SEASMast™

INTEGRATED AUTOMATION SYSTEMS FOR MERCHANT AND PASSENGER SHIPS. ENHANCED OPERATIONAL EFFICIENCY AND SHIP MANAGEMENT.

SEASTEEMA

MARINE AUTOMATION SOLUTIONS
Seastema S.p.A. is a company involved in the design, development and supply of integrated automation systems for different areas of the marine industry and in the design, development and supply of entertainment systems. The headquarter is in Genoa (Italy) with branch offices in Lucca and in Trieste. Seastema continuously cooperates with external Partners and Research Institutions in order to increase the products portfolio with reliable solutions, to maximize innovation and to develop strategic products. Seastema provides end users with a global after-sales service throughout the entire life cycle of the ship even supported by partners organizations.

SEAS: a global vision

Seastema’s Enhanced Automation System (SEAS) is a single control and supervision system that is able to integrate all single sub-systems on board and to provide a unique interface to the operators by the use of multifunctional operator stations. This high level of integration and the extensive use of automated functions leads toward a reduction of the operating costs and an advance in the ship operability in terms of safer and more efficient operations.

— Seastema S.p.A. is a Fincantieri Group company. Fincantieri is one of the world’s largest shipbuilding groups. It is world leader in cruise ship construction and a reference player in other sectors, from naval vessels to cruise ferries, from mega yachts to special high value-added vessels, ship repairs and conversions and offshore vessels. Headquartered in Trieste, the Group has more than 20,000 employees, of whom 7,700 are in Italy, and 21 shipyards in four continents. Fincantieri is a major western shipbuilder and the biggest in terms of diversification and presence in every high value-added sector.
Towards more efficient ship management

— Seastema SEASMast™ is the state of the art of marine automation technology, a reliable Integrated Automation System (IAS) that grants continuous control of onboard safety, operability and equipment efficiency. The high level of integration and the increased number of automated features of the SEASMast™ package are the best answer to the new requirements of operational efficiency coming from the end user companies. Seastema’s experience in Ship Automation projects and the specific solutions for power management, propulsion control, machinery automation, safety management and navigation systems integration applied on Merchant Vessels, and Passenger Ships, help our customers to maximize machinery and bridge operation efficiency, minimizing the fuel consumption and improving readiness in operations and safety on board. Life cycle costs are considerably reduced by a more efficient ship management and by the standardization of the electronic equipment onboard.

High standard solutions

— Combining cutting-edge technology in process automation with leading expertise in ship-building, Seastema offers state of the art Integrated Automation Systems for merchant ships. Typical scope of supply includes monitoring and control of machinery equipment, electrical and generation systems, hull services, ship services and safety systems. All systems are designed to guarantee the highest level of redundancy for the maximum of availability and ship operability in case of damage or emergency conditions.

**STANDARD SUPPLY:**
- Power Management System (PMS)
- Propulsion Control System
- Machinery auxiliaries monitoring and control
- Hull and Ship services monitoring and control
- HVAC plant and machineries control system

**ADDITIONAL FEATURES:**
- Emergency Shut Down (ESD)
- Damage Control System
- Energy Management System
- Integrated Condition Assessment System (CBM)

**ADDITIONAL PACKAGES:**
- Navigation and Communication Systems
- Diesel Electric Propulsion Systems
- Dynamic positioning

— A sophisticated set of specialized libraries combining full access to all information and subsystems functionality with simplified operating functions that optimize crew intervention, are what make our SEASMast package extremely appreciated by our customers.
Leader in integrated solutions

— Open systems technology, leading expertise in developing large process automation systems and specific know how in Marine Automation Systems for large vessels, make Seastema the ideal partner in developing the high level of integration needed to improve ship operation and efficiency. Our basic concept is the ship management operation through a single system with all subsystems managed through IAS monitors. This vision extends the Machinery Automation Concept to an Integrated Automation System that includes the full integration of the onboard electronic systems such as Damage Control, Emergency Shutdown, Navigation and Communication Systems.

— Seastema solutions include extended packages with their high level of functional integration, providing advantages both in terms of smaller need for ship manning and more interoperability from the operator workstations.

Integrated Bridge and Automation System

— The SEASMast™ Integrated Bridge and Automation System (IBAS) integrates ship automation and navigation systems on the same network. All electronic devices are connected to the same system and exchange the same information. This system enables the operator to work with the following packages by the same multifunctional operator workplace: Radar, Ecdis, Conning, Safety systems, Security systems and Ship Automation.

Diesel Electric Propulsion Systems

— Thanks to a recent experience with two Italian Coastguard Ships, where Seastema has supplied the Electric Propulsion System, a strong know how and specific partnerships with leading makers of components, Seastema is able today to offer technologically advanced solutions of Diesel Electric Propulsion to his partner customers. Each project is developed starting from the customer requirements, proceeding with the engineering, the delivery of the equipment, and the commissioning until the full satisfaction of the customer requirements.
System reliability and availability

Reliability and availability are granted by the system design requirements such as fault tolerance, multi-level redundancy, the ability to withstand the toughest marine environments, advanced self-diagnostic tools, online configuration and easy maintenance procedures that help to minimize restoring time. All systems are approved by the relevant classification societies.
State of the art technology

— Easy navigation through ship machinery information, immediate data access, storage and management are all enabled by the SEASMast™ Software platform that is at the core of the system.
— Personalized workplaces, intuitive and flexible navigation for focused and fast information access, integrated data for informed decision-making and comprehensive operator functionality for reliable control are distinctive features of the SEASMast™ package.
— SEASMast™ object oriented technology presents the entire ship equipment information in a simple graphic way. To access information and operations of any object, simply click on it and all relevant information and operating features appear at the user fingertips.
— An extensive set of trending features for online and offline analysis of the process’s variables is also provided. Extended archiving features like long term storage of data and personalized reporting can be included in the package if required.
From requirements to turn-key projects

BASIC DESIGN
— The basic design of the automation system starts with the preliminary stage of close cooperation with the customers to define the most efficient solution for them while also taking into consideration the vessel’s characteristics and operational requirements. Our considerable experience demonstrates that this approach results in an Integrated Automation System that provides added value to the whole ship.

PROJECT MANAGEMENT
— Meeting project targets is a must for our professional project management team. Shipyards and Owners organizations are supported from the beginning to the end of a project with a single contact point committed to implementing all technical and contractual requirements.

SYSTEM CONFIGURATION AND LAYOUT
— Based on our experience, system configuration, layout and cabinet dimensions can be defined in the early stages in order to help GA definition. Detailed information will follow during the project design phase.

SYSTEM SPECIFICATIONS
— Following functional specification and technical requirements, the project starts with detailed engineering and test specification, in compliance with our engineering process. Particular requirements, fault and damage analysis and redundancies, are carefully analyzed in this phase.

SOFTWARE AND HARDWARE DESIGN
— Application software is the heart of the automation system. By combining our in-depth knowledge of ship processes, high-level programming tools and a set of standard libraries for ship automation, we develop solutions that meet the most important requirements for fast and accurate control and human machine interface. The hardware design is also critical because it must be such as to meet all requirements for environmental and fault tolerance.
INSTALLATION ACTIVITIES
— Correct system installation requires engineering, planning and supervision tasks ensuring that all work is punctually and accurately completed in accordance with all requirements. Our expert team can provide added value to projects all over the world, even utilizing partnership with local organization.

TESTING AND COMMISSIONING
— Testing activities are carefully planned; starting from the factory acceptance test, that is carried out on the entire system, to on board tests, where our commissioning team verifies that all interfaces run correctly and make if necessary, final adjustments during berthing and sea-trials. Noise, vibration and EMC requirements, and even particular demanding temperature requirements sometimes need specific tests that are performed in specialized laboratories.
A commitment for the whole life cycle

Service activities begin with the ship’s operation and last for her entire lifetime. Seastema utilizes COTS products that have a very extensive life cycle and provide 3 stages before obsolescence: Active products, Classic products (new developments are stopped) and Limited products (limited production). Next product generations overlap to existing ones in a way that enable transitions also skipping one generation. This fact allows Customers to plan system upgrades only when necessary, reducing as much as possible the impact on the installed systems and ensuring a very long life time. To assist crews all over the world, Seastema can rely on a worldwide flexible service organization that often involves also technical partners based in the operative area of the ships. The life cycle concept, the large use of COTS products available everywhere and the worldwide service network ensure high system availability during the whole operating life of the ship.

Added value applications

The most advanced technologies in process automation, leading competences in cruise and ferry vessels automation, and an in-depth knowledge of customers needs provide the ideal mix for the best solutions in a project. Seastema’s customer oriented organization ensures projects go smoothly, from the project detail’s definition, together with the client’s technical organizations, to the project implementation, commissioning and ship delivery. SEASMast™, as a single system providing a unique plant interface to the operators, is the quickest route towards a reduction of the operating costs and an advance in ship operability for safer and more efficient Ship management. Seastema’s commitment in helping customers to improve ship efficiency and ship operations at all levels, together with Seastema’s high level of customer care, functional knowledge, automation technologies and worldwide service network result in a genuine added value to the ship.
### Selected IAS References

<table>
<thead>
<tr>
<th>Owner</th>
<th>Gross Tonnage</th>
<th>Length between Pp</th>
<th>Shipyards</th>
<th>Year of last delivery</th>
<th>Integrated Automation System</th>
</tr>
</thead>
<tbody>
<tr>
<td>SilverSea</td>
<td>36,000 t</td>
<td>167 m</td>
<td>Mariotti for Silver Shadow and Silver Whispers, Fincantieri for Silver Spirit</td>
<td>2010</td>
<td>6,000 I/O channels</td>
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<td>Holland American Line</td>
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<td>254 m</td>
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<td>2011</td>
<td>9,000 I/O channels</td>
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<td>Compagnie Du Ponant</td>
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<td>126 m</td>
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<td>2015</td>
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<td>abt. 84 m</td>
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<td>2008</td>
<td>2,500 I/O channels</td>
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<td>Société des Transversiers du Québec</td>
<td>abt. 16,200 t</td>
<td>abt. 133 m</td>
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<td>2014</td>
<td>7,000 I/O channel</td>
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<td>Visentini</td>
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<td>abt. 170 m</td>
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