

4.7.3 Instructions for the HOBO Pendant light and temperature logger

The HOBO Pendant light and temperature logger has a waterproof housing and can record both temperature and light intensity. Each SeagrassNet site receives 7 HOBO Pendants, to be used as follows:

- 3 HOBO Pendants are used to collect light and temperature data. These loggers are launched and placed in the field 2 weeks before SeagrassNet sampling (on Land/Air and in the water at cross-transects A and C). All three of these HOBO Pendants are retrieved and downloaded after 2 weeks (as described for HOBO LI light loggers, Section 4.3.2 Light Level).
- 2 HOBO Pendants are used to collect temperature data only. These loggers are attached at the base of the center screw anchors on cross-transects A and C. The HOBO Pendants used to measure temperature remain in the field and are replaced every 3 months (as described for the iButton loggers, Section 4.3.3 Temperature).
- 2 extra HOBO Pendants are kept with the SeagrassNet kits and used to exchange with the 2 loggers measuring temperature that are already in the field.



Materials (for 1 site): 7 HOBO Pendant loggers, HOBOWare Lite CD, HOBO Pendant Coupler and USB cable, 2 PVC support brackets, 7 desiccant packets (keep sealed), extra pendant casing, and 4 extra batteries.

Loading HOBOWare Lite onto your computer (PC or Macintosh):

- You must have administrative access on your computer to install HOBOWare Lite.
- Insert the HOBOWare Lite CD into your computer's CD-ROM drive.
- *PC Users:* Please double-click "HOBOWareLite_Setup.exe" and follow the instructions. (If you do not have a supported version of Java (1.4.2 or later) installed, the installer will download and install it for you. HOBOWare will inform you if your Java version is not up to date.)
- *Mac Users:* Please double-click "HOBOWareLite.pkg" and follow the instructions. When you reach the final screen of the installation program, click **Restart**.



Launching HOBO Pendant with HOBOware

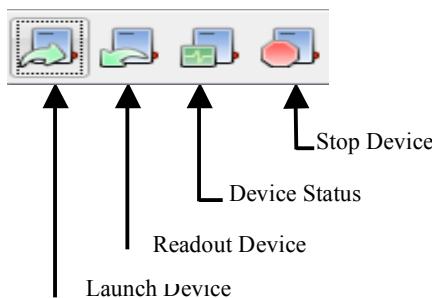
↳ Start the HOBOware program:

- *PC Users:* HOBOware Lite should open automatically after the first time it is installed. At other times, you can start the program in two ways: 1) double-click the HOBOware Lite icon on your desktop or on your C drive > Program Files > Onset Computer Corporation > HOBOware, 2) in the lower left hand corner of the screen click the “Start” menu, then select “Applications” and “HOBOwareLite.”
- *Mac Users:* Open HOBOware Lite by double-clicking the HOBOware Lite icon in your computer’s Applications folder. You may also place the HOBOware Lite icon in the desktop’s dock for easy access.

↳ Connect your HOBO Pendant to your computer:

- Open HOBOware Lite.
- Plug the HOBO interface USB cable into your computer.
- Insert the Optic USB Base Station into the Pendant Coupler (a black plastic casing). The Optic USB Base Station looks like a HOBO Pendant, but it is black and has a USB cable coming out of one end. The raised strip on the Optic Base Station must be matched to the groove inside the Pendant Coupler (the coupler and the base station may already be connected).
- Insert the HOBO logger into the Pendant Coupler. Match the raised strip to the Pendant Coupler’s groove. It may take a moment for your computer to recognize the HOBO logger. (Note: Your computer may tell you to reboot before you can use the logger. It is not necessary to reboot.)
 - Check the desiccant packet on the inside cover of the HOBO Pendant. The desiccant packet has a blue band if it is still good. If the band is no longer blue, remove the desiccant packet and dry until the blue band is restored. To remove the desiccant packet, remove set screws and remove the lid. When replacing the lid, make sure you have a watertight seal.
 - After many uses, the casing may become scratched. If the casing is scratched or no longer clear, replace it as follows: after the casing is dry, remove the set screws, lid, sensor device and desiccant packet. Place these items in the extra pendant casing provided.
- As soon as your computer recognizes the HOBO logger, the message at the bottom of the HOBOware Lite screen will change from “No device connected” to indicate the model, serial number, and number of HOBO Pendants connected.

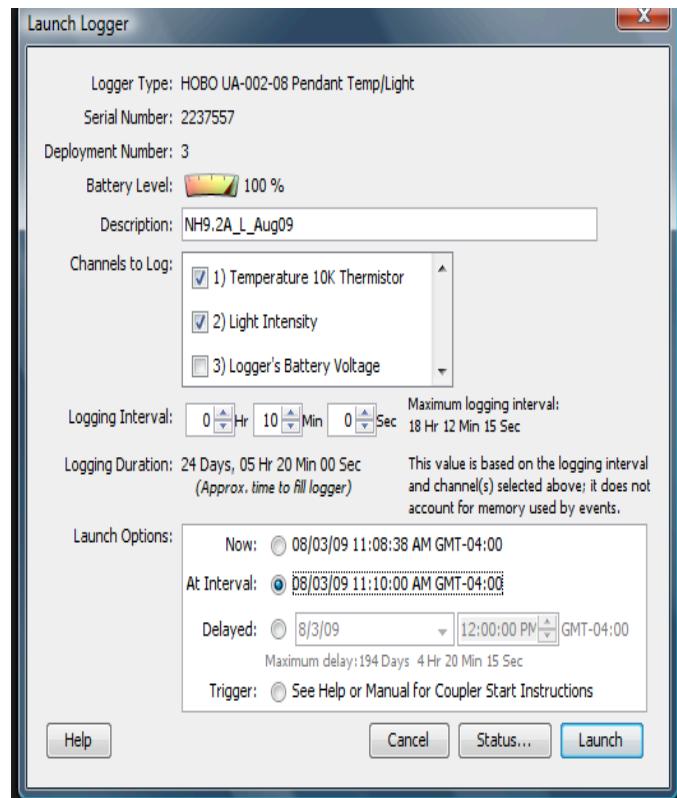
Launch your HOBO Pendant logger:



- When you launch a logger, it acquires the date and time from your computer. Prior to launching the loggers, please make sure that your computer is set to the correct, local date and time.
- These symbols (left) are used to launch, download, and stop your HOBO Pendant and are located at the top left of the HOBOware Lite window.

Launch for Light and Temperature:

- The 3 Pendant sensors will log both light and temperature data for the 2 week duration before SeagrassNet sampling, in addition to the designated sensors logging temperature for the 3 months between sampling dates.
- To launch the logger, click on the “Launch Device” icon. A window appears similar to the “Launch Logger” window (right).
- Check the battery level. Replace battery if less than 25%.
- Enter the Pendant logger information inside the Launch Logger window.
- In the Description box, enter your site name, site number, L (meaning light and temperature), cross-transect (A, C, or LAND), and the launch date (month and year).
- In the “Channels to Log” box: for light, put a check mark next to 1) Temperature 10K Thermistor and 2) Light Intensity when launching the three HOBO Pendants marked “L.” Two Pendant loggers are attached to the side of the screw anchors on transects A and C, and 1 Pendant logger is attached to a pole (or other tall object) on land (in the air) where it is not shaded during the day. Do NOT put a check next to 3) Logger’s Battery Voltage.
- Set the Logging Interval to record every 10 minutes: put a “10” in the middle box (Min) and “0” in the other boxes.

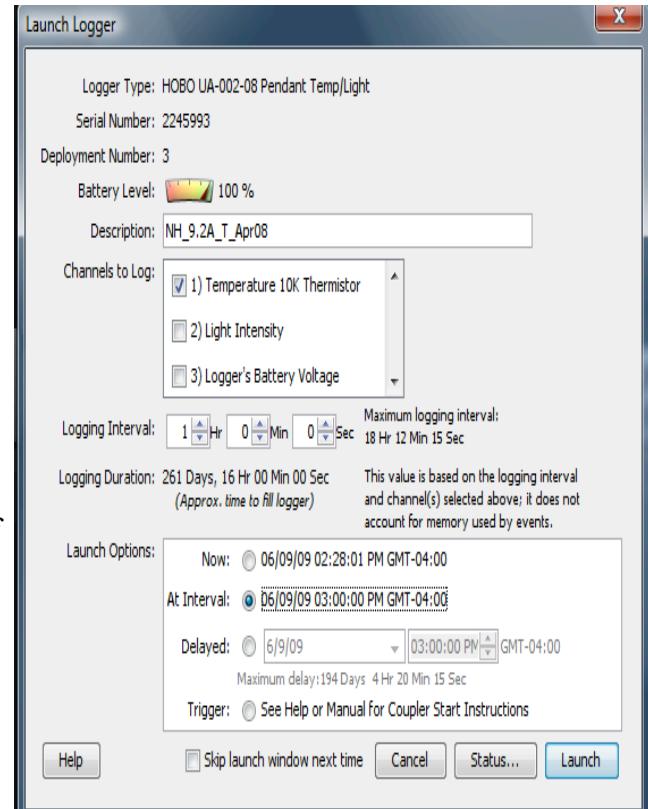




- Set the Launch Options to “At interval”: this setting makes each logger record on the minute mark.
- After you have changed the settings, your window should look similar to the one above (the window above was set for a Pendant logger to record light and temperature in New Hampshire site 9.2, cross-transect A in April 2008).
- Select the “Launch” button in the bottom right-hand corner of the window. Do not unplug the logger until instructed. At this time, you can click the “Status...” button to determine if the logger is working.
- When instructed by HOBOware Lite, remove the HOBO Pendant and observe that the red light blinks intermittently.
- Repeat the above sequence until you have launched light/temperature loggers for cross-transect A, cross-transect C and LAND.
- If you get an error message when launching (e.g., “no device connected”), please try again.
- Label the HOBO Pendants being deployed so they can be distinguished from the HOBO Pendants being retrieved (DO NOT write on the upper surface, over the sensor).

Launching for Temperature:

- To launch the logger, click on the “Launch Device” icon. A window appears similar to the “Launch Logger” window (right).
- Check the battery level. Replace battery if less than 25%.
- Enter the temperature logger information inside the Launch Logger window.
- In the Description box, enter your site name, site number, T (meaning temperature), cross-transect (A, C), and the launch date (month and year).
- “Channels to Log” box: For temperature, put a check mark next to 1) Temperature 10K Thermistor when launching the two HOBO Pendants marked “T.” Do NOT check the box for 2) Light Intensity or 3) Logger’s Battery Voltage.
- Set the Logging Interval for the temperature HOBO Pendants to record every hour: put a “1” in the first box (Hr) and “0” in the other boxes.



- Set the Launch Options to “At Interval”; this setting makes each logger record on the hour.
- After you have changed the settings, your window should look similar to the one above (the window above was set for temperature at New Hampshire site 9.2, cross-transect A in April 2008).
- Select the “Launch” button in the bottom right hand corner of the window. Do not unplug the logger until instructed. At this time you can click the “Status...” button to determine if the logger is working.
- When so instructed, remove the HOBO Pendant, and observe that the red light blinks intermittently and label each logger.
- Repeat the sequence until you have launched temperature loggers for both cross transects, A and C.
- If you get an error message when launching (e.g., “no device connected”), please try again.

Deploying the HOBO Pendant (Light/Temperature):



- HOBO Pendants (3) to log light and temperature should be deployed 2 weeks prior to quarterly sampling. Two Hobo Pendants for light/temperature are deployed in the water, on the center screw anchor of cross-transects A and C, and one is deployed on land (in the air), attached to a post or other un-shaded, permanent structure.
- Put a strip of clear tape evenly over the flat surface of the pendant (the green side that says “Hobo”), wrap the tape around the case, with ends of the tape overlapping on the back of the case with the raised strip. The tape protects the pendant light sensors. Make sure there are no air bubbles or debris obstructing the light sensing area.

- Send two zip ties through the HOBO Pendant bail, in opposite directions.
- Slide both ends of both cable ties through the PVC support bracket.
- In the field, using the zip ties, attach the HOBO Pendant to the eye of the screw anchor at cross-transects A and C, orienting the HOBO Pendant toward the Equator (i.e., facing south in the Northern Hemisphere





and facing north in the Southern Hemisphere). Sunlight reaching the HOBO Pendant should not be obstructed by shadows; the horizontal surface with sensors and flashing light should be level and face the sky. Cut off the unused ends of the cable ties (see picture at right). Deploy the third HOBO Pendant for light collection on land (in the air) in a convenient but protected location without shadows throughout the day.

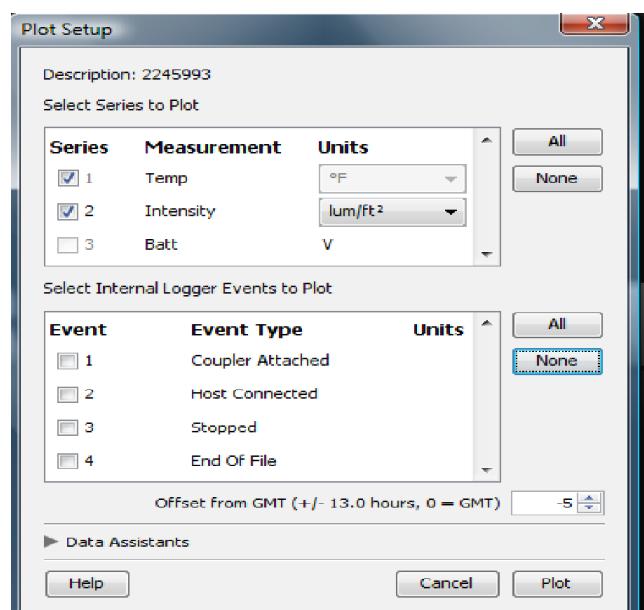
- After the HOBO Pendants have been deployed for 2 weeks, collect the light sensors and download the data.

Deploying the HOBO Pendant (Temperature only):

- HOBO Pendants (2) to log temperature are deployed at the time of the quarterly SeagrassNet sampling and exchanged with the loggers which have been in place for the past 3 months.
- Put a strip of clear tape evenly over the flat surface of the pendant, again wrapping the tape around the case, with ends of the tape overlapping on the side of the pendant with the raised strip. The tape protects the sensors.
- Send two zip ties through the HOBO Pendant bail in opposite directions (see picture above).
- Clip off the used sensor and attach the fresh HOBO Pendant at the base of the screw anchor, near the sediment surface at cross-transects A and C.

Downloading light/temperature data from the HOBO Pendant logger:

- After retrieving all three light/temperature sensors from the field, wash them in fresh water and clean any debris or encrusting material from the cases.
- Allow the pendant sensors to dry completely before downloading. Once they are dry, remove the clear tape.
- Insert the HOBO Pendant in its case and the Optic USB Base Station into the Pendant Coupler (aligning the raised strip and groove). Plug the USB cable from the Base Station into your computer. Open HOBOware Lite.
- Click the “Readout device” icon in the upper left hand corner of the window. You will be asked, “Do you wish to stop logging before reading out the logger?” Press “Stop”.





- Save the file using the file name for your site (for example: NH_9.2A_L_Apr08.hobo). The file will be saved with a “.hobo” at the end of the file name so that HOBOware Lite can identify it.
- You will then be prompted to select the plot setup features. Please check the Temperature box and select degrees C. Also check the box for Intensity and select “lum/ft²” for units. None of the Events should be checked.
- Click “Plot” to view a graph of the light/temperature data.
- Export the data as an Excel file. In the “File” menu select “Export Points as Excel Text...”, then select “Export to a single file” and select the destination file.

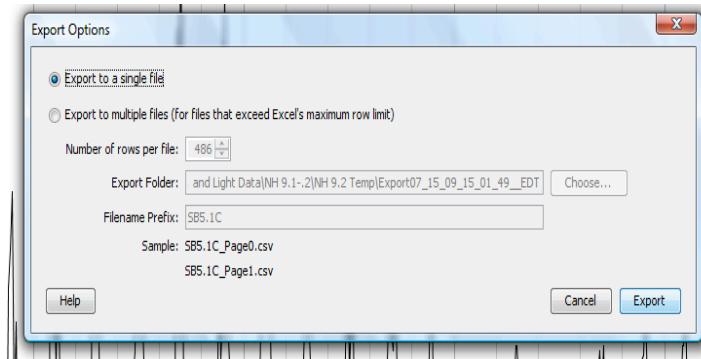
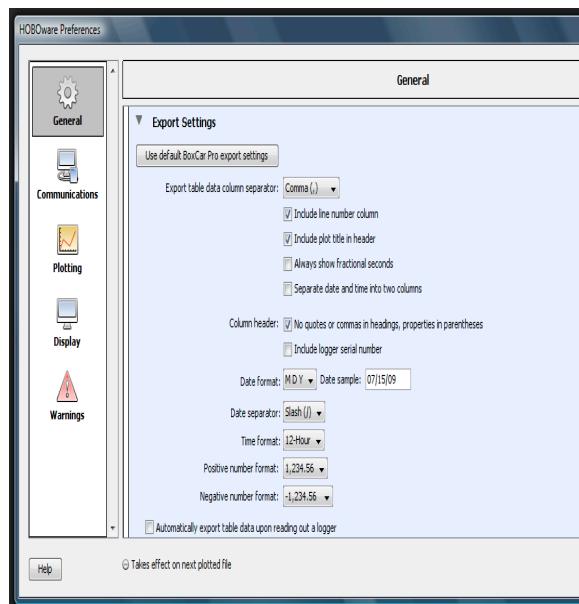
Downloading temperature data from the HOBO Pendant logger:

- After retrieving both temperature sensors from the field, wash them in fresh water and clean any debris or encrusting material from the cases.
- Allow the pendant sensors to dry completely before downloading. Once they are dry, remove the clear tape.
- Insert the HOBO Pendant and Optic USB Base Station into the Pendant Coupler (aligning the raised strip and groove). Plug the USB cable into your computer. Open HOBOware Lite.
- Click the “Readout device” icon in the upper left hand corner. You will be asked, “Do you wish to stop logging before reading out the logger?” Press “Stop”.
- Save the file using the file name for your site (for example: NH_9.2A_T_Apr08.hobo). The file will be saved with a “.hobo” at the end of the file name so that HOBOware Lite can identify it.
- You will then be prompted to select the plot setup features. Please check the box for Temp and select “°C” for units. None of the Events should be checked.
- Click “Plot” to view a graph of the temperature data.



Exporting your data for submission to the website:

- In order to submit the light or temperature data to the SeagrassNet website, it must be exported from HOBOware Lite as a .csv file as follows:
 - The “export data column separator” should be set to Comma (,).
 - Check only the boxes for:
 - ✓ “Include line number column”
 - ✓ “Include plot title in header”
 - ✓ “No quotes or commas in headings, properties in parentheses”
 - Date Format should be set to [MDY]
 - Date Separator should be set to [Slash (/)]
 - Time Format should be set to [12 Hour]
 - When these settings are specified, click “OK” at the bottom right-hand side of the “HOBOware Preferences”, “General” screen.
- Next click “File”, “Export Points as Excel Text...”
- Make sure the circle next to “Export to a single file” is filled in, then click “Export”
- Save the file using the file name for your site (for example: NH_9.2A_T_Apr08.csv)





Submitting your data to the SeagrassNet website:

The light/temperature (3 files: cross-transects A and C, plus “Land/Air”) and temperature data (2 files: cross-transects A and C) are uploaded separately.

For Light/Temperature Data:

- Please upload the text data files for light/temperature data to the SeagrassNet website: http://www.seagrassnet.org/data-test/insert_light_temp.php
- Enter the site name and transect code using the drop-down menu. For light/temperature, all 3 text data files (“Air”= “Land” and cross-transects A and C) must be uploaded separately. If several sites share a single Land/Air light sensor, the Land/Air data file must be uploaded multiple times, once for each site.
- Select the correct "Country, Location and Transect" and "Station". For "Data file type", select "Hobo Pendant – Light and Temperature"
- Select the data file to upload and click "Submit".

For Temperature Data:

- Please upload the text data files for temperature data to the SeagrassNet website: http://www.seagrassnet.org/data-test/insert_light_temp.php
- Temperature data (2 files: cross-transects A and C) are uploaded separately.
- Enter the site name and transect code using the drop-down menu.
- Select the correct "Country, Location and Transect" and "Station". For "Data file type", select "Hobo Pendant - Temperature"
- Select the data file to upload and click "Submit".

After data submission:

- Make sure the Pendant sensor is turned off (no flashing red light). Then cover the sensor side of the Pendant with clear plastic tape to protect the logger in storage and during the next deployment.
- If you are unable to upload the data via the web site, your data can be emailed. Send the data file as an attachment to: Seagrass.Net@unh.edu