



# Exhaust Gas Analysers & Systems

for

**NO<sub>x</sub>** (Chemiluminescent)

**SO<sub>2</sub>** (UV Fluorescent)



ET Marine is an associate company of Enviro Technology Services plc (ET), one of the best known and longest standing companies in the world specialising in air pollution monitoring equipment.

Key staff at ET Marine have over 100 man/years combined experience in the atmospheric emissions monitoring industry and have carefully selected a range of products and systems designed to solve the problems faced by the marine industry particularly with regard to MARPOL ANNEX VI which focuses on gaseous emissions.

Working exclusively through an international network of experienced distributors in the marine supply and engineering industry, ET Marine is the number 1 choice for the supply, installation, training and after-sales support of a range of rugged, reliable and advanced emissions monitoring equipment.



## Chemiluminescent NO<sub>x</sub> Stack Gas Analyser

The ET Marine SeaNOx is a ruggedly constructed Chemiluminescence NO<sub>x</sub> analyser integrated with a high quality stainless steel heated dilution probe. This combination forms a highly reliable and cost effective NO<sub>x</sub> monitoring system that has been well proven in marine emissions monitoring applications for over 15 years



- Continuous Emissions Monitoring equipment for NO<sub>x</sub> SO<sub>2</sub> CO CO<sub>2</sub> O<sub>2</sub> THC and Particulates
- Single analysers through to 'turnkey' packages
- Tamperproof data logging systems
- Data collection, analysis and reporting software
- Internet based password protected data distribution
- Worldwide service and support



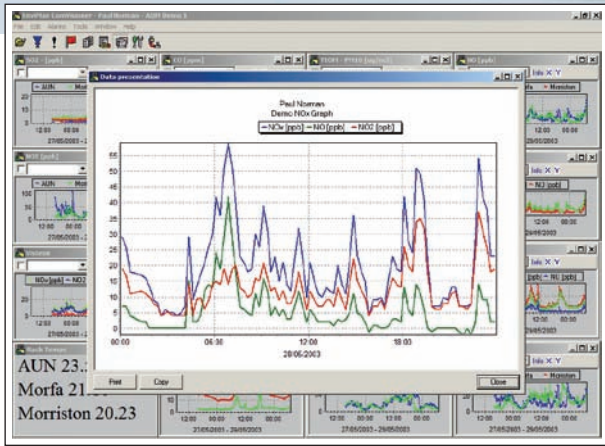
## UV Fluorescent SO<sub>2</sub> Stack Gas Analyser

The ET Marine SeaSOx is a ruggedly constructed UV Fluorescent SO<sub>2</sub> analyser integrated with a high quality stainless steel heated dilution probe. This combination forms a highly reliable and cost effective SO<sub>2</sub> monitoring system that has been well proven in marine emissions monitoring applications for over 15 years



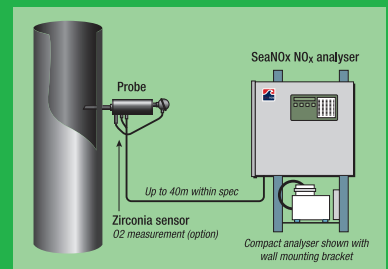
ET Marine exhaust gas monitoring systems are based on the Dilution Extractive principle.

- No heated sample lines
- No 'cold spots' resulting in condensation
- Highly reliable
- Maintenance free



# The process

Sample gas from the ship's exhaust is diluted with dry, clean instrument grade compressed air and is transported back to the analyser using up to 40m of



typically unheated sample line. The sample gas flow is accurately controlled by the use of two temperature controlled critical flow orifices. A low maintenance pump is used to provide a continuous vacuum.

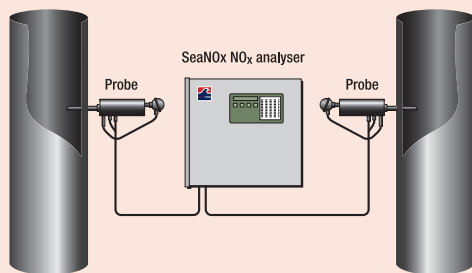
In its most simplistic format, the SeaNOx and SeaSOx analysers provide as standard a 4-20mA output which can be connected into the ships DCS/PLC/SCADA system. Alternatively ET Marine can provide tamper proof data logging equipment, data collection, analysis and reporting software and a range of communications options including satellite modem, GSM or GPRS data transfer. Password protected internet data distribution services are also available.

## Options for SeaNOx and SeaSOx

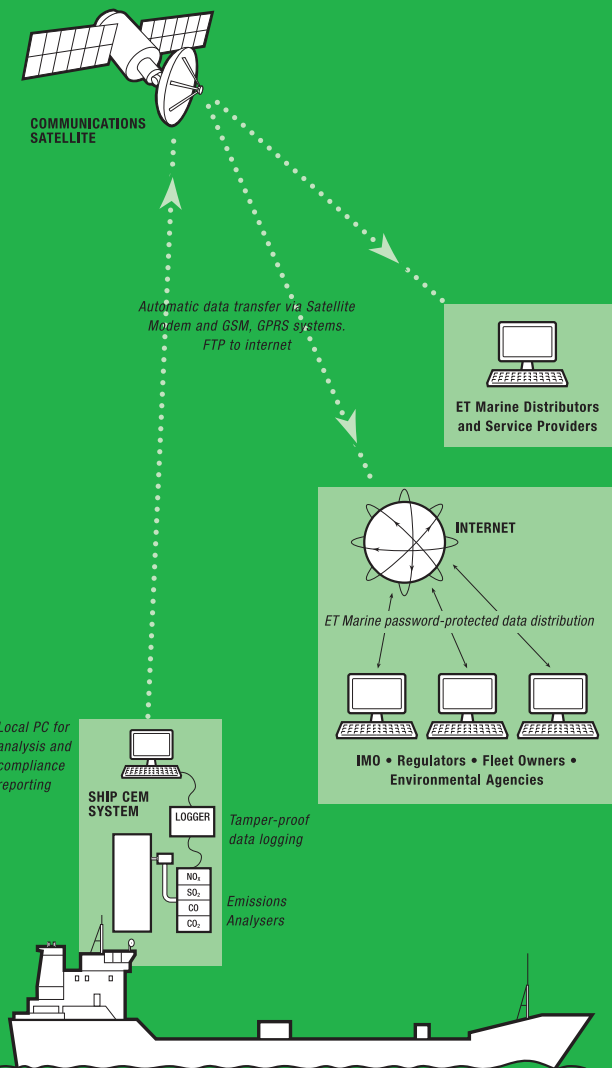
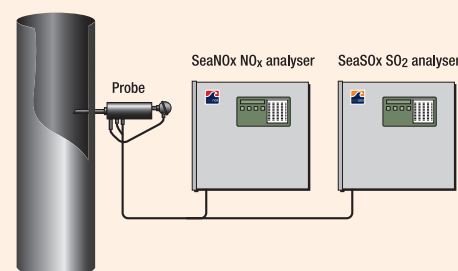
ET Marine can provide the following options for the SeaNOx and SeaSOx products.

- SeaNOx<sup>2</sup> - measure two exhausts with just one SeaNOx analyser
- O<sub>2</sub> measurement - Zirconia Sensor fitted to dilution probe
- Wall mount or free standing brackets
- Mounting flanges
- Automatic calibration set
- Longer (or heated) sample line if required (5m standard)
- Data loggers and reporting software
- Communications equipment, satellite GPRS/GSM

### SeaNOx<sup>2</sup>



### SeaNOx/SeaSOx combination



# Specifications

## SeaNOx

## SeaSOx

Ranges	User selectable 0-3000 ppm	User selectable 0-3000 ppm
Noise at zero	0.2 ppm	0.2 ppm
Noise at span	1.0% of FS	1.0% of FS
Lowest detectable limit	0.4 ppm	0.4 ppm
Zero drift	0.5ppm/24hrs (zero with dynamic zero)	0.5ppm/24hrs (zero with dynamic zero)
Span drift	1.0% FS/7 days (zero with dynamic span)	1.0% FS/7 days (zero with dynamic span)
Lag time	10 secs (from probe with 40m sample line)	10 secs (from probe with 40m sample line)
Rise time	95% in 60 secs (with 40m sample line)	95% in 60 secs (with 40m sample line)
Fall time	95% in 90 secs (with 40m sample line)	95% in 90 secs (with 40m sample line)
Linearity	1.0% FS	1.0% FS
Repeatability	0.6% FS	0.6% FS
Temperature range	0-45 OC ambient temperature	0-45 OC ambient temperature
Outputs	2 x 0/4-20mA isolated	2 x 0/4-20mA isolated
Communication	RS232 opto-isolated	RS232 opto-isolated
Status output	SPDT contact closure for common alarm	SPDT contact closure for common alarm
Power supply	230 VAC 50 Hz / 115 VAC 60 Hz	230 VAC 50 Hz / 115 VAC 60 Hz
Air supply	Clean, oil free, non-condensing 3-8 Bar	Clean, oil free, non-condensing 3-8 Bar
Air supply consumption	10 NLPM	10 NLPM
Enclosure	IP43 (optional IP54)	IP43 (optional IP54)
Dimensions (H x W x D)	500 x 520 x 210 mm	500 x 520 x 210 mm
Weight	30 kg	27 kg
EMC (CE Mark)	EN 50081-1 / Immunity EN 50082-2	EN 50081-1 / Immunity EN 50082-2
Max stack gas temp	STD = 500 OC optional HT = 1800 OC	STD = 500 OC optional HT = 1800 OC
Probe length	Up to 1000 mm	Up to 1000 mm
Probe material	Stainless steel AISI 316	Stainless steel AISI 316
Probe heater	300 W	300 W



SeaNOx was successfully trialled on the P&O ferry 'The Pride of Kent'



Local Distributor

[www.etmarine.co.uk](http://www.etmarine.co.uk)



**et marine ltd**

Kingfisher Business Park, London Road, Stroud, Gloucestershire GL5 2BY, UK  
 Tel: +44 (0)870 1613362 Fax: +44 (0)870 1613363 Email: [info@etmarine.co.uk](mailto:info@etmarine.co.uk)  
 Website: [www.etmarine.co.uk](http://www.etmarine.co.uk)