IAQ Monitor
&
Datalogging
IAQ Monitor

800048 & 800049
Instruction Manual

SPER
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Environmental Measurement Instruments

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INTRODUCTION

Poor air quality may cause fatigue, loss of concentration, and illnesses such as Sick Building Syndrome. Sper Scientific Indoor Air Quality (IAQ) monitors are ideal for crowded indoor public spaces with potentially high levels of carbon dioxide (CO_2) such as offices, factories, classrooms, hospitals, and hotels.

Automatic Baseline Calibration (ABC) and maintenance free NDIR (non-dispersive infrared) CO_2 sensor ensure long-term accuracy, stability and reliability. The large display continually monitors air temperature, relative humidity (RH), and CO_2. Visual alarms alert the user when CO_2 exceeds customized maximum levels.

These instruments feature automatic baseline calibration (ABC). They will stand on a desk top or can be mounted on a wall. An AC adapter is included.

Datalogging Model 800049 can record up to 32,000 data points. A USB cable and datalogging software are included for downloading readings.

FEATURES

• Monitors CO2, RH, and Air Temperature
• Large LCD display
• Easy-to-understand icons indicate air quality levels
• Stable and accurate NDIR sensor
• Minimum and Maximum Readings
• Visual Alarms
• Automatic baseline calibration
• Desktop or wall mount capability

MATERIALS SUPPLIED

• AC 9V 0.5A Adapter
• Instruction Manual
• USB Cable (model 800049 only)
• CD (USB Driver and Logger Software)
  (model 800049 only)

FRONT PANEL DESCRIPTION & LCD DISPLAY

1. POWER - Power on/off, enter setting mode
2. MODE - Min/Max
3. SEL/R - Change Value / Key Start Mode
4. TRH/M - Select Mode
5. UNIT - Change Temp. Unit
6. REC/ALRM LIGHTS
7. CO2 Icon indicator:

    😄 : 350 ppm to 450 ppm
    🙂 : 450 ppm to 700 ppm
    😐 : 700 ppm to 1000 ppm
    🙁 : 1000 ppm to 2500 ppm
    😖 : 2500 ppm to 5000 ppm
    😣 : 5000 ppm ↑

8. CO2 ppm measurement - Temp alarm is set
9. Alarm indicator
10. Humidity: Relative Humidity
11. Air Temp: Ambient Temperature (°C / °F selectable)
12. H M : Hour: Minute / M D : Month: Day

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ABC CALIBRATION

The monitor defaults to automatic baseline calibration (ABC) when the unit is turned on. ABC ensures accuracy by eliminating the zero drift of the infrared sensor. This will automatically calibrate the monitor at the minimum CO_2 reading detected during 7.5 days of continuous monitoring.

The ABC is designed for test areas that receive fresh air with a CO_2 level of 400 ppm at some point during seven days of monitoring. If the monitor is being used in a closed area with consistently high levels of CO_2, the ABC should be disabled and the monitor calibrated manually.

1. Connect the AC power adapter to the monitor and plug it into a power supply.

2. Press and hold **POWER** to turn the monitor off.

3. Press and continue to hold **MODE** and **UNIT**.

4. While holding down **MODE** and **UNIT**, press **POWER** to enter ABC mode.

5. Press **SEL/R** to select ABC **on** or **off**.

6. Press and hold **TRH/M** for two seconds to save the setting. The monitor will restart automatically.
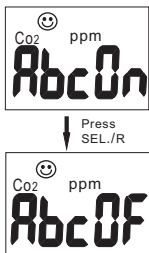
MANUAL CO2 CALIBRATION

Note…
Manual calibration is not recommended unless the unit can be kept in a 400 ppm CO2 environment for at least 12 hours.

1. Set the monitor in an area with stable ambient conditions and no people, or other sources of CO2.

2. Connect the AC power adapter to the monitor and plug it into a power supply. The unit will turn on automatically.

3. Press and hold **TRH/M** for approximately 6 seconds. "CAL" will appear on the LCD.

4. Release **TRH/M** when "CAL 60" flashes. The monitor will count down 60 seconds for calibration.

5. "End" displays on the LCD when calibration is complete.

6. Unplug the adapter from the power source.

7. Plug the adapter back in to the power source. The monitor will return to Normal Mode.

MEASUREMENT PROCEDURES

For the most accurate measurement, do not place the monitor close to any source of CO_2.

Note…
Measurement response time is 10 seconds for CO_2 and 2 seconds for RH. If the operating environment changes, it takes approximately 30 seconds for the CO_2 sensor to respond and 30 minutes for the RH sensor to stabilize.

1. Connect the AC power adapter to the monitor and plug it into a power supply.

2. Set the date and time in the monitor. This should be done whenever it is turned on. See "Monitor Setup: Date and Time" on p.12 for instructions.

3. The monitor will warm up briefly and the reading will be displayed. Levels are updated every 6 seconds.

4. To change the temperature scale, press **UNIT** to cycle the display between °C and °F.

Note…
When CO_2 exceeds 1000 ppm, both the alarm (bell) icon and the red LED will flash a warning. When the CO_2 level falls below this threshold, these visual alarms will stop.

Minimum and Maximum Readings

The monitor automatically records minimum and maximum **CO2 levels**. To view the minimum and maximum readings while in Normal Mode:

1. Press **MODE** to display the maximum reading.

2. Press **MODE** again to display the minimum reading.

3. Press **MODE** to return to Normal Mode.

To reset the minimum and maximum readings:

1. With the minimum or maximum reading displayed, press **MODE** for 2 seconds.

2. "Clr" will display and the monitor will return to Normal Mode.

Monitor Setup: Date and Time

Note…
To exit Setup Mode at any step in the process, press
POWER for one second.

1. Press **POWER** to enter Setup Mode.

2. "2013" will flash. Press **SEL/R** to select the current year, once set, press **TRH/M** to save the selection and move to the next setting.

3. The month will flash on the LCD. Press **SEL/R** to select the current month, once set, press **TRH/M** to save the selection and move to the next setting.

4. The day of the month will flash. Press **SEL/R** to select the current date, once set, press **TRH/M** to save the selection and move to the next setting.

5. The hour will flash. Press **SEL/R** to select the current hour, once set, press **TRH/M** to save the selection and move to the next setting.

6. The minutes will flash. Press **SEL/R** to select the current minute, once set, press **TRH/M** to save the selection. The date and time will appear alternately on the LCD display.

Monitor Setup: CO2 Alarm (model 800049)
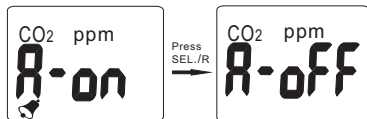
1. After the Date and Time are set up, for model 800049, "A-on" appears on the display. Press SEL/R to toggle the alarm off and on.

2. Press TRH/M to save the selection.

The default CO2 alarm setting is 1000 ppm.
To change the alarm value:

1. When "A-on" appears on the display in step 1 to indicate that the alarm is on, press SEL/R for 3 seconds.

2. Press TRH/M. The alarm value will appear on the display.

3. Press SEL/R to increase the value. You may also hold down SEL/R as desired. The value will cycle through the units, tens, hundreds, and thousands digits.

4. Press TRH/M to save the selection. The display will return to Normal Mode.

Appendix

Datalogging
IAQ Monitor

800049

SOFTWARE INSTALLATION

Installing the USB Logger Driver for Windows

1. Insert the CD into your computer's CD drive.
2. The Auto Play dialogue box appears. Click on "Open folder to view files" to view the file names on the disc.
3. The list of "Files Currently on the Disc" appears. Double click to select "Step1-USB Driver."
4. Double click to select "PL2303_Prolific_Driverinstaller_v110."
5. Select "yes" to allow the program Setup.exe to make changes to your computer.
6. The PL-2303 Driver Installer program opens. Select "Next" to start the installation.
7. Select "Finish" to complete the driver installation. Now you can install the logger software.

Installing Logger Software from Website

You can now download the software that came with your meter directly o your computer. Go to **www.sperdirect. com/software.htm** and find your meter or search for you meter (**800049**) and download from product page.

Note...
Some software may not be available to download because it needs to be purchased. If you find that the software you need is not available, please contact our Customer Support at 480.948.4448 or email info@sperscientific.com for further assistance.

Installing the Logger Software for Windows

8. Press the back arrow ← to return to the list of files on the disc.
9. Double click to select "Datalogger_Products" Software.
10. Double click again to open the folder.
11. Double click to select "Setup" (Type: Application).
12. Select "yes" to allow the program Setup.exe to make changes to your computer.
13. The Destination Directory appears. This lists the target directories for the datalogger and software. Select "Next."
14. Read the license agreement and select "I accept the License Agreement." Click "Next."
15. Select "Next" again to start the installation.
16. Select "Finish" to complete the software installation.
17. Restart the computer.

RUNNING THE SOFTWARE FROM WINDOWS

1. Connect the mini-USB end of the cable to the corresponding port on the side of the monitor.
2. Insert the USB cable into the USB port on your computer.
3. Open the Start Menu and select the "Data Logger" Icon from the programs list.
4. The USB Data Logger Monitor screen displays.

Note…

The monitor should be plugged into the USB port before the software is opened.

If the monitor is not plugged into the correct port, an error message will appear. Make sure that the monitor is plugged in correctly.

DATALOGGER SETTINGS

To Access Setting Options:

• Select "Setting" from the header options on the upper left-hand side of the USB Data Logger Monitor screen. "Comm. Port" and "Log Setting" options appear in a drop-down menu.

Communication (Comm.) Port Setting

1. Select "Comm. Port" from the Setting options. The Comm. Port Setting Menu displays.
2. The menu displays the port number, baud rate, data bits, parity, and stop bits. Select the correct port number.

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3. Click "OK" to finish.

Troubleshooting the Communication Port Setting

If the software does not recognize that the logger is plugged into the USB port you should verify that the communications port number is correct.

Note…

The port information is found on the computer under "Device Manager." However, depending upon your version of Windows, the first steps below to access "Device Manager" may differ slightly.

1. Open the "Start Menu" on the computer.
2. Select "Control Panel."
3. Select "Hardware and Sound."
4. Find the "Devices and Printers" option. Select "Device Manager."
5. Double click on the "Ports" option.
6. The correct port will list "Prolific USB-to-Serial Comm Port" followed by the communication port number in parentheses. This is the port number that should be selected in the Settings Options.

Basic Logger Setting

The basic menu allows you to designate a name for your logger and specify the current date and time.

1. Select "Log Setting" from the Setting options. The Logger Setting menu displays.
2. Select the "Basic" tab.
3. Enter a name for your logger, consisting of up to 20 characters.
4. Select "OK" to save your entry.
5. The system will automatically show the current computer date and time. Select "OK" to save your entry and sync the monitor's current date and time.

Logger Alarm Threshold Setting

Note…

In order to use the alarm feature during datalogging, the alarm must be turned on manually before the monitor is connected to the computer using the USB cable.

The software will override any manually set alarm threshold and default to 1000 ppm. To change the alarm threshold before datalogging:

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1. Select "Log Setting" from the Setting options. The Logger Setting menu displays.

2. Select the "Alarm & Sensor" tab.

3. The default alarm value of 1000 ppm displays. Adjust the ▲ or ▼ indicators to change the value. Alternatively, click on the field and type in the new value. Continue by setting the logger sampling parameters, below.

Logger Sampling Setting

4. Select the "Setting" tab.

5. The monitor sampling range is 1 second to 6:59:59. Adjust the ▲ or ▼ indicators to specify the sampling rate in hours, minutes, and seconds.

6. Adjust the ▲ or ▼ indicators to select Immediate, Roll Over, Schedule or Key start mode.

Setting Immediate Start Mode

This option will cause the monitor to begin taking readings as soon as the option is confirmed. Reading will continue when the monitor is detached from the USB port.

1. Adjust the ▲ or ▼ indicators to specify the number of sample points, in thousands, from 1000 to 32,000.

2. Adjust the ▲ or ▼ indicators to toggle between units: °C or °F.

3. Select "Ok" to save the settings and exit the menu, or "Cancel" to exit without saving the new settings.

Setting Roll Over Mode

This option allows for continued recording even when the monitor is full. After the data limit has been reached new readings will be recorded over the earliest record.

1. Adjust the ▲ or ▼ indicators to specify the number of sample points, in thousands, from 1000 to 32,000.

2. Adjust the ▲ or ▼ indicators to toggle between units: °C or °F.

3. Select "Ok" to save the settings and exit the menu, or "Cancel" to exit without saving the new settings.

Setting Schedule Mode

This option allows you to pre-set the date and time that the monitor will automatically begin recording.

Note…

The date and time formats must be Month/Day/Year and H:M:S.

1. Adjust the ▲ or ▼ indicators to specify the number of sample points, in thousands, from 1000 to 32,000.

2. Adjust the ▲ or ▼ indicators to toggle between units: °C or °F.

3. The fields for the start date and time and the stop date and time will be automatically populated with default values. Click on any of these fields and use the computer keyboard to make changes as desired.

4. Select "Ok" to save the settings and exit the menu, or "Cancel" to exit without saving the new settings.

Setting Key Start Mode

1. Adjust the ▲ or ▼ indicators to specify the number of sample points, in thousands, from 1000 to 32,000.

2. Adjust the ▲ or ▼ indicators to toggle between units: °C or °F.

3. Select "Ok" to save the settings and exit the menu.

DATA SAMPLING AND RECORDING

Note…

When the monitor is disconnected from the computer, a "No port found" error message will display. This will not affect the data sampling and recording. Click "OK" to continue.

Sampling and Recording in Immediate Mode

1. The green LED will flash to indicate that the monitor is recording data.
2. Disconnect the USB cable from the computer and monitor. Recording will continue.
3. Place the monitor in the desired location for sampling.
4. The datalogger will record up to 32,000 data points. Once the memory is full, recording will stop.

Sampling and Recording in Roll Over Mode

1. The green LED will flash to indicate that the monitor is recording data.
2. Disconnect the USB cable from the computer and monitor. Recording will continue.
3. Place the monitor in the desired location for sampling.
4. The monitor will record up to 32,000 data points. When the memory is full, the monitor will continue recording over the oldest records.

Sampling and Recording in Schedule Mode

1. Disconnect the USB cable from the computer and monitor. Place the monitor in the desired location for sampling.
2. At the scheduled start date and time, the green LED will flash to indicate that the logger is recording data.
3. The datalogger will record up to 32,000 data points. Once the scheduled stop date and time are reached, recording will stop.

Sampling and Recording In Key Start Mode

1. Disconnect the USB cable from the computer and meter. Place the meter in the desired location for sampling.
2. At the desired start date and time, press and hold the Key Start Button for 3-5 seconds. The green LED will flash to indicate that the logger has started recording data.
3. The datalogger will record the number of data points formerly set up in the software (see page 24).
4. To stop the session early, press and hold the Key Start Button again for 3-5 seconds.

DOWNLOADING DATA

1. Connect the mini-USB end of the cable to the corresponding port on the side of the monitor.
2. Insert the USB cable into the USB port on your computer.
3. Open the Start Menu and select the "Data Logger" Icon from the programs list.
4. The USB Data Logger Monitor screen displays.
5. Click the "LOGGER Status" button to finish recording. The datalogger ID, number of records sampled, and the sampling parameters and rate will display.
6. Click the "Download" button to download the data. A graph of the data will display.

Viewing the Graph

Note…

To display the values for a specific data point, click the left mouse button to move the red cursor (located on the red vertical line) to the desired point on the graph. You may also hold down the left mouse button and drag the cursor to the desired point.

- To zoom in: Hold CTRL and click the left mouse button.
- To zoom out: Hold CTRL and click the right mouse button.
- To move the graph: Hold CTRL and Shift and then click and hold the left mouse button. Use the cursor to move the graph.
- To read each measurement: Use the left and right arrow keys.
- To reset the size of the graph to the default:
    a) Click on the colored bar to the left of one of the data parameters under the graph (Temp., Humidity, Dew Point, or Wet Bulb).
    b) Move the mouse to select a new color and click on it.
    c) The selection will be saved and the graph size will return to the default.

Printing the Graph

1. Click the Printer Icon button to print the graph.
2. Click "OK" to confirm the selection.

Viewing and Printing Data Tables

1. Click the "View" button and select "Data Table" to view the data in table format.
2. To print data from the table, click the Printer Icon button. The Printing Table Data dialogue box will open.
3. Enter the record range you wish to print (for example, 1-2,350) or leave the field blank to print all the records.
4. Click "OK" to confirm your selection.
5. Click "OK" to start printing.

Saving the Data

1. Click the Save button (floppy disc icon) to save the data.
2. Enter a unique name for the file.
3. Click "OK" to confirm.

Retrieving Stored Files

1. Click the "File" button (open folder icon).
2. Select the file you want to open.
3. Click "OK" to confirm.

TROUBLESHOOTING

Note…

Take care not to drop the monitor; this could cause malfunctions which require service.

Error Code Description

E-1: CO2 sensor malfunction

E-2: Humidity sensor malfunction

E-3: Temperature sensor malfunction

E-4: Operating temperature is too high

E-5: Operating temperature is too low

E-6: Hardware malfunction

POWER SUPPLY

The monitor is powered by an AC adapter. When the adapter is plugged in, the unit turns on automatically.

Power Supply Requirements

Input Voltage	100 to 240 VAC, 50-60 HZ
Output Voltage	DC 7.5 to 9.0 V
Output Current	0.5 A

Note…
Failure to use the correct power configuration will damage the monitor.

CE CERTIFICATE

This Sper Scientific Instrument complies with EMC directive 2004/108/EC.

Technical standards for emissions:

• EN 61326-1:2006 Class B
• EN 55011:2009/A1:2010 Group 1 Class B Immunity
 EN 61326-1:2006
• EN 61000-4-2:2009
• EN 61000-4-3:2006/A2:2010

SPECIFICATIONS

		Range	Res.	Accuracy
Temperature		-10 to 50 °C	0.1 °C	± 0.6 °C (-10 to 50°) otherwise ± 1.2 °C
		-14 to 122 °F	0.1 °F	± 2.5 °F
RH	800048	10% to 90%	0.1%	± 5% (at 25 °C & 10 to 99% RH) otherwise ±7%
	800049	0.1% to 99.9%		
CO2		0 to 9999 ppm	1 ppm	± 75 ppm +5% of rdg (0 to 2000 ppm)
Dimensions		4½" × 4¼" × 2" (108 × 115 × 51 mm)		
Weight		6 oz (170 g)		