Rosemount™ 370XA

Process Gas Chromatograph

The Rosemount™ 370XA gas chromatograph, the latest analyzer to join the XA Series of Emerson gas chromatographs, is designed to provide ease of use and highly accurate measurement performance for your lighter gas process applications.

A unique feature of the 370XA is its *Maintainable Module™* technology, which allows you to easily replace the GC module in the field in under three hours, including warm-up time and purge, greatly reducing downtime and overall operating costs.

Incorporating an operating method similar to previous gas chromatographs, the 370XA gives you the option of using air/nitrogen actuation gas instead of helium.

The local operator interface (LOI), a standard feature in the 370XA, is a full color VGA display with an alpha-numeric keypad that allows operators to perform common tasks without having to connect to a computer. The LOI has built-in tutorials to guide even the most inexperienced operator through step-by-step instructions on how to safely operate and maintain the GC, therefore reducing the need for specialized technicians.

Rosemount™ 370XA Gas Chromatograph.

Features

Designed for maximum functionality in a small footprint

- Compact design, 460 mm H x 305 mm W x 280 mm D (18 in. H x 12 in. W x 11 in. D) and only 22 kg (50 lb)
- Flexible communications with two RS-232/485 serial ports and two Ethernet ports configurable with unique Modbus maps
- Three-stream plus calibration stream analysis capability

Simplified Functionality and Ease of Use

Full color LOI with built-in software assistants to guide the operator through common tasks, such as:

- GC startup
- Module replacement
- Calibration gas change
- Auto-valve timing

Reduced Installation Costs

- 24 Vdc power with less than 55 Watts startup and < 25 Watts (steady state) nominal power
- Pole (standard) and wall mount options
- No shelter required for most environments, optional enclosure available for extreme environments

Lower Operational Costs

- Reduced carrier gas usage
- Automatic validation routine reduces calibration gas usage
- *Maintainable Module™* replacement is quick and easy
- Optional utility gases: He, N_2

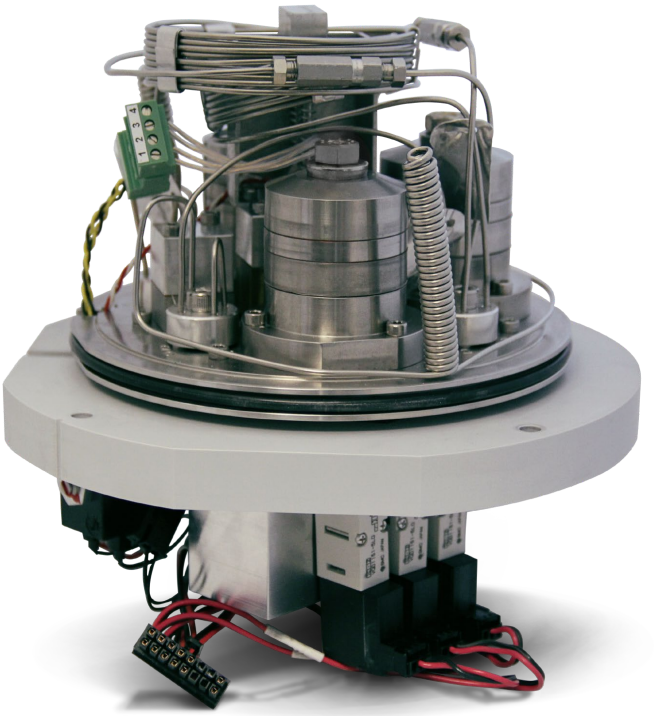
Note: The hydrogen sulfide and water limit in a sample is 0.02 mole %.

The Emerson difference

A key advantage of the 370XA is the compact *Maintainable Module™* that includes the columns, thermal conductivity detectors (TCDs), analytical valves, and solenoids, all within a single enclosure. Providing the technician with easy access to these key components inside a single enclosure is a cost-effective way to service or repair the module compared to other GCs that have no serviceable components.

Using a multi-layer manifold, which replaces the tubing found in traditional chromatograph ovens to connect the various components in the module, eliminates the need for compression fittings that can be a potential source of leaks.

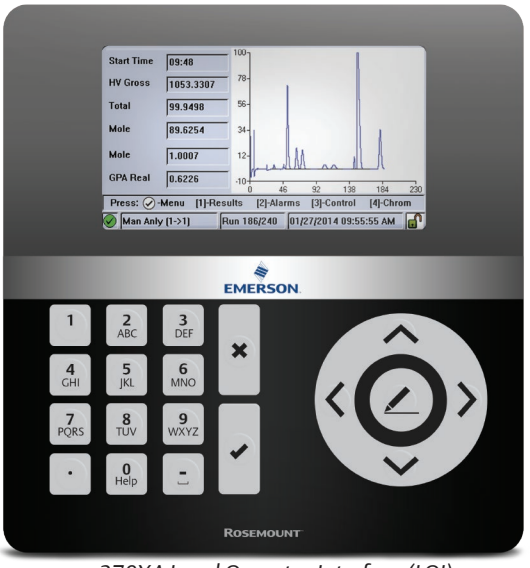
If the *Maintainable Module™* needs repair, it can be quickly and easily replaced in the field without causing major interruptions or delays. Once the replacement module has been properly installed and is back online, the GC will self-validate and calibrate before switching automatically to *Analysis* mode.



370XA Maintainable Module™

Local operator interface (LOI)

A challenging concern in the industry today is the declining experience of operators in the field and the lack of available time to perform routine maintenance service calls. The Rosemount 370XA has a full-color LOI designed to simplify GC operations in the field. The LOI uses a full VGA LCD interface combined with a 19-key tactile feedback keypad that is rated for Class I, Division 1 hazardous areas.



370XA Local Operator Interface (LOI).

You can perform most GC maintenance functions directly from the LOI. In most cases, the Rosemount 370XA can be installed, configured, and placed online without the use of a computer.

Routine maintenance functions

- **Changing calibration gas** - When replacing the standard calibration gas, built in software assistants in the LOI walk you through the basic steps:
  - Validate the existing calibration according to the thermal conductivity of each of the components.
  - Change the calibration bottle.
  - Enter new values.
  - Purge the calibration gas.
  - Analyze the calibration gas to validate the new concentration values.
  - Calibrate to the new standard.
  - Return to automatic analysis of the stream.

■ **Auto-Valve Timing** – Over time, restrictions can build up inside the analytical flow-paths of a gas chromatograph oven. The auto-valve-timing adjusts the analytical valve timings and integration events to optimize the analysis to account for these changes. This reduces the need for fully trained gas chromatograph experts in the field and ensures the analyzer is maintaining the tight tolerances required to reduce mismeasurement.

■ **Module Replacement** – When a module is replaced in the field, the LOI initiates the purge, validation, and calibration sequence. The status and progress of the module initiation sequence can be monitored from the LOI and will confirm when the analyzer is back online.

Additionally, many of the functions historically performed with a computer can now be done using the LOI, including:

- Viewing, accepting, and clearing alarms
- Stopping and starting the analysis cycle
- Viewing chromatograms
- Viewing calibration, validation, and calibration reports
- Viewing archive data and trends
- Viewing and configuring communication settings

Flexible Communication and I/O

You can connect the 370XA to supervisory systems, such as DCS and PLC control systems, using two RS-232/485 serial ports or two Ethernet ports. Each serial or Ethernet port can be configured with unique Modbus maps that provide individual read/write access control. You can use the industry standard SIM_2251 Modbus map or a fully customized map based on either the Enron (one register per floating point) or Modicon (two registers per floating point) data formats.

Additionally, two analog outputs, one analog input, one digital input, and one digital output are available on the GC.

One of the Ethenet ports has a RJ-45 connector that you can use to connect to a local computer for maintenance and diagnostic access. This Ethernet port has a switchable DHCP server that can assign an IP address to the connected computer.

Data Archiving and Reports

Every analysis is time and date stamped and archived for retrieval via MON2020™. Pre-configured reports can be displayed, printed, or stored internally. Results can be trended directly or exported easily to several common formats such as ASCII text, HTML, and Microsoft® Excel™.

The following kinds of data are available:

- **Archiving** – Assuming a four-minute analysis time, at least 85 days of analysis records and at least 370 days of calibration records (one calibration per day) is archived automatically by time and date.
- **Chromatograms** – Over four days worth of analysis chromatograms, 370 final calibration chromatograms (depending on the analysis time), and user selected *protected chromatograms* that are permanently stored.
- **Drawings and Documents** – User manuals and drawings in several file formats are stored in the 370XA's memory for convenient retrieval with MON2020. This eliminates the risk of manuals and drawings being misplaced. User generated documents such as maintenance checksheets or installation drawings can also be uploaded to the 370XA for later retrieval.

Standard logs and reports include:

- **Audit logs** – data and event logs that fully conform to API report 21.1 for metering audit purposes and backup to primary systems (flow computer, SCADA, DCS).
- **Event logs** – a continuous record of all operator changes, with time, date, and user-identified change records.
- **Alarm logs** – a continuous record of all historical alarms, time and date stamped with alarm state and description.
- **Maintenance logs** – a *scratch pad* for tracking maintenance or testing performed on the gas chromatograph.
- **Average reports** – hourly, 24-hour, weekly, monthly, and variable averages.
- **Analysis reports** – physical property calculations for component and group analysis and alarms.
- **Raw data reports** – retention times, peak areas, method, integration start/stop, and peak width for the analysis.
- **Calibration reports** – raw component data, new response factors, retention times, and deviation from last calibration.
- **Final calibration reports** – results from the calibration response factors and retention time adjustments.

MON2020™

The Rosemount™ 370XA gas chromatograph is designed to operate unattended. If adjustments are needed, our proprietary gas chromatograph software, called MON2020™, allows complete control of the 370XA either locally or remotely.

From within MON2020, you can:

- Start or stop analysis, calibration, or validation cycles.
- Generate and save current and historical analysis and calibration reports.
- Review and modify analytical settings.
- Upload and display multiple chromatograms for comparison.
- Upload and trend any of the measured results.
- Export data to text, HTML, or Excel for use in third party applications.
- Check on original calibration against the last calibration.
- Perform GC operation checks and modifications simultaneously.
- Upload and view manuals and drawings stored in the gas chromatograph.

MON2020 is a Windows® based software that makes 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.

With its abilities to communicate with your enterprise network and export to numerous file types, MON2020 is a powerful tool that ensures operators, engineers, maintenance personnel, and management have access to critical data, such as current and archived chromatograms, alarm history, event logs, and maintenance logs.

MON2020's chromatogram viewer allows you to view and compare both live and archived chromatograms simultaneously. Despite its small size (less than 100 kb), the chromatogram file (.xcgm) includes analysis and calculation results, integration and valve timing settings, retention time settings, and raw peak data.

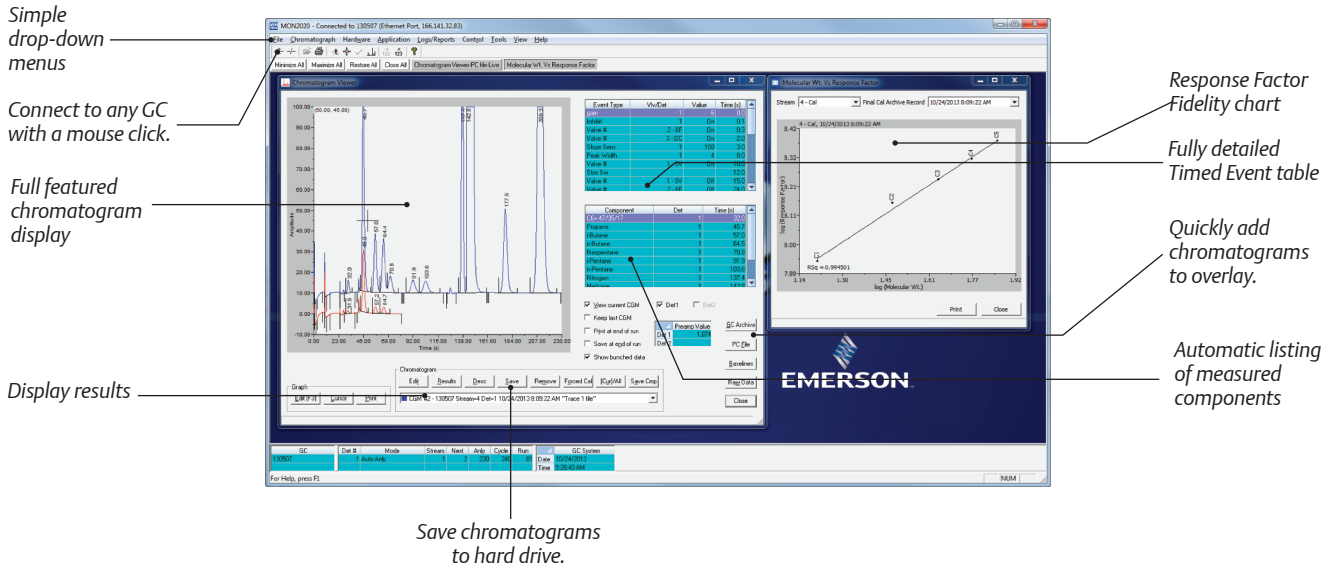
MON2020's trend viewer makes it easy to trend multiple variables on a single chart. To help diagnose process or analysis issues, you can select single or multiple points on the trend viewer; the chromatograms associated with these points will open in the chromatogram viewer. The trends can be saved as trend files or exported as text, CSV, or Microsoft® Excel files.

MON2020 can connect to a 370XA via Ethernet directly or over your local or wide area network. MON2020 is equipped with multi-level username and password security settings to limit and control access to the GC, and provide five levels of authority ranging from read-only access to full control of the GC and its data.

MON2020's unique Diagnostic File feature makes remote diagnostics and documenting the analyzer performance easy and consisent. The diagnostic data file combines chromatograms, alarm logs, event logs, and configuration details into a single file that is time and date stamped. The generation of the diagnostic file is a simple menu selection and not only creates the file, but also creates an email with the time stamped file attached, ready for dissemination.

The MON2020 software is supplied with the Rosemount 370XA, is common across the XA platforms, and is available to download from the Emerson website, making it easy to access.

MON2020™ Interface



Analytical systems & integration services

Emerson offers a comprehensive range of analytical system solutions and third party integration services. From standalone panels and cabinets to three-sided shelters and environmentally controlled walk-in enclosures, our complete range of capabilities is backed by more than 60 years of analytical expertise across thousands of process installations throughout the world.

From front end engineering design (FEED) and consulting services to comissioning services and on-going lifecycle support, Emerson provides complete turnkey analytical solutions.

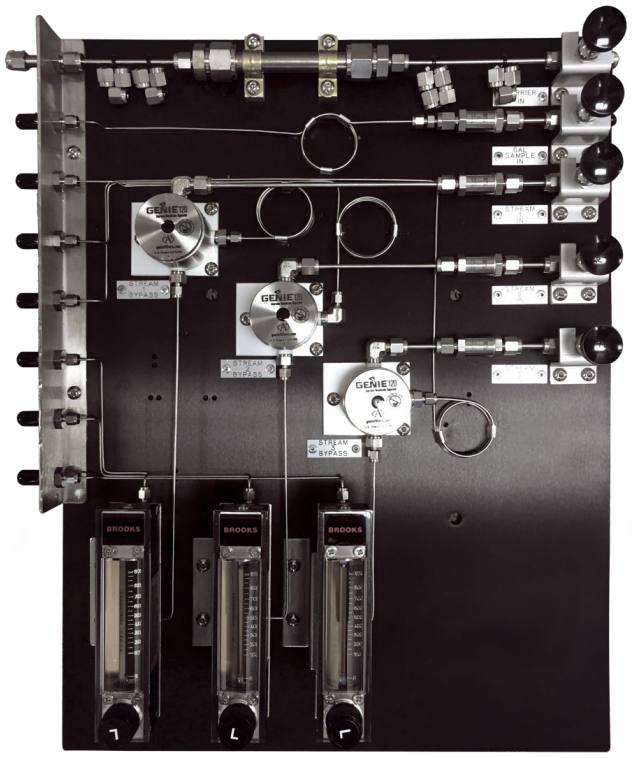
With seven full scope analytical systems and integration centers and 16 regional support facilities strategically located across the world, Emerson has the global resources and analytical experise to provide localized support.

Engineered sample systems

Any process gas chromatograph is only as good as the quality of the sample it measures. Every sample system for Emerson's process gas chromtographs is 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



Our custom-engineered sample systems meet the specifiications of each unique requirement.

Environmental chamber testing

Every Emerson gas chromatograph that leaves our facility undergoes rigorous testing throughout assembly. The majority of our systems are put into a 24-hour environmental chamber test, where they must operate to specification in an environment where the temperature cycles between -18 and 54 °C (0 and 130 °F) for a minimum of 24 hours.

Our product testing procedures are much stricter than the industry standard for analytical measurement products. When you purchase an Emerson gas chromatograph, you can be assured that you're purchasing the highest-quality process gas chromatograph or natural gas chromatograph available.

As a result of chamber testing, 100 percent of all gas chromatographs that we ship are proven to operate to the performance specifications across the stated operating range.

Specifications

Please consult Rosemount™ if your requirements are outside the specifications listed below. Improved performance, other products, and material offerings may be available depending on the application.

Construction

Environmental temperature: -20 to 60 °C (-4 to 140 °F)

Enclosure protection rating: IP65 and Type 4X

Dimensions (without sample system or mounts):
460 mm H x 305 mm W x 280 mm D
(18 in. H x 12 in. W x 11 in. D)

Mounting: Pole (standard) wall mount or floor stand

- Refer to the drawings on the next page for mounting dimensions.
- An enclosure that offers protection from extreme environmental conditions and from un-authorized third party access is available. All customer connections will be to externally provided connections, and all tubing and wiring inside the enclosure will be done at the factory.

Approximate weight (without sample system): 22 kg (50 lb)

Area safety certification options:

- **CSA:**
  - USA / Canada
    - Class I, Zone 1, Ex/AEx d IIB + H2, T6, IP65
    - Class I, Division 1, Groups B, C, D, T6, Enclosure Type 4X

- **ATEX/IECEx**

  Ex d IIB+H_2 T6 Gb

  Ⓔx II 2G

  T_a = -20 °C to 60 °C

Warranty: 2 year limited warranty
(see Terms and Conditions for details)

Electronics

Power:
- 24 Vdc at the unit (21–30 Vdc)
- 55 Watts (Startup)
- < 25 Watts (Steady state)

Performance capabilities

Repeatability: Application dependent

Calculations: ISO 6976, AGA 8, GPA 2172 (using the GPA 2145 physical properties table)

Carrier gas: Zero-grade helium

Actuation gas: Helium, Nitrogen, or clean dry air (90 PSIG)

Sample input pressure range: 0.7 to 1.7 BarG (10 to 30 PSIG)

Valves: Three six-port diaphragm chromatograph valves

Oven: Airless iso-thermal

Detector: Thermal Conductivity Detector (TCD)

Streams: Three-stream plus calibration stream

Chromatograms stored/archived internally: Stores up to 85 days of analysis report data and up to 2,500 individual chromatograms

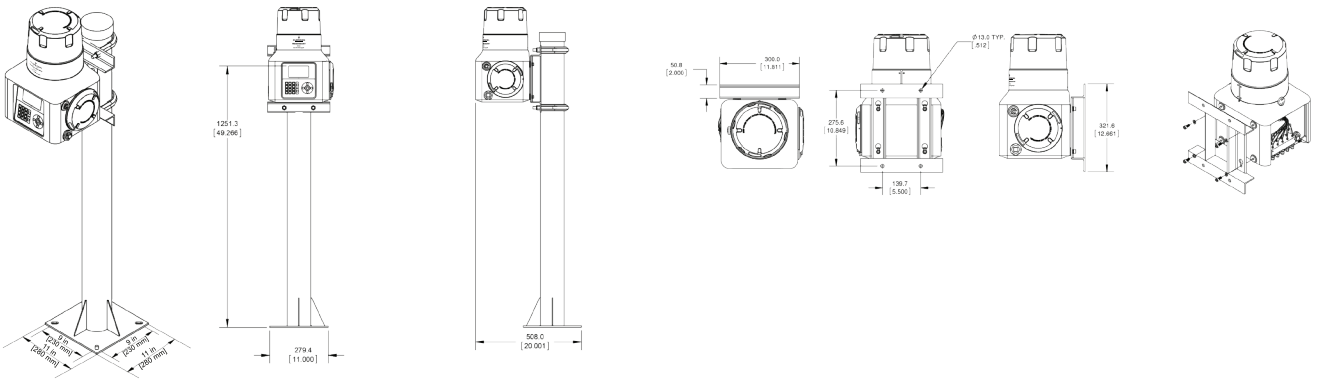
Communications (standard)

- Ethernet: Two available 10/100 Mbps connections – one RJ-45 port and one four-wire terminal
- Analog inputs: One standard input filtered with transient protection, 4–20 mA (user scalable and assignable)
- Analog outputs: Two isolated outputs, 4–20 mA
- Digital inputs: One input, user assignable, optically isolated, rated to 30 Vdc at 0.5 A
- Digital outputs: One user-assignable output, Form C and electro-mechanically isolated, 24 Vdc
- Serial: Two terminal blocks, configurable as RS-232 or RS-485

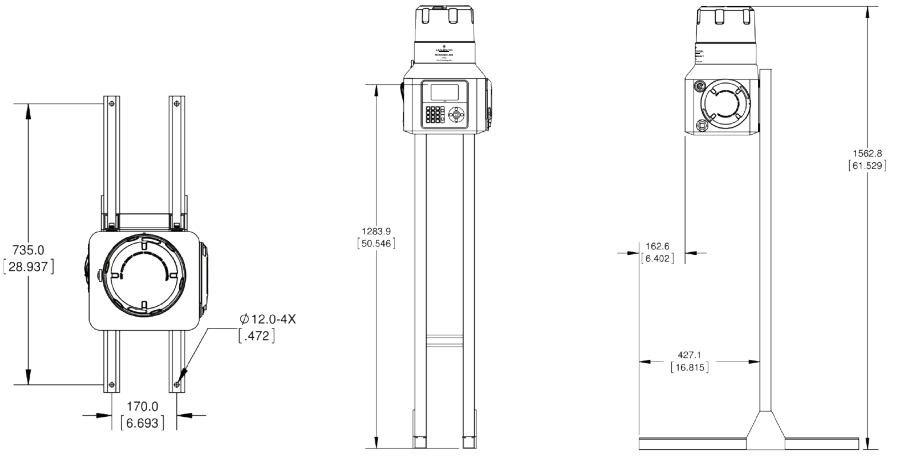
Recommended Installation

The drawings below represent the minimum recommended installation guidelines for the Roseomount™ 370XA gas chromatographs. Please consult Rosemount for detailed installation recommendation of your application.

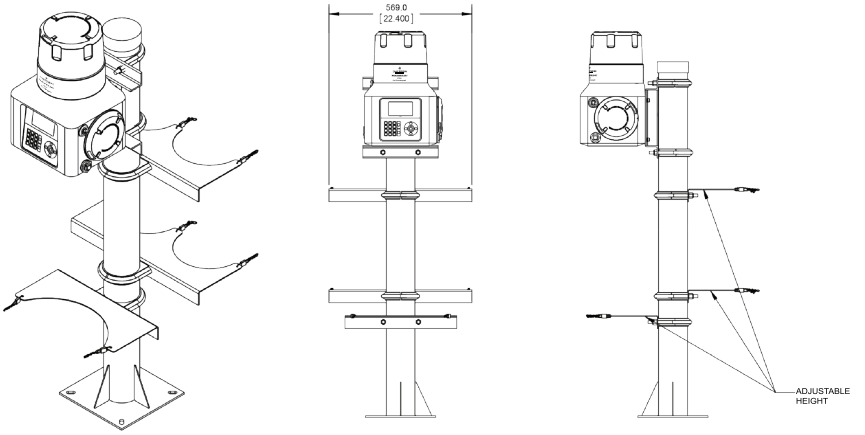
Pole Mount/Wall Mount



Floor Stand



Optional Gas Bottle Cradle Assemblies



Americas

Emerson Automation Solutions
10241 West Little York, Suite 200
Houston, TX 77040
+1 866 422 3683 or +1 713 396 8880
+1 713 466 8175
GC.CSC@Emerson.com

Europe Regional Office

Emerson Automation Solutions Europe GmbH
Neuhofstrasse 19a P.O. Box 1046
CH 6340 Baar
Switzerland
+1 954 846 5030
+1 952 846 5121
GC.CSC@Emerson.com

Asia Pacific Regional Office

Emerson Automation Solutions Asia Pacific Pte LTD
1 Pandan Crescent
Singapore 128461
+65 6777 8211
+65 6777 0947
GC.CSC@Emerson.com

Middle East and Africa Regional Office

Emerson Automation Solutions
Emerson FZE P.O. Box 17033
Jebel Ali Free Zone - South 2
+971 4 8118100
+971 4 88665465
GC.CSC@Emerson.com

Analyticexpert.com

Linkedin.com/company/Emerson-Automation-Solutions

Twitter.com/Rosemount_News

Facebook.com/Rosemount

Youtube.com/user/RosemountMeasurement

Google.com/+RosemountMeasurement