

LI-COR Trace Gas Analyzers

Performance Data and Specifications

LI-COR laser-based Trace Gas Analyzers include patented gas analysis technology that delivers laboratory-level performance wherever your research requires it.

Utilizing Optical Feedback-Cavity Enhanced Absorption Spectroscopy (OF-CEAS) and our patented technologies, the Trace Gas Analyzers provide highly precise and stable measurements within a robust and rugged design that does not limit you to a lab.

But don't just take our word for it. The data speaks for itself.



When Methane Matters the Most: The LI-7810 CH₄/CO₂/H₂O Gas Analyzer

When methane matters the most, the LI-7810 provides CH₄ measurements with high precision and stability. It also measures water vapor to provide fully corrected dry mole fraction of methane in moist air.

LI-7810 Long-Term Outdoor CH₄ Stability

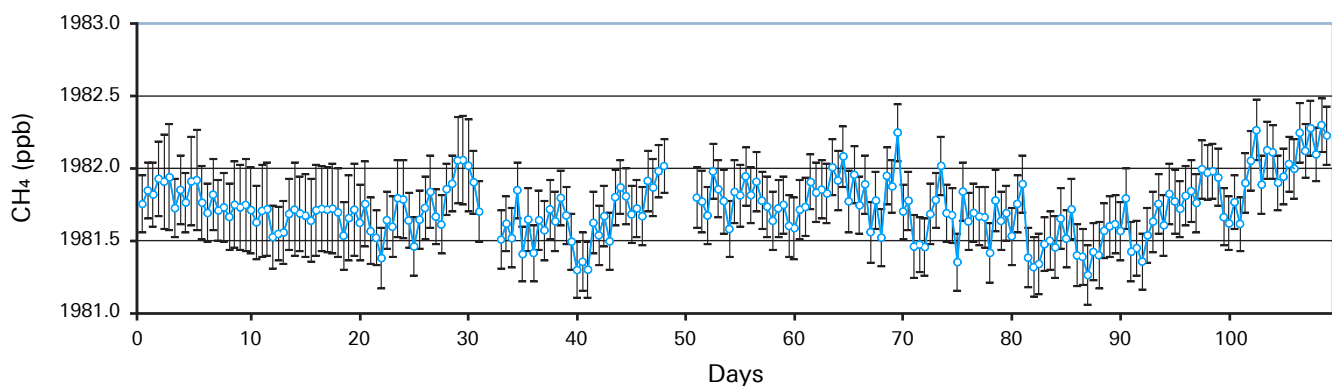


Figure 1. A long-term methane measurement stability dataset from an LI-7810 CH₄/CO₂/H₂O analyzer deployed in an enclosed shelter at an outdoor monitoring site in Lincoln, Nebraska. The instrument was operated continuously over the entire time period. The analyzer measured ambient air between stability checks. During stability checks, the analyzer was flushed for 10 minutes with tank gas (2 ppm CH₄, 400 ppm CO₂ mixed in air balance, 1% nominal concentration accuracy) and a time series data set was subsequently recorded for 10 minutes every 12 hours except for two periods shown where the test failed to execute. The points show the mean value and error bars represent the 1 σ (standard deviation) of the 10-minute measurements.

LI-7810 Long-Term Indoor CH₄ Stability

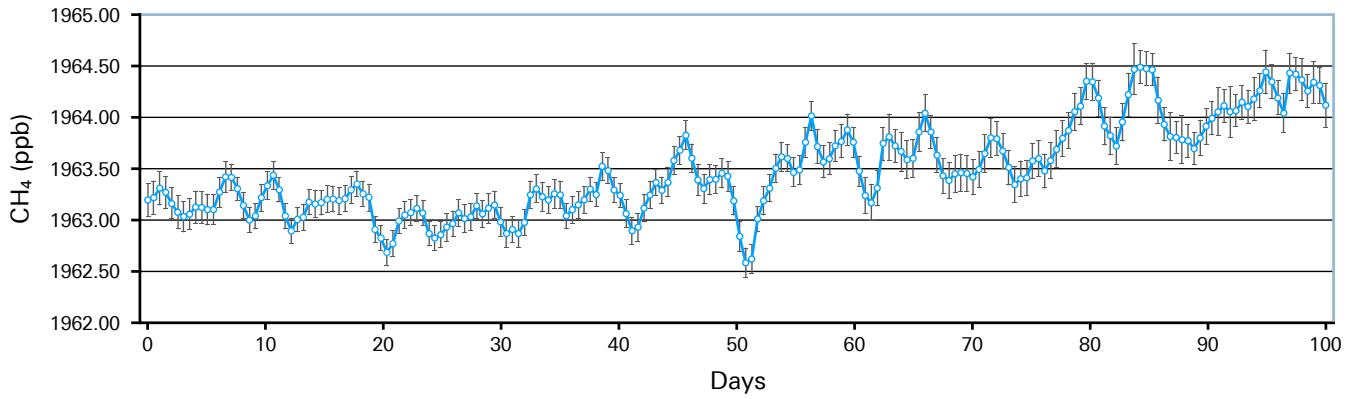


Figure 2. A long-term methane measurement stability dataset from an LI-7810 CH₄/CO₂/H₂O analyzer deployed in a laboratory in Lincoln, Nebraska. The analyzer measured ambient air between stability checks. During stability checks, the analyzer was flushed for 10 minutes with tank gas (2 ppm CH₄, 400 ppm CO₂ mixed in air balance, 1% nominal concentration accuracy) and a time series data set was subsequently recorded for 10 minutes every 12 hours. The points show the mean value and error bars represent the 1 σ (standard deviation) of the 10-minute measurements.

LI-7810 7-Day CH₄ Precision with Allan Deviation Plot

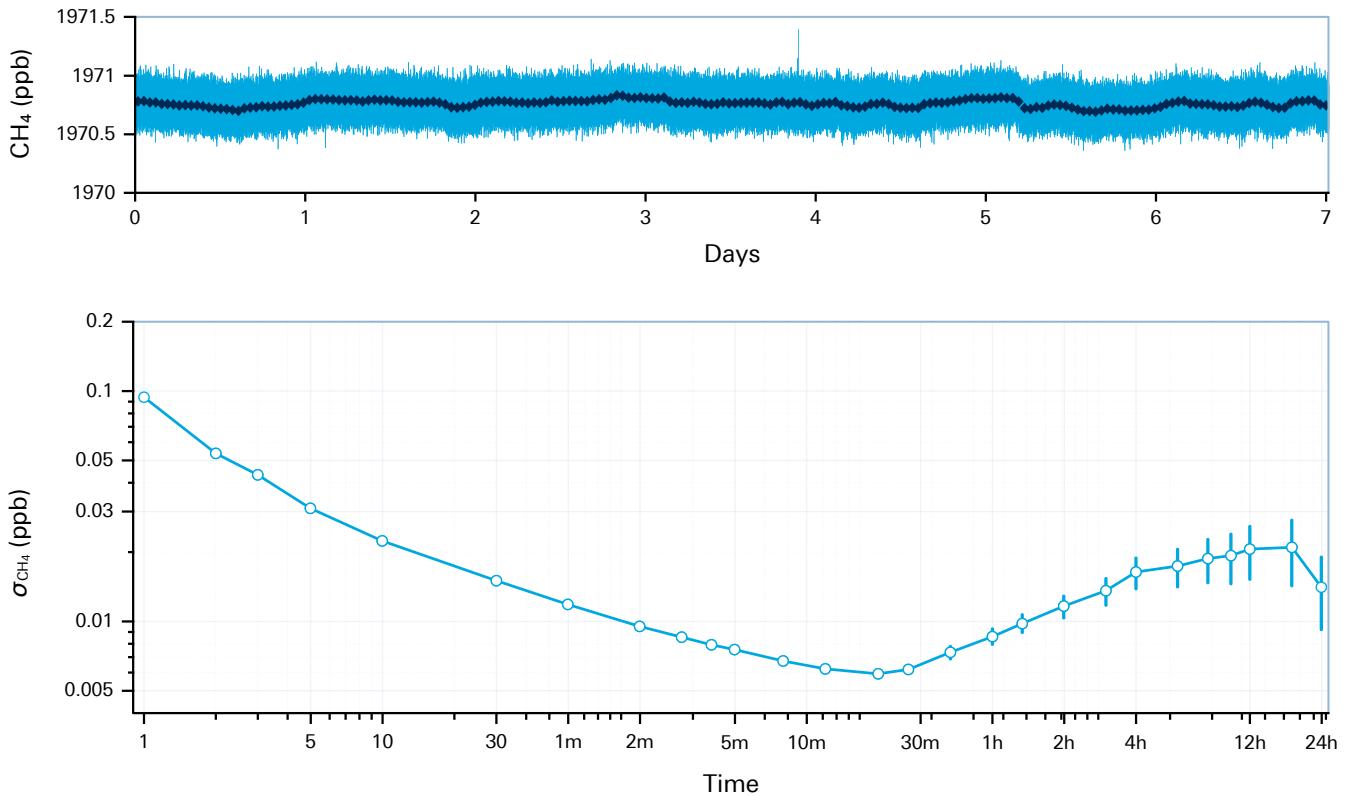


Figure 3. Seven-day CH₄ stability data from an LI-7810 CH₄/CO₂/H₂O analyzer (top). The instrument was operated continuously over a 7-day period with a continuous flow of tank gas. The light blue line shows 1-second measurements; the dark blue line shows a 50-minute block average. Allan deviation plot (bottom) of CH₄ measurements from an LI-7810 measuring a mixture of 1970.7 ppb methane and 387.5 ppm CO₂ shows precision at 1-second signal averaging, with improved precision as averaging time increases. Error bars represent 68% ($\pm 1\sigma$) confidence intervals based on number of averaged time series available at each τ . For a finite timeseries, fewer averaged series are available for longer τ .

The LI-7815 CO₂/H₂O Analyzer: For High Precision CO₂ Measurements

The LI-7815 CO₂/H₂O Gas Analyzer provides exceptionally stable and precise CO₂ measurements in a rugged, portable, and cost-effective design.

LI-7815 Long-Term Outdoor CO₂ Stability

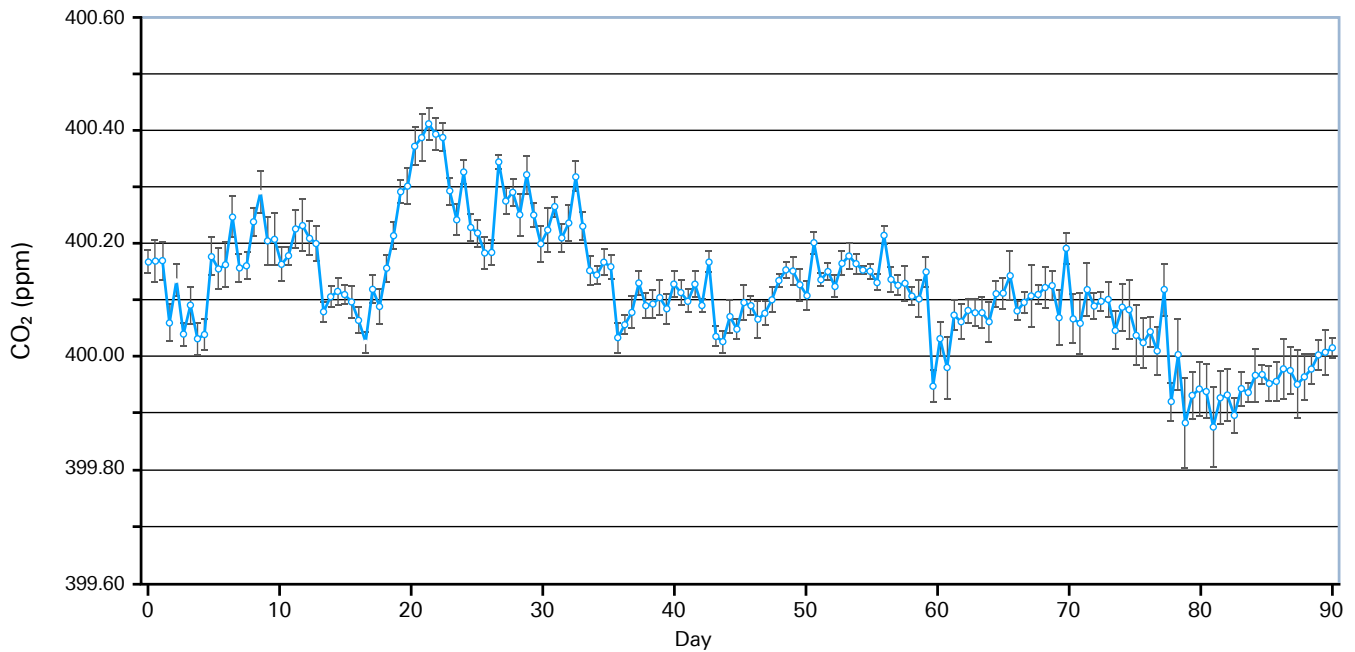
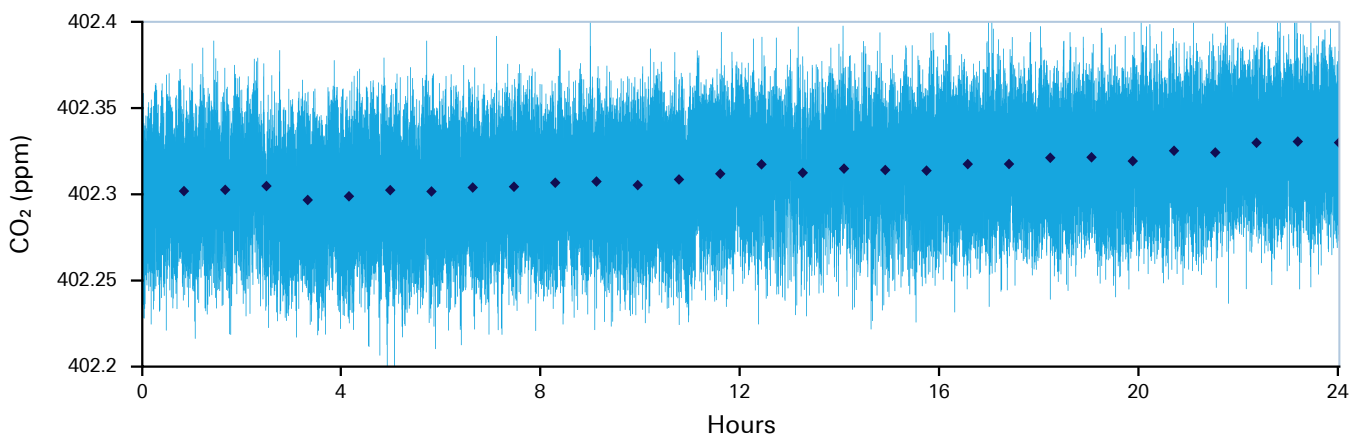


Figure 4. A long-term CO₂ measurement stability dataset from an LI-7815 CO₂/H₂O analyzer. The instrument was operated outdoors continuously over the entire time period, measuring ambient air between stability checks. During stability checks, the analyzer was flushed for 10 minutes with tank gas (2 ppm CH₄, 400 ppm CO₂ mixed in air balance, 1% nominal concentration accuracy) and a time series data set was subsequently recorded for 10 minutes every 12 hours. The points show the mean value and error bars represent the 1 σ (standard deviation) of the 10-minute measurements.

LI-7815 24-Hour CO₂ Precision with Allan Deviation Plot



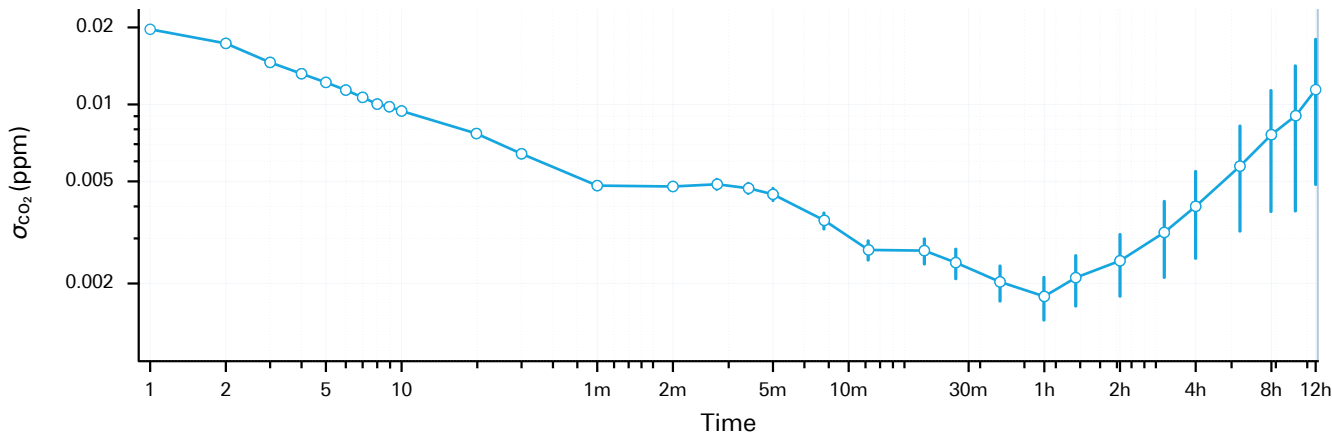


Figure 5. 24-hour CO₂ stability data from an LI-7815 CO₂/H₂O analyzer (top). The instrument was operated continuously over a 24-hour period with a continuous flow of tank gas. The blue line shows 1-second measurements; the diamond line shows a 50-minute block average. Allan deviation plot (bottom) of CO₂ measurements from an LI-7815 measuring 402.3 ppm CO₂ shows precision at 1-second signal averaging, with improved precision as averaging time increases. Error bars represent 68% ($\pm 1\sigma$) confidence intervals based on number of averaged time series available at each τ . For a finite timeseries, fewer averaged series are available for longer τ .

Specifications

To see the full specifications, visit licor.com/tracegas

LI-7810 CH₄/CO₂/H₂O Performance Specifications

Measurement Technique: OF-CEAS (Optical Feedback-Cavity Enhanced Absorption Spectroscopy)

Measurement Rate: 1 sample per second (1 Hz)

Flow Rate: 280 sccm (nominal)

Response Time (T₁₀-T₉₀): CH₄ ≤ 2 seconds, 0 to 2 ppm

CH₄ Measurements

Range: 0.1 to 50 ppm

Precision (1σ): 0.25 ppb with 5 second averaging

Max Drift: < 1 ppb per 24-hour period

CO₂ Measurements

Range: 1 to 10,000 ppm

Precision (1σ): 1.5 ppm with 5 second averaging

H₂O Measurements

Range: 100 to 60,000 ppm

Precision (1σ): 20 ppm with 5 second averaging

LI-7815 CO₂/H₂O Performance Specifications

Measurement Technique: OF-CEAS (Optical Feedback-Cavity Enhanced Absorption Spectroscopy)

Measurement Rate: 1 sample per second (1 Hz)

Flow Rate: 280 sccm (nominal)

Response Time (T₁₀-T₉₀): CO₂ ≤ 2 seconds, 0 to 400 ppm

CO₂ Measurements

Range: 1 to 10,000 ppm

Precision (1σ): 0.04 ppm with 5 second averaging

Max Drift: < 0.2 ppm per 24-hour period

H₂O Measurements

Range: 100 to 60,000 ppm

Precision (1σ): 20 ppm with 5 second averaging

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