

User Manual R1.0

CO2Meter, Inc.

Personal Safety CO2 Monitor with Data Logging SAN-11



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INTRODUCTION

Congratulations on your purchase of this CO2Meter SAN-11 Personal CO2 Monitor. CO2Meter SAN-11 is a smart carbon dioxide (CO2) monitor using NDIR technology to provide long term stability. The SAN-11 Personal Safety CO2 Monitor with data logging is designed for employees who work in enclosed areas where carbon dioxide buildup may cause personal harm. It is designed to alert people in the area with excessive carbon dioxide gas. SAN-11 is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

FEATURES

- Audible, visual strobe and vibrating alarms
- Large LCD display
- Rugged design with protective rubber enclosure
- Heavy duty metal clip
- Front facing sensor unit
- Rechargeable Battery 4.2v, 1500mAh
- Micro USB cable and Wall USB charger
- Rechargeable Li-Ion battery – 20+ hours per charge
- Man down alarm - leveraging accelerometer technology
- Dual calibration methods: Ambient Air (300-600ppm) and Nitrogen (0-200ppm)
- Automatic atmospheric pressure compensation for CO2 concentrations
- No over-exposure or negative memory effects
- Stable NDIR sensor for CO2 detection.
- CO2, temperature, relative humidity, barometric pressure, and alarm log data logging with time stamping
- Up to 149,500 time-stamped records in internal memory. Data can be exported via USB
- Has the ability to upgrade firmware online through USB--potential for upgrade after use

MONITOR

1. Visual alarm/strobe
2. Front facing sensor
3. Charging indicator
4. LCD display
5. Power button
6. Temperature units
switching button
7. USB port and charging inlet

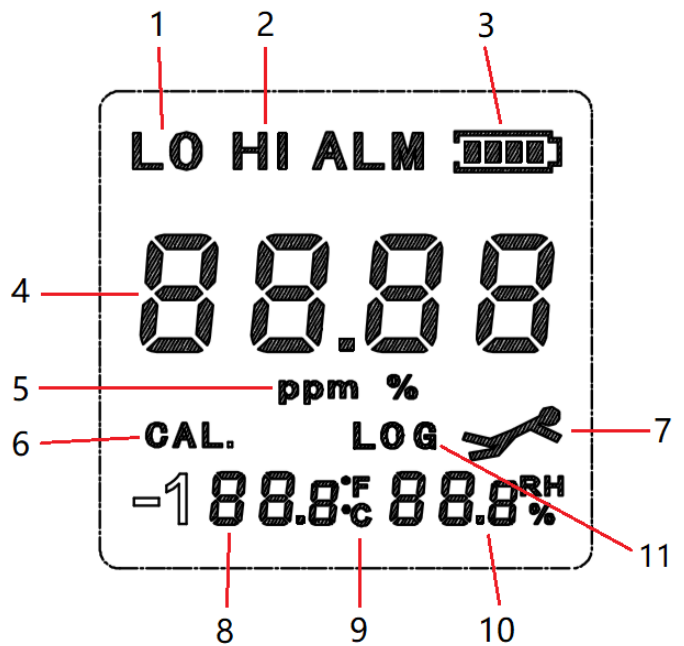
(bottom side)

- 8. Heavy duty metal clip
- 9. Factory reset button





LCD DISPLAY

- 1. Low alarm indicator
- 2. High alarm indicator
- 3. Battery indicator
- 4. CO2 concentration
- 5. CO2 concentration units (ppm or % when >9,999 ppm)
- 6. Calibration icon
- 7. Man down alarm
- 8. Air Temperature
- 9. Temperature unit (Fahrenheit or centigrade degrees)
- 10. % Relative Humidity
- 11. Data logging indicator



OPERATION


1. Power button

- 1) When the Monitor is turned off, press  to turn on the unit.
- 2) When the Monitor is turned on, press  for 3 seconds to turn off the unit.



When the unit is first turned on, it performs 5 seconds countdown for Monitor warm up, then enters normal display with current CO2, temperature, and humidity readings displayed. The monitor starts taking measurements when power on and updates readings every 2 seconds.








2. Temperature Units Switching Button








2.1 Temperature Unit

Press  shortly to switch two temperature units: °F and °C.

2.2 Menu Status

By pressing the temperature unit switching button  for **5** seconds, the unit enters into **Menu status**. There are six menu items by pressing the temperature unit switching button  shortly to loop switching between **AIR**, **N2**, **Hx.x**, **Lx.x**, **A ON/AOFF**, **SC**, **Px**, **Log** and **E** (exit). The menu items are described in the following table.

Menu Items	Functional Description
AIR (“AIR”)	“AIR” means Ambient Air Calibration. User presses the power button  to implement Ambient Air Calibration (300~600ppm).
N2 (“N2”)	“N2” means Nitrogen Calibration. User presses the power button  to implement Nitrogen Calibration (0~200ppm).
H0.5/H0.5T/H1.0/H1.5/H3.0	High Alarm Threshold setup. User presses the power button  to switch the high alarm threshold: H0.5 (5000 ppm), H0.5T (5000 ppm TWA), H1.0 (10000 ppm), H1.5 (15000 ppm), and H3.0 (30000 ppm).
L0.5/L0.5T/L1.0/L1.5/L3.0	Low Alarm Threshold setup. User presses the power button  to switch the low alarm threshold: L0.5 (5000 ppm), L0.5T (5000 ppm TWA), L1.0 (10000 ppm), L1.5 (15000 ppm), and L3.0 (30000 ppm).
A ON/ AOFF (“A ON” / “AOFF”)	Setting Man down alarm function on/off. User presses the power button  to switch “A ON” (allowing Man down alarm) or “AOFF” (prohibiting Man down alarm).
SC (“SC”)	Real time clock setup User presses the power button  to enter the real time clock setup: a. Press button  to switch the time items Year (“4”), Month (“0”), Day (“0”), Hour (“h”), Minute (“i”), Second (“5”) and “E”.

	<p>b. In each time item, press button  to increase the value until the correct time. This value is a cyclic change. Press button  in “E” to save and exit the menu status.</p> <p>For example, setting the year to 2019 by pressing button  in “4”:</p> <p style="text-align: center;">4 0 ⇌ 4 19</p> <p>Setting the month to February by pressing button  in “0”:</p> <p style="text-align: center;">0 2</p> <p>Other similar operations.</p>
Px	<p>Data logging period setup</p> <p>User presses the power button  to switch the data logging period: P30 (30 seconds), P60 (60 seconds), P120 (120 seconds or 2 minutes), P300 (300 seconds or 5 minutes), P600 (600 seconds or 10 minutes) and P900 (900 seconds or 15 minutes).</p>
Log (“L 09”)	<p>Data logging memory operation</p> <p>User presses the power button  to switch the data logging memory operation:</p> <p>EP (Export data logging by USB), RES (Reset the memory), and E (Exit without operation).</p>
E	<p>User presses the power button  to exit the menu status.</p>

3. Alarm Threshold

There are high and low alarm thresholds in SAN-11. Both high and low alarm has five thresholds: 5000 ppm, 5000 ppm TWA, 1.0%, 1.5%, and 3.0%. Obviously, high alarm threshold should not less than low threshold. They can be same alarm level.

The SAN-11 is equipped with audible, visual and vibration alarms to alert users when the ambient oxygen concentration exceeds either of the two factory preset alarm levels:

- **Danger High Alarm:** LED will flash and audible alarm will sound 3x / sec.
- **Warning Low Alarm:** LED will flash and audible alarm will sound 2x / sec.

4. Automatic Atmospheric Pressure Compensation

The CO2 measurement is affected by atmospheric pressure or altitude changing. When users are at high altitude, compensation should be made to assure maximum monitor accuracy.

This device has automatic atmospheric pressure compensation for CO2 concentrations by means of a digital atmospheric pressure sensor integrated in the unit.

5. Man down alarm

Falling by breathing dangerous gases can cause serious injury and even fatality to workers. If the Man down alarm function in SAN-11 is set on, SAN-11 can detect falls and send a man down alert which will activate the audible and visual alarms and alert other people in the area.



The man-down detection uses a three-axis accelerometer to automatically monitor the user's movements in order to identify a sudden fall/impact and a lack of movement for a period of 6 seconds.

Once alert, people can turn off the current man-down alarm by pressing any one of the two buttons.

6. Reset Button

Users can reset the unit by pushing a reset button through a hole on back of shell.



MAINTENANCE

Calibration

The SAN-11 comes pre-calibrated from the factory. However, the O₂ sensor should be calibrated at least once a year, or as described in your company's safety procedures. You can perform the calibration yourself, or you can return it to CO₂Meter for factory calibration at a nominal fee.

The temperature and humidity sensors do not require calibration and should remain accurate for the life of your unit.

Cleaning and Storage

Apply sparingly with a soft cloth and allow drying completely before using. Do not use soap or Alcohol cleaning. Do not use aromatic hydrocarbons or chlorinated solvents for cleaning.

SPECIFICATIONS

Method - Dual Beam NDIR (Non-dispersive-Infrared)

Sample Method – Diffusion

Automatic Background Calibration (ABC): Eliminate

Device Specifications

Operating Environment	32°F~122°F (0°C~50°C), <95% RH non-condensing
Storage	14°F~140°F (-10°C~60°C), <99% RH non-condensing
Power Supply	Li-ion battery (4.2V,1500mAh),Micro USB cable w. Wall USB charger
Dimensions	3.9x2.0x1.7 Inch (98x50x42mm)
Weight	4.76 oz. (135 grams)

Out of range of operating conditions will impact the accurate of CO2 measurement.

CO2 Sensor Specifications

Measurement Range	0~65,530ppm(6.55%Vol) display
Display Resolution	1ppm / 0.01%
Accuracy	±40ppm or ±3% of reading
Repeatability	±20ppm @ 400ppm
Temperature Dependence	Typ. ±0.3% of reading per °C or ±4ppm per °C, whichever is greater, referenced to 25 °C
Pressure Dependence	0.13% of reading per mmHg
Response Time	About 2 min for 90% of step change
Warm-up Time	<5 seconds at 22°C
Measurement interval	2 seconds

Temperature Sensor Specifications

Temperature Range	14~140°F (-10.0~60.0°C) display
Display Resolution	0.1°F (0.1°C)
Display Options	°F/°C switchable
Accuracy	±0.9°F (±0.5°C)
Response Time	5~30 seconds (device must equilibrate with environment)

Relative Humidity Sensor Specifications

Measurement Range	0.0~99.9%RH
Display Resolution	1%RH
Accuracy	±4.5%RH
Response Time	<8 seconds for 63% of step change

TROUBLESHOOTING

Symptom / Issue	Possible Cause / Resolution
Cannot power on	Press the Power Button for more than 5 seconds
	Check that the Li-ion battery is charged
	If monitor is charged but will not turn on, contact support
Monitor is not recognized by computer or software	Verify that software and drivers are installed correctly before attaching monitor to PC.
	Verify the software and drivers were installed before the monitor was plugged into the PC with the USB cable.
	Verify that the ftd2xx.dll file is in the same folder as the executable program.
	Try using a different USB cable.
Windows reports "unknown device" error	Go to CO2Meter.com, select the App Notes tab, and follow the instructions for AN153: Troubleshooting Software Driver Installation (PDF) .
Slow response	The log file stored in the monitor is very large. The monitor needs time to transfer data to your computer.
Readings do not change	Confirm the monitor is correctly connected to the computer. Make sure the computer recognizes your monitor and connects with your monitor successfully.

SUPPORT

The quickest way to obtain technical support is via email. Please send all support inquiries 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.

For more information visit our website: www.co2meter.com/pages/terms-conditions

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.

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 (386) 256-4910 or email us at support@co2meter.com. When requesting a RMA please provide reason for return and the original order number.

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.


[For additional warranty information visit our website: www.CO2Meter.com/pages/faq](http://www.CO2Meter.com/pages/faq)


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)

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