

Continuous Temperature and Water Level Monitoring in Streams and Lakes

- Pre-deployment procedures
- Sensor launch

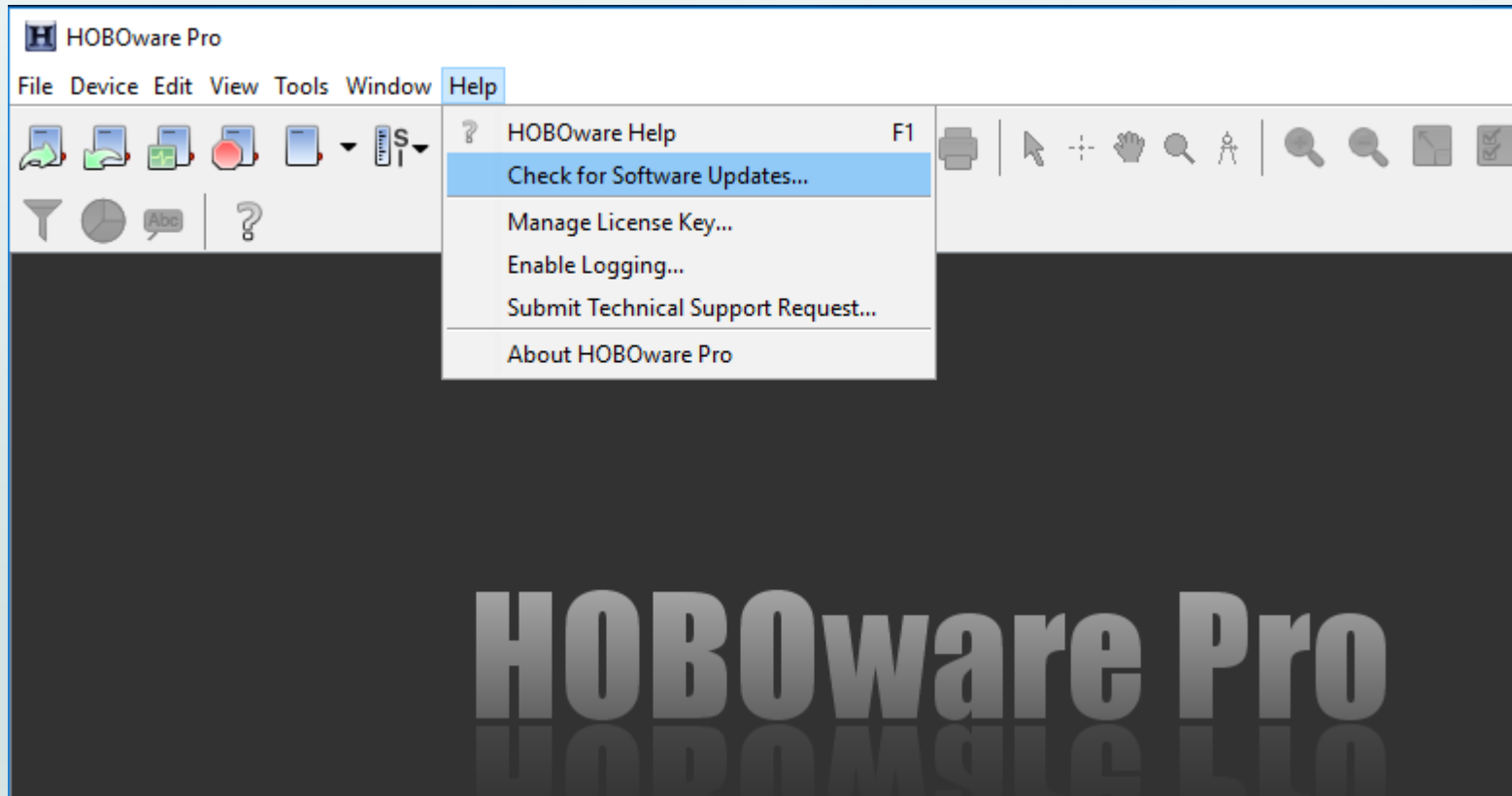
Disclaimer: this is not an endorsement of Onset equipment. It just happens to be the equipment that most RMN partners are using right now. If you are using other brands of equipment for similar types of monitoring, please share your experiences with us. We will add in additional material as it becomes available.

Preparing loggers for deployment

- Check that logger software is up-to-date
- Check that computer clock is correct and set to correct time zone
- Launch Loggers (more in next slides)
- If using the HOBO Waterproof Shuttle, make sure:
 - Batteries are less than 1 year old
 - It has the latest firmware
 - It has been launched
 - Its clock is synchronized to the computer clock



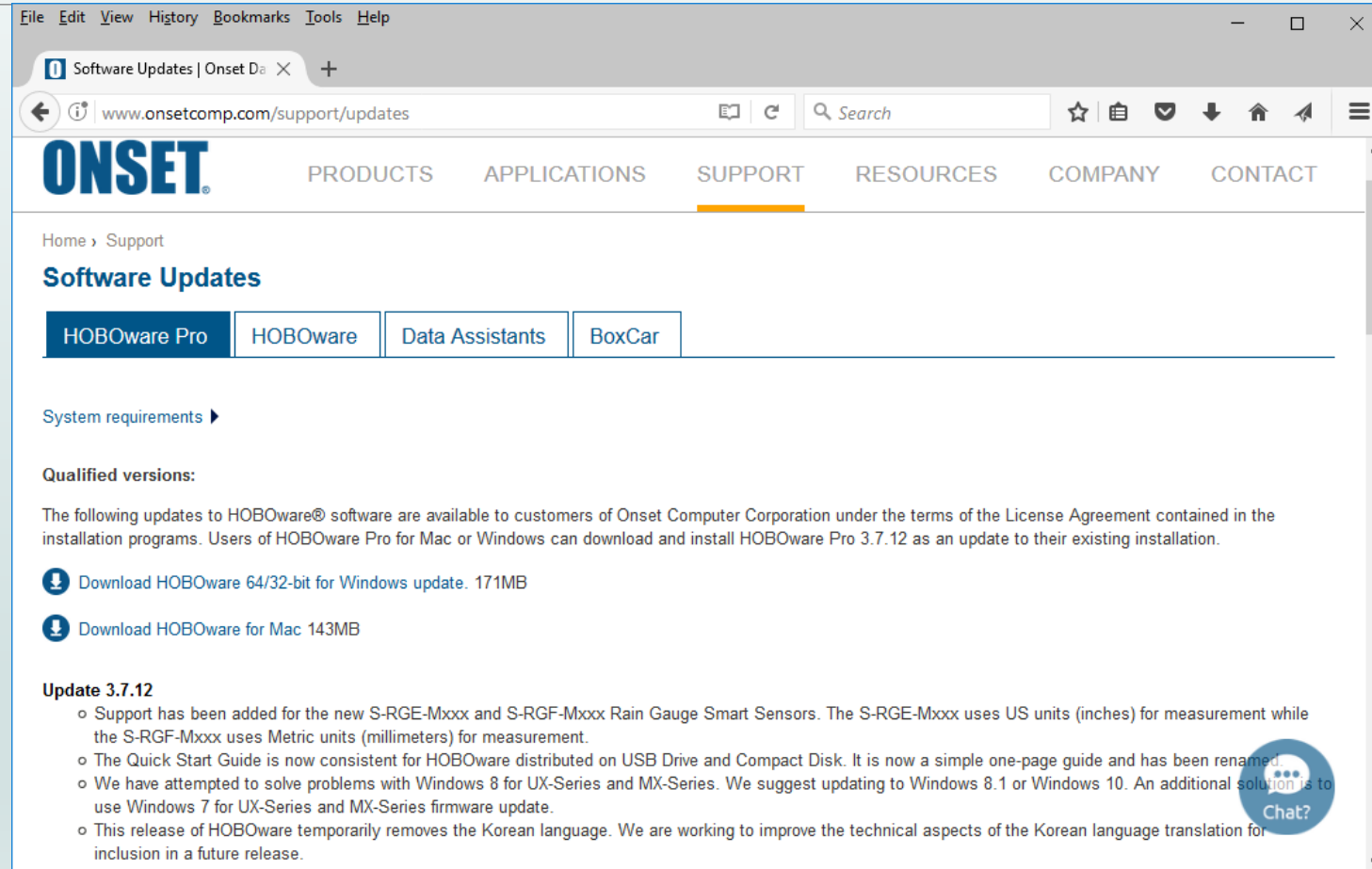
Make sure software is up-to-date



Check for
HOBOWare updates

Check for HOBOWare Updates

If there are updates, you will be directed to this web page to download the update:



The screenshot shows a web browser window displaying the 'Software Updates' page on the Onset Computer Corporation website. The browser's address bar shows 'www.onsetcomp.com/support/updates'. The website's navigation menu includes 'ONSET', 'PRODUCTS', 'APPLICATIONS', 'SUPPORT' (which is highlighted), 'RESOURCES', 'COMPANY', and 'CONTACT'. Below the navigation menu, the breadcrumb 'Home > Support' is visible, followed by the 'Software Updates' heading. A horizontal menu contains four buttons: 'HOBOWare Pro' (selected), 'HOBOWare', 'Data Assistants', and 'BoxCar'. Under the 'HOBOWare Pro' button, there is a section for 'System requirements' and 'Qualified versions:'. The 'Qualified versions' section states that updates are available to customers under the terms of the License Agreement. It lists two download options: 'Download HOBOWare 64/32-bit for Windows update. 171MB' and 'Download HOBOWare for Mac 143MB'. Below this, the 'Update 3.7.12' section provides details about the update, including support for new S-RGE-Mxxx and S-RGF-Mxxx Rain Gauge Smart Sensors, a renamed Quick Start Guide, and improvements to Windows 8 compatibility and Korean language translation.

File Edit View History Bookmarks Tools Help

Software Updates | Onset Da X +

www.onsetcomp.com/support/updates

ONSET

PRODUCTS APPLICATIONS SUPPORT RESOURCES COMPANY CONTACT

Home > Support

Software Updates

HOBOWare Pro HOBOWare Data Assistants BoxCar

System requirements ▶

Qualified versions:

The following updates to HOBOWare® software are available to customers of Onset Computer Corporation under the terms of the License Agreement contained in the installation programs. Users of HOBOWare Pro for Mac or Windows can download and install HOBOWare Pro 3.7.12 as an update to their existing installation.

Download HOBOWare 64/32-bit for Windows update. 171MB

Download HOBOWare for Mac 143MB

Update 3.7.12

- Support has been added for the new S-RGE-Mxxx and S-RGF-Mxxx Rain Gauge Smart Sensors. The S-RGE-Mxxx uses US units (inches) for measurement while the S-RGF-Mxxx uses Metric units (millimeters) for measurement.
- The Quick Start Guide is now consistent for HOBOWare distributed on USB Drive and Compact Disk. It is now a simple one-page guide and has been renamed.
- We have attempted to solve problems with Windows 8 for UX-Series and MX-Series. We suggest updating to Windows 8.1 or Windows 10. An additional solution is to use Windows 7 for UX-Series and MX-Series firmware update.
- This release of HOBOWare temporarily removes the Korean language. We are working to improve the technical aspects of the Korean language translation for inclusion in a future release.

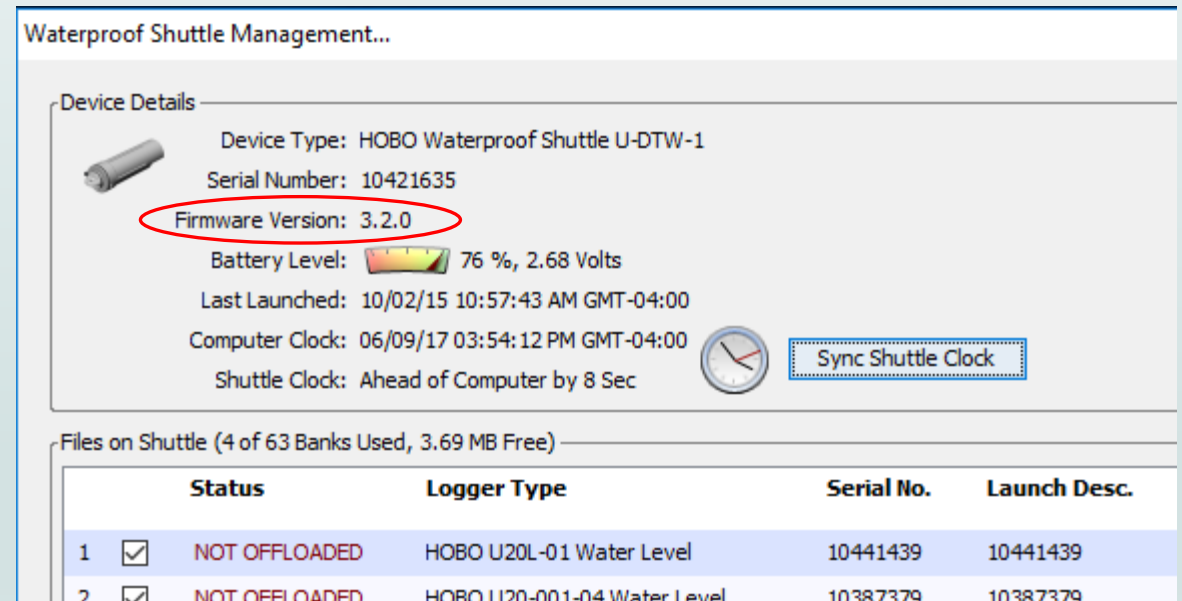
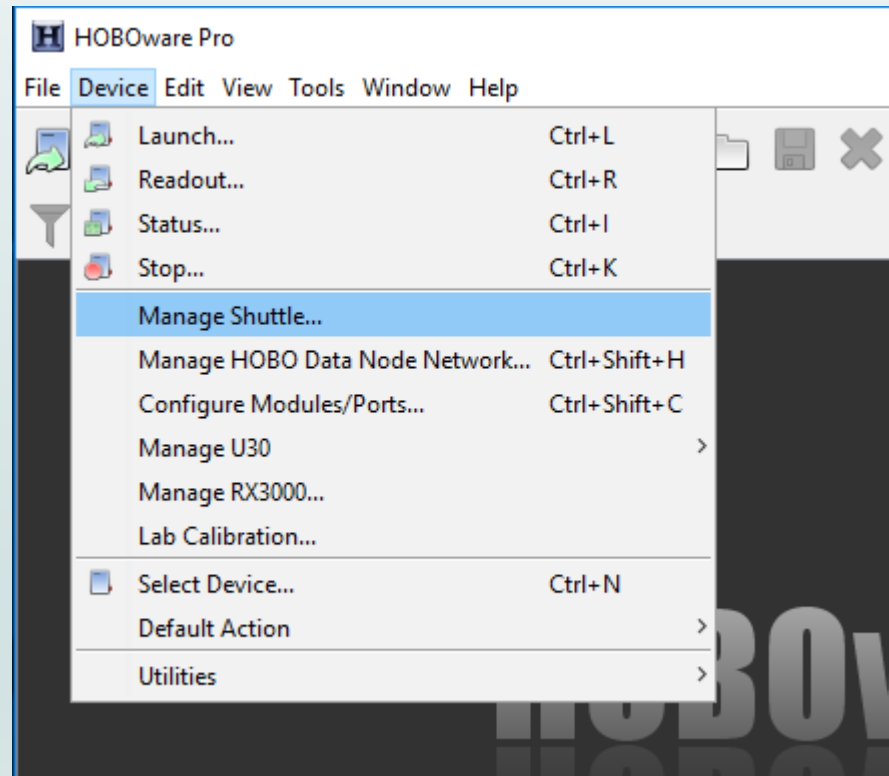
Chat?

Check HOBOWaterproof Shuttle Version

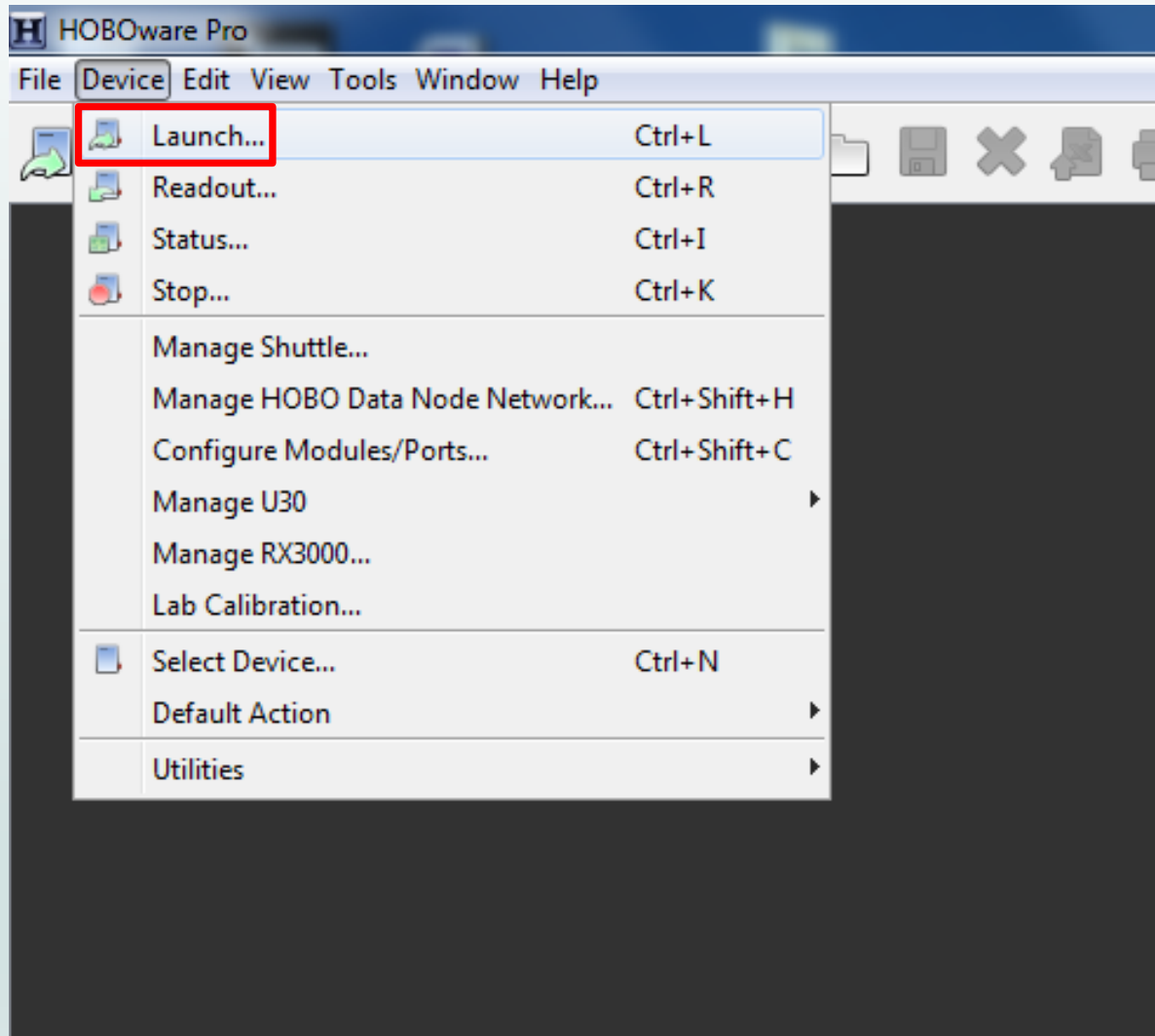
Check for latest shuttle version here:

http://www.onsetcomp.com/support/firmware_updates

Check your shuttle version with HOBOWare:



Launch configuration



Open HOBOWare

- Device
 - Launch

Launch configuration

Note: in order to access this screen, your computer needs to be plugged into the sensor + base station or shuttle

Launch Logger

HOB0 U20L-04 Water Level

Name: 20135017
Serial Number: 20135017
Deployment Number: 3
Battery State: GOOD

Sensors

Configure Sensors to Log:

- ☒ 1) Absolute Pressure <Enter label here>
- ☒ 2) Temperature <Enter label here>

Deployment

+ Add Interval

Logging Interval: 1) 1 minute

Start Logging: Now 14:10:46

Samples	Logs until
21657	15.0 days

Help Skip launch window next time Cancel Start

Initial default name is the serial number (change if desired)

Confirm battery status is 'good'

- For our purposes, leave 'label' fields blank
- Make sure both pressure and temperature have check marks ✓
- Logging 'battery' life is optional

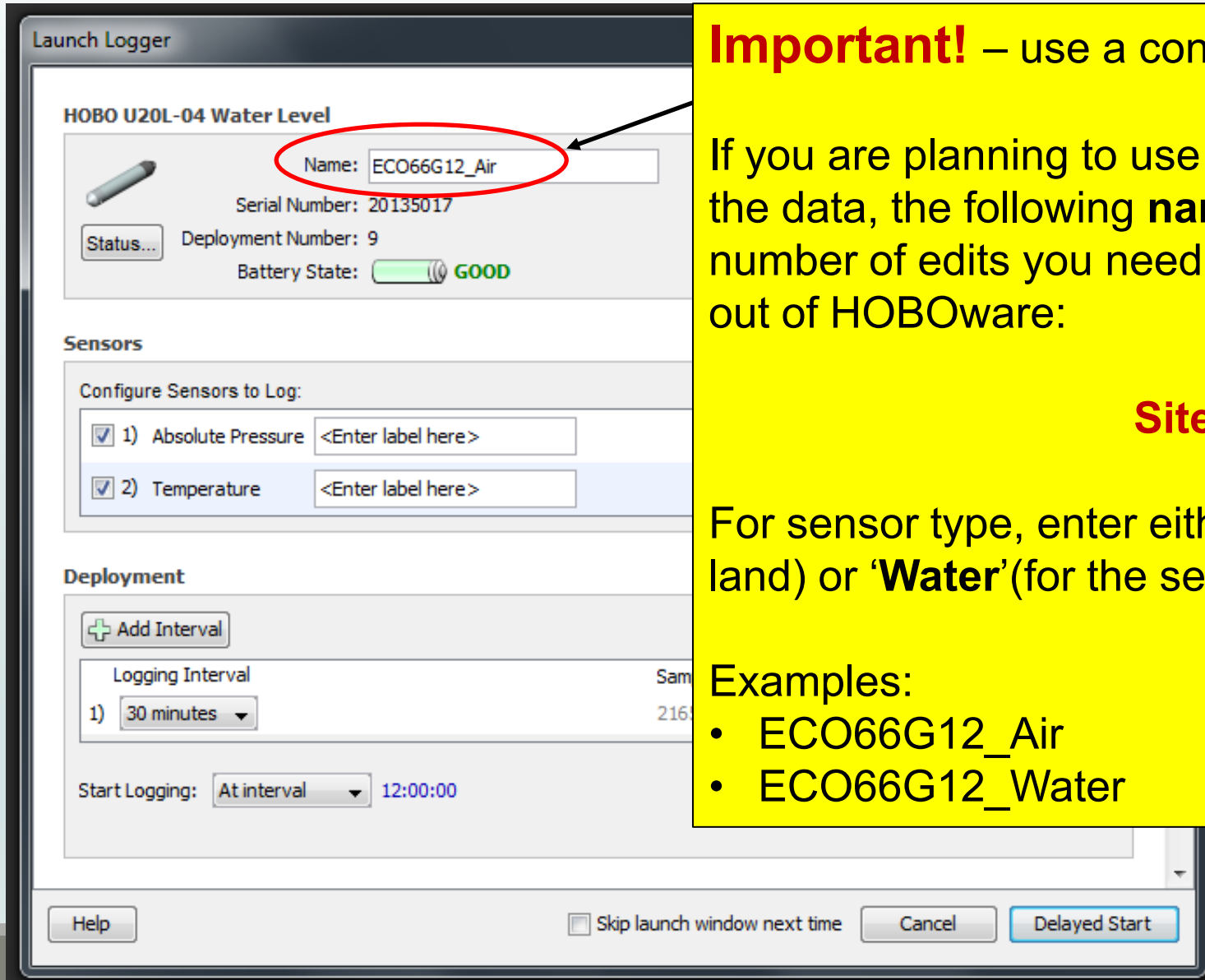
Select the desired recording interval

Select the desired start time.

Important! For our purposes, start Logging "At Interval" or "On Date/Time" (**do not use "Now"**)


Click on 'Start'

Launch configuration – naming the sensor




Launch Logger

HOB0 U20L-04 Water Level

 Name: ECO66G12_Air

Serial Number: 20135017

Status... Deployment Number: 9

Battery State:  **GOOD**

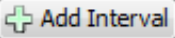
Sensors

Configure Sensors to Log:

☒ 1) Absolute Pressure <Enter label here>

☒ 2) Temperature <Enter label here>

Deployment

 Add Interval

Logging Interval

1) 30 minutes

Start Logging: At interval 12:00:00

Help ☐ Skip launch window next time Cancel Delayed Start

Important! – use a consistent naming scheme

If you are planning to use the **ContDataQC R package** to QC the data, the following **naming scheme** will minimize the number of edits you need to make when you export data files out of HOBOWare:

SiteID_SensorType

For sensor type, enter either '**Air**' (for the sensor you install on land) or '**Water**' (for the sensor you install in the water).

Examples:

- ECO66G12_Air
- ECO66G12_Water

Launch configuration – logging interval

Launch Logger

HOB0 U20L-04 Water Level

Name: ECO66G12
Serial Number: 20135017
Deployment Number: 3
Battery State: **GOOD**

Sensors

Configure Sensors to Log:

- ☒ 1) Absolute Pressure <Enter label here>
- ☒ 2) Temperature <Enter label here>

Deployment

+ Add Interval

Logging Interval

- 1) 1 minute
- 1 minute
- 5 minutes
- 10 minutes
- 15 minutes**
- 30 minutes
- 1 hour
- 2 hours
- 4 hours

Start

Help

☐ Skip launch window next time

Cancel Start

There are numerous options for logging intervals in the drop-down menu. You also have the option to add in a new interval.

At RMN sites, we've generally been using 15 or 30-minute intervals

Launch configuration – start time

Example: **30-minute logging interval**

The screenshot shows the 'Launch Logger' window for 'HOB0 U20L-04 Water Level'. The sensor details include Name: ECO66G12_Water, Serial Number: 20135018, Deployment Number: 8, and Battery State: GOOD. Under the 'Sensors' section, 'Absolute Pressure' and 'Temperature' are selected for logging. In the 'Deployment' section, a table shows a logging interval of 30 minutes, 21657 samples, and logging until 1.2 years. The 'Start Logging' dropdown is set to 'At interval', and the time is set to 12:00:00. An arrow points to the 'At interval' dropdown.

Logging Interval	Samples	Logs until
1) 30 minutes	21657	1.2 years

If you select '**start logging at interval**', it will start logging at the next hour or half hour (e.g., if you do this at 11:45, it will start logging at 12:00)

The screenshot shows the 'Launch Logger' window for 'HOB0 U20L-04 Water Level' with the same sensor details as the first image. In the 'Deployment' section, the 'Start Logging' dropdown is set to 'On Date/Time', with the date set to 06/03/17 and the time set to 14:00:00. An arrow points to the 'On Date/Time' dropdown.

Logging Interval	Samples	Logs until
1) 30 minutes	21657	1.2 years

If you select '**start logging on date/time**', it will start logging at whatever date/time you enter (in this example, 6/3/2017 at 14:00)

Launch configuration – start time

The screenshot shows the 'Launch Logger' window. At the top, it displays 'HOB0 U20L-04 Water Level' with a sensor icon. Below this, fields for 'Name: ECO66G12_Water', 'Serial Number: 20135018', 'Deployment Number: 8', and 'Battery State: GOOD' are visible. The 'Sensors' section has a 'Configure Sensors to Log:' area with two checked items: '1) Absolute Pressure' and '2) Temperature', each with a label input field. A 'Filters...' button is to the right. The 'Deployment' section includes an 'Add Interval' button and a table with columns 'Logging Interval', 'Samples', and 'Logs until'. The table contains one row: '1) 30 minutes', '21657', and '1.2 years'. Below the table, the 'Start Logging:' dropdown is set to 'At interval' with a time of '12:00:00' next to it. A red circle highlights this 'At interval' option, and another red circle with a diagonal line through it highlights the 'Now' option. At the bottom, there are buttons for 'Help', 'Skip launch window next time', 'Cancel', and 'Delayed Start'.

Important! If you are deploying air and water level loggers at a site, or a chain of temperature sensors in a lake, **please make sure they are recording at the same time**. This will make data processing easier and will improve the quality of your data.

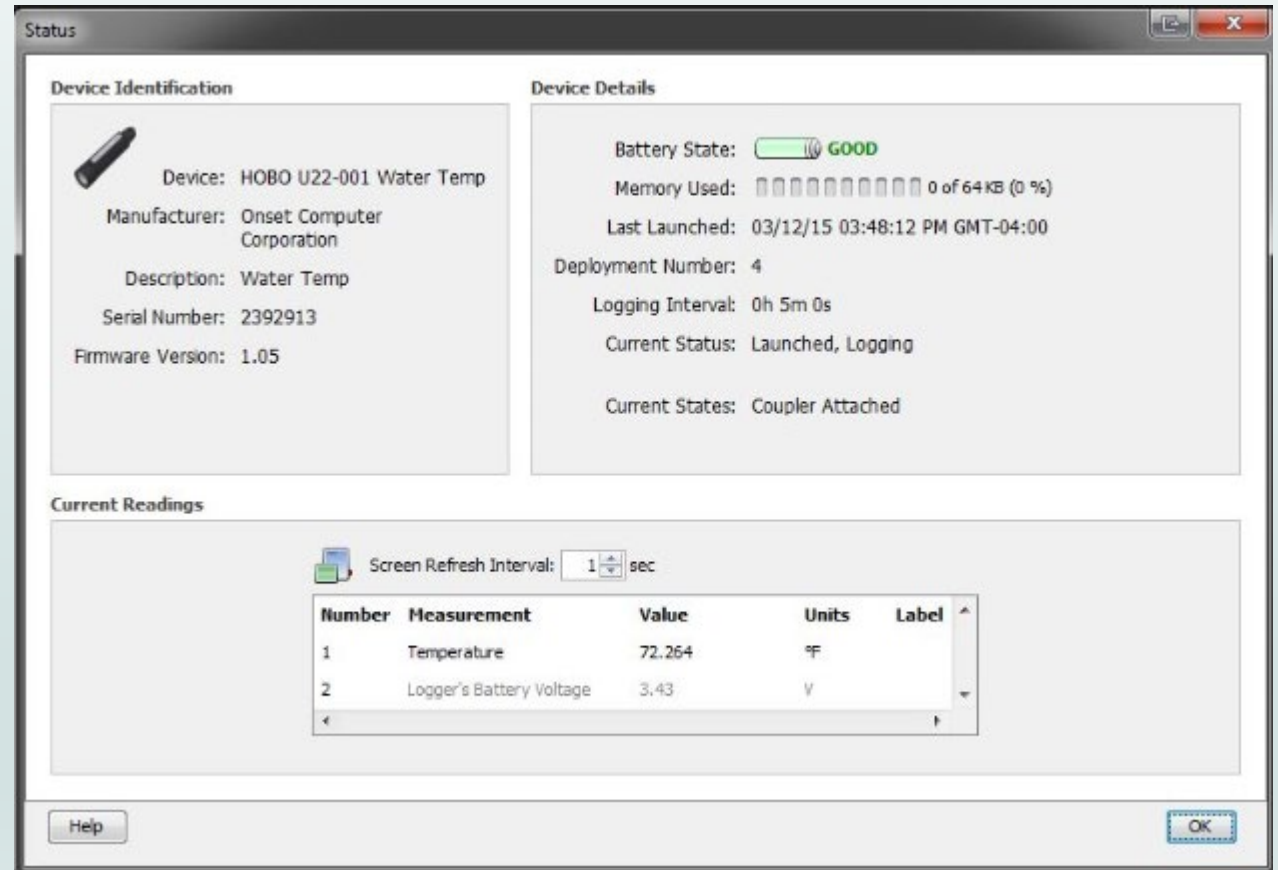
Some people have had problems with air and water sensors getting out of sync (e.g., one records at 11:03 and the other records at 11:18). This happens when the user selects 'Start Logging: Now' and then deploys one sensor and then the other (at that point, recording times are usually spaced about 10-15 minutes apart).

Good news! You can easily avoid this by selecting '**Start Logging: At interval**' or '**On date/time**' (and enter on the hour and half hour if it's a 30-minute logging interval).

If you launch the sensor with these settings, the sensor will retain these settings during future downloads and relaunches with waterproof shuttles. If your air and water sensors get out of sync, you will need to bring a laptop into the field and enter the proper settings during the relaunch.

Configuration & Launch

After you have launched your device you can go back into HOBOWare and check the status of your logger:





The screenshot shows the 'Status' window in HOBOWare. It is divided into three main sections: 'Device Identification', 'Device Details', and 'Current Readings'.

Device Identification: Includes a device icon and the following information:

- Device: HOBO U22-001 Water Temp
- Manufacturer: Onset Computer Corporation
- Description: Water Temp
- Serial Number: 2392913
- Firmware Version: 1.05

Device Details: Includes the following information:

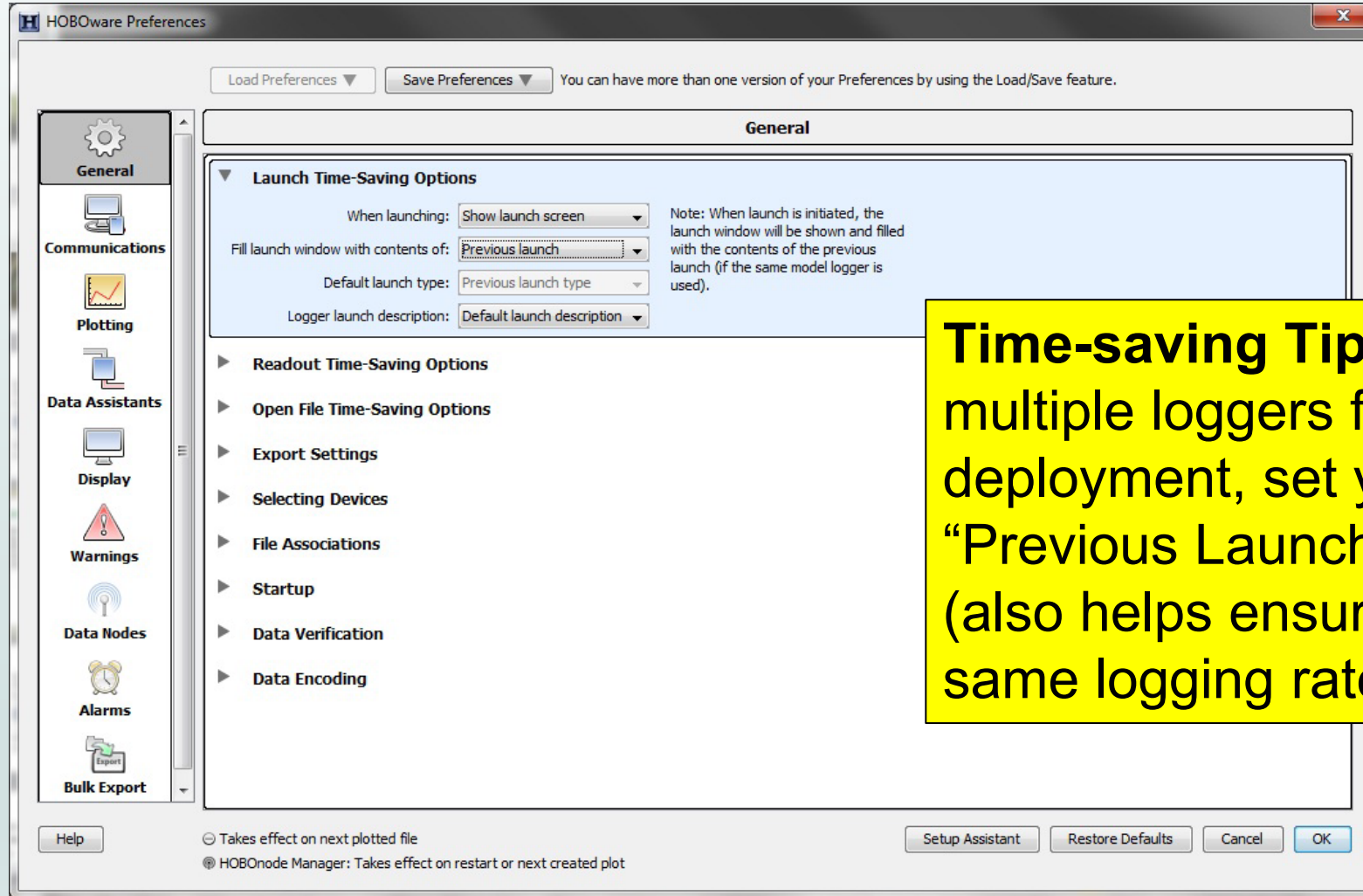
- Battery State:  GOOD
- Memory Used:  0 of 64 KB (0 %)
- Last Launched: 03/12/15 03:48:12 PM GMT-04:00
- Deployment Number: 4
- Logging Interval: 0h 5m 0s
- Current Status: Launched, Logging
- Current States: Coupler Attached

Current Readings: Includes a 'Screen Refresh Interval' set to 1 sec and a table of current readings.

Number	Measurement	Value	Units	Label
1	Temperature	72.264	°F	
2	Logger's Battery Voltage	3.43	V	

At the bottom of the window, there are 'Help' and 'OK' buttons.

Preparing loggers for deployment



Time-saving Tip: When launching multiple loggers for the same deployment, set your preferences to use “Previous Launch” to “Fill launch window” (also helps ensure all loggers have the same logging rate and start time)

Pre-deployment accuracy check

RMN protocols call for performing either **single- or multi-point pre-deployment accuracy checks** on temperature sensors (either stand-alone or built-in the pressure transducers) to verify that the sensors meet the accuracy quoted by the manufacturer. Instructions on how to conduct these checks can be found in the EPA “Best Practices” report (see next slide).

Differences in readings from the sensors and National Institute of Standards and Technology (NIST)-calibrated thermometer* **should not exceed the accuracy quoted by the manufacturer** (for sensors deployed at RMN sites, that number is $\pm 0.5^{\circ}\text{C}$ or, in some cases, $\pm 0.2^{\circ}\text{C}$).

Sensors that have **anomalous readings** are set aside for **further testing or returned** to the manufacturer for replacement.

There are **other reasons to do these as well!** (e.g., good way to familiarize yourself with the equipment, check battery life and ensure sensors are launching and downloading data properly...better to find out in the lab vs. months after deploying them in the field!).

Acknowledgements

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