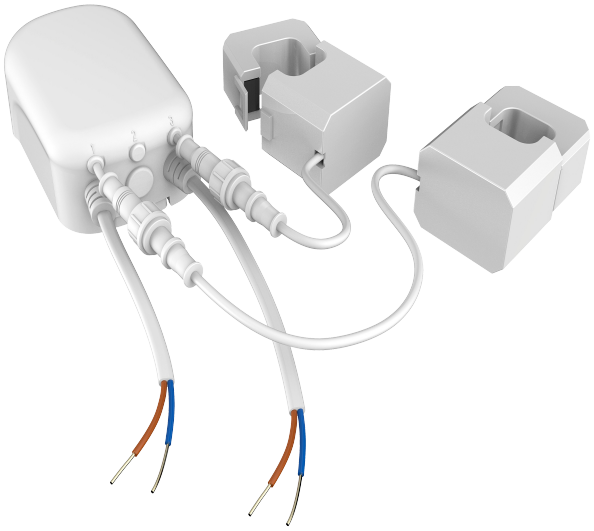
Aeon Labs Home Energy Meter (2nd Edition)

(Z-Wave Home Energy Meter (2nd Edition))



Change history

Revision	Date	Change Description
1	**5/13/2013**	Initial draft.
2	**8/3/2013**	Updata Z-wave Labrary

Aeon Labs Home Energy Meter(2nd Edition)
Engineering Specifications and Advanced Functions for Developers
(V1.05)

Aeon Labs Home Energy Meter is a kind of energy meter for the entire home electric power consumption. It can report immediate wattage and kWh and voltage and amperage usage of the AC mains to a Z-Wave gateway wirelessly. It can send Z-Wave REPORTS (Meter v3 Command Class) to response Z-Wave GET command at any time.
HEM can also be configured as sending unsolicited reports periodically to the associated nodes (within an association group). The time interval of reports can also be configured
HEM can also send report of each individual channel with corresponding current clamp via the command of “Multi Channel Command Class Encapsulation ”.
To reduce the network traffic, HEM can send reports only when the loads significant change occurred(by percentage or Wattage value change, which can be configured)

1. Library and Command Classes

1.1 SDK: 4.55.00

1.2 Library

- Basic Device Class: BASIC_TYPE_ROUTING_SLAVE
- Generic Device class: GENERIC_TYPE_METER
- Specific Device Class: SPECIFIC_TYPE_SIMPLE_METER

1.3 Commands Class

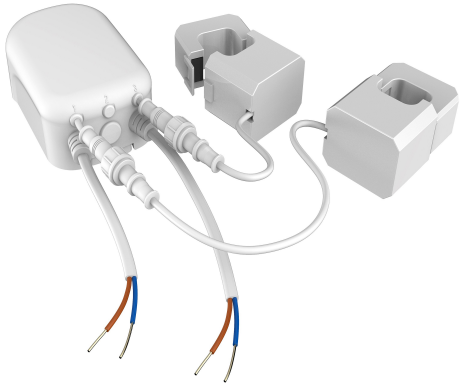
- COMMAND_CLASS_CONFIGURATION V1
- COMMAND_CLASS_METER V3
- COMMAND_CLASS_MULTI_CHANNEL V3
- COMMAND_CLASS_ASSOCIATION V1
- COMMAND_CLASS_MANUFACTURER_SPECIFIC V2
- OMMAND_CLASS_VERSION V1

2. Technical Specifications

RF Range : Up to 100 ft / 30 meters indoors and 300 ft / 100 meters outdoors.
Input Voltage: 380V~, 50Hz. (EU, AU)
Rated Current: 60/100/200A @ 380V~,50Hz, 3Phase (EU Version)
60/100/200A @380V~, 50Hz, 3 Phase (AV Version)
Operating temperature: -25℃ to 40℃.
Relative humidity: 8-80%

3. Familiarize yourself with your HEM

3.1 Interface



4. All functions of each trigger

4.1 Function of Z-Wave Button

Trigger	Description
Click one time	**Add HEM G2 into an existing z-wave network:** 1. Connect HEM G2 to power and install the device properly (according to the Installation instruction, if necessary, please ask an electrician for help) , at beginning its LED blink slowly. 2. Let the primary controller of existing Z-Wave network into inclusion mode (If you don't know how to do this, refer to its manual). 3. Press the Z-Wave button of HEM G2. 4. If learning success, HEM G2 LED will stop slow blink, or it will still slow blink, please repeat the process from step 2. **Remove HEM G2 from an existing z-wave network:** 1. Make sure the HEM G2 is powered, its LED be light on steadily. 2. Let the primary controller of existing Z-Wave network into remove mode (If you don't know how to do this, refer to its manual). 3. Press the Z-Wave button. 4. If exclusion success, HEM G2 LED will blink slowly or its LED still be on, please repeat the process from step 2.
Press and hold 10 seconds	**Reset HEM G2 to factory Default:** 1. Make sure HEM G2 has been connected to the power supply. 2. Press and hold the Z-Wave button for 10 seconds. 3. If HEM G2 LED blinks slowly, it indicates reset success, otherwise please repeat step 2. Note: Reset HEM G2 to factory default Settings will: sets HEM G2 to not in Z-Wave network state; delete the Association setting, power measure value and restore the Configuration Settings to the default.

5. Special rule of each command

5.1 Association Command Class

HEM can also be configured as sending unsolicited reports periodically to the associated nodes within its own network via the Association Command Class. There is only 1 associated group supported by HEM, of which with a maximum of 5 associated nodes . HEM send report of unsolicited single-cast frame to all of the 5 nodes within the associated group. The type of REPORTS (meter, etc.) can be configured via Configuration Command Class (see below section)

5.2 Multi channel Command Class

The Multi channel Command supports 3 end points. End point 1 is for clamp 1, End point 2 is for clamp 2 and End point 3 is for clamp 3. But the End point 2 is not used, because it is regarded as neutral.
The 3 end points package Meter Command Class .
The Multi channel cmd encap command is used to get two clamps to detection of electricity. Include wattage, KWH, voltage and current.

5.3 Configuration Set Command Class

7	6	5	4	3	2	1	0
Command Class = COMMAND_CLASS_CONFIGURATION							

Command = CONFIGURATION_SET		
Parameter Number		
Default	Reserved	Size
Configuration Value 1(MSB)		
Configuration Value 2		
.....		
Configuration Value n(LSB)		

Parameter Number Definitions (8 bit):

Parameter Number	Description	Default Value	Size
2	If the reverse clamping pliers, negative power is detected. (0==disable,1==enable)	0	1
3	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. (0 == disable, 1 == enable)	1	1
4	Threshold change in wattage to induce a automatic report (Whole HEM). (Valid values 0-60000)	50(W)	2
5	Threshold change in wattage to induce a automatic report (Clamp 1). (Valid values 0-60000)	50(W)	2
7	Threshold change in wattage to induce a automatic report (Clamp 3). (Valid values 0-60000)	50(W)	2
8	Percentage change in wattage to induce a automatic report (Whole HEM). (Valid values 0-100)	10	1
9	Percentage change in wattage to induce a automatic report (Clamp 1. (Valid values 0-100)	10	1
11	Percentage change in wattage to induce a automatic report (Clamp 3). (Valid values 0-100)	10	1
100	Set 101-103 to default.	N/A	1
101	Which reports need to send in Report group 1 (See flags in table below).	2	4

102	Which reports need to send in Report group 2 (See flags in table below).	1	4
103	Which reports need to send in Report group 3 (See flags in table below).	0	4
110	Set 111-113 to default.	N/A	1
111	The time interval of sending Report group 1 (Valid values 0x01-0xFFFFFFFF).	5	4
112	The time interval of sending Report group 2 (Valid values 0x01-0xFFFFFFFF).	120	4
113	The time interval of sending Report group 3 (Valid values 0x01-0xFFFFFFFF).	120	4
200	Partner ID (0= Aeon Labs Standard Product, 1= AT&T).	0	1
254	Device Tag.	0	2
255	Reset configuration set up to default setting.	N/A	1

Configuration Values for parameter 101-103

	7	6	5	4	3	2	1	0
configuration Value 1(MSB)	Reserved							
configuration Value 2	Reserved		Auto send Meter REPORT (for A) at the group time interval (Clamp 3)	Reserved	Auto send Meter REPORT (for A) at the group time interval (Clamp 1)	Auto send Meter REPORT (for V) at the group time interval (Clamp 3)	Reserved	Auto send Meter REPORT (for V) at the group time interval (Clamp 1)
configuratio	Reserved		Auto	Reserv	Auto	Auto	Reserv	Auto

n Value 3		send Meter REPORT (for kWh) at the group time interval (Clamp 3)	ed	send Meter REPORT (for kWh) at the group time interval (Clamp 1)	send Meter REPORT (for Watt) at the group time interval (Clamp 3)	ed	send Meter REPORT (for Watt) at the group time interval (Clamp 1)
configuration Value 4(LSB)	Reserved			Auto send Meter REPORT (for A) at the group time interval (Whole HEM)	Auto send Meter REPORT (for V) at the group time interval (Whole HEM)	Auto send Meter REPORT (for wattage) at the group time interval (Whole HEM)	Auto send Meter REPORT (forKWH) at the group time interval (Whole HEM)

Example:

Auto Report Every 30 seconds for Clamp 1 and Clamp 3:

1.Have report group 1 send Multi Channel Meter CC(Watts) and MultiChannel Meter CC (KWH) of clamp 1 and clamp 3 automatically

ZW_SendData(0x70,0x04,0x65, 0x04, 0x00,0x00,0x2d,0x00); //Configuration Set

2. Set the interval of sending report group 1

ZW_SendData(0x70,0x04,0x6F, 0x04, 0x00,0x00,0x00,0x1E); //Configuration Set

3. Associate to node "1"

ZW_SendData(0x85, 0x01, 0x01, 0x01); //Association set

Note: Meter CC(Watts) and Meter CC (KWH) is of clamp 1 and clamp 3 is packaged in Multi Channel Command. end point 1 is for clamp 1,end point 2 is for clamp 2, end point 3 is for clamp 3.