

WLS-23-ZW Water Leakage Sensor

Introduction

WLS-23-ZW is a Z-Wave enabled device and is fully compatible with any Z-Wave enabled network. It is a Security Enabled Z-Wave Plus product and is capable of sending wireless signals to the Z-Wave enabled network upon water detection. The Water Sensing Cable and built-in water sensing probes can detect water leakage or flood condition. It can be placed on the ground, or mounted on the wall and further extended by connecting to another water sensing cable to improve detection range.

Z-Wave is a wireless communication protocol that uses a low-power RF radio. By taking advantage of the Z-Wave mesh network, commands can be routed to their destination via intermediary "listening" Z-Wave products.

Parts Identification

1. LED Indicator

- Flash once:
 - The Water Leak Sensor is transmitting a signal

2. Buzzer

3. External Water Probe Connector

4. Battery Compartment

- The Water Leak Sensor is powered by one CR123 3V Lithium battery.

5. Mounting Hook

6. Function Button (inside the cover)

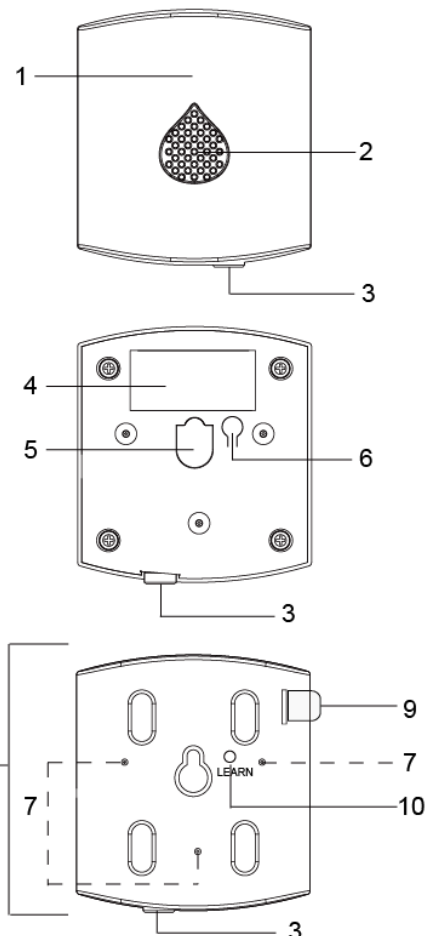
- Press the button 3 times within 1.5 seconds to send a learn code.
- Press once to send a temperature/humidity and supervisory signal to the Z-Wave network.
- Press and hold the button for 10 seconds to factory reset.
- Press once during alarm to enter Alarm Silenced Mode.

7. Built-in water sensing probes

8. Waterproof Case

9. Battery Insulator

10. Learn (characters imprinted on the back cover) aka Function Button



Features

● **Battery and Low Battery Detection**

- The Water Leak Sensor uses one CR123 3V Lithium battery as its power source. The Water Leak Sensor will report its battery percentage to the Gateway/Control Panel respectively at 100%, 90%, 80%, 70%, 60%, 50%, 40%, 30%, and 20%. The LED will flash once every 4 seconds when the battery is extremely low and needs to be replaced with a new one.

● **Water Detection**

- The Water Leak Sensor will be activated when water is detected through:
 1. The **external water sensing cable or water probe cable:**
Please remove the pre-installed plastic plug from the external water probe connector, the Water Leak Sensor will emit beep sound every 10 seconds for 5 minutes to indicate absence of plastic plug, connect the external water sensing cable to the connector (Refer to **Mounting** for details).
 2. The **built-in water sensing probe.**
Please make sure the plastic plug is well inserted when using this type of detection function. (Refer to **Mounting** for details).
- If water is detected for 50 seconds through the above two detecting methods, the Water Leak

Sensor will start alarming and will transmit an alarm signal to the Z-Wave network coordinator.

- If the water sensing cable is unplugged during alarm activation, the Water Leak Sensor will stop alarming followed by one beep sound every 10 seconds for 5 minutes.
- If water is not detected for 50 seconds, the Water Leak Sensor will stop alarming and transmit a restore signal to the Control Panel.

● **Alarm Silence**

- You can silence the alarm by pressing the Learn/Test button once. The Water Leak Sensor will silence the buzzer and enter Sleep Mode until the water subsides. During the Sleep Mode, if the water condition persists, the Water Leak Sensor will no longer raise alarm. If you press the Function button under Sleep Mode, the Water Leak Sensor will emit a long beep to remind you the water has not subsided yet.

NORMAL OPERATION:

- When the probes come into contact with water, Water Sensor will transmit an alarm signal to the Control Panel, and raise alarm with its built in buzzer.
- Whenever the water level subsides, the Water Sensor will transmit an alarm restore signal and stop the alarm.
- You can silence the alarm by pressing the Learn/Test button once. The Water Sensor will silence the buzzer and enter Sleep Mode until the water subsides. During the Sleep Mode, if the water condition persists, the Water Sensor will no longer raise alarm. If you press the Learn/Test button under Sleep Mode, the Water Sensor will emit a long beep to remind you the water has not subsided yet.
- After the water has subsided and the probes are no longer in contact with water, the Water Sensor will send a restore signal to the Control Panel to indicate the water condition has been restored. The Water Sensor then returns to Normal Operation Mode.
- **Temperature and Humidity Detection**
 - The Water Leak Sensor will transmit temperature and humidity signals regularly according to setting. The factory default interval is 30 to 33 minutes.
 - If the temperature detected changes by +/- 2°C within 10 seconds, the Water Leak Sensor will transmit a signal and resume the interval.
 - If the humidity detected changes by +/- 10% within 10 seconds, the Water Leak Sensor will transmit a signal and resume the interval.
 - You can also press the Function Button once to transmit a temperature signal manually.

● **Adding Device (Inclusion)**

This product can be included and operated in any Z-Wave network with other Z-Wave certified devices from other manufactures and/or other applications. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.

- Open the cover by removing the bottom fixing screw (using a Philips screwdriver) on the Water Leak Sensor.
- Insert the battery in the battery compartment
- Put the Z-Wave gateway or control panel into **Inclusion** mode (please refer to the Z-Wave gateway or control panel manual).
- Within 1.5 seconds, press the Function Button 3 times.
- Refer to the operation manual of the Z-Wave gateway or control panel to complete the adding process.
- If the sensor has already been added (included) into another Z-Wave Gateway/Control Panel, or if the sensor is unable to be learnt into the current Z-Wave Gateway/Control Panel, please exclude it first (see **Removing Device**) before attempting to include it into the current Z-Wave Gateway/Control Panel.
- Reattach the cover to the base and tighten the bottom-fixing screw.

● **Removing Device (Exclusion)**

The Water Leak Sensor must be removed from existing Z-Wave network before being included into another. There are two methods available to exclude a device:

Exclusion Mode

- Put the Z-Wave gateway or control panel into **Exclusion mode** (please refer to the Z-Wave gateway or control panel manual).
- Within 1.5 seconds, press the Function Button 3 times and the Water Leak Sensor will be removed from the Z-Wave network.

Factory Reset

(Only use factory reset when network Control Panel/Gateway is missing or inoperable).

- Press and hold the Function Button of the Water Leak Sensor for 10 seconds to factory reset.

<NOTE>

- ☞ Factory resetting the Water Leak Sensor will restore it to factory default settings (excluded from the Z-Wave network). The Z-Wave gateway or control panel will still keep its Z-Wave settings. Please refer to the gateway or control panel manual on how to remove the Water Leak Sensor's Z-Wave settings.

- **Range Test**

To test whether the device is able to communicate with the Z-Wave Gateway or Control Panel:

- Put the Gateway / Control Panel into range test mode (Walk Test).
- Press the Function Button on the device.
- The Gateway / Control Panel should display if the device is within the operation range (please refer to the operation manual of the Gateway / Control Panel).

- **Supervisory Signal**

This function uses the Z-Wave Wake Up Command Class. The Wake Up Command Class allows the battery-powered Water Leak Sensor to notify the Control Panel/Gateway that it is awake and ready to receive any queued commands. The wake up interval is programmed automatically according to the Control Panel's setting when the Water Leakage Sensor is included. The default wakeup interval is 5 minutes.

- **Z-Wave Sleep Mode**

- The Water Leak Sensor will enter Z-Wave Sleep mode (to conserve power) after waking up for a short period of time (~10 seconds). While in Z-Wave sleep mode, Z-Wave gateways or control panels are unable to send commands to the Water Leak Sensor.

Installation

- **Mounting**

There are two ways to mount the Water Sensor:

- **Wall mounting (use the external water sensing cable):**
 1. Choose to install the Water Leak Sensor at a desirable height.
 2. Drill hole in the surface.
 3. Insert the screw into the hole.
 4. Hook the Water Leak Sensor onto the screw using the Mounting Hook behind the device.
 5. The external water probe connector is pre-installed with a **plastic plug (Fig.1)**, please remove it.

(Fig 1.)



6. Connect the enclosed water sensing cable to the external water probe connector.

- **Ground surface mounting (use the built-in water sensing probe):**
 - Simply place your Water Leak Sensor at the desirable location on the ground.
 - Do NOT place on conductive surface.

- **Water Sensing Cable**

A Water Sensing Cable or Water Probe Cable is available for selection. The cable can be further extended by connecting to another cable to improve detection range.

**Water Sensing Cable
(earphone jack type):**

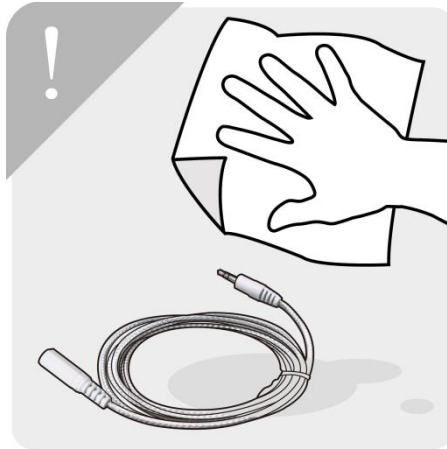


**Water Probe Cable
(earphone jack type):**



User Guidelines

- When water is detected through the Water Sensing Cable or Water Sensing Probe, the Water Leak Sensor will start alarming and transmit an alarm signal to the Control Panel.
- Upon receiving an alert notification from the Control Panel, unplug the Water Sensing Cable.
- Use a towel to dry the Water Sensing Cable.

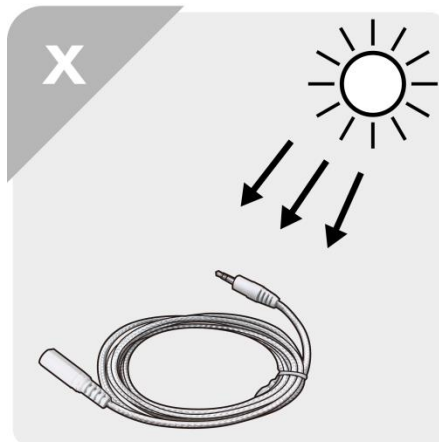


- It is recommended to air dry residual water in a ventilated place for at least two hours before inserting the sensing cable.



<NOTE>

- ☞ Avoid direct or indirect sunshine.
- ☞ Improper storage can cause damage to the sensor and the cable.



Z-Wave Information

Device Type: GENERIC_TYPE_SENSOR_NOTIFICATION

Role Type: ROLE_TYPE_SLAVE_SLEEPING_REPORTING

Command Class Support/Control

Mandatory CC Support:

- Z-Wave Plus Info CC (S2)
- Association CC, V2 (S2)
- Association Group Information CC
- Multi Channel Association CC, V3 (S2)
- Transport Service CC
- Version CC, V2 (S2)
- Manufacturer Specific CC, V2 (S2)
- Device Reset Locally CC (S2)
- Powerlevel CC (S2)
- Security_2 CC
- Notification CC, V8 (S2)
- Wake UP CC (S2)
- Sensor Multilevel CC, V4 (S2)
- Battery CC (S2)
- Supervision CC (S2)
- Firmware Update Md CC, V4 (S2)

● **Z-Wave's Groups (Association Command Class Version 2)**

The Water Leak Sensor can be set to send reports to associated Z-Wave devices. It supports 2 association groups with one nodes each.

Group 1 for "LifeLine": (maximum node: one)

Sensor Multilevel CC (COMMAND_CLASS_SENSOR_MULTILEVEL_V4)

Notification CC, V8 (COMMAND_CLASS_NOTIFICATION)

Battery CC (COMMAND_CLASS_BATTERY)

Device Reset Locally CC, V4 (COMMAND_CLASS_DEVICE_RESET_LOCALLY)

Group 2 for "Basic Set": (maximum node: one)

- When the Water Leak Sensor is triggered, it will send "Basic set" (0xFF) to the node in Group 2.
- When the Water Leak Sensor is restored, it will send "Basic set" (0x00) to the node in Group 2.

● **Command Class Data Format**

● **Factory Reset [COMMAND_CLASS_DEVICE_RESET_LOCALLY] [NOTIFICATION_REPORT]**

- Press and hold the function button for 10 seconds to perform factory reset and send factory reset report to the Control Panel.

● **Battery: [COMMAND_CLASS_BATTERY] [BATTERY_REPORT]**

- 0x64 --- 100% Battery Full
- 0x5A --- 90% Battery
- 0x50 --- 80% Battery
- 0x46 --- 70% Battery
- 0x3C --- 60% Battery
- 0x32 --- 50% Battery
- 0x28 --- 40% Battery
- 0x1E --- 30% Battery
- 0x14 --- 20% Low Battery
- 0xFF --- Battery Dead (Cut Off)
- Cut Off --- The device will stop working and the LED will flash every 4 seconds.

● **Water Alarm/Restore: [COMMAND_CLASS_NOTIFICATION] [NOTIFICATION_REPORT]**

- Water Alarm: 00 00 00 FF 05 02 00
- Water Restore: 00 00 00 FF 05 00 01 02

● **Test Button: [WAKE_UP_NOTIFICATION]**

- Press the function button once to awaken the Water Leak Sensor and it will send a wake up notification along with temperature and humidity report to the Control Panel.

● **Temperature/Humidity: [COMMAND_CLASS_SENSOR_MULTILEVEL] [SENSOR_MULTILEVEL_REPORT]**

- Press the function button once to send temperature and humidity information to the Control Panel.
- Temperature: 01 42 09 D1
- If temperature signal 01 42 09 D1 is transmitted, 09 D1 can be viewed as 0x09D1 in Hexadecimal number. You can convert hexadecimal to decimal and divide by 100 to check the temperature data (in

Celsius).

$0x09D1=2513=25.13^{\circ}\text{C}$.

- Humidity: 05 02 00 3B
- If humidity signal 05 02 **00 3B** is transmitted, 00 3B can be viewed as $0x003B$ in Hexadecimal number. You can convert hexadecimal to decimal to check the humidity level (in percentage).
003B= $0x003B=59\%$