



The HOBO MX Temp/RH data logger records and transmits temperature and relative humidity (RH) in indoor environments with its integrated sensors. This Bluetooth® Low Energy (BLE)-enabled logger is designed for wireless communication with a phone, tablet, or computer. Using the HOBObconnect® app, you can easily configure the logger and then download logged data to view or export for further analysis. The logger can calculate minimum, maximum, average, and standard deviation statistics and can be configured to trip audible or visual alarms at thresholds you specify. The logger also supports burst logging in which data is logged at a different interval when sensor readings are above or below certain limits. This compact data logger also has a built-in LCD screen to display the current temperature, relative humidity, logging status, battery use, memory consumption, and more.

## HOBO MX Temp/RH Data Logger

Models: MX1101  
MX1101-01 (Japan and Korea)

### Included Items:

- Command™ strip
- Double-sided tape
- Hook & loop strap
- Two AAA 1.5 V alkaline batteries

### Required Items:

- HOBObconnect app
- Mobile device with Bluetooth and iOS, iPadOS®, or Android™, or a Windows computer with a native BLE adapter or supported BLE dongle

## Specifications

### Temperature Sensor

Range	-20° to 70°C (-4° to 158°F)
Accuracy	±0.21°C from 0° to 50°C (±0.38°F from 32° to 122°F), see Plot A
Resolution	0.024°C at 25°C (0.04°F at 77°F), see Plot A
Drift	<0.1°C (0.18°F) per year

### RH Sensor\*

Range	1% to 90% (non-condensing)
Accuracy	±2% from 20% to 80% typical to a maximum of ±4.5% including hysteresis at 25°C (77°F); below 20% and above 80% ±6% typical
Resolution	0.01%
Drift	<1% per year typical

### Response Time



Temperature	7:30 minutes in air moving 1 m/s (2.2 mph)
RH	20 seconds to 90% in airflow of 1 m/s (2.2 mph)

### Logger

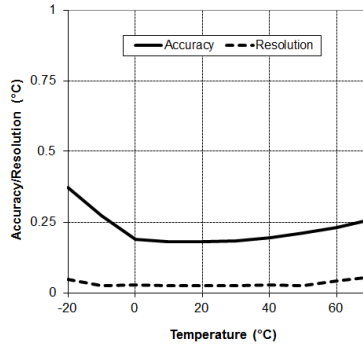
Radio Power	1 mW (0 dBm)
Transmission Range	Approximately 30.5 m (100 ft) line-of-sight
Wireless Data Standard	Bluetooth Low Energy (Bluetooth Smart)
Logger Operating Range	-20° to 70°C (-4° to 158°F); 0 to 95% RH (non-condensing)
Logging Rate	1 second to 18 hours
Logging Modes	Fixed interval (normal, statistics) or burst
Memory Modes	Overwrite when full or stop when full
Start Modes	Immediate, push button, date and time, or next interval
Stop Modes	When memory is full, push button, date and time, or after a set logging period
Restart Mode	Push button
Time Accuracy	±1 minute per month at 25°C (77°F), see Plot B
Battery Life	1 year, typical with logging interval of 1 minute. Faster logging and/or statistics sampling intervals, entering burst logging mode, and remaining connected with the app affects battery life. Excessive readouts, audible alarms, and paging all affect battery life. Visual alarms and other events can have a marginal effect on battery life.
Battery Type	Two AAA 1.5 V alkaline batteries, user replaceable
Memory	128 KB (84,650 measurements, maximum)
Full Memory Download Time	Approximately 60 seconds; may take longer the further the device is from the logger

\*Per RH sensor manufacturer data sheet

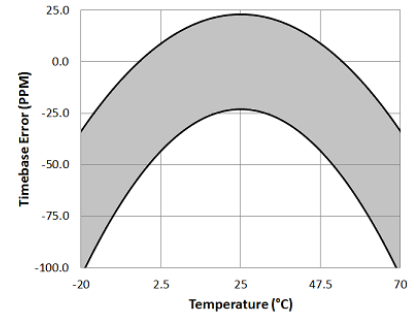
## Specifications (continued)

<b>LCD</b>	LCD is visible from 0° to 50°C (32° to 122°F); the LCD may react slowly or go blank in temperatures outside this range
<b>Size</b>	3.66 x 8.48 x 2.29 cm (1.44 x 3.34 x 0.9 in.)
<b>Weight</b>	56 g (1.98 oz)
<b>Environmental Rating</b>	IP50
	The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).
	See last page

\*Per RH sensor manufacturer data sheet

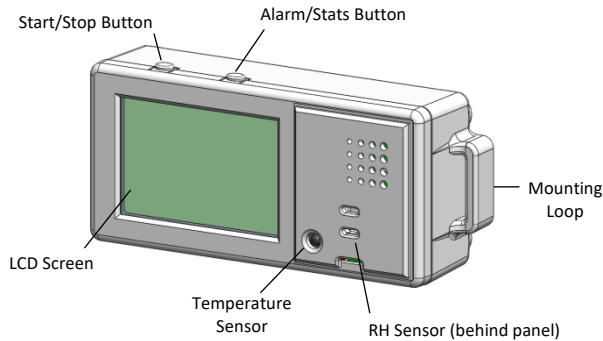


**Plot A: Temperature Accuracy and Resolution**



**Plot B: Time Accuracy**

## Logger Components and Operation



**Start/Stop Button:** Press this button for 3 seconds to start or stop logging data, or to resume logging on the next even logging interval. This requires configuring the logger in the app with a push button start or stop, and with Allow Button Restart selected (see *Configuring the Logger*). You can also press this button for 1 second to record an internal event (see *Logger Events*), to silence a beeping alarm (see *Setting up Alarms*), or to turn the LCD screen on if the option to turn off the LCD has been enabled (see *Configuring the Logger*).

Press both the Start/Stop button and the Alarm/Stats button simultaneously for 3 seconds to reset a logger password.

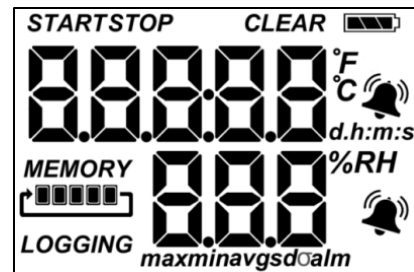
**Alarm/Stats Button:** Press this button for 1 second to switch between statistics, alarm readings, and the current sensor readings as applicable or to silence a beeping alarm. Press this button for 3 seconds to clear a visual alarm if the logger is configured in the app to maintain the visual alarm until the alarm button is pressed (see *Setting up Alarms*).

**Mounting Loops:** Use the two mounting loops (only one visible in the diagram) to mount the logger with the hook-and-loop strap (see *Mounting the Logger*).






**Temperature Sensor:** This sensor is located in the lower left corner of the raised panel to the right of the LCD screen.



**RH Sensor:** This sensor is located behind the vented panel in the logger case to the right of the LCD screen and the temperature sensor.

**LCD Screen:** This logger is equipped with an LCD screen that displays details about the current status. This example shows all symbols illuminated on the LCD screen followed by definitions of each symbol in the table on the next page.



LCD Symbol	Description
<b>START</b>	The logger is waiting to be started or restarted. Press and hold the Start/Stop button for 3 seconds to start the logger.

LCD Symbol	Description
<b>STOP</b>	The logger has been started with push button stop enabled; press and hold the Start/Stop button for 3 seconds to stop the logger.
	The battery indicator shows the approximate battery power remaining.
<b>MEMORY</b> 	The logger has been configured to stop logging when memory fills. The memory bar indicates the approximate space remaining in the logger to record data. When first started, all five segments in the bar are empty. In this example, the logger memory is almost full (only one segment in the memory bar is empty).
<b>MEMORY</b> 	The logger has been configured to never stop logging. The logger continues recording data indefinitely, with newest data overwriting the oldest data until the batteries die or the logger is reconfigured. When first launched, all five segments in the memory bar are empty. In this example, the memory is full (all five segments are filled in) and new data is now overwriting the oldest data. This continues until the logger is stopped or the battery runs out.
<b>LOGGING</b>	The logger is currently logging.
	A sensor reading is above or below the high or low alarm limit that you configured. Press and release the Alarm/Stats button until the "alm" symbol (described below) is displayed on the screen. This symbol at left clears depending on how visual alarms are configured in the app. If the visual alarm is set to clear when the logger is reconfigured, this symbol remains on the LCD until the next time new configuration settings are loaded onto the logger (see <i>Configuring the Logger</i> ). Otherwise, it clears when the sensor reading is back within the alarm limits or by pressing the Alarm/Stats button for 3 seconds.
<b>CLEAR</b>	A visual alarm is ready to be cleared. This appears only if the app is configured to maintain the visual alarm until the alarm button is pressed. Press the Alarm/Stats button for 3 seconds to clear the visual alarm. Note that you can silence an audible alarm by pressing the Start/Stop button or Alarm/Stats button for 1 second.
<b>max</b> <b>min</b> <b>avg</b> <b>sd</b> $\sigma$	Press the Alarm/Stats button for 1 second to cycle through the statistics configured to display and then back to the current sensor reading (or to the alarm value if applicable). The screen displays these symbols at the bottom and shows the maximum, minimum, average, and standard deviation values most recently calculated by the logger (if you have selected the fixed logging mode in the app and have selected each statistic; see <i>Statistics Logging</i> ).
<b>alm</b>	This is the farthest out-of-range sample displayed during the logger deployment. Press the Alarm/Stats button to view this reading. Press the Alarm/Stats button again to cycle through any statistics (defined above) and ultimately back to the current sensor reading.
	This is an example of a temperature reading. Temperature units are determined by the settings in the app. To switch between Celsius and Fahrenheit, change the units in the app settings (you must reconfigure the logger for units changes to take effect).

LCD Symbol	Description
	This is an example of an RH reading.
	The logger has been configured to start logging on a particular date/time. The display counts down in days, hours, minutes, and seconds until logging begins. In this example, 5 minutes and 38 seconds remain until logging begins.
<b>Load</b>	The configured settings are being loaded onto the logger from the app.
<b>Err</b>	An error occurred while loading the configuration settings onto the logger from the app. Try reconfiguring the logger.
<b>Stop</b>	The logger has been stopped with the app or because the memory is full.

**Notes:**

- You can disable the LCD screen when logging. Deselect "Show LCD" when setting up the logger as described in the next section. When this option is disabled, you can still temporarily view the LCD screen by pushing the Start/Stop button for 1 second. The LCD remains on for 10 minutes.
- The LCD screen refreshes every 15 seconds regardless of the logging interval selected in the app. If you choose a logging interval less than 15 seconds, the data is recorded at the faster interval, but the sensor readings are updated on the screen only every 15 seconds.
- When the logger has stopped logging, the LCD screen remains on and displays "STOP" until the logger is offloaded to your mobile device (unless the logger is configured with the "Show LCD" option disabled). Once the logger has been offloaded, the LCD turns off automatically after 2 hours. The LCD turns back on the next time the logger connects with your device through the app.
- The LCD screen flashes "HELLO" when you page the logger from the app (see *Downloading the App and Connecting to a Logger*).
- The LCD screen flashes "CHIRP OFF" when an audible alarm is cleared.

**Downloading the App and Connecting to a Logger**









Install the app to connect to and work with the logger.

1. **Download the app.** Download HOBObconnect to a phone or tablet from the App Store® or Google Play™ or download the app to a Windows computer from [www.onsetcomp.com/products/software/hobobconnect](http://www.onsetcomp.com/products/software/hobobconnect).
2. **Install the batteries.** Open the battery door on the back of the logger and insert two AAA batteries observing polarity (see *Battery Information*). Reinsert the battery door and snap it back into place.
3. **Open the app.** Enable Bluetooth in your device settings if prompted.
4. **Connect to the logger.** Tap Devices and then tap the logger tile in the app to connect to it.

If the logger does not appear or if it is having trouble connecting, follow these tips:

- Make sure the logger is within range of your mobile device or computer. The range for successful wireless communication is approximately 30.5 m (100 ft) with full line-of-sight.
- If your device can connect to the logger intermittently or loses its connection, move closer to the logger, within sight if possible.
- If the logger appears in the app, but you cannot connect to it, close the app and then power down your device to force the previous Bluetooth connection to close.

Once the logger is connected, you can:

Tap this:	To do this:
	Specify logger settings and save them onto the logger to start logging. See <i>Configuring the Logger</i> .
	Tap to view live data.
	Stop a beeping alarm on the logger if audible alarms are enabled as described in <i>Setting up Alarms</i> .
	<p>Lock the logger. Set a password for the logger so that it is not mistakenly stopped or reconfigured. Tap the icon, enter a password, and then tap Set. Once a password is entered on a phone or tablet, that mobile device is the only one to “remember” it. This means you can connect to the logger without entering a password on that mobile device, but you must enter a password on all other mobile devices. For example, if you set the password for the logger with your tablet and then try to connect to the device later with your phone, you must enter the password on the phone but not with your tablet. Similarly, if others attempt to connect to the logger with different devices, they are also required to enter the password.</p> <p>To reset a password:</p> <ul style="list-style-type: none"> <li>• Simultaneously press both the Start/Stop button and the Alarm/Stats button for 3 seconds, or</li> <li>• Tap Manage Password and then tap Reset.</li> </ul>
	Manage Password. Reset your existing password or set a new password for the logger.
	Stop logging data (this overrides any Stop Logging settings described in <i>Configuring the Logger</i> ).
	Start logging if the logger was configured to start with a button push. See <i>Configuring the Logger</i> .
	Download logger data. See <i>Downloading Data From the Logger</i> .



Mark the logger as a favorite. You can then filter the list of devices to show only loggers marked as favorites.



Make the logger beep one time to help you locate it. “HELLO” also appears on the LCD when the logger is paged.



Update the firmware on the logger. A logger readout will be completed automatically at the beginning of the firmware update process.

**Important:** Before updating the firmware on the logger, check the remaining battery level and make sure it is no less than 30%. Make sure you have the time to complete the entire update process, which requires that the logger remains connected to the device during the upgrade.

## Configuring the Logger

Use the app to set up the logger, including setting alarms, selecting the options to start and stop logging, and choosing a logging mode. These steps provide an overview of setting up the logger. For complete details, see the HOBObconnect User Guide.

1. In the app, tap Devices and then tap the logger tile to connect to it.
2. Tap Configure & Start to configure the logger.
3. Tap Name and type a name for the logger (optional). If you do not enter a name, the app uses logger serial number as the name.
4. Tap Group to add the logger to a group (optional).
5. Tap Logging Interval and choose how frequently the logger will record data unless operating in burst logging mode (see *Burst Logging*).
6. Tap Start Logging and select when logging begins:
  - **On Save.** Logging begins immediately after configuration settings are saved.
  - **On Next Interval.** Logging begins at the next even interval as determined by the selected logging interval.
  - **On Button Push.** Logging begins when you press either the Start/Stop logging button on the logger for 3 seconds or start logging with the app.
  - **On Date/Time.** Logging begins at a date and time you specify. Select the Date and Time.
5. Tap Stop Logging and specify when logging ends.
  - **Never Stop (Overwrites Old Data).** The logger does not stop at any predetermined time. The logger continues recording data indefinitely, with newest data overwriting the oldest.
  - **On Date/Time.** The logger stops logging on a specific date and time that you specify.
  - **After.** Select this if you want to control how long the logger should continue logging once it starts. Choose the amount of time you want the logger to log data. For example, select 30 days if you want the logger to log data for 30 days after logging begins.

- **Stop When Memory Fills.** The logger continues recording data until the memory is full.
6. Tap Pause Options, then select Pause On Button Push to specify that you can pause the logger by pressing its button for 3 seconds. Select Allow Button Resume to specify that you can press the Start/Stop button on the logger to resume logging.

**Important:** When you select Allow Button Resume and you use the Start/Stop button on the logger to stop and restart logging, logging restarts on the next even logging interval, not at the time you pushed the button. For example, a logger started logging at 7:00 AM with a logging interval set to 1 hour. If you press the Start/Stop button to stop the logger at 8:45 AM and then press the button again at 10:15 AM, logging will not begin immediately at 10:15 AM. Instead, logging will begin again at 11:00 AM, which is the next even interval time based on your 1-hour logging interval. Depending on the logging interval, the gap between the time you press the button to resume logging and the time actual logging begins could be significant. The faster the logging interval, the less time elapses before logging resumes.

7. Tap Logging Mode. Select either fixed or burst logging. With fixed logging, the logger records data for all enabled sensors and/or selected statistics at the logging interval selected (see *Statistics Logging* for details on choosing statistics options). In burst mode, logging occurs at a different interval when a specified condition is met. See *Burst Logging* for more information.
8. Enable or disable Show LCD, which controls whether the LCD on the logger remains illuminated while the logger is logging. If you disable Show LCD, the LCD on the logger does not show the current reading, status, or other information while the logger is logging. You can temporarily turn the LCD screen on by pressing the Start/Stop button on the logger for 1 second. In addition, you can always view the status of any in-range logger on your mobile device regardless of the logger's LCD setting (may require a logger password as applicable).
9. Select the sensor measurement types that you want to log. By default, both the temperature and RH sensors are enabled. Both sensors are required to calculate dew point, which is an additional data series available for plotting after downloading data from the logger. You can also set up alarms to trip when a sensor reading rises above or falls below a specified value. See *Setting up Alarms* for details on enabling sensor alarms and selecting the associated audible and visual alarm settings.
10. Select whether to upload data to HOBOLink® via the gateway or the app (optional and requires an active HOBOLink account).
11. Tap Start to save the configuration settings.

Logging begins based on the settings you selected. Press the start button on the logger if you set it up to start logging with a button push. Deploy the logger using the mounting materials (see *Mounting the Logger*). After logging begins, you can read out the logger at any time (see *Reading Out the Logger* for details).

## Setting up Alarms

You can set an alarm to trip on the logger when a sensor reading rises above or falls below a specified value. This alerts you to problems so you can take corrective action. To set an alarm:

1. Tap Devices.
2. Tap the logger tile in the app to connect to it and tap Configure & Start.
3. Tap a Sensor/Channel.
4. Tap Enable Logging, if necessary.
5. Tap Alarms to open that area of the screen.
6. Select Low if you want an alarm to trip when the sensor reading falls below the low alarm value. Enter a value to set the low alarm value.
7. Select High if you want an alarm to trip when the sensor reading rises above the high alarm value. Enter a value to set the high alarm value.
8. For the Duration, select how much time should elapse before the alarm trips and select one of the following:
  - **Cumulative Samples.** The alarm trips once the sensor reading is out of the acceptable range for the selected duration any time during logging. For example, if the high alarm is set to 85°F and the duration is set to 30 minutes, then the alarm trips once the sensor readings have been above 85°F for a total of 30 minutes since the logger was configured.
  - **Consecutive Samples.** The alarm trips once the sensor reading is out of the acceptable range continuously for the selected duration. For example, the high alarm is set to 85°F and the duration is set to 30 minutes, then the alarm trips only if all sensor readings are 85°F or above for a continuous 30-minute period.
9. Repeat steps 2–8 for the other sensor.
10. In the Alarm Settings area, enable Audible Alarm if you want a beep to sound on the logger every 30 seconds when the sensor alarm trips. The beeping continues until you clear the alarm in the app, press either button on the top of the logger, or 7 days have passed. Battery life is slightly reduced when this setting is enabled. It is recommended that you enable this feature only if you have regular access to the logger so that you can easily turn off the beeping.
11. For Show Visual Alarms Until, select one of the following options to determine how long the alarm icon remains illuminated on the logger LCD screen after an alarm trips:
  - **Logger Reconfigured.** The alarm icon remains visible on the LCD until the next time the logger is reconfigured.
  - **Sensor in Limits.** The alarm icon remains visible on the LCD until the sensor reading returns to the normal range between any configured high and low alarm limits.
  - **Alarm Button Pressed.** The alarm icon remains visible until you press the Alarm/Stats button on the logger.

### Notes:

- The alarm icon is illuminated on the logger LCD when the alarm trips. You can also press the Alarms/Stats button on the logger to view the farthest out-of-range value during the deployment. The logger checks alarm limits

when the logger's LCD screen refreshes every 15 seconds.

- The actual values for the high and low alarm limits are set to the closest value supported by the logger. In addition, alarms can trip or clear when the sensor reading is within the resolution specifications. This means the value that triggers the alarm may differ slightly from the value entered.
- When you download data from the logger, alarm events can be displayed on the plot or in the data file. See *Logger Events*.
- Once cleared, an audible alarm starts beeping again if the sensor values go out of the normal range. Even if an audible alarm is cleared, a visual alarm may remain on the logger LCD and in the app depending on the settings selected for maintaining visual alarms or because the alarm condition may still be in effect. In addition, an audible alarm continues beeping when the sensor values have returned to the normal range until it is cleared as described in step 10.
- Although an audible alarm and a visual alarm can occur at the same time when a sensor alarm is tripped, they are cleared in different ways. The audible alarm can be cleared as described in step 10. Meanwhile, a visual alarm is cleared as determined by the setting selected for Maintain Visual Alarm Until configuration setting. This means you could clear a beeping audible alarm and the visual alarm remains on the LCD and in the app until the logger is reconfigured, the sensor is in limits, or the alarm button is pressed—depending on the setting you selected.
- If the logger is configured to stop logging with a button push, any tripped alarms are cleared automatically when logging is stopped and no Alarm Cleared event is logged. This ensures that the logger starts checking for alarm conditions when logging resumes (if the logger was configured with Allow Button Resume selected).

## Burst Logging

Burst logging is a logging mode that allows you to set up more frequent logging when a specified condition is met. For example, a logger is recording data at a 5-minute logging interval and burst logging is configured to log every 30 seconds when the temperature rises above 85°F (the high limit) or falls below 32°F (the low limit). This means the logger records data every 5 minutes as long as the temperature remains between 85°F and 32°F. Once the temperature rises above 85°F, the logger switches to the faster logging rate and records data every 30 seconds until the temperature falls back to 85°F. At that time, logging then resumes every 5 minutes at the fixed logging interval. Similarly, if the temperature falls below 32°F, then the logger switches to burst logging mode again and record data every 30 seconds. Once the temperature rises back to 32°F, the logger then returns to fixed mode, logging every 5 minutes. **Note:** Sensor alarms, statistics, and the Stop Logging option Never Stop (Overwrites Old Data) are not available in burst logging mode.

To set up burst logging:

1. Tap Devices. Press the Start/Stop button on the logger to wake it up, if necessary.
2. Tap the logger tile in the app to connect to the logger and tap Configure & Start.
3. Tap Logging Mode and then tap Burst Logging.
4. Set the burst logging interval, which must be faster than the logging interval. Keep in mind that the faster the burst logging rate, the greater the impact on battery life and the shorter the logging duration. Because measurements are being taken at the burst logging interval throughout the deployment, the battery usage is similar to what it would be if you had selected this rate for the normal logging interval.
5. Select Low and/or High and type a value to set the low and/or high values.
6. Repeat step 5 for the other sensor if desired.

### Notes:

- The high and low burst limits are checked only when the logger's LCD screen refreshes once every 15 seconds. If you set the logging interval to less than 15 seconds and the sensor reading falls outside the levels, burst logging does not begin until the next 15-second refresh cycle.
- If high and/or low limits are configured for more than one sensor, burst logging begins when any high or low condition goes out of range. Burst logging does not end until all conditions on all sensors are back within normal ranges.
- The actual values for the burst logging limits are set to the closest value supported by the logger.
- Burst logging mode can begin or end when the sensor reading is within the resolution specifications. This means the value that triggers burst logging may differ slightly from the value entered.
- Once the high or low condition clears, the logging interval time is calculated using the last recorded data point in burst logging mode, not the last data point recorded in fixed mode. For example, a logger has a 10-minute logging interval and logs a data point at 9:05. Then, the high limit is surpassed and burst logging begins at 9:06. Burst logging then continues until 9:12 when the sensor reading falls back below the high limit. Now back in fixed mode, the next logging interval is 10 minutes from the last burst logging point, or 9:22 in this case. If burst logging had not occurred, the next data point would have been at 9:15.
- A New Interval event is created each time the logger enters or exits burst logging mode. See *Logger Events* for details on plotting and viewing the event. In addition, if the logger is stopped with a button push while in burst logging mode, a New Interval event is automatically logged and the burst condition is cleared, even if the actual high or low condition has not cleared. The logger checks the high and low conditions when logging resumes (if the logger is configured with Allow Button Resume selected).

## Statistics Logging

During fixed logging, the logger records data for enabled sensors and/or selected statistics at the logging interval

selected. Statistics are calculated at a sampling rate you specify with the results for the sampling period recorded at each logging interval. You can log the following statistics for each sensor:

- The maximum, or highest, sampled value,
- The minimum, or lowest, sampled value,
- An average of all sampled values, and
- The standard deviation from the average for all sampled values.

For example, a logger is configured with both the temperature and RH sensors enabled, and the logging interval set to 5 minutes. The logger is set to Fixed Logging Mode and all four statistics are enabled and with a statistics sampling interval of 30 seconds. Once logging begins, the logger measures and records the actual temperature and RH sensor values every 5 minutes. In addition, the logger takes a temperature and RH sample every 30 seconds and temporarily stores them in memory. The logger then calculates the maximum, minimum, average, and standard deviation using the samples gathered over the previous 5-minute period and logs the resulting values. When downloading data from the logger, this results in 10 data series (not including any derived series, such as dew point): two sensor series (with temperature and RH data logged every 5 minutes) plus eight maximum, minimum, average, and standard deviation series (four for temperature and four for RH with values calculated and logged every 5 minutes based on the 30-second sampling).

To log statistics:

1. Tap Devices. Press the Start/Stop button **on the logger** to wake it up, if necessary.
2. Tap the logger tile in the app to connect to it and tap Configure & Start.
3. Tap Logging Mode and select Fixed Logging Mode.
4. Tap to turn on Statistics.
 

**Note:** Fixed Logging Mode records sensor measurements taken at each logging interval. The selections you make in the Statistics section add measurements to the recorded data.
5. Select the statistics you want the logger to record at each logging interval: Maximum, Minimum, Average, and Standard Deviation (average is automatically enabled when selecting Standard Deviation). Statistics are logged for all enabled sensors. In addition, the more statistics you record, the shorter the logger duration and the more memory is required.
6. Enter a value in Statistics Sampling Interval to use for calculating statistics. The rate must be less than, and a factor of, the logging interval. For example, if the logging interval is 1 minute and you select 5 seconds for the sampling rate, the logger takes 12 sample readings between each logging interval (one sample every 5 seconds for a minute) and use the 12 samples to record the resulting statistics at each 1-minute logging interval. Note that the faster the sampling rate, the greater the impact on battery life. Because measurements are being taken at the statistics sampling interval throughout the deployment, the battery

usage is similar to what it would be if you had selected this rate for the normal logging interval.

Once logging begins, click the Alarm/Stats button on the logger to cycle through the current maximum, minimum, average, and standard deviation data on the LCD screen. Note that the logger always displays the current sensor readings in the app even if they are not being logged. You can plot the statistics series once you read out the logger.

## Setting a Password

You can create an encrypted password for the logger that is required if another device attempts to connect to it. This is recommended to ensure that a deployed logger is not mistakenly stopped or purposely altered by others. This password uses a proprietary encryption algorithm that changes with every connection.

To set a password:

1. Tap Devices. Press the Start/Stop button **on the logger** to wake it up, if necessary. Tap the logger tile in the app to connect to it.
2. Tap Lock Logger.
3. Type a password and then tap Set.

Only the device used to set the password can then connect to the logger without entering a password; all other devices are required to enter the password. For example, if you set the password for the logger with your tablet and then try to connect to the logger later with your phone, you must enter the password on the phone but not with your tablet. Similarly, if others attempt to connect to the logger with different devices, they are also required to enter the password. To reset a password, press and hold the two top buttons for 10 seconds.

## Downloading Data From the Logger

To download data from the logger:

1. Tap Devices. Press the Start/Stop button **on the logger** to wake it up, if necessary. Tap the logger tile in the app to connect to the logger.
2. Tap Download Data. The logger downloads data to the phone, tablet, or computer.
3. Once the download is complete, tap Done to return to the previous page or tap Export and Share to save the file in the specified format.
4. When the export file has successfully been created, tap Done to return to the previous page or tap Share to use your device's usual modes of sharing.

You can also upload data automatically to HOBOLink, Onset's web-based software, using the app or the MX gateway. For details, see the HOBOLink User Guide and see the HOBOLink help for details on working with data in HOBOLink.

## Logger Events

The logger records the following internal events to track logger operation and status. You can view events in exported files or plot events in the app.

To plot events, tap HOBO Files and select a file to open.

Tap  (if applicable) and tap . Select the events you want to plot and tap OK.

Internal Event Name	Definition
Host Connected	The logger was connected to the mobile device.
Started	The Start/Stop button was pressed to begin or resume logging.
Stopped	The logger received a command to stop recording data (from the app or by pushing the Start/Stop button).
Button Up/Button Down	The Start/Stop button was pressed for 1 second.
Chan <#> Alarm Tripped	A sensor alarm has tripped; <#> is the sensor number, where 1 is temperature and 2 is RH.
Chan <#> Alarm Cleared	A sensor alarm has cleared; <#> is the sensor number, where 1 is temperature and 2 is RH. This event also contains the value that was furthest out of range for the sensor before the alarm cleared, which is only available in a shared or exported file.
New Interval	The logger has entered or exited burst logging mode.
Safe Shutdown	The battery level dropped below 1.85 V; the logger performs a safe shutdown.

## Mounting the Logger

There are several ways to mount the logger using the materials included:

- Use the four magnets on the back of the logger case to mount it to a magnetic surface.
- Attach Command strips to the back of the logger to mount it a wall or other flat surface. Double up the two Command strips so that they protrude past the magnets.
- Use the double-sided tape to affix the logger to a surface.
- Insert the hook-and-loop strap through the mounting loops on both sides of the logger to mount it to a curved surface, such as a pipe or tubing.

## Protecting the Logger

The logger is designed for indoor use and can be permanently damaged by corrosion if it gets wet. Protect it from condensation. If the message FAIL CLK appears on the LCD screen, there was a failure with the internal logger clock possibly due to condensation. Remove the battery immediately and dry the circuit board.

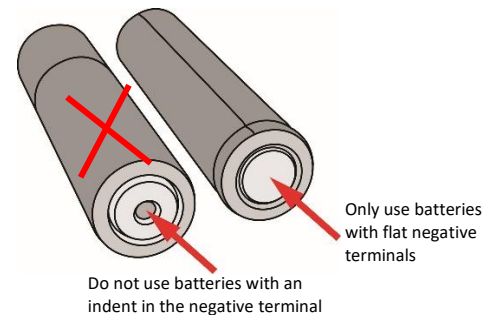
**Note: Static electricity may cause the logger to stop logging.**

The logger has been tested to 8 KV, but avoid electrostatic discharge by grounding yourself to protect the logger. For more information, search for “static discharge” on onsetcomp.com.

## Battery Information

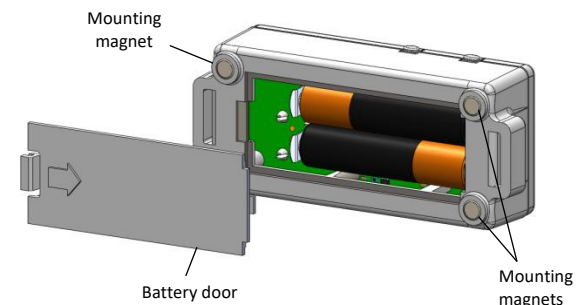
The logger requires two user-replaceable AAA 1.5 V alkaline or optional lithium batteries for operation at the extreme ends of the logger operating range. Expected battery life varies based on the ambient temperature where the logger is deployed, the logging or sampling interval, frequency of offloading and connection to the mobile device, number of channels that are active, audible alarms duration, use of burst mode or statistics logging, and battery performance. New batteries typically last 1 year with logging intervals greater than 1 minute. Deployments in extremely cold or hot temperatures, a logging interval faster than 1 minute, or a sampling interval faster than 15 seconds can impact battery life. Estimates are not guaranteed due to uncertainties in initial battery conditions and operating environment.

**Note:** Make sure the batteries installed have flat negative terminals. There should be no indent in the bottom of the batteries. Batteries with indents in the negative terminals may become loose and prevent proper operation.



To install or replace the batteries:

1. Open the battery door on the back of the logger.



2. Remove any old batteries.
3. Insert two new batteries observing polarity.
4. Reinsert the battery door and snap it back into place.

**WARNING:** Do not cut open, incinerate, heat above 85°C (185°F), or recharge the lithium batteries. The batteries may explode if the logger is exposed to extreme heat or conditions that could damage or destroy the battery case. Do not dispose of the logger or batteries in fire. Do not expose the contents of the batteries to water. Dispose of the batteries according to local regulations for lithium batteries.

**Federal Communication Commission Interference Statement**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**FCC Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

**Industry Canada Statements**

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

**Avis de conformité pour l'Industrie Canada**

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

To comply with FCC and Industry Canada RF radiation exposure limits for general population, the HOBO MX1101 loggers must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

**NCC Statement**

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

**Translation:****Article 12**

Without permission granted by the NCC, any company, enterprise, or user is not allowed to change frequency, enhance transmitting power or alter original characteristic as well as performance to an approved low power radio-frequency device.

**Article 14**

The low power radio-frequency devices shall not influence aircraft security and interfere with legal communications. If found, the user shall cease operating immediately until no interference is achieved. The said legal communications means radio communications is operated in compliance with the Telecommunications Act. The low power radio-frequency devices must be susceptible with the interference from legal communications or ISM radio wave radiated devices.