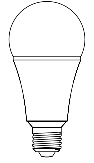
AEOTEC
BY AEON LABS

LED BULB

View the expanded manual:
http://aeotec.com/support

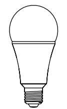


① Aeotec by Aeon Labs LED Bulb.

Make any light a smart light.
LED Bulb brings the connected light bulb to Z-Wave. Offering the perfect shades of cool and warm light, along with 16 million shades of other coloured light, LED Bulb is the modern light bulb as it should be: connected, controllable and perfectly considered.

② Familiarise yourself with your LED Bulb.

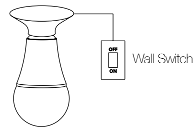
Your LED Bulb contains all its technology within its silver and white exterior. It has no external buttons.



ADDED WEIGHT OF THE DEVICE MAY CAUSE INSTABILITY OF A FREE-STANDING PORTABLE LUMINAIRE.
THIS DEVICE IS NOT INTENDED FOR USE WITH EMERGENCY EXITS OR NOT FOR EMERGENCY LIGHTING.
SUITABLE FOR USE IN ENCLOSED LUMINAIRES.

③ Quick start.

Getting your LED Bulb up and running is as simple as inserting it into a lamp holder and adding it to your existing Z-Wave network. You'll need to set your Z-Wave hub to accept new products; to do this, please refer to its user manual.



1. Toggle off the wall switch into the OFF position.
2. Remove any existing light bulb and replace it with LED Bulb.
3. Set your Z-Wave gateway to accept new products.
4. With LED Bulb in its fitting, wait 2 seconds. Now toggle your wall switch ON. LED Bulb's green LED will blink to indicate that it is looking for a Z-Wave network to connect to.
5. After successfully connecting to your network, LED Bulb will illuminate. If a network connection has failed, it will remain without light.

Using LED Bulb.

With your LED Bulb now a part of your smart home, you'll be able to schedule, configure and control it your Z-Wave gateway. Please refer to the relevant pages of your gateway's user manual for instructions on configuring LED Bulb to your needs.
Please note that the wall switch controlling LED Bulb needs to be left in the on position in order for LED Bulb to function within your Z-Wave network. In the off position, LED Bulb will not be able to draw power and will not be remotely controllable nor be able to serve as a Z-Wave repeater.

④ Advanced functions.

Manually changing LED Bulb's colour.

LED Bulb can fill your room with multiple shades of white and an additional 16 million different colours. It's possible to manually select some of these without the use of your Z-Wave gateway. To do this;

1. Keep the wall switch in the "ON" state and then toggle LED Bulb off, on, off, on in quick succession via its wall switch. LED Bulb has now entered colour cycle mode and will cycle through the following colours: warm white, cold white, red, orange, yellow, green, cyan, blue and violet.
2. When the colour cycle arrives at the colour you'd like to select, toggle off LED Bulb via the wall switch. The visible colour will be set as your bulb's default.

Removing LED Bulb from a Z-Wave network.

Your LED Bulb can be removed from your Z-Wave network at any time using your Z-Wave gateway. To set your gateway into removal mode, please refer to the respective section of its user manual.

1. Set your Z-Wave gateway into device removal mode.
2. Keep the wall switch in the "ON" state.
3. Toggle LED Bulb's wall switch off, on, off, on, off, on in fast succession.
4. LED Bulb should now be removed from your Z-Wave network. To confirm successful removal its colour will change to orange for 2 seconds before changing to white. If removal was unsuccessful, LED Bulb will blink orange for 3 seconds before changing to red for 2 seconds.

Removing LED Bulb from your Z-Wave network will reset LED Bulb to default factory settings. **Use this procedure only in the event that the network primary controller is missing or otherwise inoperable.**

Security inclusion.

1. Keep the wall switch in the "ON" state.
2. Set your Z-Wave gateway into pairing mode.
3. Toggle the wall switch off, on, off, on, off, on. The blue LED will blink to indicate the Bulb is entering into secure pairing mode.
4. If LED Bulb has been successfully added to your Z-Wave network, its RGB LED will be solid when you turn LED Bulb on.

⑤ Manual configuration.

You may wish to manually configure LED Bulb via Z-Wave command classes through your gateway. What follows is a list of the associated information.

Colour Display Cycle Configuration.

Parameter 37 [4 byte] will cycle the colour displayed by LED Bulb into different modes:

	7	6	5	4	3	2	1	0
Value 1 (MSB)	Colour Transition Style		Colour Change Speed Option			Colour Display Cycle		
Value 2	Brightness							
Value 3	Cycle Count							
Value 4 (LSB)	Time Base of Coulor Change Speed			Colour Change Speed Level				

Colour Display Cycle (4 bits)

The Colour Display Cycle field can have the following values corresponding to 4 different modes:

Colour Display Cycle	Description
0	Inactive (keep the current configuration values).
1	Rainbow Mode(red, orange, yellow, green, cyan, blue, violet).
2	Multi Colour Mode(colours cycle between selected colours).
3	Random Mode.
4	Single Colour Mode.
5 to15	Reserved.

Colour Transition Style (2 bits)

The following values correspond to 2 different transition styles between colours:

Colour Transition Style	Description
0	Smooth Colour Transition.
1	Fade Out Fade In Transition.

Cycle Count (8 bits)

The Cycle Count is used to define the number of repetitions/cycles displayed by your LED Bulb in Colour Display Cycle before stopping.

Cycle Count	Description
0	Unlimited.
1 to 254	Total number of repetitions/cycles before stopping.
255	Inactive (keep the current configuration values)Inactive (keep the current configuration values).

Brightness (8 bits)

Brightness Level	Description
1 to 99	1 = Min level. 99 = Max level.
0 or 255	Inactive (keep the current configuration values).

Time Base of Colour Change Speed (3 bits)

This function would be used when the Colour Transition Style is set to Fade Out/In.

Time Base	Description
0	Time base is 1s.
1	Time base is 10ms.
2	Time base is 100ms.

Colour Change Speed Level (5 bits)

This function would be used when the Colour Transition Style is set to Fade Out/In.

Speed Level	Description
0	Constant speed.
1 to 30	Accelerate/decelerate speed from the level 1 to 30.
31	Inactive (keep the current configuration values).

The table above shows a decimal representation of the settings that can be set on parameter 37.

Parameter 39 [4 byte] can be used to set up to 8 colours to cycle between when LED Bulb is in Multi Colour Mode. Colours transition from Colour Index 1-8.

	7	6	5	4	3	2	1	0
Value 1 (MSB)	Index 1				Index 2			
Value 2	Index 3				Index 4			
Value 3	Index 5				Index 6			
Value 4 (LSB)	Index 7				Index 8			

Colour Component Id:

ID	1	2	3	4	5	6	7	8
Colour	Red	Orange	Yellow	Green	Cyan	Blue	Violet	Pinkish

Example:
If you set the parameter 39 to 305135616 (0x12300000 in hexadecimal), the colour will be changed from Red to Orange and then Orange to Yellow circularly(Red-Orange-Yellow).

When your Bulb is in Single Colour Mode and the Fade Out Fade In transition style, the parameter 39 would be used to set the RGB value.

	7	6	5	4	3	2	1	0
Value 1 (MSB)	Red value							
Value 2	Green value							
Value 3	Blue value							
Value 4 (LSB)	Reserved							

When your Bulb is in Random Mode, the parameter 39 would be used to set the random seed, then your bulb will automatically generate random colours to be displayed according to the random seed you set.

	7	6	5	4	3	2	1	0
Value 1 (MSB)	Random seed value							
Value 2								
Value 3								
Value 4 (LSB)								

⑥ Technical specifications.

Model number: ZW098.
Bulb holder type: E26 for USA version, E27/B22 for EU/AU version.
Max operating power: 9W.
Max brightness: 750 lumens.
Rated colour temperature: 5000K.
Useful life: 25000 to 30000 hours.
Operating temperature: 0℃ to 40℃/32℉ to 104℉.
Relative humidity: 8% to 80%.
Operating distance: Up to 492 feet/150 meters outdoors.
AC Input:

Version	Input (Standby Power)	Working band
AU	230V 50Hz, Max: 0.7W	921.42MHz
BR	220V 60Hz, Max: 0.7W	921.42MHz
CN	220V 50Hz, Max: 0.7W	868.40MHz
EU	230V 50Hz, Max: 0.7W	868.42MHz
IL	230V 50Hz, Max: 0.7W	916.02MHz
IN	230V 50Hz, Max: 0.7W	865.20MHz
UK	230V 50Hz, Max: 0.7W	868.42MHz
US	120V 60Hz, Max: 0.5W	908.42MHz

⑦ Warranty.

If you are in need of any technical support during or subsequent to your products' warranty, please get in touch with our support team via http://aeotec.com/support. The Company you bought this product from has also guaranteed to assist you with any of your support needs, and you can also contact them for accordingly.
This guarantee made by the company who you purchased the product from includes the transfer of Aeon Labs' full warranty to that Company. They've guaranteed that they'll be able to assist you, the Customer, with all technical support and repair needs on our behalf.
Aeon Labs warrants to the original purchaser of Products that for the Warranty Period (as defined below), the Products will be free from material defects in materials and workmanship. The foregoing warranty is subject to the proper installation, operation and maintenance of the Products in accordance with installation instructions and the operating manual supplied to Customer. Warranty claims must be made by Customer in writing within thirty (30) days of the manifestation of a problem. Aeon Labs' sole obligation under the foregoing warranty is, at Aeon Labs' option, to repair, replace or correct any such defect that was present at the time of delivery, or to remove the Products and to refund the purchase price to Customer.
The "Warranty Period" begins on the date the Products is delivered and continues for 3 years.
Any repairs under this warranty must be conducted by an authorized Aeon Labs service representative and under Aeon Labs' RMA policy. Any repairs conducted by unauthorized persons shall void this warranty.

Excluded from the warranty are problems due to accidents, acts of God, civil or military authority, civil disturbance, war, strikes, fires, other catastrophes, misuse, misapplication, storage damage, negligence, electrical power problems, or modification to the Products or its components.

Aeon Labs does not authorize any person or party to assume or create for it any other obligation or liability in connection with the Products except as set forth herein.

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Customer must prepay shipping and transportation charges for returned Products, and insure the shipment or accept the risk of loss or damage during such shipment and transportation. Aeon Labs will ship the repaired or replacement products to Customer freight prepaid.
Customer shall indemnify, defend, and hold Aeon Labs and Aeon Labs' affiliates, shareholders, directors, officers, employees, contractors, agents and other representatives harmless from all demands, claims, actions, causes of action, proceedings, suits, assessments, losses, damages, liabilities, settlements, judgments, fines, penalties, interest, costs and expenses (including fees and disbursements of counsel) of every kind (i) based upon personal injury or death or injury to property to the extent any of the foregoing is proximately caused either by a defective product (including strict liability in tort) or by the negligent or willful acts or omissions of Customer or its officers, employees, subcontractors or agents, and/or (ii) arising from or relating to any actual or alleged infringement or misappropriation of any patent, trademark, mask work, copyright, trade secret or any actual or alleged violation of any other intellectual property rights arising from or in connection with the products, except to the extent that such infringement exists as a result of Aeon Labs' manufacturing processes.

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STORE INDOORS WHEN NOT IN USE. SUITABLE FOR DRY LOCATIONS. DO NOT IMMERSE IN WATER. NOT FOR USE WHERE DIRECTLY EXPOSED TO WATER.

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 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.

Warning

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.

Contact your local government for information regarding the collection systems available.

Certifications (regional):

Z-Wave and Z-Wave Plus are registered trademarks of Sigma Designs and its subsidiaries in the United States and other countries

FCC ID: XBAFT098

CONFORMS TO UL STD.1993
CERTIFIED TO CSA STD.C22.2 NO.1993-09

Intertek
4005555

Version:501009800004-AB

www.aeotec.com

Configuration parameter information

Parameter Number Definitions (8 bit):

Parameter Number Hex / Decimal	Description	Default Value	Size
0x14 (20)	The Bulb's state after re-power on it. 0 = The last state before re-power on. 1 = Always On. 2 = Always Off.	1	1
0x20 (32)	Enable/disable to send out a report when the color is changed. 0 = Disable. 1 = Hail CC. Others = Ignore.	0	1
0x21 (33)	Get the Bulb's color value. Value 1 = Reserved. Value 2 = Red color value. Value 3 = Green color value. Value 4 = Blue color value.	-	4
0x22 (34)	Enable/disable the function of using External Switch to turn on/off the bulb. 0 = Disable. 1 = Enable. Others = Ignore.	0	1
0x23 (35)	Enable/disable the function of using External Switch to changes the bulb's color. 0 = Disable. 1 = Enable. Others = Ignore.	1	1
0x24(36)	Reboot/save/exit Colorful mode. 0 = Un-reboot Colorful mode. 1 = Reboot Colorful mode. 2 = Exit Colorful mode. 3 = Save the current Colorful mode value and then to be exited.	-	1
0x25(37)	Colorful mode configuration. (See the below table)	0x09630000	4
0x26 (38)	Change speed: Value 1: the speed from OFF to ON. Value 2: the speed from ON to OFF. Value 3: pause time of ON. Value 4: pause time of OFF.	0x03000300	4
0x27 (39)	Color index configuration when the bulb is in Multi color mode. (See the below table)	0x87654321	4
0x50 (80)	Enable to send notifications to associated devices (Group 1) when the state of LED Bulb is changed. 0 = Nothing. 1 = Hail CC. 2 = Basic CC report.	1 (US version) 2(other version)	1
0x70 (112)	Dimmer mode: 0 = Parabolic curve. 1 = Index curve. 2 = (Parabolic + Index)/2. 3 = Linear.	0	1
0xFC (252)	Enable/disable Lock Configuration (0 =disable, 1 = enable). Value = 0, the setting of configuration parameters is allowed. Value = 1, all configuration parameters cannot be set (Locked).	0	1
0xFF (255)	1, Value = 0x55555555、Default = 1、Size = 4. Reset to factory default settings and removed from the z-wave network	N/A	4
	2, Value = 0、Default = 1、Size = 1. Reset all configuration parameters to factory default settings	N/A	1

Parameter 37 [4 byte] will set the Bulb into different modes:

	7	6	5	4	3	2	1	0
Value 1 (MSB)	Color Transition Style		Color Change Speed Option			Color Display Cycle		
Value 2	Brightness							
Value 3	Cycle Count							
Value 4 (LSB)	Time Base of Color Change Speed			Color Change Speed Level				

Color Display Cycle (4 bits)

The Color Display Cycle field can have the following values corresponding to 4 different modes:

Colour Display Cycle	Description
0	Inactive (keep the current configuration values)
1	Rainbow Mode(red, orange, yellow, green, cyan, blue, violet, pinkish)
2	Multi Color Mode(colors cycle between selected colors)
3	Random Mode
4	Single Color Mode
5 to 15	Reserved

Single Color Mode: The Bulb will be solid/ blinking with one color in this mode.

Rainbow Mode: The Bulb has 8 colors to display and will change through a range of colors (Red→Orange→Yellow→Green→Cyan→Blue→Violet→pinkish).

Multi Color Mode: The Bulb can change between multiple colors according to the color index which is configurable through configuration parameter 39, see the configuration table of parameter 39 below.

Random Mode: The Bulb's color will be displayed randomly.

Color Transition Style (2 bits)

The following values correspond to 3 different transition styles between colors:

Dim Style	Description
0	Smooth Color Transition.
1	Fade Out Fade In Transition.

Brightness (8 bits)

Level	Description
1 to 99	1 = Min level. 99 = Max level.
0 or 255	Inactive (keep the current configuration values)

Cycle Count (8 bits)

The Cycle Count is used to define the number of repetitions/cycles displayed by your LED Bulb in Color Display Cycle before stopping.

Cycle Count	Description
0	Unlimited
1 to 254	Total number of repetitions/cycles before stopping.
255	Inactive (keep the current configuration values).

Note: The process of the first color change to the last color is regarded as a cycle.

For example:

When the Bulb is in Rainbow mode, the color change from red to pink (Red→Orange→Yellow→Green→Cyan→Blue→Purple→Pink), going through the colors is regarded as 1 cycle.

Time Base of Colour Change Speed (3 bits)

This function would be used when the Color Transition Style is set to Fade out/in.

Time Base	Description
0	Time base is 1s.
1	Time base is 10ms.
2	Time base is 100ms.

Colour Change Speed Level (5 bits)

This function would be used when the Color Transition Style is set to Fade out/in.

Level	Description
0	Constant speed
1 to 30	Accelerate/decelerate speed from the level 1 to 30.
31	Inactive (keep the current configuration values)

Parameter 39 [4 byte] can be used to set the 8 colour index when the Bulb is in Multi color mode.

	7	6	5	4	3	2	1	0
Value1 (MSB)	Index 1				Index 2			
Value2	Index 3				Index 4			
Value3	Index 5				Index 6			
Value4 (LSB)	Index 7				Index 8			

Colour component id:

ID	1	2	3	4	5	6	7	8
Colour	Red	Orange	Yellow	Green	Cyan	Blue	Violet	Pinkish

The color will be changed form index 1 to index 8 circularly when your bulb is in Multi color mode.

For example:

If you set the parameter 39 to 305135616 (0x12300000 in hexadecimal, which means the Index 1=1(Red), the Index 2=2(Orange) and the Index 3=3(Yellow)), the color will be changed from Blue to Violet and then Violet to Pinkish (Red→Orange→Yellow).

When your Bulb is in Single Colour Mode and the Fade Out Fade In transition style, the parameter 39 would be used to set the RGB value.

	7	6	5	4	3	2	1	0
Value1 (MSB)	Red value							
Value2	Green value							
Value3	Blue value							
Value4 (LSB)	Reserved							

When your Bulb is in Random Mode, the parameter 39 would be used to set the random seed, then your bulb will automatically generate random colours to be displayed according to the random seed you set.

	7	6	5	4	3	2	1	0
Value1 (MSB)	Random seed value							
Value2								
Value3								
Value4 (LSB)								

Association information

The LED Bulb supports 2 association groups and can add max 5 nodes for each group.

Association Group	Nodes	Send Mode	Send commands
Group 1	0	N/A	N/A
	1 [2,5]	Single Cast	When the state of LED Bulb (turn on/off the bulb) is changed: 1, Set Configuration parameter 80 to 0: Reserved (Default). 2, Set Configuration parameter 80 to 1: Send Hail CC. 3. Set Configuration parameter 80 to 2: Send the Basic Report.
Group 2	0	N/A	N/A
	[1,5]	Single Cast	Forward the Basic Set, Switch Binary Set, Switch Multilevel Start Level Change, Switch Multilevel Stop Level Change, Switch Multilevel Set, Scene Activation Set to associated nodes in Group 2 when the LED Bulb receives the Basic Set, Switch Binary Set, Switch Multilevel Start Level Change, Switch Multilevel Stop Level Change, Switch Multilevel Set, Scene Activation Set commands from the main controller.

5.5 Association Group Info Command Class

5.5.1 Association Group Info Report Command Class

Profile: General: NA (Profile MSB=0, Profile LSB=0)

5.5.2 Association Group Name Report Command Class

Group 1：Lifeline

Group 2：Retransmit

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