

Ring Range Extender

User Manual

Preface

As this is the full User Manual, a working knowledge of Z-Wave automation terminology and concepts will be assumed. If you are a beginner user, please visit www.Ring.com for instructions. This manual will provide in-depth technical information about the Range Extender, especially in regards to its compliance to the Z-Wave standard (such as compatible Command Classes, Association Group capabilities, special features, and other information) that will help you maximize the utility of this product in your system.

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Description and Features

The Ring Range Extender is a Z-Wave range extender with battery backup. It is a Security Enabled Z-Wave Plus Product.

Specifications

Technical Specifications

SKU	4AR1S70EN0
Radio protocol	Z-Wave(500 series)
Power supply	110/240 V AC
Working current	Max 120 mA
Operating temperature	0 - 40 °C
Radio frequency	908.4Mhz or 916Mhz
Range	Up to 250' depending on environment
Dimensions (L x W x H)	Excluding Plug:

Table 1 - Technical Specifications

Package Contents:

Inclusion & Exclusion

Inclusion (Add to System)

1. For proper inclusion, bring the Range Extender to the final location where it will be used*.
2. Follow the instructions for your Z-Wave controller to enter inclusion mode.
3. Remove the battery tab.
4. Supply power to the Range Extender to begin inclusion mode. If the Range Extender is already powered on, press the button 3 times quickly.
5. The device will enter inclusion mode for 30 seconds and the LED Ring will blink quickly (1 times/sec) until it's included in a system.

Upon successful inclusion, the LED Ring will blink slowly three times and then stay on permanently.

Exclusion (Remove from System)

Follow the instructions for your Z-Wave Certified Controller to enter exclusion mode. When prompted by the controller:

1. Make sure the Range Extender is powered on.
2. Press the Button quickly 3 times in a row.

Upon successful inclusion, the LED Ring blink slowly three times and then blink once every half second until it is included in a system.

*For non Z-Wave Plus networks, please consult the owner's manual for your primary controller to determine the best method and location for adding the Range Extender to your Z-Wave network.

Resetting the Range Extender

If needed, the Range Extender can be reset locally by following these steps.

Only do this if your Z-Wave controller is missing or otherwise unreachable.

Beware that resetting your device will disconnect it from the system:

1. Make sure that your Range Extender is powered on.
2. Press the button 6 times quickly, then immediately press and hold for 10 seconds.

The Range Extender's memory will be erased to factory settings and the LED Ring will blink very quickly six times and then blink once every half second until it is included in a system.

Physical Installation

The Range Extender can be plugged directly into a standard power outlet. Include the Range Extender into your Z-Wave network and make sure it can communicate from the installation location before continuing further.

Installation On the Power Outlet (Secured with Screw)

1. Unscrew the wall plate screw adjacent to the outlet the Range Extender will be plugged into.
2. Plug in the Range Extender, making sure the Screw Flange is directly over the wall plate's screw hole.
3. Secure the Range Extender in place by replacing the wall plate screw.

Installation On the Power Outlet (Unsecured)

1. Plug in the Range Extender.

LED Behavior

Color	Event	Behavior
Blue	In Pairing Mode	Long Blink pattern repeated for 30 sec
	Paired successfully	Steady for 5s
	Device is not yet paired	5 short blinks - repeat every 1 min
	Factory Reset	TBD - please specify
	Enter Exclusion Mode/ Send Node Info	TBD - please specify

Short blink = 500ms on + 500ms off

Long blink = 1s on + 1s off

Range Extender Behavior

This whole page is tentative!

Action	Condition	Result
Power On	Range Extender Not Yet Included in System, and Controller is in Inclusion Mode	Device enters inclusion mode for up to two min and includes into whichever network is also in inclusion mode.
	Range Extender Already Included in System	Device powers on.
Push Button 3 Times	Range Extender Already Included in System	Device sends node info to Group 1
	Range Extender Already Included, and Controller is in Exclusion Mode	Device is excluded from the system and removes the Home ID from its memory
	Range Extender Not Yet Included in System	Device enters inclusion mode for up to two min and includes into whichever network is also in inclusion mode.
Press and hold the button for TEN seconds	Range Extender Already Included in System	Device will be reset to factory settings, and a DEVICE_RESET_LOCALLY command will be sent to Group 1
	Any condition (as long as the device has power)	The device's memory will erase to factory default settings and any associations, configuration parameters, and other locally saved data will be lost

Compatible Command Classes

Command Class	Notes
Device Reset Locally V1 (5A)	-
Node Information Frame (NIF)	The node Information Frame (NIF) advertises the device's Generic Device Type, Specific Device Type, and Role Type. Generic Device Type: GENERIC_TYPE_REPEATER_SLAVE Specific Device Type: SPECIFIC_TYPE_REPEATER_SLAVE Role Type: ROLE_TYPE_SLAVE_ALWAYS_ON
Security Class	WILL NOT request the S2 Access Control Security Class WILL request the S2 Authenticated Security Class WILL request the S2 Unauthenticated Security Class
Powerlevel V1 (73)	-
BatteryV1(80)	The Battery Report interval will be 70 minutes by default and is configurable using a configuration parameter.
Association Group Information V1 (59)	-
Firmware Update Meta Data (7A)	
Version V2 (86)	Returned Value: 03 04 21 01 11 1E 00 Z-Wave Library Type: 03 (Enhanced Slave) Protocol Version: 04 21 Protocol Sub-Version: 01 11 Application Version: 1E Application Sub-Version: 00
Manufacturer Specific V2 (72)	Returned Value: 03 46 04 01 01 01 Manufacturer ID: 03 46 Product Type: 04 01 Product ID: 01 01 Device specific get has serial number, of the following format: Serial Number Format: BHRP VYY WW DM XXXXXX V: Ring hub Version (right now it's 1, we will let you know if/when it changes) YY: Year of manufacture WW: week number of manufacture XXXXXX: incremented serial number Example: 3,245th Ring first version extender built in the 36th week of 2017 = BHRP11736DM003245

Command Class	Notes
Z-Wave Plus Info V2 (5E)	<p style="text-align: center;">Returned Value: 01 05 00 1B 00 1B 00</p> <p>Z-Wave Plus Version: 01 Role Type: 05 (Always On Slave) Node Type: 00 (Z-Wave Plus Node) Installer Icon Type: 1B 00 (Repeater) User Icon Type: 1B 00 (Repeater)</p>
Association V2 (85)	<p>Group 1 Group 1 is the “Lifeline” group, which can hold five devices. The Range Extender repeats all signals it receives to this group. The Range Extender also sends this group Battery Reports, Power Management notifications, and a Device Reset Locally notification to remove itself from the Z-Wave network.</p>

Command Class	Notes
Notification V4 (71)	<p>The Range Extender sends Notification Reports to update the Primary Controller of changes in power status (e.g. battery is charging, AC power is disconnected, etc.)</p> <p style="text-align: center;">Returned Value: 00 00 00 FF 07 XX YY ZZ</p> <p>V1 Alarm Type: 00 (Unsupported) V1 Alarm Level: 00 (Unsupported) Reserved: 00 (Reserved) Notification Status: FF (Unsolicited Reporting is Enabled) Notification Type: 08 (Power Management) Event: AC Power Disconnected—02 (AC mains disconnected) AC Power Connected—03 (AC mains re-connected) Battery is Charging—0C (Battery is Charging) Battery is not Charging—00 (Event Inactive) Sequence/Reserved/Event Parameters Length: 00 Notification Event Parameters: 00 (No Event Parameters)</p>
Configuration V1 (70)	See ""Configuration" Command Class Parameters" on page 16.

Table 2 - Command Classes Continued

“Configuration” Command Class Parameters

Configuration parameters are sent using a standard syntax to ensure interoperability between all manufacturers’ products. All values are represented using the hexadecimal number system.

Typical syntax is as shown below. Note that the value sent must be the exact size, in bytes, as accepted by the setting. The “extra” spaces should be filled with zeros (see the “value” column below.)

Example Configuration Parameter: 02 02 00 0A

Param #	Size	Value
02 (Param #2)	02 (2 Bytes)	00 0A (10)

Param #	Size	Name	Available Values	Default Value
01	This parameter sets how often the device sends battery reports to the Main Controller. It can be set to any value from 60 ~ 1,440 minutes (1 ~ 24 hours) in 1 minute increments.			
	02	Battery Report Interval	3C ~ 05 A0 (60 ~ 1,440 minutes [1 ~ 24 hours] in one minute increments)	00 46 (70 Minutes)
02	If this parameter is enabled, the LED Ring will flash everytime there motion is detected. If this is disabled, the LED Ring will not flash to indicate motion events.			
	01	Enable/Disable LED Ring	1 (LED Disabled) 2 (LED Enabled)	01 (LED Enabled)

Troubleshooting

Q: Help! My Range Extender paired successfully, but my controller can't see it anymore after I installed it!

A: First, make sure your the Range Extender is still powered up. Otherwise, the Z-Wave signal is probably weak in that area of your home. Remember that the 120' - 150' range doesn't take into account walls, furniture, and other obstacles. To boost your Z-Wave network coverage, add a few non-battery powered Z-Wave devices between the controller and the furthest device, like the Ring On/Off Plug or Water Main Shut-Off, or of course, the Ring Range Extender!

Q: There's so many words in this manual I don't understand. How can I learn more about Z-Wave?

A: Remember you don't have to understand everything in this manual to start automating your home. Our Quick-Start Guides have all you need to start using any device. For more thorough information about Z-Wave home automation, visit www.Ring.com/support.

Q: I've tried multiple times, but I can't include the Range Extender in my system.

A: Make sure your device is getting power. Then, follow the instructions under "Factory Reset & Misc. Functions" on page 8 and try going through the inclusion process again. If you are still having issues, please visit www.Ring.com/support

Q: All of a sudden, my Range Extender is offline.

A: Check your power supply and make sure your device is getting power. If powered, make sure you still have Z-Wave network coverage. If you are still having issues, visit www.Ring.com/support.

Warranty & Support

FCC 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 or more 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IC STATEMENT

This device complies with Industry Canada's licence-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.