The LI-820 CO₂ Gas Analyzer
The LI-820 is an absolute, non-dispersive, infrared (NDIR) gas analyzer based upon a single path, dual wavelength, infrared detection system. This low-cost, low-maintenance analyzer is designed for continuous monitoring of CO₂ over a wide range of environmental conditions.

**LI-820 Features**

- High accuracy over the entire measurement range due to automatic temperature and pressure compensation
- High stability with low zero and span drift
- 1 ppm signal noise at 370 ppm CO₂
- CO₂ measurement range of 0-20,000 ppm
- User cleanable optical path does not require factory recalibration
- Factory calibration made using gases traceable to WMO and EPA standards
- Operating temperature range of –25 °C to +45 °C

User defined high and low alarms are available as voltage outputs, allowing you to control CO₂ within a desired range. For instance, the LI-820 can trigger an exhaust fan in a greenhouse environment. Relays can trigger devices such as automatic dialers, alarms, pumps, and valves in industrial environments. Alarm values can be changed easily using the Windows®-compatible application software included with the LI-820.

**Multiple Data Outputs**

The LI-820 includes easy-to-use Windows® interface software for user calibration and data collection. You can easily set operational parameters and logging options, as well as output data to a printable chart. Once parameters have been set, a main window displays CO₂ concentration and status of settings.
The LI-820 optical path is designed to achieve accurate CO₂ concentration measurement:
- The reflector and optical path are gold plated to increase energy transmission.
- CO₂ is measured in a single path through the use of narrow band optical filters.
- The entire optical path is in thermal equilibrium.
- A pressure transducer corrects for changes in barometric pressure.
- A foam enclosure surrounds the optical bench. This helps maintain a controlled thermal environment as well as protect the bench from mechanical shock and vibration.

A choice of analog outputs (Temperature, Pressure, or CO₂) are selectable on either of the two user-scalable DAC channels. Linear analog voltage (0-2.5V, 0-5V) and current loop (4-20mA) outputs are available. A removable terminal strip allows easy connection of external recording devices such as the LI-COR LI-1400 Datalogger.

An eXtensible Markup Language (XML) communication protocol provides for complete OEM application integration. XML is a simple text-based language allowing bi-directional communication between the LI-820 and your data acquisition system. As an example, sending this command:

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<LI820><DATA>?</DATA></LI820>
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instructs the LI-820 to send the most recent set of data values. The XML communication protocol allows the LI-820 to be polled for data at user-defined intervals, globally reconfigured, or configured to perform automatic calibration routines.
**Applications**

The LI-820 can be used for continuous monitoring of carbon dioxide under a wide range of environmental conditions due to its stability, accuracy, and design. As a result, the instrument can be used in a variety of applications:

- pCO₂, DIC
- Indoor Air Quality
- CO₂ Sequestration
- CO₂ Storage
- Soil CO₂ Flux
- Ambient Air Monitoring
- Meteorology
- Agriculture
- Horticulture
- Entomological Respiration Studies
- Volcanology
- Geological Monitoring
- Bioremediation
- TOC Analyzer System
- Particulate Analyzer System
- Greenhouse Control Systems
- Growth Chambers
- Fruit Storage
- Food and Beverage Industry
- Industrial CO₂ Monitoring
- Other Portable Instruments Requiring CO₂ Detection

**Specifications**

**CO₂**

- **Measurement Range:** 0-20,000 ppm
- **Accuracy:** <3% of reading

**Calibration Drift**

- Zero Drift: <0.15 ppm/°C
- Span Drift: <0.03%/°C
- Total Drift at 370 ppm: <0.4 ppm/°C

**RMS Noise at 370 ppm with 1 sec signal filtering:** <1 ppm

- Zero Drift is the change with temperature at 0 concentration.
- Span Drift is the residual error after re-zeroing following a temperature change.
- Total Drift is the change with temperature without re-zeroing or re-spanning.

**Measurement Principle:** Non-Dispersive Infrared

**Traceability:** Traceable gases to WMO standards from 0 to 3,000 ppm. Traceable gases to EPA protocol gases from 3,000 to 20,000 ppm

**Pressure Compensation Range:** 15 kPa – 115 kPa

**Maximum Gas Flow Rate:** 1 liter/min

**Output Signals:**
- Two Analog Voltage (0-2.5V or 0-5V)
- Two Current (4-20mA)
- Digital: TTL (0-5V) or Open Collector

**DAC Resolution:** 14-bits across user-specified range

**Source Life:** 18,000 Hours (~2 years continuous use)

**Power Requirements:**
- Input Voltage 12-30 VDC; 1.2A @ 12V (14W) maximum during warmup with heaters on; 0.3A @ 12V (3.6W) average after warmup with heaters on

**Operating Temperature Range:** –20 to 45°C

**Relative Humidity Range:** 0 to 95% RH, Non-Condensing

**Dimensions:** 8.75" x 6" x 3" (22.23 x 15.25 x 7.62 cm)

**Weight:** 2.2 lbs. (1 kg)

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**Ordering Information**

LI-820 CO₂ Analyzer:
- Includes LI-820 CO₂ Analyzer, spare parts kit, 2 disposable air filters, cleaning kit, Windows® communications software, 9-pin RS-232 communications cable, and RS-232 to USB adapter. Requires external power source. Pump not included.

800-401 AC Power Adapter (110 VAC):
- 18 VDC output, 800 mA, for indoor use only. An alternate AC adapter is required for 220VAC operation. See Power Requirements in the specifications.

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