

LI-7810 CH₄/CO₂/H₂O Trace Gas Analyzer Specifications

The LI-7810 CH₄/CO₂/H₂O Trace Gas Analyzer is a laser-based instrument that uses OF-CEAS in combination with numerous patented technologies to measure CH₄ in air with high precision and stability. This document describes the performance specifications of the LI-7810.

General

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

Measurement Rate: 1 sample per second (1 Hz)

Optical Cavity Volume: 6.41 cm³

Flow Rate:

250 sccm nominally in standard configuration
150 sccm nominally in high altitude configuration
70 sccm nominally in reduced flow rate configuration with installed kit

Total Weight: 10.5 kg (including batteries)

Case Dimensions: 51 × 33 × 18 cm (L × W × H)

Operating Temperature Range: -25 °C to 45 °C (without solar load)

Operating Humidity Range: 0 to 85% RH (non-condensing, without solar load)

Sample Line Humidity Range: 0 to 99.9% (non-condensing)

Operating Pressure Range:

70 to 110 kPa in standard and reduced flow rate configuration
50 to 110 kPa in high altitude configuration

Connectivity: Ethernet and Wi-Fi (not available in some countries)

Wi-Fi Compatibility: 2.4 GHz, 802.11 a/b/g/n/ac

Power Consumption:

Steady State Operation: 22 Watts at 25 °C without batteries charging

Warmup: Up to 65 W without batteries charging; up to 100 W with batteries charging

Off: Up to 2.3 W when powered from pins 3 and 4 without batteries charging; up to 0.2 W when

powered from pins 1 and 5 without batteries charging

Power Supply Requirements:

Pins 1 and 5 (24 VDC Input): Minimum 6 A at 24 V

Pins 3 and 4 (10.5 to 33 VDC Input): Minimum 14 A at 10.5 VDC; 6 A at 24 VDC

Power Supply: Universal Power Adapter (Input: 100 to 240 VAC, 50-60 Hz; Output: 24 VDC)

Battery Life: 8 hours typical with 2 batteries

Data Storage: Up to 5,356,800 records; about 62 days of continuous data collection

Pollution Degree: 2

Over-voltage Category: II

Class 1 Laser Product

CH₄ Measurements

Response Time (T₁₀ - T₉₀) from 0 to 2 ppm:

≤2 seconds in standard configuration

≤3 seconds in high altitude configuration

Range: 0 to 100 ppm

Precision (1σ):

0.60 ppb at 2 ppm with 1 second averaging

0.25 ppb at 2 ppm with 5 second averaging

Maximum Drift: < 1 ppb per 24-hour period

CO₂ Measurements

Range: 0 to 10,000 ppm

Precision (1σ):

3.5 ppm at 400 ppm with 1 second averaging

1.5 ppm at 400 ppm with 5 second averaging

H₂O Measurements

Range: 0 to 60,000 ppm

Precision (1 σ):

45 ppm at 10,000 ppm with 1 second averaging

20 ppm at 10,000 ppm with 5 second averaging

**LI-COR Biosciences**

4647 Superior Street
Lincoln, Nebraska 68504
Phone: +1-402-467-3576
Toll free: 800-447-3576 (U.S. and
Canada)
envsales@licor.com

LI-COR Distributor Network:
www.licor.com/envdistributors

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Regional Offices

LI-COR Biosciences GmbH
Siemensstraße 25A
61352 Bad Homburg
Germany
Phone: +49 (0) 6172 17 17 771
envsales-gmbh@licor.com

LI-COR Biosciences UK Ltd.
St. John's Innovation Centre
Cowley Road
Cambridge
CB4 0WS
United Kingdom
Phone: +44 (0) 1223 422102
envsales-UK@licor.com

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