

Acoustic Leak Detection

With the flowIQ® 2200, Leak Detector Software and Kamstrup Services





Preserving water resources is everyone's responsibility, but as a water professional, minimizing water loss and Non-Revenue Water is literally your business.

A proactive approach to fighting water loss

Today ...

Leak detection is often a time-consuming inefficient and expensive task as service connections are often on private property. With limited knowledge about what goes on in your distribution network and the state of your service connections, locating leaks can be like finding a needle in a haystack.

And when you cannot identify where the leaks in your distribution network are coming from, how do you optimize and prioritize your daily work? How do you assess the need for maintenance and future investments?

Just imagine ...

Instead, what if you had real-time data and insight that enabled you the ability to identify and verify potential leaks before they developed into bursts? Or, if you could efficiently prioritize your time and target your resources where you knew they would deliver the most value?

With Kamstrup's next generation solution for acoustic leak detection, which detects leaks upstream of the meter, you'll have full transparency of your distribution network, which ultimately allows you to have the tools you need for an efficient and proactive approach to leak detection and fighting water loss.

Less Non-Revenue Water

Faster and more efficient leak detection enables you to reduce your level of Non-Revenue Water. By lowering operational costs as you distribute less water, you are more likely to meet legislative and environmental goals and requirements. And, with detailed knowledge on leaks and the overall condition of your network, you can better prioritize - perhaps even postpone - investments in maintenance, renovation or additional capacity.



Acoustic Leak Detection

The solution



flowIQ® 2200

flowIQ® 2200 raises the bar for what you can expect from a residential water meter. You get uncompromising accuracy, state-of-the-art built-in acoustic leak detection, full support for remote reading and a host of other intelligent features in one superior meter that is protected from water ingress and has up to 20 years battery-lifetime.



Remote reading

The flowIQ® 2200 offers full support for both drive-by and network remote reading. This ensures efficient, stable and secure meter reading and significantly reduces the time, costs and administration involved in your data collection.



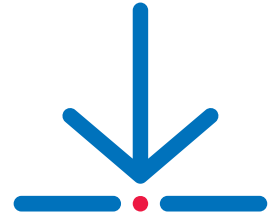
Leak Detector

The accompanying analytics module, Leak Detector, assists you in locate leaks in service connections and distribution mains based on acoustic noise levels registered by flowIQ® 2200 meter. Leak Detector generates a visual map and provides you with insightful data about your distribution network, allowing you to narrow down areas and focus your efforts.



Service & Support

Implementation is done in close cooperation with Kamstrup to ensure that you get off to the best possible start, and you can choose between different options for how much support and training you need. This ranges from standard set-up and onboarding, to service packages where we monitor your network and provide you with a list of possible leaks for further investigation.



\$12
per MP

On average the water lost in service connection has a value of \$12 per meter point every year*

**European statistics.*



22%

leaks on service line*

29%

leaks on service mains*

**Results from Kamstrup conducted in 2020*

Raising the bar for residential water meters based on proven ultrasonic technology

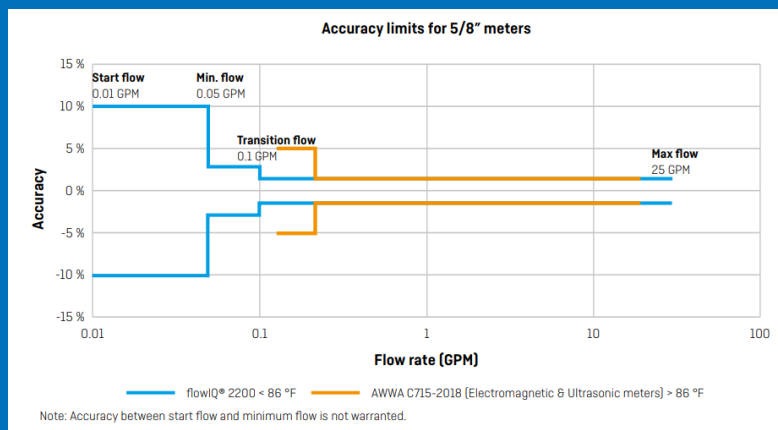
The flowIQ® 2200 smart water meter is the first of its kind with integrated acoustic leak detection. The meter monitors noise patterns that indicate possible leaks in the adjacent pipes and allows you to identify high-risk installations and find leaks in both service connections and distribution mains.

Containing no moving parts, the meter maintains the same high-level of pinpoint accuracy throughout the meter's lifetime. With full support for remote reading, the flowIQ® 2200 offers a number of configurable data packages, both well-known and new intelligent alarms as well as a number of target volumes, volumes, maximum and minimum flows and temperature values.

In addition, the flowIQ® 2200 comes with a new display that shows flow rate and updates every twenty seconds.

Ability to improve customer service

Acting like a fine-meshed network of noise-loggers, the meters listen to the distribution lines and service connections to detect possible leaks. Through early detection of leaks, the flowIQ® 2200 enables you to provide more proactive customer service due to the real-time data that can warn about possible leaks before scale bursts which ultimately can limit the amount of consequential property damage.



flowIQ® 2200 – Technical features

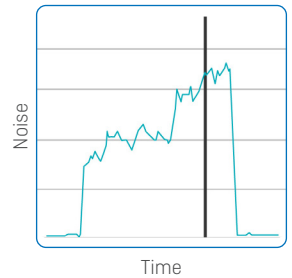
Accuracy and reliability that customers know today, but with add-on functionality of acoustic leak detection.

- Acoustic leak detection
- Flow rate shown in display
- Histogram
- Hourly log
- Remote reading
 - 3 Channel
 - AMR (912.5, 915, 918.5 MHz)
 - AMI (450-470 MHz)
- Intelligent alarms
 - Leak
 - Burst
 - Tamper
 - Dry
 - Reverse Flow
 - Low Battery
 - High ambient temperature
 - Low ambient temperature
 - Overflow
- Flow measurement/display update
 - 1 sec/20 sec (>0.05 GPM)
- Water ingress protection
 - IP68
- Sizes
 - 5/8" x 3/4" x 7 1/2" (1" thread, PPS) 25 GPM
 - 5/8" x 3/4" x 5.1" (1" thread, PPS) 25 GPM
 - 5/8" x 1/2" x 7 1/2" (3/4" thread, PPS) 25 GPM
 - 3/4" x 7 1/2" (1" thread, PPS) 32 GPM
 - 3/4" x 9" (1" thread, PPS) 32 GPM (incl. PPS extender)
 - 5/8" x 3/4" x 7 1/2" (1" thread, stainless steel) 25 GPM
 - 3/4" x 7 1/2" (1" thread, stainless steel) 35 GPM
 - 3/4" x 9" (1" thread, stainless steel) 35 PGM
 - 1" x 10 3/4" (1 1/4" thread, stainless steel) 55 PGM
- Battery lifetime
 - 20 years
- AWWA C715-18 Compliance

5 examples of leaks found by the flowIQ® 2200

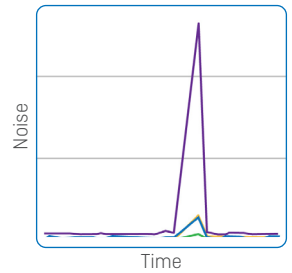
1 Leak turning into a burst on a service connection

When something escalates in the distribution network, it is important to act in time. The example shows a case where a leak was detected the moment the meter was installed, but after a short while this leak quickly rose to be in potential risk of bursting. The leak was discovered before it actually ended up with a burst, saving both money and valuable water.



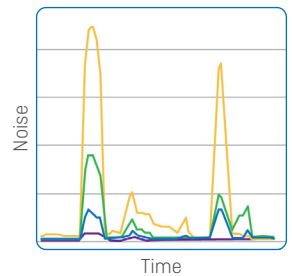
2 Burst inside consumer's home

A sudden spike of high acoustic values indicates that something has deviated - likely either due to extremely high consumption or a burst. The example shows a burst inside a consumer's home, which was also detected by the neighboring meters. This kind of correlation is particularly interesting as it will be able to detect acoustic changes far out in the distribution network.



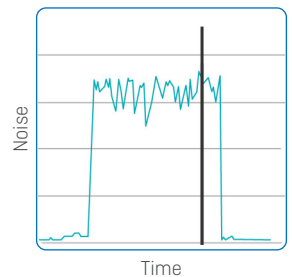
3 Simulated leak on service connections

This example shows a simulated leak on a service connection close to the main pipe. This leak was approximately 2.2 GPM to 3.3 GPM, and therefore a relatively large leak that would have had a costly effect. In the figure there is a clear representation of the spikes in the acoustic noise created by the leak as it was "turned on" which could be detected by several meters.



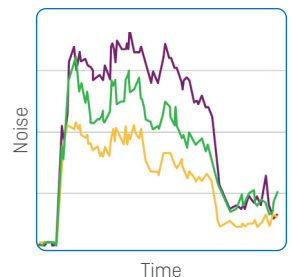
4 Leak on service connection

Leaks on service connections can be a black-box for many utilities, and they often require a lot of time and effort to find. This example shows multiple leaks discovered on service connections and a rapid increase in acoustic values. This spike happened just after the flowIQ® 2200 was installed, and a leak was detected instantly.



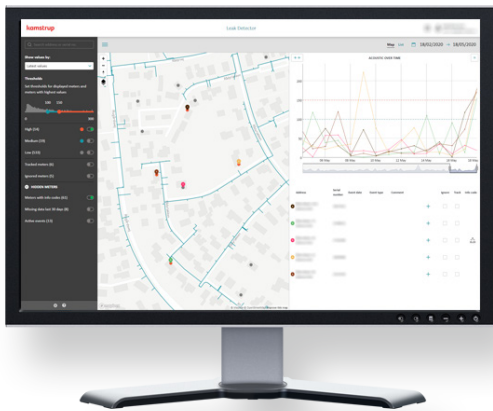
5 Leaking fire hydrant

The flowIQ® 2200 can also register leaking fire hydrants. In the figure, one of the leaky fire hydrants was registered by several meters in close proximity, which can be seen in the similar pattern in the acoustic values. The leak was repaired and the noise fell to a normal level again.



Leak Detector

Easily identify leaks on service connections and distribution mains based on acoustic data noise in a cloud-based platform aimed at analyzing data



Leaks can be caused by a variety of reasons and often difficult to detect. With acoustic noise data from your water meters, leaks can now be detected in an entirely new way. Leak Detector, the analytics module in conjunction with the flowIQ® 2200, enables you to locate leaks based on acoustic noise levels registered by the meter, which means time can be spent fixing leaks instead of searching blindly for them.

Leak Detector provides a map-based overview of your supply area and shows your meters with intuitive color coding representing the noise level registered by each, with graphs visualizing the development over time. The module enables you to easily identify high-risk installations where elevated noise levels indicate possible leaks or bursts.

With faster and more efficient leak detection, you can reduce the cost per identified leak and also reduce Non-Revenue Water. Detailed knowledge about high-risk installations with possible leaks and the overall condition of your network will also enable you to prioritize your daily efforts to when and where they will have the biggest impact.

Identifying high-risk installations

The map in Leak Detector shows your meters with intuitive color coding representing the acoustic noise level in the surrounding pipes registered by each meter.

Filters and customizable thresholds let you control what meters are shown on the map. You can filter out meters with low noise levels, so you can focus on the meters where the risk of a leak is highest. You can also correlate the noise data from one meter with that of others to look for nearby meters with similar noise patterns, which could indicate a possible leak on a distribution main.

Noise data visualized

As you select one or more meters, graphs visualize the registered acoustic noise over time, allowing you to follow the development.

This enables you to take action as soon as the noise reaches a critical level. It also helps you to distinguish meters with a noise level caused by a leak from meters in which the noise is caused by something else, such as a circulation pump.

Increased transparency

Leak Detector provides the ability to increase overall transparency in your supply area.

A reduction in water loss will lower your operational costs. It also will limit your overall costs, and help you to meet environmental and legislative goals and requirements.

Set-up for success

Implementation of a smart meter solution with acoustic leakage detection including flowIQ® 2200 water meters and the Leak Detector analytics module is done in close cooperation with Kamstrup to ensure that you get off to the best possible start. You can choose between different options for how much support and training you need.

A range of services and training offerings are available to support you in fighting Non-Revenue Water. By working in close cooperation with Kamstrup you can choose between different options for services, support and training to scale and customize your needs for not only today, but also the future.

Up & Running Service

With Up & Running Service, you get off to a better – and faster – start utilizing the Leak Detector module by having Kamstrup provide set-up and dedicated guidance on module overview.

Who is this for?

Up & Running Leak Detector is for those who want turnkey help creating the right foundation for maximizing the Leak Detector module.

What's in it for you?

- Minimal time investment and hassle
- Proper foundation for efficient use
- Faster time to use

Leak Monitoring Service

With Leak Monitoring Service, Kamstrup monitors your service connections through the Leak Detector module and then notifies you of potential leaks to give you the information you need to efficiently verify and locate them.

Who is this for?

Leak Monitoring Service is for those who want to improve detection of leaks in service connections by having someone else monitor them.

What's in it for you?

- Efficient use of field time
- High hit rate for beating leaks
- Improved customer service and satisfaction

Pipeline Integration Service

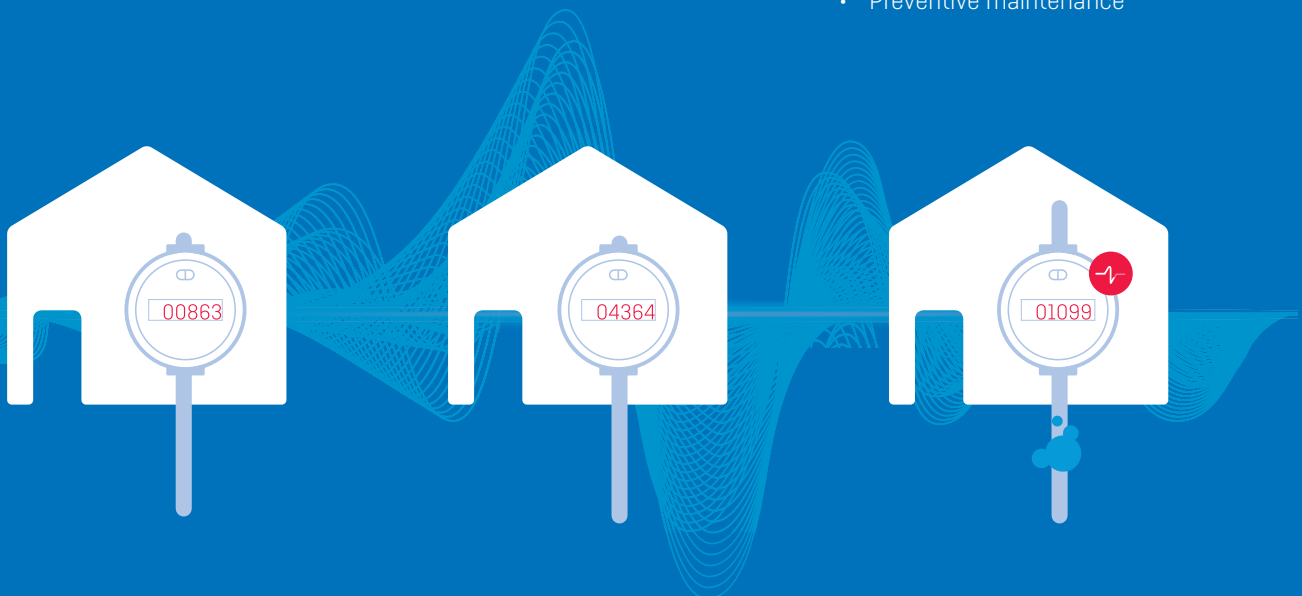
Pipeline Integration for Water Intelligence provides an improved overview of your assets, the ability to pinpoint incidents and a better understanding of potential improvements to pipeline design. With Pipeline Integration Service, your pipeline layout will be integrated into your water intelligence module.

Who is this for?

Pipeline Integration Service is for utilities that want better transparency of their distribution network through the various Water Intelligence modules but want to outsource the integration.

What's in it for you?

- Increased transparency
- Preventive maintenance



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