LATTICE GATEWAY

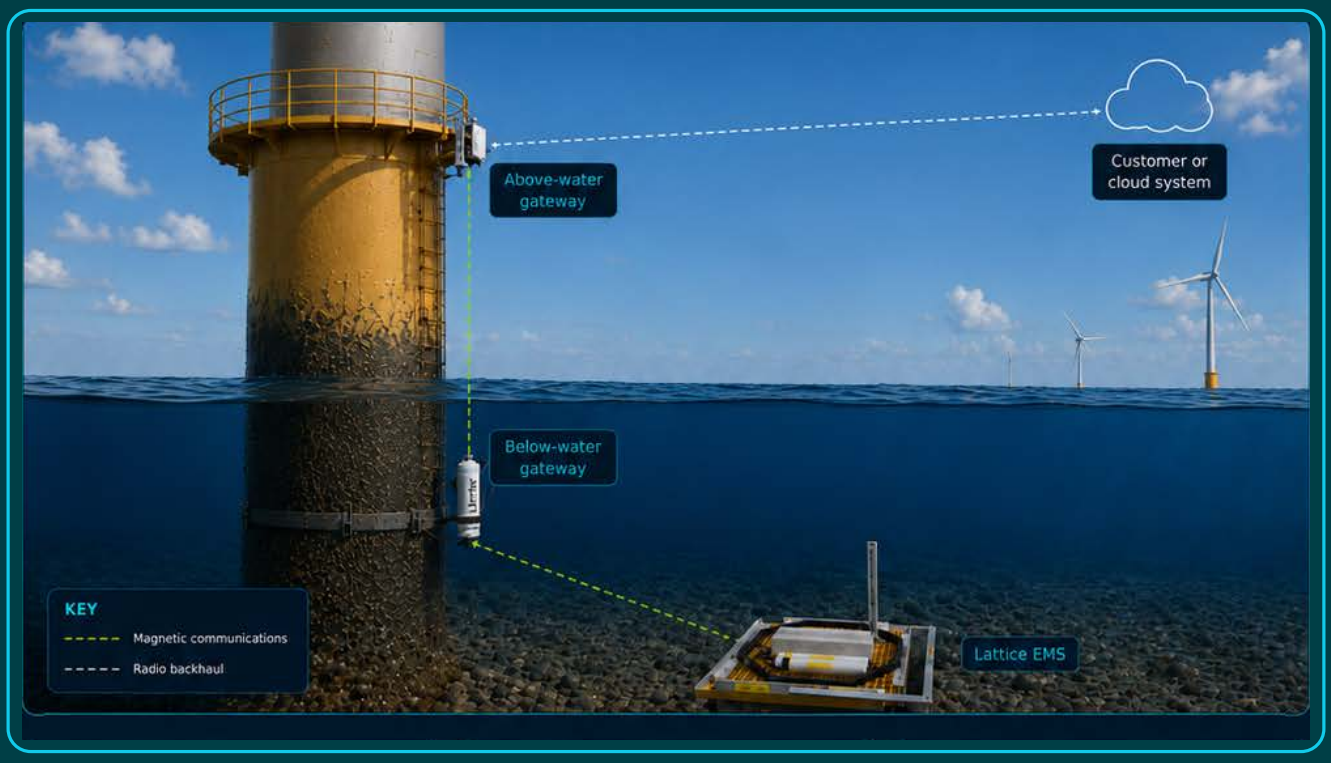
Topside-to-seabed wireless communications

Lattice Gateway is the route from installed subsea Lattice devices to operator systems. It collects selected sensor and device-health information, transfers it across the water-air boundary and passes it to the vessel, platform or cloud service.

The architecture is modular. A below-water gateway receives information from Lattice devices through magnetic communications in shallow water or an acoustic link in deeper water. It transfers that information magnetically to an above-water gateway. The above-water gateway connects to the selected local and backhaul network.

INFORMATION RECOVERY

Lattice devices retain detailed local information. The Gateway transfers the selected information required for operations, maintenance planning, asset-integrity management and security decisions. Local buffering and store-and-forward operation maintain the information service when backhaul is unavailable.



Fixed installation example: Lattice device to below-water gateway, above-water gateway and customer or cloud system.

FROM DEVICE TO CLOUD

Fixed, mobile and hybrid deployments

SUBSEA COLLECTION

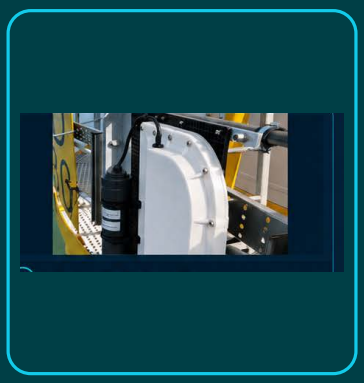
A below-water gateway is mounted on a subsea device, seabed frame, fixed structure or ROV-operated reader. In deep water, each remote Lattice device can link directly to the submerged gateway using a hybrid magnetic-acoustic link. In shallow water, the local link can remain in the magnetic domain.

THROUGH THE WATER-AIR BOUNDARY

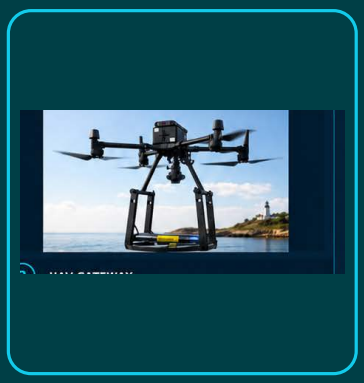
The submerged gateway transfers selected information to an above-water gateway using low-frequency magnetic communications. The above-water gateway can be fixed to a handrail, pipe, vessel, buoy or adjacent structure. The magnetic link avoids a through-water cable, wet connector or dunker.

LOCAL INTERFACE AND BACKHAUL

Bluetooth/BLE is the standard local interface. Ethernet, 4G, 5G, Wi-Fi, Starlink or the customer network can provide the onward connection. The selected route is matched to the deployment, vessel or asset. The system can also be configured for a mobile gateway carried by an ROV or UAV.



ABOVE-WATER GATEWAY



MOBILE GATEWAY



BELOW-WATER GATEWAY

PILOT-TRIAL SCOPE

A representative trial should verify the full link: Lattice device, acoustic or magnetic subsea link, below-water gateway, magnetic water-air link, above-water gateway, selected backhaul and delivery to the operator system or cloud.

TECHNICAL PERFORMANCE

Lattice Gateway configurations and interfaces

GATEWAY CONFIGURATIONS

Configuration	Deployment and function
Below-water gateway	Subsea device, seabed frame, fixed structure or ROV-operated reader. Receives local Lattice information and forwards it to the above-water gateway.
Above-water gateway	Handrail, pipe, vessel, buoy or adjacent structure. Receives the magnetic water-air link and connects to the local interface and selected backhaul.
Mobile gateway	ROV or UAV deployment for information recovery from remote Lattice devices where a fixed gateway is not required.

COMMUNICATIONS AND INTEGRATION

Technical parameter	Performance or configuration
Local subsea link	Magnetic communications in shallow water; hybrid magnetic-acoustic link to the submerged gateway for extended reach.
Magnetic range	Up to approximately 50 m through water; approximately 150-200 m across seabed. Final performance follows the project link budget.
Network and integration	Bluetooth/BLE as standard; Ethernet, 4G, 5G, Wi-Fi, Starlink or customer network. Ethernet-facing TCP or serial interface available for system integration.
Power, service and deployment	Battery-powered or hard-wired above-water options. Wireless ROV hot-swap battery service where specified. Final power, depth, enclosure, hazardous-area requirement, mounting and duty cycle follow the deployment.

Indicative information. Final configuration is confirmed against the selected equipment, link budget and deployment geometry.