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Find the *Amphenol Advanced Sensors / Telaire T7001D* at our website: *Click HERE*

Introduction

The Telaire® 7001 CO_2/Temperature monitor (shown in Figure 1 below) is an easy to use hand-held instrument, which provides stable and highly accurate readings due to Telaire patented dual beam NDIR technology. The monitor, equipped with a 0-4 V output, is ideal for long-term monitoring and recording.

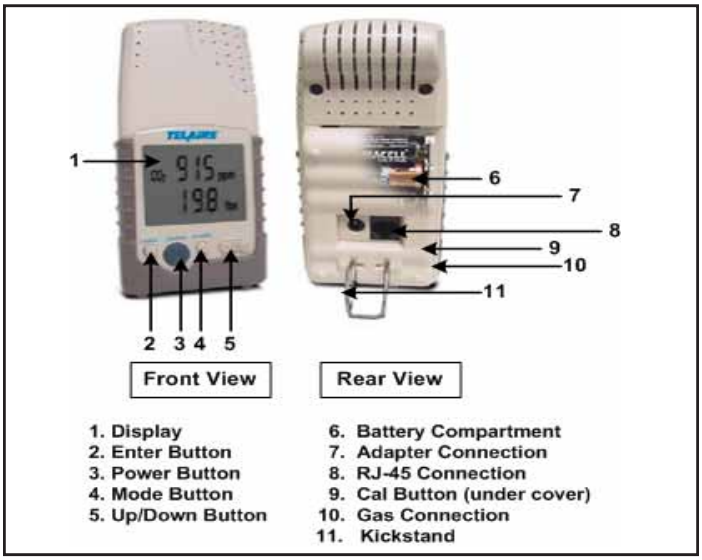


Figure 1: Telaire 7001 CO_2/Temperature Monitor

Startup Procedure

The following procedures describe Battery Operation, Low Battery and AC Power Operation.

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 cover from the battery compartment and following the diagram displayed on the back of the monitor (see Rear View in Figure 1 above).

Low Battery

The low battery signal flashes when less than 30 minutes of battery life remains. At this point, the batteries should be replaced or the AC adapter should be used as a substitute. If ordinary operation continues, the monitor will become inoperable and only the LOW BATT signal will display on the LCD.

AC Power Operation

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

Note: *It is important to use the adapter supplied with the Telaire 7001. Using the wrong adapter may cause damage to the monitor. Also, the battery operation will not function as a backup during a power loss.*

Power-Up Procedure

To power-up the monitor, do as follows:

1. Press the Power Button and a 2 second delay will occur before the display becomes visible.
2. A duration of 10 seconds will elapse before displaying the current CO_2 readings.
3. WARM-UP will display for approximately 1 minute. During this time, adjustments cannot be made to the sensor.

Display Features and Modes

- WARM-UP - Indicates a 1 minute warm-up
- ON LINE - Indicate when a PC is communicating to the sensor via RJ45 port
- Normal Operating Mode - After warm-up the sensor will stabilize and display the current conditions

Adjustment Modes

By pressing the mode button, you can scroll 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. The following are the adjustment modes:

- ELEVATION - Used to compensate for elevation changes.
- CALIBRATION - Used when calibrating.
- TEMPERATURE -Used for temperature calibration
- OUTSIDE - To manually input CO_2 levels for the CFM ventilation rate.
- CALIBRATION IN PROGRESS - Displays during calibration.

Display Features

- CO_2 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).

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CO_2/Temperature Monitor Operation

Before using the Telaire 7001 monitor, it is important to make the elevation correction outlined below.

Elevation Correction

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

To change the default setting, do as follows:

1. Press the Mode button until ELEVATION begins to blink.
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 in increments of 500 feet or 100 meters. Once the correct altitude is set, press Enter to save the setting and return to normal mode.



This drawing is for reference to identify the location of the different modes and adjustment features. The display will not display all features simultaneously, as shown.

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 the elevation correction has been made, as described above, the sensor will begin to accurately display current room conditions.

Using an External Datalogger

Voltage output for both CO_2 and temperature are available via an RJ-45 jack located on the rear of the unit.

Ventilation Rate (cfm/p)

The ventilation rate is defined as the value that represents how much outside air is being introduced on a CFM per person basis.

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 CO_2 differential readings.

The 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 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 CO_2 concentrations.

Adjusting the Outside CO_2 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 CO_2 can be changed by measuring outside levels or by manually adjusting the monitor, using the following procedure:

1. Power up outside and wait for CO_2 levels to stabilize (approx. 5 min).
2. Save the reading by holding the Enter button on the sensor for 5 seconds.
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 the steps below:

1. Press the Mode button until CO_2 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 CO_2 value.
4. Press Enter to save and store the value in the monitor.

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Calibration (CO_2)

IMPORTANT: *The sensor has been factory calibrated and should be recalibrated once every 12 months, using either a zero concentration gas or a gas with a specified concentration of CO_2. For the most accurate field calibration Amphenol Advanced Sensors recommends purchasing a Telaire calibration kit, PN 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. To calibrate manually, complete the following steps:

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. Verify the elevation correction has been set. Refer to the procedure outlined in "*Elevation Correction*" on page 2.
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.
6. Press Enter.
7. Use the Up/Down button to adjust reading to the current ambient conditions or concentration for 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 CO_2 should be used when adjusting the reading. Bottled nitrogen can be used to provide a zero concentration gas.*

8. Locate the push button on the back side of the unit (under the battery cover, in the small round hole to the right of the connector jack). Using a small pointed object, depress and hold the switch for 5 seconds. CALIBRATION will begin to blink.
9. Press Enter.
10. Calibration in Progress will begin to blink. At this point the unit will program itself based on the CO_2 value that was entered in step 7 above. The calibration process will take approximately 5 minutes.
11. When the calibration is completed, 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.

Adjust the temperature output as follows:

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 stabilized in the operating environment. Do not hold the unit in your hand during this period. Press the mode button until the blinking word TEMPERATURE appears.
3. Press Enter. Both the word TEMPERATURE and the numeric temperature display will begin blinking in unison.
4. Use the Up/Down button to adjust the temperature reading to match the reference.
5. Press Enter. The temperature offset is immediately adjusted, the blinking stops, and the unit is now in normal operating mode.

Accessories

The following accessories are provided with the Telaire 7001 CO_2 / Temperature Monitor:

1. CO_2View™ Real-Time Graphing/Calibration Software 2080 - This software allows the Telaire 7001 Monitor to log directly to a Windows compatible PC and graph concentrations in real time (includes RS232 cable). The software also includes an interface that allows the user to perform a zero and span calibration on the sensor.
2. HOBO® Data-Logger Kit CO_2 - Temp & RH 2077 - This is a small datalogger which is mounted on the back of the monitor. It records CO_2, Temp, and Relative Humidity. It has the capacity of storing over 7,900 data points and samples at a user adjustable time interval. It also includes the graphing software.
3. 2070 Datalogging Cable - This cable connects the monitor to a third party devices. It includes two leads for the CO_2 and temperature outputs.
4. Calibration Kit 2075 - This kit includes the necessary equipment to perform zero calibration.

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Specifications

The Telaire 7001 Monitor meets all the specifications listed below.

Method
Dual Beam Absorption Infrared™

Display - LCD
- Independent CO_2 and temperature readings.
- Calculates and displays ventilation rates

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

Performance - CO_2 Channel

Measurement Range:
- 0 -10,000 ppm display
- 0 - 4,000 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 CO_2. 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) CO_2
0-4 VDC, 1 mV/ppm (4,000 ppm max)

Temperature
0 - 4 VDC linear, 32 to 104°F (0 to 40°C)

Output Impedance
100 Ohms

(Digital)
RS232 for use with Telaire®CO_2View™ 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 6 V

General

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

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

Certifications:
- FCC Class 15 Part B
- CE

Warranty
18 months parts and labor

Warranty Repairs

Amphenol Thermometrics, Inc. will repair Telaire product that fails to meet the terms provided for in the Return and Warranty Policy Statement (*See*, www.amphenol-sensors.com).Warranty period shall start from date of manufacture and be based on product category and type of equipment as specified in Table 1: Product Warranty Periods. For all warranty repairs, Amphenol Thermometrics, Inc. will bear all product repair parts, labor, and standard ground shipping charges.

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

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