

HOBO® U11 3-State/1-Event
Data Logger
(Part # U11-001)

Inside this package:

- HOBO U11 3-State/1-Event Data Logger
- Four input cables
- Mounting kit with magnet, hook and loop tape, tie-wrap mount, tie wrap, and two screws.



Doc # 13124-A, MAN-U11001
Onset Computer Corporation

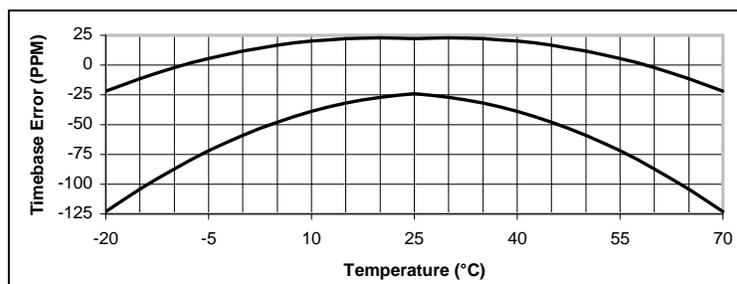
Thank you for purchasing a HOBO data logger. With proper care, it will give you years of accurate and reliable measurements.

The HOBO U11 3-State/1-Event data logger has 64K of memory and can record up to 43,000 state changes or events. The three state channels and one event channel monitor conditional changes when the allocated conductors are connected or disconnected. External contact closer devices are used to “make” and “break” the logger’s conductors and are controlled by external sensing devices. External sensing devices are commonly used in monitoring equipment and machines such as motors, doors and other cycling equipment. The logger uses a direct USB interface for launching and data readout by a computer.

A HOBOWare software starter kit is required for logger operation. Visit www.onsetcomp.com for compatible software.

Specifications

State and Event Channels	External contact input: Passive relay switch or contact closure - minimum duration 1 second (open > 300 KΩ or closed < 10 KΩ)
Max total cable run	32 m (105 ft); if using only state channels, 64 m (210 ft)
Time accuracy	Approximately ± 1 minute per month at 25°C (77°F); see Plot A
Operating temperature	Logging: -20° to 70°C (-4° to 158°F) Launch/readout: 0° to 50°C (32° to 122°F), per USB specification
Humidity range	0 to 95% RH, non-condensing
Battery life	1 year typical use with normally open contacts; two months if all four channels are logging with continuously closed contacts
Memory	64K bytes (up to 43,000 state changes or events); see “Storage capacity” on the next page
Weight	50 g (1.8 oz)
Dimensions	58 x 74 x 22 mm (2.3 x 2.9 x 0.9 inches)
	The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).



Plot A

Accessories Available

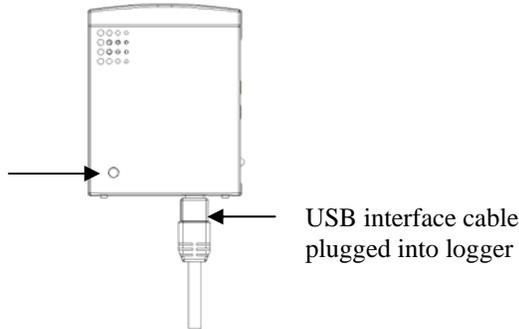
AC Current Switch (Part # CSV-A8)

Connecting the Logger

The U-Family logger requires an Onset-supplied USB interface cable to connect to the computer. If possible, avoid connecting at temperatures below 0°C (32°F) or above 50°C (122°F).

Plug the large end of the USB interface cable into a USB port on the computer. Plug the small end of the USB interface cable into the bottom of the logger, as shown in the diagram.

Important: Press this button for at least **3 seconds** when logger is launched with Button Start, or press for at least **1 second** to record an event while logging.



If the logger has never been connected to the computer before, it may take a few seconds for the new hardware to be detected. Use the logger software to launch and read out the logger.

You can read out the logger while it continues to log, stop it manually with the software, or let it record data until the memory is full. Refer to the software user's guide for complete details on launching, reading out, and viewing data from the logger.

Important notes:

Some mechanical contacts/closures may bounce enough to cause false state changes and events when the duration is greater than the minimum (1 second).

If you use a portable computer with a rechargeable battery, ensure that the AC power cord is not connected to the computer when you are communicating with the logger. This may produce false events.

If you configure the logger to start with a button start, be sure to press and hold down the button on the front of the logger for at least three seconds when you want to begin logging data.

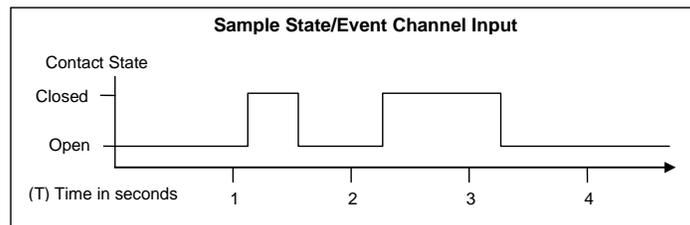
Plug the cables into the side of the logger before logging begins. Plugging cables in or removing them while logging may produce false state changes or events on other channels.

The state and event channels are always enabled. An unused event channel will record nothing. An unused state channel will record an initial open state only.

Connecting input cables to the logger while the battery is low can reset the logger and stop it from operating.

State Logging

The logger checks the state value every second. It is unaware of any changes that happen between checks. Accordingly, if the contact activity shown in Plot B below is on a **state** channel, the logger does not see the momentary closure that happens between T1 and T2 because the contacts are open at both times. However, the state changes from T2 to T3, and from T3 to T4, are recorded as a closure that begins at T3 and ends at T4.



Plot B

Event Logging

The event channel records the transition from a closed contact to an open contact. The logger checks every second to see if a transition happened during the last second. If a transition occurred, it is recorded as an event at that second. Accordingly, if the contact activity shown in Plot B above is on an **event** channel, an event is recorded at T2 and another event is recorded at T4. Note that the contacts close between T2 and T3 but open between T3 and T4, causing the event to be logged at T4. Closing the contacts does not trigger the event; re-opening them afterward does.

Logging the Battery Voltage

In addition to event and state readings, the logger can record battery readings at regular intervals. If you enable the internal battery channel for logging, battery measurements should be made at long intervals (one hour or greater) to minimize memory usage.

Internal Events

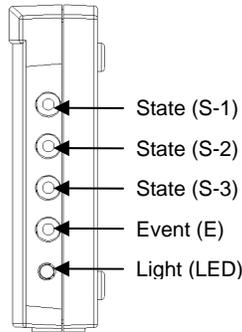
Like other U-Family loggers, this logger stores events that are unrelated to the external state and event inputs. Events are stored when the pushbutton is pressed or released, when the battery drops below approximately 2.7V, when the battery rises above 2.8V, when a host computer is connected, and when the logger is stopped by a command from the host software.

Press and hold down the button on the front of the logger for at least one second to record a pushbutton event. Both a button down and button up event will be recorded. This is useful if you want to manually mark the datafile at a particular point.

Operation

A light (LED) on the side of the logger confirms logger operation.

The following table explains when the logger blinks during logger operation:



When:	The light:
The logger is logging	Blinks when logging a sample, and every four seconds between logging samples
The logger is awaiting a start because it was launched in Start At Interval, Delayed Start, or Button Start mode	Blinks once every eight seconds until launch begins
The button on the logger is being pushed for a Button Start launch or manual event	Blinks once every second while pressing the button and then (button start only) flashes rapidly once you release the button. The light then reverts to a blinking pattern based on the logging interval

Storage Capacity

The logger's storage capacity depends on the interval between state changes or events. The longer the interval between a state change or event, the more memory is needed to store the data. The following table shows how memory capacity is affected by various intervals between events, assuming the battery channel is disabled.

Average interval between events	Approximate total points
1 sec. – 15 sec.	43,439
16 sec. – 4.24 min.	32,512
4.25 min – 68.25 min.	26,009

Protecting the Logger

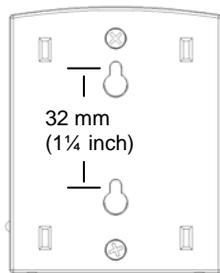
The logger can be permanently damaged by corrosion if it gets wet. Protect it from condensation. If it gets wet, remove the battery immediately and dry the circuit board with a hair dryer before reinstalling the battery. Do not let the board get too hot. You should be able to comfortably hold the board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

Note! Static electricity may cause the logger to stop logging. To avoid electrostatic discharge, transport the logger in an anti-static bag, and ground yourself by touching an unpainted metal surface before handling the logger. For more information about electrostatic discharge, visit our website at <http://www.onsetcomp.com/Support/support.html>.

Mounting

There are four ways to mount the logger using the materials in the mounting kit included with the logger:

- Use the hook-and-loop tape to affix the logger to a surface.
- Attach the magnet, then place the logger on a magnetic surface.
- Use the tie wrap and tie wrap mount to tie the logger to an object.
- Fasten the logger to a surface with the two Phillips-head screws. The back of the logger has two inserts for the screws, 32 mm (1¼ inches) apart.



Battery

The logger requires one 3-Volt CR-2032 lithium battery. Expected battery life varies based on the temperature and the frequency at which the logger is recording data (the logging interval and the rate of state changes and/or events). A new battery typically lasts one year with logging intervals greater than one minute and normally open contacts. Deployments in extremely cold or hot temperatures, logging intervals faster than one minute, or continuously closed contacts may significantly reduce battery life.

Battery life is about two months when all four channels' contacts are closed continuously.

To replace the battery:

1. Disconnect the logger from the computer.
2. Unscrew the logger case.
3. Lift the circuit board and carefully push the battery out with a small blunt instrument, or pull it out with your fingernail.
4. Insert a new battery, positive side facing up.
5. Carefully realign the logger case and re-fasten the screws.

⚠ WARNING: Do not cut open, incinerate, heat above 85°C (185°F), or recharge the 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 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.

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