

## Nano Dimmer (User Guide)

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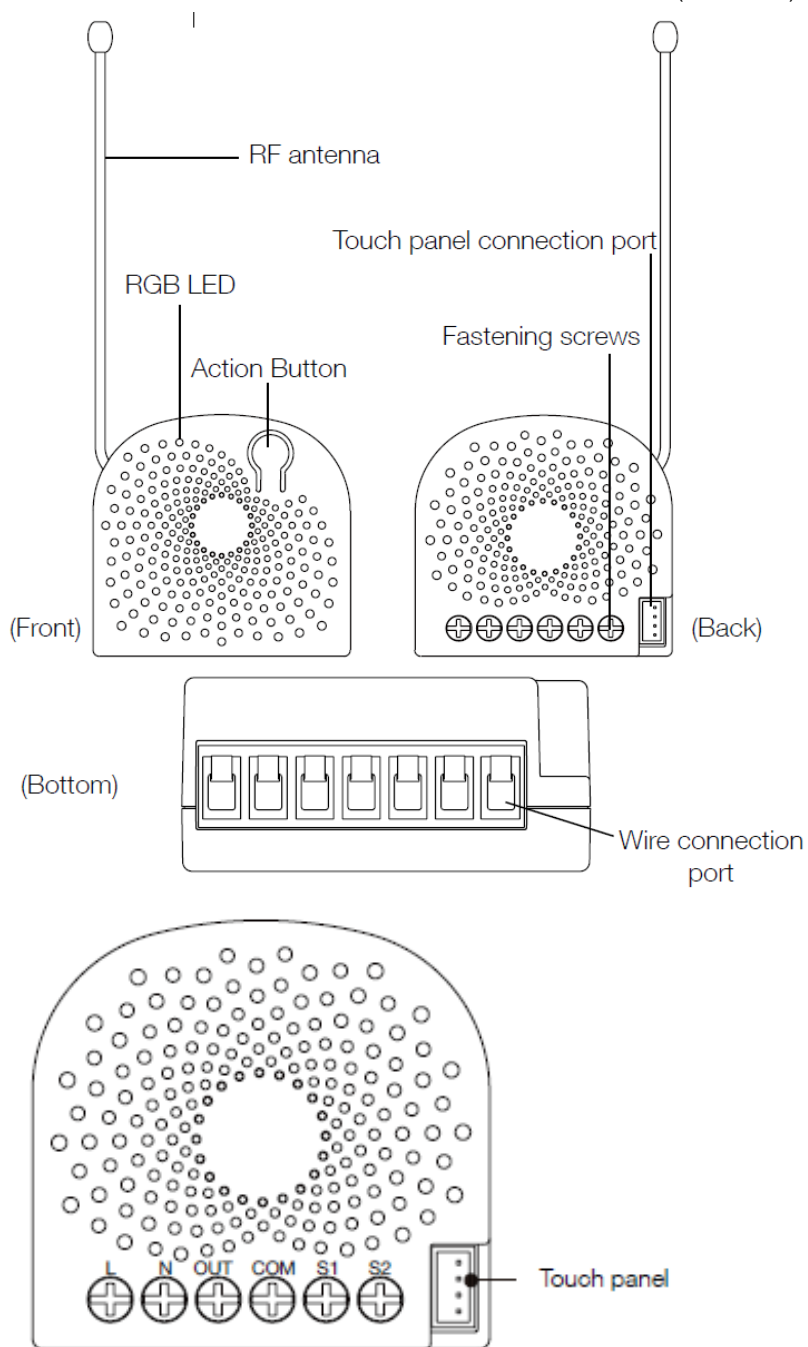
### **Aeotec by Aeon Labs Nano Dimmer.**

Aeotec Nano Dimmer is a low-cost Z-Wave Switch specifically used to enable Z-Wave command and control (on/off/dim) of any wall switches. It can report immediate wattage consumption or kWh energy usage over a period of time. In the event of power failure, non-volatile memory retains all programmed information relating to the unit's operating status.

It can connect to 2 external manual switches to control the load ON/OFF independently. Its surface has a pin socket, which can be used for connecting to the touch panel, so you can also use the touch panel to control the Nano Dimmer.

The Nano Dimmer is also a security Z-Wave plus device and supports Over The Air (OTA) feature for the products firmware upgrade.

### **Familiarize yourself with your Nano Dimmer.**



### Notes for the wire connection ports:

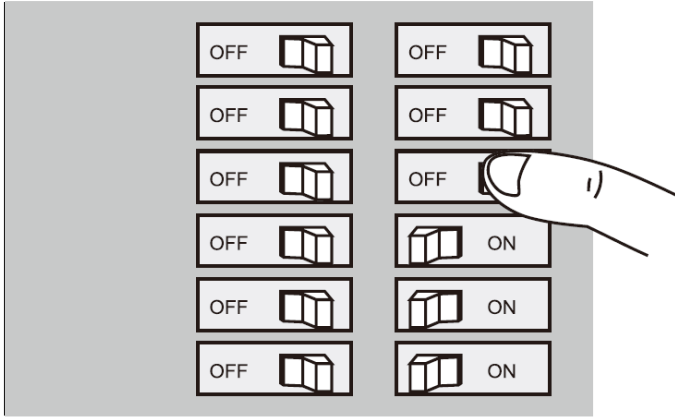
- L** – Power input for live
- N** – Power input for neutral
- OUT** – Output for load
- COM** – Common port for all External switches (S1 and S2)
- S1** – External switch 1 control for load
- S2** – External switch 2 control for load

### Install the Nano Dimmer.

**Important: A licensed electrician with knowledge and understanding electrician systems and electrical safety should complete the electrical installation.**

1. Shut off the main circuit breaker of your home for safety during the installation and ensure the wires are not short circuited during the installation which will cause damage to the Nano Dimmer.

Note: Your home's main circuit breaker must support the overload protection for safety.

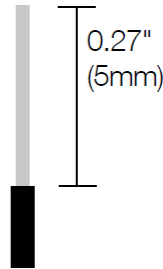
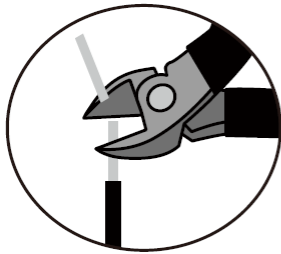


2. Preparing connection wires

14 AWG power wires for Input/Output.

18 AWG copper wires for external manual switch.

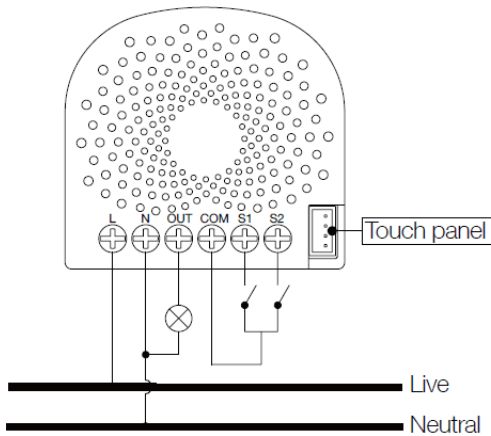
Use the wire stripper cut the metallic part of the connection wire and make sure the length of the metallic part is about 5mm.



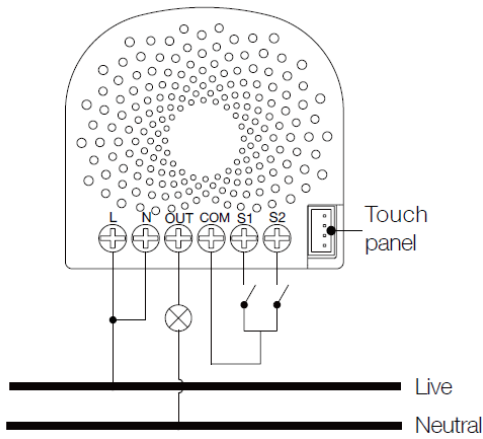
Cut wire if necessary      Strip Gage (measure bare here)

Note: All connection wires needs to be flexible cable.

**Wiring diagram of 3-Wire system**

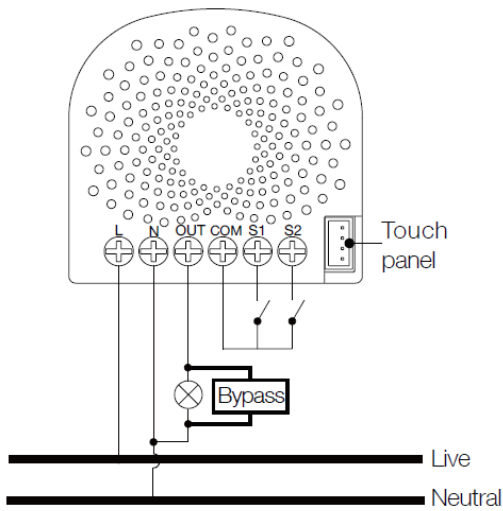


**Wiring diagram of 2-Wire system**

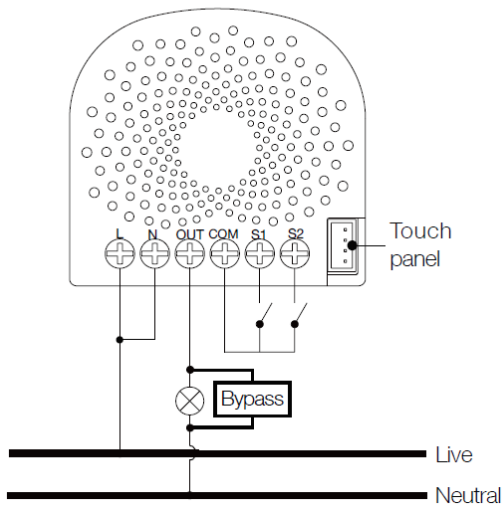


Note: The “N” terminal should be connected to the “L” terminal when the Nano Dimmer is installed by 2-Wire system.

You may need to connect a small power load (E.g. a LED light or a compact fluorescent lamp) to be controlled. In this case, the Nano Dimmer may not get enough power from the AC power supply, so a bypass can be added to act as a dummy load to keep your Nano Dimmer get enough power from the power supply. It can also keep your light from flickering when dimming off the light.



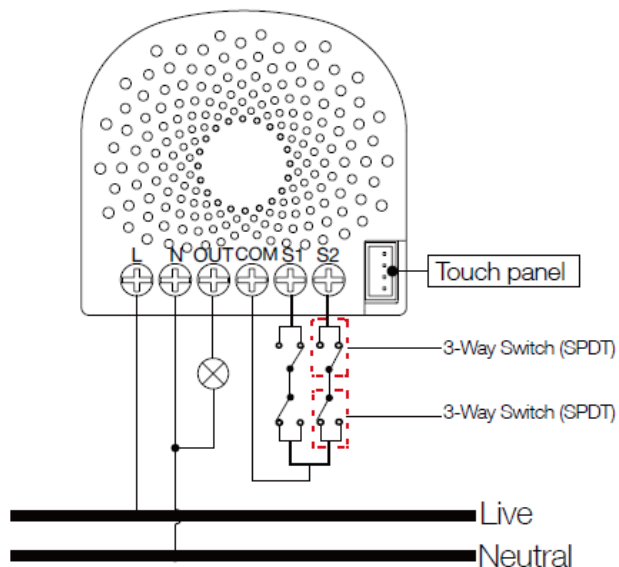
or



All above wiring diagrams show that the Nano Dimmer uses 2-Way or momentary button switches as the external manual switch.

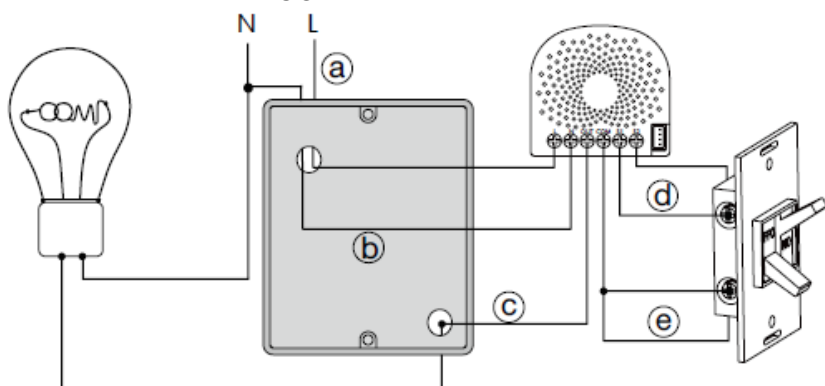
The below diagram will show you that the Nano Dimmer uses the SPDT (Single-Pole Double-Throw) switches as the external manual switch.

### Wiring diagram of SPDT as the external manual switch

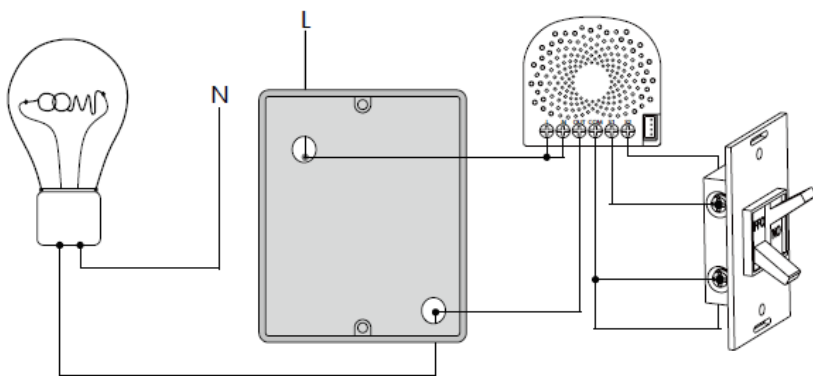


### 3. Install Nano Dimmer to the gang box.

- Live/Hot wire connection:** Connect the Live/Hot wire to the “L” terminal on the Nano Dimmer.
- Neutral wire connection:** Connect the Neutral wire to the “N” terminal on the Nano Dimmer.
- Load wire connection:** Connect the Load wire to the “OUT” on the Nano Dimmer.
- External/manual Switch connection 1:** Connect 2 18AWG wires to the “S1” and “S2” on the Nano Dimmer.
- External/manual Switch connection 2:** Connect 2 18AWG wires from the 2 terminals on the External/manual Switch to the “COM” on the Nano Dimmer.



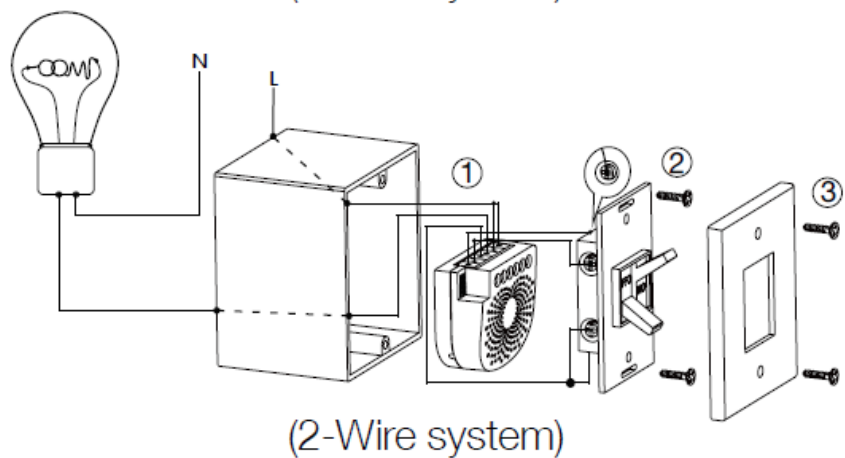
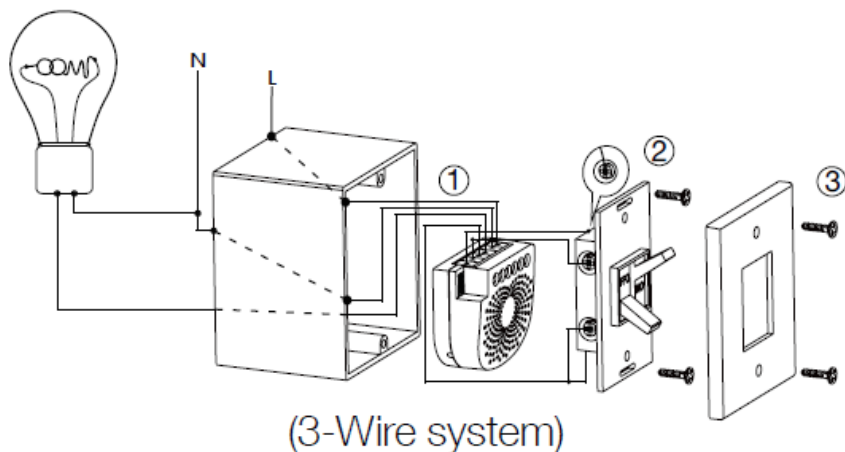
Note: The above physical connection diagram is for 3-Wire system, the below diagram would be for the 2-Wire system.



In 2-Wire system, since the power input terminals of Nano Dimmer just need to connect one power wire, so the terminal of “N” on Nano Dimmer should connect to the “L” on the Nano Dimmer.

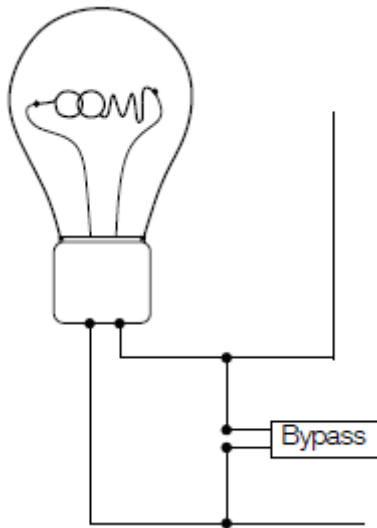
#### 4. Mounting the gang box.

- Position all wires to provide room for the device. Place the Nano Dimmer inside the gang box towards the back of the box.
- Position the antenna towards the back of the box, away from all other wiring.
- Reinstall the Nano Dimmer to the gang box.
- Reinstall the cover onto the gang box.



#### Note:

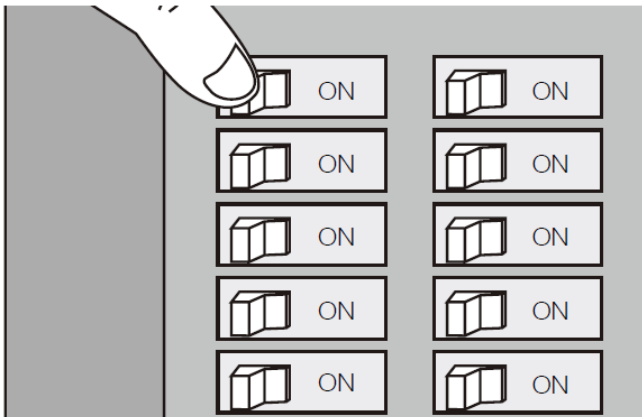
- The gang box should be sized  $3 \times 2 \times 2.75$  inch /  $75 \times 50 \times 70$  mm or larger, minimum volume  $14 \text{ in}^3 / 230 \text{ cm}^3$ .
- Use flexible copper conductors only.
- If a Bypass installation is needed, the Bypass should be in parallel with the bulb load, see below:



**Warning:** The main circuit breaker or fuse must be shut off during the Bypass installation or bulb change.

#### 5. Restore Power.

Restore power at the main circuit breaker or fuse.



When Nano Dimmer is powered on, it will automatically identify the connected load type and then match it.

## Quick start.

### Adding your Nano Dimmer to a Z-Wave network.

After your Nano Dimmer is installed and powered on, you are now able to manually control the Nano Dimmer to turn it On/Off/Dim directly via pressing your Nano Dimmer's Action Button, it is time to add your Nano Dimmer to the Z-Wave network. To set your Z-Wave gateway/controller into pairing mode, please refer to the respective section within your controller instruction manual.

1. Set your Z-Wave controller into pairing mode.
2. Press the Action Button on the Nano Dimmer or toggle the external manual switch once, the green LED (non-secure indication) will blink to indicate the Nano Dimmer is entering into pairing mode.
3. If the Nano Dimmer has been successfully added to your Z-Wave network, its RGB LED will be solid. If the pairing was unsuccessful, the red LED will be on for 2 seconds and then remain a colourful gradient, repeat the instructions above from step 1.

With your Nano Dimmer now working as a part of your smart home, you'll be able to configure it from your home control software/phone application. Please refer to your software's user guide for further instructions on configuring Nano Dimmer to your needs.

The colour of RGB LED will change according to the output load power level:

Version	LED indication	Output (W)
US	Green	[0W, 48W)
	Yellow	[48W, 96W)
	Red	[96W, 144W)
AU	Green	[0W, 92W)
	Yellow	[92W, 184W)
	Red	[184W, 276W)
EU	Green	[0W, 92W)
	Yellow	[92W, 184W)
	Red	[184W, 276W)

## Removing Nano Dimmer from a Z-Wave network.

Your Nano Dimmer can be removed from your Z-Wave network at any time. You'll need to use your Z-Wave network's main controller. To set your Z-Wave controller/gateway into removal mode, please refer to the respective section within your controller instruction manual.

1. Set your Z-Wave controller into removal mode.
2. Press the Action Button on the Nano Dimmer or toggle the external manual switch 3 times in fast succession.
3. If the Nano Dimmer has been successfully removed from your Z-Wave network, its RGB LED will remain colourful gradient. If the removal was unsuccessful, the RGB LED will still be solid (following the state of the output load), repeat the instructions above from step 1.

## Advanced functions.

### Changing mode on the External Switch/Button Control.

The Nano Dimmer can be controlled via 2-state (flip/flop) external/manual switch, momentary push button or the 3-way switch. To automatically detect and set the mode to the appropriate type of manual switch wired into Nano Dimmer, toggle the button on the manual switch once and wait 2 seconds for the Nano Dimmer to detect the type of manual switch.

You can also set the external switch mode through Configuration Command Class.

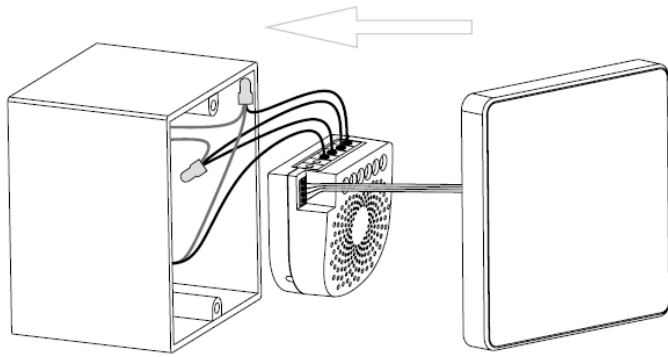
Parameter 120 [1 byte dec] is the parameter that will set one of the 3 different modes. If you set this configuration to:

- (0) Enter automatic identification mode.
- (1) Momentary push button mode
- (2) 3-way switch mode
- (3) 2-state switch mode

### Touch panel control.

As you can see that the Nano Dimmer's surface has a pin port, this port is used to connect the Touch panel. When you have already connected it to the Nano Dimmer, you will be possible to control the Nano Dimmer through the Touch panel directly.





## Monitoring Energy Consumption.

The Aeotec Nano Dimmer can report wattage energy usage or kWh energy usage to a Z-Wave control point when requested. If this function is supported by the control points, the energy consumption will be displayed in the user interface of the control points. (The specific Z-Wave commands supporting energy monitoring are the Meter Command Class. Automatic reports are sent to association group 1, which is setup via the Association Command Class.) Please consult the operation manual for these control points for specific instructions on monitoring the Nano Dimmer.

## Security or Non-security feature of your Nano Dimmer in Z-Wave network.

### Including Nano Dimmer as a non-secure device:

If you want your Nano Dimmer as a non-secure device in your Z-Wave network, press the Action Button once on Nano Dimmer when you pair it to your gateway. If inclusion is successful, the green LED will be on for 2 seconds, and then return to a solid indication. If inclusion is unsuccessful, the red LED will be on for 2 seconds and then return to a colourful gradient.

### Including Nano Dimmer as a secure device:

In order to take full advantage of the Nano Dimmer, you will want your Nano Dimmer as a security device that uses encrypted messages to communicate in your Z-wave network. A security enabled controller/gateway (or Z-Wave Plus controller) is required.

1. Set your Z-Wave Plus controller into pairing mode.
2. Press the Action Button 2 times within 1 second on the Nano Dimmer, the blue LED (secure indication) will blink to indicate the Nano Dimmer is entering into secure pairing mode.
3. If the Nano Dimmer has been successfully added to your Z-Wave network, its RGB LED will be solid. If the pairing was unsuccessful, the red LED will be on for 2 seconds and then remain a colourful gradient, repeat the instructions above from step 1.

## Reset your Nano Dimmer.

If at some stage, your primary controller is missing or inoperable, you may wish to reset all of your Nano Dimmer's settings to their factory defaults.

To do this, press and hold the Action Button for 20 seconds and then release it. Your Nano Dimmer will now be reset to its original settings, and the green LED will be solid for 2 seconds and then remain the colourful gradient status as a confirmation.

## Technical specifications.

**Model number:** ZW111

**Power input:** 120 to 240VAC, 50/60Hz.

**Rated output:** Max 1.2A.

**Max standby power:** <0.8W.

**Power measurement accuracy:** + or - 3W.

**Operating temperature:**

0°C to 40°C

32°F to 104°F.

**Relative humidity:** 8% to 80%.**Operating distance:**Up to 492 feet outdoors.

Up to 150 meters outdoors.

**Supported Loads:**

Control ability	Supported load types
With dimming function (On/Off/Dim control)	Incandescent bulbs, halogen bulbs with or without electronic transformer, dimmable LED bulbs, dimmable compact fluorescent lamps.
Without dimming function (On/Off control)	Non-dimmable bulbs (Compact fluorescent lamps with electronic rectifier, fluorescent tube lamps with electronic ballast, LED bulbs).

**Warning.**

1. Install only in a UL listed junction box sized  $3 \times 2 \times 2.75$  inch ( $75 \times 50 \times 70$  mm) or larger, minimum volume 14 in<sup>3</sup> (230 cm<sup>3</sup>).
2. Use Copper Conductors Only.
3. "CAUTION – Risk of Electric Shock – More than one disconnect switch may be required to de-energize the equipment before servicing".
4. "WARNING - This device shall not be used in combination with a wall switch controlling a receptacle."