

The Shuttle’s internal clock

The time set in the Shuttle is only as accurate as the time on the computer it was connected to. The Shuttle’s time is used to set the logger’s launch timer. If accurate time is important, you may want to use a utility that sets the PC clock to a time standard, and readout or launch the Shuttle just before going into the field.

Replacing the HOBOb Shuttle batteries

Important: Replace all batteries at the same time and observe correct polarity when inserting them into the battery holder.

The host computer displays the Shuttle’s battery status when you launch or read out the Shuttle. If the batteries are low (32% or less), you should replace them before going into the field. The data stored in the Shuttle is retained when you remove the

batteries; however, as a data safety measure, a Shuttle with low batteries prohibits you from offloading additional loggers.

To change the Shuttle’s batteries:

1. Open the case by unsnapping the latch and lifting the lid. Work over a desk or table to provide a safe platform for the disassembly.

2. Gently pull the tab on the label to remove the circuit board from the case.

3. Unwrap the label from the circuit board and remove the batteries from their holder.

4. **Be sure to install the new batteries in their correct orientation.** When the last battery makes proper contact, all of the Shuttle’s LEDs light in sequence from top to bottom, then from bottom to top.

5. After new batteries have been installed, the Shuttle’s clock must be synchronized before it can offload a logger. To do this, connect the logger to the host computer and run BoxCar. Select Launch... from the Logger menu. The software synchronizes the Shuttle’s clock and displays the battery status.



WARNING: Do not install backwards, recharge, put in fire, expose to extreme heat, or mix with other battery types, as the batteries may explode or leak. Contents of an open or leaking battery can cause chemical burn injuries. **Replace all used batteries at the same time.** Recycle or dispose of the battery according to all applicable federal, state, and local regulations.

Service and Support

HOBOb products are easy to use and reliable. In the unlikely event that you have a problem with this instrument, contact the company where you bought the logger: Onset or an Onset Authorized Dealer. Before calling, you can evaluate and often solve the problem if you write down the events that led to the problem (are you doing anything differently?) and if you visit the Technical Support section of the Onset web site at www.onsetcomp.com/support.html. When contacting Onset, ask for technical support and be prepared to provide the product number and serial number for the logger and software version in question. Also completely describe the problem or question. The more information you provide, the faster and more accurately we will be able to respond.

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

Returning Products to Onset

Direct all warranty claims and repair requests 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 to protect 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. Products must be clean and free of any contaminants 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.

Optional Services

Please contact Onset for more information and prices on:

- ASAP Repair. Onset will expedite the repair of a returned product.
- Data-back™ Service. HOBOb 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 HOBOb data logger.

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 HOBOb 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.

5. After new batteries have been

installed, the Shuttle’s clock must be synchronized before it can offload a logger. To do this, connect the logger to the host computer and run BoxCar. Select Launch... from the Logger menu. The software synchronizes the Shuttle’s clock and displays the battery status.



WARNING: Do not install backwards, recharge, put in fire, expose to extreme heat, or mix with other battery types, as the batteries may explode or leak. Contents of an open or leaking battery can cause chemical burn injuries. **Replace all used batteries at the same time.** Recycle or dispose of the battery according to all applicable federal, state, and local regulations.

This warranty is void if the product has been damaged by the purchaser as a result of improper maintenance, abuse, misuse, mishandling, misapplication, error or negligence of Purchaser, or if there has been an unauthorized alteration, attachment or modification.

THERE ARE NO WARRANTIES BEYOND THE EXPRESSED WARRANTY AS PROVIDED IN THIS DOCUMENT. IN NO EVENT SHALL ONSET BE LIABLE FOR LOSS OF PROFITS OR INDIRECT, CONSEQUENTIAL, INCIDENTAL, SPECIAL OR OTHER SIMILAR DAMAGES ARISING OUT OF ANY BREACH OF THIS CONTRACT OR OBLIGATIONS UNDER THIS CONTRACT, INCLUDING BREACH OF WARRANTY, NEGLIGENCE, STRICT LIABILITY, OR ANY OTHER LEGAL THEORY.

LIMITATION OF LIABILITY. The Purchaser’s sole remedy and the limit of Onset’s liability for any loss whatsoever shall not exceed the Purchaser’s price of the product(s). The determination of suitability of products to the specific needs of the Purchaser is solely the Purchaser’s responsibility. **THERE ARE NO WARRANTIES BEYOND THE EXPRESSED WARRANTY IN THIS DOCUMENT. EXCEPT AS SPECIFICALLY PROVIDED IN THIS DOCUMENT, THERE ARE NO OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NO INFORMATION OR ADVICE GIVEN BY ONSET, ITS AGENTS OR EMPLOYEES SHALL CREATE A WARRANTY OR IN ANY WAY INCREASE THE SCOPE OF THE EXPRESSED WARRANTY OFFERED WITH THE SALE OF THIS PRODUCT.**

INDEMNIFICATION. Products supplied by Onset are not designed, intended, or authorized for use as components intended for surgical implant or ingestion into the body or other applications involving life-support, or for any application in which the failure of the Onset-supplied product could create or contribute to a situation where personal injury or death may occur. Products supplied by Onset are not designed, intended, or authorized for use in or with any nuclear installation or activity. Products supplied by Onset are not designed, intended, or authorized for use in any aeronautical or related application. Should any Onset-supplied product or equipment be used in any application involving surgical implant or ingestion, life-support, or where failure of the product could lead to personal injury or death, or should any Onset-supplied product or equipment be used in or with any nuclear installation or activity, or in or with any aeronautical or related application or activity, Purchaser will indemnify Onset and hold Onset harmless from any liability or damage whatsoever arising out of the use of the product and/or equipment in such manner.

LEGAL REMEDIES. This warranty gives you specific legal rights. You may also have other rights which vary by jurisdiction. The remedies provided herein are in lieu of all other remedies, express or implied.

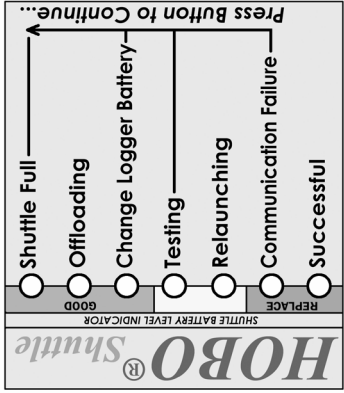
© 2003, 2004 Onset Computer Corporation. All rights reserved.
Part #: MAN-H09-003-08, Doc #: 8091-B
Onset, HOBOb, and BoxCar are registered trademarks of Onset Computer Corporation. Other products and brand names may be trademarks or registered trademarks of their respective owners.

HOBOb® Shuttle

(Part # H09-003-08)

Operating Instructions

Doc # 8091-B
MAN-H09-003-08
Onset Computer Corporation



Inside this package:

- HOBOb Shuttle
- 12” logger interconnect cable

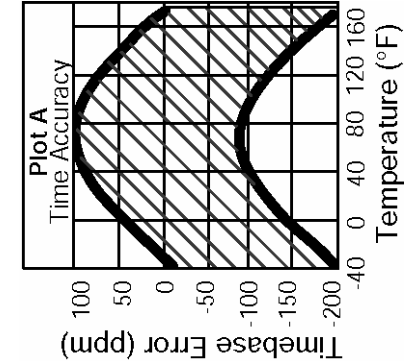
Thank you for purchasing a HOBOb Shuttle. The HOBOb Shuttle performs several major functions. It:

- Offloads all logger information (serial number, deployment number, data, etc.) from loggers in the field for transfer to host computer
- Checks and displays its own battery level

Although the HOBOb Shuttle is intuitive and simple to use, Onset strongly recommends that you spend a few minutes reading this manual and trying out the procedures described here before taking the Shuttle into the field. **Incorrect operation may result in loss of data.**

- Checks logger battery level, allowing logger battery to be replaced in the field
- Refuses to offload a logger when the Shuttle battery level or memory is too low
- Relaunches the logger, resetting the logger’s time to the Shuttle’s time

Compatibility	HOBOb H6 family, H8 Pro Series, HOBOb Thermocouple family, HOBOb Event, HOBOb CO, and HOBOb Data Logging Rain Gauges RG2 and RG2-M
Requirements	BoxCar® 3.7+ or BoxCar® Pro 4.3+ for Windows software; PC interface cable (included with BoxCar®)
Data capacity	448 – 511K nonvolatile memory (depending on the combination of loggers and amount of data in each); enough for 56 full 8K loggers, 14 full 32K loggers, or 7 full 64K loggers; up to 120 readouts of partially filled loggers if memory allows
Time accuracy	±1 minute per week (±100 ppm) at 20°C/68°F
Logger-to-Shuttle data transfer speed	Offloads one full 8K HOBOb in 90 seconds; one full 64K Pro Series logger in 60 seconds; one full 32K HOBOb in approximately 6 minutes
Shuttle-to-PC transfer speed	Full HOBOb Shuttle readout to host computer in under 2 minutes
Batteries	3 AA alkaline batteries
Battery life	One year typical use (application dependent)
Weight	133.3 g (4.76 oz)
Dimensions	12.1 x 8.9 x 3.8 cm (4.75 x 3.5 x 1.5 inches)
CE	The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).



Specifications

Preparing to go on location

Before using a newly powered Shuttle, you must use either the **Launch** or **HOBO Shuttle Readout** command in BoxCar. These commands synchronize the Shuttle’s clock with the host computer’s clock and display the Shuttle’s battery level. This ensures that the data loggers are relaunched with the most accurate time, and that the Shuttle’s batteries are not near end of life.

- To launch the Shuttle without reading out, connect the Shuttle to the host computer with the cable provided in the software starter kit. (See the important note on using the Launch command in the *Read out data to the host computer* discussion on page 3).
- Run BoxCar and select **Launch...** from the **Logger** menu. The software automatically synchronizes the Shuttle’s clock with the host computer’s clock, and displays the Shuttle’s battery level. If the battery level is low (32% or less), change them immediately. **If you change the batteries in the field, the Shuttle loses its time synchronization and will not offload any loggers until it is launched or read out.**

Important: BoxCar may warn that the batteries should be changed even when they are still good. Earlier Shuttle models required battery changes at a higher battery power percentage, and BoxCar 4.3.1.1 and earlier cannot distinguish between the HOBO Shuttle models.

Look at the percentage of battery power remaining. Your H09-003-08 HOBO Shuttle batteries are not truly “low” and do not need to be changed until they reach 32% or less. If the batteries do need to be changed, change them immediately and then relaunch before going into the field.

Note: *The Shuttle is automatically synchronized after you read it out. If you read out the Shuttle immediately before going into the field, there is no need to launch it again.*

- Disconnect the Shuttle from the host computer when you are finished. Leaving the Shuttle connected to the computer (or a logger) drains the batteries.

- Disconnect the 12” cable from the Shuttle, coil it, and store it in the Shuttle case. (Disconnecting the cable from the Shuttle prevents the cable from being strained when you close the lid.) Be careful to position the cable in the case so that it does not engage the button when the lid is closed.

Offloading Loggers

The following procedure describes the process of offloading and automatically relaunching a logger. The Shuttle performs most of these steps by itself, and notifies you only if it needs help.

- Before opening your Shuttle in the field, dry off the outside of the case so that no moisture gets in when you open it.
- Connect the logger to the Shuttle by plugging one end of the 12” cable into the Shuttle’s jack, and the other end into the 3.5 mm jack on the logger. The logger should start offloading automatically. If it doesn’t, press the button on the Shuttle to begin offloading. The orange “Offloading” LED on the Shuttle blinks until all the data has been transferred to the Shuttle.

Note: *If the “Shuttle Full” and “Communication Failure” LEDs start blinking alternately, this indicates the last BoxCar-to-Shuttle communication session was interrupted before it was complete. Launch or read out the Shuttle again before continuing .*

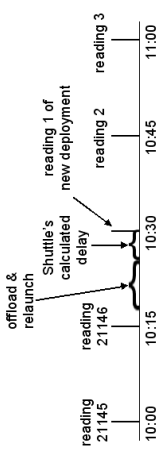
- Once the logger data is successfully transferred to the Shuttle, the Shuttle then checks the logger’s battery. If the logger’s battery level is at least 30%, the Shuttle proceeds to the next step. If the logger battery level is less than 30%, the red “Change Logger Battery” LED blinks to indicate that the logger battery should be replaced. Refer to the “*Change Logger Battery*” indicator discussion below for details.

- If the attached logger is a HOBO H6 family/HOBO Event logger, the Shuttle can verify its operation after completing the logger battery test. Otherwise, this step is skipped. The orange “Testing” LED flashes every half-second as it tells the logger to

report its status. For HOBO H6 family loggers, the LED double-flashes when the logger state is open or off. For HOBO Event loggers, the LED double-flashes every time the logger logs an event. After you have verified the operation of the logger, press the Shuttle button to stop the test.

- The Shuttle relaunches the logger and synchronizes the logger’s clock to the Shuttle’s internal clock. The Shuttle’s orange “Relaunching” LED flashes during relaunch.

For the HOBO H8 loggers, CO loggers, and Thermocouple loggers, the Shuttle programs the logger with a delay that causes its readings to be synchronized with those of the previous deployment, as shown in the diagram below. The sampling interval is the same as in the previous deployment. All other types of loggers are relaunched without a delay.



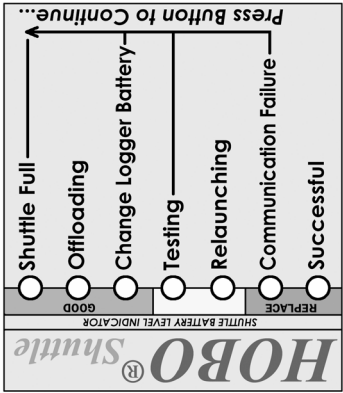
- When the relaunch has completed, the green “Successful” LED blinks. The LED stops blinking only when you disconnect the logger. If that offload filled the Shuttle, it blinks the red “Shuttle Full” LED as well.
- Disconnect the 12” cable from the logger and the Shuttle, coil it, and store it in the Shuttle case.

When you disconnect the logger from the Shuttle, the Shuttle uses the indicator LEDs to display a bar graph of the Shuttle’s battery status. The bar graph legend runs along the left side of the indicator LEDs, and is sectioned by color to indicate relative battery health.

Important: Always disconnect the Shuttle from the logger or host computer when you are finished. Leaving the Shuttle connected will drain the Shuttle batteries.

- Close the Shuttle case.

Indicator lights



Shuttle Full

The red “Shuttle Full” LED blinks when the Shuttle has less than 64K left of memory. If you attempt to offload a logger when this light is blinking, the data remains in the logger, and the logger continues logging without interruption.

Offloading

The orange “Offloading” LED blinks when the offload is proceeding normally.

Change Logger Battery

If the “Change Logger Battery” LED is blinking and you want to use the Shuttle to offload another logger, disconnect the logger with the bad battery and press the button three times to clear the battery check. You can then use the Shuttle normally.

If you want to replace the bad logger battery now, disconnect the logger from the Shuttle and install the new battery. Then reconnect the logger to the Shuttle and press the button. The Shuttle checks the new battery. If the new battery has low voltage, the Shuttle blinks the “Change Logger Battery” LED again.

If the logger battery is extremely low, both the “Change Logger Battery” and “Communication Failure” LEDs blink. There may be enough capacity in the logger’s battery to relaunch so you can collect some data until you can replace the battery. If you are not sure that the offload was successful, **Onset recommends that you wait until there is a fresh battery in the logger before allowing it to relaunch.** Once the logger is relaunched, the previous data is overwritten.

If, after three button pushes, the Shuttle has not detected a good battery, it proceeds to the next step (test or relaunch) regardless of the logger’s battery status.

To avoid relaunching a logger with a bad battery, disconnect it from the Shuttle before pressing the button a third time.

Testing

If the attached logger is a HOBO H6 family/HOBO Event logger, the orange “Testing” LED blinks when the Shuttle is checking the logger’s status.

Relaunching

The orange “Relaunching” LED blinks when the Shuttle is installing the updated launch parameters and launching the logger.

Communication Failure

If the offload or relaunch communications fail, the red “Communication Failure” LED on the Shuttle blinks. If this happens, disconnect from the logger or host and press the Shuttle button once to stop the blinking LED. (If you do nothing, the LED stops blinking after several minutes.) Then carefully reconnect to try again.

Successful

When the relaunch has completed normally, the green “Successful” LED blinks until the logger is disconnected.

Shuttle battery level

Always check the battery level before going into the field! You can check the Shuttle’s battery level when the Shuttle is idle. Press the button for three seconds; the Shuttle battery level indicator bar graph displays briefly.

Note: *If, after the battery display disappears, the “Shuttle Full” and “Communication Failure” LEDs blink alternately, you must launch or read out the Shuttle before continuing.*

A reading in the red zone (bottommost two LEDs) means that the batteries should be replaced.

A reading in the yellow zone (next two LEDs) means that you should be prepared to replace the batteries soon.

The Shuttle first checks its own internal battery level before attempting to interrupt a logger to offload it. If you connect a logger when the Shuttle’s batteries are too

low to properly offload the data, the bottommost two LEDs (in the red REPLACE region of the Shuttle battery level indicator) blink in unison, and the Shuttle will not attempt contact with the

logger. Disconnect the logger and press the button on the Shuttle to stop the blinking. The logger that was attached will continue logging without interruption.

With the batteries this low, you can still safely offload the Shuttle to the host computer, but you **must** replace the Shuttle’s batteries and resynchronize the Shuttle before offloading any more loggers.

Power interruption

If, when you press the button briefly, all the LEDs light up and down in sequence, this indicates that the Shuttle’s power was interrupted. The Shuttle must now be read out from the host computer in order to resynchronize it. You must offload or launch the Shuttle before it can offload more loggers. Since the data is stored in non-volatile memory, it will survive power interruptions intact.

Read out data to the host computer

To read out the data stored in the Shuttle, connect it to the PC interface cable, run BoxCar, and select **HOBO Shuttle Readout** from the **Logger** menu. The computer offloads all data, saves each logger’s data to files, checks the Shuttle’s batteries, and synchronizes its clock.

Data in the Shuttle is not erased when the Shuttle is read out. After the Shuttle’s data has been read out, it remains intact until the next logger to be offloaded into the Shuttle overwrites the previous data. You must read out the Shuttle at least once before the data in the Shuttle can be overwritten.

Important: Take care when using the Launch command, as BoxCar cannot warn you if the Shuttle has not been offloaded. After you launch the Shuttle, any subsequent logger offloads will overwrite the previous data on the Shuttle, even if the Shuttle was not read out. If you don’t remember whether you read out the Shuttle or not, use the HOBO Shuttle Readout command before offloading any loggers.