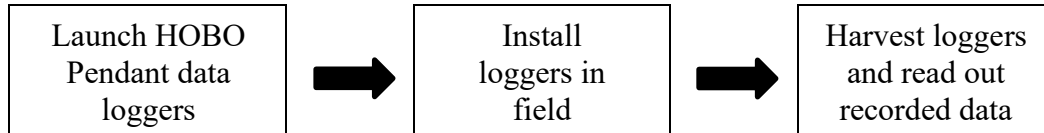


# SOP: HOBO temperature logger

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## Overview:

This standard operating procedure (SOP) describes a protocol for monitoring soil temperature using HOBO Pendant data loggers. Detailed manual of the instrument can be found here: <https://www.onsetcomp.com/products/data-loggers/ua-002-08/>



## Instrumentation & Consumables:

### Logger setup

- HOBO Pendant® Temperature/Light 8K Data Logger (<https://www.onsetcomp.com/products/data-loggers/ua-002-08/>)
  - Same model with larger memory: HOBO Pendant® Temperature/Light 64K Data Logger (<https://www.onsetcomp.com/products/data-loggers/ua-002-64/>)
- HOBO Optic USB Base Station (<https://www.onsetcomp.com/products/communications/base-u-4/>)
- HOBO Base Station Pendant Coupler (<https://www.onsetcomp.com/products/replacements/coupler2/>)
- HOBOWare Free Download (<https://www.onsetcomp.com/hoboware-free-download>)
- Desktop/laptop to install HOBOWare
- Screwdriver
- Coin battery (CR2032)
- Oven

### Field installation and harvest

- Spade/shovel/trowel for digging hole
- Flag (at least 4" longer than the installation depth)
- Plier for bending flag

### Data extraction

- HOBO Pendant® Temperature/Light 8K Data Logger (<https://www.onsetcomp.com/products/data-loggers/ua-002-08/>)
- HOBO Optic USB Base Station (<https://www.onsetcomp.com/products/communications/base-u-4/>)

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- HOBO Base Station Pendant Coupler (<https://www.onsetcomp.com/products/replacements/coupler2/>)
- HOBOWare Free Download (<https://www.onsetcomp.com/hoboware-free-download>)
- Desktop/laptop to install HOBOWare

## Detailed Procedure:

### I. Logger setup

1. Install HOBOWare - Free download at <https://www.onsetcomp.com/hoboware-free-download>
2. Connect HOBO Pendant Logger to a desktop/laptop using USB Base Station, place the coupler (black part) on the base and firmly press the pendant into the coupler.



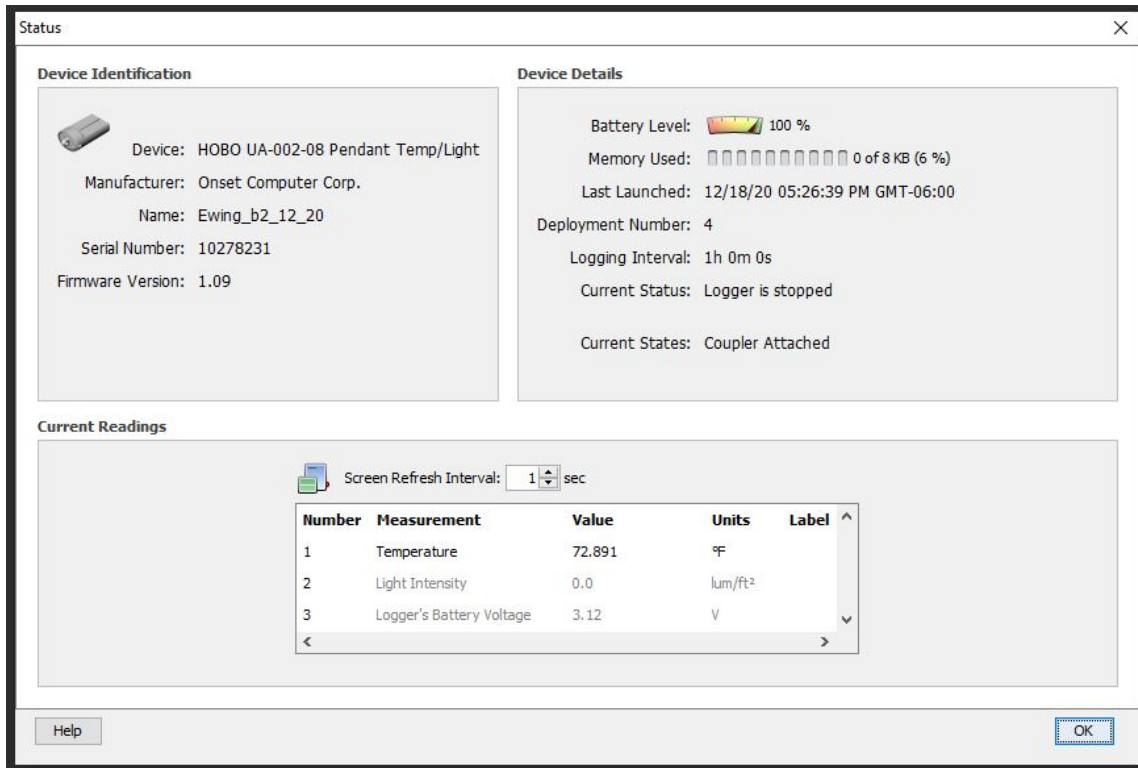
3. Open HOBOWare and check the bottom of the window to see that software recognizes the logger

All buttons used for setting up the logger is located at the top left corner of the window



From left to right (launch, readout, status check, and stop)

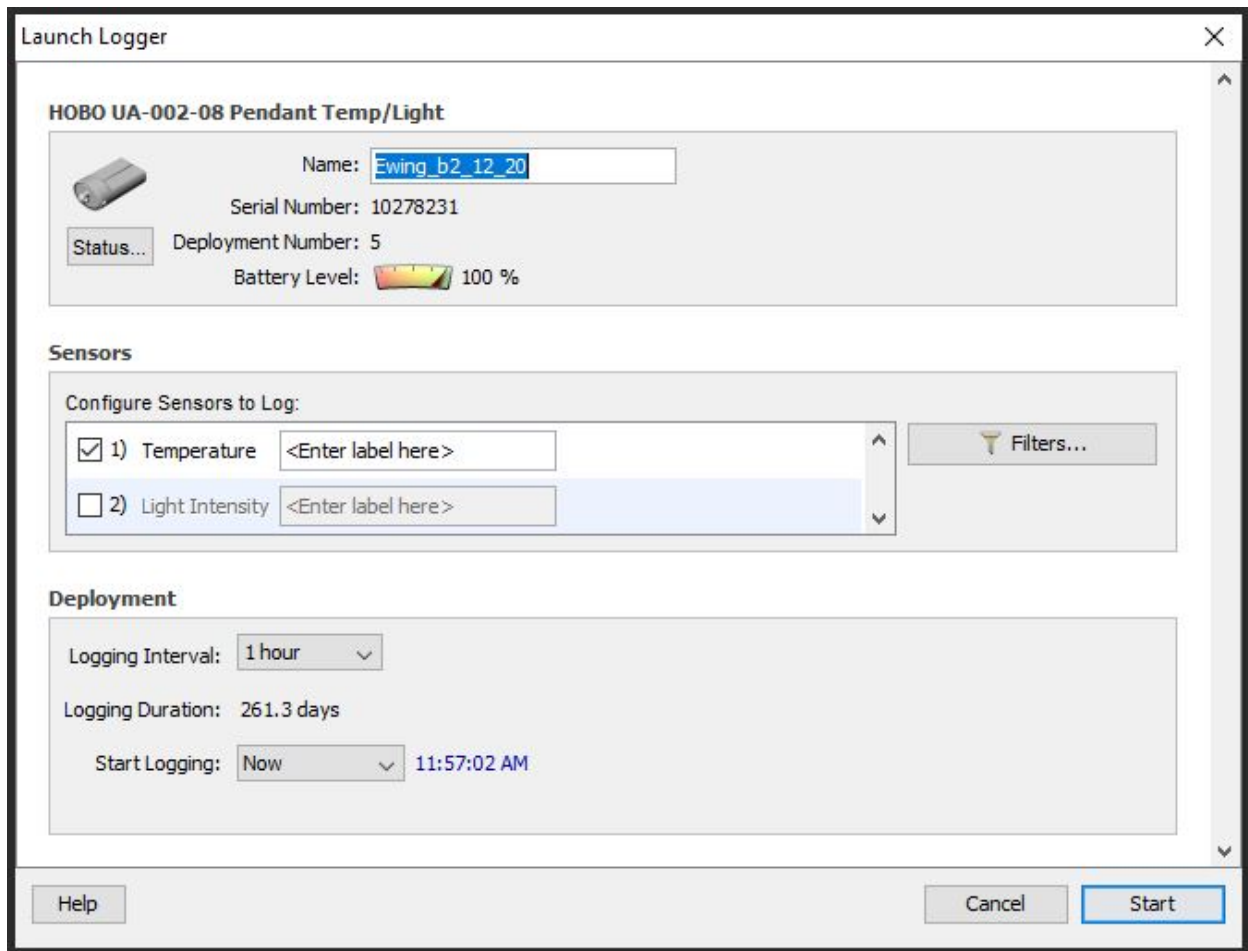
4. When connected, press status check icon and window below should pop up. Status window shows the battery level, memory used, and if the logger is currently logging or not. If battery is low (less than 70%), replace the battery as described below.



- Unscrew the small screws on the two sides of the cap using screwdriver and pull off the black cap. Inside you should find one desiccant bag and the main electronic part of the logger with battery inserted. Carefully slide the battery out and replace with new one. If the desiccant is pink, place the desiccant in an oven (~ 70°C) for at least 30 min. Once color turns blue, cool down the desiccant in ambient air. Reassemble the logger and screw back the screws, ensuring tight seal so that logger is protected from water.



6. When the logger is ready to be launched after inspection, re-connect the logger to the desktop/laptop  
Note: launching logger will erase previously stored data, so make sure to save all necessary data (described in the last section) before launching
7. Click on launch icon and select the name, click the 'Temperature' log checkbox, logging interval, logging start time. Logger can be set to start at specific time, in order to standardize the logging time of multiple loggers.



8. After launching the logger, clip on the status icon to check if the setting is properly applied to the logger. Then de-plug the logger from the base and if you set the logger to start logging now, you should see red light flashing from the logger.
9. Logger is now ready for installation. It is recommended to place the logger into a bag/box labelled with associated name as logger is hard to be labelled directly (or you could label & attach the flag).

## II. Field installation and harvest

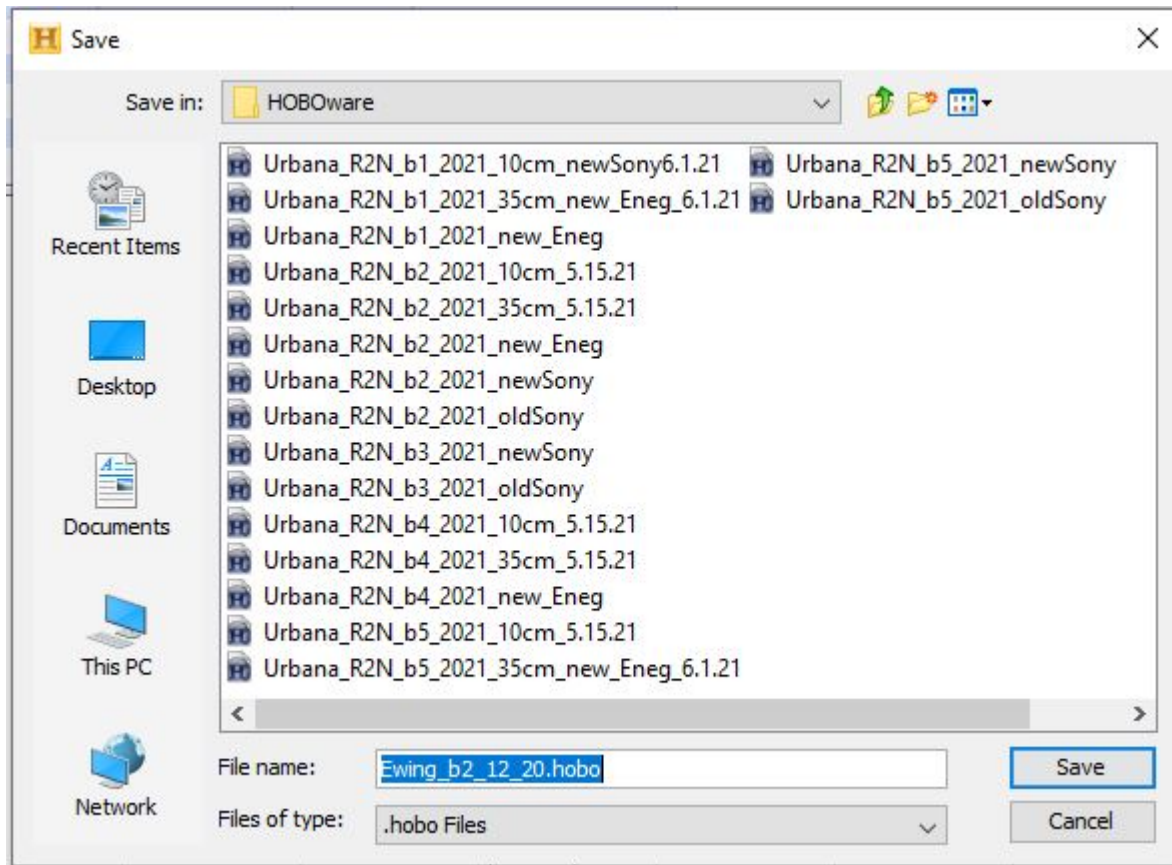
1. Before installation, attach a flag (should be at least 4" longer than the depth of installation) to the logger by wrapping the wire part of the flag through the hole on the black cap of the logger (plier can be helpful here). This makes harvest process very simple, as you can simply pull out the flag. Bend the wire so the front of the logger is facing up while the flag is perpendicular (upward).
2. Dig a hole wide enough to place logger into, to the desired depth (based on the research question), and then place the logger into the hole. Horizontally laying the logger in the hole enables you to see the red flashing light to make sure that the logger is running. It is recommended to

keep the bag/box (labelled) that was used to store the logger because they will come in handy after harvest.

3. Fill the hole back in and make sure the flag is visible. Labelling of the flag with Sharpie is also recommended.
4. When the logger is ready to be harvested, loosen the soil as needed and carefully pull the flag out of the hole. Place the logger back into the bag/box with correct label.

### III. Data extraction

1. Make sure the logger is clean/free of soil or debris. Connect the logger back to the desktop/laptop using the base + coupler and click on the readout icon to extract the data from the logger. The window may ask you if you want to stop the logging or not, so click on yes if you want to. You can manually stop the logger by clicking on the stop icon in the main window too.



2. Save the logger data as .hobo Files that can later be re-opened. Re-launching the logger can automatically delete the data, so make sure to save them if needed.
3. The window asks you to set up plot, so set the unit of temperature you want to display, and click plot. Then you should be able to see the plot of temperature logged over time.

Plot Setup ✕

Description:

Select Series to Plot

All  None

Series	Measurement	Units	Label
<input checked="" type="checkbox"/> 1	Temp	°F	
<input type="checkbox"/> 2	Intensity	lum/ft <sup>2</sup>	
<input type="checkbox"/> 3	Batt	V	

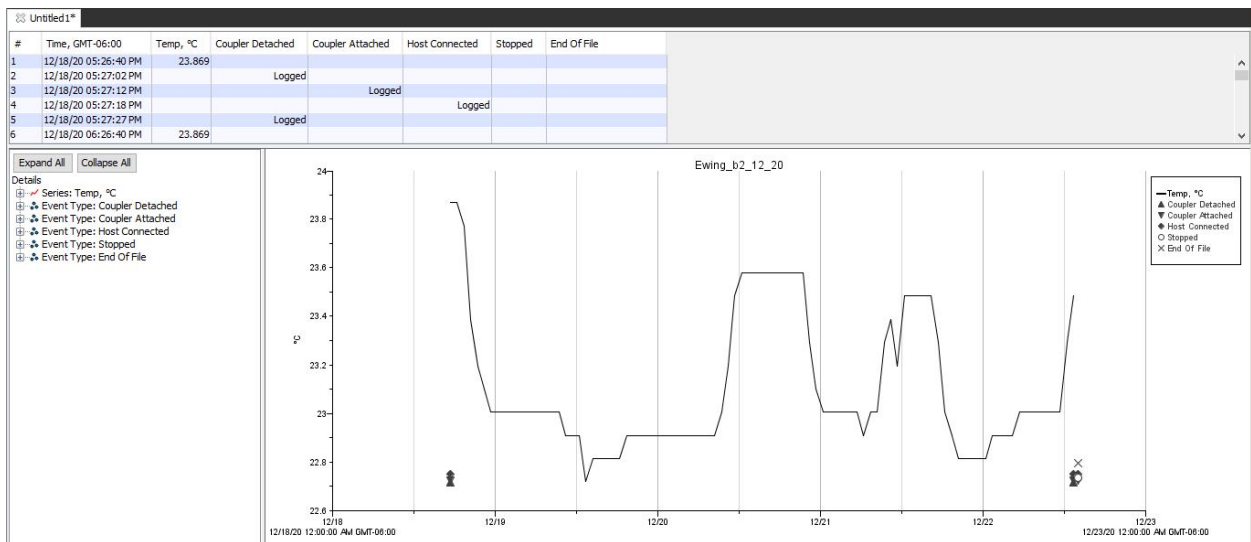
Select Internal Logger Events to Plot

All  None

Event	Event Type	Units
<input checked="" type="checkbox"/> 1	Coupler Detached	
<input checked="" type="checkbox"/> 2	Coupler Attached	
<input checked="" type="checkbox"/> 3	Host Connected	
<input checked="" type="checkbox"/> 4	Stopped	

Offset from GMT  (+/- 18.0 hours, 0 = GMT)

► Data Assistants



## References:

<https://www.onsetcomp.com/products/data-loggers/ua-002-08/>



**Citation:**

SOP: HOBO temperature logger. 2021. Soils Lab, University of Illinois Urbana-Champaign. Urbana, IL. Accessed at:  
<https://margenot.cropsciences.illinois.edu/methods-sops/>

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