User Manual
Oxygen Sampling Data Logger

Models:

CM-0185 (0-25% O2)

CM-0195 (10-95% O2)

Table of Contents

Welcome

Thank you for purchasing our meter. This meter allows you to measure oxygen in inaccessible areas. The iSense Oxygen Sampling data-logger is a long life 0-25% and 10-95% Oxygen level transmitter that provides multiple analog linear outputs of O2 concentrations. It's designed to be rugged, maintenance-free and can be calibrated in normal air of any known oxygen concentration.

CO2Meter, Inc. is a Florida based business specializing in the design and manufacturing of gas detection and monitoring devices – mainly CO2. Our approach is one based in the science of gas and how best to accurately and repeatedly measure that gas for the end users purposes. Our business partners in agriculture, HVAC, science, safety, research, pharmaceuticals, beverage, and other fields find our devices to be highly accurate and cost effective.

We approach each customer's application as a unique opportunity to understand, educate, and provide product solutions that meet the customers' needs while exceeding their expectations for reliability and service. Our continued product innovation in combination with our "customer first" focus allows CO2Meter, Inc. to continue to provide solutions for the future.

CO2Meter, Inc. appreciates your business and looks forward to working with you and your team in the future.

Please take the time to read through this manual in order to get the most out of your meter. Visit our website regularly to find more information about this product and to download the latest free software. Once you have installed the software, you can use the "Check for updates" function under the Help menu to search for new updates. Please also pay special attention to the important safeguards shown on the pages ahead.

WARNING!

Install GasLab® software before connecting your CO2Meter® to your computer. Failure to do so may affect the ability for GasLab® to detect your meter/sensor. If this happens, please follow the instructions shown in the Troubleshooting Guide of this manual.

Important Safeguards

To reduce the risk of fire, electrical shock and/or injury to persons, basic safety precautions should always be followed when using electrical appliances, including the following:

1. READ ALL INSTRUCTIONS BEFORE USING THIS DEVICE!
2. Use only the supplied power supply to operate the unit.
3. Ensure that when sampling in a closed environment that the tubes are securely fashioned to the device.
4. Do not operate with a blocked off sample path.
5. Do not operate the device if it is malfunctioning.
6. Do not operate the device with the cover detached.

SAVE THESE INSTRUCTIONS!

Package Contents

Please verify that your package contains the following items before using the meter:

MAP units:

- (1) Meter
- (1) Certificate of Calibration
- (1) User Manual
- (1) 1- M12, 12-Positions 5M Cable
- (1) 10-footlength 1/8" tubing
- (1) Moisture Trap (CM-0112)
- (2) 1/8" Barb tubing bulkhead fitting
- (2) 1/8" Barb 10-32 fittings
- (1) Extreme Condition Moisture Trap (CM-0103)
- (1) USB Cable
- (2) Particle Filter(CM-0117)
- (2) Hydrophobic Filter(CM-0118)

GasLab® Software

Our GasLab® software will allow users to:

- Manage and download logs
- Configure Sensor
- Adjust logging intervals
- Automatic data logging when meter is powered ON
- Data logging session status displayed on LCD screen
- Collect data real-time

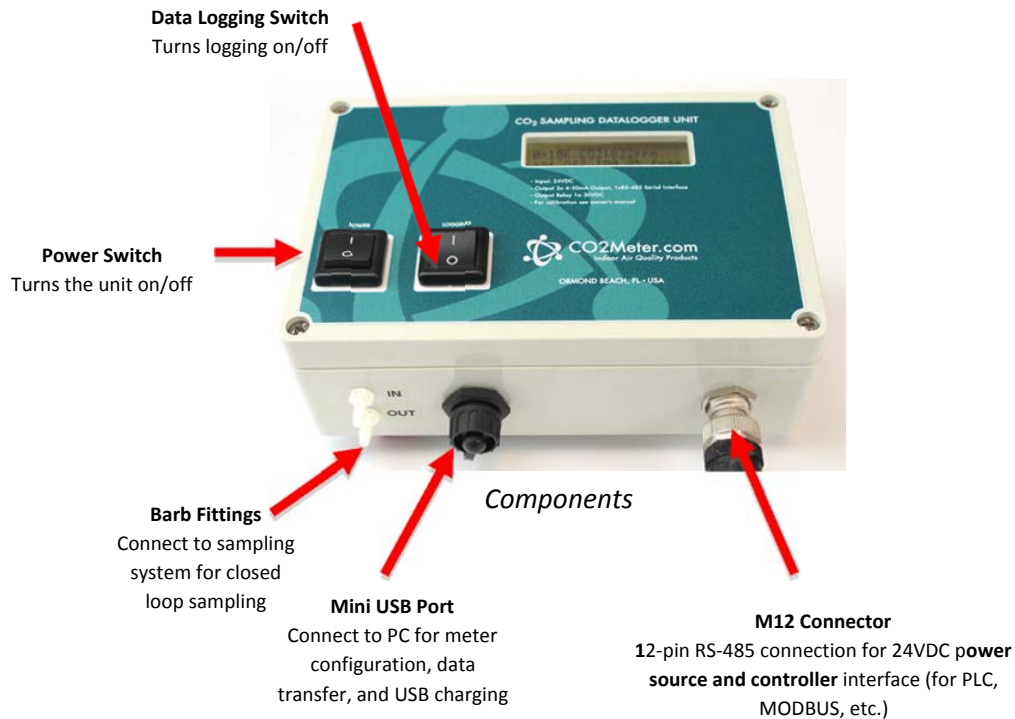Visit: http://www.co2meter.com/pages/downloads for your free download of our GasLab® software.
Note GasLab® must be installed prior to connecting the meter/sensor to your computer.
Please observe Minimum System Requirements before downloading Gaslab to your computer.

IMPORTANT: **INSTALL SOFTWARE BEFORE CONNECTING YOUR DEVICE TO A COMPUTER**

Operation

Please read through these instructions before using your meter. This guide will help you become familiar with your meter in the least amount of time possible.

Data Logging Switch
Turns logging on/off

Power Switch
Turns the unit on/off

Components

Barb Fittings
Connect to sampling system for closed loop sampling

Mini USB Port
Connect to PC for meter configuration, data transfer, and USB charging

M12 Connector
12-pin RS-485 connection for 24VDC p**ower source and controller** interface (for PLC, MODBUS, etc.)

The oxygen meter is factory calibrated. During its life cycle, periodic calibration is necessary for guaranteed operation and ensured accuracy. **Please contact CO2Meter.com for information regarding the Configuration and Calibration of your O2 Sensor.**

Theory of Operation

The zirconia oxygen sensor utilizes solid-state electrochemical reactions to produce a voltage proportional to the current oxygen. This voltage is then digitalized and filtered to a usable value. The oxygen sensor has also been factory calibrated to meet specifications.

Powering the Unit

The unit can be powered by connecting 24 VDC power through the CM-0127 Single Ended cord set (included).

LCD Display

The Liquid Crystal Display (LCD) screen shows the oxygen level in percentage format (##.## %)

Analog 4-20mA Output

This meter features a 4-20mA output linearly scaled to the current O2 reading. This output is powered by the input supply and we recommend using a 250Ω resistor load to measure the output. The exact maximum drivable load will be determined by the input power supply, in accordance with Ohm's Law. The loop scaling is set up as follows:

Oxygen Loop Output: CM-0185   4-20mA   0-25% O2

                                            CM-0195   4-20mA   10-95% O2

M12 Cable Pinouts

Included in the package is the CM-0127 with 12-pin mating connector.

The wire legend (**Figure 1** below) shows the Pin Number, Color Code and function of each wire of the electrical connection.

Pin #	Wire Color	Color Legend	Description
1	Brown		CO2 4-20mA - (not used)
2	Blue		N/O Relay (not used)
3	White		CO2 4-20mA+ (not used)
4	Green		RS-485 Ground
5	Pink		N/C Relay (not used)
6	Yellow		COM Relay
7	Black		Power Ground
8	Grey		O2 4-20mA -
9	Red		Voltage Input
10	Purple		O2 4-20mA +
11	Pink/Grey		RS-485 B
12	Red/Blue		RS-485 A

Figure 1: Wire color legend for 12-pin connector

Optional: Power Cable (CM-0182) with RS-485 to USB and M12 Connector with 24 Volt Power Adapter may be ordered.

Data Logging

The Sampling Data Logger will record data and store up to 60,000 Log Files in internal memory when the Logging Switch is in the ON position. The logging interval default setting is 10 seconds.

To prevent filling the memory and losing data, the Log Files must be periodically downloaded (weekly) and the memory cleared before each logging session. This can be done with the Gaslab® software

Calibration

All units are factory-calibrated and have been verified to be accurate before shipment. However, the sensor can drift, requiring recalibration. Contact CO2Meter.com before calibrating the sensor.

CM-0185 0-25% O2 Sensor Calibration

Caution: Components on O2 Board may be hot!

Atmospheric Calibration

1. Remove front cover and allow sensor to stabilize for 1 hour.
2. Connect Sensor "IN" port to Fresh air. Wait for stable readings.
3. Press 123 to enter service menu.
4. Display will show 1234 when you have entered service menu.
5. Press 2 to enter the Oxygen submenu.
6. Press 2 to perform Atmospheric Calibration.
7. Press 3 to save Atmospheric Calibration value.

Note: Steps 3 - 7 must be done quickly or sensor will exit calibration mode. Press 1-2-3-2-2-3 to perform Atmospheric Oxygen Calibration.

Zero Point Calibration using 100% Nitrogen

1. Remove front cover and allow sensor to stabilize for 1 hour.
2. Connect "IN" port to 100% N2. Wait for stable readings.
3. Press 123 to enter Service Menu.
4. Display will show 1234 when you have entered service menu.
5. Press 2 to enter the Oxygen submenu.
6. Press 1 to Calibrate to 0% Oxygen (100% Nitrogen).
7. Press 3 to save Zero Point Calibration value.

Note: Steps 3 - 7 must be done quickly or sensor will exit calibration mode. Press 1-2-3-2-1-3 to perform Zero Point calibration.

CM-0195 10-95% O2 Sensor Calibration

Caution: Components on O2 Board may be hot!

Atmospheric Calibration

1. Remove front cover and allow sensor to stabilize for 1 hour.
2. Expose Sensor to Fresh air. Wait for stable readings.
3. Press 123 to enter service menu.
4. Display will show 1234 when you have entered service menu.
5. Press 2 to enter the Oxygen submenu.
6. Press 1 to perform Atmospheric Calibration.
7. Press 3 to save Atmospheric Calibration value.

Note: Steps 3 - 7 must be done quickly or sensor will exit calibration mode. Press 1-2-3-2-1-3 to perform Atmospheric Oxygen Calibration.

Span Calibration using 70% Oxygen

You must use 70% Oxygen Gas to perform Span Calibration

1. Remove front cover and allow sensor to stabilize for 1 hour.
2. Expose Sensor to 70% O2. Wait for stable readings.
3. Press 123 to enter Service Menu.
4. Display will show 1234 when you have entered service menu.
5. Press 2 to enter the Oxygen submenu.
6. Press 2 to Calibrate to 70% Oxygen.
7. Press 3 to save Span Calibration value.

Note: Steps 3 - 7 must be done quickly or sensor will exit calibration mode. Press 1-2-3-2-2-3 to perform 70% Oxygen Span Calibration.

Device Specifications

Measuring Range:		
	25% O2	0-25% vol.
	95% O2	10-95% vol.
Repeatability:		
	0-25% CO2	± 0.02%, ± 1 % of measured value
	0-95% O2	± 0.05%, ± 1 % of measured value
Accuracy :		
	25% / 95%	±2% full scale
Power Supply:		
	Maximum Voltage	24VDC
	Minimum Voltage	20VDC
	Power Consumption	600mA @ 24VDC
Sensor Ratings:		
	Life Expectancy	>15 years
	Maintenance Interval	No maintenance required
	Warm-up Time	<15 min (instant measurements)
Outputs:		
	O2 Output Value	4-20 mA, linearly scaled
	RS-485	Modbus Interface
	PUMP	Flow 0.80 LPM @ 150 mbar (Max Vac. 52%) (Max Pres. 600mbar)

Support

The quickest way to obtain technical support is via email. Please send all support enquires to **support@co2meter.com**. In your email, please include a clear, concise definition of the problem and any relevant troubleshooting information or steps taken so far, so we can duplicate the problem and quickly respond to your inquiry.

Warranty

This unit comes with a 1YEAR (warranty period) limited manufacturer's warranty, starting from the date the unit was shipped to the buyer.

During this period of time, CO2Meter.com warrants our products to be free from defects in materials and workmanship when used for their intended purpose and agrees to fix or replace (at our discretion) any part or product that fails under normal use. To take advantage of this warranty, the product must be returned to CO2Meter.com at your expense. If, after examination, we determine the product is defective, we will repair or replace it at no additional cost to you.

This warranty does not cover any products that have been subjected to misuse, neglect, accident, modifications or repairs by you or by a third party. No employee or reseller of CO2Meter.com's products may alter this warranty verbally or in writing.

Returns

If the product fails under normal use during the warranty period, an
RMA (Return Material Authorization) number must be obtained from CO2Meter.com. After the item is received, CO2Meter.com will repair or replace the item at our discretion.

To obtain an RMA number, call CO2Meter.com at **(877) 678-4259**. When requesting an RMA number, please provide the reason for return and original order number.

If we determine that the product failed due to improper use (water damage, dropping, tampering, electrical damage etc.) or abuse, or if it is beyond the warranty period, we will inform you of the cost to fix or replace your device.

If you are returning your device due to a warranty claim (with an RMA number) and you still have the unit original package, please use it to ship your unit to us. Please make sure to include the provided RMA number on the outside of the box, preferably on the shipping label. Make sure you secure the unit inside the package properly to prevent any damage during transit that could void your device's warranty.
Finally, please ship your device to the address shown under the "Contact Us" section below. CO2Meter.com will not, under any circumstances, be responsible for your shipment expenses and no refund will be issued for shipping charges necessary for you to ship the unit to us.

Liability

All liabilities under this agreement shall be limited to the actual cost of the product paid to CO2Meter.com. In no event shall CO2Meter.com be liable for any incidental or consequential damages, lost profits, loss of time, lost sales or loss or damage to data, injury to person or personal property or any other indirect damages as the result of use of our products.

Contact Us

We are here to help!

If the troubleshooting guide above doesn't help you solving your problem or for more information, please contact us using the information below.

✉ support@co2meter.com

📞 (386) 256-4910 (M-F 9:00am–5:00pm EST)

🖨 (866) 422-2356

🖥 www.co2meter.com

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