



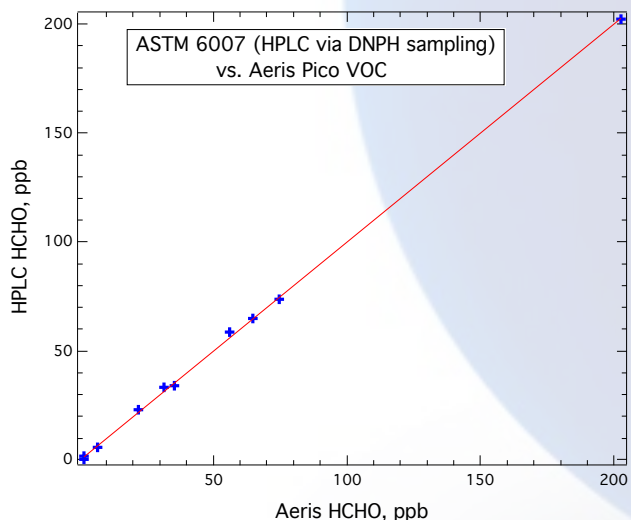
# MIRA Ultra VOC

## High Accuracy Formaldehyde Analyzer

**Monitor Formaldehyde levels in real-time with high sensitivity and accuracy using the MIRA Ultra VOC gas analyzer.**

Introducing the MIRA Ultra VOC, the World's first portable high accuracy formaldehyde gas analyzer. The Ultra VOC is based on Aeris' revolutionary, miniature laser-based sensor engine, which achieves sub-ppb sensitivity and accuracy in seconds. The Ultra Series analyzer provides extended, low drift performance via its precision temperature stabilized optical core. Portable Ultra systems can be uniquely employed for a wide range of fixed, handheld, and mobile applications. The low power consumption of Ultra systems makes them ideal for solar powered applications.

Aeris MIRA Series analyzers operate in the *middle infrared (MIR) region*, achieving unparalleled specificity and sensitivity in a compact, low power consumption platform. The ability to monitor HCHO in real-time with a portable analyzer enables a wide range of lab as well as field applications that were previously impractical due to traditional size, weight, power, and cost constraints. Ultra Series analyzers offer performance levels traditionally associated with much larger, more expensive gas analyzers, representing a paradigm shift in high accuracy laser-based gas analysis systems.



Formaldehyde emission data comparison for several engineered wood product samples measured using ASTM 6007 (with DNPH/HPLC) vs. Aeris MIRA real-time technology.



### Key Features

- Temperature and pressure stabilized core
- Autonomous, built-in calibration or zero cycle
- 1 or 2Hz operation
- GPS ready for creating HCHO "maps"
- Built-in wifi, RS-232, and optional analog out
- Lowest, 20W (average) power consumption
- Maintenance-free sensor, User-serviceable filters
- 2-port, differential sampling, Built-in pump

### Real-Time Ambient and Source Monitoring

The MIRA Ultra VOC is suitable for long-term ambient monitoring applications as well as emissions quantifications studies. Common sources of formaldehyde include including engineered wood products, glues and paints, and industrial facilities such as die-cast or plastics manufacturing plants. Comparisons with ASTM methods quantify system accuracy and linearity from ppb to ppm levels, determining absolute HCHO levels in minutes instead of hours, while eliminating wet chemistry steps and consumables (column) associated with other methods.

As an absorption-based method, MIRA Ultra systems achieve high sensitivity and linearity over an extremely wide concentration range. Ultra VOC systems come equipped with two programmable sample ports and associated software that enables autonomous calibration (or rezeroing) as well as differential measurements. As the optical core in the Ultra VOC is heated to 40°C, it is ideal for use in humid environments where the potential for condensation in the analyzer is of concern.

### About Aeris Technologies, Inc.

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



# MIRA Ultra VOC Formaldehyde Analyzer

## System Specifications

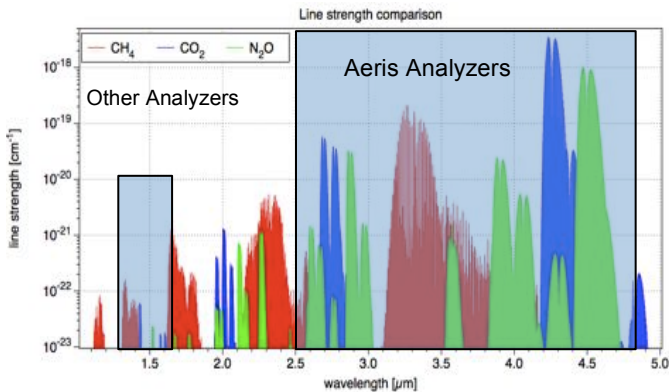
Metric	Specification
Measurement method	Middle-Infrared Laser Absorption Spectroscopy
Sensitivity ( $\sigma$ )	1ppb/s
Drift*, **	1-2ppb
Temp/Humidity	10-35°C/10 to 95% RH (non-condensing)
Concentration Range	<1ppb to 500 ppm**
Size (Nominal)	14.5"W x 12"D x 7"H
Weight	6 kg (13.2 lbs)
Power Consumption	20W after warmup, 45W at startup
Voltage, current	110-220VAC: 1A, 12-15V DC: 4A
Interface/Outputs	WiFi, USB, RS232, analog out (optional)
Memory	32GB, expandable
Data Update Rate	1 or 2 Hz

\* 24 hours isothermal after 1 hour warmup, or over specified temperature range with 45 minute soaking time

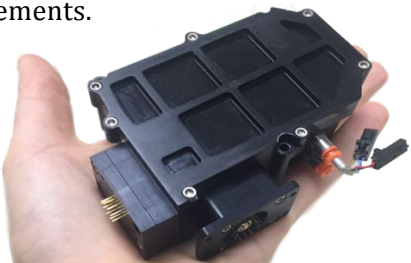
\*\*1ppb with built-in autozero, interval depends on environment

### Core Technologies

MIRA series analyzers combine Aeris' Patented multipass absorption cell with solid-state MIR laser technology and custom electronics 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 HCHO absorption lines are thousands of times stronger than commonly used near-IR spectra.



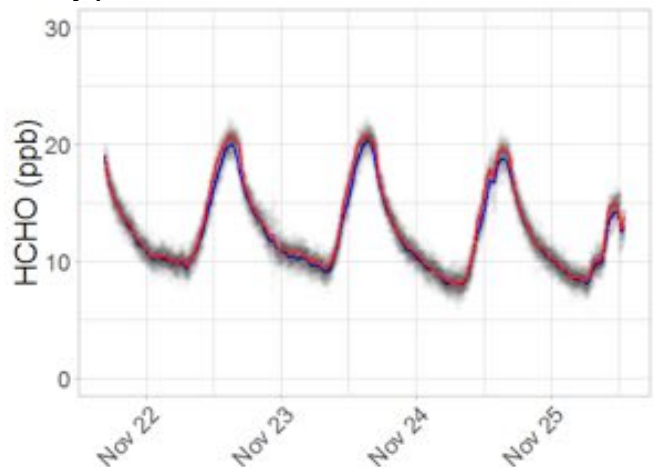
The Patented sensor engine used in all MIRA analyzers uniquely achieves a long absorption path length in an extremely small volume, providing ultra-high sensitivity and rapid response time with reduced pumping and power requirements.



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.

### Low-Drift Operation with Differential Mode for Built-In Zero or Calibration

MIRA Ultra HCHO gas analyzers achieve a 1ppb/s sensitivity and accuracy level, while even lower, ppt-accuracy levels can be achieved with signal averaging. Ultra systems achieve stable, low drift operation via the temperature stabilized sensor core, greatly extending the time between or altogether eliminating calibration cycles. Ultra systems come with two programmable sampling ports that can be used for either periodic rezeroing (or calibration), or for differential measurements. For zeroing, a compact, long-life, catalytic scrubber can be installed in the analyzer as the zero gas, effectively removing slow instrument drift to achieve 1ppb or better accuracy. Featuring a much faster warmup period than the Pico systems, Ultra systems can also be taken into the field to perform high accuracy measurements, using either wallplug or battery power.



Time series of ambient air for two co-located Ultra VOC gas analyzers, monitoring 10-20 ppb levels in a remote shed. Both analyzers are within 1ppb of each other over days of operation.