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**ZigBee™-Wall Switch**

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# **User Manual**

## **One Channel Wall Switch**

**Model: Z815A**

**Energy Consumption Monitoring Series**

For Home Automation

Network indicator

Switch button & status light



Binding key

N

L in

L out



## Introduction

NETVOX Z815A 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 3<sup>rd</sup> 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.

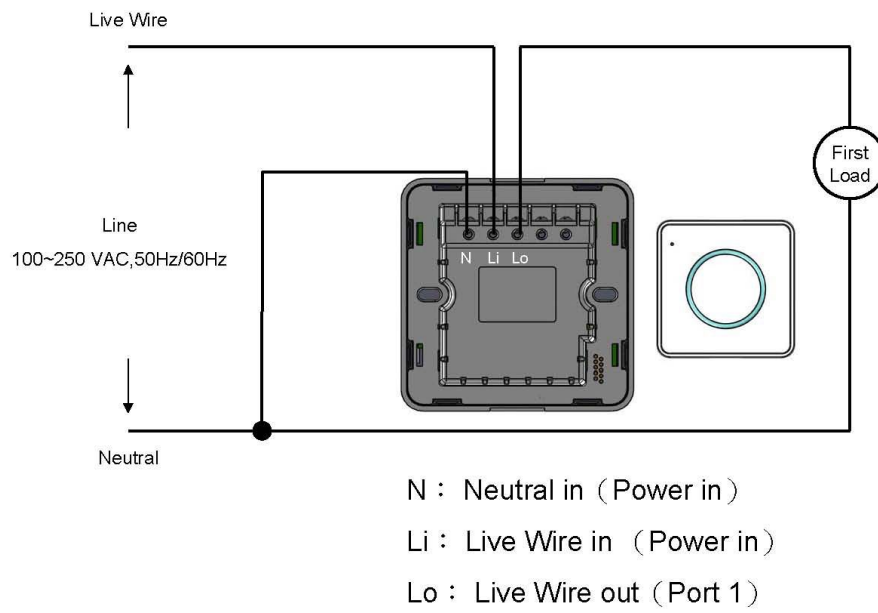
*Note: Wireless communication, in some real use cases, can be limited by the signal blockage. Please consult your service provider or place of purchase.*

## Product Specification

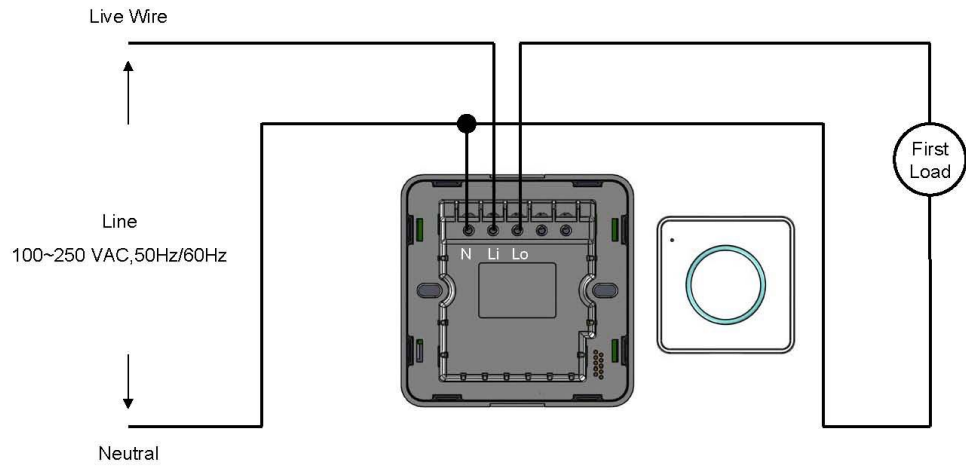
- |   |  |
|---|--|
| ✓ Fully IEEE 802.15.4 compliant (ZigBee Pro)                  | ✓ Consumption monitoring range 125mA to 8A, with ±1% measurement tolerance |
| ✓ Utilizes 2.4GHz ISM band                                    |  |
| ✓ 85~250VAC, 50/60HZ input power                              | ✓ Wireless: Output Power 7dbm (max.)<br>Receiver -101 dbm                  |
| ✓ Resistive load max: 8A/250VAC                               | ✓ Operating Ambient: -10 °C to 50°C /5~85% RH max.                         |
| ✓ Inductive load: 1/6 HorsePower@250VAC                       | ✓ Storage Ambient: -40 °C to 85°C  |
| ✓ Up to 70 meters non-obstacle wireless transmission distance |  |
| ✓ Simple operation and device configuration                   |  |

Installation Diagram

Z815A Wiring Diagram 1 :



Z815A Wiring Diagram 2 :



- N : Neutral in ( Power in )
- Li : Live Wire in ( Power in )
- Lo : Live Wire out ( Port 1 )

## Setting up the Z815A 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 Z815A to function, it must first join to a ZigBee network. When it is given power it will automatically start searching for an existing network. So before you give power to Z815A 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 Z815A is powered on Z815A 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 Z815A.

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. Z815A device will start to search for the network within reach. (Notice: If the network indicator stays solid lit in the beginning, this indicates that Z815A 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: if joining is in process, the network indicator on the Z815A will flash then turn non-flashing. A **non-flashing solid light** indicates successful otherwise the indicator stays dark. If unsuccessful remove power from the device and repeat the whole procedure again. Make sure that the permit-join of a router or coordinator is enabled first.

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

To wirelessly control Z815A, it is required to pair with ZigBee enabled on/off/toggle remote controller. If you do not wish to control Z815A with wireless switches, you may skip this step and go to [How to use Z815A](#).

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 then release the key (LED flashes once). Z815A 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 Z815A will slow flash **5 times**, otherwise quick flashes **10 times** indicating pairing **unsuccessful**. If successful you should be able to wireless control Z815A.

**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 Z815A

### *Soft switch*

Z815A can switch its output through the button switches.

### *Wireless remote controller*

If the Z815A 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 Z815A. You may operate it without pairing the device to a remote controller as Z815A already has a manual switch.*

## Power Consumption Reporting

When the load is attached to the device, the embedded meter reads the supplied current drawn overtime. Z815A 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 Z815A will not sent consumption reading. Z815A can report the consumption reading to Netvox's ZiG-BUTLER or to any 3<sup>rd</sup> party in-home display.

Power drawn overtime is measured. Current ([unit mA](#)), Voltage ([unit V](#)), Power ([unit W](#)) and Energy ([unit Wh](#)). Z815A 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 8A .



## Permit other device to join

Z815A 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 Z815A 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 Z815A or on other router device to allow new devices to join.

Z815A 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.
3. Z815A 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

Z815A 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 20 seconds or so until the indicator flashes once then release the key, then *within 2 seconds*, short press switch button once. If successful the indicator will flash once.

## Restore to factory setting

Z815A is capable of storing and saving includes network routing information. If you wish to remove Z815A 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 15 seconds or so until the indicator flashes once then release the key, then *within 2 seconds*, short press any switch button once. If successful the indicator will flash once.

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
<b>Restore to factory setting</b>	Hold press binding key 15s then within 2s press control button once.	Flashes once (hold press binding key) Flashes quickly (switch button once)
<b>Permit Join</b>	Short press binding key once	Flashes 60 times in 60 seconds.
<b>Resetting power consumption summation</b>	Hold press binding key 20s then within 2s short press control button once.	Flashes once (hold press binding key) Flashes once (switch button once)
<b>Device Pairing</b>	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 Z815A

Home Automation device feature is defined by the endpoint which contains functional clusters. Table 1 lists clusters for the endpoint of Z815A *Netvox Proprietary*

Table 1: Clusters supported by the endpoint

<b>Cluster for Z815A</b> <b>Device ID: Mains Power Outlet (0x0009)</b> <b>EndPoint: 0x01, 0x02, 0x03</b>	
Server side	Client side
Basic (0x0000)	<i>None</i>
Identify (0x0003)	
Group (0x0004)	
Scene (0x0005)	
On/Off (0x0006)	
Meter (0x0702) (endpoint 1) <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	Z815IE3R	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 Z815A 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 Z815A and see if the load attached can be turned on and off.

**Test 2.** Enable permit join on other router device and see if Z815A LED indicator is also flashing which will last for 60 seconds together like other routers do. This result implied that Z815A 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 Z815A 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 Z815A to factory setting then associate Z815A 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.

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