Continuous Temperature and Water Level Monitoring in Streams and Lakes

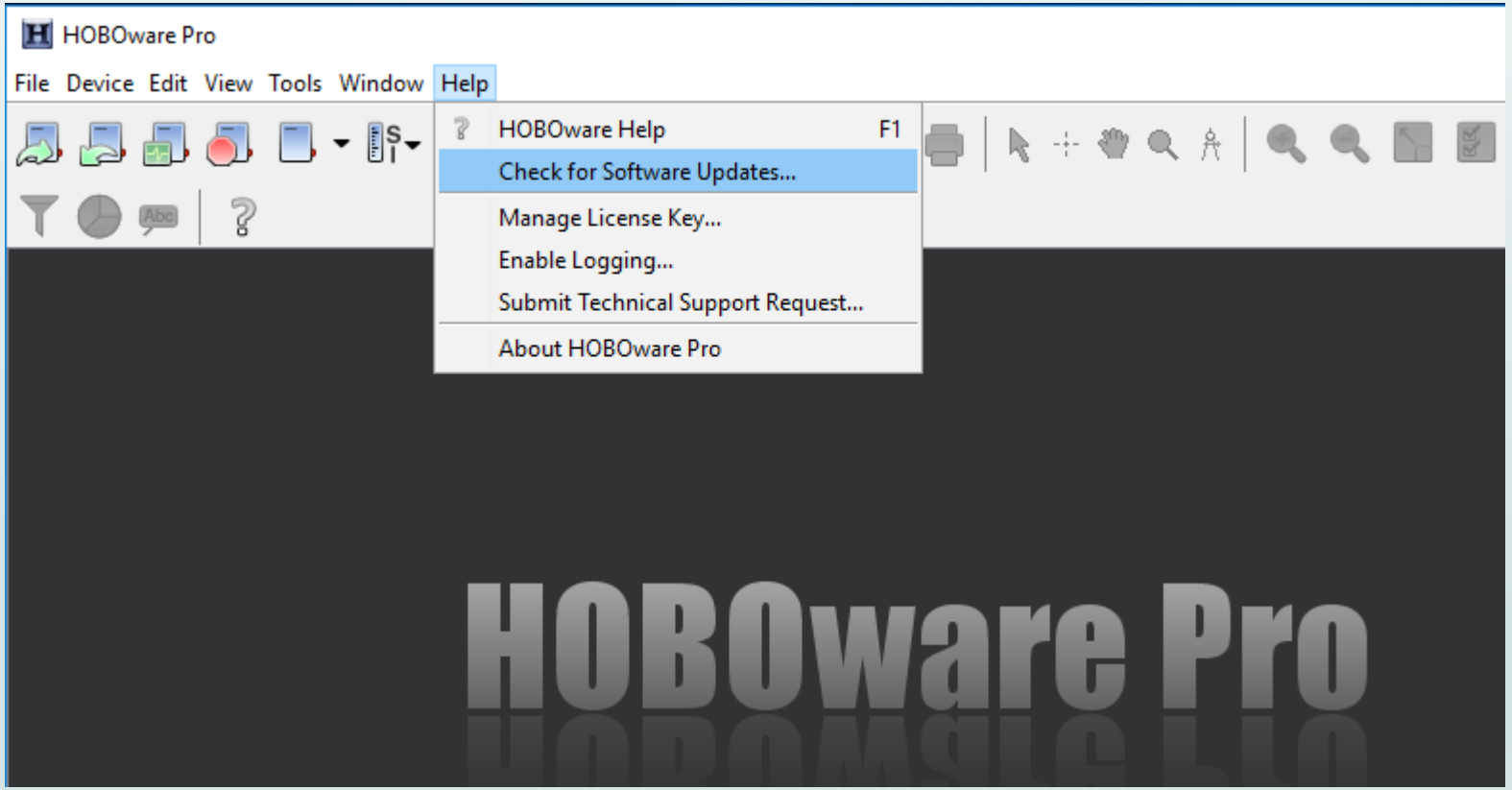
- Pre-deployment procedures
- Sensor launch

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

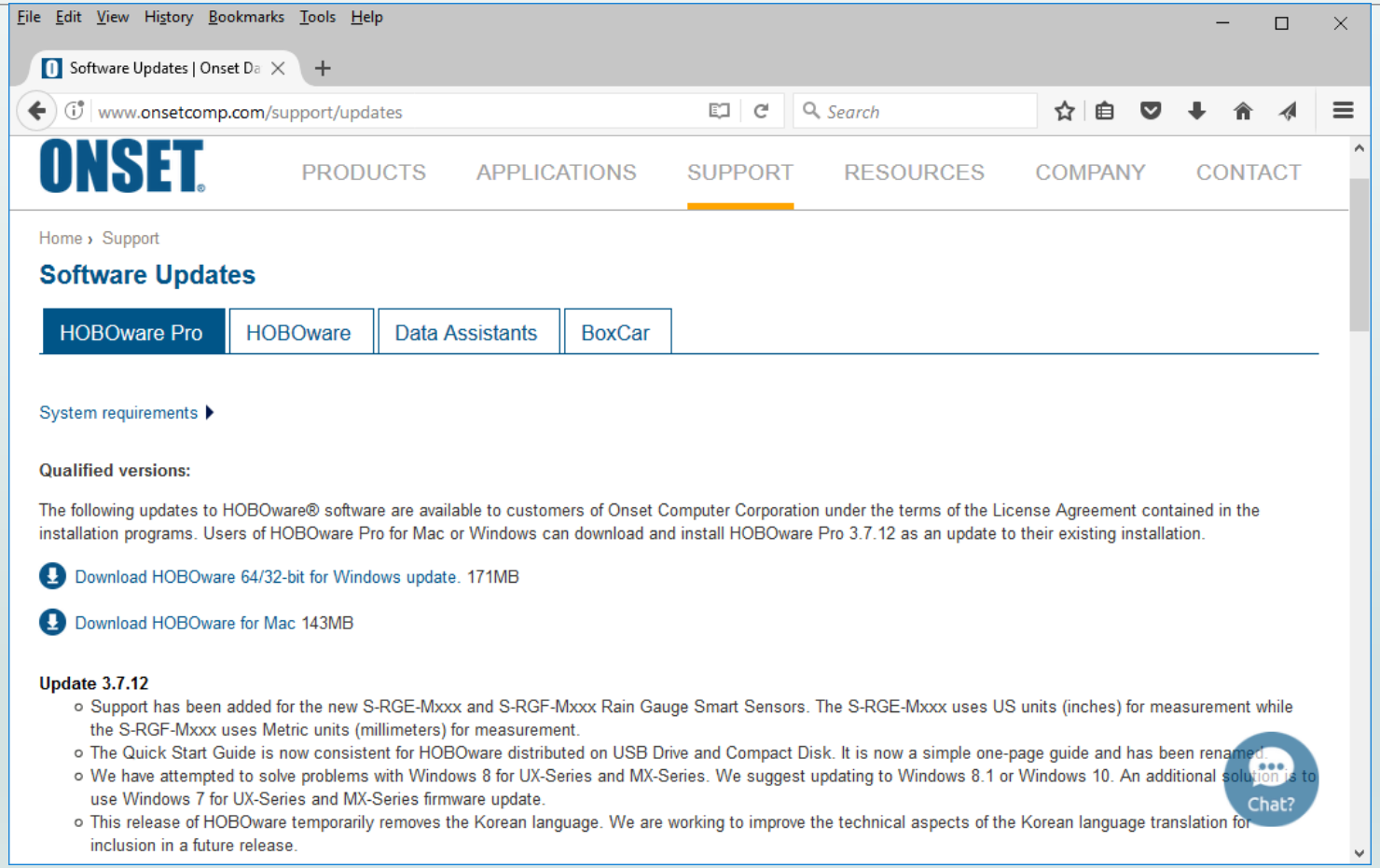
Make sure software is up-to-date



Check for HOBOware updates

Check for HOBOware Updates

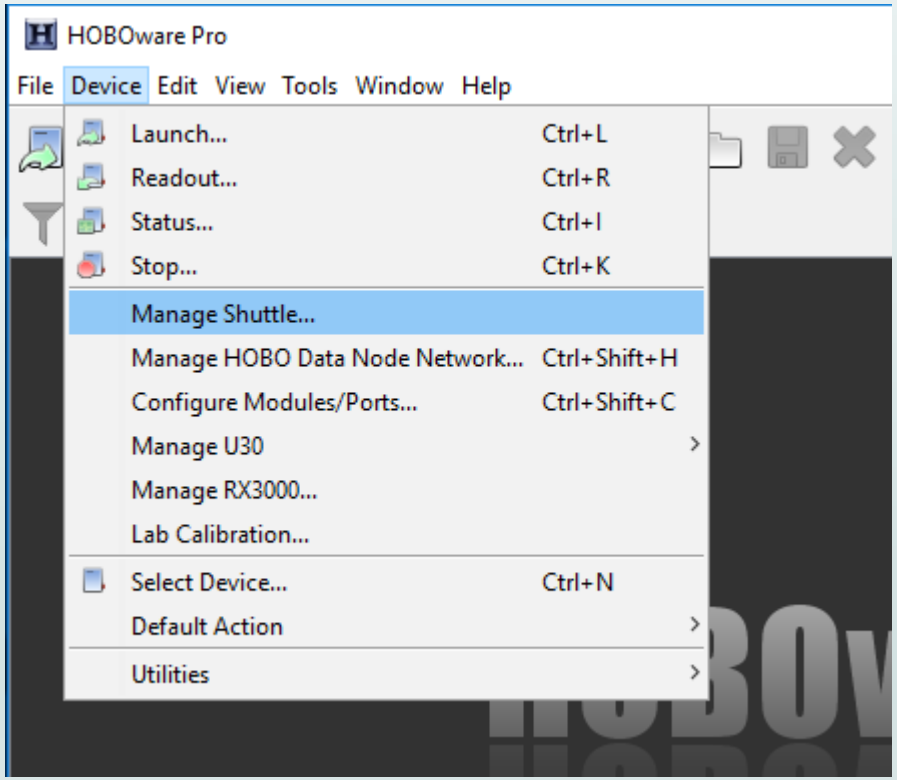
If there are updates, you will be directed to this web page to download the update:

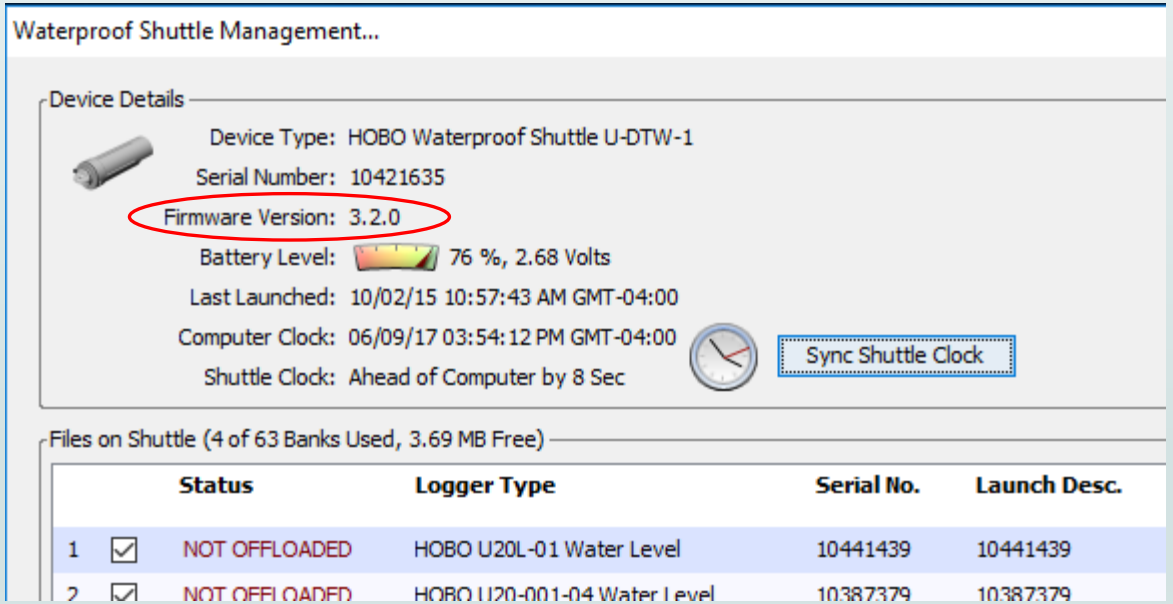


Check HOBO Waterproof Shuttle Version

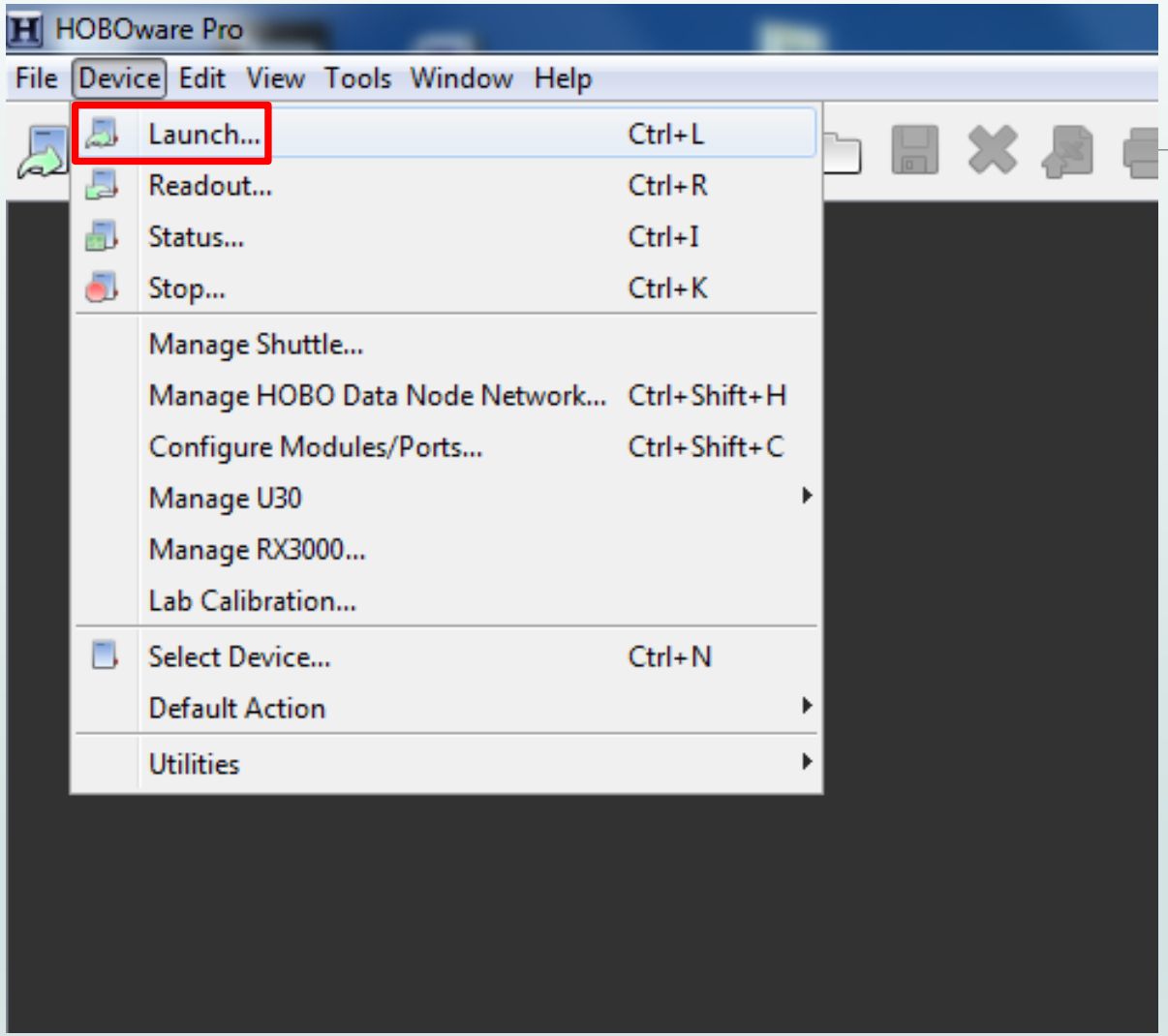
Check for latest shuttle version here:
http://www.onsetcomp.com/support/firmware_updates

Check your shuttle version with HOBOware:





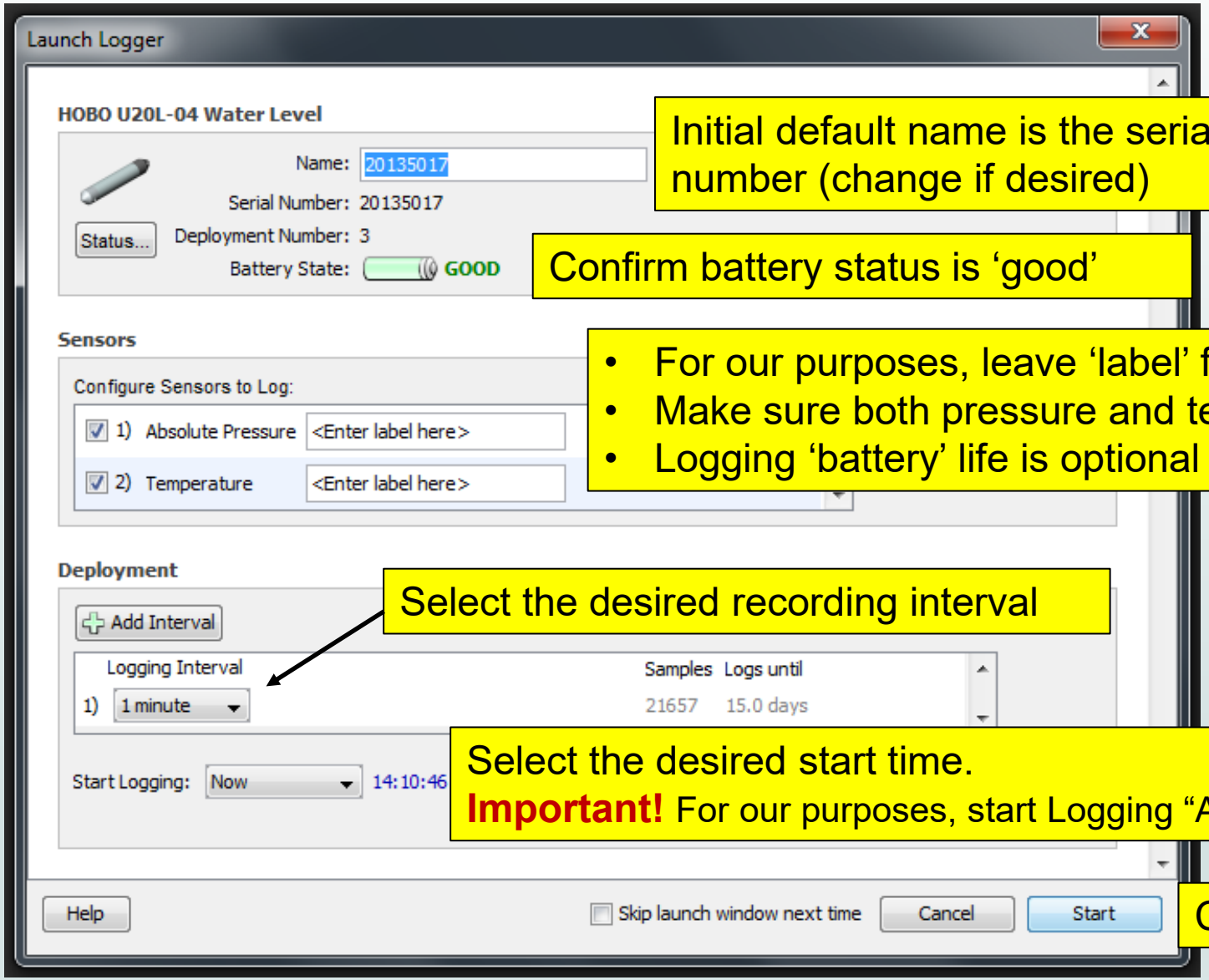
Launch configuration



Open HOBOware

- Device
  - Launch

Launch configuration



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

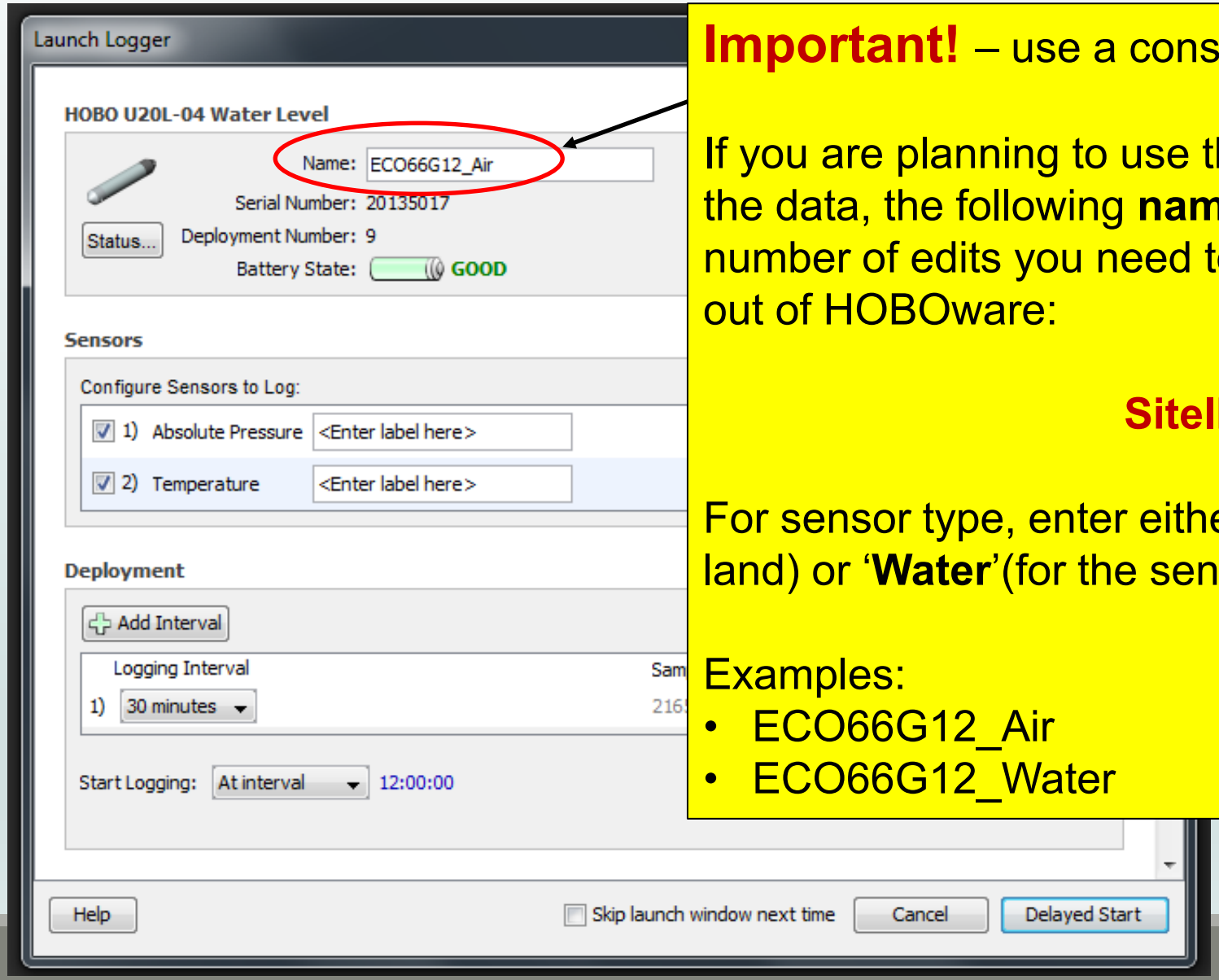
Select the desired recording interval

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

Click on 'Start'

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

Launch configuration – naming the sensor



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:

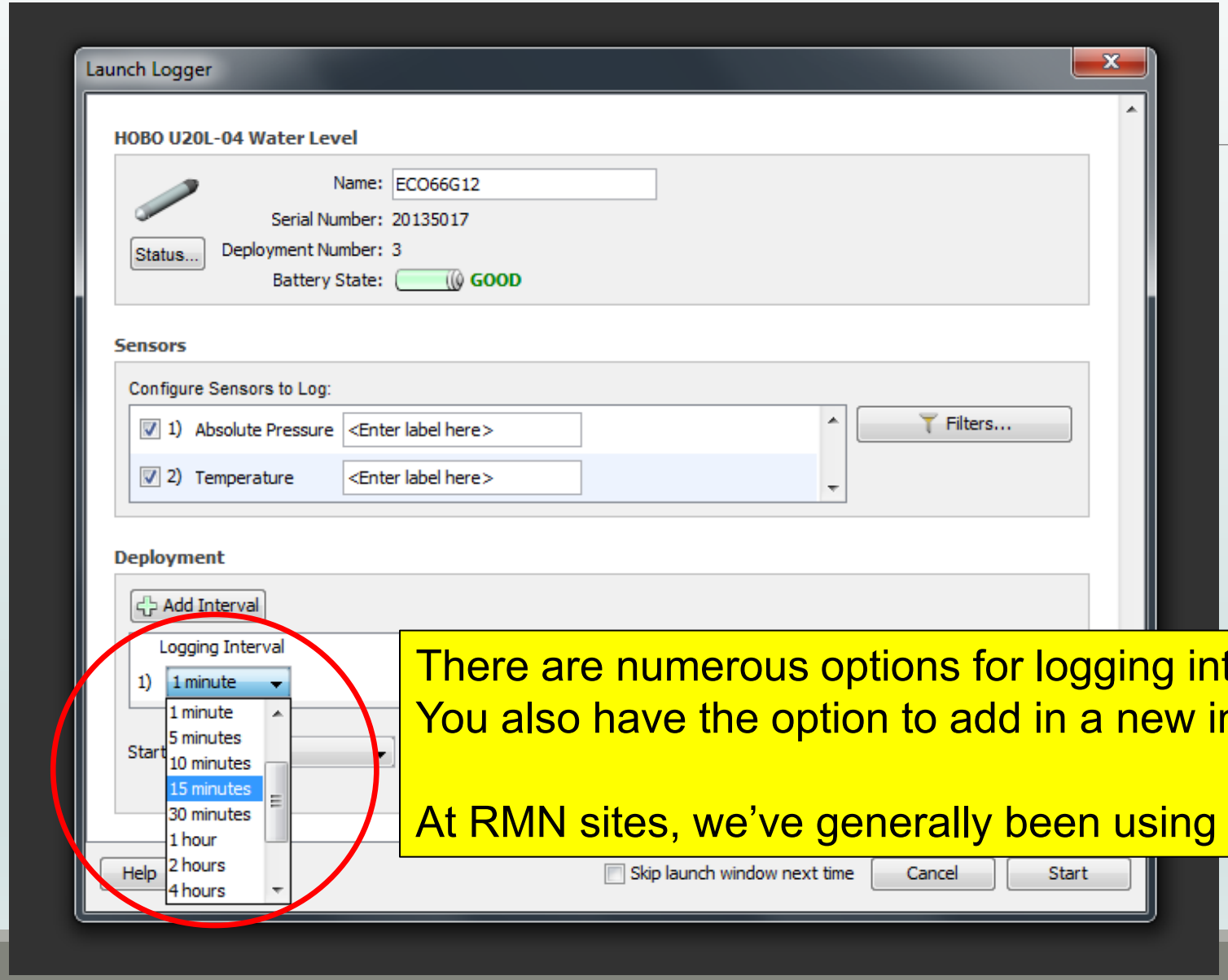
SiteID_SensorType

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

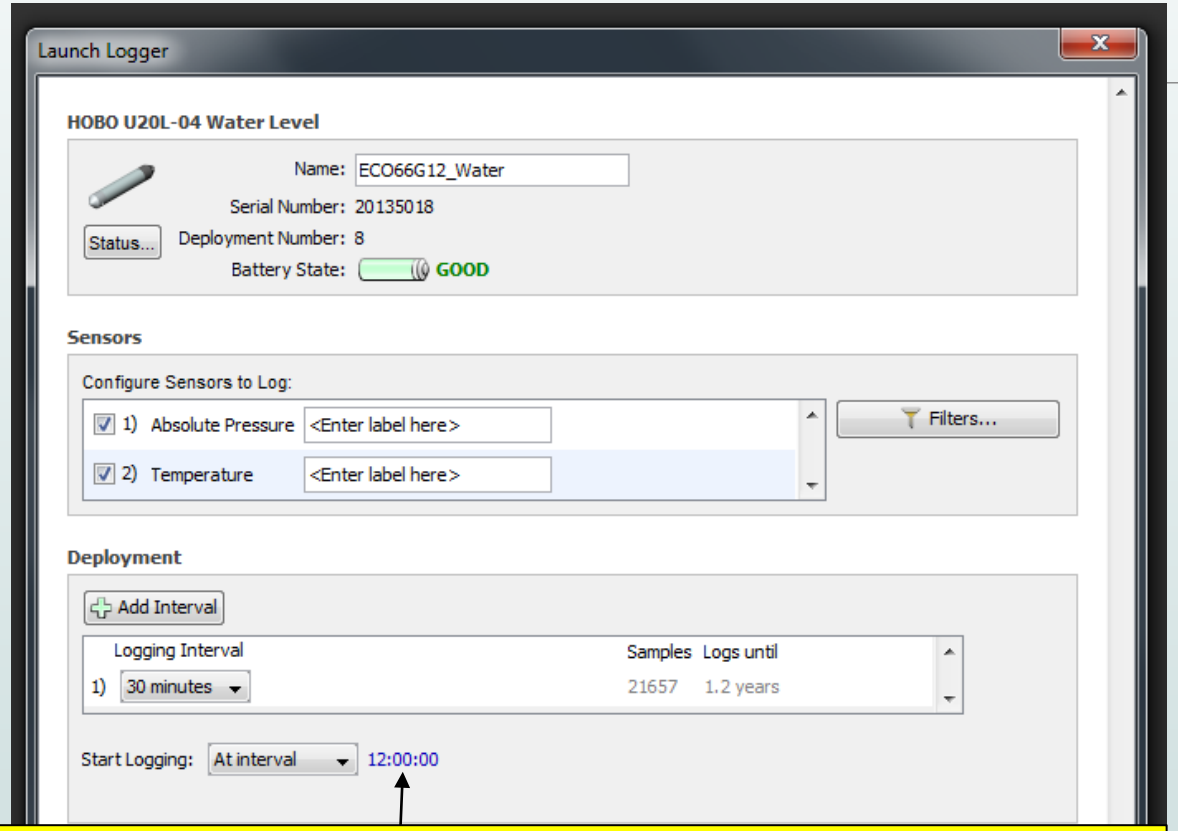


There are numerous options for logging intervals in the drop-down menu. You also have the option to add in a new interval.

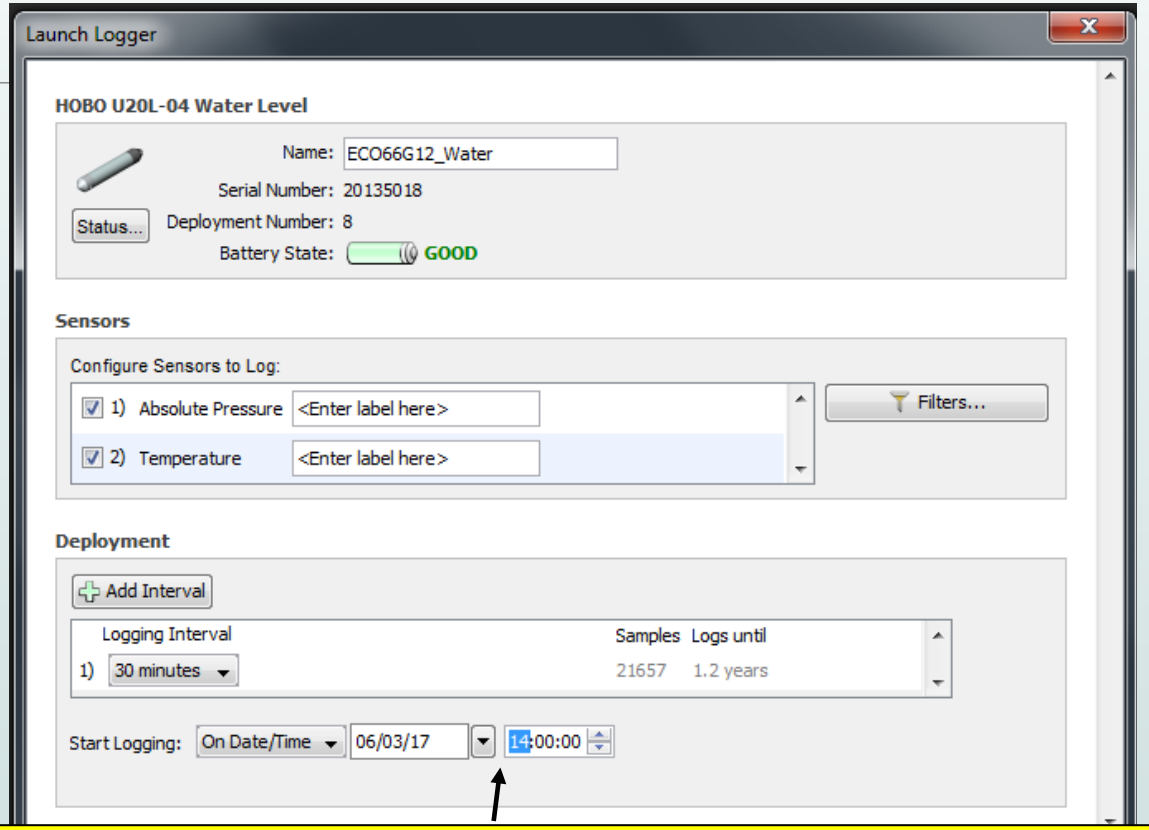
At RMN sites, we've generally been using 15 or 30-minute intervals

Launch configuration – start time

Example: 30-minute logging interval

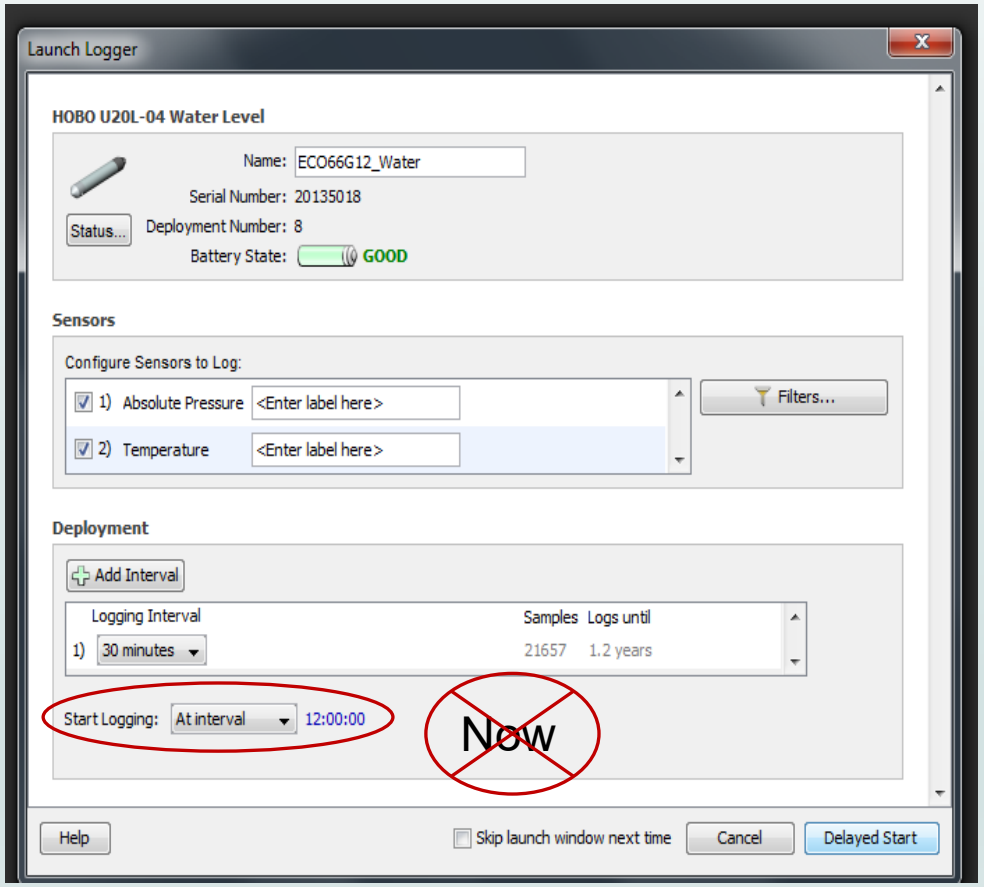


If you select '**start logging at interval**', it will start logging at the next hour or half hour (e.g., if you do this at 11:45, it will start logging at 12:00)



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



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.

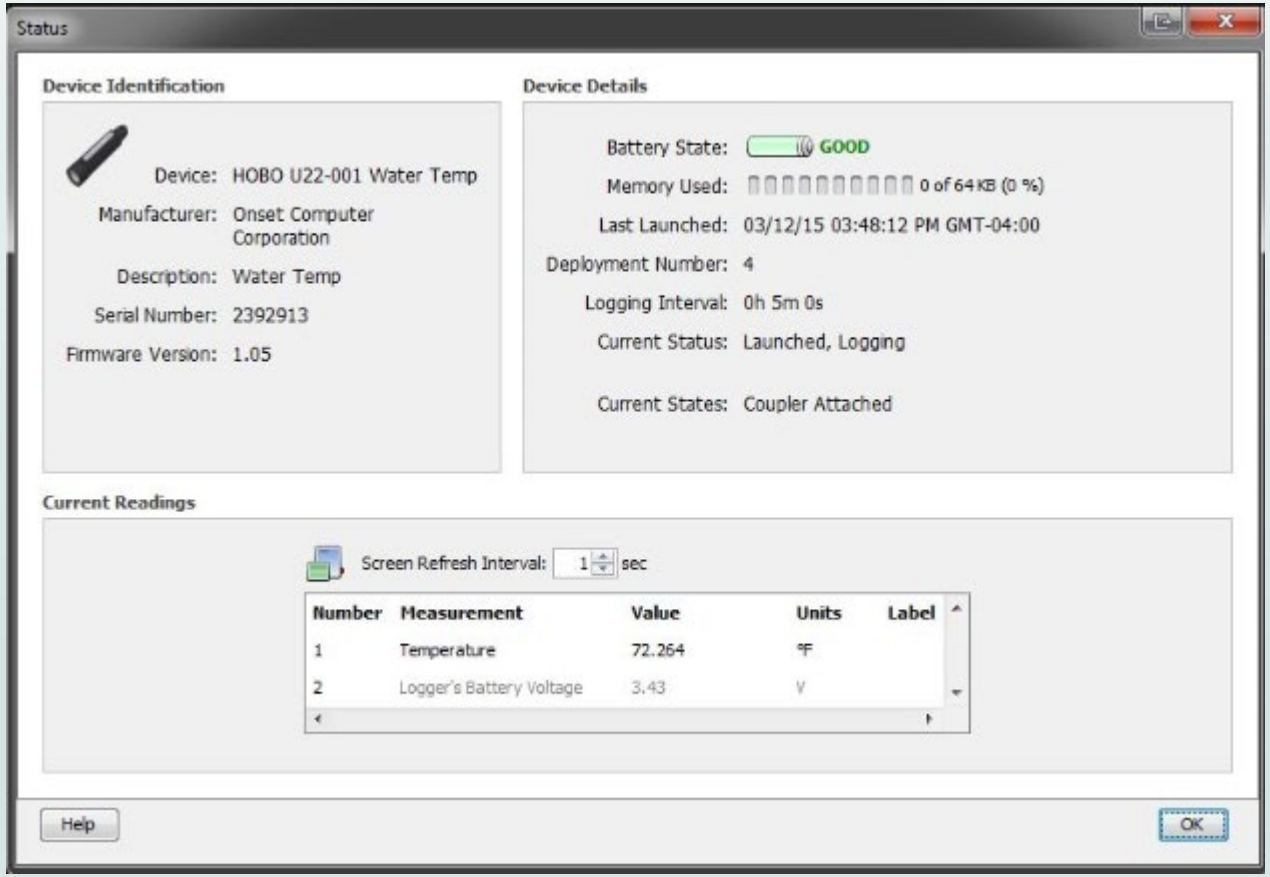
Some people have had problems with air and water sensors getting out of sync (e.g., one records at 11:03 and the other records at 11:18). This happens when the user selects 'Start Logging: Now' and then deploys one sensor and then the other (at that point, recording times are usually spaced about 10-15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

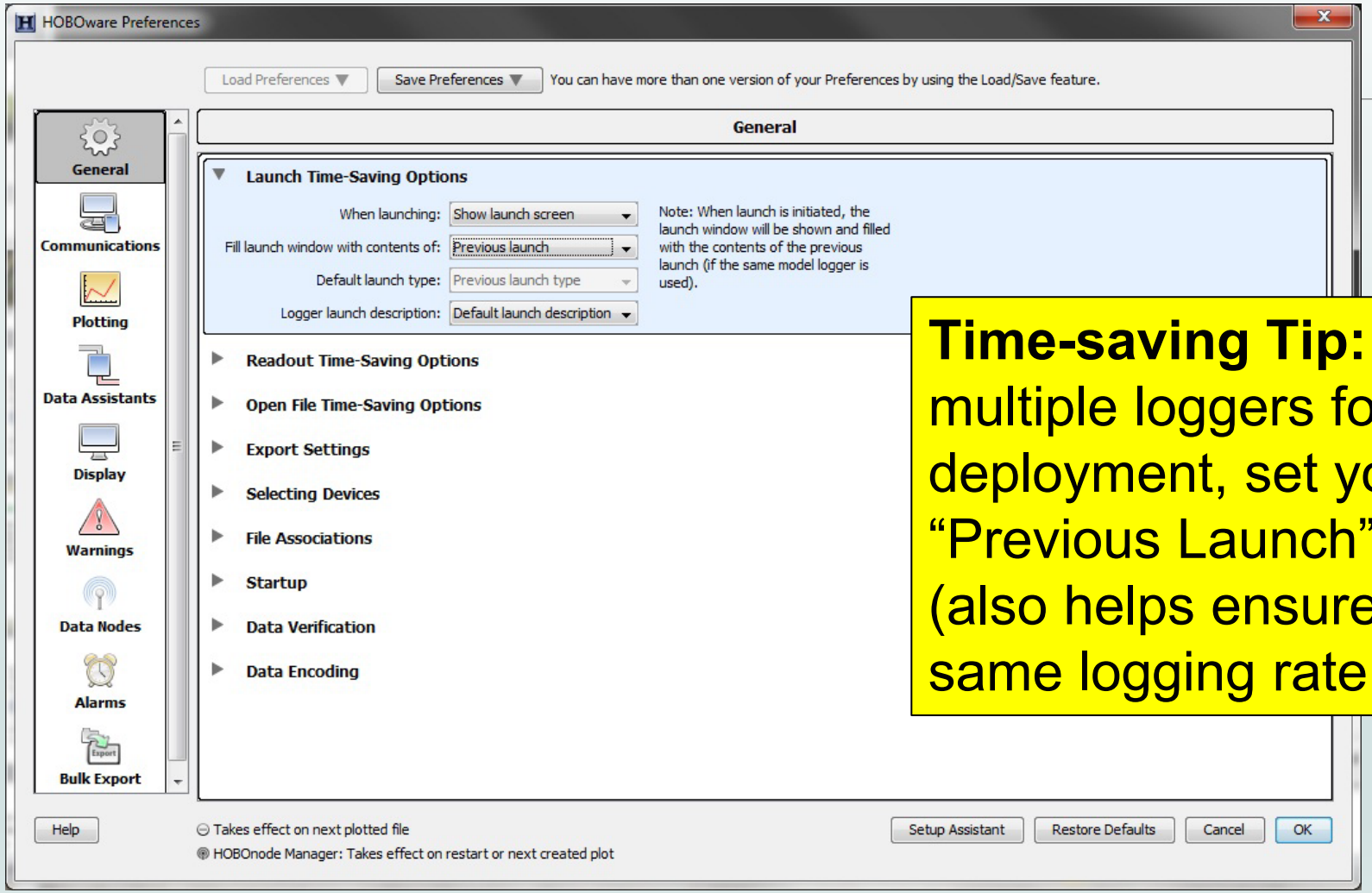
If you launch the sensor with these settings, the sensor will retain these settings during future downloads and relaunches with waterproof shuttles. If your air and water sensors get out of sync, you will need to bring a laptop into the field and enter the proper settings during the relaunch.

Configuration & Launch

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



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 ±0.5°C or, in some cases, ±0.2°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!).

*needs to meet appropriate accuracy specs

Acknowledgements

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