



MIRA Pico EtO

Ultrasensitive Ethylene Oxide Analyzer

Monitor Ethylene Oxide levels in real-time with sub-ppb sensitivity using the World's first handheld, laser-based Ethylene Oxide gas analyzer.

Introducing the MIRA Pico ETO, the World's first portable, battery powered high accuracy nitrous oxide and carbon monoxide gas analyzer. The Pico ETO is based on Aeris' revolutionary, miniature laser-based sensor engine, which achieves sub-ppb sensitivity and accuracy in seconds. The MIRA Pico is the World's first truly portable, high accuracy gas analysis platform.

The Pico ETO provides precise and accurate concentrations via the proven method of tunable diode laser absorption spectroscopy (TDLAS). However, Aeris MIRA Series analyzers uniquely operate in the *middle infrared (MIR) region*, achieving unparalleled specificity and sensitivity in a compact, low power consumption platform. The distinct, middle infrared "fingerprint" used in the Pico ETO enables the rapid determination of sub-ppb to ppm levels in seconds. The ability to simultaneously monitor EtO in real-time with a portable analyzer enables a wide range of field applications previously impractical due to the size, weight, power, and cost constraints of other technologies.



Key Features

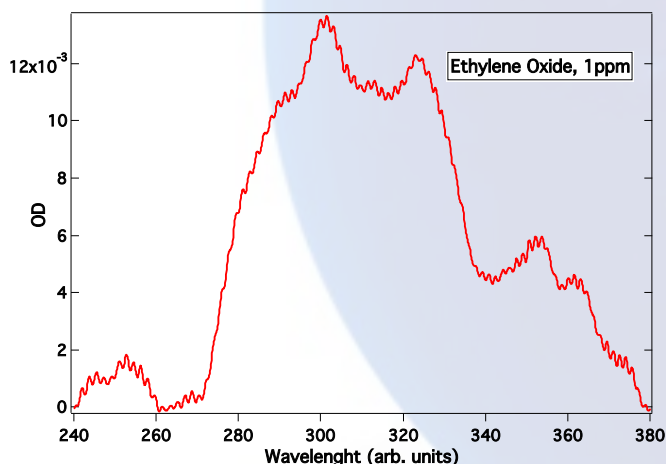
- Real-time, sub-ppb/s sensitivity
- Autonomous, built-in zero calibration
- 1 or 2Hz operation
- GPS option for creating ETO "maps"
- Built-in wifi, RS-232, and optional analog out
- Lowest, 15W power consumption
- Maintenance-free sensor core
- User-serviceable filters
- Built-in 6hr battery, built-in sampling pump
- Compact, 2.75kg Lab-In-a-Box™

Real-Time Ambient and Source EtO Monitoring

EtO is a suspect carcinogen that is widely used to make antifreeze, adhesives, detergents, polyester, fumigants and pesticides, and sterilization agents for medical equipment. The EPA has concluded that chronic EtO inhalation at even trace levels is associated with lymphoid and breast cancers, and new regulations are going into effect that drastically reduce target exposure levels. The MIRA Pico EtO provides high accuracy, ppt-level measurements in real-time, enabling new ambient and source monitoring applications. In addition to high sensitivity and accuracy, MIRA Pico systems also provide linearity over an extremely wide concentration range. The Pico EtO comes with two programmable sampling ports, enabling differential measurements including periodic zeroing of the analyzer. A catalytic filter can be used on one of the Pico ports to provide a clean "zero" gas that effectively removes instrument drift to achieve ppt-level accuracy. Pico EtO systems are uniquely configurable to span fixed, handheld, mobile, or drone applications.

About Aeris Technologies, Inc.

Aeris Technologies, Inc. provides high accuracy, ultrasensitive gas analyzers for trace gas monitoring applications. Aeris is redefining the *state-of-the-art* in laser-based gas analysis systems, reaching unparalleled size, weight, power, and cost milestones.



Spectral absorption "fingerprint" of ethylene oxide in the middle infrared region. Several features are scanned at a 1kHz repetition rate, enabling the simultaneous measurement of ethylene oxide and water vapor. Ethylene oxide data are reported as raw concentrations or as dry mole fractions by subtracting the water vapor contribution.

MIRA Pico EtO

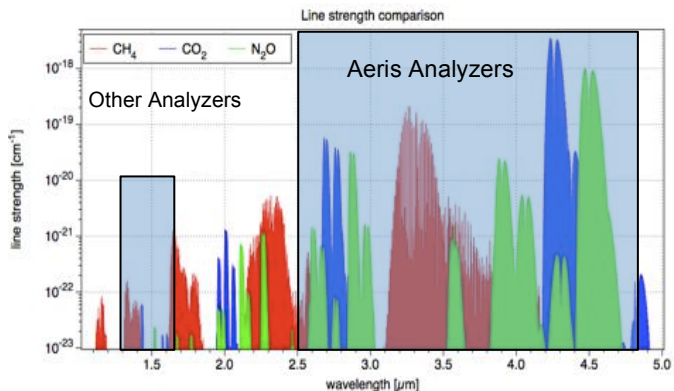
System Specifications

Metric	Specification
Measurement method	Middle-Infrared Laser Absorption Spectroscopy
Sensitivity (σ)	500ppt/s
Accuracy (w/zero)*	<1ppb/cycle (30s)
Temp/Humidity	10-40°C/10 to 95% RH (non-condensing)
Concentration Range	40 ppt to 100 ppm (est.)
Size (Nominal)	11.5"W x 8"D x 3.75"H
Weight	2.75 kg (6 lbs), with 6 hour battery and pump
Power Consumption	15W
Voltage, current	12-15V DC: 1.5A, 110-220Vac: 0.2A
Interface/Outputs	WiFi, USB, RS232, Analog out (optional)
Memory	32GB, expandable
Data Update Rate	1 or 2 Hz

* Auto-differential measurement mode using scrubber or zero gas

Core Technologies

MIRA series analyzers combine Aeris' Patented multipass absorption cell with solid-state MIR laser technology to achieve sub-ppb sensitivity and ppb level accuracy in an extremely robust and compact package. The MIRA Platform operates in the mid-IR, where absorption lines are orders of magnitude stronger than commonly used near-IR spectra.



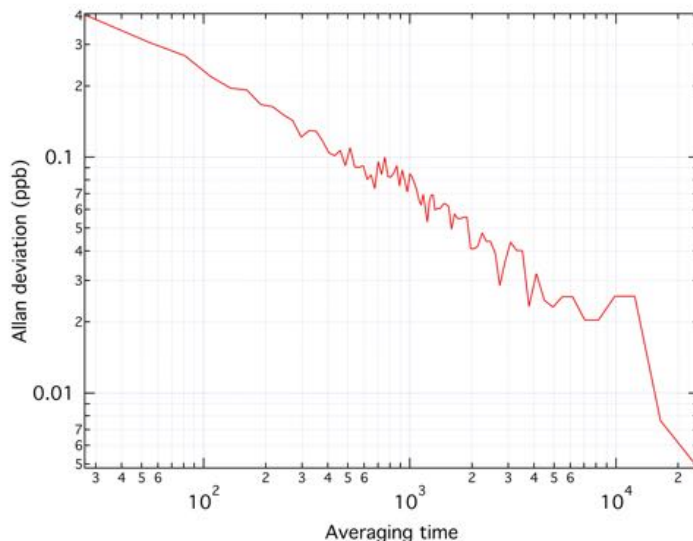
The Patented sensor engine used in all MIRA analyzers uniquely achieves a long absorption path length in an extremely small volume, providing ultra-high sensitivity and rapid response time with reduced pumping and power requirements.



MIRA laser-based sensor engine, comprising a fixed, hermetic optical bench, integrated laser and detector subassemblies, and ultra-compact, 60cc, 13m path length optical multipass cell.

Realtime Monitoring With The World's First Handheld, Ultrasensitive EtO Gas Analyzer

MIRA Pico EtO gas analyzers achieve an unmatched 1ppb/s sensitivity level, achieving ppt-levels in seconds. MIRA Pico EtO systems feature user-defined calibration intervals, which enables the highest accuracy to be achieved for specific applications. All MIRA Pico systems are GPS-ready and record location and gas concentration in a .kml file format that is suitable for viewing in Google Earth. MIRA gas analyzers also include a built-in WiFi hub that allows remote access to the analyzer via user networks laptops, etc. Systems can also be configured to support other hardware such as cellular modems and other hardware.



Extended Pico EtO concentration measurement from a compressed air tank, demonstrating long-term instrument accuracy levels. Built-in, periodic calibration is performed autonomously at user-specified intervals. Sub-ppb precision can be obtained by signal averaging and using the built-in zero feature. As an absorption-based method, Pico concentration data are highly linear over an extremely wide dynamic range.