

HOBO® Pendant® Temperature Data Logger (UA-001-xx) Manual



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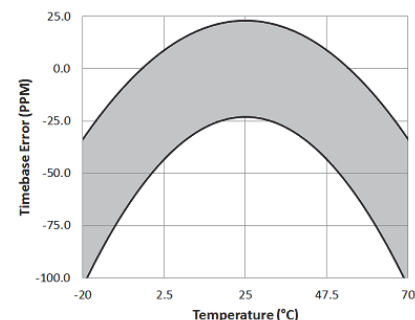
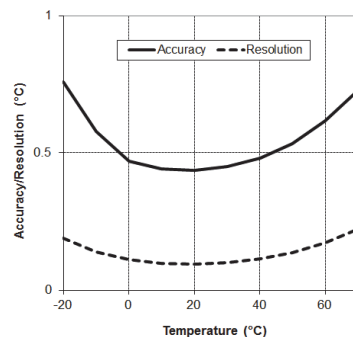


The HOBO Pendant Temperature Data Logger is a waterproof, one-channel logger with 10-bit resolution and can record up to approximately 6,500 (8K model) or 52,000 (64K model) measurements or internal logger events. The logger uses a coupler and optical base station with USB interface for launching and data readout by a computer. Onset software is required for logger operation.

Specifications

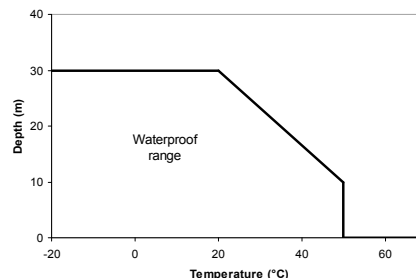
Measurement Range	-20° to 70°C (-4° to 158°F)
Alarms	High and low alarms can be configured for total amount of contiguous or non-contiguous time outside of user-defined limits between -20° and 70°C (-4° to 158°F)
Accuracy	±0.53°C from 0° to 50°C (±0.95°F from 32° to 122°F), see Plot A
Resolution	0.14°C at 25°C (0.25°F at 77°F), see Plot A
Drift	Less than 0.1°C/year (0.2°F/year)
Response Time	Airflow of 2 m/s (4.4 mph): 10 minutes, typical to 90% Water: 5 minutes, typical to 90%
Time Accuracy	±1 minute per month at 25°C (77°F), see Plot B
Operating Range	In water/ice: -20° to 50°C (-4° to 122°F) In air: -20° to 70°C (-4° to 158°F)
Water Depth Rating	30 m from -20° to 20°C (100 ft from -4° to 68°F), see Plot C
NIST Traceable Certification	Available for temperature only at additional charge; temperature range -20° to 70°C (-4° to 158°F)
Battery Life	1 year typical use
Memory	UA-001-08: 8K bytes (approximately 6.5K sample and event readings) UA-001-64: 64K bytes (approximately 52K sample and event readings)
Materials	Polypropylene case; stainless steel screws; Buna-N o-ring
Weight	15.0 g (0.53 oz)
Dimensions	58 x 33 x 23 mm (2.3 x 1.3 x 0.9 inches)
Environmental Rating	IP68
CE	The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).

Passed RTCA DO160G, part 21H



Plot A

Plot B



Plot C

HOBO Pendant Temperature Data Logger

Models: UA-001-08
UA-001-64

Required Items:

- HOBOware 2.x or later
- USB cable
- Pendant Optic USB Base Station & Coupler (BASE-U-1)
- Optic USB Base Station (BASE-U-4) or HOBO Waterproof Shuttle (U-DTW-1) & Coupler (COUPLER2-A)

Connecting the Logger

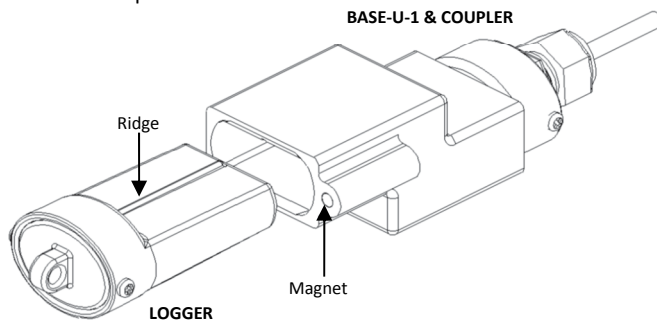
The HOBO Pendant logger requires either of the following to connect to the computer:

- Pendant Optic USB Base Station & Coupler (BASE-U-1); HOBOWare 2.1 or later
- OR**
- Optic USB Base Station (BASE-U-4) or HOBO Waterproof Shuttle (U-DTW-1); coupler (COUPLER2-A); HOBOWare 2.2 or later

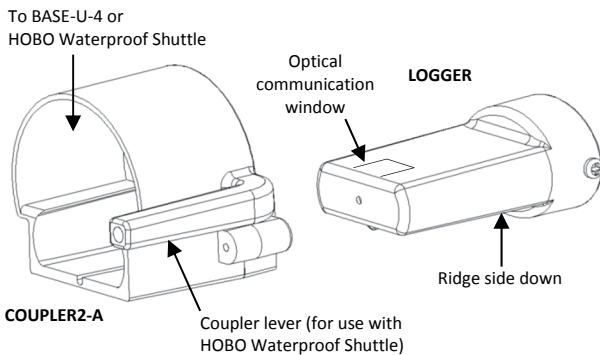
If possible, avoid connecting at temperatures below 0°C (32°F) or above 50°C (122°F).

1. Plug the USB connector on the base station into an available USB port on your computer.
2. Insert the logger and the base station into the coupler, as shown in the following diagrams.

For BASE-U-1, make sure that the logger is inserted in the end of the coupler that has the magnet, and that the ridges on the base station and logger are aligned with the grooves in the coupler.



For BASE-U-4 or the HOBO Waterproof Shuttle, firmly insert the optical end of the base station into the D-shaped end of the coupler, and make sure that the ridge on the logger is aligned with the groove in the coupler.



3. If you are using the HOBO Waterproof Shuttle, briefly press the coupler lever to put the shuttle into base station mode.
4. If the logger has never been connected to the computer before, it may take a few seconds for the new hardware to be detected.
5. Use the logger software to set up the alarms, launch, and read out the logger.

You can read out the logger or check its status 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: Do not cover the optical communication window in the logger (shown in diagram above) with a label or sticker as that may interfere with the communications with the base station or shuttle.

Triggered Start

This logger can be configured to start at your command, using the magnet in the coupler to trigger a start.

1. Use HOBOWare to launch the logger with Using Coupler selected. Remove the logger from the coupler.
2. Bring the logger and an empty coupler or strong magnet to the deployment location.

Important: Any magnet can trigger a start. This can be helpful, but it can also cause a premature start. Keep the logger away from strong magnetic fields until you are ready to begin logging.

3. When you are ready for the logger to start logging, insert the logger into the empty coupler (or place it next to a strong magnet) and remove it after three seconds.

Important: The logger will not launch if the base station is in the coupler.

4. Verify that the logger's light is blinking at least every four seconds.

Sample and Event Logging

The logger can record two types of data: samples and internal logger events. Samples are the measurements recorded at each logging interval (for example, temperature every minute). Events are independent occurrences triggered by a logger activity, such as Bad Battery or Host Connected. Events help you determine what was happening while the logger was logging.

Operation

Lights (LEDs) on the front of the logger confirm logger operation. The following table explains when the lights blink during logger operation.

When:	The Lights:
The logger is logging faster than four seconds	Blink at the logging interval: <ul style="list-style-type: none"> • Green LED if temperature is OK • Red LED if high alarm has been triggered • Blue LED if low alarm has been triggered
The logger is logging at four seconds or slower	Blink every four seconds: <ul style="list-style-type: none"> • Green LED if temperature is OK • Red LED if high alarm has been triggered • Blue LED if low alarm has been triggered
The logger is awaiting a start because it was configured to start logging At Interval, On Date/Time, or Using Coupler	Green light blinks once every eight seconds until launch begins

Protecting the Logger

The logger can be damaged if the water depth rating is exceeded. The depth rating is approximately 30 m (100 ft) at temperatures below 20°C (68°F), but is less in warmer water. Refer to Plot C for details.

Do not store the logger in the coupler. Remove the logger from the coupler when you are not using it. When the logger is in the coupler or near a magnet, it consumes more power and will drain the battery prematurely.

Keep the logger away from magnets. Being near a magnet can cause false coupler events to be logged. It can also launch the logger prematurely if it was waiting for a trigger start.

Periodically inspect the desiccant and dry it if it is not bright blue. The desiccant pack is located in the cap of the logger. To dry the desiccant, remove the desiccant pack from the cap and leave the pack in a warm, dry location until the bright blue color is restored. (Refer to the *Battery* section for instructions on removing and replacing the logger cap.)

Temperature Range	Desiccant Maintenance Schedule
Less than 30°C (86°F)	Approximately once per year
30° to 40°C (86° to 104°F)	Approximately every six months
Over 40°C (104°F)	Approximately every three months

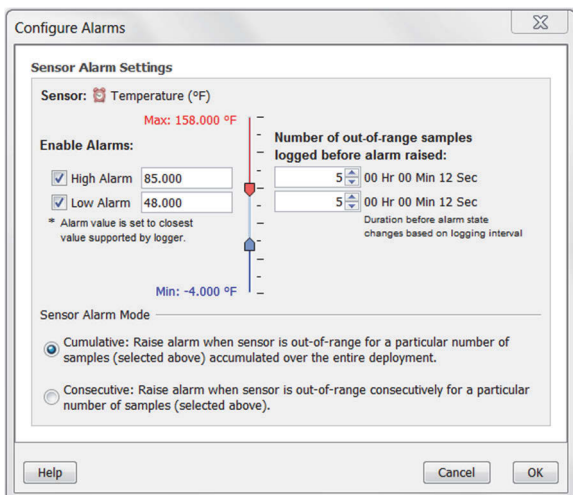
Note! Static electricity may cause the logger to stop logging.

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.

Alarms

Configure alarms to flash a warning on the high or low LEDs if monitored sensor falls outside user-selectable limits.

- From the Launch Logger window in HOBOWare, click the Alarms button to open the Configure Alarms window.



- Select the check box for the High Alarm and/or the Low Alarm. Type a value in each box to define the alarm threshold or use the sliders.
- Type the number of out-of-range samples that are needed to trigger each alarm.

- Choose an Alarm Mode. If you select Cumulative, the alarm will be triggered after a specific number of samples have been logged above or below an allowed value, even if the samples are not logged consecutively. If you select Consecutive, the alarm will be triggered only when the value has been above or below an allowed value for a specific amount of time. If the value goes back in range before triggering the alarm, the count is reset.
- Click OK when done.

Battery

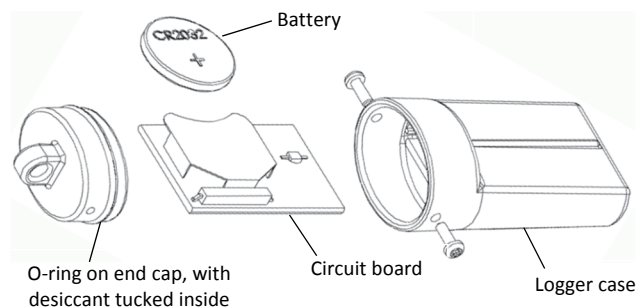
The logger requires one 3-Volt CR-2032 lithium battery. Battery life varies based on the temperature and the frequency at which the logger is recording data (the logging interval). A new battery typically lasts one year with logging intervals greater than one minute. Deployments in extremely cold or hot temperatures, or logging intervals faster than one minute, may significantly reduce battery life. Continuous logging at the fastest logging rate of one second will deplete the battery in as little as two weeks.

Replacing the Battery

You will need a small Philips head screwdriver and silicone-based O-ring grease, such as Parker Super-O-Lube, to complete these steps (no petroleum-based lubricants). The logger should be wiped clean and dried completely before opening it.

To replace the battery:

- Avoid electrostatic discharge while handling the logger and internal circuit board; ground yourself by touching an unpainted metal surface. Hold the circuit board by its edges and avoid touching electronics.
- Working on a clean, dry surface, remove the two screws that secure the end cap to the case and remove the cap.
- Examine the desiccant pack that is tucked into the cap. If the desiccant is not bright blue, put the desiccant pack in a warm, dry place until the blue color is restored. Or, for faster drying, the desiccant can be dried for two hours in a 70°C (160°F) oven.
- Gently tap the case to loosen the circuit board and remove it from the case.



- Carefully push the battery out of the holder with a small, nonmetallic blunt instrument.
- Insert a new battery, positive side facing up.

7. Return the circuit board and label to the case, carefully aligning the circuit board with the grooves in the case so that the battery faces the ridged side of the case.
8. Remove the O-ring from the end cap. Use the thumb and finger of one hand to hold the cap from the top and bottom, and use the thumb and fingers on your other hand to slide the O-ring to form a loop as shown. Use this loop to roll the O-ring off the cap.



9. Inspect the O-ring for cracks or cuts and replace it if any are detected (the O-ring is included in the Pendant replacement parts kit, UA-PARTSKIT).
10. Using your fingers (not cloth or paper), spread a small dot of silicone-based grease on the O-ring, just enough to moisten it all the way around and making sure that the entire O-ring surface is completely coated with grease. As you work the grease into the O-ring, make sure there is no grit or debris on the O-ring.
11. Place the O-ring back on the end cap, making sure it is fully seated and level in the groove. Make sure the O-ring is not pinched or twisted and that no dirt, lint, hair, or any debris is trapped on the O-ring. This is necessary to maintain a waterproof seal.
12. Very slightly grease the inside rim of the case, especially around the screw holes with the silicone grease, just enough to moisten the inside edges without touching any circuitry. Make sure that there is no excess lubricant that could get onto the logger electronics or label. Make sure there is no debris on this surface.
13. Check that the desiccant pack is tucked into the cap.
14. Carefully push the end cap into the lubricated case until the screw holes are aligned. Visually check that the O-ring forms a uniform seal all around.
15. Re-fasten the screws. Tighten the screws until you feel them hit the bottom of the screw holes, but not so tight that they distort the clear housing.

⚠ 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.