

HOBOnode® ZW Series Wireless Network Quick Start Guide

This guide explains how to set up a HOBOnode ZW Series Wireless Network, which consists of a receiver, router nodes, and end-point data nodes. The receiver is the central data collection hub that receives data from the router nodes and data nodes in the network. Router nodes can either be standalone routers (no data logging capability) or data nodes doubling as routers (operating in dual mode: data logging plus routing). End-point data nodes record data only (no routing capability). Follow the steps in this guide to set up these devices.

1 Survey the site and mark the measurement points

Walk through your site to map out the measurement points, which are the locations where you want to record sensor data. This will determine where you need to place either router nodes operating in dual mode or end-point data nodes. Note that the real-time communication range possible between nodes will depend on the obstructions in the path. You may need to add more router nodes in the path to help data from the measurement points reach the receiver or another active router node. Every data node and router comes with a mounting bracket. The mounting bracket allows you to adjust the node orientation against the mounting surface so that it gets better signal reception. For details on choosing the best location for nodes, refer to the *HOBOnode Data Node Deployment Guide* at <http://www.onsetcomp.com/indoor-wireless-hobo-data-nodes>.

2 Identify power outlets for router nodes

Router nodes require AC power. Locate available outlets in your site that can be used to provide AC power to the router nodes, which may be necessary for strengthening the communication within the network. The more router nodes you use, the more robust the network is.

3 Start HOBOnode Manager

HOBOnode® Pro 3.0 or higher is required for a ZW Series Wireless Network. Install the software now if you have not already done so.

1. Open HOBOnode. From the Device menu, select Manage HOBOnode Data Node Network.
2. Click Yes to enable data node capability in HOBOnode.

4 Connect the receiver to the computer

1. Connect the power adapter to the receiver and plug it into a wall outlet.
2. Insert three AAA batteries into the receiver for backup power.
3. Connect the small end of the USB cable to the communication port on the receiver. Plug the large end into the USB port on the computer running HOBOnode Manager. **Note:** The computer used to set up the network must be the same one used to offload data from the receiver at the site.

IMPORTANT: The receiver requires continuous power from the computer to communicate with the other devices in the network. Do not plug the receiver into a USB port that may be shut down due to the power settings on the computer. Disable any power saving options, such as Turn Off Hard Disks, Hibernation, or Shut Down, on the computer. If you connect the receiver to a USB port on your computer monitor, do not enable any energy savings options on the monitor.

4. The red and green LEDs blink continuously and the receiver is displayed in the device table in HOBOnode Manager with a status of CONNECTED as shown below. (If the receiver does not appear in the device table, make sure the USB cable is completely plugged in at both ends or try unplugging the receiver and plugging it back in.)

Type	S/N	Status	Meas. Type
ZW-RCVR	2372376	CONNECTED	-

A message also appears indicating a new receiver has been detected and asking if you would like to begin forming a network. Click Form Network Now. The receiver is now in Form Network mode with both LEDs staying continuously lit and the Forming Network progress indicator appearing in HOBOnode Manager.

5 Build a backbone of router nodes

Build a backbone of AC-powered router nodes (dedicated or dual mode) before adding any battery-powered data nodes to the network. Start with the router node closest to the receiver and move steadily to the farthest point, adding one node at a time and ensuring it is ACTIVE on the network before you proceed to the next node as described in the following steps.

Note: Leave the logging and connection intervals on the nodes at the default of 1 minute and 10 minutes respectively until you have built the complete network. Do not permanently mount a node until you are sure it is being recognized on the network.

To add a router node to the network:

1. The Forming Network progress indicator should still be visible in HOBOnode Manager. If it is not, then click the Form Network button at the bottom of the HOBOnode Manager window.
2. If this router node will also be recording data, connect any external sensors.
3. Plug in the AC adapter to power the node. With a wire paper clip, press and hold the reset button located inside the small hole at the bottom of the case for 5 seconds as shown below. This will erase any previous network information stored in the node. The red LED will blink multiple times, then stop blinking, and then both LEDs will be lit briefly.



4. Disconnect any power to the node (remove any batteries and unplug the AC adapter). Wait for one minute, then plug in the AC adapter to power the node again. Do not install the batteries.
5. Using the paper clip again, press the reset button once (a quick 1-second push) to put the node in "Form network mode." The green and red LEDs will alternate blinking.
 - If the node finds a communication path to the receiver within a minute, the alternate blinking will stop and the green LED will blink. The node will display as ACTIVE in the device table in HOBOnode Manager as shown below. After a few seconds, both LEDs will light and remain on while network formation continues. You can now add backup batteries to the node and mount it with the mounting bracket. Also consider labeling the node in HOBOnode Manager and writing the same label on the node sticker (see "Label nodes" on the reverse side for more details).

Type	S/N	Status	Meas. Type	Reading
ZW-RCVR	2372376	CONNECTED	-	-
ZW-013	2431994	ACTIVE	-	-
ZW-INT-TMP1	2431994-1	ACTIVE	Temperature	75.942 °F
ZW-INT-RH1	2431994-2	ACTIVE	RH	45.619 %
<Select Analog Sensor>	2431994-3	OFF	Unavailable	Unavailable
<Select Analog Sensor>	2431994-4	OFF	Unavailable	Unavailable

- If the node is not able to join the network, it will stop the alternate blinking pattern after a minute and then start blinking red. Move it to another location or adjust the orientation of the node against the mounting surface and repeat step 5 again.
 - If the alternate blinking pattern lasts for more than 2 minutes, try resetting the node again (steps 3 and 4) and then putting it back in Form Network mode (step 5).
6. Repeat steps 2 through 5 until you have placed all router nodes one at a time, from the closest to the receiver to the farthest. Before you proceed to the each new node, identify which existing active node will provide a communication path from the new node back to the receiver. Refer to the Signal Attenuation chart in the *HOBO Data Node Deployment Guide* to understand the impact of the obstructions in the path between nodes.

6 Add end-point data nodes

Once all the router nodes are active, you can add end-point, battery-powered data nodes. Before you deploy an end-point data node, identify the nearest ACTIVE router node(s) that will provide connectivity to the receiver. If more than one router can provide connectivity, then this path redundancy will improve the self-healing property and robustness of the network.

1. Make sure the receiver is still in “Form Network” mode. Click the Form Network button in HOBOnode Manager if it is not.
2. Connect any external sensors to the data node if necessary.
3. Add batteries to the node. With a wire paper clip, press and hold the reset button for 5 seconds to erase any previous network information that the node may have been saving. The red LED will blink multiple times and then stop blinking.
4. Disconnect any power to the node (remove any batteries and unplug the AC adapter). Wait for one minute, then install the batteries to power the node again. Do not plug in the AC adapter.
5. Using the paper clip again, press the reset button once (a quick 1-second push) to put the node in “Form network mode.” The green and red LEDs will alternate blinking.
 - If the node finds a communication path to the receiver within a minute, the alternate blinking will stop and the green LED will blink. The node will display as ACTIVE in the device table in HOBOnode Manager. Now you may mount the node with the mounting bracket. Also consider labeling the node in HOBOnode Manager and writing the same label on the node sticker (see “Label nodes” in the next section for more details).
 - If the node is not able to join the network, it will stop the alternate blinking pattern after a minute and then start blinking red. Move it to another location and repeat step 5 again.
 - If the alternate blinking pattern lasts for more than 2 minutes, try resetting the node again (steps 3 and 4) and then putting it back in Form Network mode (step 5).
6. Repeat steps 2 through 4 until you have placed all data nodes.
7. Once all devices have joined the network and appear in the device table, click the X in the Form Network Progress indicator to exit Form Network mode.

7 Customize the network with HOBOnode Manager

Use HOBOnode Manager to customize the network to work for your site.

Configure external sensors

The device table in HOBOnode Manager lists all nodes that joined the network. Current readings for internal sensors and any external Temp/RH sensors are automatically displayed in the table with an ACTIVE status. All additional sensor channels are disabled by default and listed as OFF in the Status column as shown below.

Type	S/N	Status	Meas. Type	Reading
ZW-RCVR	2372376	CONNECTED	-	-
ZW-013	2431994	ACTIVE	-	-
ZW-INT-TMP1	2431994-1	ACTIVE	Temperature	75.942 °F
ZW-INT-RH1	2431994-2	ACTIVE	RH	45.619 %
<Select Analog Sensor>	2431994-3	OFF	Unavailable	Unavailable
<Select Analog Sensor>	2431994-4	OFF	Unavailable	Unavailable
ZW-005	2431949	ACTIVE	-	-
CABLE-TEMP/RH (Temp)	2431949-1	ACTIVE	Temperature	72.394 °F
CABLE-TEMP/RH (RH)	2431949-2	ACTIVE	RH	85.474 %
<Select Analog Sensor>	2431949-3	OFF	Unavailable	Unavailable
<Select Pulse Sensor>	2431949-4	OFF	Unavailable	Unavailable

If you are using any external sensors other than the external Temp/RH, you must configure the sensors in HOBOnode Manager to record measurements.

1. Double-click the row in the table for the sensor you wish to configure.
2. In the Configure Sensor window, select the appropriate Sensor Type from the drop-down list. Add a label if desired.
3. Click OK. The status for that sensor will change to ACTIVE.

If no data or incorrect measurements appear for an external sensor, make sure the sensor has been configured as described above and the correct sensor type was selected.

Plot the measurements

Click the checkbox in the Plot column in the device table for any nodes/sensors you wish to plot (up to 20 maximum). It may take a few minutes for data to start appearing in the plot.

Adjust logging and connection intervals

By default, data nodes will record measurements once every minute and send data to the receiver every two minutes. To change these logging and connection intervals for a device, double-click that device in the table. Change the intervals and click OK. You can also change the default intervals in the Preferences (click the Actions button in HOBOnode Manager and select Edit Data Node Preferences).

Label nodes

It is helpful to label each node in HOBOnode Manager as you deploy it and write the same label on the node sticker (included in the data node or router packaging). Double-click the <Enter label here> field in the device table in HOBOnode Manager to add a label to a node. Then, write the same name on the sticker and affix it to the node.

Remove nodes

To remove a node from the network, double-click the node in the device table in HOBOnode Manager and then click the Remove Node button. Unplug the AC adapter if connected and remove any batteries.

Additional resources

For additional guidelines on deploying the network, including information about using brackets for spatial orientation of the nodes and details on the node LEDs, refer to the *HOBO Data Node Deployment Guide* available on onsetcomp.com. A list of frequently asked questions about the ZW wireless system is also available on onsetcomp.com

Refer to the help system in HOBOWare or the *HOBOWare User's Guide* for additional details on working with HOBOnode Manager and the devices in the network, including setting alarms, setting up a network map, creating groups, exporting data, and much more.