

Service and Support

HOBO® products are easy to use and reliable. In the unlikely event that you have a problem with the hardware or software, please read the following.

Who do I contact?

Contact the company that you bought the loggers from: Onset Computer Corporation or an Onset Authorized Dealer.

Before calling, you can evaluate and often solve your problem if you try the following:

1. Read this manual and the ReadMe file on the software disk. It may only take a few moments to get the answers you need.
2. Write down the events that led to the problem. Have you changed anything in your computer recently? Are you doing anything differently?

When contacting Onset Computer Corporation, please indicate that you need Technical Support for HOBO® products.

Be prepared to:

1. Provide the product number which is found on the bottom of the logger, the software version and serial number if present on the disk.
2. Provide details on the hardware and software configuration of your computer including: manufacturer, model number, peripherals, and version of operating system.
3. Completely describe the problem or question. The more information you provide, the faster and more accurately we will be able to respond.

Onset Technical Support

Onset Computer Corporation
470 MacArthur Blvd.
Bourne, MA 02532
Mailing: PO Box 3450
Pocasset, MA 02559-3450
1-800-LOGGERS (1-800-564-4377)
Phone: (508) 759-9500
Fax: (508) 759-9100
e-mail: loggerhelp@onsetcomp.com
www.onsetcomp.com

Warranty

The HOBO® products are warranted to be free from defects in material and workmanship for a period of one year from the date of original purchase. During the warranty period Onset will, at its option, either repair or replace products that prove to be defective. This warranty is void if the Onset products have been damaged by customer error or negligence or if there has been an unauthorized modification.

Returning Products to Onset

Direct all warranty claims to place of purchase. Before returning a failed unit, you must obtain a Return Merchandise Authorization (RMA) number from Onset. You must provide proof that you purchased the Onset product(s) directly from Onset (purchase order number or Onset invoice number). Onset will issue an RMA number that is valid for 30 days. You must ship the product(s), properly packaged against further damage, to Onset (at your expense) with the RMA number marked clearly on the outside of the package. Onset is not responsible for any package that is returned without a valid RMA number or for the loss of the package by any shipping company. Loggers must be clean and free of any toxins before they are sent back to Onset or they may be returned to you.

Repair Policy

Products that are returned after the warranty period or that are damaged by the customer as specified in the warranty provisions can be returned to Onset with a valid RMA number for evaluation.

ASAP Repair Policy

For an additional charge, Onset will expedite the repair of a returned product.

Optional Services

Please contact Onset for more information and prices on:

Data-back™ Service

HOBO® data loggers store data in nonvolatile EEPROM memory. Onset will, if possible, recover your data to a disk.

Tune Up™ Service

Onset will examine and retest any HOBO® data logger.

HOBO® Carbon Monoxide Logger User's Manual

Requires Onset Computer Corporation's BoxCar® Pro 4, Lor BoxCar® 3, 7 or later software and a PC cable for operation.
© 2002 Onset Computer Corporation, all rights reserved.

Onset, HOBO, StowAway, TibbiT, BoxCar, and HandCar are registered trademarks of Onset Computer Corporation. Palm OS is a trademark of Palm Computing Inc. Other products and brand names may be trademarks or registered trademarks of their respective owners.

Inside this package

The HOBO Carbon Monoxide logger is shipped with:

1. One HOBO Carbon Monoxide logger (part number H11-001)
2. Mounting screws, and hook and loop tape

Thank you for buying a HOBO Carbon Monoxide logger. With proper care it will give you years of accurate and reliable measurements.

This manual covers the HOBO Carbon Monoxide logger which is compatible with the HOBO Shuttle or HandCar running on a Palm™ handheld allowing for convenient retrieval of data.

Specifications

Measurement Ranges and Accuracy

The HOBO Carbon Monoxide logger has three measurement ranges. Although normally only one range should be selected, selecting multiple ranges allows a wider dynamic range without sacrificing resolution at the low end. Note that selecting multiple ranges results in values being stored for each range selected, therefore reducing the maximum deployment time at a given sample rate.

Ranges are selected or viewed by selecting the corresponding channel shown below.

Logger ranges:

Channel	Nominal range	Actual range
1	0 - 125 ppm	0.2 - 124.3 ppm
2	0 - 500 ppm	1 - 497.1 ppm
3	0 - 2000 ppm	4 - 1988 ppm

Resolution/Accuracy ranges:

Channel	Resolution	Maximum Error (20°C)	Typical Accuracy (20°C)
1	0.5 ppm	±10.5 ppm ±12% of reading	±4.5 ppm ±7% of reading
2	2 ppm	±12 ppm ±12% of reading	±6 ppm ±7% of reading
3	8 ppm	±18 ppm ±12% of reading	±12 ppm ±7% of reading

The CO sensor is temperature compensated over the entire operating range; however, there may be an additional error that increases as the temperature gets farther from 20°C. For temperatures from 0°C to 20°C the readings may be lower by as much as 5% or 5ppm, whichever is greater. For temperatures from 20°C to 40°C the readings may be higher by as much as 5% or 5ppm, whichever is greater.

Physical shocks or rapid changes in ambient pressure may show up as spikes in the data.

Common Specifications

Number of measurements: 32,520 maximum

Response time for 90% change: <11 minutes typical

(dependent upon installation location and orientation)

Time accuracy: ±1 minute per week (100 ppm at +68°F or +20°C), full dependence shown in Plot A

Operating temperature range: +32°F to +104°F (0°C to +40°C)

Storage temperature: -40°F to +158°F (-40°C to +70°C)

Operating humidity range: 10% to 95% RH, non-condensing

Operating pressure range: 1 Atmosphere ±10%

Cross Gas Interferences: Conforms to UL2034

Size: 5.7" H x 2.6" W x 1.6" D (144 mm x 66 mm x 40 mm)

Weight: 0.29 lbs (0.13 kilograms)

Battery: CR-2032 lithium, user replaceable

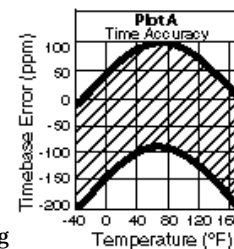
Battery life: In normal applications the battery should last one year. In circumstances where the ambient CO concentration averages 10 ppm or more, the battery life will be shorter:

Average concentration Battery life

10 ppm	10 months
100 ppm	6 months
1000 ppm	2 months

Expected life of sensor: five years

(Yearly verification is recommended for critical applications.)



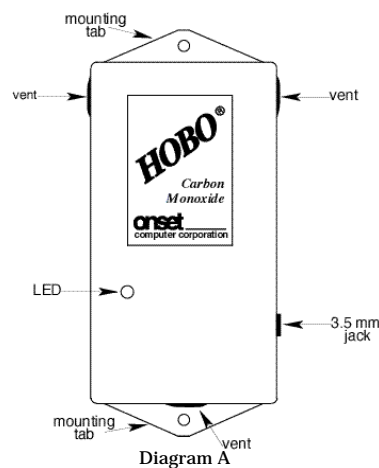
WARNING! - The HOB0 Carbon Monoxide logger is a data recording device only. The logger does not replace the need for safety/warning alarm devices that alert personnel when Carbon Monoxide (CO) exposure reaches dangerous levels. Exposure to carbon monoxide can result in death. Please refer to the Exposure Level Reference chart for exposure guidelines.

Connecting the Communications Cable and Launching

A Starter Kit, which includes a PC interface cable and software, is required to operate your logger. Connect the interface cable into the 3.5 mm jack on the logger and into an available serial port of your computer. Install and start the logger's software. Select **Launch...** under **Logger** on the menu bar and a launch dialog box will be provided. For a complete explanation on installing the software and launching your logger, please refer to the software manual.

Operation Indicator

The HOB0 data loggers have a light-emitting diode (LED) that blinks while logging. The LED blinks brightly at every measurement, and weakly every two seconds if the interval between measurements is longer than two seconds. The blinking LED is most visible when viewed straight on, as shown in Diagram A.



Readout

Reconnect the HOB0 data logger to the PC interface cable and start the logger software. Select **Readout** under **Logger** on the menu bar and the data will be displayed in a graphical or tabular form. For a complete explanation on reading out your logger, please refer to the software manual.

Keep it Dry

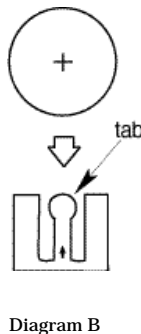
Your HOB0 data logger can be permanently damaged by corrosion if it gets wet. Protect it from rain or condensation. Should it get wet, remove the battery immediately and dry the board completely with a hair dryer before reinstalling the battery. Do not let the board get too hot. You should be able to comfortably hold it in your hand while drying.

Changing the Battery

We recommend changing the HOB0's battery when its level is less than 30% (battery level is displayed on the host computer during Launch, Readout, on the HOB0 Shuttle, or HandCar after data offload). Data stored in the HOB0 CO logger will not be lost when removing the battery.

To change the battery:

- (1) Remove the back cover by unscrewing the 4 Phillips head screws.
- (2) Remove the battery by pushing down on the battery holder's tab with your finger, which will cause the battery to snap up. (see Diagram B)
- (3) Reinstall the new battery with the positive side away from the HOB0's circuit board. Press down on the battery until it snaps in place.
- (4) Reinstall back cover.



The logger's LED will blink a number of times after the battery has been installed. **Note: Do not cut open, incinerate, heat above +85°C (+185°F) or recharge lithium battery. Dispose per local regulations.**

Important Installation and Operation Guidelines

- The CO logger's LED only provides indication of operation. If warning of potentially hazardous levels of CO is required, a properly installed CO alarm-type unit needs to be in the area.

- For proper operation of the HOB0 Carbon Monoxide logger, the installation area must always remain within the temperature, pressure, and humidity limits as described in the specifications.

IMPORTANT! - The unit will only monitor CO gas received at the sensor - therefore it is important that the logger be mounted properly within the area to be monitored, allowing for adequate circulation between the CO source and the logger.

- The logger should be placed in an area that allows free flow of room air but away from any external drafts, such as leaky windows and doors. CO is slightly lighter than the major constituents of air, N₂ and O₂, and since it is usually associated with incomplete combustion, it would tend to be warmer than the surrounding air and therefore may tend to rise. The HOB0 CO logger may be placed on a wall or on a ceiling. It should not be placed too close to the meeting of a wall and ceiling or wall and wall, as these are dead air spots; nor should the logger be mounted in recesses in a wall or ceiling (such as between studs or floor joists), as these too tend to inhibit air circulation. The logger should be placed as far away as practical from sources of dust, dirt, grease, or high humidity.

- The H11-001 uses an electrochemical CO sensor and requires an equal amount of available oxygen as the concentration of CO being measured. It produces a very low level current in proportion to the CO levels it is exposed to. Due to these low signal levels, the H11-001 data logger may not be suitable for environments that have a lot of electrical noise present. The H11-001 CO sensor efficiency can also be decreased by presence of interfering gases, including organic vapors, caustics, sulfur compounds, and halocarbons. Although the CO sensor contains an additional filtration system that filters out most common interference gases, continuous exposure or exposure to high levels of these gases can overload the filtration system and permanently damage the CO sensor. Therefore, the CO logger should not be used in environments where high levels of organic vapors, caustics, sulfur compounds, and halocarbons are anticipated.

About the H11-001 CO Sensor

The HOB0 CO logger uses an electrochemical reaction to produce a current proportional to the ambient Carbon Monoxide concentration. Because Carbon Monoxide is consumed as part of this electrochemical reaction, CO logger operation alters the concentration of Carbon Monoxide in the region being monitored. The effect on concentration, which is dependent on the size of the space being monitored and the initial concentration of CO, is typically very small and can be disregarded in most instances. For example, in a 10-liter space with an initial ambient CO concentration of 50 ppm, the CO logger would consume 1 ppm every 5.6 hours. Contact Onset Computer or an Authorized Onset Dealer if you require additional information on calculating the rate of CO consumption for a specific application.

Filters in the Vents

The logger incorporates filters in the housing's vents to prevent infiltration of dust, dirt, or grease into the CO sensor's opening. Removing these filters will provide increased airflow and slightly faster response time, but at the risk of damage to the sensor from contaminants that may reach the opening. Do not attempt to clean the CO sensor's opening with alcohol or other chemicals, as this will damage the sensor. The filters should be checked periodically and cleaned or replaced as necessary (Onset part number HRV-CO).

To check the vent filters (see Diagram A), remove the back cover and verify that you can see a light through the filters. If they appear dirty or clogged you can blow them out with compressed air (about 20 psi), blowing from the inside out. Before blowing out the filters, you should remove the CO sensor so that it does not get damaged. The CO sensor says "Monox" on it. It can be removed by pulling it straight out. After the vent filters are cleaned or replaced, the CO sensor can be inserted back into the pin socket. The sensor should not be off of the board for longer than 1-2 hours. Reinstall the back cover with the two internal pads against the CO sensor. If the sensor has been removed for an extended period of time, allow 24 hours from the time it is replaced for the readings to stabilize.

EXPOSURE LEVEL REFERENCE

* U.S. Department of Labor Occupational Safety & Health Administration (OSHA) regulation 1917.24: The CO content in any enclosed space shall be maintained at not more than 50 ppm (0.005%). Remove all personnel from enclosed space if the CO concentration exceeds 100 PPM (0.01%).

0-1 ppm	Normal background
9 ppm	ASHRAE Standard 62-1989 for living areas
50 ppm	OSHA enclosed space 8-hour average level*
100 ppm	OSHA exposure limit*
200 ppm	Mild Headache, nausea, fatigue and dizziness
800 ppm	Convulsions and death within 2-3 hours

DANGER - The CO sensor, which is enclosed within the HOB0 Carbon Monoxide logger, contains sulfuric acid. Sulfuric acid is a highly toxic poison. Sulfuric acid is sealed within the CO sensor. Leakage can result if the sensor is mechanically damaged and/or used outside of the specification limits. Exposure to sulfuric acid can cause severe burns. Avoid the hazard by not tampering with the CO sensor and by maintaining the product within the specification limits set forth in this manual. In the event of leakage, protective gloves are necessary to handle the CO sensor and logger. As precautions, it is recommended that protective gloves be worn whenever handling the CO sensor, and that hands be kept away from the eyes and washed immediately after servicing the logger. Keep out of reach of children.

Dispose of the HOB0 Carbon Monoxide logger and/or sensor in a manner consistent with all applicable local, state, and federal regulations.