



Aeotec

## Nano Dimmer

SKU: AEOEZW111



### Quickstart

This is a **secure Light Dimmer for Europe**. To run this device please connect it to your mains power supply. Turn the primary controller of Z-Wave network into inclusion mode, short press the products Action button that you can find on the product's housing.

### Important safety information

Please read this manual carefully. Failure to follow the recommendations in this manual may be dangerous or may violate the law. The manufacturer, importer, distributor and seller shall not be liable for any loss or damage resulting from failure to comply with the instructions in this manual or any other material. Use this equipment only for its intended purpose. Follow the disposal instructions. Do not dispose of electronic equipment or batteries in a fire or near open heat sources.

### What is Z-Wave?

Z-Wave is the international wireless protocol for communication in the Smart Home. This device is suited for use in the region mentioned in the Quickstart section.

Z-Wave ensures a reliable communication by reconfirming every message (**two-way communication**) and every mains powered node can act as a repeater for other nodes (**meshed network**) in case the receiver is not in direct wireless range of the transmitter.

This device and every other certified Z-Wave device can be **used together with any other certified Z-Wave device regardless of brand and origin** as long as both are suited for the same frequency range.

If a device supports **secure communication** it will communicate with other devices secure as long as this device provides the same or a higher level of security. Otherwise it will automatically turn into a lower level of security to maintain backward compatibility.

For more information about Z-Wave technology, devices, white papers etc. please refer to [www.z-wave.info](http://www.z-wave.info).



### Product Description

Aeotec Nano Dimmer is a Z-Wave Smart Dimmer 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 units 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.

### Prepare for Installation / Reset

Please read the user manual before installing the product.

In order to include (add) a Z-Wave device to a network it **must be in factory default state**. Please make sure to reset the device into factory default. You can do this by performing an Exclusion operation as described below in the manual. Every Z-Wave controller is able to perform this operation however it is recommended to use the primary controller of the previous network to make sure the very device is excluded properly from this network.

#### Reset to factory default

This device also allows to be reset without any involvement of a Z-Wave controller. This procedure should only be used when the primary controller is inoperable.

Press and hold the Action button that you can find on the product's housing for 20 seconds and then release. This procedure should only be used when the primary controller is missing or inoperable.

#### Safety Warning for Mains Powered Devices

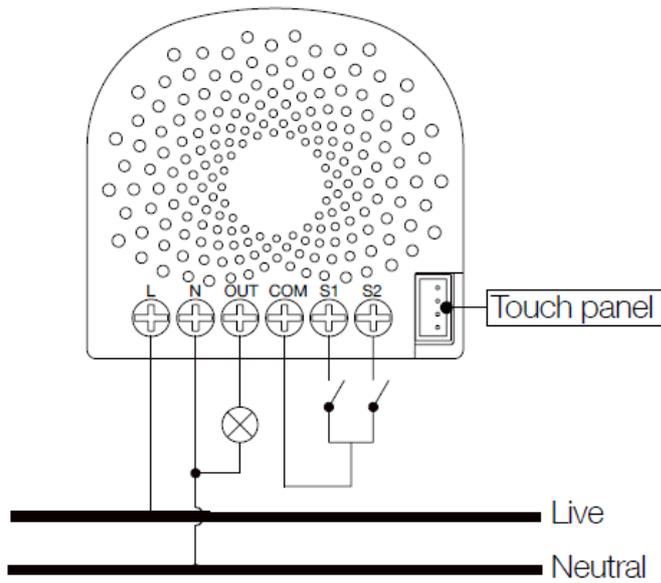
**ATTENTION:** only authorized technicians under consideration of the country-specific installation guidelines/norms may do works with mains power. Prior to the assembly of the product, the voltage network has to be switched off and ensured against re-switching.

### Installation

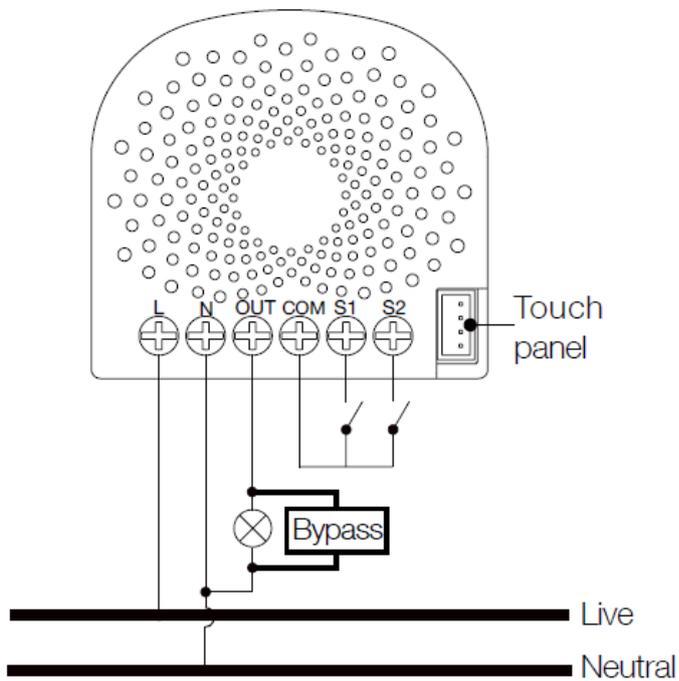
1. Shut off the main circuit breaker of your home for safety during the installation and ensure the wires are not short circuited during the installation which will cause damage to the Nano Dimmer
2. Preparing connection wires 14 AWG or 12 AWG power wires for Input/Output. 18 AWG copper wires for external 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.

Note: All connection wires need to be flexible cable

## Wiring diagram of 3-Wire system.

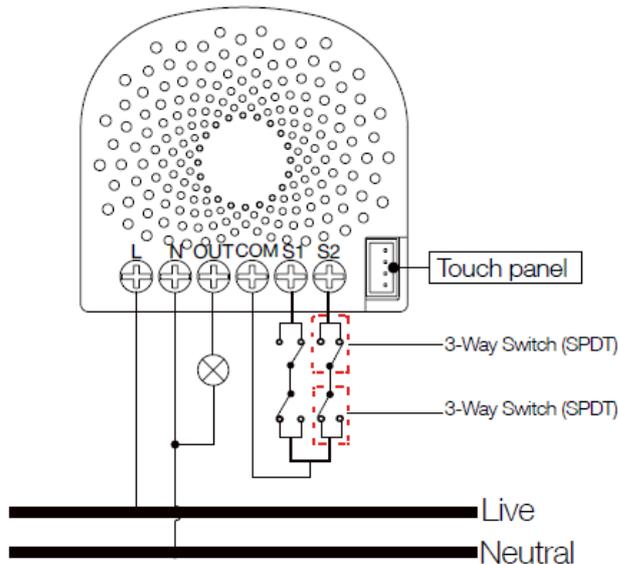


You may need to connect a small power load (E.g. a LED light or a compact fluorescent lamp) to be controlled. In this case, the Nano Dimmer may not get enough power from the AC power supply, so a bypass can be added to act as a dummy load to keep your Nano Dimmer get enough power from the power supply.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



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.



Since the S1 port and S2 port can be used to control the load separately, you can choose to connect the SPDT switches to the S1 or S2.

### Inclusion/Exclusion

On factory default the device does not belong to any Z-Wave network. The device needs to be **added to an existing wireless network** to communicate with the devices of this network. This process is called **Inclusion**.

Devices can also be removed from a network. This process is called **Exclusion**. Both processes are initiated by the primary controller of the Z-Wave network. This controller is turned into exclusion respective inclusion mode. Inclusion and Exclusion is then performed doing a special manual action right on the device.

#### Inclusion

1. Install the device according to the instructions.
2. Press the button 2 times within 1 second on the Nano Dimmer.

#### Exclusion

1. Press the button once on the Nano Dimmer.

### Quick trouble shooting

Here are a few hints for network installation if things dont work as expected.

1. Make sure a device is in factory reset state before including. In doubt exclude before include.
2. If inclusion still fails, check if both devices use the same frequency.
3. Remove all dead devices from associations. Otherwise you will see severe delays.
4. Never use sleeping battery devices without a central controller.
5. Dont poll FLIRS devices.
6. Make sure to have enough mains powered device to benefit from the meshing

### Association - one device controls another device

Z-Wave devices control other Z-Wave devices. The relationship between one device controlling another device is called association. In order to control a different device, the controlling device needs to maintain a list of devices that will receive controlling commands. These lists are called association groups and they are always related to certain events (e.g. button pressed, sensor triggers, ...). In case the event happens all devices stored in the respective association group will receive the same wireless command wireless command, typically a 'Basic Set' Command.

#### Association Groups:

Group Number	Maximum Nodes	Description
1	5	Z-Wave Plus Lifeline. When the load state of Nano Dimmer (on/off/dim the load) is changed, the Hail CC, Switch Multilevel Report and Basic Report (configured by parameter 80) can be sent to the associated nodes in this group.
2	5	Forward the Basic Set, Switch Binary Set, Switch Multilevel Start Level Change, Switch Multilevel Stop Level Change, Switch Multilevel Set, Switch all to the associated nodes in Group 2 when the Nano Dimmer receives the Basic Set, Switch Binary Set, Switch Multilevel Start Level Change, Switch Multilevel Stop Level Change, Switch Multilevel Set, Switch all commands from main controller.
3	5	Send Basic Set (configured by parameter 0x51) to the associated nodes in Group 3 when the external switch S1 is operated
4	5	Send Basic Set (configured by parameter 0x52) to the associated nodes in Group 4 when the external switch S2 is operated

## Configuration Parameters

Z-Wave products are supposed to work out of the box after inclusion, however certain configuration can adapt the function better to user needs or unlock further enhanced features.

**IMPORTANT:** Controllers may only allow configuring signed values. In order to set values in the range 128 ... 255 the value sent in the application shall be the desired value minus 256. For example: To set a parameter to 200 it may be needed to set a value of 200 minus 256 = minus 56. In case of a two byte value the same logic applies: Values greater than 32768 may needed to be given as negative values too.

### Parameter 3: Current Overload Protection.

*Output Load will be turned off automatically after 30 seconds and if the current overrun 1.5A.*

Size: 1 Byte, Default Value: 1

Setting	Description
0	Disable
1	Enable

### Parameter 4: Overheat protection.

*Output Load will be turned off automatically after 30 seconds and if the temperature of product inside exceeds 100°C.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Disable
1	Enable

### Parameter 20: Configure the output status after re-power on it.

*Configure the output status after re-power on it.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Last status
1	Always on
2	Always off

### Parameter 80: To set which notification would be sent to the associated devices (Group 1)

*To set which notification would be sent to the associated devices (Group 1) when the state of Nano Dimmers load is changed.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Send Nothing
1	Send Hail CC
2	Send Basic CC report
3	Send Multilevel Switch report
4	Send Hail CC when using the manual switch to change the load state.

### Parameter 81: To set which notification would be sent to the associated nodes in association group 3

*To set which notification would be sent to the associated nodes in association Group 3 when using the external switch 1 to switch the loads.*

Size: 1 Byte, Default Value: 1

Setting	Description
0	Send Nothing
1	Send Basic Set CC

### Parameter 82: To set which notification would be sent to the associated nodes in association group 4

*To set which notification would be sent to the associated nodes in association Group 4 when using the external switch 2 to switch the loads.*

Size: 1 Byte, Default Value: 1

Setting	Description
0	Send Nothing
1	Send Basic Set CC

### Parameter 85: Set appointment 1

*Set the ON time of output load.*

Size: 4 Byte, Default Value: 1573017

Setting	Description
0 - 99	The brightness level
256 - 316	The minute value of ON time
65536 - 65560	The hour value of ON time
16777215 - 16777222	The day value (Mon to Sun)

#### Parameter 86: Set appointment 2

*Set the ON time of output load.*

Size: 4 Byte, Default Value: 2293760

Setting	Description
0 - 99	The brightness level
256 - 316	The minute value of ON time
65536 - 65560	The hour value of ON time
16777215 - 16777222	The day value (Mon to Sun)

#### Parameter 90: Enables/disables parameter 91 and 92 below:

*Enables/disables the function of parameter 91 and 92.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Disable
1	Enable

#### Parameter 91: Set the threshold value of wattage.

*Threshold change in wattage (in terms of wattage) to induce an automatic report.*

Size: 2 Byte, Default Value: 25

Setting	Description
0 - 60000	The threshold value range is 0 to 60000

#### Parameter 92: Set the threshold value of wattage.

*Threshold change in wattage (in terms of percentage) to induce an automatic report.*

Size: 1 Byte, Default Value: 5

Setting	Description
0 - 100	The threshold value range is 0 to 100

#### Parameter 100: Set parameter 101-103 to default value.

*Set parameter 101-103 to default value.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Reset the parameter 101-103

#### Parameter 101: To set which reports need to be sent in Report group 1.

*To set which reports need to be sent in Report group 1.*

Size: 4 Byte, Default Value: 0

Setting	Description
1	Send Meter Report of voltage (V)
2	Send Meter Report of current (A)
4	Send Meter Report of wattage (W)
8	Send Meter Report of energy (kWh)

#### Parameter 102: To set which reports need to be sent in Report group 2.

*To set which reports need to be sent in Report group 2.*

Size: 1 Byte, Default Value: 0

Setting	Description
1	Send Meter Report of voltage (V)
2	Send Meter Report of current (A)
4	Send Meter Report of wattage (W)
8	Send Meter Report of energy (kWh)

Parameter 103: To set which reports need to be sent in Report group 3.

*To set which reports need to be sent in Report group 3.*

Size: 1 Byte, Default Value: 0

Setting	Description
1	Send Meter Report of voltage (V)
2	Send Meter Report of current (A)
4	Send Meter Report of wattage (W)
8	Send Meter Report of energy (kWh)

Parameter 110: Set parameter 111-113 to default value.

*Set parameter 111-113 to default value.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Reset the parameter 111-113

Parameter 111: Set the interval of automatic report for Report group 1.

*Set the interval of automatic report for Report group 1.*

Size: 4 Byte, Default Value: 3

Setting	Description
1 - 2147483647	The range of interval time is 1 to 2147483647.

Parameter 112: Set the interval of automatic report for Report group 2.

*Set the interval of automatic report for Report group 2.*

Size: 4 Byte, Default Value: 600

Setting	Description
1 - 2147483647	The range of interval time is 1 to 2147483647.

Parameter 113: Set the interval of automatic report for Report group 2.

*Set the interval of automatic report for Report group 3.*

Size: 4 Byte, Default Value: 600

Setting	Description
1 - 2147483647	The range of interval time is 1 to 2147483647.

Parameter 120: Configure the external switch mode for S1.

*Configure the external switch mode for S1.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Enter automatic identification mode
1	2-state switch mode
2	3 way switch mode
3	Momentary push button mode

Parameter 121: Configure the external switch mode for S2.

*Configure the external switch mode for S2.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Enter automatic identification mode
1	2-state switch mode
2	3 way switch mode
3	Momentary push button mode

#### Parameter 122: Get the state of touch panel port

*Get the state of touch panel port*

Size: 1 Byte, Default Value: 0

Setting	Description
0	the touch panel is not connected.
5	the touch panel is connected.

#### Parameter 123: Set the control destination for external switch S1

*Set the control destination for external switch S1*

Size: 1 Byte, Default Value: 3

Setting	Description
1	control the output loads of itself.
2	control the other nodes
3	control the output loads of itself and other nodes.

#### Parameter 124: Set the control destination for external switch S2

*Set the control destination for external switch S2.*

Size: 1 Byte, Default Value: 3

Setting	Description
1	control the output loads of itself.
2	control the other nodes.
3	control the output loads of itself and other nodes

#### Parameter 125: Set the default dimming rate.

*Set the default dimming rate.*

Size: 1 Byte, Default Value: 3

Setting	Description
1 - 255	The value range is 1 to 255 seconds.

#### Parameter 128: Get the current working mode

*Get the current working mode. Note: This parameter is a Get-only parameter.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Unknown working mode.
1	2-wire mode
2	3-wire mode

#### Parameter 129: Set the dimming principle

*Set the dimming principle.*

Size: 1 Byte, Default Value: 1

Setting	Description
0	Trailing edge mode
1	Leading edge mode

#### Parameter 130: To get what type of load the Dimmer is connected to.

*To get what type of load the Dimmer is connected to. Note: This parameter is a Get-only parameter.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Unknown load.
1	Resistive load
2	Capacitive load
3	Inductive load

Parameter 131: Set the min brightness level that the load can reach to.

*Set the min brightness level that the load can reach to.*

Size: 1 Byte, Default Value: 0

Setting	Description
0 - 99	The level range is 0 to 99.

Parameter 132: Set the max brightness level that the load can reach to. Note:

*Set the max brightness level that the load can reach to. Note:*

Size: 1 Byte, Default Value: 99

Setting	Description
0 - 99	The level range is 0 to 99.

Parameter 249: Set the recognition way of load

*Set the recognition way of load*

Size: 1 Byte, Default Value: 2

Setting	Description
0	Never recognize the load when power on
1	Only recognize once when first power on
2	Recognize the load once power on

Parameter 252: Lock/unlock configuration parameters

*Lock/unlock configuration parameters.*

Size: 1 Byte, Default Value: 0

Setting	Description
0	Unlock
1	Lock

Parameter 255: Reset the Nano Dimmer

*Reset the Nano Dimmer to factory default.*

Size: 4 Byte, Default Value: 0

Setting	Description
0	Reset all configuration parameters to factory default setting
1431655765	Reset to factory default setting and removed from the z-wave network

## Technical Data

<b>Dimensions</b>	0.0420000x0.0395000x0.0200000 mm
<b>Weight</b>	26.62 gr
<b>Hardware Platform</b>	ZM5101
<b>EAN</b>	1220000013971
<b>IP Class</b>	IP 20
<b>Voltage</b>	230 V
<b>Load</b>	276W
<b>Device Type</b>	Light Dimmer Switch
<b>Network Operation</b>	Always On Slave
<b>Z-Wave Version</b>	6.51.09
<b>Certification ID</b>	ZC10-17015388
<b>Z-Wave Product Id</b>	0x0086.0x0003.0x006F
<b>Frequency</b>	Europe - 868,4 Mhz
<b>Maximum transmission power</b>	5 mW

## Supported Command Classes

- Switch All
- Association Grp Info
- Association V2
- Basic
- Clock
- Configuration
- Device Reset Locally
- Firmware Update Md V3
- Manufacturer Specific V2
- Meter V3
- Notification V4
- Powerlevel
- Scene Activation
- Scene Actuator Conf
- Security
- Switch Binary
- Switch Multilevel V3
- Version V2
- Zwaveplus Info V2

## Controlled Command Classes

- Basic
- Hail

## Explanation of Z-Wave specific terms

- **Controller** — is a Z-Wave device with capabilities to manage the network. Controllers are typically Gateways, Remote Controls or battery operated wall controllers.
- **Slave** — is a Z-Wave device without capabilities to manage the network. Slaves can be sensors, actuators and even remote controls.
- **Primary Controller** — is the central organizer of the network. It must be a controller. There can be only one primary controller in a Z-Wave network.
- **Inclusion** — is the process of adding new Z-Wave devices into a network.
- **Exclusion** — is the process of removing Z-Wave devices from the network.

- **Wakeup Notification** — is a special wireless message issued by a Z-Wave device to announces that is able to communicate.
- **Node Information Frame** — is a special wireless message issued by a Z-Wave device to announce its capabilities and functions.

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