

Start up

Battery Operation- For portable use, the monitor will operate up to 70 hours on 4 AA industrial alkaline batteries. The batteries can be installed by removing the battery cover and following the diagram imprinted on the back plastic cover.

LOW BATT flashes 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 BATT** will be blink on the LCD display.

AC Power Operation - The sensor is shipped with a 6V DC 500mA AC/DC adapter. To use the adapter, connect the plug into the back of the unit and plug the transformer into any standard wall outlet.

NOTE Use the supplied adapter. The wrong adapter may cause damage to the unit. Battery operation will not function as a back up during a power loss.

Power-Up

- 1. Press the Power Button and a 2 second delay will occur before the display becomes visible.
- 2. 10 seconds will elapse before displaying current CO2 readings
- 3. **WARM-UP** will display for approximately 1 minute. During this time, adjustments can not be made to the sensor.

Display Features and Modes

WARM-UP - indicates a 1 minute warm-up

ON LINE - Displays when a PC is communicating to the sensor via RJ45 port.

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

Adjustment Modes

Pressing the **mode** button scrolls through the adjustment modes. Once the desired mode is displayed, press Enter to make adjustments. Press Enter again to save and leave the adjustment mode.

- ELEVATION** - Used to compensate for elevation changes.
- CALIBRATION** - Used when calibrating.
- TEMPERATURE** - For Temperature calibration
- OUTSIDE** - To Manually input CO2 levels for the CFM ventilation rate
- CALIBRATION IN PROGRESS** - Displays during calibration

Display Features

CO2 Readings (Upper Display) - Remain visible at all times.

Temperature and Ventilation Rates (Lower Display)

The Up/Down arrows allow you to toggle through the Temperature and Ventilation modes. When pressing the up arrow, the display will go through the following sequence:

Temp°C > Temp°F > Vent Rate l/p/s > Vent Rate cfm/p > Blank

US Standard to Metric Conversion

The Temperature, Ventilation rates and Elevation Readings can be viewed in US Standard or Metric readings. The Temperature is converted from Fahrenheit (°F) to Celsius (°C), the Ventilation Rates are converted from Cubic Feet Per Minute Per Person (cfm/p) to Liters Per Second (l/p/s) and the Feet (ft) to Meters (m).

Operation

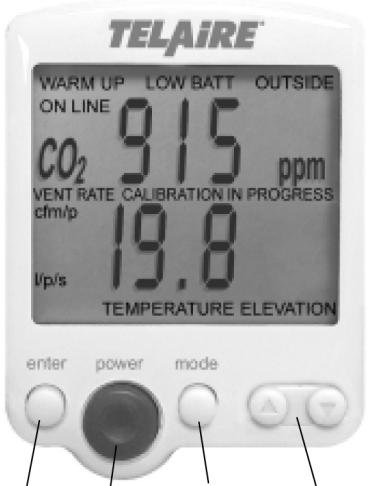
Elevation Correction - The sensor, like any other gas measuring device is affected by altitude changes. The sensor is shipped with the elevation setting set at “zero” or sea level. If you are at an altitude greater than 500 feet, an adjustment should be made to assure maximum sensor accuracy. Once the elevation correction is set it will be stored and saved in the monitor memory. To change the default setting follow the steps below.

- 1. Press the **Mode** button until **ELEVATION** begins to blink.
- 2. Press **Enter**.
- 3. Press **Mode** to toggle the elevation reading between feet(ft) & meters(m).
- 4. Use the **Up/Down** button to adjust the altitude in increments of 500(ft) or 100(m). Once the correct altitude is set, press **Enter** to save the setting and return to normal mode.

Temperature or CFM/Person – The lower display will cycle through the following units when the **Up/Down** button is pressed: Temp°F, Temp°C, CFM, turn lower display off.

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

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



Enter Button Power Button Mode Button Up/Down Button
This drawing is for reference to identify the location of the different modes and adjustment features. The display won't display all features simultaneously (as shown).

7001
Carbon Dioxide and Temperature Monitor



Features

- 1. Display
- 2. Enter Button
- 3. Power Button
- 4. Up/Down Button
- 5. Batter Compartment
- 6. Adapter Connection
- 7. RJ-45 Connection
- 8. Cal Button (under cover)
- 9. Gas Connection
- 10. Kickstand

The Telaire® 7001 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.

62292-006 05/12/2004

Ventilation Rate (cfm/p)

Overview - Press the **up/down** button until cfm/p is displayed. This value represents how much outside air is being introduced on a CFM per person basis. The reading is derived from calculating the outside air ventilation rate to a space based on the inside/outside CO2 differential readings. Current codes/standards generally require 15 to 20 CFM/ Person to be delivered to most spaces to ensure acceptable air quality. Low values indicate low ventilation rates and potentially poor air quality. High levels can indicate excessive ventilation and potential excessive energy usage. To obtain accurate measurements, readings should be taken 2 to 3 hours after occupancy has stabilized in a space or at a peak in daily CO2 concentrations.

Adjusting the Outside CO2 Concentration

The sensor is factory set to assume an outside level of 400 ppm, which should be close to the outside concentration in most areas. The outside level of CO2 can also be changed by measuring outside levels or by manually adjusting the monitor.

- 1. Power up outside and wait for CO2 levels to stabilize (approx 5 min).
- 2. Save the reading by holding the **Enter** button on the sensor for 5 secs.
- 3. This value is used to calculate the ventilation rate based on the differential of the measured outside value and into measured inside concentration.

Manual Input of Outside Concentration

The monitor is factory set at 400 PPM. To adjust the factory setting (for the cfm/person calculation) or to verify the current setting follow steps below:

- 1. Press the mode button until **CO2** and **ppm** flash.
- 2. Press the enter button and the current outside value will display.
- 3. Use the **Up/Down** button to increase/decrease the CO2 value.
- 4. Press enter to save and store the value in the monitor.

Calibration (CO2)

IMPORTANT - The sensor has been factory calibrated and should need calibration once every 12 months using either a zero concentration gas or a gas with a specified concentration of CO2. For the most accurate field calibration we recommend purchasing a Telaire calibration kit (P/N 2075).

Sensor drift usually occurs at the zero reference point. The manual calibration process allows the user to perform a one point calibration based on ambient levels or by flowing a gas of a known concentration through the sensor. This process will adjust the zero offset of the sensor and will provide an accurate calibration. If a two point calibration is required the Calibration kit should be used. For manual calibration, follow the steps below.

- 1. The calibration procedure will last approximately 15 minutes. Before performing the calibration procedure, remove the battery cover to

- access the calibration activation switch. Connect the supplied AC adapter to the back of the sensor or ensure new batteries are installed.
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. If you are calibrating to ambient conditions make sure the sensor is displaying a stable reading - avoid breathing in the area of the monitor. If you are flowing gas to the calibration port of the sensor, allow the gas to flow for at least 10 minutes before initiating calibration.
 5. Press the **Mode** button twice. The Calibration mode will begin blinking.
 5. Press **Enter**.
 6. Use the **Up/Down** button to adjust reading to the current ambient conditions or concentration of the gas being used. 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. Bottled nitrogen can be used to provide a zero concentration gas.

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. **CALIBRATION** 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 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. 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 place in a stable environment, 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. Press the mode button until the blinking word **TEMPERATURE** appears.
4. Press **Enter**. Both the word **TEMPERATURE** and the numeric temperature display will begin blinking in unison.
5. Use the **Up/Down** 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.

Accessories

CO2View™ Real-Time Graphing/Calibration Software 2080
Allows the 7001 to log directly to a Windows™ compatible PC and graph concentrations in real time (includes RS232 cable). Includes an interface that allows the user to perform a zero and span calibration on the sensor.

Hobo® Data-Logger Kit CO2 – Temp & RH 2077
Small data-logger that mounts to the back of the 7001. Records CO2, Temp, and Relative Humidity. Stores over 7900 data points and samples at a user adjustable time interval. Graphing software included.

2070 Datalogging Cable
Connects the 7001 to 3rd party devices. Includes two leads for the CO2 and temperature outputs.

Calibration Kit 2075
Comes with necessary equipment to perform zero calibration.

Warranty

This Telaire product has been examined and tested for proper operation. Please operate this product only in accordance with the instructions.

Telaire warrants this product against defects in workmanship and materials for a period of 18 months from the date of purchase by the original owner. If the product should become defective within this warranty period we will repair or exchange it. A return authorization number must be obtained from the factory prior to returning equipment. Items received without a return authorization number will be refused. Product to be serviced under this warranty should be sent to Telaire, 6860 Cortona Dr, Suite B, Goleta, CA 93117. Shipment must be prepaid, properly packed and insured.

Telaire is not and will not be liable for any consequential loss or damages that may occur by reason of purchase and use of this product. The responsibility of Telaire, in any event, is strictly limited to the replacement/repair of the product.

Telaire seeks to present reliable information concerning the composition, properties and use of its products, however; (1) All advice concerning selection and use of any product is provided at no charge and with no warranty. (2) No warranty is made hereby. Products described herein are warranted to conform to Telaire specifications only at the time of sale. All sales are subject to Telaire standard terms and conditions, which are reproduced on the reverse side of each invoice. All warranties of merchantability and fitness of purpose are disclaimed and remedy for any breach of warranty is limited to replacement of the defective product. (3) Telaire assumes no responsibility for any patent liability arising from the use of any product in a process, manner or formula not designed by Telaire.

Specifications

Method
Dual Beam Absorption Infrared™

Display - LCD
Independent CO2 and Temperature readings.
Calculates and Displays Ventilation Rates

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

Performance - CO2 Channel

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

Display Resolution
± 1 ppm

Accuracy
±50 ppm or ±5% of reading up to 5,000 PPM (Above 5,000 PPM not specified)

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)

Response Time
<60 seconds for 90% of step change

Warm-Up Time
<60 seconds at 22°C

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

Performance - Temperature Channel

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

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)

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

Outputs

(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

(Digital)
RS232 for use with Telaire® CO2View™ Graphing Software

(Wiring Connection)
One RJ-45 Connector
Dual Analog output plus digital output

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

General

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

Storage Temperatures
-4 to 140°F (-20 to 60°C)

Certifications
FCC Class 15 Part B
CE

Warranty
18 months parts and labor

This product is covered by one or more of the following patents:
5,650,624 / 5,721,430 / 5,444,249 / 5,747,808 / 5,834,777 / 5,163,332 / 5,340,986 / 5,502,308 / 6,344,798 / 6,023,069 / 5,370,114 / 5,601,079 / 5,691,704 / 5,767,776 / 5,966,077 / 6,107,925 / 5,798,700 / 5,945,924 / 5,592,147 / 6,255,653 / 6,250,133 / 6,285,290