

## Introduction

The Telaire® 7001 is an easy-to-use handheld CO<sub>2</sub>/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 CO<sub>2</sub> 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 Button** - Used to increase or decrease values while in the edit mode.
- 5. Mode Button** - Toggles between 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 CO<sub>2</sub> or Temperature.
- 10. Voltage Output**- The sensor is equipped with an output for datalogging. (see accessories).
- 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 is 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 CO<sub>2</sub> 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

**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.

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 CO<sub>2</sub> 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 CO<sub>2</sub> and temperature are available via an RJ-45 jack on the rear of the unit.

## Calibration (CO<sub>2</sub>)

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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 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)

#### 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

### 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 (accessory cable 2070 or 2071)

### Output - Digital

#### 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

48 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

#### Accessories

2070 Datalogging cable for analog output

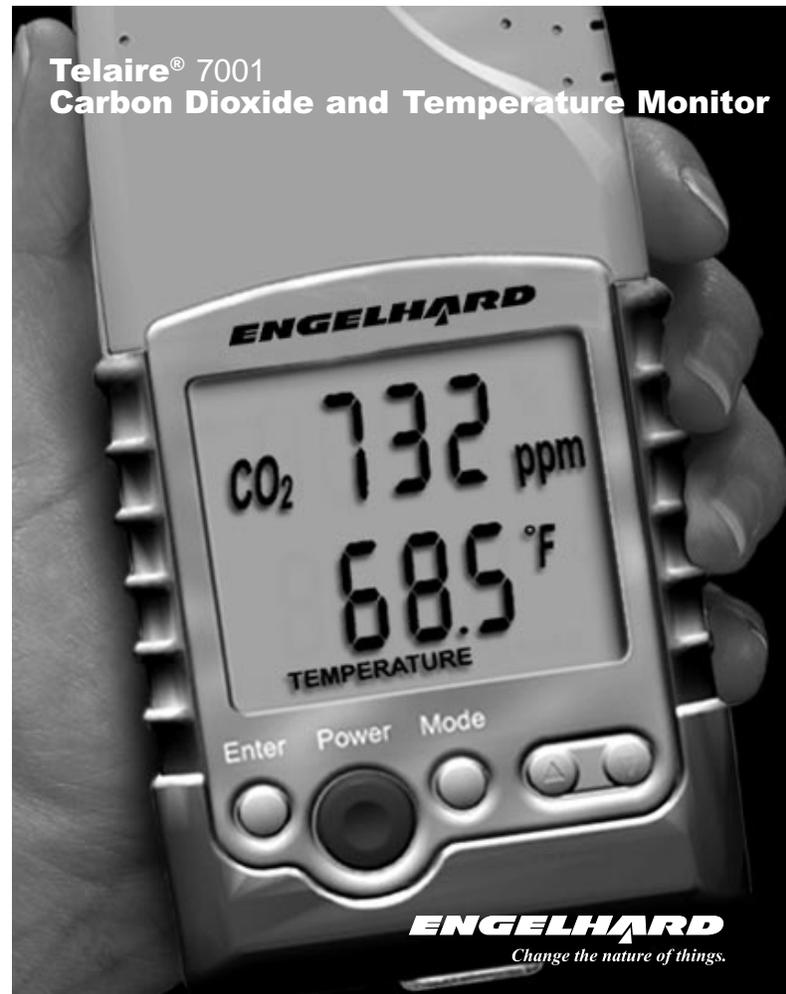
2071 Datalogging cable Recordaire®

2075 Calibration kit

1058 Recordaire® datalogger, 4-channel

1058GSW VG Graphing software

All specifications and instructions subject to change without notice. Protected by United States Patents - 5,060,508 and 5,163,332.



## Warranty

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

Engelhard 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 Engelhard, 6489 Calle Real, Goleta, CA 93117. Shipment must be prepaid, properly packed and insured.

Engelhard 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 Engel-

hard, in any event, is strictly limited to the replacement/repair of the product.

Engelhard 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 Engelhard's specifications only at the time of sale. All sales are subject to Engelhard's 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) Engelhard assumes no responsibility for any patent liability arising from the use of any product in a process, manner or formula not designed by Engelhard.