

AeOTEC

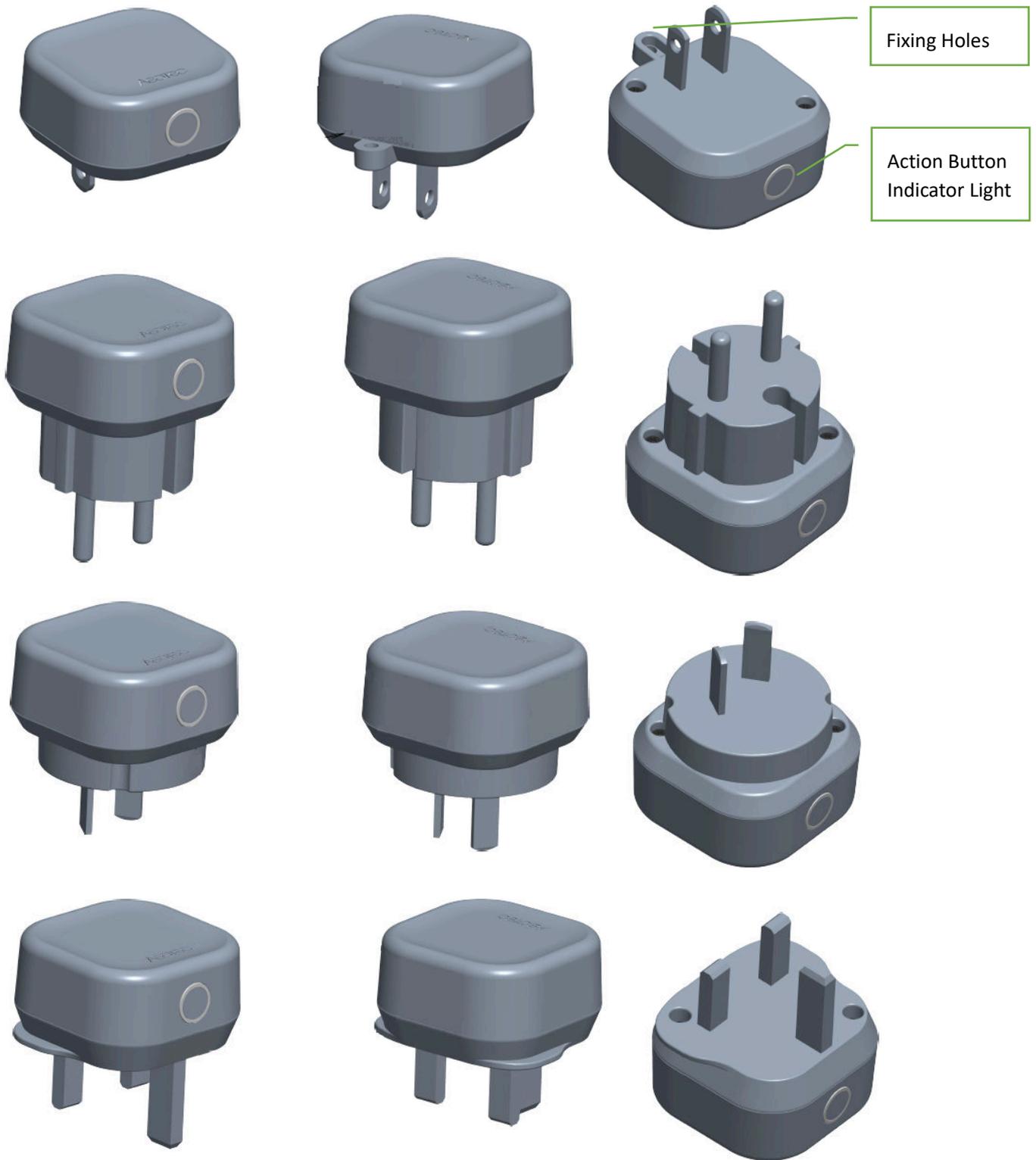
Range Extender Zi



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1 INTERFACES & ACCESSORIES



Terminology	Description
Action Button	Used for networking and resetting.
Indicator Light	Used for indicating the current state of the product.
Fixing Holes	Used for fixed product.

2 FEATURES & SPECIFICATIONS

2.1 Structural Characteristics

Parameter	Value
Product Identifier	WG001-Z01
Dimensions	53.1×46×21.6mm
Color	White
Usage	For indoor use. Used for extender the communication range of ZigBee Network
Operating Temperature	32~104°F (0~40°C)
Relative Humidity	8%~80%

2.2 Hardware Characteristics

Parameter	Value
ZigBee Module	EFR32MG21
RF TX Power	Max: 20dBm
Indicator Light Color	White
Buttons and Connectors	Action Button (x1)
Input Voltage	AU EU US (85-265V),50/60Hz
Battery Included	No
Working Current	MAX: 150mA@230VAC,50Hz
Power Consumption	MAX: 1.0W
Over-Heat Protection	Support
Built-in Sensors	No
Surge Protection	Support

2.3 Software Characteristics

Parameter	Value
Wireless Technology	ZigBee
Stack	ZigBee 3.0
Profile	Home Automation [0x0104]
Device	Repeater generic [0x0008]
Device Type	Router
Manufacturer	AEOTEC LIMITED [0x1310]
compatible	Backwards compatible to ZHA (ZigBee Home Automation) Backwards compatible to ZLL (ZigBee Light Link) profile
Over The Air (OTA)	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 ZigBee network.

3.3 How to add the product into centralized network

This product can be included and operated in any ZigBee network with other ZigBee certified devices from other manufacturers and/or other applications.

3.3.1 Using Action Button

1. Set your ZigBee Controller into its 'Add Device' mode in order to add the product into your ZigBee 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 until it is added into the network.
4. If Adding fails, it will come back to breathing white light; repeat steps 1 to 3. Contact us for further support if needed.
5. If Adding succeeds, it will turn to white light. Now, this product is a part of your ZigBee home control system. You can configure it and its automations via your ZigBee system; please refer to your software's user guide for precise instructions.

3.3.2 Using Install Code

Products can be added into a ZigBee network by scanning the Install Code QR Code present on the product with a controller providing inclusion.

Note: What Is an Install Code?

ZigBee installation codes, sometimes also referred to as "install codes," are provided as a means for a device to join a ZigBee network in a reasonably secure fashion. The installation code itself is a random value installed on the joining device at manufacturing time, and is used to encrypt the initial network key transport from the ZigBee network's centralized Trust Center device (the coordinator) to the joining device.

The installation code can be thought of as similar to the PIN code on Bluetooth devices when two devices are paired. The PIN code is provided as an authorization code for the parent device so that the joining device knows it is receiving information securely, such as when a hands-free headset is paired to a smartphone.

3.4 How to add the product into ZLL network (as a Touch Link target)

1. Product is always in touchlink target mode and can be added to other networks by touchlink;
2. Place the remote controller within 10cm of the product.

2. When touchlink in communication, the indicator light will flash;
3. If Adding fails, it will come back to breathing white light;
4. If Adding succeeds, it will turn to white light. Now, this product is a part of your ZigBee home control system. You can configure it and its automations via your ZigBee system; please refer to your software's user guide for precise instructions.

3.5 How to add other ZLL device into network (as a touch link initiator)

1. Click Action Button 3 times quickly
2. Indicator Light will become turns on slowly and turns off quickly.
3. Held Close to the ZLL device (10cm apart).

3.6 How to turn on or off the indicator light (in network)

1. Click Action Button 2 times quickly
2. Change the regular light mode: Constantly white light or Turn off the light.

3.7 How to send OnOff cluster to the binding node

1. Click Action Button 2 times quickly
2. Product will send on off cluster to the binding node;
3. When the indicator light is on, send On Command;
4. When the indicator is off, send Off Command.

3.8 How to send Level Control cluster to binding node

1. Press the Action Button for twice and long press the second time for more than one seconds; Product will send the Level Control cluster to the binding node; Send every 200ms, increasing by 5% each time until 255.
2. Press the Action Button for 3 times and long press the third time for more than one seconds; Product will send the Level Control cluster to the binding node; Send every 200ms, reducing by 5% each time until 5.

3.9 How to finding and binding (as a initiator)

1. Click Action Button 4 times quickly
2. Indicator light turns on quickly and turns off slowly
3. Product enters the find and bind initiator mode for 5 seconds.

3.10 How to finding and binding (as a target)

1. Click Action Button 5 times quickly
2. Indicator light flashes quickly
3. Product enters the find and bind target mode for 180 seconds. Click the key to exit this mode (the indicator light does not flash).

3.11 How to send endpoint information to initiator (as a touch link target)

1. Click Action Button 6 times quickly
2. Product will send endpoint information to the initiator

3.12 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 10s. The Indicator Light will become breathing white light, which indicates the reset operation is successful. Otherwise, please try again. Contact us for further support if needed.

Note:

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

4 SOFTWARE FUNCTION DEFINITION

4.1 User Behavior Interaction

User behavior	Out of the ZigBee network	In the ZigBee network
Power OFF	Cut the power.	Cut the power.
Power ON	Indicator Light will become breathing white light	Indicator Light become regular light mode (constantly white light or off).
Click Action Button once	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 Node ID. If Adding succeeds, it will become regular light mode (constantly white light or off). And will into find and bind target mode, this progress will continue to 180s. If Adding fails, it will return breathing white light.	Reserved.
Click Action Button 2 times quickly	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.
Click Action Button 3 times quickly	Indicator Light will become off when press, and become turns on slowly and turns off quickly	Start scanning ZLL device (as a initiator)
Click Action Button 4 times quickly	Indicator Light will become off when press, and become turns on quickly and turns off slowly	Trigger the device to send Initiator query finding and binding the other devices in the network, this progress will continue to 5s (as an initiator).
Click Action Button 5 times quickly	Indicator Light will become off when press, and become quickly flash	Trigger the device to find and bind target mode for 180 seconds (as a target).
Press and hold Action Button for [1, 2s)	Indicator Light will become off when press, and become breathing white light when release.	Indicator Light will become off when press, and become regular light mode when release.
Press and hold Action Button for [2, 5s)	Indicator Light will become flash slow.	Indicator Light will become flash.
Press and hold Action Button for [5, 10s)	Indicator Light will become flash fast.	Indicator Light will become flash fast.
Press and hold Action Button for [10, ∞)	Reserved. Indicator Light will become constantly light when press, and become breathing white light when release.	Factory Reset. When the time reaches 10s, Factory Reset is performed after release. The product will perform factory reset. Indicator Light will become breathing white light, which indicates the reset operation is successful. Otherwise, please try again.

4.2 Device Simple Descriptor

Endpoint	Device id	Cluster id (Server)	Cluster id (Client)
endpoint1	0x0008 HA Range Extender	0x0000 (Basic) 0x0003 (Identify)	0x0003 (Identify) 0x0019 (OTA Upgrade)
Endpoint2	0x0820 LO Non-color Controller	0x0000 (Basic) 0x0003 (Identify)	0x0003 (Identify) 0x0006 (On/Off)

		0x1000 (ZLL Commissioning)	0x0008 (Level Control) 0x1000 (ZLL Commissioning)
Endpoint3	0x0061 GP Proxy Basic		0x0021 (Green Power)

4.3 DEVICE SPECIFICATIONS

Clusters Common to All Devices:

Clusters Common to All Devices	
Server Side	Client Side
Mandatory	
Basic	None
Identify	
Optional	
Clusters with reporting capability	Clusters with reporting capability
Power Configuration	Time
Device Temperature Configuration	OTA Upgrade
Alarms	
Electrical Measurement	
Poll Control	
Partition	Partition
Manufacturer-specific	Manufacturer-specific

Note: The Range Extender device shall only support the mandatory common clusters

Features and Functions Supported by an HA Device:

Features and Functions Supported by an HA Device	
Join (end devices and routers only)	M
Form Network (Coordinator only)	M
Allow Others to Join Network (routers and Coordinators only)	M
Restore to Factory Fresh Settings	M
Enable Identify Mode	O
Group Nodes (send out an Add Group If Identify)	O
Create Scene (Store Scene)	O
Service discovery (Match Descriptor Request)	O
ZDP Bind Response	O
ZDP Unbind Response	O
End Device Annce/Device Annce	M
Service Discovery Response (Match Descriptor Response)	M
EZ-Mode Commissioning	M

4.4 Basic Cluster [0x0000]

This cluster supports an interface to the node or physical device. It provides attributes and commands for determining basic information, setting user information such as location, and resetting to factory defaults.

Command:

Command Identifier	Description	M/O	Remarks
0x00	Reset to Factory Defaults	0	Reset to Factory Defaults

Command Generated: NULL

Attributes:

Identifier	Name	Type	Range	Access	Default	M/O
0x0000	ZCLVersion	uint8	0x00-0xff	Read Only	0x08	M
0x0001	<i>ApplicationVersion</i>	uint8	0x00-0xff	Read Only	0x40 (1.0.0)	0
0x0002	<i>StackVersion</i>	uint8	0x00-0xff	Read Only	0x00	0
0x0003	<i>HWVersion</i>	uint8	0x00-0xff	Read Only	0x01	0
0x0004	<i>ManufacturerName</i>	string	0-32 bytes	Read Only	AL001	0
0x0005	<i>ModelIdentifier</i>	string	0-32 bytes	Read Only	WG001-Z01	0
0x0006	<i>DateCode</i>	string	0-16 bytes	Read Only	Empty string	0
0x0007	<i>PowerSource</i>	enum8	0x00-0xff	Read Only	0x01	M
0x0010	<i>LocationDescription</i>	string	0-16 bytes	Read Write	Empty string	0
0x0011	<i>PhysicalEnvironment</i>	enum8	0x00-0xff	Read Write	0x00	0
0x0012	<i>DeviceEnabled</i>	bool	0x00-0x01	Read Write	0x01	0
0x0013	<i>AlarmMask</i>	map8	000000xx	Read Write	0x00	0
0x0014	<i>DisableLocalConfig</i>	map8	000000xx	Read Write	0x00	0
0x00F0	<i>InstallCode</i>	string	20 bytes	Read Write	Install Code	0
0x00F1	<i>SerialNumber</i>	string	16 bytes	Read Write	Serial Number	0
0x00F2	<i>uniqueNumber</i>	string	8 bytes	Read Only	<i>unique</i> Number	0
0x4000	<i>SWBuildID</i>	string	Upto16bytes	Read Only	Empty string	0

Note:

ApplicationVersion format: fv.sv.tv (0.0.0 –3.3.15)

Shortened name	Full name	Description
fv	First version	. The first bit, 2 bits, numbers 1 ~ 3, when sv bit is full, fv++ . fv counts from 1
sv	Second version	. The second bit, 2 bits, numbers 0 ~ 3, when the tv bit is full, sv++ . Value range: 0 ~ 3 . sv counts from 0
tv	Third version	. The third, 4 bits, numbers 0-15, test once, tv++ . tv counts from 0

SN:

Offset from User Data starting address		Description		
Series 1	Series 2	Size	Name	Description
0x001A	0x0010	16 Bytes	TOKEN_MFG_STRING	Serial number

Install Code:

Offset from User Data starting address		Description		
Series 1	Series 2	Size	Name	Description
0x0270	0x0270	20 Bytes	TOKEN_MFG_INSTALLATION_CODE	Install code

4.5 Identify Cluster [0x0003]

Attributes and commands to put a device into an Identification mode (e.g., flashing a light), that indicates to an observer – e.g., an installer - which of several devices it is, also to request any device that is identifying itself to respond to the initiator.

Command Received:

Command Identifier	Description	M/O
0x00	Identify	M
0x01	Identify Query	M
0x40	Trigger effect	0

Command Generated:

Command Identifier Field Value	Description	M/O
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0x00	Identify Query Response	M
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Attributes:

Identifier	Name	Type	Range	Access	Default	M/O
0x0000	Identify Time	uint16	0x0000-0xffff	Read Write	0x0000	M

4.6 ZLL commissioning [0x1000]

The *touchlink commissioning* cluster shall have a cluster identifier of 0x1000. Those commands in the touchlink commissioning command set shall be sent using the profile identifier, 0xc05e whereas those commands in the commissioning utility command set shall sent using the profile identifier, 0x0104.

Command Received:

	Identifier	Description	M/O	Remarks
Touchlink	0x01	Scan response	M	
	0x03	Device information response	M	
	0x11	Network start response	M	
	0x13	Network join router response	M	
	0x15	Network join end device response	M	
Utility	0x40	Endpoint information	O	
	0x41	Get group identifiers response	M	
	0x42	Get endpoint list response	M	

Command Generated:

	Identifier	Description	M/O	Remarks
Touchlink	0x00	Scan request	M	
	0x02	Device information request	M	
	0x06	Identify request	M	
	0x07	Reset to factory new request	M	
	0x10	Network start request	M	
	0x12	Network join router request	M	
	0x14	Network join end device request	M	
	0x16	Network update request	M	

Utility	0x41	Get group identifiers request	O	
	0x42	Get endpoint list request	O	

4.7 OTA Upgrade [0x00019]

The main goal of Over The Air Upgrade cluster is to provide an interoperable mean for devices from different manufacturers to upgrade each other's image. Additionally, the OTA Upgrade cluster defines a mechanism by which security credentials, logs and configuration file types are accessible by offering a solution that utilizes a set of optional and mandatory commands.

Firmware information:

Command Identifier	Description
Manufacture ID	0x1310
Image Type	0x1602