

# Complete Process Analytical Solutions

Gas Chromatography / Gas / Liquid



**ROSEMOUNT**<sup>®</sup>  
Analytical

  
**EMERSON**<sup>™</sup>  
Process Management

# TRUSTED AROUND THE WORLD: THE SINGLE-SOURCE FOR ADVANCED ANALYTICAL SOLUTIONS

UNMATCHED ACCURACY. SUPERIOR PERFORMANCE. WORRY-FREE DEPENDABILITY.

Our leading-edge instruments and applications expertise, based on a rich heritage of more than 70 years of online process analysis experience, make Emerson's Rosemount Analytical instruments the industry standard. We help our customers maximize process performance, productivity, and profitability. Our solutions can provide reduced installation and maintenance costs while improving process quality. We offer a complete range of instrumentation for:

- > Gas chromatography (*pages 4-5*)
- > Combustion, process and emission analysis (*pages 6-8*)
- > Continuous on-line liquid analysis (*pages 9-11*)

All around the world, thousands of customers count on Emerson Process Management as the single source for design, manufacturing, factory and on-site test, commissioning, training and ongoing support.



## EMERSON'S WORLDWIDE STRENGTH

Emerson Process Management is part of Emerson, a global company that brings together technology and engineering to provide innovative solutions for our customers in a wide range of industrial, commercial and consumer markets. Our priority is to design, produce and deliver products, systems and solutions that make people's lives better.



# WORLD CLASS TRANSMITTER TECHNOLOGY

## COUNT ON THE WORLD'S MOST ADVANCED TRANSMITTER SOLUTIONS

Rosemount Analytical solutions are based on our years of experience as problem solvers and include the latest generation of transmitter style analyzers. They're designed to reduce installation costs, while enabling in-situ mounting or mounting close to the process sample point for the fastest measurement response offered by any analyzer on the market. This field-tested design minimizes or eliminates the need for additional environmental and flammable area protection. By utilizing our innovative analytical transmitters, our customers can greatly improve overall plant performance.

For hazardous plant areas, we provide a range of international agency approved 'transmitter' style analyzers designed for the rigors of harsh ambient plant environments. These analyzers offer significant operational benefits and flexibility in installation requirements. Our systems can be engineered to meet any plant classification around the world making expensive, specially designed enclosures unnecessary.



Whether you prefer close-coupled field mounted analyzers or a centralized air purged and air conditioned shelter approach, Rosemount Analytical analyzer system solutions can be tailored to your exact needs – without compromise and with proven versatility. Our systems expertise extends over a vast range of process applications and industries – ranging from chemical/petrochemical, refining and gas production to emissions monitoring and steam and water quality monitoring.

## Increase Accuracy and Throughput, Reduce Costs – PlantWeb Makes the Difference

Rosemount Analytical field devices are core components of the PlantWeb digital plant architecture, and capture rich diagnostic data about the health of the device, as well as the process itself. Device functionality is presented at the user interface in ways that are consistent, intuitive, and easy to use.



PlantWeb architecture consists of intelligent field devices, scalable platforms and integrated modular software, all working together. The result is optimal plant performance by getting the right information to the right user, in time



to make a difference. The advanced diagnostics in Rosemount Analytical sensors alert users to device or process problems, before they happen. Control in the field can provide more reliable process control.

## > GAS CHROMATOGRAPHY

Emerson's complete line of gas chromatographs for natural gas pipeline, process and terminal applications offer outstanding value, accuracy and flexibility. Rosemount Analytical Process Gas chromatographs can be installed in a shelter or outdoors near the sampling point. They are designed with micro-packed and/or capillary columns that improve component separation, shorten analysis time and reduce carrier gas consumption.



### Model 700 On-Line Field-Mounted Gas Chromatograph

The Model 700 is our newest chromatograph and is designed for a variety of refining, petrochemical, food and beverage, pharmaceutical, power and environmental applications where selected components in gaseous or liquid streams must be precisely monitored on a continuous basis.

- > Rigorously tested in an environmental chamber between 0° to 130°F for 24 hours minimum
- > Designed for field mounting without the need for expensive shelters and without sacrificing analytical power
- > Diaphragm-based chromatograph valves available in 6-port and 10-port versions
- > Thermal Conductivity Detector (TCD) sensitive to low parts-per-million levels
- > Fully compatible with Ethernet networks and DCS communication
- > Flame Ionization Detector (FID) sensitive to parts-per-billion levels
- > Last chromatogram for each sample and calibration stream stored in gas chromatograph memory
- > Archives up to 64 item averages, up to 35 days of standard runs and calculations



### Model 1000 Gas Chromatograph

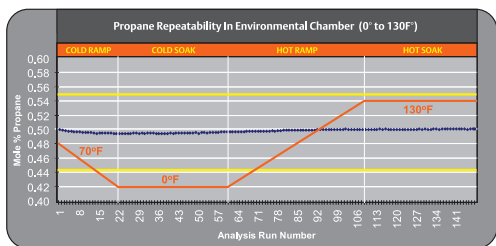
- > Combines the proven analytical components of the Model 500 and Model 700
- > Traditional air-bath oven design for maximum application flexibility
- > Fully compatible with modern ethernet networks and DCS communication
- > Diaphragm-based chromatograph valves
- > Oven capacity for up to six chromatograph valves and two detectors

### Model 500 Gas Chromatograph

- > Proven performance with thousands of units installed around the globe
- > Every model 500 is rigorously tested in an environmental chamber between 0° - 130°F for a minimum of 24 hours
- > With large ambient temperature specification of -18°C to 55°C, the cost of an expensive analyzer shelter can often be eliminated
- > Able to measure liquid and gas samples with one analyzer
- > Custom engineered for each application







## Environmental Chamber Testing

Emerson Process Management provides the most thorough process gas chromatograph testing in the world. Each Model 700 must operate to specification in our walk-in environmental test chambers cycling between 0°F and 130°F for 24 hours minimum. This is all part of our commitment to provide process gas chromatographs that provide reliable measurements in the field.



## Custom Engineered Sample Systems

Any process gas chromatograph is only as good as the quality of the sample it measures. So every sample system for Rosemount Analytical Process Gas Chromatographs is custom engineered for the specific requirements of the application.

Common features include:

- > Heated and open panel designs
- > All components rated for the area classification
- > Automatic calibration / validation available as an option
- > Variety of sample probes to extract a reliable and stable sample from the process



## Custom Engineered Solutions

Although Rosemount Analytical Gas Chromatographs are designed for easy installation and operation in hostile environments, customers may still require engineered solutions to meet their demands. With years of engineering experience, the Gas Chromatographs Division is prepared to meet our customers' requirements.

Experiences include:

- > 3-sided enclosures
- > Custom-sized cabinets
- > Hazardous-rated area shelters
- > Complex sample system development
- > Integration into existing and new data acquisition networks
- > Custom software solutions

## MON2000 Gas Chromatograph Software

Rosemount Analytical Process Gas Chromatographs are designed to operate unattended. If, however, adjustments are needed our exclusive MON2000™ software allows complete control of your gas chromatographs - either locally or remotely. The MON2000 Software is Windows®-based software designed to make analyzer configuration, maintenance and data collection easy. With intuitive drop-down menus and fill-in-the-blank tables, even new users can quickly navigate through the software. MON2000 can display both current and multiple archived chromatograms on the screen streamlining the time needed to perform routine analyzer maintenance.

From within MON2000, a user can:

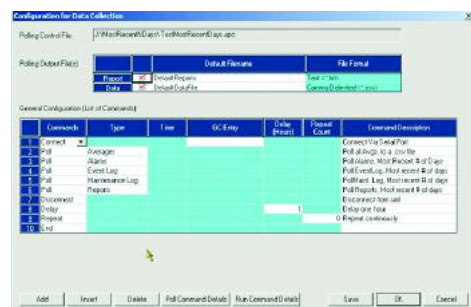
- > Review and modify analytical settings
- > Upload and display multiple chromatograms on the screen for comparison
- > Upload and trend any of the measured results
- > Overlay multiple chromatograms for troubleshooting and calibration
- > Check original calibration against last calibration



## MON2000Plus! Gas Chromatograph Software

MON2000Plus! is the versatile software solution for process Gas Chromatography analysis. It provides configurable Auto-Sequencing collection and storage of data analysis from the gas chromatograph controller or a network of controllers. Combined with a network and remote access from your laptop or PC, you can collect, store, and print data from any location. MON2000Plus! gives you more control over analysis reports with ease of setup and configuration that requires minimal user instruction time.

MON2000Plus! software provides you with remote data collection and storage capabilities and is designed to accommodate your measurement and maintenance requirements.



## > COMBUSTION, PROCESS AND EMISSION ANALYSIS

For true process optimization, manual sampling and computer-based models just won't do – you need direct, in-line, in-process measurements. With world-class Rosemount Analytical instruments, you can:

- > Reduce energy, installation and maintenance costs.
- > Lower process variability and improve process diagnostics and safety.
- > Enhance product quality and increase throughput.
- > Meet or exceed regulatory requirements.

### X-STREAM Oxygen Analyzer

The X-STREAM continues our long line of reliable, highly accurate Rosemount Analytical in situ combustion analyzers. X-STREAM offers enhanced features, an expandable and customizable measurement system to perfect your process, and exclusive service-in-place design – all while delivering the ultimate in performance.

- > Accumax enhanced system performance
  - Best signal stability – less than +/- .03%
  - Insensitive to process temperature changes – less than +/- .05% from 100-600 degrees C
  - Calibration validity – calibration mimics process condition within +/- .02%
- > Adaptable to most existing probe installations
- > Stoichiometer feature measures oxygen deficiency during reducing conditions
- > Sensor core replaces in 15 minutes
- > Extended cell warranty
- > 2-wire loop-powered electronics
- > HART® communications standard
- > Extended process temperature range, to 850 degrees C (1562F)
- > Advanced sensor diagnostics including calibration recommended
- > AMS/PlantWeb compatible with EDDL





### OCX 8800 O<sub>2</sub>/Combustibles Transmitter

This rugged, compact unit has two of the world's most reliable and accurate sensors – the same high-performance oxygen sensor as the Oxymitter – while its unique combustibles detector has proven to be the most reliable on the market.

- > Rugged sulfur resistant catalytic bead sensor (patent pending)
- > Improved temperature control and heater design
- > Vacuum Fluorescent Local Operator Interface (LOI)
- > LOI safety lock-out
- > Improved sensor and sample block temperature stabilization
- > Line voltage diagnostics
- > Calibration check and abort feature
- > HART® communications
- > Backward compatibility to upgrade your existing OCX



### Oxymitter In Situ Flu Gas Oxygen Transmitter

Oxymitter transmitters provide the optimum in reliability and accuracy, giving your operators the confidence to set combustion fuel/air ratio to the most efficient levels.

- > Accuracy  $\pm$ .75% of reading or .05% oxygen
- > 700°C (1300°F) maximum process temperature (1050°C (2000°F) with bypass accessory)
- > Electronics integral to probe or remote-mounted
- > Completely field-repairable
- > HART® or FOUNDATION™ fieldbus communications
- > High sulfur/HCL versions available
- > Advanced diagnostics, including “calibration recommended”
- > Optional autocalibration



### Combustion Efficiency Equipment

Emerson offers complete combustion solutions. From carbon monoxide measurements to opacity measurements and final actuation devices for air damper control Emerson has the solution. These products are easy to install, maintain and operate while providing accurate measurements and reliable operation.

- > HART® & fieldbus based pneumatic damper drives
- > Opacity Monitors
- > Infrared Cross-stack CO monitors



### Custom & Pre-Engineered Systems Solutions

Emerson offers a wide variety of custom designed process and environmental analyzer packages as well as cost effective pre-engineered solutions to meet a wide variety of applications. Continuous Emissions Monitoring Systems can be designed for a variety of combustion and off gas monitoring and reporting. Many commonly used process applications can reduce initial engineering costs by selecting from our library of previously engineered packages.

- > Measurement options: CO, CO<sub>2</sub>, SO<sub>2</sub>, NO, NO<sub>x</sub>, O<sub>2</sub>, THC and opacity
- > Fully pre-engineered using Emerson's own industry-preferred analyzers
- > Self-diagnostics
- > Manufactured under ISO 9001-certified quality standards
- > Optional startup, RATA certification testing and ongoing service programs available



## > COMBUSTION, PROCESS AND EMISSION ANALYSIS

### X-STREAM Process Analyzers

To tightly control a process, its constituents must first be defined – precisely and consistently, every time. Only then can your process be fine-tuned to yield its optimal performance. That's where Emerson's new Rosemount Analytical X-STREAM series of gas analyzers come in. X-STREAM is available in three versions – general purpose, field housing and flameproof – so there's one for your application.



General Purpose X-STREAM



Field Housing X-STREAM



Flameproof X-STREAM

X-STREAM gas analyzers offer single and dual channel analysis using infrared, ultraviolet and visible (NDIR/UV/VIS) photometry, paramagnetic and electrochemical oxygen, and thermal conductivity sensor technologies.

X-STREAM analyzers provide:

- > User-friendly operator interface
- > Support for multiple languages
- > Easy access for maintenance and repair
- > Extended ambient temperature range
- > Modbus communication capability over an Ethernet or serial interface

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### General Purpose X-STREAM

Available in either rack mountable or tabletop versions.

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### Field Housing X-STREAM

Features wall mountable NEMA 4X/IP66 painted stainless steel housing. The NEMA 4X/IP66 design allows operation in harsh industrial environments. Upgraded with a CSA-C/US approved z-purge pressurization system, it can be installed in Div. 2 hazardous areas. ATEX type-approved pressurized solutions are available for hazardous areas classified as Zone 1 or Zone 2.

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### Flameproof X-STREAM

Features wall-mountable flameproof NEMA 4X/IP66 painted cast aluminum housing that can be field mounted in the harshest environmental conditions without the need of a purge. Can be installed in Class I, Zone 1, Group IIB + H2 hazardous areas requiring ATEX or CSA-C/US certifications.

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### MLT Series of Analyzers

The MLT Series of analyzers have the capability of measuring up to five gas components in a single analyzer using NDIR/UV/NIS photometry, paramagnetic and electrochemical oxygen, and thermal conductivity detectors and can be combined with chemiluminescence and flame ionization sensor technologies.

- > Designed for high sensitivity and interference rejection in order to measure concentrations as low as 0 to 10 ppm CO and 0 to 5 ppm CO<sub>2</sub>
- > FOUNDATION™ fieldbus communication
- > ATEX, CSA-C/US, GOST and other certifications for hazardous areas; TUEV, MCERTS and QAL 1 certifications for CEMS applications





## > CONTINUOUS ON-LINE LIQUID ANALYSIS

Emerson offers a complete range of Rosemount Analytical analyzers, transmitters, sensors and systems for the continuous on-line measurement of pH, ORP, conductivity, dissolved oxygen, ozone, chlorine, turbidity, and total suspended solids. Every day, all around the world, Rosemount Analytical liquid analysis products prove their reliability, accuracy and dependability.



### Two-Wire Transmitters for Demanding Environments



#### 5081

- > Intrinsically safe design allows transmitter to be used in hazardous environments (FM, CSA, CE and ATEX with Class 1, Div. 1 and 2, explosion proof certifications)
- > Non-volatile memory retains program settings and calibration data during power outages
- > Choice of communication protocol: HART® or FOUNDATION® fieldbus



#### Xmt

- > Clear, easy-to read display can be used for measuring pH, ORP, conductivity, resistivity, oxygen, free chlorine, monochloramine and ozone in a variety of process liquids
- > Menu screen includes all main European languages – reduce on-site training time
- > FM, CSA, CD and ATEX certifications
- > Choice of HART, FOUNDATION fieldbus or FISCO configurations

### Four-Wire Analyzers for General Purpose Environments



#### 1056 Series

- > Multi-parameter instrument with single or dual input offers an unrestricted choice of dual measurement combinations, reducing the cost per loop and needed panel space
- > Easy to set up and troubleshoot. Exclusive quick-start screens appear the first time the analyzer is powered up
- > Features the largest high-contrast LCD display available on a line-operated instrument
- > Seven languages – Chinese, English, French, German, Italian, Portuguese and Spanish



#### 54e HART Analyzers

- > Available for pH/ORP analysis with extensive pH diagnostics that warn the user of the need for calibration, maintenance or sensor replacement
- > Conductivity/resistivity version accepts either contacting or inductive sensors to meet most applications
- > Amperometric version utilizes an on-board pressure sensor for automatic calibration of oxygen sensors
- > Rugged aluminum enclosure

## > CONTINUOUS ON-LINE LIQUID ANALYSIS

### Analytical Sensors for Every Application

With the widest range of liquid analysis sensors in the world we can help you choose the right sensor for your application – whether it is high purity water, pulp and paper, chemical processing, power, potable water, wastewater or drinking water treatment.



#### Toroidal Conductivity Sensors

A full range of toroidal (inductive) sensors is offered which can be used in even the harshest processes. Flow-through models for installations of viscous, fibrous or corrosive samples



#### 400 Endurance™ Conductivity Sensors

Suitable for the measurement of conductivity in samples ranging from ultra-pure water to cooling water. Titanium electrodes provide stability and ruggedness without sacrificing accuracy.



#### pH and ORP Sensors

The industry standard for low cost-of-ownership pH and ORP sensors for harsh, dirty applications. General purpose sensors measure pH and ORP in aqueous solutions in pipelines, open tanks, or ponds.



#### Amperometric Sensors

Designed to cover the widest range of amperometric requirements, such as dissolved oxygen, ozone and chlorine. These membrane sensors are rugged and easy to maintain.



#### Severe Service pH Sensors – 3300HT and 3400HT

Incorporates several design innovations that prolong sensor life in severe applications. Sensors live longer, respond faster and drift less, thereby minimizing maintenance and lowering the total cost of ownership.

**PERPH-X™**

## Analytical Sensors continued



### Specialty Sensors

Sensors for biopharmaceutical, food processing, chemical, power and semiconductor industries include the HX338 steam sterilizable pH and BX438 dissolved oxygen sensors



### High Purity Water pH Sensor with pHaser Flowing Junction

The model 3200 HP is designed for the accurate measurement of pH in low conductivity, high purity water. Incorporates features for rapid temperature response, measurement stability, quick and easy calibration and replaceable open-capillary junction.

## System Solutions



### Models FCL/MCL systems measure free chlorine and monochloramine

- > Packaged systems measure free chlorine and monochloramine without the expense and hassle of tubing, pumps, and reagents
- > Model FCL measures free chlorine in water with pH as high as 9.5
- > Model MCL measures monochloramine
- > Both systems are complete with analyzer, sensors and constant head flow controller

### Model WQS Water Quality Monitoring Solution

- > Complete “Plug and Plumb” systems designed to withstand rigors of real world water distribution environment
- > Ease of use features “no reagent” design for most measurements
- > HART™ and FOUNDATION fieldbus communications are available



### Clarity II™ Turbidimeter System

- > Compliance with US EPA Method 180.1 and ISO 7027 measurement regulations
- > Single or dual channel sensor input
- > Plug and Plumb™ Systems – quick start-up
- > Superior Low Level Accuracy



## > COMPLETE PROCESS ANALYTICAL SOLUTIONS

### GAS CHROMATOGRAPHY



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