

Hexagon Bulk Inventory 3D Silo

Real-time 3D bulk and rock measurement for marine and offshore operations

Radar-based bulk inventory monitoring

The Hexagon Bulk Inventory 3D Silo is a high-resolution radar-based inventory monitoring solution for shipboard bunkers, storage holds, and bulk material containers. By generating a three-dimensional representation of the material surface, the system provides accurate volume calculations and detailed insights into material distribution throughout the entire bunker.

Unlike conventional level sensors, Bulk Inventory 3D Silo captures the complete material topography, allowing operators to identify uneven loading, material segregation, voids, build-up, and flow-related issues that would otherwise remain undetected.

Reliable performance in harsh marine and offshore environments

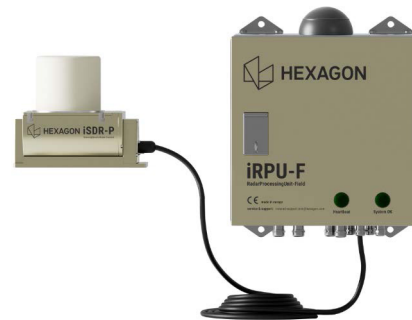
The system operates reliably in harsh dredging, marine, and bulk-handling environments using contactless 3D radar measurement, including low-visibility, high-particulate, and temperature-extreme conditions. Unlike LiDAR or laser-based systems, performance is unaffected by low visibility or airborne particulates, continuing operations while other optical systems degrade.

Precision measurement and monitoring

Unlike conventional level sensors and manual inventory estimation methods, Bulk Inventory 3D Silo creates a complete three-dimensional model of the bunker inventory, providing accurate volume calculations and continuous visibility into loading conditions across the entire bunker. The contactless radar technology delivers reliable measurements in harsh marine environments while requiring minimal maintenance and no material contact.

Installed in a single shift

Easy-to-use hardware components and intuitive software enable customers to install and commission the system themselves, minimising downtime. Designed for rapid deployment, the Bulk Inventory 3D Silo can be fully installed within a single shift.



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Benefits:

- Accurate real-time bunker inventory and volume measurement
- Full 3D visualisation of material distribution and loading conditions
- Reliable operation in harsh marine and offshore conditions
- Easy retrofit installation on existing bunkers, silos, and holds

Features:

- Contactless radar technology with no wear parts or recalibration requirements
- High-resolution data logging and historical trending
- Integration with supervisory control and data acquisition (SCADA) and control systems

Performance:

- Designed to operate in harsh conditions on deck, below deck, or integrated into bunker structures
- Graphical 3D surface information, as well as programmable logic controller (PLC)/SCADA-readable outputs, including the filling height of virtual bins
- Performs in rain, spray, fog, humidity, dust, vibration, and extreme temperatures

System architecture

True 3D radar sensing with centralised processing for 3D surface and volume measurement, consisting of the following:	
Processing unit	iRPU-F
3D radar sensor	iSDR-P

Measurements

Total volume [m³]
Total filling [%]
Average filling height [m]
Filling height in sector n [m] (customer configurable)
Note: Other specific requirements are available upon request

Performance

3D surface model accuracy	1–5 cm
Update rate	Up to 10 Hz

Communication

Ethernet IP
Modbus TCP
PROFIBUS DP
PROFINET
DeviceNet
Analogue 4–20 mA
Note: Other interfaces are available upon request

Environmental

IP Rating	IP67
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Operating temperature

iRPU-F	-20°C to +65°C
iSDR-P	-40°C to +70°C

Compliance	CE, FCC, RED, RoHS, UL/UR
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Features

- Dedicated processing unit (iRPU-F) enabling integration with industrial control systems
- Web server with 3D visualisation and dashboards
- Modular radar, processing, and interface architecture
- Surface coverage of the monitored bunker, storage hold, or bulk container
- PLC/SCADA-ready outputs for volume, filling percentage, and configurable bunker sectors

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