

**Design, manufacture and supply
of oil-in-water content monitors
for marine, offshore and
industrial applications**



RIVERTRACE

Cleaner. Smarter.

rivertrace.com

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RIVERTRACE

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Established in 1983,
Rivertrace is an
ISO 9001 assured
market leader in
oil-in-water quality
monitoring.

Marine



Offshore



Industrial



Welcome to Rivertrace

Our focus

At Rivertrace, our focus is on enabling our customers in marine, offshore and industrial sectors to run environmentally compliant operations in the most efficient ways.

Ultimately, we're here to help our customers achieve better outcomes for their business and the environment.

Our offer

We do this by advising on, supplying and supporting devices that actively measure, monitor and control oil levels in water, to avoid oil-pollution. This helps our customers to stay compliant with environmental regulations in ways that improve operating efficiencies.

This is Cleaner. Smarter.

It's our expertise and what we do best.

Sustainability

Our stance:

Enabling environmentally-compliant operations:
A better way to operate – Where there's a win
for profit and the planet every time.

Our sustainability mission:

Helping our customers to operate within
environmental regulations.

Finding new and better ways for our customers
to operate efficiently and be planet-positive.



Our products are rigorously tested to meet international standards and supported by our ISO9001:2015 quality accreditations.

Markets and applications

Our extensive range of products covers applications for legislative discharge requirements, condition monitoring equipment and digital technology for enhanced efficiency and compliance.

See how we help at: rivertrace.com/applications



Dedicated R&D team focused on creating innovation

At Rivertrace, we pride ourselves in having our own in-house R&D team. The team is focused on developing our existing products and finding new ways for our customers to to be compliant in more efficient and effective ways. Our R&D team also support our sales team on individual customer requirements and addressing new legislative issues and industry problems.

Visit our website rivertrace.com for more information on each of the products and to download the product datasheets.

Industry knowledge

Rivertrace has over 4 decades of experience working in marine, offshore and industrial markets, covering a wide range of applications.

This allows us to draw on cross-industry knowledge to provide a tailored solution to your environmental compliance requirements.

Flexibility

With a dynamic flexible approach to our business, we will work with you to develop a solution to your problem and support your company throughout the life of the project.



Our range of applications include:

Marine and offshore applications

- Bilge water discharge (MEPC 107)
- Slop water discharge (MEPC 108)
- Exhaust scrubber wash water monitor
- Oil condition monitoring
- NOx EGR water discharge
- Produced water monitoring
- Deck drains discharge

Industrial applications

- Cooling water monitoring
- Boiler feed protection monitor
- Hydrocarbon leak detection
- Ground water discharge
- Wastewater discharge
- Sewage treatment effluent

Compliance assurance, plus increased operating efficiencies in one digitally integrated system

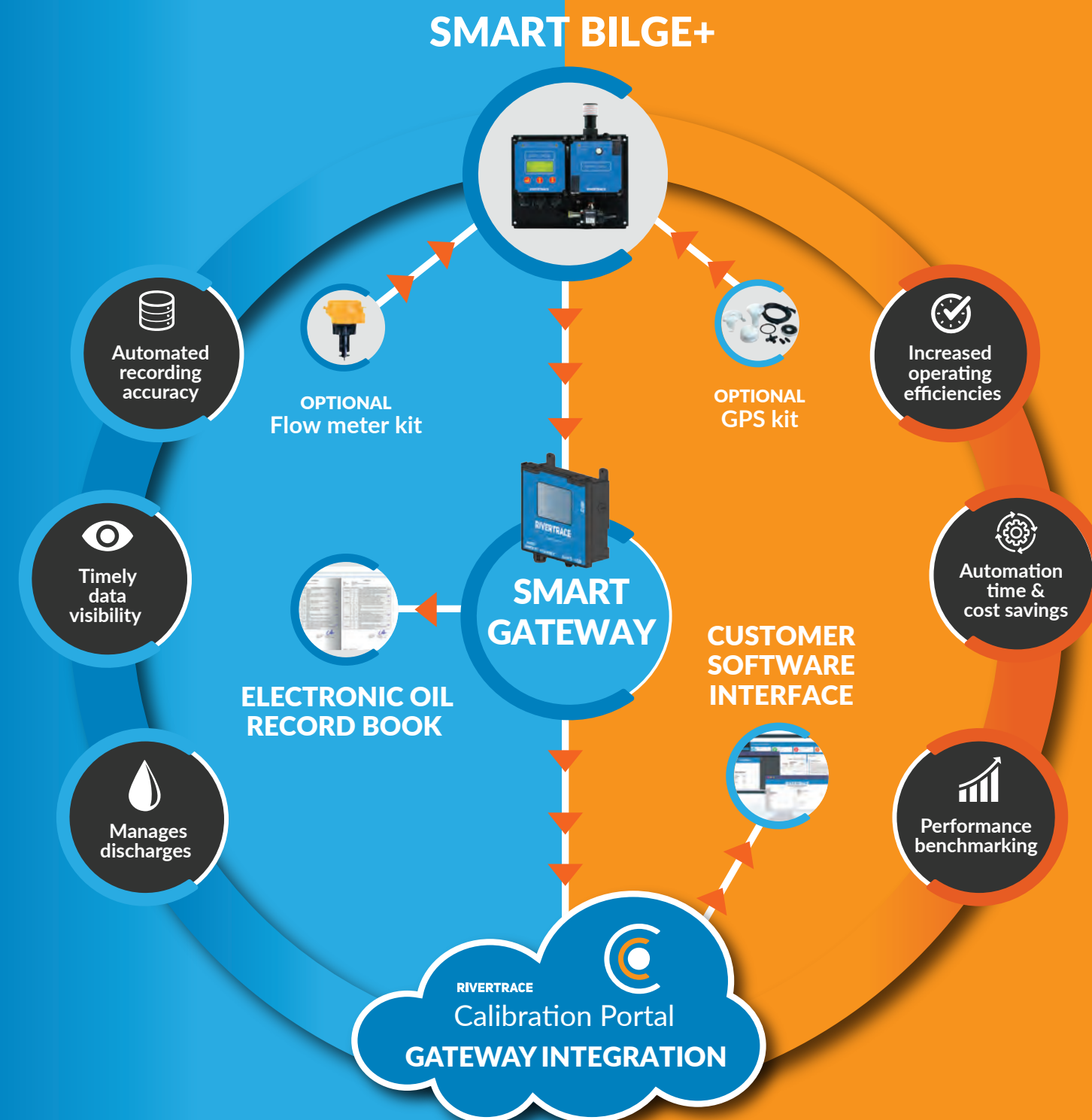
Introducing the way forward; where environmental regulation compliance is achieved seamlessly in ways that enable your operations to run more efficiently than ever before.

- Digital, automated measuring, monitoring and reporting - Staying compliant in the most efficient and effective way possible
- Be connected in real time to the IMO data captured by having access anywhere in the world

Compliance
assurance



Operating
efficiencies



Products and services overview

The Rivertrace range of smart devices and digital systems actively measure, monitor and control oil levels in water.

We apply our deep knowledge of the environmental regulations to advise and support our customers to choose the right solutions for their specific compliance and operating requirements.

Services we offer:

Commissioning

Seamless set up of your monitoring equipment.

Bespoke solutions

Identifying the devices and functionality that best-suit the operating and reporting requirements.

Servicing and repair

Ensuring your equipment continues to operate effectively.

Calibration checks and certificates

Ensuring your equipment is operating with optimal precision.

Contact us to discuss a project you're working on.
We're always happy to help.

Contents - Our products

MARPOL

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INDUSTRIAL

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OCD XTRA

DISCHARGE SECURITY

SMARTSAFE ORB

SENSORS

SMART WiO

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SMART BILGE

BILGE WATER MONITOR DESIGNED TO BE COMPLIANT WITH REGULATION MEPC.107



The SMART BILGE is a 15ppm oil content monitor approved to MEPC.107(49). The SMART BILGE is made up of 2 key components, the SMART BILGE 'module' and the SMART 'CELL' measuring cell.

The SMART CELL utilises a unique detector array technology, developed by Rivertrace, allowing the OCM to analyse all three oil types (HFO, diesel and emulsions) simultaneously without the need for re-calibration. This innovative design allows for simple routine maintenance of the OCM while maintaining optimal conditions.

Replacement calibrated measuring cells can be purchased for easy change over on board the vessel and calibration check kits enable the crew to demonstrate the monitor is within factory calibration to PSC surveyors.

Key features

- Easy maintenance with exchange scheme and fleet deals
- Digital certification certificates with online portal giving automated reminders
- Onboard calibration check kits
- Worldwide approved service centres for calibration checks
- Test button for demonstration of alarm points to port state control



MEPC.107(49) OWS discharge data can be captured and shared digitally to the cloud which can then be integrated into electronic ORBs.

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- **5PPM alarm** - the SMART Cell Bilge Alarm is readily available as a 5ppm version if required
- **Autoclean** - our pneumatic autoclean solution has been designed to ensure the measuring cell glass tube is kept free from fouling. Cell fouling is recognised as a leading cause of monitor malfunction
- **Flowswitch** - the flowswitch option has been designed to ensure that bilge water is flowing mode. An error is shown on the display if there is no flow. The flowswitch monitors the flow of water.

SMART BILGE with autoclean and flow switch options



BASIC SPECIFICATIONS

Oil range:	0-40ppm
Accuracy oil + solids:	+/- 5ppm up to 30ppm
Analogue output:	Active 4-20mA / 0-20mA
Switch inputs:	2 x switch inputs for separator and backflush status
Calibrate on data storage:	Stored in cell
IMO required data:	Stored in control enclosure
IMO required data retrieval:	Via LCD display, RS 232 comms link or USB
Supply voltage:	115 or 230V or 24V AC, 50-60Hz
Protection class:	IP 65
Approvals:	MEPC.107(49)

SMART PFM

A VERSATILE MONITOR TO SUIT A VARIETY OF APPLICATIONS



The SMART PFM measures particulates in the sample stream on a continuous basis by passing the process fluid through a proprietary photo optical measuring cell developed by Rivertrace.

Using a combination of optical recognition algorithms and light intensity it is possible to differentiate between oil particles, gas/air bubbles and solid particulates in the range 1-500 microns. Flow and particulate characteristics can be visualised live via the 7" display.

Oil concentration, pressure, temperature and oil alarm status are displayed on an HD touchscreen. Oil concentrations, alarms and fault log are stored within the system to comply with the reporting requirements of IMO resolution MEPC.107(49) and can be downloaded onto a pc via LAN or USB for further analysis.

Key features

- Oil type independent
- Solid discrimination to mepc.107(49)
- Uses microscopy to measure oil content
- Automatic cleaning of the optical cell
- Camera display to view contaminants within the sample

- **Hazardous environments** (Zone 1 & 2) - The SMART PFM can be offered in an explosion proof cabinet
- **Sample conditioning** - the SMART PFM can be packaged as a system with sample conditioning equipment to suit the application
- **Marine and industrial** versions of the SMART PFM can be offered. The industrial version allows for variable alarm pointsflow. The flowswitch monitors the flow of water.

SMART PFM Ex"D"



BASIC SPECIFICATIONS

Oil concentration range:	0-40ppm
Oil concentration accuracy:	+/- 1ppm
Output signal:	4-20mA
Network communication:	Ethernet (RJ45). Wi-Fi optional with additional hardware
IMO data transfer:	USB 2 memory stick
Supply voltage:	100-240V AC
Degree of ingress protection:	IP65
Approvals:	MED and MEPC.107 (49)

SMART ODME

A SLOP WATER MONITOR FOR TANKERS

The Oil Discharge Monitoring Equipment (SMART ODME) has been designed to provide means of monitoring, recording and controlling the ballast discharge for crude oil, product and chemical tankers including ICE class vessels.

This system is modular in construction and does not require the usual pump/motor bulkhead penetration as used on older systems.

The SMART ODME includes all components required to meet MEPC 108(49) and the latest MEPC 240(65) for bio fuels, effective 1 January 2016.

The SMART ODME incorporates a 'simulation mode' to aid system demonstration to PSC surveyors and is designed for ease of retrofitting, operation, installation and maintenance. Discharge limits are set at 30 litres of oil per nautical mile or 1/30,000 of the previous cargo for slop and wash water discharges.



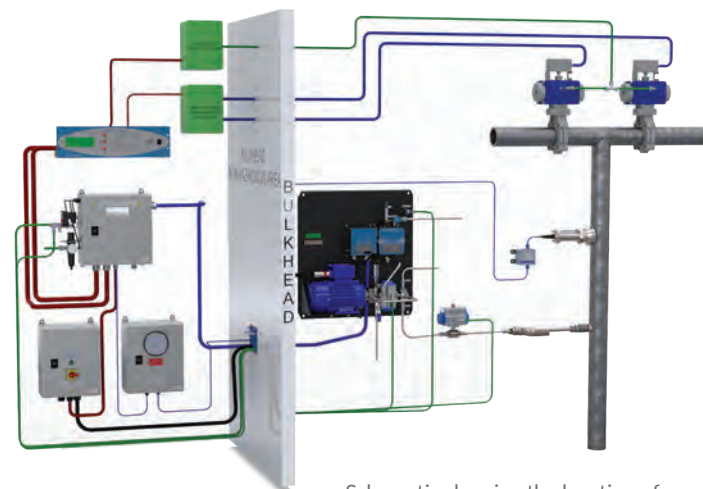
Key features

- The system has been designed for an easy installation at the yard with only one flow meter and one sample point
- Minimal bulkhead penetration with motor and pump in one location
- Paddle wheel flow sensor making for simple installation and maintenance
- Onboard calibration check kits available for functional testing
- Fleet deals – frame agreements and exchange schemes

The SMART ODME has been designed in modules to allow for integration into bespoke ship designs.

This includes:

- Enclosures for the on-deck installations
- ICE class notations
- Dual sample point and flowmeters
- Pneumatic or electric sample pump options



Schematic showing the location of equipment and pipework and cabling

BASIC SPECIFICATIONS

Oil types:	As per MEPC.108(49) and MEPC.240(65) requirements
Oil measurement range:	0–1000ppm all types
Hazardous area:	VPC is Group II Zone 1G IIB T4
Supply voltage:	115/230V AC, 50–60Hz (Switchable)
Approvals:	MEPC.108(49) and MEPC.240(65)

SMART ESM

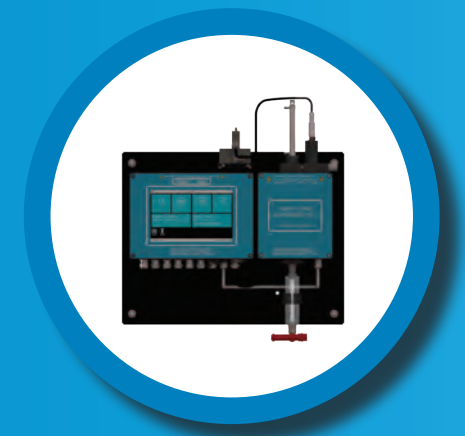
SCRUBBER WASHWATER MONITOR

The SMART ESM is designed to monitor the washwater from exhaust gas cleaning system (EGCS). The SMART ESM is suitable for both the inlet and outlet of the EGCS, measuring and recording the required parameters of PAH, Turbidity, Temperature and pH.

The monitor can be installed on new build or retrofit systems and can accommodate open loop, closed loop and hybrid scrubber systems.

The innovative measuring cell design allows for unique Plug and Play maintenance design. Each measurement parameter is enclosed in a separate cassette slotted inside the measuring cell around the sample tube.

This allows the calibrated parts to be swapped without the need of isolating the sample which flows through a glass tube in the centre of the cell.



Key features

- Flexible configuration at each sample point for the relevant measurement parameters – pah, ph, temperature and turbidity
- Plug and play design for each measurement parameter for easy maintenance
- Onboard calibration check kits available
- On-screen historical data graphs showing instant/hourly/daily/weekly figures
- Automatic cleaning of optical path

We offer 2 main design options with optional sample conditioning equipment.

Option 1 - Frame mounted

This option is based on a modular design all mounted onto a frame/backplate.

Option 2 - Box mounted

This option is based on a twin enclosure design.

Other optional components include:

- Sample heat exchanger
- Motor/pump



SMART ESM frame mounted option



SMART ESM box mounted option

BASIC SPECIFICATIONS

PAH range:	0µg/L to 4500µg/L
PAH accuracy:	5% of measurement reading
Turbidity range:	0–500NTU
Turbidity accuracy:	0.1NTU up to 100NTU, 1NTU thereafter
pH range:	0–14 pH
pH accuracy:	0.1 pH
Supply voltage:	230V AC 50/60Hz
Outputs:	MODBUS 4–20mA
Approvals:	MEPC.259(68) and MEPC.340(77)

SMART 50M

OIL-IN-WATER

The SMART 50M is a versatile and sophisticated monitor designed for high temperature and high pressure applications.

The OCM uses a nephelometry based detection technique and sophisticated algorithms to detect oil content in the sample stream.

The monitor has 2 versions available to suit different oil ranges – low and medium. Combined with proprietary measuring cell autoclean capability and auto-zeroing functionality the monitor boasts minimal maintenance with accurate measurements.

An internal data recorder will log the following data – oil concentration, sample pressure, sample temperature, fault status alarm and run status.



Key features

- Wide range capability
- High sample temp and pressure capability
- Bespoke systems for individual project requirements

Rivertrace offers bespoke systems to accommodate the specific parameters and requirements for the application.

This could include:

- Sample conditioning equipment
- Enclosures
- Mounting solutions
- Hazardous area zone 1 and 2



SMART 50M EXD in enclosure

BASIC SPECIFICATIONS

Ranges:	Low range 0–10ppm. Medium range 0–200ppm
Accuracy:	Low range +/- 0.15%. Medium range +/- 5ppm
Output signal:	4–20mA
Supply voltage:	115–230V AC
Degree of protection:	IP56
Approvals:	Tested to EN61010 EN61326 (CE), c UL us.

SMART 40M

SIMPLE OIL-IN-WATER MONITORING

SMART 40M is a version of our bilge monitor designed for industrial applications.

Originally designed for use onboard vessels under MARPOL regulation the monitor has been redeveloped for industrial use with user adjustable alarm points to suit the environmental requirement.

The monitor is designed with two key components, the control module and the calibrated measuring cell. This allows for easy recalibration and service of the device while retaining the data storage for historical data integrity.

The measuring cell comes as standard with a manual cleaning device. This can be upgraded to a pneumatic auto-clean. This ensures the cell is cleaned at regular intervals without the need for manual cleaning



Key features

- Easy maintenance with measuring cell exchange
- Digital calibration certification
- Use of Rivertrace Connected calibration portal
- Integrated data log with download function
- Data integration with maintenance software
- Flexible design solutions to fit your requirements

Rivertrace offers bespoke systems to accommodate the specific parameters and requirements for the application

This could include:

- Sample conditioning equipment
- Enclosures
- Mounting solutions
- Hazardous area zone 1 and 2



SMART 40M EXD in enclosure

BASIC SPECIFICATIONS

Ranges:	0–40ppm
Accuracy:	+/- 5ppm up to 30ppm
Output signal:	Active 4–20mA / 0–20mA
Supply voltage:	115 or 230V AC, 50–60Hz (24V AC & 12V DC available)
Degree of protection:	IP56
Approvals:	Tested to EN61010 EN61326 (CE), c UL us.

OCD CW

ENTRY LEVEL OIL-IN-WATER MONITOR

The OCD CW Oil Content Meter (OCM) has been developed as a versatile low-cost solution for simple oil-in-water monitoring applications.

The OCM was originally designed for use as a detector of hydrocarbons in sample streams, up to 99ppm.

The system is widely used in engine cooling water and freshwater systems but has been applied to many applications such as groundwater discharge.

With solids discrimination up to 50ppm the OCD CW provides repeatable accurate monitoring and is highly effective in industrial wastewater applications.



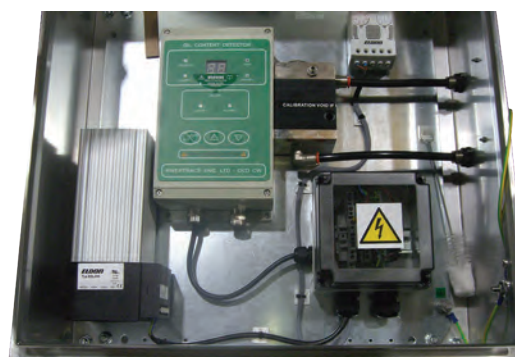
Key features

- User adjustable alarm points
- Minimal maintenance
- Increased accuracy with oil sample

Rivertrace can offer improved accuracy by calibrating the OCD CW on a known oil type.

This will adjust the calibration to the exact oil types from the process line.

The system can also be installed in various configurations to achieve local environmental and climate requirements.



OCD CW in enclosure with cabinet heater

BASIC SPECIFICATIONS

Oil range:	0–99ppm
Accuracy oil range:	+/- 2ppm
Alarms:	2 x adjustable alarm points and delays
Sample temperature:	1–40°C
Ambient temperature:	1–55°C
Protection class:	IP 55

OCD XTRA

OCD XTRA IS A OILY CONTENT ANALYSER DESIGNED FOR PRODUCED WATER APPLICATIONS

It is a unique oil content monitor that combines multiple light wavelengths with multiple sensor technology, to measure oil accurately in the range 0–200 ppm. Multiple oil types are automatically compensated for by sophisticated algorithms. The multi-parameter display shows the sample's oil content, pressure and a graphical average of the last 4 hours oil readings.

Oil and turbidity alarms can be set within the full range of measurement and with the fault condition, drive three corresponding alarm relay contacts available for user termination. Two additional control relays are also provided for pump and valve control if required.

It is also possible to adjust the calibration settings of the OCD Xtra against laboratory analysis on site. This will increase accuracy and repeatability for field conditions. The OCD Xtra can also be supplied for hazardous area environments zone 1 and 2 in a purged enclosure.



Key features

- Factory calibrated on 6 different oil types
- Onsite calibration adjustment
- Bespoke systems for individual project requirements

Rivertrace offers bespoke systems to accommodate the specific parameters and requirements for the application.

This could include:

- Sample conditioning equipment
- Enclosures
- Mounting solutions
- Hazardous area zone 1 and 2



OCD XTRA Ex'D' in weatherproof 316SS enclosure



OCD XTRA Ex'D' on 316SS frame

BASIC SPECIFICATIONS

Oil range:	0–200ppm
Accuracy oil range:	+/- 5ppm up to 50ppm thereafter 10% of reading
Solids discrimination:	100ppm minimum (any calibrated solid type)
Analogue output:	Isolated 0–20mA, 4–20mA, 0–5V DC
Remote input:	Remote start/stop function available with latching switch
Protection class:	IP 65

SMARTSAFE ORB

BILGE DISCHARGE SECURITY SYSTEM

The SMARTSAFE ORB Bilge Overboard Security System was developed to prevent the vessel from illegal discharge “Magic Pipes” and minimise discrepancies in the oil record book.

In its simplest form the SMARTSAFE ORB will utilise the ship's GPS and records each ‘event’ of the bilge water discharge process. The control module will store these events for a period of three years, exceeding MEPC requirements.

It is a complete interlocked system ensuring security of your discharges. This includes tamper proof electronic flow meters and secondary diverter valve with position feedback installed after the standard IMO diverter valve.

The secondary diverter valve is controlled solely by the SMARTSAFE ORB and will immediately be closed should a malfunction or malicious act be detected.

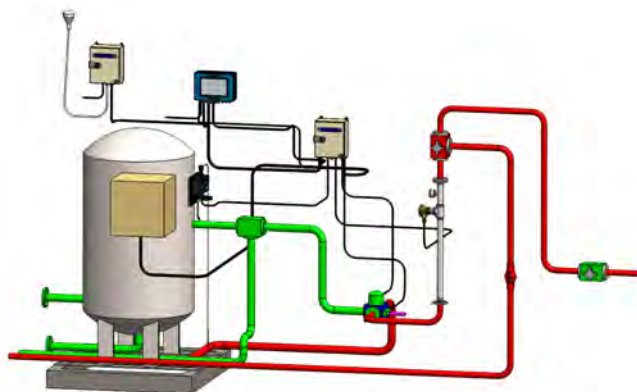


Key features

- Compatible with all OWS
- Increased security against ‘Magic Pipes’ and reduced administration on the crew
- Data security – reduce risk of lawsuits and criminal charges
- Mitigate against detentions and port delays
- Compatible with class and flag approved electronic ORB

Rivertrace's SMARTSAFE ORB can provide electronic recording of the discharges. When connected to the ship's LAN system the monitor will send automated emails at set intervals.

All data, including the email report, can be accessed through the dashboard, providing the user with a full auditable trail of the discharges.



Schematic of equipment and pipework and cabling

- Our standard system is a modular solution which allows the equipment to be positioned throughout the vessel
- Alternatively, the SMARTSAFE ORB can be provided in an enclosure with security tags to allow for simpler installation
- We can also offer an optional GPS signal and interface unit to be included
- The SMART SAFE ORB can be integrated into electronic oil record books to auto-populate the IMO data



SMART SAFE ORB in an enclosure

SMART WiO

WATER-IN-OIL SENSOR

The SMART WiO (Water-in-Oil) sensor works on the principle that oil has the ability to hold a certain amount of dissolved water. This is called the humidity of the oil. The maximum amount of water that oil can hold is characterised by the saturation point (100% humidity). Above this point, free water precipitates, which can lead to corrosion inside an aggregate.

The saturation point is influenced by temperature and other various factors such as the composition of the oil and the formula of the additives. Moreover, it changes during a lifetime.

The system provides very precise measurement result compensating temperature and ageing effects. Simply the SMART WiO will provide an alert function of a pre-alarm and main alarm indicating the humidity and condition of the oil. Installed in a robust stainless-steel housing our SMART WiO sensor withstands the most demanding environmental conditions.



Key features

- Measures the absolute water content in oil
- Early warning by using pre alarm and alarm
 - The PAV (Pre Alarm Value) is set to 50% humidity
 - The MAV (Main Alarm Value) is set to 90%
- Takes the oil temperature into consideration in order to measure the saturation
- The sensor measures the saturation of the oil independent of the oil type and oil age
- No cleaning of the sensor is needed



SMART WiO Controller



Optional SMART WiO Humidity Dial Indicator

We offer a range of water quality sensors including:
Conductivity, Dissolved Oxygen, Ph, BOD/COD, TOC

BASIC SPECIFICATIONS

Power supply:	18–32V DC
Current Consumption:	60mA
Polarity Protection:	Yes
Alarm relays:	Pre-alarm at 50% humidity. Main alarm at 90% humidity
Output current:	<300mA
Operating temperature:	-25 to +85°C
Protection degree:	IP67
Analog output water-in-oil:	4–20mA (equiv. 0–100% humidity linear)
Analog output temperature:	4–20mA (equiv. 0–100°C linear)
Dimensions:	125mm x 80mm x 57mm
Local indication:	LED indicators

Calibration portal

All customers have access to our online cloud-based calibration portal.

- Automatic reminders for calibration renewals and calibration checks
- Digital calibration certificates
- Access to product manuals

Rivertrace approved partners and service centres offer calibration checks and issue digital calibration check certificates.

Rivertrace devices can also be returned to us for checking and re-certification in the UK.

Onboard calibration check kits are available for crew use and for port state control demonstrations.



Global reach into 45 countries

To serve our international customer base, Rivertrace is supported by a network of distribution partners and service centres worldwide, covering 45 countries.

Our partners provide a local service and spares support wherever and whenever required.

At Rivertrace we believe in investing time and resources to ensure our extensive network of distributors and service partners are trained and hold the right stock of spares to enable a rapid response.

This allows us to service the needs of the fast-paced, global demand of the shipping industry with same day dispatch on all stocked spares.

We work with strategic partners who have similar ethos and values, with innovation at the heart of their companies.

These partners support our commitment to driving sustainable change in our industry and advocate using technology to minimise risk, increase safety and keep our oceans clean.

Contact our team at sales@rivertrace.com to learn more about these partnerships or if you have a partner solution that you'd like to discuss.

Delivering results. Globally.





Sales

For new monitor or spares enquiries please contact our sales team via the email address below.

sales@rivertrace.com



Technical Support

Should you require technical support with any of our products, please contact us via the email address below.

remotesupport@rivertrace.com



Service

Please contact our service co-ordinators to arrange a calibration check or service attendance.

service@rivertrace.com

RIVERTRACE

Cleaner. Smarter.

Rivertrace Limited
Unit P, Kingsfield Business Centre
Philanthropic Road, Redhill
Surrey RH1 4DP England

T: +44 (0)1737 775500

F: +44 (0) 1737 775501

E: sales@rivertrace.com

rivertrace.com