1% or 30% CO2 + Temperature & %RH

Diffusion Data Loggers

Models Covered

CM-0016	CM-0209
CM-0017	CM-0210
CM-0018	CM-0212
CM-0-18AA	CM-0213
CM-0019	

Save For Future Reference

Your Model: _____

Serial Number: _____

Purchase Date: _____

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Welcome

Thank you for purchasing our meter. 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.

Based in Ormond Beach, FL, CO2Meter, Inc. is committed to the success of our customers; the health, welfare, and prosperity of our talented employees; and the continued development of our local community.

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

Please take some time to read through this manual in order to become familiar with your meter. Pay special attention to the important safeguards below.

Important Safeguards

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

1. READ ALL INSTRUCTIONS BEFORE USING THIS METER.
2. INSTALL GasLab® SOFTWARE BEFORE CONNECTING METER TO A COMPUTER.
3. Charge rechargeable meters for at least 5-8 hours before use.
4. The rechargeable data loggers contain a lithium polymer (Li-Ion) battery. Do not expose to extreme heat or cold.
5. The Li-Ion battery is not user-replaceable. Please do not attempt to open the meter and replace the battery.
6. Do not use rechargeable AA batteries.
7. For models using AA batteries, do not store the meter with the AA Alkaline batteries installed to prevent the potential for battery leakage.
8. Use only the supplied 5/6VDC international wall power supply adapter. Precisely 5/6V must be applied to the meter. Other voltages can cause permanent damage.
9. The meter is not designed for outdoor use.
10. Do not allow the meter to be exposed to water.
11. Do not operate the meter with the enclosure opened.
12. Do not operate the meter if it is malfunctioning.
13. Use of this device in environments above 95% humidity may cause irreparable damage to the components.

SAVE THESE INSTRUCTIONS

Product Overview

This CO2Meter, Inc. data logger is designed to measure carbon dioxide (CO2),percent of relative humidity (%RH), and temperature through diffusion sampling. It stores collected data to its internal memory to be retrieved at a later time for analysis. When combined with our GasLab® software, you can also see real-time data on your computer's screen.

Scientific devices such as this data logger require the user to have an intimate knowledge of the meter, its operation, the required software, and the meter specifications prior to use. CO2Meter, Inc. highly recommends reading this user's manual before operating the device, especially the *Important Safeguards* section above.

Theory of Operation

The CO2 sensor inside this meter uses NDIR (non-dispersive infrared) technology to sense, as a function of transmitted light, the concentration of CO2 in the air. It has been factory calibrated to operate within the specified range and precision.

Package Contents

Verify that your package contains the following items before using the meter:

All meters:

- (1) Meter
- (1) 5/6VDC international power supply
- (1) 6-foot USB Cable
- (1) Calibration Certificate Tag
- (1) User's Manual

CM-0016 or CM-0017

CM-0018, CM-0018AA,
CM-0019, CM-0209, CM-0210
CM-0212, CM-0213

Optional Accessories

A Hydrophobic Vent Filter Kit may be purchased separately. These filters are ideal for high-humidity environments to allow air flow while keeping humidity out. Long-lasting, use anywhere humidity is very high (> 95%). Order part number CM-0172.

Powering the Meter

All data loggers come with an international power adapter and are battery-powered. Some meters are powered by an internal rechargeable Li-Ion battery and others by dry cell non-rechargeable alkaline AA batteries (not included), depending on the model of the meter. The table below shows detailed information about the battery used by each available model.

Model No.	Configuration	LCD	Battery Type	Capacity(mAh)
CM-0016	1% CO2 + RH/T	Yes	4 Dry AA Cell*	1,800-2,600
CM-0017	30% CO2 + RH/T	Yes	4 Dry AA Cell*	1,800-2,600
CM-0018AA	1% CO2 + RH/T	No	4 Dry AA Cell*	1,800-2,600
CM-0018	1% CO2 + RH/T	No	Rechargeable Li-Ion	2,200
CM-0019	30% CO2 + RH/T	No	Rechargeable Li-Ion	2,200
CM-0209*	30% CO2 + RH/T	No	Rechargeable Li-Ion	6,000
CM-0210*	1% CO2 + RH/T	No	Rechargeable Li-Ion	6,000
CM-0212	1% CO2 + RH/T	No	Rechargeable Li-Ion	3,600
CM-0213	30% CO2 + RH/T	No	Rechargeable Li-Ion	3,600

Discontinued Models

IMPORTANT: METERS USING DRY AA CELLS: USE NON-RECHARGEABLE ALKALINE BATTERIES ONLY. DO NOT STORE THE METER WITH THE BATTERIES INSTALLED TO PREVENT THE POTENTIAL FOR BATTERY LEAKAGE.

Battery Life

The battery life for data loggers depends on the selected logging interval. The table below shows the estimated battery life based on some typical logging intervals.

Logging Interval	Est. Battery Life 2,200mAh or AA	Est. Battery Life 3,600mAh
30 sec.	24 hrs.	40 hrs.
1 min.	48 hrs.	80 hrs.
5 min.	240 hrs.	400 hrs.
10 min.	480 hrs.	800 hrs.
30 min.	1,440 hrs.	2,400 hrs.
1 hour.	2,880 hrs.	4,800 hrs.

Once the memory is full, the meter will continue to log new data over the original data beginning at the first data point. Therefore, after each logging session you should use Gaslab® to save your data.

Because the data is stored in non-volatile memory, data will be logged until the batteries are exhausted. However, the logs files may not appear in Gaslab®. You can still extract them using the "recover logs" feature in Gaslab®.

IMPORTANT: DOWNLOAD THE LOGGED DATA AND RECHARGE BATTERIES AFTER EVERY USE TO PREVENT POSSIBLE DATA LOSS.

IF THE MEMORY IS FULL, PREVIOUSLY LOGGED DATA WILL BE OVERWRITTEN.

Charging the Meter

Meters powered by rechargeable Li-Ion batteries can be charged using the supplied universal power adapter or a USB port on a powered computer. Li-Ion batteries will be fully charge in 5-8 hours and will lose about 8% of their charging capacity per every year of use at 25°C.
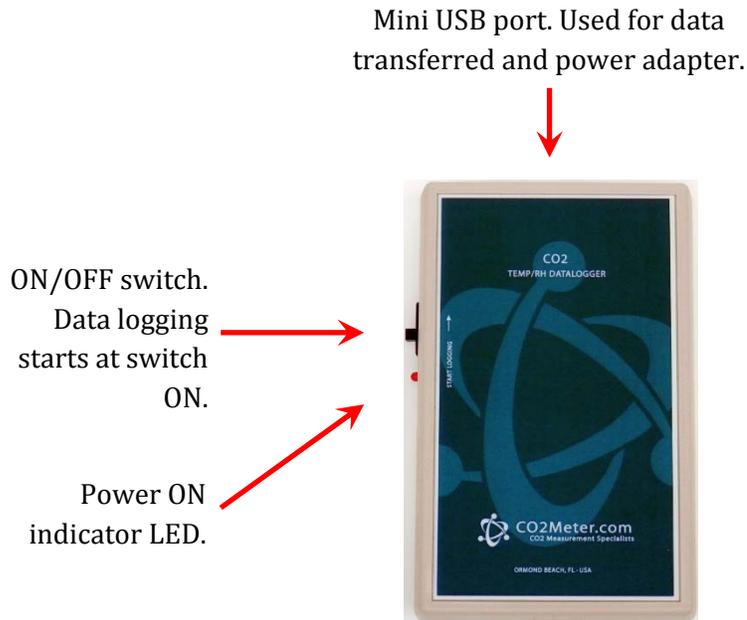
Mini USB port. Used for data transferred and power adapter.

ON/OFF switch. Data logging starts at switch ON.

Power ON indicator LED.

Figure 1: Data logger models without display

Mini USB port.

LCD display.

ON/OFF switch. Data logging starts at switch ON.
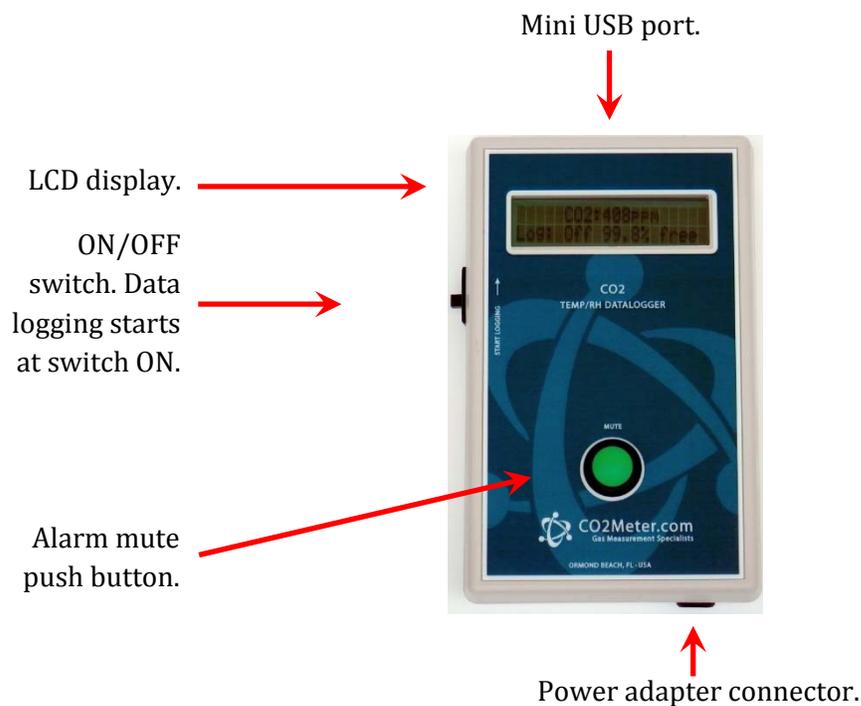
Alarm mute push button.

Power adapter connector.

Figure 1: Data logger models with display

Software

Our meters use GasLab® software, a free tool that lets you configure your meter, download data logs and more.

Capabilities
- Configure Meter
- Manage and download logs
- Adjust logging intervals
- Calibrate the meter
- Automatic data logging when meter is powered ON
- Collect data in real-time and view on screen

Minimum System Requirements
To utilize the software, your PC must meet the following minimum requirements:

- 1GHz processor with 1GB RAM, 1GB free disk space (2GB free disk space for 64-bit systems).
- Windows XP*/7/8/8.1 with Microsoft .NET Framework 4.0** or later.
- On Intel-based Mac computers, GasLab® software can run using a Windows 7/8 virtual machine software such as *VMware Fusion*® or similar.

*Microsoft .NET is not supported on Media Center or Tablet editions.
**Installer will optionally install .NET Framework.

Installation
Go to http://www.co2meter.com/pages/downloads to download our free GasLab® software for Windows.

IMPORTANT: **YOU MUST INSTALL SOFTWARE BEFORE CONNECTING THE METER TO YOUR COMPUTER.**

To install the GasLab® software, follow the steps and instructions prompted by your computer's operating system. Make sure you have administrator privileges in order to install this program.

After the software is installed, plug in the meter with the included USB cable. Your operating system will automatically install the proper USB drivers necessary for the meter to "talk" to your PC.

We strongly recommend allowing GasLab® to install drivers for the meter automatically.

Read the GasLab® manual http://co2meters.com/Documentation/Manuals/Manual-GasLab.pdf carefully to become more familiar with how the software works so that you can get the maximum benefit from your meter.

Operation Guide

Make sure you read through these instructions thoroughly before using the meter. This guide will help you become more familiar with the meter in order to be as productive as possible in a short period of time. Please read the Important Safeguards on page 3 before continuing.

<u>**IMPORTANT**</u>**: Follow these instructions to ensure proper set up:**

1. Download and install the GasLab® Software to your computer.
2. Power the meter using batteries or the included international power adapter.
   NOTE: connecting the included USB cable to a port in a computer will not supply the appropriate power.
3. Turn *ON* the meter.
4. If the meter has a LCD display wait until the display changes colors to visually confirm it has reset successfully after connecting it to a USB port on a computer.

Connecting the Meter

The first time the meter is connected to your computer, the operating system will install the necessary USB drivers as shown in *Figure 2.* This process could take a few minutes.
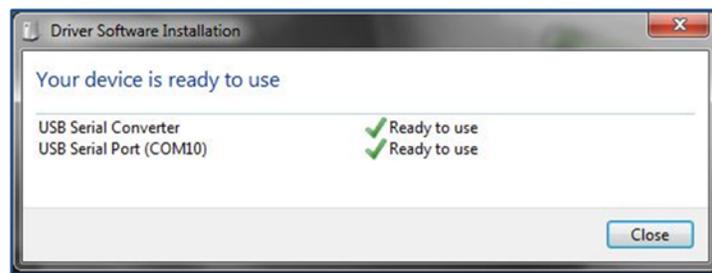

Figure 2: USB Driver Installation.

Setting the Meter

1. Ensure the data logging switch is in the ON position.
2. Connect the meter to the computer using the included USB cable.
3. Launch the GasLab® software.
4. Connect the meter/sensor to your computer

NOTE: The meter must be started at least 1 minute prior to use and data logging to allow the CO_2 sensor enough time to warm-up and calibrate.

After connecting the meter to a computer and setting it, the GasLab® software will allow you to perform the following main functions:

- **Collect Real-time** – data being recorded is displayed on graph.
- **Manage and Download Logs** – provide options to manage data logs saved in the meter.
- **Configure Sensor** – provide options to setup the sensor inside the meter and data logging options, among other features.
   NOTE: A separate data file will be created each time the meter is powered ON (starts logging).

Logging Data
Once the GasLab® software has been installed and the meter is connected to the computer, you can gather data in a variety of ways. Depending on the type of meter, data can be collected in real time, data logs can be downloaded from the meter's memory (if equipped), and saved to the computer, and data can be reviewed on the meter's LCD display (if equipped).

For each logging session
1. Turn the meter ON.
2. The meter must be started at least 1 minute prior to deployment and data logging to allow the CO_2 sensor time to warm-up and calibrate.
3. Set the logging interval (min 30 sec) as desired and commence logging.
4. When data logging is completed, turn the meter OFF.

Setting the Logging Interval
To change the default settings, connect the meter to a computer using the included USB cable. Select the desired meter, and change the settings.
NOTE: Refer to the GasLab® User's Manual for complete instructions.

Display and Alarm (CM-0016, CM-0017 only)
This data logging meter includes a built-in audible (80dB) alarm and an LCD (Liquid Crystal Display) display that provides visual indication of the current CO_2 level by changing color to green, yellow or red, depending on CO_2 level ranges selected. The display will change colors depending on the actual CO_2 level readings by setting the "Green", "Yellow", and "Red" ranges.

The alarm is set per LEED IAQ levels by default but can be programmed to other standards such as OSHA levels using the GasLab® software. The new alarm level will be maintained in the meter's memory.

During operation, when the meter is turned on, and when the high concentration CO_2 level programmed is reached, an 80dB alarm will sound. The alarm can be muted for 30 seconds by pressing the button on the front of the meter. This feature can be changed in GasLab®.

Calibration
The CO_2 sensor, in IAQ applications only, uses an algorithm called Automatic Background Calibration (ABC) to ensure maximum accuracy by continuously adjusting the zero-point.

The ABC algorithm allows the CO_2 sensor to dynamically shift its CO_2 reading by a constant. It works via storing the lowest CO_2 sample taken over the ABC Period and assuming that this low value is equal to a known value (the target value). It then adjusts the output of the CO_2 reading by the delta between these values. This algorithm does not affect the linearization of the output signal. For example, by default ABC is enabled with an ABC Period of 180 hours, a target value of 400ppm, and a maximum delta of 30ppm. This operates under the principle that ambient, outdoor air is at 400ppm.

The sensor will keep track of the lowest CO2 reading recorded over a period of 180 hours and then adjust the zero point, up to 30ppm at a time, towards that value.

To ensure maximum accuracy it is recommended to install the device in an environment that will routinely see this low value.

In addition, this meter can be exposed to fresh air for a few minutes between uses to verify calibration by making sure the readings are close to 400 ppm, or can be manually calibrated using the GasLab® software*.*

NOTE: Refer to the GasLab® User's Manual for complete instructions.

Meter Specifications

Measuring Principle:	CO2	Non-dispersive infrared (NDIR) sensor
Measuring Range:		
	1% CO2 models	0-10,000 ppm
	30% CO2 models	0-300,000 ppm (0-30% vol.)
Repeatability:		
	1% CO2 models	±20 ppm, ±1% measured value
	30% CO2 models	±0.1%, ±2% of measured value
Accuracy:	1% CO2 models	±30ppm, ±3% measured value
	30% CO2 models	±0.2%, ±3% of measured value
CO2 Sensor Ratings:		
	Life Expectancy	>15 years
	Warm-up Time	<1 min (instant measurements)
Temperature Sensor:	Range	-40 to 120°C
	Repeatability	±0.1°C
	Accuracy	±0.5°C
Relative Humidity Sensor:		
	Range	0-100%
	Repeatability	±0.1%
	Accuracy	±3%
Dimensions: L x W x D		(mm) inches (146.1)5.75 x (91.4)3.60 x (32.7)1.30
Data Logging:	Data Points	60,000 in internal memory
	Programmable Interval Data	Date, Time, CO2, %RH, Temp.
Power:	Input Voltage	5VDC (use only supplied adapter)
	Power Consumption	500 mA (while charging)
	Charging Time	5-8 hrs. (approximately)
	Battery Type/Capacity	4xAA (CM-0016,-0017,-0018AA) Li-Ion/2,200mA (CM-0018,-0019) Li-Ion/6,000mA (CM-0209,-0210) Li-Ion/3,600mA (CM-0212,-0213)
	Li-Ion Battery Lifetime	2-3 years depending on cycles

Troubleshooting Guide

Symptom / Issue	Possible Cause	Resolution
Meter is not recognized by computer	No power.	Replace/recharge the batteries or connect meter to the included power supply and power meter ON.
Meter is not recognized by computer	Unable to find correct COM port for USB.	Read this App note on reassigning COM ports for USB: http://www.co2meters.com/Documentation/AppNotes/AN134-Change-COM-Ports.pdf
All log time stamps start in the year 2000	The real-time clock was not synced.	Connect the meter to the computer with data logging off. The time will synchronize in GasLab®.
No logs are present on the meter after data logging	Meter was disconnected while logs were being downloaded.	Connect the meter to the computer and download logs again.
	Meter voltage dropped below 5V.	Use "Recover Logs" function in Gaslab.
The display is Blue or shows Sensor Missing	The meter's EEPROM is corrupted, or battery/power supply issues.	Email technical support for further assistance.
CO2 Readings are inaccurate	ABC is adjusting the zero point.	Turn off ABC in software or ensure the unit is exposed to 400ppm air while data logging.
	Batteries are low.	Replace/recharge batteries.
	The meter was disturbed mechanically. Meter may need calibration.	Perform a calibration or send to CO2Meter for professional calibration and recertification.

Support

The quickest way to obtain technical support is via email. Please send all support inquires to **support@co2meter.com**.

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 meter comes with a 1YEAR (warranty period) limited manufacturer's warranty, starting from the date the meter 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.

Use of this device in environments above 95% humidity may cause irreparable damage to the components and is not warranted.

Liability

All liability 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.

Returns

If the product fails under normal use during the warranty period, a 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 a RMA number, call us at or email us at (386) 256-4910 support@co2meter.com. When requesting a RMA please provide reason for return and original order number.

If the product fails under normal use in the first 10 days of ownership, at our discretion we will email you a postage-paid UPS label to return the product at our expense.

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

Contact Us

We are here to help!

For information or technical support, please contact us.

✉ support@CO2Meter.com

📞 (386) 256-4910 (Technical Support)
📞 (386) 872-7665 (Sales)

🖥 www.CO2Meter.com

Address:
CO2Meter, Inc.
131 Business Center Drive
Ormond Beach, FL 32174
USA