AN184 Z-Wave Metering Mini Plug

The Metering Plug is a Z-Wave Plus enabled device which is fully compatible with any Z-Wave enabled network. Inclusion of this unit on other manufacturer's Z-Wave Wireless Controller menu allows remote operation of the unit and the connected load.

This product supports the S2 security protocol that uses encrypted Z-Wave Plus messages to communicate to other security-enabled Z-Wave Plus products. A security-enabled Z-Wave Plus Controller must be used in order to fully utilize the security features of this product.

The Metering Plug is designed to turn on/off the appliances in your house. Its metering function can measure electricity usage in KW/hr and supports individual measurements of wattage, voltage, current and Power Factor. As a safety feature, if any power overload is detected it will instantly switch off the connected appliance to protect from electrical hazard.

WARNING:

⚠️ CAUTION 📖 Read operator's manual

For safety concerns:
- Do not connect appliances to this remote controlled socket-outlet if the instruction manual of the appliances prohibits to be remote controlled (for example appliances such as grills, toasters and similar portable cooking appliances, or portable kitchen appliances, or appliances with heating elements like ovens or heaters, etc).
- Do not connect any appliances to this remote controlled socket-outlet which are radiating heat and may cause ignition or burning of surrounding materials (for example radiation heaters, portable heaters, portable floodlights, desk lamps, etc).
- Take into consideration that connected appliances might be moved by pets, cleaning staff or other persons who are not aware of the remote control functions.
- Do not connect any appliances with potential hazards by moving parts (for example drills, table saws, blender, etc).
- The connection/installation of this product should be in a suitable area with the remote controlled socket-outlet easily readable and accessible for disconnection actions.
- Connected equipment should not cause any hazard to the environment, personnel, other equipment and property when left unattended.
- The socket outlet on equipment forbids to insert to other equipment of wall plug (Direct Plug-in) or Power bar.
- The socket outlet only can insert power cord, The direction of power cord is drooping naturally, Power Cord length needs < 2M.
- The socket-outlet shall be installed near the equipment and shall be easily accessible.

Product Overview

On/Off button* & LED Indicator

*Also acts as Link Key for pairing to Z-wave network

Adding to Z-Wave Network

On the unit you can find a link key which is used to carry out the function of inclusion, exclusion, and reset. When power is applied for the first time, the LED will flash on and off alternately and repeatedly, implying that the device has not been paired with other Z-Wave devices yet. This unit supports the Auto Inclusion function when power is applied and no node ID is stored in the memory.

Auto Inclusion

The module may automatically execute the function of inclusion when ;

1. The power is applied for the first time and no node ID has been stored in the module.
2. The execution of reset is successful where the stored node ID is cleared.

Note: The duration for Auto Inclusion is 30 seconds. Unlike the "inclusion" procedure shown in the table below, the execution of Auto Inclusion is automatic without the necessity of pressing the link key.

Action/Status	Description	LED indication
No node ID	The Controller does not allocate a node ID to the unit.	2-second on, 2-second off
Auto Inclusion	The power is applied for the first time and no node ID has been stored in the module, or after executing reset.	
Manual Inclusion	1. Put the Z-Wave Controller into inclusion mode. 2. Press the link key three times within 1.5 seconds to put the unit into inclusion mode.	
Exclusion	1. Put the Z-Wave Controller into exclusion mode. 2. Press the link key three times within 1.5 seconds to put the unit into exclusion mode.	
Reset (Use this procedure only in the event that the network primary controller is missing, or otherwise inoperable.)	1. Press the link key three times within 1.5 seconds to put the unit into exclusion mode. 2. Within 1 second of step 1, press link key again and hold it until LED is off (about 5 seconds). 3. Node ID is excluded. The device reverts to factory default state and will be in auto-inclusion mode for 25 secs	
※ Failed or successful results in including/excluding the node ID can be viewed on the Controller.		

Note: If you are connecting this unit to a Z-wave Controller that utilizes the S2 security protocol, your controller may ask you to enter a 5 digit Device Specific Key (DSK) that is unique to each unit. This can be found in one of two places:
- on the QR code label on the back of the unit
- on the insert card inside the packaging

Operation

Under normal operation mode, press the on/off button on the unit to turn on/off the connected load. The unit can also be controlled by receiving commands from the Z-Wave Controller. When set to on, the LED indicator will light up for 5 seconds only.

The unit is able to remember the status of the relay when power is cut off (e.g. during a black-out). When power is supplied again, the unit will resume the last status of the relay (on or off) automatically.

Its metering function can measure electricity usage up to 10485.75kW*h and supports individual wattage, voltage, ampere, and PF measurements.

In the event an overload is detected at 1600W, the unit will turn off the connected appliance as a safety measure. When this happens its LED will flash continuously and any command from Z-wave controller to turn on the connected load will be ignored. To restore normal operation, first remove the connected appliance and check for any abnormality. Temporarily remove the metering plug from the wall socket and plug it back in again. Connect back the appliance only after verifying it is fit for use.

Programming

Z-Wave Group Support

The unit supports two association groups with 1 node support for Grouping 1 and 4 nodes support for Grouping 2. This has the effect that when the unit is operating, all devices associated with the unit will receive the relevant reports.

- When the unit is powered for the first time, the unit will send a Notification Report to the node of Group 1 (Notification Type=0x08, Event=0x01).
- When setting the unit or changing the unit's status, the unit will send a Binary Switch Report to the node of Group 1.
- When performing Reset the unit will send Device Reset Locally Notification to the node of Group1.
- The unit can be configured to periodically report the value of W and/or kW*h to the node of Group 1 (refer to Configuration parameter 4 & 5).
- The unit can be configured to report the status of wattage to the node of Group 1 on special occasions (refer to Configuration parameter 6 & 7).
- The minimum interval time between two reports sent from this unit to the node of Group 1 is 3 seconds. Refer to **Configuration** parameter 2 for more information.
- When the button on the unit or the wall switch is pressed, the unit will send a Basic Set command to the nodes of Group 2. When the unit is OFF, Basic Set Value = 0x00. When the unit is ON, Basic Set Value = 0xFF.
- When the unit detect an overload condition, it will send a Notification Report to the node of Group 1 (Notification Type=0x08, Event=0x08)
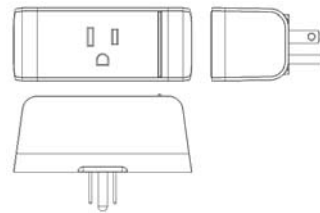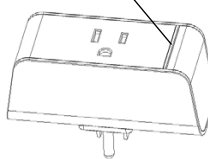
Z-Wave Plus Info

Role Type	Node Type	Installer Icon	User Icon
Slave Always On	Z-Wave Plus node	On/Off Power Switch	On/Off Power Switch Plug
0x05	0x00	0x0701	0x0701

Version

Protocol Library	3 (Slave_Enhance_232_Library)
Protocol Version	5.03 (hex:0x05 0x03)

Manufacturer Specific Get

Manufacturer ID	Product Type	Product ID
0x0060	0x0004	0x000B

Association Command Class

Group	Max Node
1	1
2	4

AGI (Association Group Information) Table

Group	Profile	Command Class & Command (List) N bytes	Group Name(UTF-8)
1	General	Device Reset Locally Notification Notification Report Binary Switch Report Meter Report	Lifeline
2	Control	Basic Set	On/Off control (Button)

Basic

- Basic Get: Inquire about the status of the device.
- Basic Report: Report the status of the device.
- Basic Set: Set the status of the device.

Notification

When powered on, the device will send (Notification Type = 0x08, Event = 0x01) to the node of Group 1. When overload occurs, the device will send (Notification Type = 0x08, Event = 0x08) to the node of Group 1.

Configuration

The configurable values are as following:

Parameter Number	Parameter Function	Size	Range	Default
1	Set Basic Set Command value	2	0~99, 255(0xFF)	255 (0xFF)
2	Set the delaying time to report to Group 1	1	3 - 25 (seconds)	3
3	Set whether to remember the last status	1	1/0	1: remember (0: do not remember)
4	Set the interval for wattage auto report	2	0-32767 (minutes)	1 (0: does not report automatically)
5	Set the interval for kW*h auto report	2	0-32767 (minutes)	60 (0: does not report automatically)
6	Auto report when load surpasses the set value of wattage	2	0-3500 (W)	0 (0: does not report automatically)
7	Auto report when the change of wattage surpasses the set percentage	1	0-100 (%)	0 (0: does not report automatically)

Metering

Supports kW*h, W, V, A, and PF:

Meter Type	Scale	Size	Precision
Electric Meter	0 (kW*h)	4	2
	2 (W)	4	2
	4 (V)	2	2
	5 (A)	2	2
	6 (PF)	1	2

Command Classes

The module supports Command Classes including…

- COMMAND_CLASS_ZWAVEPLUS_INFO_V2
- COMMAND_CLASS_ASSOCIATION_V2
- COMMAND_CLASS_ASSOCIATION_GRP_INFO_V1
- COMMAND_CLASS_TRANSPORT_SERVICE_V2
- COMMAND_CLASS_VERSION_V2
- COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2
- COMMAND_CLASS_DEVICE_RESET_LOCALLY_V1
- COMMAND_CLASS_POWERLEVEL_V1
- COMMAND_CLASS_SECURITY
- COMMAND_CLASS_SECURITY_2
- COMMAND_CLASS_SUPERVISION
- COMMAND_CLASS_FIRMWARE_UPDATE_MD_V2
- COMMAND_CLASS_NOTIFICATION_V4
- COMMAND_CLASS_SWITCH_BINARY
- COMMAND_CLASS_CONFIGURATION
- COMMAND_CLASS_METER_V3
- COMMAND_CLASS_APPLICATION_STATUS_V1

Troubleshooting

Symptom	Cause of Failure	Recommendation
Device not responding and LED not displaying	The device is not connected to the mains power correctly	Check if connection is correct, or voltage is too high or too low
LED displaying, but cannot control On/Off status of connected load	The connected load has its own on/off switch	Turn the switch of the connected load to On.
Pressing on/off button works, but cannot control by Z-wave controller	Out of range	1. Relocate the controller closer to the unit. 2. Install a Z-Wave repeater to extend the range.

Specification

Power Input	90-120V/60Hz
Maximum Load	Resistive load Max.1450W
Transmission Range	100 meters (Open space)
Overload cut-off	1600W
Working Temperature	-10°C - 40°C

Specifications are subject to change without notice

Mobile of end product

Federal Communication Commission Interference Statement

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.

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 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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

WARNING:

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.
Contact your local government for information regarding the collection systems available.
If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.
When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.

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