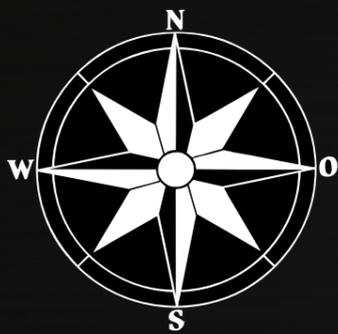


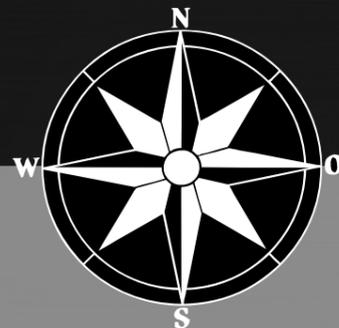


Unique Yacht Automation –
Made in Germany

NORIS.



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Content

Your drive is our drive – since 1925

Almost one century of experience

For almost one century the name NORIS has been associated with innovative measuring and automation technology for the shipbuilding industry "**made in Germany**". With numerous innovations, the NORIS Group GmbH became one of the leading manufacturers of marine automation and propulsion control systems in the exclusive yacht building and shipbuilding industry on German and international markets.

In concrete figures this means:

- more than 5,000 automation systems
- more than 3,000 safety systems, local operating panels and engine operating panels
- more than 130 new constructions equipped in the recent years

Powerful, individual and unique solutions

One of our greatest strengths is the unique product and system design combined with the latest state-of-the-art technology. This results in an individual, powerful and unique look and feel for every project we deliver.

Everything from a single source

Being one of few manufacturers on the market, NORIS is able to support its customers from measurement, signal processing and visualisation up to high-performance automation solutions. All components and systems are developed, designed and manufactured in Nuremberg and Rostock, Germany. Our long-standing technical know-how makes us a specialist and reliable partner for your yacht project.

Since 1925 there has been actually only a few vessels left where there is not installed a product from NORIS.

NORIS service – trust and reliability, right from the start

Everything starts with confidence

Developing economically efficient working practices means keeping devices and systems in perfect working order at all times. It is the only way to avoid repair work and keep downtimes to a minimum. And it is something we can help you achieve.

First-rate service with short response times guaranteed

Our service personnel receive the best possible training and equipment, and work with high-quality spare parts. By combining this with state-of-the-art training facilities and professional support, we can guarantee first-rate service with short response times.

Customer proximity means going global

Achieving short response times and ensuring spare parts are always available requires a carefully considered strategy as well as intelligent spare parts logistics. Our service and representative network stretches across the entire globe and guarantees the best possible support at any time, in any location, whether this means drawing up a quotation or performing service work. One call is all it takes.

Service and support for any product, at any time

Reinforcing your market position and ensuring service perfection means thinking ahead. Whether you are looking for a routine in-

spection, repair work, a retrofitting solution, or simply a customised package of spare parts as a preventative measure, we can provide exactly what you need for any of the products and systems you have purchased from us, at any time. Our aim is always the same: to find a cost-effective solution that works for you.



No matter where you are.

Almost one century of experience – a continuous success story



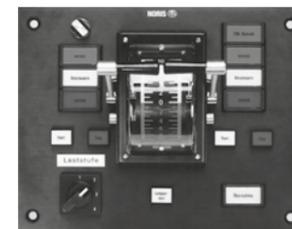
The company was founded on the 24th of August 1925 in Nuremberg under the name **NORIS Tachometerwerk Dr. Siegfr. Guggenheimer GmbH** by the German physicist Dr. Siegfried Guggenheimer.

1925



Development of the first **digital monitoring system – the NORIMOS 1000** - that went into series production in 1980 and within a short period of time became a **bestseller**.

1977



In 1992 NORIS awarded the contract to develop its first **propulsion control system for bridges** to supplement the existing monitoring and safety systems: the **NORISTAR** was born.

1992



At the end of 2014 the development of the new **NORIMOS 4 monitoring system** was complete, and the first orders with this new system are presently being delivered.

2015

1966



In 1966 NORIS became the **first company** to fit out a ship for unsupervised operation according to GL specifications. The complete new range of marine automation products was developed.

2010



NORISTAR 4 - Market launch of the latest generation of propulsion control systems in modern, timeless and ergonomic design.



Your benefits

- Tailor-made and unique yacht bridge design for a classical ambience of timeless elegance
- State-of-the-art yacht propulsion control solutions with individual system and product design
- Almost one century of experience in the fields of instrumentation and automation technology
- Worldwide service wherever you are - rapid and uncomplicated response
- Highest quality made in Germany
- Everything under one roof: development department, in-house production and service department



It is your decision – full supply or integration

Full supply for a common look and feel on the bridge

We have the complete package for an exclusive and homogenous bridge design. Our own automation platform NORISYS offers everything to provide a pleasant and comfortable ambiance. The latest state-of-the-art technology, designed and created from our in-house 3D designers and developers provides interfaces to the bridge's technology partners. Combined with timeless elegance, our HMI and propulsion control solution transform the yacht bridge into an individual, modern and outstanding place. Besides the homogeneous look and feel, a further advantage is the uniform handling of the technology on the bridge. This is made possible by the holistic operating concept of the NORISYS platform.

Integration of the propulsion control into the navigation technology

In some projects the operating concept is provided by a technology partner, e. g. the navigation provider. In this case, our propulsion control is integrated into the existing bridge design. The automation platform NORISYS provides all necessary interfaces to ease installation and to enable connection and communication with the technology partners.

Your benefits at a glance

- Unique and homogenous look and feel combined with timeless elegance and the latest state-of-the-art technology
- Holistic operating concept
- Integration of all bridge technology partners into one aesthetic look and feel
- Security based on redundant bus technology and web access for remote maintenance
- Easy installation and long-term spare parts supply



Bridge Technology Partner

- Navigation
- Alarm and Monitoring
- Illumination Control
- Horn Control
- Lighting
- Marine Wiper
- etc.

Interfaces



Interfaces

Bridge Technology Partner

- Navigation
- Alarm and Monitoring
- Illumination Control
- Horn Control
- Lighting
- Marine Wiper
- etc.

It is your decision

Applicable drives

It is your decision – Classic or Avantgarde

Classic version

The **Classic version** is based on our exclusive operating panel series and offers a wide range of individually configurable devices. It integrates all subsystems into an ergonomic and aesthetic surface for simple and comfortable operation.

The **Classic version** comes with innovative membrane keypads with background illuminated push buttons and indication fields and provides both individual control of brightness for each indication light colour and an integrated central dimming function.

The **Classic version** is rounded off with a visualisation by our analogue indicators with exclusive and unique dial and scale design (e. g. with your logo, an illustration or the name of the yacht, etc.).

Avantgarde version

The **Avantgarde version** is our solution for highest demands on comfort and user-friendliness.

It comes with a high resolution graphic touchscreen display for intuitive and comfortable operation. The system status and monitoring information can be easily retrieved via menu buttons. Graphical objects, such as indicators or bargraphs, enable a simple and quick registration of certain information.

The **Avantgarde version** can also be rounded off with our analogue indicators with exclusive and unique scale design (e. g. with your logo, an illustration or the name of the yacht, etc.).



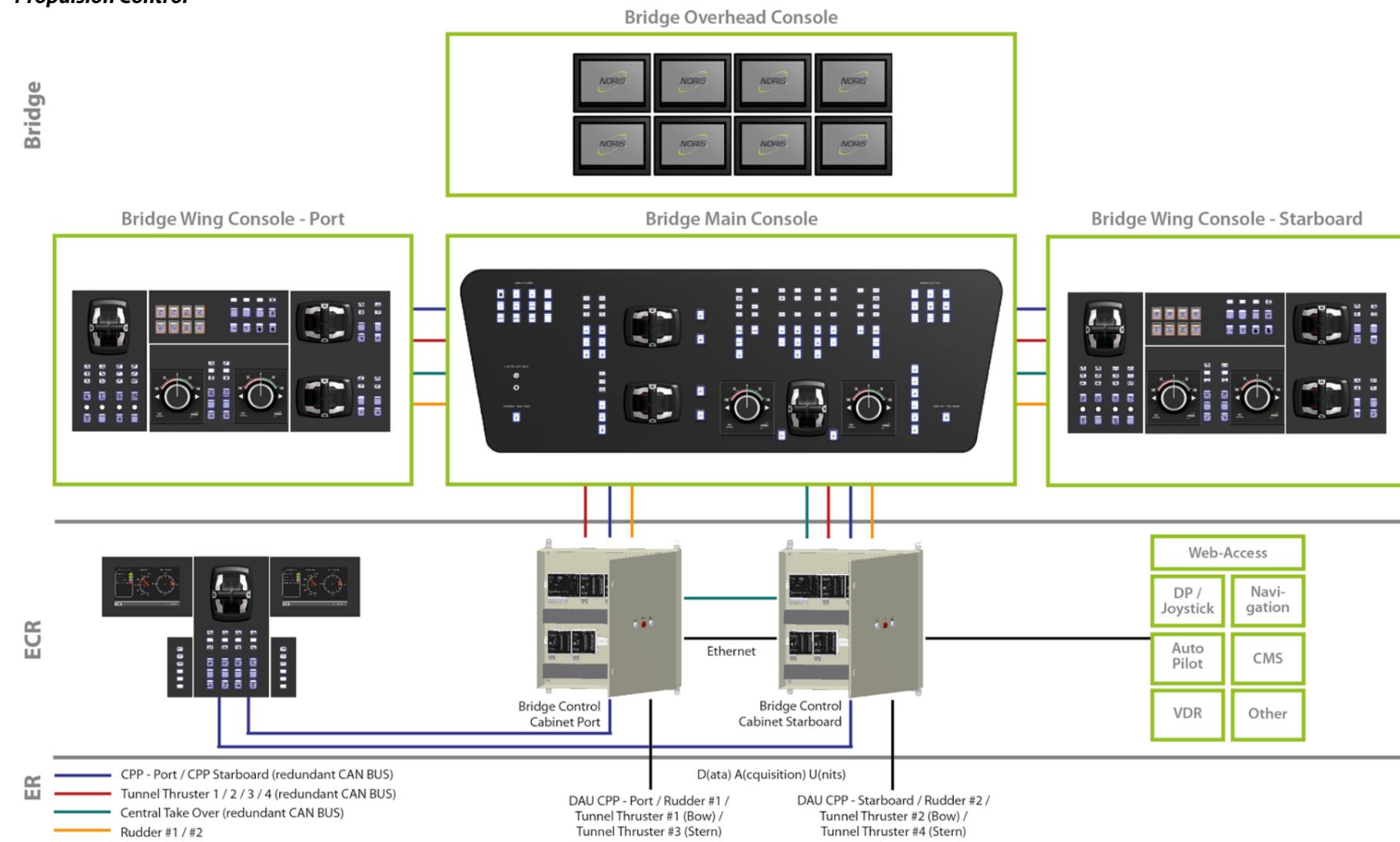
Classic version

Avantgarde version

It is your decision

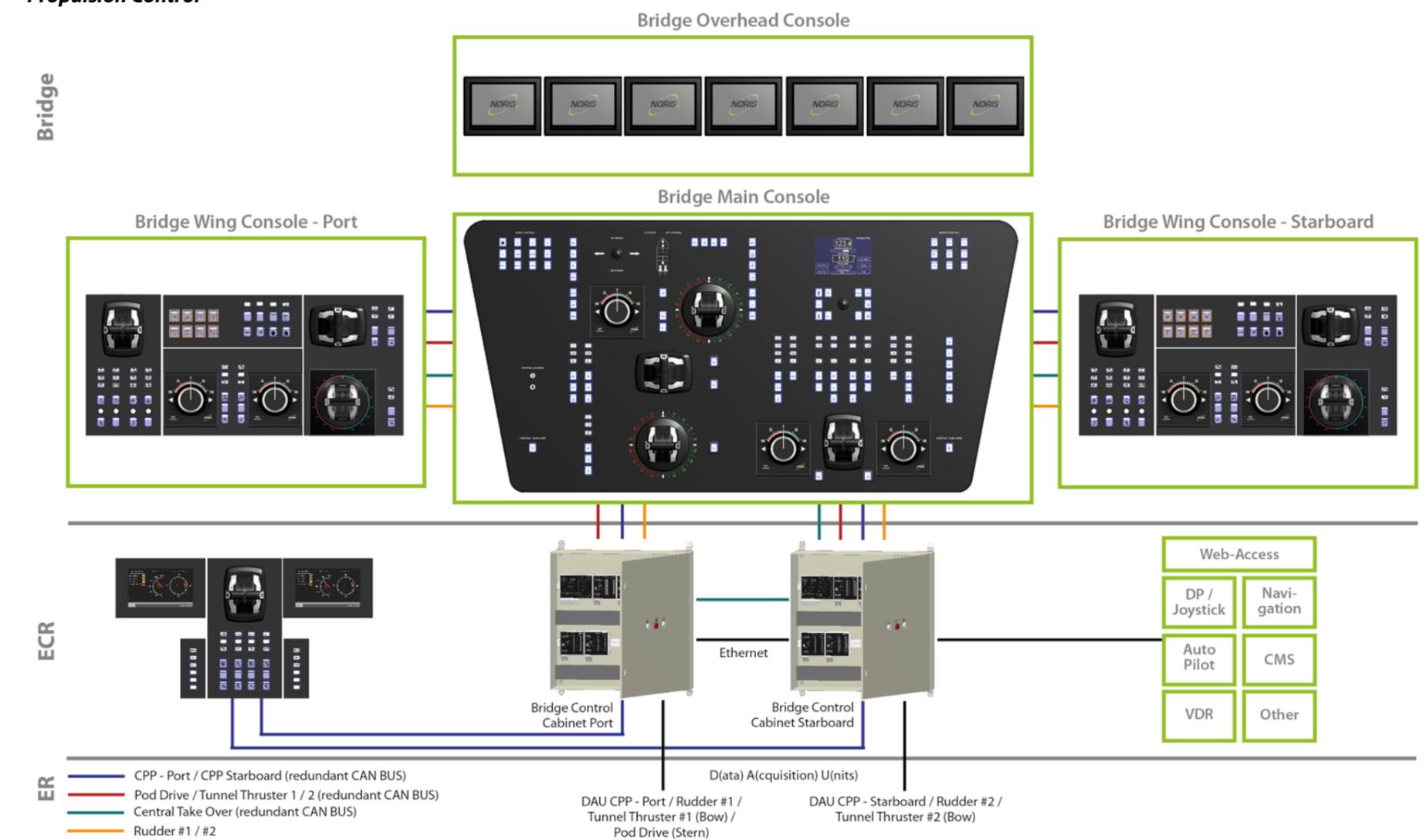
Classic or Avantgarde

Propulsion Control



System examples

Propulsion Control



System examples

Unique propulsion control solutions for all propulsion drives

To us, propulsion control is a matter of trust, because the entire yacht propulsion is controlled with our equipment. Thus, our propulsion control meets all modern safety requirements and includes all installed propulsion drives on the ship as an integrated solution. It is provided as a full follow-up electronic propulsion control system for the ship's propulsion machinery.

Its primary purpose is the propulsion control of thrust and direction of the vessel. The system is adapted to the owner's requirements and includes automatic functionalities as standard version to operate the propulsion plant as safely and effectively as possible. It is class approved according to the ship's notification.

Supported and integrable propulsion drives

- Gas or diesel engines
- Electric motors
- Combustion turbines
- Hybrid drive systems

Interfaces

- To ship alarm- and monitoring system
- To voyage data recorder
- To dynamic positioning and electronic anchoring system
- To navigation system
- To autopilot and main steering

Our control levers - a symbol for power and movement

When you start moving your yacht, this happens with a control lever, e. g. on the bridge. At this very moment, you transform tens of thousands of kilowatts into movement with just a small gesture of your hand. This is a special and exciting moment for us, because you realise all this with our control levers. For us, for this purpose, the control lever is not only part of a propulsion control system but also part of the bridge. It is the crucial, visible object that sets your yacht in motion - an equivalent for power and movement for us. Therefore - the heart of the yacht - is tailor-made and the customer can expect an extraordinary solution.

Your benefits at a glance

- Use for both convenient and failsafe operation
- Graphical HMI for comfortable monitoring
- Automated functions for control selection, load control as well as acceleration programs
- Emergency stop panel for propulsion
- Synchronised use of one control throttle for combined drive operation (SYNC-Master function)
- „One button“ take over system between control stands
- Media redundant with CANbus interconnection
- Self monitoring function for each system



Propulsion control system

Alarm, monitoring and control system

Your yacht meets the highest demands in regard to unique design and state-of-the-art technology. This is shown in the yacht architecture, interior fittings and, of course, in the technical equipment in accommodation, on the bridge, but also in the engine room. We all know that luxury and uniqueness is reflected in details. And we offer you these details: a homogenous and intuitive high end graphical visualisation combined with a high performance PLC based alarm, monitoring and control system. The maximum of comfort and usability is self-evident.

The system can be easily adapted to individual requirements. With features like data logging, trend monitoring, alarm and event history and user right management, the system is ideally suitable for sophisticated applications. The intuitive, simple and elegant visualisation ensures a comfortable operation.

Furthermore, the system can be easily extended with remote access for automatic and secure data transfer and storage to onshore data services for service and analysing purposes. The optional alarm extension indicates the system status at any place on board the ship.

Your benefits at a glance

- Elegant and discreet HMI
- Customised graphical high end visualisation
- Simple use due to intuitive and user-friendly operation
- Additional remote displays for crew accommodation and bridge
- Modular and expandable system
- Maximum safety due to redundant system design (DP 2 compliance)
- Remote Access for service and maintenance
- Plug & Play components and spare parts
- World-wide service due to our global subsidiaries and partners

Applications

- Control and monitoring of machinery
- Control of heating, ventilation and air conditioning
- Monitoring and control of pumps and valves
- Other auxiliary systems
- Option: engine safety system



Alarm, monitoring and control system

Alarm, monitoring and control system

Energy storage solutions – for the most efficient use of energy

For hybrid and fully electric systems on ships, the energy storage is an essential part and has to be designed in regard to the respective challenging application performance. Thus, we offer you customised solutions with a well-established and safe energy storage system (ESS) that is already in use in numerous projects – from fish farming vessels and ferries to offshore supply vessels and also on mega yachts, not to mention the numerous onshore industrial applications.

Our ESS solution is based on liquid cooled, encapsulated high power battery modules and is currently one of the safest in the world. The modular system concept makes it easy to customise your energy storage solution exactly to your application. The batteries come as „plug & play“ modules and are installed in modular racks. This ensures an easy installation and replacement and reduces purchase and maintenance costs. And even when the system is outdated, it is not necessary to acquire a new system, because it can be easily renewed by replacing the components – a cost-effective and sustainable solution.

Your benefits at a glance

- Individual consulting for your application from experts
- Safe and reliable energy storage due to *PBES CellCool™ Liquid Cooling*
- High performance XALT Lithium-ion cells (3C rating) for maximum power and performance
- Simple integration into both new buildings and retrofits
- Modular concept (*CellSwap™*) ensures customisable power and easy maintenance
- Simple installation in various configurations due to modular racks
- Reduced blackout risk through operating ESS
- Optimised fuel consumption and lower engine maintenance costs through efficient energy usage
- Reduced number of generator start/stops or even saves space due to the fact that less generators are necessary
- Project-specific class approval for any of the major classes (ABS, BV, DNV-GL, LR)

Application and Features

- Power Mode: Providing high energy in short time
- Energy Mode: Providing constant energy level over long time
- Peak Shaving Mode: Providing punctually energy to avoid load peaks
- Harbour Mode: Get power without running your Diesel generators or without shore connection – clean and silent!
- “Bring me to harbour” Mode: Your redundant system for propulsion

CellSwap™ Advantages

Traditional battery systems require the entire system to be replaced at end of life – but not with *CellSwap™*: The process is simple and safe. The cell stack easily separates from the electrical controls. The new cell stack is pre-assembled in the SPBES factory in Norway and shipped to the vessel for installation. Old cell stacks are refurbished in the factory and reused and thus, *CellSwap™* helps to protect the environment.

- Provides a more efficient and cost effective solution
- Reduces battery system size and weight
- Reduces capital investment
- Reduces operational and installation costs
- Reduces installation time and effort
- Reduces electronic waste due to refurbishing aged components
- No changes in power management necessary
- Avoids system over sizing for cell aging

NORIS Automation GmbH is a registered solution partner of SPBES
<http://www.pb.es.com/>



PBES CellCool™ Liquid Cooling

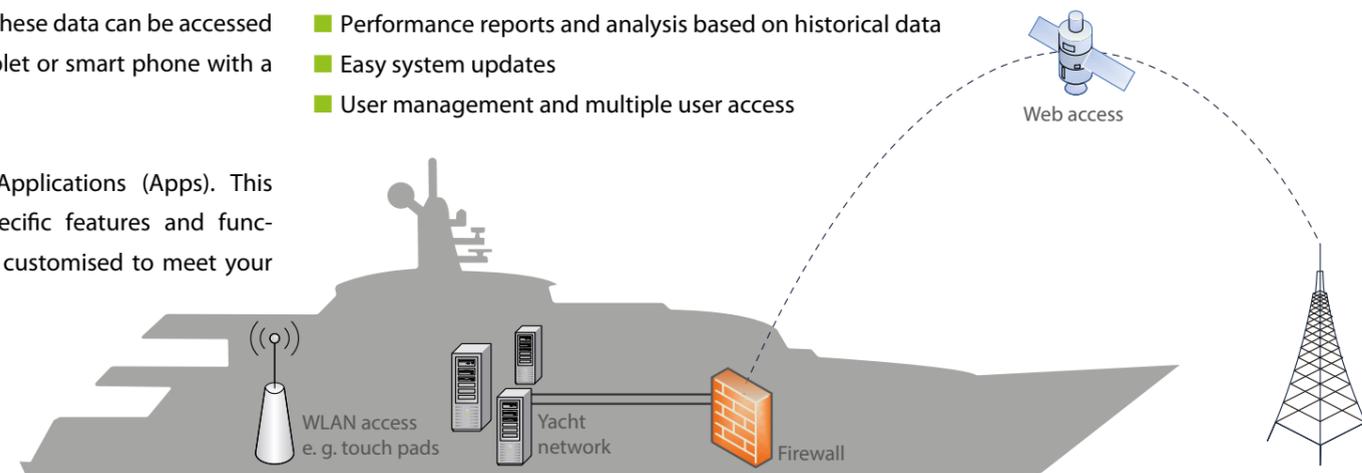
Traditional ESS are based on air cooled batteries. Disadvantages of these batteries are increased aging and thus, a reduced life cycle and also the problem of overheating and inflammation in case of peak loads. The *PBES CellCool™ Liquid Cooling* ensures a uniform temperature across the battery cells and thus, a uniform battery aging. Furthermore a temperature sensor on each cell is used for overheating monitoring and allows to observe bad cell behaviour developing over time. An external air conditioning system, as it is used for air cooled solutions, is also not necessary. This is the safest way for your application.



NORINET – cloud-based solution for remote monitoring and analysis

NORINET cloud-based monitoring and analysis is based on the latest maritime 4.0 infrastructure. The NORINET interface unit is installed on the vessel with access to the internet and connected to the vessel's LAN network. It works as data collector, processor and gateway. The secure data transfer from the interface unit to the cloud is done via MQTT messaging protocol and ensures minimum network traffic and maximum scalability. Data from the alarm, monitoring and control system (AMCS) and navigation data is transferred via GPRS to an onshore server into the NORINET cloud. These data can be accessed via internet with multiple clients (PC, tablet or smart phone with a standard web browser).

NORINET cloud service is based on Applications (Apps). This allows the user to select and use specific features and functions. The NORINET applications can be customised to meet your requirements.



Your benefits at a glance

- Fast, reliable and secure data transfer via MQTT protocol
- Data caching when internet connection is interrupted
- Optimisation of vessel and fleet performance as well as maintenance processes
- App-based functionality to ease customisation and to reduce costs
- Secure real-time remote monitoring
- Performance reports and analysis based on historical data
- Easy system updates
- User management and multiple user access

Web access

Engine order telegraph – secure command transfer

The NORISTAR EOT engine order telegraph is an emergency communication system between the bridge and engine room for transmitting basic commands quickly and reliably.

When a command push-button (e. g. on the bridge EOT) is pressed, the connected EOT panels indicate the command visually and acoustically: the relevant command push-button flashes and an integrated buzzer is activated at the same time. The operator has to acknowledge the command at the receiving EOT by pressing the flashing command push-button.

Your benefits at a glance

- Simple and reliable command transmission
- Perfect integration into the NORIS HMI look and feel
- Interface to the light calling column, alarm, monitoring and control system as well as voyage data recorder
- Different types of EOT panels for bridge and engine control room
- Integrated system failure monitoring



Engine order telegraph

Last but not least – extract from our references

We have gained more than 90 years of experience in the sensor, signal processing, visualisation and automation sectors. Since 1985 we are also represented at the yacht market and have equipped numerous yachts with our innovative and unique solutions. Our alarm, monitoring and control systems, engine safety systems as well as our innovative and exclusive designed propulsion control systems have been installed on numerous yachts, starting from small motor yachts up to luxurious mega yachts with more than 100 metres. We are proud of the privilege to be able to work with some of the most famous yacht builders.







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■ Nuremberg ■ Rostock ■ Rotterdam ■ Singapore ■ Shanghai

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