



**Inside this package**  
The HOB0 H8 Family of loggers are shipped with:

1. One HOB0 H8 logger (part number H08-007-IS)
2. Mounting Accessories:  
Magnet  
Hook and loop tape  
Double-sided tape

# HOB0® H8 Temp/RH/2x Ext Intrinsically Safe User's Manual

Requires Onset Computer Corporation's BoxCar® Pro or BoxCar® 3.6 or later software and PC cable for operation.  
© 1997-2003  
Onset Computer Corporation, all rights reserved.  
Onset, HOB0, StowAway, Tidbit, and BoxCar are registered trademarks of Onset Computer Corporation.

**Thank you** for buying a HOB0 data logger. With proper care it will give you years of accurate and reliable measurements.

This manual is for the HOB0 H8 Temp/RH/2x External Intrinsically Safe Logger. This logger stores 7944 time-stamped measurements.

## Safety Information - Read First

**WARNING:** Only the HOB0 H08-007-IS logger is rated as Intrinsically Safe, however, available communication 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 locations and the HOB0 H08-007-IS.

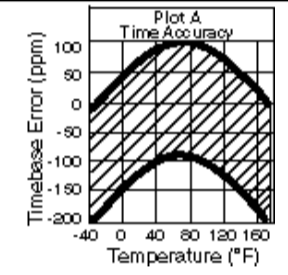
**WARNING:** Fire, Explosion, and Severe Burn Hazard. The logger contains a lithium battery. The battery may explode if the logger is exposed to extreme heat or conditions that could damage or destroy the battery case. Do not attempt to recharge or heat the logger or battery above +185°F (+85°C). Do 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.

**WARNING:** Do not use the logger's external inputs with a 4-20 mA input cable or device. Only passive input cables and devices with passive components and **without** energy storage or external power sources should be used.

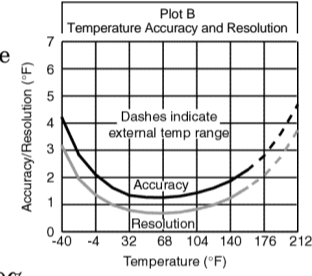
## Logger Specifications

Operating range (logger): -20°C to +70°C (-4°F to +158°F),  
0 - 95% RH non-condensing  
Time accuracy: approx. ±1 minute per week (±100 ppm at +20°C or +68°F), full dependence shown in Plot A  
Measurement capacity: 7944 measurements total, stored in non-volatile memory  
Size: 2.4" x 1.9" x 0.8"  
Weight: approximately 1 oz.  
Battery: Sony or Renata CR-2032 (lithium) user-replaceable; Onset Part Number HRB-TEMP (box of 10)  
Battery life (continuous use): 1 year  
Storage temperature: -40°C to +75°C (-40°F to +167°F)  
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.

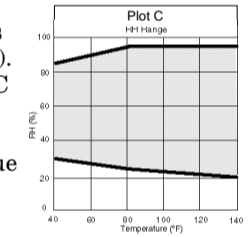


## Measurement Specifications

**Temperature** - Each logger has an internal temperature sensor on a four inch wire which is mounted on the circuit board inside the snap lid case. Typically, the sensor is left inside the case and measures ambient air temperature over the operating range of the logger: -20°C to +70°C (-4°F to +158°F) with a response time of about fifteen minutes in still air typical to 90%. The internal sensor can be placed outside the case when a shorter response time is needed (less than one minute in air and about two seconds in water typical to 90%). The temperature sensor is capable of measuring temperature from -40°C to +120°C (-40°F to +248°F) when extended from the case (see **Using the Sensor Outside the Box** for more information). The HOB0 data logger's temperature resolution and accuracy are shown in Plot B. This error includes the measurement uncertainty due to the sensor resolution.

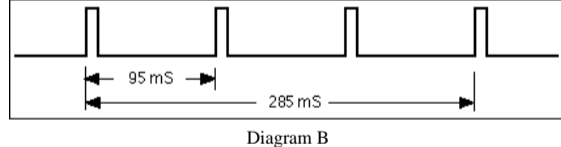


**Relative Humidity** - The HOB0's user-replaceable relative humidity sensor is temperature compensated, and the logger's relative humidity accuracy is ±5% over the entire +5°C to +50°C (+41°F to +122°F) operating range of the sensor when used with BoxCar Pro 4.3 or BoxCar 3.7.3. NOTE: Accuracy specifications reflect improvements made to BoxCarPro 4.3 and BoxCar 3.7.3. Earlier software versions provide ± 5% accuracy except in elevated humidity environments (60% to 95% non-condensing and non-fogging) where accuracy is ± 10%. Upgrading to BoxCar Pro 4.3 or BoxCar 3.7.3 or later version will bring all current and old data file accuracy to ±5% for the full operating range. The relative humidity sensor's operating RH range is 25% to 95% at +25°C (+77°F) and for intervals of 10 seconds or longer. Full dependence shown in Plot C. RH sensor drift is < 1% per year. NOTE: The HOB0's RH sensor will be damaged by condensation. It must not be exposed to fog, mist or other condensing conditions!

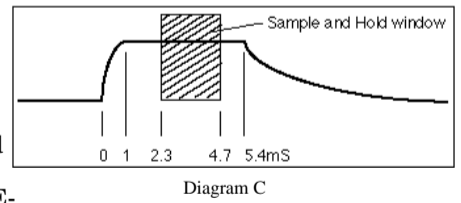


Voltage Input Cable Connections	
red wire	switched 2.5 V output
white wire	voltage input
black wire	0 volts

**External Input with Onset Sensors** - See Safety Information on external inputs - The HOB0 data loggers accept a range of Onset temperature sensors. For compatible sensors, contact Onset or contact your Onset authorized dealer.



**Connecting Passive External Sensors** - This signal can be used to power a sensor directly. External sensors should draw no more than 2 mA when powered. The switched 2.5 V output turns on for about 5.4 ms every time a measurement is made on any channel. A logger with four channels enabled will turn on four 5.4 ms pulses each interval. An example of four enabled channels is shown in Diagram B. The external port can accommodate a voltage input cable (Onset part number CABLE-2.5-Stereo) which allows variable resistances to be recorded. This input reads 0 to 2.5 DC volts. The accuracy is ±10 mV ±3% of reading. Input impedance is 10k . The external sensor's zero volt input is not the same as the serial port's ground connection. Connecting the zero volt connection to ground may damage the logger.



Details of the output pulse - The data is sampled at a specific point in each pulse shown in Diagram C. The start of the sample window is 2.3 ms after the beginning of the pulse, and it ends 2.4 ms later.

To maintain the intrinsically safe rating the 4-20 mA cable must not be used with this logger. When using the voltage input cable only passive devices (thermistors, variable resistors) will maintain the IS rating.

## 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 a working 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 LED that blinks while they are 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 D.

**Operation on Computers Equipped with a Power Conservation Mode**

Many newer computers, especially laptops, have a power conservation feature which shuts the serial port off after a short period of time. If a HOB0 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.

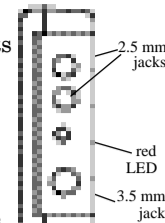


Diagram D

**Mounting Options**

Included with your HOB0 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 HOB0. When using the magnet, note that it works best on flat surfaces.

**Readout**

The HOB0 data logger must be removed from the hazardous location for readout. Reconnect the HOB0 data logger 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.

**Using the Sensor Outside the Box**

In normal operation, the HOB0 data logger's internal temperature sensor should be left inside the case. To use the sensor outside the case, open the snap-lid case as shown in Diagram E and remove the circuit board. Unwind the four inch sensor wire from the circuit board and place the board back into the case. When closing the case, make sure the sensor is aligned in the small notch in the case as shown in Diagram F and press the snap-lid closed. **Be careful, the sensor is fragile and easily damaged!** When using the sensor outside the box the logger must still be kept within its operating range of -20°C to +70°C (-4°F to +158°F)

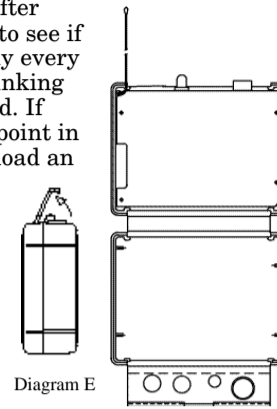


Diagram E

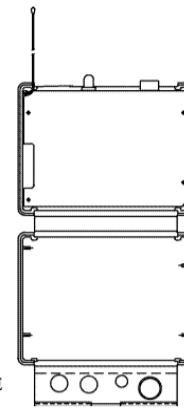


Diagram F

**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. The RH sensor is damaged by any exposure to condensation, if it gets wet it will need to be replaced (Onset part number HUM-UPS-500).

**Changing the Battery**

We recommend changing the HOB0 data logger's battery when its level is less than 30% (battery level is displayed on the host computer during Launch, Readout or on the HOB0 Shuttle after data offload). The HOB0 logger must be removed from the hazardous location to check battery level, change battery, and relaunch. Data stored in the HOB0 will not be lost when removing the battery. To change the battery, open the case, 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 HOB0's circuit board as shown in Diagram G. **In order to maintain the Intrinsically Safe rating, your logger must use a Sony or Renata CR2032 (3.0V 225mAH) battery, Onset part number HRB-TEMP.** The logger's red LED will blink a number of times after the battery has been installed. Note: 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.

Battery Holder

Diagram G

**Intrinsically Safe**

Factory Mutual Research Corporation has certified that the HOB0 H08-007-IS is safe for use in certain hazardous areas. The National Electrical Code has classified many types of hazardous locations. The HOB0 H08-007-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 locations 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 operation 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 HOB0 H08-007-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 gasses and dusts are sorted into groups with similar ignition characteristics. The HOB0 H08-007-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 HOB0 H08-007-IS has a T4 rating, which means that no part of the device will become warmer than +135°C (+275°F) 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](http://www.ul.com/hazloc/define.htm).

**Service and Support**

HOB0® 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 HOB0® 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 diskette.
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](mailto:loggerhelp@onsetcomp.com)  
[www.onsetcomp.com](http://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 HOB0® 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. Please contact Onset for more information and prices on:

**ASAP Repair Policy**

Onset will expedite the repair of a returned product.

**Data-back™ Service**

HOB0® 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 HOB0® data logger.