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HOBO MX100 Temp Logger User Manual

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Manual

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HOBOTemp MX100 Temp Logger



Introduction

The HOBOTemp MX100 Temp logger measures temperature in indoor environments. With an IP67 environmental rating, the logger can be deployed in indoor locations where moisture may form. This Bluetooth® Low Energy-enabled logger is designed for wireless communication with a phone, tablet, or computer. Using the HOBOTempconnect® app, you can easily configure the logger and then download logged data to view or export for further analysis. The logger has a built-in alarm you can configure to trip at thresholds you specify. Designed with a non-replaceable lithium battery,

this logger also has a power-saving mode that allows you to use the Bluetooth signal only when needed to maximize battery life. Note: This logger is not supported by the HOBO MX Gateway. Contact Onset Technical Support for questions on MX100 logger compatibility with the gateway.

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

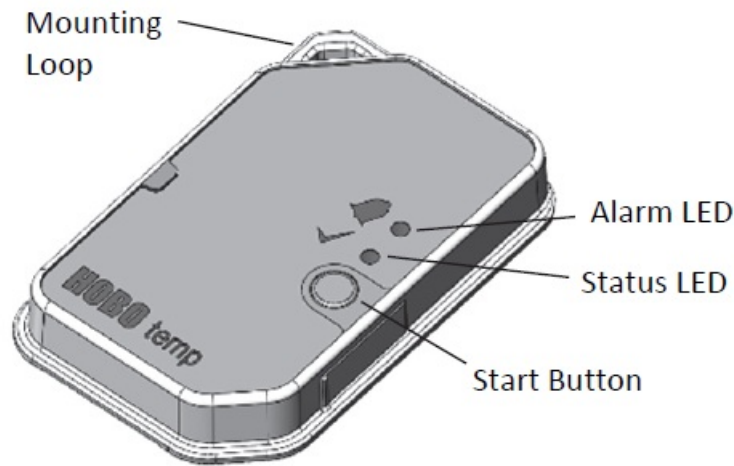
Temperature Sensor

- **Range**
-30° to 70°C (-22° to 158°F)
- **Accuracy**
±1.0°C from -30° to -5°C (±1.8°F from -22° to 23°F)
±0.5°C from -5° to 50°C (±0.9°F from 23° to 122°F)
±1.0°C from 50° to 70°C (±1.8°F from 122° to 158°F)
- **Resolution**
0.04°C (0.072°F)
- **Drift**
<0.01°C (0.018°F) per year
- **Response Time**
6 minutes typical to 90% in open air moving 1 m/s, unmounted

Logger

- **Logger Operating Range**
-30° to 70°C (-22° to 158°F)
- **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)
- **Logging Rate**
1 second to 18 hours
- **Time Accuracy**
±1 minute per month at 25°C (77°F)
- **Battery**
CR2450 3V lithium, not replaceable
- **Battery Life**
1 year, typical with logging interval of 1 minute and Bluetooth Always On enabled; 2 years, typical with logging interval of 1 minute and Bluetooth Always On disabled. Faster logging intervals, remaining connected with the app, excessive downloads, and paging may impact battery life.
- **Memory**
30,000 measurements
- **Full Memory Download Time**
Approximately 30 seconds; may take longer the farther the device is from the logger
- **Dimensions**
6.9 x 4.5 x 1.1 cm (2.71 x 1.76 x 0.42 inches)
- **Weight**
25.5 g (0.90 oz)
- **Environmental Rating**
IP67

Logger Components and Operation



Mounting Loop: Use this when deploying the logger by tying it to an object.

Alarm LED: This LED blinks red every 4 seconds when an alarm is tripped (unless Show LED is disabled as described in Configuring the Logger). Both this LED and the status LED will blink once when you press the start button to wake up the logger before configuring it. If you blink the logger LED with the app, both LEDs will be illuminated for 4 seconds.

Status LED: This LED blinks green every 4 seconds when the logger is logging (unless Show LED is disabled as described in Configuring the Logger). If the logger is waiting to start logging because it was configured to start "On Button Push" or with a delayed start, it will blink green every 8 seconds.

Start Button: Press this button for 1 second to wake up the logger; both the alarm and status LEDs will blink. Once the logger is awake, press this button for 1 second to move it to the top of the loggers list in the app. Press this button for 4 seconds to start or stop the logger when it is configured to start or stop "On Button Push" (see Configuring the Logger). Both LEDs will blink four times when you press the button to start or stop logging. Press this button for 10 seconds to reset a password.

Downloading the App and Connecting to a Logger

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

1. Download HOBOTemp to a phone or tablet from the App Store® or Google Play™. Download the app to a Windows computer from www.onsetcomp.com/products/software/hoboconnect.
2. Open the app and enable Bluetooth in the device settings if prompted.
3. Press the button on the logger to wake it up.
4. Tap Devices and then tap the logger 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 "awake" by pressing the start button. The alarm and status LEDs will blink once when the logger wakes up. You can also press the button a second time to bring it to the top of the list in the app if you are working with multiple loggers.
- 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:**

Select logger settings and save them onto the logger to start logging. See *Configuring the Logger*.



Read out (offload) logger data. See *Reading Out the Logger*.



Start logging if the logger was configured to start with a button push. See *Configuring the Logger*.




Stop the logger from recording data (this overrides any Stop Logging settings described in *Configuring the Logger*).



Illuminate the logger LEDs for 4 seconds.



Set a password for the logger that will be required if another mobile device attempts to connect to it. To reset a password, press the button on the logger for 10 seconds or tap  and tap Reset.




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



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.




Note: Tapping this icon  is only required when using the app on an iPhone®, iPad®, or Android device.

Configuring the Logger

Use the app to set up the logger, including selecting the logging interval, start and stop logging options, configuring alarms, and other settings.


1. Press the button on the logger to wake it up.
2. In the app, tap Devices. If you are working with multiple loggers, you can press the button on the logger a second time to bring it to the top of the list. Tap the logger in the app to connect to it.



3. Tap  to configure the logger.
4. Tap Name and type a name for the logger (optional). If no name is selected, the logger serial number is used as the name.
5. Tap Group to add the logger to a group (optional). Tap Save.

6. Tap Logging Interval and choose how frequently the logger will record data.
7. Tap Start Logging and select when logging will begin:
 - Now. Logging will begin immediately after the configuration settings are loaded on the logger.
 - On Next Logging Interval. Logging will begin at the next even interval as determined by the selected logging interval.
 - On Button Push. Logging will begin once you press the button on the logger for 4 seconds or start logging with the app.
 - On Date/Time. Logging will begin at a date and time you specify. Select the Date and time.Tap Save.
8. Tap Stop Logging and select the options for when logging will end.
 - a. Choose one of two memory options:
 - When Memory Fills. The logger will continue recording data until the memory is full.
 - Never (Wrap When Full). The logger will continue recording data indefinitely, with newest data overwriting the oldest.
 - b. Select On Button Push if you want to be able to stop logging by pushing the button on the logger for 4 seconds.
 - c. Select one of the following time options for when to stop logging:
 - Never. Select this if you do not want the logger to stop at any predetermined time frame.
 - On Date/Time. Select this if you want the logger to stop logging on a specific date and time. Select the date and time.
 - 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.Tap Save.
9. Enable or disable Show LED. If Show LED is disabled, the alarm and status LEDs on the logger will not be illuminated while logging (the alarm LED will not blink if an alarm trips). You can temporarily turn on LEDs when Show LED is disabled by pressing the button on the logger for 1 second.
10. Enable or disable Bluetooth Always On. If Bluetooth Always On is enabled, the logger will “advertise” or regularly send out a Bluetooth signal for the phone or tablet to find via the app while it is logging, which uses battery power. When Bluetooth Always On is disabled, the logger will only advertise during logging when you press the button on the logger to wake it up, thereby preserving as much battery power as possible.
11. Set up temperature alarms (optional).
 - a. Select High if you want an alarm to trip when the sensor reading rises above the high alarm value. Drag the slider or type a value to set the high alarm value.
 - b. Select Low if you want an alarm to trip when the sensor reading falls below the low alarm value. Drag the slider or type a value to set the low alarm value. The actual values for the high and low alarm limits are set to the closest value supported by the logger.
 - c. For the Duration, select how much time should elapse before the alarm trips and select one of the following:
 - Cumulative. The alarm will trip 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 will trip once the sensor readings have been above 85°F for a total of 30 minutes since the logger was configured.
 - Consecutive. The alarm will trip 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 will only trip if all sensor readings are 85°F or above for a continuous 30-minute period.
 - d. Tap Save.



12. Tap  to save the configuration settings.

Logging will begin 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. See Mounting the Logger for details on mounting and see Reading Out the Logger for details on downloading. If the logger was configured with alarm settings, an alarm will trip when the temperature reading is outside the range specified in the logger configuration. When an alarm trips, the logger alarm LED blinks every 4 seconds (unless Show LED is disabled), an alarm icon appears in the app, and an Alarm Out of Range event is logged. Even if the temperature reading returns to a normal range, the alarm indicator will not clear in the app and the alarm LED will continue to blink.


Setting a Password

You can create an encrypted password for the logger that will be 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 button on the logger to wake it up (if necessary) and tap the logger in the app to connect to it.



2. Tap  (if applicable) and then
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 will be 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 will be required to enter the password on the phone but not with your tablet. Similarly, if others attempt to connect to the logger with different devices, then they would also be required to enter the password. To reset a password, press the button on the logger for




10 seconds or connect to the logger and tap  (if applicable), then , and tap Reset.

Reading Out the Logger


To download data from the logger:

1. Tap Devices. Press the button on the logger to wake it up (if necessary) and tap the logger in the app to connect to it.



2. Tap . The logger will read out the data to the phone, tablet, or computer.



3. Once the readout is complete, tap HOBOLink and select the file to view it. Tap  (if applicable) and then



to export the data

Data can also be uploaded automatically to HOBOLink®, Onset's web-based software. For details, see the app user's guide and see the HOBOLink help for details on working with data in HOBOLink.

Note: MX100 loggers are not supported by the HOBOLink Gateway. Contact Onset Technical Support for questions on MX100 logger compatibility with the gateway.

Logger Events

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

To plot events, tap HOBOLink and select a file to open



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

Event Name/Definition

- **Host Connect**

The logger was connected to a mobile device.

- **Started**

The logger started logging.

- **Stopped**

The logger stopped logging.

- **Alarm Out of Range/In Range**

An alarm has occurred because the reading was outside the alarm limits or back within range. Note: Although

the reading may return to a normal range, the alarm indicator will not clear in the app and the alarm LED will continue to blink until you reconfigure the logger.

- **Safe Shutdown**

The battery level dropped below a safe operating voltage and performed a safe shutdown.

Mounting the Logger

You can mount the logger by using tape or the mounting loop.

- On the back of the logger, remove the backing on the tape that is adhered to the top and bottom of the logger and then mount it on a flat surface.
- Use the mounting loop to tie the logger to another object.

The logger can be placed in indoor locations that experience condensation. Although the logger can withstand incidental splashing with water, do not deploy it in a permanently wet location.

Protecting the Logger

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 www.onsetcomp.com.

Battery Information

The logger uses one CR2450 non-replaceable lithium battery. Battery life is 1 year, typical with a logging interval of 1 minute, but may be extended to 2 years when the logger is configured with Bluetooth Always On disabled. Expected battery life varies based on the ambient temperature where the logger is deployed and the frequency of connections, downloads, and paging. Deployments in extremely cold or hot temperatures or a logging interval faster than 1 minute can impact battery life. Estimates are not guaranteed due to uncertainties in initial battery conditions and operating environment.

WARNING: Do not cut open, incinerate, heat above 85°C (185°F), or recharge the lithium battery. The battery 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 battery in fire. Do not expose the contents of the battery to water. Dispose of the battery 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.

To comply with FCC and Industry Canada RF radiation exposure limits for general population, the logger 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.

Documents / Resources



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