Next Generation Gas Analyzers
Introducing the new MIRA Ultra Series high accuracy middle infrared laser-based gas analyzer platform from Aeris Technologies, Inc. MIRA gas analyzers employ simple and robust laser absorption spectroscopy to monitor a wide range of species with ppb sensitivity and accuracy via their middle infrared fingerprints. MIRA Ultra Series analyzers provide performance levels previously only achieved in much larger, more expensive analyzers, enabling new applications and broader markets.

Species Accessible with the MIRA Platform Include:
- Greenhouse gases: CO₂ and its isotopes (¹³C and ¹⁸O), CH₄, N₂O, H₂O
- Natural Gas: CH₄, C₂H₆
- Pollutants: CO, H₂CO

Core Technologies
MIRA series analyzers combine Aeris’ Patent Pending multipass cell technology with state-of-the-art electronics and laser sources sources to achieve high specificity, sensitivity and accuracy in an compact, low power consumption package. MIRA's single board computer efficiently controls all critical analyzer functions, with industry-lowest power consumption.

The proprietary sensor engine used in every MIRA analyzer uniquely achieves a long absorption path length in an extremely small volume, providing ultra-high sensitivity and a fast response time with reduced pumping requirements.

Capabilities
MIRA Ultra Series rack-mount analyzers utilize a compact, temperature and pressure stabilized sensor core to achieve high sensitivity and low drift, significantly reducing or eliminating calibration requirements in many cases.

Key Features include:
- ppb/s sensitivity and ppb accuracy
- Few ppb long-term drift over temperature range
- kHz intrinsic operation, 1Hz data updates
- 60cc cell volume, rapid flushing with small pump
- 7” Touchscreen interface, WiFi, Ethernet, USB
- 20-25W power consumption (typical conditions)
- Robust optical platform, 100x times less susceptible to optical contamination compared to “cavity-based” gas analyzers

Applications
MIRA Ultra Series analyzers offer high accuracy, real-time monitoring solutions for applications including:
- natural gas leak detection
- greenhouse gas and pollution monitoring
- process control
- continuous emissions monitoring
- analytical chemistry/isotopic analysis

MIRA Ultra Series rackmount systems come in a compact 3U, 1ft deep form factor, the smallest in the industry. MIRA Ultra Series gas analyzers redefine the state-of-the-art in laser-based gas analysis systems.

About Aeris Technologies, Inc.
Aeris Technologies, Inc. is a Silicon Valley startup that provides new, breakthrough gas analysis systems. The Aeris team includes seasoned experts in laser spectroscopy and laser-based gas analysis. Aeris is redefining the state-of-the-art in laser-based gas analysis solutions.
**MIRA Ultra-Series™ Gas Analyzers**

**Typical Specifications**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Concentration Range (typical, CH₄)</td>
<td>0.02 ppm to 10,000 ppm</td>
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<tr>
<td>Sensitivity (typical, CH₄)</td>
<td>&lt;1ppb/Hz¹/₂</td>
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<tr>
<td>Accuracy, drift (typical, CH₄)</td>
<td>2ppb p-p over temp range, or 0.1% of reading</td>
</tr>
<tr>
<td>Operating Environment</td>
<td>15-35°C, 10-95% RH, noncondensing</td>
</tr>
<tr>
<td>Data Acquisition Rate, Output Rate</td>
<td>1kHz, up to 2Hz</td>
</tr>
<tr>
<td>Size (Nominal)</td>
<td>3U Rackmount (19”Wx12”Dx5-1/4”H)</td>
</tr>
<tr>
<td>Weight</td>
<td>5 kg</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>25W</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>100-240VAC, 1A</td>
</tr>
<tr>
<td>Interface/Outputs</td>
<td>7” LCD Touchscreen, USB, Ethernet, Analog, RS232</td>
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<tr>
<td>Data Storage</td>
<td>32GB minimum</td>
</tr>
<tr>
<td>Temporal Response</td>
<td>1s, 3s 90% recovery with built-in pump</td>
</tr>
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**MIRA Ultra Series** gas analyzers are based on mid-infrared laser absorption spectroscopy, providing high sensitivity and specificity. Compared to near-infrared absorption-based analyzers currently on the market, MIRA mid-infrared analyzers enable the same absorption to be obtained in a much shorter path length. This eliminates the need for fragile, high reflectivity optics in the sensor core, making MIRA analyzers 100x less susceptible to optical contamination than analyzers based on “cavity-enhanced” approaches.

![Typical C₂H₆/CH₄ absorption spectrum obtained with the MIRA Ultra Series Analyzer. Spectra are obtained at a repetition rate of 1kHz, providing real-time concentration as well as dry mole fraction data in cases where water vapor is measured simultaneously.](image1.jpg)

![Typical precision and long-term drift shown over several thermal cycles over a 1-hour running average. Low drift is achieved by thermally stabilizing the optical core.](image2.jpg)