

Leak Gopher Z-Wave Valve Control

Model: LGZW-1
Rev 2.04
Power 12VDC 1A



Leak Gopher
Z-Wave Valve Controller
with a 3/4" Valve
LGZW-1

Important Information

Safety, Compliance and Warranty
Read Manual Before Product Use

WARNING FIRE & ELECTRIC SHOCK HAZARD

Risk of fire or electric shock which may result in personal injury or death

Use as instructed

Safe Usage Guidelines for Products

- Install in accordance with the manufacturer's instructions
- Maintain a minimum distance of at least 6 inches (15 cm) around apparatus for sufficient ventilation
- Do not push objects into apparatus vents or slots
- Place apparatus in a stable location so it will not fall
- No naked (open) flame sources, such as lighted candles, should be placed on or near the apparatus
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
- Do not defeat the safety purpose of the polarized plug. A polarized plug as two blades with one wider than the other. The wide blade is provided for your safety. If the provided plug does not fit into the outlet, consult an electrician for a replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- The apparatus shall be disconnected from the mains by unplugging the power cord of the apparatus from the AC mains receptacle.
- Do not immerse product in water. Exposure to water will destroy the inner electronics.



BATTERY WARNING

Improperly replaced batteries may present a risk of leak or explosion and personal injury. Mistreated batteries may present a risk of fire or chemical burn. Do not disassemble or expose to conducting materials, moisture, liquid, or heat above 54 degrees C (130 degrees F). Do not use the battery if it appears to be leaking, discolored, deformed, or in any way abnormal. Do not leave your battery unused for extended periods. Do not short circuit a battery. BE sure batteries are installed with the correct polarity. Battery life varies with usage. Non-operational batteries should be discarded according to local laws. If no laws or regulations govern, dispose of your device in a waste bin for electronics. Keep batteries away from children.

FCC STATEMENT

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. This equipment has been tested and found to comply with the limits for 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. If not installed and used in accordance with the instructions, may cause harmful interference to radio communications. 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 or more of the following measure:

- 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 which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Features

- ⌚ Electronically Controlled Water valves
 - ¾", 1" , 1 ¼ , 1 ½", 2"valves
- ⌚ Wireless control using many available Home Automation platforms and security panels
- ⌚ Control via Internet or Smart Phone
- ⌚ Prevent expensive water damage even when you're not home
- ⌚ Z-Wave Wireless connectivity
 - Advanced Mesh Network
 - 5th Generation Technology
 - 300' Radio Range
 - Over-The-Air firmware update
- ⌚ Z-Wave Plus Certified



Overview

The Leak Gopher is a critical component to protect your home from costly damage due to a water leak. A burst pipe can result many thousands of dollars in repair costs and the LGZW can stop the leak at the source.

Compatible with many security panels and most Home Automation systems, you can control the Leak Gopher from your Smart Phone or computer from anywhere in the world via the Internet. Automation systems can automatically turn off the water if a leak is detected and a text message sent to you informing you of the alert.

Z-Wave wireless connectivity ensures reliable operation and compatibility with other Z-Wave products from many manufacturers and software providers.

Leak Gopher is easily installed by a homeowner with the help of our YouTube videos. Professional installation is recommended.

Do NOT insert fingers into the valve as this may cause serious injury!



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Introduction

The Leak Gopher Z-Wave Valve Control (LGZW-1) works with Z-Wave enabled security alarm systems to protect your home or business from water leaks. The Z-Wave Valve Control is designed to connect to an existing alarm system where water sensors are attached. When the water sensors detect water, the Z-Wave Controller can be programmed to tell the Leak Gopher to automatically turn the water off, protecting your home or business. The Z-Wave Valve Control is Z-Wave Plus certified to support the latest Z-Wave Controller capabilities.

You can also operate the electronic water valve directly using on and off buttons located in the top of the Z-Wave Valve Control.

Z-Wave is a wireless mesh-networking protocol for reliable, intelligent home control of all Z-Wave compatible devices. Z-Wave devices can act as repeaters to create a mesh-network to ensure reliable communication regardless of the manufacturer or type of device. This product can be included and operated in any Z-Wave network with other Z-Wave certified devices from any other manufacturer. Z-Wave devices such as lamp modules, fan controllers, thermostats, dimmer switches and many other types of home control devices are available from a wide range of manufacturers. The Z-Wave Alliance (www.z-wavealliance.com) provides a list of manufacturers of Z-Wave compliant devices. Z-Wave was created by [Sigma Designs](http://www.sigma-designs.com) and more details on the technology can be found at www.z-wave.com.

Installation



***** CAUTION *****

Do NOT insert fingers into the valve as this may cause serious injury!

Watch the Leak Intelligence videos on You Tube for detailed installation instructions. Search for "Leak Gopher" on <http://www.youtube.com> to find the latest videos.

Locate and install the electronic water valve and connect it to the Leak Gopher using standard telephone wires (4 wire) and connectors.

How to install the Leak Gopher Z-Wave Valve Control

1. Determine where you want to mount the Leak Gopher Z-Wave Valve Control and secure it to the wall using the mounting holes located in the top and bottom of the device.
2. Plug the 5VDC power adapter (included) into the bottom of the Leak Gopher.
3. Install the Electronic Water Valve



How to install the Leak Gopher Electronic Water Valve

The plumbing in every building is different. Determining where to locate the Leak Gopher Electronic Water Valve is an important part of the installation process. While outside the scope of these instructions, the optimum place to locate the valve is where it can turn off all of the water entering the premises to be protected. In a residential setting this is typically on the main water line coming into the house. Variations in plumbing make it impossible to provide detailed installation instructions for your installation. Your situation may require rerouting the water line, or other changes to your plumbing. It is your responsibility to check with your local codes department to determine if a licensed plumber is required to install the Electronic Water Valve.

You can get a 6 conductor 14 foot telephone wire and connector to extend the valve wire at www.leakintel.com. You can also install a biscuit or other device to extend the wire but care should be taken not to reverse the polarity on wires 2 & 5 and 1 & 6. Wires 2 & 5 open and closes the valve. Wires 1 & 6 report the valve position to the Leak Gopher.

Depending on your Z-Wave controller, and its capabilities, the Leak Gopher Z-Wave Valve Control can be added to the controller as a Z-Wave device, operated directly from the controller, or incorporated into scenes, etc.

Z-Wave Inclusion

How to Add the Leak Gopher Z-Wave Valve Control to your Z-Wave Controller

- Plug the wall cube power adapter (included) into the receptacle on the bottom of the Leak Gopher Z-Wave Valve Control marked "5 VDC". Plug the wall cube into a 110 VAC outlet. This provides power to the Leak Gopher Z-Wave Valve Control.
- Configure the Z-Wave Controller to Include/Add a device.
- When the Z-Wave Controller is ready to include/add a device, it will display a message like "waiting to add device". Press Include/Add button on the front of the device.
- The Include/Exclude button is located on the front of the Leak Gopher Z-Wave Valve Control. The button is the Z-Wave logo located under the OFF button. Press the Include/Remove button. Depending on your controller you may have to press the button 3 times.
- The Z-Wave Controller will acknowledge that the Leak Gopher Z-Wave Valve Control had been added to the Z-Wave network.
- Your Leak Gopher Z-Wave Valve Control is ready to use.



Z-Wave Exclusion

How to Remove the Leak Gopher Z-Wave Valve Control to your Z-Wave Controller

- Plug the wall cube power adapter (included) into the receptacle on the bottom of the Leak Gopher Z-Wave Valve Control marked "5 VDC". Plug the wall cube into a 110 VAC outlet. This provides power to the Leak Gopher Z-Wave Valve Control.
- Configure the Z-Wave Controller to Exclude a device.
- When the Z-Wave Controller is ready to exclude a device, it will display a message like "waiting to exclude device. Press exclude button on the device"
- The Include/Exclude button is located on the front of the Leak Gopher Z-Wave Valve Control. The button is the Z-Wave logo located under the OFF button. Press the Include/Remove button. Depending on your controller you may have to press the button 3 times.
- The Z-Wave Controller will acknowledge that the Leak Gopher Z-Wave Valve Control had been excluded from the Z-Wave network.
- Your Leak Gopher Z-Wave Valve Control is excluded from this controller.

Reset to Factory Defaults

How to reset the Leak Gopher Z-Wave Valve Control

- If the exclusion process above is not working or the Z-Wave controller LGZW was originally joined to is lost or not available, the following process can be used to factory reset the device to the same state it has when shipped new.
- To reset the Leak Gopher Z-Wave Valve Control Z-Wave radio and routing table, press and hold the Include/Exclude button located on the front of the Leak Gopher Z-Wave Valve Control for 15 seconds. The LED will blink very quickly while holding the Z-Wave button down. Once the LED turns off, release the Z-Wave button.

Manual Valve Operation

How to turn water on and off manually

- Plug the wall cube power adapter (included) into the receptacle on the bottom of the Leak Gopher Z-Wave Valve Control marked "5 VDC". Plug the wall cube into a 110 VAC outlet. This provides power to the Leak Gopher Z-Wave Valve Control.
- Plug the Leak Gopher electronic ball valve into the RJ-11 (telephone type connector) connector located on the bottom of the Leak Gopher Z-Wave Valve Control.
- Standard telephone wires, extenders, and connectors with RJ-11 connectors can be used to extend the distance between the Leak Gopher Z-Wave Valve Control and the Leak Gopher electronic ball valve up to 30 feet. The maximum recommended distance between the Leak Gopher Z-Wave Valve Control and the Leak Gopher electronic ball valve is 30 feet.



- On front of the Leak Gopher Z-Wave Valve Control there are two buttons.
 - o On
 - Press this button to open the Leak Gopher electronic ball valve turning the flow of water on.
 - o Off
 - Press this button to close the valve turning the water off.
- When the valve has changed state, a Z-Wave command will be sent to the Z-Wave system controller informing it of the change.

LED Indicator

The blue LED on the face of the Leak Gopher Z-Wave Valve Control indicates the current mode of the LGZW.

LED	Description
DARK	Power is off
BLINKS slowly 0.5Hz	Not joined to a Z-Wave network - Press the Z-Wave button to join
BLINKS quickly 5Hz after pressing the Z-Wave button	Sent a Z-Wave Node Info and attempting to either Include or Exclude from a Z-Wave network. Expires after about 10 seconds if not joined
BLINKs very quickly	The sensors from the valve are in an invalid state. This happens while the valve is in transition or if there is a fault in the wiring.
WINKs ON	If the LED is OFF most of the time and briefly “winks” ON every 2 seconds, then the valve is CLOSED and the LGZW is joined to a Z-Wave network
WINKs OFF	If the LED is ON most of the time and briefly “winks” OFF every 2 seconds, then the valve is OPEN and the LGZW is joined to a Z-Wave network



Software Developer Technical Information

This section is intended for home control software developers to support LGZW in their home control software. Users of LGZW do not need this information but it is provided here for serious DIYers who want to understand how the device works under the hood.

All Z-Wave communication uses standard Z-Wave Command Classes. Each command class is fully described in the Z-Wave specification documents available at SigmaDesigns.com. Specific details of how each command class is used by the LGZW are described below.

Z-Wave Command Classes

Command Class	Purpose	Version
ZWAVEPLUS_INFO	Provides the Z-Wave Role Type, Node Type and Icon	V2
VERSION	Provides the firmware version, SDK version and version of each command class	V2
MANUFACTURER_SPECIFIC	Provides the Manufacturer ID, Product ID and Product type ID to uniquely identify the LGZW.	V2
DEVICE_RESET_LOCALLY	When the LGZW is reset locally, a notification is sent to the controller to inform that the LGZW has been reset to the factory defaults and is no longer part of the Z-Wave network.	V1
ASSOCIATION	Assigns the destination for changes in the state of the valve	V2
ASSOCIATION_GRP_INFO	Details on the LifeLine association Group	V1
POWERLEVEL	Can be used to measure the quality of the radio link	V1
SWITCH_BINARY	Commands the valve to be on or off and reports status Use this command class to control the valve via Z-Wave.	V1
BASIC	BASIC commands can also be used to turn the valve on or off and report status	V1
NOTIFICATION_V4	Hardware failure of the valve is reported with a System Error notification	V4
FIRMWARE_UPDATE_MD	Firmware in the LGZW can be updated via this class	V2

The Z-Wave command class version supported by the firmware in the LGZW can be obtained via the `VERSION_COMMAND_CLASS_GET` command. Note that the firmware may support a later version than is documented here.

Association and Association Group Info

The LGZW has a single Association Group, Group 1 also known as the “Lifeline” group as required for Z-Wave Plus certification. Four (4) NodeIDs can be SET into Group 1. Typically the Z-Wave system controller or Hub will be the most important member of Group 1.

When the ON or OFF buttons are pressed on the LGZW and the state of the valve changes, a `SWITCH_BINARY_REPORT` is sent to each NodeID in Group 1. If a hardware failure is detected due to a broken wire on the valve, a Notification Command Class is sent to each NodeID in Group 1.



Thus, it is critical that the Z-Wave system controller configure Association Group 1 with its NodeID when the LGZW is joined to a Z-Wave network.

The Association Group Info command class can be used to obtain the name of group 1 “Lifeline” and other information about the commands that can be received from LGZW.

Basic

The BASIC command class can be used to turn the valve ON or OFF. A BASIC_SET with a Value of 0 will turn the valve off (CLOSED) and value of 1-99 or 0xFF will turn the valve ON (OPEN). Reserved values are ignored. A BASIC_GET will return a BASIC_REPORT with either 0x00 (CLOSED) or 0xFF(OPEN).

Binary Switch

The Binary Switch command class is identical to the Basic command class for the LGZW. A SWITCH_BINARY_SET with a value of 0 will turn the valve off (CLOSED) and a value of 1-99 or 0xFF will open the valve. Reserved values are ignored. A SWITCH_BINARY_GET will return a SWITCH_BINARY_REPORT with the current value of the valve (0x00 or 0xFF). Note that a SWITCH_BINARY_REPORT will be sent if the valve is manually operated or fails to change to the desired state. The valve takes several seconds to move to the opposite state. The REPORT is not sent until the valve has stopped moving so there is some delay from the time you press the button until the Z-Wave system controller receives the report.

Firmware Update

The LGZW firmware can be updated in the field using the Firmware Update Command Class. Contact Leak Intelligence for the latest Intel Hex file of the Over-The-Air firmware for the LGZW. The Z-Wave system controller must support the Firmware Update command class in order to update the firmware. Refer to the Z-Wave system controller documentation to initiate a firmware update.

It is strongly recommended to bring LGZW within a few feet of the system controller. This ensures reliable radio transfer of the firmware and minimizes the duration of the process. The firmware update takes about five minutes of continuous radio traffic so the update should only be done when the rest of the system is not required to be operational.

Notification

If a hardware failure is detected a NOTIFICATION_REPORT with a Notification Type of SYSTEM (0x09) and an Event of 0x03 (Hardware Failure) will be sent to all nodeIDs in Association group 1. The Z-Wave system controller should then inform the user that the valve is offline and needs to be repaired. A NOTIFICATION_REPORT with an Event of 0x00 indicates the failure has been fixed and the unit is operating normally. The NOTIFICATION_REPORT will be repeated once/hour until the failure has been repaired. Note that the failure has to exist for 1 minute before the notification is sent. If the failure is fixed, another NOTIFICATION_REPORT will be sent with an Event of 0x00 indicating



the failure has been fixed. Unplugging the valve will send the notification report of 0x03 in 60 seconds. Plugging it back in will send the notification immediately.



Troubleshooting

Problem	Solution
Not Powering on - No LED lights	Check outlet for voltage: If there is no voltage check the fuse panel for thrown breaker. If voltage but no power, replace the power supply.
Unable to join to a Z-Wave network	Perform a Z-Wave Exclusion on the device first, then try re-including. If that fails, press and hold the Z-Wave button for 30 seconds to do a full Reset to Factory Defaults. Bring the LGZW close to the Z-Wave system controller (3 feet or less).
Valve non responsive	Make sure valve is plugged into Z Wave Valve Controller. If it is still not responding to commands replace valve.
Any other questions	Call our helpline at 855-828-2811
Other sources of technical help	www.z-wavealliance.org www.z-wave.com

Technical Specifications

Operating Temperature Range: 5°C to 80°C

RF Range: 300 feet minimum line of sight

RF Data Rate: 9.6Kbps, 40Kbps, 100Kbps

RF Frequency: 908/916MHz (US)

RF Interface: ZM5202

Power Supply: 12vdc-1A

Dimensions: 4in X 5 ½in X 2in

Weight: Less than 1lb



Z-Wave Plus Certification

Certificate number: ZC10-16025006

This product can be included and operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers 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.

Z-Wave is a registered trademark of Sigma Designs and/or its subsidiaries.



Ordering Information – Part Numbers

LGZW-1 Leak Gopher Z-Wave Valve Controller with 3/4" valve

LGZW-2 Leak Gopher Z-Wave Valve Controller with 1" valve

LGZW-3 Leak Gopher Z-Wave Valve Controller with 1-1/4" valve

LGZW-4 Leak Gopher Z-Wave Valve Controller with 1-1/2" valve

LGZW-5 Leak Gopher Z-Wave Valve Controller with 2" valve

Leak Intelligence, LLC

855-828-2811

www.leakintel.com



Limited Warranty & Disclaimer

Leak Intelligence, LLC will repair or replace, at its option, any part of the device, which proves to be defective in workmanship or material under normal use, in the USA except in the states of Alaska or Hawaii, for up to ten years from the date of purchase. This warranty does not include issues caused by the buildup of calcium or other chemicals in the valve or damage caused by chemicals in the water supply. Leak Intelligence, LLC will repair and provide all labor and parts necessary to correct such defects, free of charge, provided the device has been operated in accordance with the manufacturer's guidelines. The Customer must return the device to Leak Intelligence, LLC for testing and repair or replacement. Should you need service, during warranty period or beyond, call 855-828-2811 to obtain return authorization before shipping your device to Leak Intelligence, LLC.

Except for the obligation to repair or replace the Leak Gopher as stated herein, Leak Intelligence, LLC shall not be liable for any incidental or consequential damage caused by failure of the Leak Gopher to function as advertised or expected.

All warranty service will be provided by Leak Intelligence, LLC technicians and this warranty is void if the device has been opened or serviced by anyone other than a Leak Intelligence, LLC technician.

EXCEPT FOR THE LIMITED WARRANTY AS STATED IN THIS AGREEMENT, THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE. LEAK INTELLIGENCE, LLC DISCLAIMS THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AS TO PRODUCTS AND SERVICES SUPPLIED UNDER THIS AGREEMENT. IN NO EVENT WILL LEAK INTELLIGENCE, LLC BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, COMMERCIAL LOSS, PROPERTY DAMAGE, LOSS OF USE, LOSS OF REVENUES, PROFITS, OR SAVINGS, EVEN IF LEAK INTELLIGENCE, LLC KNEW OR SHOULD HAVE KNOWN OF THE POSSIBILITY OF SUCH DAMAGES.

Leak Intelligence, LLC does not guarantee the leak notification service in regard to notification of leaks. Leak Intelligence, LLC is not responsible for any value of water loss, commercial loss or any property damage, or for any other loss or damage caused or incurred as a result of the failure of the device and/or failure of the notification service.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. To know what your legal rights are in your state, consult your local or state consumer affairs office or your state's Attorney General.