MIRA Strato N_2O/CO_2

HIGH SENSITIVE GAS ANALYZER FOR UAV/DRONE-BASED ENVIRONMENTAL MONITORING

UAV/DRONE

The **MIRA Strato N_2O/CO_2**, developed by Aeris Technologies, Inc., is a compact, lightweight greenhouse gas analyzer that operates in the mid-infrared (mid-IR) range, delivering unmatched sensitivity for nitrous oxide (N_2O) and carbon dioxide (CO_2) at ultra-low levels—<95 ppt/s for N_2O and <200 ppb/s for CO_2. This portable system pairs an innovative real-time laser absorption spectrometer with GPS, offering exceptional precision and unlocking a diverse array of field applications previously limited by traditional constraints in size, weight, power, and cost. The Strato features two interchangeable 90-minute battery packs and can operate on external DC power, such as from a drone, using a DC/DC converter. The Strato enhances versatility and represents a groundbreaking advancement in high-sensitivity, laser-based gas analysis. MIRA Strato is the world's most lightweight analyzer for greenhouse gas detection.

The compact, lightweight MIRA Strato seamlessly integrates with many commercially available drones (e.g., DJI Matrice 600) and can be mounted in any orientation. Data communication is typically handled via the RS232 port, streaming at rates up to 5 Hz. Designed to withstand vibrations, the Strato has demonstrated exceptional robustness across numerous drone-based studies.

- *Superior sensitivity: N_2O: <95 ppt/s, CO_2: <200 ppb/s*
- *GPS-enabled for generating spatial maps*
- *Built-in Wi-Fi, RS232, and optional analog output*
- *Low 19 W (steady state) power consumption*
- *Maintenance-free sensor design*
- *User-serviceable filters*
- *Portable, 2.01 Kg handheld operation*
- *6-hour battery life*
- *1 Hz standard, up to 5 Hz capability*

Many commercially available drones can support up to two Aeris Strato units, enabling simultaneous monitoring of multiple gases, such as N_2O and CO_2, as well as CH_4 and C_2H_6, in a single flight.

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Industry-leading
sub ppb accuracy and sensitivity

Metric	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
Temperature / Humidity	10 - 40° C, 10 - 90% RH (non-condensing)
Measurement Range*	N_2O: 2 ppb - 500 ppm / CO_2: 10 ppm - 100,000 ppm
Flow Rate	0.2 to 0.3 L/min
Size	21.0 cm W (8.25") x 21.0 cm D (8.25") x 8.9 cm H (3.50")
Weight	2.01 Kg (4.42 lbs.)
Power Consumption	19 W steady state, 23 W at startup
Voltage / Current	12-15 VDC 2 A, 100-240 VAC 0.23 A (50-60 Hz)
Interface / Outputs	Wi-Fi, USB-A, DB9 RS232 (optional Ethernet, analog out)
Memory	32 GB (expandable)
Data Update Rate	1 Hz (selectable options up to 5 Hz)

***Linear measurement range. Operational range configurable for specific applications.**

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

Optional:	High Flow
Scrubber	Nafion Dryer
Advanced GPS Upgrade	Anemometer

MIRA Strato is a lightweight, high-sensitivity sensor crafted for the most demanding UAV and drone applications. Weighing just 4.42 lb (2.01 kg), it features built-in GPS and swappable battery packs, providing a compact and powerful solution without sacrificing performance. The Strato's ability to log data from third-party GPS devices and lightweight anemometers makes this analyzer an ideal tool for greenhouse gas monitoring in hard-to-reach areas.

Core Sensor Technology

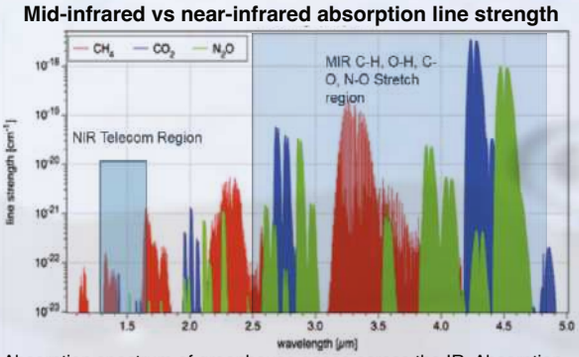
MIRA series analyzers combine Aeris' patented multipass cell technology with mid-IR solid-state lasers and custom electronics to achieve superior sensitivity and accuracy in an extremely robust and compact platform. The proprietary sensor engine used in every MIRA analyzer uniquely achieves a long absorption 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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