Aeon Labs Smart Switch 6

(Z-Wave Smart Switch 6)

Change history

Revision	Date	Change Description
1	3/30/2015	Initial draft.
2	6/1/2015	Update
3	6/10/2015	Update
4	7/02/2015	Update LED indication
5	7/03/2015	Update
6	6/27/2016	Update the document
7	8/26/2016	Update

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

Aeon Labs Smart Switch 6 is a Z-Wave power binary 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 Switch 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_BINARY
- Specific Device Class: SPECIFIC_TYPE_POWER_SWITCH_BINARY

1.3 Commands Class

	Included Non-Secure Network	Included Secure Network
Node Info Frame	COMMAND_CLASS_ZWAVEPLUS_INFO V2 COMMAND_CLASS_SWITCH_BINARY V1 COMMAND_CLASS_CONFIGURATION V1 COMMAND_CLASS_SWITCH_ALL V1 COMMAND_CLASS_CLOCK V1 COMMAND_CLASS_METER V3 COMMAND_CLASS_SWITCH_MULTILEVEL V1, COMMAND_CLASS_COLOR_SWITCH 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_SECURITY V1 COMMAND_CLASS_DEVICE_RESET_LOCALLY V1 COMMAND_CLASS_MARK 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_DEVICE_RESET_LOCALLY V1 COMMAND_CLASS_MARK V1 COMMAND_CLASS_HAIL V1

Security Command Supported Report Frame	-	COMMAND_CLASS_SWITCH_BINARY V1 COMMAND_CLASS_CONFIGURATION V1 COMMAND_CLASS_SWITCH_ALL V1 COMMAND_CLASS_CLOCK V1 COMMAND_CLASS_METER V3 COMMAND_CLASS_SWITCH_MULTILEVEL, COMMAND_CLASS_COLOR_SWITCH, COMMAND_CLASS_ASSOCIATION_GRP_INFO V1 COMMAND_CLASS_ASSOCIATION V2 COMMAND_CLASS_FIRMWARE_UPDATE_MD V2 COMMAND_CLASS_POWERLEVEL V1

2. Technical Specifications

Model number: ZW096

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 15A Resistor load. (USA Version)

230V~, 50Hz, Max 13A Resistor load. (EU Version)

230V~, 50Hz, Max 10A Resistor load. (CN Version)

230V~, 50Hz, Max 10A Resistor load. (AU Version)

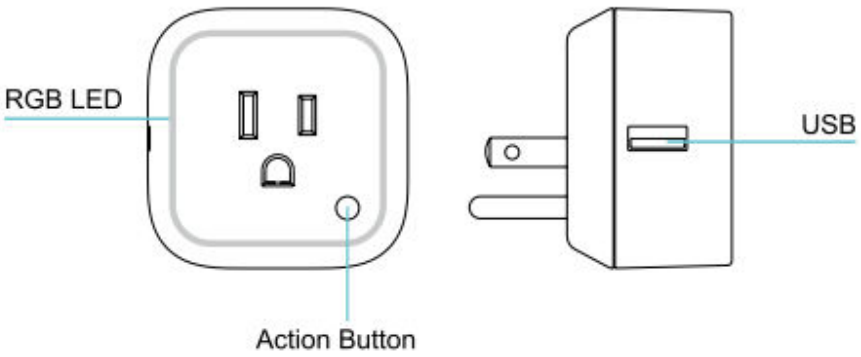
230V~, 60Hz, Max 10A Resistor load. (BR Version)

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

Button Action	Description
Press one time	**1. Send non-security Node Info frame.** **2. Add Smart Switch into a Z-Wave network:** 1. Insert the Smart Switch to power socket, The purple 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 is successful, the 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 Switch from a Z-Wave network:** 1. Insert the Smart Switch to power socket, the 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, the LED will blink slowly. If the LED still is solid, please repeat the process from step 2.
Quick press 2 times	**1. Send Security Node Info frame.** **2. Add Smart Switch into a secure Z-Wave network:** 1. Insert the Smart Switch into 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 is successful, the 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 Switch from a z-wave network:** 1. Insert the Smart Switch into power socket, the 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, the LED will be colorful gradient status. If the LED

	is still solid, please repeat the process from step 2.
Press and hold 20 seconds	**Reset Smart Switch to factory default:** 1. Make sure the Smart Switch has been powered on. 2. Press and hold the Action Button for 20 seconds. 3. The green LED will be on for 2 seconds and then remain colorful gradient status, which indicates the reset is successful, otherwise please repeat from step 2. **Note:** 1, This procedure should only be used when the primary controller is missing or inoperable. 2, Reset the Smart Switch to factory default will exclude the Smart Switch from Z-Wave network, clear the Association settings, energy metering value, Scene configuration settings and restore the Configuration settings to the default.

4.2 RGB LED indication when Smart Switch 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, 900W) AU version， the range of load wattage is [0W, 1000W) EU version， the range of load wattage is [0W, 1500W)
	Yellow	Output load is in big wattage range. US version，the range of load wattage is [900W, 1600W) AU version，the range of load wattage is [1000W, 2000W) EU version，the range of load wattage is [1500W, 2500W)
	Red	Output load is in warning wattage range. US version， the range of load wattage is [1500W,2000W) AU version， the range of load wattage is [2000W, 2500W) EU version， the range of load wattage is [2500W, 3000W)

4.3 RGB LED indication when Smart Switch is in RF Power Level Test Mode

RGB	RGB indication	Status
RGB LED	Blue 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	0x0700 (ICON_TYPE_GENERIC_ON_OFF_POWER_SWITCH)
User Icon Type	0x0700 (ICON_TYPE_GENERIC_ON_OFF_POWER_SWITCH)

5.2 Basic Command Class

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

Basic Set = 0x00, turn OFF output load.

Basic Set = 0xFF maps to Binary Switch Set = 0xFF,

Basic Set = 0x00 maps to Binary Switch Set = 0x00,

Basic Get/Report maps to Binary Switch Get/Report.

5.3 Association Command Class

Smart Switch 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

	[1,5]	Single Cast	When the state of Smart Switch (turn on/off the load) is cha nged: 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 Binary Set to associated nodes in Group 2 when the Smart Switch receives the Basic Set, Switch Binary 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=00, Profile LSB=00)

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	0x60 (96)

5.6 Multilevel Switch Command Class

The Multilevel Switch CC is used to change the brightness level for the RGB LED when it is in Night light mode (configurable).

Note:

1. It cannot be used to change the state of output load.

2. The level value can be set in any modes, but it will only have effect on the LED's brightness level in Night light mode.

5.7 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
0x03 (3)	Current Overload Protection. Output load will be closed after 2 minutes if the current overruns (US: 16.5A, AU: 10.5A, EU: 14A). 0 = Disabled 1 = Enabled	1	1
0x14 (20)	Configure the output load status after re-power on 0 = The last status before the power outage. 1 = Always on 2 = Always off	0	1
0x21 (33)	Set the RGB LED's color for testing. Value1: Reserved Value2: Red value Value3: Green value Value4: Blue value	-	4
0x50 (80)	To set which notification would be sent to the associated nodes in association group 1 when the state of output load is changed. 0 = Nothing 1 = Hail CC 2 = Basic Report CC	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). 1 = Momentary indicate mode. When the state of Switch's load changed, The LED will follow the status (on/off) of its load, but the LED will turn off after 5 seconds if there is no any switch action. 2 = Night light mode. The LED will remain the state that is set via the Multilevel Switch Set CC or Color Switch Set CC. Note: In Night light mode, the Multilevel Switch Set CC is used to set the LED's brightness level, the Color Switch Set CC is used to set the LED's color.	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=0x32 Yellow=0x32 Red=0x32	3
0x5A (90)	Enable/disable the parameter 91 and 92 below 0 = Disable 1 = Enable Note: If this parameter is set to 1 (Enable), the parameter 101 – 103 should be set to 0.	0	1
0x5B (91)	The value here represents minimum change in wattage (in terms of wattage) to induce a Meter Report (available range 0-60000).	25 (W)	2
0x5C (92)	The value here represents minimum change in wattage percent (in terms of percentage) to induce a Meter Report (available range 0-100).	5 (%)	1
0x64 (100)	Set 101-103 to default.	N/A	1
0x65 (101)	To set which report would be sent in Report group 1 (See flags in table below).	0x00 00 00 00	4

0x66 (102)	To set which report would be sent in Report group 2 (See flags in table below).	0x00 00 00 00	4
0x67 (103)	To set which report would be sent 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)	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							
configuration Value 3	Reserved							
configuration Value 4(LSB)	Reserved	Reserved	Reserved	Reserved	Auto send Meter REPORT (kWh)	Auto send Meter REPORT (Watt)	Auto send Meter REPORT (Current)	Auto send Meter REPORT (Voltage)

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);