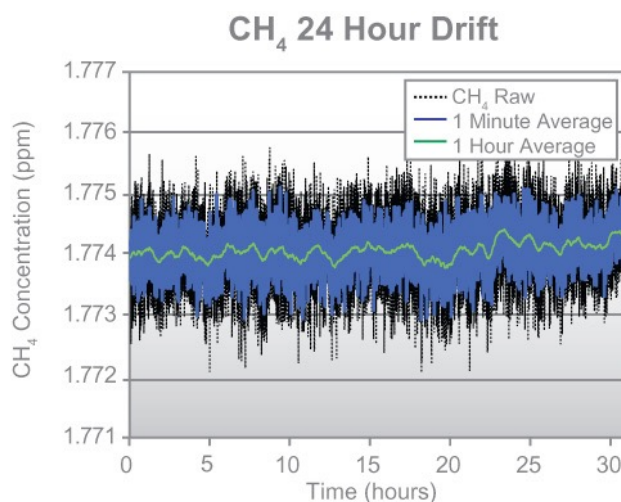
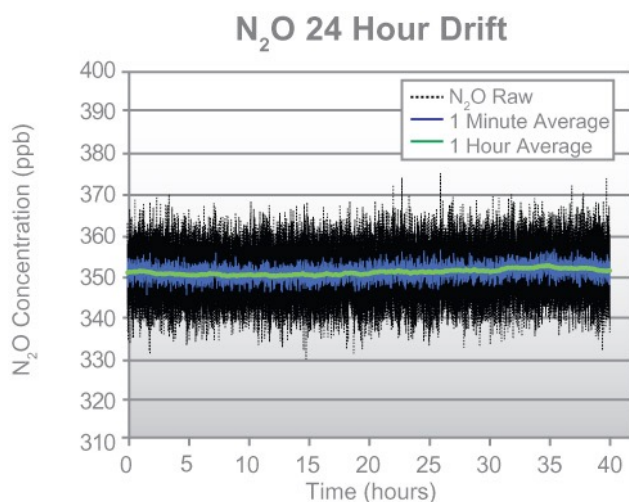


# PICARRO G2308 CRDS Analyzer $\text{N}_2\text{O}$ + $\text{CH}_4$ + $\text{H}_2\text{O}$ in Air

Continuous, lab-quality measurements of  $\text{N}_2\text{O}$  and  $\text{CH}_4$  in the field using a single, low-drift instrument



- PPB precision of  $\text{N}_2\text{O}$  and  $\text{CH}_4$  at ambient concentrations and beyond
- Integrates easily with chamber systems
- Operates with closed or open loop systems
- Automatically calculates and reports dry mol fraction
- Detects and flags data with potential interferences



**Advantage Note:** Picarro's Cavity Ring-Down Spectroscopy (CRDS) technology is capable of measuring  $\text{N}_2\text{O}$ ,  $\text{CH}_4$  and water vapor down to parts-per-billion (ppb) sensitivity with negligible drift, for continuous high quality data collection even with challenging and dynamic conditions in the field. The G2308 features Picarro's unique software algorithms for automatic water correction and data flagging for detected spectral interference. From remote soil flux measurements on the Tibetan plateau to in-situ measurements on ships of opportunity, researchers the world over have field-proven Picarro analyzers.

**Portable & Ruggedly Build for Field Deployment:** The Picarro's small size makes it easy to transport in any vehicle to the field or lab, where it can be running within minutes out of the box, and can operate for months without user interaction. In order to ensure measurement fidelity over long periods of time, even in the harshest environments, Picarro's optical cavities incorporate amazingly precise temperature and pressure control along with careful material selection and meticulous mechanical design. Scientists using these systems have reported the highest quality data, day in and day out, with fewer calibrations than other spectral absorption-based instruments.

**Picarro's Patented CRDS Technology:** The heart of the Picarro analyzer is a sophisticated time-based measurement that uses a Telecom, Near-Infrared (NIR) laser to quantify spectral features of gas phase molecules in an optical cavity. Picarro's patented CRDS technology enables an effective measurement path length of up to 20 kilometers in a compact cavity, which results in exceptional precision and sensitivity with a small footprint. Because lasers drift in all instruments, Picarro uses a patented, high-precision wavelength monitor to maintain absolute spectral position and the most accurate peak quantification of any instrument.

**Easy Data Management & Instrument Control:** The analyzer can be configured to automatically deliver data in the format best suited to the application. Digital (RS-232) or analog data can be transmitted via Ethernet at user defined intervals or output in real-time. Using a standard Remote Desktop connection, users can remotely check and control the analyzer's internal, Windows-based PC.

*G2308 Analyzer uses patented cavity ringdown spectroscopy (CRDS) technology with measurement cell conditions maintained within +/- 0.005 °C , +/- 0.0002 atm for highest precision and lowest drift performance*

Performance Specifications in Air	N <sub>2</sub> O	CH <sub>4</sub>
Precision Raw (1σ)	< 25 ppb + 0.05 % of reading	< 10 ppb + 0.05 % of reading
Precision 5 min (1σ)	< 3.5 ppb + 0.008 % of reading	< 3 ppb + 0.02 % of reading
Guaranteed Spec Range	0.3-200 ppm	1-15 ppm
Operating Range	0-400 ppm	0-20 ppm
Measurement rate	< 6 seconds	< 10 seconds
Gas Response (Rise-Fall 10-90%, 90-10%)	< 10 seconds	< 10 seconds
Report dry mol fraction	Yes	Yes

Other measured species	Data Rate	Precision Raw (1σ)
CO <sub>2</sub>	~ 5 seconds	20 ppm
H <sub>2</sub> O	~ 5 seconds	200 ppm

System Operation Parameters	Specifications
Ambient Temperature	10-35°C
Ambient Humidity	< 99% RH, non-condensing
Sample Pressure	300 to 1,000 Torr (40 to 133 kPa)
Sample Flow Rate	~ 230 sccm (ml/min)
Sample Humidity	< 99% RH, non-condensing, Water correction tested to 25 °C dew point
Sample temperature	-10-45°C
Closed-loop / Recirculation Capability	< 0.05 sccm gas leak / 12 hours (tested with 1-liter chamber)
Inlet Fittings	1/4" Swagelok®
Dimensions	Analyzer: 17" w x 7" h x 17.55" d (43.18 x 17.78 x 44.57 cm) not incl. 0.5" feet External Pump: 5.6" w x 6.4" h x 11.9" d (14.3 x 16.3 x 30.3 cm)
Weight	64.4 lbs (29.2 kg), includes external pump
Power	100 - 240 VAC, 47 - 63 Hz (auto-sensing), < 260 W start-up (total); 110 W (analyzer) + 80 W (pump) at steady state
Installation	Benchtop (standard) or 19" rack mount chassis (optional)
Accessories	Included: Vacuum pump, keyboard, mouse. Optional: LCD monitor, 16-port valve manifold

**Analyzer specificity:** Picarro's CRDS technology utilizes extremely narrow spectral regions, which greatly reduces the likelihood of interference from other gas species when compared to other spectral measurement techniques. However, in real-world samples, interferences can happen. Picarro has included interference detection software and has tested and characterized the effects of the following species for this analyzer:

Trace Gases	N <sub>2</sub> O Sensitivity
Carbon Dioxide	None - Automated correction good to 20,000 ppm CO <sub>2</sub>
Methane	None - Automated correction good to 200 ppm CH <sub>4</sub>
Ammonia	None - Automated correction good to 2 ppm NH <sub>3</sub>
Ethane	0.2 ppb N <sub>2</sub> O / ppm C <sub>2</sub> H <sub>6</sub> tested up to 120 ppm
Ethylene	0.5 ppb N <sub>2</sub> O / ppm C <sub>2</sub> H <sub>4</sub> tested up to 16 ppm
Acetylene	Not for use with acetylene experiments
Background Gas	Designed for use in ambient air, not for use with highly varying or enriched N <sub>2</sub> , O <sub>2</sub> , H <sub>2</sub> , or He
ChemDetect™ Software	Unique Picarro algorithms detect and flag data which may be inaccurate due to spectroscopic interference