CSignum Launches Through-Ice Wireless Monitoring

Year-round wireless water monitoring now possible as CSignum announces through-ice wireless monitoring capability with its EM-2Q system.

EDINBURGH, UNITED KINGDOM, January 22, 2026 /EINPresswire.com/ -- CSignum, the leader in wireless data communications for underwater and underground applications, today announced through-ice wireless monitoring with the patented EM-2Q electromagnetic field signalling (EMFS) system. The system enables continuous, real-time water quality monitoring throughout winter conditions when traditional wired systems fail.

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>
> *Jonathan Reeves, CEO at CSignum*

Critical monitoring is often suspended for several months annually, leaving a blind spot during a period of significant biological and chemical change in lakes, reservoirs, and inland water bodies, as ice formation typically forces monitoring equipment to be removed or disabled for several months each year.

Surface cables are prone to damage and failure as ice forms and shifts, creating safety risks, equipment loss, and significant gaps in environmental data.

CSignum's EM-2Q system addresses this long-standing challenge by enabling wireless data transmission through water, ice, and surface barriers, eliminating the need for exposed cables that are vulnerable to winter conditions.

"Seasonal ice has historically meant 'no data' for much of the year," said Jonathan Reeves, CEO at CSignum. "With EM-2Q, monitoring devices can remain in place year-round, delivering continuous insight into under-ice conditions that have been largely unmeasured until now."

The ability to maintain monitoring under ice is critical for understanding water system health across seasonal cycles:
- Under-ice conditions drive key processes that influence water quality through spring and

summer, yet these processes are poorly characterised due to winter data gaps.
- Oxygen depletion beneath ice cover can significantly impact fish populations and overall ecosystem health but often goes undetected until adverse effects appear.
- Phosphorus release from sediments occurs more frequently under ice, contributing to nutrient loading and increasing the risk of harmful algal blooms later in the year.
- Ice thickness and duration influence summer algae growth, yet the lack of winter measurements limits the ability to understand and manage these outcomes.
- Cable failures frequently force the removal of monitoring devices at the first sign of ice, while broken cables can result in the permanent loss of submerged equipment.

EM-2Q allows wireless through-ice monitoring

By enabling continuous real-time under-ice monitoring EM-2Q allows researchers, utilities, and environmental agencies to capture a complete annual picture of water system behaviour and immediate reaction in the event of equipment failures.

EM-2Q uses low-frequency electromagnetic fields to transmit data wirelessly from submerged sensors to above-surface EM-2 gateways, providing real-time, on-line monitoring. The gateway uploads measurements to the cloud for real-time remote monitoring.

The system is well suited to long-term deployments in harsh and seasonally variable environments and can be integrated with a variety of industry sensors to monitor environmental and other parameters.

The through-ice capability builds on CSignum's broader work in wireless monitoring for water quality, infrastructure, and environmental applications where conventional communications methods are impractical or unreliable.

"This capability closes one of the biggest data gaps in water monitoring," added Reeves, "It allows four-season monitoring which is critical for accurate modeling. Two-way communications allows future applications where control of under ice devices is required."

With year-round monitoring now feasible, organisations can better understand seasonal nutrient cycling, anticipate oxygen-related stress events, and make more informed decisions about water

management, fisheries protection, and environmental compliance.

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