Z-Wave Plus Switch Engineering Specifications

V1.3

Version History

NO.	Version	Date	User	Description
1	V1.0	2020.07.24	Eric	Created
2	V1.1	2020.09.23	Eric	Update All functions of each trigger.
3	V1.2	2020.12.23	Eric	1. Redescribe the LED behavior for reset operation in section 5.4. 2. Add Meter Command Class In section 6.4. 3. Update command version in section 4.2. 4. Update default value to 0 of 'Delayed OFF Time'.
4	V1.3	2021.01.07	Eric	1. Update Required Security Class in section 4.2. 2. Add Indicator Report in Lifeline Group. 3. Update [Altering capability] value to false.

The Switch is a binary switch device based on Z-Wave™ slave library of V7.13.06. This Switch integrated Z-Wave communication module to connect with Z-Wave gateway.
The Switch 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.
The Switch is a security Z-Wave device (S2), so a security enabled controller is needed for take full advantage of all functionally for the Switch.
SmartStart enabled products can be added into a Z-Wave network by scanning the Z-Wave QR Code present on the product with a controller providing SmartStart inclusion. No further action is required and the SmartStart product will be added automatically within 10 minutes of being switched on in the network vicinity.

Features:

- AC output switch on/off by manual or Z-Wave command.
- LED indicates the working status.
- Supporting repeater role.

1 Hardware Specifications

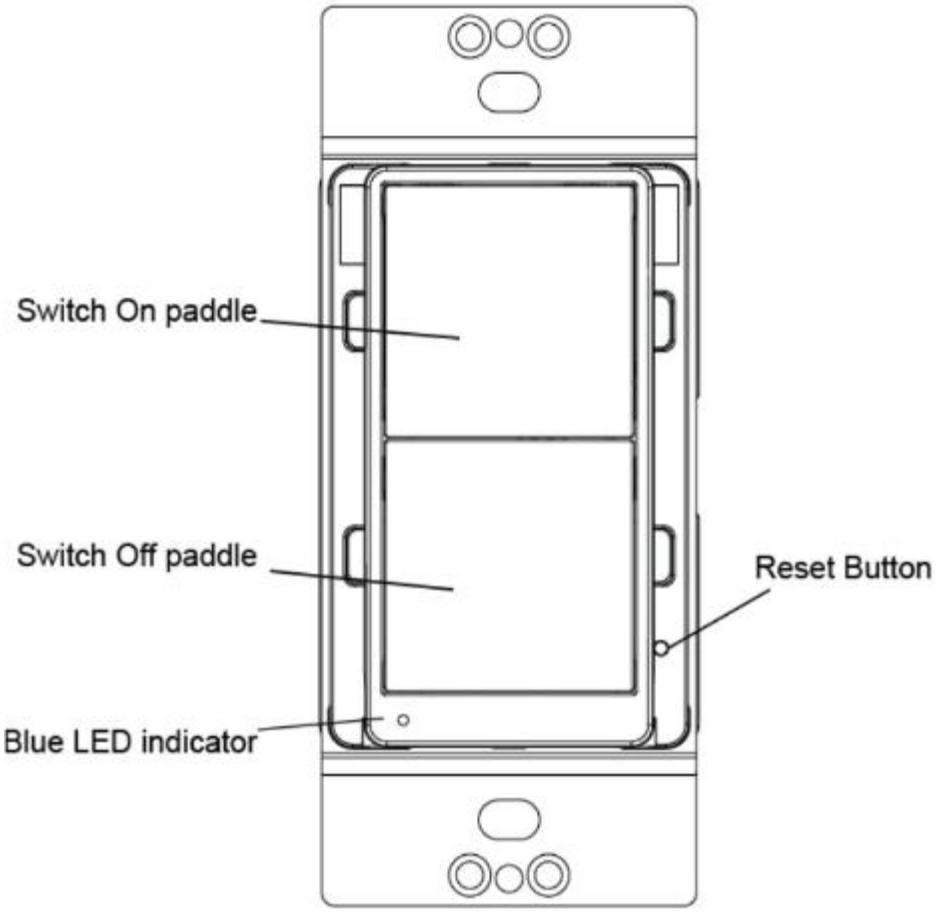
Wireless Protocol	Z-Wave
Radio Frequency	908.42MHz(US)
Communication Distance	40m(LOS)
Modulation Mode	FSK(BFSK/GFSK)
Rated load current	15A
Voltage(V)	120V +/-10%, 60Hz
Dimensions(mm)	103mm*43mm*44.5mm

2 Z-Wave Specifications

SDK Version	7.13.06
SDK Library	libZWaveSlave
Explorer Frame Support	Yes
Routing	Yes
SmartStart	Yes
Device Type	Binary Switch
Basic Device Class	BASIC_TYPE_ROUTING_SLAVE
Generic Device Class	GENERIC_TYPE_SWITCH_BINARY

Specific Device Class	SPECIFIC_TYPE_NOT_USED
Role Type	Always On Slave (AOS)

3 Familiarize yourself with Switch



4 Security and non-Security features of Switch

This device is a security enabled Z-Wave Plus™ product that is able to use encrypted Z-Wave Plus messages to communicate to other security enabled Z-Wave Plus products.
When a node includes into a S2 Z-Wave network, the node supports S2 unauthenticated class, S2 authenticated and so do the supported CCs.

4.1 Supported Security Levels

- SECURITY_KEY_S2_AUTHENTICATED_BIT
- SECURITY_KEY_S2_UNAUTHENTICATED_BIT

4.2 Commands List

Supported Command Classes	Version	Required Security Class

COMMAND_CLASS_ZWAVEPLUS_INFO_V2	2	None
COMMAND_CLASS_TRANSPORT_SERVICE_V2	2	None
COMMAND_CLASS_SECURITY_2_V1	1	None
COMMAND_CLASS_SUPERVISION_V1	1	None
COMMAND_CLASS_APPLICATION_STATUS_V1	1	None
COMMAND_CLASS_BASIC_V2	2	Highest granted Security Class
COMMAND_CLASS_SWITCH_BINARY_V2	2	Highest granted Security Class
COMMAND_CLASS_METER_V5	5	Highest granted Security Class
COMMAND_CLASS_CONFIGURATION_V4	4	Highest granted Security Class
COMMAND_CLASS_ASSOCIATION_V2	2	Highest granted Security Class
COMMAND_CLASS_ASSOCIATION_GRP_INFO_V3	3	Highest granted Security Class
COMMAND_CLASS_VERSION_V3	3	Highest granted Security Class
COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2	2	Highest granted Security Class
COMMAND_CLASS_DEVICE_RESET_LOCALLY_V1	1	Highest granted Security Class
COMMAND_CLASS_POWERLEVEL_V1	1	Highest granted Security Class
COMMAND_CLASS_FIRMWARE_UPDATE_MD_V5	5	Highest granted Security Class
COMMAND_CLASS_INDICATOR_V3	3	Highest granted Security Class
COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3	3	Highest granted Security Class
COMMAND_CLASS_PROTECTION_V2	2	Highest granted Security Class

5 All functions of each trigger

5.1 SmartStart

Trigger	Description
PowerOn	**Switch is not on the Z-Wave network:** **1.** The Switch led will slow blink 3 minutes. **2**. Add the Switch into the Z-Wave network via SmartStart (**SmartStart Inclusion**) Add the Switch DSK into the primary controller SmartStart Provisioning List (If your controller does not support SmartStart inclusion, please refer to the manual for your controller for non-SmartStart inclusion.). **a)** Power cycle once for Switch. **b)** The Switch will send “Explorer Auto inclusion” frame to start

	SmartStart inclusion. **c)** Wait a moment, the Switch should be added to the controller. Then the Switch led will keep on 1 minute when it has been included into the network. Otherwise, the Switch led will slow blink 3 minutes. In which case you need to repeat the process from step a. Note: The Switch has a DSK string, you can key in first five digit to increment SmartStart process, or you can scan QR code. The QR code can be found on the Switch. Ex: DSK: 65286-19008-32952-20593-44872-18102-41266-46651 The Switch will Start SmartStart Inclusion when it is removed from a Z-Wave network. **Switch is on the Z-Wave network:** **1.** The Switch led will keep on 1 minute. **2.** The Switch will send INIF.

5.2 ON Button

ON Button Trigger	Description
Press once	**1.** Open the Load. **2.** Send Switch Binary Report to lifeline.
Short press 3 times (within 1.5second)	**Switch is not on the Z-Wave network:** **1.** The Switch led will fast blink, and send node info frame. **2.** Add the Switch into the Z-Wave network **(Manual Inclusion):** **a)** Set the Z-Wave network main controller into inclusion mode. **b)** Short press 3 times ON Button, the Switch led will fast blink. **c)** Wait a moment, the Switch should be added to the controller. Then the Switch led will keep on 1 minute when it has been included into the network. Otherwise, the Switch led will slow blink 3 minutes. In which case you need to repeat the process from step a. **Normal mode - Switch is on the Z-Wave network:** **1.** The Switch led will fast blink, and send node info frame. **2**. Remove the Switch from a Z-Wave network **(Manual Inclusion)**: **a)** Assuming Switch was added to controller and was power on. **b)** Set the Z-Wave network main controller into removing mode. **c)** Short press 3 times ON Button, the Switch led will fast blink. **d)** Wait a moment, and then the Switch led will slow blink 3 minutes when it has been removed from the network. Otherwise, the Switch led will keep on 1 minute. In which case you need to repeat the process from step b.

5.3 OFF Button

OFF Button Trigger	Description
Press once	**1.** Close the Load. **2.** Send Switch Binary Report to lifeline.
Short press 3 times (within 1.5second)	**Switch is not on the Z-Wave network:** **1.** The Switch led will fast blink, and send node info frame. **2.** Add the Switch into the Z-Wave network **(Manual Inclusion):** **a)** Set the Z-Wave network main controller into inclusion mode. **b)** Short press 3 times OFF Button, the Switch led will fast blink. **c)** Wait a moment, the Switch should be added to the controller. Then the Switch led will keep on 1 minute when it has been included into the network. Otherwise, the Switch led will slow blink 3 minutes. In which case you need to repeat the process from step a. **Normal mode - Switch is on the Z-Wave network:** **1.** The Switch led will fast blink, and send node info frame. **2**. Remove the Switch from a Z-Wave network **(Manual Inclusion)**: **a)** Assuming Switch was added to controller and was power on. **b)** Set the Z-Wave network main controller into removing mode. **c)** Short press 3 times OFF Button, the Switch led will fast blink. **d)** Wait a moment, and then the Switch led will slow blink 3 minutes when it has been removed from the network. Otherwise, the Switch led will keep on 1 minute. In which case you need to repeat the process from step b.

5.4 Reset Button

Reset Button Trigger	Description
Press and hold:20 Seconds	**Reset the device to factory default:** 1. Press and hold the Reset Button for 20 seconds, then the Switch led will fast blink 1 second. 2. The Switch led will blink 2 seconds, when released Reset Button. It will send “Device Reset Locally Command”. Otherwise please repeat step 1. Note： 1. Please use this procedure only when the network primary controller is missing or otherwise inoperable. 2. Reset the Switch to factory default settings will sets the Switch to not in z-wave network state; delete the Association setting and restore the Configuration setting to the default.

5.5 Group Control

Key Trigger	Description
press ON and OFF at same time	Send Basic Set 0xFF/0x00 to association group 2

6 Special Rule of Each Command

6.1 Basic Command Class

Basic Set maps to Binary Switch Set
Basic Get maps to Binary Switch Get
Basic Report maps to Binary Switch Report

6.2 Association Command Class

The Switch supports 2 association groups.

Grouping Identifier	Max Nodes	Send Commands
Lifeline	0x05	1. Switch Binary Report 2. Device Reset Locally Notification 3. Meter Report 4. Indicator Report
Group2	0x05	Basic Set

Group 1: Lifeline
Description: Members of this group will receive unsolicited messages related to the status of the switch.
Binary Report:
Changings of load caused by user action or receiving of Switch Binary Set or Basic Set CC will trigger this cc.
Meter Report:
Power or energy changings will trigger this cc.
Device Reset Locally:
Long press the Reset Button fot more than 20 seconds will trigger this cc.

Group 2: On/Off Control
Description: Sends Basic Set to associated devices, when press ON Button and OFF Button at same time.

6.3 Z-Wave Plus Info Command Class

Parameter	Value
Z-Wave Plus Version	V2
Role Type	ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_ALWAYS_ON
Node Type	ZWAVEPLUS_INFO_REPORT_NODE_TYPE_ZWAVEPLUS_NODE
Installer Icon Type	ICON_TYPE_GENERIC_ON_OFF_POWER_SWITCH
User Icon Type	ICON_TYPE_GENERIC_ON_OFF_POWER_SWITCH

6.4 Meter Command Class

Meter Type	Rate Type	Scale	Precision	Size
Electric meter(0x01)	Import only(0x01)	kWh(0x00)	3	4
		W(0x02)	3	4
		V(0x04)	3	4
		A(0x05)	3	4

6.5 Configuration Set Command Class

#	Name	Size	Range	Description	Default
1	LED indicator Status	1	0~1	Synchronization of load power and LED indicator. 0: Power On, LED off, means that the power and the LED are in the different state. 1: Power On, LED On, means that the power and the LED are in the same state.	1
2	Delayed OFF Time	1	0~240	Delay off means when users press button to turn off the load, there's a reaction time.	0
3	Power On Status	1	1~3	When the device is powered on, the initial status. 1= Off 2= On	1

				3= Last State	
4	Child Lockout Enable	1	0-1	Child lockout feature can enabled and disabled local control. 0= Disable 1= Enable	0

Name	Info	Parameter Number	Default Value(dec)	Max Value(dec)	Min Value(dec)	Size	ReadOnly	Format	Altering capability
LED indicator Status	LED indicator Status	0x01	1	1	0	1	No read-only	Unsigned integer	false
Delayed OFF Time	Delayed OFF Time	0x02	0	240	0	1	No read-only	Unsigned integer	false
Power On Status	Power On Status	0x03	1	3	1	1	No read-only	Unsigned integer	false
Child Lockout Enable	Child Lockout Enable	0x04	0	1	0	1	No read-only	Unsigned integer	false