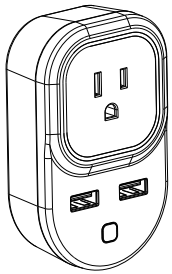


OPERATING MANUAL

SMART PLUG

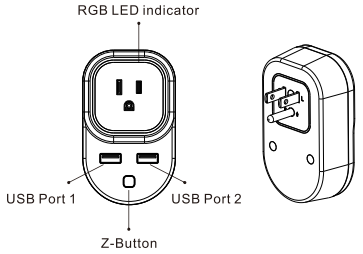
HKZW-SO03 - V1.0

Smart plug is a Z-Wave Switch plugin module specifically used to enable Z-Wave command and control (on/off) of any plug-in tool. It can report wattage consumption or kWh energy usage. Smart Plug is also a security Z-Wave device and supports the Over The Air (OTA) feature for the product's firmware upgrade.

HKZW-SO03 is a Smart Plug based on Z-Wave plus specification.
The features list:
1) Supports 1xAC output and 2xUSB outputs;
2) AC output switch on/off by manual or Z-Wave command;
3) RGB LED indicates the Z-WAVE network range;
4) RGB LED indicates the load power;
5) Z-Wave plus compatible (500 serials product);
6) Supporting power meter;
7) Supporting repeater role;
8) Supporting firmware OTA;

Ⅰ. GENERAL INFORMATION ABOUT SMART PLUG

1. Product layout



2. Specifications

Power supply:	120V +/-10%, 60Hz
Rated load current:	15A
Power consumption:	≤1.5W
Power output (plug for resistive load):	1800W
Power output: (USB port 1):	5W 5+/-0.25V 1.0A
Power output: (USB port 2):	12W 5+/-0.25V 2.4A
Storage environment:	-20℃~60℃ 0%~80%
Operational temperature:	-10℃~40℃
Radio protocol:	Z-Wave
Radio frequency:	908.42MHz
Range:	More than 150m outdoors About 40m indoors (depending on building materials)
Dimensions:	100*60*31mm

Ⅱ. INSTALLATION

(1) Insert your device into a socket.
(2) Add device into your Z-Wave network if necessary.
(3) Connect load to the plug, make sure the load does not exceed 1800W.
(4) Set the connected device to ON, to turn on connected device manually, turn on the Smart Plug by clicking Z button.
(5) Click Z button to turn off the Plug manually, once the Smart Plug is turned off, the RGB LED indicator will turn burgundy.

Ⅲ. Z-WAVE NETWORK INCLUSION

Smart Plug 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.

Included as a non-secure device
Smart Plug can be included into the Z-Wave network manually via the Z-Button. In addition, the Smart Plug may be included in auto inclusion mode, by simply connecting the power supply.
To include the smart plug into a Z-Wave network please complete following tasks:

Automatic Z-Wave network inclusion:
1) Set the Z-Wave network main controller into inclusion mode (see Z-Wave network controller operating manual).
2) Insert the Plug into a socket.
3) Auto-inclusion will be activated, i.e. Plug automatically starts looking for Z-Wave network controller. Auto-inclusion activation is signaled by a single, RGB LED indicator blink fast in blue.
4) Smart Plug should be recognized and automatically included into the Z-Wave network.

Manual Z-Wave network inclusion:
1) Connect the power supply.
2) Set the Z-Wave network main controller into inclusion mode (see Z-Wave network controller operating manual).
3) Triple click the Z-button, RGB LED indicator should blink fast in blue.
4) Smart Plug should be recognized and included into the Z-Wave network.

Included as a secure device
1) Connect the power supply.
2) Set the Z-Wave network main controller into and node secure mode (see Z-Wave network controller operating manual).
3) Press and hold the Z-button for more than 3 seconds, RGB LED indicator should blink fast in green。
4) Smart Plug should be recognized and included into the Z-Wave security network

After the inclusion process complete, Plug's auto-inclusion function will be deactivated, i.e. Plug will not try to include itself into a Z-Wave network.

TIP:
If you want your Smart Plug to be a security device that use secure/encrypted message to communicate in a Z-Wave network, then a security enabled Z-Wave controller is needed.

Ⅳ. REMOVING FROM Z-WAVE NETWORK

To remove Smart Plug from the Z-Wave network:

(1) Insert the Plug into a socket.
(2) Set the Z-Wave network controller into the exclusion mode (see Z-Wave controller operating manual).
(3) Triple click the Z button.
(4) RGB LED indicator will blink orange till the removing process is completed, than the indicator will keep orange for 3 seconds.

Ⅴ. RESETTING SMART PLUG

Reset procedure clears the Smart Plug's memory, including Z-Wave network controller information and energy consumption data.
To reset Smart Plug:

1) Insert the Plug into a socket,
2) Press and hold the Z button for more than 20 seconds,
3) If holding time more than 20seconds, the RGB LED indicator will keep yellow for 2 seconds, which means resetting is complete.

TIP:
Once the reset procedure is completed, Plug's relay will turn off. The reset feature works only when the plug has been included into a Z-Wave network.

NOTE:
Use this procedure only in the event that the network primary controller is missing or otherwise inoperable.

Ⅵ. ASSOCIATION

Association command class allows Smart Plug to communicate with other Z-Wave devices directly, such as sending BASIC REPORT whenever the smart plug is turn on or off.

Smart Plug supports 1 association grouping.
The max number of associated nodes is 5.

Ⅶ. POWER INDICATION

Smart Plug's RGB LED indicator will show different light colors when it connect loads with different power.
There are 8 light color indications:
Burgundy – Smart Plug's output is OFF.
Blue – 0~300W.
Cyan – 300~600W.
Green – 600~900W
Yellow – 900~1200W
Red – 1200~1500W
Purple – 1500~1800W
Purple blink – exceeds 1800W

Ⅷ. TESTING Z-WAVE NETWORK RANGE

Smart Plug' RGB LED indicator can signals its communication quality with the Z-WAVE main controller.
To start testing: press and hold the Z button for 6 to 9 seconds, release when the RGB LED indicator turns to violet.

Blink in green – Smart Plug establish a direct communication with the main controller, and still under checking.
Keep green – The green light should last about 2 seconds, which means the direct communication is stable.
Blink in orange – Smart plug can communicate with the main controller in intermediate radio transmit power level, and still under checking.
Keep orange – The communication quality is moderate.
Keep Red – The communication is fail.

TIP:
1.This function works only when Smart Plug has been included into a Z-WAVE network.
2.Click the Z button to exit the test.

Ⅸ. ADVANCED CONFIGURATION

Smart Plug offers a wide variety of advanced configuration settings. Below parameters can be accessed from main controllers configuration interface.
GENERAL SETTINGS:
Parameter No. 20 Overload protection
Smart Plug keep detecting the load power, once the AC current exceeds 16.5A for more than 5s, smart plug's relay will turn off.

0 - The function is disabled
1 - The function is enabled.

Default setting: **1**
Parameter size: **1 [byte]**

Parameter No. 21 Setting device status after power failure
Define how the Plug reacts after the power supply is back on.

0 - Smart Plug memorizes its state after a power failure.
1 - Smart Plug does not memorize its state after a power failure. Connected device will be on after the power supply is reconnected.
2 - Smart Plug does not memorize its state after a power failure. Connected device will be off after the power supply is reconnected.

Default setting: **0**
Parameter size: **1 [byte]**

Parameter No. 24 Notification when Load status change
Smart Plug can send notifications to association device (Group Lifeline) when state of smart plug's load change.

0 - The function is disabled.
1 - Send Basic report.
2 - Send Basic report only when Load condition is not changed by Z-WAVE Command.

Default setting: **1**
Parameter size: **1 [byte]**

Parameter No. 27 Indicator modes
After smart plug being included into a Z-Wave network, the RGB LED indicator will indicator the situation of load.

0 - The Smart Plug will work in Power indication mode (Point Ⅶ). .
1 - The Smart Plug will work in Power indication mode (Point Ⅶ) for 5 seconds, when the state of Smart Plug's load changed. RGB LED indicator will turn off if there is no more switch action in 5 seconds.

Default setting: **0**
Parameter size: **1 [byte]**

POWER AND ENERGY REPORTS SETTINGS:
Parameter No. 151 Threshold of power report
Power threshold to be interpreted, when the change value of load power exceeds the setting threshold, the smart plug will send meter report to association device (Group Lifeline).

Available settings: **0 - 65535 (0 - 65535W)**
0 - The function is disabled.

Default setting: **50 (50W)**
Parameter size: **2 [byte]**

Parameter No. 152 Percentage threshold of power report
Power percentage threshold to be interpreted, when change value of the load power exceeds the setting threshold, the smart plug will send meter report to association device (Group Lifeline).

Available settings: **0 - 255 (0 - 255%)**
0 - The function is disabled.

Default setting: **10 (10%)**
Parameter size: **1 [byte]**

Parameter No. 171 Power report frequency
The interval of sending power report to association device (Group Lifeline).

Available settings: **5- 2678400 (5 - 2678400s)**
0 - The function is disabled.

Default setting: **30 (30s).**
Parameter size: **4 [byte]**

Parameter No. 172 Energy report frequency
The interval of sending energy report to association device (Group Lifeline).

Available settings: **5- 2678400 (5 - 2678400s)**
0 - The function is disabled.

Default setting: **300 (300s).**
Parameter size: **4 [byte]**

Parameter No. 173 Voltage report frequency
The interval of sending voltage report to association device (Group Lifeline).

Available settings: **5- 2678400 (5 - 2678400s)**
0 - The function is disabled.

Default setting: **0 (disabled)**.
Parameter size: **4 [byte]**

Parameter No. 174 Electricity report frequency
The interval of sending electricity report to association device (Group Lifeline).

Available settings: **5- 2678400 (5 - 2678400s)**
0 - The function is disabled.

Default setting: **0 (disabled).**
Parameter size: **4 [byte]**

Ⅹ. FCC NOTICE (for USA)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.