Aeon Labs Smart Dimmer 6

(Z-Wave Smart Dimmer 6)

Change history

Revision	Date	Change Description
1	02/07/2015	Initial draft.
2	14/09/2015	Update
3		
4		

Aeon Labs Smart Dimmer 6
Engineering Specifications and Advanced Functions for Developers

Aeon Labs Smart Dimmer is a Z-Wave multilevel switch device based on Z-Wave enhanced 232 slave library V6.51.06.
Its surface has the Smart RGB LEDs on, which can be used for indicating the output load status, the strength of wireless signal. You can also configure its indication colour according to your favour.
It can be included and operated in any Z-wave network with other Z-wave certified devices from other manufacturers and/or other applications. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.
It is also a security Z-wave device and supports the Over The Air (OTA) feature for the product's firmware upgrade.
As soon as Smart Dimmer is removed from a z-wave network it will be restored into default factory setting.

1. Library and Command Classes

1.1 SDK: 6.51.06

1.2 Library

- Basic Device Class: BASIC_TYPE_ROUTING_SLAVE
- Generic Device class: GENERIC_TYPE_SWITCH_ MULTILEVEL
- Specific Device Class: SPECIFIC_TYPE_POWER_SWITCH_MULTILEVEL

1.3 Commands Class

	Included Non-Secure Network	**Included Secure Network**
Node Info Frame	COMMAND_CLASS_ZWAVEPLUS_INFO V2 COMMAND_CLASS_SWITCH_MULTILEVEL V2 COMMAND_CLASS_COLOR_SWITCH COMMAND_CLASS_MULTI_CHANNEL_V4 COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATIO N_V3 COMMAND_CLASS_METER V3 COMMAND_CLASS_SWITCH_ALL V1 COMMAND_CLASS_CONFIGURATION V1 COMMAND_CLASS_ASSOCIATION_GRP_INFO V1 COMMAND_CLASS_ASSOCIATION V2 COMMAND_CLASS_MANUFACTURER_SPECIFIC V2 COMMAND_CLASS_VERSION V2 COMMAND_CLASS_FIRMWARE_UPDATE_MD V2 COMMAND_CLASS_POWERLEVEL V1 COMMAND_CLASS_CLOCK V1 COMMAND_CLASS_MARK V1 COMMAND_CLASS_DEVICE_RESET_LOCALLY V1 COMMAND_CLASS_HAIL V1	COMMAND_CLASS_ZWAVEPLUS_INFO V2 COMMAND_CLASS_VERSION V2 COMMAND_CLASS_MANUFACTURER_SPECIFIC V2 COMMAND_CLASS_SECURITY V1 COMMAND_CLASS_MARK V1 COMMAND_CLASS_DEVICE_RESET_LOCALLY V1 COMMAND_CLASS_HAIL V1
Security Command Supported Report Frame	–	COMMAND_CLASS_ASSOCIATION_GRP_INFO V1 COMMAND_CLASS_SWITCH_MULTILEVEL V2 COMMAND_CLASS_SWITCH_ALL V1 COMMAND_CLASS_COLOR_SWITCH COMMAND_CLASS_MULTI_CHANNEL_V4 COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATIO N_V3 COMMAND_CLASS_METER V3 COMMAND_CLASS_CONFIGURATION V1 COMMAND_CLASS_ASSOCIATION V2

		COMMAND_CLASS_POWERLEVEL V1 COMMAND_CLASS_CLOCK V1 COMMAND_CLASS_FIRMWARE_UPDATE_MD V2

2. Technical Specifications

Model number: ZW099

Operating distance: Up to 300 feet/100 meters outdoors.

Input: 120V~, 60Hz. (USA Version)
230V~, 50Hz. (EU, AU, CN Version)
230V~, 60Hz. (BR version)

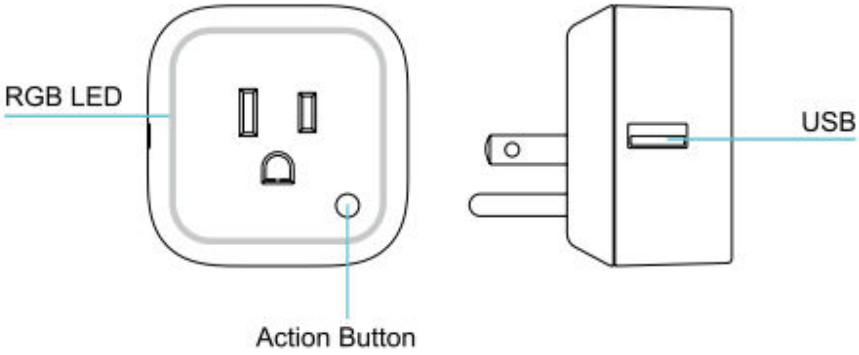
Output: 120V~, 60Hz, Max 2.5A Resistor load. (USA Version)
230V~, 50Hz, Max 2.5A Resistor load. (EU Version)
230V~, 50Hz, Max 2.5A Resistor load. (CN Version)
230V~, 50Hz, Max 2.5A Resistor load. (AU Version)
230V~, 60Hz, Max 2.5A Resistor load. (BR Version)

Operating temperature: 0℃ to 40℃.

Relative humidity: 8% to 80%.

3. Familiarize yourself with your Smart Switch

3.1 Interface



4. All functions of each trigger

4.1 Function of Action Button

Trigger	Description
Short press one time	**1. Send non-security Node Info frame.** **2. Add Smart Dimmer into a z-wave network:** 1. Insert the Smart Dimmer to power socket, The RGB LED will be colorful gradient status. 2. Let the primary controller into inclusion mode (If you don't know how to do this, refer to its manual). 3. Press the Action button. 4. If the inclusion success, Smart Dimmer LED will be solid. Otherwise, the LED will remain colorful gradient status, in which you need to repeat the process from step 2.

	3. Remove Smart Dimmer from a z-wave network: 1. Insert the Smart Dimmer to power socket, The Smart Dimmer LED will be solid. 2. Let the primary controller into remove mode (If you don't know how to do this, refer to its manual). 3. Press the Action button. 4. If the remove is successful, Smart Dimmer LED will be colorful gradient status. If Smart Dimmer LED still be solid, please repeat the process from step 2.
Short press 2 times	**1. Send Security Node Info frame.** **2. Add Smart Dimmer into a z-wave network:** 1. Insert the Smart Dimmer to power socket, The LED will be colorful gradient status. 2. Let the primary controller into inclusion mode (If you don't know how to do this, refer to its manual). 3. Press the Action Button. 4. If the inclusion success, Smart Dimmer LED will be solid. Otherwise, the LED will remain colorful gradient status, in which you need to repeat the process from step 2. **3. Remove Smart Dimmer from a z-wave network:** 1. Insert the Smart Dimmer to power socket, The Smart Dimmer LED will be solid. 2. Let the primary controller into remove mode (If you don't know how to do this, refer to its manual). 3. Press the Action button. 4. If the remove success, Smart Dimmer LED will be colorful gradient status. If Smart Dimmer LED still be solid, please repeat the process from step 2.
Press and hold 20 seconds	**Reset Smart Dimmer to factory Default:** 1. Make sure the Smart Dimmer has been connected to the power supply. 2. Press and hold the Z-wave button for 20 seconds. 3. If holding time more than one second, the LED will blink faster and faster. If holding time more than 20seconds, the green LED will be on for 2 seconds and then remain colorful gradient status, it indicates reset success, otherwise please repeat step 2. **Note:** 1, This procedure should only be used when the primary controller is inoperable. 2, Reset Smart Dimmer to factory default settings will: a), exclude the Smart Dimmer from Z-Wave network; b), delete the Association setting, power measure value, Scene Configuration settings and restore the Configuration settings to their defaults.

4.2 RGB LED indication when Smart Dimmer is in Energy Mode

RGB	RGB indication	Status
RGB LED	Purple color (10%)	Output load is turned off.
	Green	Output load is in small wattage range. US version，the range of load wattage is [0W, 180W) AU version， the range of load wattage is [0W, 345W) EU version， the range of load wattage is [0W, 345W)
	Yellow	Output load is in big wattage range. US version，the range of load wattage is [180W, 240W) AU version，the range of load wattage is [345W, 460W) EU version，the range of load wattage is [345W, 460W)
	Red	Output load is in warning wattage range. US version， the range of load wattage is [240W,300W) AU version， the range of load wattage is [460W, 575W) EU version， the range of load wattage is [460W, 575W)

4.3 RGB LED indication when Smart Dimmer is in Wireless Power level Test Mode

RGB	RGB indication	Status
RGB LED	Purple LED fast blink	Enter into the wireless power level test mode
	Green LED is switched to ON state for 2 seconds	wireless power level is good
	Yellow LED is switched to ON state for 2 seconds	wireless power level is acceptable but latency can occur
	Red LED is switched to ON state for 2 seconds	wireless power level is insufficient

5. Special rule of each command

5.1 Z-Wave Plus Info Report Command Class

Parameter	Value
Z-Wave Plus Version	1
Role Type	5 (ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_ALWAYS_ON)
Node Type	0 (ZWAVEPLUS_INFO_REPORT_NODE_TYPE_ZWAVEPLUS_NODE)
Installer Icon Type	0x0600 (ICON_TYPE_GENERIC_LIGHT_DIMMER_SWITCH)
User Icon Type	0x0600 (ICON_TYPE_GENERIC_LIGHT_DIMMER_SWITCH)

5.2 Basic Command Class

Basic Set=0x01 to 0x63 or 0xFF, turn ON output load.

Basic Set=0x00, turn OFF output load.

5.3 Association Command Class

Smart Dimmer supports 2 association groups and Max 5 nodes for each group.

Association Group	Nodes	Send Mode	Send commands
Group 1	0	N/A	N/A
	1 [2,5]	Single Cast	When the state of Smart Dimmer(on/off/dim the load) is changed: 1, Set Configuration parameter 80 to 0： Reserved (Default). 2, Set Configuration parameter 80 to 1： Send Hail CC. 3. Set Configuration parameter 80 to 2: Send the Basic Report.
Group 2	0	N/A	N/A
	[1,5]	Single Cast	Forward the Basic Set, Switch Multilevel Start Level Change, Switch Multilevel Stop Level Change, Switch Multilevel Set to associated nodes in Group 2 when the Smart Dimmer receives the Basic Set, Switch Multilevel Start Level Change, Switch Multilevel Stop Level Change, Switch Multilevel Set commands from main controller.

5.4 Association Group Info Command Class

5.4.1 Association Group Info Report Command Class

Profile: General: NA (Profile MSB=0, Profile LSB=0)

5.4.2 Association Group Name Report Command Class

Group 1: Lifeline

Group 2: Retransmit

5.5 Manufacturer Specific Report

Parameter	Value
Manufacturer ID 1	US/EU/AU=0x00 CN=0x01
Manufacturer ID 2	US/EU/AU=0x86 CN=0x6A
Product Type ID 1	EU=0x00, US=0x01, AU=0x02 CN=0x1D (29)
Product Type ID 2	0x03
Product ID 1	0x00
Product ID 2	0x63 (99)

5.6 Multilevel Switch Command Class

The Multilevel Switch CC is used to change the state/brightness level of output load.

5.7 Multi Channel Command Class

Multi Channel CC encapsulates the Multilevel Switch CC, Z-wave plus info CC, Association Group info CC, Association CC, Color Switch CC and supports 2 endpoints.
Multi Channel encapsulation Multilevel Switch CC of endpoint 1 is used to Set/Get the state of output load.
Multi Channel encapsulation Multilevel Switch CC of endpoint 2 is used to Set/Get the brightness level of RGB LED when it is in Night light mode.

5.8 Color Switch Command Class

Supported color component: Red (02), Green (03), Blue (04).
Color Switch Set is used to change the color of RGB Led only in Night light mode.

5.9 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 Hex / Decimal	Description	Default Value	Size
0x02 (2)	Make Dimmer blink. Configuration Value 1：1-255 Configuration Value 1 is to Specify the time that Dimmer need blink, The unit is Second; Configuration Value 2：1-255 Configuration Value 2 is to Specify the Cycle of on/off; the unit of it is 0.1 second. For example: if we set Configuration Value 1 to '15',Configuration Value 2 to '10',then Dimmer will open 0.5 second, close 0.5 second, and repeat for 14 times.	0xfa	2
0x03 (3)	Current Overload Protection. Output Load will be turned off automatically when the Current overrun 2.6A and the time more than 2 minutes (0=disabled, 1=enabled).	0	1
0x14 (20)	Configure the output load status after re-power on (0=last status, 1=always on, 2=always off)	0	1
0x21 (33)	Set the RGB LED color value for testing. Value1: Reserved Value2: Red value Value3: Green value Value4: Blue value	-	4
0x50 (80)	Enable to send notifications to associated devices (Group 1) when the state of Smart Dimmer's load changed (0=nothing, 1=hail CC, 2=basic CC report).	0	1

0x51 (81)	Configure the state of LED when it is in 3 modes below: 0= Energy mode, the LED will follow the status (on/off) of its load. 1= Momentary indicate mode, when the state of Dimmer's load changed, The LED will follow the status (on/off) of its load, but the red LED will turn off after 5 seconds if there is no any switch action. 2= Night light mode.	0	1
0x53 (83)	Configure the RGB value when it is in Night light mode. Value1: Red color value Value2: Green color value Value3: Blue color value	Value1=0x1B Value2=0x14 Value3=0x1B	3
0x54 (84)	Configure the brightness level of RGB LED (0%-100%) when it is in Energy Mode/momentary indicate mode. Value1: green color value. Value2: yellow color value. Value3: red color value.	Green=50 Yellow=50 Red=50	3
0x5A (90)	Enables/disables parameter 91 and 92 below (1=enabled, 0=disabled).	0	1
0x5B (91)	The value here represents minimum change in wattage (in terms of wattage) for a REPORT to be sent (Valid values 0-60000).	25 (W)	2
0x5C (92)	The value here represents minimum change in wattage percent (in terms of percentage) for a REPORT to be sent (Valid values 0-100).	5 (%)	1
0x64 (100)	Set 101-103 to default.	N/A	1
0x65 (101)	Which reports need to send in Report group 1 (See flags in table below).	0x00 00 00 00	4
0x66 (102)	Which reports need to send in Report group 2 (See flags in table below).	0x00 00 00 00	4
0x67 (103)	Which reports need to send in Report group 3 (See flags in table below).	0x00 00 00 00	4
0x6E (110)	Set 111-113 to default.	N/A	1
0x6F (111)	The time interval of sending Report group 1 (Valid values 0x01-0x7FFFFFFF).	0x00 00 00 03	4
0x70 (112)	The time interval of sending Report group 2 (Valid values 0x01-0x7FFFFFFF).	0x00 00 02 58	4
0x71 (113)	The time interval of sending Report group 3 (Valid values 0x01-0x7FFFFFFF).	0x00 00 02 58	4
0xC8 (200)	Partner ID (0= Aeon Labs Standard Product, 1= others).	0	1
0xFC (252)	Enable/disable Configuration Locked (0 =disable, 1 = enable).	0	1
0xFE (254)	Device Tag.	0	2

0xFF (255)	1, Value=0x55555555、Default=1、Size=4 Reset to factory default setting and removed from the z-wave network	N/A	4
	2, Value=0、Default=1、Size=1 Reset to factory 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							
configuration Value 3	Reserved							
configuration Value 4(LSB)	Reserved	Reserved	Reserved	Reserved	Auto send Meter REPORT (for kWh) at the group time interval	Auto send Meter REPORT (for watt) at the group time interval	Auto send Meter REPORT (for current) at the group time interval	Auto send Meter REPORT (for voltage at the group time interval

Example:

a. Automatically report Meter CC (Watts) to node "1" every 12 minutes

1. Enable sending Meter CC (Watts) automatically in report group 1

ZW_SendData(0x70, 0x04, 0x65, 0x04, 0x00,0x00,0x00,0x04);

2. Set the interval of sending Meter CC (Watts) in report group 1

ZW_SendData(0x70, 0x04, 0x6F, 0x04, 0x00,0x00,0x02,0xd0);

3. Associate to node "1"

ZW_SendData(0x85, 0x01, 0x01, 0x01);

b. Set default values

ZW_SendData(0x70, 0x04, 0x255,0x01,0x00);