

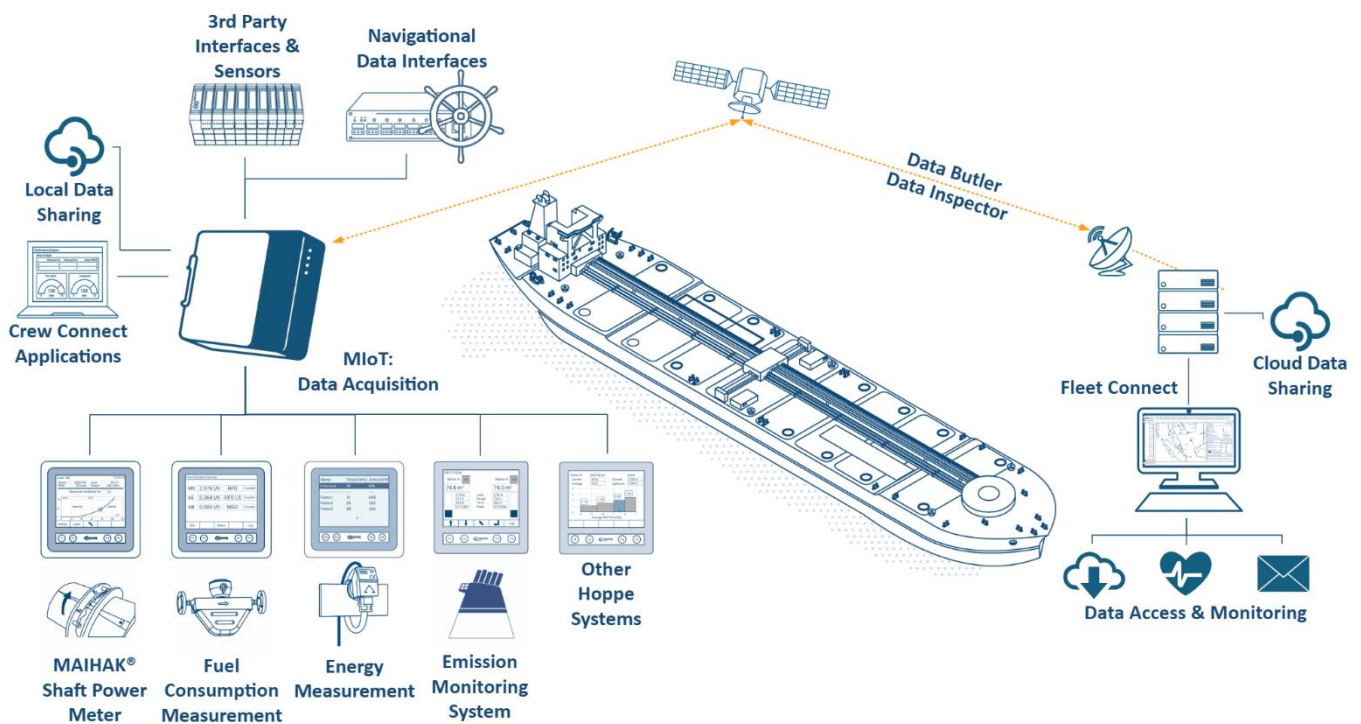
System description

The maritime industry is entering a new phase of digitalization and transparency. Charterers and operators increasingly demand reliable operational data to demonstrate efficiency and compliance. At the same time, accurate and verifiable data is becoming essential for emissions monitoring and regulatory frameworks such as IMO DCS, CII, EU MRV, and EU ETS.

Vessel optimization is no longer optional. It has become a key requirement for operating ships efficiently and meeting both regulatory and commercial expectations. Together, these drivers significantly increase the demand for high frequency, high quality sensor data, as it forms the basis for reliable insights and well-informed operational decisions.

Hoppe's Maritime Internet of Things (MIoT) Data Acquisition System provides a flexible and scalable platform for collecting sensor data from any onboard system and individual sensors. Built on a consistent focus on data standardization and data quality, it creates an independent single source of truth for all sensor data, decoupled from its utilization and analysis.

This enables seamless integration with any analysis platform, reporting tool, or data warehouse, giving vessel owners and managers full freedom to design and develop their digital ecosystem according to their specific requirements.



In this role, the system acts as a true enabler for long term flexibility, ensuring that sensor data remains fully owned and controlled, while being independent of how it is used in analysis, reporting, and digital applications.

Data is collected from all relevant onboard sources, including Hoppe systems, navigational equipment, and third-party systems such as AMS, PMS, and draught measurement systems. Direct integration of existing sensors as well as the supply of additional sensors and interface modules is supported, enabling fully customized measurement setups. A wide range of interfaces is covered, including analogue and digital signals, serial communication, NMEA, OPC UA, and MQTT, ensuring seamless connectivity across all systems.

Onboard, data is accessible via Hoppe's Crew Connect applications and can be shared through network interfaces or REST APIs. For shore side use, data can be securely transmitted to the Hoppe Fleet Connect cloud platform and can be seamlessly integrated into third party systems or customer specific data warehouses.

Facts and features

- Applicable for newbuild and retrofit projects with seamless integration of Hoppe systems, third party systems, and individual sensors.
- Modular system architecture with a wide range of interfaces and I/O modules, expandable with additional sensors and interfaces after initial commissioning.
- Standardization of all signals with continuous logging of sensor data, system data, and system health information in a high-performance database.
- Over 15 years of experience in data logging as well as sensor and system interfacing for performance monitoring.
- Web based visualization via Crew Connect applications, providing crew access to all collected data for reporting and performance monitoring, accessible via workstations within local network or an optional 10" touch panel.
- Local data sharing via Modbus TCP or REST API, enabling integration with Planned Maintenance Systems, reporting tools, electronic logbooks, and other onboard applications.
- Commissioning by the crew with active Ship to Shore connectivity and online support via the Hoppe Fleet Connect Service Portal.
- Ship to Shore module for cyber secure communication with the Hoppe Fleet Connect cloud platform, including data sharing, data quality monitoring, and remote troubleshooting.
- Cyber secure system design and communication with separation of IT and OT networks.

Technical Data

MloT Data Acquisition kit

Includes:

- MloT Connect Device
- Modbus RTU Gateways
- Serial Converters
- Ethernet Switch
- Terminals for additional I/O Modules
- Power Supply

Dimensions (W × H × D):

- 556.5 × 130.0 × 130.0 mm

Requires:

- Power Supply 100–240 V AC, 50–60 Hz, pre-fuse 10 A

Standard Input Interfaces:

- Interfaces to all Hoppe Systems and Sensors
- NMEA via Ethernet (UDP) according to IEC61162

Additional Input Interfaces (Custom):

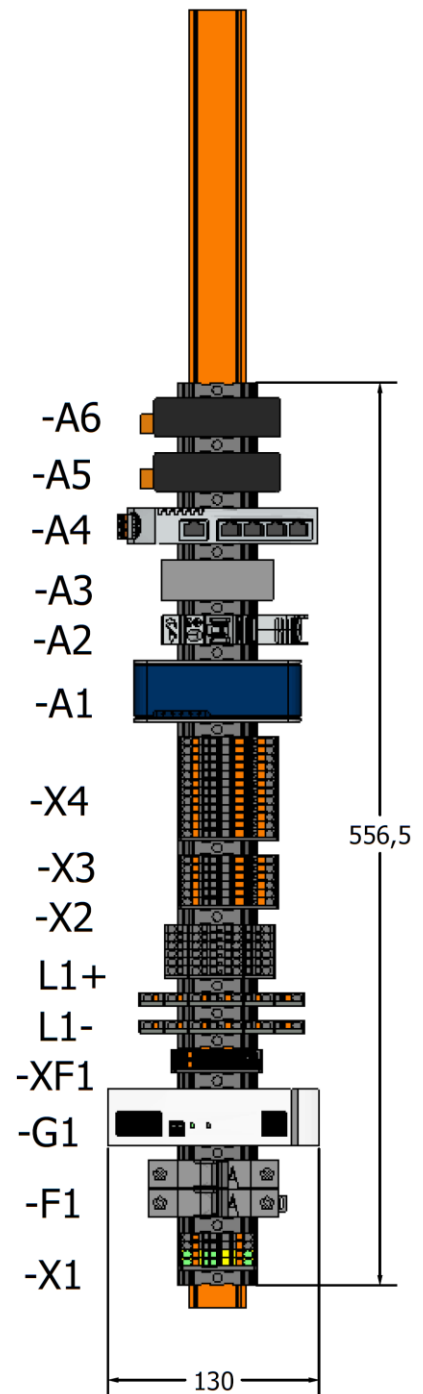
- Modbus RTU and Modbus TCP
- OPC UA
- Analogue Inputs (4-20 mA, 0-10 VDC, ...)
- Digital Inputs (24 VDC, pulses, ...)
- ASCII, MQTT and other interfaces on request

Output Interfaces (Custom):

- Modbus TCP
- REST API

I/O Modules and additional Sensors:

- NMEA serial to ethernet multiplexer and signal doubler
- Draft interface modules
- Rogowski coils for electric energy measurement
- Electronic inclinometer and accelerometer
- Analogue and digital input modules with signal doubler
- Additional sensors, e.g. for temperature, pressure, and more



Technical Data

MIoT Connect device

Processor:

- Raspberry Pi Compute Module 4
- Broadcom BCM2711
- Cortex-A72 (ARM v8)

Storage:

- 128 GB (M.2 SATA SSD)

Interfaces:

- 2 × Ethernet port (1 GbE LAN, separated)

Dimensions (W × H × D):

- 102.5 × 129 × 38 mm



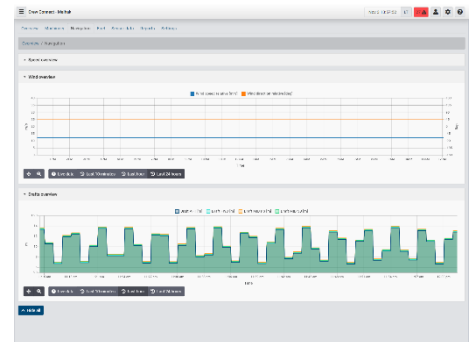
Crew Connect – BASIC

Access:

- Locally hosted web application
- Accessible via touch panel or from any workstation within the same network

Includes:

- Data visualization and raw data download
- Signal quality and alerts information
- System configuration and documentation



Additional Options

User Interface Systems:

- 10" local touch panel, remote panel PCs, or workstation setups

Switch Cabinet:

- Housing for MIoT Data Acquisition kit with integrated touch panel and cabinets for I/O modules



Crew Connect - MAIHAK®:

- Noon and event reporting with advanced data visualisation

Data Services:

- Access to Fleet Connect
- Cyber secure Ship to Shore transmission
- Service Connection, Data Butler, Data Inspector
- Remote troubleshooting, advanced data sharing and more

