kamstrup

CORPORATE PROFILE

- Founded in 1946 by Olaf Kamstrup in Aarhus, Denmark
- Headquarters and primary manufacturing facility: Skanderborg, Denmark
- Acquired by Danish oil company OK in 1990
- Leading manufacturer of electric, heat, and water meters
- Offices in 20 countries and distributors in 60
- Over 1200 employees worldwide; 300 in R&D
- Highly automated manufacturing with extensive use of robotics
- First ultrasonic meters produced in 1991
- Intelligent flowIQ® ultrasonic water meter released in 2010
- Entered US market in 2013; US headquarters in Atlanta; distributors across the US
- US manufacturing facility in Atlanta started production in early 2018
- Six million water/heat meters sold to date
- Revenue of $247M in 2016
- Fully integrated quality and environment system: ISO 9001, ISO 14001
- flowIQ® ultrasonic waters range from 5/8 through 2 inches
- Starting in 2018, larger meters will be released
- flowIQ® meters are AMR/AMI ready with either internal radios or encoded output
- Published start flow of 0.015 GPM for residential meters

Contact:

Doug McClintic
Regional Sales Manager
Kamstrup
206-858-1261
dkm@kamstrup.com

kamstrup

Product Overview
Water

	flowIQ® 2100	flowIQ® 3101	MAG8000
Typical area of use	Residential	Commercial	Commercial district
Measuring principle	Ultrasonic	Ultrasonic	Magnetic
Nominal flow	25-32 GPM	55-160 GPM	74-179,262 GPM
Minimum flow	0.10 GPM	0.25-0.5 GPM	0.03-90 GPM
Starting flow	0.015 GPM	0.04-0.1 GPM	0.03-90 GPM
Pressure loss at nominal flow	Must not exceed 15 PSI at 20 GPM	Must not exceed 15 PSI at 20 GPM	Unrestricted flow tube
Maximum pressure	250 PSI	300 PSI	145 or 232 PSI
IP Classification	IP68	IP68	IP68
Installation length [mm]	7½" and 9"	10 3/4" - 17"	8" - 60"
Battery life	20 years	20 years	6 years
Available with main supply	No	No	Yes
Info code logger	50 events	50 events	26 events
Data logger	36 months, 460 days	36 months, 460 days	Selectable log interval up to 26 months
Water temperature measurement	Yes	Yes	No
Ambient temperature measurement	Yes	Yes	No
Communication	Wireless M-Bus Encoded output	Wireless M-Bus Encoded output	GSM/GPRS, Pulse, Modbus, Encoded output
Pulse output for volume	No	No	Yes
Suitable for network reading	Yes	Yes	Yes
Suitable for walk-by/drive-by reading	Yes	Yes	Yes

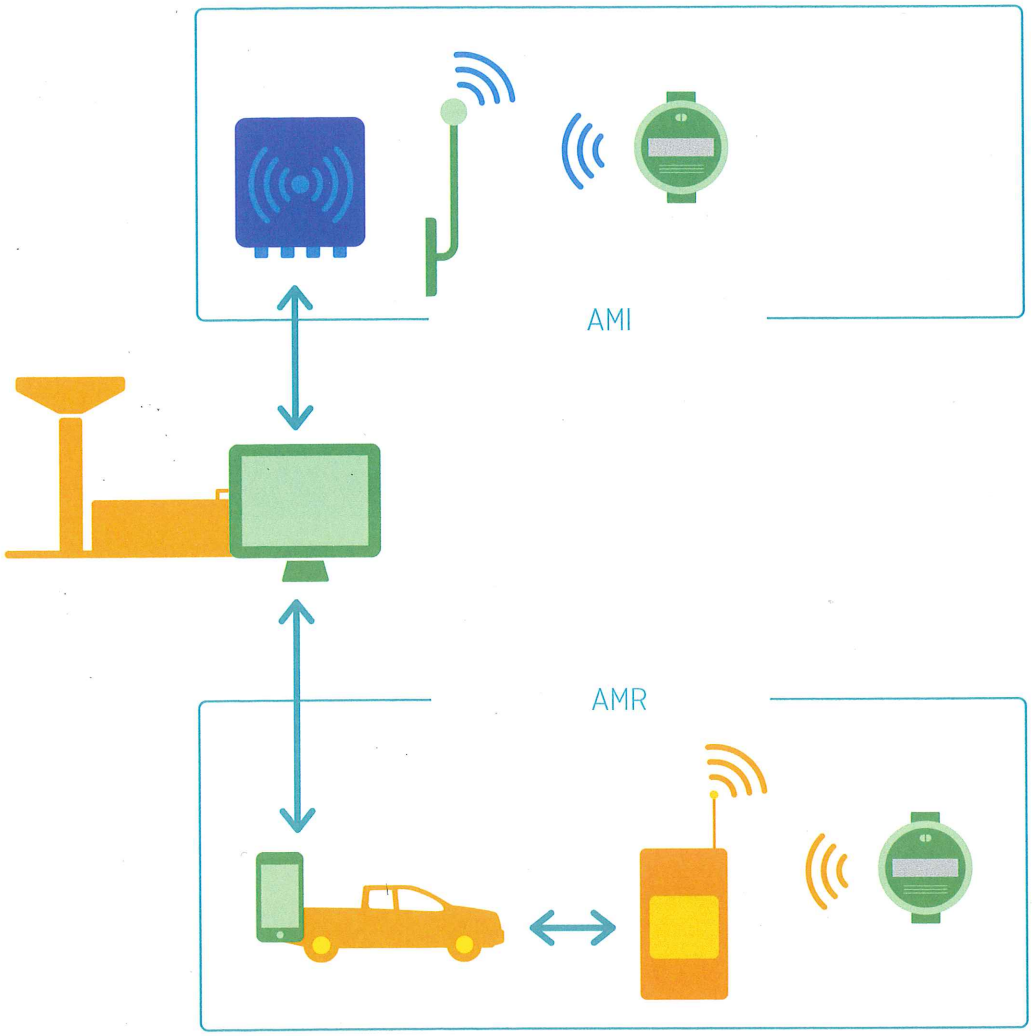
Kamstrup A/S • 58114930_B1_US_03.2018

Kamstrup Water Metering, LLC · 245 Hembree Park Drive, Ste. 110 · Roswell, GA 30076, USA · T: +1 (404) 835-6716 · info-us@kamstrup.com · kamstrup.com

The AMR/AMI Solution

Kamstrup's solution for reading water meters can be used for both drive-by meter reading (AMR) or remote reading via a radio network without leaving the utility (AMI).

The solution is modular, meaning the system offers standardized components that can fit together in a variety of ways. Therefore, your water system can start with AMR and seamlessly progress to AMI – by implementing the system either at one time or in steps. Both the AMR and AMI components are designed for simple installation and commissioning, making it easy to build your own network.



Accurate ultrasonic meters

Kamstrup flowIQ® ultrasonic water meters are based on the transit time method, in which flow is measured by the time it takes for an ultrasonic signal to pass from one transceiver to another. Transit time meters have no moving parts, so they have no risk of wear and tear to the internal components or damage from water impurities. This secures that meters will maintain their accuracy with no drift for the life of the meter.
A specially designed electronic circuit controls all measurements, references, readings, calculations and data communication. The meters are hermetically closed and vacuum-sealed to prevent humidity from reaching the electronics and avoid condensation between the glass and display. The meters is IP68 (submersible) type tested and suitable for installation in meter pits.

Meter and communication unit in one

Combining the communication unit and meter in one compact unit significantly reduces installation costs and time. By eliminating the need for fragile wires between the meter and communication unit, water systems can prevent unplanned budget dollars in maintenance costs due to animals, vandalism, flooding, etc. This adds predictability to future planning.

AMR and AMI meters

The meters are available in two different categories with different communication possibilities. AMR meters are optimized for drive-by operation, while AMI meters can be used for both AMR and AMI meter reading.

AMR meter

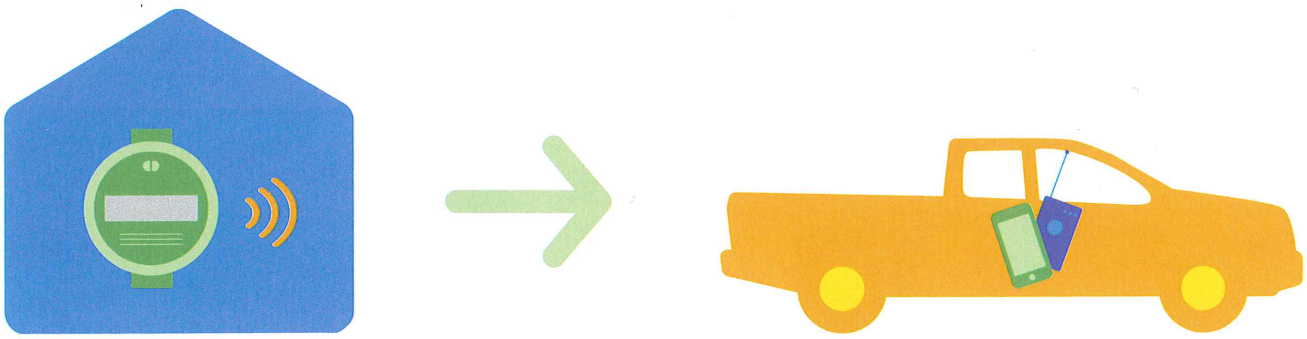
- Perfect for drive-by
- Daily values logged and available via IR

AMI meter

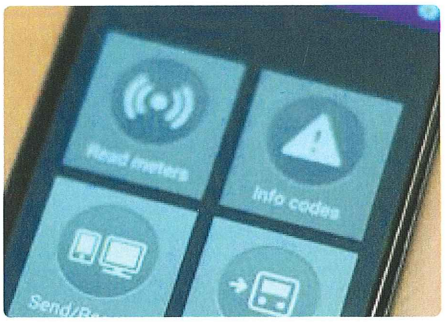
- Perfect for drive-by and AMI
- Hourly values logged and available via remote reading
- Upgradable firmware
- Remote configuring of alarm limit

Reading meters in an AMR Solution

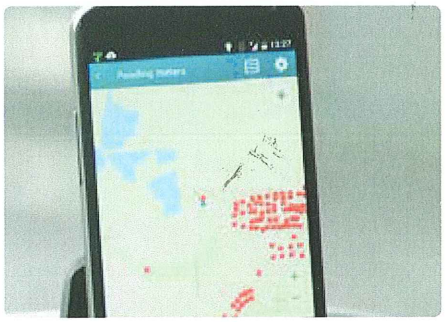
With AMR, meters are read by driving around the supply area with an Android mobile unit (smartphone or tablet) and a small reading unit (READy Converter). Meter data is collected within the READy App. When the reading is complete, meter data is transferred to READy Manager, which is the program on your computer that tracks and stores your meter data.



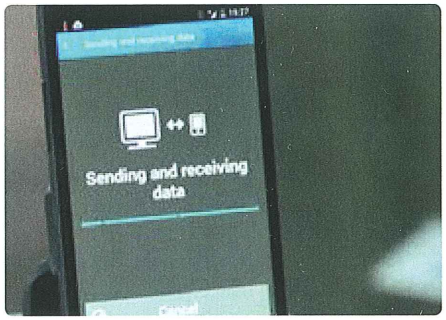
READy App is intuitive, making it easy to use. To start, press the "Send/Receive" button to synchronize data wirelessly between the READy App and READy Manager. Then, simply press "Read meters" on the start screen before starting your route.



During the meter reading process, READy App uses an integrated Google Maps module to show meters that have not yet been read, in order to maximize the efficiency of your route. As soon as the meters are read, they disappear from the map, which provides the meter reader with a clear picture of the remaining meters' locations. The map functions both as an indicator of the remaining meters and as navigation help during the reading. The reading continues during phone calls, but can also be put on hold and continued later.



When the meters have been read, a single push on the button "Send/Receive" makes the data available in READy Manager. This module ensures that the meter reader can continue with other tasks without having to return to the office to transfer data.

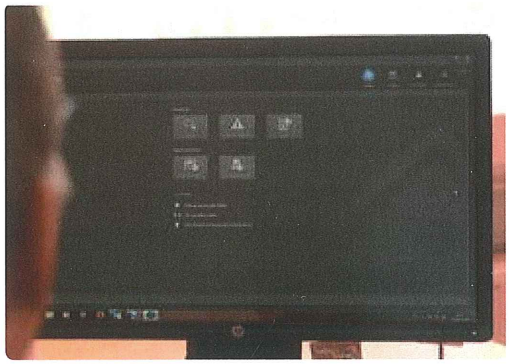


Reading of logged data from AMR meters

In addition to reading meters, the READy App allows for manual reading of the meter's data logger. By placing the Bluetooth®-enabled optical eye on the infrared connection port of the meter, the READy App can access daily consumption and info codes. Meter data can also be made available in READy Manager by synchronizing it in the same way as data read via a mobile unit. This information makes the READy App a useful tool to for you to quickly answer questions and solve billing disputes.

READy Manager

The handling of meters and meter data takes place in READy Manager. READy Manager opens with a start page and icon-based navigation, making the interface intuitive and easy to use. Basic how-to help can be found by clicking the help icon on the start page.



READy Manager – Visualization of meters

The location of each meter is shown directly on a map in READy Manager to ensure the best overview of the installed meters. By clicking a meter on the map, further information about that meter is shown. The map is based on Google Earth, and therefore, it is possible to use the street view function to see physical features and other details about the installation sites.

READy Manager uses bar charts to visualize historical consumption for individual meters. This provides straightforward data from which your water system can make informed decisions about maintenance. In the same chart, info codes are also shown, making it easy to see possible correlations between consumption and info codes. READy Manager also makes it possible to compare multiple meters in the same graphical chart. The comparison includes data from either pressure sensors, district meters or consumption meters.
By comparing pressure and flow in one section, it is possible to discover dimensioning errors and/or assess the need for pressure boosters or pressure reducing valves in parts of the network.

READy Manager - Export of data

To simplify the integration with third-party billing systems, READy Manager makes it possible to export data in flexible export formats. It is possible to generate most formats by selecting the data to export, the order and the separator.
Data can be either exported ad hoc or by creating an automatic job, which exports data to a user-defined FTP/FTPS server in selected intervals.
Alternatively, you can set up READy Manager to automatically send out the read data via email in certain intervals.

The handling of meters and meter data takes place in READy Manager. READy Manager opens with a start page and icon-based navigation, making the interface intuitive and easy to use. Basic how-to help can be found by clicking the help icon on the start page.

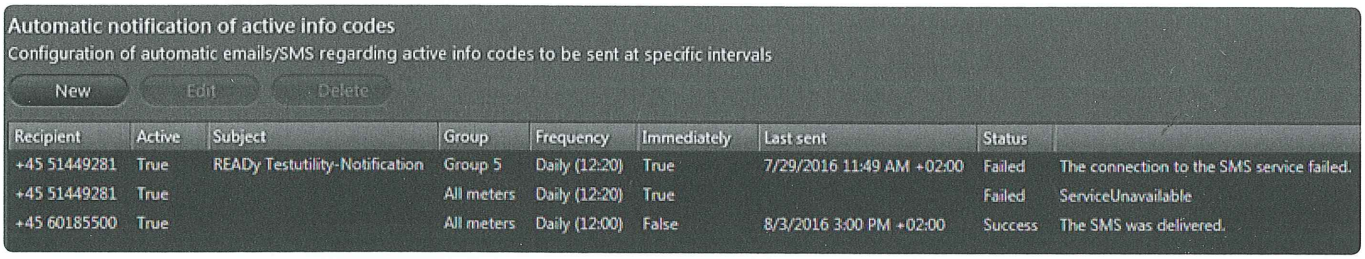
READy Manager – Info codes and notifications

All meters with alarms and other meter notifications (info codes) are shown in the overview menu "Info codes". Here, alarms can be sorted quickly so the newest and most important info codes can easily be found.

Available Info codes	Description	AMR meters	AMI meters
Leak	By monitoring the consumption pattern, the meter is able to identify leaks in the installation. With information about leaks, the utility can warn the consumer before the water bill escalates. Consequential damage from leaking pipes can be reduced when the leak is discovered early.	X Trigger level is configurable via the IR interface on the meter	X Trigger level is configurable from the AMI network or from the street via app and converter.
Burst	If the consumption in a predefined interval exceeds a certain limit, this is registered as a burst. Quickly being aware of bursts can dramatically decrease water loss and the cost of consequential damage.	X Trigger level is configurable via the IR interface on the meter	X Trigger level is configurable from the AMI network or from the street via app and converter.
Tamper	If forced access to the meter is detected, this is registered as tamper. When tamper is registered, the meter will continue to operate and measure, but an indication in the display and the data package will indicate that tampering has been attempted.	X	X
Dry	If the meter is not filled with water, it will trigger the info code "dry". Meters can be dry either because the supply is interrupted, or because the meter has been taken out of the installation i.e. with the purpose of stealing water.	X	X
Reverse	If the water is flowing in the wrong direction in the meter, it is either because the meter is installed in the wrong direction, or because the water is flowing back into the distribution network. In either case it is valuable information for the utility in order to secure revenue or avoid contamination.	X	X

Available Info codes	Description	AMR meters	AMI meters
Low Batt	Some meters might live significantly longer on the battery than specified. Knowing which meters are close to the end of their lifetime makes it possible to improve asset management and lower the lifecycle cost of the meters.		X
Ambient temperature limits	Knowing the ambient temperature of the meter is especially important in areas with temperatures below freezing. The info code "Ambient temperature Low" can warn you of meters that are at risk of frost bursting thus avoiding water loss and consequential damage. The info code "Ambient temperature high" can warn you of risk of bacteria growth and gives you the opportunity to flush water in the system to lower the temperature.		X Trigger level is configurable directly from the AMI network or from the street via app and converter
V1 above Qmax	If a meter is operating outside its flow range, this will result in an info code, giving the utility the chance to change the meter to a suitable size. Right-sizing meters is crucial for reducing non-revenue water and managing pressure.		X

With the notification feature in READy Manager, the system can automatically forward selected info codes via text message and/or email to a user-defined number of recipients. It is possible to determine which meters and which kind of info codes should trigger a text message/email.



READy Manager - Advanced search functions

Being able to easily navigate data collected from AMI is key to harvesting the value of the system. READy Manager has intelligent search functions, where you can combine different categories of meters with freely definable search words. Examples include:

- Choosing to only search among meters that have a certain consumption within a specified period
- Finding all meters with final reads within a specific time period
- Finding all meters where the registers have wrapped the last day

READy Manager – Final read function

With Kamstrup AMI, a final read for consumers moving out can be completed without visiting the meter. The AMI system marks the reading as final for that consumer, indicating the time of vacancy, and is used for final billing. It is possible to search for final reads with the advanced search functions and export all final reads with the export functionality.

READy Manager - Reading performance reporting and visualization

For AMI networks, the demand for high performance is more and more evident. Having the right tool to validate and document the data collection success is important for your operations, as well as other stakeholders, such as city officials. With the performance reading reporting and visualization module, you have access to an overview of the network performance of meters selected. Based on pre-defined performance indicators, you can verify the quality of your network's performance.

Meters available in READy Manager are listed for an easy overview. Each meter is shown within a user-defined area, with its percentage of data messages received. It is possible to create a report that shows the reading performance of a group of meters according to user-defined parameters.