



Inside this package
The HOB0 Thermocouple IS logger is shipped with:

1. One HOB0 Thermocouple logger (part number H12-002-IS)
Thermocouple probes are purchased separately.
2. Mounting Accessories:
Magnet
Hook and loop tape
Double-sided tape

HOB0® Type K Thermocouple Intrinsically Safe Logger User's Manual

Requires Onset Computer Corporation's BoxCar® Pro 4.1 or BoxCar® 3.7 or later software and PC cable for operation.
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Thank you for buying a HOB0 data logger. With proper care it will give you years of accurate and reliable measurements.

This manual covers the HOB0 H12-002-IS Type K Thermocouple IS logger.

Safety Information - Read First

WARNING: The H12-002-IS logger is rated as Intrinsically Safe, however, available communications accessories are not. Do not attempt to download or relaunch the logger using the HOB0 Shuttle, handheld PDA, or any host computer in a hazardous environment, as these devices do not carry the Intrinsically Safe rating and are not intrinsically compatible with HOB0-IS Loggers. See the "Logger Specifications" for the complete Intrinsically Safe listing and see the section of this manual entitled "Intrinsically Safe" for more information about hazardous location and the H12-002-IS.

WARNING: Fire, Explosion, and Severe Burn Hazard. The logger contains a lithium battery. The battery may explode if the logger is exposed to extreme heat or conditions that could damage or destroy the battery case. Do not attempt to recharge or heat the logger or battery above +185°F (+85°C). Do not dispose of the logger or battery in fire. Do not expose the contents of the battery to water. Dispose of the battery according to local regulations for lithium batteries.

WARNING: Only qualified personnel should install and service equipment located in Hazardous (classified) Areas

Overview

The HOB0 H12-002-IS Type K Thermocouple IS logger has three temperature channels. Channels one and two are different measurement ranges for a user-attached thermocouple. The third channel is the logger's internal temperature, which is used for cold-junction compensation of the thermocouple output. Choosing channels one or two determines the range and corresponding resolution of the recorded measurements. The number of channels selected for recording determines the memory storage available for each channel, which in turn determines the maximum deployment time at a given sample interval. Choosing only one channel (range) provides the maximum deployment time.

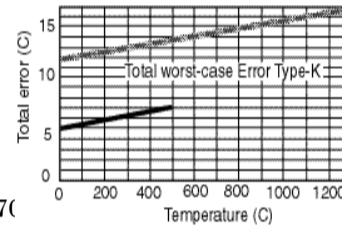
Important note: Cold-junction compensation is always performed on the thermocouple measurements, independent of whether or not the cold-junction reference channel (channel 3) is selected for recording.

While the thermocouple probes may be exposed to the temperatures listed in the table below, the logger itself must be kept in a 0°C to +50°C (+32°F to +122°F) environment to allow for proper cold-junction compensation.

Measurement Range and Resolution

HOB0 Type K Thermocouple (part number H12-002-IS)

Channel	Range	Resolution: max / min
1	0°C to +500°C (+32°F to +932°F)	2°C / 4°C (3.6°F / 7°F)
2	0°C to +1250°C (+32°F to +2282°F)	5°C / 10°C (9°F / 18°F)
3 (Int.)	0°C to +50°C (+32°F to +122°F)	0.4°C @ 21°C (0.7°F @ 70°C)



Note: The temperature measurement accuracy plot shows the worst case errors for the logger and its range. This does not include any error associated with the attached thermocouple.

Specifications

Logger internal (channel 3, cold-junction) temperature accuracy: ±0.7°C @ 21°C (±1.3°F @ 70°F)

Measurement capacity: 32,530 measurements total, stored in non-volatile memory

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

Logger operating temperature range: 0°C to +50°C (outside this range the cold-junction temperature compensation will not work properly)

Logger operating humidity range: 0 to 95% RH, non-condensing

Size: 2.4" x 1.9" x 0.8" (68 mm x 48 mm x 19 mm)

Weight: approximately 0.9 oz (26 gms)

Battery: Sony or Renata CR-2032 (lithium), user-replaceable

Battery life (continuous use): 1 year

Storage temperature: -40°F to +167°F (-40°C to +75°C)

Intrinsically Safe rating: IS, Class I, II, Division 1, Groups A-G, Temperature Code T4 (<135°C); NI, Class I, Division 2, Groups A-D, Temperature Code T4 (<135°C); S, Class II, Division 2, Groups F and G

Compatible Thermocouple Sensors

The HOB0 H12-002-IS Type K Thermocouple Intrinsically Safe logger can accept any standard type K thermocouple sensor with standard thermocouple subminiature connectors. Note that the Type-K logger will only work with Type-K thermocouples. The ANSI standard thermocouple color coding is yellow for Type-K sensors (Chromel-Alumel). If your thermocouples have stripped-wire ends, there are male subminiature connectors with screw terminals available. You must use a matching type K subminiature connector for the type K thermocouple that you are using.

Note that the subminiature connectors have one pin (negative input) that is wider than the other. Make sure that the plug is inserted into the mating jack correctly. See diagram A.

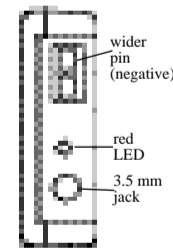
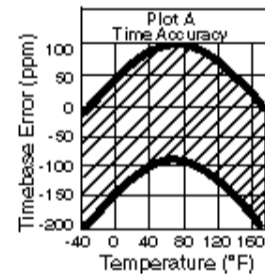


Diagram A

Connecting the Communications Cable and Launching

A Starter Kit, which includes a PC interface cable and software, is required to operate your logger. The HOB0 data logger must be launched before it is deployed in a hazardous location. 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 red 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.

Operation on Computers Equipped with a Power Conservation Mode

Many newer computers, especially laptops, have a power conservation feature which shuts the serial

Continued on next page





port off after a short period of time. If a HOBO or StowAway logger is still connected to the serial port when this happens, the logger will shut off. To resolve power conservation shut off of the serial port, BoxCar Pro 4.0, 4.1, and 4.2.x customers should download the BoxCar Pro 4.3 or later upgrade patch. Similarly, BoxCar 3.6 and 3.7.1 customers should download the BoxCar 3.7.3 or later upgrade patch. Both are available for free on our website under Tech Support, Software Upgrades and Utilities. If you have an earlier version of BoxCar and you would like to test to see if you will be affected by the power conservation feature do the following. Using BoxCar, launch your logger from the computer that you are testing. If you are using a laptop, it may behave differently when running off battery versus running off the power plug; please test both. After launch, leave the logger attached to the PC interface cable and watch the LED to see if it remains blinking. When a logger is actively logging, the LED will blink faintly every 2 seconds. If the power conservation is causing a problem, the LED will stop blinking within one minute. Download the datafile to see how many points were collected. If power conservation is causing the logger to shut off, you will only see one data point in the file. If your computer has the power conservation feature, you should download an upgrade patch as noted above.

Mounting Options

Included with your HOBO Thermocouple data logger are three options for mounting it on location: a magnet, hook and loop tape, and double-sided tape. These can be stuck on the back of your HOBO. When using the magnet, note that it works best on flat surfaces.

Readout

The HOBO data logger must be removed from the hazardous location for readout. Reconnect the HOBO to the PC interface cable, 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 HOBO 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. The HOBO logger should be removed from the hazardous location for this procedure.

Changing the Battery

We recommend changing the HOBO's battery when its level is less than 30% (battery level is displayed on the host computer during Launch, Readout, or on the HOBO Shuttle after data offload). The HOBO logger must be removed from the hazardous location to check battery level, change battery, and relaunch. Data stored in the HOBO will not be lost when removing the battery. To change the battery, open the snap-lid case as shown in Diagram B, lift the circuit board and remove the battery by carefully pushing it out with a small screwdriver or other small, blunt instrument. Be sure to install the battery with the printed side away from the HOBO's circuit board as shown in Diagram C. **In order to maintain the Intrinsically Safe rating, your logger must use a Sony or Renata CR2032 (3.0V 225mAh) battery.** The logger's red LED will blink a number of times after the battery has been installed. If you will not be using the logger right away bring the logger to the launch window of BoxCar Pro or BoxCar and then select cancel or you can offload the data. This action puts the logger into its low power state to conserve your battery power. **Note: Do not cut open, incinerate, heat above +185°F (+85°C) or recharge lithium battery. Dispose per local regulations.**

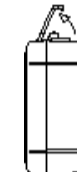


Diagram B

Battery



Battery Holder



Diagram C

Intrinsically Safe

Factory Mutual Research has certified that the H12-002-IS is safe for use in certain hazardous areas. The National Electrical Code has classified many types of hazardous locations. The H12-002-IS has been approved as intrinsically safe in Class I and II locations which are areas where ignitable concentrations of gas (Class I) and/or dust (Class II) exist. The NEC further classifies hazardous location by Division (1 or 2). The division designation refers to the likelihood that the area will contain ignitable concentrations of gas or dust. Division 1 locations will have ignitable concentrations of gas or dust continuously or under normal operating conditions. Division 2 locations will have ignitable concentrations of gas or dust only during infrequent or abnormal operations (which may include areas located near Division 1 locations). The H12-002-IS has been approved for use in both Division 1 and 2 locations. The hazardous area classification scheme is further defined by listing the types of ignitable gases and dusts that may be present in a hazardous location. Ignitable gases and dusts are sorted into groups with similar ignition characteristics. The H12-002-IS is certified for all possible groups: A-G for gas and A-D, F and G for dust. Finally every Intrinsically Safe Device is given a temperature rating. The H12-002-IS has a T4 rating, which means that no part of the device will become warmer than +275°F (+135°C) in a worst-case fault. For more information on Hazardous (Classified) Locations visit the Underwriters Laboratory web site at www.ul.com/hazloc/define.htm.



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.

NOTE: Onset allows one technical support contact for each software license.

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

Onset Computer Corporation ("Onset") warrants to the original end-user purchaser for a period of one year from the date of original purchase that the HOBO® product(s) purchased will be free from defect in material and workmanship. During the warranty period Onset will, at its option, either repair or replace products that prove to be defective in material or workmanship. This warranty shall terminate and be of no further effect at the time the product is (1) damaged by extraneous cause such as fire, water, lightning, etc. or not maintained in accordance with the accompanying documentation; (2) modified; (3) improperly installed; (4) repaired by someone other than Onset; or (5) used in a manner or purpose for which the product was not intended.

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.

