Sustainable efficiency for every class of ship.

Your single-source partner for integrated marine solutions.
Optimize your operations, on board and onshore

Today’s shipping industry is challenged by global competition, rising operating expenses and increasingly stringent environmental regulations. Enhance your marine solution with high-performance emission monitoring and process instrumentation technology to achieve more cost-efficient operation and continued compliance with evolving safety standards.

With more than 130 years of experience in automation for marine and industry applications, Siemens is your trusted partner for integrated marine solutions.

From bow to stern and everything in between, every marine application can be fully optimized with Siemens automation solutions:

• Measure your process conditions with our portfolio of process instrumentation
• Exhaust gas parameters with our selection of analytic tools
• Position your control valves with SIPART products
• Integrate all of your data quickly and easily into the SIMATIC PCS 7 process control system
• Analyze your data with the EcoMAIN software solution
• Ensure efficient data transmission at sea and on land with SCALANCE X and W components
• Keep every system running smoothly with SITOP power supply solutions

Our worldwide service and partner network ensures efficient and convenient installation or maintenance in every port, without disrupting your schedule or the safety of the people and equipment on board.

Siemens marine solutions - integrated automation at its best.
Maximize your ship’s potential

With EcoMAIN, Siemens brings you a highly advanced common management platform to enhance the cost efficiency of your onboard applications.

Is your ship operating at its full commercial potential? Stay ahead of the curve with the EcoMAIN Decision Support System, a common management platform designed to support the marine shipping industry in overseeing onboard procedures, optimizing resource usage and saving money.

EcoMAIN collects operating data from measuring devices and other systems across the ship and processes it in a single, standard format, helping you to make more informed decisions about onboard operations:

• Analyzes a wide range of processes including energy consumption, emissions, storage of liquids, maintenance schedules, documentation and information management
• Fully adapts to Siemens process instrumentation and reliably integrates SIMATIC S7 process information
• Seamlessly connects to the SCALANCE communication network

Explore the EcoMAIN operations management system in greater detail:

siemens.com/ecomain
**Level**

**Flow**

**Temperature**

**Positioner**

**Pressure**

**In-situ**

**CGA**

**GC**

**Power supplies**

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**Industrial Ethernet Network**

**Industrial Wireless Communication**

**Industrial Ethernet**

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### A. Ballast Water Management System (BWMS)

- **Sea water intake**
- **Ballast water tank**
- **Mechanical separation**
- **Physical or chemical disinfection**
- **To deballing**

### B. Fuel Monitoring and Optimization

- **From setting tank (180 °C)**
- **Supply pumps**
- **Mixer**
- **Booster pumps**
- **Heater**
- **Viscorator**
- **Filter (130 °C)**
- **Main engine**
- **Auxiliary engine**

### C. Exhaust Gas Cleaning System (EGCS)

- **Process tank**
- **Filter**
- **Exhaust gas**
- **Scrubber**
- **Water treatment tank**
- **Exhaust gas to atmosphere**

### D. Selective Catalytic Reduction (SCR)

- **Engine**
- **DeNOx catalysts**
- **Process tank**
- **Urea-water solution**
- **Exhaust gas**

### E. Bunkering

- **Marine diesel (MGO)**
- **Liquid natural gas (LNG)**
- **Heavy fuel oil (HFO)**

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**Power Supplies**

- **In-situ**
- **ECO main**
- **Control room**

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**Industrial Ethernet**

- **Wireless Communication**
- **Network**

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**Mechanical separation**

**Physical or chemical disinfection**

**Ballast Water Management System (BWMS)**

**Exhaust Gas Cleaning System (EGCS)**

**Selective Catalytic Reduction (SCR)**

**Bunkering**

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Solutions to match your needs

Experience seamless integration from field level to operation level. With Siemens instrumentation, automation and communication solutions, you can significantly increase the efficiency of every marine installation.

Explore our interactive process charts on the web to find the perfect fit for your needs. For in-depth product information our marine product overview brochure and dedicated website provide additional benefit descriptions and application recommendations for the entire Siemens Process Automation marine portfolio at: siemens.com/sensors/marine

To configure a product for your individual specifications, visit the PIA Life Cycle Portal: siemens.com/piaselector

A Ballast water management system

Invasive aquatic species discharged through ballast water pose a major threat to marine environments. To clean, monitor and control your ballast water we bring the well-proven Siemens standard of excellence onboard with our treatment solutions tailored to meet even the strictest IMO standards.

Our solutions: SITRANS F M MAG 5100 W electromagnetic flowmeter, SITRANS P DS III pressure transmitter, SITRANS T temperature sensors and transmitters, SIPART PS2 positioner and SIMATIC PCS7 control.

Main benefits:
• Accurate and reliable measurement
• Easy integration into SIMATIC PCS 7 via SITRANS Library faceplates and function blocks
• Excellent resistance in harsh environments
• “Plug and Play” communication modules and batch control
• Communication options via 4-20 mA HART or Profibus
• Broad range of certifications including ABS, LR, BV, DNV/GL and ATEX

B Fuel monitoring and optimization

Upon entry into SECA areas, IMO directives require precise recording of the type and quality of fuel used by both the main and auxiliary engines. Siemens process instruments document all density and temperature measurements and also facilitate usage monitoring to reduce overall fuel consumption.

Our solutions: SIPART PS2 positioner, SITRANS Probe LU level transmitter, SITRANS T temperature sensors and transmitters, SITRANS FC410 Coriolis flowmeter and SIMATIC PCS7 control.

Main benefits:
• Multiparameter fuel consumption measurement
• Mass flow, density, volume and temperature for up to 30 consumption measurement points
• Low pressure loss and high vibration resistance
• Easy integration into SIMATIC PCS 7 via SITRANS Library faceplates and function blocks
• Broad range of certifications including ABS, LR, BV, DNV/GL and ATEX

siemens.com/sensors/marineA

Efficient, safe, reliable and low-cost operation

siemens.com/sensors/marineB

Accurate and reliable multiparameter measurement
**E Bunkering**

Uncertain and intransparent measurements, time-consuming manual tank soundings and strict environmental regulations all place a strain on the bunker fuel industry and vessel crews. In order to meet demanding requirements and maximize your profitability, we offer you a system-integrated solution capable of very precise and transparent measurements – even of viscous and aerated bunker fuel. We also provide a system for the mandatory monitoring of volatile organic compounds (VOC) from tankers, and we support the LNG bunkering process with precise fiscal metering.

**Our solutions:** SITRANS CV energy meter, RUGGEDCOM and SCALANCE industrial communication components, SITRANS LUT400 ultrasonic controller, SITRANS LG level meter, SITRANS FC410 flowmeter and SIMATIC PCS7 control.

**Main benefits:**
- Time- and cost-efficient bunkering process with accurate billing
- Fueling process optimization thanks to simultaneous multi-parameter monitoring and graphical displaying
- Direct bunker fuel measurement with no need for volume conversion
- Detection of air/nitrogen presence in the fuel oil supply and alert system for intended air infusion
- Marine-certified system consistent with MID (MI-005)

siemens.com/sensors/marineE

**C Exhaust gas cleaning system**

IMO regulations require minimizing the sulfur concentration in marine fuels. A continuous emission monitoring system (CEMS) equipped with precise and reliable Siemens process instrumentation plays an important role in overseeing the desulfurization process.

**Our solutions:** ULTRAMAT 6 gas analyzer, SITRANS DS III pressure transmitter, SITRANS F M MAG 3100 electromagnetic flowmeter, SITRANS T temperature sensors and transmitters and SITRANS LUT400 ultrasonic controller.

**Main benefits:**
- Short ROI period for ECA-going vessels
- Reliable solution for lower ship operating expenses
- Large installed base of Siemens analyzers around the world
- Easy integration into SIMATIC PDM

siemens.com/sensors/marineC

**D Selective catalytic reduction**

For full control of ammonia residuals during the DeNOx catalysis on ships and test stands as well as improved efficiency of the entire process, a dedicated gas analyzer is the answer.

**Our solutions:** LDS 6 in-situ ammonia analyzer, ULTRAMAT 6 gas analyzer for nitrogen oxides monitoring, SITRANS T temperature sensors and transmitters and SITRANS LUT400 ultrasonic controller.

**Main benefits:**
- Significantly reduces process costs by optimizing urea-water dosing
- Precise pollutant monitoring
- Help to increase the lifetime of the engine and catalysis components
- Easy integration into SIMATIC PDM

siemens.com/sensors/marineD

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siemens.com/sensors/marineD
Complete integration of cruise ship operations
AIDA Cruises, an American-owned German cruise line based in Rostock, Germany, chose to enhance one of their ships with a complete Siemens solution. This included: drives, engines, generators and automation systems with a network that can process approximately 16,000 measuring points on the ship.

The automation and control system SISHIP IMAC, based on the SIMATIC PCS 7 process control system, controls and monitors the various operating states of the ship. The two ring bus systems, featuring SCALANCE X-200 and SCALANCE X-400 switches, connect all of the information and communication systems via fiber-optic cable.

A one Gbps ring network links the operator and monitoring stations throughout the ship. The controllers for communication are connected via fiber-optic ring lines with a transmission capacity of 100 Mbps.

Key customer benefits
• Horizontal integration of the systems as a ring: reliability and availability of all systems during operation
• Vertical integration of the management, control and field levels: effective linking of ship, bridge and shipping line
• Safe and smooth interaction of all processes, guaranteeing passenger safety and comfort

Full IMO compliance with a short return on investment
The global shipping company Dorian LPG Ltd. needed to bring its new and very large gas carrier, the Dorian Corvette, into compliance with the IMO MARPOL Annex VI regulation, which restricts the sulfur content in fuel. Dorian LPG chose Norway-based Clean Marine AS to equip the ship with a hybrid sulfur scrubber.

Part of the scrubbing process requires a MARPOL-compliant continuous emission monitoring system (CEMS) and the first choice of Clean Marine was SHIPCEMS from Vimex/Norsk Analyse AS.

The SHIPCEMS system is type approved with the ULTRAMAT 6 gas analyzer from Siemens, which conforms with the latest IMO Marine Environment Protection Committee resolution. SHIPCEMS was chosen as a result of its considerable installed base and demonstrated reliability in meeting challenges faced by the marine industry.

Key customer benefits
• Monitors sulfur oxides emissions compliance and allows for the use of less expensive heavy fuel oil in all sea zones
• Short return on investment period
• Pre-conditions vessels for future IMO particulate matter or black carbon regulations
• Marine-certified CEMS
Flexible and durable operator station for enhanced system visibility

BESI Marine Systems GmbH & Co. KG, from Bremen, Germany, was looking for an appropriate operator station design for their new, integrated BESI Ballast Water Management System for ballast tanks.

The company’s chosen solution was to centralize the required components in an operator box, based on the Siemens SIMATIC Microbox PC 427B. A connected SIMATIC flat-panel monitor functions as a control interface. One or more operator stations can be installed depending on the size of the ship and the organization of the components, and Siemens PLC software is installed on every Microbox computer to provide redundancy in case one station should fail.

The modular design ensures that additional subsystems (e.g. logistic computers) can be integrated at a later time via SCALANCE X switches. The Siemens-equipped operator station provides BESI with reassurance that their BWMS is performing up to par by providing them with accurate information about the entire ship.

Key customer benefits
• Resistance against extraneous radiation, shock and vibration
• Process temperature range of up to 55°C / 131°F
• Marine-certified system from leading classification companies

Reduced energy consumption via an all-in-one Siemens solution

Evoqua Water Technologies is the developer of the SeaCURE Ballast Water Management System, a highly cost-effective way to prevent vessels from discharging organisms during ballasting.

To control the efficiency of the SeaCURE system, Evoqua chose the SIMATIC S7-300 PLC. The S7-300 reduces energy consumption and costs via dose-on-demand logic. This allows it to determine when a vessel is ballasting in unpolluted water and lower the production and dosage of hypochlorite as appropriate.

Additionally, Evoqua ensures that the system remains fully operational by monitoring flow, pressure and liquid levels with a variety of Siemens process instruments, including SITRANS F M electromagnetic flowmeters, SITRANS P DS III pressure transmitter and SITRANS LR250 radar level transmitter.

Key customer benefits
• Robust and reliable process parameter measurement
• Easy integration of Siemens instruments into SIMATIC PCS 7 via SITRANS Library faceplates and function blocks
• Control and process instrumentation out of one hand
The information provided in this brochure contains merely general descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

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