



Aeon Labs Smart Strip

(Z-Wave Smart Strip)



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Version:	2					
Description:	The purpose of this document is to provide guidelines for the user and application developer of Aeon Labs Z-Wave Smart Strip.					
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REVISION RECORD

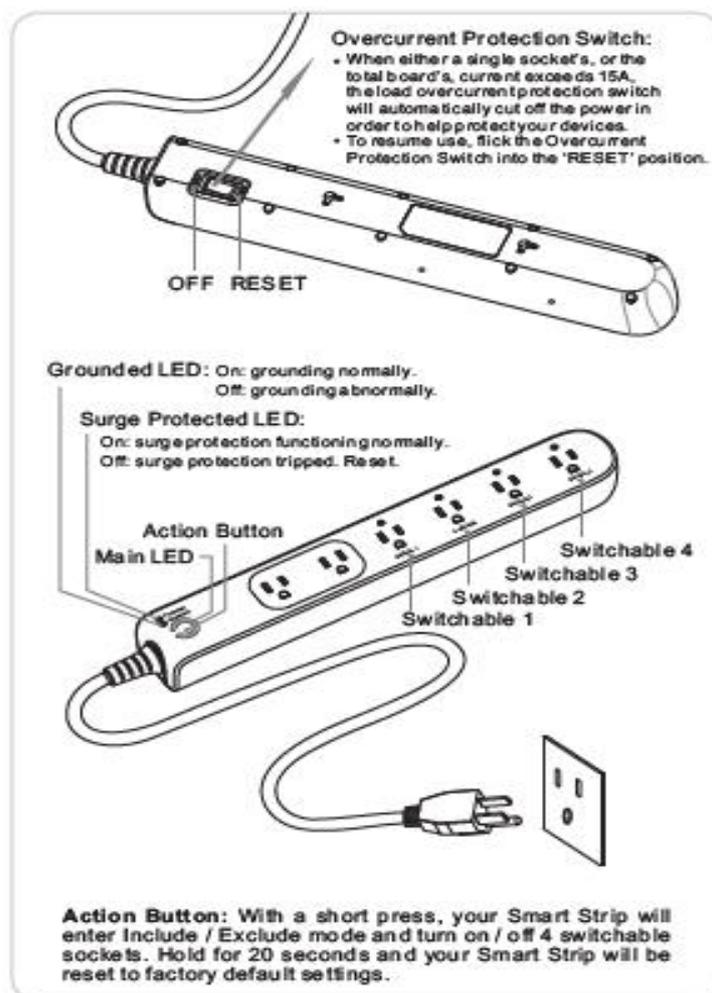
Revision	Date	BY	Brief description of changes
1			Initial draft.
2	2014/7/2	D.C	

Aeon Labs Smart Strip

Engineering Specifications and Advanced Functions for Developers

1. Features of Smart Strip

Following figure to explain the appearance and structure of Smart Strip:



- Aeon Labs Smart Strip is a power board with 6 power points of which 4 can be wireless controlled. Customer can turn on/off their electrics when needed with manually operation or Z-wave wireless control. Smart Strip has plenty of functions, for

example the Over Current Protection and Surge Protection, these functions can efficiently protect people's various electrics from damage.

- Customer can monitor electrics power consumption of which connected to Smart Strip. Beside the power consumption can be get with the Z-wave "GET" command, it also can be setup to automatically REPORT to any given node within its own network via the Association Command Class (one association group). The sent REPORTs can be set to various intervals.
- Smart Strip has the ability to reduce network traffic by reporting only when there is a significant change in wattage draw (configurable either by percentage or wattage increase).

1.1 LED Behavior

Main LED (blue): Regarding the inside/outside network status of product as "Basic Signal". After product finished some specific action, it will indicate the "Basic Signal" again. The indication of Main LED as following:

- Solid ON: Product Inside network(included)
- BLINK : Product Outside network(excluded)

Protected LED:

- ON: Surge protected function be normal.
- OFF: Surge protected function be abnormal.

Grounded LED:

- ON: Grounded function be normal
- OFF: Grounded function be abnormal

Note: Within this document frequency of BLINK is 0.667Hz, each blink period with same time of light on and extinguish.

1.2 Functions Description

The product's main functions are as following table:

Items	Function Detailed Description
Inclusion	<p>While there is a remoter require adding product node;</p> <p>i) If product is not in a Z-Wave network, and is at learning status, the product will send out Node Info frame and will be included to the network of remoter</p> <p>ii) If product is already in a Z-Wave network, and at learning status, product send Node Info</p> <p>If the remoter is in the product's own network, the Node ID of product in network would not be changed</p> <p>If the remoter is not in the same network of the product, the product could not be included to the network of remoter.</p>
Exclusion	<p>While there is a remoter require removing nodes:</p> <p>If product is in a network, and is in learning status, the product will send Node Info, and will be removed from network, Entering the "outside of network status", after being excluded, the product will reset to factory default(except Configuration set 254).The Home ID will be random number and the Node ID be 0.</p> <p>If product is outside of any network, it will keep the status of outside of network.</p>
Get the Instant Power Level Of load (Watts)	<p>In normal circumstance of product working, Send command of "Meter get, Scale=0x02" to product, it will report current power level of loads(Watts)(Configure the parameter of Configuration also can implement this function, make the product send unsolicited info frame of the Meter report with specific time interval)</p>
Get the accumulated power consumption of loads(KWH)	<p>In normal circumstance of product working, Send command of "Meter get, Scale=0x00" to product, it will report power consumed (KWH) by loads currently(Configure the parameter of Configuration also can implement this function, make the product send unsolicited info frame of the Meter report with specific time interval)</p>
Support one Association group	<p>Information that report to association group 1:Configured auto reported information、Hail CC、Basic Report.</p>

Turn On/Off loads	After inclusion, If remoter send following command to product: Basic set 0x00/0xff Switch Binary set 0x00/0xff Scene Activation set 0x00/0xff Can turn on/off loads
“Power Off” memorize function	After power down, product can remember the status of loads that before the power down
Reset factory default	Restore all configuration parameter to default value, clean the Association nodes, exit form network (parameter 254 won't be restored)

1.3 Action Button Press Related

1.3.1 Hold (Long Press) Action Button

While customer holding the Action Button, according to time period of holding the corresponding main LED behavior and product function is as following table:

Time span of Action(s)	Main LED indication(blue)	Function
[1, 20)	Accelerate flash	N/A
[20, 22)	Keep On	Reset factory default
[22, ∞]	Slow blink	N/A

1.3.2 Tap (Short Press) Action Button

Main LED indication(blue)		Function
Outside of network	Blink Slowly	Broadcast the Node Info frame (Can be included while controller is at inclusion permitting status), Turn On/Off loads (Take the first switchable channel status as

		reference).
Inside of network	Keep On	Broadcast the Node Info(Can be excluded while controller is at exclusion status), Turn On/Off loads(Take the first switchable channel status as reference).

Note: When the time from button pressed to released is longer than 0.04s and shorter than 1s, the button pressing action is regard as “Short Press”.

2. Compatible with Z-Wave protocol

2.1 Supported Protocol Version

SDK: 4.55.00 (Library 3.67)

Device Classes:

Basic Device Class: BASIC_TYPE_ROUTING_SLAVE

Generic Device Class: GENERIC_TYPE_SWITCH_BINARY

Specific Device Class: SPECIFIC_TYPE_POWER_SWITCH_BINARY

2.2 Supported Command Version

- COMMAND_CLASS_SWITCH_BINARY V1
- COMMAND_CLASS_METER V2
- COMMAND_CLASS_SWITCH_ALL V1
- COMMAND_CLASS_BASIC
- COMMAND_CLASS_MULTI_CHANNEL_V2
- COMMAND_CLASS_CONFIGURATION V1
- COMMAND_CLASS_ASSOCIATION V1

- COMMAND_CLASS_MANUFACTURER_SPECIFIC V2
- COMMAND_CLASS_VERSION V1
- COMMAND_CLASS_MARK V1
- COMMAND_CLASS_HAIL V1

Note: All of the commands implementation comply Z-Wave protocol, for their formats, functions, operations please refer to relevant Z-Wave documents.

For the part of which do not specified in the Z-Wave protocol, please see following section.

3. Special Commands

3.1 Association Command

Product supports 1 association group, which can have up to five nodes in the group.

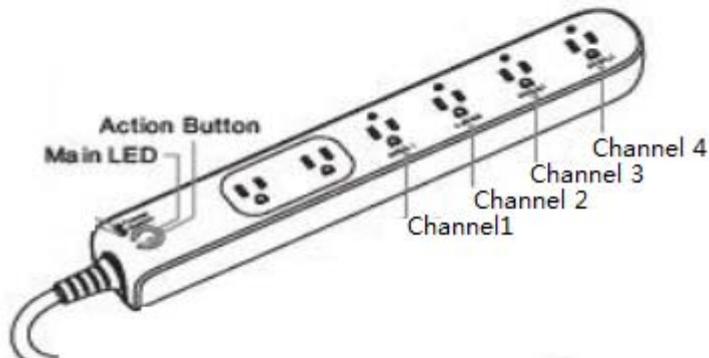
Number of Nodes	Send method	Contents
0	N/A	N/A
1	Single Cast	While status of product's load change:
[2,5]	Multi Cast	Set Configuration parameter 80 as 0: Do not send any information(Default) Set Configuration parameter 80 as 1: Send Hail command Set Configuration parameter 80 as 2: send Basic Report

3.2 Multi Channel Commands

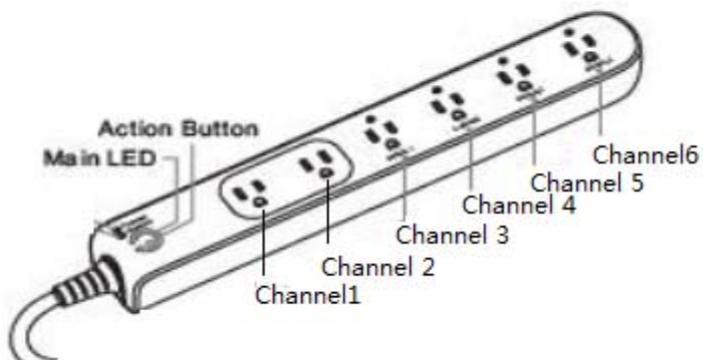
Support 4 channels of control, 6 channels of electric measurement.

Multi Channel Command Encapsulation of commands such as "Switch binary, Meter and Basic"

4 Channel of control (Multi Channel Basic CC):



6 Channel of electric measurement (Multi Channel Meter CC):



3.3 Configuration Commands Parameter

Parameter	Explanation	Default	Length(bytes)
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0x04	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
0x05	Threshold change in wattage to induce an automatic report (Whole Smart Strip). (Valid values 0-60000)	25(Watt)	2
0x06	Threshold change in wattage to induce an automatic report (Socket 1). (Valid values 0-60000)	25(Watt)	2
0x07	Threshold change in wattage to induce an automatic report (Socket 2). (Valid values 0-60000)	25(Watt)	2
0x08	Threshold change in wattage to induce an automatic report (Socket 3). (Valid values 0-60000)	25(Watt)	2
0x09	Threshold change in wattage to induce an automatic report (Socket 4). (Valid values 0-60000)	25(Watt)	2
0x0A	Threshold change in wattage to induce an automatic report (Socket 5). (Valid values 0-60000)	25(Watt)	2
0x0B	Threshold change in wattage to induce an automatic report (Socket 6). (Valid values 0-60000)	25(Watt)	2
0x0C	Percentage change in wattage to induce an automatic report (Whole Smart Strip). (Valid values 0-100)	5(%)	1
0x0D	Percentage change in wattage to induce an automatic report (Socket 1). (Valid values 0-100)	5(%)	1
0x0E	Percentage change in wattage to induce an automatic report (Socket 2). (Valid values 0-100)	5(%)	1
0x0F	Percentage change in wattage to induce an automatic report (Socket 3). (Valid values 0-100)	5(%)	1
0x10	Percentage change in wattage to induce an automatic report (Socket 4). (Valid values 0-100)	5(%)	1

0x11	Percentage change in wattage to induce an automatic report (Socket 5). (Valid values 0-100)	5(%)	1
0x12	Percentage change in wattage to induce an automatic report (Socket 6). (Valid values 0-100)	5(%)	1
0x50	Status of load changed, send group 1 associate nodes Hail CC or Basic report CC. <ul style="list-style-type: none"> ● Value=0, No send. ● Value=1, Send Hail CC. ● Value=2, Send Basic report. ● Other values are invalid 	0	1
0x5A	Get temperature of Smart Strip (Only GET is valid)	—	2**
0x64	Reset 101~103 to default value	—	—
0x65	Configure auto report which information as item 1	0	4
0x66	Configure auto report which information as item 2	0	4
0x67	Configure auto report which information as items 3	0	4
0x6E	Reset parameter 111~113 to factory default	—	—
0x6F	Configure auto report time interval of item 1	600	4
0x70	Configure auto report time interval of item 2	600	4
0x71	Configure auto report time interval of item 3	600	4

0xFC	Parameter being locked <ul style="list-style-type: none"> ● Value=0,unlock ● Value=1,lock ● Other Values are invalid 	0	1
0xFD	Enter Meter Calibration Mode	—	4
0xFE	Device tag, inclusion and/or reset will not change the value	0	2
0xFF	Restore Configuration parameters to factory default, except parameter 254.	—	—

Note: Except parameter 0x5A, for those parameters without default value, will not response the command of Configuration get, no report.

Parameter number 101-103 detailed parameter:

	7	6	5	4	3	2	1	0
Parameter 1 (MSB)	Reserved							
Parameter 2	Reserved							
Parameter 3	Reserved	Auto report power level with specified time interval (channel6)	Auto report power level with specified time interval (channel5)	Auto report power level with specified time interval (channel 4)	Auto report power level with specified time interval (channel 3)	Auto report power level with specified time interval (channel 2)	Auto report power level with specified time interval (channel 1)	Auto report the total power level of all channels With specified time interval
Parameter 4 (LSB)	Reserved	Auto report power consumption with specified time interval	Auto report power consumption with specified time interval (channel5)	Auto report power consumption with specified time interval	Auto report power consumption with specified time interval	Auto report power consumption with specified time interval	Auto report power consumption with specified time interval	Auto report the total power consumption of all channels

		(channel6)		interval (channel 4)	interval (channe l3)	(channel 2)	interval (channel 1)	with specified time interval
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****Parameter 90:**

	High BYTE								Low BYTE							
BIT	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
°C	$-(2^7)$	2^6	2^5	2^4	2^3	2^2	2^1	2^0	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	2^{-6}	2^{-7}	2^{-8}