AEOTEC
BY AEON LABS

Aeon Labs

Home Energy Meter (C3 60A)

SKU: AEOEZW095C3A60

Z-WAVE PLUS

Quickstart

This is a **Smart Meter** for **Europe**. To run this device please connect it to your mains power supply. To add this device to your network execute the following action:
- Push the button on backside

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.

Z-WAVE®

Product Description

Installed in an electricity box, the energy meter will monitor the total consumption of electricity used by an entire building. And its intelligent clamps will report that energy use back to your Z-Wave gateway or controller, in watts or kilowatt-hours, and in real time. So you can see how much electricity you really use and when you use it.

Red LED

Clamps

Action Button

AC Input Wire
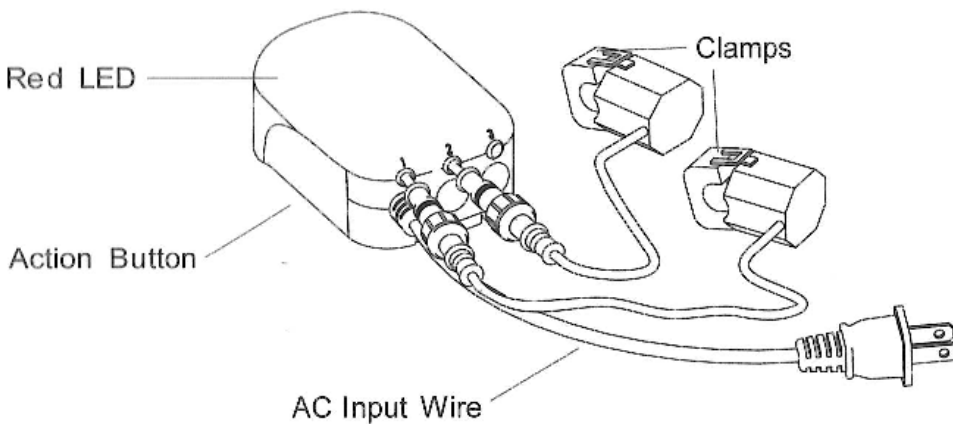
Prepare for Installation / Reset

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 button on the backside for 10 seconds

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

Unless otherwise stated, the circuit box's main breaker should be turned off to perform these installation steps.

1. Turn the main breaker off.
2. Open the main circuit box panel.
3. Clip one clamp of the meter around the incoming electricity cable that connects to the main circuit breaker.
4. Connect the clamp to the meter using a Clamp Connector.
5. Connect the AC Wire to the meter using the AC Wire Connector.
6. Wire the AC Wire into one breaker. The brown wire is Live, the blue wire is neutral.
7. Replace the main circuit box panel.
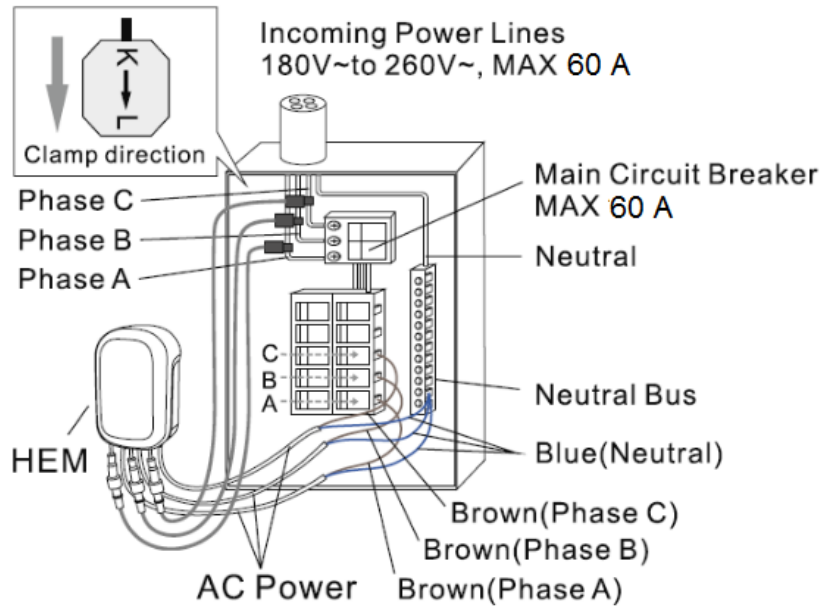8. Turn the main breaker back on.

It is now time to place the main body of the Home Energy Meter. Inside the meter is a radio antenna used for communications, and this must be taken into consideration when selecting a location for the meter.
If the circuit boxes is made of metal the radio signal strength may be reduced. In this situation it is recommended that the main body of the meter be affixed outside the circuit box. This will improve the radio signal strength. The Home Energy Meter has been weatherized to the international IP43 standard so that it is resistant to rain and snow when placed vertically with the wires protruding from the bottom of the unit.

To place the Home Energy Meter:

1. Unslot the backing plate from the back of your meter.
2. Affix the plate to the selected wall space using the provided screws.
3. Attach your meter to the backing plate.

Diagram of EU/AU Version(3 Phases,4 Wires):

Clamp direction

Incoming Power Lines
180V~to 260V~, MAX 60 A

Phase C
Phase B
Phase A

Main Circuit Breaker
MAX 60 A

Neutral

C
B
A

Neutral Bus

Blue(Neutral)

HEM

Brown(Phase C)
Brown(Phase B)

AC Power   Brown(Phase A)

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
- Push the button on backside

Exclusion
- Push the button three times on backside

Product Usage
Setting Parameter 101 -103

Byte #	Decimal Value	Output	Clamp #	HEM Restriction
byte 4	1	kWh	Total Readings	
byte 4	2	Watt	Total Readings	
byte 4	4	Voltage	Total Readings	
byte 4	8	Amperage	Total Readings	
byte 4	16	kVarh	Total Readings	Gen5 only
byte 4	32	kVar	Total Readings	Gen5 only
byte 4	64	Reserved		
byte 4	128	Reserved		
byte 3	256	Watt	Clamp 1	
byte 3	512	Watt	Clamp 2	
byte 3	1024	Watt	Clamp 3	
byte 3	2048	kWh	Clamp 1	
byte 3	4096	kWh	Clamp 2	
byte 3	8192	kWh	Clamp 3	
byte 3	16384	Reserved		
byte 3	32768	Reserved		
byte 2	65536	Voltage	Clamp 1	
byte 2	131072	Voltage	Clamp 2	
byte 2	262144	Voltage	Clamp 3	
byte 2	524288	Amperage	Clamp 1	
byte 2	1048576	Amperage	Clamp 2	
byte 2	2097152	Amperage	Clamp 3	
byte 2	4194304	Reserved		
byte 2	8388608	Reserved		
byte 1	16777216	kVah	Clamp 1	Gen5 only
byte 1	33554432	kVah	Clamp 2	Gen5 only
byte 1	67108864	kVah	Clamp 3	Gen5 only
byte 1	134217728	kVar	Clamp 1	Gen5 only
byte 1	268435456	kVar	Clamp 2	Gen5 only
byte 1	536870912	kVar	Clamp 3	Gen5 only
byte 1	1073741824	Reserved		
byte 1	2147483648	Reserved		

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 an other 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

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	Send configured Value to devices
2	5	Send configured Value to devices
3	5	Send configured Value to devices

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 2: Energy detection mode
For parameters of 101, power, energy detection mode
Size: 1 Byte, Default Value: 0

Setting	Description
0	report power, energy absolute value
1	report positive/negative power, report the algebraic sum energy
2	report positive/negative power, only report energy positive part (consuming electricity)
3	report positive/negative power, only report energy negative part (generating electricity)

Parameter 3: Selective reporting
Enable selective reporting only when power change reaches a certain threshold or percentage set in 4-11 below. This is used to reduce network traffic.
Size: 1 Byte, Default Value: 1

Setting	Description
0	disable
1	enable

Parameter 4: Threshold change in wattage
Threshold change in wattage to induce a automatic report (Whole HEM).
Size: 2 Byte, Default Value: 50

Setting	Description
0 - 60000	Watt

Parameter 5: Threshold change in wattage (Clamp 1)
Threshold change in wattage to induce a automatic report
Size: 2 Byte, Default Value: 50

Setting	Description
0 - 100	Valid value

Parameter 6: Threshold change in wattage (Clamp 2)
Threshold change in wattage to induce a automatic report
Size: 2 Byte, Default Value: 50

Setting	Description
0 - 100	Valid value

Parameter 7: Threshold change in wattage (Clamp 3)
Threshold change in wattage to induce a automatic report
Size: 2 Byte, Default Value: 50

Setting	Description
0 - 100	Valid value

Parameter 8: Percentage change in wattage (Whole HEM)
Percentage change in wattage to induce a automatic report
Size: 1 Byte, Default Value: 10

Setting	Description

Parameter 9: Percentage change in wattage (Clamp 1)
Percentage change in wattage to induce a automatic report
Size: 1 Byte, Default Value: 10

Setting	Description
0 - 100	Valid value

Parameter 10: Percentage change in wattage (Clamp 2)
Percentage change in wattage to induce a automatic report
Size: 1 Byte, Default Value: 10

Setting	Description
0 - 100	Valid value

Parameter 11: Percentage change in wattage (Clamp 3)
Percentage change in wattage to induce a automatic report
Size: 1 Byte, Default Value: 10

Setting	Description
0 - 100	Valid value

Parameter 13: Enable /disable reporting
Enable /disable reporting CRC-16 Encapsulation Command
Size: 1 Byte, Default Value: 0

Setting	Description
0	disable
1	enable

Parameter 100: Reset parameter 101-103

Size: 1 Byte, Default Value: 0

Setting	Description
1	reset parameter 101-103

Parameter 101: Setting automatic report flags Group 1
Example: 1 + 1024 = Value 1025 If you want to report everthing, you would add the whole table together and set in to 101.
Please, see table in usage.
Size: 4 Byte, Default Value: 0

Setting	Description
1	Report Total HEM - KWH
2	Report Total HEM - Watt
4	Report Total HEM - Voltage
8	Report Total HEM - Current

Parameter 102: Setting automatic report flags Group 2
Example: 1 + 1024 = Value 1025 If you want to report everthing, you would add the whole table together and set in to 102.

Setting	Description
1	Report Total HEM - KWH
2	Report Total HEM - Watt
4	Report Total HEM - Voltage
8	Report Total HEM - Current

Parameter 103: Setting automatic report flags Group 3
Example: 1 + 1024 = Value 1025 If you want to report everthing, you would add the whole table together and set in to 103.
Please, see table in usage.
Size: 4 Byte, Default Value: 0

Setting	Description
1	Report Total HEM - KWH
2	Report Total HEM - Watt
4	Report Total HEM - Voltage
8	Report Total HEM - Current

Parameter 110: Reset parameter 111-113

Size: 1 Byte, Default Value: 0

Setting	Description
1	reset parameter 111-113

Parameter 111: Setting an automatic report interval
Set the report intervall for Group 1
Size: 4 Byte, Default Value: 0

Setting	Description
1 - 2097152	seconds

Parameter 112: Setting an automatic report interval
Set the report intervall for Group 1
Size: 4 Byte, Default Value: 0

Setting	Description
1 - 2097152	seconds

Parameter 113: Setting an automatic report interval
Set the report intervall for Group 1
Size: 4 Byte, Default Value: 0

Setting	Description
1 - 2097152	seconds

Parameter 200: Partner ID

Size: 1 Byte, Default Value: 0

Setting	Description
0	Aeon Labs Standard Product
1	others

Parameter 252: Enable/disable Configuration Locked

Size: 1 Byte, Default Value: 0

Setting	Description
0	disable
1	enable

Parameter 255: Factory Reset

Size: 4 Byte, Default Value: 0

Setting	Description
1	Reset to factory default setting
1431655765	Reset to factory default setting and removed from the zwave network

Technical Data

Dimensions	0.1000000x0.1900000x0.0750000 mm
Weight	510 gr
Hardware Platform	ZM5202
EAN	1220000015548
IP Class	IP 44
Voltage	400V
Load	60A
Device Type	Smart Meter
Firmware Version	01.02
Z-Wave Version	04.22
Certification ID	ZC10-16105288
Z-Wave Product Id	0x0086.0x0002.0x005f
Frequency	Europe - 868,4 Mhz
Maximum transmission power	5 mW

Supported Command Classes

- Basic
- Meter
- Crc 16 Encap
- Association Grp Info
- Device Reset Locally
- Zwaveplus Info
- Multi Channel
- Configuration
- Manufacturer Specific
- Powerlevel
- Firmware Update Md
- Association
- Version
- Multi Channel Association

- **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.

- **Association** — is a control relationship between a controlling device and a controlled device.

- **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.