

Instruction Manual

Power plug

Thank you for your support

- Please read the instruction manual carefully before operating
- Please keep the instruction manual for further reference



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Product Introduction

SmartPlug is a universal, Z-Wave™ Plus compatible and relay switch in the form of a socket adapter. The device may be used to operate any device up to 3000w power output. The device features voltage, current, active power and power consumption measuring.

This product 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.

This device must be used in conjunction with a Security Enabled Z-Wave Controller in order to fully utilize all implemented functions

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

Specifications

| | |
|-------------------------|---|
| Power Supply | 110 – 230V AC, ±10%, 50/60Hz |
| Power Consumption | Up to 0.8W |
| Operational Temperature | 0 - 70°C |
| Communication frequency | 908.40MHz, 916.00MHz(US) |
| Range | Up to 45m indoors (depending on the building structure),Up to 80m outdoors. |

Technical Information

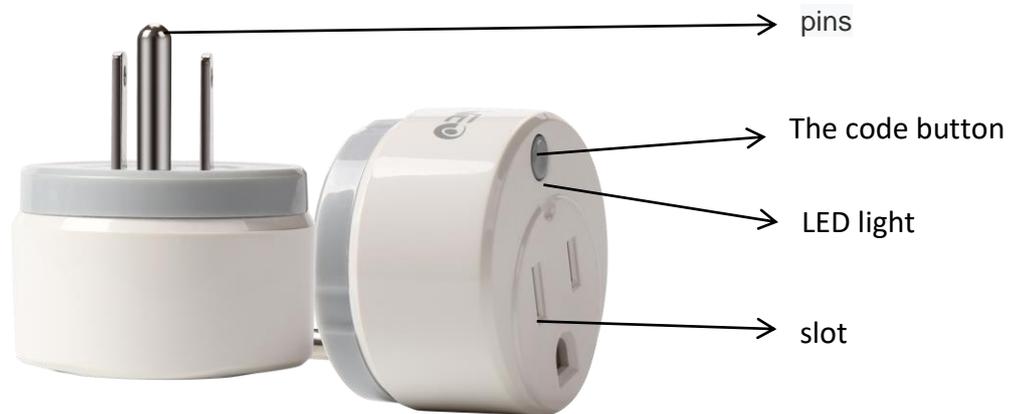
- The on and off of the power plug can be switched remotely by mobile phone App.
- The working status of the power plug can be viewed through the mobile phone App
- Compatible with any Z-Wave main controller.
- Switching power supply is convenient and quick
- Protect the safety of household electricity

- Electricity metering can be used to calculate electricity consumption
- Over current protection can be used more safely

Product Configuration

Product List

- Power plug 1pc
- Instruction manual 1pc



Z-Wave™ Network Inclusion/Exclusion/Reset

There is one button on the side of the device, it can be executed inclusion, exclusion and reset from Z-Wave™ network.

| | | |
|----------------------------------|--|--|
| Add¹ | <ol style="list-style-type: none"> 1、 Power up the device. 2、 Set Z-Wave™ Controller into inclusion mode 3、 Press and hold the button for 5s until green led lights is on, then release the button before green led turn off. | Blue led will blink with 1s interval until inclusion successful. |
| Remove | <ol style="list-style-type: none"> 1、 Power up the device. 2、 Set Z-Wave™ Controller into exclusion mode 3、 Press and hold the button for 5s until Green led lights is on, then release the button before green led turn off. | Blue led will blink with 1s interval until exclusion successful. |
| Factory Reset² | <ol style="list-style-type: none"> 1、 Power up the device. 2、 Press and hold the button for 10s until Red led lights is on, then release the button before red led turn off. | |
| Product Test Mode | <ol style="list-style-type: none"> 1、 Press and hold the button. 2、 Power on the device, device will enter factory product test mode | |
| Send NIF³ | Press and hold the button for 5s until Green led lights is on, then release the button before green led turn off. | |

Notice 1: When device enters into inclusion mode, the device all functionality will be useless. The inclusion mode will be timeout after 30s, user can press and hold the button for 5s to terminate

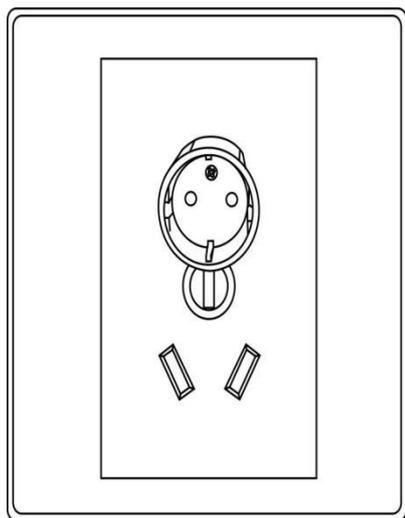
inclusion mode.

Notice 2: Factory Reset will clear the device all Z-Wave™ Network data (include home id, node id, etc...) saved in memory, and restore all configuration parameters to factory default. Please use this procedure only when the network primary controller is missing or otherwise inoperable.

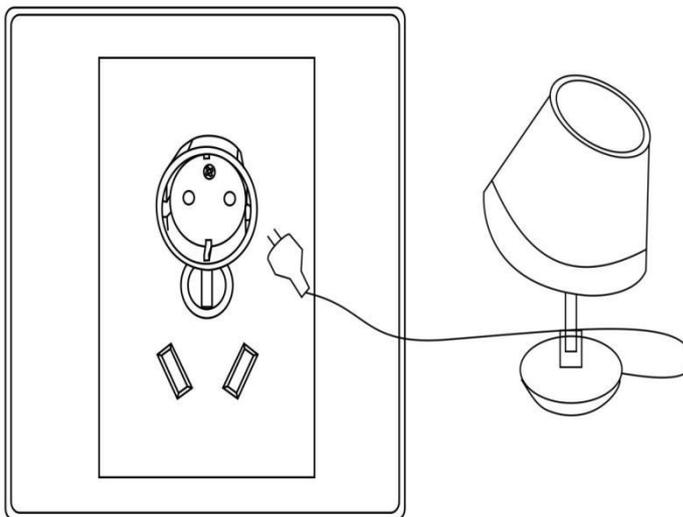
Notice 3: NIF – Node Information Frame

Installation Steps

- Plug the power plug in the socket
- Plug the load in the power plug



Plug the power plug in the socket



Plug the load in the power plug

Tips

- Please do not spray water on the power plug.
- The on and off of power plug can be switched remotely by mobile phone APP.
- The load connected with the power plug shouldn't exceed 2500w to avoid damaging the power plug.
- Make sure of that power plug is in the z-wave network.

Association

The device supports 2 association groups, and each group supports max 5 associated nodes.

Group 1, Lifeline – All nodes which associated in group 1(lifeline group) will receive the messages that send by device through lifeline.

Group 2, all nodes which associated in group 2 will be controlled by device through BASIC_SET command. When device detect a over-current event, the device will trigger a OCP Alarm and send a notification report to controller, the meantime device also send a BASIC_SET = 0xFF to the nodes that associated in group 2. And BASIC_SET = 0x00 will be sent after OCP Alarm Event is cleared.

The Command Class supported by each association group is shown in the table below:

| Group | Command Class | Command |
|-----------------|-----------------------------------|-----------------------------------|
| 1 (Lifeline) | COMMAND_CLASS_SWITCH_BINARY | SWITCH_BINARY_REPORT |
| | COMMAND_CLASS_NOTIFICATION | NOTIFICATION_REPORT |
| | COMMAND_CLASS_METER | METER_REPORT |
| | COMMAND_CLASS_INDICATOR | INDICATOR_REPORT |
| | COMMAND_CLASS_DEVICE_RESET_LOCALY | DEVICE_RESET_LOCALLY_NOTIFICATION |
| 2 (Control) | COMMAND_CLASS_BASIC | BASIC_SET |

Device Functionality and Z-Wave™ Message Report

The SmartPlug has four main functions: Switch On/Off, electrical parameters measurement over-current protection, and timing.

Switch On/Off

There are three ways of controlling the outlet switch:

- 1) Press the button shortly
- 2) Operated the device Via Z-Wave™ Controller or Others Devices that associated it by Command Class list as below table.

| SmartPlug State | Command Class | Command | Value |
|-----------------|-----------------------------|-----------------------|-------|
| ON | COMMAND_CLASS_SWITCH_BINARY | SWITCH_BINARY_S ET | 0xFF |
| | COMMAND_CLASS_BASIC | BASIC_SET | 0xFF |

| | | | |
|-----|---------------------------------|-----------------------|------|
| OFF | COMMAND_CLASS_SWITCH_BINAR Y | SWITCH_BINARY_S ET | 0x00 |
| | COMMAND_CLASS_BASIC | BASIC_SET | 0x00 |

Electrical Parameters Measuring

The device provides line voltage (V), loaded current (A), active power (W), and accumulated energy consumed (kWh) measurement; the significant digits of the measured result should be two digits after the decimal point;

These electrical parameters result will be reported to the Z-Wave™ controller regularly through the Meter Report of Meter Command Class, the interval of which can be configured by the user by means shown in "**Configuration: No.11**"

The device also provides the function of reporting the measurement results to the Z-Wave™ controller when the load current changes and the user can set the changed quantity of the load current freely by means shown in "Configuration: No.10"

The electric quantity detection result is reported to Command Class

| Command Class | Command | Scale | Precision |
|-------------------------|------------------|--------|-----------|
| COMMAND_CLASS_MET ER | METER_REPO RT | kWh | 0.01kWh |
| | | Watt | 0.01W |
| | | Volt | 0.01V |
| | | Ampere | 0.01A |

The max accumulate energy is **21474836.47**kWh, if it is over this value, it will be back to 0kWh automatically.

Over-current Protection

The outlet can provide a maximum load current of 16A, and when the load current exceeds 16A, the load power supply will be automatically cut off. And it will inform the host of the overload of the outlet through NOTIFICATION_REPORT of the Notification Command Class, and meanwhile, the LED light of the outlet will flash with an interval of one second; Users can remove the overload alarm by pressing the button or sending SWITCH_BINARY_SET=0xFF, and for safety's sake, before that, users should remove the load from the outlet first.

Users can control the maximum output current of the outlet by setting the maximum output current, the setting method of which is shown in "**Configuration: No. 8**".

Overload protection communication Command Class

| | |
|----------------------|--|
| Command Class | COMMAND_CLASS_NOTIFICATION |
| Command | NOTIFICATION_REPORT |
| Type | NOTIFICATION_TYPE_POWER_MANAGEMENT (0x08) |
| Event | NOTIFICATION_EVENT_POWER_MANAGEMENT_OVERLOAD_DETECTED (0x08) |

Timer

The device also provides the function of timing, and users can turn off the outlet by opening this function and setting the time cycle, the setting method of which is shown in "**Configuration: No.4 and Configuration No 11**".

Command Class Configuration

The device supports the controller to configure parameters of the device through Configuration Command Class, and the device has 10 parameters available for users to set according to their different needs:

1) Relay On/Off state Saved Disable

Sets this configuration to '1', the device will save the current relay state, and after the device is powered down and restarted, it will automatically recover to the relay state before power-down.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|------------------|-------------|--------------------|---------------|
| 1 | 1 | 0, 1 | 1 |

2) Button Switch Function Disable

Setting this configuration as '0' will be disabling to turn on and off the relay by pressed button.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|------------------|-------------|--------------------|---------------|
| 2 | 1 | 0, 1 | 1 |

3) LED indication Disable

Setting this configuration as '0' will disable led light on when turn on the device. This setting is invalid during device power-up.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|------------------|-------------|--------------------|---------------|
| 3 | 1 | 0, 1 | 1 |

4) Countdown Timer Enable

Setting this configuration as '1' will start the timing function of the plug, and the length of time is determined by the setting of "**Configuration: No.7**".

This function can only provide the time to turn off device function when the device is open.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|------------------|-------------|--------------------|---------------|
| 4 | 1 | 0, 1 | 0 |

5) Meter Monitor Enable

This configuration sets the meter Monitoring function enabled or disabled. '0' – Disable meter measuring Function.

'1' – Enable meter measuring Function.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|------------------|-------------|--------------------|---------------|
| 5 | 1 | 0, 1 | 1 |

6) Meter Report Enable

This configuration sets the meter report function enabled or disabled.

'0' – Disable meter report function.

'1' – Enable meter report function with time interval defined by “**Configuration No. 11**”. When device is detected an OCP event or the relay turned on or turned off, device still will report all meter values once if this value be set to '0'.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|------------------|-------------|--------------------|---------------|
| 6 | 1 | 0, 1 | 1 |

7) Countdown Time Setting

This configuration sets the time length for turning off the device. This configuration is only valid when “**Configuration No.4**” is set to '1'. Unit: minute.

| Parameter Number | Size (Byte) | Available Settings | Default value (min) |
|------------------|-------------|--------------------|---------------------|
| 5 | 2 | 0 ~ 30000 | 120 |

8) Maximum output current setting

This configuration sets the maximum output current that the device can provide. When the current consumed by the load is greater than the setting value, the device will automatically cut off the power of the load and send out alarm information. Unit: 0.01A (Ampere).

This value must be great than the alarm value defined by **Configuration No. 9**.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|------------------|-------------|--------------------|---------------|
| 8 | 2 | 0 ~ 1600 | 1600 |

9) Output Current Alarm

This configuration sets the alarm value of the load current (volatility). When the load current is large than this value, the led will be indicated with yellow. Unit: 0.01A (Ampere).

This value must be less than the max. output value defined by **Configuration No. 8**.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|------------------|-------------|--------------------|---------------|
| 9 | 2 | 0 ~ 1550 | 1500 |

10) Current Change Ratio

This configuration sets the changed value of the load current (volatility). When the differential between two measurements of current consumed by the load exceeds the value set by this configuration, the device will report the last measured results automatically to the controller.

The changed value = [Value] × 0.01A.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|------------------|-------------|--------------------|---------------|
| 10 | 2 | 0 ~ 1000 | 50 |

11) Interval of meter reporting setting

This configuration sets the interval of reporting electric quantity detection result. This parameter is only valid when Parameter 6 is set as '1'. Unit: Second.

| Parameter | Size (Byte) | Available Settings | Default value |
|-----------|-------------|--------------------|---------------|
|-----------|-------------|--------------------|---------------|

| | | | |
|--------|---|-----------|-----|
| Number | | | |
| 11 | 2 | 0 ~ 30000 | 300 |

- To Simulate Over Current Protection Function, First User Must Turn on SmartPlug And Then

Write 1 Byte Data 0xFF(255) to **Parameter Number 99**. SmartPlug will Be Turned Off And Report Alarm Messages to Hubs. Meantime Red Led Will Blink with 1s Interval.

Command Class Basic

The Basic Command Class is mapped to Switch Binary Command Class as Follow:

- 1) Basic Set = 255 maps to Binary Switch Set = 255
- 2) Basic Set = 0 maps to Binary Switch Set = 0
- 3) Basic Set = 1 ~ 99 maps to Binary Switch Set = 255
- 4) Basic Get/Report maps to Binary Switch Get/Report

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.

This device supports SmartStart function. QR code is printed on the label that pasted on on surface of product and the outside of packing box. And the full DSK code is printed can be found on the packing box.

The device will enter SmartStart if the device is not included in network after power up. And then

- 2nd SmartStart time delay approximately 16s
- 3rd SmartStart time delay approximately 32s
- 4th SmartStart time delay approximately 64s
- 5th SmartStart time delay approximately 128s
- 6th SmartStart time delay approximately 256s
- 7th SmartStart time delay approximately 512s

Afterwards, the Smartstart mode will be auto running with 512 second interval until device is included successfully.

Security Network

The device supports the security function with and S2 + SmartStart encrypted communication. The device will auto switch to the security mode when the device included with a security controller. In the security mode, the follow commands must use security or security_2 command class wrapped to

communicate, otherwise the device will not response any commands.

Security Keys

This device supports security levels are listed in below table:

| Security Levels | Support (Yes/No) |
|---------------------------------|------------------|
| SECURITY_KEY_S0 | Yes |
| SECURITY_KEY_S2_UNAUTHENTICATED | Yes |
| SECURITY_KEY_S2_AUTHENTICATED | Yes |
| SECURITY_KEY_S2_ACCESS | No |

All Supports Command Class in Each NIF Lists

| Command Class | Version | Not Included | Non-secure Included | S0 Included | | S2 Included | |
|---|---------|--------------|---------------------|-------------|--------|-------------|--------|
| | | | | Non-Secure | Secure | Non-Secure | Secure |
| COMMAND_CLASS_ZWAVEPLUS_INFO | 2 | ● | ● | ● | | ● | |
| COMMAND_CLASS_SECURITY | 1 | ● | ● | ● | | ● | |
| COMMAND_CLASS_SECURITY_2 | 1 | ● | ● | ● | | ● | |
| COMMAND_CLASS_TRANSPORT_SERVICE | 2 | ● | ● | ● | | ● | |
| COMMAND_CLASS_VERSION | 3 | ● | ● | | ● | | ● |
| COMMAND_CLASS_POWERLEVEL | 1 | ● | ● | | ● | | ● |
| COMMAND_CLASS_ASSOCIATION | 2 | ● | ● | | ● | | ● |
| COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION | 3 | ● | ● | | ● | | ● |
| COMMAND_CLASS_ASSOCIATION_GRP_INFO | 1 | ● | ● | | ● | | ● |
| COMMAND_CLASS_MANUFACTURER_SPECIFIC | 2 | ● | ● | ● | | | ● |
| COMMAND_CLASS_DEVICE_RESET_LOCALLY | 1 | ● | ● | | ● | | ● |
| COMMAND_CLASS_SWITCH_BINARY | 2 | ● | ● | | ● | | ● |
| COMMAND_CLASS_NOTIFICATION | 8 | ● | ● | | ● | | ● |
| COMMAND_CLASS_METER | 5 | ● | ● | | ● | | ● |
| COMMAND_CLASS_INDICATOR | 3 | ● | ● | | ● | | ● |
| COMMAND_CLASS_CONFIGURATION | 4 | ● | ● | | ● | | ● |
| COMMAND_CLASS_SUPERVISION | 1 | ● | ● | ● | | ● | |
| COMMAND_CLASS_FIRMWARE_UPDATE_MD | 5 | ● | ● | | ● | | ● |

Notice 1: When device is included with S0 level,

COMMAND_CLASS_MANUFACTURER_SPECIFIC is supported non-securely. And when device is included with S2 level, COMMAND_CLASS_MANUFACTURER_SPECIFIC is supported securely only.

Notice 2: “●” – Indicates the corresponding command class is supported in NIF, Blank means the command class is not supported.

Led Color Indicator

| Led Color | Action | Description |
|-----------|---------------------------|---|
| Red | Light On 1s When Power On | Not Add in Z-Wave Network |
| | Blink One Time | Sensor Measuring Time |
| | Light On 1s | Press And Hold Button 10s, Off at 11 th Second |
| | Blink With 1s Interval | Over Current Detected, SmartPlug Turn Off. |
| Green | Light On 1s When Power On | Add in Z-Wave in Network Already |
| | Light On 1s | Press And Hold Button 5s, Off at 6 th Second |
| | Light On Always | SmartPlug Turn On |
| Blue | Blink with 1s Interval | Z-Wave Protocol Indicator |
| Yellow | Blink with 500ms Interval | OTA is Running |
| | Light On Always | Button Pressed and Held Time Large Than 12s. |
| | | Load Current Large Than Alarm Current Value |

The guarantee shall not cover:

- mechanical damages (cracks, fractures, cuts, abrasions, physical deformations caused by impact, falling or dropping the device or other object, improper use or not observing the operating manual);
- damages resulting from external causes, e.g.: flood, storm, fire, lightning, natural disasters, earthquakes, war, civil disturbance, force majeure, unforeseen accidents, theft, water damage, liquid leakage ,battery spill, weather conditions, sunlight, sand, moisture, high or low temperature, air pollution
- damages caused by malfunctioning software, attack of a computer virus, or by failure to update the software as recommended by the Manufacturer;

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