GasLab® Pro, Multi Gas Sampling Data Logger Operation Overview
## *Inclusive to all CM-1000 Series Data Loggers*

Overview

Thank you for selecting the **CM-1000 Gaslab® Pro, Multi-Gas Sampling Data Logger**. The **CM-1000** series is designed to simultaneously measure from multiple gas concentrations through sampling methods. This device features a Li-ion rechargeable battery which allows for 30+ hours of use. The CM-1000 series data can also be recorded to a micro SD card for further retrieval and analysis. The full color LCD display details each sensors readings as well as graphing the data on the screen. The CM-1000 was designed specifically for fire suppression testing, fumigation, scientific, laboratory and bio incubation applications.

Features:

✔ Options for CO_2 measurement range: 1%, 5%, 10%, 20%, 30%, and 100%
✔ Measures CO_2, CO, O_2, RH, AMB, DP, ALTI
✔ Large LCD Display, for easy reading of gas concentration, temperature, and humidity ✔ Audible alarms
✔ Data logging to SD card
✔ A Built-in LCD back-light for easy readability in the dark
✔ Supplied with Li- ion 18650 3.7V rechargeable batteries, for longer lifespan

(Display Features and Modes)
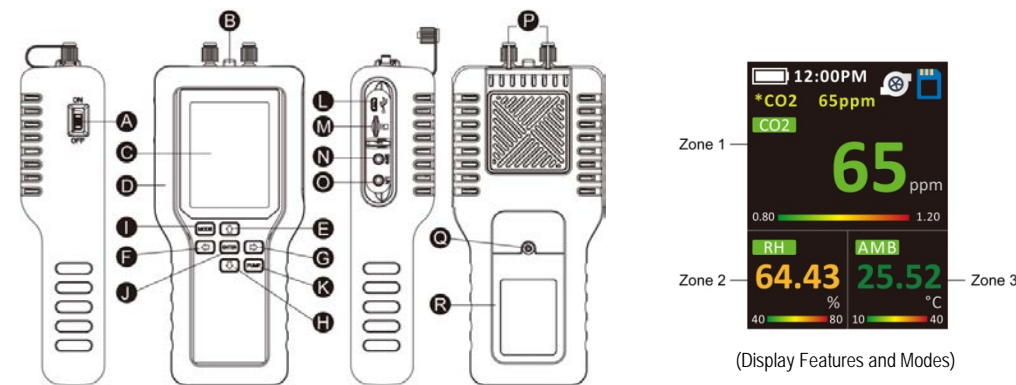
A. Power Switch On/Off
B. Temp/Humidity Sensor
C. LCD Displays Screen
D. Rubber Enclosure
E. Up Key

F. Left Arrow Key
G. Right Arrow Key
H. Down Arrow Key
I. Mode Key
J. Enter Key

K. Pump Key
L. USB Socket
M. SD Card Slot
N. CO2Meter Internal
O. Analog/Voltage
Output - Internal Use

P. Luer Cap
Q. Screw Position
R. Battery Cover

Key description:

MODE (Ⓘ)	Enter the setting menu.
Up (Ⓔ) / Down (Ⓗ) / Left (Ⓕ) / Right (Ⓖ)	Change parameter values or select options.
Enter (Ⓙ)	Execute a command
PUMP (Ⓡ)	Start the pump or data logger

LCD display symbol description:

Symbol	Meaning	Description
CO2	CO_2 concentration, parts per million (ppm)	The current CO_2 concentration
CO	CO concentration, parts per million (ppm)	The current CO concentration
O2	O_2 concentration, % (percent)	The current O_2 concentration
RH	Relative humidity	Relative humidity
AMB	Ambient temperature	Ambient temperature
DP	Dew point	The current dew point
ALTI	Atmospheric pressure	Compensates the pressure changes with appropriate altitude of location when measurements are made

TWA	Time weighted average (8 hours)	CO_2, 8-hr time weighted average
STEL	Short-Term Exposure Limit (15 min. weighted average)	CO_2, 15 min. weighted average
MAX	Maximum value	Maximum value of gas measurement
MIN	Minimum value	Minimum value of gas measurement
0.80 ▬ 1.20	High/low alarm	Customize the range of color Bar
🔋	Battery capacity	Battery capacity without segment display.
12:00PM	Real-time display	12/24-hour time display
❗	Warning	Need to calibrate the sensor or exceed the pump life time.
⚙	Pump	The pump icon rotates to indicate that the pump has been started.
💾	Micro SD card	Micro SD card working status (When the icon flashes, it means that the Micro SD card is broken or full: when the icon remains stationary, it indicates normal operation.)

Operation / Settings Instructions

1. Power on: Switch the Red Power Key (A) **Up** which is located on the left side of the device. To turn off, Switch the Power Key (A) **Down**. This device uses Li-ion rechargeable batteries, which can provide a 30+ day charge.
Please note - when the device is turned off and charged with a USB it cannot be turned off

2. Operation / Custom Settings: After powered on, the device starts to measure/update the data every 3-4 seconds. Before getting started you will need to enter into the settings screen, by holding down Mode Key (I).You will then use your up and down arrow keys to highlight over to the appropriate settings which upon selection will become highlighted in **purple** and can be changed by using the up and down arrow keys, then selecting enter to return back to the main screen.
Please Note, You may wish to navigate to "auto power off" and "back-light time" in the settings screen to change the standard 30s time period to 150 for continued use

1. On the main display you will notice 3 zone squares:
Zone 1 (top display sensor area) Zone 2 (bottom left - RH) and Zone 3 (bottom right - DP/AL/AMB).
2. To select a zone use the Left / Right Arrow Keys to select the parameter or sensor to be adjusted, the zone will highlight in **red**, next you can press the right key (G) to proceed to the setting screen and use Up/Down arrow keys to edit the parameter values or alarm levels.

Zone 1 parameter and settings

| Item	Select 1	Select 2	Select 3	Select 4	Nothing
	MAX	MIN	STEL	TWA	
AL L / AL H	Press Up (Ⓔ) / Down (Ⓗ) key to edit the parameter value.			–	

Note: AL L and AL H are expressed as a percentage. Example: 0.04 = 400ppm

Zone 3 parameter unit selection:

Sensor	Unit 1	Unit 2	Unit 3	Unit 4
DP	DP=°C	DP=°F	–	–
AMB	°C	°F	–	–
ALTI	m	mf	mmHg	hpa

3. Display all sensor readings
Press/hold Enter key (J) to display all sensor readings. Press Mode key (I) return to the main screen.
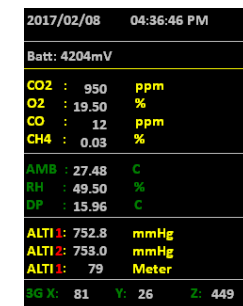
4. Settings
Press/hold Mode key (I) to enter the setup menu, then press Mode key (I) to enter to the next page. Press Up / Down keys to select options or change parameter values. Then press Enter key (J) to confirm it. Press/hold Mode key (I) to return to the main screen.

The first page:

Date	01/01/2017 ~ 2099
Time	12/24-hour time

Continue alarm	Yes (The buzzer sounds continuously.) / No (The buzzer sounds once.)
Screen auto rotate	Yes / No
Backlight level	1~32 (The larger the number, the brighter the screen)
Background color	⬛⬜🟪 (There are a total of 4 background colors.)
Backlight time	10~999 sec (Backlight display time)
Auto power off	1~999 min
Graph line 2	CO_2/ O_2/CO/ (The second trend line shows the gas measurements.)
About	CO2Meter – www.co2meter.com
The second page (2/2)	
Analog for Zone 1	0-10V/4~20mA (Zone 1 voltage or current output)
Analog for 4-20mA	CO_2/O_2/CO/(Another analog output option)
Data log time	Data logging interval time
Flow rate level	1~5 (The larger the number, the greater the pump output)
Exhaust time	10~240 sec
Ventilate time	0~120 sec
Gas compensation	Yes / No (CO_2 and O_2)
Sensor times info	Sensor re-calibrated time and pump life time (The time is displayed in the countdown mode. If you need to calibrate the sensor or exceed the pump life time, the time will be displayed in red.) CO_2: 99999999 days O_2: 99999999 days CO: 99999999 days Pump: 99999999 min
Reset to factory	Yes / No (Recover the factory setting to cancel customize setting.)
Sensor calibration (▲+▼)	Please refer to the calibration section.

5. Power off:
Switch the Power Key (A) off.
Note: When the device is charged with USB, it cannot be turned off.

Data Logging / Interface Instructions

Before Using

1. Verify SD Card is installed in the card slot.
2. Verify the batteries are fully charged before deployment.

Measuring CO2

1. Turn CM-1000 series red power switch "ON".
2. **Remove the caps on the top of the device from Inlet and Outlet ports.**
3. Verify the CM-1000 displays CO2/RH/TEMP on the main screen.

Recording Data

1. Place the CM-1000 Multi-Gas Sampling Data Logger in a suitable location.
2. Connect the included tubing and filters as required to the top ports.
3. To begin logging, press and hold the PUMP button until the SD Card Icon changes color.
   a. When the SD card icon inner square is **green**, the CM-1000 is recording data.
   b. When the SD card icon is **blue**/**green**, the pump will run continuously.
4. To stop logging, press and hold the PUMP button until the SD Card icon changes color.
5. When the SD card is **White** the data is not being recorded.
6. When the SD Card is **White**, the pump will stop after 60 seconds of sampling.
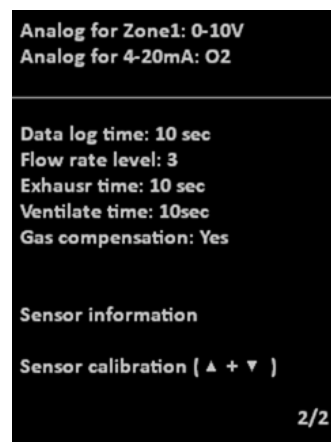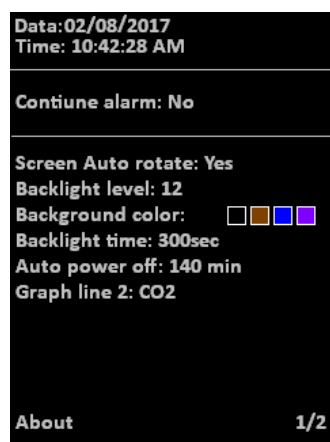
Managing Files

1. The CM-1000 series stores "Log Files" on the removable SD card.
2. At the completion of your tests, remove the SD Card from the CM-1000.
3. Place the SD card into the included card reader or simply place into your PC.
4. Open the Log Files in Excel.
5. You have successfully downloaded and managed the CM-1000 data.

The CM-1000 Multi Gas Series, is designed for user or factory 1-Point field calibration, by using appropriate gas concentrations (100% CO2 Gas).

To enter 1-Point Calibration Mode, please follow the appropriate steps below:

1. Turn on CM-1000 and wait for display to initialize.

2. Press and hold Mode (I) until first menu page appears - confirm the screen shows "**1/2**".

3. Press Mode (I) again, and the second menu page will appear - "**2/2**".

```
Data:02/08/2017
Time: 10:42:28 AM

Contiune alarm: No

Screen Auto rotate: Yes
Backlight level: 12
Background color: ☐ ▨ ▨ ▨
Backlight time: 300sec
Auto power off: 140 min
Graph line 2: CO2

About                    1/2
```

```
Analog for Zone1: 0-10V
Analog for 4-20mA: O2

Data log time: 10 sec
Flow rate level: 3
Exhausr time: 10 sec
Ventilate time: 10sec
Gas compensation: Yes

Sensor information

Sensor calibration ( ▲ + ▼ )

                         2/2
```

4. Press the Down arrow key (H) to scroll until "Sensor Calibration" is highlighted in **Red**.

5. Press the Enter key (J) and "Sensor Calibration" will now be highlighted in **Purple**.

6. Next, simultaneously press and hold both the UP (E) and Down (H) arrow keys at the same time to enter the specific "Sensor Calibration" page.

7. Press the Enter key (J) to highlight "Target Sensor" in **Red**.

```
Sensor calibration
Target Sensor: CO2
 Raw reading: 455
 Offset:              0
 Perform reading:  455
```

8. Press the Down arrow key (H) to scroll through the available sensors, for 100% we will press the down button until "**CO2**" appears.

9. Press Enter key (J) to select the desired target sensor.

10. Next press the Down arrow key (H) to highlight "**Offset**" in **Red**.

11. Connect your inlet port to a source of gas, such as 100% CO2 and wait for readings to stabilize.

12. Press the "Up" or "Down" arrow keys to adjust the "**Perform Reading**" to read 10000.

13. Press and Hold the Enter key (J) to return to the main display screen.

14. The CM-1000 series will not display approximately 99.99%.

15. Remove the 100% CO2 from the Inlet Port.

16. *Congratulations, you have successfully calibrated the CM-1000!*

The CM-1000 Multi Gas Series, can also be designed for user or factory 2-Point field calibration, by using appropriate gas concentrations (100% CO2 Gas and 100% N).

CO2Meter strongly advises that 2 Point Calibration be completed by the manufacturer, by sending your device back to CO2Meter for a nominal calibration fee.

However, should you wish to calibrate using 2-Point Calibration please follow the step-by-step instructions by using the link below,

To enter 2-Point Calibration Mode, please follow the appropriate steps below:

https://cdn.shopify.com/s/files/1/0019/5952/files/CM1000_TwoPointCalibration_CO2Meter.pdf

CM-1000 Product Specifications

Measurement Range & Accuracy	CO_2: 1%, 5%, 10%, 20%, 30%, 100%
	CO: 0~1,000ppm
	O_2: 0~25%, < 2% FS / 0.1 mbar
	RH: 0~100%, ±3% @25°C (20~80%RH), others ±5%
	Temperature: 0~50°C,±1℃
	Barometer: 50~110kPa, ±0.4kPa
Display Resolution	CO_2: 1ppm, 10ppm, or 100ppm
	CO: 1ppm
	O_2: 0.01%
	RH: 0.01%
	Temperature: 0.01°C
	Barometer: 0.1mmHg
Alarm Volume	80db±5%@10cm
Operating Conditions	0~50°C(32~122°F), 0~95%RH, non-condensing
Storage Temp.	-20~60°C(-4~140°F)
Comm. Interface	RS485 ModBus BR19200、N、8、1
Power Supply	Rechargeable Battery : Li-ion 18650 3.7V
	AC Adapter : 5V±5% >1A, 100~240 VAC, 50/60 Hz
Storage Capacity	depend on SD card capacity (max.16G SD card)
Weight	480g (1.05 lbs) - without batteries
Dimensions	225.8x99.6x55 mm (8.9 x 3.9 x 2.2 in.)

CM-1000 Pump Pneumatic Data

Max. Flow	500 ml/min
Max intermittent duty	380 to 400 mbar
Max. continous pressure	150 mbar
Max. restart pressure	150 mbar
Max. vacuum	-360 to -400 mbar
Max. restart vacuum	-150 mbar

Electrical / General Data

Motor type	Standard DC
Rated power	3.5 to 5 V/90 mA
Protection class	IP00
Ambient Temperature	10 to 50°C
Media Temperature	10 to 50°C
Weight	17g (0.03lb)

Note: After power-on, it takes 20 minutes for the device to stabilize and measure the temperature and relative humidity.

⚠ **EMC/RFI:** Readings may be affected if the unit is operated within radio frequency electromagnetic field strength of approximately 3 volts per meter, however the performance of the instrument will not be permanently affected.

Rechargeable Batteries

'Battery OK': Measurements are possible

'Battery Low': The battery needs to be recharged, measurements are still possible

'Battery Exhausted': Measurements are not possible

Battery installation:
This device is supplied with Li-ion 18650 3.7V rechargeable battery *3 pcs.
Please confirm whether batteries + polarity are Li ion18650 positive bump specification and install batteries in the correct polarity. If the battery polarity is reversed, the capacity will be insufficient and the battery life will be shortened.

Battery charging:
During battery charging, the temperature of the device will rise by 5°C~10°C. At this time, the measurements of temperature and humidity will be affected by temperature rise. This could cause an effect on the accuracy of temperature when charging. Please use a fan to blow toward the Temperature & Humidity Sensor (B) directly, in order to gain a compensated balance of temperature and humidity between that of the temperature sensor and surrounding area. (5V/1A USB adapter charger).

Safety and Product Care

To ensure correct and safe device use, please read the User Manual before using the device. Please handle the device lightly, do not subject the device to impact/shock.

1. Do not submerse the device in water, this will cause electric shock, fire or malfunction which may result in damage.

2. Do not keep the device in a hot/humid environment. Keep the device away from heat source or water.

3. Please use a standard USB power supply (such as PC's USB port, universal AC adapter with USB port).

4. **Improper power supply can cause serious damage to the device, or result in injury or death to the user.**

Product Maintenance

1. The maximum capacity of the SD card is 16G. **(This is <u>five years</u> worth of space)**

2. During battery charging, the temperature of the device rises. The temperature and humidity sensors are affected. At this time, measurements are only for reference. After batteries are fully charged and the device cools down, measurements are reliable.

3. **Repair –** Do not attempt to repair the device or modify the circuitry by yourself. Please contact the local manufacturer if the device needs servicing.

4. **Caution –** The CO sensor must be replaced every 3 years.

5. **Cleaning –** Disconnect the power before cleaning. Use a damp cloth, do not use a liquid cleaning agent, such as benzene, thinner or aerosols.

6. **Maintenance** – Recommended that the user conducts a comprehensive test and calibration every year to ensure normal operation of the device.

Support & Warranty

Contact Us: We're here to help!

If the troubleshooting guide above does not help you solve your device issue, or for more information please contact us using the information below:

✉ Support@CO2Meter.com

Sales@CO2Meter.com

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

🌐 www.CO2Meter.com

Click here for CO2Meter, Inc. Terms & Conditions

Package Contents

- CM-1000 Multi Gas Sampling Logger
- Pump and Filter Kit
- Tubing
- Manual
- Li-ion 18650 3.7V rechargeable batteries (3)
- SD Card and Converter
- USB 1.5M cable

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