Elevating Maritime Automation for the Shipbuilding Industry

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Solutions for maritime automation

Elevating Maritime Automation

Navigating tomorrow’s challenges

Empowering the future of maritime efficiency

The maritime industry is facing unprecedented challenges: from the need to reduce CO2 emissions and comply with strict environmental regulations, to ensuring the highest safety standards and integrating advanced technologies.

The increasing complexity of modern ships and the demand for more efficient operations require innovative solutions that are not only reliable but also future-proof.

In the midst of these challenges, Noris offers customised automation solutions for the shipping industry. Our state-of-the-art systems and technologies are designed to maximise the efficiency and safety of your vessel.

With a deep understanding of the specific requirements of the maritime industry and decades of experience in automation technology, we deliver solutions that optimise your operations and ensure a safe voyage.

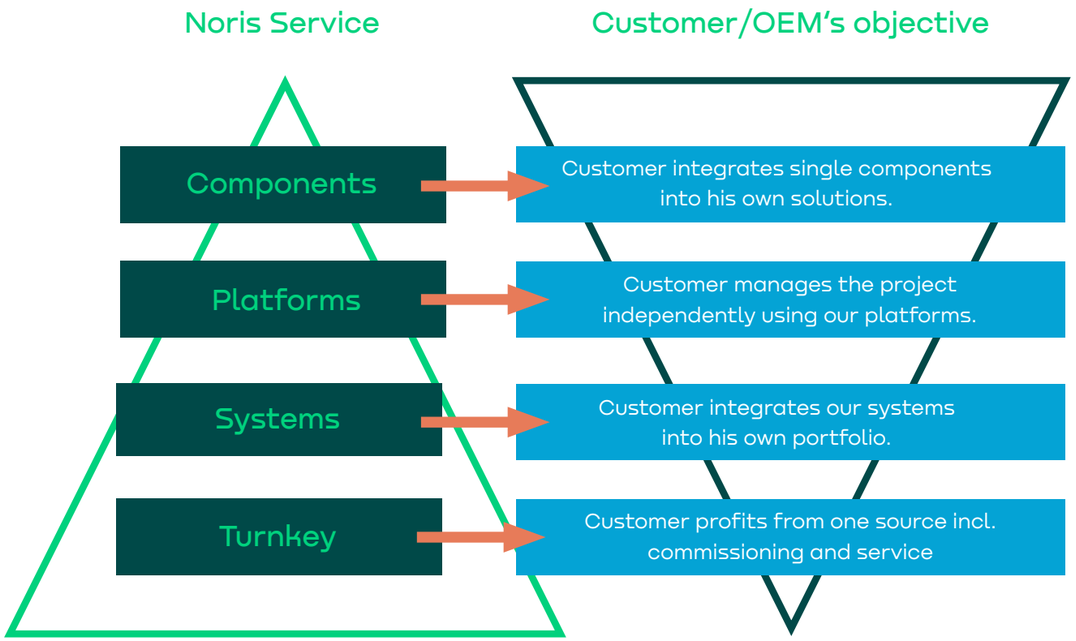
Benefit from our expertise

- Efficient project management
- Direct contact with our development and project planning departments
- Class approval of systems and solutions
- Full service from project planning through installation and commissioning to servicing through our locations worldwide and our partner network.

Well-known suppliers, shipyards and shipping companies worldwide are among our customers and confirm our expertise.

From single components to turnkey solutions

We are your trusted partner for automation solutions, offering everything from individual components to delivering complete turnkey solutions.



Our solutions at a glance

Highest performance for maritime application

EMS
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Energy Management

Efficient energy use and CO2 reduction

- Reduce wear and tear
- Manage all power sources and consumers
- Stabilise power consumption

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For all ship and propulsion types

- High scalability
- Functional and customisable
- Innovative foil and illumination concept

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Distribute energy and save fuel

- Improve the energy balance
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For single projects or series production

- Ideally suited for engine and gearbox manufacturer
- Local control with LOPs
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- Class approved
- Reduce downtime
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For a unique „Look and Feel" on the bridge

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- Consistent user-friendly operation
- Standardised interfaces

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- Class approved sensors
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- Analogue indication

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Integrated Platform Management

Control and monitor all systems in one platform

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- Certified project management
- Compliance with country-specific regulations

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Remote Access and Telemetry

For secure and cloud-based data storage

- Remote access for maintenance and service
- Remote monitoring for ship systems
- Cloud-based storage of system data

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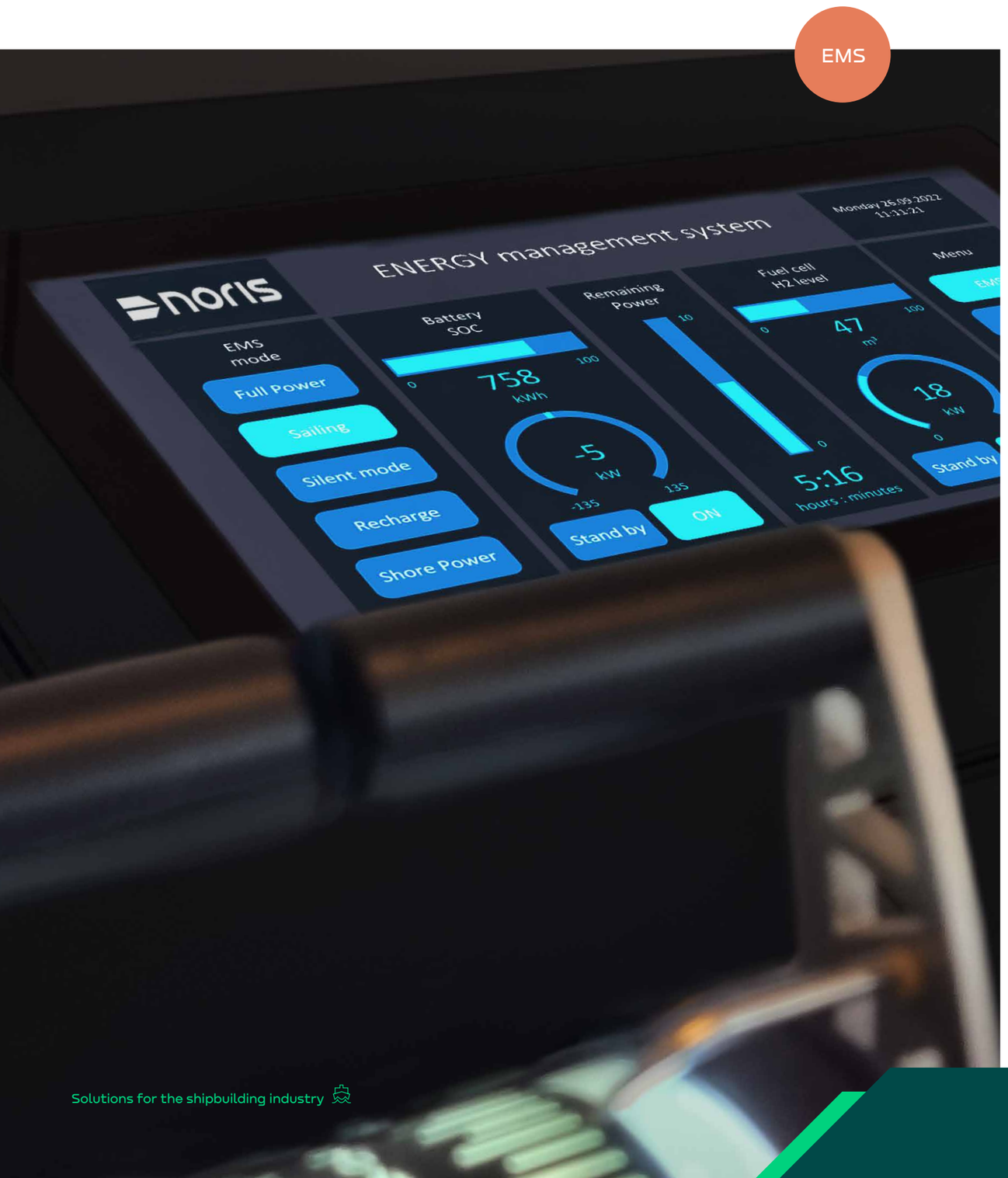
Integrated Alarm, Monitoring and Control

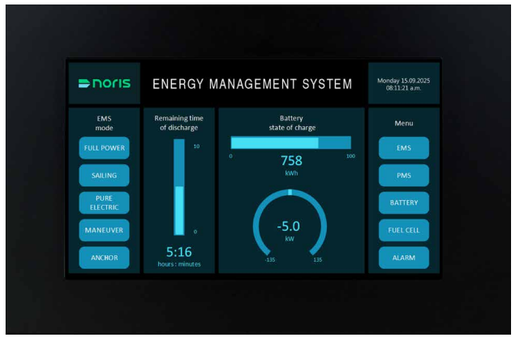
For engines, generators and auxiliary equipment

- Seamless integration
- Customised solutions for special application
- Flexible and scalable: from simple data collection up to highly complex automation and control

Energy Management

Use energy efficiently, reduce CO2 emissions





Easy and intuitive control via Touchscreen or PC displays from 10" to 34"

Central control

For all energy sources and consumers

The energy management system (EMS) is a centralised control system for the safe and efficient operation of all hybrid and electrically powered ships. It enables the optimal utilisation of all energy resources and takes into account the different characteristics of all energy sources and consumers.

Functions and features

Adaptable to your vessel's tasks

- Automatic selection of the optimal combination of energy sources
- Standby/Reserve mode
- Peak shaving
- Load management
- Reduction of residual waves
- Noise reduction

Your benefits a glance

- Reduce operating and maintenance costs
- Enhance efficiency by lowering fuel and energy consumption
- Control all functions in one system
- Integrate all major brands of energy generators and consumers
- Benefit from interfaces to external alarm and monitoring systems, propulsion control systems, and power management, or complete integration into our systems
- Stabilise your power supply
- Reduce wear on generators and batteries
- Increase operational safety and security mode

Propulsion Control

noriStar – Powerful solution for all ship sizes

PCS

Suitable for all propulsion types

Flexible, modular and scalable

The noriStar propulsion control system, also known as remote control system (RCS) is based on our modular platform that allows easy customisation and scaling of the system for any propulsion application:

- Conventional, hybrid, or fully electric propulsion
- Controllable pitch propellers (CPP)
- Fixed-pitch propellers (FPP)
- Azimuth thrusters (azimuthing thruster propulsors, POD and waterjet propulsion, bow thrusters)
- Propulsion configurations with summation gear, as well as the integration of PTO, PTH, and PTI

Functions and features

Easy integration through standardised interfaces

- Locally configurable propulsion functions
- Adjustable combinator curves and automated load control
- “One Button Take Over” function
- Electric-Shaft function
- Self-monitoring function
- Inputs for safety systems
- Interfaces to VDR, IAMCS and CONNING

Innovative customisable foil and illumination concept

Different control levers for different propulsion drives

3D modeling of a panel view

Innovative foil and illumination concept

Modern, timeless and functional design

The button backlight can be controlled individually and independently of the signal lights:

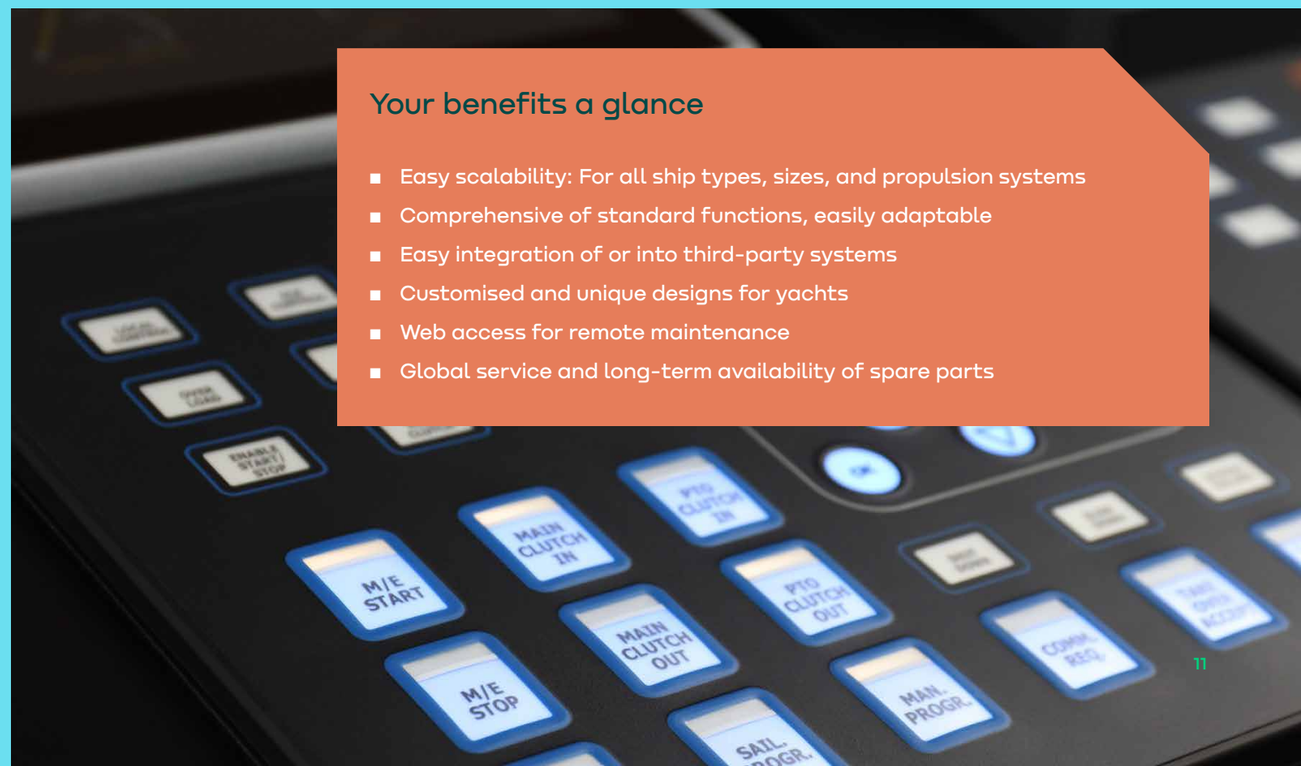
- The coloured signal lights are dimmable
- Different brightness levels can be assigned to individual lighting colours
- Signal light colours can be optionally selected for various statuses
- Fine-tuned dimming for uniform overall lighting

Standardised communication

Easy integration via standardised interfaces

The noriStar propulsion control system is based on our modular platform that allows easy customisation and scaling of the system for any propulsion application:

- CAN: communication between control panels, with the central control unit, and with external systems
- RS422/RS485: communication with additional systems, such as Voyage Data Recorder
- MODBUS-RTU/-TCP: data transfer to other stations, such as the alarm, monitoring, and control system for engine monitoring
- Ethernet: communication with the ship’s network



Your benefits a glance

- Easy scalability: For all ship types, sizes, and propulsion systems
- Comprehensive of standard functions, easily adaptable
- Easy integration of or into third-party systems
- Customised and unique designs for yachts
- Web access for remote maintenance
- Global service and long-term availability of spare parts

Integrated Alarm, Monitoring and Control

noriMos – Proven success across four system generations

The integrated alarm, monitoring and control system (IAMCS) noriMos is a flexible and fully customisable solution for operating and monitoring a variety of ship systems. It automates and visualises the control processes of different ship systems within a single system.

Functions and features

IAMCS

All functions and features customisable

- Simple data collector or complex IAMCS
- Visual and acoustic alarm notification
- High-resolution, graphical visualisation (customisable) based on CODESYS
- Standard functions: Alarm List, Function Groups, Graphical Display of System States, Trend Monitoring, Alarm and Event Logging, Operating Hour Counter, etc.
- Alarm extension system with on-call function for bridge, office and accommodation
- Interfaces for integration of and into other systems (PMS, RCS, IPMS, etc.)

noriMos 4 – Multi Master/Client system architecture

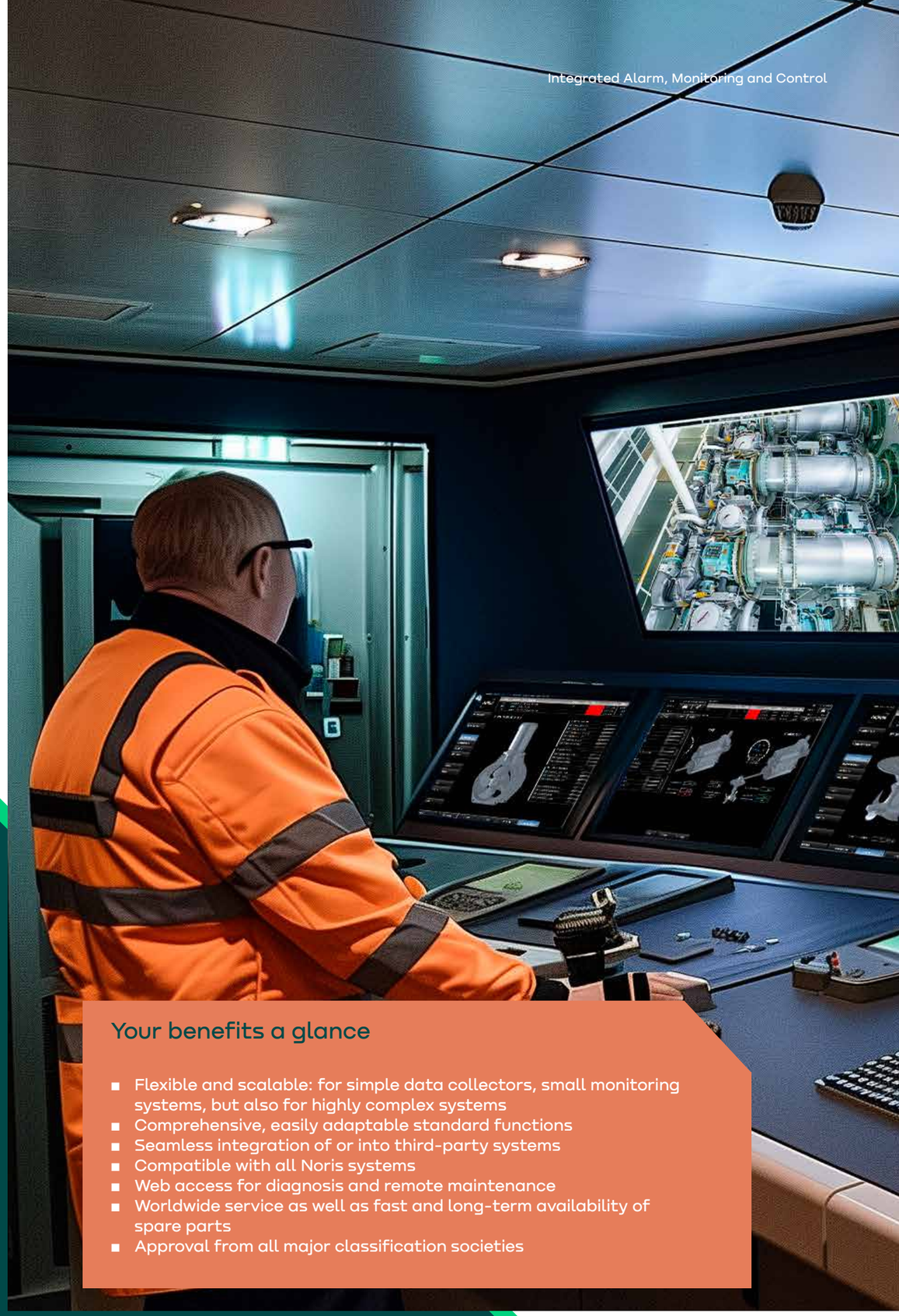
Decentralised with independent operating subsystems and redundant communication

- Maximum system security through independently operating subsystems and redundant interfaces
- Components, functionality, and software ‚Made in Germany'
- Easy integration from and into third-party systems
- Maintenance efficiency through web access for remote maintenance and fast, long-term availability of spare parts

noriMos 3500 – Centrally PC controlled system

Based on two central, redundant PC master stations

- Standardised, modular components and features
- Easily scalable and customisable to specific requirements
- System security through redundant interfaces
- Cost-effective due to approved standard components
- High-resolution displays for bridge and accommodation



Your benefits a glance

- Flexible and scalable: for simple data collectors, small monitoring systems, but also for highly complex systems
- Comprehensive, easily adaptable standard functions
- Seamless integration of or into third-party systems
- Compatible with all Noris systems
- Web access for diagnosis and remote maintenance
- Worldwide service as well as fast and long-term availability of spare parts
- Approval from all major classification societies

Power Management

Protect the onboard power grid and save fuel

The noriSync Power Management System (PMS) is an integrated system that monitors, controls, and optimises the distribution of energy on board. It regulates the load distribution and synchronisation of generators with the onboard power grid, adjusting the power output of generators to match current consumption or load.

Functions and features

- Various operating modes
- Automatic synchronisation
- Automated start and stop of generators
- Automatic load distribution
- Analysis and monitoring of loads
- Intelligent control of energy storage systems
- Redundant energy distribution
- CPU-based multi-master system for flexible system scaling
- System security through redundant communication

Power Management Controller – the heart of the PMS

The power management controller (PMC) can be used as a standalone system and expanded with a touchscreen display for visualisation. With additional components from our automation platform, complex systems can be managed using the controller.

For isolated or parallel operation

The core of the power management controller is an ARM 32-bit Cortex™-M4 processor. In its basic configuration, the controller is used for connecting and disconnecting generators to and from the grid, and is also suitable for use in emergency power systems. It is approved by the major ship classification societies.

Your benefits a glance

- Improve your energy balance: reduce energy consumption and lower your energy costs
- Avoid blackouts by securely controlling critical loads
- Reduce investment costs
- Protect generators and other electrical equipment through monitoring for safe operation

Integrated Bridge System

State-of-the-art technology meets comfort and unique design

Elegant and unified design

Integration of all technology partners

The integrated bridge system (IBS) enables the combination and integration of multiple systems from various manufacturers on the bridge into a central system and panel to enhance the safety and efficiency of ship navigation.

We merge innovative technology with an intuitive design to provide you with the utmost ergonomics, control and comfort on board. You receive a uniquely tailored bridge system, perfectly aligned with your ship and preferences.

More efficiency and more safety

Open system architecture

The open system architecture and modular design allow not only an individual design but also for centralised monitoring and communication of all integrated systems, such as:

- Autopilot
- Dual Radar/ARPA
- Gyro
- Position Fixing Systems,
- ECDIS and Conning Display
- Power Distribution System,
- Steering Gear
- GMDSS

Your benefits a glance

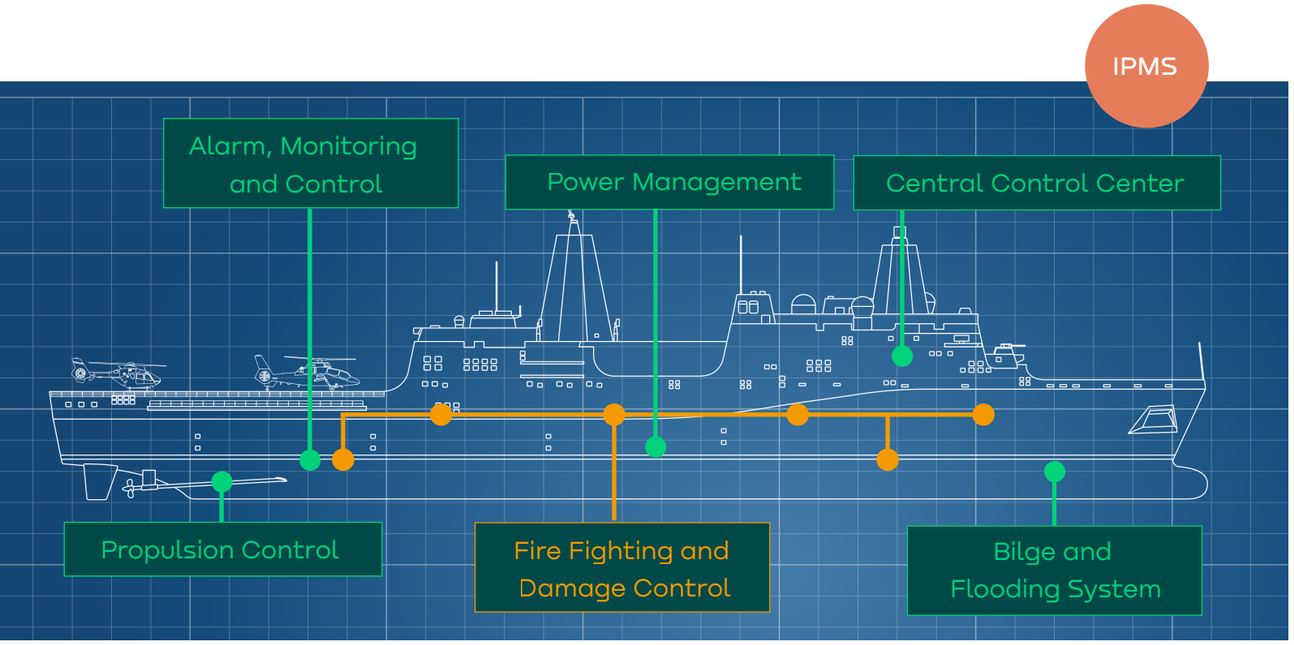
- Standardised interface across the entire bridge panel
- Integration of all technology partners
- Consistent operation
- Ergonomics and user-friendliness
- 3D modeling
- On request: integrated bridge system (IBS), propulsion control system (RCS), alarm, monitoring and control system (IAMCS) from a single source

IBS

Integrated Platform Management

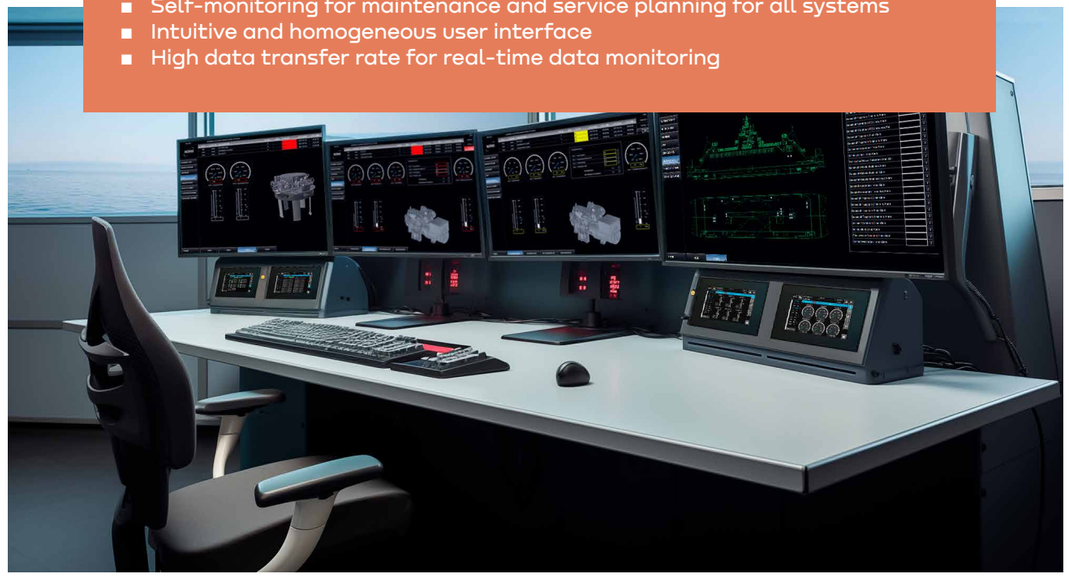
Control all systems on one platform

The Integrated platform management system (IPMS) monitors, controls and automates all essential systems necessary for the operation of a ship: from propulsion control (PCS) and machinery monitoring (AMCS), power management (PMS), handling alarms, fire fighting and damage control system (FFDCS) to flooding systems, bilge control, and closed circuit television (CCTV).



Your benefits a glance

- All systems in a central control center, supporting screen sizes up to 65”
- Control, monitoring and automation of all relevant ship systems
- Modular and open system architecture for the integration of all system platforms
- Compatibility and easy integration of all Noris automation systems (PCS, IAMCS, PMS, EMS, IBS, etc.)
- Integrated training and simulation procedures
- Automated sequences for events in various system platforms
- Self-monitoring for maintenance and service planning for all systems
- Intuitive and homogeneous user interface
- High data transfer rate for real-time data monitoring



Functions and features

Monitoring and control

The IPMS enables centralised monitoring and control of various ship systems, including propulsion, power generation, auxiliary systems, and more.

Data logging and reporting

It records ship performance data and enables analysis and reporting. This data is crucial for maintenance, troubleshooting, and optimising operational processes.

Alarm and safety systems

It provides advanced alarm and safety features, informing the crew about deviations or critical conditions, thereby enhancing the safety operation of the ship and its crew.

Integration of sensors and instruments

The IPMS provides interfaces to a variety of sensors and instruments throughout the ship, collecting real-time data on parameters such as navigation, environmental conditions, engine performance, and tank levels.

Redundancy and fail-safe measures

The IPMS includes redundancy and fail-safe features to ensure that essential functions remain available even in the event of a system failure.

Energy management

It ensures energy availability by monitoring and optimising energy consumption and distribution on board. The IPMS enables the efficient use of fuel and energy resources.

Remote monitoring and control

It enables remote monitoring and control, which is crucial for unmanned or semi-autonomous operations.

Maintenance and diagnostics

The IPMS provides diagnostic information and pre-warnings for specific events and maintenance tasks. This assists the crew in resolving potential issues before they escalate into critical conditions.

Remote Access and Telemetry

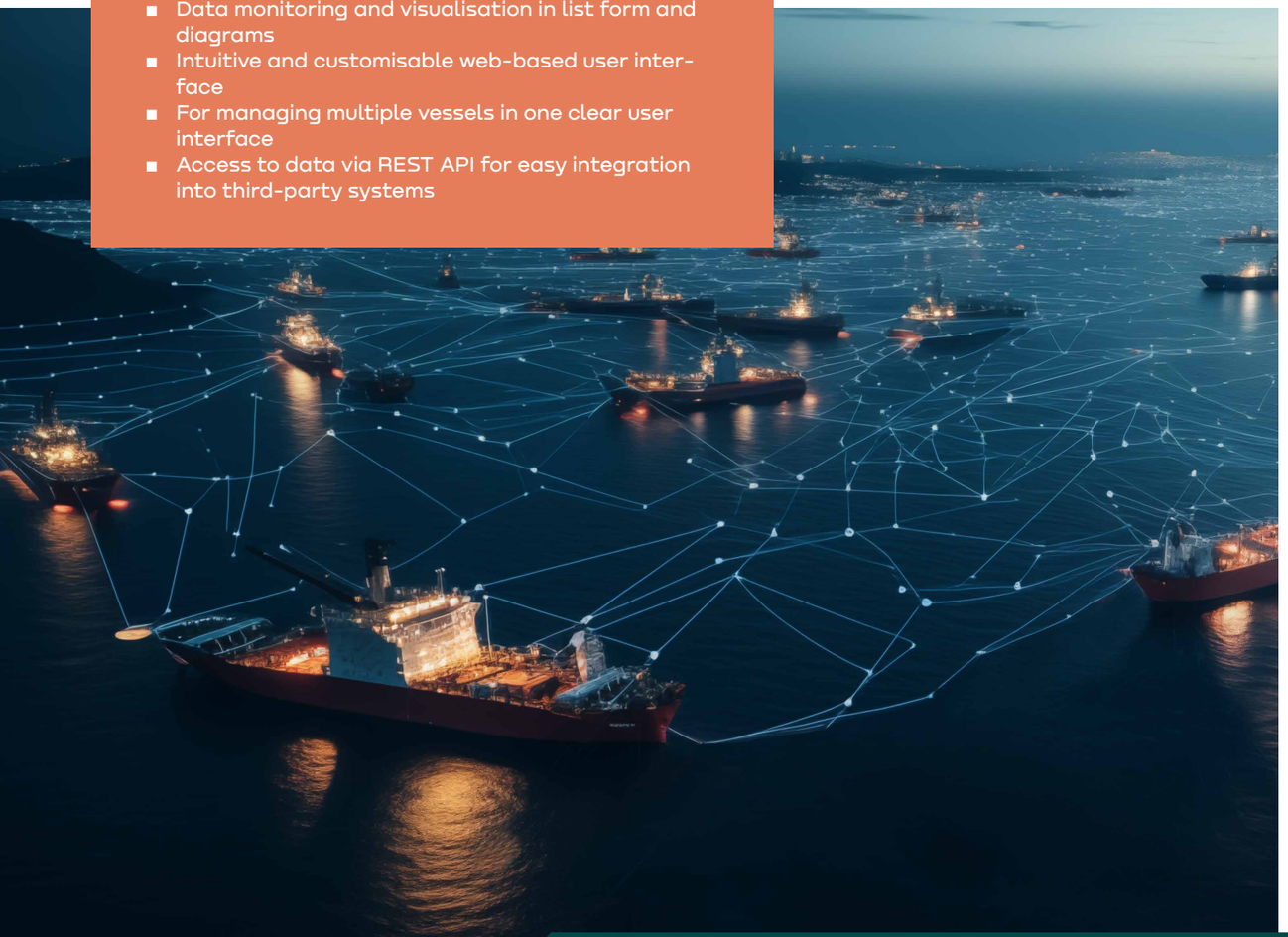
Cloud-based data storage with noriNet

The remote access and telemetry system noriNet is a cloud-based software solution for ships that offers you two functions:

- **Remote access to on-board systems for service and support**, e.g., for system updates and maintenance
- **Data collection from ship systems,** e.g. from AMCS, LOPs, navigation, etc. for cloud-based data storage and subsequent analysis

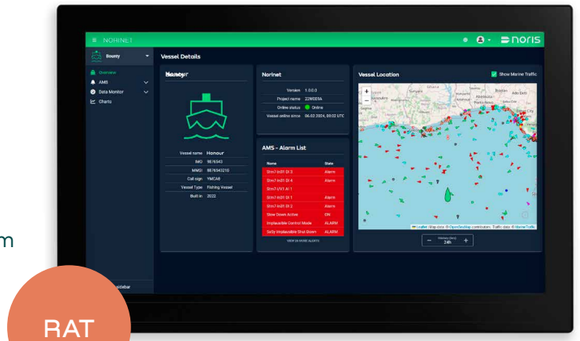
Your benefits a glance

- Secure remote connection via VPN
- Data monitoring and visualisation in list form and diagrams
- Intuitive and customisable web-based user interface
- For managing multiple vessels in one clear user interface
- Access to data via REST API for easy integration into third-party systems



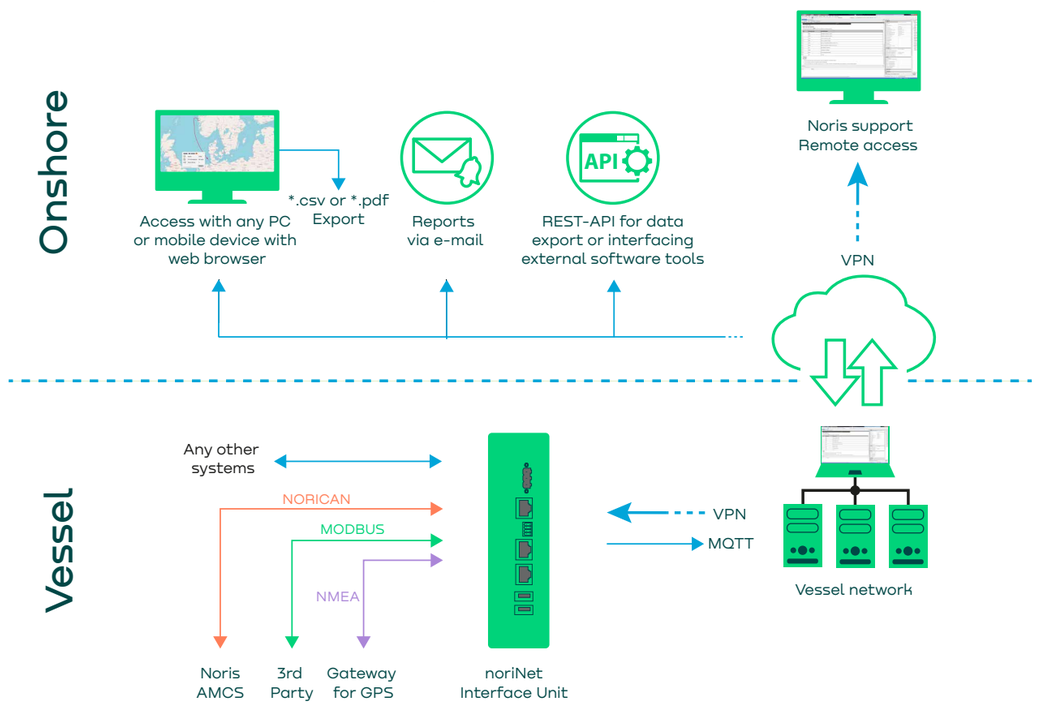
Functions and features

- Remote access for service and remote maintenance of Noris systems
- Live monitoring and cloud-based data collection
- Web-based, high-resolution, graphical or tabular visualisation (e.g. dashboard, alarm list, event history, charts)
- Storage of customised tables and reports and sending via email at defined time intervals
- Localisation of your ships



Secure data transmission through MQTT

noriNet can also be easily retrofitted in existing systems. Our systems or third-party provider can be connected to noriNet via standardised or customised interfaces and transfer protocols. Secure data transmission via MQTT is particularly suitable for networks with high latency and low bandwidth.



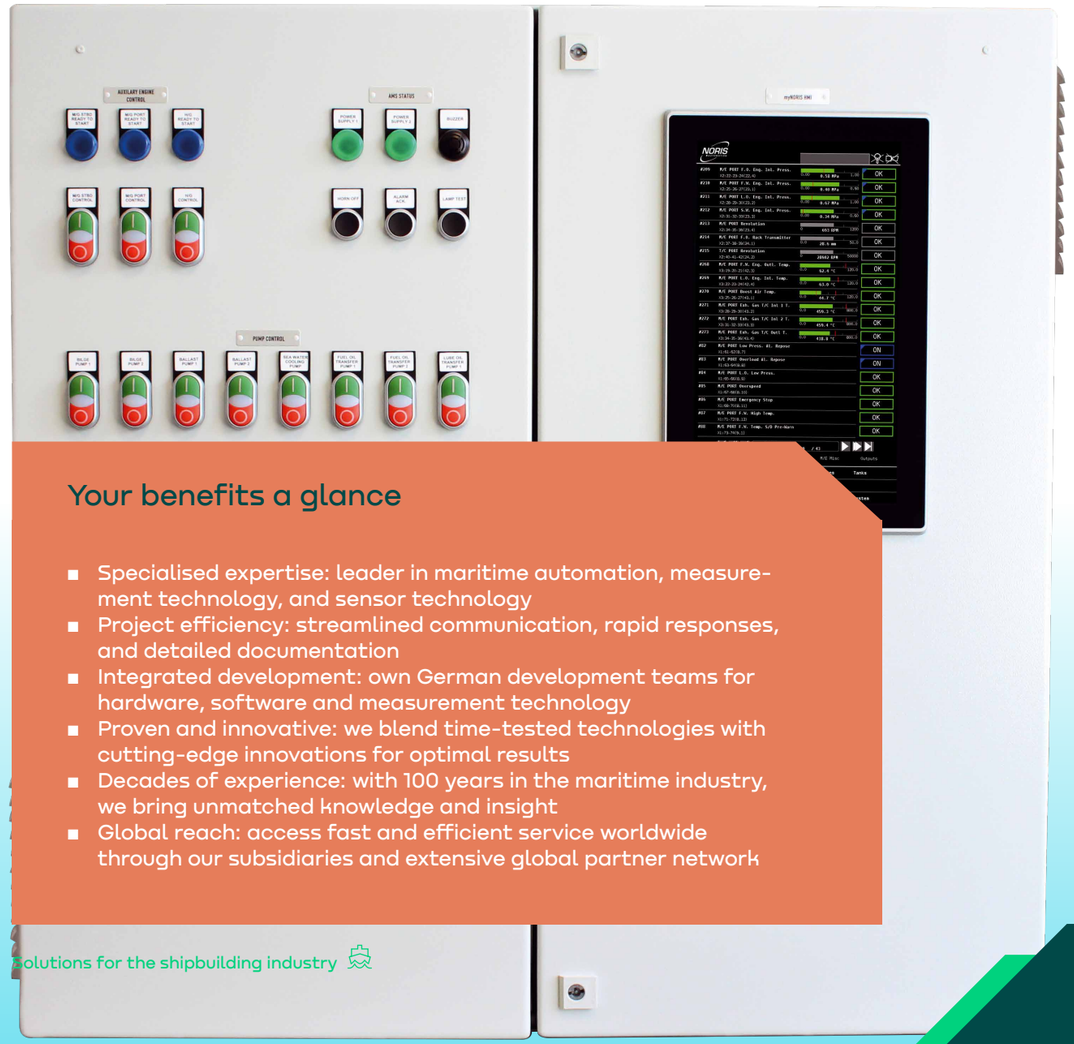
Customised Automation Solutions

Individual maritime projects and small series (OEM)

Our tailor-made automation solutions are based on our modular and flexibly scalable myNoris automation solution. Both individual automation projects for shipyards and shipping companies as well as small series for engine and gearbox manufacturers can be implemented.

- **For suppliers (OEM):** specialising in local control units (LOPs) for engines and gearboxes in series production.
- **For unique projects:** delivering tailored solutions for shipyards and shipowners with specific needs.

OEM



Your benefits a glance

- Specialised expertise: leader in maritime automation, measurement technology, and sensor technology
- Project efficiency: streamlined communication, rapid responses, and detailed documentation
- Integrated development: own German development teams for hardware, software and measurement technology
- Proven and innovative: we blend time-tested technologies with cutting-edge innovations for optimal results
- Decades of experience: with 100 years in the maritime industry, we bring unmatched knowledge and insight
- Global reach: access fast and efficient service worldwide through our subsidiaries and extensive global partner network

Direct contact with development departments

You have direct contacts in development and project planning. This means that technical questions can be clarified much more quickly. This saves time and creates transparency.

Ship classification approval

We have long-standing relationships with ship classification societies and a deep understanding of their requirements and methodology. Upon request, we can secure approval for both individual and series projects, ensuring compliance and confidence.

Global reach and local support

Our extensive worldwide partner network ensures prompt, professional service wherever you are. From installation and commissioning to maintenance, we offer seamless support, including service personnel from Germany when needed. Keeping everything in one hand simplifies processes and enhances reliability.

Extended system lifespan

Our commitment to long-term support means many customers still receive spare parts for their systems even after 20 years. When original components are unavailable, we provide alternative solutions to keep your systems operational, a benefit our customers highly value.

Measurement and Indication

M&I

Tailor-made sensors with classification approval

Speed measurement for demanding applications

Ensure optimal performance and safety for your application through precise speed measurement. We measure speed of:

- Marine engines and generators
- Turbochargers
- Gearboxes
- On shafts with impulse bands

Feature	Expression
Measuring principle	Magnetic
Construction type	Threaded Flange Tailor-made
Frequency	Up to 30 kHz
Channels	Up to 4 signal outputs
Special	Standstill Direction of rotation
Power supply	Active or passive

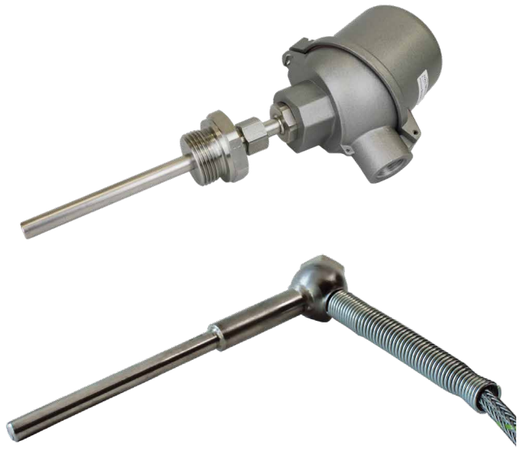
Temperature measurement in harsh environments

In the shipbuilding industry, our temperature sensors are used in particular by engine and gearbox manufacturers, e.g. for detection of:

- Exhaust gas temperatures
- Lubricating oil temperature
- Cooling water temperature
- Air inlet temperature in engines

Feature	Expression
Measuring elements	Pt100/Pt1000 Thermocouple NTC thermistor
Construction type	Flange Stick-in Screw-in Tailore-made
Temperature *	-40 ... 800 °C
Wiring technology *	2-wire 3-wire 4-wire

* Depending on measuring elements



Further sensor technology for your application

In addition to speed and temperature sensors, we offer the following sensors in our portfolio:

- Acceleration sensors
- Multi sensors
- Speed encoders and tachogenerators
- Rotary position sensors
- Pressure sensors

Analogue indicators

The right indicator variant for every application

All of our analogue indicators are manufactured in-house according to your wishes and requirements. We offer two technically different variants that are suitable for different applications: Stepper motor or moving coil technology.

Feature	Stepper motor type NIR3 / NIQ3	Moving coil type SIR3 / SIQ3
Application	Advanced indication, e.g. with alarm status notification	Simple indication
Construction type	Round/square in different sizes	Round/square in different sizes
Scale dial (black or white)	individual customisable	individual customisable
Advantages	Flexible and customisable illumination Additional useful functions Class approval	Cost-effective Class approval

Maritime Refit Solutions

From small systems to complete packages

As vessels age and technology advances, refit solutions become essential for maintaining operational efficiency and environmental sustainability. Our comprehensive refit services offer innovative upgrades and modifications, ensuring your ship meets modern standards and regulations.

Our refit portfolio

Our comprehensive refit portfolio for ship automation includes:

- Small local engine or gerabox control systems
- Integrated alarm, monitoring and control systems (IAMCS)
- Propulsion control systems (PCS, RCS)
- Power management systems (EMS)
- Out-of-the-box solutions for systems from other well-known manufacturers
- Complex automation systems for a wide range of maritime systems

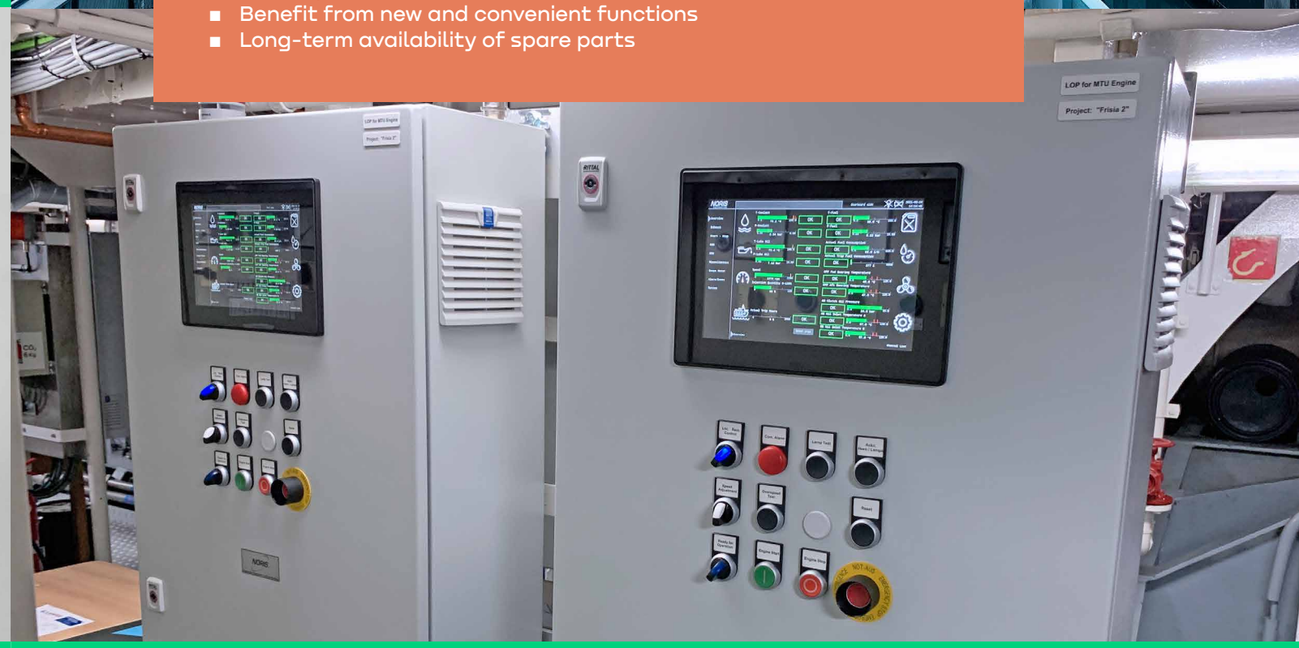
Ready-made refit solutions

We offer ready-made refit solutions for third party systems like:

- WECS 2000 Wärtsilä engine control system refit solution
- MTU Blueline MCS-5 control system Refit-solution

Your benefits a glance

- Benefit from decades of experience in ship automation
- Extend the service life of your systems
- Reduce downtime and lower maintenance costs
- Make operation more efficient and extend maintenance intervals
- Benefit from new and convenient functions
- Long-term availability of spare parts



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Solutions for the shipbuilding industry
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