11**

Quote #226280 - Conference Room 116

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	Barco ClickShare Bar Pro	$3,414.08	$3,414.08
1	Barco ClickShare Bar TV Mount	$111.75	$111.75
1	HD Pro P/35	$285.18	$285.18
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	SNN Straight Security Tether	$10.80	$10.80
1	Cables Connectors Hardware	$116.40	$116.40
1	Shipping Charges	$235.16	$235.16
	Total:		**$5,054.76**

Quote #226282 - Clerk Room 132

Qty	Description		Extended Price

	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	Barco ClickShare Bar Pro	$3,414.08	$3,414.08
1	Barco Clickshare Bar TV Mount	$111.75	$111.75
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cables Connectors Hardware	$116.40	$116.40
1	Shipping Charges	$222.94	$222.94
	Total:		**$4,798.35**

Quote #226283 - Deputy Clerk Room 133

Qty	Description		
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cable Connectors and Hardware	$58.21	$58.21
1	Shipping Charges	$46.65	$46.65
	Total:		**$1,038.03**

Quote # 226455 - Deputy Treasurer Room 151

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20

1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cable Connectors and Hardware	$58.21	$58.21
	Bluewater Professional Services		
1	Shipping Charges	$46.65	$46.65
	Total:		$1,038.03

Quote #226284 - Treasurer Room 152

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	Barco ClickShare Bar Pro	$3,414.08	$3,414.08
1	Barco Clickshare Bar TV Mount	$111.75	$111.75
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cables Connectors Hardware	$116.40	$116.40
1	Shipping Charges	$222.94	$222.94
	Total:		**$4,798.35**

Quote #226285 - Planning Director 163

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cable Connectors and Hardware	$58.21	$58.21
1	Shipping Charges	$46.65	$46.65
	Total:		**$1,038.03**

Quote #226286 - DPS Director 173

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cable Connectors and Hardware	$58.21	$58.21
1	Shipping Charges	$46.65	$46.65
	Total:		**$1,038.03**

Quote #226290 - Reception 120

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cable Connectors and Hardware	$58.21	$58.21
1	Shipping Charges	$46.65	$46.65
	Total:		**$1,038.03**

Quote #226293 - Reception 130

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
2	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$65.16
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$38.41
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30

1	Cable Connectors and Hardware	$58.21	$58.21
1	Shipping Charges	$49.89	$49.89
	Total:		**$1,105.85**

Quote #226294 - Reception 160

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
2	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$65.16
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$38.41
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cable Connectors and Hardware	$58.21	$58.21
1	Shipping Charges	$49.89	$49.89
	Total:		**$1,105.85**

Quote # 226296 - Employee Wellness Center 190

Qty	Description		Extended Price
	Video System		
1	Series 75" 4K Class Ultra HD Commercial LED TV	$1,108.15	$1,108.15
1	Micro-Adjust Tilt Wall Mount, Large	$254.78	$254.78
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cable Connectors and Hardware	$58.21	$58.21
1	Shipping Charges	$81.13	$81.13
	Total:		**$1,761.88**

Quote #226469 - Exterior Displays

Qty	Description		Extended Price
	Video System		
2	55" Pro TV Terrace Edition Outdoor QLED 1500nit, 16/7 - Black	$3,072.60	$6,145.21

2	H.265, True 4K, dual video decode, enterprise HTML5 player	$558.73	$1,117.45
2	64GB Class 10 Micro SD Memory Card	$45.79	$91.58
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$24.60
2	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$365.47
1	Cables Connectors Hardware	$931.22	$931.22
	Outdoor Enclosures		
2	The TV Shield Pro 55-60" Outdoor Weatherproof TV/ Display Enclosure	$2,560.84	$5,121.68
1	Shipping Charges	$644.58	$644.58
	Total:		**$14,467.38**

Equipment & Material Total		**$174,363.54**
Install Labor		**$42,300.00**
Commissioning, Engineering, Project Management		**$53,922.00**
Grand Total		**$270,585.54**

Add Cost for Payment and Performance Bond		**$2,195.00**

Motor City Electric Technologies

Submitted to White Lake Township

January 29, 2025

White Lake Township Public Safety Building

Low Voltage & AV Proposal – Public Safety Building

White Lake Township, Michigan

9440 Grinnell St.
Detroit, MI 48213-1151
Phone: 313.921.5300
www.mceco.com

INTRODUCTION

On behalf of the entire Motor City Electric Technologies (MCET) and Bluewater Technologies (BWT) staff, I would like to thank you for your interest in our products and services. MCET and BWT have been servicing our customers for over thirty years by specializing in all facets of the Technologies and Audio/Visual industry. Our philosophy is to build successful, long-lasting relationships with our customers.

With our years of experience in Technologies, AV design, and installation industry, MCET and BWT are confident that we can provide White Lake Township with a more effective and user-friendly Low Voltage and AV solution, while maintaining a similar budget to what is outlined in the current bid. Our proposal aims to enhance the overall functionality and ease of use for the township's Low Voltage and AV systems, ensuring it is intuitive for all users.

Beyond providing a user-friendly design, our solution will also focus on improving the long-term reliability of the AV systems. By utilizing more robust components and streamlined systems, we can offer a setup that reduces the complexity of future maintenance and service needs, saving time and costs in the future. We would appreciate the opportunity to work with you on a Design/Assist proposal that would allow us to develop a tailored AV solution that delivers the highest possible quality for all rooms, at a competitive price point. Our goal is to ensure that the township of White Lake receives the best possible AV experience, now and in the years to come.

We look forward to the possibility of collaborating on this project and are excited about the potential to serve the township's needs.

MCET COMPANY HISTORY & INFORMATION

As one of the largest contractors in the nation, Motor City Electric Co. (MCE) was founded in 1952 and has continued to grow its position as an electrical contractor in the Midwest. MCE has nine focused divisions, including Automotive and Process, Commercial, Industrial, Specialty Industries, Service and Emergency, Public Works and Steel, Technologies, Utilities and Excavation.

Motor City Electric Technologies, formally the Cadre Corporation, was created in 1993 and is the technology, integration, and engineering subsidiary of Motor City Electric Co. MCET is an Information Technology, Controls Engineering and Low Voltage integrator/installer that provides professional and technical services in all aspects of Information Technology, from system design to comprehensive maintenance and installation services. MCET’s staff of experienced designers, project managers, engineers, estimators, technicians, and installers are your sole source for structured cable, voice & data, life safety systems, video surveillance & card access systems, audio/visual solutions, and Information Technology communication systems, whether wired or wireless.

As a member of the IBEW and NECA, MCET currently employs more than fifty (50) IBEW Local 58 Union Sound and Communication Technicians with an average length of employment of 7 years and has an office support staff of over twenty-five employees comprised of CAD Operators, Engineers, Designers, Programmers and Project Managers.

BLUEWATER TECHNOLOGIES COMPANY PROFILE

Bluewater Technologies is a privately held, woman-owned, S-corporation founded in metro-Detroit in 1985. The company began by providing simple AV equipment rentals for local businesses and organizations, then rapidly evolved in response to changes in technology and the demands of customers. Currently, Bluewater provides a full range of technology, fabrication, software and creative services for Meetings & Events, Workplace Technology, Retail Experience and Environments & Exhibitions, and ranks among the top 15 Systems Integrators nationally. From TVs and VCRs on carts in the '80s, to high-end projection systems and LED video walls in the '90s, to the technology-fueled experiences of the 2000s, Bluewater has always pushed the boundaries of innovative technology and maintained a focus on excellence.

As a privately held company, Bluewater does not share financial information. However, we can confirm that we are financially stable and profitable. If additional details are required, please contact Eric Butler, CFO at ebutler@bluewatertech.com.

Organizational Structure

Bluewater serves our diverse portfolio of clients through four locations: Our company headquarters in Wixom, MI, offices in Grand Rapids, a production facility in Mesick, MI, and an office in Indianapolis, IN. We currently employ a staff of 175 throughout these locations.

WORK PROGRAM

Scope Requirement: - MCET will provide and install the required low voltage system (voice, data, cable infrastructure, fiber backbone, terminations, testing, and certification) as required in the RFP. MCET and our strategic Audio-Visual partner Bluewater Technologies (BWT). will provide the installation of the required Audio Video systems, commissioning and testing as required in the RFP. As part of the Scope of Work, The MCET Team will provide the necessary project management, project engineering, technical implementation support, training, and other professional services for the implementation of the project. Our team will ensure the timely and satisfactory completion of each site / facility location as outlined in the RFP.

Closeout Procedure - MCET will provide O&M manuals, drawings, documentation, test documentation, warranty documentation, and training.

MCET EXECUTIVE TEAM AND STAFF

Management Team

David M. Krausman (RCDD), Vice President of Motor City Electric Technologies, leads our management team. David joined MCET in 2003 with 25 years of experience in the technology industry.

Justine Fleming (RCDD), General Manager of Motor City Electric Technologies, joined MCET in 1996 with 30 years of experience in the technology industry.

Scott Sutherland, Senior Estimator of Motor City Electric Technologies, joined MCET in 2001 with 35 years of experience in the technology industry.

Mahria Boone, (CCENT, CCNA, and iBwave certification), RF Design Engineer/Network Technician of Motor City Electric Technologies, joined MCET in 2004 with 24 years of experience in the industry.

Marc Spontack, Security Engineer/Project Manager of Motor City Electric Technologies, joined MCET in 2012 with 28 years of experience in the technology industry.

Jonathan Buchler, Project Manager of Motor City Electric Technologies, joined MCET in 2019 with 20 years of experience in the technology industry.

Ronald Kitchen, Project Manager of Motor City Electric Technologies, joined MCET in 2021 with 35 years of experience in the technology industry.

Danial Jipping, Project Manager of Motor City Electric Technologies, joined MCET in 2020 with 5 years of experience in the technology industry.

Trey Ebinger (PMP, RCDD), Project Manager Motor City Electric Technologies, joined MCET in 2020 with 5 years of experience in the technology industry.

Project Management Team

Our project management team brings with them 20 years of experience in the technology industry managing various size projects including but limit to educational, commercial, municipal, manufacture, distribution, transportation, utilities, industrial, distribution, and large public venues. The MCET project management team carries BICSI and RCDD certification and accreditation.

Capabilities

Motor City Electric Technologies offers complete technology contracting services from design and installation to operations, maintenance, and service. Types of work provided include but limit to cellular phone registration systems, emergency radio response systems, wireless systems, security systems, communications, controls, data centers, fiber optic, sound and video, telecommunications infrastructure, transportation systems, networks, programing, configuration, and system testing.

Client industries include commercial, automotive, casinos, governments and municipalities, medical/hospitals, hotels, service industry, manufacturers, schools, universities, arenas/stadiums, utilities, and fresh water/wastewater treatment plants.

Engineering and Design Services

Our engineering team utilizes state-of-the-art software tools to assist with BIM, Revit, 3D modeling, and other workflow processes for our engineering and design work and for coordination with our trade colleagues. This includes tools from AutoCAD, including:

- Autodesk Design Suite
- Revit
- AutoCAD
- BIM 360
- iBwave Level 3

Technicians and Installers Team

Motor City Electric Technologies technicians and installer teams bring with them over 20 years of experience in the technology industry and our signatory to IBEW. MCET is dedicated to keeping our teams up to date on the latest certifications, industry standards, including but limit to cross and specialized system training to provide a well divers installation field team. Our installation varies anywhere from structures cabling, security systems, network systems, wireless, public safety, and cellular reinforcement systems.

Technician Staff Certifications Consist of:

- RCDD and BICSI certified technician
- BICSI certified Technicians
- CCNA certified network technicians

Service Group

Motor City Electric Technologies provides service technician equipped service vehicles dedicated to non-emergency (Next business day) and emergency (24/7, 4-Hour Response) dispatch. We provide project oriented spare critical equipment to ensure all emergency responses can be handled without major disruption.

Quality

Motor City Electric Technologies is ISO 9001:2015 certified, but for our team members, taking pride in our work is a greater measure of quality performance. That means doing it right, checking to make sure that it is right, and making sure that the customer is satisfied with the results.

Safety

Motor City Electric Technologies provides safety training to its employees on a regular basis. From the National Electric Code (NEC), National Fire Protection Association codes (NFPA), and OSHA standards to first aid, CPR, equipment operation, hazardous materials to ensure workplace safety.

CLIENTS REFERENCES

Project:	Brose Headquarters, Multiple Projects
Company Name:	Brose North America Inc.
Contact Name:	Gerardo Calderon
Phone Number:	(956) 832-2260
Email Address:	Gerardo.Calderon@brose.com

Project:	Oakland University - Engineering Center Low Voltage Installation
Company Name:	Oakland University
Contact Name:	Sue Riley, Senior Project Manager
Phone Number:	(248) 370-4613
Email Address:	riley23@oakland.edu

Project: Macomb Community College – Multiple Projects
Company Name: Macomb Community College
Contact Name: Bernie Jacobs, Manager of Construction & Engineering
Phone Number: (586) 445-7019
Email Address: jacobsb@macomb.edu

Project: Little Caesars Arena
Company Name: Barton Malow – Hunt – White
Contact Name: Sean Hollister
Phone Number: (248) 436-5000
Email Address: shollister@bmhwteam.com

Project: City of Royal Oak
Company Name: Convergent Technology Partners
Contact Name: Eric Helsel
Phone Number: (810) 223-0531
Email Address: ehelsel@ctpartners.net

PROJECT PROFILE

Wayne County Criminal Justice Center

Scope: Wayne Count Criminal Justice Center Project encompasses four buildings. It has adult and juvenile detention facilities (525,000 square-feet and 129,000 square-feet respectively), a 263,000 square-foot courthouse, and a 155,000 square-foot sheriff's office. MCET was responsible for the installation of voice/data, security, IPTV, public safety network, and wireless access points.

Over the course of the project, MCET will install 321 wireless access points, 992 cameras, 487 IPTVs, 185 PSN devices, and 1,976 access control doors. Additionally, MCET will install 1,094,573 feet of copper cable and 37,806 feet of fiber cable throughout the Wayne County Criminal Justice Center.

Customer: Wayne County

Target Completion Date: 2023

Value: $10.5 Million

Little Caesars Enterprises, Inc.
Little Caesars Headquarters

Scope: This newly constructed nine-story, 234,000 square foot, Little Caesars Global Resource Center at the corner of Woodward Avenue and Columbia Street in The District Detroit features a one-of-its-kind Passive Optical Network (PON) powered by digital electricity (DE). The installation is a Corning ONE based solution with single mode fiber to the edge. The implementation is designed with four (4) optical line terminals, seven (7) software defined data planes, one (1) top of rack switch operating over nine hundred (900) optical line terminals allowing up to four thousand (4,000) user ports. This passive optical network

supports six hundred (600) users, one hundred and sixty (160) security cameras, one hundred fifty (150) wireless access points with a building wide audio video solution supporting one hundred ten (110) Crestron Nvx's, one hundred fifty (150) flat panel display, ten (10) video projectors, two (2) interactive video walls.

This innovative technology provides the owner with all the network connections they are accustomed to with a less expensive network operational cost. The design eliminates the use of Ethernet switches in the network and reduces the overall network infrastructure. While future proofing the cabling infrastructure, this allows the network maintenance to become centralized and easier to manage.

Customer: Brinker Christman A Joint Venture

Completed: 2019

Value: $5 Million

Olympia Development
Little Caesars Arena

Scope: This newly constructed 800,000 square-foot arena is home to the Detroit Red Wings and Detroit Pistons. MCET was responsible for the installation of the voice/data, broadcast, intercom, LED televisions and lower bowl audio systems. Over the course of the project, MCET installed more than 2.5 Million feet of Category 6A Ethernet cable, 500,000 feet of jacketed fiber optic cable (8.4 Million feet or 1,590 Miles by the strand), and 2 Million feet of Broadcast audio/video cable. This project also included the installation of over 1,300 high-definition televisions and 900 wireless access points.

Customer: Barton Malow – Hunt – White

Completed: 2017

Value: $20 Million

Oakland and University
Engineering Center

Scope: As the home for the School of Engineering and Computer Science, this 6-story 127,000 square-foot facility features state-of-the-art classrooms and research space. MCET installed over 2,700 Category 6A voice/data drops as well as the audio/visual, access controls, CCTV and building management systems. A redundant diverse fiber optic communication backbone was installed at the university data center as part of this project.

Customer: Oakland University

Completed: 2015

Value: $4 Million

Macomb County Department of Roads
Communications and Technology Center (COMTEC)

Scope: A 25,000 square foot state-of-the-art facility that provides 24/7 situational awareness for residents, businesses and first responders. The facility houses the Macomb County Sheriff's Office Centralized Dispatch, the Road Department Traffic Operations Center, the Information Technology Department and Data Center, and the Emergency Management & Communications Department. For this project, MCET installed the supporting audio/visual equipment and structured cabling to support a 20' x 50' video wall, eight traffic-monitoring stations, twenty-five E911 dispatch stations, the County-wide Emergency Operations Center, a centralized data center, and a computer lab/training facility.

Customer: Michigan Department of Transportation / Macomb County Dept. of Roads

Completed: 2013

Value: $3.3 Million

BLUEWATER TECHNOLOGIES COMPANY PROFILE

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Organizational Structure

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Officers and Executives

Suzanne Schoeneberger - President & Owner – Wixom
John Tracy – CEO – Wixom
Eric Butler - CFO - Wixom
Nanette Studebaker – COO - Wixom
Nick Marino – VP, Sales - Integration - Wixom
Brittney Bemb – VP, Integration Operations – Wixom

BWT EXECUTIVE TEAM

Nick Marino – Vice President Sales, Integration Nick has been with Bluewater for over 15 years. He joined the company as a senior account executive in 2009 and has since been promoted from the Director of Sales to the Vice President of Sales leading the Integration sales team. Nick has led some of Bluewater's largest projects such as Macomb County Comtec, Buffalo Wild Wings, BAE Systems, The Taubman Company and Little Caesars Arena. Prior to joining Bluewater, Nick was the National Sales Manager at Sport View Technologies for over 5 years.

Brittney Bemb – Vice President of Operations, Integration MBA, PMP Brittney has over 15 years of project management experience from live event and software management to platform integration and AV Project Management. In her career, she has successfully managed over 1,500 projects ranging from $2,000 to $3.5 million in value. Brittney changed course in 2015 from managing projects to following her path as a teacher and mentor to become the Director of Bluewater's PMO and Experiential teams. As demand in the industry shifted, Brittney did the same to help Bluewater launch new processes, tools, and platforms to better serve their clients and team members as the Director of Operational Excellence. As a Bluewater team member for 11 years, Brittney now acts as the Vice President of Operations - Integration. She works to drive consistent improvement in quality standards and efficiency to provide the best solutions and experience for Bluewater's clients.

Derek Monette – Director of Operations Derek began his career in the commercial AV industry after graduating from Central Michigan University in 2007. He started as a Field Technician before transitioning to Project Management and joined Bluewater as a Project Manager in 2013. In 2017, Derek moved to the Engineering team, eventually leading it until 2022, when he took on the role of Director of Operations. With expertise in project management and engineering, Derek ensures operational excellence across Bluewater.

Ben Lindsey - Quality Assurance Manager, CTS Ben has been an invaluable member of the Bluewater team since 2000, bringing in over two decades of expertise. Starting with bench-level equipment repair for top manufacturers like NEC, Sony, and Biamp, Ben quickly expanded his role to fieldwork and system support. From 2008 to 2018, he became a go-to expert for programming installations, integrating complex systems like Crestron, AMX, and Extron. Ben's deep technical knowledge and leadership skills led him to manage several key teams, including Programmers, Managed Service Technicians, and Engineering. Currently, he serves as Bluewater's Quality Assurance Manager, ensuring every project meets the highest standards. Throughout his career, Ben has been dedicated to supporting his teammates at every phase of the project life cycle, making him a vital resource for both technical and strategic success.

Lisa Page – Project Management Lead Lisa has been with Bluewater for two years, starting as a Project Manager and quickly advancing to Project Management Lead. She began her project management career in architectural construction, overseeing projects from design through fabrication and installation. With a solid foundation in both construction and AV, Lisa is known for her exceptional problem-solving abilities and ensures that both her clients and team have everything they need for a successful project. Her talent for listening, clear communication, and relentless determination makes her a trusted leader who consistently delivers exceptional results.

Melissa Phillips – Account Manager Melissa has been an integral part of our team for the past eight years, consistently demonstrating her dedication and expertise as an Account Manager. Known for her meticulous attention to detail and client-focused approach, Melissa excels in understanding and addressing the unique needs of each client, ensuring their satisfaction and success. As a team player, she collaborates seamlessly with her colleagues, fostering a cooperative and productive work environment. Her commitment to building strong client relationships and ensuring that we are a dependable partner for their solutions has been pivotal to our company's growth and reputation. Melissa's unwavering dedication to her clients and her ability to deliver tailored solutions make her a valued asset to our team and a trusted advisor to our clients.

Woody Booth – Senior Project Manager With over 25 years in the commercial audio-visual industry, Woody started at Bluewater as a Lead Installation Technician and later became the Installation Manager and Estimator. Over the past 17 years, he has excelled as a Project Manager and Estimator, handling Bluewater's largest installation projects for high-profile clients like GM, Ford, and Quicken Loans. Woody specializes in large-scale, new construction installations, notably managing multi-million-dollar projects in downtown Detroit. His detailed, client-focused approach ensures on-time project completion and outstanding client experiences, also providing critical support in large project estimates.

Steve Insley – Director of Managed Services and Install Steve has over 11 years of experience in the AV industry, progressing from Installation Supervisor to Integration Operations Manager and now Manager of Operations and Managed Services. He also brings over 10 years of expertise in voice, data, and structured cabling. Steve works closely with all members of Bluewater's integration and service teams, ensuring seamless collaboration and operational excellence. His professional certifications include Crestron DMC-D-4K, and Extron EAVA, demonstrating his commitment to industry standards and quality.

Drew Kergan – Field Engineer, CTS-I Drew began his career in the audio-video industry working in residential AV from 1997 to 1999 before joining Bluewater in 1999. He quickly advanced to Lead Technician, playing a pivotal role in transitioning projects from analog to digital systems. As one of the most knowledgeable technicians in the industry, Drew holds a CTS-I certification and is highly sought after for his expertise. Known for handling tough on-site situations with ease, he excels at keeping clients informed and satisfied through clear communication and well-defined next steps. His ability to work seamlessly with all trades ensures the success of even the most challenging projects, making him an invaluable asset to the Bluewater team.

Jeff Hynes – Programmer, CTS-I Jeff has been a key contributor to Bluewater since 2011, progressing from Field Engineer to a highly skilled AV Systems Programmer. Specializing in Crestron programming, Jeff has extensive experience working with top manufacturers like Q-sys, Extron, and Biamp. His certifications include Crestron Certified Programmer and Avixa's CTS-I, along with numerous other programming credentials that highlight his expertise in advanced technologies. Jeff's deep technical knowledge enables him to design, program, and implement complex AV systems, providing innovative solutions tailored to meet clients' needs.

PROJECT PROFILES

Little Caesars Enterprises' World Headquarters - Detroit, MI
PROJECT VALUE: $2.8 MILLION - Completed 2019

In conjunction with MCET, Bluewater provided a turn-key AV solution for the entire Little Caesars Enterprises' World Headquarters. This included a video/IP solution that provides the ultimate in flexibility by providing the ability to provide any source to any designation. Additionally, BW furnished and installed 50+ conference rooms, huddle rooms, boardrooms, and collaboration spaces that ranged from extremely basic with wireless and wired collaboration to a display to spaces with much more functionality including wireless/wired collaboration for presentations, video, and audio conferencing, multi touch capability and fully integrated control that controls all aspects of the space.

In addition to the conference room spaces, Bluewater furnished and installed Direct View LED in an open space for presentation and digital signage capabilities, a test kitchen, a Little Caesars replicated site, Focus/ Observation area, divisible training room for individual training session with 4 spaces or the ability to open up for a much larger group, a gym, a terrace with mobile systems for presentation overflow, and entry way projection mapped floor and sound masking throughout the entire 9 floor building. Bluewater worked with the architect, the designer and consultant to specify and install equipment and provide 2 years of post-install support.

Lastly, Bluewater designed and built the studio for LCE that relies on green screen technology and is in the process of designing a new XR studio in the same space.

United Shore Mortgage - Pontiac, MI:
PROJECT VALUE $ 2.2 MILLION

Bluewater provided all digital signage and conference room technology throughout United Shore's new state-of-the-art headquarters in Pontiac, MI. Spaces include: the lobby's custom LED welcome signage, the auditorium, which will boast rear projectors, new audio, and Crestron control; the fitness center and full basketball court, with audio and monitors throughout; and 11 training rooms, all of which have a presentation area, control, and audio. Bluewater gave the same treatment to the cafeteria, security room, conference rooms, and the common areas throughout all three floors. In total, Bluewater installed over 175 displays and dozens of speakers throughout the building. The finished product is a completely tech-savvy office for the modern worker. We are grateful to be recognized as one of SCN's 2018 Installs of the Year for this project.

Penske Entertainment - Indianapolis Motor Speedway – Indianapolis, IN
PROJECT VALUE: $5+ Million since 2020. Projects on-going.

Bluewater has installed and/or is repairing and supporting all LED boards out at Indianapolis Motor Speedway since 2020. We also provide LED and AV technicians for on-site race support. We have also worked with Penske Entertainment on providing installation and support of their conference room technologies. Recent changes started in 2020 with the 100' x 20' 6mm Pagoda board. 2023- Updated scoring Pylon from 16mm pixel pitch to a brighter 10mm pixel pitch. 2023-New Start/Finish line 10mm LED board and Infield 10mm board. 2024 work includes 12 new 3mm infield mound boards, Turn 7,

outside Turn 1 and 4 10mm LED boards. We are currently managing 63 individual LED displays. LED displays are ABSEN and KWAV

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Salesforce Tower – Indianapolis, IN

PROJECT VALUE: $3 Million - Completed 2019

Bluewater was chosen by Salesforce as the most qualified AV integrator to install and support their 100 conference rooms across 14 floors in Salesforce Tower. There were 3 bid phases and Bluewater won each phase based on consistent workmanship, attention to detail and LIVE support. Their top floor "The Ohana Floor" was $750k by itself and Bluewater supports their Townhall meetings that take place there. Technology includes Crestron, QSC, Shure, Biamp, Samsung.

PROJECT TIME FRAME FLOW CHART

Gant Chart will be provided upon award.

Motor City Electric Technologies Inc.
ISO 9001:2015

9440 Grinnell St.
Detroit, MI 48213-1151
Phone: 313.921.5300
www.mceco.com

January 29, 2025

Ms. Trish Pergament
White Lake Township
7525 Highland Road
White Lake, MI 48383

Subject: White Lake Township
Public Safety Building Low Voltage & AV Design Work
Motor City Electric Technologies Inc. Proposal No. 25-0640 Public Safety Building

Dear Ms. Pergament:

Motor City Electric Technologies Inc. is pleased to offer our proposal for the above-referenced project located in White Lake Township Hall, Michigan.

Price Breakout for Exhibit C - Public Safety Building -- Low Voltage & AV Design Work and Exhibit D- Township Hall - Low Voltage & AV are provided below.

Our proposal is based on the following:

- Low Voltage & AV - New Civic Center Buildings - White Lake Township 10-25-24 Final
- White Lake Public Safety Building Low Voltage Design Work Specifications (V4)
- White Lake Public Safety Building Low Voltage Drawings
- Public Safety Building -Drawings Construction
- Public Safety Bldg Project Manual

SCOPE OF SERVICES

Motor City Electric Technologies Inc. will provide the following services:

IT Room 247

- Furnish and install 12” ladder rack and ladder rack dropouts.
- Furnish and install one (1) 42U server cabinet per specification and one (1) metered PDU.
- Furnish and install one (1) 45U 2-post relay rack, two (2) vertical wire managers, and one (1) metered PDU.
- Furnish and install one (1) telecommunications ground bar.
- Ground server cabinet, relay rack, and ladder rack to the telecommunications ground bar.
- Furnish and install 24-port modular patch panels with category 6 jacks and F-type inserts for each terminated cable.
- Furnish and install the required 1U horizontal wire managers.
- Furnish and install one (1) rack mount enclosure and required LC singlemode fiber adapter plate.
- Furnish and install category 6 1-foot patch cords for each patch panel termination.
- Furnish and install RG6 coaxial 1-foot patch cords for each patch panel termination.
- Furnish and install EZ path sleeves per the specification.

IDF

- Furnish and install one (1) wall mount fiber splice cabinet.

Fiber Backbone

- Furnish and install one (1) 12-strand underground outdoor fiber singlemode fiber between Public Safety Building and Town Hall Building.
- Furnish and install one (1) 12-strand singlemode armored plenum fiber from the IDF wall mount fiber splice cabinet to IT room 247 fiber enclosure. Fiber will be fusion spliced to the outdoor fiber from the Public Safety Building and the IDF and fusion spliced to fiber pigtails the fiber enclosure in IT room 247.
- OTDR directional test fiber, certify per the specification and provided documentation.

Low Voltage Outlets

- Furnish and install the non-continuous support for the new category 6 cable and fiber pathways.
- Furnish and install the required faceplate and surface mount per the low voltage drawing outlet locations.
- Furnish and install category 6 RJ45 jacks in various colors for the data, voice, wireless access point, fire sensors, intercoms, security monitors, cameras, audio-video low voltage drawing outlet locations.
- Furnish and install F-type coaxial inserts per the low voltage drawing outlet locations.
- Furnish and install HDMI inserts per the low voltage drawing outlet locations.
- Furnish and install category 6 plenum cable in various colors from each jack location to IT room 247 and terminate cable at each end.
- Furnish and install RG6 plenum coaxial cable from each F-type insert location to IT room 247 and terminate cable at each end.
- Furnish and install category 6 plenum cable and 18 AWG/2 conductor plenum rated cable from the fire sensor locations to watch room 230 and terminate cable at each end.
- Label, test, and certify category 6 cable per specification and provided documentation.

Access Control Cabling

- Furnish and install 22 AWG/6 conductor plenum rated cable from the card reader locations to IT room 247 and coil cable at each end for future installation.
- Furnish and install 18 AWG/4 conductor plenum rated cable from the door contact locations to IT room 247 and coil cable at each end for future installation.
- Furnish and install 18 AWG/2 conductor plenum rated cable from the duress button locations to IT room 247 and coil cable at each end for future installation.
- Furnish and install 18 AWG/4 conductor plenum rated cable from the electrified lock locations to IT room 247 and coil cable at each end for future installation.
- Furnish and install 18 AWG/4 conductor plenum rated cable from the alarm surveillance locations to IT room 247 and coil cable at each end for future installation.
- Furnish and install 18 AWG/4 conductor plenum rated cable from the strobe locations to IT room 247 and coil cable at each end for future installation.

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LMR400 Coax

- Furnish and install LMR400 plenum rated cable coaxial cable to the mezzanine area coil cable at each end for future installation.

Additional Items

- Man lift (as required.)
- Necessary cable supports for structured cabling system.
- As-builts
- Fire-Stopping
- Permits

AV Design Work

- Furnish and install AV systems per the specification and drawings in the following areas.
    - Exercise 103
    - Briefing 112
    - Public Lobby 241
    - Community Room 242
    - Dispatch 250
    - Patrol SGTS 115
    - Patrol LT 117
    - Hub Zone 123
    - Apparatus Bay 200 (OFE PROVIDED AKNOWLEGED)
    - Fire Chief 212
    - Fire Marshall 213
    - Admin 214
    - Admin Hallway 215 (OFE PROVIDED AKNOWLEGED)
    - Conference Room 219
    - Sleep Room 221 (OFE PROVIDED AKNOWLEGED)
    - Sleep Room 222 (OFE PROVIDED AKNOWLEGED)
    - Sleep Room 223 (OFE PROVIDED AKNOWLEGED)
    - Sleep Room 224 (OFE PROVIDED AKNOWLEGED)
    - Watch Room 230
    - Shift Commander Office 231
    - Shift Commander Office 232 (OFE PROVIDED ACKNOWLEDGED)
    - Kitchen/Day Room 234 (OFE PROVIDED ACKNOWLEDGED)
    - Admin LT 248
    - Conference Rooms 256
    - Future Officer 260
    - Social Worker 264
    - Future Officer 266
    - Police Admin 265
    - Police Chief 267
    - SRO 271
    - Detective 272
    - Detective 273
    - Detective LT 274
    - Paging System

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Clarifications

1. Briefing 112: Lower-Level Plan R.10.1. The Shows 3 HDMI input locations but only calls for 2 HDMI wall plates and TVS. We have provided for 2 as defined.
2. Who is managing the Digital Signage Players? Does a CMS platform need to be specified or is there one desired? We did not provide a quote for a CMS platform.
3. 8" Atlona Panel has been discontinued. We have provided funds for a 10" Velocity Panel
4. All owner furnished equipment and furniture shall be available prior to install.

Exclusions

Our proposal excludes the following:

- Low voltages and AV Conduits, back boxes, floor boxes, floor cores, power.
- Backerboards for TV monitors
- Door hardware
- Overtime.
- Dumpsters.
- Winter Conditions.
- Ground man
- BIM and BIM coordination
- Parking
- Access control, Surveillance, intrusion detection systems and installation
- Intercom Master Stations and Intercoms and installation.
- Network Switches, Wireless Access Points and UPS
- Copper patch cord and installation at the device outlets.
- Cutouts in furniture for popup or cable cubby interfaces.

BASE PRICE

The Total Sum as specified herein by Motor City Electric Technologies Inc. is Five Hundred Twenty-Five Thousand, Two Hundred Thirty-Five and 00/100 (**$525,235.00**) Dollars. Note: Taxes Not Included

Add for Payment & Performance Bond **Add: $ 4,255.00**

PRICE BREAKOUT

EXHIBIT A

Exhibit A - Township Hall - Low Voltage & AV Design Work **Exhibit A Price: $ 316,665.00**

Add for Payment & Performance Bond: $ 2,565.00

EXHIBIT B

Exhibit B - Township Hall - Low Voltage & AV Design Work **Exhibit B Price: $ 208,570.00**

Add for Payment & Performance Bond: $ 1,690.00

Complete Bill of Materials and Unit Pricing Provided Below for Exhibit A & Exhibit B

SCHEDULE

In accordance with the above, it is Motor City Electric Technologies' intention to begin work on this project upon receipt of the order and project schedule, with the completion of all work within a mutually agreed upon time frame.

TERMS AND CONDITIONS

1. All prices shall remain in effect subject to your acceptance until July 29, 2025.

2. Our terms of payment are thirty (30) days net from the date of invoice. We will invoice the last working day of each month for all work performed that month.

3. Our labor is based on IBEW, Sound, and Communication rates, Monday thru Friday, 8-hour days, (First Shift).

4. Our installation price does not include the following:
   - Shift or Overtime

5. Our price does not include MBE involvement.

6. Any delays due to additional changes to the system and/or omissions of others will be charged as additional work.

7. Motor City Electric Technologies will not be responsible for the correctness or accuracy of any information supplied by others or the subsequent errors resulting from such incorrect information.

8. Motor City Electric Technologies will not be held liable for any schedule delays due to drawing approval delays and/or errors or omissions of others.

9. Back charges for any field additions, deletions, modifications, or "corrections" authorized and implemented without our knowledge and consent will not be accepted.

10. Standard manufacturer warranties apply unless otherwise stated.

11. This proposal is not a firm offer and shall not bind MCET to enter into an agreement for the work described. Any agreement must be based upon terms acceptable to MCET.

Thank you for the opportunity to quote these services. Should you have any questions regarding our proposal, please do not hesitate to call.

Sincerely,

Scott Sutherland

Scott Sutherland
Estimator
Motor City Electric Technologies Inc.
(313) 957-3611
E-mail: ssutherland@mce-tech.com

Exhibit C - Public Safety Building - Low Voltage & AV Design Work

Public Safety Building Low Voltage

Qty	Description	Unit Price	Extended Price
57000	BERK-TEK 10032094 LANMARK-1000 CATEGORY 6 U/UTP PLENUM CABLE, 4-PAIR, BLUE	$ 0.37	$ 21,018.75
256	LEVITON 61110-RL6 EXTREME CATEGORY 6 QUICKPORT JACK, BLUE	$ 6.44	$ 1,648.00
108	LEVITON 41089-1WP QUICKPORT 1-PORT QUICKPORT SURFACEMOUNT BOX, WHITE	$ 2.38	$ 256.50
403	LEVITON 41084-BW QUICKPORT BLANK QUICKPORT INSERT, WHITE	$ 0.25	$ 100.75
431	TERM - EQPMT ROOM 4 PR (DATA)	$ -	$ -
431	CABLE TEST - 4 PR (DATA)	$ -	$ -
545	PANDUIT S100X150YAJ 1" X 1.5" POLYESTER SELF-LAMINATING LABEL - OUTLET	$ 0.13	$ 68.13
495	PANDUIT S100X150YAJ 1" X 1.5" POLYESTER SELF-LAMINATING LABEL - PATCH PANEL	$ 0.13	$ 61.88
1044	PANDUIT S200X225YAJ 2" X 2.25" POLYESTER SELF-LAMINATNG LABEL - CABLE	$ 0.25	$ 261.00
256	LEVITON 61110-RL6 EXTREME CATEGORY 6 QUICKPORT JACK, BLUE PP	$ 6.44	$ 1,648.00
281	LEVITON 6D460-1L EXTREME CATEGORY 6 SLIMLINE BOOT PATCH CORD, 1-FT, BLUE	$ 3.94	$ 1,106.44
25	INSTALL CUSTOMER SUPPLIED WIRELSS ACCESS POINT	$ -	$ -
220	LEVITON 42080-4WS QUICKPORT 4-PORT SINGLE-GANG QUICKPORT WALLPLATE, WHITE	$ 1.88	$ 412.50
20000	BERK-TEK 10032092 LANMARK-1000 CATEGORY 6 U/UTP PLENUM CABLE, 4-PAIR, WHITE	$ 0.37	$ 7,375.00
89	LEVITON 61110-RW6 EXTREME CATEGORY 6 QUICKPORT JACK, WHITE	$ 6.44	$ 572.94
89	LEVITON 61110-RW6 EXTREME CATEGORY 6 QUICKPORT JACK, WHITE, PP	$ 6.44	$ 572.94
89	LEVITON 6D460-1W EXTREME CATEGORY 6 SLIMLINE BOOT PATCH CORD, 1-FT, WHITE	$ 3.94	$ 350.44
15000	BELDEN 9116P RG6 18 SOL CCS FFPE DUOFOIL+ 60% AL BRD SHD FLRT JKT CMP 75 OHM	$ 1.00	$ 15,000.00
54	LEVITON 40834-W HDMI FEED-THROUGH COUPLER CONNECTOR, WHITE	$ 14.81	$ 799.88
64	LEVITON 40831-FWG QUICKPORT F-TYPE INSERT GOLD-PLATED FEED-THROUGH, WHITE	$ 3.50	$ 224.00
128	BELDEN FSNS6U PROSNS UNIVERSAL F-MALE RG-6 COAX SNAP-N-SEAL CONNECTOR	$ 1.81	$ 232.00
64	LEVITON 40831-FWG QUICKPORT F-TYPE INSERT GOLD-PLATED FEED-THROUGH, WHITE PP	$ 3.50	$ 224.00
64	RG6 18 AWG 75 OHM QUAD SHIELDED F-F CONNECT COAXIAL JUMPER, 1-FT	$ 9.94	$ 636.00
2	LEVITON 42080-6WS QUICKPORT 6-PORT SINGLE-GANG QUICKPORT WALLPLATE, WHITE	$ 1.88	$ 3.75
17000	BERK-TEK 10033997 LANMARK-1000 CATEGORY 6 U/UTP PLENUM CABLE, 4-PAIR, ORANGE	$ 0.37	$ 6,268.75
59	LEVITON 61110-RO6 EXTREME CATEGORY 6 QUICKPORT JACK, ORANGE	$ 6.44	$ 379.81
59	LEVITON 61110-RO6 EXTREME CATEGORY 6 QUICKPORT JACK, ORANGE PP	$ 6.44	$ 379.81
59	LEVITON 6D460-1X EXTREME CATEGORY 6 SLIMLINE BOOT PATCH CORD, 1-FT, ORANGE	$ 3.94	$ 232.31
6000	BERK-TEK 10032090 LANMARK-1000 CATEGORY 6 U/UTP PLENUM CABLE, 4-PAIR, YELLOW	$ 0.37	$ 2,212.50
27	LEVITON 61110-RY6 EXTREME CATEGORY 6 QUICKPORT JACK, YELLOW	$ 6.44	$ 173.81
27	LEVITON 61110-RY6 EXTREME CATEGORY 6 QUICKPORT JACK, YELLOW, PP	$ 6.44	$ 173.81
27	LEVITON 6D460-1Y EXTREME CATEGORY 6 SLIMLINE BOOT PATCH CORD, 1-FT, YELLOW	$ 3.94	$ 106.31
6000	BELDEN 6300UE 004U1000 2C/18 AWG UNSHIELDED STRANDED CMP CABLE, YELLOW	$ 0.29	$ 1,725.00
16	LEVITON 4108W-1SP 1-PORT QUICKPORT SINGLE GANG STAINLESS STEEL PHONE PLATE	$ 10.63	$ 170.00
730	CADDY CAT64HP 4" J-HOOK	$ 5.94	$ 4,334.38
730	STEEL CITY 500-SC BEAM CLAMP	$ 2.56	$ 1,870.63
15	LEVITON 43115-075 75' VELCRO BULK ROLL CABLE TIE, BLACK	$ 75.00	$ 1,125.00
90	HILTI FS-ONE HIGH PERORMANCE FIRE STOP SEALANT	$ 31.25	$ 2,812.50
1	GREAT LAKES 7901ES-2442-B ES CABINET 79"H X 24"W X 42"D, 42 RMU, BLACK	$ 2,162.50	$ 2,162.50
1	GREAT LAKES 7903E-24-B ES CABINET 79”H X 24"W SOLID DOORS, BLACK	$ 337.50	$ 337.50
1	GREAT LAKES 7902E-MC24SL-B ES CABINET 79"H X 24"W MESH DOORS, BLACK	$ 768.75	$ 768.75
1	GREAT LAKES 7910-36ELS-B ES CABINET 79"H SIDE PANELS, BLACK	$ 431.25	$ 431.25
1	GREAT LAKES ES/EZ 225 ES CABINET 225 CFM FAN TOP, BLACK	$ 425.00	$ 425.00
1	CHATSWORTH 55053-715 2-POST STANDARD RELAY RACK 19'W X 8'H X 3'D, BLACK	$ 443.75	$ 443.75
1	CHASTWORTH 40604-003, CONCRETE FLOOR INSTALLATION KIT	$ 15.00	$ 15.00
2	CHATSWORTH 10605-019 19" RACK INSULATOR KIT	$ 93.75	$ 187.50
2	CHATSWORTH 11374-715 SINGLESIDED VERTICAL WIRE MANANGER 6'W X 8'H X 6.38'D, BLACK	$ 581.25	$ 1,162.50
3	ORTRONICS GBH19KIT CABINET 19" HORIZONTAL RACK GROUND BAR	$ 131.25	$ 393.75
150	ALLWIRE THHN6STR-GN #6 AWG GREEN SHEATH GROUND WIRE	$ 1.14	$ 171.56
22	PANDUIT LCC6-14D-L LONG BARREL 2-HOLE #6 AWG 1/4 LUG, COPPER	$ 2.63	$ 57.75

3	CHATSWORTH 10250-712 UNIVERSAL CABLE RUNWAY 12"W X 1.5"H X9.96'L (BLACK)	$ 131.25	$ 393.75
4	CHATSWORTH 11421-712 CABLE RUNWAY 12" WALL ANGLE SUPPORT KIT, (BLACK)	$ 30.00	$ 120.00
3	CHATSWORTH 11301-701 CABLE RUNWAY BUTT-SPLICE KIT, .038"W X 1.5"H X 5"L, BLACK	$ 13.75	$ 41.25
2	CHATSWORTH 112101-701 CABLE RUNWAY RADIUS DROP, STRINGER ADJUSTABLE, BLACK	$ 46.25	$ 92.50
6	CHATSWORTH 10607-002 CABLE RUNWAY SLOTTED SUPPORT BRACKETS, 3/8"	$ 8.13	$ 48.75
1	B-LINE 1 5/8" X 1 5/8", 9/16" X 1 1/8" CHANNEL SLOTTED STRUT, 12 GA, GRN -10 FT	$ 182.50	$ 182.50
6	COOPER B-LINE 1/2' X 120"ALL THREAD ROD 10FT	$ 48.75	$ 292.50
6	1/2" CHANNEL SPRING NUT	$ 1.25	$ 7.50
6	1/2' HEX NUT	$ 0.25	$ 1.50
6	1/2' FLAT WASHER	$ 0.13	$ 0.75
6	1/2' LOCK WASHER	$ 0.13	$ 0.75
2	CHATSWORTH PRODUCTS INC 40164-001, CABLE RUNWAY GROUNDING STRAP KIT	$ 28.75	$ 57.50
26	LEVITON 49255-L24 FLAT QUICKPORT 24-PORT, 1U PATCH PANEL W/CABLE MANAGEMENT BAR	$ 71.25	$ 1,852.50
28	CHATSWORTH 30130-719 1U SINGLESIDE UNIVERSAL HORIZ MGR 19.25'W X 1.72"H X 4.96"D	$ 68.75	$ 1,925.00
1	CORNING CCH-02U 2U RACK MOUNT CCH HOUSING, ACCEPTS 4 CCH PANELS, BLACK	$ 275.00	$ 275.00
2	APC AP8830 NETSHELTER RACK PDU 2G METERED ZEROU 20A,100-120V 24 5-20R	$ 862.50	$ 1,725.00
1	GREAT LAKES FTC103 THERMOSTAT VARIABLE FAN CONTRREL	$ 312.50	$ 312.50
1	CHATSWORTH 10595-712 3" CHANNEL RACK TO RUNWAY MOUNTING PLATE	$ 68.75	$ 68.75
2	CHATSWORTH 10622-020 WALL-MOUNT BUSBAR KIT, 4"H X 20"W X 0.25"D	$ 250.00	$ 500.00
4	STI EZDP44S2 EZ-PATCH FIRE-RATED PATHWAY KIT W/WALL PLATE 4"W X 4-5/8"H X 14"L	$ 418.75	$ 1,675.00
19000	BELDEN 6504FE 877U1000 6C/22 AWG SHIELDED STRANDED CMP CABLE, NATURAL	$ 0.27	$ 5,106.25
8000	BELDEN 6302UE 877U1000 4C/18 AWG UNSHIELDED STRANDED CMP CABLE, NATURAL	$ 0.39	$ 3,150.00
2000	BELDEN 6300UE 877U1000 2C/18 AWG UNSHIELDED STRANDED CMP CABLE, NATURAL	$ 0.29	$ 575.00
800	CORNING 012ZUC-T4F22D20 ALTOS 12-STRAND SM (OS2) LT, FIBER	$ 1.66	$ 1,325.00
4	CORNING CCH-CP12-A9-P03RH CCH PIGTAIL MODULE, 12-FIBER LC DUPLEX, SM (OS2)	$ 475.00	$ 1,900.00
4	CORNING M67-048 12 FIBER SPLICE TRAY	$ 43.75	$ 175.00
48	CORNING 2806031-1 60MM FIBER PROTECTION SLEEVES	$ 1.06	$ 51.00
48	FO CABLE SPLICE- FUSION	$ -	$ -
24	CABLE TEST - OPTICAL dB LOSS	$ -	$ -
24	CABLE TEST - OTDR FIBRE TRACE	$ -	$ -
350	CORNING 012E88-31131-A3 12-STRAND SM (OS2) MIC INDOOR TB, PLENUM ARMORED FIBER	$ 1.59	$ 557.81
2000	TIME MICROWAVE LMR400 ULTRAFLEX	$ 1.88	$ 3,750.00
1	CORNING EDC-06P-NH WALL MOUNT ENVIROMENTAL DISTRIBUTION CENTER, HOLDS 6 PANELS	$ 500.00	$ 500.00
1	MISC MATERILS	$ -	$ 4,663.00

Material Total		**$112,420.38**
Install labor		**$164,000.00**
Equipment		**$4,940.00**
Permits		**$2,000.00**
PM & DJE		**$33,305.00**
Grand Total		**$316,665.38**

Add Cost for Payment and Performance Bond		**$2,565.00**

Exhibit D - Public Safety Building - Low Voltage & AV Design Work

Public Safety Building AV

Quote #226301 - Exercise 103

Qty	Description	Unit Price	Extended Price
	Video System		
3	65In BED Series Commercial TV Crystal UHD Display, 300nit	$651.85	$1,955.55
3	Micro-Adjust Tilt Wall Mount, Large	$254.78	$764.34
3	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$548.21
3	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$36.90
1	Shipping Charges	$165.25	$165.25
	Total:		**$3,470.25**

Quote #226302 - Briefing 112

Qty	Description		Extended Price
	Video System		
2	Series 75" 4K Class Ultra HD Commercial LED TV	$1,108.15	$2,216.30
2	Micro-Adjust Tilt Wall Mount, Large	$254.78	$509.56
2	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$365.47
1	2x1 Automatic 4K UHD HDMI Standby Switcher	$224.65	$224.65
1	FC-46H2 4K HDR HDMI Audio De–embedder	$358.52	$358.52
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	ClickShare Gen 2 C-10, C-10 Base, 1 Gen4 Button	$1,315.35	$1,315.35
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
2	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$24.60
	Audio System		
4	6.5"CEILING SPKR W/X-FRMER (2PR Per CTN)	$175.36	$701.44
1	VMA 2120: (8) input channel x (2) 120W output channel Mixer/Amplifier	$520.55	$520.55
1	Wall Controller W/ Volume Control - White	$71.33	$71.33
	Headend Equipment and Rack		
1	12SP27D MOBILE F RACK GE	$750.80	$750.80
1	12 RU Rackrail 10-32 for MFR Series	$32.02	$32.02
1	2SP UTIL.DRAWER, BLK	$130.95	$130.95
1	Advanced Rack mount power conditioner	$116.40	$116.40
1	16/2 Plenum Black	$259.69	$259.69
1	Cat 6A F/UTP CMP - Small O.D 500Mhz	$1,385.88	$1,385.88

1	Cable Connectors and Hardware	$582.02	$582.02
1	Shipping Charges	$453.05	$453.05
	Total:		**$10,095.96**

Quote #226303 - Public Lobby 241

Qty	Description		Extended Price
	Video System		
2	65In BED Series Commercial TV Crystal UHD Display, 300nit	$651.85	$1,303.70
2	Micro-Adjust Tilt Wall Mount, Large	$254.78	$509.56
2	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$365.47
2	H.265, True 4K, dual video decode, enterprise HTML5 player	$558.73	$1,117.45
2	64GB Class 10 Micro SD Memory Card	$45.79	$91.58
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$24.60
1	Cables Connectors Hardware		$0.00
1	Shipping Charges	$171.90	$171.90
	Total:		**$3,609.85**

Quote #226306 - Community Room 242

Qty	Description		Extended Price
	Video System		
2	Epson PowerLite L770U Laser Projector, 700 Lumen, White	$4,738.73	$9,477.45
2	Da-Lite Tensioned Advantage Series, 52" x 92" with Da-Mat	$3,117.01	$6,234.02
2	CMA-110 FLAT CEILING PLATE, WHITE	$54.40	$108.81
2	ADJ. PIPE 36" TO 60" WHITE	$134.69	$269.38
2	65In BED Series Commercial TV Crystal UHD Display, 300nit	$651.85	$1,303.70
2	Micro-Adjust Tilt Wall Mount, Large	$254.78	$509.56
4	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$730.94
1	6X2 Matrix Presentation Switcher with USB Hub	$2,758.73	$2,758.73
2	Wallplate HDBaseT Transmitter with HDMI Input	$299.62	$599.24
2	HDBaseT Receiver with Audio De-Embedding	$486.10	$972.19
1	Splitter / Distribution Amplifier	$285.18	$285.18
1	ClickShare CX-50 Gen 2	$3,012.49	$3,012.49
	Audio System		
1	CONVERGE Pro 2 48VT DSP Mixer with 4 mic/line inputs (AEC), 8 mic/line	$2,745.92	$2,745.92
1	4 Channel x 160 watt At 4ohms, 8ohms, 70V and 100V per channel	$1,887.17	$1,887.17

12	6.5"CEILING SPKR W/X-FRMER (2PR Per CTN)	$164.51	$1,974.09
1	Wall-Mounted Bluetooth® Audio Format-A Interface - WHITE	$378.31	$378.31
2	Active Three-Pair Receiver - Twisted Pair Format-A - XLR and stereo phono outputs - Black	$242.03	$484.06
2	WIRELESS, R41, HANDHELD, W/OM2 CAPSULE	$442.32	$884.63
1	Combines4;2Channel Systems;8Channels w/1 Set of Antennas;1 Power Supply	$488.88	$488.88
1	Power Inserter / Signal Breakout - Twisted Pair Format-A	$103.59	$103.59
	Control System		
1	24-port 10/100/1000BASE-T (RJ45) PoE+ with 300W PoE budget	$1,101.16	$1,101.16
1	Velocity System 10" VESA Mount Touch Panel with LED (White) includes Wall Mount Kit	$1,539.30	$1,539.30
1	Hardware Gateway for AV Control and Management plus Room Scheduling	$1,815.87	$1,815.87
	Headend Equipment and Rack		
1	18U/24"DEEP, CONFIGURED RK	$853.81	$853.81
1	3SP ANODIZED DRAWER	$185.08	$185.08
1	Advanced Rack mount power conditioner	$116.40	$116.40
1	6 OUTLETS,20A, CORD, NS	$157.14	$157.14
1	16/2 Plenum Black	$259.69	$259.69
1	Cat 6A F/UTP CMP - Small O.D 500Mhz	$1,385.88	$1,385.88
1	Cables Connectors Hardware	$1,780.95	$1,780.95
1	Shipping Charges	$2,123.28	$2,123.28
	Total:		**$46,526.94**

Quote #226307 - Dispatch 250

Qty	Description		Extended Price
	Video System		
10	65In BED Series Commercial TV Crystal UHD Display, 300nit	$651.85	$6,518.50
10	Full-Service Video Wall Mount w/ Quick Release - landscape - Black	$449.31	$4,493.13
10	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$1,827.36
12	EVO-IP Transmitter	$491.79	$5,901.53
10	EVO-IP Receiver	$491.79	$4,917.94
	Control System		
1	24-port 10/100/1000BASE-T (RJ45) PoE+ with 300W PoE budget	$1,101.16	$1,101.16
1	EVO-IP Control Box	$384.47	$384.47
1	4K 1×4 HDMI Splitter over Cat6 Cable with HDMI Loop-out	$725.06	$725.06
15	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$488.71
44	3ft (0.9m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$16.28	$716.32
3	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$36.90

3	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$38.37
15	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$288.04
12	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 15ft	$24.44	$293.29
1	Cables Connectors Hardware	$1,746.04	$1,746.04
1	Shipping Charges	$1,386.56	$1,386.56
	Total:		**$30,863.38**

Quote #226308 - Patrol SGTS 115

Qty	Description		Extended Price
	Video System		
1	65In BED Series Commercial TV Crystal UHD Display, 300nit	$651.85	$651.85
1	Micro-Adjust Tilt Wall Mount, Large	$254.78	$254.78
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cables Connectors Hardware	$29.10	$29.10
1	Shipping Charges	$55.72	$55.72
	Total:		**$1,199.28**

Quote #226309 - Patrol LT 117

Qty	Description		Extended Price
	Video System		
1	65In BED Series Commercial TV Crystal UHD Display, 300nit	$651.85	$651.85
1	Micro-Adjust Tilt Wall Mount, Large	$254.78	$254.78
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
2	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$24.60
1	Cables Connectors Hardware	$40.74	$40.74
1	Shipping Charges	$58.92	$58.92
	Total:		**$1,278.20**

Quote #226310 - Hub Zone 123

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
2	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$24.60
1	Cables Connectors Hardware	$40.74	$40.74
1	Shipping Charges	$47.27	$47.27
	Total:		**$1,033.49**

Quote#226313 - Apparatus Bay 200 (OFE PROVIDED AKNOWLEGED)

Qty	Description		Extended Price
	Video System		
	Audio System		
1	Shipping Charges	$0.00	$0.00
	Subtotal:		$0.00
	Total:		**$0.00**

Quote #226316 - Fire Chief 212

Qty	Description		Extended Price
	Video System		
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	Shipping Charges	$3.23	$3.23
	Total:		**$67.80**

Quote #226317 - Fire Marshall 213

Qty	Description		Extended Price
	Video System		

1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	Shipping Charges	$3.23	$3.23
	Total:		**$67.80**

Quote#226318 - Admin 214

Qty	Description		Extended Price
	Video System		
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	Shipping Charges	$3.23	$3.23
	Total:		**$67.80**

Quote # 226319 - Admin Hallway 215 (OFE PROVIDED AKNOWLEGED)

Qty	Description		Extended Price
	Video System		
1	Shipping Charges	$0.00	$0.00
	Total:		$0.00

Quote# 226320 - Conference Room 219

Qty	Description		Extended Price
	Video System		
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Integrator Series? Certified Plenum 18G 4K High Speed Active HDMI 24 AWG with ProGrip? Su	$236.87	$236.87
1	Shipping Charges	$14.11	$14.11
	Total:		**$296.35**

Quote #226322 - Sleep Room 221 (OFE PROVIDED AKNOWLEGED)

Qty	Description		Extended Price

	Video System		
1	Shipping Charges	$0.00	$0.00
	Total:		$0.00

Quote # 226323 - Sleep Room 222 (OFE PROVIDED AKNOWLEGED)

Qty	Description		Extended Price
	Video System		
1	Shipping Charges	$0.00	$0.00
	Total:		$0.00

Quote #226325 - Sleep Room 223 (OFE PROVIDED AKNOWLEGED)

Qty	Description		Extended Price
	Video System		
1	Shipping Charges	$0.00	$0.00
	Total:		$0.00

Quote #226328 - Sleep Room 224 (OFE PROVIDED AKNOWLEGED)

Qty	Description		Extended Price
	Video System		
1	Shipping Charges	$0.00	$0.00
	Total:		$0.00

Quote #226329 - Watch Room 230

Qty	Description		Extended Price
	Video System		
1	Splitter / Distribution Amplifier	$295.43	$295.43
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	HD Pro P/35	$285.18	$285.18
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58

1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	Cables Connectors Hardware	$40.74	$40.74
1	Shipping Charges	$32.90	$32.90
	Total:		**$731.62**

Quote # 226331 - Shift Commander Office 231

Qty	Description		Extended Price
	Video System		
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$19.20
1	Shipping Charges	$3.23	$3.23
	Total:		**$67.80**

Quote # 226334 - Shift Commander Office 232 (OFE PROVIDED ACKNOWLEDGED)

Qty	Description		Extended Price
	Video System		
1	Shipping Charges	$0.00	$0.00
	Total:		$0.00

Quote # 226337 - Kitchen/Day Room 234 (OFE PROVIDED ACKNOWLEDGED)

Qty	Description		Extended Price
	Video System		
1	Shipping Charges	$0.00	$0.00
	Total:		$0.00

Quote # 226338 - Admin LT 248

Qty	Description		Extended Price
	Video System		
1	55In BED Series Commercial TV Crystal UHD Display, 300nit, 16/7	$511.01	$511.01
1	Micro-Adjust Tilt Wall Mount, Medium	$162.56	$162.56

1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	Pro AV/IT Specialist Series High Speed 4K60 HDMI Cable 10ft	$19.20	$38.41
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
1	Cable Connectors and Hardware	$58.21	$58.21
1	Shipping Charges	$48.26	$48.26
	Total:		**$1,071.64**

Quote # 226339 - Conference Rooms 256

Qty	Description		Extended Price
	Video System		
1	65In 65IN BED Series Commercial TV Crystal UHD Display, 300nit	$651.85	$651.85
1	Micro-Adjust Tilt Wall Mount, Large	$254.78	$254.78
1	ClickShare Gen 2 C-10, C-10 Base, 1 Gen4 Button	$1,315.35	$1,315.35
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	HD Pro P/35	$285.18	$285.18
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
1	SNN Straight Security Tether	$10.80	$10.80
1	Cables Connectors Hardware	$58.21	$58.21
1	Shipping Charges	$138.56	$138.56
	Total:		**$2,967.93**

Quote # 226340 - Future Officer 260

Qty	Description		Extended Price
	Video System		
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$32.58
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$12.79
1	HD Pro P/35	$285.18	$285.18
1	Cables Connectors Hardware	$58.21	$58.21
1	Shipping Charges	$16.53	$16.53
	Total:		**$405.29**

Quote # 226342 - Social Worker 264

Qty	Description		Extended Price
	Video System		
1	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$36.66	$36.66
1	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$14.39	$14.39
1	HD Pro P/35	$320.83	$320.83
1	Cables Connectors Hardware	$45.83	$45.83
1	Shipping Charges	$0.00	$0.00
	Total:		**$417.72**

Quote # 226343- Future Officer 266

Qty	Description		Extended Price
	Video System		
2	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$65.16
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	HD Pro P/35	$285.18	$570.37
1	Cables Connectors Hardware	$58.21	$58.21
1	Shipping Charges	$33.06	$33.06
	Total:		**$752.38**

Quote # 226345 - Police Admin 265

Qty	Description		Extended Price
	Video System		
1	Series 75" 4K Class Ultra HD Commercial LED TV	$909.10	$909.10
1	Micro-Adjust Tilt Wall Mount, Large	$254.78	$254.78
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
1	7ft (2.1m) Cat6a Snagless Unshielded (UTP) Ethernet Network Patch Cable - Purple	$13.95	$13.95
1	Cables Connectors Hardware	$40.74	$40.74
1	Shipping Charges	$68.02	$68.02
	Total:		**$1,469.34**

Quote # 226346 - Police Chief 267

Qty	Description		Extended Price
	Video System		

1	65In BED Series Commercial TV Crystal UHD Display, 300nit	$651.85	$651.85
1	Micro-Adjust Tilt Wall Mount, Large	$254.78	$254.78
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
2	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$65.16
2	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$24.60
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	HD Pro P/35	$285.18	$570.37
1	Cables Connectors Hardware	$58.21	$58.21
1	Shipping Charges	$88.75	$88.75
	Total:		**$1,922.04**

Quote #226348 - SRO 271

Qty	Description		Extended Price
	Video System		
2	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$65.16
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	HD Pro P/35	$285.18	$570.37
1	Cables Connectors Hardware	$58.21	$58.21
1	Shipping Charges	$33.06	$33.06
	Total:		**$752.38**

Quote # 226349 - Detective 272

Qty	Description		Extended Price
	Video System		
2	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$65.16
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	HD Pro P/35	$285.18	$570.37
1	Cables Connectors Hardware	$58.21	$58.21
1	Shipping Charges	$33.06	$33.06
	Total:		**$752.38**

Quote # 226351 - Detective 273

Qty	Description		Extended Price
	Video System		

2	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$65.16
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	HD Pro P/35	$285.18	$570.37
1	Cables Connectors Hardware	$58.21	$58.21
1	Shipping Charges	$33.06	$33.06
	Total:		**$752.38**

Quote # 226353 - Detective LT 274

Qty	Description		Extended Price
	Video System		
1	65In BED Series Commercial TV Crystal UHD Display, 300nit	$651.85	$651.85
1	Micro-Adjust Tilt Wall Mount, Large	$254.78	$254.78
1	WattBox IP Power Strip & Surge Protector w/ Wi-Fi | 2 Controlled	$182.74	$182.74
2	HDMI Pass Through Single Gang Wall Plate - Brushed Aluminum	$32.58	$65.16
1	7ft (2.1m) Cat6a Snagless Shielded (STP) Ethernet Network Patch Cable - Purple	$12.30	$12.30
2	Pro AV/IT Specialist Series? High Speed 4K60 HDMI Cable 6ft	$12.79	$25.58
2	HD Pro P/35	$285.18	$570.37
1	Cables Connectors Hardware	$58.21	$58.21
1	Shipping Charges	$88.14	$88.14
	Total:		**$1,909.12**

Quote # 226409 - Paging System

Qty	Description		Extended Price
	Paging System		
8	BOGEN WB1EZ EASY DESIGN WALL BAFFLE SPEAKER, 1W, VOLUME CONTROL TERMINAL STRIP	$64.02	$512.16
1	NYQUIST IP PAGING SYSTEM - ADMIN IP PHONE - COLOR TOUCH DISPLAY	$575.03	$575.03
1	BOGEN NQ-PA120 NYQUIST 4-INPUT, 120W, 1RU, PUBLIC ADDRESS MIXER-AMP	$902.12	$902.12
1	BOGEN MT300M 25V/70V MATCHING TRANSFORMER MODULE, MAX. 250W	$71.01	$71.01
1	BOGEN NQ-RMK04 NETWORK APPLIANCE JOINING BRACKET (MMPA, SYSCTRL, A2XXX OR A4XXX'S)	$58.21	$58.21
1	BOGEN NQ-C4000-B1 C4000 SERIES SYSTEM SOFTWARE LICENSE - BUNDLE 1	$1,821.69	$1,821.69
1	BOGEN NQ-C4000PBXI NYQUIST C4000 SERIES SYSTEM - PBX INTEGRATION	$459.79	$459.79
1	LIBERTY AV 18-2C-PSH-WHT LIBAV P/N 18-2C-PSH-WHT COMMERCIAL 18/2 OASH CMP WHT 1000FT SPOOL	$288.54	$288.54
1	Cables Connectors Hardware	$931.22	$931.22

1	Shipping Charges	$234.43	$234.43
	Total:		**$5,854.18**

Equipment & Material Total		**$118,403.29**
Install Labor		**$46,530.00**
Commissioning, Engineering, Project Management		**$43,637.00**
Grand Total		**$208,570.29**

Add Cost for Payment and Performance Bond		**$1,690.00**

Quote # 226559 - Optional Alternate Request 1

Qty	Description	Unit Price	Extended Price
	Video System		
1	SMP 351	$3,808.75	$3,808.75
	Bluewater Professional Services		
1	Shipping Charges	$0.00	$0.00
	Total:		$3,808.75

Equipment & Material Total		**$3,808.75**
Commissioning, Engineering, Project Management		**$410.00**
Grand Total		**$4,218.75**

Quote #226560 - Optional Alternate Request 2

Qty	Description	Unit Price	Extended Price
	Control System		
2	Velocity System 10" VESA Mount Touch Panel with LED (White) includes Wall Mount Kit	$1,539.30	$3,078.60
1	Hardware Gateway for AV Control and Management plus Room Scheduling	$1,815.87	$1,815.87
	Bluewater Professional Services		
1	Shipping Charges	$2,123.28	$2,123.28
	Total:		$7,017.75

Equipment & Material Total		**$7,017.75**
Commissioning, Engineering, Project Management		**$3,620.00**
Grand Total		**$10,637.75**

White Lake Charter Township

7525 Highland Road

White Lake, MI 48383

Challenger 2.0, LLC, DBA Cable Runners, in partnership with Third Coast Tech, LLC, is interested in providing low voltage cabling and A/V gear as specified.

Challenger 2.0 is a spinoff from Challenger Technologies, where Steve McComb, BICSI RCDD, its CEO, has provided low-voltage cabling services for over 17 years. We are centrally located in southern lower Michigan to provide services from coast to coast (Lake Michigan to Lake Erie).

Third Coast Tech is highly recommended. They have over 40 years of AV experience and are based in Waterford, MI. They are highly local and can provide exceptional service and response times.

Both teams are familiar with new construction projects and are excited to work closely with the project GC, technology design firms, and the Township. Both teams have worked with the Township in the past.

References are available upon request.

Challenger 2.0, LLC dba Cable Runners
119 5th Street, Michigan Center, MI 49254
517.879.0124
challenger2.net

12. The selected Vendor shall be required to indemnify, defend, and hold harmless White Lake Township, its elected and appointed officials, employees, and agents from all claims incurred by or asserted against the Township by any person or entity, which are alleged to have been caused by the acts or omissions of Vendor, Vendor's employees and Vendor's subcontractors. The Township's right to indemnification is in excess and above any insurance required by the Township. The Vendor shall have no right against the Township for indemnification, contribution or subrogation.

13. The selected Vendor shall be required to provide a warranty for their work, which covers defects in materials and workmanship and for a period of one year from the date of occupancy.

14. The selected Vendor shall be required to, at a minimum, meet the insurance requirements as described in **Exhibit E.** The selected Vendor shall provide the Township with the proper certificate of insurance upon award of business and prior to performing any work on site. The selected Vendor shall provide a performance bond and bond in the amount of 100% of the total cost of the project in conformance with the bond documents provided in Exhibit F. The selected Vendor shall indicate the cost of the bonds as a separate line item in its proposal.

15. The Vendor certifies to White Lake Township that neither it nor any of its successors, parent companies, subsidiaries, or companies under common ownership or control of the Vendor, are an "Iran Linked Business" engaged in investment activities of $20,000,000.00 or more with the energy sector of Iran, within the meaning of Michigan Public Act 517 of 2012. It is expressly understood and agreed that the Vendor, if selected shall not become an "Iran linked business" during the term of an agreement with the Township.

NOTE: IF A PERSON OR ENTITY FALSELY CERTIFIES THAT IT IS NOT AN IRAN LINKED BUSINESS AS DEFINED BY PUBLIC ACT 517 OF 2012, IT WILL BE RESPONSIBLE FOR CIVIL PENALTIES OF NOT MORE THAN $250,000.00 OR TWO TIMES THE AMOUNT OF THE CONTRACT FOR WHICH THE FALSE CERTIFICATION WAS MADE, WHICHEVER IS GREATER, PLUS COSTS OF INVESTIGATION AND REASONABLE ATTORNEY FEES INCURRED, AS MORE FULLY SET FORTH IN SECTION 5 OF ACT NO. 517, PUBLIC ACTS OF 2012.

Signature: _____

Print Name: Steven M McComb

Title: CEO Date: 12/5/2024

Company Name: Challenger 2.0, LLC

Address: 119 5th St, Michigan Center, MI 49254

EXPECTATIONS FOR AWARD ACCEPTANCE

1. To have on file proper certificates of insurance and executed bonds prior to performing work on site.
2. To have proper equipment and responsible personnel to complete work as specified.
3. To repair any adjacent materials damaged in the execution of the work specified in this RFP and provide continuous housekeeping and clean-up.
4. Expediting, communication, and follow-up is required.
5. Cooperation with the other contractors on-site as needed to perform work.
6. Ability to begin work in accordance with the timing of the physical buildings as described above under **General Terms** item #1.

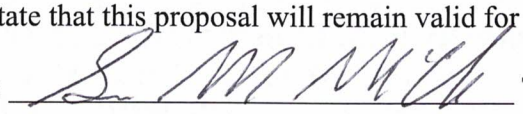
CERTIFICATIONS

The final product and all related materials shall be the sole property of White Lake Charter Township.

I hereby state that I have read, understand, and become thoroughly familiar with and understand the terms and scope of work contained in the RFP.

I hereby state that all the information I have provided is true, accurate and complete. I hereby state that I have the authority to submit this proposal, which will become the basis for a binding contract if accepted by White Lake Township.

I hereby state that this proposal will remain valid for six (6) months from this certification date.

Signature:  Title: CEO

Print Name: Steven M McComb Date: 12/5/2024

Company Name: Challenger 2.0, LLC Address: 119 5th St, Michigan Center, MI 49286

AIA Document 310 - 2010 Bid Bond

CONTRACTOR (Name, legal status and address):

Challenger 2.0, LLC
119 5th Street
Michigan Center, MI 49254

SURETY (Name, legal status and principal place of business):

RLI Insurance Company
9025 N. Lindbergh Dr., Peoria IL, 61615
P.O. Box 3967 Peoria IL, 61612

OWNER (Name, legal status and address):

White Lake Township
7325 Highland Road
White Lake, MI 48383

Bond Amount: Five Percent (5%) Amount Bid

PROJECT : (Name, location or address, and Project number, if any):

White Lake Township - Hall Building
Low Voltage and AV Cabling
2025 Civic Center Drive, White Lake Township, MI 48383

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters in to a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed by the Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 4th day of December, 2024

(Witness) (Seal)

(Witness) (Seal)

Challenger 2.0, LLC
(Principal) (Seal)
CEO
(Title)

(Surety)
Ashley Skelly, Attorney-in-Fact
(Title)

Language conforms to AIA Document A310 Bid Bond
BID70001ZZ0311f

POWER OF ATTORNEY

RLI Insurance Company
Contractors Bonding and Insurance Company

9025 N. Lindbergh Dr. Peoria, IL 61615
Phone: 800-645-2402

Know All Men by These Presents:

That this Power of Attorney is not valid or in effect unless attached to the bond which it authorizes executed, but may be detached by the approving officer if desired.

That **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, each an Illinois corporation, (separately and together, the "Company") do hereby make, constitute and appoint:

Jason McLelland, Heidi Schluessler, Ashley Skelly, jointly or severally

in the City of Adrian, State of Michigan its true and lawful Agent(s) and Attorney(s) in Fact, with full power and authority hereby conferred, to sign, execute, acknowledge and deliver for and on its behalf as Surety, in general, any and all bonds and undertakings in an amount not to exceed **Twenty Five Million** Dollars (**$25,000,000.00**) for any single obligation.

The acknowledgment and execution of such bond by the said Attorney in Fact shall be as binding upon the Company as if such bond had been executed and acknowledged by the regularly elected officers of the Company.

RLI Insurance Company and/or **Contractors Bonding and Insurance Company**, as applicable, have each further certified that the following is a true and exact copy of a Resolution adopted by the Board of Directors of each such corporation, and is now in force, to-wit:

> "All bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or Agents who shall have authority to issue bonds, policies or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile."

IN WITNESS WHEREOF, the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, as applicable, have caused these presents to be executed by its respective Vice President with its corporate seal affixed this 16th day of March, 2023.

CONTRACTORS BONDING AND INSURANCE COMPANY CORPORATE SEAL ILLINOIS

RLI INSURANCE COMPANY CORPORATE SEAL ILLINOIS

RLI Insurance Company
Contractors Bonding and Insurance Company

By: B. H. W. D.
Barton W. Davis — Vice President

State of Illinois }
County of Peoria } SS

On this 16th day of March, 2023, before me, a Notary Public, personally appeared Barton W. Davis, who being by me duly sworn, acknowledged that he signed the above Power of Attorney as the aforesaid officer of the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company** and acknowledged said instrument to be the voluntary act and deed of said corporation.

By: Catherine D. Geiger
Catherine D. Geiger — Notary Public

CATHERINE D. GEIGER
OFFICIAL SEAL
NOTARY PUBLIC STATE OF ILLINOIS
Notary Public - State of Illinois
My Commission Expires
December 05, 2026

CERTIFICATE

I, the undersigned officer of **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, do hereby certify that the attached Power of Attorney is in full force and effect and is irrevocable; and furthermore, that the Resolution of the Company as set forth in the Power of Attorney, is now in force. In testimony whereof, I have hereunto set my hand and the seal of the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company** this 4th day of December, 2024.

RLI Insurance Company
Contractors Bonding and Insurance Company

By: Jeffrey D Fick
Jeffrey D Fick — Corporate Secretary

Township Hall Cost Summary

Low Voltage Cabling

Material - $83,550.00

Labor - $86,750.00

Audio/Video Cabling and Hardware

Material - $159.250.00

Labor - $38,625.00

Low Voltage and A/V Totals

Material - $242,800.00

Labor - $125,375.00

Performance & Payment Bond - $11,045.00

Project Total - $379,220.00

Township Hall

Low Voltage Cabling

MDF - Provide and install a 45u 2-post floor rack and a 42u x 40" server cabinet with automatic fans and a networked PDU.

IDF – Provide and install a 36u wall-mounted cabinet with automatic fan and networked PDU (not called out in specification)

Backbone – Provide and install 6 strand single mode fiber optic cable between MDF and IDF. (not called out in specification)

Pathway – Provide and install pathway to support the cables properly.

Patch Panel – Provide and install Hubbell 24 and 48 port unloaded patch panels as required.

Modular Jacks – Provide and install Hubbell category 6 network data jacks in the corresponding colors as specified.

Wall Plates - Provide and install wall plates to coordinate with electrical wall plates.

Patch Cables – Provide 1' category 6 patch cables in the corresponding colors as specified.

Cable Management – Provide and install horizontal and vertical wire management as required.

Qty 42 – Access control cabling

Qty 43 – Camera cabling

Qty 59 – Single data drop cabling

Qty 73 – Double data drop cabling

Qty 19 – Distress button cabling

Qty 6 – Door contact cabling

Qty 2 – Electric strike cabling

Qty 14 – CATV coax cabling

Qty 15 – Wireless access point cabling

*** device hardware and device installation is not included in this quote.

Proposal

White Lake- Township Hall AV

Challenger 2

119 5th St.
Michigan Center, MI 49254

Modified:	12/3/2024
Revision:	0

Gathering/Meeting Rooms: Boardroom 001/Av Room 002

Built per specifications listed in White lake twp. hall drawings & specifications manual dated 08/23/2024. TCT to pull Low voltage AV cabling, & install specified equipment. TCT will follow scopes of work outlined in Exhibit A- White Lake Low Voltage Design. TCT will verify system functionality upon completion of work performed.

3 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Barco Commercial**

CX-50 Gen 2 ClickShare Conference Set. TAA Compliant - Black

3 **Chief**

X-Large fusion micro-adjustable tilt wall mount

2 **Dell**

Experience four times more detail than Full HD with 3840x2160 Ultra HD 4K resolution.
Your images shine the way they were meant to on the world’s first 31.5” 4K Ultra HD monitor with VESA certified DisplayHDR 400i featuring HDR content playback support.

1 **Furman**

15A STD POWER CONDITIONER W/LIGHTS

1 **intel**

Intel NUC G7, i7 Processor, 16GB RAM, 256SSD, Windows 10 Pro

15 **Jbl Pro**

Compact Full-Range Pendant Speaker - Black

1 **LEA Professional**

Connect Series 702 2 Channel Amplifier, 700 Watts Per Channel

3 **LG Electronics**

86 UR340C Series UHD Commercial TV

1 **Listen Technologies**

Wi-Fi/RF Base System

1 **Netgear**

M4350-24X4V Fully Managed Switch (XSM4328CV), 24x10G/Multi-Gig PoE+ (576W base, up to 720W) and 4xSFP28 25G (NA, UK, EU

1 **NewTek**

Add protection for your equipment and peace of mind with 24/5 access to support with the Protek Prime Coverage Plan from NewTek

3 **NewTek**

the remote-controlled camera that delivers live video anywhere on your network via NDI 5.
Built-in NDI|HX3 allows it to connect over standard computer networks to any of the hundreds of systems, devices, and applications that support NewTek's innovative Network Device Interface (NDI) technolo

2 **NewTek**

Add protection for your equipment and peace of mind with 24/5 access to support with the Protek Prime Coverage Plan from NewTek

8 **NewTek**

IP video converter designed for the NewTek open-source NDI standard. It supports up to UHD 4Kp60 input and output from NDI to HDMI and from HDMI to NDI. It allows you to connect your camera, webcam, or computer to stream live over the internet or other broadcast platforms.

1 **NewTek**

Control Panel is the essential control solution for fast-paced TriCaster TC1 video production. With industry-leading, software-driven live production technology.

1 **NewTek**

his compact, all-in-one eight-input switcher lets you easily switch between four HD/SD-SDI or eight NDI video sources, mix audio, add graphics and titles, and add advanced effects such as virtual sets

12 **Shure**

Mute Button Accessory Adds Local Or Remote Mute Control Via A Programmable Button For Use With The Microflex MX395-LED Low Profile Boundary

12 **Shure**

Gooseneck microphone, surface mount preamplifier, light ring, no cartridge, 15"

2 **Shure**

Dual Wireless Vocal System with SM58

1 **Soundcraft**

24-Channel Digital Mixer

1 **TCT**

System Installation.

1 **TCT**

Allotted for:
* Plenum 18/2
* Plenum cat6 (Shielded where required)
* Audio Cables
* HDMI Cables
* Cat6

1 **TCT**

System Programming

1 **Tripp-Lite**

25U SmartRack Standard-Depth Server Rack Enclosure Cabinet with doors & side panels

Gathering/Meeting Rooms: Activity Space (031,032,033,034,035)

2 **Audix**

Antenna Distribution System - Combines 4 - Two Channel Systems (8 Channels) with One Set of Antennas and One Power Supply.

5 **Audix**

Wireless System Microphone

1 **Crimson AV**

Floor Standing Data Rack Enclosure (19") 18U

1 **DBX**

12 x 6 Digital zone processor

5 **DBX**

Programmable Volume And Mute Control For Driverack 220I, 260 And Zonepro Processor

5 **DBX**

Wall-Mounted Zone Controller

2 **DBX**

Breakout Box For Driverack And Zonepro Processor

1 **Furman**

15A STD POWER CONDITIONER W/LIGHTS

12 **JBL**

6" Ceiling speaker, 150 Watt

1 **LEA Professional**

Connect Series 168 Smart Amplifier, 8 Channel, 160 Watts Per Channel

1 **NewTek**

IP video converter designed for the NewTek open-source NDI standard. It supports up to UHD 4Kp60 input and output from NDI to HDMI and from HDMI to NDI. It allows you to connect your camera, webcam, or computer to stream live over the internet or other broadcast platforms.

5 **Radio Design Labs (RDL)**

Wall-Mounted Bluetooth Audio Format-A Interface

2 **Radio Design Labs (RDL)**

Power Inserter / Signal Breakout

2 **Radio Design Labs (RDL)**

Active Three-Pair Receiver - Twisted Pair Format-A - Balanced line outputs

1 **TCT**

System Installation.

1 **TCT**

Allotted For:
* Plenum 16/2
* Plenum Category 6 Control Wire
* 3U Rack drawer

Small Spaces: Conf. Room 003

1 **Barco Commercial**

CX-20 Wireless Conferencing Media Center - Medium Room

1 **Crestron Electronics**

UC Video Conference Smart Sound Bar & Camera

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Lobby 011

1 **BrightSign**

Standard i/O Player

2 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

2 **JBL**

6" Ceiling speaker, 150 Watt

1 **LG Electronics**

65 UR340C Series UHD Commercial TV

1 **Liberty AV**

AMPLIFIER SCH POWER 60W GLOBAL

1 **NewTek**

IP video converter designed for the NewTek open-source NDI standard. It supports up to UHD 4Kp60 input and output from NDI to HDMI and from HDMI to NDI. It allows you to connect your camera, webcam, or computer to stream live over the internet or other broadcast platforms.

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector

Small Spaces: Loounge/Reception 016

2 **BrightSign**

Standard i/O Player

2 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

2 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & 2 surge protectors

Small Spaces: Deputy supervisor 105

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: supervisor Office 106

1 **Crestron Electronics**

UC Video Conference Smart Sound Bar & Camera

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector

Small Spaces: Conf. Room 108

1 **Barco Commercial**

CX-20 Wireless Conferencing Media Center - Medium Room

1 **Crestron Electronics**

UC Video Conference Smart Sound Bar & Camera

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Lobby 111

2 **BrightSign**

Standard i/O Player

1 **Crimson AV**

Ceiling mount box and universal screen adapter assembly for 37" to 63"+ screen

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

2 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & 2 surge protector

Small Spaces: Conf. Room 116

1 **Barco Commercial**

CX-20 Wireless Conferencing Media Center - Medium Room

1 **Crestron Electronics**

UC Video Conference Smart Sound Bar & Camera

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Clerk Room 132

1 **Barco Commercial**

CX-20 Wireless Conferencing Media Center - Medium Room

1 **Crestron Electronics**

UC Video Conference Smart Sound Bar & Camera

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Deputy Clerk Room 133

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector

Small Spaces: Deputy Treasurer Room 151

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Treasurer Room 152

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Barco Commercial**

CX-20 Wireless Conferencing Media Center - Medium Room

1 **Crestron Electronics**

UC Video Conference Smart Sound Bar & Camera

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Planning Director 163

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & Surge protector.

Small Spaces: DPS Director 173

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Reception 120

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Articulating mount for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Reception 130

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Articulating mount for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Reception 160

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Articulating mount for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Employee Wellness Center 190

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Articulating mount for 32" to 55"+ flat panel screen

1 **LG Electronics**

4K UHD Commercial TV with management software, scheduler and certified Crestron Connected

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Exterior

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

2 **BrightSign**

Standard i/O Player

2 **SunBriteTV**

Signature 2 4K Ultra HDR Partial Sun Outdoor TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, (2) outdoor rated surge protectors, & enclosure cooling fans.

Project Summary

Client:	**Date**
Contractor: Third Coast Tech, LLC.	**Date**

White Lake Charter Township

7525 Highland Road

White Lake, MI 48383

Challenger 2.0, LLC, DBA Cable Runners, in partnership with Third Coast Tech, LLC, is interested in providing low voltage cabling and A/V gear as specified.

Challenger 2.0 is a spinoff from Challenger Technologies, where Steve McComb, BICSI RCDD, its CEO, has provided low-voltage cabling services for over 17 years. We are centrally located in southern lower Michigan to provide services from coast to coast (Lake Michigan to Lake Erie).

Third Coast Tech is highly recommended. They have over 40 years of AV experience and are based in Waterford, MI. They are highly local and can provide exceptional service and response times.

Both teams are familiar with new construction projects and are excited to work closely with the project GC, technology design firms, and the Township. Both teams have worked with the Township in the past.

References are available upon request.

Challenger 2.0, LLC dba Cable Runners
119 5th Street, Michigan Center, MI 49254
517.879.0124
challenger2.net

12. The selected Vendor shall be required to indemnify, defend, and hold harmless White Lake Township, its elected and appointed officials, employees, and agents from all claims incurred by or asserted against the Township by any person or entity, which are alleged to have been caused by the acts or omissions of Vendor, Vendor's employees and Vendor's subcontractors. The Township's right to indemnification is in excess and above any insurance required by the Township. The Vendor shall have no right against the Township for indemnification, contribution or subrogation.

13. The selected Vendor shall be required to provide a warranty for their work, which covers defects in materials and workmanship and for a period of one year from the date of occupancy.

14. The selected Vendor shall be required to, at a minimum, meet the insurance requirements as described in **Exhibit E.** The selected Vendor shall provide the Township with the proper certificate of insurance upon award of business and prior to performing any work on site. The selected Vendor shall provide a performance bond and bond in the amount of 100% of the total cost of the project in conformance with the bond documents provided in Exhibit F. The selected Vendor shall indicate the cost of the bonds as a separate line item in its proposal.

15. The Vendor certifies to White Lake Township that neither it nor any of its successors, parent companies, subsidiaries, or companies under common ownership or control of the Vendor, are an "Iran Linked Business" engaged in investment activities of $20,000,000.00 or more with the energy sector of Iran, within the meaning of Michigan Public Act 517 of 2012. It is expressly understood and agreed that the Vendor, if selected shall not become an "Iran linked business" during the term of an agreement with the Township.

NOTE: IF A PERSON OR ENTITY FALSELY CERTIFIES THAT IT IS NOT AN IRAN LINKED BUSINESS AS DEFINED BY PUBLIC ACT 517 OF 2012, IT WILL BE RESPONSIBLE FOR CIVIL PENALTIES OF NOT MORE THAN $250,000.00 OR TWO TIMES THE AMOUNT OF THE CONTRACT FOR WHICH THE FALSE CERTIFICATION WAS MADE, WHICHEVER IS GREATER, PLUS COSTS OF INVESTIGATION AND REASONABLE ATTORNEY FEES INCURRED, AS MORE FULLY SET FORTH IN SECTION 5 OF ACT NO. 517, PUBLIC ACTS OF 2012.

Signature: _____

Print Name: Steven M McComb

Title: CEO Date: 12/5/2024

Company Name: Challenger 2.0, LLC

Address: 119 5th St, Michigan Center, MI 49254

EXPECTATIONS FOR AWARD ACCEPTANCE

1. To have on file proper certificates of insurance and executed bonds prior to performing work on site.
2. To have proper equipment and responsible personnel to complete work as specified.
3. To repair any adjacent materials damaged in the execution of the work specified in this RFP and provide continuous housekeeping and clean-up.
4. Expediting, communication, and follow-up is required.
5. Cooperation with the other contractors on-site as needed to perform work.
6. Ability to begin work in accordance with the timing of the physical buildings as described above under **General Terms** item #1.

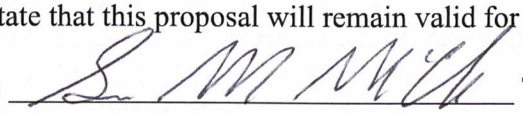
CERTIFICATIONS

The final product and all related materials shall be the sole property of White Lake Charter Township.

I hereby state that I have read, understand, and become thoroughly familiar with and understand the terms and scope of work contained in the RFP.

I hereby state that all the information I have provided is true, accurate and complete. I hereby state that I have the authority to submit this proposal, which will become the basis for a binding contract if accepted by White Lake Township.

I hereby state that this proposal will remain valid for six (6) months from this certification date.

Signature:  Title: CEO

Print Name: Steven M McComb Date: 12/5/2024

Company Name: Challenger 2.0, LLC Address: 119 5th St, Michigan Center, MI 49286

AIA Document 310 - 2010 Bid Bond

CONTRACTOR (Name, legal status and address):

Challenger 2.0, LLC
119 5th Street
Michigan Center, MI 49254

SURETY (Name, legal status and principal place of business):

RLI Insurance Company
9025 N. Lindbergh Dr., Peoria IL, 61615
P.O. Box 3967 Peoria IL, 61612

OWNER (Name, legal status and address):

White Lake Township
7325 Highland Road
White Lake, MI 48383

Bond Amount: Five Percent (5%) Amount Bid

PROJECT : (Name, location or address, and Project number, if any):

White Lake Township - Public Safety Building
Low Voltage and AV Cabling
10785 Elizabeth Lake Road, White Lake Township, MI 48383

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters in to a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed by the Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 4th day of December, 2024

(Witness) (Seal)

(Witness) (Seal)

Challenger 2.0, LLC (Seal)
(Principal)
CEO
(Title)

(Surety)
Ashley Skelly, Attorney-in-Fact
(Title)

Language conforms to AIA Document A310 Bid Bond
BID70001ZZ0311f

POWER OF ATTORNEY

RLI Insurance Company
Contractors Bonding and Insurance Company

9025 N. Lindbergh Dr. Peoria, IL 61615
Phone: 800-645-2402

Know All Men by These Presents:

That this Power of Attorney is not valid or in effect unless attached to the bond which it authorizes executed, but may be detached by the approving officer if desired.

That **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, each an Illinois corporation, (separately and together, the "Company") do hereby make, constitute and appoint:

Jason McLelland, Heidi Schluessler, Ashley Skelly, jointly or severally

in the City of Adrian, State of Michigan its true and lawful Agent(s) and Attorney(s) in Fact, with full power and authority hereby conferred, to sign, execute, acknowledge and deliver for and on its behalf as Surety, in general, any and all bonds and undertakings in an amount not to exceed **Twenty Five Million** Dollars (**$25,000,000.00**) for any single obligation.

The acknowledgment and execution of such bond by the said Attorney in Fact shall be as binding upon the Company as if such bond had been executed and acknowledged by the regularly elected officers of the Company.

RLI Insurance Company and/or **Contractors Bonding and Insurance Company**, as applicable, have each further certified that the following is a true and exact copy of a Resolution adopted by the Board of Directors of each such corporation, and is now in force, to-wit:

"All bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or Agents who shall have authority to issue bonds, policies or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile."

IN WITNESS WHEREOF, the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, as applicable, have caused these presents to be executed by its respective Vice President with its corporate seal affixed this 16th day of March, 2023.

CONTRACTORS BONDING AND INSURANCE COMPANY CORPORATE SEAL ILLINOIS

RLI INSURANCE COMPANY CORPORATE SEAL ILLINOIS

RLI Insurance Company
Contractors Bonding and Insurance Company

By: B. W. D.
Barton W. Davis — Vice President

State of Illinois }
County of Peoria } SS

On this 16th day of March, 2023, before me, a Notary Public, personally appeared Barton W. Davis, who being by me duly sworn, acknowledged that he signed the above Power of Attorney as the aforesaid officer of the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company** and acknowledged said instrument to be the voluntary act and deed of said corporation.

By: Catherine D. Geiger
Catherine D. Geiger — Notary Public

CATHERINE D. GEIGER
OFFICIAL SEAL
NOTARY PUBLIC STATE OF ILLINOIS
Notary Public - State of Illinois
My Commission Expires
December 05, 2026

CERTIFICATE

I, the undersigned officer of **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, do hereby certify that the attached Power of Attorney is in full force and effect and is irrevocable; and furthermore, that the Resolution of the Company as set forth in the Power of Attorney, is now in force. In testimony whereof, I have hereunto set my hand and the seal of the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company** this 4th day of December, 2024.

RLI Insurance Company
Contractors Bonding and Insurance Company

By: Jeffrey D Fick
Jeffrey D. Fick — Corporate Secretary

Public Safety Cost Summary

Low Voltage Cabling

Material - $141,950.00

Labor - $151,675.00

Audio/Video Cabling and Hardware

Material - $128,360.00

Labor - $37,225.00

Low Voltage and A/V Totals

Material - $270,310.00

Labor - $188,900.00

Performance & Payment Bond - $13,776.30

Project Total - $472,986.30

Public Safety

Low Voltage Cabling

MDF - Provide and install a 45u 2-post floor rack and a 42u x 40" server cabinet with automatic fans and a networked PDU.

IDF – Provide and install a 36u wall-mounted cabinet with automatic fan and networked PDU (not called out in specification)

Backbone – Provide and install 6 strand single mode fiber optic cable between MDF and IDF. (not called out in specification)

Pathway – Provide and install pathway to support the cables properly.

Patch Panel – Provide and install Hubbell 24 and 48 port unloaded patch panels as required.

Modular Jacks – Provide and install Hubbell category 6 network data jacks in the corresponding colors as specified.

Wall Plates - Provide and install wall plates to coordinate with electrical wall plates.

Patch Cables – Provide 1' category 6 patch cables in the corresponding colors as specified.

Cable Management – Provide and install horizontal and vertical wire management as required.

Qty 67 – Access control cabling

Qty 5 – Alarm surveillance cabling

Qty 45 – Camera cabling plus 2 gamechanger long distance cabling

Qty 160 – Single data drop cabling

Qty 84 – Double data drop cabling

Qty 4 – Distress button cabling

Qty 17 – Door contact cabling

Qty 2 – Electric strike cabling

Qty 26 – Fire Sensor cabling

Qty 5 – Strobe cabling

Qty 64 – CATV coax cabling

Qty 25 – Wireless access point cabling

*** device hardware and device installation is not included in this quote.

Proposal

White Lake- Public Safety Building

Challenger 2

119 5th St
Michigan Center, MI 49254

Modified:	12/3/2024
Revision:	0

Gathering/Meeting Rooms: Exercise 103

Built per specifications listed in Public safety drawings & specifications manual dated 08/23/2024. TCT to pull Low voltage AV cabling, & install specified equipment. TCT will follow scopes of work outlined in Exhibit C- White Lake Low Voltage Design. TCT will verify system functionality upon completion of work performed.

3 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

3 **LG Electronics**

65 UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & (3) Surge protectors.

Gathering/Meeting Rooms: Briefing 112

1 **Barco Commercial**

CX-20 Wireless Conferencing Media Center - Medium Room

2 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **Furman**

15A STD POWER CONDITIONER W/LIGHTS

2 **JBL**

6" Ceiling speaker, 150 Watt

1 **Jbl Pro**

CSMA series 8 channel 120 Watt powered mixer amplifier

1 **Jbl Pro**

SINGLE GANG WALL PLATE VOLUME CONTROL FOR JBL MIXER AMPLIFIERS

1 **Kramer Electronics**

2 X 1 Automatic 4K HDMI Standby Switcher

2 **LG Electronics**

4K UHD Commercial TV with management software, scheduler and certified Crestron Connected

1 **Middle Atlantic**

MULTI MOUNT RACK 10UX20D

1 **TCT**

HDMI Audio extractor.

1 **TCT**

Hardwired HDMI connection and Hardware

1 **TCT**

System Installation.

1 **TCT**

Allotted for:
* Plenum 16/2
* Plenum category 6
* 2U Rack Drawer
* (2) Surge Protectors

1 **TCT**

System Programming

Gathering/Meeting Rooms: Public Lobby 241

2 **BrightSign**

Standard i/O Player

2 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

2 **LG Electronics**

65 UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protectors.

Gathering/Meeting Rooms: Community Room 242

1 **Atlona**

Omega 6X2 Matrix switcher with 2x HDBaseT inputs, 3x HDMI inputs, 1x USB-C input, 1xHDBaset output, 1x HDMI scaled output, with USB pass through.

1 **Atlona**

Omega 4K/UHD HDMI over HDBaseT Receiver with Control. Audio Output, and PoE (Power Source Equipment).

2 **Atlona**

Omega 4K/UHD HDMI over HDBaseT Transmitter Wall Plate

1 **Atlona**

Atlona Velocity Gateway for 10 Rooms

1 **Atlona**

AV control touch panel with integrated bezel lighting. It features contemporary, refined styling with 1280times;800 native resolution, and a capacitive glass surface that supports multi-touch and gesture interactions. Bright LED lighting on the edge of the bezel is ideal for providing a visual repre

1 **Audix**

Antenna Distribution System - Combines 4 - Two Channel Systems (8 Channels) with One Set of Antennas and One Power Supply.

2 **Audix**

Wireless Microphone System – R42 Two Channel Diversity Receiver with Two H60/OM2 Handheld Transmitters, 554 MHz – 586 MHz

1 **Barco Commercial**

CX-20 Wireless Conferencing Media Center - Medium Room

2 **Chief**

KIT, RPMAU, CMS009012,CMA101

1 **Clear One**

advanced professional audio DSP platform for conferencing and sound reinforcement applications.

2 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

2 **Da-Lite**

Cosmo Tnsd 106D DM Tensioned Cosmopolitan High Definition Tv 16:9 52 X 92 Da-Mat

2 **Epson Professional**

1 **Furman**

15A STD POWER CONDITIONER W/LIGHTS

6 **JBL**

6" Ceiling speaker, 150 Watt

1 **LEA Professional**

Connect Series 164 Smart Amplifier, 4 Channel, 1600 Watts Per Channel

2 **LG Electronics**

65 UR340C Series UHD Commercial TV

1 **Monoprice**

Blackbird 4K 1x2 HDMI Amplifier Splitter

2 **Nec**

1 **Radio Design Labs (RDL)**
Wall-Mounted Bluetooth Audio Format-A Interface

1 **Radio Design Labs (RDL)**
Power Inserter / Signal Breakout

1 **Radio Design Labs (RDL)**
Active Three-Pair Receiver - Twisted Pair Format-A - Balanced line outputs

1 **TCT**
System Installation.

1 **TCT**
Allotted for:
* Plenum 16/2
* Plenum Category 6
* Plenum shielded category 6 wire
* 3U Drawer
* (4) Surge protectors

1 **TCT**
System Programming

1 **Tripp-Lite**
SmartRack 18U UPS-Depth Wall-Mount Rack Enclosure Cabinet, Hinged Back

Gathering/Meeting Rooms: Dispatch 250

1 **Evolution**
4K 14 HDMI Splitter over Cat6 Cable with HDMI Loop-out

1 **Evolution**
HDMI over IP Control Box

12 **Evolution**
HDMI over IP Transmitter

10 **LG Electronics**
65 UR340C Series UHD Commercial TV

10 **Peerless-AV**
Smart full-service video wall mount with quick release - landscape for 46" to 65" display TV

1 **TCT**
System Installation.

1 **TCT**
Alloted for:
* Plenum category 6
* (6) Surge protectors

1 **TCT**
System Programming

10 **Vanco**

Supports 4K@60Hz, 4:4:4 chroma
System can support over 1000 transmitters and receivers
HDR10 and Dolby Vision compatible
Dolby/DTS/PCM audio formats supported
HDCP 2.2/1.4
POE or can be powered using provided power supply

Small Spaces: Patrol SGTS 115

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

65 UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Patrol Lt 117

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

65 UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Hub Zone 123

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Fire Chief 212

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Fire Marshall 213

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Admin 214

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Conf Room. 219

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Watch Room 230

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Monoprice**

Blackbird 4K 1x2 HDMI Amplifier Splitter

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Shift Commander Office 231

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Admin Lt 248

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

55UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector

Small Spaces: Conf. Room 256

1 **Barco Commercial**

CX-20 Wireless Conferencing Media Center - Medium Room

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

65 UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, Surge protector, HDMI Floor box.

Small Spaces: Future Officer 260

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Social Worker 264

1 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Future Officer 266

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Police Admin 265

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

4K UHD Commercial TV with management software, scheduler and certified Crestron Connected

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: Police Chief 267

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

65 UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Small Spaces: SRO 271

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Detective 272

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Detective 273

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **TCT**

System Installation.

1 **TCT**

Hardware

Small Spaces: Detective Lt 274

2 **AV Access**

KIT TX-RX
AV Access HDMI Extender(HDBaseT),Uncompressed 4K 60Hz Over Single Cat5e/6a, 70m(230ft) 1080P,40m(130ft) 4K,PoE+IR+RS232+HDCP2.2,HDR & Dobly Vision,Dolby Atmos & DTS:X

1 **Crimson AV**

Universal tilting wall mount with post installation leveling for 32" to 55"+ flat panel screen

1 **LG Electronics**

65 UR340C Series UHD Commercial TV

1 **TCT**

System Installation.

1 **TCT**

Hardware, & surge protector.

Police Department Paging System

2 **Bogen Communications**

large 7” color touch screen that makes navigating Nyquist C4000 & E7000 System features and menus swift, easy and convenient.

4 **Bogen Communications**

Matching Transformer Module 250 Watts

1 **Bogen Communications**

C4000 series system software license - bundle 1 (3 zones/1 CCL pk/3yr s/w updates)

1 **Bogen Communications**

C4000 series system - PBX integration services (tech support assist with SIP,FXO,FXS integrations)

3 **Bogen Communications**

1-Channel Public Address Mixer/Amplifier 120W @ 70V/8 ohms

5 **Bogen Communications**

Nyquist appliance joining bracket

8 **Bogen Communications**

Wall Baffel, 1w, Easy Design

1 **TCT**

System Installation.

1 **TCT**

Alloted for:
* Miscellaneous hardware
* 18G AWG Two conductor plenum cable

Project Summary

Client:	**Date**
Contractor: Third Coast Tech, LLC.	**Date**