

Eco Dual Switch

Advanced Information Product Manual



Engineering Specification

Eco Dual Switch Advanced Information Product Manual

Document No.	Engineering Specification – Z-Wave™ Product Line (ZW802)
Version	1.0
Description	This document mainly introduces the new generation Eco Dual Switch. The content mainly includes its interfaces, accessories, features, specifications, quick start, and software function definition. This device is a security enabled Z-Wave Plus™ v2 product that is able to use encrypted Z-Wave Plus v2 messages to communicate to other security S2 enabled Z-Wave Plus v2 products. This device must be used in conjunction with a security enabled Z-Wave controller in order to fully utilize all implemented functions. This product can be operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.
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Version Date		Brief description of changes
2.0	2023.10.05	First revision.

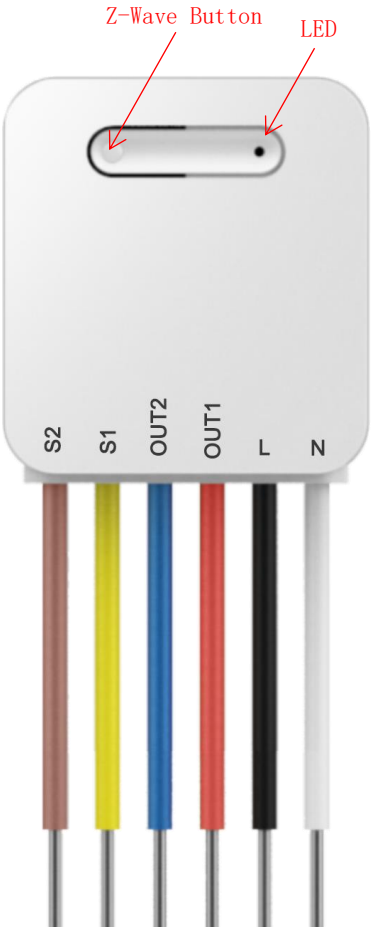
Table of Content

1	INTERFACES & INSTALLATION	1
1.1	Interfaces	1
1.2	Installation	2
2	FEATURES & SPECIFICATIONS	4
2.1	Structural Characteristics	4
2.2	Hardware Characteristics	4
2.3	Software Characteristics	5
3	PRODUCT QUICK START	7
3.1	Important safety information	7
3.2	About Z-Wave	7
3.3	About SmartStart	7
3.4	About Z-Wave Long Range	7
3.5	How to add the product into Z-Wave network	8
3.6	How to remove the product from Z-Wave network	8
3.7	How to factory reset	9
3.8	Z-Wave DSK Location	9
3.9	Auto-Detect external switches connected	9
3.10	About Product	10
3.11	About Security	10
4	SOFTWARE FUNCTION DEFINITION	11
4.1	User Behavior Interaction	11
4.2	Supported Command Classes	11
4.3	Basic Command Class mapping	13
4.4	ZWAVEPLUS_INFO	13
4.5	Manufacturer Specific	14
4.6	Version	14
4.7	Association Group Info	14
4.8	Meter	16
4.9	Notification	16

4.10	Central Scene	17
4.11	Indicator	17
4.12	Configuration	17

1 INTERFACES & INSTALLATION

1.1 Interfaces

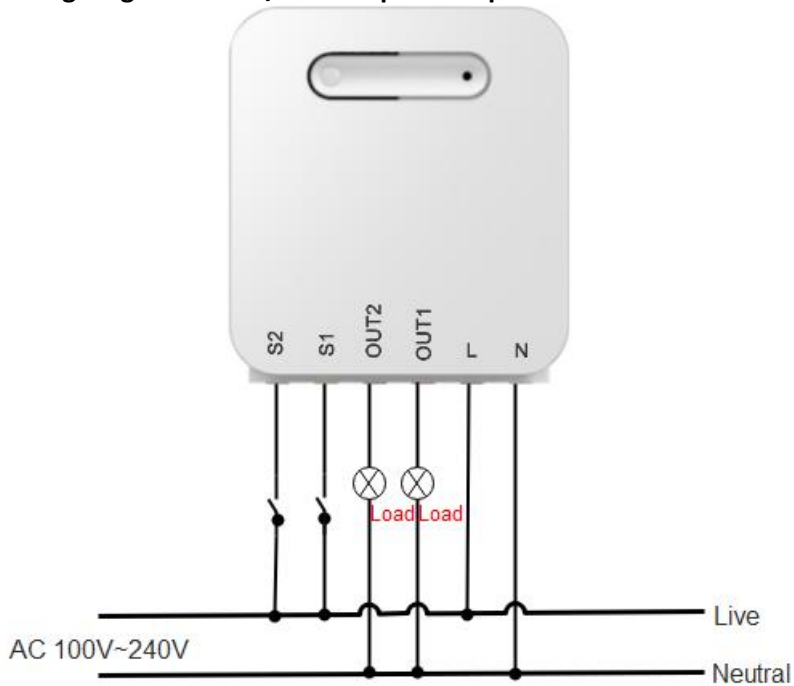


Terminology	Description
L	Power input for live.
N	Power input for neutral.
OUT1	Output for load (This is directly connected to your Loads input to receive power).
OUT2	Output for load (This is directly connected to your Loads input to receive power).
S1	External switch control for OUT1
S2	External switch control for OUT2
LED	Indicates Z-Wave network status or relay on/off status
Z-Wave Button	On/Off control or Z-Wave network settings or Restore factory settings

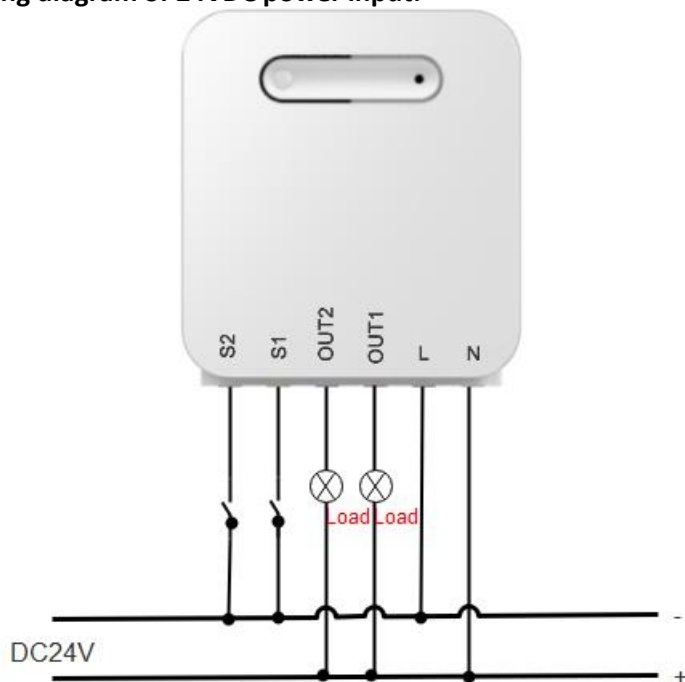
QR Code	2D barcode format that can contain large amounts of information in a small square of encoded blocks resembling a random checkerboard pattern. In Z-Wave, it is used to represent the S2 public part of the DSK on a device, as well as additional information needed for the inclusion process
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1.2 Installation

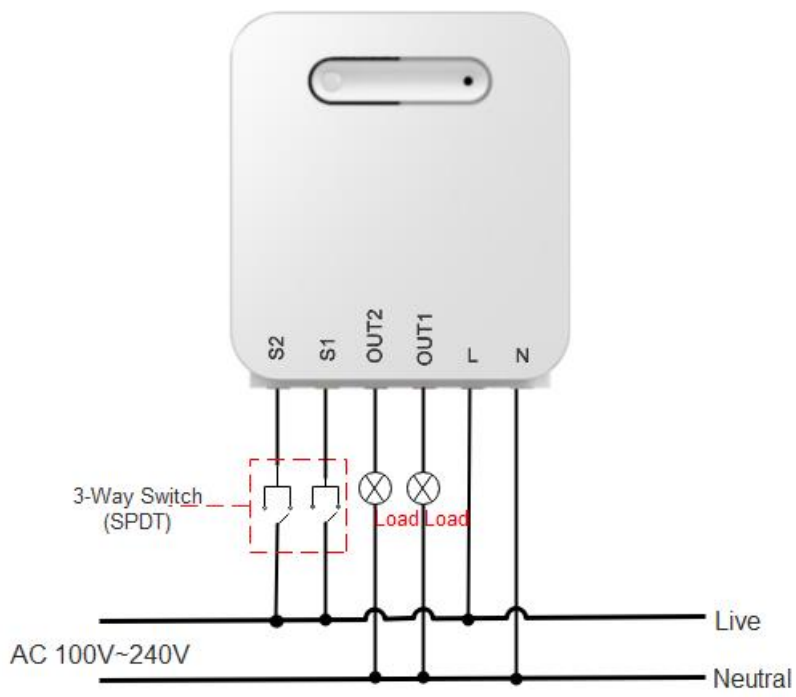
Wiring diagram of 100/240VAC power input:



Wiring diagram of 24VDC power input:



Wiring diagram of 3-Way connection for the external manual switch:



2 FEATURES & SPECIFICATIONS

2.1 Structural Characteristics

Parameter	Value
Product Identifier	ZW802
Dimensions	35*38*18mm
Weight	31.65 g
Color	White
Usage	For indoor use.
Operating Temperature	32-104° F (0-40° C)
Relative Humidity	8% to 85% non-condensing

2.2 Hardware Characteristics

Parameter	Value
Z-Wave Module	EFR32ZG23A010F512GM40
Z-Wave TX Power	Max: 14dBm
Z-Wave Antenna Distance	40m (Indoor) /150m (Outdoor)
Indicator Light Color	red and green
Power	100-240VAC, 50/60Hz
Maximum Loads	100-130VAC 50/60Hz Resistive Max: 5A/channel Inductive Max: 2A/channel Capacitive Max: 2A/channel 220-240VAC 50/60Hz Resistive Max: 5A/channel Inductive Max: 2A/channel Capacitive Max: 2A/channel
Max standby power	<0.8W
Power measurement accuracy	±2W(<100W), ±1.5%(>100W)

2.3 Software Characteristics

Parameter	Value
Wireless Technology	Z-Wave
Certification Type	Z-Wave Plus v2
Z-Wave SDK Version	7.18.08
Z-Wave Library Type	Enhanced 232 Slave
Z-Wave Role Type	ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_ALWAYS_ON (0x05)
Generic Device Type	GENERIC_TYPE_SWITCH_BINARY (0x10)
Specific Device Type	SPECIFIC_TYPE_NOT_USED (0x00)
Security Class	Non-Security, S2-UNAUTHENTICATED, S2-AUTHENTICATED
SmartStart	Support. After powering on, SmartStart is auto active if it's out of the Z-Wave network.
Over The Air (OTA)	Support. Firmware can be updated via RF.
Multichannel Device	Yes.
Association	Support. Refer to Section 4.7 Association Group Info.
Factory Reset	Support. Refer to Section 3.7 How to factory reset.
Power-down Memory	Support. All command settings will stay unchanged even power down.
Scene Control	Support. Refer to Section 4.8 Central Scene
Group Control	Support. Refer to Section 4.7 Association Group Info
On/Off Status Report	Support. When Manual or Z-Wave on/off control, send out Basic Report or Binary Switch Report via Group 1.
Energy Measurement	Support.
Power Measurement	Support.
Voltage Measurement	Support.
Current Measurement	Support.
Over Heat Protection	Support.
Over load Protection	Support.

Over Voltage Protection	Support.
Signal Repeater	Support.
Z-Wave Long Range	Support.

3 PRODUCT QUICK START

3.1 Important safety information

Please read this Engineering Specification carefully for correct and effective use.

Failure to follow the recommendations set forth by ZVIDAR Limited may be dangerous or cause a violation of the law. The manufacturer, importer, distributor, and/or reseller will not be held responsible for any loss or damage resulting from not following any instruction in this guide or in other materials.

The product is intended for indoor use in dry locations only. Do not use in damp, moist, and /or wet locations.

3.2 About Z-Wave

Z-Wave is the international wireless protocol for communication in the Smart Home.

Z-Wave ensures a reliable communication by reconfirming every message (two-way communication) and every mains powered node can act as a repeater for other nodes (meshed network) in case the receiver is not in direct wireless range of the transmitter.

This device and every other certified Z-Wave device can be used together with any other certified Z-Wave device regardless of brand and origin as long as both are suited for the same frequency range.

If a device supports secure communication it will communicate with other devices secure as long as this device provides the same or a higher level of security. Otherwise it will automatically turn into a lower level of security to maintain backward compatibility.

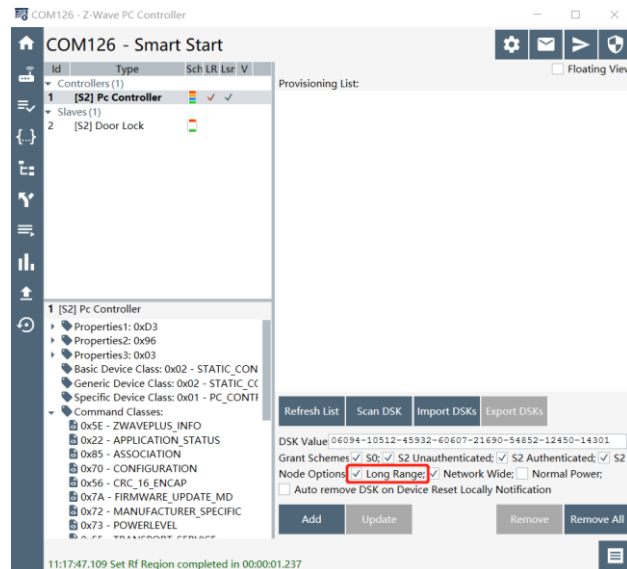
3.3 About SmartStart

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.

3.4 About Z-Wave Long Range

Z-Wave Long Range device can only support be included via SmartStart.

Extract the DSK from end device and paste it into the DSK Value in PC Controller, make sure the 'Long Range' option is ticked.



In the scanning process when using US_LR frequency, the end device will switch between 2 PHY setups, the classic US PHY and the LR PHY with both LR channels active. When the inclusion of end device starts, it will settle on using the PHY that was used by the controller for inclusion. In other words, during learn mode, an end node that support LR will send SmartStart Prime on both classic Z-Wave and Z-Wave LR PHY, both request are send up to the host on the controller and it is the host's responsibility to determine which PHY is used for inclusion.

The controller doesn't do channel scanning the same way as in end device. The controller will scan 4 channels, including 3 classic Z-Wave channels 9.6/40/100 kbps and 1 LR channel, using US_LR frequency will scan at 912 MHz while using US_LR_BACKUP will scan at 920 MHz during startup. The active LR channel can be switch at runtime.

3.5 How to add the product into Z-Wave network

1. Follow the user guide of hub to enter inclusion mode.
2. Click the Z-Wave button 3 times quickly, enter "Include mode"
3. The LED will fast blink green during the inclusion, and then solid green for 2 seconds to indicate the inclusion is successful, otherwise the LED will solid red for 2 seconds in which you need to repeat the process from step 1

3.6 How to remove the product from Z-Wave network

1. Follow the user guide of hub to enter exclusion mode.
2. Click the Z-Wave button 3 times quickly, enter "Exclusion mode"
3. LED will fast blink green during the exclusion, and then solid green for 2 seconds to indicate that the exclusion is successful, otherwise the LED will solid red for 2 seconds in which you need to repeat the process from step 1

3.7 How to factory reset

1. Please use this procedure only when the network primary controller is missing or otherwise inoperable.
2. Press and hold the Config Button more than 20 seconds. The LED indicator will flash during the process and turn red, the **Eco Dual Switch** will reset itself to factory default by sending a "Device Reset Locally Notification" to gateway when the button is released

3.8 Z-Wave DSK Location

You can find the QR code on the back of the **Eco Dual Switch**.

You may also find the QR Code and DSK card in the individual package of each product.

Please do not remove or damage them.

3.9 Auto-Detect external switches connected

After the **Eco Dual Switch** was first time powered, trigger the connected external switch once, the **Eco Dual Switch** will automatically detect the switch type of this connect switch. If not (auto-detect failed), you can also manually operate to configure/match the external switch type, as below:

Manually configure S1 external Switch

1. Quickly press the Z-Wave Button 5 times within 2 seconds. The **Eco Dual Switch** will enter into a switch type selecting mode. The LED will flash in green to indicate the switch type it should connect:

Flash once in circle (every 2 seconds) - Toggle Switch;

Flash twice in circle (every 2 seconds) - Momentary Switch;

Flash 3 times in circle (every 2 seconds) - Toggle switch with fixed actions (NO/NC Switch);

Flash 4 times in circle (every 2 seconds) - 3-way impulse control;

2. When in the switch type selecting mode, press the Z-Wave Button ONCE in sequence to shift the switch types.
3. After the switch type match the external switch, press and hold the Z-Wave Button for more than 1 second to confirm the selection. If the selection is not confirmed in 30 seconds, the Eco Switch will exit the switch type selecting mode

Manually configure S2 external Switch

1. Quickly press the Z-Wave Button 6 times within 2 seconds. The Eco Switch will enter into a switch type selecting mode. The LED will flash in orange to indicate the switch type it should connect:

Flash once in circle (every 2 seconds) - Toggle Switch;

Flash twice in circle (every 2 seconds) - Momentary Switch;

Flash 3 times in circle (every 2 seconds) - Toggle switch with fixed actions (NO/NC Switch);

Flash 4 times in circle (every 2 seconds) - 3-way impulse control;

2. When in the switch type selecting mode, press the Z-Wave Button ONCE in sequence to shift the switch types.
3. After the switch type match the external switch, press and hold the Z-Wave Button for more than 1 second to confirm the selection. If the selection is not confirmed in 30 seconds, the Eco Switch will exit the switch type selecting mode

3.10 About Product

This product can be operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers. All mains operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.

3.11 About Security

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. S2 Security Enabled Controller is required to operate the device.

4 SOFTWARE FUNCTION DEFINITION

4.1 User Behavior Interaction

User behavior	Out of the Z-Wave network	In the Z-Wave network
Power on	LED will keeps green slow blink Send Inclusion Requests for SmartStart	LED Following load state
Inclusion network	Click the Z-Wave button 3 times quickly or Click the External Switch 3 times quickly (Configurable by param 9), enter "Include mode"	NA
Exclusion network	NA	Click the Z-Wave button 3 times quickly or Click the External Switch 3 times quickly (Configurable by param 9), enter "Exclusion mode"
Factory reset	NA	2 x tap and hold (the second time) for 10 seconds
Relay Control	Click the Z-Wave button or External Switch the Relay will be on or off	Click the Z-Wave button or External Switch the Relay will be on or off, the LED Following load state Send Basic Report or Binary Switch Report to association group 1(Configurable by param 4) Send Basic Set to go association group 2
Scene Control	NA	Action the external switch. Send Central Scene Notification to association group 1(Configurable by param 5)

4.2 Supported Command Classes

ENDPOINT ROOT:

Command		Mapped
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_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_MULTI_CHANNEL_ASSOCIATION_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_MULTI_CHANNEL_V4	4	Highest granted Security Class
COMMAND_CLASS_METER_V3	3	Highest granted Security Class
COMMAND_CLASS_NOTIFICATION_V8	8	Highest granted Security Class
COMMAND_CLASS_CENTRAL_SCENE_V3	3	Highest granted Security Class
COMMAND_CLASS_INDICATOR_V3	3	Highest granted Security Class

ENDPOINT 1/2:

Command Classes	Version	Required Security Class
COMMAND_CLASS_ZWAVEPLUS_INFO_V2	2	None
COMMAND_CLASS_SUPERVISION_V1	1	None
COMMAND_CLASS_SECURITY_2_V1	1	None
COMMAND_CLASS_SWITCH_BINARY_V2	2	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_MULTI_CHANNEL_ASSOCIATION_V3	3	Highest granted Security Class
COMMAND_CLASS_METER_V3	3	Highest granted Security Class

4.3 Basic Command Class mapping

Basic Command maps to Switch Binary Command Class, as shown below.

Command	Value	Mapped	Value
Basic Set	0x00	Switch Binary Set	0x00
	0xFF		0xFF
Basic Get/Report		Switch Binary Get/Report	

4.4 ZWAVEPLUS_INFO

The Command is used to differentiate between Z-Wave Plus v2, Z-Wave for IP and Z-Wave devices. This command provides additional information about the Z-Wave Plus v2 device in question.

Parameter	Value
Z-Wave Plus Version	0x02
Role Type	0x05 (ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_ALWAYS_ON)
Node Type	0x00 (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)

4.5 Manufacturer Specific

The Command is used to advertise manufacturer specific information.

Parameter	Value
Manufacturer ID 1	0x04
Manufacturer ID 2	0x5A
Product Type ID 1	0x00
Product Type ID 2	0x04
Product ID 1	0x03
Product ID 2	0x22

4.6 Version

The Command may be used to obtain the Z-Wave library type, the Z-Wave protocol version used by the application, the individual command class versions used by the application.

Parameter	Value
Z-Wave Protocol Library Type	0x03
Z-Wave Protocol Version	0x07
Z-Wave Protocol Sub Version	0x12
Firmware 0 Version	Z-Wave Chip Firmware Version Major
Firmware 0 Sub Version	Z-Wave Chip Firmware Version Minor
Hardware Version	0x01
Number of firmware targets	0x00

4.7 Association Group Info

The Command is used to manage associations to Node ID destinations.

ID	Name	Count	Profile	Function
1	Lifeline	5	General: Lifeline (0x0001)	Basic Report(0x2003): Issued when relay status changed (Configurable by param 4). Switch Binary Report(0x2503):

				Issued when relay status changed (Configurable by param 4). Device Reset Locally Notification (0x5A01): Issued when Factory Reset is performed. Central Scene Notification(0x5B03): Issued when external switch is performed (Configurable by param 5). Meter Report(0x3202): Issued periodically according to the parameter 41-52 or above the threshold. Notification Report(0x7105): Issued When over load detected. Configuration Report(0x7006) Issued when the External switch configuration value is changed by Z-Wave button Indicator Report(0x8703): Issued when indicator set received
2	EP1 On/Off Control	5	General: Control (0x2001)	Basic Set (0x2001) : When endpoint 1 these commands are received, they will be re-transmitted to the associated nodes.
3	EP2 On/Off Control	5	General: Control (0x2002)	Basic Set (0x2001) : When endpoint 2 these commands are received, they will be re-transmitted to the associated nodes.

Endpoint 1:

ID	Name	Count	Profile	Function
1	Lifeline	0	General: Lifeline (0x0001)	Mapping to Lifeline group of Endpoint root
2	EP1 On/Off Control	5	General: Control (0x2001)	Mapping to group 2 of Endpoint root

Endpoint 2:

ID	Name	Count	Profile	Function
1	Lifeline	0	General: Lifeline (0x0001)	Mapping to Lifeline group of Endpoint root
2	EP2 On/Off Control	5	General: Control	Mapping to group 3 of Endpoint root

			(0x2002)	
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4.8 Meter

The meter command class is used to read accumulated consumption meter values in the device. The default scale value is kWh(0x00) in Electric meter and the default rate type is Import(0x01).

1. Meter supported Report:

- 1) Meter Reset: 0x01
- 2) Rate Type: 0x01 (Import only)
- 3) Meter Type: 0x01 (Electric meter)
- 4) Scale Support: 0x35 (A, V, W, kWh)

Scale	Description
KWh	Default scale, the report interval can be configured by param44/45/46.
W	The report interval can be configured by param41/42/43.
V	The report interval can be configured by param47/48/49.
A	The report interval can be configured by param50/51/52.

- 5) M.S.T: 0

4.9 Notification

The Command is used to advertise events or states, such.

Notification Type = Power Management (0x08), according to Table 4-9-1

Notification Type = Heat Alarm (0x03), according to Table 4-9-2

Table 4-9-1:

Description	Event	Alarm type	Alarm Level	Parameters
State idle (Detected Over-voltage Idle)	0x00	0x16	0x00	0x07
State idle (Detected Over-load Idle)		0x17	0x00	0x06
Over-voltage detected	0x07	0x16	0xFF	
Over-load detected	0x08	0x17	0xFF	

Table 4-9-2:

Description	Event	Alarm type	Alarm Level	Parameters
State idle (Detected Overheat Idle)	0x00	0x18	0x00	0x02
Overheat detected	0x02	0x18	0xFF	

4.10 Central Scene

The Command is used to advertise external switch action, such.

External Switch 1:

Action	KeyAttributes	SceneNumber	Description
Held	0x02	0x01	
Released	0x01	0x01	
1x	0x00	0x01	
2x	0x03	0x01	only param 7/8 =1
3x	0x04	0x01	only param 7/8 =1
4x	0x05	0x01	only param 7/8 =1
5x	0x06	0x01	only param 7/8 =1

External Switch 2:

Action	KeyAttributes	SceneNumber	Description
Held	0x02	0x02	
Released	0x01	0x02	
1x	0x00	0x02	
2x	0x03	0x02	only param 7/8 =1
3x	0x04	0x02	only param 7/8 =1
4x	0x05	0x02	only param 7/8 =1
5x	0x06	0x02	only param 7/8 =1

4.11 Indicator

The Command is used to help end users to monitor the operation or condition of the application provided by a supporting node.

Indicator ID		Property ID	
Node Identify	0x50	On Off Period	0x03
		On Off Cycles	0x04
		On time within an On/Off period	0x05

4.12 Configuration

The Command allows product specific configuration parameters to be changed.

Note: No Bulk Support equals to True. *It will return an Application Rejected Request Command when receiving Configuration Bulk Set or Get (if received without Supervision encapsulation).* It will reset all its configuration parameters if either manually reset to factory default or receives a Configuration Default Reset Command. It will NOT modify or reset any configuration parameter when being included or excluded of a Z-Wave network.

Parameter 1:

Parameter	0x01 (1)			
Name	Led indicator modes			
Info	Led indicator modes			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	2
	Read-only	False	Default Value	1
	Altering capabilities	False	Advanced	False
Description	Enable or disable the LED indicator to reflect the current on/off status of the connected load (LED on when the load is on, LED off when the load is off).			
	Value	Function		
	0	Disable, LED will only be used for network operation indicator, such as inclusion, exclusion, factory reset.		
	1	Load status indicate mode, Display load On/Off Status.		
	2	Energy indicate mode,		
		Green	Output load is in small wattage range. US version, the range of load current is (0A, 2A] AU/EU version, the range of load current is (0A, 2A]	
		Yellow	Output load is in big current range. US version, the range of load current is (2A, 4A] AU/EU version, the range of load current is (2A, 4A]	
		Red	Output load is in warning wattage range. US version, the range of load current is (4A, 5A] AU/EU version, the range of load current is (4A, 5A]	

Parameter 2:

Parameter	0x02 (2)			
Name	Restore state after power failure, OUT1			
Info	Restore state after power failure, OUT1			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	2
	Read-only	False	Default Value	2
	Altering capabilities	False	Advanced	False
Description	Set the on/off status for the OUT1 after power failure.			
	Value	Function		
	0	Forced to OFF (regardless of state prior to power outage).		
	1	Forced to ON (regardless of state prior to power outage).		
	2	Remembers and restores on/off status after power failure.		

Parameter 3:

Parameter	0x03 (3)			
Name	Restore state after power failure, OUT2			
Info	Restore state after power failure, OUT2			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	2
	Read-only	False	Default Value	2
	Altering capabilities	False	Advanced	False
Description	Set the on/off status for the OUT2 after power failure.			
	Value	Function		
	0	Forced to OFF (regardless of state prior to power outage).		
	1	Forced to ON (regardless of state prior to power outage).		

	2	Remembers and restores on/off status after power failure.
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Parameter 4:

Parameter	0x04 (4)			
Name	Load status report command setting			
Info	Load status report command setting			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	3
	Read-only	False	Default Value	2
	Altering capabilities	False	Advanced	False
Description	Which report will be sent to lifeline group when the load status is changed.			
	Value	Function		
	0	Send nothing.		
	1	Send Basic Report.		
	2	Send Switch Binary Report		
	3	Send Basic Report and Switch Binary Report.		

Parameter 5:

Parameter	0x05 (5)			
Name	Enable or disable scene control			
Info	Enable or disable scene control			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	1
	Read-only	False	Default Value	1
	Altering capabilities	False	Advanced	False
Description	Enable or disable scene control functionality for quick multi-tap triggers (works best with momentary wall switches).			

	Value	Function
	0	Disabled scene control.
	1	Enabled scene control.

Parameter 6:

Parameter	0x06 (6)			
Name	Enable or disable Relay control			
Info	Enable or disable Relay control			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	2
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Enable or disable physical and/or Z-Wave on/off control. If disabled, you' ll only be able to control the connected light via Z-Wave. Scenes and other functionality will still be available through paddles.			
	Value	Function		
	0	Config Button, External switch, and Z-Wave control enabled.		
	1	Config Button and External switch control disabled, Z-Wave control enabled		
	2	Config Button, External switch, and Z-Wave control disabled		

Parameter 7:

Parameter	0x07 (7)			
Name	External switch 1 type			
Info	External switch 1 type			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	4
	Read-only	False	Default Value	0

	Altering capabilities	False	Advanced	False
Description	Choose the type of wall switch connected to the relay and its on/off behavior.			
	Value	Function		
	0	Automatic identification		
	1	Toggle switch (device changes status when switch changes status).		
	2	Momentary switch (one-button switch).		
	3	Toggle switch with fixed actions (always toggle up for on, always toggle down for off).		
	4	3-way impulse control (for selected 3-way scenarios, refer to the notes in the wiring instructions for your set-up)		

Parameter 8:

Parameter	0x08 (8)			
Name	External switch 2 type			
Info	External switch 2 type			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	4
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Choose the type of wall switch connected to the relay and its on/off behavior.			
	Value	Function		
	0	Automatic identification		
	1	Toggle switch (device changes status when switch changes status).		
	2	Momentary switch (one-button switch).		
	3	Toggle switch with fixed actions (always toggle up for on, always toggle down for off).		
	4	3-way impulse control (for selected 3-way scenarios, refer to the notes in the wiring instructions for your set-up)		

Parameter 9:

Parameter	0x09 (9)			
Name	External switch pair			
Info	External switch pair			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	1
	Read-only	False	Default Value	1
	Altering capabilities	False	Advanced	False
Description	Enable/disable the device to pair through External Switch.			
	Value	Function		
	0	Disable.		
	1	Enable.		

Parameter 10:

Parameter	0x0A (10)			
Name	Auto turn-off timer, OUT1			
Info	Auto turn-off timer, OUT1			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Automatically turns the Switch OFF after this many seconds. When the Switch is turned ON a timer is started that is the duration of this setting. When the timer expires, the Switch is turned OFF. The unit is second.			
	Value	Function		
	0	Timer disabled.		
	1-2678400	Timer enabled, 1 to 2678400s.		

Parameter 11:

Parameter	0x0B (11)			
Name	Auto turn-on timer, OUT1			
Info	Auto turn-on timer, OUT1			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Automatically turns the Switch ON after this many seconds. When the Switch is turned OFF a timer is started that is the duration of this setting. When the timer expires, the Switch is turned ON. The unit is second.			
	Value	Function		
	0	Timer disabled.		
	1-2678400	Timer enabled, 1 to 2678400s.		

Parameter 12:

Parameter	0x0C (12)			
Name	Auto turn-off timer, OUT2			
Info	Auto turn-off timer, OUT2			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Automatically turns the Switch OFF after this many seconds. When the Switch is turned ON a timer is started that is the duration of this setting. When the timer expires, the Switch is turned OFF. The unit is second.			
	Value	Function		
	0	Timer disabled.		
	1-2678400	Timer enabled, 1 to 2678400s.		

Parameter 13:

Parameter	0x0D (13)			
Name	Auto turn-on timer, OUT2			
Info	Auto turn-on timer, OUT2			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Automatically turns the Switch ON after this many seconds. When the Switch is turned OFF a timer is started that is the duration of this setting. When the timer expires, the Switch is turned ON. The unit is second.			
	Value	Function		
	0	Timer disabled.		
	1-2678400	Timer enabled, 1 to 2678400s.		

Parameter 14:

Parameter	0x0E (14)			
Name	Overheat protection			
Info	Overheat protection			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	1
	Read-only	False	Default Value	1
	Altering capabilities	False	Advanced	False
Description	Turn off the switch after 30 seconds when temperature inside exceeds 100°C.			
	Value	Function		
	0	Disabled.		
	1	Enabled.		

Parameter 15:

Parameter	0x0F (15)			
Name	Over-load protection			
Info	Over-load protection			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	1200
	Read-only	False	Default Value	600 (US) 1200 (EU/AU)
	Altering capabilities	False	Advanced	False
Description	Turn off switch when current of load connected bypasses the maximum allowed power regardless of always on setting. Unit W.			
	Value	Function		
	0	Disable overload protection.		
	1~1200	When watt detected above this setting value, the switch will be turned off immediately. And an over-load notification will be sent.		

Parameter 16:

Parameter	0x10 (16)			
Name	Over-voltage protection			
Info	Over-voltage protection			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	255
	Read-only	False	Default Value	135 (US) 255 (EU/AU)
	Altering capabilities	False	Advanced	False
Description	This parameter is used to set the over-voltage protect value, unit V.			
	Value	Function		
	0	Disable over-voltage protection.		

	1~255	When voltage detected above this setting value, the switch will be turned off immediately. And an over-voltage notification will be sent.
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Parameter 17:

Parameter	0x11 (17)			
Name	kWh report threshold, Whole			
Info	kWh report threshold, Whole			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	1000
	Read-only	False	Default Value	10
	Altering capabilities	False	Advanced	False
Description	Whole kWh changed threshold setting for inducing automatic report. Unit 0.1kWh.			
	Value	Function		
	0	Disable whole kWh changed threshold check.		
	1~1000	0.1-100kWh.		

Parameter 18:

Parameter	0x12 (18)			
Name	kWh report threshold, OUT1			
Info	kWh report threshold, OUT1			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	1000
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT1 kWh changed threshold setting for inducing automatic report. Unit 0.1kWh.			
	Value	Function		
	0	Disable OUT1 kWh changed threshold check.		

	1~1000	0.1-100kWh.
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Parameter 19:

Parameter	0x13 (19)			
Name	kWh report threshold, OUT2			
Info	kWh report threshold, OUT2			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	1000
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT2 kWh changed threshold setting for inducing automatic report. Unit 0.1kWh.			
	Value	Function		
	0	Disable OUT2 kWh changed threshold check.		
	1~1000	0.1-100kWh.		

Parameter 20:

Parameter	0x14 (20)			
Name	Watt report threshold, Whole			
Info	Watt report threshold, Whole			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	1200
	Read-only	False	Default Value	50
	Altering capabilities	False	Advanced	False
Description	Whole Watt changed threshold setting for inducing automatic report. Unit W.			
	Value	Function		
	0	Disable whole Watt changed threshold check.		

	1~1200	1-1200W.
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Parameter 21:

Parameter	0x15 (21)			
Name	Watt report threshold, OUT1			
Info	Watt report threshold, OUT1			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	1200
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT1 watt changed Threshold setting for inducing automatic report. Unit W.			
	Value	Function		
	0	Disable OUT1 Watt changed threshold check.		
	1~1200	1-1200W.		

Parameter 22:

Parameter	0x16 (22)			
Name	Watt report threshold, OUT2			
Info	Watt report threshold, OUT2			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	1200
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT2 Watt changed threshold setting for inducing automatic report. Unit W.			
	Value	Function		
	0	Disable OUT2 Watt changed threshold check.		

	1~1200	1-1200W.
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Parameter 23:

Parameter	0x17 (23)			
Name	Voltage report threshold, Whole			
Info	Voltage report threshold, Whole			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	240
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Whole voltage changed threshold settings for inducing automatic report. Unit V.			
	Value	Function		
	0	Disable whole voltage changed threshold check.		
	1~240	1-240V.		

Parameter 24:

Parameter	0x18 (24)			
Name	Voltage report threshold, OUT1			
Info	Voltage report threshold, OUT1			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	240
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT1 voltage changed threshold settings for inducing automatic report. Unit V.			
	Value	Function		
	0	Disable OUT1 voltage changed threshold check.		

	1~240	1-240V.
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Parameter 25:

Parameter	0x19 (25)			
Name	Voltage report threshold, OUT2			
Info	Voltage report threshold, OUT2			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	240
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT2 voltage changed threshold settings for inducing automatic report. Unit V.			
	Value	Function		
	0	Disable OUT2 voltage changed threshold check.		
	1~240	1-240V.		

Parameter 26:

Parameter	0x1A (26)			
Name	Current report threshold, Whole			
Info	Current report threshold, Whole			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	50
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Whole current changed threshold settings for inducing automatic report. Unit 0.1A.			
	Value	Function		
	0	Disable whole current changed threshold check.		

	1~150	0.1-15A.
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Parameter 27:

Parameter	0x1B (27)			
Name	Current report threshold, OUT1			
Info	Current report threshold, OUT1			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	50
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT1 current changed threshold settings for inducing automatic report. Unit 0.1A.			
	Value	Function		
	0	Disable OUT1 current changed threshold check.		
	1~150	0.1-15A.		

Parameter 28:

Parameter	0x1C (28)			
Name	Current report threshold, OUT2			
Info	Current report threshold, OUT2			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	50
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT2 current changed threshold settings for inducing automatic report. Unit 0.1A.			
	Value	Function		
	0	Disable OUT2 current changed threshold check.		

	1~150	0. 1-15A.
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Parameter 29:

Parameter	0x1D (29)			
Name	kWh report % threshold, Whole			
Info	kWh report % threshold, Whole			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Whole kWh changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 30:

Parameter	0x1E (30)			
Name	kWh report % threshold, OUT1			
Info	kWh report % threshold, OUT1			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT1 kWh changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 31:

Parameter	0x1F (31)			
Name	kWh report % threshold, OUT2			
Info	kWh report % threshold, OUT2			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT2 kWh changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 32:

Parameter	0x20 (32)			
Name	Watt report % threshold, Whole			
Info	Watt report % threshold, Whole			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	10
	Altering capabilities	False	Advanced	False
Description	Whole Watt changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 33:

Parameter	0x21 (33)			
Name	Watt report % threshold, OUT1			
Info	Watt report % threshold, OUT1			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT1 Watt changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 34:

Parameter	0x22 (34)			
Name	Watt report % threshold, OUT2			
Info	Watt report % threshold, OUT2			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT2 Watt changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 35:

Parameter	0x23 (35)			
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Name	Voltage report % threshold, Whole			
Info	Voltage report % threshold, Whole			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Whole voltage changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 36:

Parameter	0x24 (36)			
Name	Voltage report % threshold, OUT1			
Info	Voltage report % threshold, OUT1			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT1 voltage changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 37:

Parameter	0x25 (37)			
Name	Voltage report % threshold, OUT2			

Info	Voltage report % threshold, OUT2			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT2 voltage changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 38:

Parameter	0x26 (38)			
Name	Current report % threshold, Whole			
Info	Current report % threshold, Whole			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Whole current changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 39:

Parameter	0x27 (39)			
Name	Current report % threshold, OUT1			
Info	Current report % threshold, OUT1			

Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT1 current changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 40:

Parameter	0x28 (40)			
Name	Current report % threshold, OUT2			
Info	Current report % threshold, OUT2			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	100
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	OUT2 current changed percentage threshold setting for inducing automatic report.			
	Value	Function		
	0	Disable.		
	1~100	1-100%.		

Parameter 41:

Parameter	0x29 (41)			
Name	Watt automatic report interval, Whole			
Info	Watt automatic report interval, Whole			
Properties	Size	4	Min Value	0

	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	600
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of whole Watt. Unit second.			
	Value	Function		
	0	Disable.		
	1~2678400	1-2678400s.		

Parameter 42:

Parameter	0x2A (42)			
Name	Watt automatic report interval, OUT1			
Info	Watt automatic report interval, OUT1			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of OUT1 Watt. Unit second.			
	Value	Function		
	0	Disable.		
	1~2678400	1-2678400s.		

Parameter 43:

Parameter	0x2B (43)			
Name	Watt automatic report interval, OUT2			
Info	Watt automatic report interval, OUT2			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0

	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of OUT2 Watt. Unit second.			
	Value	Function		
	0	Disable.		
	1~2678400	1-2678400s.		

Parameter 44:

Parameter	0x2C (44)			
Name	kWh automatic report interval, Whole			
Info	kWh automatic report interval, Whole			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	3600
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of whole kWh. Unit second.			
	Value	Function		
	0	Disable.		
	1~2678400	1-2678400s.		

Parameter 45:

Parameter	0x2D (45)			
Name	kWh automatic report interval, OUT1			
Info	kWh automatic report interval, OUT1			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of OUT1 kWh. Unit second.			

	Value	Function
	0	Disable.
	1~2678400	1-2678400s.

Parameter 46:

Parameter	0x2E (46)			
Name	kWh automatic report interval, OUT2			
Info	kWh automatic report interval, OUT2			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of OUT2 kWh. Unit second.			
	Value	Function		
	0	Disable.		
	1~2678400	1-2678400s.		

Parameter 47:

Parameter	0x2F (47)			
Name	Voltage automatic report interval, Whole			
Info	Voltage automatic report interval, Whole			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of whole Voltage. Unit second.			
	Value	Function		
	0	Disable.		

	1~2678400	1-2678400s.
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Parameter 48:

Parameter	0x30 (48)			
Name	Voltage automatic report interval, OUT1			
Info	Voltage automatic report interval, OUT1			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of OUT1 Voltage. Unit second.			
	Value	Function		
	0	Disable.		
	1~2678400	1-2678400s.		

Parameter 49:

Parameter	0x31 (49)			
Name	Voltage automatic report interval, OUT2			
Info	Voltage automatic report interval, OUT2			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of OUT2 Voltage. Unit second.			
	Value	Function		
	0	Disable.		
	1~2678400	1-2678400s.		

Parameter 50:

Parameter	0x32 (50)			
Name	Current automatic report interval, Whole			
Info	Current automatic report interval, Whole			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of whole Current. Unit second.			
	Value	Function		
	0	Disable.		
	1~2678400	1-2678400s.		

Parameter 51:

Parameter	0x33 (51)			
Name	Current automatic report interval, OUT1			
Info	Current automatic report interval, OUT1			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of OUT1 Current. Unit second.			
	Value	Function		
	0	Disable.		
	1~2678400	1-2678400s.		

Parameter 52:

Parameter	0x34 (52)			
Name	Current automatic report interval, OUT2			

Info	Current automatic report interval, OUT2			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Set the automatic report interval time of OUT2 Current. Unit second.			
	Value	Function		
	0	Disable.		
	1~2678400	1-2678400s.		