Z-Wave Long Range™ Garage Door Controller User Manual

M/K: GDZW7-ECO

Revision 3

Product Overview

The Garage Door Controller is a security device for users to wirelessly control and monitor their garage door. It monitors and reports the state of the garage door through use of a paired wireless (or wired) tilt sensor. It can also determine when the garage door is active by utilizing an accelerometer to detect specific vibration patterns. The Garage Door Controller may ignore commands to control the garage door if it deems that is unsafe to execute the command.

Product Specification

- Supports Z-Wave Long Range (must be added via SmartStart) and Z-Wave Plus™
- Indoor use only
- Operating Frequency: 345MHz, Z-Wave™ (908.42MHz, 916MHz), Z-Wave Long Range (912MHz, 920MHz)
- Operating Temperature: 32°F to 120°F
- Power: 12VDC, 1.0A
- Accelerometer 2-16G I2C/SPI
- External contact for installer to opt in using magnetic contact instead of using tilt sensor for determination of the garage door's state
- Temperature sensor
- S2 Encryption

Definitions

- Panel or Controller are used interchangeably here and is what you are pairing the device with.
- Device Specific Key (DSK) – PIN Code and QR-Code Used for inclusion and to setup encrypted S2 communication.
- S2 – Secure Communication Technology.
- SmartStart – New method for easy inclusion.
- Inclusion / Adding / Pairing – Adding to a device to a Z-Wave network.
- Exclusion / Removal / Unpairing – Removing a device from a Z-Wave network or at least unpairing a device from a network that it had been added to previously.
- Node Info Frame – Used for inclusion/Exclusion carrying information about the device.

Adding to or Removing from a Z-Wave Network

Adding:

Power up the Garage Door Controller, and the device's status indicator will blink green three times every six seconds to indicate that the Garage Door Controller is actively looking to be included into a network. The Garage Door Controller must not already be added to a Z-Wave network. If the device is added to a Z-Wave network, follow instructions below on removing. There are a few methods to add a device to a Z-Wave network: SmartStart, Classic and Network Wide Inclusion.

For both methods, you may need to locate the Device Specific Key (DSK) which is on the device's box and on the back side of the device itself. Scan the DSK QR-Code with the panel's or controller's smartphone app or enter it in manually when prompted.

****Note: Adding in the device as a long range node can only be done via SmartStart.*

SmartStart:

SmartStart enabled products can be added into a Z-Wave network by scanning the Z-Wave QR Code present on the product with a controller providing SmartStart inclusion. No further action is required and the SmartStart product will be added automatically within 10 minutes of being switched on in the network vicinity.

1. When the Garage Door Controller is powered up and not included in a network, it is ready for SmartStart. The status indicator will blink green three times every six seconds.
2. The device may take a few minutes to be added.
3. When it is successfully added, the device will beep and blink green once.

Classic / Network-Wide Inclusion

1. Follow the instructions of the Z-Wave controller to put the Z-Wave controller into manual or classic Z-Wave inclusion mode.
2. Locate and press the hub button on the device.
3. The device will attempt to include itself.
4. Be prepared to enter the DSK if asked.
5. When it is successfully added, the device will beep and blink green once.

If the device beeps twice and blinks yellow once, then it was added unsecured, and the device will automatically factory reset itself. This may leave a ghost node on the Z-Wave controller. Follow the Z-Wave controller's instructions to remove the unresponsive node.

This device also supports Network Wide Inclusion such that the device can be included into the Z-Wave network over the mesh network and not directly near the main controller. This mode is automatically activated after regular inclusion was not successful.

Removal:

There are two methods to removing the Garage Door Controller from a Z-Wave network: exclusion and performing a factory reset (see section on Factory Reset).

1. Follow the Z-Wave controller's instructions on putting the Z-Wave controller into removal/exclusion mode.
2. Locate and press the hub button.
3. Device's status indicator will blink red and beep three times to indicate successful removal.

Mounting and Connections to Garage Door Opener

Mount the tilt sensor to the top panel of the garage door. Mount the Garage Door Controller to the garage door opener's hardware using the included mounting bracket. Alternatively, you can mount the Garage Door Controller on the ceiling near the garage door opener and the power outlet. Connect the Garage Door Controller's relay switch wires to the pushbutton wall console terminals on the garage door opener. Make sure not to disconnect any wires that are already connected to the garage door opener.

Factory Reset

Please use this procedure only when the network primary controller is missing or otherwise inoperable. Factory resetting the Garage Door Controller will default it to factory settings and reset the tilt sensor pairing to the original tilt sensor.

1. Locate the reset button.
2. Insert a paperclip into the hole until you feel the button depress. There will be a short beep.
3. Hold the button down for ten seconds. The status indicator will blink red while the reset button is pressed and will go out after ten seconds.
4. The device's status indicator will turn green when the reset operation is complete. The device is now ready to be added to a Z-Wave network.

Note: Factory reset only works when the device is already added into a Z-Wave network. If the Garage Door Controller is not included in a network, then it cannot be factory reset.

Adding a Tilt Sensor

The Garage Door Controller pairs with the tilt sensor to monitor the state of the garage door.

The original (included with the Garage Door Controller) tilt sensor does not need to be added. To add a different Ecolink ClearSky tilt sensor:

1. Locate and press the tilt button. There will be a short beep.

2. Remove pull-tab from the tilt sensor or reinsert the battery into the tilt sensor.
3. If pairing is successful, the device's warning light will blink white and beep for one second.

Adding an External Contact

Alternatively, the Garage Door Controller can pair with an external contact to monitor the state of the garage door.

To add a hardwired external contact:

1. Connect the external contact's wires to the Garage Door Controller's blue terminal block
2. Locate and press the tilt button. There will be a short beep.
3. Trigger the external contact to the "open" state.
4. If pairing is successful, the device's warning light will blink white and beep for one second.

What is Z-Wave?

The Z-Wave protocol is an interoperable, wireless, RF-based communications technology designed specifically for control, monitoring and status reading applications in residential and light commercial environments. Mature, proven and broadly deployed (with over 35 million products sold worldwide), Z-Wave is by far the world market leader in wireless control, bringing affordable, reliable and easy-to-use 'smart' products to many millions of people in every aspect of daily life. Certified Z-Wave devices regardless of manufacturer can work together to form a Z-Wave mesh network. Always on Z-Wave devices can act as repeaters in the mesh increasing range and redundancy.

For a more complete look at Z-Wave technology for non-technologists, and to learn more about Z-Wave's role as a key enabling technology for the Internet of Things and connected objects, please visit z-wave.com.

What is Z-Wave Long Range?

Engineered to provide significantly extended wireless range and support robust networks, Z-Wave LR extends Z-Wave connectivity beyond the boundaries of the home and accelerates the adoption of Z-Wave in other verticals such as light commercial, hospitality, and multi-dwelling units (MDU). Z-Wave Long Range is an extra 100kbps DSSS OQPSK modulation addition to the Z-Wave protocol. The modulation is treated as a fourth channel – allowing gateways to add LR nodes to the existing Z-Wave channel scanning. At this time, Z-Wave LR is only available for the US market however, the Technical Workgroup is evaluating and testing to ensure compliance and to be able to support Europe and APAC regions in the future.

Z-Wave Device Class and Command Class Information

This device is a Z-Wave generic Device Class of `GENERIC_TYPE_ENTRY_CONTROL` (0x40), and a specific device class of `SPECIFIC_TYPE_SECURE_GATE` (0x06).

Manufacturer Specific

- Manufacturer ID: `0x014A`
- Product Type: `0x0007`

- Product ID: `0x4731`

Mapping of the Basic Command Class

The Garage Door Controller has the Basic Command Class mapped to the Barrier Operator Command Class such that a Basic Set of a value is the equivalent of a Barrier Operator Set of a target value. A Barrier Operator Report with a state of 0x00 will map to a Basic Report with a current value of 0x00. And a Barrier Operator Report with a state > 0x00 will map to a Basic Report with a current value of 0xFF.

Z-Wave Command Classes

Command Class	Version	Secured via S2
Z-Wave Plus Info	2	
Association	2	√
Association Group Info	3	√
Barrier Operator	1	√
Configuration	4	√
Device Reset Locally	1	√
Firmware Update Metadata	5	√
Indicator	3	√
Manufacturer Specific	2	√
Multichannel Association	3	√
Multilevel Sensor	11	√
Notification	8	√
Power Level	1	√
Security 2	1	
Security 0	1	
Supervision	1	
Transport Service	2	
Version	3	√

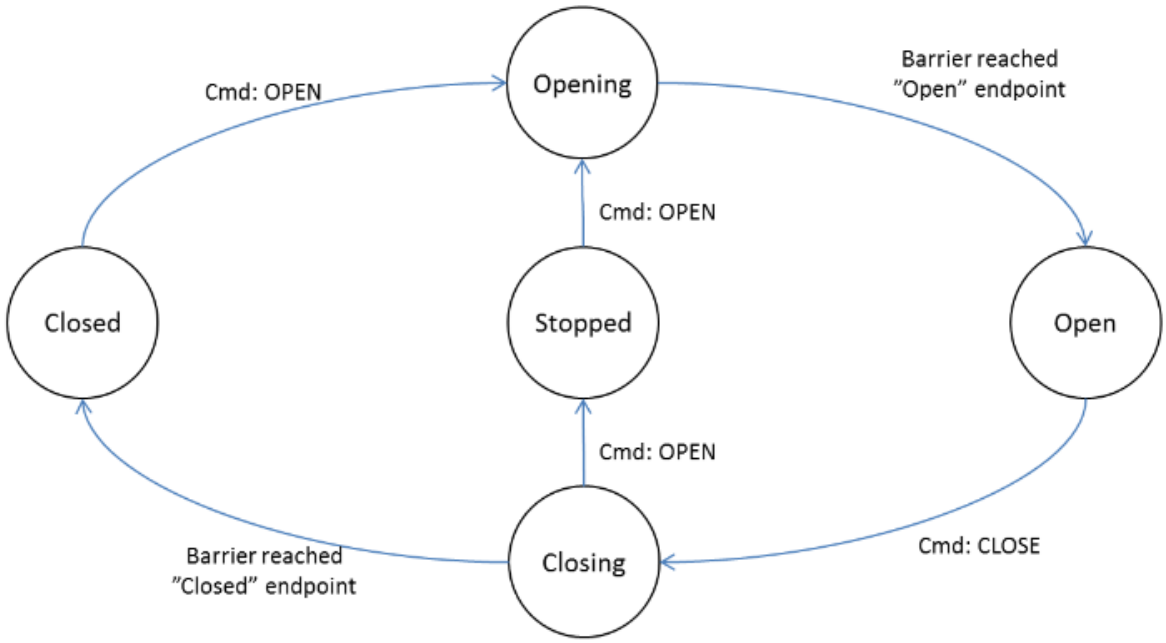
Association

The Garage Door Controller supports one Association group: the “Lifeline” group which can have one node in the group. All unsolicited Z-Wave messages are transmitted to the node in the Lifeline group such as Barrier Operator, Device Reset Locally notifications, Indicator, and Notification.

Barrier Operator

The Garage Door Controller supports the Barrier Operator Command Class which is used to control and query the status of the garage door. A Barrier Operator Set Command of 0xFF will initiate an unattended open, and a command of 0x00 will initiate an unattended close. Before an unattended close command is executed, it will have a minimum wait period of 5 seconds, during which the warning light will flash, and the speaker will beep. If the state of the garage door changes or the garage door is active during this unattended wait period, the original close command will be ignored.

Any state/command pair not specified in the following figure will not cause any action:



The Garage Door Controller will not respond to Set Commands if any of the following issues are detected:

- No tilt sensor is paired
- Tilt sensor is tampered
- Tilt sensor counter is out of sync
- Tilt sensor is lost (Garage Door Controller hasn't heard from the tilt sensor in 2 hours)
- Tilt sensor is in the wrong state

A timeout error will occur if the tilt sensor does not change states after an unattended open/close command is executed. **After a timeout error occurs, Barrier Operator Set open/close commands will be ignored until the garage door operator is manually triggered by the user and the tilt sensor changes states.**

Whenever the Garage Door Controller receives and ignores a Barrier Operator Set Command, the Garage Door Controller's warning light will blink 3 times**.**

The "Stopped" state is removed because the tilt sensor only reports open or closed: there is no way to confidently know that the garage door is stopped.

Barrier Operator Signal Set Commands can be sent but will not cause any action to the audible or visual subsystems.

Configuration

The Garage Door Controller supports the six configuration parameters listed below.

1. Unattended Wait Period

Description	Unattended close operation wait period in seconds.
Size	1
Format	Unsigned Integer

Read only	No
Min Value	5
Max Value	60
Default Value	5

2. Relay Switch Period

Description	**Number of milliseconds to turn on relay switch for.**
Size	2
Format	Unsigned Integer
Read only	No
Min Value	100
Max Value	5000
Default Value	1000

3. Door Open Timeout

Description	**Seconds allowed for garage door to open until timeout.**
Size	1
Format	Unsigned Integer
Read only	No
Min Value	5
Max Value	60
Default Value	20

4. Door Close Timeout

Description	**Seconds allowed for garage door to close until timeout.**
Size	1
Format	Unsigned Integer
Read only	No
Min Value	5
Max Value	60
Default Value	15

5. Accelerometer Sensitivity

Description	**Accelerometer vibration detection sensitivity: 1 is least sensitive, 100 is most sensitive.**
Size	1
Format	Unsigned Integer
Read only	No
Min Value	1
Max Value	100
Default Value	96

6. Application-Level Retries

Description	Number of attempts on top of the stack-level retries to try to reach the controller/hub with Z-Wave messages.
Size	1
Format	Unsigned Integer
Read only	No
Min Value	0
Max Value	10
Default Value	3

Indicator

Indicator ID	Name	Binary	Level	Time Out Seconds	On-Off Period	One Time On-Off Period	On-Off Cycles
0x50	Identify	**0x02**	**0x01**	**0x07**	**0x03**	**0x05**	**0x04**

The indicators supporting properties On-Off Period, One Time On-Off Period, and On-Off Cycles can safely interrupt the other indicators, and the other indicators if active will resume.

The Identify indicator flashes the device's status indicator.

Multilevel Sensor

The temperature is reported through the Multilevel Sensor Command Class. The temperature sensor is polled every 30 seconds and any change in temperature will send a Multilevel Sensor Report. A Multilevel Sensor Report will also be sent if the temperature has not changed in the past hour. Temperature is reported in Celsius with a precision of one (e.g. a decimal value of 212 would be equivalent to 21.2 °C).

Notification

The following Notifications are supported and sent to the Lifeline Association Group.

Type	Event
Access Control (0x06)	Window/door is open (0x16)
	Window/door is closed (0x17)
	Barrier motor has exceeded manufacturer's operational time limit (0x42)
	Barrier unable to perform requested operation due to UL requirements (0x44)
	Barrier sensor not detected / supervisory error (0x49)
	Barrier sensor low battery warning (0x4A)
System (0x09)	Tampering, product cover removed (0x06)

Supervision

When included with S2, all unsolicited Z-Wave messages from the device to the Z-Wave controller are encapsulated in a Supervision Get command to ensure proper decoding, so the device must see both an ACK and a corresponding Supervision Report to consider the message communicated successfully.

Indicator (LED and Beeper) States

Event	LED Behavior	Beeper Behavior	Beeper Tone
SmartStart	3 green blinks (500ms on/off), off for 3 seconds	None	None
Classic Inclusion	3 green blinks (500ms on/off), off for 3 seconds	None	None
Inclusion in progress	repeated green blinks (100ms on/off)	None	None
Secured pairing completed	3 seconds green	1 second beep	Good tone (2240 Hz)
Unsecured pairing completed	3 seconds yellow	2 quick beeps: 200ms on, 100ms off	Bad tone (1050 Hz)
Inclusion failed	3 seconds red	None	None
Learn timeout	3 alternating red and green blinks (500ms on/off)	None	None
Exclusion	3 seconds red	3 quick beeps: 200ms on, 100ms off	Bad tone (1050 Hz)
Factory Default Wait	red blinks(250ms on/off) for 10 seconds	None	None
Factory Default Success	5 seconds green	None	None
Powered on when included	5 seconds green	None	None
Any button press	None	200ms beep	Button press (2790 Hz)
Tilt sensor or external contact pairing successful	1 second white	1 second beep	Good tone (2240 Hz)
Barrier Set Command was ignored due to a tilt sensor error or safety issue	3 white blinks (250ms on/off)	None	None
Unattended close wait period	repeated white blinks(100ms on, 150ms off)	repeated beeps: 100ms on, 150ms off	Good tone (2240 Hz)
OTA Firmware Update	100ms green/100ms red, every 10 seconds	None	None

Troubleshooting

Problem	Possible Cause	Solution
Unable to add device to Z-Wave network	Device was not properly excluded from a previous Z-Wave network	Try removing the device by putting the Z-Wave controller into exclusion mode and then pressing the Garage Door Controller's Hub button. You can also factory reset the device in the case of a missing or inoperative Z-Wave controller.
Z-Wave open/close commands don't do anything and warning lights flashes 3 times	One of the following: - Tilt sensor is lost - Tilt sensor is tampered - Tilt sensor counter is out of sync - Previous close/open operation timed out	To determine the cause, check the Notification Report which is sent in response to an ignored Z-Wave open/close command. If the tilt sensor is tampered, make sure the sensor covering is properly closed. For all other causes, manually operate the garage door opener via the pushbutton wall console to resync the tilt sensor and Garage Door Controller.
Device flashes and beeps during the unattended wait period, but the door does not move	Device detected a vibration during the unattended wait period and cancelled the original close command.	Send the close command again. If this is a recurring issue, consider lowering the accelerometer sensitivity (Configuration Parameter #5)
Device's relay switch is activated, but the door does not move	Incorrect wiring	Make sure the relay switch wires are connected to the correct terminals on the garage door opener terminal. They should be connected to the garage door opener's pushbutton wall console terminals. Do not disconnect any wires from the garage door opener.

FCC Compliance Statement

FCC ID: **XQC-GDZW7**

IC ID: **9863B-GDZW7**

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 devices, 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 instruction manual, 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 or more of the following measures:

- **Re-orient or relocate the receiving antenna**
- **Increase the separation between the equipment and receiver**
- **Connect the equipment to an outlet on a different circuit from the receiver**
- **Consult the dealer or an experienced radio/TV contractor for help.**

Warning: Changes or modifications not expressly approved by Ecolink Intelligent Technology Inc. could void the user's authority to operate the equipment.

IC Compliance Statement

This device complies with Industry Canada licence-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.C'et appareil est conforme la norme d'Industrie Canada exempts de licence RSS. Son fonctionnement est soumis aux deux conditions suivantes: (1) c'et appareil ne peut pas provoquer d'interférences, et (2) c'et appareil doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de la dispositif.

Warranty

Ecolink Intelligent Technology Inc. warrants that for a period of 1 year from the date of purchase that this product is free from defects in material and workmanship. This warranty does not apply to damage caused by shipping or handling, or damage caused by accident, abuse, misuse, misapplication, ordinary wear, improper maintenance, failure to follow instructions or as a result of any unauthorized modifications.

If there is a defect in materials and workmanship under normal use within the warranty period Ecolink Intelligent Technology Inc. shall, at its option, repair or replace the defective equipment upon return of the equipment to the original point of purchase.

The foregoing warranty shall apply only to the original buyer, and is and shall be in lieu of any and all other warranties, whether expressed or implied and of all other obligations or liabilities on the part of Ecolink Intelligent Technology Inc. neither assumes responsibility for, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.
The maximum liability for Ecolink Intelligent Technology Inc. under all circumstances for any warranty issue shall be limited to a replacement of the defective product. It is recommended that the customer check their equipment on a regular basis for proper operation.