

# Continuously monitor emissions in real-time and gain detailed insight into your gas measurement operations with Quantum Cascade Laser analyzers

## Background

Regulatory requirements to monitor and report emissions are a responsible practice for global industries. However, understanding evolving regulatory standards changes and options about technologies to control the emission of gaseous and particle pollutants can be a challenge. Continuous emissions monitoring systems (CEMS) help ensure compliance and, with highly accurate and reliable instrumentation, can even further improve the overall performance and insight into an operation.

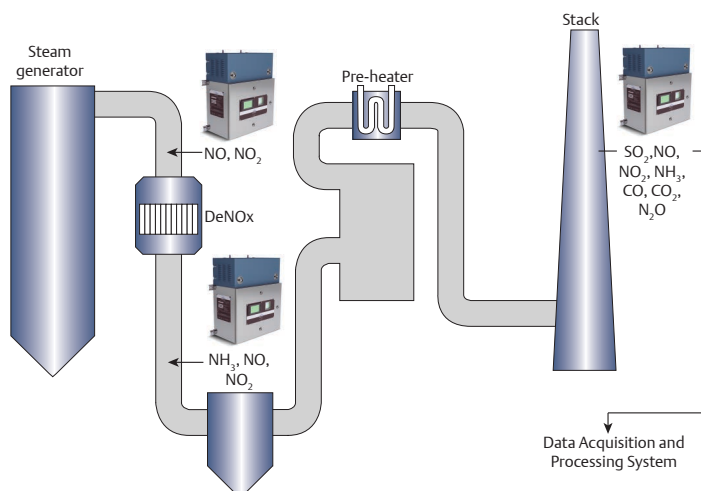
## What's your challenge?

Environmental legislation continues to evolve and set stricter limits on a range of atmospheric pollutants. Operators are challenged to ensure CEMS analyzers are reporting accurately to prevent costly fines or unexpected shutdowns.

## What's your opportunity?

Rosemount's QCL/TDL technology delivers superior emissions monitoring coverage with high reliability and low maintenance that assure greater analyzer availability.

Figure 1 – Typical CEMS Process



## QCL Benefits for Continuous Emission Monitoring Systems (CEMS)

Rosemount QCL/TDL-based CEMS offers a unique and field-proven system to monitor up to twelve critical components gases and potential pollutants to ensure compliance and improved, overall operations.

- Robust, accurate CEMS delivers the speed and reliability operators demand to ensure global, national, state, and local level compliance
- Hybrid, multi-component QCL/TDL system offers the most comprehensive analysis available for detecting a range of components in both the near and mid-infrared spectral range
- Patented laser chirp technique used to identify and record thousands of measurements every second and ensures repeatable monitoring of emissions
- Unmatched reliability and accuracy of particle measurement
- No consumables and no in-field enclosure reduces cost and simplifies installation
- Easy and infrequent maintenance with auto validation and/or calibration
- Sample temperature up to 374 °F (190 °C) to keep hot/wet sample above acid dew point when required

Table 1 – Typical Measurement Ranges

Component	Measurement Range		
	Range	LOD	Repeatability*
NO	0–10 ppm	0.1	± 1 %
NO <sub>2</sub>	0–10 ppm	0.04	± 1 %
O <sub>2</sub>	0–25 %	0.02	± 1 %
CO	0–50 ppm	0.04	± 1 %
CO <sub>2</sub>	0–12 %	0.01	± 1 %
SO <sub>2</sub>	0–200 ppm	0.2	± 1 %

\* Repeatability is ± 1 % of reading or the Limit of Detection (LOD), whichever is greater.

## Recommended Technology

### Rosemount™ CT5100 Continuous Gas Analyzer



- The first Quantum Cascade Laser specifically developed for process gas analysis and emissions monitoring
- Designed for up to six lasers
- Multi-component and simultaneous measurement
- Purged and pressurized enclosure suitable for hazardous areas

### Rosemount™ CT5400 Continuous Gas Analyzer




- QCL/TDL gas analyzer purpose built for process analytics
- 19" rack enclosure for incorporation into existing infrastructure
- Able to measure up to twelve gases with modular configuration for up to six lasers
- Embedded ARM processor
- Most powerful analyzer available

## Features & Benefits

Emerson's advanced Rosemount analyzers incorporate both Quantum Cascade Laser (QCL) and Tunable Diode Laser (TDL) technology to deliver the most sophisticated industrial gas sensing, analysis, and emission monitoring solution.

Features	Benefits
First hybrid QCL and TDL analyzer	Realize true savings from a more powerful device that gives greater process insight and analysis.
Multiple component measurement in a single device	Detect, analyze, and monitor up to twelve different gases and eliminate the need for multiple analyzers and sample handling systems.
Simple field service and upgrades	Simplify installation, commissioning, upgrades, and any required maintenance with intuitive user interface and all solid-state components.
Fully autonomous operation	Improve uptime with embedded ARM processor, rugged design for extreme environments, and 374 °F (190 °C) maximum sample cell operating temperature.
No consumables	Avoid expense and hassle of high amounts of gas consumables in daily operation.
No costly shelters or enclosures	Lower installation costs with in-the-field wall mount or rack mount configurations.
Calibrations seldom required	Reduce the need for validation/calibration frequency with Inherent calibration stability.

### EmersonProcess.com/GasAnalysis

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