

$\delta^{13}\text{CH}_4$ and C_2H_6 -to- CH_4 Gas Analyzer

PICARRO



- Simultaneously measures $\delta^{13}\text{CH}_4$ and C_2H_6 -to- CH_4 ratio
- Measures CO_2 and H_2O vapor, and reports dry mole fractions
- Field-deployable for real-time CH_4 emissions source attribution
- Small cavity (35 mL) for fast sample turnover time
- High precision and low drift with outstanding temperature and pressure (T&P) stability

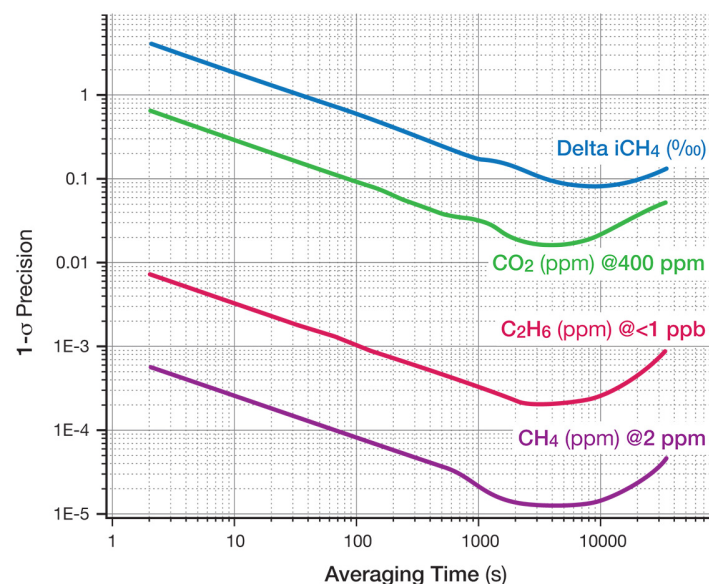
The **Picarro G2210-i Analyzer** is designed to address the scientific community's need for real-time methane emissions source attribution. High-precision atmospheric methane and ethane measurement capabilities, combined with carbon dioxide and water vapor measurements, provide the user with a unique tool to measure and determine the source of methane emissions—including landfills, fracking sites and abandoned oil and gas wells.

Methane (CH_4) is responsible for about 20% of global warming, and about 60% of methane emissions originate from anthropogenic activities. Long-term trend analysis reveals a consistent renewed increase in methane since 2007. The Picarro analyzer is ideal for discerning and measuring the source of methane emissions real-time in the field or through grab-sample measurements in the lab.

The analyzer measures $\delta^{13}\text{CH}_4$ at 0.5 – 1.0 ‰ precision, and it measures concentrations of CH_4 to less than 0.1 parts-per-billion (ppb) and C_2H_6 to less than 1 ppb (all precision measurements at a 5-minute average). It also measures CO_2 and H_2O in dry mole fractions. And it performs all measurements with negligible drift for continuous high-quality data collection. Patented Picarro cavity ring-down

spectroscopy (CRDS) technology enables an effective measurement path length of up to 30 kilometers in a compact cavity, which results in exceptional precision and sensitivity with a small-footprint analyzer. A meticulously designed small optical cavity incorporates precise temperature and pressure control. As a result, the analyzer delivers a best-in-class combination of precision, accuracy, low drift and ease-of-use.

Allan Deviation Plot



G2210-i Performance Specifications

Specifications	C ₂ H ₆	CH ₄	CO ₂	δ ¹³ CH ₄
Precision (1σ, 5-minute average)	<1 ppb	<0.1 ppb	<200 ppb	0.5 – 1.0‰
Dynamic Range	0 – 100 ppm	1.5 – 30 ppm	300 – 2000 ppm	2 – 30 ppm

G2210-i System Operating Specifications

Mode Switching	Mode 1: Single range (2 – 30 ppm [CH ₄] + δ ¹³ CH ₄) with [C ₂ H ₆] measurements.	Mode 2: [CH ₄] + [C ₂ H ₆] with faster scan rate and no δ ¹³ C measurement.
Measurement Frequency	Mode 1: ~0.8 – 1 Hz	Mode 2: ~1.5 Hz
Gas matrix	~20% O ₂ in air (approximately ambient concentrations)	
Interferences	This instrument is designed to measure the specified gases in an ambient air or air-like matrix. There may be interference from elevated levels of other gases, such as H ₂ S, other VOCs. Please contact us for more information.	
Sample Flow Rate	~40 sccm	
Stability	The Picarro advantage for isotopic measurements is long-term stability with infrequent calibration. Ideally, this analyzer could be used in the field for months at a time with limited calibration requirements.	
Measurement Technique	Cavity Ring-Down Spectroscopy (CRDS)	
Measurement Cell Temperature Control	±0.005°C	
Measurement Cell Pressure Control	±0.0002 atm	
Sample Temperature	-10 to 45°C	
Sample Pressure	300 to 1000 Torr (40 to 133 kPa)	
Sample Humidity	<99% RH non-condensing @40°C, no drying required	
Ambient Temperature Range	15 to 35°C (operating), -10 to 50°C (storage)	
Ambient Humidity	<85% R.H. non-condensing	
Operating System Info	Windows 10 OS	
Accessories	Pump (external), keyboard, mouse, LCD monitor (optional)	
Outputs	RS-232, Ethernet, USB	
Fittings	¼" Swagelok®	
Dimensions (single box system)	17" w x 18" d x 7" h (43 x 46 x 18 cm)	
Weight	47.0 lbs (21.3 kg) for analyzer and 14.3 lbs (6.5 kg) for external pump	
Power Requirements	100 –240 VAC; 47– 63 Hz (auto-sensing); < 375 W at start-up (total). Steady-state operation: 120 W (analyzer), 150 W (pump).	

Compatible Peripherals: Small Sample Introduction Module (SSIM A0314), 16-port Distribution Manifold (A0311) and Closed System Measurement Package (A0701/A0702)

Check with Picarro for DC power source setup in case of field deployment.