



# Marine and Offshore



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# Marine and Offshore

## WAGO, Your Reliable Partner for Marine Technology

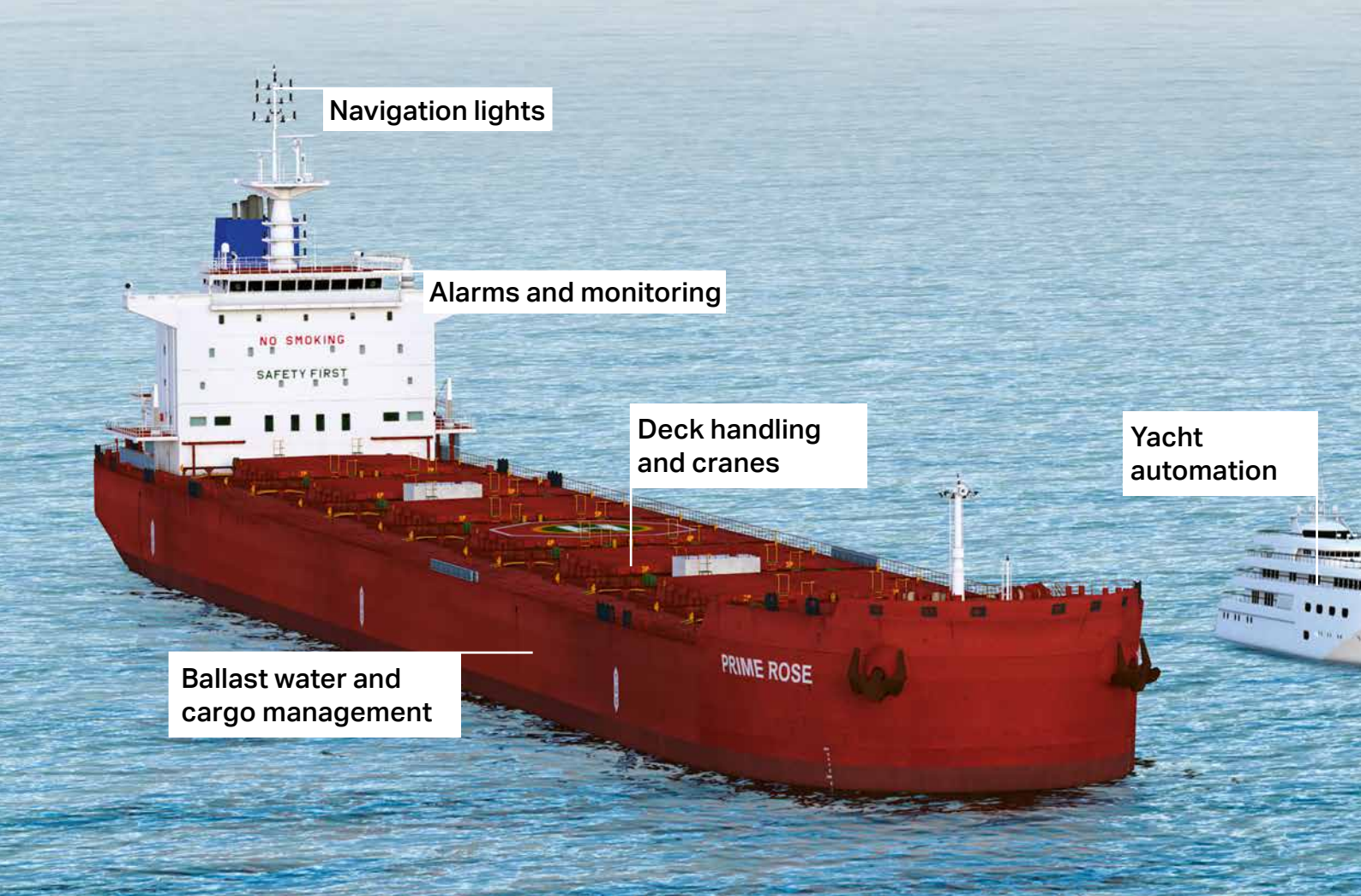
**Safe, reliable, robust components –  
tested, verified and certified**

Whether freighters or mega-yachts, all ships face the same tough requirements at sea. Our automation and connection technologies meet the most challenging requirements on the high seas.

As confirmed by seals from the classification societies of the IACS Association, WAGO products have proven

their durability and strength, ability to withstand extreme temperatures and electromagnetic compatibility (EMC), as well as vibration and shock resistance. These same components also fulfill the requirements for hazardous environments per IECEx and other local legislation.





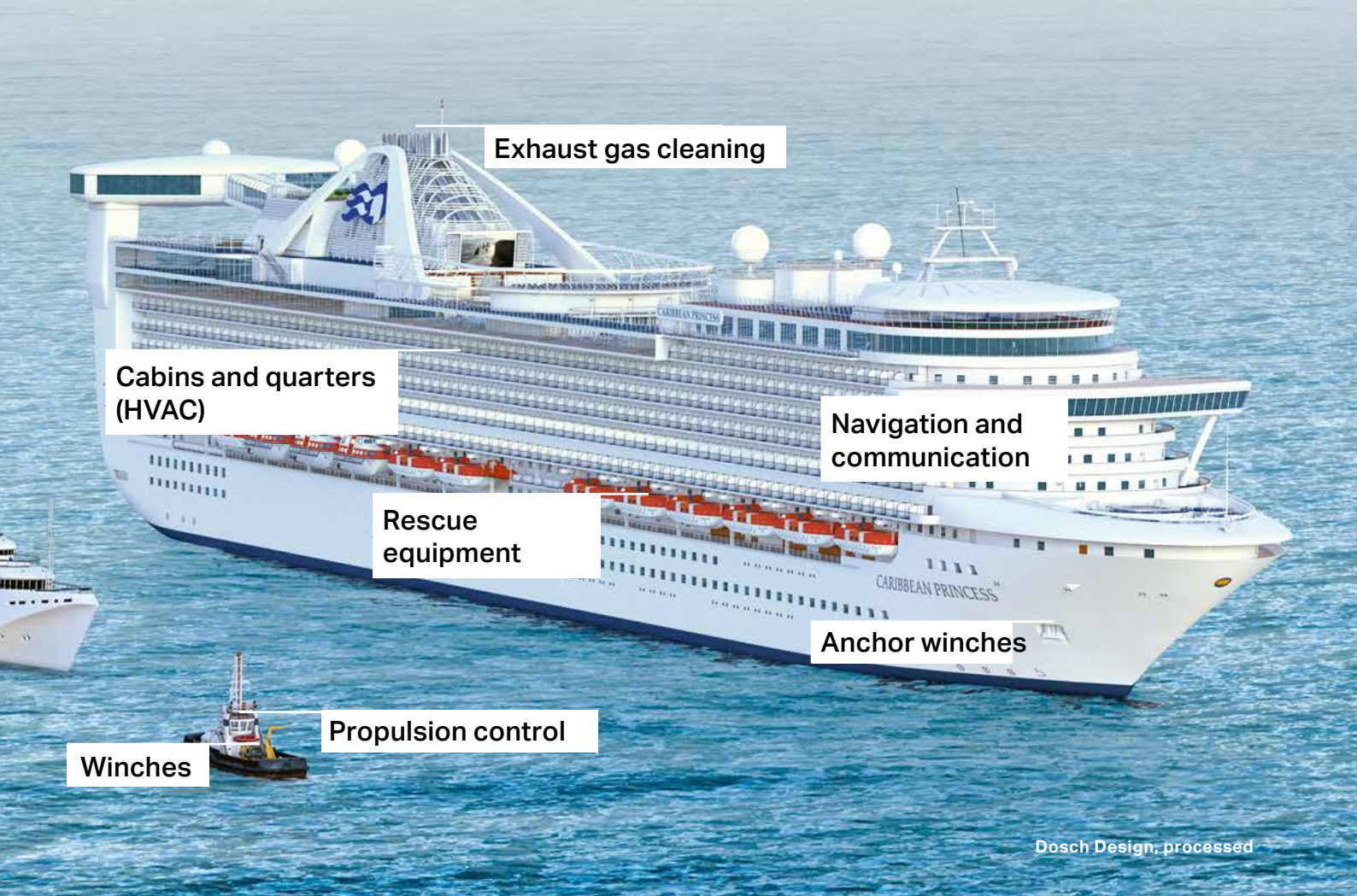
# From the Bridge to the Engine Room

**WAGO is at Home in All Applications.**

## From the bridge to the engine room – automation and reliable connection from WAGO

Our marine automation and offshore products automate nearly every onboard application. Propulsion automation, auxiliary and deck machinery, navigation and communication equipment – every application has its own special requirements. Again and again, WAGO provides the right solutions with its relays, optocouplers, signal conditioning modules, power supplies and network switches.

TOPJOB® S Rail-Mount Terminal Blocks cover conductor cross-sections from 0.08 to 185 mm<sup>2</sup> – a solid basis for electrical connection technology in marine applications. The same also applies to the more than 500 modules of the WAGO I/O System 750. Special certificates (BSH, near the compass) allow these components to be used everywhere, from the bridge to the bilge.



Exhaust gas cleaning

Cabins and quarters  
(HVAC)

Navigation and  
communication

Rescue  
equipment

Anchor winches

Propulsion control

Winches

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### Safe and Reliable in all Applications

- Bridge approval based on IEC EN 60945
- Classified for extreme environments (approved for use in the engine room)
- Low storage and training costs
- Broad application scope for the WAGO I/O System 750



shutterstock.com/Jeanette Dietl

# Alarm and Monitoring Systems

## All Signals in View – Ship Monitoring with WAGO Products

**Collecting, processing and visualizing data, as well as generating alarms – routine, yet important, tasks that the WAGO I/O System handles easily.**

As an engineering planner, you can implement any conceivable configuration in different network topologies using the modular components from the WAGO I/O System 750. Whether decentralized intelligence or a central control system with a powerful PLC; whether digital and analog signals for valve control or light scenarios for a pleasant ambience – our comprehensive automation portfolio lets you create custom solutions.

**The e!COCKPIT engineering platform supports you throughout the entire lifecycle.**

Mapping entire topologies and processing multi-controller systems are the ideal support for processing alarm and monitoring systems with up to 10,000 measuring points. Visualization is based on HTML5 and can be shown on WAGO displays or mobile devices.

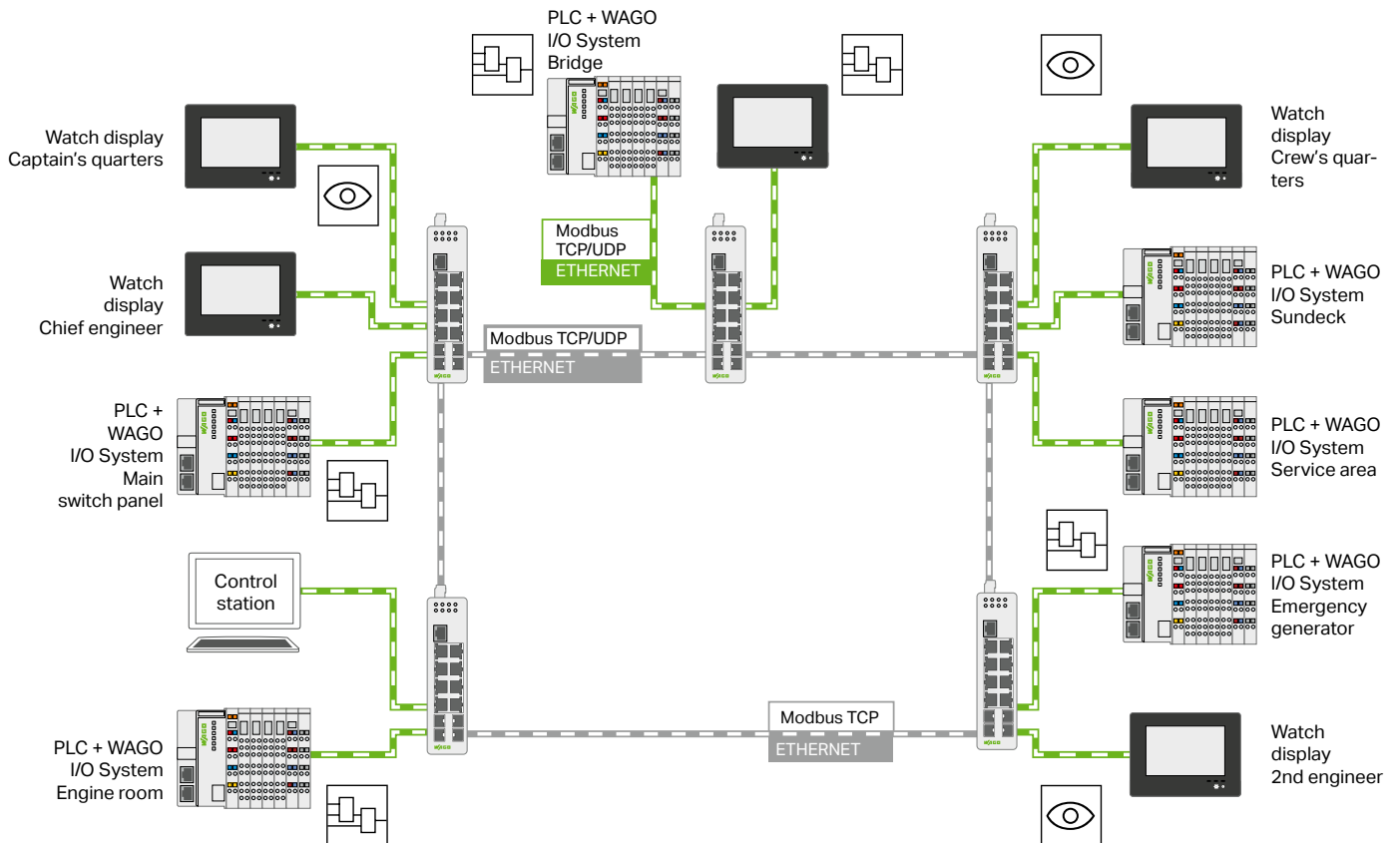
### Alarm and Monitoring Systems

- Modular and distributed
- Bus-independent and scalable
- Network technology and automation from a single source



# Topology of a Ring-Network-Based Alarm and Monitoring System

With Distributed Processing



## 4-Channel Analog Module with Electrically Isolated Multipoint Inputs

Electrically isolating signal inputs effectively prevents interference due to potential differences that may occur in decentralized automated systems. The 4-Channel Analog Module (Item No. 750-471) from the WAGO I/O System 750 has electrically isolated inputs that can be parameterized channel-by-channel, making it ideal for use in such applications. The resolution of the analog inputs is 16 bits. The channels can be configured either as current inputs or voltage inputs. This makes the module very flexible, allowing almost any analog encoder to be recorded depending on the application.



# High Availability on Standard Components

## Application-Based Controller Redundancy

**Redundant, but not superfluous – increase availability using two parallel controllers.**

WAGO's **e!COCKPIT** engineering software tool is the intuitive programming environment for the controller. The multi-node programming environment can easily transmit the PLC program to both PLCs. To take advantage of application-based controller redundancy, a software library with the necessary synchronization functions must be linked to the master PLC. The library offers the option of redundantly linking subnodes using a dual LAN. The subnodes, also known as smart couplers, do not have to be programmed; they can simply be booted from an SD card and then configured via an integrated Webserver. The smart coupler automatically detects the analog and digital input/output modules; the process image is also made available to the higher-level master PLCs auto-

matically. The master PLCs can communicate with higher-level SCADA systems via the Modbus TCP protocol. The redundant coupling happens over two separate networks.

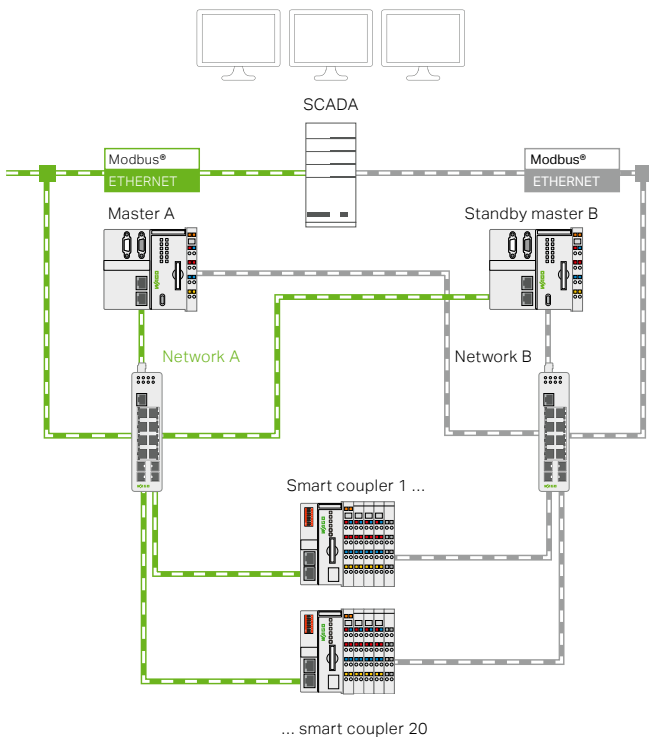
The solution's design corresponds to an SPOF-tolerant system, which means that any occurring fault – like a voltage supply failure, a poor LAN connection, switches or controller – can always be compensated for. The duplication of the ETHERNET topology and the redundant message transmission allow bumpless switchover in the event of a network fault. The typical switchover times after a PLC failure are within DNV GL requirements when this configuration is used in typical alarm and monitoring systems.



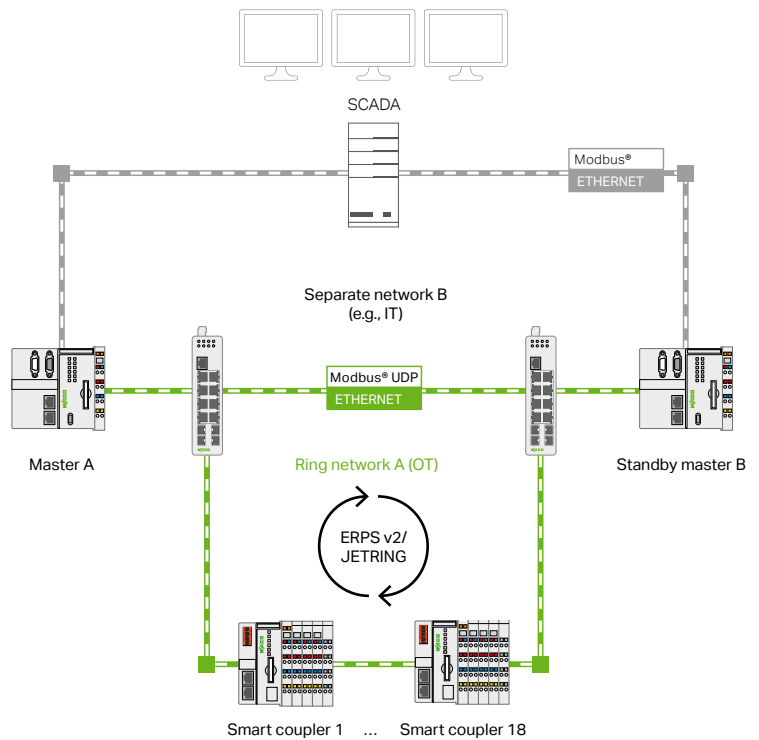
An ETHERNET network can be designed as a dual LAN network or ring. The dual LAN network enables bumpless switching, but is associated with higher cabling costs. Ring network protocols are more economical alternatives; however, they usually require longer switchover times from the system. Switchover times for the more familiar redundancy protocols of office networks (STP, RSTP and MSTP) offer cold redundancy at best – in practice, they require more than two seconds. ERPS offers a standardized, manufacturer-independent ring protocol for switchover in less than 200 ms.

Based on the Modbus TCP protocol, this solution is already used in alarm and monitoring systems. The special advantage of this redundancy solution special is extremely simple commissioning of an entire system using WAGO's standard hardware. For WAGO customers, this represents tremendous cost savings during the system integration of their automation system.

### Controller Redundancy in a DUAL LAN



### Controller Redundancy in a SINGLE LAN



	DUAL LAN	RING LAN (ERPS)
Network	Uninterruptible	200 ms
PLC	200 ms	200 ms
<b>System</b>	<b>200 ms</b>	<b>200 ms</b>

Switchover time



# In Perfect Balance

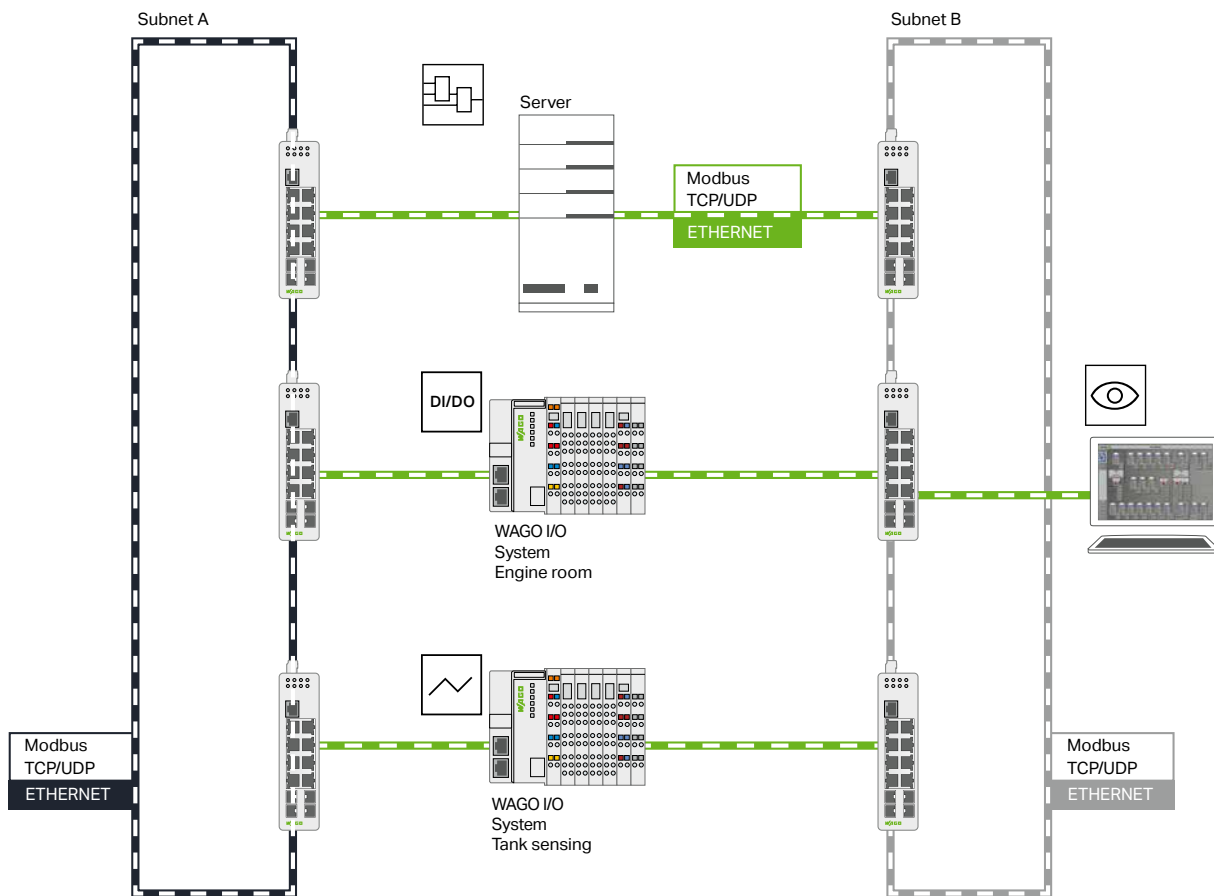
## Automation for Tank Ballast and Cargo Management Systems

**Maintaining stability on rough seas is vital for cargo ships.**

A reliable tank ballast system is a ship's insurance against incorrect trim, heel or draft. The anti-heeling system can automate several steps for this essential function. An automated cargo management system can make rapid loading and unloading significantly easier. Ensure that processes run down safely in the event of a fault with a WAGO automation-equipped emergency shutdown system. This solution for protecting humans and the environment has long been standard equipment for German- and Italian-built cruise ships. As the global movement of

goods increases, protecting native species is becoming more and more critical. Microorganisms can be transported from one biosphere to another in ballast water and upset nature's delicate balance. To prevent this, the IMO Convention on ballast water treatment defines limits. The only way to comply with these limits is with filtration systems. A modular, efficient, effective setup using WAGO components will help you minimize the additional costs this entails.

# Topology of a Tank Ballast System with a Dual Ring and Central Processing



## WAGO Field-Side Power Supply Filters and WAGO Power Supply Filters with Integrated Ground Diagnostics for Equipment and Systems with Insulation Monitoring

Until now, reliably powering a fieldbus node was the only job of WAGO's field-side power supply filters and WAGO's power supply filters. However, two new variants now offer integrated ground fault diagnostics as well. These models protect the system against high-energy disturbances on DC supply lines, such as those caused by switching over-voltages or inductive loads, and also guard the field supply against transient overvoltages.

### Redundant power supply

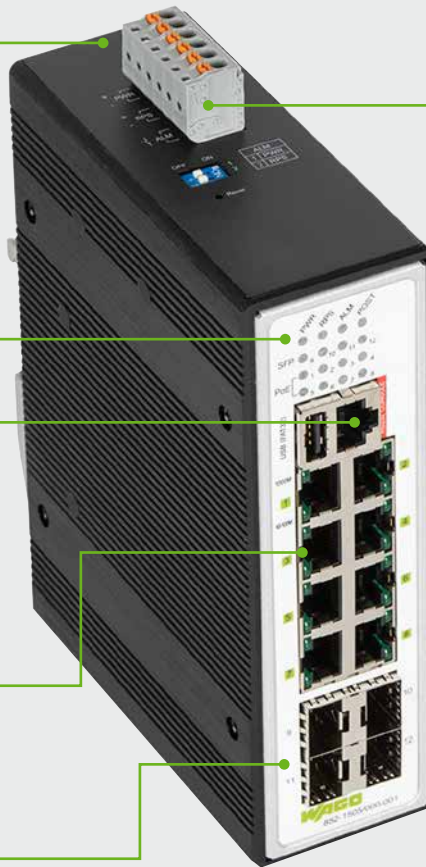
### Status LEDs

- Primary power supply available
- Secondary power supply available
- Alarm message pending

### RS-232 interface for command-based configuration

### Integrated Web-Based Management for configuration or diagnostics

### Use of 1 Gbit/s SFP modules



### Alarm contact

- Jet ring diagnostics
- ERPS ring diagnostics
- Monitoring the primary and secondary power supplies
- Monitoring ETHERNET ports
- Signaling via PLC or remote I/O (e.g., indicator light on the front of the control cabinet)

### USB interface

- Firmware update
- Saving the diagnostics (Syslog)
- Loading/saving the configuration

### Configurable functions

- Network security
- Availability (redundancy and diagnostics)
- Performance
- Data transmission

\* Small Form-factor Pluggable Interface for fiber optic cables

# Industrial Managed Switches

## Fully Managed – Powerful and Secure

	PoE+		
			
<b>Item number</b>	<b>852-303</b>	<b>852-1305<sup>3</sup></b>	<b>852-1505/000-001</b>
<b>Copper ports</b>	8 × 10/100BASE-TX	8 × 10/100/1000BASE-T	8 × 10/100/1000BASE-T
<b>PoE+ ports</b>	-	-	8 × PoE+ 30 W per port
<b>SFP ports</b>	2 × SFP 100BASE or 1000BASE <sup>1</sup>	4 × SFP 1000BASE-SX/LX/ZX	4 × SFP 1000BASE-SX/LX/ZX
<b>Supply voltage</b>	12 ... 60 VDC	12 ... 60 VDC	24 ... 57 VDC
<b>Redundant power supply</b>	■	■	■
<b>Alarm contact</b>	■	■	■
<b>Dimensions (W × H × D)</b>	50 × 120 × 162 mm	50 × 120 × 162 mm	50 × 120 × 162 mm
<b>Ambient temperature (operation)</b>	-40 ... +70 °C	-40 ... +70 °C	-40 ... +70 °C -10 ... +60 °C per UL 61010
<b>Approvals</b>	UL, DNV GL	UL, DNV GL	UL <sup>2</sup> , IEC 61850-3, DNV GL, LR
<b>Prioritization</b>	IEEE 802.1Q	IEEE 802.1Q	IEEE 802.1Q

<sup>1</sup> Configurable via DIP switch (1000BASE-SX/-FX/-ZX or 100BASE-FX)

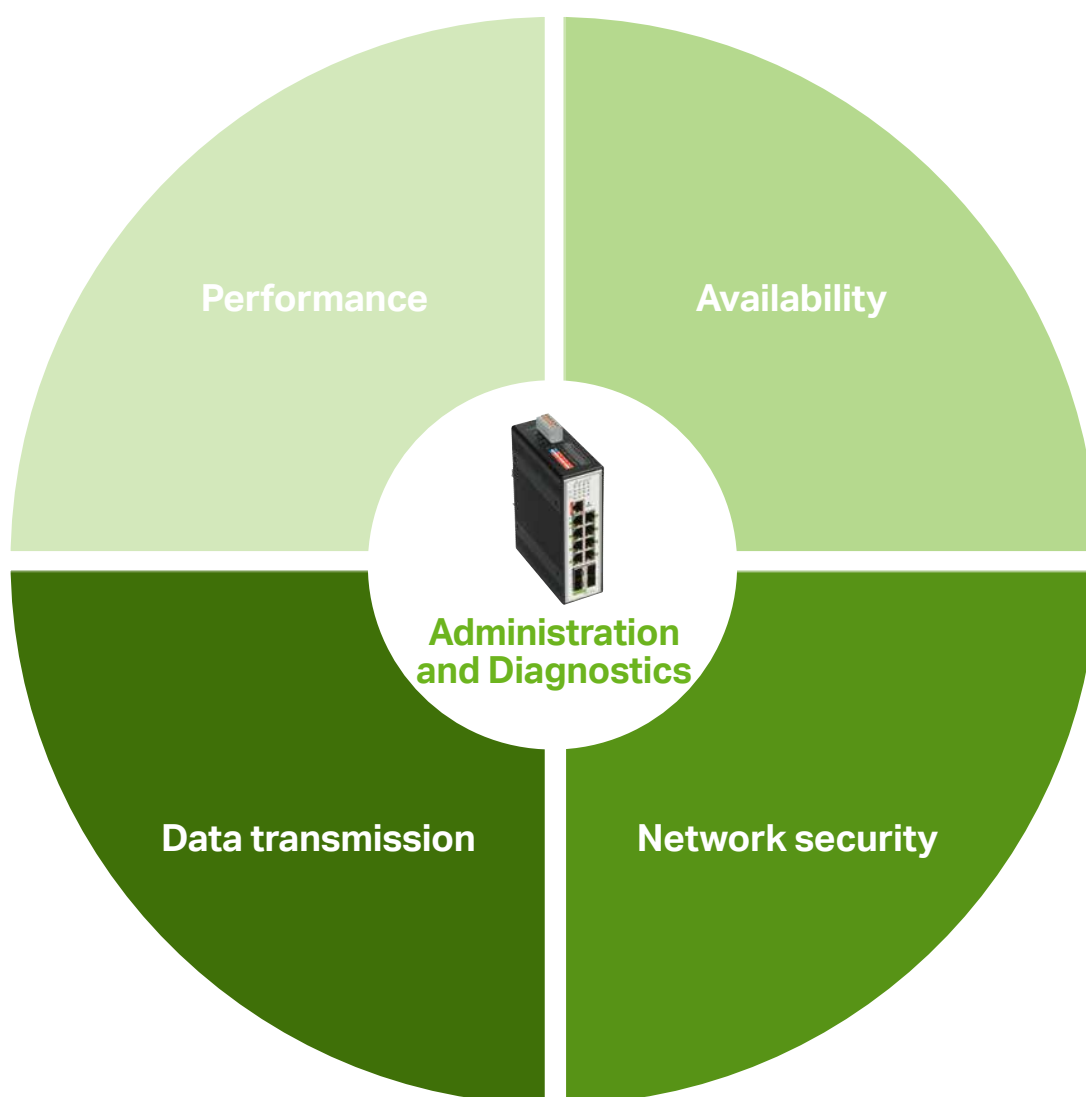
<sup>2</sup> For supply voltage < 48 VDC, the PoE power budget is limited to 120 W.

<sup>3</sup> Also available as a PoE version (852-1505)

# Function Overview: Fully Managed Switches

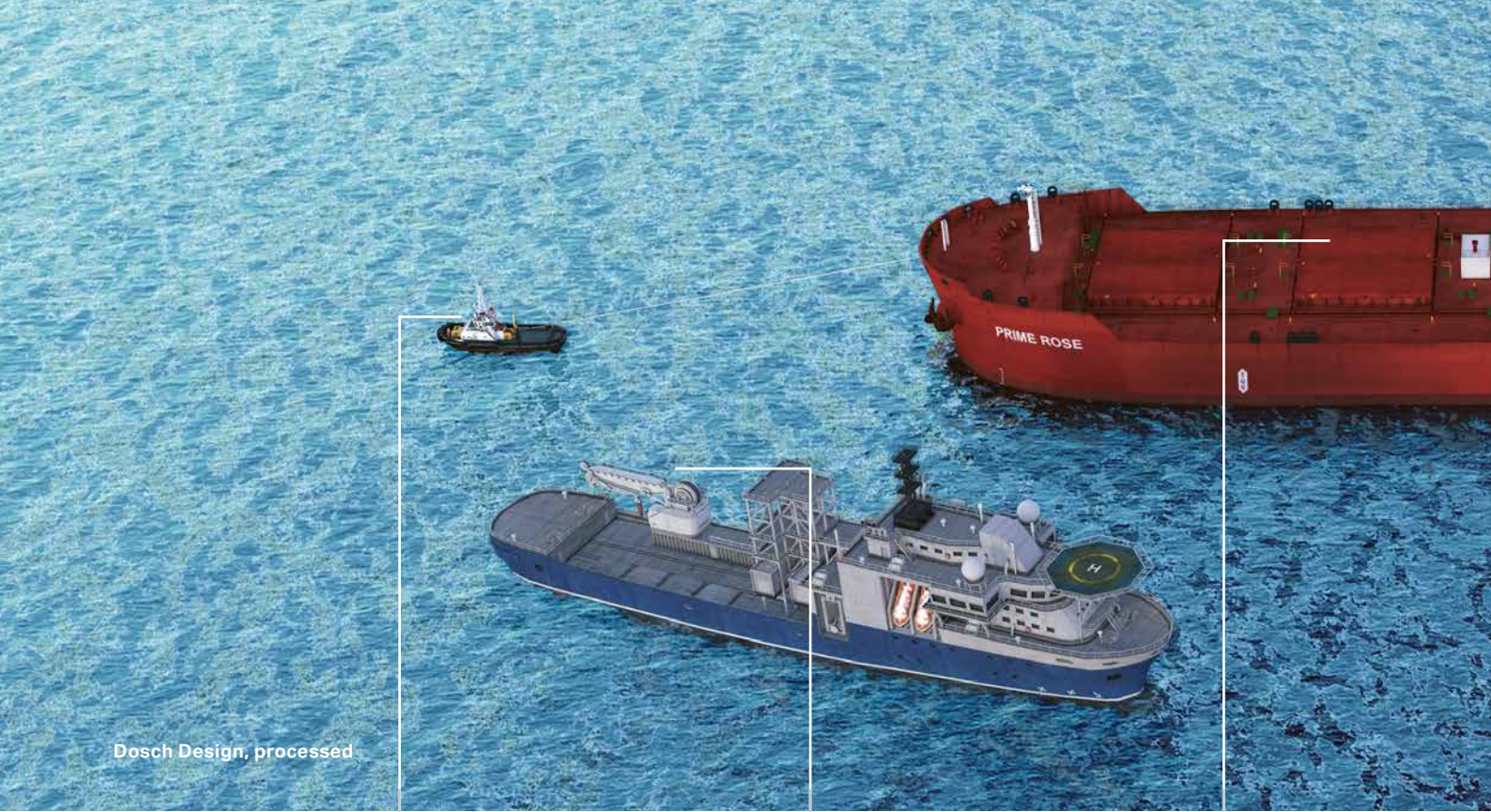
- Storm control
- Bandwidth control
- Auto-provisioning
- Link aggregation
- ...

- ERPS
- Dual homing
- Xpress/jet ring
- Dual ring
- STP/RSTP
- ...



- VLAN
- IGMP snooping
- IP-based VLAN
- MAC-based VLAN
- ...

- IEEE 802.1X authentication
- Access control list
- DHCP snooping
- Port security
- Service control
- ...



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# Deck and Cargo Handling

## Closed Hatches and Secured Cargo

**On rough seas or in environmental protection zones, modern tugboats must escort ever larger ships safely into port.**

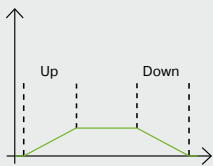
Time is quite literally money in this industry; the ability to offer your services as frequently as possible, nearly "around the clock," is a significant competitive advantage. Highly automated winches and other on-deck machines provide the best possible protection for the crew. The same is true of the process of using cranes and gangway systems for loading and unloading on offshore wind farms or oil drilling platforms. Direct control of proportional valves is a major advantage, making expensive valve drives and proprietary solutions a thing of the past. Parameterization joins automation at the point where the toolchain is available anyway.

### Deck and Cargo Handling

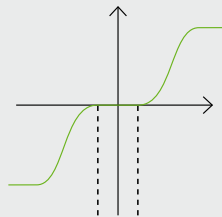
- Direct valve control from the WAGO I/O System
- Controller library for CODESYS
- Parameterization of proportional valve modules via WAGO-I/O-CHECK



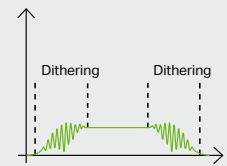
### Setpoint ramps



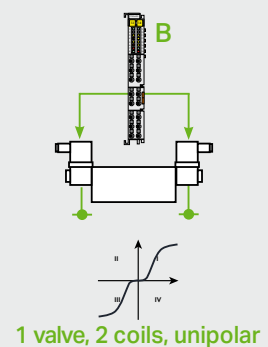
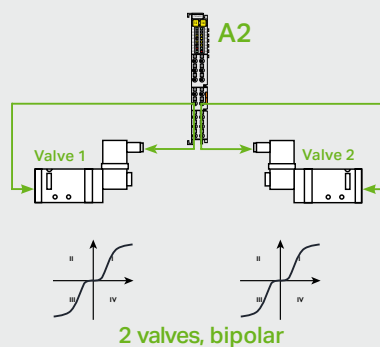
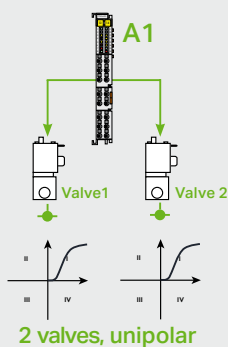
### Valve adjustment



### Dithering

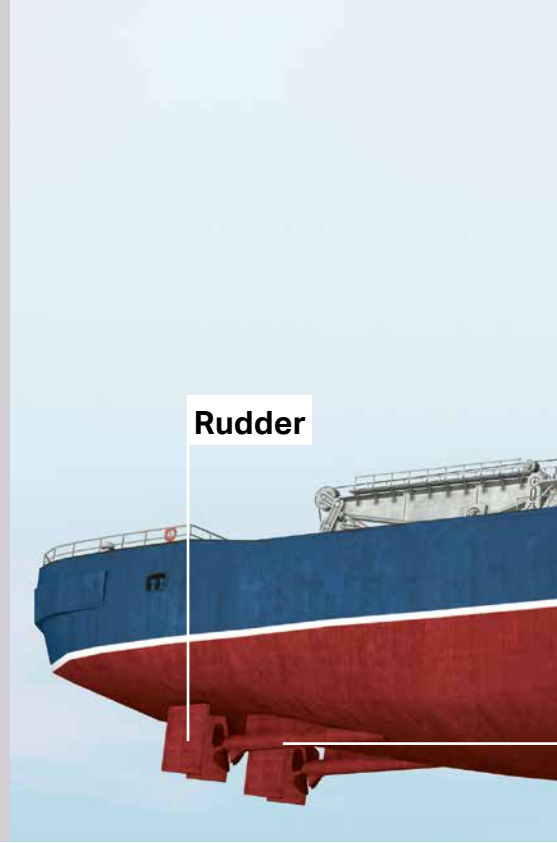
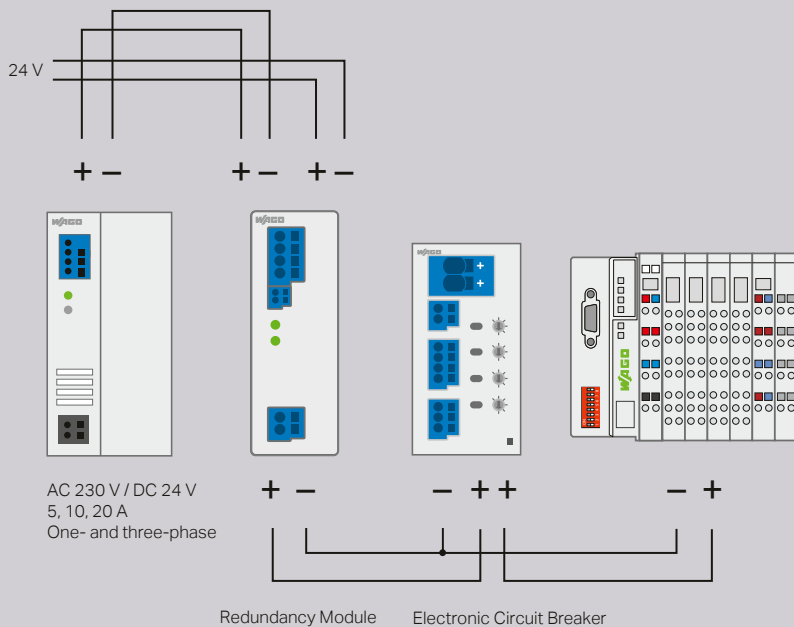


### Operating modes



WAGO's proportional valve module controls two single-coil valves with up to 24 V/1.6 A, or one valve with up to 24 V/2 A. The module features two current-controlled PWM\* outputs with adjustable dithering. Both unipolar and bipolar valve control are possible. Additionally, operation of a valve with two unipolar coils is also provided. In this operating mode, it functions as a single-channel module! Characteristic curve adaptations, such as zero offset, dual gain compensation and range limitations,

can be adjusted via parameters. Scaling and configurable up/down ramps let you adapt the setpoints to the specific application. Two additional digital inputs are available for monitoring threshold value switches, for example. Commissioning and valve parameters adjustment are performed via the WAGO-I/O-CHECK software or the controller.



## Full Speed Ahead

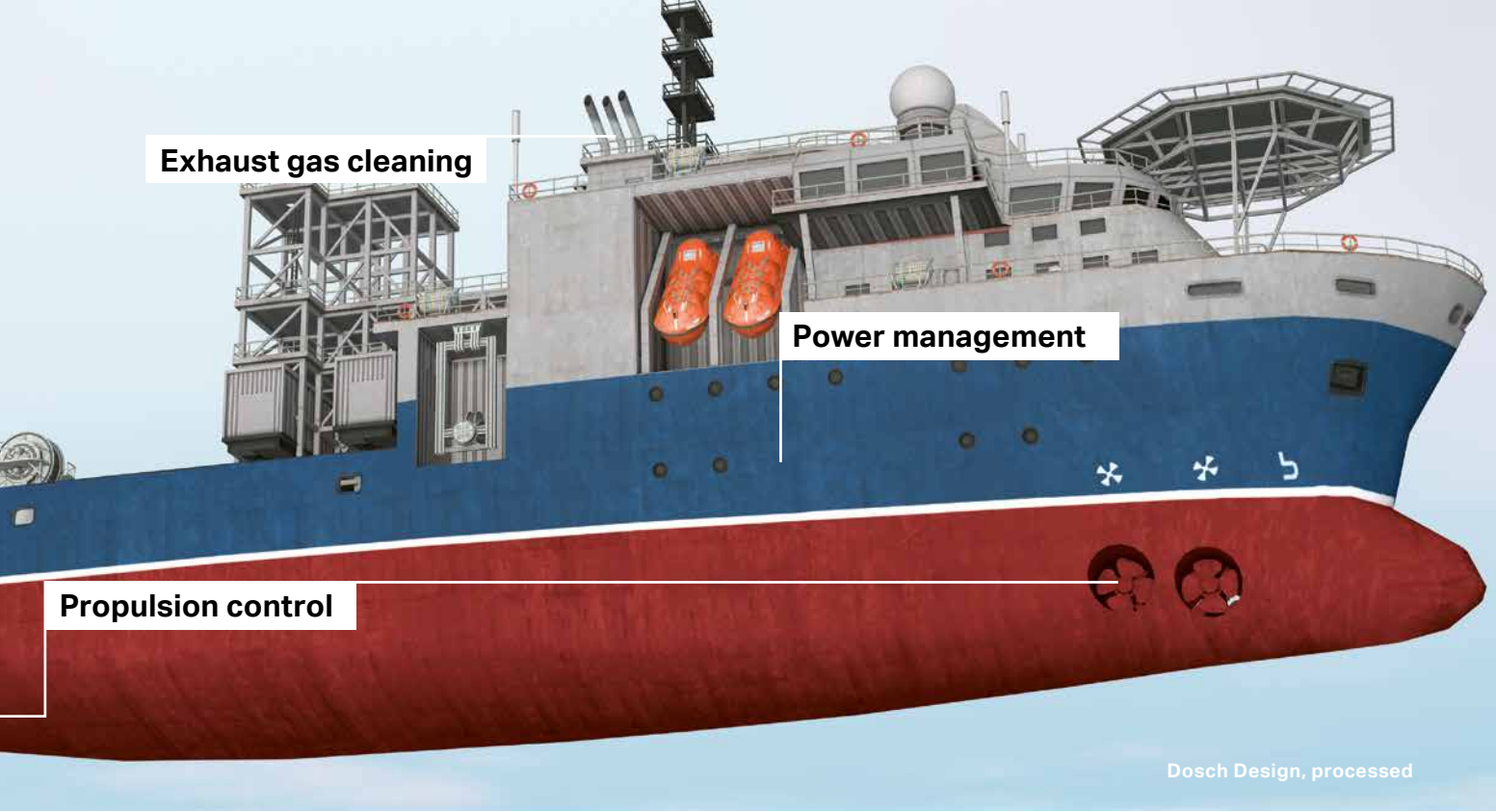
### Whether a Diesel Engine with Exhaust Gas Cleaning or a Hybrid Propulsion System: The Propulsion Automation Comes from WAGO

#### Marine propulsion technology is being tested.

Trends such as slow steaming, dual fuel, exhaust gas reduction, hybrid propulsion and LNG as fuel involve requirements that increase the complexity of propulsion systems. Therefore, demands for intelligent automation solutions make perfect sense. The intrinsically safe portfolio of the WAGO I/O System 750 enables you to automate LNG propulsion systems or retrofit scrubber and filter systems for exhaust gas reduction. The 750 XTR Series components are specifically hardened for use with particularly high or low ambient temperatures, extreme

vibration or EMC conditions. Our power supply modules are designed for more stringent availability and reliability requirements. In case of a fault, single- and multi-phase power supplies and buffer modules ensure automation system availability. Protection of the secondary circuits is conveniently provided via remote-controlled electronic fuses. Energy measurement modules for diesel-electric propulsion systems and an extensive portfolio of signal converters and signal amplifiers complete the product range.





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MARPOL Annex 6: Fuel Sulfur Content		
Time	Upper Limits for Fuel Sulfur Content (%)	
	SOx ECA*	Rest of World
2000	1.5 %	4.5 %
July 2007	1.0 %	
2012		3.5 %
2015	0.1 %	
2020**		0.5 %

MARPOL Annex 6: Nitrogen Oxide Emission Limits				
Tier	Time	NOx Limit g/kW		
		n < 130	130 < = n < 2000	n > = 2000
Tier I	2000	17,0	45 * n <sup>-0.2</sup>	9,8
Tier II	2011	14,4	44 * n <sup>-0.23</sup>	7,7
Tier III	2016*	3,4	9 * n <sup>-0.2</sup>	1,96

Overview of exhaust gas standards



The WAGO I/O System 750 XTR is temperature-resistant from -40°C to +70°C, vibration-proof up to 5g and resistant to impulse voltage per EN 60870-2-1.

- Propulsion and Rudder Systems**
- Intrinsically safe modules for sensors in Zone 2
  - Marine-compliant power supply design
  - Signal conversion and automation from a single source



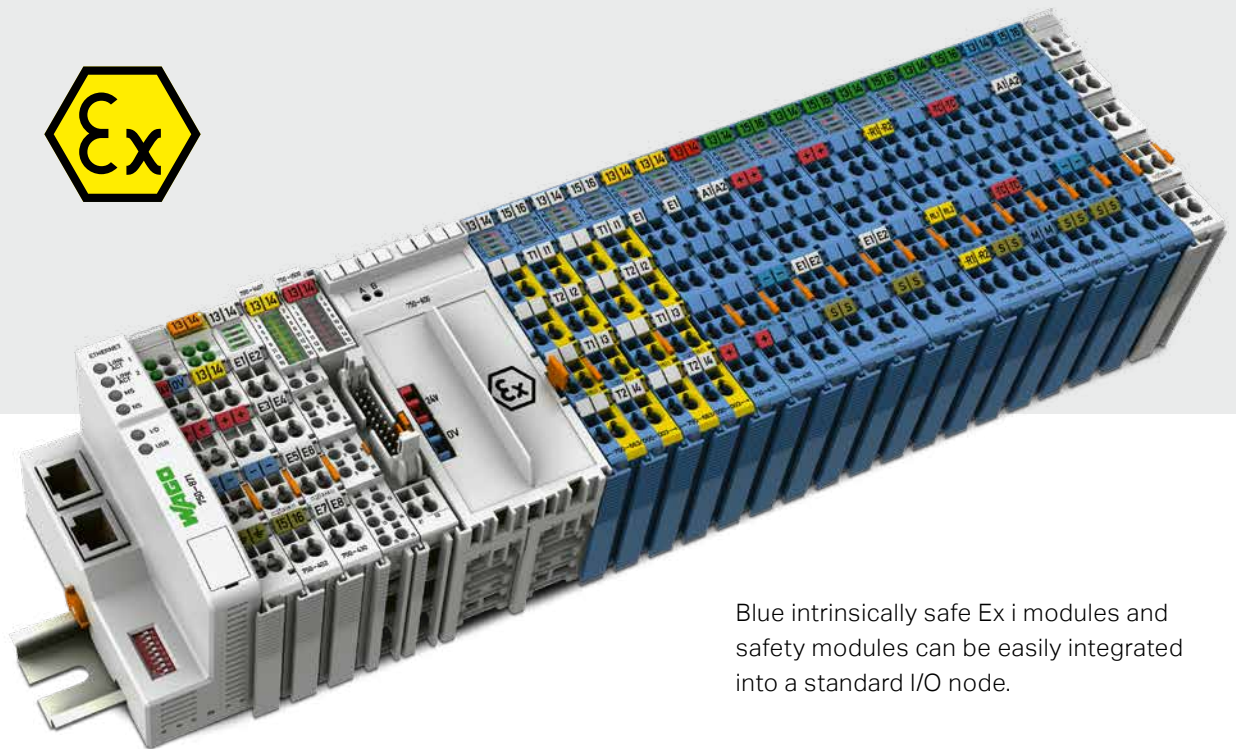
# SHAPING A SUSTAINABLE FUTURE

WAGO offers solutions for your sustainable future projects. Proven in hybrid concepts and for controlling and monitoring fuel cells, we are your experienced partner. With our reliable, certified solutions, as well as maritime features such as redundancy, we'll help you shape a sustainable future.

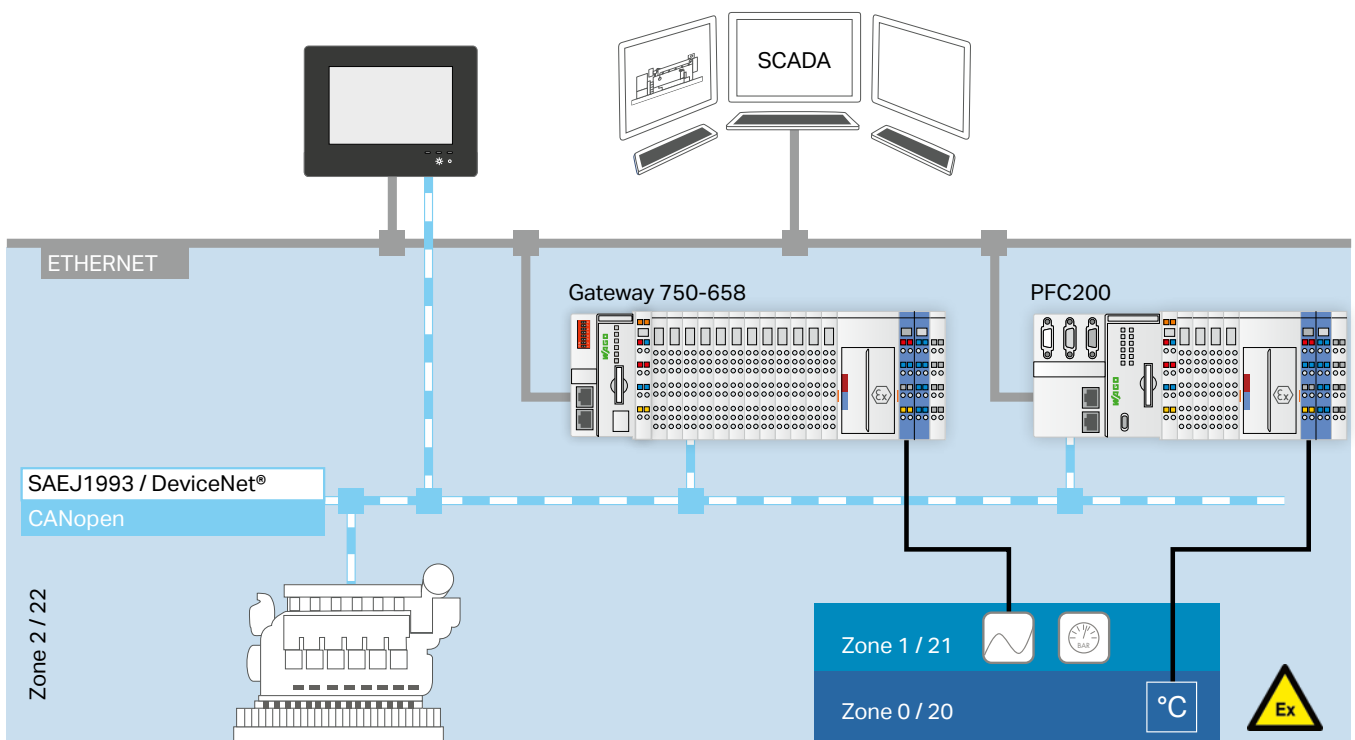


[www.wago.com/marine](http://www.wago.com/marine)

# Safety on the High Seas



Blue intrinsically safe Ex i modules and safety modules can be easily integrated into a standard I/O node.



Example applications can also be realized with other fieldbus systems.



## Optimizing Subsystems

WAGO's high-performance touch panels for demanding control and visualization tasks improve the operability of machines and systems while offering an outstanding design and advanced technology. Depending on the application, panels are available with resistive touchscreens, capacitive multi-touch panels with glass surfaces and devices with matte black anti-reflection surfaces for marine applications.

### Available as:

- Visu Panel in the following sizes: 4.3", 5.7", 7.0" and 10.1"
- Control Panel in the following sizes: 4.3", 5.7", 7.0" and 10.1"

### With the Following Marine Features:

- Marine approval
- Certified compass distance per EN 60945 for use on the bridge
- "Dim-to-zero" function
- Brightness, front LEDs and internal beeper control
- Non-reflective surface
- High brightness (up to 800 cd/m<sup>2</sup>)



More Information

# Parameter Setting – Not Programming!

Whether a megayacht, freighter or cruise ship – subsystems like diesel generators, boilers and fuel metering systems rely on decentralized automation. In addition to the core processes, a decentralized alarm and monitoring system (AMS) is desirable; however, programming is time-consuming and distracts project engineers from their main job.

That’s why WAGO’s solution is designed to require no programming – only parameter setting. A library for decentralized AMSs for the programming environment simplifies the process. The goal is quickly assembling a decentralized AMS using preprogrammed functions, visualizations and database connections. Because this system solution emphasizes parameterization, system designers have more time for their core tasks. Inputs can be created, and limits for alarms can be set via a configurator. All requirements of the DNV classification society are considered, such as history, handling, alarm acknowledgment and read-in.

Alarm	Message	Timestamp	TS_Start	TS_End	Description	Unit	Value	Unit	Value	Unit	Value
1	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
2	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
3	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
4	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
5	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
6	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
7	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
8	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
9	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
10	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
11	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
12	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
13	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
14	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
15	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1
16	OK	NOTACK-INACTV	14.10.18	08:00:00	Planned Closure 1	Shutdown	1	08:00:00	1	08:00:00	1

System integrators can easily expand existing systems to include a decentralized AMS. The speed with which they can adapt preprogrammed functions, visualizations and database connections is another benefit and saves them the laborious work of alarm handling.

The new WAGO library for the e!COCKPIT programming environment allows users to quickly set up a decentralized AMS using pre-programmed functions, visualizations and database connections.

### The Three Elements of the e!COCKPIT Solution:

- Function block for calculating and converting input data. The parameters, which are set using the configurator, evaluate the input data and convert it. Warnings and alarms that occur are visualized in pre-programmed “alarm tables.” The current values can also be displayed in a “measured value table.”
- The alarm handler monitors the parameters set with the configurator and provides the programmer with a structure (array) listing all alarm states.
- The third element is a data logger with an SQLite database. Marine-compliant recording is ensured for all incoming and outgoing alarms. All measurement points are stored in parallel at predetermined intervals. The stored values can be accessed and exported at the user’s convenience in an alarm history or a measured value history.



# Smart Cabin Control System

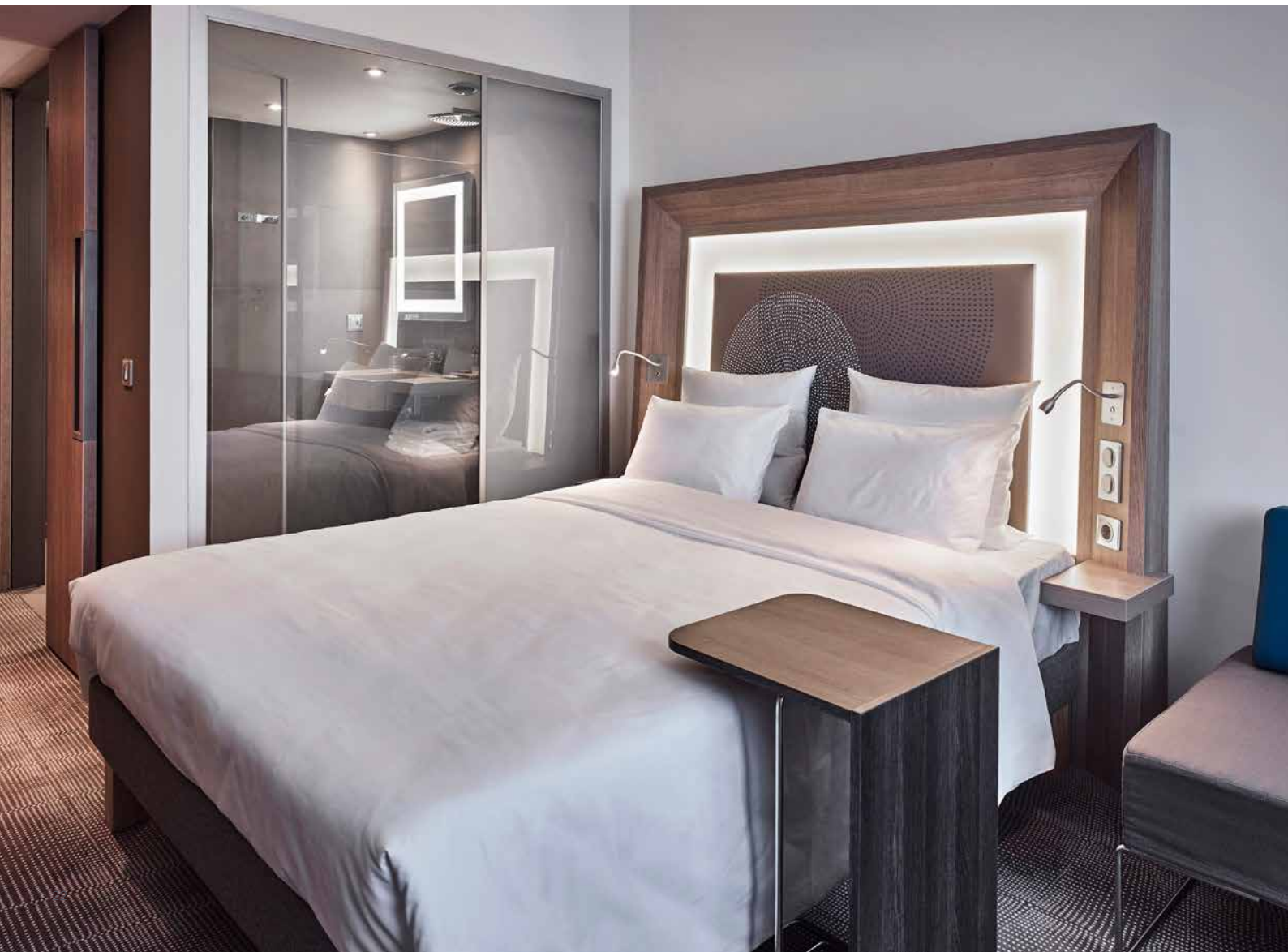
## Cabin Automation

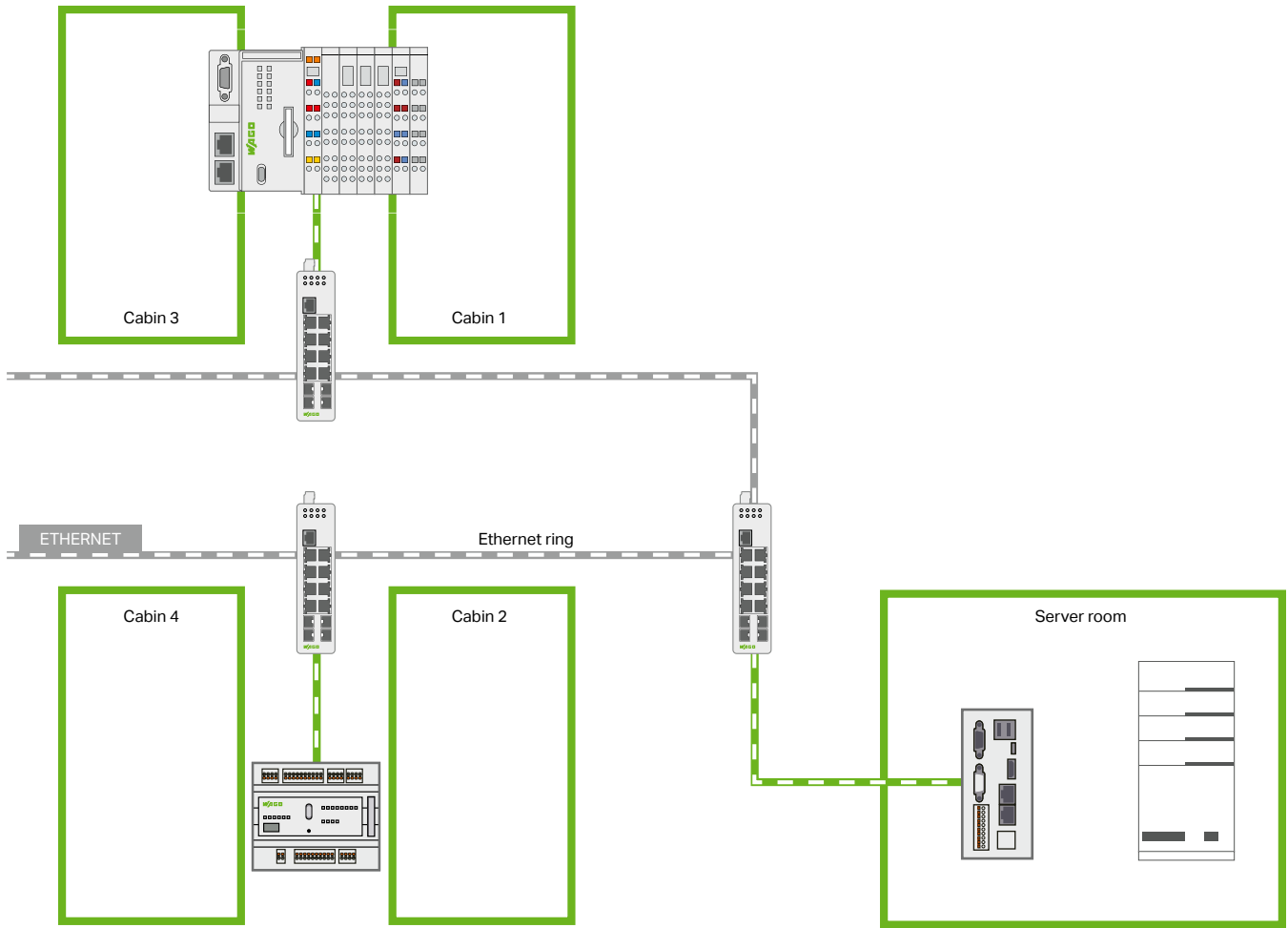
On yachts, megayachts and cruise ships, passenger satisfaction is a high priority. The solution: demand-driven, passenger-oriented room control.

The HVAC control is based on room occupancy and passenger preference. The choice among different light scenarios and brightness levels allows them to make their little oasis perfect. The system can be operated via a touch panel or smartphone using an app. A connection

to the server allows remote monitoring, programming and connection to the hotel system. New technologies like Docker® allow the program to run both on a server and locally as a back-up.

Whether with WAGO Compact Controllers or the modular WAGO I/O System 750, WAGO's automation solutions and control cabinet equipment help you meet future requirements.



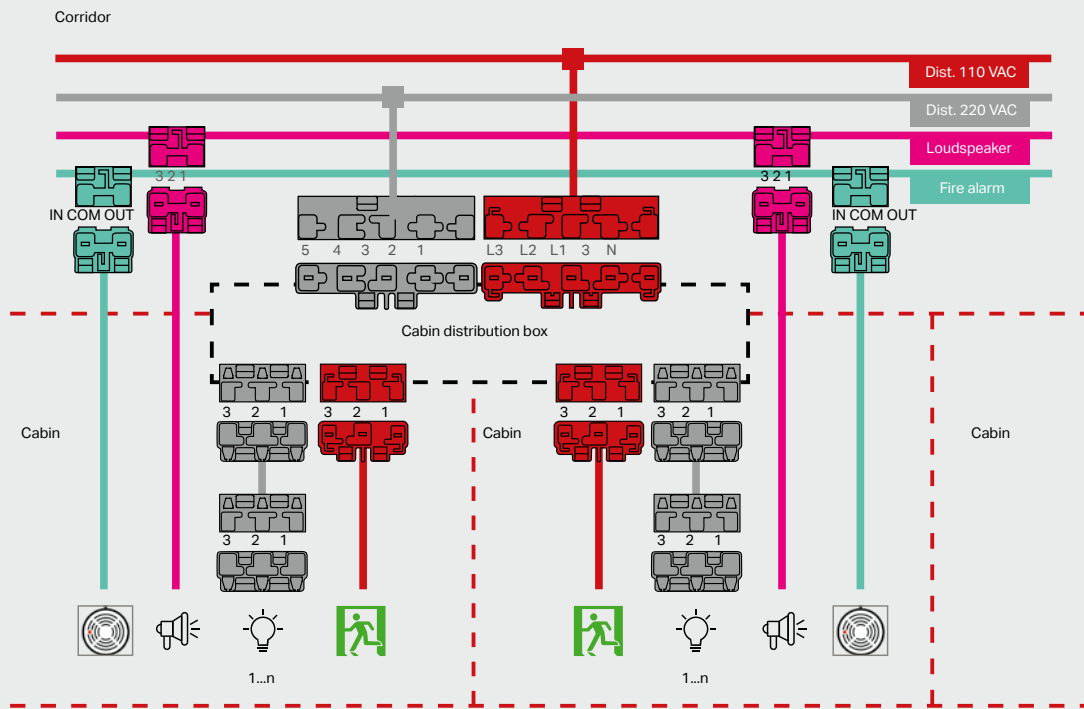


## Use Applications Faster with Docker®

Docker® container technology speeds up software development, testing and deployment, since its use is app-based. WAGO controllers now make it possible to exploit these advantages on an embedded platform.

Docker® virtualization technology, based on Linux®, can make software deployment significantly easier because it packages applications in a portable form.

Modern software and numerous applications provided by developers internationally can then be used quickly and easily on WAGO devices.



# Cabin Distribution

## The Floating Hotel – Safety and Functionality

**Cruises are growing in popularity, prompting an understandable increase in comfort and safety demands.**

The WINSTA® Pluggable Connection System for electrical distribution contributes to the safety and reliability of onboard pluggable connections. The plugs are pre-assembled under carefully controlled conditions in the workshop – a win-win situation, improving wiring quality and minimizing expensive onboard installation time. Whether for cabin distribution or in the dining area, lighting manufacturers are relying more and more on pluggable PCB connectors from the WINSTA® line. The WINSTA® product line is supplemented by the pluggable X-COM®-SYSTEM for rapid plugging in control cabinets – two products that complement each other perfectly.

The benefits of the WAGO I/O System are also evident in cabin distribution boxes: WAGO's comprehensive function libraries let you program switching and control functions easily.

WAGO's **e!COCKPIT** Engineering Software simplifies the programming and configuration of multi-controller systems. The new object orientation prevents recurring errors and increases the reusability of existing code.

### Cabin Installation

WINSTA® and X-COM® SYSTEM:

- Color-coded
- Mechanically coded
- Reduced costs for onboard electrical installations

### Cabin Automation

WAGO I/O System:

- Modular and distributed
- Access to building automation libraries
- Flexible solution for various signals and bus protocols



# Fire Alarm System

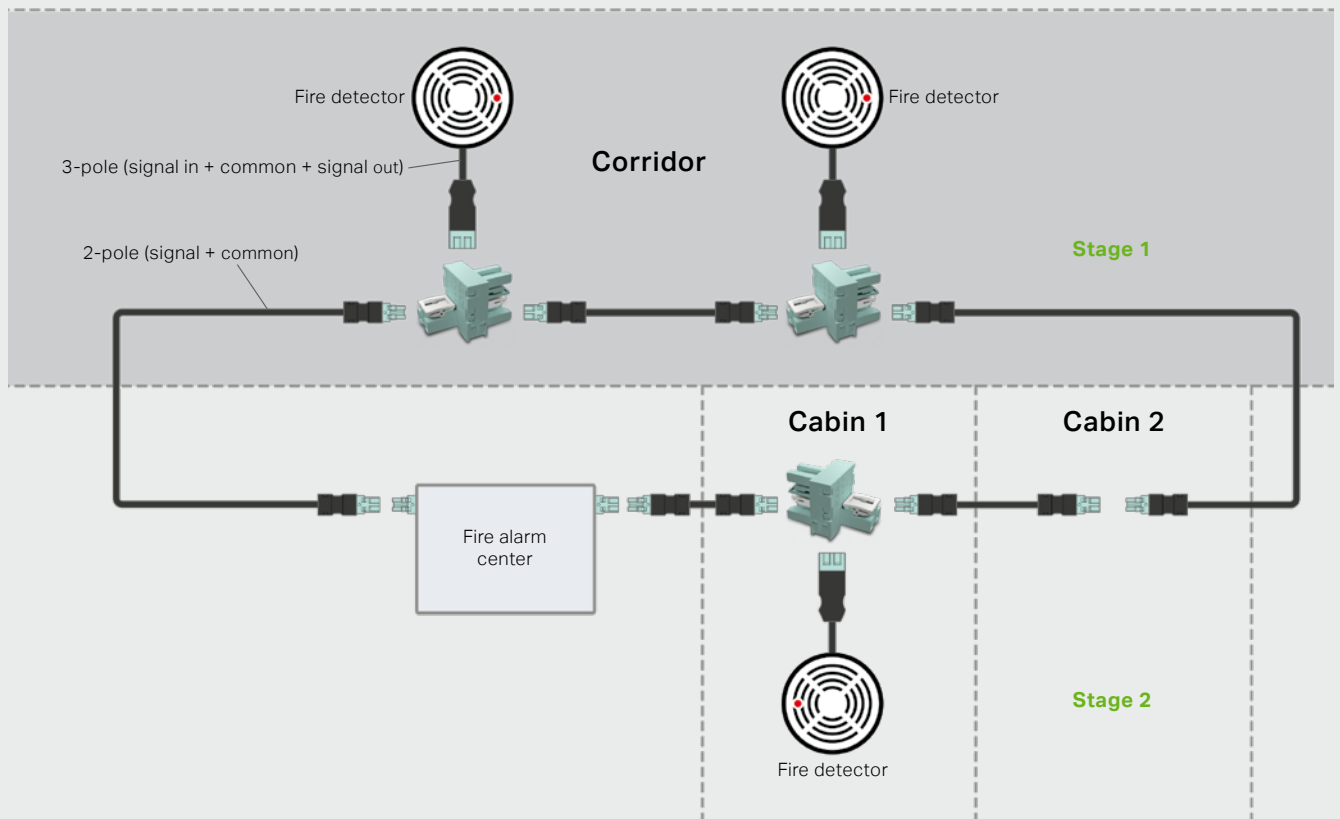
## Pluggable Solution for Fire Alarm Systems

### Convenient installation of fire alarm systems

The WINSTA® Pluggable Connection System for modern marine engineering offers a simple, economical, efficient solution for manufacturers of fire alarm systems on ships and in shipbuilding. The distribution box is the first solution to allow a pluggable connection of the fire alarm system loop. It allows the flexible, temporary connection of additional fire alarms, such as those for cabin installation, without extensive downtime. The system is perfectly tailored to the requirements of onboard fire alarm systems and complies with DNV GL and the MED Directive. All components are DNV GL-approved (further approvals upon request).

#### Advantages:

- Simple pluggable connection of an additional fire alarm within the line
- Time-consuming onboard wiring replaced by plug-and-play configured cables
- Simple setup of a temporary fire alarm network during commissioning



**The fire alarms are installed in two stages for the same loop:**

- Stage 1:** During commissioning: installation of all fire alarms, or every other fire alarm, in the corridors
- Stage 2:** Subsequent connection of in-cabin fire alarms during commissioning



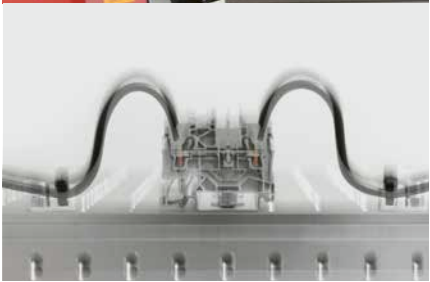
# Our Lab Tests

## Tough Challenges on Rough Seas

Quality comes from experience and uncompromising attention to detail.

As the world market leader and inventor of screwless connection technology, we offer the industry's broadest range of rail-mount terminal blocks with spring pressure connection technology, accommodating conductor

cross-sections from 0.08 to 185 mm<sup>2</sup> (28–4/0 AWG). Years of experience have proven that our maintenance-free spring clamp connections remain secure – even after 35 years!



Vibration test



Climatic chamber



Salt spray test



**Proven quality thanks to certified processes and products**

Our products meet the highest quality demands. That's more than just our promise – it's also guaranteed by internationally recognized certificates. In addition DIN

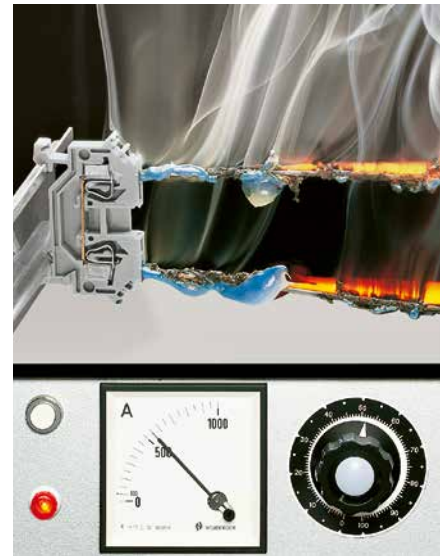
ISO 9001:2000 and ISO 14001, WAGO also meets the necessary maritime approvals: DNVGL, ABS, LRS, BV, KRS and classNK.



Gastight clamping unit



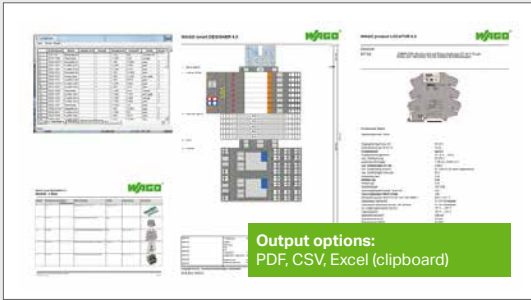
EMC tests



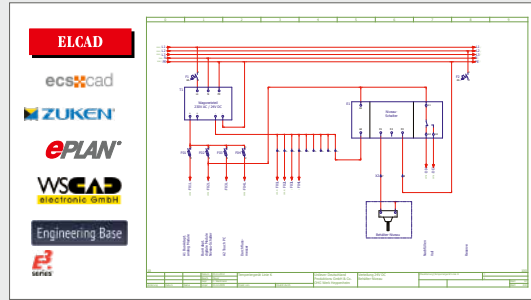
Temperature test

## WAGO Smart Designer Configurator

### Planning



### Export/Import

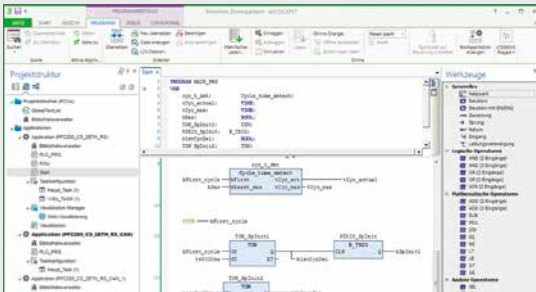


### CAD Data Download



## e!COCKPIT

### Programming



### Visualization



### Configuration



# The WAGO Tool Chain

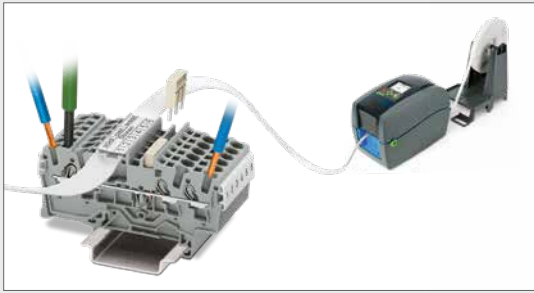
## Full Support – from Planning to Commissioning

Rapid engineering is essential for success in today's globally networked world. Tapping into new markets and outperforming competitors requires adapting to your customers' needs and demands. WAGO supports you in these efforts with an end-to-end toolchain.

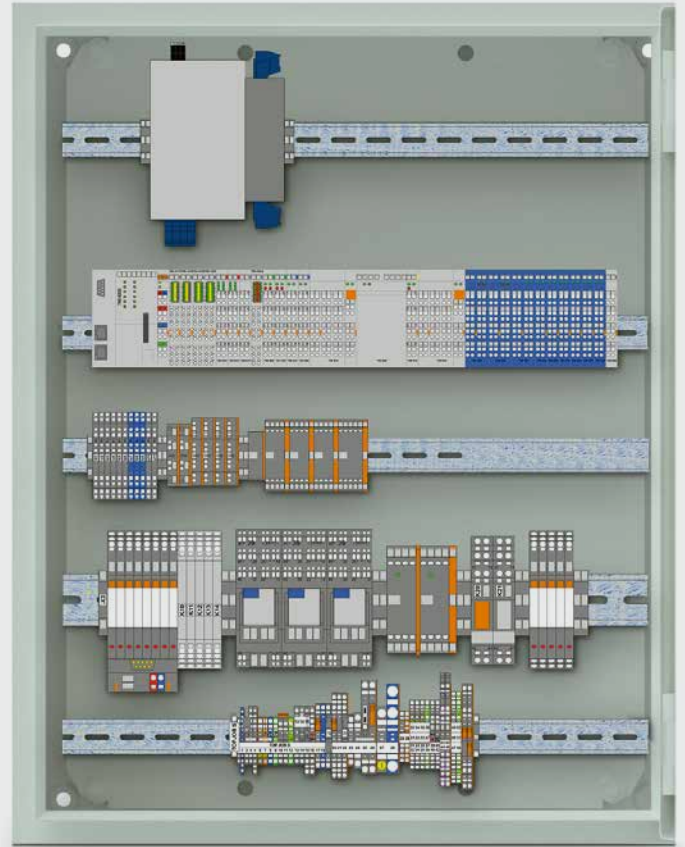
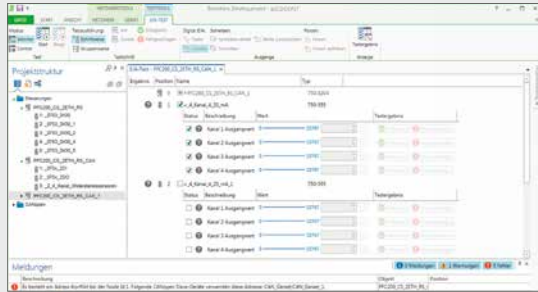
WAGO's Smart Designer Configurator accompanies you in every phase of control cabinet construction – with bidirectional interfaces to CAE systems, WAGO's Thermal Transfer Smart Printer, and of course, the WAGO eShop. All master data and parts lists are managed at a single point.

Discover **e!COCKPIT** and get a clear overview of your entire project – from graphic network design, to parameterization and diagnostics for the WAGO I/O System 750, to standards-compliant programming in CODESYS 3.5, to modern visualization in HTML5.

## Marking



## Diagnostics



## Consistent Support

- e!COCKPIT for integrated engineering in automation
- WAGO's Smart Designer Configurator for the lifecycle of the control cabinet
- Seamless integration into CAE systems

# Proven and Reliable

## Innovation – Quality – Safety

### Quality through Experience and Attention to Detail

- QA is integrated into the manufacturing process
- 100% testing for proper operation
- Accredited in-house laboratory for internal electrical and mechanical testing on terminal blocks and pluggable connectors and environmental simulation per DIN EN ISO/IEC 17025
- Accredited in-house EMC laboratory
- Worldwide approvals

### Proven Quality Thanks to Certified Processes and Products

- DIN ISO 14001:2004 certificate
- DIN EN ISO 50001 energy management certification
- DIN ISO 9001:2008 certificate
- IRIS certificate
- KTA approval for select products



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## ZERTIFIKAT

Die Zertifizierungsstelle  
der TÜV SÜD Management Service GmbH  
bescheinigt, dass das Unternehmen

**WAGO**<sup>®</sup>

**WAGO Kontakttechnik GmbH  
(nach Schweizer Recht) & Co. KG**  
Hansastraße 27, 32423 Minden, Deutschland  
einschließlich der Standorte gemäß Anlage

für den Geltungsbereich

**ELECTRICAL INTERCONNECTIONS**  
Entwicklung, Produktion und Vertrieb von Klemmen, Klemmleisten und Steckverbindern mit Federklemmtechnik für die Elektrotechnik und Elektronik

**AUTOMATION**  
Entwicklung, Produktion und Vertrieb von Komponenten & Subsystemen für die Automatisierung von Maschinen, Anlagen und Gebäuden auf der Basis von Feldbussystemen, steckbaren und schienenmontierbaren Interface Bausteinen

ein Qualitäts- und Umweltmanagementsystem  
eingeführt hat und anwendet.

Durch Audits, dokumentiert im Auditbericht (Bericht-Nr. 70024958),  
wurde der Nachweis erbracht, dass diese Managementsysteme  
die Forderungen folgender Normen erfüllen:

**ISO 9001:2008  
ISO 14001:2004**

Dieses Zertifikat ist gültig vom 2013-11-04 bis 2016-11-01.  
Zertifikat-Registrier-Nr. 12 100/104 16077 TMS

Produkt Compliance Management  
München, 2013-11-04  
Seite 1 von 2

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## C E R T I F I C A T E

awarded to

**WAGO Kontakttechnik GmbH & Co. KG**  
Hansastraße 27  
32423 Minden  
Germany

**TÜV SÜD Management Service GmbH**

confirms, as an IRIS approved certification body, that the Management System of the  
above organization has been assessed and found to be in accordance with the

**International Railway Industry Standard (IRIS)  
Revision 02, May 2009**

for the activity of Design and development & Manufacturing  
for the scopes of certification 9 (On board vehicle control),  
20 (Single railway components)

for products of interconnection components with spring clamp technology, automation  
components for field bus systems and interface modules for railway industries.

Certificate valid from: 30/08/2013      Certificate valid until: 29/08/2016 \*



This certificate was modified on: 12/08/2013  
Certificate-Register-No.: 1211316077/01

\* Providing that the subsequent surveillance audits are successful before the anniversary of this validity date.  
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1 / 2

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## ZERTIFIKAT

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eingeführt hat und anwendet.

Durch ein Audit, Bericht-Nr. 70024958  
wurde der Nachweis erbracht, dass die Forderungen der

**ISO 9001:2008**

erfüllt sind. Dieses Zertifikat ist gültig vom 2013-11-09 bis 2016-11-08.  
Zertifikat-Registrier-Nr. 12 100 16077 TMS

Produkt Compliance Management  
München, 2013-10-21  
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