EGM-4 Environmental Gas Analyzer for CO$_2$

For Users Who Demand Portability, Accuracy, Reliability And Long Term Stability

For over 25 years, PP Systems has been manufacturing high quality CO$_2$ infrared gas analyzers for researchers worldwide. The EGM-4 is designed for applications that demand a high degree of accuracy and control with minimal maintenance.

Calibration

The design of the EGM-4 ensures an inherent calibration stability that has been confirmed by over 25 years experience in gas analysis technology. The EGM-4 does not require CO$_2$ recalibration (we recommend periodic checks to confirm system integrity). The EGM-4 employs a non-dispersive, infrared measurement technique, coupled with microprocessor-based signal processing, to achieve excellent stability and specificity to CO$_2$. Our innovative "Auto-Zero" technology ensures fast warm-up, long term stability, accuracy and analyzer calibration. It also minimizes the effects on span (gas sensitivity) of sample cell contamination, source aging, changes in detector sensitivity and changes in pre-amplifier gain.

Measurement Ranges

The EGM-4 can be supplied with two different optical benches. One bench is optimized for measurement of CO$_2$ in the ranges of 0-1,000 ppm up to 0-30,000 ppm and another optimized for 0-50,000 or 0-100,000 ppm. For users that want to recalibrate the gas analyzer to a new level, this can easily be achieved as long as it is within the range for that particular optical bench.

Portability

The EGM-4 is a compact, lightweight (1.9 kg) instrument that is packaged in a rugged aluminum enclosure. It can be supplied with either a 12V lead acid battery (up to 4 hours continuous use) or 12V NiMH battery (up to 8 hours continuous use) making it an ideal instrument for field applications. For laboratory studies, it can be operated continuously from mains power using the AC power supply that is included.

System Features

- High precision, compact CO$_2$ analyzer
- Accuracy: < 1% of span concentration over calibrated range
- Lightweight, field portable
- Built-in sampling pump
- Automatic pressure and temperature compensation
- High resolution LCD display
- Voltage, current and digital (RS232) output
- Visual and audible alarm
- Integral data logging capability

For Use In:

- Plant physiology
- Soil CO$_2$ efflux
- Whole canopy assimilation
- Global change studies
- CO$_2$ sequestration
- Forest & agricultural meteorology
- Air-sea surface exchange (pCO$_2$)
- Animal/insect respiration
- Environmental toxicology
- Volcanology
- Bioremediation
- Porometry

The sensor inputs (I/O), analog and digital output (RS232), 4-20mA output and gas connections are conveniently located on the top of the EGM-4.

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Integral Sampling Pump

The EGM-4 features an integral, long life air sampling pump that can be controlled for applications that require both dynamic and static measurements. For dynamic measurements, the pump operates at a flow rate of approximately 350 ml/min. Static measurements are performed by simply disabling the integral pump and injecting a gas stream directly into the gas analyzer for analysis.
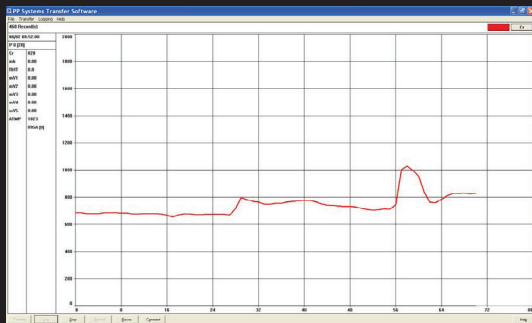
Data Storage and Output

Measurements can be recorded manually or automatically at user selected intervals. Data is safely stored in battery backed RAM and can be later output to a PC in standard ASCII format. Analog and digital output is available for use with external data loggers or for display, collection and recording from an external PC using the Windows® software included.

Flexible, Versatile User Interface

The EGM-4 is an extremely powerful and versatile instrument. The following accessories/sensors can be used with the EGM-4 enhancing measurement capability:

- Humidity sensor
- Soil respiration chamber
- Soil temperature
- PAR
- Temperature/PAR
- Canopy assimilation
- Oxygen
- Steady state porometer

The EGM-4 is supplied with a Windows® based software program for transferring and logging sensor data. The sensor data may be recorded manually or automatically depending on user specified settings. Stored records (ASCII) can be later imported into your favorite spreadsheet program for further analysis.

On-line help is available to guide you every step of the way.

Technical Specifications

Analysis Method
Non-dispersive infrared, configured as an absolute absorptiometer with microprocessor control of linearization.

Measurement Range
CO$_2$: 0-1,000 ppm (μmol mol^{-1})
0-2,000 ppm (μmol mol^{-1})
0-5,000 ppm (μmol mol^{-1})
0-10,000 ppm (μmol mol^{-1})
0-20,000 ppm (μmol mol^{-1})
0-30,000 ppm (μmol mol^{-1})
0-50,000 ppm (μmol mol^{-1})
0-100,000 ppm (μmol mol^{-1})

Custom ranges up to 100,000 ppm upon request. Measurements are automatically corrected for temperature and pressure.

Accuracy
< 1% of span concentration over the calibrated range, but limited by the accuracy of the calibration gas mixture.

Linearity
< 1% throughout the range.

Stability
Automatic Zero at regular intervals, corrects for sample cell contamination, source and detector ageing and pre-amplifier gain changes.

Sampling Pump
Integral DC pump operating at a flow rate of 350 ml/min. Pump can be disabled for static measurements on demand.

Gas Flow Rate Through Analyzer
Minimum flow rate: 200 ml/min
Maximum flow rate: 500 ml/min

Environmental Sensor Interface
Two inputs available for use with external sensors (humidity, temperature, PAR, oxygen, soil respiration, etc.).

Air Filter
Filtered sample line (hydrophobic).

Calibration
Default value preset in factory (built-in initialization). Automatic calibration by keypad if required.

CO$_2$ Control
High and low set points.

Alarm
Audio alarm

Real Time Clock
Accuracy > 1 minute per month at 25° C, operating temperature 0-70° C. Automatic correction for month end and leap years.

Recording
Manual (by keypress) or automatic at user selected intervals between 1 and 250 minutes.

Keypad
Custom, tactile keypad.

Data Storage
512K Battery backed RAM (1,000 records).

Response Time
Display/Analog Output: 1.6 seconds

Analog Output
4-20 mA, 0-1V, 0-2V, 0-3V, 0-4V, 0-5V (Linear).

Digital (RS232) Output
9600 baud/8 data bits, 1 start bit/2 stop bits/ no parity. ASCII format.

Display
High contrast 2 x 16 character LCD.

Power Supply
12V rechargeable lead acid battery providing up to 4 hours continuous operation or 12V NiMH rechargeable battery providing up to 8 hour continuous use. Battery life may be reduced when EGM-4 is used with add-on sensors/accessories.

Power Consumption
12V @ 0.7A (warm-up)
12V @ 0.4A (normal operation)

Gas Connections
Two barbed fittings (inlet and exhaust) for use with 1/8" (.125") ID tubing.

Housing
High impact, aluminum enclosure.

Operating Environment
-5° C - 50° C, non-condensing. In dirty environments, external air filtration is required.

Dimensions
18 cm (W) x 21.5 cm (H) x 6.3 cm (D)

Weight
1.9 kg

PP Systems is continuously updating its products and reserves the right to amend product specifications without notice.

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Distributor

For further information, please contact us at:

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