

ChemDAQ's Ethylene Oxide Emissions Monitoring System complies with the EPA's Emissions Regulations for EtO, specifically 40 CFR 63.630 (subpart O). For on-going monitoring of a major source, the system:

- Measures EtO concentration at outlet to atmosphere after any control device
- Measures EtO once per hour and calculates 24-hour daily average (sample frequency is user adjustable)
- Automatically stores emissions data to meet record retention requirement of at least 5 years
- For dry bed applications, analyzing ppm data over time can help determine when beds are spent and may need replaced

SYSTEM CONFIGURATION

There are three principle parts to the base system:

1. **Emissions Monitoring Control Unit (EMCU):** Wall mounted, connected to the sampling port installed in the exhaust duct via a sample tube and then connected to the DAQ via signal cable. Includes:
 - a. Gas Flow System (comprised of mass flow controller, fault alarm, pump and control board for communication to DAQ computer)
 - b. Remote Sensor Module measures EtO gas concentration in sample draws
2. **DAQ Emissions Monitoring Computer** is the management platform, typically located in the control room. The DAQ is set up to sample EtO exhaust hourly but can be configured by the source to sample the exhaust more frequently, up to continuous. DAQ analyzes gas samples, calculates 24-hour daily average, alarms if a parameter is approaching or is exceeded and includes various display options to trend data.
3. **Sensor Calibration Exchange Program (SXP®)** provides factory calibrated sensors at pre-scheduled intervals.

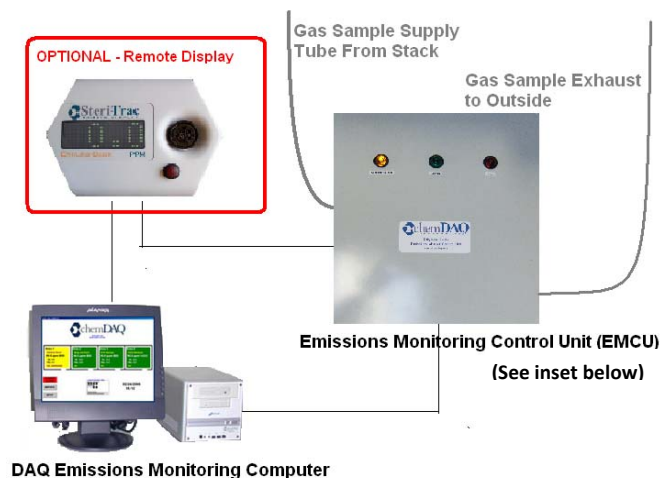
Options to the base system:

- For customers that already have ChemDAQ's EtO Gas Monitoring System for Employee Safety installed, the existing DAQ can be retrofitted to allow a 2nd screen to display Emissions Monitoring
- For customers that want to display gas readings and have alarms at a location outside of the control room, ChemDAQ's area monitor and remote display repeater are available

SYSTEM OVERVIEW

ChemDAQ's Emissions Monitoring System measures the EtO exhaust gas real-time, based on the frequency set by the user and programmed into the DAQ computer. Flow sensors will alert personnel if there is an interruption in the test gas flow or a problem in the flow circuit.

- A pump draws a sample of the exhaust gas from the sample port to the sensor. Pressure sensors will alert personnel if there's an interruption in the test gas flow or a problem in the flow circuit.
- Sensor measures EtO gas concentration and communicates to DAQ Emissions Monitoring Computer.
- Exhaust sample is exhausted through a separate tube leading from the EMCU.
- DAQ Management Station performs the required data analysis and displays:
 - Current EtO gas concentration reading in ppm
 - Previously stored 24-hour daily average in ppm
 - Current days elapsed time average in ppm
 - Color-coded alarms if a parameter is reached for any of the locally configured alarm levels
- DAQ stores and automatically backs up data for future retrieval, analysis and report generation.



EMCU Internal View

INSTALLATION REQUIREMENTS

Power:	110V – 240V, 50/60Hz required for EMCU and Computer
Sampling Point:	Sample port is installed in exhaust duct, downstream from exhaust fan, with sample tube (maximum length 35') connected to EMCU
Gas Sample Exhaust:	Tube installed from EMCU to an exhaust point, preferably outside of building
EMCU:	Wall mounted indoors as close to sampling point as practical. Assure sampling tube < 35' and is accessible by technician in order to swap EtO sensor and maintain flow control components (Approx 18" x 16" x 8" deep)
DAQ Computer:	Located in control room, away from extremes of temperature, humidity and dust. Max distance from EMCU = 4,000 feet. (Includes CPU, monitor, keyboard & printer)

TECHNICAL SPECIFICATIONS:

Sensor Principle	Electrochemical oxidation
Calibration Interval	4 months (factory calibrated)
Sensor Range	0 to 50 ppm EtO
Response time	<140s (T ₉₀)
Temperature range	-20 to + 50 °C
Humidity (at sensor/EMCU)	15 – 95% non-condensing
Communications	Digital RS485
Alarms (at DAQ Computer)	Instantaneous alarm, hourly average and 24-Hour daily average (locally configured)
DAQ Operating System	Windows XP, ChemDAQ proprietary Emissions Monitoring Software. Automatic data back-up to removable storage. Various display options with trending, data exportable to csv