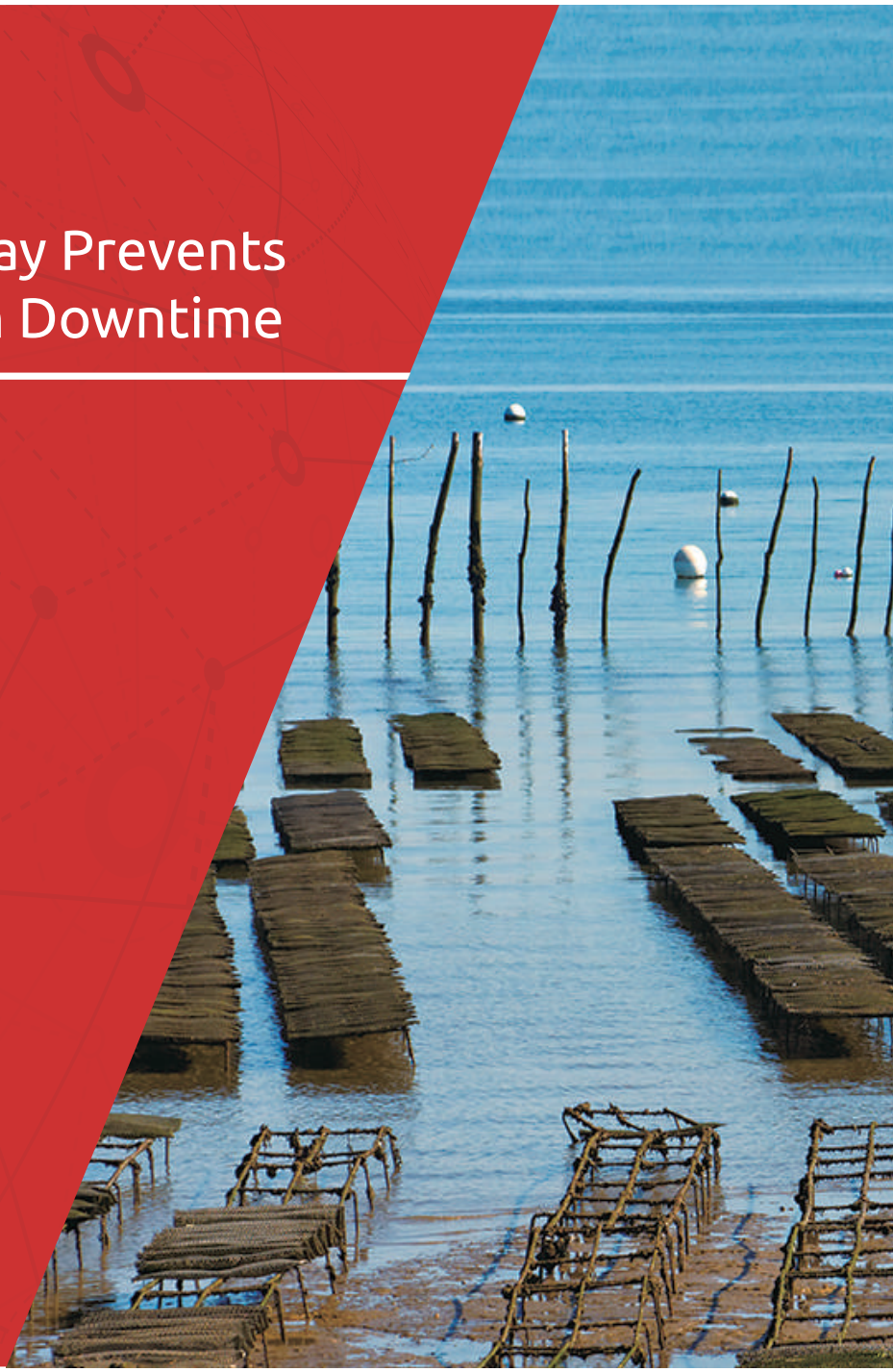
ADLINK
Leading EDGE COMPUTING

Application Story

ADLINK IoT Gateway Prevents Costly Oyster Farm Downtime



www.adlinktech.com

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Oysters possess the innate ability to absorb contaminants from their immediate environment. When runoff from heavy rainfall reaches estuaries in which commercial oyster beds are situated, harvesting must be stopped until the oysters are free of health-threatening contaminants. Such shutdown decisions are often made based on the determination of weather stations distant from the oyster farms with no actual water samples to analyze.

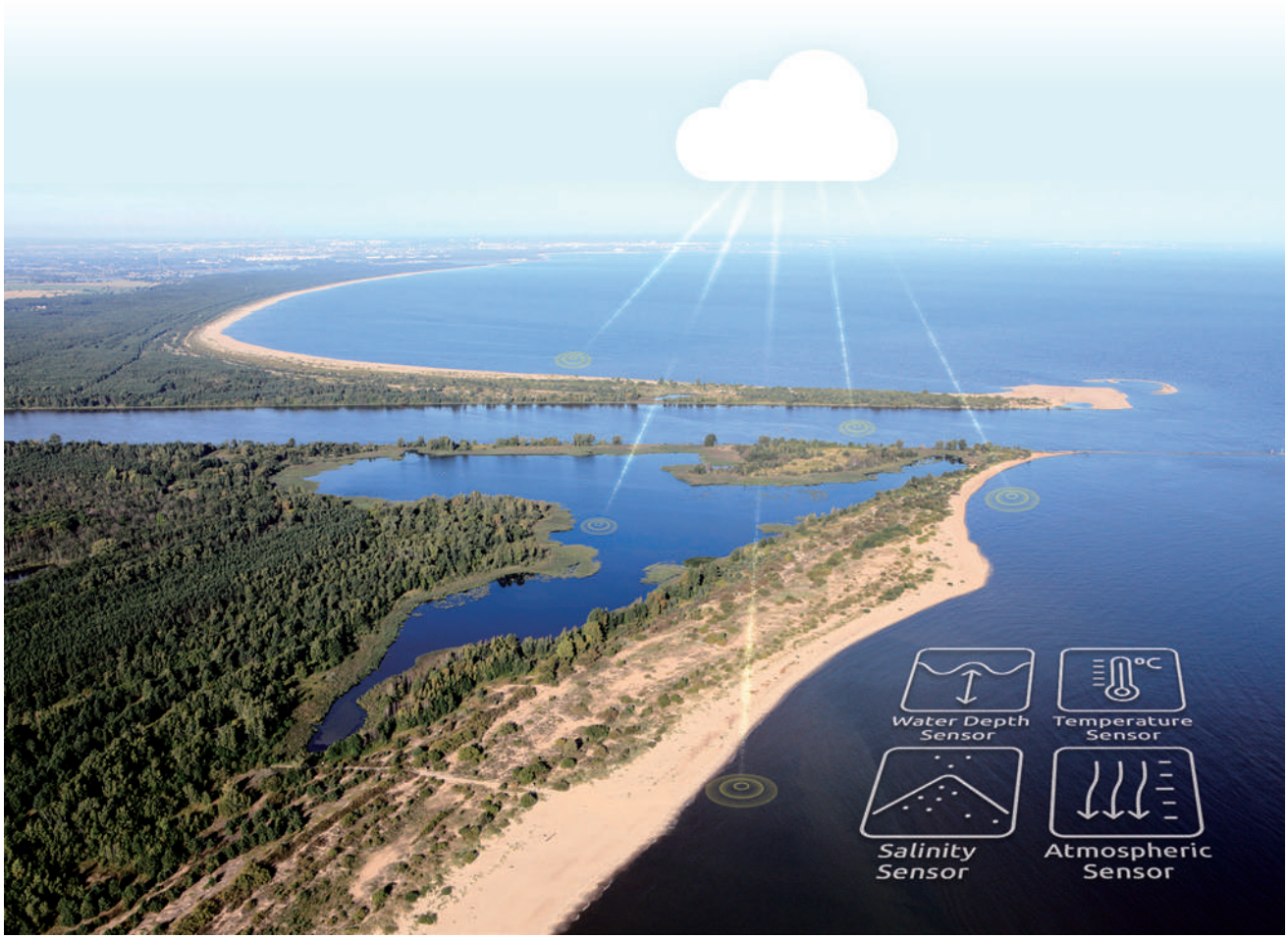
Lack of the right data at the right time to accurately assess actual contamination creates considerable frustration for oyster farming operations in Australia. Currently accessed weather data frequently fails to reflect real onsite environmental conditions, resulting in unnecessary shutdowns causing financial losses of up to AUS$100k per day. As well, hands-on onsite analysis to support decision making, including water sample acquisition with subsequent salinity/contaminant testing, in vitro contamination measurement, and others, is time-consuming and labor-intensive.

ADLINK's Solution

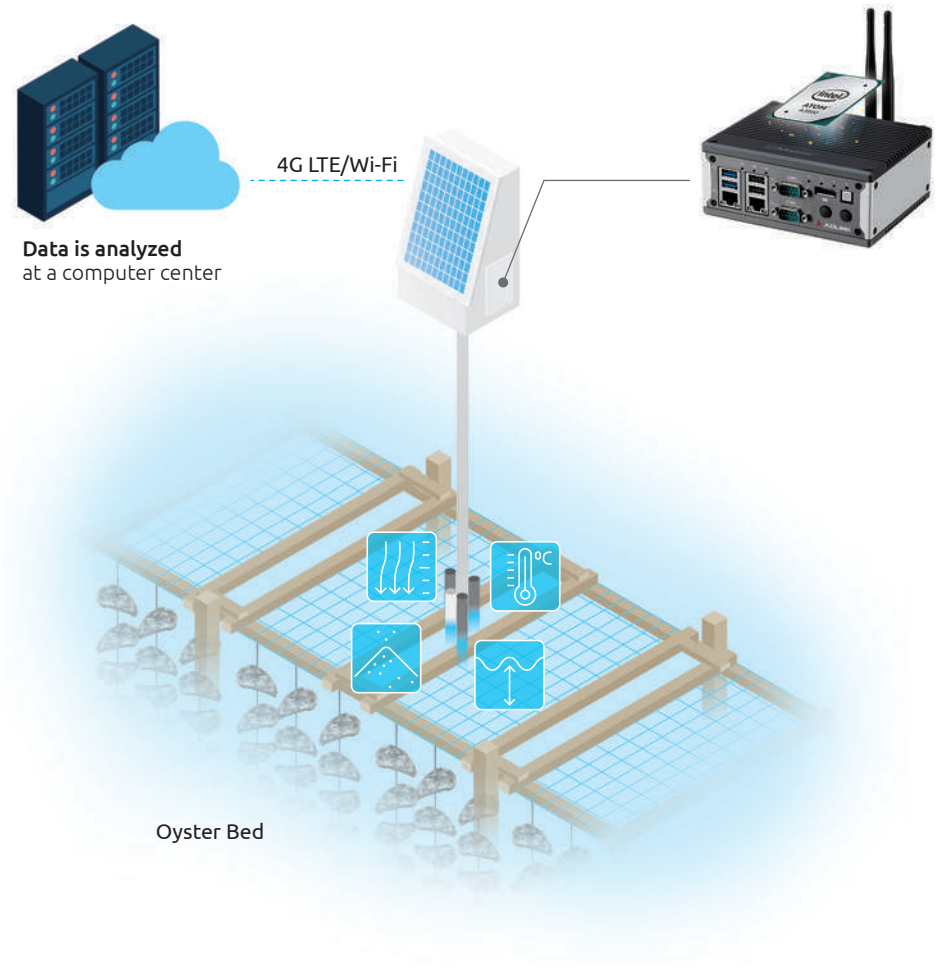
ADLINK's IoT Gateway Solution consists of the ultra-compact ADLINK MXE-212i IoT Gateway based on Intel Atom® X5-E3930 processor and container-based Wind River® Pulsar™ Linux OS, delivering IoT connectivity, robustness, and security, as demanded in aquaculture applications.

Connectivity Delivers Smart Aquaculture

Despite its fitting in the palm of your hand, the MXE-212i fully supports three wireless communication protocols, leveraging the Intel Atom processor's rich high-speed interfaces. Key water quality readings are acquired by sensors via 6LoWPAN, including salinity, temperature, depth, and atmospheric pressure. Collected data is transmitted via Wi-Fi and LTE to a cloud platform where it can be accessed remotely in near-real time, analyzed incorporating machine learning algorithms, and shared with regulatory authorities and research bodies.



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MXE-212i

- 4G LTE, Wi-Fi, and 6LoWPAN in a gateway
- Ruggedness, compact & -40~85°C support
- Container-based Pulsar Linux to isolate applications

"Reduce Unnecessary Closure by 30%"

Robust 24/7 Operation

The MXE-212i is engineered from the ground up to ensure system reliability, 24/7. The low-power dual-core Intel Atom processor not only empowers the MXE-212i for data acquisition but also helps sustain a low thermal footprint. This allows the MXE-212i to accommodate a -40 to 85°C operating range with fanless passive cooling. Further, rugged construction keeps the MXE-212i impervious to salt and fresh water spray and airborne contaminant ingress, making it ideal for measuring stations in practically any aquaculture environment.

The MXE-212i's system performance and status are monitored by the built-in Smart Embedded Management Agent (SEMA®) utility, providing timely remote checks on power cycle, system uptime, and boot errors to enable system health diagnosis and facilitate troubleshooting.

The container-based Pulsar OS, with parallel silo-type deployment of applications, enables significantly enhanced resistance to operational disruption from application errors. If one application fails, the OS allows other applications to keep running, preventing the IoT gateway from suffering complete shutdown.

Secured Data

Multi-layer protection prevents the MXE-212i from tampering following deployment. At the hardware level, Trusted Platform Module (TPM) can boot the MXE-212i to a secure state, while Intel® Boot Guard easily circumvents unauthorized software and malware takeovers. At the OS level, Pulsar provides update capabilities, continuous security monitoring, and vulnerability protection to mitigate risk.

In conclusion, with ADLINK's IoT Gateway solution, oyster farmers and regulatory authorities can monitor onsite water quality in near-real time. If salinity drops, indicating increased runoff with potential contamination, quantified data can be analyzed to predict water quality, reducing unnecessary shutdown by 30%. Better understanding of underwater conditions can alert aquaculture operators in advance and allow harvesting and staff roster adjustment while food safety remains uncompromised.

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