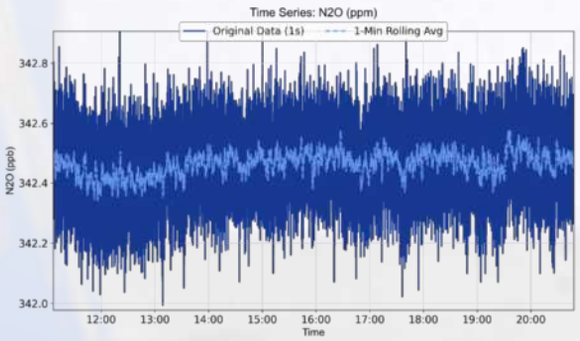
MIRA Ultra N_2O/CO_2

THE WORLD'S FIRST TRULY PORTABLE, HIGH-ACCURACY NITROUS OXIDE AND CARBON DIOXIDE GAS ANALYZER

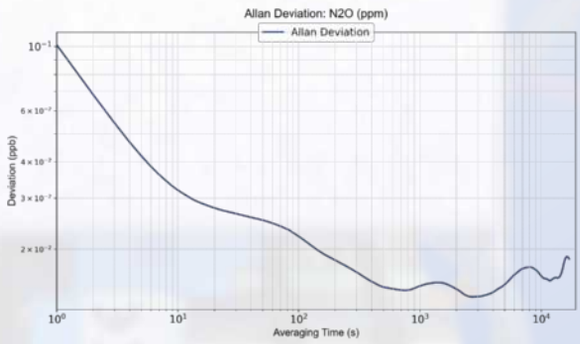
Real-Time Continuous Ambient and Source Monitoring

- *Superior sensitivity: N_2O: <95 ppt/s, CO_2: <200 ppb/s*
- *High stability and accuracy*
- *Operates up to 5 Hz*
- *GPS-enabled: generating N_2O and CO_2 spatial maps*
- *GPS-supported fixed timestamp functionality*
- *Built-in WiFi, RS232, and optional analog out*
- *Low power consumption (27 W steady-state)*
- *Maintenance-free sensor, user-serviceable filters*

The **MIRA Ultra N_2O/CO_2** analyzer offers a powerful new tool for laboratory or field studies of these two critical greenhouse gases (GHGs), delivering sensitivity and accuracy levels previously achievable with instruments significantly larger and with substantially higher power consumption. Thanks to its unparalleled low power consumption, compact size, and lightweight design, the MIRA Ultra N_2O/CO_2 system enables novel field applications that were previously impractical with competing analyzers. Additionally, MIRA Ultra systems can be solar-powered, making them ideal for monitoring remote, unattended locations. Utilizing an absorption-based method, MIRA Ultra systems provide exceptional linearity across a wide concentration range, spanning several orders of magnitude and achieving ppt accuracy levels for N_2O and ppb accuracy levels for CO_2.



A typical time series from MIRA Ultra N_2O/CO_2 analyzer showing N_2O with 1 second and 60 second averages demonstrating stability over several hours.



Allan deviation plot of N_2O using the MIRA Ultra platform showing precision of 100 ppt with 1 second averaging.

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Industry-leading
sub ppb accuracy and sensitivity

Metric	Ultra Portable Specification
Measurement Method	Mid-Infrared Direct Laser Absorption Spectroscopy
Sensitivity (1σ) at 1 Hz	N_2O: <200 ppt/s / CO_2: <440 ppb/s
Sensitivity (1σ) at 5 Hz	N_2O: <95 ppt/s / CO_2: <200 ppb/s
Max Drift (24 hrs)	N_2O: <2 ppb / CO_2: <1 ppm
Temperature / Humidity	10 - 35° C, 10 - 95% RH (non-condensing)
Measurement Range*	N_2O: 2 ppb to 500 ppm / CO_2: 10 ppm to 100,000 ppm
Flow Rate	0.17 to 0.28 L/min
Size (Nominal)	37.3 cm (14.7") W x 30.2 cm (11.9") D x 18.6 cm (7.3") H
Weight	6.4 kg (14.1 lbs.), 6.8 kg (15 lbs.) with battery
Power Consumption	27 W steady state, 50 W at startup
Voltage / Current	12-15 V DC 4.2 A, 100-240 VAC 0.5 A (50-60 Hz)
Interface / Outputs	Wi-Fi, USB-A, USB to DB9 RS232 Adapter (optional Ethernet or analog out)
Memory	32 GB (expandable)
Data Update Rate	1 Hz (selectable options up to 5 Hz)

Metric	Ultra Rackmount Specification
Size (Nominal) / Weight	48.3 cm (19") W x 17.7 cm (7") H x 27.9 cm (11") D / 8.8 Kg (19.4 lbs)
Power Consumption	26 W steady state, 50 W at startup
Voltage / Current	110-240 VAC 0.50 A (50-60 Hz)
Interface / Outputs	Wi-Fi, USB-A, DB9 RS232, Ethernet (optional analog out)

***Linear measurement range; optional ranges, etc. can be configured for specific applications**

Included Accessories:	GPS
Rugged Shipping Case	Tablet
User-Friendly Software	12 V and 110/240 V Power Plug

Optional Accessories:	Advanced GPS
Scrubber	Nafion Dryer
Stainless Steel Sampling	Anemometer

Offered in both Rackmount and Portable configurations, **MIRA Ultra** systems ensure stable, low-drift performance with a temperature- and pressure-controlled sensor core, delivering exceptional accuracy and reproducibility for simultaneous gas measurements. This stability extends calibration intervals and, in some cases, eliminates the need for calibration. The system features two programmable sampling ports for calibration, re-zeroing, or differential measurements, supporting a wide variety of applications.

Core Sensor Technology

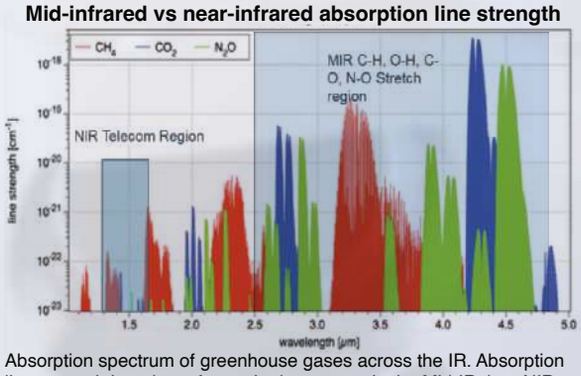
MIRA series analyzers combine Aeris' patented multipass cell technology with mid-IR solid-state lasers and custom electronics to achieve superior sensitivity and accuracy in an extremely robust and compact platform. The proprietary sensor engine used in every MIRA analyzer uniquely achieves a long absorption path length in an extremely small volume resulting in a fast response time with reduced pumping and power requirements.

MIRA's compact optical core achieves a 13 meter path length in a 60 cc volume.

The Power of Mid-infrared

Spanning wavelengths from 2.5 to 5 micrometers (μm), the Aeris mid-IR technology achieves the same or superior short-term sensitivity as fragile NIR cavity-based techniques. The robust design of the mid-IR core is well suited for a wide range of applications including airborne analysis and environmental monitoring.

Mid-infrared vs near-infrared absorption line strength



Absorption spectrum of greenhouse gases across the IR. Absorption line strength is orders of magnitude stronger in the Mid-IR than NIR.

Aeris Technologies, Inc. provides 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.

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