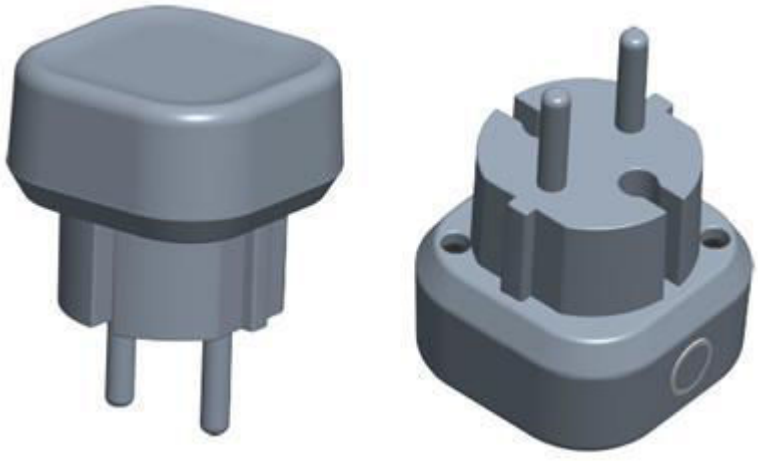
Range Extender 7



Engineering Specification

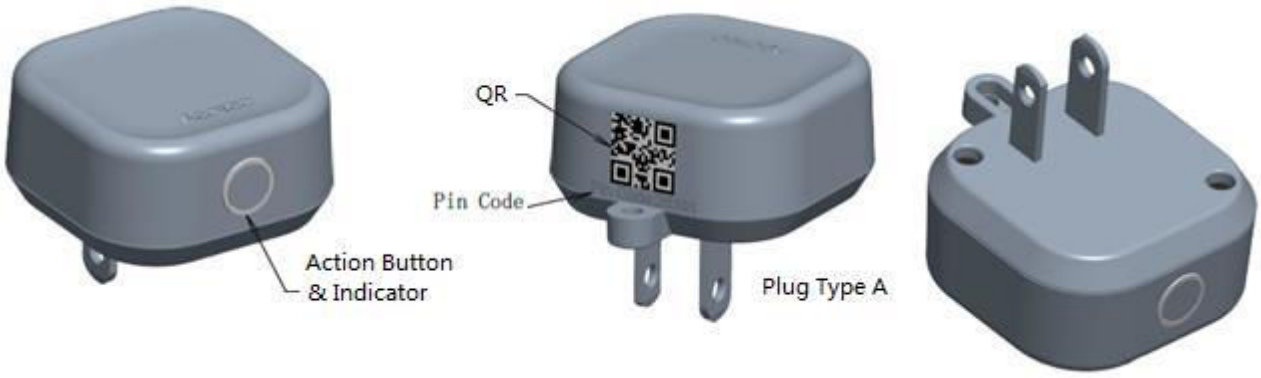
Range Extender 7

Document No.	SPEC-ZW189
Version	1
Description	This document mainly introduces the new generation AEOTEC Range extender. The content mainly includes its interfaces, accessories, features, specifications, quick start, and software function definition. Range extender 7 is based on Z-Wave. ● Can extender the communication range of z-wave network ● Support SmartStart, which makes inclusion more convenient. ● Support S2, which makes it more secure and reliable.
Written By	
Date	
Reviewed By	
Date	
Approved By	
Date	

REVISION RECORD		
Version	Date	Brief description of changes
1	2019.06.11	First revision.
2	2019.07.01	Weight and dimensions added

Table of Content

1 INTERFACES & ACCESSORIES



Terminology	Description
Action Button	Used for networking and resetting.
Indicator Light	Used for indicating the current state of the product.
Plug	Used for AC power input, models vary from different contries.
Attenna	Used for Wireless communication.
QR Code	Used for Z-Wave SmartStart Inclusion.

2 FEATURES & SPECIFICATIONS

2.1 Structural Characteristics

Parameter	Value
Product Identifier	ZW189-A01/B21/C15/C07
Dimensions	US: 53.2×46×40mm EU: 46×46×60.65mm AU: 46×46×48.6mm UK: 53.2×46×48.6mm
Weight	US: 33.9g EU: 38.8g AU: 34.9g UK: 38.9g
Color	White
Shell Surface Treatment	Frosted(upper shell), Bright fine lines(lower shell)
Shell Fire-proof Level	UL94 V-0
Waterproof and Dustproof	Rated IP20 under IEC 60529
Usage	For indoor use. Used for extender the communication range of Z-Wave Network
Operating Temperature	32~104°F (0~40°C)
Relative Humidity	8%~80%

2.2 Hardware Characteristics

Parameter	Value
Z-Wave Antenna Distance	30m (Indoor) /150m (Outdoor)
Plug and Socket Type	Plug Type A for USA，Plug Type 21 for AU，Plug Type E/F for EU, Plug Type G for UK
Indicator Light Color	White
Buttons and Connectors	Action Button (x1)
Input Voltage	US: 120V AC, 60Hz. EU/AU/UK: 230V AC, 50Hz.
Battery Included	No
Working Current	EU/UK/AU：MAX 150mA@230VAC,50Hz US：MAX 100mA@120VAC.60Hz
Power Consumption	US: Max 0.6W EU/AU/UK: Max 1.2W
Over-Heat Protection	Support.
Built-in Sensors	No
Safety Certifications	US：FCC/ETL AU：RCM EU：CE

2.3 Software Characteristics

Parameter	Value
Wireless Technology	Z-Wave
Z-Wave Plus	Yes
Z-Wave Version	7.11.00
Z-Wave Library Type	Enhanced 232 Slave
Z-Wave Device Type	REPEATER_SLAVE
Z-Wave Role Type	Always On Slave

Security Class	Non-Security, S2 Unauthenticated, and S2 Authenticated
Smart Start Compatible	Support
Over The Air (OTA)	Support
Multi Channel Device	No
Association	Support
Factory Reset	Support
Power-down Memory	Support

3 PRODUCT QUICK START

3.1 Important safety information

Please read this Engineering Specification carefully for correct and effective use.

Failure to follow the recommendations set forth by AEOTEC Limited may be dangerous or cause a violation of the law. The manufacturer, importer, distributor, and/or reseller will not be held responsible for any loss or damage resulting from not following any instruction in this guide or in other materials.

3.2 How to install the product

Getting your Range Extender up and running is as simple as plugging it into a wall outlet and adding it to your Z-Wave network.

3.3 How to add the product into Z-Wave network

This product supports Security 2 Command Class. While a Security S2 enabled Controller is needed in order to fully use the security feature. 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.

3.3.1 SmartStart Learn Mode

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 after this product being powered on in the network vicinity.

3.3.2 Classic Inclusion Learn Mode

1. Set your Z-Wave Controller into its 'Add Device' mode in order to add the product into your Z-Wave system. Refer to the Controller's manual if you are unsure of how to perform this step.

2. Make sure the product is powered. If not, plug it into a wall socket and power on; its LED will be breathing white light all the time.

3. Click Action Button once, it will quickly flash white light for 30 seconds until it is added into the network. It will become constantly bright white light after being assigned a NodeID.

4. If your Z-Wave Controller supports S2 encryption, enter the first 5 digits of DSK into your Controller's interface if /when requested. The DSK is printed on its housing.

5. If Adding fails, it will come back to breathing white light; repeat steps 1 to 4. Contact us for further support if needed.

6. If Adding succeeds, it will turn to white light. Now, this product is a part of your Z-Wave home control system. You can configure it and its automations via your Z-Wave system; please refer to your software's user guide for precise instructions.

Note:

If Action Button is clicked again during the Classic Inclusion Learn Mode, the Classic Inclusion Learn Mode will exit. At the same time, Indicator Light will become breathing white light.

3.4 How to remove the product from Z-Wave network

1. Set your Z-Wave Controller into its 'Remove Device' mode in order to remove the product from your Z-Wave system. Refer to the Controller's manual if you are unsure of how to perform this step.

2. Make sure the product is powered. If not, plug it into a wall socket and power on.

3. Click Action Button once.

4. If Removing fails, it will turn back to constantly white light; repeat steps 1 to 3. Contact us for further support if needed.

5. If Removing succeeds, it will become breathing white light. Now, it is removed from Z-Wave network successfully.

3.5 How to factory reset

If the primary controller is missing or inoperable, you may need to reset the device to factory settings.

Make sure the product is powered. To complete the reset process manually, press and hold the Action Button for at least 20s. The LED indicator will become breathing white light, which indicates the reset operation is successful. Otherwise, please try again. Contact us for further support if needed.

Note:

1. This procedure should only be used when the primary controller is missing or inoperable.

2. Factory Reset will:

(a) Remove the product from Z-Wave network;

(b) Delete the Association setting;

4 SOFTWARE FUNCTION DEFINITION

4.1 User Behavior Interaction

There is only one color white for the indicator, and different action will cause flash / constantly / off mode.

User behavior	Out of the Z-Wave network	In the Z-Wave network
Power OFF	Cut the power.	Cut the power.
Power ON	**SmartStart Learn Mode:** Indicator Light will become flash white light for 1s indicating the product has been powered, and then become breathing white light. SmartStart Learn Mode starts after power on, and It will become flash white light after a controller begin to response to its SmartStart inclusion request. If Adding succeeds, it will bright white light for 2s and become regular light mode(constantly white light or off). If Adding fails, it will turn back to breathing light and then start SmartStart Learn Mode again.	**Supply power:** Indicator Light will become flash white light for 1s indicating the product has been powered, and become regular light mode(constantly white light or off).
Click Action Button once	**1.Send Node Info for Adding:** When click Action Button once, Indicator Light will quickly flash white light until it is added into the network. It will become constantly white light after being assigned a NodeID. If Adding succeeds, it will become regular light mode(constantly white light or off).. If Adding fails, it will return breathing white light. **2.Exit Classic Inclusion Learn Mode:** If Action Button is clicked again during the Classic Inclusion Learn Mode, the Learn Mode will exit. At the same time, Indicator Light will extinguish immediately, and then become breathing white light. Product will start SmartStart Mode in 30s.	**Send Node Info for Removing:** Indicator Light will flash for up to 2s. If Removing succeeds, it will become breathing white light. If Removing fails, it will turn back to regular light mode(constantly white light or off).
Click Action Button 2 times quickly	**Reserved:** Indicator Light will become off when press, and become breathing light when release.	**Change the regular light mode:** **1.** constantly white light; **2.** Turn off the light.
Press and hold Action Button for [1, 2s)	**Reserved:** Indicator Light will become off when press, and become breathing white light when release.	**Reserved:** Indicator Light will become off when press, and become regular light mode when release.
Press and hold Action Button for [2, 5s)	**Reserved:** Indicator Light will become constantly light, and become breathing white light when release.	**Reserved:** Indicator Light will become constantly light, and become breathing white light when release.
Press and hold Action Button for [5, 10s)	**Reserved:** Indicator Light will become flash when press, and become breathing white light when release.	**Test communication quality:** I Indicator Light will become flash when press, and quickly flash when release, indicating start to test communication quality between the product and Node 1.

		At the end of the test, product will send a Powerlevel Report to Gateway according to the communication quality.
Press and hold Action Button for [10, 20s)	**Reserved:** Indicator Light will speed up flashing when press, and become breathing white light when release.	**Reserved:** Indicator Light will speed up flashing when press, and become breathing white light when release.
Press and hold Action Button for [20, ∞)	**Reserved:** Indicator Light will become constantly light when press, and become breathing white light when release.	**Factory Reset:** When the time reaches 20s, Factory Reset is performed after release. The product will send out Device Reset Locally Notification Report via Lifeline, and it will perform factory reset no matter the Nodes in the Lifeline Group receive the Device Reset Locally Notification from it or not. Indicator Light will become breathing white light, which indicates the reset operation is successful. Otherwise, please try again.

4.2 Announced Command Classes in NIF

Note: When DUT is included on S0 level, MANUFACTURER_SPECIFIC CC is supported non-securely; while included on S2 level, MANUFACTURER_SPECIFIC CC is supported securely only.

Command Class	Version	Not added	Non-secure added	Securely 2 added	
				Non-secure	Secure
ZWAVEPLUS_INFO	2	Support	Support	Support	
ASSOCIATION	2	Support	Support		Support
MULTI_CHANNEL_ASSOCIATION	3	Support	Support		Support
ASSOCIATION_GRP_INFO	3	Support	Support		Support
TRANSPORT_SERVICE	2	Support	Support	Support	
VERSION	3	Support	Support		Support
MANUFACTURER_SPECIFIC	2	Support	Support		Support
DEVICE_RESET_LOCALLY	1	Support	Support		Support
INDICATOR	3	Support	Support		Support
POWERLEVEL	1	Support	Support		Support
SECURITY_2	1	Support	Support	Support	
SUPERVISION	1	Support	Support	Support	
FIRMWARE_UPDATE_MD	5	Support	Support		Support

4.3 Z-Wave Plus Info

Parameter	Value
Z-Wave Plus Version	2
Role Type	5 (ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_ALWAYS_ON)
Node Type	0 (ZWAVEPLUS_INFO_REPORT_NODE_TYPE_ZWAVEPLUS_NODE)
Installer Icon Type	0x1B00 (ICON_TYPE_GENERIC_REPEATER)
User Icon Type	0x1B00 (ICON_TYPE_GENERIC_REPEATER)

4.4 Manufacturer Specific

Parameter	Value
Manufacturer ID 1	0x03
Manufacturer ID 2	0x71

Product Type ID 1	EU=0x00,US=0x01,AU=0x02,HK=0x04
Product Type ID 2	0x04
Product ID 1	0x00
Product ID 2	0xBD (189)

4.5 Version

Parameter	Value
Z-Wave Protocol Library Type	0x03
Z-Wave Protocol Version	0x07
Z-Wave Protocol Sub Version	0x0B
Firmware 0 Version	Software Version MSB
Firmware 0 Sub Version	Software Version LSB
Hardware Version	0xBD (189)
Number of firmware targets	0x00

4.1 Indicator

Indicator ID = 0x50 (Node Identify)

Property ID = 0x03 (On/Off Periods)

= 0x04 (On/Off Cycles)

= 0x05 (On time within an On/Off peried)

Supported report (reference《SDS14220-Indicator-Command-Class.xlsx》)

Parameter	Value
Indicator ID	0x50 (Node Identify)
Next Indicator ID	0x00 (NA)
Property Supported Bit Mask Length	0x01
Property Supported Bit Mask 1	0x38

4.2 Association Group Info

Root device

ID	Name	Node count	Profile	Function
1	Lifeline	5	General: Lifeline	**Device Reset Locally Notification:** Issued when Factory Reset is performed.

（1） Association Group Name Report

Group	Name	ASSIC Code
Group 1	Lifeline	01 08 4C 69 66 65 6C 69 6E 65

（2） Association Group Info Report

Group	Profile	Vg1
Group 1	General:Lifeline	01 01 00 00 01 00 00 00

（3） Association Group Command List Report

Group	Command Class	Command	Code
Group 1	COMMAND_CLASS_DEVICE_RESET_LOCALLY	DEVICE_RESET_LOCALLY_NOTIFICATION	5A 01