

emissions monitoring for ships



Marine Approved Emissions and Particulate Matter Monitoring Systems





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Emsys emissions and Particulate Matter Monitoring technology

Proven technology for all maritime emissions applications

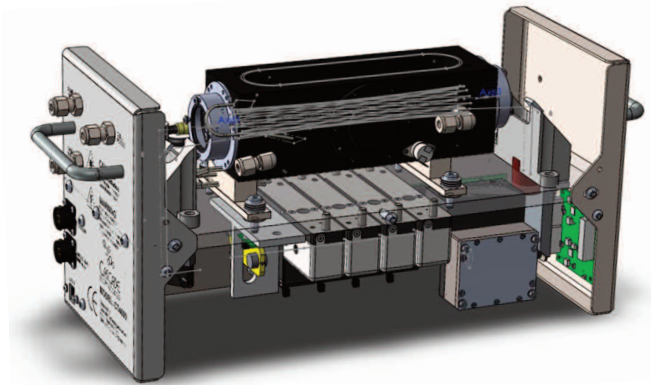
Designed specifically for the maritime industry, Emsys Maritime uses expertise gained from extensive deployment across multiple vessel types and monitoring applications to create the worlds most advanced maritime emissions monitoring system, the Emsys-iS.

Emsys EMS technology has been supplied to the worlds' premier shipbuilders, shipowners and scrubber manufacturers. Installations on-board cruise ships, container ships, LNG carriers, tankships, drillships and semi-submersibles are amongst a long list of industry references.

Emsys is offered in 2 basic configurations, a low-cost SO₂/CO₂ version for Exhaust Gas Cleaning System (EGCS-Scrubber) applications and an enhanced version with modular upgrade capability. The enhanced sensor has the facility to measure additional gases such as NO_x, CO, NH₃ and CH₄ for applications including MARPOL Annex VI, SCR monitoring and EU MRV data collection.

Type Approved by ABS

MEPC.184(59) EGCS applications
MARPOL Annex VI, Regulation 13 Direct Measurement and Monitoring
MEPC. Circ. 471 CO₂ Indexing
Mass Emissions recording (Suitable for EU MRV)
Approved for monitoring all engine types engines (2-Stroke/4-Stroke marine diesels), boilers, incinerators and gas combustion units (GCU's)
Emsys has also been approved by the US EPA for offshore drilling permits in the US Gulf of Mexico on drillships and semi-submersibles



Quantum Cascade Laser (QCL) sensor can be configured to measure 8 gases

Key Features

IP56 stainless steel enclosure (316L) is certified for installations on the weather deck.

The QCL laser sensor has a rapid measurement response time, allowing a single Emsys enclosure to monitor up to 4 scrubbers within the allowable cycle time in MEPC.184(59)

High ambient operational temperature (55°C), no need for Emsys to be installed in an air conditioned (A/C) space or require an integral A/C unit

Up to 4 measurement points per Emsys-iS enclosure, and up to 4 enclosures per system (16 points maximum)

Typical Applications;

EGCS scrubber compliance monitoring
SCR (DeNO_x) applications for IMO Tier III NO_x (NECA)
MARPOL regulation 13 NO_x monitoring (DMM)
EU MRV, for reporting of total CO₂ emissions
Air permits for FPSO, FSRU & MODU's
Vessel performance monitoring including maintenance indicators (turbocharger cleaning)

Multiple Exhaust Gas Mass Flow Measurement Options

Carbon Balance (standard configuration)
Direct Measurement using a Type Approved mass flow sensor
Air/Fuel Method



Emsys enclosure installed on the weather deck close to scrubber outlet

Emsys - designed specifically for maritime applications



Configurable sensor - The Quantum Cascade Laser (QCL) sensor can measure just SO₂/CO₂ for scrubber applications (low cost version) or be specified to measure up to 8 gases simultaneously. Gases include NO, NO₂, SO₂, CO₂, CO, CH₄, NH₃ & H₂O

Accurate measurements in scrubbing applications

Emsys can measure accurately in low concentration applications. For scrubber applications our standard SO₂ range measures down to 3 ppm lower detectable limit (LDL). We also offer an enhanced range version that measures down to 1 ppm SO₂ LDL for applications where increased accuracy may be required.

The sensor is drift and cross-interference free, very important in scrubbing applications where the low temperature and high moisture present in the gas stream can affect CO₂ readings on IR and UV type analysers.

Calibration Free Operation

The QCL sensor is calibration-free. Only an annual calibration check and mandatory Class/Flag zero/span checks are required. This means you don't have to purchase large volumes of calibration gas which is expensive and difficult to transport to your vessel.

Compact Size

800mm x 600mm x 300mm enclosure weighs less than 60kg. This is advantageous for retrofit installations where space and access requirements are a critical consideration.

Emsys can measure Particulate Matter (PM)

Measurement of opacity, specific PM and volumetric PM data are available as an option. Measurements from each stack in mg/m³ and g/kWh available for PM.

Low power requirements

Only a single power supply to each Emsys enclosure is required, typically total system power is >3kW. Each stack probe and sample line are heated along a single umbilical powered from the main enclosure.



Emsys probes are powered from the main enclosure meaning only a single power supply is required

Emsys fully integrates into the vessels automation system or scrubber panel

Emsys is designed to fully integrate into other shipboard systems using MODBUS. Emsys provides data to the vessels automation and alarm systems and can provide valuable information to vessel performance management software.

Comprehensive data reporting software provides instantaneous, specific and mass emissions

Emsys features the most comprehensive data suite of all marine CEM's systems. Specific (MARPOL) emissions, instantaneous measurements, mass emissions and PM along with a host of other engine performance data provides the owner with a huge amount of data to ensure compliance whilst providing valuable metrics to enable optimisation of vessel performance.

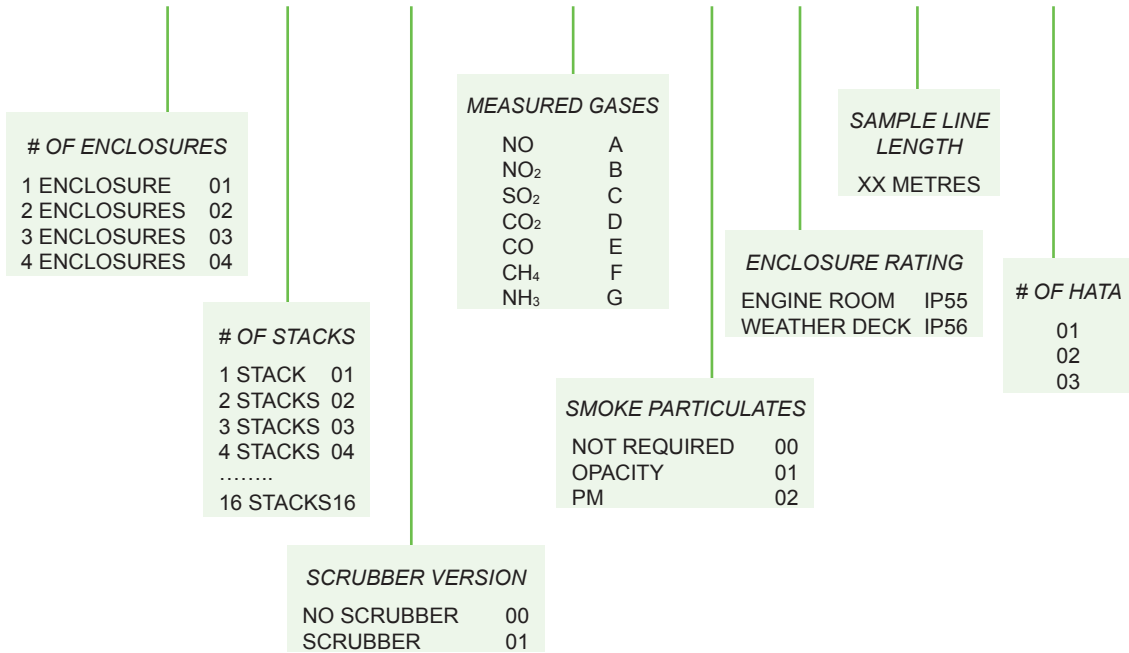
Engine	Time	NOx (g/kWh)	SO2 (ppm)	Sulfur Content (%)	CO2 (%)	H2O (ppm)	SO2/CO2 Ratio (%)	PM (mg/m3)	PM (g/kWh)	Power (kW)	GPS Lat.	GPS Lon.	Flow Rate (kg/h)	CO (ppm)	CO (g/kWh)	CH4 (ppm)	CH4 (g/kWh)
ENGINE Apr21	13:50	1.9 216.0	98.0	0.4	5.0	30422.0	19.50	2901.8	12.9	4707.1	36.880	-76.214	0.0	77.0	0.4	97.0	0.3
ENGINE Apr21	13:50	3.2 276.0	17.0	0.0	5.0	48059.0	3.40	737.7	3.8	4582.2	36.880	-76.214	0.0	91.0	0.5	82.0	0.3
ENGINE Apr21	14:10	2.3 188.0	78.0	0.2	9.0	57696.0	8.67	2084.3	9.5	4566.5	36.880	-76.214	0.0	65.0	0.3	88.0	0.2
ENGINE Apr21	14:10	1.3 150.0	67.0	0.1	9.0	41333.0	7.44	961.3	3.2	6830.0	36.880	-76.214	0.0	59.0	0.2	84.0	0.2
ENGINE Apr21	14:30	2.8 262.0	30.0	0.0	7.0	50959.0	4.29	427.5	2.1	4004.2	36.880	-76.214	0.0	83.0	0.5	90.0	0.3
ENGINE Apr21	15:20	1.7 192.0	22.0	0.0	8.0	58042.0	2.75	401.3	1.7	4707.1	36.880	-76.214	0.0	59.0	0.3	62.0	0.1
ENGINE Apr21	15:40	1.7 196.0	14.0	0.0	5.0	42000.0	2.80	862.7	3.8	4707.1	36.880	-76.214	0.0	80.0	0.4	53.0	0.1
ENGINE Apr21	15:50	1.3 150.0	32.0	0.0	8.0	59969.0	4.00	226.9	1.0	4707.1	36.880	-76.214	0.0	71.0	0.3	83.0	0.2

EmChart software provides detailed reporting and trending



PRODUCT CODE

EIS-EN-01-PAB 04-SCR-00-GAS ABCDF-PM-02-IP 56-HSL 10-HATA-01



Emsys Maritime offers 24/7/365 support to its customers

Our service team specialises in through-life support, ensuring your Emsys system is operational at all times. We offer distance support packages that allow remote diagnosis of issues that often allow the crew to re-instate system operation without the deployment of a technician. We also offer comprehensive extended warranty packages and service level agreements to provide peace-of-mind and ensure your Emsys remains fully serviceable at all times



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