

Contents

Chapter 1 Getting Started.....	3
Getting Started with a Remote Monitoring Station	3
Getting Started with MX Series Loggers	3
HOBOLink Basics	4
Chapter 2 Configuring Devices.....	5
General Configuration.....	6
Launch Configuration (U30 Stations)	6
Readout Configuration.....	7
Module/Sensor Configuration	9
Scaling Sensor Data.....	11
Calculating Energy in kWh	14
Calculating Power in kW	15
Scaling Factors for FlexSmart TRMS Module and Sensors	17
Scaling Factors for the E50B2 Power & Energy Meter	17
Relay Configuration.....	18
Start/Stop (RX3000 Stations)	19
Alarm Configuration.....	20
System Alarms	20
Sensor Alarms	22
Battery Configuration	24
Chapter 3 Monitoring Devices	25
Working with a Map	27
Viewing Device Details.....	27
Sharing a Device Page	30
Using the U30 Summary Page.....	31
Viewing Tripped Alarms	35
Chapter 4 Managing and Sharing Data.....	36
Exporting Data	37
Scheduling Data Delivery	40
SFTP Certificate Setup.....	42
Downloading U30 Data Files	42
Working with Data Feeds.....	44
Changing Export File Settings.....	45
Chapter 5 Reference.....	47
Changing User Settings	47
Managing a Communications Plan.....	48
Removing a Device.....	49
Troubleshooting.....	49
FAQs.....	51

Chapter 1

Getting Started

HOBOLink is web-based software for configuring and monitoring RX3000 and U30 Remote Monitoring Stations. You can also use HOBOLink to manage data uploaded from MX series loggers in HOBOMobile. This section provides an overview for getting started with HOBOLink.

Getting Started with a Remote Monitoring Station



Step 1: Create a HOBOLink account or log in to an existing account at www.hobolink.com.

Step 2: Register the station.

1. Log in to your HOBOLink account.
2. Click Devices, click List, and then click Register a Device.
3. Type a nickname for the station.
4. Type the serial number and the device key from the label inside the station door.
5. Read the terms of use and check the "I agree" box.
6. Click Register. Click Devices then List to see the station.

Step 3: Set up the hardware for the station as described in the Quick Start Guide or manual.

- For instructions on setting up an RX3000 station, refer to the HOBOLink RX3000 Remote Monitoring Station manual at www.onsetcomp.com/manual/rx3000.
- For instructions on setting up a U30 station, refer to the [U30 Station User's Guide](#).
- For documentation on specific sensors or other devices, go to <http://www.onsetcomp.com/support/manuals>.

Step 4: Configure the station logging interval, connection interval, sensors, and more. Click Devices, then List, and then the arrow next to the  icon. Select a configuration option from the drop-down menu. Or click the station name and then click  at the top of the station page. Make changes and click next to move through each of the configuration screens. See Configure Devices for more details.

Note: If you are performing a pre-deployment test configuration, consider setting the connection interval in Readout Configuration to a faster rate than the one you will be using during deployment. This will allow you to verify proper operation of the device without having to wait a long time between readouts. For devices using a communications plan, this rate will be limited by the fastest connection allowed by your plan. Once you confirm the readouts are occurring as expected, then change the connection interval to the desired schedule for deployment.

Step 5: The station will connect to HOBOLink based on the connection interval selected in Readout Configuration. After it has started connecting to HOBOLink, you can monitor the latest conditions, connections, graphs, and more. Refer to Chapter 3 for details. You can also view or export data from the device as described in Chapter 4.

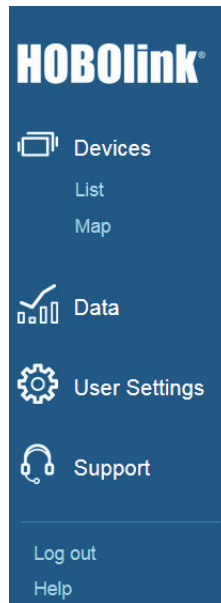
Getting Started with MX Series Loggers




1. Create a HOBOLink account or log in to an existing account at www.hobolink.com.
2. In HOBOMobile, go to Settings and enable the Upload Data option for HOBOLink. See the [HOBOMobile User's Guide](#) for details on working with HOBOMobile.
3. Once a logger has been read out in HOBOMobile, the data will be automatically uploaded to HOBOLink. Click Devices and then List to view the Standalone Device Deployments list with MX series logger. If this is the first time data has been uploaded for this logger deployment, a new entry is added to the Standalone Device Deployments list. If data was previously uploaded for

this deployment, an existing entry in the list will be updated. Click Export to export and download the data. For more details on working with this list, see Chapter 3. For details on working with the uploaded data, see Chapter 4.

HOBOLink Basics

Use the left menu to navigate HOBOLink and use this button  to collapse or expand the left menu (not available on mobile phones).



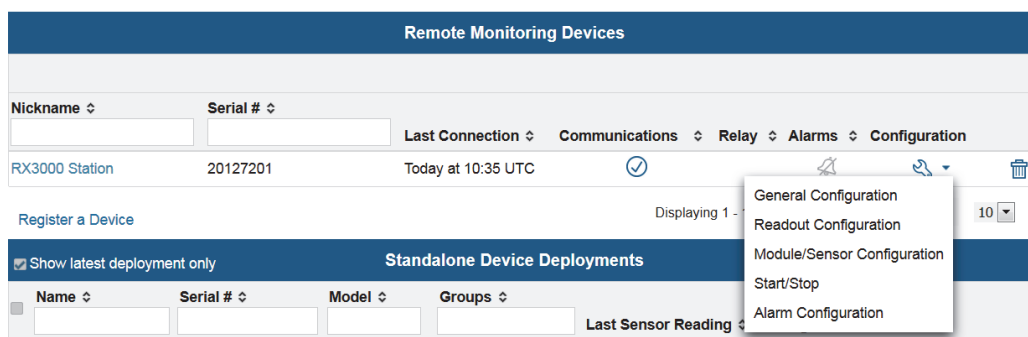
Select this:	To do this:
 Devices	<p>View a list or map of all remote monitoring stations registered to this account. Check a station's status, including when it last connected to HOBOLink and whether an alarm has tripped. You can also click a station name to view device details.</p> <p>View a list of standalone deployments uploaded from MX series loggers with HOBOMobile and click a deployment to export the data.</p> <p>See Monitoring Devices for more details on using both lists.</p>
 Data	<p>Create new exports, access existing exports, schedule automatic delivery of exports, download U30 station data files, and work with data feeds.</p>
 User Settings	<p>Change account settings, units, and export settings or grant public access to station pages.</p>


Chapter 2

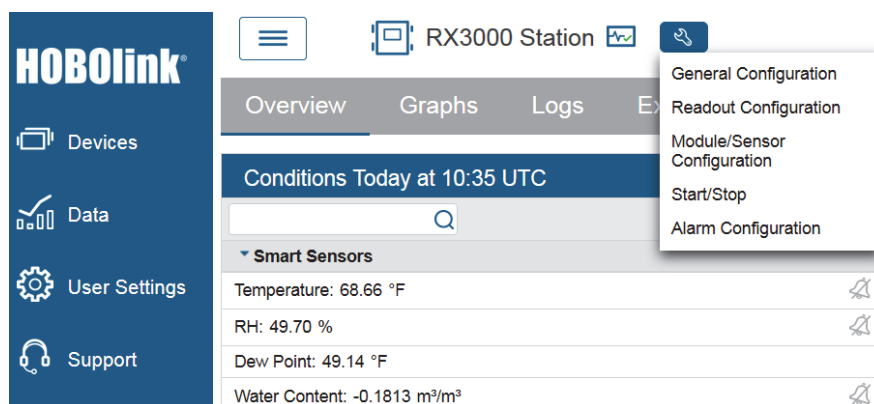
Configuring Devices


There are several settings you can configure on a remote monitoring station, including the logging interval, connection interval, sensor scaling, alarms, and more. To configure your station:

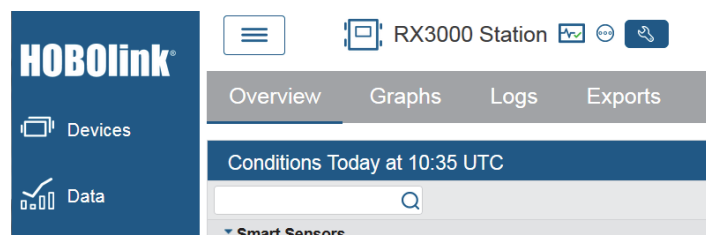
1. Click Devices, then List.
2. Find the station in the list, click the arrow next to the  icon, and select a configuration option from the drop-down menu.



Or, click the station name, click , and select a configuration option from the drop-down menu.




3. Once a configuration screen is open, you can use the left menu or click the Next button to move from one screen to the next. Any changes you make are saved by either clicking Next or Save in the configuration pages. You will lose any changes made if you click Back without clicking Next first. A circle icon  indicates a saved configuration change is pending.




General Configuration

On the General Configuration page, you can change the station nickname, time zone, and image. For U30 stations, you can also control whether the device wraps (continues logging) when the memory fills.

To change the nickname or time zone (all stations) and wrap settings (U30 stations only):

1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select General Configuration.
2. In the Nickname field, type a name that identifies the device.
3. In the Time Zone field, select the time zone where the device is located. This setting ensures that the time stamp associated with each logged data point is displayed properly for your region. If the time switches between Daylight Saving Time and Standard Time during logging, the time shown on the graphs on your device page will be adjusted automatically.
4. For U30 stations only: Select the "Wrap when memory fills" checkbox if you want the U30 station to wrap rather than stop logging after the memory is full. If wrap is enabled, newly recorded data will overwrite the oldest logged information once the memory is full. If this checkbox is not enabled, then the U30 station will stop recording data when the memory is full and you will need to restart it. Changing this setting will cause the U30 station to be relaunched the next time it connects to HOBOLink. (Note: RX3000 stations log continuously.)
5. Click Save (or click Next to move to the next configuration page). Changes to the nickname will take effect immediately. Changes to the time zone will not be reflected in the device graphs until the next time the device connects with HOBOLink. When you change the time zone for the device, also double-check the night mode settings in Readout Configuration to ensure the start and end time is still set correctly.

The image selected in General Configuration is displayed on the banner at the top of your device page and on the map. You can keep the default image of the device or choose your own image. To change the image:


1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select General Configuration.
2. Click the Choose Image button.
3. Select the image you want to use. An image file must be a .jpg, .gif, or .png format and less than 1 MB.
4. Click the Upload button to use the newly selected image. The new image will be used in HOBOLink immediately.

To revert to the original image for the device, click the Use Default button.

Launch Configuration (U30 Stations)

On the Launch Configuration page, you can enter a launch description, set logging and sampling intervals, and select other settings for U30 stations only. Any changes you make on this page will result in the device being relaunched the next time it connects to HOBOLink. Launch Configuration is only available for U30 stations. (**Note:** See Module/Sensor Configuration for setting logging and sampling intervals for RX3000 stations.)

To change the launch settings for your device:

1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Launch Configuration.
2. In the Launch Description field, type a name for the launch. The launch description is used as the file name for data readouts.
3. Select a logging interval, which is the rate at which the device will record sensor data. The minimum logging interval is 1 minute and the maximum is 18 hours. The logging interval must be no more than half the connection interval, which is set in Readout Configuration. Keep in mind that the faster the logging interval, the more quickly memory fills and battery power is consumed. If your device has a communications plan associated with it, you will also see the percentage of the plan used so far for the month as well as the estimated total usage for the month based on the logging interval settings. You may need to adjust the logging interval to fit within your communications plan. For more details, see Managing a Communications Plan.
4. If one or more of the sensors connected to the device support measurement averaging, then you can set a sampling interval for those sensors. Select the Enable checkbox and set the sampling interval, which must be less than or equal to the logging interval (up to four minutes). A sampling interval rate faster than 1 minute will reduce the device's battery life.

What is a sampling interval?

When a sampling interval is configured, the station will take multiple measurements within a given logging interval and then average them together to create a single logged data point. This is only an option if the smart sensor supports measurement averaging. Smart sensors that support measurement averaging are temperature (S-TMB-M0xx), PAR (S-LIA-M003), solar radiation (S-LIB-M003), barometric pressure (S-BPA-CM10 and S-BPB-CM50), 4-20mA input (S-CIA-CM14), 12-bit voltage input (S-VIA-CM14), and FlexSmart TRMS module (S-FS-TRMSA-D). Disable the sampling interval if none of your smart sensors support measurement averaging to avoid unnecessary drain on the battery power.

5. Select the "Force relaunch on next connection" checkbox only if you have not changed any other settings in Launch Configuration and you wish to relaunch the device. You may need to force a relaunch if the device has stopped logging because the memory is full (if "wrap when memory is filled" was disabled in General Configuration) or if you need to add or remove sensors.
6. Select the "Full readout upon power reset" if you want all data to be offloaded after turning off the device power. **This will take a significant amount of time and is not recommended.** If you are concerned about losing important data, you can configure a frequent Connection Interval in Readout Configuration, or if you lose power, you can manually read out data from the device via a direct USB connection and HOBOWare.
7. Click Save (or click Next to move to the next configuration page). Any changes made will take effect the next time the device connects to HOBOLink. Changes to the Launch Description, Logging Interval, or Sampling Interval will cause the device to be relaunched, as will enabling the "Force relaunch on next connection" checkbox.


Notes:

- Although you can launch the U30 station with HOBOWare, it is strongly recommended that launching be done exclusively through HOBOLink. HOBOLink launch settings take precedence over HOBOWare settings. Therefore, any settings in the Launch Configuration page in HOBOLink will override the settings in Launch Logger window in HOBOWare. For example, if you launch the device in HOBOWare with a 30-second logging interval and you set the logging interval to 1 minute in HOBOLink, the device will be relaunched with the 1-minute interval the next time it connects to HOBOLink.
- The delayed launch feature in HOBOWare in which you select logging to begin on a specific date/time is not supported with HOBOLink. The device will begin logging at the next scheduled launch time as configured in HOBOLink with the first sample logged at the next even logging interval.

Readout Configuration

On the Readout Configuration page, you can set how frequently the device connects to HOBOLink and reads out the latest data. You can also set up an alternate "night mode" connection schedule. Data from RX3000 stations is saved in a database and can be accessed by setting up data exports, which can be run as needed or delivered to an email or FTP/SFTP address automatically on a regular basis. Data from U30 stations is saved to a data file and optionally to a text file that you can download (you can also set up export and data delivery of files from U30 stations). For more information, see Manage and Share Data.

To change readout settings:

1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Readout Configuration.
2. Select the connection interval for the device. This will control how often the device connects to HOBOLink and is offloaded, or read out. At each connection interval, data is uploaded to HOBOLink and your device's page is updated with the latest details, such as sensor readings and graphs. Keep in mind that frequent connections will reduce battery life. The Readout Configuration page shows how many connections will take place per day based on the connection interval you select (not including any connections due to alarms). If your device has a communications plan associated with it, you will also see the percentage of the plan used so far for the month as well as the estimated total usage for the month based on the readout settings. You may need

to adjust the connection interval to fit within your communications plan. For more details, see Managing a Communications Plan.

3. Select the "Night mode" checkbox if you wish to set up a second readout schedule using a different connection schedule during a time frame that you specify. This allows you to set up two readout schedules: one with more frequent connections during a specified period and the other with less frequent connections during a different period. This can help preserve battery power and minimize connection charges (if applicable) if there is a part of the day when you don't need as many data readouts. Select when you want night mode to begin and end for the device's time zone (note that "night mode" does not need to be at night). Enter a different rate in the hours, minutes, and seconds fields than you entered in the Connection Interval fields. Note that the second readout schedule will not begin at precisely the hours you select. Rather, it will begin and end with 1 to 59 minutes of the hours that you selected.
4. For U30 stations only: Select the "Save data as text file" checkbox if you want the data offloaded from the device to be saved in text file format (.csv) in addition to the default HOBOWare format (.dtf). Be sure to select this checkbox if you have any sensors that were scaled in HOBOLink (such as pulses scaled as kWh, for example) because scaled data will not be available in the .dtf file.
5. Click Save (or click Next to move to the next configuration page). The changes will take effect the next time the device connects to HOBOLink.

Important: Changes made on the Readout Configuration page will not force the device to restart. To restart an RX3000 station, select Start/Stop under Configure in HOBOLink or use the Start/Stop button on the device to stop and then start it again when desired. To restart a U30 station, select "Force relaunch on next connection" in the Launch Configuration page.

Notes:

- If you are performing a pre-deployment test configuration with your device, consider setting the Connection Interval to a more frequent rate than the one you will be using during deployment. This will allow you to verify proper operation of the device without having to wait a long time between readouts. For devices using a communications plan, this rate will be limited by the fastest connection allowed by your plan. Once you confirm the readouts are occurring as expected, then change the Connection Interval to the desired schedule during deployment.
- If an alarm trips, the connection schedule will restart from the time of the alarm (unless the device is in night mode). For example, if the device has been connecting every hour (1:00, 2:00, and 3:00) and then an alarm trips at 3:15, the device will connect again at 4:15 instead of 4:00.
- When you change the time zone for the device, also double-check the night mode settings to ensure the start and end time is still set correctly.
- For U30 stations only: An alternative to changing the connection interval is to manually connect to HOBOLink for a test using HOBOWare. Connect the device to a computer, open HOBOWare and click the Status button on the toolbar (or select Status from the Device menu). Click the Contact HOBOLink button in the Status window. This will force the device to connect to HOBOLink. Disconnect the device from the computer once the test is complete. The device will then connect to HOBOLink at the next scheduled time as determined by the connection interval.
- For U30 stations only: You can manually read out the device with HOBOWare. Connect the device to the computer and open HOBOWare. From the Device menu, select Readout. When the readout is complete, disconnect the device from the computer. If you are using the device with HOBOWare during the device's regularly scheduled connection time, it will not connect to HOBOLink. When you are finished using the device with HOBOWare, it will connect at the next scheduled connection time instead.

Configuration

- General
- Readout
- Smart Sensors Logging
 - Temperature
 - RH
 - Dew Point
 - Water Content
 - Temperature
 - Pressure
- Battery
- Start/Stop
- Alarms

Readout Configuration

Connections: **6** Per Day

Actual usage to date: **0% of plan** This Month

Estimated usage with this configuration: **12% of plan** This Month

*Data usage estimation assumes no tripped alarms or logger launches.

Connection Interval:
 hours minutes seconds

Night mode from UTC to UTC


Night mode will begin and end within 1 to 59 minutes of the hour selected
 hours minutes seconds

Module/Sensor Configuration

For RX3000 stations, you can configure the logging and sampling interval for all connected smart sensors and the settings for each individual smart sensor (label, graphs, and scaling). You can also configure the optional analog sensor module and analog sensors.

For U30 stations, you can configure each smart sensor. Logging and sampling intervals are set in Launch Configuration.

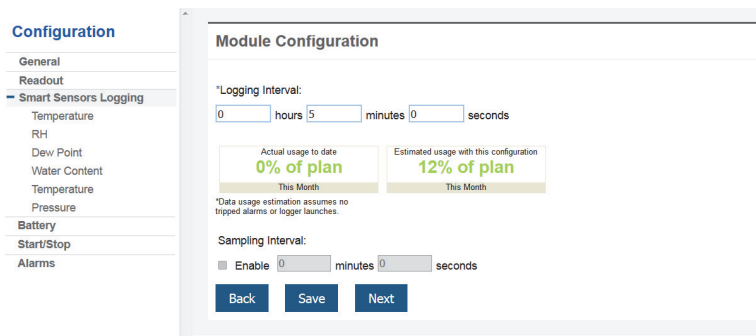
Configuring Smart Sensor Logging for RX3000 Stations

1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Module/Sensor Configuration.
2. Select Smart Sensors Logging from the menu on the left.
3. Select the logging interval. This logging interval will be used by all enabled smart sensors. It can be different than the logging interval used for analog sensors (if applicable). Minimum logging intervals are determined by the device model and communications plan.
4. Enable the sampling interval and enter the rate to use in minutes and seconds (only used with smart sensors that support sampling; refer to the sensor manual at www.onsetcomp.com).


What is a sampling interval?

When a sampling interval is configured for smart sensors, the station will take multiple measurements within a given logging interval and then average them together to create a single logged data point. This is only an option if the smart sensor supports measurement averaging. Smart sensors that support measurement averaging are temperature (S-TMB-M0xx), PAR (S-LIA-M003), solar radiation (S-LIB-M003), barometric pressure (S-BPA-CM10 and S-BPB-CM50), 4-20mA input (S-CIA-CM14), 12-bit voltage input (S-VIA-CM14), and FlexSmart TRMS module (S-FS-TRMSA-D). Disable the sampling interval if none of your smart sensors support measurement averaging to avoid unnecessary drain on the battery power.

5. Click Save (or click Next to move to the next configuration page).




Configuring Smart Sensors for RX3000 and U30 Stations


1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Module/Sensor Configuration (RX3000 stations) or Sensor Configuration (U30 stations).
2. Select the sensor from the menu on the left.
3. To add a label to a sensor, type a name in the Label field. Labels are helpful if you are using more than one sensor of the same type. The label for the sensor will be listed in parenthesis following the sensor measurement type.
4. Click Enable Graph to show a graph of data for the sensor on the device page.
5. Click Enable Graph Totals to add a dashed line to graphs for filtered totals from a rain gauge or pulse input adapter sensor. The dashed line will be added to the applicable graphs the next time the device connects to HOBOLink. When that option is selected, Past Day graphs note the total rainfall or pulses in the past day and the dashed line represents hourly totals. For Past Week and Past Month graphs, the total rainfall or pulses for the past week or month is noted and the dashed line represents daily totals.
6. Click Enable Scaling to set up scaling for the sensor. Fill in the scaled units, multiplier, offset, and scaled measurement type fields. For more details, see Scaling Sensor Data later in this chapter.

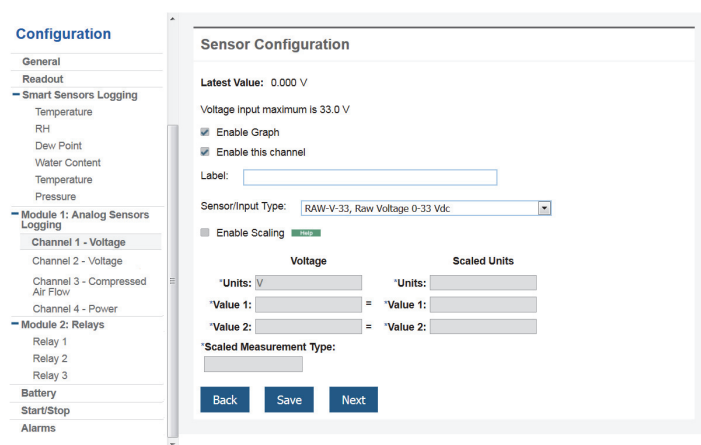
- Click Save (or click Next to move to the next configuration page).

Configuring Analog Sensors Logging for RX3000 Stations

- Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Module/Sensor Configuration.
- Select Module 1 (or 2): Analog Sensors Logging from the menu on the left.
- Select the logging interval. This will be used by all enabled analog sensors for this module. It can be different than the logging interval used for smart sensors (if applicable). Minimum logging intervals are determined by the device model and communications plan.
- Click the Enable checkbox under Sampling Interval if you want to log statistics. Enter the sampling interval to be used for calculating statistics (must be a factor of the logging interval). Select the statistics to be logged: minimum, maximum, average, and standard deviation. Statistics will be calculated between each logging interval at the sampling interval rate you select. Each statistic value will then be logged at each logging interval.
- Enable "Use excitation power" if you want the sensor to use excitation. Select Warmup and enter the seconds or milliseconds or select Continuous.
 - With Warmup, the device supplies excitation power for a brief period prior to each measurement. This allows you to select the minimum warm-up time needed to allow for sensor stabilization while conserving battery power. For example, if you specify a warm-up of one second and set the logging interval for the module to one minute, the device will power the external sensor for one second, log a measurement, and then turn off the excitation power for the next 59 seconds. Note that the excitation mode is automatically set to Continuous if the warmup time selected is within one second of or greater than the logging or sampling intervals.
 - With Continuous, the device supplies constant excitation power to the sensor for the entire duration of the deployment. Continuous mode is required if the sensor needs more than two minutes of warm-up time. Continuous mode greatly affects battery life and is generally not recommended.
- Click Save (or click Next to move to the next configuration page).

Configuring Analog Sensors for RX3000 Stations


1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Module/Sensor Configuration.
2. Click an analog sensor channel from the left menu.
3. Select Enable Graph to show a graph for the sensor on the device page.
4. Select "Enable this channel" if you want the device to record data for this channel.
5. Type a name for the channel in the Label field.
6. Select the sensor or input that you will be using for this channel in the Sensor/Input Type drop-down list. This is needed to set the voltage or current range for the analog input.
7. Select Enable Scaling and then enter the scaled unit name and values as defined in the sensor manual. The raw unit name and values will be pre-filled based on the sensor/input type selected. Type the name for the scaled measurement in the Scaled Measurement Type.
8. Click Save (or click Next to move to the next configuration page).

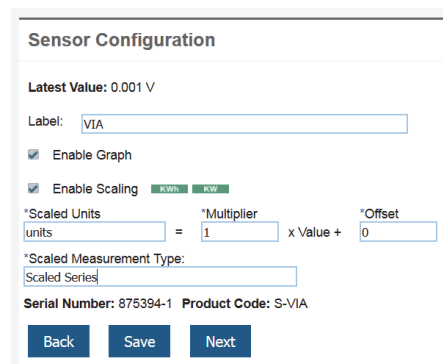


Scaling Sensor Data

You can configure a sensor to scale logged data into a different engineering unit than its default unit. This includes linear and pulse scaling, which allows scaling for kWh, kW, or for any device data that is output in electronic pulses, as well as analog inputs from the S-CIA and S-VIA analog input adapters and scaling for the E50B2 Power & Energy Meter.

Configuring Scaling for a Smart Sensor

1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Module/Sensor Configuration.
2. Select the sensor from the menu on the left.
3. Select the Enable Scaling checkbox.



4. In the Scaled Units field, type the unit name (up to 20 characters) for the scaled data (e.g. kWh).
5. HOBOLink converts the raw values to scaled values using the following equation: $y = m * x + b$

Where:

y = scaled units

m = multiplier, in scaled units

x = unscaled value

b = offset, in scaled units

In the multiplier field, type the numerical value (up to 10 digits) used to scale the units. In the Offset field, type the numerical value (up to 10 digits) in the scaled units if applicable. Refer to the sensor documentation for scaling values. For WattNode sensors, see *Calculating Energy in kWh and Calculating Power in kW*. See also *Scaling Factors for a FlexSmart TRMS Module and Sensors and Scaling Factors for the E50B2 Power & Energy Meter*.

If you are using a Veris Industries H8051/H8053 kWh transducer, note that these devices provide a choice of "kWh per pulse" rate selectable with dip switches located on the transducer/CT. Make sure the scaling factors entered in these fields matches your choice.


If you do not have a multiplier and offset, you can calculate them using the raw output range and the corresponding measurement range as described in *Calculating Multiplier and Offset* below.

6. In the Scaled Measurement Type field, type a name (up to 30 characters) for the scaled series (e.g. Energy Used). Do not use quotation marks ("") in the series name if you plan to use .csv files with Microsoft Excel.
7. Click Save. In the Conditions panel on your device page, the measurement type for that sensor will be changed to the name you entered in the Scaled Measurement Type field followed by the name you entered for the scaled units. Enabled graphs will display the scaled series name, units, and data the next time the device connects to HOBOLink.

Important note for U30 stations: Scaled sensor data will only appear in text files and not in the raw .dtf files. Make sure you select the "Save data as text file" checkbox in Readout Configuration for any device with a scaled sensor.

To remove scaling from a smart sensor, deselect the Enable Scaling checkbox for that sensor on the Sensor Configuration page.

Configuring Scaling for an Analog Sensor

1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Module/Sensor Configuration.
2. Click an analog sensor channel from the left menu.
3. Make sure "Enable this channel" is selected.
4. Select the sensor or input that you will be using for this channel in the Sensor/Input Type drop-down list. This is needed to set the voltage or current range for the analog input.
5. Select Enable Scaling and then enter the scaled unit name and values as defined in the sensor manual. The raw unit name and values will be pre-filled based on the sensor/input type selected. Type the name for the scaled measurement in the Scaled Measurement Type.
6. Click Save. In the Conditions panel on your device page, the measurement type for that sensor will be changed to the name you entered in the Scaled Measurement Type field followed by the name you entered for the scaled units. Enabled graphs will display the scaled series name, units, and data the next time the device connects to HOBOLink.

Notes:

- If you configure an alarm for a sensor with scaling, make sure you enter the values on the Alarm Configuration page in the scaled units. If you configure scaling and have existing alarms, you must modify the alarms to use the scaled units.
- If you unplug a scaled sensor and then plug it back in, the scaling configuration will be deleted. Reconfigure the scaling after reconnecting the sensor.

Calculating Multiplier and Offset for Smart Sensors

Both a multiplier and offset (also referred to as slope and intercept) are needed to scale the data for a sensor. If the sensor documentation does not have this information, you can calculate them using the sensor's specifications for raw output range (raw values) and the corresponding measurement range (scaled values). You will need two raw values and their corresponding scaled values:

raw1 -> scaled1

raw2 -> scaled2

To calculate the multiplier (m), use the following equation:

$$m = (\text{scaled2} - \text{scaled1}) / (\text{raw2} - \text{raw1})$$

If both raw1 and scaled1 are zero, calculate the multiplier using the following equation: $m = \text{scaled2} / \text{raw2}$. In this case you do not need to enter an offset in the scaling configuration pane.

Once you have determined the multiplier, calculate the offset (b) using the following equation:

$$b = \text{scaled1} - (m * \text{raw1})$$

For example, you have a water level sensor that measures 0–10 feet, output as 4-20mA to your device. In this case:

$$\text{raw1} = 4 \text{ mA}$$

$$\text{raw2} = 20 \text{ mA}$$

$$\text{scaled1} = 0 \text{ feet}$$

$$\text{scaled2} = 10 \text{ feet}$$

Therefore, the multiplier equation for this sensor is:

$$m = (10 - 0) / (20 - 4)$$

$$m = 0.625$$

and the offset equation is:

$$b = 0 - 0.625 * 4$$

$$b = -2.5$$

Some manufacturers provide their offsets in raw units so you must convert that value to scaled units (multiply by multiplier) using the following formula:

$$b \text{ (offset in scaled units)} = m \text{ (slope)} * \text{offset in raw units.}$$

Smart Sensor Scaling Example 1: Counts to Liters

In this example, counts are converted to liters to measure water usage during peak hours. Given a ratio of 1 count (raw1 value) equal to 5 liters (scaled1 value), the multiplier is 5 ($5/1 = 5$). The scaled units are liters, the scaled measurement type is Water Usage, and there is no offset. In addition, the sensor label should be "peak hours." With this information entered, the sensor on the Sensor Configuration page looks like this:

Sensor Configuration

Latest Value: 0.0 #

Label:

Enable Graph

Enable Graph Totals

Enable Scaling Kwh KW

*Scaled Units = *Multiplier x Value + *Offset

*Scaled Measurement Type:

Serial Number: 1137892-1 Product Code: S-UCA

And then appears like this in the device overview page:

Latest Conditions

Relay State: Deactivated (Open)

Water Usage (peak hours): 0.00 liter

Smart Sensor Scaling Example 2: Current to Inches of Water Column

In this example, current in mA is converted to inches in water column (in WC) to measure air duct pressure. Assuming the following values: raw1 = 4 mA, raw2 = 20 mA, scaled1 = 0 in WC, and scaled2 = 10 in WC. Therefore the multiplier calculation is: $(10.0 - 0.0)/(20 - 4) = 0.625$. The offset calculation is: $0 - (0.625 * 4) = -2.5$. The scaled units are in WC, the scaled measurement type is Pressure, and the optional label is "air duct bldg 3." With this information entered, the sensor on the Sensor Configuration page looks like this:

Sensor Configuration

Latest Value: 0.002 mA

Label:

Enable Graph

Enable Scaling kWh kW

*Scaled Units: = *Multiplier: x Value + *Offset:

*Scaled Measurement Type:

Serial Number: 1072476-1 Product Code: S-CIA

Back
Save
Next

And then appears like this in the device overview page:

Latest Conditions

Relay State: Deactivated (Open)

Pressure (air duct bldg 3): -2.498 in WC

Calculating Energy in kWh

To calculate energy in kilowatt-hours, you need the kilowatt-hours per pulse. When configuring scaling for smart sensors, type the value for kilowatt-hours per pulse in the Multiplier field and enter 0 in the Offset field. Type kWh for the Scaled Units and Energy for the Scaled Measurement Type.

To find the value for kilowatt-hours per pulse for a WattNode sensor, refer to WattNode Scaling Factors for Energy below. (These values are for the Standard Bidirectional Output model WattNode sensors only. Scaling factors for other WattNode models can be found in the WattNode manufacturer's manual included with each WattNode sensor.) To find the value for other manufacturers, refer to the documentation that came with the sensor. The E50B2 Power & Energy Meter uses different scaling factors; see Scaling Factors for the E50B2 Power & Energy Meter in this chapter for details.

WattNode Sensor Scaling Factors for Energy

Kilowatt-hours per pulse

CT Size (amps)	Model #: 3Y-208/3D-240	Model #: 3Y-400/3D-400	Model #: 3Y-480/3D-480	Model #: 3Y-600
5	0.000125	0.0002396	0.0002885	0.0003615
15	0.000375	0.0007188	0.0008656	0.0010844
20	0.0005	0.0009583	0.0011541	0.0014458
30	0.00075	0.0014375	0.0017313	0.0021688
50	0.00125	0.0023958	0.0028854	0.0036146
60	0.0015	0.002875	0.0034625	0.0043375
70	0.00175	0.0033542	0.0040396	0.0050604

Kilowatt-hours per pulse

CT Size (amps)	Model #: 3Y-208/3D-240	Model #: 3Y-400/3D-400	Model #: 3Y-480/3D-480	Model #: 3Y-600
100	0.0025	0.0047917	0.0057708	0.0072292
150	0.00375	0.0071875	0.0086563	0.010844
200	0.005	0.0095833	0.011542	0.014458
250	0.00625	0.011979	0.014427	0.018073
300	0.0075	0.014375	0.017313	0.021688
400	0.01	0.019167	0.023083	0.028917
600	0.015	0.02875	0.034625	0.043375
800	0.02	0.038333	0.046167	0.057833
1000	0.025	0.047917	0.057708	0.072292
1200	0.03	0.0575	0.06925	0.08675
1500	0.0375	0.071875	0.086563	0.10844
2000	0.05	0.095833	0.11542	0.14458
3000	0.075	0.14375	0.17313	0.21688

Calculating Power in kW

Power in kilowatts is calculated by multiplying the pulse count by the multiplier. To calculate the multiplier, use the following equation:

$$(3600 \div \text{Logging Interval in seconds}) \div \text{pulses per kWh} = \text{multiplier}$$

When configuring scaling for smart sensors, type the result of that equation in the Multiplier field and enter 0 in the Offset field. Type kWh for the Scaled Units and Power for the Scaled Measurement Type.

To determine the value for the pulses per kWh, refer to the WattNode Scaling Factors for Power below. For other manufacturers, refer to the documentation that came with the sensor. The E50B2 Power & Energy Meter uses different scaling factors; see Scaling Factors for the E50B2 Power & Energy Meter later in this chapter for details.

Note: If you change the logging interval for a device with a sensor scaled for kWh, you will need to recalculate the scale factor.

WattNode Sensor Scaling Factors for Power

Pulses per kilowatt hour

CT Size (amps)	Model #: 3Y-208/3D-240	Model #: 3Y-400/3D-400	Model #: 3Y-480/3D-480	Model #: 3Y-600
5	8000.00	4173.91	3465.70	2766.57
15	2666.67	1391.3	1155.24	922.19
20	2000.00	1043.48	866.450	691.643
30	1333.33	695.652	577.617	461.095
50	800.000	417.391	346.570	276.657
60	666.667	347.826	288.809	230.548
70	571.429	298.137	247.550	197.612
100	400.000	208.696	173.285	138.329
150	266.667	139.13	115.523	92.219
200	200.000	104.348	86.643	69.164
250	160.000	83.478	69.314	55.331
300	133.333	69.565	57.762	46.11
400	100.000	52.174	43.321	34.582
600	66.667	34.783	28.881	23.055
800	50.000	26.087	21.661	17.291
1000	40.000	20.87	17.329	13.833
1200	33.333	17.391	14.440	11.527

Pulses per kilowatt hour

CT Size (amps)	Model #: 3Y-208/3D-240	Model #: 3Y-400/3D-400	Model #: 3Y-480/3D-480	Model #: 3Y-600
1500	26.667	13.913	11.552	9.2219
2000	20.000	10.435	8.6643	6.9164
3000	13.333	6.9565	5.7762	4.611

Calculating Power Examples

Example 1: WattNode Transducer Model WNB-3Y-208-P with 50 Amp CT

The logging interval is set to 1 minute, or 60 seconds and the pulses per kWh for this transducer is 800 (see table above). Therefore the multiplier equation is $(3600 \div 60) \div 800 = 0.075$. The offset is 0, the scaled units name is KW, and the scaled measurement type is power. With this information entered, the sensor on the Sensor Configuration page looks like this:

Sensor Configuration

Latest Value: 0.0 #

Label:

Enable Graph

Enable Graph Totals

Enable Scaling kWh KW

*Scaled Units = *Multiplier x Value + *Offset

*Scaled Measurement Type:

Serial Number: 1137892-1 Product Code: S-UCA

Example 2: WattNode Transducer Model WNB-3D-240-P with 100 Amp CT

The logging interval is set to 15 minutes, or 900 seconds and the pulses per kWh for this transducer is 400 (see table above). Therefore the multiplier equation is $(3600 \div 900) \div 400 = 0.01$. The offset is 0, the scaled units name is KW, and the scaled measurement type is power. With this information entered, the sensor on the Sensor Configuration page looks like this:

Sensor Configuration

Latest Value: 0.0 #

Label:

Enable Graph

Enable Graph Totals

Enable Scaling kWh KW

*Scaled Units = *Multiplier x Value + *Offset

*Scaled Measurement Type:

Serial Number: 1137892-1 Product Code: S-UCA

Scaling Factors for FlexSmart TRMS Module and Sensors

When configuring scaling for a FlexSmart TRMS (S-FS-TRMSA-D) module and associated sensors, use the following table to fill in the appropriate fields. For your sensor model part number, enter the Scaled Units, Multiplier, Offset, and Scaled Measurement Type listed below in each of the fields. See Scaling Sensor Data for additional information on scaling.

Sensor Model	Scaled Units	Multiplier	Offset	Scaled Measurement Type
T-ACT-0750-020	Amp	0.0600006	0	Current
T-ACT-0750-050	Amp	0.1500015	0	Current
T-ACT-0750-100	Amp	0.300003	0	Current
T-ACT-0750-250	Amp	0.7500075	0	Current
T-MAG-0400-005	Amp	0.01501502	0	Current
T-MAG-0400-010	Amp	0.03003003	0	Current
T-MAG-0400-020	Amp	0.06006006	0	Current
T-MAG-0400-050	Amp	0.15015015	0	Current
T-MAG-0400-075	Amp	0.22522523	0	Current
T-MAG-SCT-005	Amp	0.01501502	0	Current
T-MAG-SCT-020	Amp	0.06006006	0	Current
T-MAG-SCT-050	Amp	0.15015015	0	Current
T-MAG-SCT-100	Amp	0.3003003	0	Current
T-MAG-SCT-200	Amp	0.6006006	0	Current
T-MAG-SCT-600	Amp	1.8018018	0	Current
T-MAG-SPT-150	VAC	0.34534535	0	Voltage
T-MAG-SPT-300	VAC	0.69069069	0	Voltage
T-MAG-SPT-600	VAC	1.38138138	0	Voltage

Scaling Factors for the E50B2 Power & Energy Meter

If you are using the E50B2 Power & Energy Meter (T-VER-E50B2), you can apply scaling to the Counts channel. The following table lists the names and values you should enter in the Scaling fields. The default settings for the three native E50B2 data outputs are listed as well as all supported scaling values. These scaling factors must match the configuration entered into the device or inaccuracies will result. Documentation on the E50B2 is available at <http://www.onsetcomp.com/products/sensors/t-ver-e50b2>.

For Scaled Units, Enter this:	Choose a Multiplier to Enter:	For Scaled Measurement Type, Enter this:
VARh	1 VARh per pulse (Default) 10 VARh per pulse 100 VARh per pulse 1,000 VARh per pulse 10,000 VARh per pulse	Reactive Energy
Wh	1 Wh per pulse (Default) 10 Wh per pulse 100 Wh per pulse 1,000 Wh per pulse 10,000 per pulse	Real Energy
Ah	0.001 Ah per pulse 0.01 Ah per pulse (Default) 0.1 Ah per pulse 1 Ah per pulse 10 Ah per pulse	Amp Hours

In addition to the three native data outputs (VARh, Wh, and Ah), you can also calculate other types of data outputs. To do this, download the .csv file and follow the instructions in the Microsoft Excel file located here: http://www.onsetcomp.com/files/manual_pdfs/Derived-Channels.zip.

That file uses the following calculations for each additional type of data output:


Data Output	Unit	Calculation
Reactive Power	VAR	VARh/h
Volt-Amps	VA	SQRT (Wh ² + VARh ² /h)
Volts	V	SQRT (Wh ² + VARh ²)
Power Factor	PF	Wh/SQRT (Wh ² + VARh ²)
True Power	W	Wh/h
True Power	KW	W/1000
Kilowatt Hours	KWh	Wh/1000
Amp	A	Ah/h

(where 'h' is hours = Logging Interval/3600)

Relay Configuration

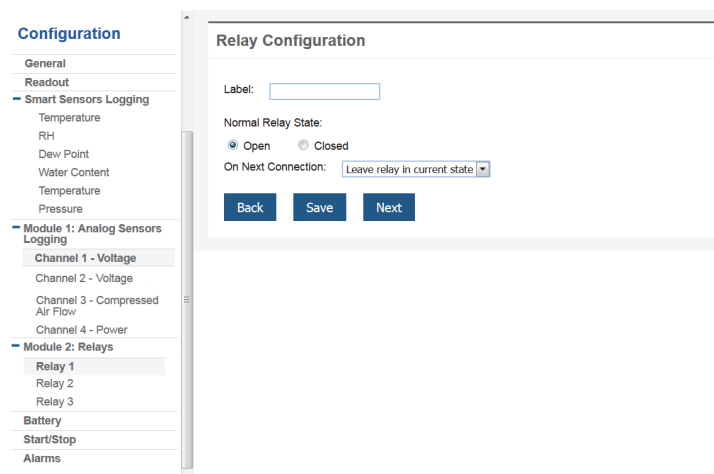
Configuring the Relay Module in an RX3000 Station

The RX3000 station can include an optional relay module with three individual relays for connecting devices. To configure the relay module in an RX3000 station:

1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Relay Configuration. Or, click the station name to open its detailed page, click the arrow next to the Configure button, and select Relay Configuration.
2. Click a relay on the left menu to configure it.
3. Type a label and select Open or Closed for the Normal Relay State. The label can be used to show what Open or Closed corresponds to in your system (for example, "closed relay turns pump on").
4. Select what should happen on the station's next connection to HOBOLink: open relay, close relay, or leave relay in its current state.
5. Click Save (or click Next to move to the next configuration page).
6. Repeat steps 2 through 5 for any additional relays you want to configure.

See Sensor Alarms for details on configuring a relay to open, close, or pulse for one second when a sensor alarm trips.

Refer to the RX3000 station manual for information on connecting devices to the relay module.




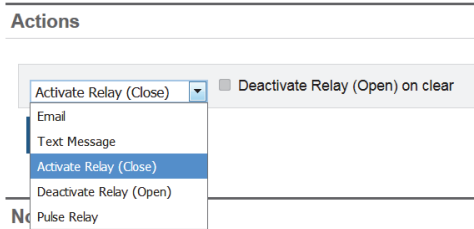
Configuring the U30 Station Relay Contact

The relay contact on a U30 station can be opened, closed, or pulsed to control the operation of an external device, such as an irrigation system or fountain, when an alarm is tripped. Setting up the relay is a two-step process. First, use HOBOWare to set the default

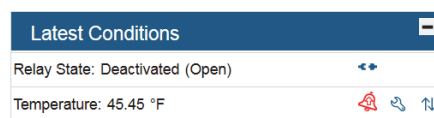
deactivated state of the relay to open or closed (the factory default is normally open). Then, set the alarm action for the appropriate sensor to activate, deactivate, or pulse the relay in HOBOLink.

To configure the relay in a U30 station:

1. With the device connected to the computer, open HOBOWare and select Manage U30 > Control U30 Relay > Set default (deactivated) state.
2. Select Open if you want the relay to open when there is a sensor alarm (such as an irrigation system that shuts off when it is raining or a fountain that shuts off when it is too windy).
Select Close if you want the relay to close when there is a sensor alarm (such as an irrigation system that turns on when the temperature drops below a specific reading to avoid frost damage to an orchard or cranberry bog).
Select Pulse if you will be setting up a pulse relay in which the relay will close briefly to activate a piece of equipment and then reopen (such as if you want to trigger a water sample when the water level reaches a certain amount).
3. If you are setting up a pulse relay in which the relay will close, select Device > Manage U30 > Configure U30 Alarms in HOBOWare. In the Sensor Alarms window, set the pulse width (the default is 1 second) and click Set.
4. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Alarm Configuration.
5. Click an existing sensor alarm or click Add a Sensor Alarm to create a new one. Set or edit the fields under Sensor Condition (see Working with Sensor Alarms in this chapter for more details).
6. Under Actions, select Activate Relay (Close) or Pulse Relay as needed if the default state was set to Open in HOBOWare. Select Deactivate Relay (Open) if the default state was set to Closed in HOBOWare.



7. If you selected Activate Relay (Close), you also have the option to deactivate the relay (reopen it) when the alarm clears. Select the Deactivate Relay (Open) on clear checkbox if desired. Another option would be to create a second alarm with a Deactivate Relay (Open) action and the conditions set to the values you wish to use to clear the relay (or stop the equipment).
8. Add or edit any additional actions for this alarm, such as sending an email or text message.
9. Click Save. Connect the equipment to the device and run a test to make sure the relay operates as expected. You can view the device relay state as of the last time the device connected to HOBOLink on the device overview page.




Refer to the U30 user guide for information on connecting equipment and examples of starting and stopping equipment.

Start/Stop (RX3000 Stations)

For RX3000 stations, you can start or stop logging as needed from within HOBOLink or by pressing the Start/Stop button on the device.

To start or stop logging with HOBOLink:

1. Click Devices then List and find the station you want to start or stop. Click the arrow next to the  icon and select Start/Stop.
2. Click Start if you want the device to start logging data or click Stop if you want the device to stop logging data.


The device will start or stop logging the next time it connects to HOBOLink.

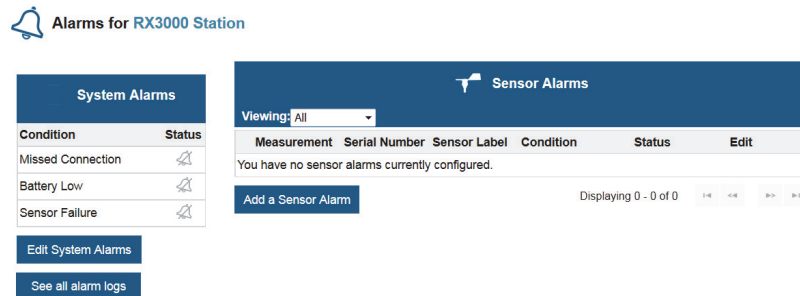
Alarm Configuration

There are two types of alarms that can be configured in HOBOLink:

- System alarms, where an alarm trips if the device misses a connection, the battery is low, or there is a sensor error. For U30 stations, there is also an alarm for low memory.
- Sensor alarms, where an alarm trips if the sensor reading falls above or below a specific value or outside of a specified range.

Note: Alarms can have a significant impact on the communications data usage for cellular devices. The amount of allocated data available for your communications plan should be considered when configuring alarms.

To set up an alarm, click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Alarm Configuration. On the Alarms page, you can then create, edit, or delete system and sensor alarms and view a list of the latest tripped alarms in the alarm logs.



System Alarms


You can receive email or text notifications when a station has a missed connection, low battery, low memory (U30 stations only) or a sensor failure.

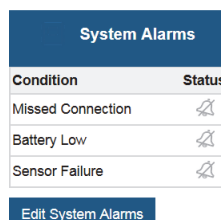
Types of System Alarms

The following system alarms can be configured for the device:

- **Missed Connection.** The device has missed its regularly scheduled connection to HOBOLink by a specified amount of time.
- **Battery Low.** The battery level for the device has dropped below 4.05 volts and needs to be recharged. The device will stop communications after the battery drops to 3.9 volts.
- **Memory Low (U30 stations only).** There is less than 12.5% memory remaining for the device (only available if the "Wrap when memory fills option" is disabled in General Configuration).
- **Sensor Failure.** A sensor connected to the device has failed. This alarm is automatically enabled when you enable a sensor alarm.

How to Set Up a System Alarm with Email or Text Notifications

1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Alarm Configuration.
2. On the Alarms page, click Edit System Alarms under the System Alarms panel.



3. Under Communication, select the Missed Connection checkbox if you wish to set up a Missed Connection alarm. Select how long (in minutes, hours, or days) HOBOLink should wait to trip the alarm after a missed connection. The current connection schedule is displayed for your reference, with the regular interval listed first followed by the night mode interval. In the following example,

the device is connecting every 4 hours and then every 8 hours during night mode and 10 minutes has been selected for the amount of time to wait before the alarm will trip after a missed connection.

4. Select the notification action to be taken when the Missed Connection alarm trips to send an email or a text message (the default is to send an email to the address associated with the HOBOLink account).
 - **For email notifications:** Select Email from the drop-down list and enter an address in the field. Select the "Send on clear also" checkbox if you want an email to be sent when the alarm condition clears.
 - **For text notifications:** Select Text Message from the drop-down list. Select one of the default country prefixes and type the cell phone number without hyphens to receive text messages as shown in the previous example. If your country is not listed, then contact Onset Technical Support at www.onsetcomp.com/support/contact. Select the "Send on clear also" checkbox if you want a text message to be sent when the alarm condition clears.


Important: Standard data fees and text messaging rates may apply when using text notifications for system alarms. Onset does not charge a fee or guarantee delivery of text alerts, which is subject to your carrier's service and location. See How to Edit or Delete an Alarm Notification Action later in this section for details. If you text STOP in response to a text message from HOBOLink, Onset will disable all texts to that phone number. Because this means you will no longer receive any alarm notifications at that phone number, make sure you change the alarm notification settings to use an alternate phone number or email address to continue receiving notifications. If you text STOP and later wish to resume texts to that phone number, contact Onset Technical Support at www.onsetcomp.com/support/contact. Note that if you text STOP twice in a 30-day period, you must wait 30 days before Onset Technical Support can re-enable your phone number.

- **To add an additional email or text notification:** Click the Add Action button and repeat this step.
5. Under Device, select the checkboxes for the device alarms that you wish to set up: Battery Low, Memory Low (U30 stations only), and Sensor Failure. Repeat step 4 to add an email or text notification


Important: A separate action must be set up for the device alarms even if you created an action under Communication for the Missed Connection alarm, and even if the action you want to take is the same for all the alarms under Communication and Device.


6. Click Save when you are finished configuring the alarms. Click Back to Alarms if you do not want to save your changes. Check the System Alarms panel to see the status of the alarms you have configured (hover over an alarm icon to see if it is active, pending, tripped, or inactive).

How to Disable System Alarms

1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Alarm Configuration.
2. On the Alarms page, click Edit System Alarms under the System Alarms panel.
3. Click the checkbox next to the system alarms you want to disable to remove the checkmark and click Save. The alarm icon for any disabled alarms will be gray (hover over the icon to see that it has an inactive status). Any notifications associated with the disabled alarms will be saved and still in place if you re-enable the alarm in the future.

How to Edit or Delete an Alarm Notification Action

1. Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Alarm Configuration.
2. On the Alarms page, click Edit System Alarms under the System Alarms panel.
3. To edit an alarm notification action, make changes to the applicable email or text fields and click Save.

- To delete an email or text alarm notification action, click the  icon next to the one that you want to delete and click Save. Note that an enabled alarm requires at least one notification action. If you are deleting a text alarm notification because you no longer want to receive text alerts and do not already have an email notification action set up, change the settings in the text message action to email instead.

Notes about System Alarms

- When a Missed Connection alarm is enabled, HOBOLink checks every 5 minutes to see if the device has surpassed the specified late time. If it has, the alarm is tripped and the notification action (email, text, or both) is initiated. The Missed Connection alarm will clear after the device successfully connects. You will then receive notification of the cleared alarm if the "Send on clear also" setting is enabled if the device was able to reconnect on its own. The Missed Connection alarm will also clear if the device is relaunched or if you edit the alarm settings, but a notification will not be sent in those situations because the device did not resolve the missed connection on its own.
- For U30 stations:** When any one of the three device alarms (Battery Low, Memory Low or Sensor Failure) trips, the other configured device alarms are automatically disabled. (The Missed Connection alarm, which is a communication alarm, will remain enabled if configured.) After you resolve the problem with the device, click Edit System Alarms to re-enable the device alarms and click Save, which will automatically clear the alarm. If you select the Clear checkbox on a tripped alarm, it will not re-enable the alarm. The alarm will remain disabled until you select that alarm in the Edit System Alarms page and click Save.


Important note for U30 stations: If you re-enable the Memory Low or Sensor Failure alarms, the device automatically relaunches.

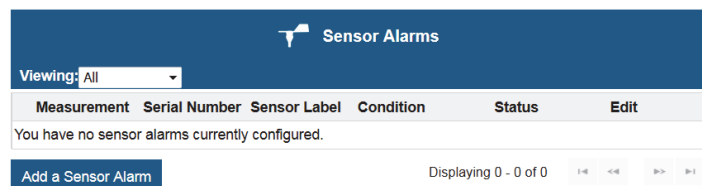
- For RX3000 stations:** A tripped Battery Low and Sensor Failure alarm will clear automatically when the station stops logging. Otherwise, the Battery Low alarm will trip and clear depending upon the battery level. When a Sensor Failure alarm trips, you can either:
 - Click the Clear checkbox on the Alarms page. This will stop the logger, prompt HOBOLink to locate all connected sensors, and start logging again.
 - Press the stop button on the logger. Inspect all smart sensors. Use the Select button to switch to the smart sensors screen on the LCD and then press the Search button (under the magnifying glass icon) so that the station can locate all connected sensors. Press the Start button to start logging again when ready.

Sensor Alarms

You can set an alarm to trip and receive an email or text notification or open/close a relay when a sensor reading is above or below a level you select or outside a normal operating range that you set for a specific number of readings.

How to Set Up a Sensor Alarm with Email or Text Notification

- Click Devices and then List, and find the station you want to configure. Click the arrow next to the  icon and select Alarm Configuration. Or, click the station name to open its detailed page, click the arrow next to the Configure button, and select Alarm Configuration.
- On the Alarms page, click Add a Sensor Alarm under the Sensor Alarms panel.



- Set up the Sensor Condition for the alarm:
 - Select a sensor from the drop-down list.
 - Select the threshold for the alarm to trip: above, below, or outside range. If you select above or below, the alarm will trip if the sensor reading rises or falls below the value entered respectively. If you select outside range, the alarm will trip if the sensor reading falls outside the range you select.

- c. Type the value for the threshold, or two values for a range. If scaling was configured for this sensor, make sure the value entered is for the scaled units. Note that the actual values for the alarm limits are set to the closet values supported by the sensor.
- d. Type the number of sensor data points you want to be logged before the alarm trips. The current logging interval is listed for your reference.
- e. For RX3000 stations: If you had selected above or below for the alarm threshold, then you can also select when the alarm should clear. Select above or below the same value or above or below a different value and then enter the value in the field that appears.

In the example below, a temperature sensor alarm was configured to trip when the temperature falls below 32°F for 4 consecutive data points. Because the logging interval is set to 5 minutes, this means an alarm will trip if the temperature falls below 32°F for 20 minutes.

Sensor Condition

(Sensor value range: -40.00 to 212.00 °F, latest value: 71.15 °F)

Temperature S/N: 1161585-1 below 32 °F for 4 logged data points Logging every: 5 min

Alarm clears: above the same value

4. Select the notification action to be taken when the alarm trips: send an email or a text message, or activate, deactivate, or pulse the relay. The default is to send an email to the address associated with the HOBOLink account.
 - **For email notifications:** Select Email from the drop-down list and enter an address in the field. Select the "Send on clear also" checkbox if you want an email to also be sent when the alarm condition clears.
 - **For text notifications:** Select Text Message from the drop-down list. Select one of the default country prefixes and type the cell phone number without hyphens to receive text messages as shown in the next example. If your country is not listed, then contact Onset Technical Support at www.onsetcomp.com/support/contact. Select the "Send on clear also" checkbox if you want a text message to be sent when the alarm condition clears.

Important: Standard data fees and text messaging rates may apply when using text notifications for system alarms. Onset does not charge a fee or guarantee delivery of text alerts, which is subject to your carrier's service and location. See How to Edit or Delete a Sensor Alarm and Notification Action later in this section for details. If you text STOP in response to a text message from HOBOLink, Onset will disable all texts to that phone number. Because this means you will no longer receive any alarm notifications at that phone number, make sure you change the alarm notification settings to use an alternate phone number or email address to continue receiving notifications. If you text STOP and later wish to resume texts to that phone number, contact Onset Technical Support at www.onsetcomp.com/support/contact. Note that if you text STOP twice in a 30-day period, you must wait 30 days before Onset Technical Support can re-enable your phone number.

Actions

(Select your country code and input a phone number. For multiple text alerts add an additional action. Message & data rates may apply. Message will be truncated to 130 characters.)

Text Message USA (1) 5087599500 Send on clear also

Add Action

- **For relay switches with RX3000 stations:** Select Open or Close for one of the three relays or select Pulse for one of the three relays from the drop-down list. For details on the relay module, see Relay Configuration in this chapter.
 - **For relay switches with U30 stations:** Select Activate Relay (Close), Deactivate Relay (Open), or Pulse Relay from the drop-down list. The default relay setting for the device is normally open, which can only be changed in HOBOWare. For details on the relay, see Relay Configuration later in this chapter.
5. Click the Add Action button if you wish to set up more than one notification action when the alarm trips (for example, you want to send an email and activate the relay). Fill out the appropriate fields as needed.

There can only be one type of relay action per alarm (you can, however, set up a second alarm on the same sensor with a different relay action).

- Type any notes about the alarm that you want to be included in the email when the alarm trips (if an email action has been configured). This helps to differentiate between multiple sensor alarms.

Notes

(Ex. "Grove East Too Cold" or "Damp Basement")

- Click Save. The alarm is added to the list of Sensor Alarms as shown in the following example. Click the + to the left of the sensor name to see any notes related to the alarm. The alarm will be in a pending state until the next time the device connects. At that time, it will then remain active until it trips or is deleted or modified.

Sensor Alarms					
Measurement	Serial Number	Sensor Label	Condition	Status	Edit
+ Temperature	1161585-1		below 32.00 °F		

Adding a Sensor Alarm

Displaying 1 - 1 of 1

To add another alarm to the same sensor or a different one, click Add a Sensor Alarm and follow steps 3 through 7.

You can also change the view of the Sensor Alarms panel to show all alarms or to only show the alarms that have tripped, have changes pending, or are inactive because the sensor is currently unavailable on the device. Click the drop-down arrow next to Viewing in the Sensor Alarms panel and choose the desired view.

Tip: Consider setting up a test alarm using a value that will trip immediately to ensure you receive an email or text as expected.

For details on tripped sensor alarms, see Viewing Tripped Alarms in the next chapter.

How to Edit or Delete a Sensor Alarm and Notification Action

- Click Devices and then List, and find the station you want to configure. Click the arrow next to the icon and select Alarm Configuration.
- Click the icon for the alarm you want to edit.
- Make any changes to the applicable fields. If you want to delete an email, text, or relay action, click the icon for the action that you want to delete and click Save. Note that an enabled alarm requires at least one action. If you are deleting a text alarm notification because you no longer want to receive text alerts and do not already have an email notification action set up, change the settings in the text message action to email instead.

To delete an alarm, click the icon for the alarm you want to delete.

Battery Configuration

- Click Devices then List and find the station you want to configure. Click the arrow next to the icon and select any option (RX3000 stations) or Sensor Configuration (U30 stations).
- Select Battery from the left Configuration menu. Battery is listed below modules for RX3000 stations and with smart sensors for U30 stations.
- Type an optional label.
- Select Enable Graph to show a graph for the battery voltage on the device page.
- Deselect Enable Scaling (scaling is not needed for a battery).
- Click Save (or click Next to move to the next configuration page).

Chapter 3

Monitoring Devices

There are several ways to monitor your devices:

- Click Devices and then List to view a list of remote monitoring stations and standalone MX series logger deployments (see below for more information on both lists).
- Click Map to view stations by location.
- View device details, including latest conditions, graphs, logs, and more.
- Share a device page so that others can monitor your station.
- Create a summary page for a U30 Station with customized monitoring.
- Check for tripped alarms.

Remote Monitoring Devices List (RX3000 and U30 Stations)

- Devices are sorted by their nickname in ascending alphabetical order. Click a column heading to change the sort order.
- Use the Nickname and Serial # fields at the top of the columns to refine the list of devices shown. Type part or all of a device name in the Nickname field or part or all of the device serial number in the Serial # field. The Device page will then be updated to only show those devices that match the characters you entered. For example, "RX3000" was entered in the Nickname field and only those devices that have "RX3000" as part of the nickname are displayed in the list.












Remote Monitoring Devices						
Summary						
Nickname	Serial #	Last Connection	Communications	Relay	Alarms	Configuration
RX CELL-3G	10665731	Today at 06:18 EDT				
RX3000 WI-FI	10689822	Today at 09:46 EDT				
U30 CELL-3G	10649648	Today at 09:34 EDT				
U30 ETH	10018388	Today at 14:43 EDT				
SRW RX	10636365	Today at 09:47 EDT				

Register a Device Displaying 1 - 10 of 11

- To register a new device, click the "Register a Device" link. Type a nickname for the device. Enter the serial number and device key found on the sticker inside the device and click Register.
- To remove a device, click this icon and follow the instructions. See Removing a Device for more details.
- **For U30 stations:** Click the Summary button to go to a different login page where you can access a tool for creating a customized summary page of your device. Refer to Using the U30 Summary Page for more information.

These are the columns in the list:

Column Name	Description
Nickname	The name given to the device, which can be changed in General Configuration. Click this name to view the device page.
Serial #	The device serial number.
Last Connection	The date and time the device last connected to HOBOLink. If the device has never connected to HOBOLink, the status will be listed as "awaiting its first call."

Column Name	Description
Communications	<p>The current status of the device communications:</p> <ul style="list-style-type: none">  indicates the device is operating normally.  indicates there is a message regarding the device. Hover over the icon to view the message, which could include that the device has not yet called in, the device has stopped logging, or the device is approaching either the limit or expiration date of its communications plan.  indicates there is a warning regarding the device. Hover over the icon to view the warning, which could include that the device has missed its last expected connection by 10 or more minutes, there is an error with the device as indicated by the status in the Device Information panel, the device has exceeded the limit of its communications plan, or the plan has expired.
Relay	<p>Two icons indicate whether the relay content on the device is open  or closed . For RX3000 stations, click the information icon  to see the status of the relays, if the station has a relay module.</p>
Alarms	<p>Four icons indicate the device's current alarm status:</p> <ul style="list-style-type: none">  indicates an alarm is configured and active, but is not currently tripped.  indicates a change to an alarm setting is pending and will take effect the next time the device connects to HOBOLink.  indicates an alarm has tripped. Click the icon to view the tripped alarm on the Alarms page.  indicates that either no alarms have been set up or previously configured alarms are not currently active.
Configuration	<p>Click the arrow next to this icon  and select an option to configure the device.</p>


Standalone Deployments List (MX Series Loggers)

- You can set up HOBOMobile to automatically upload data to HOBOLink once a readout is complete (go to Settings in HOBOMobile and enable "Upload Data" under HOBOLink; see the [HOBOMobile User's Guide](#) for complete details). When data is uploaded for the first time for a logger deployment, a new entry is added to the Standalone Device Deployments list. Otherwise, an existing deployment in the list will be updated if data was previously uploaded for that logger deployment.
- Use the "Show latest deployment only" checkbox to toggle the view between all deployments and the most recent deployments only for each logger. When the checkbox is not selected, an orange dot will be displayed next to the latest deployment(s) as shown in the example.

Show latest deployment only		Standalone Device Deployments						
Name	Serial #	Model	Groups	Last Sensor Reading	Config Date	Export	Trash	
<input type="checkbox"/>	47002616	MX1101		November 04, 2016 08:51 EDT	November 02, 2016 08:49 EDT	Export	Trash	
<input checked="" type="checkbox"/>	Copy Room	47002616	MX1101	Third Floor	November 04, 2016 09:56 EDT	November 04, 2016 09:56 EDT	Export	Trash
<input type="checkbox"/>	Copy Room	47002616	MX1101		November 04, 2016 09:52 EDT	November 04, 2016 09:52 EDT	Export	Trash
<input type="checkbox"/>	Copy Room	47002616	MX1101		November 04, 2016 09:32 EDT	November 04, 2016 08:53 EDT	Export	Trash

Remove Selected Deployments (0) Displaying 1 - 4 of 4

- Use the Name, Serial #, Model, or Group names in the fields at the top of the columns to refine the list or to search for a particular deployment. Click a column heading to change the sort order of the column.

- Click Export to export some or all the data from this deployment. See Managing and Sharing Data for more details.
- Click this icon  to delete an individual deployment or use the checkboxes and then click "Remove Selected Deployments" in the left column to delete multiple deployments at a time.



These are the columns in the list:

Column Name	Description
Name	The name given to the logger when it was configured. If no name was entered, then the serial number is used by default.
Serial #	The logger serial number.
Model	The logger model number.
Group	The group assigned to the logger (if applicable).
Last Sensor Reading	The date and time of the last reading from the most recently uploaded data.
Config Date	The date and time the logger was configured. When the logger is configured in HOBOLink, a new deployment is started. There are three deployments in the example as indicated by the three different configuration times.






Working with a Map

Use the Map feature to monitor your station and sensors on Google Maps™.

To place a device on the map:





1. Click Devices and then Map.
2. Navigate to the area on the map where your station is physically located. If you are near the station, click  in the lower right corner of the map to automatically move the map to your location. You will be prompted to give HOBOLink access to your browser's location services.
3. Click the marker  next to your station in the side menu (upper left corner of map, click the arrow button to expand the menu if necessary). Click the location on the map where the device is physically located to place the marker.

You can also do the following:



- Click  in the upper right corner if you want to change the location of the station icon on the map. Once moving is enabled, click the device icon and drag it to another place on the map. Click  once the icon is in the desired location.
- Hover over the device icon to view information on the sensors, including the alarm status and readings from the last connection to HOBOLink. **Note:** If your device has a custom image set in General Configuration, then that image will be used as the icon on the map. Also, if you cannot view the sensor information, make sure  appears in the upper right corner. You cannot view sensor information when moving is enabled. Click  to disable moving.
- Click the arrow in the upper left corner of the map to expand or collapse the side menu. Use the side menu to search for your device or click the device name to view the device overview. Click  to highlight the device location on the map.
- Use the navigation controls in the lower right corner for zooming in and out or centering the map. You can also grab the map with the hand icon to change the view.

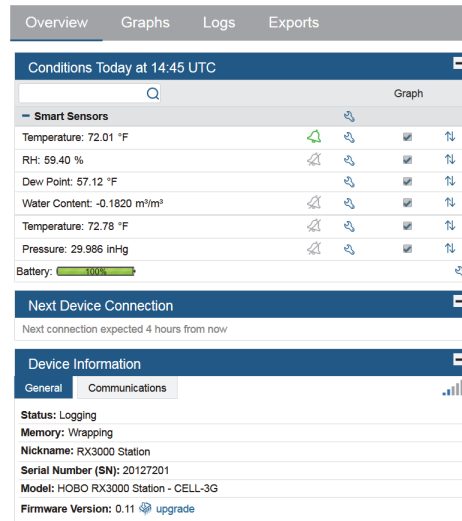
Viewing Device Details

You can view the overview, graphs, logs, and exports for each device registered to your HOBOLink account. From the Devices list or map, click a station name to view this information. The device image and nickname appear at the top of the page. For RX3000 stations, this

icon  at the top of the page indicates whether the device is currently logging or stopped  while this icon  indicates a configuration change has been made and is waiting for the next connection. Click the  icon to change the settings for your device.








Overview




Click Overview to see latest conditions, next scheduled connection, and device information panels. Use the  and  icons at the top right corner of each panel to expand or collapse the three panels in the device overview.

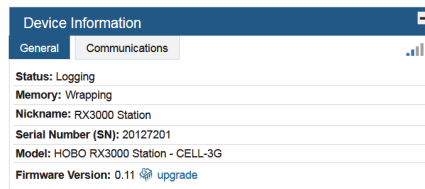


The screenshot shows the HOBOLink Overview page with the following sections:

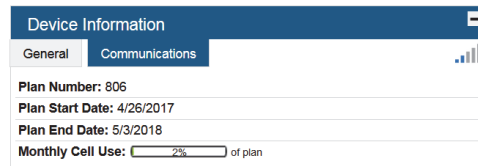
- Conditions Today at 14:45 UTC**: A table of sensor readings with columns for sensor name, value, alarm status, and graph checkbox.

Sensor	Value	Alarm	Graph
Temperature: 72.01 °F	72.01 °F		<input checked="" type="checkbox"/>
RH: 59.40 %	59.40 %		<input checked="" type="checkbox"/>
Dew Point: 57.12 °F	57.12 °F		<input checked="" type="checkbox"/>
Water Content: -0.1820 m³/m³	-0.1820 m³/m³		<input checked="" type="checkbox"/>
Temperature: 72.78 °F	72.78 °F		<input checked="" type="checkbox"/>
Pressure: 29.986 inHg	29.986 inHg		<input checked="" type="checkbox"/>
Battery: 	100%		<input checked="" type="checkbox"/>
- Next Device Connection**: Next connection expected 4 hours from now.
- Device Information**:
 - General tab selected.
 - Status: Logging
 - Memory: Wrapping
 - Nickname: RX3000 Station
 - Serial Number (SN): 20127201
 - Model: HOBO RX3000 Station - CELL-3G
 - Firmware Version: 0.11 [Upgrade](#)

- **Latest Conditions.** This panel shows the sensor readings from the last time the device connected to HOBOLink. The panel also shows the alarm condition for each sensor, the latest relay conditions, and the battery voltage for the device. If the sensor has a label, it will be listed in parenthesis following the sensor measurement type.
 - Click this  icon to drag the sensor up and down in the list. Any changes you make to the sensor order will also be reflected in the graphs (if graphs have been enabled for the sensors).
 - Click this  icon to configure a sensor (RX3000 and U30 stations) or module (RX3000 stations only).
 - For RX3000 stations, select or deselect the graph checkbox to show or hide sensor graphs for the device (accessible by clicking Graphs in the top menu). For U30 stations, click  next to the sensor you want to include in the graphs. Select or deselect the Enable Graph checkbox and click Save to show or hide the sensor graph.
 - If an analog sensor has been configured to log statistics, click the sensor description to view the latest statistics.
- **Next Device Connection.** This panel shows the time of the next expected connection for the device or the time elapsed since the last expected connection if it is overdue.
- **Device Information.** The upper right corner of this panel shows the signal strength for the device (if applicable). Click the General tab to view the following:
 - **Status.** This is the current logging status of the device.
 - **Memory.** For U30 stations, this indicates that the device is configured to continue logging when the memory is full (wrapping) or displays the remaining memory available if the device is configured to stop logging when full. For RX3000 stations, this displays “wrapping” because the device records data continuously.
 - **Nickname.** This is the name assigned to the device.
 - **Serial Number (SN).** This is the serial number for the device as listed inside the door.
 - **Model.** This is the model name for the device.
 - **Firmware Version.** This is the current version for the device's firmware. If a newer version of the firmware is available, click the Upgrade link.




Click the Communications tab to view the details for your device's communication plan, including the plan number and start and end date. For cellular models, you can view monthly cell use, which is the percentage of the allocated data that has been used for the current month based on your communications plan. For additional details on communications plans, see [Managing a Communications Plan](#) in the next chapter.



Graphs

Click Graphs to see sensor data plotted in graphs (only sensors with graphs enabled are shown). The default view displays all the data from the past day, based on when the device last connected to HOBOLink. Click the Past Week or Past Month tabs to change the view for all graphs to either a week or a month of data.



The order of the graphs is the same as the sensors listed in the Conditions panel. To change the order of the graphs, click the  icon and drag the sensor up or down in the list.

Rain gauge and pulse input adapter sensor graphs can show filtered data as a dashed line on the graph. You can enable this feature in Sensor Configuration by selecting Enable Graph Totals. When that option is selected, Past Day graphs note the total rainfall or pulses in the past day and the dashed line represents hourly totals. For Past Week and Past Month graphs, the total rainfall or pulses for the past week or month is noted and the dashed line represents daily totals.

For graphs from RX3000 stations:

- Hover over a series to see individual data points. The data point resolution for graphs is one minute for Past Day, 10 minutes for Past Week, and 30 minutes for Past Month. If the station is logging at faster intervals than those resolutions, the data is aggregated.
- Use the sliders below each graph to zoom in and zoom out.
- Sensor labels that were set in Sensor Configuration appear in parenthesis following the sensor name to the right of the graph.

For graphs from U30 stations:


- The data shown in the Past Month graphs are limited by the maximum data file size of 512K, which may be less than a month in some cases. The amount of days included in a data file depends on the logging interval as set in Launch Configuration and the number of sensors.
- Sensor labels set in Sensor Configuration appear in the upper left corner of the graph.

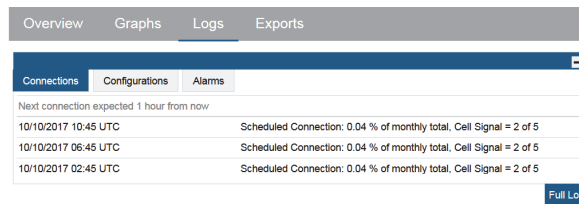
Logs

Click Logs to show device activity. Click one of these tabs:

- **Connections.** This tab displays a list of recent connections between the device and HOBOLink. A status message at the top of the list shows the time of the next expected connection for the device or the time elapsed since the last expected connection if it is overdue. A device can occasionally miss a connection if its Wi-Fi or cellular signal is weak.
- **Configurations (RX3000 stations only).** This tab displays the most recent changes made to the device, such as the device was started or stopped, a sensor was added or configured, or the power was reset.
- **Alarms.** This tab displays the most recent tripped or cleared alarms.

Click Full Log at the bottom of the Logs panel to view complete connection, configuration, and alarm logs. On the Connections log, you can click the Filter By drop-down arrow to change the view from the default of All Connections to either Only Errors or Scheduled

Connections. On the Alarms log, you can click the  icon to delete an entry or select checkboxes for multiple alarm entries and then click the Delete button.

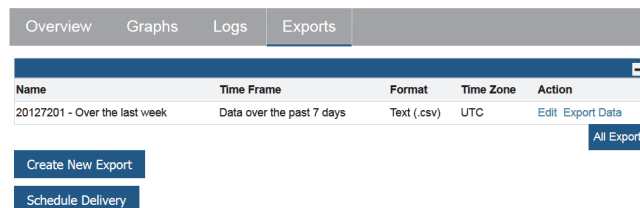


Exports

Click Exports to view saved export settings for the device, including the export name, time frame for the data to be included in the export, the format, and time zone. (For U30 stations, these are found on the Exports tab.) You can also:

- Click Edit to change the settings for the export.
- Click Export Data to generate an exported file as defined in the export settings.
- Click Create New Export to set up a new export.
- Click Schedule Delivery to set up a schedule for automatically generating and delivering the exported file.
- Click All Exports to view all exports in your HOBOLink account.

For more details on exported files, see Exporting Data in chapter 4.



For U30 stations, click the Data Files tab to view the most recent data files that have been read out from the device. Click a file to download it. Both text (.csv) and HOBOWare (.dtf) files are available if the device is set to "Save data as text file" in Readout Configuration. To view a list of all available files for the device, click All Files at the bottom of the tab. For more information about data files, see Downloading U30 Files in chapter 4.

Sharing a Device Page

Your station's device page is only viewable when you are logged into your account unless you grant public access to the page. To share your device page with others:

1. Click User Settings and then Public Access.
2. Under By Device, click the checkbox next to each station that you wish to share with others.
3. Click Save. This creates a URL for each of the stations selected. Click a URL to preview the page. Note that device information, graphs, and data are available on the public page, but the ability to change device settings is disabled.

4. Copy the URL and then share it with others.

Note for U30 stations: If you are using the Summary page feature, you can make that page public as well as the device page. To share the summary page:

1. Click User Settings and then Public Access.
2. Click the My Summary checkbox and click Save. This creates a URL for your custom U30 summary page. Note that when you enable this setting, all stations will be automatically granted public access. Click the URL to preview the page. Copy the URL and then share it with others.

To disable public access:

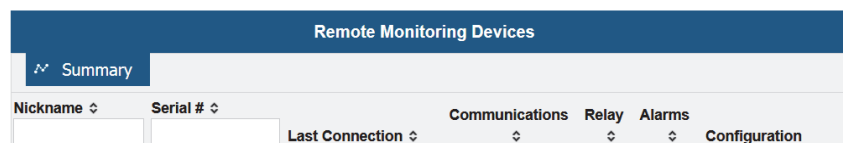
1. Click User Settings and then Public Access. Deselect the checkbox next to any device that you do not want to share with others.
2. Click Save. The URL associated with that device will no longer function and you will only be able view the device page when logged into your HOBOLink account. You can reselect the checkbox to reactivate the URL and grant public access again.

Using the U30 Summary Page

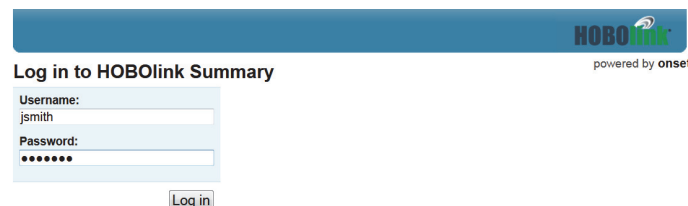
The Summary page is a separate HOBOLink tool that allows you to create a customized view of your U30 stations using widgets (this page is not available for RX3000 stations). You can then share the Summary page with others or to make it easier for you to view by marking it for Public Access under User Settings.



To access the Summary page:

1. Click Devices then List. Click the Summary button above the Nickname column.



2. Log in to the HOBOLink Summary page using the same username and password as your HOBOLink account.

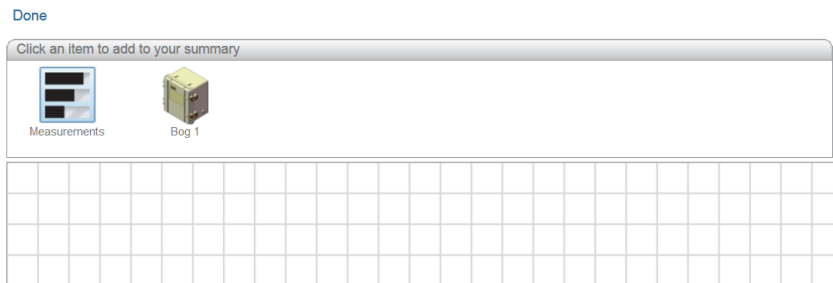



3. Click Edit to modify an existing Summary page or add widgets to create a new one as described next.
4. There are three types of widgets that you can add to the Summary page:
 - **Device widget.** Displays sensor information, relay state, and battery voltage for your device.
 - **Graph widget.** Displays the graph for a specific sensor.
 - **Measurement widget.** Displays sensors of a specific measurement type, such as temperature or wind speed, from one or more devices.
5. Click Edit to add widgets to an existing device page. While in Edit mode, you can also reposition the widget by clicking  at the top of the widget and then dragging the widget to the new position. To remove a widget, click  at the top right corner of the widget in Edit mode.

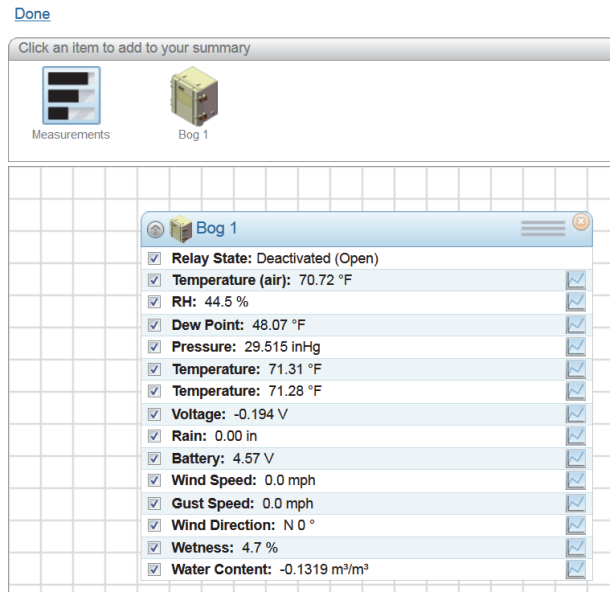
Adding a Device Widget

To add a device widget to the Summary page:

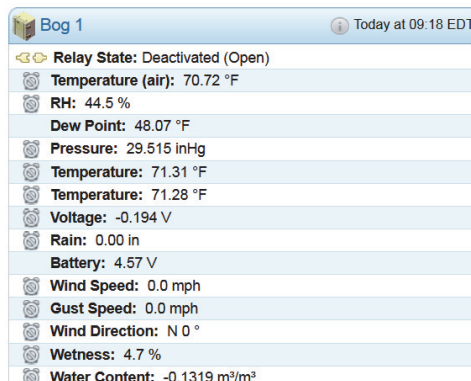
1. Click a Device icon (like Bog 1 in the following example) to add it to the grid.



2. Select or deselect the checkboxes to show or hide the relay state, sensors, and battery voltage for the device. Once a checkbox is deselected, the item is removed from the widget. Click  to see the item and then select the checkbox to add it back.



3. Click Done to view the widget on the Summary page. The items you selected are displayed in the widget along with the current alarm state for all sensors. The last connection date/time is listed at the top of the widget with a device communication status icon. The icon in the example below indicates that there is an informational message about the device. To view more details about the communication status as well as other information about the device, return to the main HOBOLink system. To change the order of the measurements in the device widget, you must change the order of the sensors in the Latest Conditions panel on your device page in the main HOBOLink system.

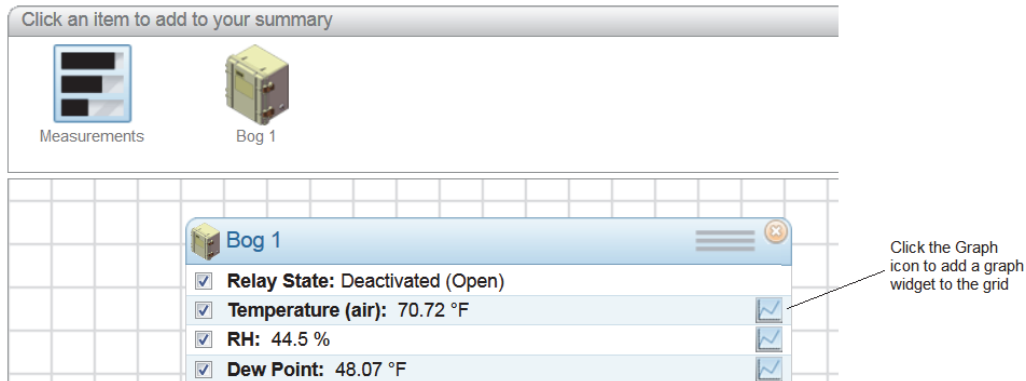


Adding a Graph Widget

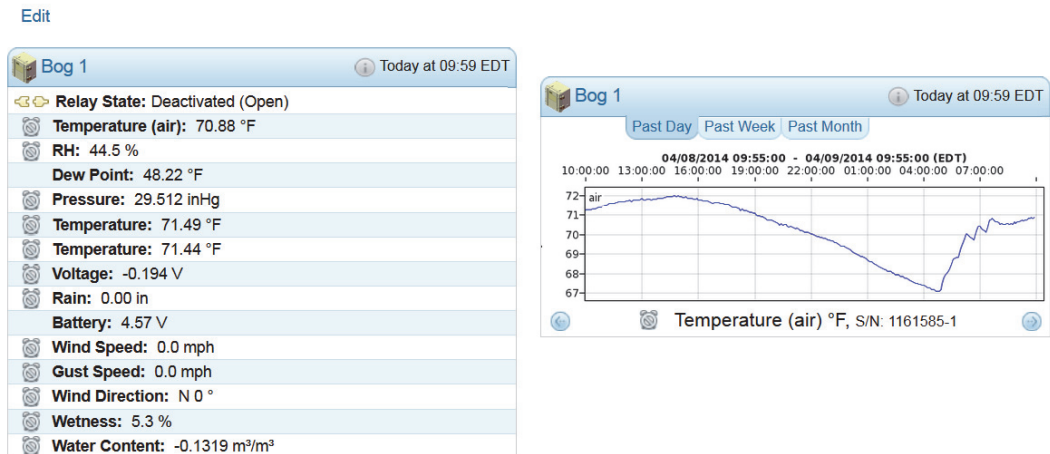
To add a graph widget to the Summary page:

1. Click Edit if a device widget is already on the page. If not, add a device widget as described in the previous section.
2. Click the graph icon next to a sensor to add the graph to the page. Click the Past Day, Past Week, or Past Month tab to change the default view to that tab. Use the arrow icons at the bottom of the graph to change the default sensor.

Done



3. Click Done to view the widget on the Summary page. Click the tabs at the top of the graph to switch the views between the Past Day, Past Week, and Past Month (if available). As with the device widget, the last connection date/time and communication status icon is at the top of the graph. Although the default view for the graph is for the sensor that you selected, you can also click the left and right arrow buttons at the bottom of the graph to view other sensor graphs for the device.

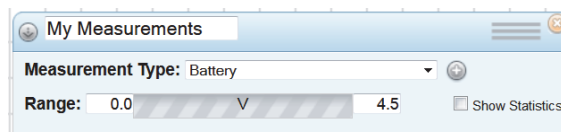



You can also add a graph widget by clicking a graph icon within the measurement widget.

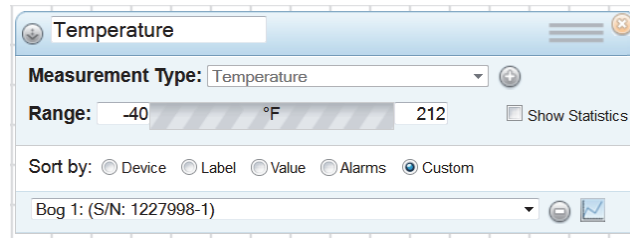
Adding a Measurement Widget

To add a measurement widget to the Summary page:

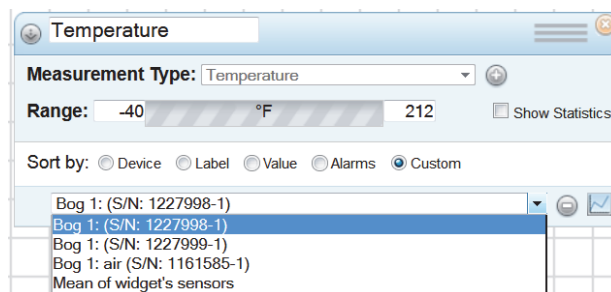
1. Click a Measurements icon  to add it to the grid.
2. Type a name for the measurement widget to replace "My Measurements."




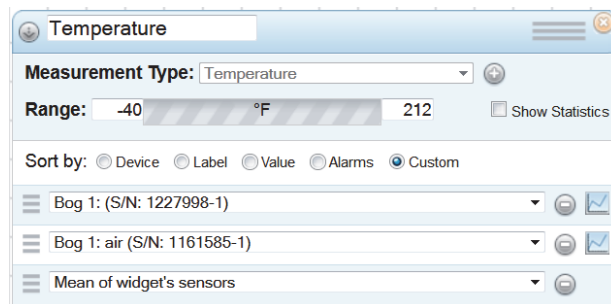
3. Select the measurement you wish to add from the Measurement Type drop down list.
4. By default, the minimum and maximum supported values for the measurement type are listed for the range. Edit this to other values within the range if desired.
5. Click  to add the selected measurement type entry to the widget.




6. Any sensors associated with the measurement type from all your devices are displayed in the drop-down list. Select the sensor you wish to include in the widget or select "Mean of widget's sensors" to show an average of all sensors associated with that measurement type.



7. Repeat steps 3–6 for any additional sensor you wish to add to the widget for this measurement type. In this example, one additional sensor was added along with an entry for the mean of the widget's sensors. To remove a sensor from the list, click the  in the row for the sensor you wish to delete. Note that you cannot change the measurement type for the widget without first deleting all sensors from the list.



8. Select how the sensors will be sorted in the widget:
 - **Device.** Sensors are sorted alphabetically by device description/nickname. Within a device group, sensors are then sorted by sensor label.
 - **Label.** Sensors are sorted alphabetically by sensor label.
 - **Value.** Sensors are sorted by sensor reading (for example, highest temperature to lowest).
 - **Alarms.** Sensors are sorted by alarm status in the order of tripped, active, and inactive.
 - **Custom.** This allows you to drag the sensors in the order you choose. Click and hold  next to the sensor you wish to reorder and drag it to the desired position.
9. Select the Show Statistics checkbox to include a sidebar on the widget with the Minimum, Maximum, Standard Deviation, and Mean calculated for the sensors in the widget.

10. Click Done to view the widget on the Summary page. The values for each sensor as of the last connection time are displayed in the widget along with statistics, if enabled.

The screenshot shows the HOBOLink interface. At the top right, it says "Logged in as jsmith | Help | Logout". Below that is an "Edit" link. The main content is divided into two panels for "Bog 1" (last updated "Today at 09:59 EDT").

The left panel shows a list of sensor readings:

- Relay State: Deactivated (Open)
- Temperature (air): 70.88 °F
- RH: 44.5 %
- Dew Point: 48.22 °F
- Pressure: 29.512 inHg
- Temperature: 71.49 °F
- Temperature: 71.44 °F
- Voltage: -0.194 V
- Rain: 0.00 in
- Battery: 4.57 V
- Wind Speed: 0.0 mph
- Gust Speed: 0.0 mph
- Wind Direction: N 0 °
- Wetness: 5.3 %
- Water Content: -0.1319 m³/m³




The right panel shows a temperature graph for "Temperature (air) °F, S/N: 1161585-1" from 10:00:00 on 04/08/2014 to 07:00:00 on 04/09/2014. The graph shows a temperature curve that starts around 71°F, peaks near 72°F, then drops to a minimum of about 67°F before rising back to 71°F. Below the graph is a "Temperature" table with a heatmap and statistics.

Device	Label	Temperature, °F				Statistics
		0	50	100	150	
Bog 1		71.49				Min 70.88
Bog 1	air	70.88				Max 71.492
	Mean		71.186			Std Dev 0.306
						Mean 71.186

You can share the Summary page with others or to make it easier for you to view by marking it for Public Access under User Settings.

Viewing Tripped Alarms

In addition to any notifications you may receive or relay switches when an alarm trips, there are several ways to check if the device has any tripped alarms within HOBOLink:

- Check for a tripped alarm icon  in the Devices list.
- The station icon on the map will be red instead of blue if an alarm has tripped. In addition, when you hover over the station icon, a tripped alarm icon with an arrow indicator  is listed next to the sensor with the tripped alarm.
- Check for a tripped alarm icon with an arrow indicator  next to a sensor in the latest conditions panel on the device overview page. The arrow indicator shows whether the sensor reading is above the threshold (up arrow) or below the threshold (down arrow), or outside the range (up and down arrow).
- Look for red or blue shading on the graph for the sensor with the tripped alarm. Red shading on the graph indicates the sensor reading was above the specified threshold while blue shading indicates the reading was below the threshold.
- When configuring alarms, any tripped alarms are displayed in red.
- Check the Alarms log for full details about the alarm, including whether it tripped or cleared, any notes, the sensor reading (if applicable), and the date and time the event occurred. To view the log, go to the Alarms page and click See All Alarm Logs or go to your device page, click Logs and then click Full log on the Alarms tab.

All alarms remain enabled when they trip or clear on RX3000 stations. On U30 stations, the Battery Low, Memory Low, and Sensor Failure alarms all are disabled as soon as one trips and must be re-enabled once the condition is resolved. See System Alarms in the previous chapter for details.

Chapter 4

Managing and Sharing Data

For remote monitoring stations, sensor data is recorded at each logging interval as defined in Module Configuration (RX3000 stations) or Launch Configuration (U30 stations). The data is stored on the device and then uploaded to HOBOLink at each connection interval as defined in Readout Configuration. Data is then handled differently depending on the type of device you are using. **Note:** You can also share your device's page with others by setting up public access. See User Settings Page for details on making your device page public.

For MX series loggers, data is automatically uploaded to HOBOLink once a logger has been read out in HOBOMobile (if the Upload Data option has been enabled in HOBOMobile Settings; see the [HOBOMobile User's Guide](#) for details on working with HOBOMobile).

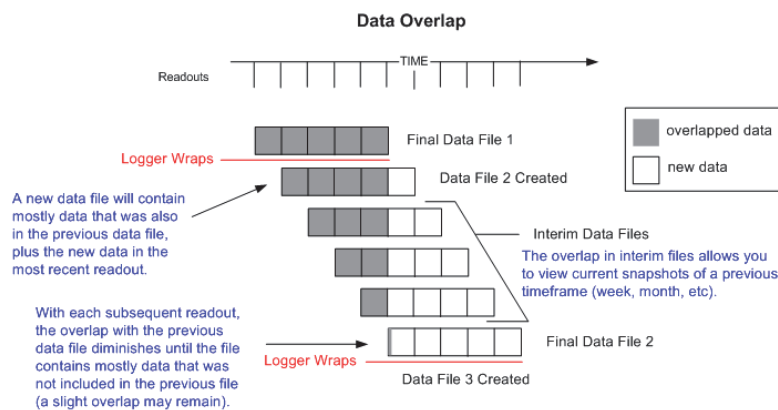
Data from RX3000 Stations

With an RX3000 station, data uploaded to HOBOLink is saved to a database, with data points saved at each logging interval. This gives you the flexibility to choose the precise sensor data you want from any point or any number of stations in a custom export that you can view in other programs or share with others. For example, you can set up an export that includes all sensor data or one that has only smart sensor data. Or, you can set up one export that has just temperature data and another that has just barometric pressure data. There are numerous ways to customize your data. You can set up or access existing exports from the Exports tab on the device page or by clicking Data and then Exports (see Exporting Data). You can also have it automatically delivered to any email address or FTP/SFTP location on a schedule that you select (see Scheduling Data Delivery).

Important: It is recommended that you use scheduled data downloads to archive all the data in a safe location as a backup. Consider setting up an export that includes all sensor data (see Exporting Data) and is delivered to an email address or FTP/SFTP location on a regular schedule (see Scheduling Exported Files for Data Delivery). You can then keep those files to retain a full data history as needed.

Data from U30 Stations

With a U30 station, data uploaded to HOBOLink is saved to a database, with data points saved at a one-minute resolution (data logged at faster intervals is aggregated). In addition, all logged data is available in a HOBOWare-compatible file format (.dtf) and an optional text file format (.csv) if "Save data as text file" was selected in Readout Configuration. The file name consists of the description entered in Launch Configuration followed by a sequence number identifying the order in which the files were created. The first time the device connects to HOBOLink after being launched, the new .dtf and .csv files (if applicable) are created. At each subsequent readout, new data recorded after the previous readout is added to the .dtf file until the device stops logging, is relaunched, or the memory wraps (because the device is set to "Wrap when memory fills" in General Configuration). At that point, new .dtf and .csv files (if applicable) are created with a new sequence number. The following figure illustrates how data files are created when memory wraps.



You can access these files from either the Exports tab on your device page or on the Data Files tab on the Data page. For details on downloading and opening these files, see the next chapter.

You can also create your own custom exported data in which you select the devices, sensors, and time frame you want to include in the file. Exported files can be created as needed or generated automatically for delivery via FTP/SFTP or email on a schedule you specify. For more details, see Exporting Data and Scheduling Data Delivery later in this chapter.

Data from MX Series Loggers

You can set up HOBOMobile to automatically upload data to HOBOLink once a readout is complete (go to Settings in HOBOMobile and enable "Upload Data" under HOBOLink; see [HOBOMobile User's Guide](#) for complete details). When data is uploaded for the first time for a logger deployment, a new entry is added to the Standalone Device Deployments list. Otherwise, an existing deployment in the list will be updated if data was previously uploaded for that logger deployment. You can export the data from each deployment as needed by clicking Export in the list (see Exporting Data). You can also configure HOBOLink to automatically deliver exported data to any email address or FTP/SFTP location on a schedule that you select (see Scheduling Data Delivery).

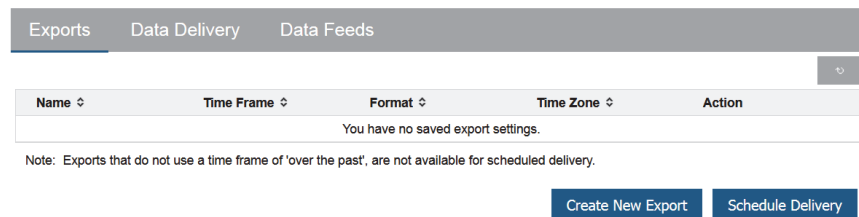
Exporting Data

You can export data from a remote monitoring station or standalone device deployment to a text (.csv), Microsoft Excel (.xlsx), or HOBOWare .csv file for analysis in other programs and sharing with others. Exported files can either be downloaded as needed or scheduled for automatic delivery via FTP/SFTP or email. To export data, you must first select a time frame for the data (e.g. all data from last week or all data between specific dates) and select which devices, configurations, and sensors you want to include in the exported file. Then you can choose to export the data immediately, save the settings for a future export, and set up a schedule for delivering the exported data. **Note:** If an export contains more than one million data points, it is divided into multiple files, each with a maximum of a million data points. The files are compressed into a .zip file available for download or sent via your data delivery schedule as applicable.

Creating a New Export

To create new export:

1. Click Data and then Exports. Or, if you are exporting data from an MX series logger, click Devices and then List. Find the MX logger deployment in the Standalone Device Deployments list and Export.
2. Click Create New Export or skip to the next step if the Create Export Settings page is already open.

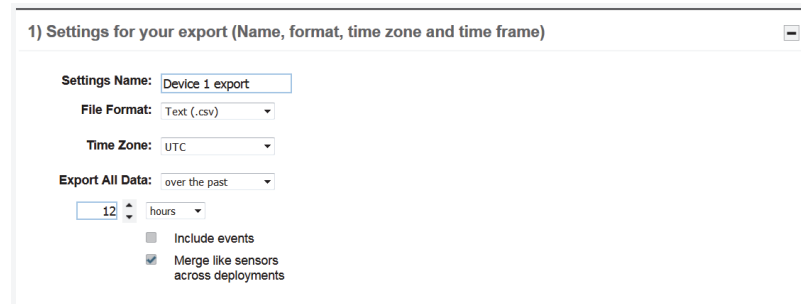





3. In section 1, type a name for the export, select a file type (Text, Excel, or HOBOWare), and select a time zone (it is recommended that you select the same time zone as the device). For Export All Data, choose one of the following time frames for exporting data:
 - **Between two dates/times.** Select "between" from the drop-down list and then click the two blank fields to select the date/time on each calendar.
 - **Before a specific date/time.** Select "before" from the drop-down list and then click the blank field to select the date/time on the calendar.
 - **After a specific date/time.** Select "after" from the drop-down list and then click the blank field to select the date/time on the calendar.
 - **Over the past <x> days, hours, or minutes.** Select "over the past" from the drop-down list. Type the number in the field and then select days, hours, or minutes. *You must choose this time frame if you are planning on setting up a schedule to have the exported file delivered via email or FTP/SFTP on a recurring basis.*

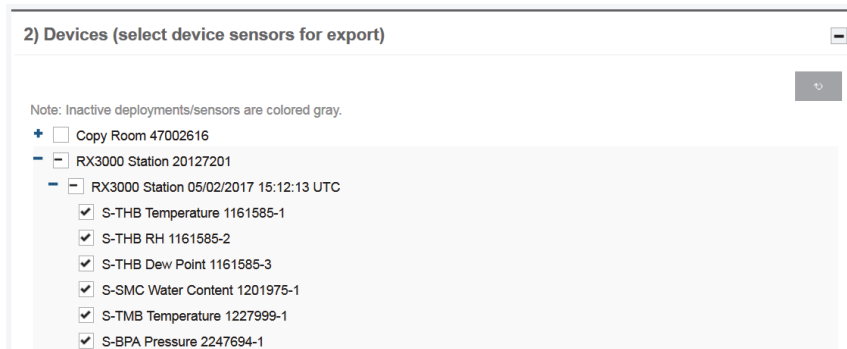
Important: Make sure the selected time frame accounts for the night mode schedule if applicable. This time frame should be at least as long as the night mode interval. For example, if the normal readout schedule is every 2 hours and the night mode readout schedule is every 6 hours, then the export time frame should be at least 6 hours. If you choose a shorter time frame (such as every 4 hours), then some of your export files may not have any data if they are generated during night mode.

Select "Include events" if you want the logger's internal events to be included in the file (available for standalone device deployments only). **Note:** "Include events" is disabled when the File Format is HOBOWare CSV because this format does not support events.


"Merge like sensors across deployments" is selected by default. Deselect this checkbox if you do not want sensors of the same measurement type to be merged into one series for all deployments in the export. Note that when this option is enabled, a successful merge requires mostly identical sensor information. For example, you cannot merge a temperature sensor from one logger with another logger into the same export. You also cannot merge the same sensor with the same logger if the logger deployment name is different.




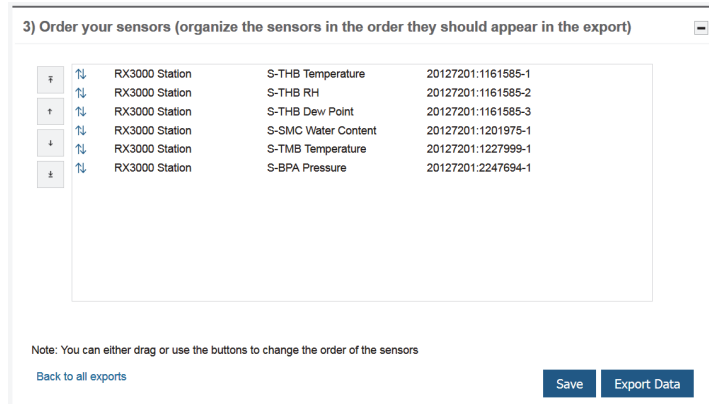
4. In section 2, click  to open this section and view the device sensors available for export. Click  to the left of the device checkbox to show the list of available deployments for the device. Click  to the left of the deployment to view the list of sensors. The sensor product code, measurement type, serial number, and any custom labels (if applicable) are listed for each sensor. Select each sensor you want to include in the export.



Tips on selecting devices, configurations, and sensors:

- To quickly select all sensors for the export, click the checkbox next to a deployment. This will automatically select all the sensors for that device deployment. Similarly, click the checkbox next to a device to include all deployments and all sensors in the export.
- Active sensors and deployments are black and inactive ones are gray. You can select either active or inactive sensors, or a combination of both to include in the export.
- For remote monitoring stations, a new deployment is created when a device nickname is changed or if the device is registered to a new HOBOLink account. Remote monitoring station deployments are not created for changing other device settings, restarting or stopping logging, or other changes that are displayed in the device activity log.
- For remote monitoring stations, a new sensor entry is added to the list when the sensor label or scaling is changed or it is moved to another device. A new entry is also created when its product type is changed (for example, choosing a new analog sensor type for an analog channel).
- If you select a remote monitoring station deployment or device, then any configuration or sensor changes that occur within that deployment or device will be automatically included in the export. However, if you select individual sensors, then you will need to edit your export settings when sensor changes occur.
- For standalone device deployments, a new deployment is created each time the logger is reconfigured.
- Click  to refresh the devices/sensors list.

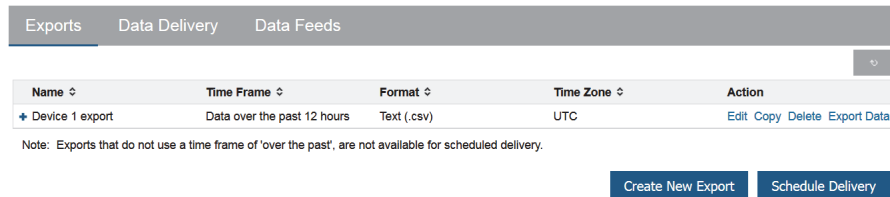
- In section 3, click  to view the list of sensors that will be included in the export based on your selections in section 2. The sensors will be listed in the order they appear in section 3 in the exported file. To change this order, use the arrow buttons or drag and drop the sensor to the desired position.



- To export the data immediately, click the Export Data button. A file will be generated that you can download and save.
- Click the Save button to save this export.

Important: The settings will not be saved if you only click the Export Data button and do not click the Save button.

After saving, the new export is added to the exports list.

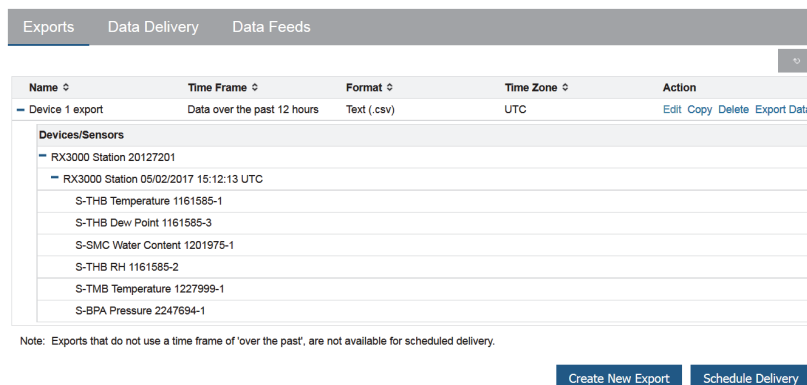


If the new export settings use a time frame of "over the past," you can click the Schedule Delivery button to set up a data delivery schedule that automatically creates and delivers exported files via email or FTP/SFTP (see Scheduling Data Delivery in this chapter). For details on changing the default time and number format in exported files, see Changing Export File Settings.

Working with Existing Exports

You can edit, copy, or delete existing exports or export data as needed. To work with an existing export:

- Click the Data and then Exports.
- Click  to expand the export, device, and deployment to see what sensors are included in the export.



- Select one of the following four actions for an export in the list:

- **Edit.** Click Edit to change the settings name, file type, time frame, devices, deployments, and sensors for this export. You can also click Edit if you need to change the order of the sensors listed. Make the changes and then click Save. Remember that only exports with a time frame of "over the past" can be scheduled for automatic delivery via email or FTP/SFTP.
- **Copy.** Click Copy to create another export that has the same settings as an existing one. Select the copied export settings entry and click Edit as described in the previous step to make any changes. This is a quick way to create a new export that is similar to an existing export.
- **Delete.** Click Delete to permanently remove the export from the list.
- **Export Data.** Click Export Data to immediately generate a file with data as defined by these settings.

Scheduling Data Delivery

You can configure HOBOLink to automatically deliver exported data files to an email address or FTP/SFTP site on a schedule that you specify. Before you can set up data delivery, you must first select the device and sensor data you want to include in the export as described in Exporting Data in this chapter. **Note: Data delivery is only available for exports that are configured with a time frame of "over the past."**

To set up a new scheduled delivery:

1. Click Data and select Data Delivery.
2. Click Create New Delivery.
3. Under General Settings, type a name for the new delivery schedule.
4. Select how often you want the exported file to be delivered (every "x" minutes, hours, days, or weeks).
5. Make sure the Active checkbox is selected. If the box is not selected, then the data will not be delivered.
6. Select the "Email on delivery failure" checkbox if you want to be notified when the exported file is unable to be delivered.
7. Under Select Data to Export, select the checkbox(es) next to the data you wish to export or click the checkbox in the column header row to quickly select all exports listed. If there are no options in this list, make sure you have selected the device and sensor data to include in an export as described in Exporting Data. Note that only ongoing exports (those configured to occur over the past "x" number of days, hours, or minutes) will display in this list. If you have set up an export to occur before or after a specific date or between two dates, then the export will not display in the list.

The screenshot shows the configuration interface for a scheduled data delivery. It is divided into two main sections: 'General Settings' and 'Select Data To Export'.

General Settings:

- Name:** Twice Daily Delivery
- Deliver Every:** 12 Hours
- Active
- Email on delivery failure

Select Data To Export:

Only includes "over the past" saved export settings. Visit the [All Exports](#) page to add/edit saved export settings.

<input checked="" type="checkbox"/>	Name	Time Frame	File Format
<input checked="" type="checkbox"/>	Device 1 export	Data over the past 12 hours	Text (.csv)

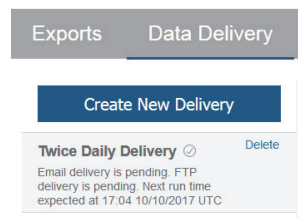
8. Under Data Destination, select the FTP (or SFTP) checkbox if you want the exported data file to be delivered to an FTP/SFTP address. Enter the following information for the server where you want exported files to be delivered:
 - **Server.** Type the name of the server (e.g. ftp.companyname.com).
 - **Port.** Type the port number used for the server or leave the field blank if the server uses the default port.
 - **Remote Folder.** Type the name of the folder on the server where you want the exported files to be delivered. Folders beginning with a slash (/) are expected to be root directory paths. Folders without a slash are assumed to be relative to your home directory.
 - **Username.** Type the username for the account used to access the server.
 - **Password.** Type the password to access the server.
 - **Compress uploaded files.** Select this option if you want to compress the file before delivering it to the server.

- **Use secure connection.** Select this option if the server is secure (SFTP). If this option is selected, then click the Use certificate checkbox if the server uses a digital certificate for authentication. See the next section on SFTP Certificate Setup for more details.
- **Use passive mode.** Select this option if the server runs in passive mode (necessary if the server is running behind a firewall). This option is not available if you have selected the Use secure connection checkbox.

Click Test Connection to make sure HOBOLink can connect to the server using the settings entered.

9. Select the Email checkbox if you want the exported data file to be sent to an email address. Change the default email address listed if necessary. Select the "Compress email file attachments" checkbox if you want the export file size to be as small as possible.

10. Click Save when done. The new scheduled delivery will be listed with a status that the email or FTP/SFTP delivery is pending and the next run time for the export. If you have configured the file to be delivered via email, the email message indicates the time period included in the file. The first delivered file will contain data from the time frame selected in the export settings. Subsequent files will contain all data logged since the last file delivery.



Tips:

- To make changes to a scheduled delivery, select the delivery from the list, enter the changes, and click Save.
- To create a new delivery based on an existing delivery, select the delivery from the list and click Save As. Type in the new delivery name and then make any other changes and click Save.
- To delete a scheduled delivery, click Delete next to the delivery you want to remove.
- To activate or deactivate a scheduled delivery, select the delivery from the list and click the Active checkbox. Click Save.
- If there is a problem with the delivery, it will be flagged in this list of scheduled deliveries. Select the delivery and revise any settings as necessary.
- If an export contains more than one million data points, it is divided into multiple files, each with a maximum of a million data points. If you selected "Compress uploaded files" or "Compress email file attachments," the files are compressed into a .zip file. Otherwise each file is uploaded or emailed individually. If multiple files cannot fit in a single email message, then multiple emails will be sent. In addition, if a file is too large to send as an attachment, the email delivery will fail.
- If the data in the file is a different time period than the device, check the time zone selected in the export settings to make sure it is the same one as the device.

- For U30 stations only, data delivery is only recommended for devices with logging intervals of 1 minute or greater. This is because data is temporarily stored or "binned" at 1-minute intervals before being saved to the HOBOLink database, where it is then retrieved for exports and data delivery as needed.
- If using data delivery with standalone device deployments, files may contain all events recorded instead of just the latest events. In addition, you may receive files with no data if the data was not uploaded from HOBOMobile to HOBOLink as expected.

SFTP Certificate Setup

If you selected the Use certificate checkbox for the SFTP settings, this means you can use a digital certificate with public key authentication on your SSH server. These instructions are for installing the HOBOLink-generated public to your OpenSSH server. If your SSH server uses other software or you are not authorized to log into the server, consult your IT administrator for help.

1. Log into the SSH server.
2. Go to the .ssh subdirectory of your account's home directory or create one if needed. (You may need to show hidden files if you are not able to view the .ssh directory.) The recommended permissions for the .ssh directory is 700.
3. Open the authorized_keys file for editing or create one if needed. The recommended permissions for the file is 600.
4. In HOBOLink, go to the FTP or SFTP settings (under User Settings > Export or when setting up data delivery). Make sure all fields are completed for SFTP and the Use certificate checkbox is enabled.
5. Click Download Public Key. Copy the generated key to your clipboard.
6. Return to the authorized_keys file and paste the key into the file. Make sure all the text from copied key is in one line in the file and save the file.
7. Make sure your account home directory, your .ssh directory, and the authorized keys file are not group-writable or world-writable.
8. Test the connection in HOBOLink.
9. Save the SFTP settings in HOBOLink.

Downloading U30 Data Files

Data files that are read out from a U30 station when the device connects to HOBOLink are available for download. Data is available in .dtf format and optional text file format (.csv) if "Save data as text file" was selected in Readout Configuration.

To download a single file:


1. Click Data and then Data Files.
2. Click a file to download it.
3. Save the file or open it immediately as prompted by your browser. Use HOBOWare® to open a .dtf file or Microsoft® Excel® or a similar program to open a .csv file.

To download multiple files:

1. Click Data and then Data Files.
2. Check the box next to the files you wish to download.
3. Click the Download as Zip button at the bottom of the page. A zip file is created in the default location determined by your browser settings. When opening the zip file, the files will be extracted and saved in the default location controlled by your browser.

A new icon appears next to the file name if it has not been downloaded.

To change the list of data files displayed, select one or more drop down menus at the top of the list. You can change the list to show all files or only data (.dtf) or text (.csv) files from all devices or a single device for the past day, week, month, year, or all time.

To delete a single file, click the  icon at the end of the row for the file you wish to delete. To delete multiple files, click the checkbox next to each file name and then click the Delete button at the bottom of the page.

To browse through multiple pages of files, use the arrows, page number icons, or page number drop-down list at the bottom right of the page.

Working with .dtf Files

When you open a .dtf file in HOBOWare, a Plot Setup window appears in which you can select the series you want to display, use applicable data assistants as desired, and adjust the Offset from GMT if needed. This offset is automatically set based on the time zone selected in General Configuration when the device was launched. While the graphs viewed in HOBOLink automatically account for switches between Daylight Saving Time and Standard Time, files in HOBOWare do not. If a switch to Daylight Saving Time or Standard Time occurs during the period of time included in the data file, the Offset from GMT will be the one in place at launch time. For example, if the device was launched in September during Eastern Daylight Time, the Offset from GMT would be -4. If you then were to open a .dtf from that device with data from September through December, the Offset from GMT in HOBOWare would still be -4 even though there was a switch to Eastern Standard Time during that time period. You could change the Offset from GMT in the Plot Setup window to -5 if desired. If you were to then relaunch the device in December and open the subsequent data file in HOBOWare, the Offset from GMT would then be -5 as that device was relaunched during Eastern Standard Time.

Working with .csv Files

Text (.csv) files contain two sections: a header that is formatted using YAML (Yet Another Markup Language, see YAML.org) and a data section in comma delimited format. If you open the text file in Excel, the Text Import Wizard gives you the option to "Start Import at Row x." Type in the first row of the data section to remove the header information from the file.

The sample text file in this section shows the header and data sections of the file. Within the header, there are the following three subsections:

- **Data Format.** This section includes information about how the text file is formatted:
 - **dateTimeDelimiter, decimalSeparator, and dateDelimiter.** These entries identify (between double quotation marks) the character used to separate date time, the character used as a decimal, and the character used to separate data values from one another respectively.
 - **dateFormat and timeFormat.** These entries describe the way dates and times are formatted within the file as determined by the preference settings in HOBOWare and the regional format settings of your operating system. For example, 07/31/13 would be represented by MM/dd/yy (single-digit values have leading zeros). The syntax is as follows: HH = 24-hour time (e.g. 15:00:00) and hh = 12-hour-time (e.g. 3:00:00 PM); this time format is followed with "a" to denote an AM/PM indicator (i.e. hh:mm:ss a). MM = months and mm = minutes. SS = milliseconds and ss = seconds.
 - **gmtOffset and daylightSavings.** These entries indicate the offset in hours from GMT on the computer that launched the device and whether the computer was in Daylight Saving time (true or false).
- **Logger Info.** This section lists information about the device associated with the file, including the launch description, model number, and serial number.
- **Series Info.** This section lists each data series in order by column, excluding the first column (the number '#' column) and the date/time column. Each series has its own subsection that includes the series name, type, and unit name.

The header and data sections in the text file are separated by a row of hyphens. Within the data section, the first row consists of the column headings, with each heading enclosed by double quotation marks (" ") and separated by a comma. The first column header is "#" for number and the second column header is "Time" for the date/time. The remaining columns identify each series name and unit type, if applicable, in the format "Series Name, Unit" (enclosed in double quotation marks). Each series has its own column. No zeros or spaces are used for fields that do not contain values. Rows of data are separated with a paragraph return. Thousands separators are not used. For example, two thousand is expressed as 2000, not 2,000.

```

Data Format:
dateTimeDelimiter: ""
decimalSeparator: "."
dataDelimiter: ","
dateFormat: MM/dd/yy
timeFormat: HH:mm:ss
gmtOffset: -5
daylightSavings: false

Logger Info:
- &t
  launchDescription: "Sample Text File"
  model: U30-001
  vendor: Onset Computer Corporation
  serialNumber: 1156303
  memorySize: 512
  firmwareVersion: 0.953
  firmwareVersionRaw: 0
  deploymentNumber: 46
Series Info:
- name: "Voltage"
  type: value
  unitName: "V"
  OMClassName: OMeasurementH21
  OMPartNumber: 91-U30-CVIA-XX
  OMUnitIndex: 0
  OMChannelType: 4
  OMValuePattern: "#,##0.00;-#,##0.00"
  logger: "1"
- name: "Current"
  type: value
  unitName: "mA"
  OMClassName: OMeasurementH21
  OMPartNumber: 91-U30-CVIA-XX
  OMUnitIndex: 0
  OMChannelType: 4
  OMValuePattern: "#,##0.00;-#,##0.00"
  logger: "1"
- name: "Temp"
  type: value
  unitName: "C"
  OMClassName: OMTemp12bit_HWS
  OMPartNumber: S-TMB-XXXX
  OMUnitIndex: 0
  OMChannelType: 1
  OMValuePattern: "#,##0.00;-#,##0.00"
  logger: "1"
- name: "Batt"
  type: value
  unitName: "V"
  OMClassName: OMMVoltage_PipeBattery
  OMPartNumber: U30 BATTERY
  OMUnitIndex: 0
  OMChannelType: 5
  OMValuePattern: "#,##0.00;-#,##0.00"
  logger: "1"
-----
"#" "Time, Eastern Daylight Time" "Voltage, V" "Current, mA" "Temp, C" "Batt, V"
1,11/30/07 15:32:07 PM,-0.193,0.000,20.91,4.48
2,11/30/07 15:32:08 PM,-0.193,0.000,20.91,4.48
3,11/30/07 15:32:09 PM,-0.193,0.000,20.91,4.47
4,11/30/07 15:32:10 PM,-0.193,0.000,20.91,4.47
5,11/30/07 15:32:11 PM,-0.193,0.000,20.91,4.46
6,11/30/07 15:32:12 PM,-0.193,0.000,20.91,4.46
7,11/30/07 15:32:13 PM,-0.193,0.000,20.91,4.46
8,11/30/07 15:32:14 PM,-0.193,0.000,20.91,4.46
9,11/30/07 15:32:15 PM,-0.193,0.000,20.91,4.46
10,11/30/07 15:32:16 PM,-0.193,0.000,20.91,4.48
11,11/30/07 15:32:17 PM,-0.193,0.000,20.91,4.48

(data continued in actual file)
.
.
.

```


Working with Data Feeds

You can set up a data feed in which your station data is regularly pushed to Weather Underground. This involves first registering your device with Weather Underground and then creating a new data feed in HOBOLink.

1. If you do not have an account with Weather Underground, go to <http://www.wunderground.com> and create one.
2. Follow the instructions on Weather Underground for signing up your station. For information on setting up a weather station, see <http://www.wunderground.com/weatherstation/overview.asp>.
3. After you sign up your station with Weather Underground, write down the Station ID and password. **Note:** If you have more than one station, you can register each station individually with Weather Underground and then set up a data feed for each station.
4. In HOBOLink, click Data and Data Feeds.
5. Click Create New Data Feed.
6. For Destination, select Weather Underground.
7. For Device, select the station you registered with Weather Underground. If you have multiple devices, you can also start typing a station nickname to pare down the list before selecting it.
8. Type in the Station ID you received from Weather Underground and your Weather Underground password.
9. Click Auto Assign to automatically match each sensor on your selected station to the corresponding Weather Underground measurement. Alternatively, to manually assign sensors (or to make corrections if necessary after clicking Auto Assign), click the drop-down arrow and select the sensor. If there is more than one sensor, select the one you want to use for this measurement (or start typing the sensor label to pare down the list before selecting the sensor). Sensors are listed with their serial number and any label assigned. In this example, the temperature sensor labeled "air" is selected for assignment to Outdoor Temperature 1. If the drop-down list has no sensors, it is because the station does not have a sensor that corresponds to the measurement. In addition, some measurements available in HOBOLink are not supported by Weather Underground.

Outdoor Temperature 1:	<Unassigned>
Outdoor Temperature 2:	20113725-1 Temperature
Outdoor Dew Point 1:	air 1161585-1 Temperature
Outdoor Humidity 1:	soil 1227999-1 Temperature
Rain 1 (over past hour):	<Unassigned>

10. Click Save. The data feed is added to the list in HOBOLink and data from each assigned sensor will be pushed to Weather Underground each time the station connects to HOBOLink. **Note:** There may be up to a 15-minute delay from the time the device connects to HOBOLink until the data appears in Weather Underground. In addition, the Weather Underground data feed will only send data at a minimum ten minute interval. If the logging rate on the station is faster than ten minutes, a data point will only be sent to Weather Underground if it is at least ten minutes after the last data point was sent. For example, if the logging interval is 1 minute and the first data point is sent to Weather Underground at 10:03, then the next data point will be sent at 10:13 even though data is logged every minute between 10:03 and 10:13.

Exports	Data Delivery	Data Files	Data Feeds
Feed Type	Nickname	Actions	Status
 Weather Underground	RX3000 Wi-Fi	Test Edit Delete	Success
Create New Data Feed			

You can sort data feeds by Feed Type, Nickname (for the station), or status.

Click Test to verify that the station ID and password entered in HOBOLink is recognized by Weather Underground.

Important: When registering a new station with Weather Underground, there is a wait time up to 30 minutes before the Station ID/Password can be validated by HOBOLink due to constraints on the Weather Underground system.

Click Edit to make changes to the data feed and then click Save.

Click Delete if you want to delete the data feed from HOBOLink. This does not remove the station from Weather Underground, but it will stop the push of data for that station from HOBOLink to Weather Underground.

Notes

- HOBOLink pushes data to the Weather Underground Tabular Data only. HOBOLink does not control the Weather Underground Summaries or Stickers. If you are using Summaries or Stickers, be aware that there may be instances where the values do not match the HOBOLink data due to limitations in Weather Underground.
- If the Weather Underground push service becomes temporarily unavailable, data that was uploaded to HOBOLink while that service is unavailable will not appear in Weather Underground immediately. Any data uploaded to HOBOLink while the connection to Weather Underground is unavailable will be pushed when the service comes back online.
- Do not use the same station ID for multiple devices because Weather Underground is only able to display one data record per logging sample time. Instead, register each of your stations in Weather Underground separately, creating individual station IDs for use in HOBOLink.

Changing Export File Settings

Click User Settings and then Export to change the following:

Export File Format Settings

To change the export file format settings:

1. Click User Settings and then click Export.
2. Under File Format Settings, change the following settings as desired. You can preview changes made to the date and time format in the Date Sample field.
 - **Default File Format.** Choose one of three ways for the exported data to be saved: Text (.csv), Excel (.xlsx), or HOBOWare CSV (.csv). The "HOBOWare CSV" file type will set up the exported file with the preferred settings for importing into HOBOWare (settings that are ignored when selecting "HOBOWare CSV" are marked on this tab). Note that YAML header information will be included HOBOWare CSV files, but not in Text (.csv) or Excel (.xlsx) files.
 - **Column Separator.** Choose whether the data in the file should be separated by tabs, commas, or semi-colons.
 - **Date Format.** Choose how the date will be listed in the exported file: Month Day Year, Day Month Year, or Year, Month, Day.
 - **Date Separator.** Select the character that will separate the date in the exported file: Slash (/) or Dash (-).
 - **Time Format.** Select how the time will be listed in the exported file: in 12-hour format or 24-hour format.
 - **Default Time Zone.** Select which time zone should be used for the exported file.
 - **Positive # Format.** Select how positive numbers will be formatted in the exported file based on these examples: 1,234.56; 1 234,56; 1.234,56; or 1.234 56.
 - **Negative # Format.** Select how negative numbers will be formatted in the exported file based on these examples: -123; 123-; or (123).
 - **Separate date and time into two columns.** Select this option if you want the date and time to be in two columns instead of combined into one in the exported file.
 - **Include line number column.** Select this option if you want the exported file to contain a separate column to the left of the data that lists a line number for each data point.
 - **Include logger and sensor label in column header if available.** Select this option to add any logger or sensor labels/names to the sensor column header in the exported file.
 - **Include logger and sensor serial number in column header if available.** Select this option to add any serial numbers for the logger and sensors as well as the sensor product code to the corresponding column header in the exported file.
 - **Include export settings in header.** Select this option to include the export name and time frame as defined in the export.
3. Click Save when done.

Default FTP (or SFTP) Settings

To change the default FTP/SFTP settings used with exported files:

1. Click User Settings and then click Export.
2. Under Default FTP (or SFTP) Settings, enter the following information for the server where you want exported files to be delivered:
 - **Server.** Type the name of the server (e.g. ftp.companyname.com).
 - **Port.** Type the port number used for the server or leave the field blank if the server uses the default port.
 - **Remote Folder.** Type the name of the folder on the server where you want the exported files to be delivered. Folders beginning with a slash (/) are expected to be root directory paths. Folders without a slash are assumed to be relative to your home directory.
 - **Username.** Type the username for the account used to access the server.
 - **Password.** Type the password to access the server.
 - **Compress uploaded files.** Select this option if you want to compress the file before delivering it to the server.
 - **Use secure connection.** Select this option if the server is secure (SFTP). If this option is selected, then click the Use certificate checkbox if the server uses a digital certificate for authentication. See the section on SFTP Certificate Setup earlier in this chapter for more details.
 - **Use passive mode.** Select this option if the server runs in passive mode (necessary if the server is running behind a firewall). This option is not available if you have selected the Use secure connection checkbox.
3. Click Test Connection to make sure HOBOLink can connect to the server using the settings entered.
4. Click Save when done. These FTP/SFTP settings will automatically be available for exports on the Data Delivery tab. You can override these default settings for a specific Data Delivery without impacting the defaults.

Default Email Settings

To change the default email settings used with exported files:

1. Click User Settings and then click Export.
2. Under Default Email Settings, type the email address to be used for delivering exported files. This email address is associated with exported files only. To change the email address for your HOBOLink account, click the Account Info tab.
3. Select "Compress email file attachments" if you want to minimize the size of the exported file before emailing it.
4. Click Save when done. These email settings will automatically be available for exports on the Data Delivery tab. You can override these default settings for a specific Data Delivery without impacting the defaults.

Chapter 5

Reference

Click Support in HOBOLink to view the current supported browsers, terms of use, and new features.

Visit the following reference topics:

- Changing User Settings
- Managing a Communications Plan
- Removing a Device
- Troubleshooting
- FAQs
- PDF Guides

For additional help, contact Onset Technical Support at 1-800-LOGGERS or 508-759-9500 or visit www.onsetcomp.com/support/contact.

Changing User Settings

Click User Settings to change account settings, units, public access, and export settings.

Account Info

Click User Settings and then Account Info to see the first and last name, email address, and username associated with your HOBOLink account.

- To change the name associated with the account, type the new first or last name in the First Name and Last Name fields and click Save.
- To change the email address associated with the account, type the new address in the Email Address field and click Save.

Important: The email address listed here will be used for all correspondence related to this device, including device communications plan expiration warnings and plan renewal information if applicable. Alarms and Data Delivery emails, however, can be sent to any email address.

- To change the password, click the Change Password link, type the old password and then the new password twice and click Save.
- You cannot change the username you selected when you created the account.

Units

Click User Settings and then Units to display the current default units selected for all devices registered to your HOBOLink account. Click the drop-down arrow to select US or SI (Metric) units and click Save. The sensor readings displayed on the device page are updated immediately to reflect a change in units as are graphs for RX3000 stations. Device graphs for U30 stations, however, will not display the new units until the next time device connects to HOBOLink.

Public Access

Click User Settings and then Public Access to make your device and U30 summary pages public. See Sharing a Device Page for details.

Export

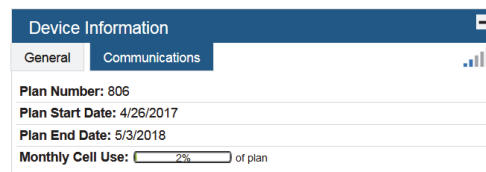
Click User Settings and then Export to change the preferences used for exporting data, including file format, FTP/SFTP, and email settings. See Changing Export File Settings for details. Note that the email address listed for Export is associated with exported files only and can be different than the one used for your HOBOLink account.

Managing a Communications Plan

A communications plan is required for cellular, Wi-Fi, and Ethernet devices. The Communications tab in the Device Information panel displays details about your device's communications plan, including the plan number, start and end date, signal strength (cellular and Wi-Fi models only), and the monthly cellular usage (cellular models only). The plan options vary depending on the model and your connection needs. Contact Onset or your Onset Authorized Dealer for details on communications plans.

Tracking Plan Usage



Some communication plans are set up to allow a specific amount of data usage per month. To check the percentage of your plan used so far in a month, view the Communications tab on the Device Information panel on your device overview page. The bar for Monthly Cell Use indicates the percentage of the plan used so far in the month. The color of the bar changes from green to orange or red depending on how close the device is to exceeding its plan limits.



Another way to track monthly plan usage is to open Launch Configuration (for U30 stations), Module Configuration (for RX3000 stations), or Readout Configuration. These show the actual usage to date (for example, 26% of the plan) and the estimated usage based on the current settings. As you change the logging interval or the connection interval, the estimated usage will automatically update so that you can determine whether your communication plan can support the revised settings.



Important: The estimated usage assumes the device will not be restarted and that there are no tripped alarms. A tripped alarm uses approximately 7K of communications data depending on your configuration and the number of sensors. Be sure to factor in the number of alarms you expect to receive when selecting logging and connection intervals. Also try to minimize the number of times the device is restarted in a month as this requires data from your plan.

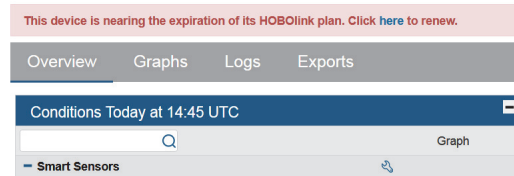
HOBOLink issues several notifications if the device is close to exceeding or has exceeded the byte allocation for your data plan:

- Launch Configuration (for U30 stations), Module Configuration (for RX3000 stations), and Readout Configuration display the date on which the plan usage will reach 100% based on the current settings.
- A warning appears at the top of your device page.
- An email is sent to the email address for the HOBOLink account.
- The icon in the Communications column on the List tab of the Devices page changes to  or  to indicate there is a caution or warning. Hover over the icon to view the message.
- The status on the General tab of the Device Information panel changes if the monthly data usage has been exceeded.

If you see any warnings in HOBOLink or receive an email that the device is in danger of exceeding its plan limit, adjust the logging interval and/or the connection interval immediately to avoid suspension of service. If the device has already exceeded its limit, all alarms will be disabled and the device will not connect to HOBOLink again until the first day of the next month. Change the logging and/or connection interval to avoid exceeding the plan next month or contact Onset or your Onset Authorized Dealer about changing to a plan that better suits your data requirements.

Plan Expiration

The plan expiration or end date is listed on the Communications tab in the Device Information panel. If the plan is nearing expiration, an email will be sent to the email address for the HOBOLink account. The icon in the Communications column on the List tab of the Devices page will change to  if the plan is nearing expiration or  if it is past the expiration. A warning will also be displayed at the top of the device page like this:



Important: Failure to renew your plan before the expiration date may require the device to be returned to Onset for service.


Contact Onset or your Onset Authorized Dealer to renew a plan.

For U30 stations: If you change the plan prior to its expiration date (which will result in an additional fee), you must follow these steps:

1. Remove or unregister the device from your HOBOLink account.
2. Remove the power sources from the device and then plug them back in to force a connection to HOBOLink. Allow the device to make one full connection to HOBOLink.
3. Re-register the device (click the Register a Device link on the Devices page). The device is now registered to your account with the new communications plan. The minimum logging and connection interval values supported by the plan are automatically entered in HOBOLink by default.

Removing a Device

To remove or unregister a device from your HOBOLink account:

1. For U30 stations: Download all the data files for the device because you will not be able to use HOBOLink to access files from that device once it is removed.
For RX3000 stations, export any data (see Exporting Data in Chapter 4) you want to keep as you will not be able to use HOBOLink to access data from that device once it is removed.
2. Click Devices and then List.
3. Click the  icon to remove the device. Confirm that you want to remove the device when prompted.

The device is no longer registered to your account and will not automatically connect to HOBOLink anymore. The device can be registered to another account or re-registered on the same account in the future. For RX3000 stations, press the Connect button on the device to connect to HOBOLink once it is re-registered. For U30 stations, once the device is registered again, you can force it to connect to HOBOLink by cycling the power (disconnect the battery and AC adapter or solar panel, wait 20 to 30 seconds and then reconnect the battery first and then the AC adapter or solar panel) or by using the Contact HOBOLink button in the Status window in HOBOWare.

Troubleshooting

Check this list or the frequently asked questions in this chapter if you are having trouble with your device. For additional help, contact Onset Technical Support at 1-800-LOGGERS or 508-759-9500 or at www.onsetcomp.com/support/contact, or contact your Onset Authorized Dealer.

There are no status indicators blinking on the U30 station.

- The indicators are very faint under direct sunlight. If no indicators appear to be blinking, shield the device from the light and check the indicators again.
- Check the Device Information panel on the device page and make sure the battery power is not too low. There needs to be at least 3.5 volts for logging to continue and 3.9 volts for cellular communication.
- The memory may be full if the device was not set to "Wrap when memory is filled" in General Configuration. Read out the device and relaunch it.

- The device may not have been launched. Check the Connections tab in the Activity Log panel to see when the device is scheduled to connect or if it is awaiting its first call.

Too many calls are being made to HOBOLink.

- Select a slower connection interval in Readout Configuration.
- Consider setting up a second connection schedule at a less frequent rate by enabling Night Mode in Readout Configuration.
- The cellular signal at the device location may be weak or there may have been an interruption in cellular service. Consider repositioning the device to a location with a stronger signal if the problem persists.

Too much battery power is being used.

- Make sure the solar panel is installed properly and functioning. The solar panel should provide enough power to recharge the battery during the day.
- Use the AC adapter to recharge the battery.

The power has run out.

Recharge the battery for 12 hours with the AC adapter. If the battery cannot be recharged, you will need to replace the battery. Contact Onset Technical Support or your Onset Authorized Dealer. It is always recommended that either a solar panel or AC adapter be connected all the time to provide a trickle-charge to the battery. The device cannot operate on the AC adapter alone.

Important: The station uses durable, high-capacity Flash memory so data is retained even when the battery runs out of charge. Do not restart the device until the data has been recovered. If the battery cannot be recharged and you are still unable to read out the device, contact Onset Technical Support or your Onset Authorized Dealer as it may be possible to retrieve the logged data.

One or more of the installed sensors are not logging.

- For RX3000 stations: Check that the sensor appears in Sensor Configuration. If it does not, then use the Search button on the device to find the connected sensor and then reconnect to HOBOLink as described in the RX3000 manual. For analog sensors, make sure "Enable this channel" is selected in Sensor Configuration.
- For U30 stations: If a sensor was added or changed while the device is logging, the device must be relaunched to detect the changes and begin recording data. Select "Force Relaunch on Next Connection" in Launch Configuration.
- Check for a loose connection in the sensors that are not logging.
- If you are using the smart sensor expander board, make sure it is connected to the device's built-in smart sensor board with the short expander cable. See the U30 stations User's Guide for more details.
- Make sure you have not exceeded 100 meters (328 ft) of network cable for all smart sensors.
- Make sure you have not exceeded 15 smart sensor channels. Note that some smart sensors use multiple data channels. For RX3000 stations, check the smart sensor count on the LCD. For U30 stations, use HOBOWare to see a list of all installed smart sensors in the Launch Logger window. Sensors are listed in ascending order by serial number. If more than 15 data channels are connected, the devices with the higher serial numbers will be ignored and their data will not be recorded.

Changes I made to Launch Configuration (U30 stations), Module Configuration (RX3000 stations), or Readout Configuration haven't taken effect.

Any changes that you made in Launch Configuration or Readout Configuration will not take effect until the next time the device connects to HOBOLink. For example, if the connection interval for the device was set to two hours, then any change you made in Launch Configuration or Readout Configuration won't take effect until the next connection on that two-hour schedule.

U30 stations: The data file contains errors.

If you are missing data for a particular sensor, check that it was properly installed and configured. Remove and reconnect the sensor and check the status in HOBOWare to verify that it can report accurate readings. If you find that it is not communicating, it may be damaged. Contact Onset Technical Support or your Onset Authorized Dealer.

U30 stations: The data file cannot be opened.

In rare circumstances, a data file may become corrupt. Contact Onset Technical Support or your Onset Authorized Dealer.

I launched the U30 station in HOBOWare, but my settings are not being logged.

Launches attempted with HOBOWare will be overridden the next time the device connects to HOBOLink. If the HOBOLink U30 station is communicating with HOBOLink, then it most likely has been relaunched in HOBOLink.

U30 stations: I configured the launch settings, but the station is not logging.

If this is the first time the device has been launched, make sure you have set the connection interval in Readout Configuration.

If this is not the first launch and the device is connecting but still not launching, then select "Force Relaunch on Next Connection" in Launch Configuration and wait for the next connection.

I exported data on my iPhone or iPad and opened the file in Google Chrome. When I try to share the file, a link is shared instead of the file itself.

There is a known limitation with sharing files downloaded from HOBOLink on an iPhone or iPad using Google Chrome. Switch to Safari to open and share the file. Or, if the problem persists, use a computer or Android device to export the data and then open and share the file.

The data file from my export won't open on my iPhone or iPad.

Data files downloaded from HOBOLink on an iPhone or iPad that are very large may not always open as expected. Change the parameters for the export to create a smaller file (i.e. reduce the time frame, sensors, or devices included in the export). Or, switch to a computer or Android device.

FAQs

Check this list or Troubleshooting in this chapter if you are having trouble with your device. For additional help, contact Onset Technical Support at 1-800-LOGGERS or 508-759-9500 or at www.onsetcomp.com/support/contact, or contact your Onset Authorized Dealer.

Why don't my graphs for the U30 station update when I switch from US to Metric (SI)?

To ensure graphs can be viewed in HOBOLink without a delay, they are created at the time the device contacts HOBOLink. Therefore, graphs in the new units will be available after the next time the device connects.

Why don't my sensor labels show up immediately on the HOBOLink graphs for the U30 station?

Since graphs are created at the time the device connects, the new labels will not appear on the graphs until the next time the device connects to HOBOLink.

Where do I find my device serial number and device key?

The serial number and device key are found inside the door of the device. Keep track of these values as you will need them to register the device to your HOBOLink account.

How do I configure the analog sensor port on the U30 station?

You must use HOBOWare to configure an analog sensor port. Connect the device to a computer with HOBOWare and select Manage U30 from the Device menu. Channels configured in HOBOWare will appear in HOBOLink. See the HOBOWare User's Guide for more details.

How do I toggle the relay or set the default state of the relay on the U30 station?

You must use HOBOWare to set the default state of the relay in real time. While you can see the state of the relay and set up alarm conditions to trip the relay in HOBOLink, it does not allow real-time control of the relay.

I launched the U30 station in HOBOWare, then it was relaunched by HOBOLink. Why did this happen?

HOBOLink is designed to be the primary software for the U30 stations. If you launched your device in HOBOWare with different launch or readout settings than HOBOLink, the U30 stations will be relaunched the next time it connects to ensure it is configured to match the settings in the HOBOLink account.

How do I stop the U30 station from logging?

You cannot stop a powered U30 stations from logging or connecting with HOBOLink as it is designed to run continuously without any user interaction. To stop logging and/or connecting to HOBOLink, unplug the battery. When you are ready for the device to begin logging again, you will likely need to select the Force Relaunch on Next Connection setting under Launch Configuration.

How do I stop my device from connecting to HOBOLink?

You cannot stop regular connections to HOBOLink for a registered, powered device even if the station is not logging. You can change to a slower connection interval in Readout Configuration. Unplug all power sources if you do not want it to connect to HOBOLink.

How did my U30 station system alarms become disabled?

As soon as one system alarm trips on a U30 station, all system alarms are disabled. For example, let's say the Battery Low and Sensor Failure alarms have all been configured and the Battery Low alarm trips. The Sensor Failure alarms will then be disabled until the Battery Low alarm is resolved and you re-enable all the system alarms.

If I modify any Launch Configuration setting, will the U30 station be relaunched automatically?

If you change the launch description, logging interval, sampling interval, or select Force Relaunch on Next Connection, the device will relaunch automatically. If you only change the Full Readout Upon Power Reset setting, then the device will not be relaunched at the next connection.

Can I set the order that my graphs are displayed?

Yes. The graphs are displayed in the same order as the sensors are listed in the Conditions panel on the device overview page. Drag the sensors in the Conditions panel to the desired order and then the graphs will automatically be updated to the same order. Note that graphs must be enabled to appear on the page.

Why does rainfall show as zero in the Conditions panel even though it has been raining?

The Conditions panel shows the rain that fell in the last logging interval only. For example, if the logging interval is set to 1 minute and there wasn't a tip in the rain gauge bucket during that minute, then the rainfall shows as zero.

Why is there a gap in the data between subsequent data files from the U30 station?

If the device's memory fills in a time period that is less than the length between scheduled connections, some of the data will be overwritten in the device. This can happen on devices that have a full suite of sensors, are set to a 1-minute logging interval, and have a connection/readout interval of more than 24 hours. To avoid this problem, set the connection interval in Readout Configuration to less than 24 hours or increase the logging interval.

Why don't the labels that I added to the dew point sensor and battery display in HOBOWare for the U30 station?

Because the battery is not a sensor and the dew point is a derived channel (temperature and RH data is needed to calculate the dew point), they do not have a presence in the header of the .dtf file. Therefore, there is no place to store those values for use in HOBOWare. The labels for battery and dew point are saved in HOBOLink and only viewable there. Labels from all other channels are displayed in HOBOWare when opening the downloaded .dtf file.