ELSYS
MARINE AUTOMATION

THE SMARTER WAY TO OPERATE, OPTIMISE, AND EMPOWER YOUR FLEET

VAMOS

VESSEL AUTOMATION & MACHINERY OPERATING SYSTEM

A comprehensive automation and control solution
designed for a smarter, more efficient future.
Combine power, energy, and data

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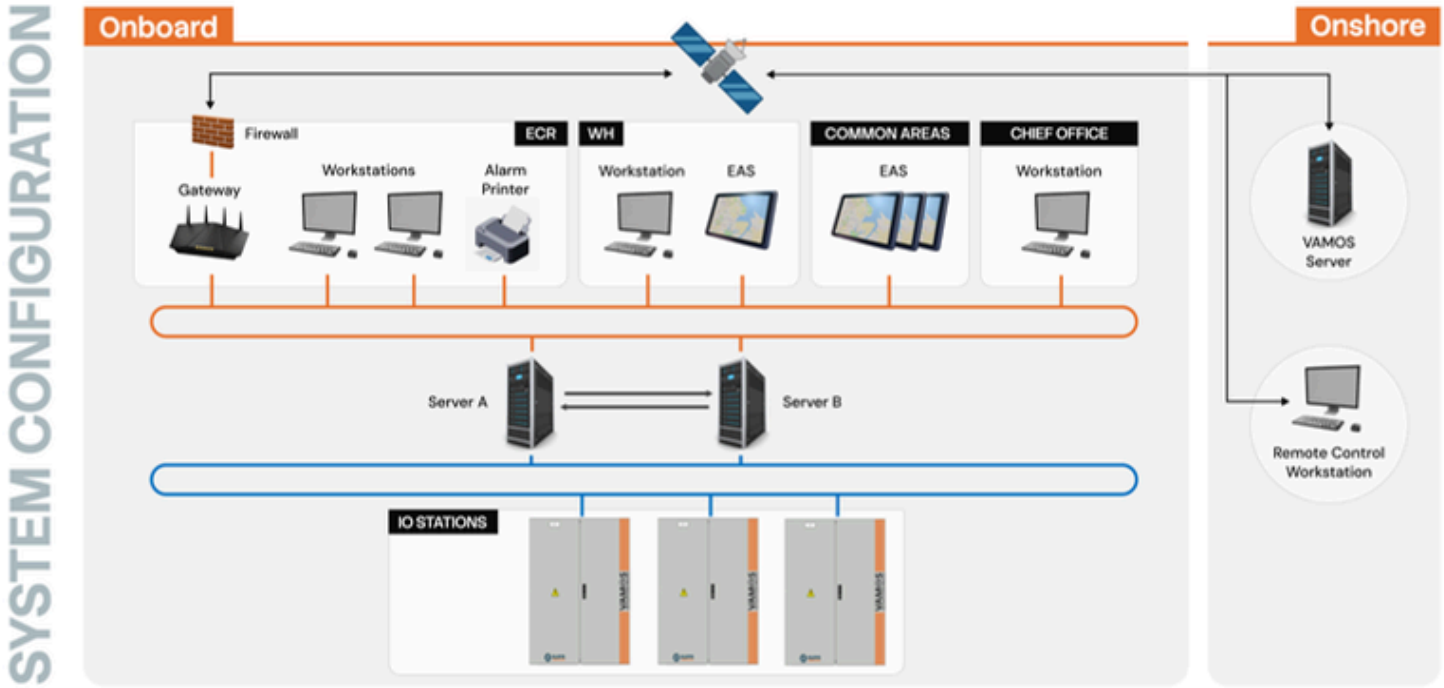
01 System Overview

A Unified Vision for Maritime Excellence

VAMOS™ represents the pinnacle of maritime automation technology, combining decades of marine engineering expertise with cutting-edge intelligent control systems designed specifically for the demanding maritime environment. This comprehensive platform seamlessly integrates all vessel systems, from propulsion and power generation to ballast, cargo handling, HVAC and safety systems, into a single, intuitive interface. By unifying operational control, VAMOS™ enhances safety, maximises efficiency and ensures regulatory compliance across every operational scenario. At the heart of VAMOS™ is a commitment to operational excellence. The system provides operators with a complete situational awareness of all critical vessel functions, presenting data through clear, interactive displays and maritime-specific graphical interfaces. Automated control sequences streamline vessel operations, allowing crews to execute complex procedures with minimal manual input while maintaining full compliance with international safety and classification standards. Advanced monitoring capabilities allow real-time tracking of system status, alarms and performance trends, supporting predictive maintenance and reducing the risk of unplanned downtime. VAMOS™ intelligent automation algorithms continuously optimise operational performance, reducing fuel consumption, minimising emissions and maximising the lifespan of onboard equipment.

Integration is seamless, whether for new build vessels or retrofits, with open architecture ensuring compatibility with existing systems and future technologies. Redundant configurations and robust hardware guarantee resilience against failure, while secure remote access enables onshore monitoring, diagnostics and fleet-wide operational oversight. Designed for versatility, VAMOS™ can scale to vessels of all sizes and types, providing tailored configurations that meet each operator's unique requirements. From fishing vessels and workboats to large commercial ships, the system enhances crew efficiency, improves operational decision making and ensures that every journey is conducted with maximum safety, reliability and performance. Through VAMOS™, vessel operators gain not only a system for monitoring and managing operations but a strategic tool that empowers intelligent decision making, predictive analysis and holistic fleet management. It represents a true evolution in maritime automation, offering a smarter, safer and more efficient way to operate vessels in today's complex maritime landscape.



SMART ASSISTANT WITH SHIP MANAGEMENT AND OPERATION

The Vessel Automation & Machinery Operating System (**VAMOS™**) is a integrated, next-generation solution built to elevate how your ships are managed and operated, improving efficiency, safety, convenience, and transparency across the board. By providing real-time operational insights into your vessel's critical equipment and systems, VAMOS™ empowers both onboard and onshore teams to make clear, informed decisions with confidence. This continuous visibility enables smoother operations, stronger control, and more intelligent fleet management overall, giving you a reliable foundation for maximizing performance and safety.

Predictive Intelligence for Vessel Efficiency

VAMOS™ incorporates advanced intelligent assistance and predictive analytics to support crews across all vessel operations. The system continuously monitors performance, operational conditions and energy usage, transforming complex data into actionable insights that enable faster, more informed decision-making. By anticipating operational requirements, VAMOS™ reduces workload, improves efficiency and ensures vessels operate safely under all conditions. Through sophisticated algorithms, VAMOS™ identifies potential inefficiencies or risks before they occur. It recommends optimal sequences for propulsion, ballast, cargo handling, power distribution and hybrid energy management. Automated routines allow crews to focus on strategic tasks while the system manages routine operational optimisation, ensuring smooth and reliable vessel performance at all times.

Energy and power are fully integrated into this intelligent assistance. VAMOS™ analyses generator loads, battery usage and hybrid systems to maximise efficiency, reduce fuel consumption and lower emissions. It balances energy allocation across critical systems, providing crews with clear guidance and enabling automated adjustments when necessary. Predictive analytics support maintenance planning by highlighting potential equipment issues, reducing unplanned downtime and extending the operational life of key systems. Alerts and notifications are prioritised intelligently, with critical messages presented immediately and routine notifications managed unobtrusively. Interactive HMIs provide clear visualisation, real-time performance trends and predictive insights, supporting crew awareness and operational decision-making. Historical and trend data are presented intuitively to support long-term planning, system optimisation and fleet-wide performance benchmarking. VAMOS™ intelligent assistance is adaptable to vessels of all sizes and types. Whether for new builds or retrofits, the system provides tailored configurations to meet each operator's requirements. From small workboats to large commercial ships, VAMOS™ supports crews in achieving operational excellence, maximising efficiency, enhancing safety and ensuring sustainable, reliable voyages.

Specifications

Application	Electric & Hybrid Propulsion Vessels
Power Supply	AC 220V / DV 24V (customisable)
Control Interface	24° Marine-grade Remote HMI
Communication Protocols	Modbus TCP/IP, RTU, CAN, IEC61850, NMEA, OPC, UA
Power Sources Supported	Generators, ESS, Fuel cell, Shore Power
System Redundancy	Dual PLC & Power Supply Support
Data Logging	Real-time & Historical Trends (12+ months storage)

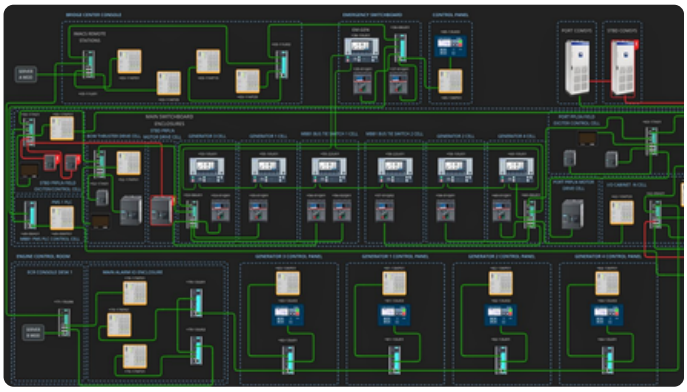
Main Function & Features

Integrated Vessel Control

VAMOS™ unifies propulsion, ballast, cargo, HVAC, and safety systems into a single interface, providing operators with complete situational awareness, seamless coordination, and enhanced operational efficiency at all times.

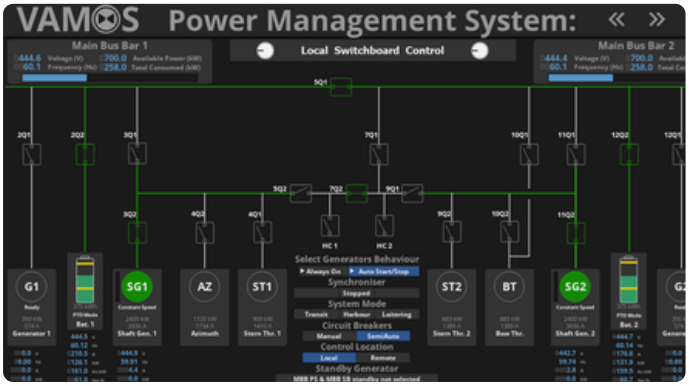
Predictive Maintenance

Advanced analytics monitor vessel systems continuously, identifying potential failures before they occur, reducing unplanned downtime, extending equipment life, and enabling crews to schedule maintenance proactively and efficiently.



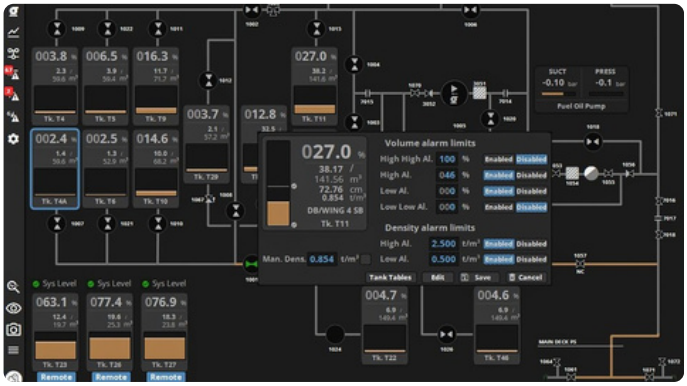
Energy Optimisation

VAMOS Energy™ intelligently manages generators, batteries, and hybrid power sources, balancing loads, reducing fuel consumption, lowering emissions, and ensuring continuous energy availability for critical vessel operations.



Automated Operational Sequences

Complex procedures are executed automatically through intelligent algorithms, minimising manual input, ensuring safety compliance, and allowing crews to focus on high-value tasks while optimising vessel performance consistently.

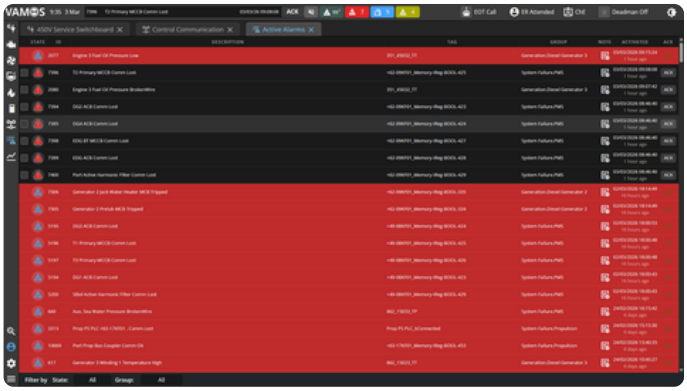


Real-Time Monitoring

Operators receive live data and performance trends across all systems, enabling fast decisions, rapid response to issues, and a clear overview of vessel operations at all times.

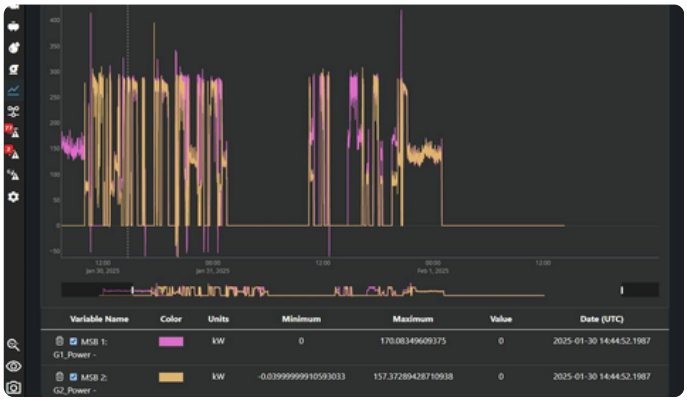
Intelligent Alarm Management

Critical alerts are prioritised instantly while routine notifications are minimised, helping crews respond quickly and reducing distractions and potential human error.



Fleet Performance Analytics

VAMOS Insight™ analyses data from multiple vessels, providing benchmarking and strategic insights to optimise fleet performance, fuel efficiency, and operational decision-making.

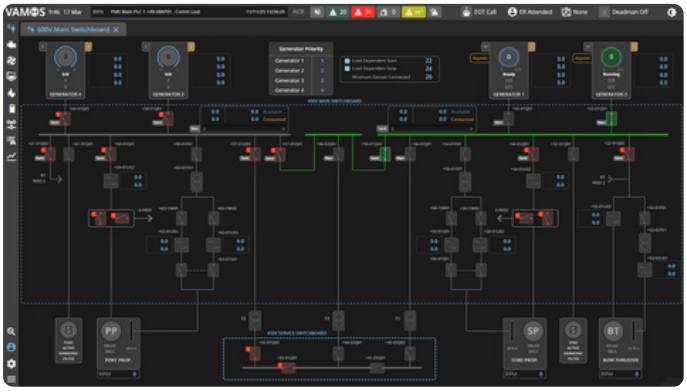


Remote Monitoring and Diagnostics

Shore teams access real-time vessel status, predictive maintenance alerts, and diagnostics remotely, supporting proactive interventions and enhanced coordination with onboard crews.

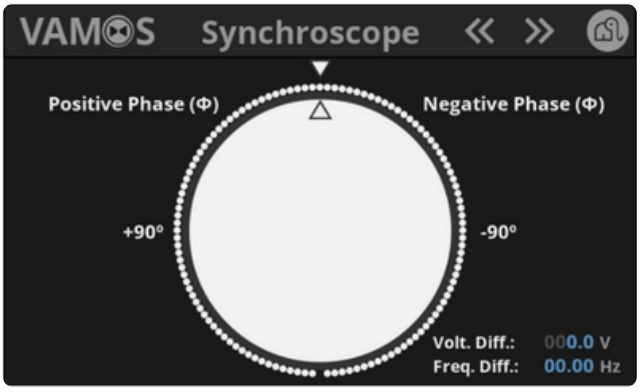
Hybrid Power Coordination

The system integrates generators, batteries, and alternative energy sources, optimising power allocation, fuel efficiency, emissions reduction, and reliable transitions between energy modes.



Interactive HMIs

Marine touch displays and intuitive interfaces show real-time data, predictive insights, and historical trends, enhancing situational awareness and informed decision-making across all systems.



02 VAMOS **Control**

VAMOS Control™ provides advanced human-machine interface systems designed specifically for maritime operations, giving crews clear, actionable information when and where it is needed. The interface combines intuitive graphical displays with interactive mimics and smart alarm prioritisation, ensuring operators receive critical data without overload. Each operator station presents real-time system status, alarms, and performance trends, while historical data and analytics support operational review and predictive decision-making. A secure extension alarm system monitors unattended machinery spaces, maintaining safety and situational awareness at all times. The platform allows seamless access to all control points, supporting coordinated operation across multiple stations. Crews can track system performance, respond to alerts, and manage maintenance schedules efficiently, while shore teams gain secure remote access for diagnostics and operational support. Designed for clarity and ease of use, VAMOS Control™ HMI enhances operational efficiency, safety, and regulatory compliance. Its scalable architecture supports new builds and retrofits, adapting to vessel size and complexity, ensuring consistent performance and reliability across the fleet.

Human Machine Interface Graphics

- Graphical displays show machinery status, fluid levels, pressures, and temperatures in real time.
- Critical alerts are prioritised with clear diagnostics, while all events are logged for review.
- Operators can view historical performance data to detect trends and identify potential issues.
- Generate standardised reports for fuel, machinery hours, and voyage data quickly and efficiently.
- Switch interface languages easily to support international crews and ensure clear communication.

Main CPU & I/O Module

At the heart of VAMOS Control™ are the Main CPU and I/O modules, industrial-grade hardware engineered for reliability and durability. They deliver real-time data processing, flexible I/O configurations, and robust performance across vessels of all types.

Model	CPU Module
Size	130.0 x 165.0 x 95.0 (H x W x D) , mm
CPU	Intel 4-Core 1.5Ghz (64bit)
Memory	LPDDR4X 16GB
Flash	eMMC 64GB
Communication	• Ethernet 1GbE x 4ch • Profibus DP x 2ch • CANOpen x 2ch • Serial (RS-232/422/485) x 8ch
ETC	• Power Input Terminal Block x 1 Port • 1GbE x 3ch • EtherCAT x 2ch • USB x 2ch • DP x 1ch

Model	IO Module
Size	11.0 x 14.5 x 81.1 (H x W x D) , mm

Communication

Analog Input	• 16Ch/Current/0~20, 4~20mA • 16Ch/Voltage/0~10, 0~5, 5VD
Analog Output	• 8Ch/Current/0~20, 4~20mA • 8Ch/Voltage/0~10VDC
Digital Input	• 16Ch/Universal/24VDC • 16Ch/Sink, Source/24VDC
Digital Ouput	• 8Ch/MOS Relay/24VDC/AC

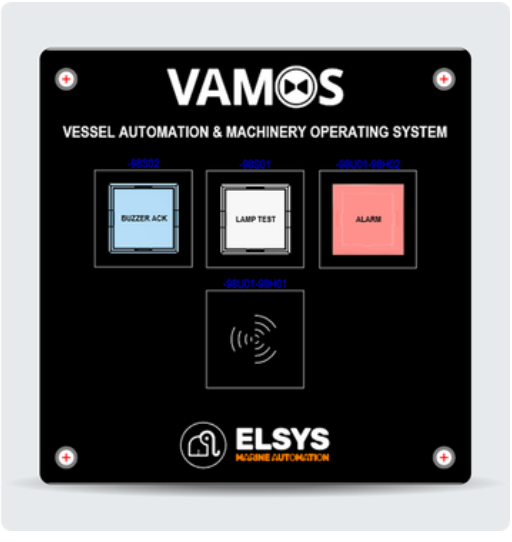
RTD : 8Ch / PT100, PT200, PT500 etc.
Pulse Input : 2Ch / 5~24VDC
Serial : 2Ch / RS232, RS422, RS485 / Modbus RTU
Ethernet : 2Ch / Modbus TCP, UDP
CAN : 2Ch / CANOpen

Extension Alarm and Deadman Panels

- Bright LED indicators and an integrated buzzer ensure critical alarms are noticed immediately.
- Panels installed in key areas keep crews aware of vessel status at all times.
- Dedicated buttons allow quick acknowledgment, buzzer silencing, and lamp testing in emergencies.

EAP HMI SAMPLE

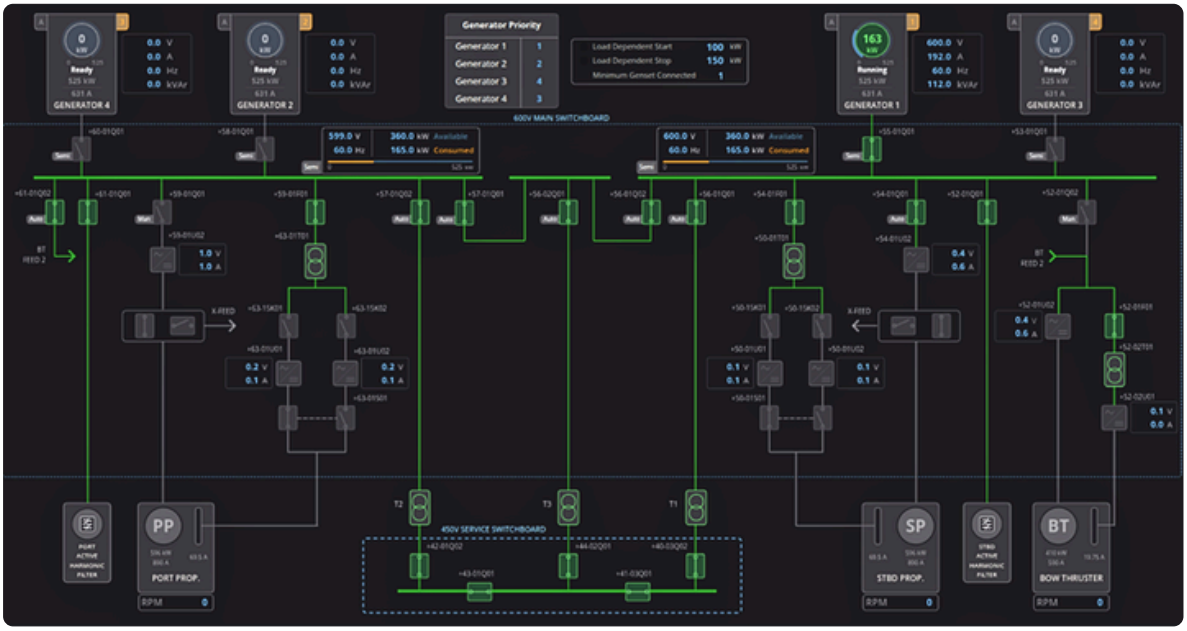
DEADMAN PANEL



03 VAMOS **Power**

Smart Power Control

VAMOS Power™ delivers advanced power management specifically engineered for maritime operations. Our intelligent system optimises generator performance, prevents blackouts, and ensures reliable power distribution through proven maritime expertise and cutting-edge control technology designed for the demanding marine environment.



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Power Sources Supported	Generators, ESS, Fuel cell, Shore Power
System Redundancy	Dual PLC & Power Supply Support
Data Logging	Real-time & Historical Trends (12+ months storage)

Main Function & Features

Integrated Power & Energy Management
Intelligent load distribution across all available power sources (gen–set, battery, fuel cell, shore)

Energy Optimization
Maximizes energy efficiency using Elsys proprietary ESS and fuel cell systems

Blackout Prevention
Fast–response fault detection and load shedding mechanisms

Why Choose Our PEMS?

Seamless Integration with Elsys ESS & Fuel Cell
Unlike conventional systems, our PEMS is natively designed to interface with Hanwha's in–house developed energy storage and hydrogen fuel cell systems, enabling real–time energy balancing and cost–efficient operation

Adaptive Energy Strategy Engine
Built–in logic dynamically adjusts energy flow based on vessel operating profiles to reduce emissions and extend equipment life.

04 VAMOS Energy

Introduction

VAMOS Energy™ delivers advanced energy management specifically engineered for hybrid and battery-powered maritime operations. The system intelligently optimises energy storage, coordinates hybrid power sources, and continuously monitors vessel energy use to maximise efficiency and sustainability. By analysing generator loads, battery performance, and alternative power inputs, VAMOS Energy™ ensures smooth transitions between energy modes, reduces fuel consumption, and lowers emissions. Integrated predictive algorithms support proactive maintenance and operational planning, while clear, interactive interfaces provide crews with actionable insights in real time.

Key Benefits

Optimise Fuel Consumption

By providing detailed analysis of energy usage, VAMOS Energy helps identify and eliminate wasteful practices, resulting in significant reductions in fuel use and operational costs.

Achieve Emission Targets

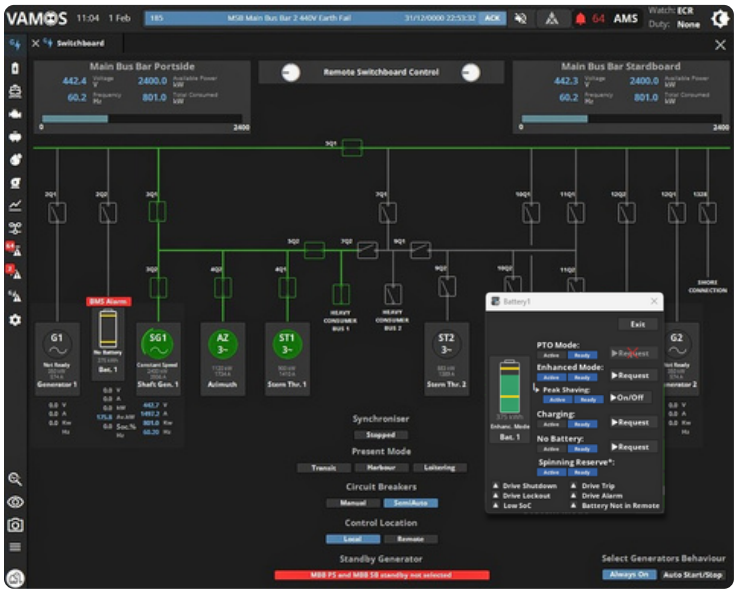
Accurate monitoring and reporting are essential for compliance with environmental regulations such as CII and EEXI. VAMOS Energy delivers verifiable data to track your carbon footprint and demonstrate regulatory compliance.

Enhance Operational Efficiency

Gain clear insights into how different operational parameters affect energy consumption. Use this knowledge to optimise voyage planning, trim, and machinery operation for maximum efficiency.

Data-Driven Decision Making

Move beyond guesswork. VAMOS Energy provides robust data to justify investments in new technologies, validate efficiency upgrades, and promote a culture of energy awareness across your fleet.



Key Features

- Battery Charging & Discharging Control
- Peak Shaving & Load Smoothing
- Shore Power Integration & Management
- Hybrid Power Source Coordination
- Energy Storage System Integration

05 VAMOS Insights

Introduction

VAMOS Insight™ delivers advanced data analytics and cloud connectivity specifically engineered for maritime operations. The system collects, processes, and transforms raw vessel data into actionable insights, providing operators and fleet managers with a complete understanding of vessel performance. By enabling real-time remote monitoring, VAMOS Insight™ allows shore-based teams to track system health, energy consumption, and operational efficiency across individual vessels or entire fleets. Predictive analytics identify potential equipment failures before they occur, supporting proactive maintenance and reducing unplanned downtime.

Key Features

- Remote Vessel Monitoring & Diagnostics
- Predictive Maintenance Analytics
- Real-Time Data Analytics & Insights
- Fleet Performance Benchmarking
- Automated Reporting & Compliance

Key Benefits

Fleet-Wide Benchmarking

Compare the performance of sister vessels or the entire fleet against key performance indicators (KPIs). Identify top-performing assets and replicate their success across other vessels.

Predictive Maintenance Planning

Analyse historical data to forecast equipment failures and plan maintenance proactively. Move from time-based to condition-based maintenance, reducing costs and avoiding unplanned downtime.

Voyage and Performance Optimisation

Review and analyse past voyages to identify opportunities for improved route planning, speed management, and fuel efficiency. Use these insights to establish new operational standards across the fleet.

Enhanced Regulatory Compliance

VAMOS Insight simplifies generating reports required for environmental and safety regulations. Automate data collection and reporting to remain fully compliant and audit-ready.