



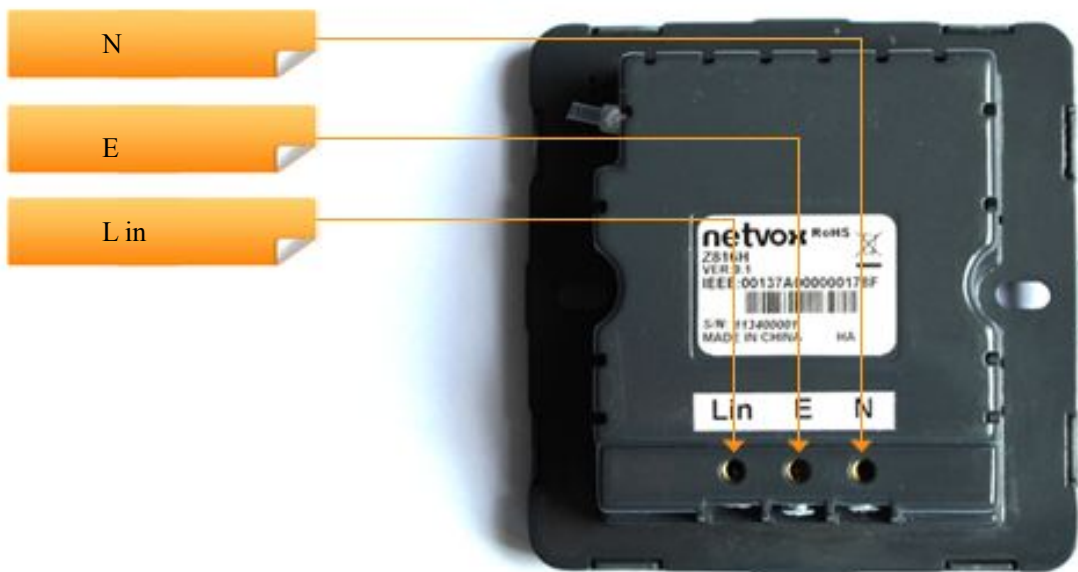
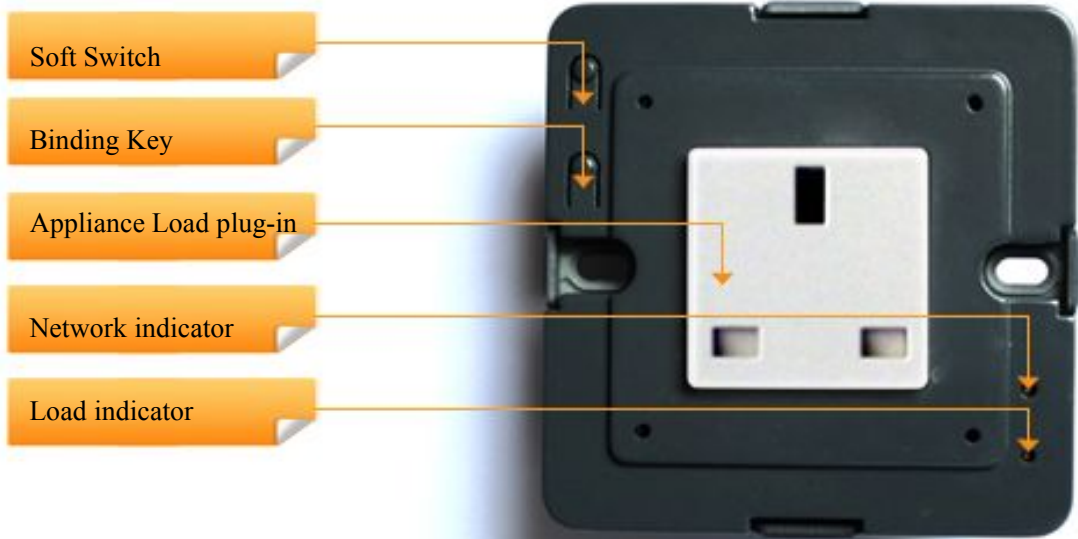
ZigBee™-Wall Switch

User Manual
One Channel Outlet

Model: Z816G

Energy Consumption Monitoring Series

For Home Automation



Introduction

NETVOX Z816G is a ZigBee Home Automation enabled power outlet with power/energy/current/voltage consumption monitoring. It acts as a router device in the Home Automation profile network. It can be manually switched through a mechanical on/off switch or switched wirelessly through any paired ZigBee Home Automation enabled switch.

Consumption reading can be captured and displayed on ZiG-BUTLER -Netvox application software, or on any 3rd party ZigBee enabled in-home display.

What is ZigBee?

ZigBee is a short range wireless transmission technology which defined for a minimum complexity, low power consumption, low data rate, cost effective wireless solution. ZigBee lies in between wireless markup technology and Bluetooth. ZigBee is based on IEEE802.15.4 standard, the mutual co-ordination between thousands of sensors to exchange data. Sensor to sensor or node-to-node communication is achieved through relays of control data between devices with only a fraction of energy use which denoted for highly transmission efficiency.

Note: Wireless communication, in some real use cases, can be limited by the signal blockage. Please consult your service provider or place of purchase.

Product Specification

- | | |
|---|---|
| ✓ Fully IEEE 802.15.4 compliant (ZigBee Pro) | ✓ Consumption monitoring range 125mA to 15A, with $\pm 1\%$ measurement tolerance |
| ✓ Utilizes 2.4GHz ISM band | |
| ✓ 100~240VAC, 50/60HZ input power | ✓ Wireless: Output Power 7dbm (max.)
Receiver -101 dbm |
| ✓ Resistive load max: 15A/250VAC; P:4000VA | ✓ Operating Ambient: -10 °C to 50°C /5~85% RH max. |
| ✓ Inductive load: 8A/220VAC; P:1760VA | ✓ Storage Ambient: -40 °C to 85°C |
| ✓ Motor load: 1.5 HorsePower@240VAC | |
| ✓ Up to 70 meters non-obstacle wireless transmission distance | |
| ✓ Simple operation and device configuration | |

Setting up the Z816G and network

Setting Up Summary

- (1) Startup and network association
- (2) Device pairing where applicable (i.e. pair with a ZigBee switch for wireless control).
- (3) Target device pairing to a collector device for consumption reporting
- (4) It is ready to be used.

Step 1. Startup and Network Association

To allow Z816G to function, it must first join to a ZigBee network. When it is given power it will automatically start searching for an existed network. So before you give power to Z816G make sure it is within the wireless coverage distance (~70 meters or less) and make sure **first** you have the **permit-join feature enabled** either on a coordinator or a router device in the network so that when Z816G is powered on Z816G will automatically join to the network.

**On how to enable permit-join please refer to the router or coordinator device user manual*

Operation:

Ensure you have detached any electrical loads from Z816G.

Step 1: Make sure you have open up permit-join function (valid for 60 seconds) of a coordinator or a router in the network.

Step 2: Now connect AC power cable to power it. Z816G device will start to search for the network within reach and the network indicator slow flashes indicating searching. (Notice: If the network indicator stays solid lit in the beginning, this indicates that Z816G has previously joined to a network. If so please clear the setting stored in the device. Refer to [Restore to factory setting](#) section of the manual.)

Step 3: A **non-flashing solid light** indicates successful otherwise the indicator stays dark. If 60 seconds expired and the network indicator still flashing, re-enable the permit-join on the router or coordinator again.

Step 2. Device pairing for On/Off control (binding)

To wirelessly control Z816G, it is required to pair with ZigBee enabled on/off/toggle remote controller. If you do not wish to control Z816G with wireless switches, you may skip this step and go to [How to use Z816G](#).

You may also utilize ZiG-BUTLER PC-based software to perform this setting.

Pairing operation:

1. To initiate binding request, hold press binding key for 3 seconds until the indicator flashes once then release the key. Z816G will send out pairing request to the air.
2. Likewise, do the same to the other device to exchange binding. (*refer to the other device user manual for device pairing procedure*)

When binding is **successful** the indicator on Z816G will slow flash **5 times**, otherwise quick flashes **10 times** indicating pairing **unsuccessful**. If successful you should be able to wireless control Z816G.

Clear pairing setting: You may remove the pairing between the two or more devices. *Unbinding procedure is exactly the same as binding operation. When you repeat the binding process, the two devices will remove the binding information stored.*

How to use Z816G

Soft switch

User may use the soft switch on Z816G to switch its output.

Wireless remote controller

If the Z816G device is properly paired with a remote controller, you should see the AC outputs responds to on or off instruction wirelessly. Refer to Step 2 Device Pairing in the previous section.

Note that device pairing is not a must feature with Z816G. You may operate it without pairing the device to a remote controller as Z816G already has a manual soft switch.

Power Consumption Reporting

When the load is attached to the device, the embedded meter reads the supplied current drawn overtime. Z816G reports the readings to a [paired target](#) device normally are an in-home display or consumption data logger. Ensure that you go through [consumption reporting and configure reporting time interval](#) described in [ZiG-BUTLER](#) page otherwise Z816G will not sent consumption reading. Z816G can report the consumption reading to Netvox's ZiG-BUTLER or to any 3rd party in-home display.

Power drawn overtime is measured. Current ([unit mA](#)), Voltage ([unit V](#)), Power ([unit W](#)) and Energy ([unit Wh](#)). Z816G stores a new value read and updates such value and clears up the previous. User may want to return the reading back to zero when wish. Refer to [Return-Zero the Consumption Reading](#) section.

[Reading accuracy](#)

If the output current is above 125mA, the reading accuracy of current, voltage and power is $\pm 1\%$. Current detection range is between 125mA to 15A .

Permit other device to join

Z816G is featured to be a router in the network. It permits other devices to join the network. In normal operation, by default the router device Z816G does not permit any device to join to the network to protect the network from unexpected or unauthorized join attempt. You will need to open up the permit-join manually on Z816G or on other router device to allow new devices to join.

Z816G is capable of holding 6 routers and 14 end devices.

Operation:

1. **Short press the binding key once.**
2. The permit join is now enabled for 60 seconds and the indicator light will flash 60 times for 60 seconds.
3. Z816G waits the new device to join in automatically. Please note that the maximum waiting time to join is 60 seconds. Repeat the process if you missed the 60 seconds period.

Resetting Power Consumption Summation

Z816G updates and stores the last *kwh* energy reading. In some cases user would wish to return the counter to zero. Same feature can be found in ZiG-BUTLER software with the **Recalculate** button.

Operation:

Hold press **binding key** for about 20 seconds until the indicator flashes once then release the key. Then *within 2 seconds*, short press **soft switch button** once. If successful the indicator will flash once.

Restore to factory setting

Z816G is capable of storing and saving includes network routing information. If you wish to remove Z816G from an exited network, you would need to clear the saved routing information to join to a new network by simply reset the device to restore to the factory setting.

Operation:

Hold press **binding key** for about 15 seconds until the indicator flashes once then release the key. Then *within 2 seconds*, short press **soft switch button** once. If successful the indicator will flash.

Soon the device will reboot itself. In so the entire ZigBee network and required information

is cleared. It will enter network search to attempt to join to a network. Refer to [network association](#) section of this manual.

Summary of Key function and corresponding display

Function	Key	Display
Restore to factory setting	Hold press binding key 15s then within 2s press control button once.	Flashes once (hold press binding key) Flashes quickly (switch button once)
Permit Join	Short press binding key once	Flashes 60 times in 60 seconds.
Resetting power consumption summation	Hold press binding key 20s then within 2s short press soft switch button once.	Flashes once (hold press binding key) Flashes once (switch button once)
Device Pairing	Hold press binding key 3s.	Flashes once. Flash 5 times if successful or it flashes quickly 10 times

Customized customer's factory default setting

At the time of power recovery from power outage, the device would remain at the default status at the AC output. There are either two status, either **restore to the last status** before the power outage happened or **Off** at power restoration. The device is set to one of these statuses at factory level. You can tell us which default setting at the time of purchase order.

Clusters of Home Automation for Z816G

Home Automation device feature is defined by the endpoint which contains functional clusters. Table 1 lists clusters for the endpoint of Z816G

Table 1: Clusters supported by the endpoint

Cluster for Z816G Device ID: Mains Power Outlet (0x0009) EndPoint: 0x0A	
Server side	Client side
Basic (0x0000)	<i>None</i>
Identify (0x0003)	
Group (0x0004)	
Scene (0x0005)	
On/Off (0x0006)	
Meter (0x0702) <i>Netvox Proprietary</i>	

Attributes of the Basic Information

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>ZCLVersion</i>	8-bit Unsigned integer	0x00 –0xff	Read only	0x03	M
0x0001	<i>ApplicationVersion</i>	8-bit Unsigned integer	0x00 –0xff	Read only	0x0A	O
0x0002	<i>StackVersion</i>	8-bit Unsigned integer	0x00 –0xff	Read only	0x2D	O
0x0003	<i>HWVersion</i>	8-bit Unsigned integer	0x00 –0xff	Read only	0x0A	O
0x0004	<i>ManufacturerName</i>	Character string	0 – 32 Bytes	Read only	netvox	O
0x0005	<i>ModelIdentifier</i>	Character string	0 – 32bytes	Read only	Z816GE3R	O
0x0006	<i>DateCode</i>	Character string	0 – 16 bytes	Read only		O
0x0007	<i>PowerSource</i>	8-bit Enumeration	0x00 –0xff	Read only	0x01	M

Troubleshooting

(1) I found that power outlet Z-800 is not functioning. We have done the pairing to a wireless control device and there is no power connection for the appliances.

Please use the method below to verify:

Test 1. Operate the mechanical switch of Z816G and see if the load attached can be turned on and off.

Test 2. Enable permit join on other router device and see if Z816G LED indicator is also flashing which will last for 60 seconds together like other routers do. This result implied that Z816G is within the network and receives command from the network no problem. (How to enable permit join, please refer to any ZigBee router device for such feature).

Test 3. If test 1 and 2 items are found working, then what was left is device pairing between Z816G and the control device. Please refer to Step 2. Device pairing (binding) of this user manual. Please keep in mind that when device pairing is done twice will actually clear pairing setting instead.

If test 2 item isn't working, please restore Z816G to factory setting then associate Z816G to the network again. Then perform device pairing. If the problem persists, we would conclude that the device is faulty. Please inform us for ship back procedure.

Important Maintenance Instructions

As the device is not water proof it is recommended to keep the device in a dry place. Liquid and heavy moisture contains minerals that may oxidize the electronic circuitry. In case of liquid spill, please leave the device to completely dry before storing or using.

- Do not use or store the device in a dusty area. Dust may cause electronic parts to destroy.
- Do not use or store the device in an over heated place. Store in a hotter temperature than the suggested maximum temperature may shorten the life span of the device; and may damage the battery and causing the housing to deform.
- Do not use or store the device in a very cold place than the suggested minimum temperature. The water can be condensed inside the device when moving to an area that is higher in temperature. This can severely damage the PCB board and circuitry. This may shorten the life span of the device; damage the battery and cause the housing to deform.
- Do not throw or strongly vibrate the device. This may damage connectivity of the electronic parts and other sensitive components on the PCB board.
- Do not use any strong chemical or washing to cleanse the device.
- Do not use any coloring materials on any removable parts which may cause poor connections and may keep the device from function properly.

All the above applies to the purchased products, battery and other packaged items. If any unusable or damaged items are found please return the product to your nearest authorized repairing center.

Important Notice

Under any circumstances without Netvox written approval, copy or redistribute any parts of this document is strongly prohibited.

Netvox adhere to product development policy and therefore reserve the right to change and/or add contents to this document without any further notice.

Under any circumstances or matters, Netvox is not responsible for data or revenue loss or any indirect additional loss that may arise from special cases or any sudden obligations.

This documentation is provided according to the product at the time of purchase. Netvox do not inherent any responsibility and promise or guarantee of the reliability of the document contents –this applies but not limited to market piloting or real use case purposes or otherwise it is legally stated. Netvox reserve the right to change and/or add contents to this document without any further notice.