



Picarro G1101-i Isotopic Carbon Dioxide Analyzer

The Picarro G1101-i Isotopic CO₂ Analyzer is a real time, trace gas monitor capable of measuring isotopic ratios of carbon in CO₂ and total CO₂ concentration with parts-per-billion (ppbv) sensitivity. The analyzer is based on Picarro's unique Wavelength-Scanned Cavity Ring Down Spectroscopy (WS-CRDS), a time-based measurement utilizing a near-infrared laser to measure a spectral signature of the molecule. Gas is circulated in an optical measurement cavity with an effective path length of up to 20 kilometers. A patented, high-precision wavelength monitor makes certain that only the spectral feature of interest is being monitored, greatly reducing the analyzer's sensitivity to interfering gas species, and enabling ultra-trace gas concentration and isotope measurements even if there are other gases present. As a result, the analyzer maintains high linearity, precision, and accuracy over changing environmental conditions with minimal calibration required. Precise temperature and pressure control systems designed into the Picarro G1101-i ensure accurate measurements over long periods of time with minimal use of calibration gases. The analyzer is exceptionally rugged, essentially drift and maintenance free, and requires no consumables, thereby offering significant ease of use and cost of ownership benefits.

Easily transportable from site to site, the analyzer can be set up and running within minutes, and require absolutely no sample preparation or drying. The gas concentration is displayed in real-time with no post-processing required, and is continuously archived to the analyzer's internal hard drive. Designed to operate both in laboratories and in harsh environments, it can operate for many months without user interaction. The analyzer can be configured to automatically send out measurement data at regular intervals via the Ethernet or optional modem and can output real-time data in digital format (via RS-232 interface) and via optional analog outputs. Users can connect remotely with the analyzer's internal Windows-based PC and control it through a standard Remote Desktop connection or with similar remote login software. The analyzer can also use the internet connection to automatically synchronize with an atomic clock time service. The software includes a valve sequencer, automatically controlling up to six external solenoid valves and a rotary valve.

Picarro G1101-i Features

- Superb sensitivity, precision & accuracy with virtually no drift
- Fast, continuous, real time measurements without interference
- Large dynamic range with high linearity
- Field and laboratory deployable with no consumables
- Installed and operational in minutes
- Rugged and insensitive to changes in ambient temperature

Performance Specifications

Target Gas (In air)	Precision (5 min., 1 σ)
CO ₂ Isotopic Ratio ($\delta^{13}C$)	<0.3‰
CO ₂ Concentration (¹² C and ¹³ C)	<200 ppbv (¹² C), <10 ppbv (¹³ C)

System Specifications

Measurement Technique	WS-CRDS
Range	CO ₂ : 0-3500 ppmv (Precision guaranteed for: CO ₂ : 300-500ppmv)
Measurement Interval	~10 seconds
Sample Temperature	-10 to 45 °C.
Sample Flow Rate	< 0.1 slm at 760 Torr, no filtration required
Sample Pressure	300 to 1000 Torr (40 to 133 kPa)
Sample Humidity	<99% R.H. non-condensing @40°C, no drying required
Temperature	10 to 35 °C (operating) -10 to 50 °C (storage)
Humidity (ambient)	<99% R.H. non-condensing
Other Gases Measured	H ₂ O
Accessories	Pump (internal), keyboard, mouse, LCD monitor (optional)
Outputs	RS-232, Ethernet, USB, analog (optional) 4-20mA / -10 – 10V
Fittings	¼" Swagelok ®
Dimensions	17" x 9.75" x 23" (43 x 25 x 59 cm) including feet
Installation	Benchtop or 19" rack mount chassis
Weight	58 lbs (26.3kg)
Power Requirements	90-120VAC, 50/60 Hz, 220 VAC, 50Hz, < 300W

2008 R&D 100 Award
Winner

