

# TOWN OF JEROME, ARIZONA

POST OFFICE BOX 335, JEROME, ARIZONA, 86331 (928) 634-7943

# REQUEST FOR PROPOSAL FOR ADVANCED METERING INFRASTRUCTURE SYSTEM

### PROJECT NO.

Submission Deadline: WEDNESDAY, NOVEMBER 5, 2025 No later than 12:00 PM – Arizona Time

> Town of Jerome Attn: Town Clerk PO Box 335 600 Clark St. Jerome, AZ 86331

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# NOTICE TO RESPONDENTS

# REQUIRED PROPOSAL PACKAGE FORMS

THE FOLLOWING ITEMS MUST BE COMPLETED AND SUBMITTED WITH THIS COMPLETE AND INTACT PROPOSAL PACKAGE FOR A PROPOSAL TO BE CONSIDERED RESPONSIVE. ANY AND ALL DEFICIENCIES OF ITEMS LISTED BELOW WILL BE CONSIDERED AN ADEQUATE REASON TO REJECT THE PROPOSAL IN ITS ENTIRETY.

- Complete Proposal Package
- Acknowledgement of Addenda
- Executed Proposal Documents
  - o Proposal
  - o Fee Proposal
  - o Non-Collusion Certificate
  - o Certificate of Ownership
  - o Respondent Qualifications, Representations, and Warranties
- Signatures, Seals, & Notaries (wherever necessary)

This information is provided for your use in preparing all documents as required for a complete proposal. Please double-check all requirements. If you have any questions regarding what is required with a submittal, please call and ask.

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# REQUEST FOR PROPOSAL

### Town of Jerome Advanced Metering Infrastructure System

**Notice is hereby given** that the Town of Jerome, Arizona, is requesting proposals from qualified person(s) or vendors (collectively, "respondents") to replace the Town's outdated water meters with an advanced metering infrastructure (AMI) system.

The Town of Jerome intends to implement a water meter replacement program and system-wide conversion of the Town's current water meters to an AMI. Existing meters will be replaced with equivalent-sized AMI meters that can capture and transmit water meter data to centralized software to streamline operations, improve subsequent billing processes, and enhance customer satisfaction.

The scope of work for this project includes, but is not limited to, providing the following:

- Water meters.
- RF-enabled (radio frequency) endpoints.
- Network software and infrastructure, including base stations and repeaters, where necessary and applicable.
- Software and equipment training.

The procurement time to complete the project is 180 calendar days from the date of the Notice to Proceed.

The Town of Jerome will receive and accept proposals until 12:00 p.m. On November 5, 2025, at Jerome Town Hall, 600 Clark St, Jerome, Arizona 86331. Proposals received after that time will not be accepted. The Town of Jerome reserves the right to reject any or all proposals and to award all or part of the proposal. Nevertheless, except when rejections of proposals are required by law, the Town reserves the right to waive any informality of the proposal. The Town intends to award the contract contemplated in this RFP to the responsible and responsive respondent whose proposal is determined, in writing, to be the most advantageous to the Town and best meets the overall needs of the Town, taking into consideration the evaluation criteria set forth in this RFP.

	Brett Klein Town Manager/Town Clerk
Posting Date:	
Publishing Dates:	

# GENERAL PROJECT INFORMATION

The Town of Jerome is located on the side of Cleopatra Hill in the Black Hills of Arizona. The Town is the sole provider of metered water services within Town limits, as well as specific locations outside of Town limits. The Town, which has stretches of exposed water utility lines, experiences "four seasons," with some nights reaching freezing or below-freezing temperatures, typically from December to March.

The Town's existing water meter system comprises a variety of meter sizes (5/8" to 4"), some of which are more than 20 years old, to serve the community's roughly 450 residents and many tourists. Current metering practices include public works employees manually reading all meters, then supplying the reads to the finance department, which uploads and checks all information before running monthly statements.

**Project Description** 

The Town of Jerome hereby requests proposals from experienced individuals or companies capable of implementing a system-wide conversion to an advanced metering infrastructure (AMI) system, comprising 332 new equivalent-sized AMI meters. The project will involve replacing all existing meters; however, it's anticipated that the Town Council may allow users to opt out at their request. Therefore, it is preferable for proposed AMI systems to be compatible with the Town's current Sensus meters. Installation guidelines will be provided by the awarded supplier to the installation company. The Town anticipates that this project will move forward as quickly as possible, with all meters to be installed within six months. Each respondent is requested to provide as much relevant information as possible within the scope of this RFP, including but not limited to the respondent's capabilities with respect to project management, the products and components proposed, service, maintenance, warranties, and post-installation support and service.

The purpose of this RFP is to invite cost proposals for services related to implementing a fixed-base AMI system and its management and maintenance as described in this RFP.

The Town of Jerome wishes to procure an AMI system that:

1. Provides integrated time interval data daily.

- 2. Replaces existing water meters (a majority are in utility easements or Town rights-ofway) and increases the accuracy of the reads associated with the system through the use of modern technology-based products.
- 3. Increases the efficiency of the water system, lowers operating costs, and enhances customer service.

4. Provides water meter reading redundancy.

- 5. Provides an option that enables the meters to be read using a drive-by method, utilizing a mobile reading device capable of reading the same transmitter as the fixed base transmitter, or some other method that equals or exceeds those described.
- 6. Provides that while in fixed base mode, the system has two-way communication capability, which allows the system to poll the transmitter at each meter location for a current read, and which also allows for upgrades of the fixed base transmitter firmware to incorporate technological advances and/or as deemed useful and necessary by the Town of Jerome.

- 7. Provides real-time meter leak detection on the distribution and customer sides of the meter.
- 8. Provides component pricing and after-sales service costs following project completion. Includes warranty information and system specifications.
- 9. Provides a system backhaul that interfaces with radio or cellular components, as fiber is not available.
- 10. Interfaces with the Town's billing software, Caselle.

Include any specifications and pricing pertaining to any additional costs, regardless of payment cycle, monthly, quarterly, annually, or otherwise, over and above the costs of installation.

### **Proposal Guidelines:**

As part of this RFP, each respondent shall submit pricing for the water meters, necessary components for operation, software and hardware, battery life and replacement specifications, if boosters/repeaters would be needed, a minimum and maximum price for every meter type listed, the maximum escalation for the percentage of increase after the first five years, and training. Thereafter, if the Town of Jerome determines to proceed with selecting a respondent, the Town and the selected respondent shall enter into negotiations for a final contract; the terms of which shall be generally consistent with this RFP. In conjunction with any contract which may be awarded in this process, the Town of Jerome will reach an agreement on provisions for securing the metering system.

The Town of Jerome is looking for longevity from this project. It is expected that the new system will have a 20-year lifespan, with warranties to ensure product life begins at the time of installation of the unit. Battery life, as well as instructions for replacing batteries in the system, must be specified in the proposal, along with the associated price. All meter sizes must be compatible with our current system, which will be provided. The system must also allow for the future development and growth of the Town. Any upgrades/changes to the system and/or meters must be agreed to in writing by the Town Manager before proceeding.

### Smart Utility Network Respondent References

Respondents must provide three references for utility systems with sizes (or larger), customer counts, and service areas (i.e., weather/location) similar to those of Jerome that are successfully using the proposed system version. Respondent must demonstrate a minimum of five years of experience in the field.

### Project Objectives - Short Term

The Town of Jerome wishes to acquire and implement an AMI system to satisfy the needs of the community. The following are short-term goals for Jerome:

- Reduce water loss.
- Improve water conservation/water accountability.
- Replace all meters in the system with an AMI system.
- Reduce the current labor required by the Public Works and Utility departments in completing monthly billing.
- Improve customer service.
- Install all system components within six months.
- A system that supports direct communication to meters in the field.

### Project Objectives - Long Term

Future objectives are as follows:

- Reduction in time spent reading meters to allow more time for infrastructure projects.
- Improve response times to potential problems.
- Asset management.
- Availability of information for emergency preparedness.
- Real-time leak detection.

### **Proprietary Information**

All materials submitted in response to this solicitation, including samples, shall become the property of the Town and are therefore subject to public release, upon request. Respondents shall clearly mark any proprietary information contained in their submittal with the words "Proprietary Information." Respondents shall not mark any Solicitation Form as proprietary. Marking all or nearly all of a submittal as proprietary may result in rejection of the submittal.

Respondents should be aware that the Town is required by law to make its records available for public inspection. All respondents, by submission of material marked proprietary, acknowledge and agree that the Town will have no obligation to advocate for nondisclosure in any form, nor will the Town assume any liability to the respondents in the event that the Town must legally disclose these materials.

### **Minimum Qualifications**

Respondents shall possess the qualifications and Arizona licenses as required by law, in addition to having extensive knowledge, expertise, and experience for the products they are recommending. Selected respondents will be required to supply, execute, and meet the terms of a standard General Services Contract, including insurance requirements, in a form acceptable to the Town Attorney. Approval of the Town Council will be required for the award of a contract. A sample agreement has not been provided with this request; however, respondents are encouraged to include a sample agreement with their proposal package, if available.

### **Proposal Submittal Delivery**

Submit proposals to: Town of Jerome

Attn: Brett Klein, Town Clerk

PO Box 335 Jerome, AZ 86331 928-634-7943

Proposals may also be sent to the following email: <u>b.klein@jerome.az.gov</u>

Proposals may be hand-delivered, but must be received by 12:00 p.m. on November 5, 2025, at 600 Clark St., Jerome, AZ 86331, and **must** specify attention to Brett Klein, Town Clerk.

## **EVALUATION CRITERIA**

The Town reserves the right to and will likely reject any proposals that do NOT meet the minimum criteria described in this RFP. For proposals meeting or exceeding the minimum criteria, the Town will review each proposal based on the criteria shown below. The Town intends to select the most highly qualified respondent based on demonstrated competence and qualifications to negotiate a contract.

#### A. General Information

- a. Brief overview of the respondent and legal organization of the company. Aquaflow Solutions Inc. is a Glendale-based wholesale waterworks distributor supplying Arizona municipalities with reliable products and technology. We provide RG3/Tesla Duo water meters, AMI/AMR meterreading systems, Cambridge Brass fittings, and Dresser/JCM repair clamps. Aquaflow is a fully incorporated Arizona company with an established team structure, local support, and a proven reputation for dependable service and waterworks solutions.
- b. Submission requirements met. Yes
- c. SAM.gov Unique Entity ID number (UEI) as required by grant funding. CYLSGQJVL457
- d. Description of at least three but no more than five similar projects in which the respondent participated for each applied service category. Describe the respondent's role in the project and the scope of work that demonstrates the respondent's expertise. Provide the name and contact information for each project. It is preferred that similar projects have been conducted in a similar topography to the Town of Jerome. Aquaflow Solutions served as the lead distributor and technical support partner responsible for supplying properly sized water meters for full system upgrades. Our role included managing procurement, overseeing orders, coordinating installation schedules, and ensuring that each meter was deployed accurately and according to system requirements. We supported the utility through complete AMI/AMR integration by assisting with billing-system configuration, cloud-based data setup, and validation of all meter data flowing into the billing platform. Aquaflow worked directly with both the manufacturer and the utility's billing staff to configure, test, and verify end-to-end system functionality. Field training, installation oversight, and system testing were conducted on-site to ensure that all meters were activated and fully operational prior to going live.

After installation, Aquaflow continued working with billing personnel throughout the first year to ensure smooth operation, proper workflow adoption, and full staff training. Our support included post-installation monitoring, routine maintenance of the meter/billing system, and ongoing verification of data accuracy to ensure long-term system reliability.

### **Project References** — Similar Terrain & System Environments

### 1. Big River Development District

Contact: Curtiss Martin - C: 928-276-1104

Service Count: ~1,300 services System: Mobile drive-by AMR

Relevance: Mountainous/uneven terrain similar to the Town of Jerome

### 2. Alpine Water Systems

Contact: Shawna Metzger - C: 928-339-4631

Service Count: ~600 services System: Mobile drive-by AMR

Relevance: Mountain regions comparable to Jerome

## TOWN OF JEROME, ARIZONA | Advanced Metering Infrastructure System

3. Pine-Strawberry DWID

Contact: Kyle Wortman - C: 928-517-1218

Service Count: ~3,600 services

System: Mobile drive-by AMR; preconfigured for fixed-base conversion Relevance: Forested and mountainous elevations similar to Jerome

4. Rim Trail Water Company

Contact: Harry Jones - C: 928-595-1111

Service Count: ~125 services System: Mobile drive-by AMR

Relevance: High-elevation rural terrain

5. ICR Water Users Association

Contact: Derek Scott - C: 928-925-1294

Service Count: ~1,800 services System: Mobile drive-by AMR

Relevance: Mountainous terrain and dispersed service locations

### B. AMI Information Requirements

a. Communication Propagation Study with a "Fixed Base" Communication system for the AMI system. Propagation study was done prior to bidding project for these estimated quantities.

b. Explain if the AMI system will include any cellular network. Yes. The AMI system includes full cellular capability through our LPN fixed-base architecture. The system allows the utility to operate in fixed-base mode, cellular mode, or a hybrid combination of both within the same platform. This provides maximum flexibility, coverage, and redundancy, enabling the Town to utilize fixed-base communication where optimal and cellular service in areas where terrain or site conditions require additional reach.

c. Explain if the AMI includes a free or paid customer engagement web portal. No, this would be a separate purchase for the town.

d. Explain if the AMI provides top-of-the-hour time-synchronized readings across the entire system with at least an update every hour. Endpoint synchronization is under 1 minute. Transmission resolution and intervals are hourly with 15 minute intervals.

e. Explain if the meters, endpoints, and AMI infrastructure are manufactured by the same company. Yes; all three are manufactured by RG3 Meter Company.

- f. Explain if the current meters and endpoints will be able to integrate with the AMI system. The existing meters will only integrate if the Town cuts the existing touch-read wire and manually connects it to our Solo endpoint. While this method is technically possible, we **do not recommend** exposing or using bare wires due to reliability, environmental concerns, and long-term maintenance issues. For this reason, we have quoted a complete replacement of the meter reading system to ensure accuracy, durability, and full AMI performance. For customers who choose not to participate in the AMI program, we recommend leaving their existing meters in place as they are. These accounts can remain on touch-read or be manually read and entered into the billing system as required.
- g. Describe if the system can identify unauthorized usage on marketed accounts. No, it cannot detect unauthorized usage.
- h. Describe if the system can configure high or low usage parameters and identify accounts in violation. High and low consumption parameters are of the billing system and identified within Caselle Billing, however, we have immediate leak alarm systems integrated into the endpoint.
- i. Explain how many users the system can support at one time. No limit.
- j. Explain if the software enhancements, upgrades, updates, and patches are included in the pricing structure or if it will be an annual cost for these items. Yes, there are annual

TOWN OF JEROME, ARIZONA | Advanced Metering Infrastructure System system support costs and they are included in the pricing structure. These will be billed annually form the manufacturer.

### C. Endpoint Information and Requirements.

- a. Describe the endpoint collection process and if it collects at the top of the hour and is synchronized with 15-minute reads from the water meter. Yes, transmission resolution and intervals are hourly with 15 minute intervals.
- b. Describe if the endpoint has two-way communication. Yes, it has two way communication.
- c. Describe the temperatures the endpoint can withstand during storage and operations. Our published warranty operating temperature for our end point is -40 degrees to 185 degrees fahrenheit.
- d. Describe if the endpoint can be installed via pit or remote. We can install pit or remote. Interior or exterior wall mount, pit/vault/through the lid.
- e. Describe the network firmware updates.
  - (i) Describe whether they can be done remotely, with infrared, or local updates. They can be done over the air (OTA) and be preformed remotely via LPN or on-site through Tesla Drive Software.
- f. Explain the environmental conditions the endpoints can withstand, including flooding or submerged pit application. Operating humidity 0-100% non condensing. IP68 for meter pit environment. Fully potted, perfectly tuned, high surface area PCB antenna. Mount and lid for increased range and network stability. Operating temp -40 degrees to 185 degrees fahrenheit.
- g. Describe the warranty for the endpoints and whether it is included. 20 year warranty (10 year full/ 10 year prorated).

# D. Customer Portal Information and Requirements

- a. Explain if the customer portal is owned and developed by the AMI manufacturer. We do not have a customer portal; we have integration for API third party.
- b. Explain if the web portal will be accessible through a standard internet browser. N/A
- c. Explain if the customer portal will allow the customer to set up a leak notification through the portal and let the customer be notified via email. N/A
- d. Explain if the utility customer service representative will be able to see the same view as the customer or if the web portal will be different for the customer and the utility staff.

  N/A
- e. Explain if the customer will be able to export consumption data in Comma Separated Value (CSV) format. N/A

### E. Training Information and Requirements

- a. Describe who will be providing the training (e.g., Manufacturer Certified Trainers). RG3 will be providing training with certified trainers on-site and remote.
- b. Describe if there will be web-based training for future head-end system updates and upgrades, and if there will be any cost that may be associated with the training. We can do web based training for future updates and upgrades. The associated cost will be included in the annual system support.
- c. Describe if training materials for end users will be available online or in electronic form. Either.

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### F. Other

a. Describe if you can replace a current meter in need of replacement with a non-AMI meter for an opt-out member and invoice separately from the project. Yes, we can do a straight read, touch read or AMR.

# **INSTRUCTIONS TO RESPONDENTS**

#### General

No clarification as to the meaning of the plans, specifications, or other pre-bid documents will be made to any respondent orally. Should conflicts occur between drawings and/or specifications, the respondent shall be deemed to have estimated the most expensive interpretation of the conflict, unless the respondent asks for written clarification before submission of the proposal. All requests for such clarification shall be in writing to:

Questions:

Brett Klein Town of Jerome PO Box 335 Jerome, AZ 86331 b.klein@jerome.az.gov

To be given consideration, a request for written clarification must be received at least four (4) days prior to the proposal opening. All such clarifications and any supplemental instructions will be in the form of a written addendum to the specifications. All such addenda will be transmitted to all respondents two days prior to the proposal opening. All addenda so issued shall become part of the Contract Documents.

Attention is called to the sheets in this RFP that include the words "REQUIRED FOR SUBMITTAL" at the bottom of the page. These sheets should be used and submitted with the proposal that is sent to the Town of Jerome, or pages with similar formatting containing all the same information should be included with the proposal.

Proposals shall be made upon the Proposal Documents contained in and submitted with this RFP. All papers bound with or attached to the proposal are necessary parts and must not be detached.

Each Proposal must be submitted in an envelope, addressed to Brett Klein, Town Manager, at Town of Jerome, 600 Clark St., PO Box 335, Jerome, Arizona 86331. Proposals will be returned unopened if not properly sealed when submitted.

Each envelope containing a proposal must be plainly marked on the outside as "TOWN OF JEROME ADVANCED METERING INFRASTRUCTURE SYSTEM." The envelope should bear on the outside the name of the respondent and their address. If forwarded by mail, the envelope containing the proposal must be enclosed in another envelope addressed to Brett Klein, Town Manager, at Town of Jerome, 600 Clark St., PO Box 335, Jerome, Arizona 86331.

Acknowledgement of Addenda

If any addenda are published prior to the proposal due date, the acknowledgement page must be signed by the contractor and returned with the proposal documents. If they are not included, the proposal will be disqualified. Addenda Acknowledged-Attached Copy

### PROPOSAL TIMELINE

### TOWN OF JEROME - ADVANCED METERING INFRASTRUCTURE SYSTEM

PROPOSAL PACKAGE AVAILABLE

October 6, 2025

Electronically from Brett Klein, at:

b.klein@jerome.az.gov

Or on the Town website, at:

www.jerome.az.gov

Town of Jerome

Phone: (928) 634-7943

PROPOSALS DUE

November 5, 2025, 4:00 PM

Office of the Town Clerk

Town of Jerome 600 Clark St. PO Box 335

Jerome, AZ 86331

ANTICIPATED CONTRACT AWARD

December 9, 2025

ANTICIPATED NOTICE TO PROCEED

To be agreed upon

(No later than December 31, 2025)

Questions regarding the project specifications should be directed in writing to Brett Klein at the Town of Jerome (email: <u>b.klein@jerome.az.gov</u>).

# PROPOSAL DOCUMENTS

The following documents and information requested thereon are required to be submitted with your proposal.

## Town of Jerome

# Proposal Document A - Proposal

To: Honorable Mayor & Council 600 Clark St. Jerome, AZ 86331

In compliance with the Town of Jerome's Request for Proposals for an Advanced Metering Infrastructure System and the Notice to Respondents by the Town Manager, the undersigned respondent:

Having carefully examined the proposal documents and being familiar with the conditions to be met, hereby submits the following proposal for furnishing the material, equipment, labor and everything necessary for the completion of the work listed and agrees to execute contract documents and furnish the required Bonds and Certificates of Insurance for the completion of said work, at the locations and for the prices set forth on the Fee Proposal.

Understands that procurement of this project shall be in accordance with all applicable Standard Specifications and as otherwise required by the General Provisions and Special Provisions.

Understands that this proposal shall be submitted with a proposal guarantee of cash, certified check, cashier's check, or surety bond (in accordance with Title 34, A.R.S.) for an amount not less than ten percent of the total amount proposal.

Agrees that upon receipt of Notice of Award from the Town of Jerome, they will enter into contract negotiations and execute the contract documents.

Work shall commence no later than 30 days, after the Notice to Proceed and shall be completed within 180 calendar days, beginning with the day following the starting date specified in the Notice to Proceed. The time allowed for completing the work includes lead time for obtaining the necessary materials and/or equipment. Respondent agrees to pay, as liquidated damages, two times the sum as stated in the latest revision of the MAG Specifications. Liquidated Damages shall be based upon the final contract amount.

The respondent hereby acknowledges receipt of and agrees that this proposal is based on the following Addenda (if there are no addenda, write NONE below).

Acknowledged 12-01-2025 -Addenda Attached.
A total o week a service of the serv

The Town of Jerome retains the right to reject any or all proposals and to waive minor defects and technicalities or withhold the award, as may be deemed best for the interest of the Town.

This proposal shall be valid for a pe	eriod of 30 days after the proposal deadline.	
THIS PROPOSAL is submitted by	Aquaflow Solutions Inc	
a corporation organized under the laws of t	the State of Arizona, a partnership consisting o	f
, or an individual tra	ading as	of the
	, and holder of Arizona State Contractor's Lic	
Classification(s) N/A		_
No.(s) <u>N/A</u>		
Respectfully Submitted,		
Aquaflow Solutions Inc Respondent		
11009 N. 51st Drive Glendale, AZ 85304		
Address		
Mike Ellis – Municipal Sales Representative		
By (Officer & Title)		
12-01-2025		
Date		
ATTEST:		
Mike Ellis		
(Officer and Title)		
Witness (if respondent is an individual)		

# Town of Jerome

# Proposal Document B - Fee Proposal

Respondent Aquaflow Solutions Inc			_
Mailing Address 11009 N. 51st Drive		City Glendale	
State AZ	Zip <u>85304</u>	Telephone <u>602-733-7777</u>	
PURSUANT to, and in compliance with Advanced Metering Infrastructure Sys Respondents, and the Proposal Documents	stem, the Notice	rome's Request for Proposals for e to Respondents, Instructions	an to

### TOWN OF JEROME ADVANCED METERING INFRASTRUCTURE SYSTEM

This is to certify that the above documents, as well as the site upon which work is to be performed and any and all conditions affecting the work, have been carefully examined, that the amount and nature of work to be accomplished is thoroughly understood and that at no time will misunderstanding of the drawings, specifications or conditions to be overcome be alleged or pled as a basis for change orders, damages or non-performances.

I (We) acknowledge that the following Fee Proposal and table are for the convenience of the Town of Jerome to analyze the individual components of the proposal and to provide a means for partial payments during the project. The sum of the extended unit prices shall be the final price for the product procurement in accordance with the technical specifications. The total price listed on the Fee Proposal shall be the same as listed on the proposal to the Town of Jerome.

### FEE PROPOSAL INSTRUCTIONS:

- 1. All items will be paid for as lump sums. The Fee Proposal's estimated quantity and unit price will be used as a means of computing progress payments and as a basis for any Change Orders incurred.
- 2. The owner reserves the right to recalculate the following Fee Proposal if they appear malapportioned.
- 3. The lump sum amounts indicated below are to include the respondent's cost of administration, mobilization, bonds, insurance, and any other miscellaneous items required for the project.

	FEE PROPOSAL  Town of Jerome  Advanced Metering Infrastructure System						
Fi	xed Based Proposal Quote #11015	Units	Unit Price	Total Price			
	CIVIL BASE PROPOSAL						
1	<sup>3</sup> / <sub>4</sub> x 5/8" AMI Meter	299	299	\$373.30	\$111,617.15		
2	1" threaded AMI Meter	17	17	\$587.70	\$9,990.88		
3	1 ½" flanged AMI Meter	13	13	\$1,264.77	\$16,442.01		
4	2" AMI Meter	2	2	\$1,628.70	\$3,257.39		
5	4" AMI Meter	1	1	\$5,506.17	\$5,506.17		
6	AMI System Software	1	1	\$26,658.43	\$26,658.43		
7	AMI System Training	1	1	Included in Software	Included in Software		
8	AMI Data Collection Hardware/Software	1	1	\$ 28,333.45	\$ 28,333.45		
9	FCC Registration/ Subscription Fee Per Mtr	1	322	\$6.52	\$2,164.91		
SU	BTOTAL COSTS – BASE PROPOSAL	\$64,359.04	\$203,970.39				
GI	RAND TOTAL, BASE PROPOSAL	\$216,820.52					

**GRAND TOTAL – BASE PROPOSAL** (in words): two hundred sixteen thousand eight hundred twenty dollars and fifty two cents.

NOTE: All Quantities Shown are approximate and are furnished solely for the contractor's convenience. The quantities provided will be the lump sum that payment will be made on. The individual items are for use by the Town to analyze proposals, use as a basis for any supplemental agreements, and for partial progress payments.

# **Aquaflow Solutions Inc**



11009 N.51st Drive Glendale AZ 85304 **602-733-777** 

# QUOTE

DATE	QUOTE#
12/1/2025	11015

### TOWN OF JEROME ATTN: TOWN CLERK PO BOX 335 600 CLARK ST. JEROME, AZ 86331

SHIP TO	
TOWN OF JEROME	
ATTN: TOWN CLERK	
PO BOX 335	
600 CLARK ST.	
JEROME, AZ 86331	

	CUST	P.O. #	PROJECT DESCRIPTION	REQUESTED BY	QUOTE EXPIRI	ES TERMS	REP
			SOLO FIXED		12/1/2025		LP
QTY	U/M	U/M DESCRIPTION				UNIT PRICE	TOTAL
1	ea	WITH TESL MDM SOFT (TRANS450)	GE (450PKG) - LAPTOP (1 DAY ON E DRIVE ROUTE SOFTWARE LOA WARE APPLICATION (MDM), 450 ), 450 TRUCK MOUNT ANTENNA ( DRIVER (TPBIT), FCC LICENSING ( LEMOTE TRAINING. SOFTWARE L	DED (COMTLAPTOP + TI TRX MOBILE DATA COL TRKANT450), TAMPER M 450FCC), RG3 BILLING IN	DRIVE), TESLA LECTOR IINI RATCHET ITEGRATION	17,392.03	17,392.03T
1	ea	FNC 450 BU INSTALLAT COAX, 24' E MDM SETU UTILITY OF	ION.  JULDING (60' LMR 600). FIXED NETTION (OFFICE, SHOP, FIRE DEPT., BASE POLE, OMNI ANTENNA, INS P AND TRAINING. TESLA DRIVE FFICE COMPUTER. 110V AC POWIOES NOT INVCLUDE MOBILIZAT	ETC.) INCLUDES A 450 T TALLATION TESLA DRIV RUNS IN THE BACKGROV ER AND INTERNET PROV	RANSCEIVER, E, AND TESLA JND ON	14,244.44	14,244.44T
332	ea	AMI ANNII	AL SUBSCRIPTION FEE PER METI	ER (AMIT2) 251-1000	AND RESIDENCE OF THE PROPERTY	6.52081	2,164.91T
5	ea	AREAS OF ON HEIGHT BUILDINGS OF BASE ST. (#RELOAD)	ECTOR (450 FNC) (SOLAR PACKA UP TO 1,000 METER. COVERAGE I, TOPOGRAPHY AND GROUND C S, TANKS, OR PHONE TYPE TOWE FATION CREATES BACKHAUL RE REQUIRED. *INSTALLATION AN *REQUIRES AT LEAST ONE PAIR	AREA IS ROUGHLY 1 MIL OVER. TYPICALLY MOU IRS. INSTALLING WITHIN DUNDANCY. CELLULAR D MOBILIZATION SEPAR OF FCC LICENSED FREQI	E DEPENDING NTS ON POLES, I LINE OF SITE DATA RELOAD ATE IF JENCIES.	1,717.802	8,589.01T
36	ea	MOBILIZAT	TION HOURLY RATE. TRAVEL TI ATION BY HOUR. TRAVEL IS CAI E SUCH AS GOOGLE MAPS, APPLI BE CHARGED FOR ALL INFRASTR	ME FROM LONG VIEW, T LCULATED BY WELL-KN E OR OTHER. ONLY ONE	X TO AND OWN MOBILIZATION	257.40	9,266.40T
16	ea	HOURLY R	ATE TO INSTALL METERS, REGIS EQUIPMENT ON TOWERS, POLES WORK SUBCONTRACTED TO MI	TERS, POLES, TOWERS ( S, BUILDINGS, ETC. ALL )	OR FIXED NSTALLATION	343.75	5,500.00T
299	ea	INTEGRAT	ED (BRASS BOTTOM, NO CHECK) #PD07RGBOSRG3	VALVE, OPTICAL, GALLO	ONS, SOLO 1	373.30151	111,617.15T
17	ea	1" PD METI	ER - RADIO NOT INTEGRATED (N M WIRE) #PD10RGBOSRG3			587.69882	9,990.88T
13	ea	1.5" PD ME #PD15RGB	TER - RADIO NOT INTEGRATED (	GALLONS, SOLO 1 COM	WIRE)	1,264.77	16,442.01T
	1				SUBTOTAL		
			E-mail	Web Site	SALES TAX (6.	3%)	

# S O L D Z S

# **Aquaflow Solutions Inc**

11009 N.51st Drive Glendale AZ 85304 **602-733-777** 

# QUOTE

DATE	QUOTE#
12/1/2025	11015

### COMPANY

TOWN OF JEROME ATTN: TOWN CLERK PO BOX 335 600 CLARK ST. JEROME, AZ 86331

### SHIP TO

TOWN OF JEROME ATTN: TOWN CLERK PO BOX 335 600 CLARK ST. JEROME, AZ 86331

	CUST	P.O. #	PROJECT DESCRIPTION	REQUESTED BY	QUOTE EXPIR	ES TERMS	REP
			SOLO FIXED		12/1/2025		LP
QTY	U/M		DESCRIF	PTION		UNIT PRICE	TOTAL
1	ea	#PD20RGBHS 4" SPIRELY U	R - RADIO NOT INTEGRATED (G. SRG3 JLTRASONIC WATER METER, 3 ODULE. 14" LL #US040RGDRG31	16 STAINLESS STEEL BO		1,628.695 5,506.17	3,257.397 5,506.177
					SUBTOTAL		\$203,970.39
		E	-mail	Web Site	SUBTOTAL SALES TAX (6.		<b>\$203,970.39</b> \$12,850.13

# $\label{lem:convergence} Proposal\ Document\ C-Non-Collusion\ Certificate$



# ADVANCED METERING INFRASTRUCTURE SYSTEM

sociation, partnership, or corporation any agreement, participated in any competitive pricing in the preparation or consideration in the award of thi
602-733-7777
Phone Number
info@aquaflowaz.com Email Address

# Proposal Document D – Certificate of Ownership



### ADVANCED METERING INFRASTRUCTURE SYSTEM

Respondent: Aquaflow Solutions Inc	
The undersigned respondent hereby certifies as follows:	
To the best of his/her knowledge, the person, vendor, as herein, are the only person, vendors, corporations, partners direct or indirect financial interest in the respondent's busine (except current bills for operating expenses), or holder of indebtedness.	hips, or other associations having any ess as legal or equitable owner, creditor
Dated this <u>01</u> day of <u>December</u> 2025.	
Wike Clis Signature	602-733-7777 Phone Number
Mike Ellis Written Name	info@aquaflowaz.com Email Address

# Proposal Document E – Respondent Qualifications, Representations, and Warranties



# ADVANCED METERING INFRASTRUCTURE SYSTEM

Respo	ondent: Aquaflow Solutions Inc	
The u	undersigned respondent hereby certifies as follows	:
X1	Taxes and Leins – Respondent has no unsatisfie	d tax or judgment lien on record.
X2	Respondent's Examination – Respondent has mare research regarding the requirements of the solicit to be done, services to be performed, any conditype and quantity of labor, equipment, and facility understands the character of the work and service made, and the terms and conditions of the solicitat that it has satisfied itself by its own examination will make no claim against the Town because interpretations made by the Town. Respondent equipment, and facilities and to perform all laboration within the time required and upon the terms and at the prices as proposed.	itions affecting the work and services, the sies necessary to perform. Respondent fully ces, the manner in which payment is to be ation. Respondent acknowledges and agrees on, investigation, and research, and that it see of erroneous estimates, statements, or thereby proposes to furnish all materials, for which may be required to do the work
Date	d this <u>01</u> day of <u>December</u> 20	025.
Signa	tike Elis	602-733-7777 Phone Number
Mike	Filis	info@aquaflowaz.com
	ten Name	Email Address
	1. Descriptions Descriptions Descriptions	enresentations and Warranties 19   Page

Alternate Bids for Your Consideration

### TOWN OF JEROME, ARIZONA | Advanced Metering Infrastructure System

	Tow	PROPOSA n of Jerom	ie		
Alt	Advanced Meter ernate #1 Duo Cellular End Point Quote	Est. Qty.	ructure Sy Units	Unit Price	Total Price
#11	014 CIVIL BA	ASE PROI			
1	<sup>3</sup> / <sub>4</sub> x 5/8" AMI Meter	299	\$448.57	\$134,122.30	
2	1" threaded AMI Meter	17	17	\$669.80	\$11,386.63
3	1 ½" flanged AMI Meter	13	13	\$1,346.05	\$17,498.60
4	2" AMI Meter	2	2	\$1,716.26	\$3,432.51
5	4" AMI Meter	1	1	\$5,506.17	\$5,506.17
6	AMI System Software	1	1	\$7,018.30	\$7,018.30
7	AMI System Training	1	1	Included in Software	Included in Software
8	AMI Data Collection Hardware/Software	0	0	\$0.00	\$0.00
9	FCC Registration/ Subscription Fee Per Mtr	1	322	\$6.52	\$2,164.91
SU	JBTOTAL COSTS – BASE PROPOSAL			\$ 16,711.67	\$181,129.42
GI	GRAND TOTAL, BASE PROPOSAL			\$192,540.57	

**GRAND TOTAL – BASE PROPOSAL** (in words): one hundred ninety two thousand five hundred forty and fifty seven cents.

NOTE: All Quantities Shown are approximate and are furnished solely for the contractor's convenience. The quantities provided will be the lump sum that payment will be made on. The individual items are for use by the Town to analyze proposals, use as a basis for any supplemental agreements, and for partial progress payments.

# S O L U T O X S

# **Aquaflow Solutions Inc**

11009 N.51st Drive Glendale AZ 85304 **602-733-777** 

# QUOTE

DATE	QUOTE#
12/1/2025	11014

### COMPANY

TOWN OF JEROME ATTN: TOWN CLERK PO BOX 335 600 CLARK ST. JEROME, AZ 86331

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		1000	20.00	v

TOWN OF JEROME ATTN: TOWN CLERK PO BOX 335 600 CLARK ST. JEROME, AZ 86331

	CUST	P.O. #	PROJECT DESCRIPTION	REQUESTED BY	QUOTE EXPIRI	ES TERMS	REP		
			DUO CELLULAR ENDPOINT	12/1/2025		ENDPOINT		LP	
QTY	U/M		DESCRIF	PTION		UNIT PRICE	E TOTAL		
1 332 299	ea ea ea	ON SITE TR TESLA MDI (MDMBI), A ANNUAL SI AMI ANNU 5/8" X 3/4" I	E & BILLING INTEGRATION PACK RAINING.TESLA DRIVE ROUTE SO M SOFTWARE APPLICATION (MD AND REMOTE TRAINING. SOFTWA UBSCRIPTION FEE AL SUBSCRIPTION FEE PER METI PD METER - RADIO NOT INTEGRA DUO 1 COM WIRE) #PD07RGBOD	OFTWARE (LAPTOP NOT I M), RG3 SIDE BILLING IN ARE LICENSE PAID WITH ER (AMIT2) 251-1000 ATED (NO CHECK VALVE RG3	PROVIDED), ITEGRATION REQUIRED	7,018.30 6.52081 448.56957	7,018.30T 2,164.91T 134,122.30T		
17	ea	1" PD METE	ER - RADIO NOT INTEGRATED (N	O CHECK VALVE, OPTICA	AL, GALLONS,	669.80176	11,386.637		
13	ea	1.5" PD ME	M WIRE) #PD10RGBODRG3 TER - RADIO NOT INTEGRATED (	GALLONS, DUO 1 COM W	/IRE)	1,346.04615	17,498.607		
2	ea	#PD15RGBI 2" PD METI	HDRG3 ER - RADIO NOT INTEGRATED (G.	ALLONS, DUO 1 COM WI	RE)	1,716.255	3,432.517		
1	ea	4" SPIRELY ENCODER	ULTRASONIC WATER METER, 3 MODULE. 14" LL #US040RGDRG31	L		5,506.17			
					SUBTOTAL		\$181,129.42		
			E-mail	Web Site	SALES TAX (6.	3%)	\$11,411.15		

### TOWN OF JEROME, ARIZONA | Advanced Metering Infrastructure System

		PROPOSA vn of Jerom	ie	vstem	
Al	ternate #2 Tesla 4 MDB Quote #11013	Est. Qty.	Units	Unit Price	Total Price
	CIVIL BA	ASE PROI	POSAL		
1	<sup>3</sup> / <sub>4</sub> x 5/8" AMI Meter	299	299	\$302.56	\$90,465.26
2	1" threaded AMI Meter	17	17	\$509.12	\$8,655.07
3	1 ½" flanged AMI Meter	13	13	\$983.39	\$12,784.11
4	2" AMI Meter	2	2	\$1,325.64	\$2,651.28
5	4" AMI Meter	1	1	\$5,506.17	\$5,506.17
6	AMI System Software	1	1	\$16,338.35	\$16,338.35
7	AMI System Training	1	1	Included in Software	Included in Software
8	AMI Data Collection Hardware/Software	0	0	\$0.00	\$0.00
9	FCC Registration/ Subscription Fee Per Mtr	1	1	\$1,000.00	\$1,000.00
sı	JBTOTAL COSTS – BASE PROPOSAL			\$ 25,965.23	\$137,400.24
Gl	RAND TOTAL, BASE PROPOSAL		\$146,056.46	•	

GRAND TOTAL - BASE PROPO	<b>DSAL</b> (in words): <u>one</u>	hundred forty	six thousand fift	y six and forty	SIX
cents.					

NOTE: All Quantities Shown are approximate and are furnished solely for the contractor's convenience. The quantities provided will be the lump sum that payment will be made on. The individual items are for use by the Town to analyze proposals, use as a basis for any supplemental agreements, and for partial progress payments.

# 

# **Aquaflow Solutions Inc**

11009 N.51st Drive Glendale AZ 85304 **602-733-777** 

# QUOTE

DATE	QUOTE#
12/1/2025	11013

### COMPANY

TOWN OF JEROME ATTN: TOWN CLERK PO BOX 335 600 CLARK ST. JEROME, AZ 86331

S	H	IP	T	0
. •	-	1000		

TOWN OF JEROME ATTN: TOWN CLERK PO BOX 335 600 CLARK ST. JEROME, AZ 86331

	CUST	P.O. #	PROJECT DESCRIPTION	REQUESTED BY	QUOTE EXPIR	ES TERMS	REP
			TESLA 4 MDB	ESLA 4 MDB			LP
QTY	U/M		DESCRI	PTION		UNIT PRICE	TOTAL
1 299 17 13 2 1	ea ea ea ea ea	TESLA MOM MOUNT AN (TPBIT), RG LICENSE PA AMR ANNU SOFTWARE TECHNICAL CHARGED I 5/8" X 3/4" P REGISTER # 1" PD METE #PD10TGBT 1.5" PD METE #PD15TGBT 2" PD METE 4" SPIRELY	ER - GALLONS - NO CHECK VALV FER - GALLONS - NO CHECK VAL	TRANSCEIVER (TRANS9 MINI RATCHET WITH BIT BI), REMOTE TRAINING. UBSCRIPTION FEE FER (AMRT1MINIMUM; 1 S, DATA STORAGE, AND TO LESS THAN 555 METE ED PRICE.  CK VALVE - TESLA 4 INTEGRATE  LVE - TESLA 4 INTEGRATE  ATED REGISTER #PD20T 16 STAINLESS STEEL BO	2000), 900 TRUCK T DRIVER SOFTWARE  -555) INCLUDES OUNLIMITED ERS (AMRT1). TEGRATED ED REGISTER TED REGISTER	1,000.00 302.5594 509.12176 983.39308 1,325.64 5,506.17	1,000.007 1,000.007 90,465.267 8,655.077 12,784.117 2,651.287 5,506.177
					SUBTOTAL		\$137,400.24
			E-mail	Web Site	SALES TAX (6.	3%)	\$8,656.22





Spire Metering offers the latest in Commercial/Industrial ultrasonic metering technology for reliable flow measurement. The rugged SpiRely water meter will provide sustained flow accuracy for the life of the meter while providing connectivity to smart AMR/AMI solutions.

### **Applications**

- Any Application that requires high accuracy across all flow rates for revenue billing
- · Municipal water and water distribution network
- Waste water, irrigation water, reclaim water and storm water
- Commercial buildings:
   Malls, campus, hospitals, industrial parks, airports, facilities
- Industrial water:
   Steel, heavy manufacturing plants, power plants, food & beverage



- Leak and tamper detection, DMA (District Metered Area) leakage detection system
- AMR/AMI projects which require flow accuracy with low life cycle costs

### Features & Benefits

- No moving parts; dependable ultrasonic performance without maintenance; lifetime accuracy without degrading
- Fully encapsulated in a heavy-duty enclosure with IP68
   / NEMA 6P submerssible rating
- Straight through flow cell design without diameter reduction, neither strainer. Ignorable pressure loss, saves significant pumping cost
- NSF61-G proved. Meets or exceeds AWWA C715
- Detect active leak, backflow, tampering, flow rate, and pipe burst

- 10 years battery lifetime with battery life indication.
- Does not measure entrained air in pipe and is unaffected by magnetic interference
- · AMR / AMI ready
- Pulse, Sensus UI 1203, Modbus and 4-20mA
- Data Logger with 700 daily totals and 24 monthly totals







# SpiRely™ Series AWWA ULTRASONIC WATER METER



SpiRely™ series Ultrasonic Water Meter is specially designed for municipal, commercial and industrial water metering applications where the demand is challenging and traditional mechanical water meters fail.

The SpiRely™ series is carefully engineered to offer robust performance in harsh environments. The flow sensor utilizes a crystal to generate an ultrasonic signal. There are no moving parts to wear out over time, as in traditional mechanical meters. The electronics, transducers and cables are all encapsulated in a heavy-duty metal enclosure which is NEMA 6P/IP68 submerssible rated. It is suitable for both outdoor and indoor applications and anywhere the meter may be submersible.

The SpiRely™ series offers the most advanced water flow measurement by



using state-of-the-art multi-path ultrasonic technology. It employs 4 pairs of ultrasonic transducers to interrogate the flow from different positions, so that flow profile distortion has minimal impact on the measurement results. This is a significant improvement compared to single-path ultrasonic flow meters, because it is very common in real applications that there is not enough straight-pipe run after an elbow, a valve or a pump, or the sensor installation is not perfectly aligned with existing pipe line. In those scenarios, turbulence (swirl) or other type of secondary flow could cause errors with single-path flow meters.

The technical specification of the SpiRely™ series water meter meets the ISO 4064 (or OIML R49) water meter standards for Class D accuracy, and exceeds the AWWA C715 water meter standard. The operational temperature ranges from 32.2°F to 140°F continuous duty. The large display can be set to display the flow total, flow rate, working time, leakage alarm, reverse flow, and more. The meter also has an output interface which can be configured as Sensus UII 203, RS485/Modbus, or pulse.

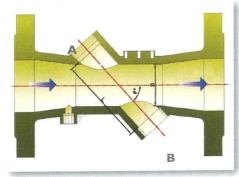
Spire Metering's SpiRely™ series
Ultrasonic Water Meter stands out
among the competition due to itsrugged
design, multi-path technology,wide
dynamic range, and long lasting battery.
The SpiRely™series is even able to
perform reliably when the water has
high particulate or the environment is
harsh. Both commercial and industrial
installations can profit from the
advantages of precision, wear-free
water flow measurement, operational
security and long service life.





### **Operating Principle**

The SpiRely<sup>TM</sup> series ultrasonic water meter consists of a flow-cell, a pair of ultrasonic flow transducers and an integrator. The transducers are firmly mounted on the flow-cell at the optimal position. As illustrated, the transducers face each other with one on the upstream, and the other on the downstream.



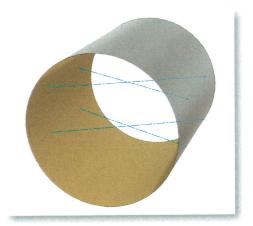
The integrator (or calculator) controls the two ultrasonic transducers to transmit and receive ultrasounds to conduct precise flow measurement. Specifically, it operates the two transducers which transmit a pulse of ultrasonic energy into the water flow toward the opposite transducer. The integrator detects the pulse signal which has traveled within the flow tube, and then is received by the opposite transducer. With advanced digital signal processing technology, the integrator precisely measures the arrival (or transit) time of each pulse signal.

Since the transit-time difference between the two pulses is directly proportional to flow velocity, it can calculate the flow velocity and flow rate. This is accomplished by combining it with the geometry of the flow-cell and fluid dynamics theory.

Only ultrasonic pulses are used to interrogate the flow which enables the meter to have no moving parts. Since the principle is based on the transit-time difference instead of transit-time, all the interfering factors, such as temperature, pressure, solids concentration and water quality, are cancelled out. The end result is an ultrasonic metering system which is inherently robust!

### Unique Multi-path Technology

In real application, it is not easy to install the flow sensor perfectly in line with the pipe line. A slight misalignment could cause flow profile distortion inside the flow sensor, and thus cause significant measurement errors. Spire Metering developed a unique multi-path technology to solve this problem. Four pairs of ultrasonic transducers are mounted on the flow sensor body to interrogate the flow from four different paths. A flow calculation algorithm based on fluid dynamics theory is then used to derive an average flow reading with improved accuracy.

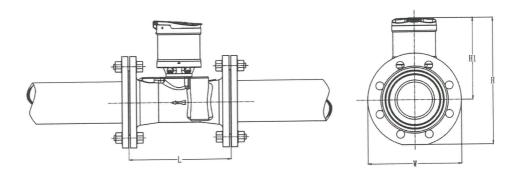






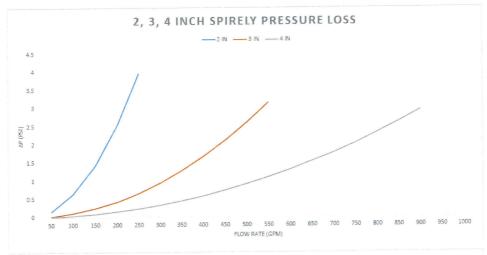
# **Technical Specifications**

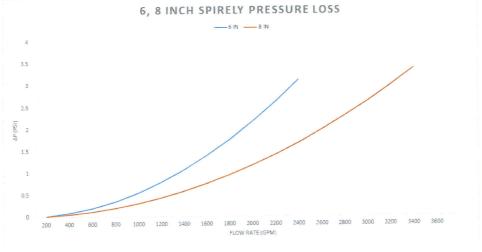
			N	ominal Siz	ze			
	Unit	DN50	DN80	DN100	DN150	DN200	DN250	DN300
		2"	3"	4"	6"	8"	10"	12"
Start Flow		0.1	0.15	0.18	0.3	0.5	0.5	1
Minimum Flow Rate (100%+/-5%)		0.56	1.4	2.24	5.59	8.8	10	14
ormal Flow Range Lower Limit (100%+/-1.5%)	GPM	1	2.5	3.5	9	18	28	40
ormal Flow Range Upper Limit (100%+/-1.5%)		270	640	1100	2300	4000	6200	9600
Safe Max Operating Capacity		270	640	1100	2300	4000	6200	9600
Pressure Loss at SMOC	psi	3.08	3.14	2.99	2.84	3.37	3.07	2.87
Dimensions and V	Veight							
	mm	432	305	356	457	508	451	502
L	inch	17"	12"	14"	18"	20"	17.75"	19.75
	mm	150	190	229	279	343	406	502
W	inch	5.91	7.48	9.01	10.98	13.5	15.98	19.75
	mm	220	240	250	280	300	325	340
H1	inch	8.8	9.45	9.84	11.02	11.81	12.8	13.38
	mm	300	335	365	420	472	528	590
Н	inch	11.81	13.18	14.37	16.8	18.58	20.78	23.22
	kg	11	16	20	33	48	60	86
Weight	lbs	24.2	35.2	44	72.6	105.6	132	189.2

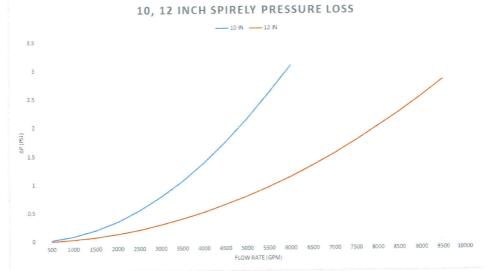


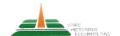












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Power Supply:	Battery, 3.6V, Lithium
Replacement Interval:	10 years
Backup Power Supply:	Internal SuperCap
Communication Interface:	Pulse, RS485 / MODBUS, Sensus UI 1203, 4-20mA

CE approval: EN61326-1:2006

Metrology Data	Meets AWWA C715 standard as well as ISO4064 / OIML R49 standard
Accuracy Class:	2 (according to ISO4064 / OIML R49)
Metrological Class:	D (according to ISO4064 / OIML R49)

Temperature Rating: T30

Meets ANSI / AWWA Standards: C715-18 Type II, C750-19

#### **Mechanical Data**

1 1 th dillion 11 mont we do not				
Environmental Class:	B. Optional A			
Electromagnetic Class:	E1			
Environmental Temp:	32~131°F			
Permission Flow Condition:	Full pipe, water with suspended solids less than 5%. Solid size less than 1/16". Non viscous fluids.			
	32.2~140°F for permanent installation and up to 185°F for short term (<24hours). Higher temperature rating available upon request.			

However, factory calibration is done at room temperature only.

Enclosure Protection: NEMA 6P / IP68 Integrator Detachable: No Lid Cover Protection: Yes Working Pressure: 232 psi Body Material: 316 stainless

### **Pressure Loss**

The pressure loss of a flow sensor is proportional to the square on the flow :  $\Delta p = k \times Q^2$ Here  $\Delta p$  is pressure loss, Q is volume flow rate and k is the coefficient. All meters have  $\Delta p$  less than 0.63bar at Q3, meet ISO4064 / OIML R49 standard and AWWA standard.

# **About Spire Metering Technology**

Spire Metering is a global leader in flow and energy management solutions. Through continuous innovation, we transform complex ultrasonic technology into affordable, reliable solutions for accurate flow and energy measurement.



# **Optical Encoder**



### Description

The Optical Encoder provides a high resolution encoded output using an industry standard ASCII communication protocol. The direct read mechanical odometer is permanently sealed and magnetically driven. With no battery and frictionless LED optical technology, the Optical Encoder provides a long and accurate service life for all AMR and AMI applications.

**Application:** 

The Optical Encoder is designed for use with RG3 Positive Displacement water meters. The Optical Encoder provides connectivity with RG3 Tesla endpoints, RG3 approved touch modules, and other RG3 approved AMR and AMI technology solutions.

**Mounting:** 

The Optical Encoder in its shroud assembly uses a bayonet mount compatible with RG3 5/8" and 1"Positive Displacement water meters. The bayonet mount allows positioning of the register in any of four orientations for direct reading convenience. The Optical Encoder can be removed from the meter without disrupting water service.

**Operation:** 

The Optical Encoder uses LED light paths to determine the exact position of each number wheel. Readings obtained by an AMR or AMI device are retrieved directly from the position of the encoder's odometer.

**Magnetic Drive Communication:** 

Reliable and dependable register coupling is provided through a direct-drive, high-strength magnetic field, through the meter body to the wetted magnet.

**Connections:** 

The Optical Encoder provides 3 wire communication to AMR and AMI devices. In-line RG3 or Nicor connectors are available for easy connection and installation. Optionally, the encoder can be purchased with flying lead bare wire for field splice connection or fully pre-wired and potted to an AMR or AMI device.

**Tamper Resistant Features:** 

The Optical Encoder is secured to the meter with a tamper resistant Torx screw. It can be installed at the factory or in the field.

**Construction:** 

The hermetically sealed, IP68 rated Optical Encoder assembly is constructed of a strengthened glass lens top and a corrosion-resistant metal bottom. The encoder gearing is self-lubricating thermoplastic to minimize friction and provide long, reliable life. The shroud assembly is constructed of nylon plastic for UV resistance and strength.

**Temperature:** 

The operating range of the Optical Encoder is 14° to 158° F.

Standards

The Optical Encoder exceeds all applicable requirements of AWWA Standard C707.



2912 South Access Rd. Longview, TX 75602 PH: 903-753-3456 Fax: 903-753-5678 RG3METER.COM



# Optical Encoder

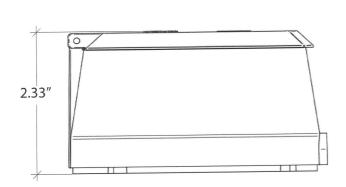


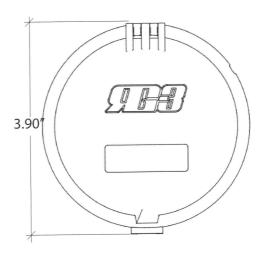
### **SPECIFICATIONS:**

FEIT ICATIONS.				
Encoder Type	Direct read, permanently sealed, magnetic drive, absolute encoder			
Unit of Measure	U.S. Gallons or Cubic Feet			
Test Circle	360° circle with ten divisions			
Number Wheels	8 digits			
Weight	10 ounces			
Humidity	0 to 100% condensing			
Temperature	14° to 158° F			
Signal Output	Industry standard ASCII Format			
Electronic Resolution	8-dial resolution for AMR and AMI			
Signal Type	3-wire for AMR and AMI (red=power, black=ground, green=data)			
Power Source	External – No internal battery			



### **DIMENSIONS:**







# Positive Displacement Large Cold Water Meters

1 1/2" (DN 40 mm) - 2" (DN 50 mm)



### **Data Sheet**

**Applications -** For use in measurement of potable cold water in residential, commercial and industrial services where flow is in one direction only.

**General -** All Positive Displacement cold water meters (1 1/2" - 2") conform to American Water Works Association (AWWA) C700 Standard Specifications latest revision.

**Measuring Chambers -** Measuring chambers are made of suitable engineering plastics to meet AWWA C700 standards. The piston has approximately the same specific gravity as water. All of the spindles are stainless steel.

**Lead Free Main Case -** The main cases are made of Bismuth BiAlloy CDA89836 or EnviroBrass™ II C89520 and are in compliance with NSF / ANSI 61 standards and the Safe Drinking Water Act (NSF 372). The serial number is permanently marked on the body, along with the size, direction of flow and manufacturer (RG3). The bolts are made of stainless steel to prevent corrosion.

Main Case	Lead Free Bronze
Main Case	Ecda Free Bronze
Measuring Unit	Thermoplastic
O-Ring	Nitrile Rubber
Magnet	Ceramic Ferrite
Strainer	Thermoplastic
Register Lens	Tempered Glass
Register Housing & Lid	Bronze or Polymer
Gearing Wheels	Thermoplastic

**Installation -** The meter must be installed in a clean pipeline, free from any foreign materials. The meter should be installed with the direction of flow as indicated by the arrow cast in the meter case. The meter may be installed in horizontal or inclined lines.

**Strainers -** All meters have a strainer installed in the meter and are made of a polypropylene plastic. The strainers are located near the inlet port in the main case just before the measuring chamber. The strainer screens are rigid, snug fitting and have an effective straining area of at least double that of the main case inlet. All strainers are easily removable and replaceable.



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**Direct Read Sealed Registers** - Registers are the straight read, magnetic drive, odometer type with a sweep hand and leak detector. Registers are hermetically sealed to prevent fogging. Registers are roll sealed and dry with a 360° test view. All direct reading register cups are made of copper to prevent corrosion and covered with a high-strength, impact-resistant glass lens to prevent breakage. The register housings and lids are made of high strength polymer or copper alloy. All registers are secured to the main case by means of a tamper-proof Torx screw to allow for in-line service replacement.

Registers include:

Company name
Month and year of manufacture
Center sweep hand
Large, easy to read numbers
Size of meter
Unit of measure
(Example U.S. Gallons, Cubic Feet, or m3)
Low flow / leak indicator





Registers include an odometer, which will give the total amount of water flow. One sweep of the hand will be equal to:

1-1/2 & 2" meters 100 gallons/10 cu ft

### **Register Options**

Direct Read Bronze or Plastic

AMR Tesla 4 TR Integrated Transceiver Register
AMI or AMR Tomahawk Encoder with Tesla Solo or Duo

**Magnetic Drive -** Meters use high strength magnets to provide positive, reliable and dependable register coupling.

**Characteristics-** Meets or exceeds latest revision of AWWA C700 Dimensional Standards. Operational Temperature range 33°F.-80°F.

All Bronze Construction	Direct Read & AMR/AMI Register Options	American Made	Excellent Start Up & Low Flow Rate	Built-in Strainer
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**Tamper-proof Features -** Registers contain a locking device to prevent theft of water usage. Removing the register requires a special tool.

**Maintenance -** The measuring chamber assembly can be removed in order to be repaired or replaced.

**Warranty -** Standard 5 year new meter accuracy warranty and a 25 year main case warranty. \* Refer to full warranty for detailed warranty guidelines and standards.



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# Positive Displacement Large Cold Water Meters

1-1/2" (DN 40 mm) - 2" (DN 50 mm)







### **Specifications**

Model		PD 15	PD 20
Size		1-1/2"	2"
Low Flow	USGPM	1 -1/2	2
Normal Flow	USGPM	5-100	8-160
High Flow	USGPM	100	160
Continuous	USGPM	50	80
Max Pressure	PSI	150	150
Extreme High Flow (Intermittent)	USGPM	120	170
Operating Tempature	Deg. F	33°-80°	33°-80°
Length	Inches	13"	17"
Height	Inches	7 - 15/16"	8 - 1/2"
Weight	Pounds	25lb	34.6lb
Ends		Flanged	Flanged

<sup>\*</sup> Due to continuous research and product enhancement, RG3 Meter Company reserves the right the change product or system specifications without notice, except to the extent an outstanding contractual obligation exists.







# LPN 450 TRX

# We've got you covered.

RG3 Licensed Private Network (LPN) data collectors offer a strategic two-way communication option for smart water and smart gas deployments. The LPN 450 TRX mobile data collector operates in the 450-470 MHz frequency band spectrum creating a highly reliable private network with far-reaching range.

The two-way system incorporates rich security features and is end-to-end upgradable remotely with over-the-air updates. The proprietary LPN RF protocol provides time-synced operations to alleviate network RF collision. Data is time-stamped and mapped to show how it travelled through the network.

### **LPN 450 TRX**

**LPN 450 TRX** The 450 TRX mobile data collector is a solid-state industrial piece of hardware that connects to a computer or tablet with a Windows operating system via USB-C or Bluetooth. It is compact and easily transferred from one place to another. It operates in the 450-470 MHz licensed frequency band and is used for collecting meter data, programing, troubleshooting, and other two-way functions in a Licensed Private Network (LPN).

**AMI Hybrid Capabilities** The 450 TRX can be used to collect hourly data from your meter system, even if your primary read strategy is drive-by AMR. When not in field use, the 450 TRX can be used as a stand alone AMI base station to stream meter data to Tesla Net MDM. Your utility can use the standard drive-by AMR antenna or erect a separate AMI antenna installed at a greater height for increased reach and coverage.

**Extensive Range** With the standard AMR drive-by antenna, the 450 TRX can easily read meters a mile away when not blocked by a major obstruction. That kind of reading range lowers cost and time to read meters in a drive-by AMR application. It can also provide a large area of coverage around your office when not being used in the field.

# **Features and Benefits**

### Solid state durability

- Light weight and easily portable
- Plug-and-play operation
- Licensed Private Network with low RF interference
- Two-way communications
- Time-Stamped readings and alarms
- End-to-End security
- · Live stream meter readings and alarms

# **Specifications**

Dimensions	6.5" x 3.2" x 3.1"
Weight	1 lbs
Operating Temperature	-4°F to +140°F (-20°C to +60°C)
Storage Temperature	-40°F to +185°F (-40°C to +85°C)
Humidity	0% to 95% non-condensing
Operating Power	12VDC
Data Connection	USB-C or Bluetooth or Ethernet
Frequency Band	450-470 MHz
Approvals	FCC Part 90 and Part 15
AMI Backhaul	Ethernet







# LPN BLACK BOX PRODUCT DATA SHEET

# **Tesla 4 TR - Transceiver Register**

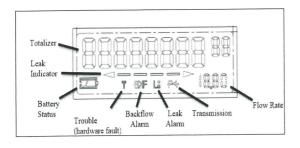


### Description

**Applications:** The Tesla 4 TR Transceiver Register is a solid-state encoder with no mechanical numerical wheels. It is equipped with an integrated 1-Watt transceiver contained entirely inside the hermetically sealed enclosure. Tesla 4 TR is ideal in harsh meter pit environments with its standard external antenna. It is designed for use with all RG3 meters and to retrofit most other manufactures' meters (Badger, Neptune, Sensus, Mueller (Hersey), Master Meter, Zenner, etc.). Tesla 4 TR provides 2-way wireless connectivity with RG3 Tesla Drive AMR reading software which eliminates the need for physical access to the meter after installation.

Operating Characteristics: The digital reading transmitted by Tesla 4 TR integrated 1-Watt transceiver is retrieved directly from the register's internal magnetic sensor coupled to the wetted magnet through the meter body. Tesla 4 TR magnetic sensors are always on and always watching. This technology provides real time reads and eliminates interpretation of odometer wheels by means of LED, optical character recognition, or electromechanical contacts that could wear out. The Tesla 4 TR solution provides superior long-term performance and the most accurate counting solution available.

**LCD:** Tesla 4 TR is equipped with a large LCD for easy reading. The LCD provides a 10-digit programmable meter read and a 6 segment leak detector indicator with flow direction arrows. Flow rate, water movement, battery status, tamper, back flow, leak warning, and transmission indicator are shown on the LCD as appropriate. At 20% battery life remaining, the battery status indicator begins to flash on and off. Status indicators are sent as part of the AMR extended message. The LCD is always active and requires no tools for visual reading.





### **Specifications**

Specifications	
Encoder Type	Straight reading, permanently sealed, electronic LCD absolute encoder with field programmable integrated 1-Watt RF transceiver for AMR applications.
Encoder Display	10-digit LCD totalizer, 6 segment leak detector, flow direction arrows, rate of flow, battery status, leak alarm, and back-flow alarm
Unit of Measure	U.S. gallons, Imperial gallons, cubic feet, cubic meters, and liters
Flow Rate	Units of Measure per Minute
Numerals	7.44 mm (.293") high and 7.24 mm (.285 wide)
Humidity	0 to 100% condensing
Weight	238 grams or 8.5 oz
Temperature	-40° to 185°F (-40° to 85°C)
Status Indicators	Electronic and visual icons for: Totalizer, flow rate, back-flow, leak, battery indicator (including 20% battery life alarm)
Signal Output	1-Watt RF Transmission
Signal Type	Unlicensed Frequency (902 MHz- 928 MHz)
Battery	D cell lithium thionyl chloride bat- tery with capacitor, fully encapsu- lated within Tesla 4 TR housing
Battery Life	25 Years (calculated)
Warranty	20 Years (Prorated)

**Water Movement Indicator:** Six segments illuminate in succession ending in an arrow to demonstrate directionality and to simulate water flow. The water movement indicator activates immediately upon water movement. Cessation of segment movement demonstrates that water movement has stopped within the past 20 seconds. After 20 seconds all segments disappear.

**Flow Rate:** Flow rate is clearly displayed in the applicable unit of measurement and updated every 10 seconds. If the unit of measure is gallons, for example on a residential meter, displayed flow rates range from 1/10th gpm to 1,999 gpm.

**Back flow:** The back flow indicator is activated after 4 units of back flow and remains illuminated for 30 days. A back flow flag is sent with the extended RF message, as long as the indicator is activated.

**No Flow:** No Flow is activated when no usage has occurred in the past 30 days. The No Flow remains until usage occurs. A No-Flow flag is sent with the extended RF message as long as the indicator is activated.

**Battery Status:** Tesla 4 TR uses a D cell lithium thionyl chloride battery with capacitor to provide a true 25 year battery profile. Tesla 4 TR adjusts the battery status indicator based on actual usage to provide the most accurate and up to date information to the utility. When the battery reaches 20%, the battery status icon on the LCD begins to flash on and off. Battery status is sent with the extended RF message each time Tesla 4 TR is read.

**Trouble:** Tesla 4 TR monitors it's own systems internally. When an unexpected event occurs, Tesla 4 TR resets the problematic section. If the unexpected event was software related, the reset will clear the issue and normal operation will continue. If the problem is located in hardware, a reset will not rectify the difficulty. If the Tesla 4 TR experiences 3 resets over the life of the product, a "T" is raised on the LCD to indicate the alarm visually. The Trouble status is sent with the extended RF message if activated each time Tesla 4 TR is read.

**Leak Detection:** Leak monitoring is constant. As a standard, the leak flag is triggered after 48 hours of continuous water movement. The leak flag will turn off if no water movement occurs for a period of 1 hour to ensure that the utility is not wasting resources addressing a leak that was in reality high usage.

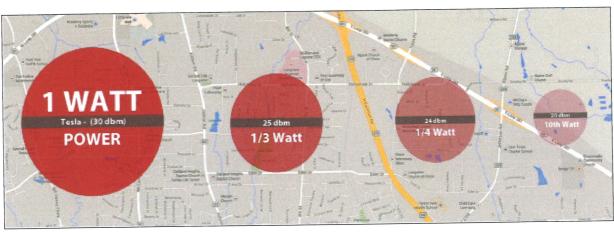
# 7.5 4.8 2.76 3.27

Tesla412241

**Leak Counter:** The leak counter indicates the number of days a leak has been occurring. The information is transmitted every time Tesla 4 TR is read. This enables the utility to provide warning to the customer and then respond accordingly if the customer has not resolved the issue. The leak counter resets after 10 days of non-continuous use.

**Time Sync for Water Loss Identification:** Every time Tesla 4 TR reads, it syncs time with the reading device. Tesla 4 TR time sync is a 2-Way transmission function and can only be accomplished with true 2-way communication. This feature is important because water loss identification through metering requires the comparison of water volumes recorded by customer and mainline meters over a specific period of time to the water volumes discharged from the treatment facilities or the volume passing through system zone meters over this same period of time. Distribution leak detection requires time synchronization to avoid "clock drift", a phenomena where two clocks do not run at the exact speed and after a period of time, "drift apart". By syncing time with the reading device, Tesla 4 TR avoids clock drift completely and delivers the most accurate leak detection possible.

**Transmission:** Tesla 4 TR technology starts where the rest of the industry's most advanced solutions top out. All functions are accomplished through streamlined 2-way communication utilizing the FCC approved unlicensed 902-928 MHz band. To ensure transmission success, Tesla 4 TR employs Cyclic Redundancy Checks (CRC), Spread Spectrum Frequency Hopping Modulation, and Channel Coding.



\*Rule of Thumb: 6dbm gain = twice the distance of Transmission

**Transmission Power:** Tesla 4 TR transmits at a full 1-watt. Unlike 1-way bubble up technologies that throw hundreds of thousands of wasted transmissions and large amounts of unnecessary energy into the atmosphere each month, Tesla 4 TR's extremely efficient 1 watt power is environmentally friendly. Although Tesla 4 TR has 10 times the transmission power of other leading AMR technologies, the total monthly output of electromagnetic radiation is at least 10,000 times less than comparable technologies, or roughly 5% of the amount emitted by the average cell phone each month in the US.

**Drive-By (AMR) Read:** Tesla 4 TR transmits its associated meter number, current read, number of digits transmitted, unit of measurement, battery status, leak counter, and back flow, tamper, and leak flags as applicable. Individual meters can be read alone or all meters can be read at once.

**Transmission Indicator:** The transmission indicator illuminates when Tesla 4 TR conducts RF activity, allowing the operator to visually confirm transmission has been sent.



**Resolution for 5/8" to 4" Meter Applications:** "Absolute" 10-digit meter reading on the LCD with precise visual readings down to the hundredths of a gallon or thousandths of a cubic foot/meter. Electronic output includes 8-digit remote meter reading. 1 to 8 digits can be communicated for billing.

**Resolution for 6" through 12" Meter Applications:** "Absolute" 9-digit meter reading on LCD with precise visual readings down to the whole unit. Electronic output includes 8-digit remote meter reading. 1 to 8 digits can be communicated for billing.

**Factory Programming:** When combined with an RG3 meter, Tesla 4 TR is factory programmed with a reading of 1 gallon and associated to its companion meter's serial number, type, and size. Factory programmed Tesla 4 TR register/meter combinations are ready for installation upon delivery just like a direct read meter with no additional operations needed.

**Construction:** Tesla 4 TR shroud assembly is constructed from engineered polycarbonate with a hermetically sealed stainless steel bottom. The enclosure is UV-resistant, weatherproof, and fully encapsulated to withstand harsh environments and to protect the solid state electronics. External antenna screw terminal pins are molded into the engineered polycarbonate lens and back sealed with a potting compound eliminating any opportunity for moisture intrusion at the connections making Tesla 4 TR suitable for installation in all environments, including continuously submerged water meter pits. Electronic circuitry is gold plated to provide increased corrosion resistance before it is encapsulated by high quality endothermic potting material that diminishes the expansion and contraction related to temperature extremes. Electronics are designed to provide immunity to electrical surges. Tesla 4 TR uses magnetically driven thermoplastic floating gears to minimize friction and provide long, reliable life. Tesla 4 TR counting mechanisms are permanently active magnetic sensors. The power source is an internal lithium battery with capacitor that is independently encapsulated in potting for redundant protection against moisture.

**Precision Counting:** Tesla 4 TR uses magnetic sensors that detect changes and disturbances in the magnetic field of the wetted meter magnet like flux, strength, and direction. This precision technology allows Tesla 4 TR to accurately count with resolutions that far exceed the flow capabilities of any water, while remaining sensitive enough to count down to the thousandths of a gallon.

**Antenna:** Tesla 4 TR is equipped with an integrated antenna that is external to the register for superior propagation and to ensure strong and reliable transmissions in flooded pit environments.

**Watchdog:** All mechanical and electronic devices are subject to the effects of their environment. Tesla 4TR is equipped with an internal watchdog that reboots the electronics if faced with an external interference such as a close proximity lightning strike or other uncontrollable event.

**Electrical:** Tesla 4 TR electronic circuitry is gold plated and designed to provide immunity to electrical surges and transients per IEC801-2, IEC801-4 Severity Level 4.

**Data Log / Consumption:** Tesla 4 TR retains 120 days of hourly data. Consumption data can be wirelessly extracted at the meter site with no need to access the meter physically.

### Tesla 4 TR can Retro-Fit to the Following Manufactures Meters:























# **TESLA DUO AMI ENDPOINTS FOR WATER**

### We've got you covered.

Tesla Duo (Duo) multi-network AMI water endpoints give you several options to read your meters from the office, as well as, a drive-by AMR backup option. Each Duo is both a cellular endpoint and a point-to-multi-point RF fixed-network endpoint, combining the two leading AMI technology options into one. Using the multi carrier eSIM over the LTE-M network, each Duo evaluates the signal strength at the installation location of multiple public cellular network carriers and chooses the strongest. The built in 450-470 MHz RF transceiver gives the Duo the ability to overcome poor cellular coverage areas and any dead spots in the service area. It also provides you with a built in network guarantee so you will have peace of mind knowing that you will always have a network available. Utilizing both public cellular networks and a utility owned Licensed Private Network provides the greatest coverage possible and unmatched redundancy. Combining the two most effective AMI read methods into one Tesla Duo multi-network endpoint produces the most versatile technology available and makes it very easy for you to read your meters from the office.



### **Instant AMI**

As soon as a Tesla Duo endpoint is installed, you can read it from your office. When an endpoint is activated, it immediately communicates with cell networks and the Licensed Private Network (LPN) if fixed data collectors are installed. If a Duo is outside of the 450 MHz LPN coverage area, or no fixed network data collectors are installed, it will operate as a cellular endpoint. If LPN coverage becomes available in the future, the Duo will automatically switch to the 450 MHz LPN network and then back to the cellular networks if LPN coverage is ever unavailable. The automatic network switch feature makes installing or expanding your system extremely easy and hassle-free.

### **Future Proof Redundant Coverage**

The Tesla Duo provides superior network coverage simply because it uses multiple networks. Typical cell endpoint challenges such as cellular tower coverage drops, tower equipment changes, and localized cell dead spots are easily overcome with built-in alternative cellular carrier options and the utility owned 450 MHz LPN. Factors that can adversely affect traditional fixed networks like new construction and vegetation growth can be damaging to a utility owned network over time. Duo AMI endpoints overcome these obstacles by switching networks automatically. The ability to move between networks as needed affords the Tesla Duo multi-network endpoint more opportunity to deliver meter data than any other technology. Auto compensating for changes in your meter system creates a highly resilient future proof technology with multiple paths of redundancy.

### **Cellular Endpoint**

When public cellular network coverage is available, Tesla Duo endpoints are self-contained. Simply install and you will be reading from the office. If cell dead spots exist in your system, Tesla Duos can use the utility owned 450 MHz Licensed Private Network to communicate.

### Point-to-Multi-point RF Fixed Network Endpoint

When cellular coverage isn't optimal everywhere in your meter system, 450 MHz LPN fixed data collectors can be installed to overcome cell network problem spots. Fixed Network Collectors can cover large areas where utility towers already exist but can also cover small areas economically using Duo Collectors (see rg3meter.com for information on Duo Collectors).

### **Guarantee of Network Performance**

Tesla Duo eSIM cards are able to automatically switch between multiple cellular cariers. If the cellular communication networks that support any Tesla Duo endpoint discontinue operation, the already built in 450 MHz transceiver can immediately be used for both drive-by AMR and fixed network AMI reading strategies. The 450 MHz Licensed Private Network is owned by the utility, providing built-in security and peace of mind. If the primary method of data delivery has been over the LPN and something catastrophic happens to a fixed data collector, the Tesla Duo will automatically begin sending meter data over the strongest cellular network available.

### Installation

The Tesla Duo housing design allows for pit or wall installation with no change in products. In meter pit installations, the low-profile lid mount rugged design brings the endpoint above the mud, water, and depths of the meter pit environment giving them the best opportunity for solid antenna propagation which translates directly into exceptional range. To ensure a long-life cycle, Tesla Duo endpoints are solid state devices built to be completely submerged for their entire service life without danger of water intrusion. Firmware can be updated at any time after installation over the air (OTA) for future feature additions and bug fixes. Tesla Duo multi-network endpoints are plug-and-play with no programming required making them easy and fast to install.



### **TESLA DUO PRODUCT DATA SHEET**

### **Encoder Compatibility**

While RG3 offers a battery free analog encoder and a universal encoder that can retrofit any meter with a removable register, Tesla Duo endpoints work with any wired make or model encoder register of any manufacture that uses the industry standard UI-1203 communication protocol. They also have the capability to detect most major manufacturer encoder register brands and utilize extended protocols if offered. They are perfect for upgrading older systems from walk-by or drive-by to read from the office AMI.

Tesla Duo endpoints can be read from the office (AMI) and or by drive-by (AMR), with no programming required to switch between the two read strategies. When using the 450-470 FCC Licensed Private Network, Tesla Duo endpoints utilize a secure and protected proprietary time-synchronized, RF protocol.

### **Features and Benefits**

- TeslaDuo eSIM cards are purchased with 10 years of pre-paid data for cost control. (Verizon is not pre-paid)
- Secure, encrypted, true 2-way communication provides greater functionality.
- Near real-time alerts and alarms improve customer service.
- TeslaDuo automatically switches to the public cellular network with the strongest signal if LPN coverage is not successful, creating unparalleled network coverage redundancy.

### Multi-Network Migratable

- Tesla Duo automatically migrates between the 450-470 MHz Licensed Private Network and multiple public cellular networks creating multi-network redundant coverage, giving you the best opportunity possible to read your meters from anywhere.
- Simultaneous redundant read strategies for enhanced system reliability.
- 120 days of hourly reads stored in the endpoint for data redundancy.

### **Long-Life Rugged Design**

- IP68 Environmental Rating for the highest protection against the meter pit environment.
- Ultra rugged, fully potted, solid-state design.
- Mount in lid antenna for increased range and network stability.
- Remote Over the Air (OTA) updates increase endpoint and system longevity.
- 20-year warranty (10-year full /10-year prorated).

### Plug-and-Play Installation

- Tesla Duo installation is quick, easy, and requires no programming.
- Endpoints are pre-configured at the factory for immediate deployment.
- No expertise needed. Install, record data, and move on.
- Automatic successful network communication verification after installation
- Endpoint serial numbers are barcoded to reduce human data errors.









### **Description**

Tesla Duo (Duo) water AMI endpoints are equipped with a cellular modem and multi carrier eSIM along with a 450 MHz RF transceiver for independent dual network communication with a drive-by AMR backup. Each endpoint can use multiple existing public cellular networks, or a point-to-multi-point Licensed Private Network (LPN) in the 450 – 470 MHz band to deliver meter data to the utility securely and with great flexibility. When used primarily as a cellular endpoint, the Duo can compensate for poor cellular areas and cell dead spots by supplementing those areas with the 450 MHz LPN. While the cellular and LPN networks can be used independently, the redundancy of multi-network coverage creates an extremely effective future evolving multi-network option not achievable with a single network. Each Tesla Duo can be read by drive-by AMR as a backup.



### **Functionality**

**Operation:** Tesla Duo water endpoints communicate with the encoder to capture interval read data and meter status information. The endpoints then send read and endpoint status information over the Licensed Private Network or public cellular networks. Two-way communication provides for time synchronization, on demand reads, over the air firmware updates, and remote shut off valve control. Multi-network coverage gives the utility the flexibility to install Fixed Network Collectors in places that make sense, while utilizing existing public cellular networks in other parts of the system, or switch from one network to another after installation for future network optimization. This speeds installations while presenting multiple options to overcome future system environmental changes such as vegetation growth, building construction, or expansion as a system evolves.

**Activation:** Tesla Duo water endpoints are shipped in an inactive, non-transmitting state. After installation, the endpoints begin communicating data once the encoder indicates water has been used. Alternatively, a magnet can be used to manually activate the endpoints and verify the encoder connection.

Data Storage: Tesla Duo endpoints store 120 days of hourly data for local retrieval via data log.

**Output Message:** Tesla Duo water endpoints communicate a unique serial number, meter reading data, and applicable status indicators such as flags and alarms.

### **Application**

**Read Strategies:** Tesla Duo water endpoints can send AMI meter related information through multiple public cellular networks, a utility owned private point-to-multi-point fixed network, AMR drive-by or switch between the read strategies with no programing required. A Multi-Network approach can also be chosen to utilize all network options simultaneously for redundancy and optimization. When more than one network is available, the Tesla Duo automatically switches between them so that the information collected has the best chance of reaching the utility.

**Configurations:** Tesla Duo water endpoints can be installed in indoor, outdoor and pit lid applications. As with all radio frequency (RF) endpoints of any manufacturer, mounting through or under a metallic pit lid has a negative impact on signal propagation. A polymer pit lid is highly suggested for optimal performance. The electronics and battery assembly are fully encapsulated in epoxy for environmental integrity. The endpoint is available with a connector assembly for ease of installation.



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### **Specifications**

Approvals  Part 90, part 15, part 22, part 24, and part 27 of the FCC rules  Battery  Non-replaceable D-Cell lithium thionyl chloride with HLC capacitor for exten  Battery life  20 years¹  Connection to register  Bare wire (splice), RG3, Nicor or other industry-standard connectors  Data resolution  4-8 digits²  Encoder disconnect  An alarm is sent if communication with the encoder is interrupted as in the cheft or vandalism  Endpoint to endpoint synchronization  < 1 min  Firmware updates  Over the air (OTA) firmware updates can be performed remotely via cellular of work, the 450 MHz LPN or on-site through Tesla Drive software  Inputs  Installation Locations  Interior or exterior wall mount, pit/vault, through-the-lid³  Meter encoder compatibility  All RG3 meter and encoders as well as most major manufacturers of water m  Meter flags and alarms  Back flow, Tamper, Leak, Major Leak, Diagnostic and Battery Status flags as w supporting extended flags and alarms from multiple meter manufacturers <sup>4</sup> Meter interface  Network compatibility  Tesla Net  Network topology  450 – 470 MHz Licensed Private Network (point-to-multi-point) and AT&T, Very-Mobile and other public cellular LTE-M networks  Network type  Two-way <sup>5</sup> On-board storage  Operating humidity  0%-100% non-condensing	led life
Battery life Connection to register Bare wire (splice), RG3, Nicor or other industry-standard connectors  Data resolution 4-8 digits² Encoder disconnect An alarm is sent if communication with the encoder is interrupted as in the content of the provided in the form of the provided in the encoder is interrupted as in the content of the provided in the encoder is interrupted as in the encoder disconnect  Endpoint to endpoint synchronization  Endpoint to endpoint synchronization  Endpoint to endpoint synchronization  Interior or the air (OTA) firmware updates can be performed remotely via cellular in work, the 450 MHz LPN or on-site through Tesla Drive software  Inputs  Interior or dual port  Interior or exterior wall mount, pit/vault, through-the-lid³  Meter encoder compatibility  All RG3 meter and encoders as well as most major manufacturers of water manufacturers of water manufacturers of water manufacturers of the provided flags and alarms from multiple meter manufacturers of water interface  Pulse or Encoder  Network compatibility  Tesla Net  Network topology  Tesla Net  Network topology  Tesla Net  Too-way <sup>5</sup> Two-way <sup>5</sup> Two-way <sup>5</sup> Two-way <sup>5</sup> Too-board storage  120 days of hourly read data  Operating humidity  O%-100% non-condensing	ded life
Connection to register  Data resolution  4–8 digits²  Encoder disconnect  An alarm is sent if communication with the encoder is interrupted as in the content of theft or vandalism  Endpoint to endpoint synchronization  Firmware updates  Over the air (OTA) firmware updates can be performed remotely via cellular more, the 450 MHz LPN or on-site through Tesla Drive software  Inputs  Interior or exterior wall mount, pit/vault, through-the-lid³  Meter encoder compatibility  All RG3 meter and encoders as well as most major manufacturers of water more supporting extended flags and alarms from multiple meter manufacturers⁴  Meter interface  Pulse or Encoder  Network compatibility  Tesla Net  Network topology  450 – 470 MHz Licensed Private Network (point-to-multi-point) and AT&T, Very T-Mobile and other public cellular LTE-M networks  Network type  On-board storage  Operating humidity  0%-100% non-condensing	
Data resolution  4-8 digits²  Encoder disconnect  An alarm is sent if communication with the encoder is interrupted as in the content theft or vandalism  Endpoint to endpoint synchronization  7-1 min  Firmware updates  Over the air (OTA) firmware updates can be performed remotely via cellular mover, the 450 MHz LPN or on-site through Tesla Drive software  Inputs  Installation Locations  Interior or exterior wall mount, pit/vault, through-the-lid³  Meter encoder compatibility  Meter flags and alarms  Back flow, Tamper, Leak, Major Leak, Diagnostic and Battery Status flags as well supporting extended flags and alarms from multiple meter manufacturers⁴  Meter interface  Pulse or Encoder  Network compatibility  Tesla Net  Network topology  450 – 470 MHz Licensed Private Network (point-to-multi-point) and AT&T, Very T-Mobile and other public cellular LTE-M networks  Network type  On-board storage  120 days of hourly read data  Operating humidity  0%-100% non-condensing	Mary Control of the C
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theft or vandalism  Endpoint to endpoint synchronization < 1 min  Firmware updates Over the air (OTA) firmware updates can be performed remotely via cellular rework, the 450 MHz LPN or on-site through Tesla Drive software  Inputs Single or dual port  Installation Locations Interior or exterior wall mount, pit/vault, through-the-lid³  Meter encoder compatibility All RG3 meter and encoders as well as most major manufacturers of water	
Firmware updates  Over the air (OTA) firmware updates can be performed remotely via cellular rework, the 450 MHz LPN or on-site through Tesla Drive software  Inputs  Single or dual port  Installation Locations  Interior or exterior wall mount, pit/vault, through-the-lid³  Meter encoder compatibility  All RG3 meter and encoders as well as most major manufacturers of water meter flags and alarms  Back flow, Tamper, Leak, Major Leak, Diagnostic and Battery Status flags as well as supporting extended flags and alarms from multiple meter manufacturers⁴  Meter interface  Pulse or Encoder  Network compatibility  Tesla Net  1-Mobile and other public cellular LTE-M networks  Network type  On-board storage  120 days of hourly read data  Operating humidity  Over the air (OTA) firmware updates can be performed remotely via cellular remotely via cellular from works and provide software.  Installation Locations  Instal	ase of
Over the air (OTA) firmware updates can be performed remotely via cellular a work, the 450 MHz LPN or on-site through Tesla Drive software  Inputs  Single or dual port  Installation Locations  Interior or exterior wall mount, pit/vault, through-the-lid³  Meter encoder compatibility  All RG3 meter and encoders as well as most major manufacturers of water interface  Network compatibility  Tesla Net  1 Eval Net  1 Eval Net  1 Eval Net  1 Eval Network (point-to-multi-point) and AT&T, Ver  1 Eval Net  2 Eval Net  2 Eval Net  3 Eval Net  4 Eval Net  4 Eval Net  4 Eval Net  4 Eval Net  5 Eval Net  6 Eval Net  7 Eval Net  6 Eval Net  7 Eval Net  7 Eval Net  7 Eval Net  8 Eval Net  9 Eval Ne	
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Meter flags and alarmsBack flow, Tamper, Leak, Major Leak, Diagnostic and Battery Status flags as we supporting extended flags and alarms from multiple meter manufacturers4Meter interfacePulse or EncoderNetwork compatibilityTesla NetNetwork topology450 – 470 MHz Licensed Private Network (point-to-multi-point) and AT&T, Verence of Testing and other public cellular LTE-M networksNetwork typeTwo-way5On-board storage120 days of hourly read dataOperating humidity0%-100% non-condensing	eters <sup>4</sup>
Network compatibility  Tesla Net  Network topology  450 – 470 MHz Licensed Private Network (point-to-multi-point) and AT&T, Very T-Mobile and other public cellular LTE-M networks  Network type  Two-way <sup>5</sup> On-board storage  120 days of hourly read data  Operating humidity  0%-100% non-condensing	ell as
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Network topology  450 – 470 MHz Licensed Private Network (point-to-multi-point) and AT&T, Very T-Mobile and other public cellular LTE-M networks  Network type  Two-way <sup>5</sup> On-board storage  120 days of hourly read data  Operating humidity  0%-100% non-condensing	
On-board storage 120 days of hourly read data Operating humidity 0%-100% non-condensing	rizon,
Operating humidity 0%-100% non-condensing	
operating narrows,	
Operating temperature -40° to 185°F (-40° to 85°C)	
Physical characteristics  Height 6.5"  Width of Threads 1.8"  Width of Cap at Threads 1.98" (2-1/8" pit lid hole required)  Dimensions of Base 3.2" w x 3.1" d  Weight: 1 lb  Color: black	6
Remote shut-off Open, close, partially closed – controlled from Tesla MDM or Tesla Drive soft	vare
Security AES 256 encryption and authentication	
AMI read transmission resolution Hourly	
AMI read transmission interval Cellular: Up to 4 times per day / 450 MHz LPN: 15 minutes	
AMI Major Leak alarm transmission Immediate	
Warranty 20 years <sup>1, 7</sup>	

 $<sup>^{1}</sup>$  Battery life warranty invalid if product is stored more than 1 year before installation and activation

<sup>&</sup>lt;sup>7</sup> Refer to RG3 standard warranty for details



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<sup>&</sup>lt;sup>2</sup> Reports all digits that are electronically available from register

<sup>&</sup>lt;sup>3</sup> Pit/vault installation under non-metallic lid

<sup>&</sup>lt;sup>4</sup> Contact factory for specific meters and flags/alarms supported

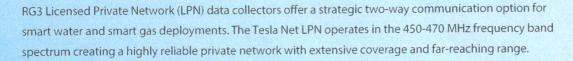
<sup>&</sup>lt;sup>5</sup> Two-way communication for time synchronization, remote configuration, on-demand reads, historical data log retrieval, valve control, and firmware over the air (OTA) updates

<sup>&</sup>lt;sup>6</sup> Contact factory for specific valves supported



# LPN DUO COLLECTOR

### We've got you covered.



The two-way system incorporates rich security features and is end-to-end upgradable remotely with over-the-air updates. The proprietary LPN RF protocol provides time-synced operations to alleviate network RF collision. Data is time-stamped and mapped to show how it travelled through the network. The result is extremely reliable network coverage.







### **LPN Duo Collector**

**Big Impact – Small Package** LPN Duo Collectors (DCs) send and receive information to Tesla AMI endpoints over a Licensed Private Network and then send collected data over one of multiple public cellular networks (Verizon, AT&T, T-Mobile, etc.), depending on which has the strongest signal at the time. DCs are ideal for communicating with up to 1,000 endpoints within a 1/2-mile radius (approximately 1 sq mile) or farther depending on geography and installation height. DCs can store up to 38,250 reads that can be retrieved manually with a 450 TRX mobile data collector as a backup.

**Easy Installation** Installing a Duo Collector is as easy as mounting it and plugging it in. DCs can be installed anywhere using the two provided mounting holes. DCs come with a cord and power converter to be powered by a standard 110v outlet with ground. If A/C power isn't' available, a solar power package can be added to make the Duo Collector self-contained. They can be screwed to a wall, clamped to a pole, or placed on the back of a street sign or light. A simple website registration is required after installation.

**Extreme Duty** Outside of power options and firmware, DCs are identical to Tesla Duo AMI endpoints. They have the same compact 6.5" x 3.2" form factor, fully potted electronics, and are also constructed with a 450-470 MHz LPN transceiver and a cellular modem. Since DCs were constructed to withstand 20 years completely submerged in a challenging meter pit environment, it is easy to see how the rugged design will provide a very long service life when mounted to an elevated tank, pole, building, or inside an office. They are built to operate in extreme temperatures ranging from -40°F to +185°F (-40°C to +85°C) and can easily stand up to a hurricane.



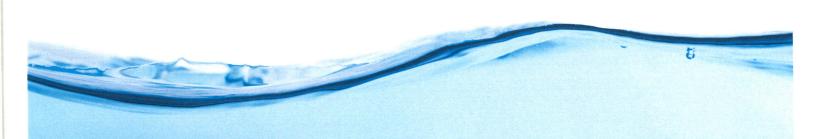
### **Features and Benefits**

### • Easy for utility personnel to install

- Quickly provide network coverage to a large subdivision (roughly 96 city blocks)
- Super easy way to read your meters from the office AMI
- · Licensed Private Network with low RF interference
- Two-way communications
- Time-Stamped readings and alarms
- Over-the-air remote firmware updates
- End-to-End security
- Hourly usage data
- Data Storage for redundant transmissions
- IP-68 weatherproof enclosure
- Built in duplexer for single antenna
- •Near real time alarms
- •Easy to add to existing network

# **Specifications**

Dimensions	6.5" x 3.2" x 3.1"
Weight	3 lbs
Mounting Options	Pole or wall mount
Operating Temperature	-40°F to +185°F (-40°C to +85°C)
Enclosure Rating	IP-68
Humidity	0% to 95% non-condensing not including AC power converter or solar package
Operating Power	110VAC, Solar
Surge Protection	3330 joules
Frequency Band	450-470 MHz
Approvals	Part 90, Part 15, Part 22, Part 24, & Part 27 of the FCC rules
Backhaul Options	Cellular
# of Endpoints Served	1,000
Capacity of Read Storage	38,200 reads





# LPN DUO COLLECTOR PRODUCT DATA SHEET



# LPN FIXED NETWORK COLLECTOR

# We've got you covered.

RG3 Licensed Private Network (LPN) Fixed Network Collectors offer a strategic two-way communications option for smart water and smart gas deployments. Tesla Net LPN operates in the 450-470 MHz frequency band spectrum creating a highly reliable private network with extensive coverage and far-reaching range.

The two-way system incorporates rich security features and is end-to-end upgradable remotely with over-the-air updates. The proprietary LPN RF protocol provides time-synced operations to alleviate network RF collision. Data is time-stamped and mapped to show how it travelled through the network. The result is extremely reliable network coverage.



# **High-Capacity FNC Base Station and Repeater**

Rugged Simplicity LPN Fixed Network Collectors (FNC) can operate as a base station or a repeater depending on internet connectivity. If plugged into Ethernet or connected to WiFi, the FNC is a base station. If not, it is a repeater. FNCs are elegantly designed with only a solid-state transceiver array and a few supporting components. The simplicity of the build makes LPN Fixed Network Collectors affordable, extremely durable, and maintenance free.

**Scalability and Performance** Depending on antenna installation height, geography, building construction, and land cover, LPN Base Stations and Repeaters can provide a coverage radius of up to 3.5-miles. A single FNC base station can communicate with up to 48,000 endpoints and store 38 million reads. FNC base stations can communicate with up to 12 FNC repeaters within a 10-mile radius. The repeater mode duty cycle limits FNC repeaters to 12,000 endpoints and a capacity of 153,000 reads.

**Data Backhaul** Ethernet is the preferred backhaul because hardwired connections are the most reliable and the data transfer speed allows utilities to view data in near real time. Wi-Fi is the second preference and offers similar performance. As a backup, stored data is also retrievable manually with a 450 TRX mobile data collector.

### **Features and Benefits**

- Up to 38 Square Miles (3.5 mile radius from tower) of network coverage from a single Fixed Network Collector
- FNC to FNC communication up to 10 miles
- Quickly migrate part or all of your meter system to read from the office AMI
- Licensed Private Network with low RF interference
- •Two-way communications
- •Time-Stamped readings and alarms
- •Two backhaul options

- · Over-the-air remote firmware updates
- End-to-End security
- · Hourly usage data
- Near real-time alarms
- Data Storage for redundant transmissions
- •Point-to-Multi-Point network
- Easy to add Solo Repeaters as coverage needs grow

### **Specifications**

**Enclosure Dimensions** 

Weight

**Mounting Options** 

Operating Temperature

Storage Temperature

**Enclosure Rating** 

Humidity

**Operating Power** 

Backup Battery (UPS)

Surge Protection

Frequency Band

Approvals

**Backhaul Options** 

# of Endpoints Served

# of Repeaters Served

Capacity of Read Storage

Backup Mode Read Retrieval

FNI	H	250	Sta	tion
8 1 A	L	ase	Jeu	CIOII

### i ite base statio

### 20" x 16" x 8"

34 lbs

Pole mount

-4°F to +140°F (-20°C to +60°C)

-40°F to +185°F (-40°C to +85°C)

NEMA 3R

0% to 95% non-condensing

110VAC

Yes

4 0000

3330 joules

450-470 MHz

and the second s

FCC Part 90 and Part 15

Wired (Ethernet/Fiber), Wi-Fi

48,000

12

38,000,000 reads

Yes

### **FNC** Repeater

20" x 16" x 8"

34 lbs

5-1105

Pole mount

-4°F to +140°F (-20°C to +60°C)

-40°F to +185°F (-40°C to +85°C)

NEMA 3R

0% to 95% non-condensing

110VAC, Solar

Yes

-----

3330 joules

450-470 MHz

FCC Part 90 and Part 15

--

12,000

....

153,000 reads

Yes



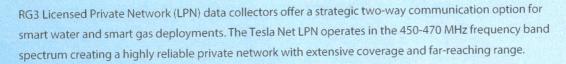
# LPN FIXED NETWORK COLLECTOR PRODUCT DATA SHEET

RG3 Meter Company . 2912 South Access Road . Longview, TX 75602 . p 903.753.3456 . f 903.753.5678 . RG3Meter.com



# LPN SOLO REPEATER





The two-way system incorporates rich security features and is end-to-end upgradable remotely with over-the-air updates. The proprietary LPN RF protocol provides time-synced operations to alleviate network RF collision. Data is time-stamped and mapped to show how it travelled through the network. The result is extremely reliable network coverage.







# **LPN Solo Repeater**

**Big Impact – Small Package** LPN Solo Repeaters communicate with Tesla AMI endpoints and LPN Fixed Network Collectors over a Licensed Private Network. Solo Repeaters are typically positioned in areas that have poor nework coverage due to geography or other obstructions. They are installed high enough to overcome the interference caused by the obstruction and relay the endpoint data to an LPN Fixed Network Collector. Solo Repeaters are ideal for communicating with up to 1,000 endpoints within a 1/2-mile radius (approximately 1 sq mile).

**Easy Installation** Installing a Solo Repeater is as easy as mounting it with the two provided mounting holes and plugging it in. Solo Repeaters come with a cord and power converter to be powered by a standard 110v outlet with ground. If A/C power isn't available, a solar power package can be added to make the Solo Repeater self-contained. They can be screwed to a wall, clamped to a pole, or placed on the back of a street sign or light. Mount it, plug it in, and your done.

Extreme Duty Outside of power options and firmware, Solo Repeaters are identical to Tesla Solo AMI endpoints. They have the same compact 6.5" x 3.2" form factor, fully potted electronics, and are also constructed with a 450-470 MHz LPN transceiver. Since Solo Repeaterss were constructed to withstand 20 years completely submerged in a challenging meter pit environment, it is easy to see how the rugged design will provide a very long service life when mounted to an elevated tank, pole, building, or inside an office. They are built to operate in extreme temperatures ranging from -40°F to +185°F (-40°C to +85°C) and can easily stand up to a hurricane.



### **Features and Benefits**

### • Easy for utility personnel to install

- Quickly extend network coverage to a large subdivision (roughly 96 city blocks)
- •Easy way to send meter reads to your office (AMI)
- Licensed Private Network with low RF interference
- Two-way communications
- •Time-Stamped readings and alarms
- · Over-the-air remote firmware updates
- End-to-End security
- Hourly usage data
- •Easy to add to existing network
- IP-68 weatherproof enclosure
- Built in duplexer for single antenna
- ·Near real time alarms
- •Mount it, plug it in & your done

# **Specifications**

Dimensions	6.5" x 3.2" x 3.1"
Weight	3 lbs
Mounting Options	Pole or wall mount
Operating Temperature	-40°F to +185°F (-40°C to +85°C)
Enclosure Rating	IP-68
Humidity	0% to 95% non-condensing not including AC power converter or solar package
Operating Power	110VAC, Solar
Surge Protection	3330 joules
Frequency Band	450-470 MHz
Approvals	Part 90, Part 15, Part 22, Part 24, & Part 27 of the FCC rules
Backhaul Options	
# of Endpoints Served	3,000

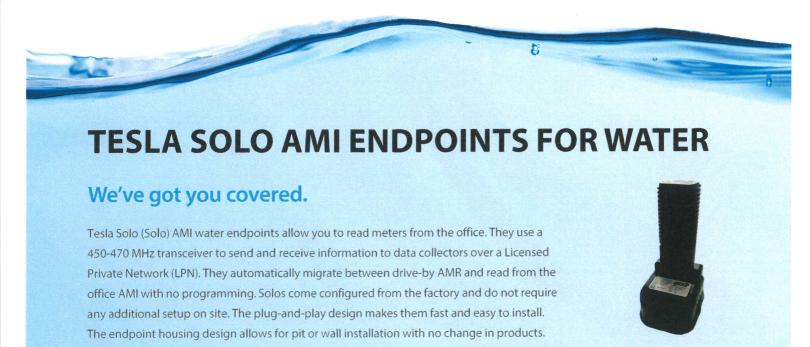




# LPN DUO COLLECTOR PRODUCT DATA SHEET







### **Exceptional Range**

Tesla Solo endpoints offer exceptional range, while eliminating network RF signal collision. They can communicate with Tesla Fixed Network Collectors (FNC) up to 3.5 miles away. FNC Repeaters can communicate with FNC Base Stations up to 10 miles. As a general rule of thumb, operating in the 450-470 MHz band affords Solo endpoints 400% more range than that of unlicensed 900 MHz systems.

Greater range to Fixed Network Collectors translates directly into improved coverage. Cost is lowered by reducing the number of FNCs needed to read the meters and performance is raised by increasing the number of successful transmissions to LPN infrastructure.

# **Long-Term Network Performance**

Meter pits tend to fill up with materials that block RF signals. Solo endpoints have a low-profile lid mount design that brings the LPN omnidirectional antenna above the mud, water, and depths of the meter pit environment. Removing the opportunity for the meter pit to block the radio signal generally improves the total range of Solo endpoints by up to 250% over technologies that use antennas built in the register, even if they use the same 450-470 MHz band. The mount in the lid design keeps the antenna above dirt and water that will eventually fill a meter pit which helps maintain network performance over time.

### **Super-Duty Construction**

To ensure a long-life cycle, Solo endpoints are solid state devices built to be completely submerged for their entire service life without danger of water intrusion. They are designed for the toughest environments and extreme temperatures. Firmware can be updated at any time after installation over the air (OTA) for future feature additions and bug fixes.

### **Encoder Capability**

While RG3 offers a battery-free analog encoder and a universal encoder that can retrofit any meter with a removable register, Solo endpoints work with any wired make or model encoder register of any manufacture that use the industry standard UI-1203 communication protocol. They also have the capability to detect most major manufacturer encoder register brands and utilize extended protocols if offered. They are perfect for upgrading older systems from walk-by or drive-by to read from the office AMI.

### Long-Life Rugged Design

- IP68 Environmental Rating for the highest protection against the meter pit environment.
- Ultra rugged 100% solid-state design with no moving parts.
- Fully potted, perfectly tuned, high surface area PCB antenna for excellent propagation.
- Mount in lid antenna for increased range and network stability.
- 20-year warranty (10-year full / 10-year prorated).

### **Two-Way Communication**

- Secure, encrypted, true two-way communication provides greater functionality.
- Time synchronous RF protocol expands efficiency.
- · On Demand Reads assists in billing inquiries.
- Near real-time alerts and alarms improve customer service.
- Remote Over the Air (OTA) updates increase endpoint and system longevity.

### Migratable Between AMI and AMR

- Solo endpoints automatically migrate between drive-by AMR and read from the office AMI.
- Add a data collector and your system will read AMI from the office.
- If no collector is in range, you can read your system by AMR drive-by.
- 120 days of hourly reads stored in the endpoint for data redundancy.

### Plug-and-Play Installation

- Solo installation is quick, easy, and requires no programming.
- Endpoints are pre-configured at the factory for immediate deployment.
- No expertise needed. Install, record data, and move on.
- Automatic successful network communication verification after installation.
- $\bullet$  Endpoint serial numbers are barcoded to reduce human data errors.







### Description

Tesla Solo (Solo) AMI / AMR water endpoints transmit meter data over a point-to-multi-point Licensed Private Network (LPN) in the 450 – 470 MHz band for smart water applications. Tesla Solo endpoints can be used in AMI and AMR applications.

### **Functionality**

**Operation:** Tesla Solo endpoints communicate with an encoder register to capture and relay interval read data and meter status information over 450 MHz point-to-multi-point Licensed Private Network. Two-way communication provides for time synchronization, on demand reads, over the air firmware updates, and remote shut off valve control. Solo endpoints are designed for AMI fixed network reading while offering AMR drive-by reading with no programming. Solo endpoints can be used in Hybrid AMR / AMI systems and can easily migrate from AMR to AMI.



**Activation:** Tesla Solo endpoints are shipped in an inactive, non-transmitting state. After installation, the endpoints begin communicating data once the encoder indicates water has been used. Alternatively, a magnet can be used to manually activate the endpoints and verify the encoder connection.

Data Storage: Tesla Solo endpoints store 120 days of hourly data for local data log retrieval.

**Output Message:** Tesla Solo AMI / AMR endpoints communicate a unique serial number, meter reading data, and applicable status indicators such as flags and alarms.

### **Application**

**Read Strategies:** Tesla Solo AMI / AMR endpoints can be utilized in a drive-by AMR, fixed network AMI or combination of the two read strategies simultaneously with no programming needed.

**Configurations:** Tesla Solo water endpoints can be installed in indoor, outdoor and pit lid applications. As with all radio frequency (RF) endpoints of any manufacturer, mounting through or under a metallic pit lid has a negative impact on antenna propagation. Polymer meter pit lids are highly recommended for optimal performance. The electronics and battery assembly are fully encapsulated in epoxy for environmental integrity. The endpoint is available with a connector assembly for ease of installation.





### **Specifications**

pecifications	
Approvals	FCC part 90 and part 15
Battery	Non-replaceable D-Cell lithium thionyl chloride with HLC capacitor for extended life
Battery life	20 years <sup>1</sup>
Connection to register	Bare wire (splice), RG3, Nicor or other industry-standard connectors
Data resolution	4–8 digits <sup>2</sup>
Encoder disconnect	An alarm is sent if communication with the encoder is interrupted as in the case of theft or vandalism
Endpoint to endpoint synchronization	< 1 min
Firmware updates	Over the air (OTA) firmware updates can be performed remotely via the LPN or onsite through Tesla Drive software
Inputs	Single or dual port
Installation Locations	Interior or exterior wall mount, pit/vault, through-the-lid <sup>3</sup>
Meter encoder compatibility	All RG3 meter and encoders as well as most major manufacturers of water meters <sup>4</sup>
Meter flags and alarms	Back flow, Tamper, Leak, Major Leak, Diagnostic and Battery Status flags as well as supporting extended flags and alarms from multiple meter manufacturers <sup>4</sup>
Meter interface	Pulse or Encoder
Network compatibility	Tesla Net
Network type	Two-way⁵
Network topology	450 - 470 MHz Licensed Private Network (point-to-multi-point)
On-board storage	120 days of hourly readings – per port
Operating humidity	0%-100% non-condensing
Operating temperature	-40° to 185°F (-40° to 85°C)
Physical characteristics	Height 6.5"  Width of Threads 1.8"  Width of Cap at Threads 1.98" (2-1/8" pit lid hole required)  Dimensions of Base 3.2"w x 3.1" d  Weight: 1 lb  Color: black
Remote shut-off	Open, close, partially closed – controlled from Tesla MDM or Tesla Drive software <sup>6</sup>
Security	AES 256 encryption and authentication
AMI read transmission resolution	Hourly
AMI read transmission interval	15 minutes
AMI Major Leak alarm transmission	Immediate
Warranty	20 years <sup>1, 7</sup>
-	

- $^{1}$  Battery life warranty invalid if product is stored more than 1 year before installation and activation
- <sup>2</sup> Reports all digits that are electronically available from register
- <sup>3</sup> Pit/vault installation best performance under non-metallic lid
- <sup>4</sup> Contact factory for specific meters and flags/alarms supported
- <sup>5</sup> Two-way communication for time synchronization, remote configuration, on-demand reads, historical data log retrieval, valve control, and firmware over the air (OTA) updates
- <sup>6</sup> Contact factory for specific valves supported
- <sup>7</sup> Refer to RG3 standard warranty for details



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### **Town of Jerome**

# Addendum to the Request for Proposals for

# **Advanced Metering Infrastructure System**

Please take note that due to an irregularity discovered, most notably with the submission deadline, proposals will be accepted until **Monday**, **December 1**, **2025**, at **5:00** p.m AZST.

Furthermore, there will be **no surety bond requirement upon submission**.

No proposals submitted have been reviewed yet. If you have submitted a proposal and would like to use this extra time to resubmit, please advise Town Manager Brett Klein that you are resubmitting. Otherwise, your previously submitted proposal will be honored.

For questions regarding the RFP, timeline and administrative issues, please contact Brett Klein at: <u>b.klein@jerome.az.gov</u>

For technical questions please contact Public Works Director Marty Boland at m.boland@jerome.az.gov or (520) 904-5272

For a listing of current meters, please contact Michele Sharif at <u>m.sharif@jerome.az.gov</u> or (928) 634-7943