

Emsys™

Continuous Emissions Monitoring System

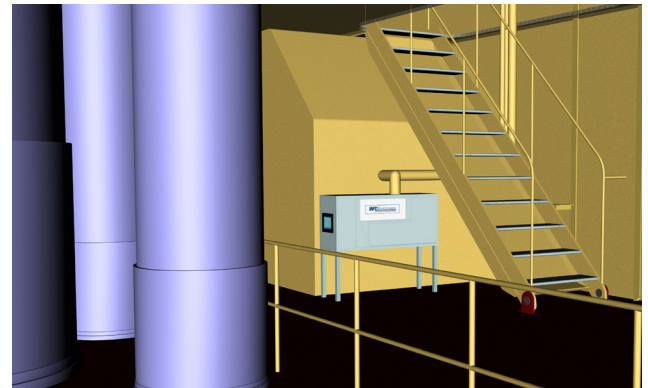


A unique 2nd generation technology combining Particulate Matter (PM) and gas emissions measurement to meet MARPOL Annex VI Maritime Emissions Regulations and North American Emission Control Area (ECA) Particulate Matter Regulations.

Description: The Emsys™ Continuous Emissions Monitoring System is a laser-optic, sensor-driven single-enclosure device that continuously monitors emissions and provides automated analysis and data recordings from multiple smokestacks and boilers in marine applications. W R Systems, Ltd. (WRSystems), developed the new technology to help the maritime industry comply with MARPOL Annex VI Maritime Emissions Regulations. Emsys™ allows operators of marine-fueled engines to continuously monitor, analyze, and record emissions from all engine exhaust stacks simultaneously. It analyzes and records nitrogen oxide (NO), nitrogen dioxide (NO₂), sulphur dioxide (SO₂), and carbon dioxide (CO₂), particulate matter (PM), and other gases such as CO, as specified. In addition, Global Positioning System (GPS) interface data and electronic charting tracks the actual vessel position to aid in voyage compliance management within Emission Control Area (ECA) zones.

Specifications:

- Self-contained unit in a single rack with Ethernet connectivity to Emsys Server and Status Reporting Units (SRU)
- Approximate Dimensions: Length: 1562 mm, Height: 876 mm, Depth: 482 mm
- Weight: Approx. 181 kg
- Provides emissions data for NO, NO₂, SO₂, CO₂, PM; data for other gases such as CO and NH₃ are available as required.
- SRU application can be installed in various locations via Ethernet.
- GPS data input for Voyage Compliance Management.
- Custom and standard reporting format capability are easily transmitted and/or recorded.
- Designed specifically for Maritime Applications.



Advantages:

- Single rack unit connects to multiple stacks providing cost-effective solution to demonstrate compliance with MARPOL Annex VI emission regulations.
- Highly accurate, laser-optic, sensor-driven system.
- Small footprint and collocation in stack area for ease of retrofit.
- Provides emissions and geographic position data for voyage compliance management.
- Provides both real-time and historical data.
- Low life cycle maintenance cost.



WR SYSTEMS
An ISO 9001:2008 Registered Company

Emsys™

Continuous Emissions Monitoring System



System Measurement Characteristics

NO _x	ppm, g/kWh, kg/Tons
SO _x	ppm, %m/m, SO ₂ /CO ₂ Ratio, kg/Tons
CO ₂	%, kg/Tons, CO ₂ Index in g, CO ₂ /unit cargo, Equivalent mile/km (user selectable)
PM	% Opacity, mg/m ³ , kg/Tons
GPS	Lat/Long Position

Type Approvals - American Bureau of Shipping (ABS)

Revised MARPOL 73/78 Annex VI Regulation 13 – Nitrogen Oxides (NO_x) - NO_x Technical Code 2008, Chapter 6.4 – Procedures for demonstrating compliance with NO_x Emissions Limits on Board – ‘Direct measurement and monitoring method (DMM)’

Resolution MEPC. 184 (59), adopted 17th July 2009 - GUIDELINES FOR EXHAUST GAS CLEANING SYSTEMS – Schemes A & B SO₂/CO₂ ratio method for measurement of SO_x emissions.

MEPC/Circ.471 - INTERIM GUIDELINES FOR VOLUNTARY SHIP CO₂ EMISSION INDEXING FOR USE IN TRIALS - estimation of mass CO₂ emissions from marine diesel engines and marine boilers for use in the calculation of the CO₂ emission index.

Reporting of mass emissions (NO_x, SO₂, CO₂) from marine diesel engines and marine boilers.

Measurement of Particulate Matter (PM) from marine diesel engines and marine boilers.

MED Wheelmark by ABS as a notified body for:

EC Type Examination Certificate (Notified Body 0729).

Annex A.1/2.8 On-Board NO_x Monitoring and recording devices.

Conformity Assessment Module ‘D.’



Power Requirements

Voltage Input	230 VAC, 60 Hz
Maximum Power Consumption	2,500 W (Base System)

Ambient Operating Conditions

Temperature Range	0° - 55° C (32° - 131° F)
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