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How Aquamonitrix® Uses Octave to Revolutionize Water Quality Monitoring

Nitrate/nitrite pollution is one of the most widespread, costly and challenging environmental problems globally. It poses threats to the health and amenity value of rivers, lakes and coastal ecosystems and the supply of safe and affordable drinking water.

But getting a handle on this problem hasn't been easy given that nitrogen-related pollution comes from many diverse sources, and existing automated, real-time monitoring tools for nitrate and nitrite are fraught with problems.

QUICKFACTS

Company

Aquamonitrix®
www.aquamonitrix.com

Customer Profile

Aquamonitrix® is a ground-breaking water quality analyser designed to provide accurate, real-time information on nitrate and nitrite levels in fresh and effluent water. Aquamonitrix is being brought to market by Aquamonitrix Ltd – a spinout backed by the resources of its parent company T.E. Laboratories (TelLab), which has a 30-year track record in laboratory analysis, chemical production, water and wastewater research and new product development.

Objectives

Aquamonitrix wanted to build a remote monitoring IoT application so it could provide real-time data on water quality to its users.

Sierra Wireless Products and Services

- Sierra Wireless Octave™, the all-in-one edge-to-cloud for connecting industrial assets to the cloud

Solution Partner

- Linkwave Technologies



“By working with Sierra Wireless and Linkwave Technologies, we’ve been able to launch a cost-effective portable water monitoring solution. ”

Alan Staunton,
New Product Development Lead
Aquamonitrix

As a result, many water resource managers continue to rely on the traditional, costly method of employing service engineers to manually take samples, bring them to a centralised lab for testing – and then wait for hours – or more typically days – for the results.

Aquamonitrix® is set to change all this as a new type of sensor, overcoming the challenges that have beset real-time nitrate and nitrite analysis.

For instance, some existing real-time analysers only function when the water sample is perfectly clean and clear, whereas Aquamonitrix® incorporates a separation step that allows it to analyse ‘dirty’ or cloudy real-world samples, without any loss of accuracy or performance. Moreover, because the sensor sits outside the water, it does not succumb to biofouling.

Accuracy drift is an issue with other analyser types, requiring users to carry out frequent and fiddly re-calibration, whereas Aquamonitrix typically requires no intervention over prolonged deployments.

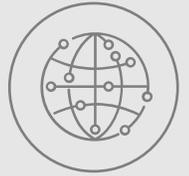
A third class of real-time analysers occupy a massive footprint and are prohibitively expensive. In contrast, Aquamonitrix® is compact, lite-weight and portable. Moreover, its total lifetime costs are low since no specialised technical skills are required to set it up, operate it or service it.

OFFERING THE BENEFITS OF REAL-TIME DATA TRANSMISSION TO ALL USERS

With these benefits, Aquamonitrix® makes access to real-time information on nitrate and nitrite in water systems practical and affordable. This offers water managers break-through opportunities to react immediately to nitrate-related pollution events, avoiding fines, environmental damage and reputation loss.

Likewise, because Aquamonitrix® allows for near-continuous monitoring, episodic pollution events need no longer go undetected. Moreover, users can gather sufficient data to better model and understand nitrate/nitrite sources and treatment dynamics, enabling them to arrive at evidence-based, optimised solutions.

“ Octave’s innovative technology helps us capture critical data on water quality every few seconds. By getting up-to-date information on water quality, management can make data-driven decisions and ensure regulatory compliance. Moreover, Octave’s efficient power consumption allows longer deployment periods, diminishing maintenance needs and providing an integrated monitoring solution that is cost-effective. ”



Alan Staunton, *New Product Development Lead, Aquamonitrix*

Some larger scale Aquamonitrix® users may decide to use their SCADA system to transmit data directly from the analyser to their centralised control infrastructure. But for users without SCADA capability, the team has developed Datamonitrix as a dedicated, cloud-based platform for receiving, storing and managing analyser data.

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Recognising that their expertise lies in chemistry and sensor design, not in cloud enablement, the team decided not to reinvent the wheel. Instead, they sought out a technology partner to help them bring the benefits of real-time data transmission to all users.

USING OCTAVE TO CONNECT AQUAMONITRIX TO THE CLOUD

In 2020, Linkwave Technologies, a UK-based Sierra Wireless Partner, introduced the Aquamonitrix team to Octave™, Sierra Wireless’s complete edge-to-cloud solution for connecting industrial assets to the cloud.

Here is a summary of why Aquamonitrix chose Octave and Linkwave Technologies to build its remote monitoring IoT application:

EDGE TO CLOUD SOLUTION

Being a complete solution, Octave provides not just the edge devices that extract data from the Aquamonitrix sensors, but also cellular connectivity and cloud actions that securely transmit sensor data over low power cellular networks to the Octave cloud portal. Engineers at Aquamonitrix did not have to build an IoT infrastructure from scratch; instead, they were able to rely on Octave and focus on what matters most – the data on water quality.





SIMPLIFYING DATA EXTRACTION

Aquamonitrix sensors do not use a standard industrial protocol, making the process of extracting and processing data from the edge a more complex. Unlike other IoT solutions, Octave can easily extract data from Aquamonitrix's proprietary communications protocol. At the edge, Octave's intelligent FX30 Gateway uses a highly versatile Octave feature, the Universal Serial Parser (USP), which can extract relevant data from most proprietary serial protocols.

PUSHING CHANGES FROM THE CLOUD TO THE EDGE

Octave offers Aquamonitrix the flexibility to easily customise and update its remote monitoring application. Aquamonitrix can push commands, configuration parameters and edge action code from the Octave portal to instantly change settings and its sensors' mission profile as and when it wants.

SIMPLIFYING CONNECTIVITY AND MINIMIZING DATA CONSUMPTION

Because Octave comes with built-in connectivity, it can dynamically choose from and automatically connect to the best available cellular network from its long list of 600+ partner networks in over 190 countries. Further, by using Octave to process data at the edge, Aquamonitrix need only send relevant data to the cloud, which reduces their IoT application's overall data consumption.

ACCELERATED TIME-TO-MARKET

Supported by Linkwave Technologies, Aquamonitrix was able to launch its remote monitoring application in a matter of months. Linkwave demonstrated Octave to Aquamonitrix in May 2020. Aquamonitrix took less than five months to build a proof of concept, test it in the field and to finally launch its remote monitoring application in Q1 of 2021.

CLOSE COLLABORATION WITH OCTAVE PARTNER

Linkwave Technologies' outstanding support as an Octave Partner ensured that Aquamonitrix's IoT project progressed smoothly and to planned timescales. By maintaining a close feedback loop between Aquamonitrix and Sierra Wireless, design issues and bugs were identified and resolved in a timely manner. Linkwave

also worked very closely with Aquamonitrix to specify and develop the Datamonitrix cloud portal from scratch and to deliver it in record time. It further provided a practical antenna implementation for the Aquamonitrix sensor unit.

“By working with Sierra Wireless and Linkwave Technologies, we’ve been able to launch a cost-effective portable water monitoring solution” Alan Staunton, New Product Development Lead at Aquamonitrix. “Octave’s innovative technology helps us capture critical data on water quality every few seconds. By getting up-to-date information on water quality, management can make data-driven decisions and ensure regulatory compliance. Moreover, Octave’s efficient power consumption allows longer deployment periods, diminishing maintenance needs and providing an integrated monitoring solution that is cost-effective.”

“With Octave’s Universal Serial Parser, it was possible to extract the data from Aquamonitrix sensors and process it at the edge to report data or alerts in a timely fashion to the cloud. We’ve been able to focus our efforts on the development of the sensor business application, to add value to the data on the cloud side for Aquamonitrix” said Andrew Newton, managing director at Linkwave Technologies Ltd.

LEARN MORE

Learn more about Aquamonitrix or find out how Octave is helping companies simplify their IoT journey.

About Sierra Wireless

Sierra Wireless (NASDAQ: SWIR) (TSX: SW) is the leading IoT solutions provider that combines devices, network and software to unlock value in the connected economy. Companies globally are adopting IoT to improve operational efficiency, create better customer experiences, improve their business models and create new revenue streams. Whether it’s a solution to help a business securely connect edge devices to the cloud, or a software/API solution to help manage processes associated with billions of connected assets, or a platform to extract real-time data to make the best business decisions, Sierra Wireless will work with you to create the right industry-specific solution for your next IoT endeavor.

For more information, visit www.sierrawireless.com.

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