



Innovair™ CD100M

Hand Held CO₂ and Temperature Monitor
User Manual

Introduction

The sensor is an easy-to-use hand-held CO₂/Temperature monitor. The unit provides stable, highly accurate readings due to our patented dual beam NDIR technology. Equipped with a 0-4V output, the unit is perfect for long-term monitoring/recording.

The unit features a large, easy-to-read display with a push-button interface which allows for easy calibration, quick adjustments for altitude correction, and simple toggling between °C and °F temperature readings.



Features

1. Lightweight- Made of ABS Plastic. This durable, lightweight plastic adds protection while weighing less than one pound.
2. Display - The large display allows for CO₂ and Temperature readings at a glance. The display also allows for adjustments to mode settings using the push button interface.
3. Soft Touch- Attractive, gives comfort and extra durability.
4. Up/Down - Used to increase or decrease values while in the edit mode.
5. Mode - Toggles between the menu options.
6. Power - Turns the power on and off.
7. Enter - When toggling between menu options, the Enter button will select desired menu option for editing (e.g. Altitude settings). After changes have been made, the Enter key will also confirm settings and return to the main menu.
8. Calibration Port - Used for gas connection during calibration.
9. Calibration Activation Switch - Located in the battery compartment, this switch is used for activating the calibration process for CO₂ or Temperature.
10. Voltage Output- The sensor is equipped with an output for datalogging.
11. Built-in Kickstand- For continuous monitoring. The built-in kickstand simply swings out from the base to support the monitor in an upright position.
12. Power Connection - For connecting the supplied 6V power adapter.
13. Battery Compartment - 4 AA Batteries are required for portable operation.
14. Battery Cover

Display

Listed below are the modes of operation visible on the display and accessible through the on-board buttons.

Warm-Up Mode - When the power button is pressed, the monitor enters a one minute warm-up indicated by the word WARM-UP in the upper left corner.

Normal Operating Mode - After warm-up the sensor will stabilize and display current conditions.

Elevation Settings Mode - This feature allows the user to correct the monitor for elevation changes.

Calibration Settings Mode - Allows user to set the CO₂ concentration or Temperature when performing a calibration.

Calibration in Prog Mode - Displays when calibration is in progress.

Low Battery - Displays when the power source is low.

Start-Up

Battery Operation - For portable use, the monitor operates on 4 AA batteries. Expected battery life is as follows:

Normal (Non-Alkaline)...Up to 50 hours

Rechargeable.....Up to 60 Hours

Industrial Alkaline ...Up to 70 Hours

If the monitor will be used frequently, we recommend rechargeable batteries. The initial investment may seem costly but may quickly pay for itself.

Battery Installation - Remove the battery cover (located on the back) by pressing the pressure clip (located on the bottom near the kickstand) and pull upward.

Follow the battery diagram imprinted on the plastic on the back cover for proper installation. Replace battery cover when battery installation is complete.

Low Battery - Depending on the battery, a warning signal will flash (indicated by the blinking Low Battery LCD) when there is less than 30 minutes of battery life. At this point the batteries should be replaced or the AC adapter should be used as a substitute. If operation continues, the unit will become inoperable and only the Low Battery will be blink on the LCD display.

AC Power - The sensor is shipped with a 6V DC 500mA AC/DC adapter.

When possible, we suggest using the power adapter to guarantee continuous power during long term monitoring or datalogging operation.

To use the AC adapter, connect the plug into the back of the unit and plug the transformer into any standard wall outlet.

NOTE

Use the supplied adapter. Using the wrong adapter may cause damage to the unit.

If power is lost during operation, battery operation will not function as a back up.



Operation

Power-Up

1. Press the Power Button.
2. A 2 second delay will occur before the display becomes visible.
3. 10 seconds will elapse before current CO₂ readings are displayed.
4. "Warm-up" will display for approximately one minute. During this one minute warm-up, adjustments can not be made to the sensor.

Elevation Correction - The sensor is shipped with the elevation setting set at "zero" or sea level. The sensor, like any other gas measuring device is directly affected by altitude changes. If you are at an altitude greater than 500 feet, an adjustment should be made to assure sensor accuracy. To change the default setting using Elevation Correction follow the steps below.

1. While in Normal Mode press the "Mode" button once. The Elevation LCD will begin blinking.
2. Press Enter.
3. Press mode to toggle the elevation reading between feet (ft) and meters (m)
4. Use the Up/Down button to adjust the altitude. The altitude can be adjusted in increments of 500 (feet) or 100 (meters). Once the correct altitude is set, press Enter to lock the setting and return to normal mode.

Display in Fahrenheit or Celsius - To change the temperature to read in Celsius or Fahrenheit, or to turn the temperature display off, use the Up or the Down button.

Stand-alone Monitoring - Once the batteries have been installed and the Elevation correction has been made (as described in the steps above), the sensor will begin to accurately display current room conditions.

Kickstand - The sensor is equipped with a kickstand located on the base of the unit. For desktop monitoring, pull the kickstand out to prop the unit on an angle.

Monitoring using an External Datalogger - Voltage outputs for both CO₂ and temperature are available via an RJ-45 jack on the rear of the unit.

Calibration (CO₂)

1. The calibration procedure will last approximately 5 minutes. Before performing the calibration procedure, remove the battery cover (see "Battery Installation") to provide access to the CO₂ calibration activation switch. Connect the supplied AC adapter to the back of the sensor. If you do not have the AC adapter, new batteries should be used.
2. Power up the sensor and wait for the Warm-up to end.
3. Next verify the Elevation correction has been set. Refer to the steps in Elevation Correction for procedure.
4. Once the Elevation is verified, press the Mode button twice. The Calibration mode will begin blinking.
5. Press Enter.
6. Use the Up/Down Rocker button to adjust the lower reading on the display to the current ambient conditions. Pressing the button once will change the readings in increments of 10 ppm. To increase the speed, press and hold the button.

NOTE

For best accuracy, a reference or known concentration of CO₂ should be used when adjusting the reading.

7. Next, on the backside of the unit locate the push button switch (under the battery cover, in the small round hole to the right of the connector jack), use a small pointed object to depress and hold the switch for 5 seconds. The Calibration light will begin to blink.
8. Press Enter.
9. Calibration In Progress will begin to blink. At this point the unit will program itself based on the CO₂ value that was input in Step 6. The calibration process will take approximately 5 minutes.

When Calibration is complete, the display will return to the steady Calibration mode. Press Enter to return to the normal operation mode.

Temperature Adjustment

Use this procedure to adjust the temperature output when, for example, you wish to have the temperature output match a reference sensor. The accuracy of a field adjustment is dependent upon the stability of the environment in which the procedure is performed, and upon the accuracy of the reference sensor.

1. Before performing the temperature adjustment, connect the supplied AC adapter to the back of the sensor. If you do not have the AC adapter, new batteries should be used.
2. Power up the sensor and, using the kickstand, place it on a flat surface in a stable environment relatively free of drafts or temperature changes. Wait 30 minutes for the unit to fully equilibrate with the environment. Do not hold the unit in your hand during this period.
3. Press the Mode button three times. The word "TEMPERATURE" at the bottom of the display will begin blinking.
4. Press Enter. Both the word "TEMPERATURE" and the numeric temperature display will begin blinking in unison.
5. Use the Up/Down Rocker button to adjust the temperature reading to match the reference.
6. Press Enter. The temperature offset is immediately adjusted, the blinking stops, and the unit is now in normal operating mode.

Specifications

Method

Dual Beam Absorption Infrared™

Sample Method

Diffusion or flow through (50 - 100 ml/min)

Warranty

18 months parts and labor

Performance

CO₂ Channel Measurement Range

0-4,000 ppm voltage output
0-10,000 ppm display

Sensitivity

± 1 ppm

Accuracy

±50 ppm or ±5% of reading, whichever is greater

Repeatability

±20 ppm

Temperature Dependence

±0.1% of reading per °C or ±2 ppm per °C, whichever is greater, referenced to 25°C

Pressure Dependence:

0.13% of reading per mm Hg (Corrected via user input for elevation)

Annual Drift

± 20 ppm typical

Response Time

<60 seconds for 0..90% of step change

Warm-Up Time

<60 seconds at 22°C

Operating Conditions

32-122°F (0-50°C)
0-95% RH, non-condensing

Storage Temperatures

-40 to 140°F (-40 to 60°C)

Calibration Interval

12 months, offset adjustment using single gas at 0-1000 ppm CO₂. Full factory calibration available

Temperature Channel

Temperature Range

Voltage output 32 to 104°F (0 to 40°C)
Display 32 to 122°F (0 to 50°C)

Calibration Interval

12 months, offset adjustment using temperature standard at 50 to 86°F (10 to 30°C). Full factory calibration available

Display Resolution

0.1°F (0.1°C)

Display Options

°F, °C, or Off. Set with panel button.

Accuracy

±2°F (±1°C)

Response Time

20-30 minutes (case must equilibrate with environment)

Output - Analog

CO₂

0-4 VDC, 1mV/ppm (4,000 ppm max)

Temperature

0-4 VDC linear, 32-104°F (0-40°C)

Output Impedance

100 Ohms

Wiring Connection

Via RJ-45 to DB9 serial port cable

Display

LCD with independent CO₂/temperature readings (panel buttons set elevation, °F/°C, calibration functions)

Power Supply

Battery Type

Four AA batteries, not included

Battery Operation

80 hours (alkaline)

External

6 VDC from external AC/DC adapter, included

Power Requirements

100 mA Peak, 20 mA average from 6V

Certification

FCC Class 15 Part B

Note

Specifications subject to change without notice. Covered by United States Patents: 5,060,508 and 5,163,332

Warranty

System Sensor warrants its enclosed sensor to be free from defects in materials and workmanship under normal use and service for a period of 18 months from date of purchase by the original owner. System Sensor makes no other express warranty for this sensor. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the repair or replacement of any part of the sensor which is found to be defective in materials or workmanship under normal use and service during the 18 month period commencing with the date of purchase by the original owner. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: System Sensor, Warranty Service, RA# _____, 3825 Ohio Avenue, St. Charles, IL 60174. Please include a note describing the malfunction and suspected cause of failure. The company shall not be obligated to repair or replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights, and you may also have other rights which may vary from state to state.

P/N 62507B
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System Sensor

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Featuring
TELAIRE®
TECHNOLOGY

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