netvox™

ZigBee™-Power Socket with Power Consumption Monitoring

User Manual

Dimmable Socket with Power Detection

Model: Z809B

Energy Consumption Monitoring Series

For Home Automation

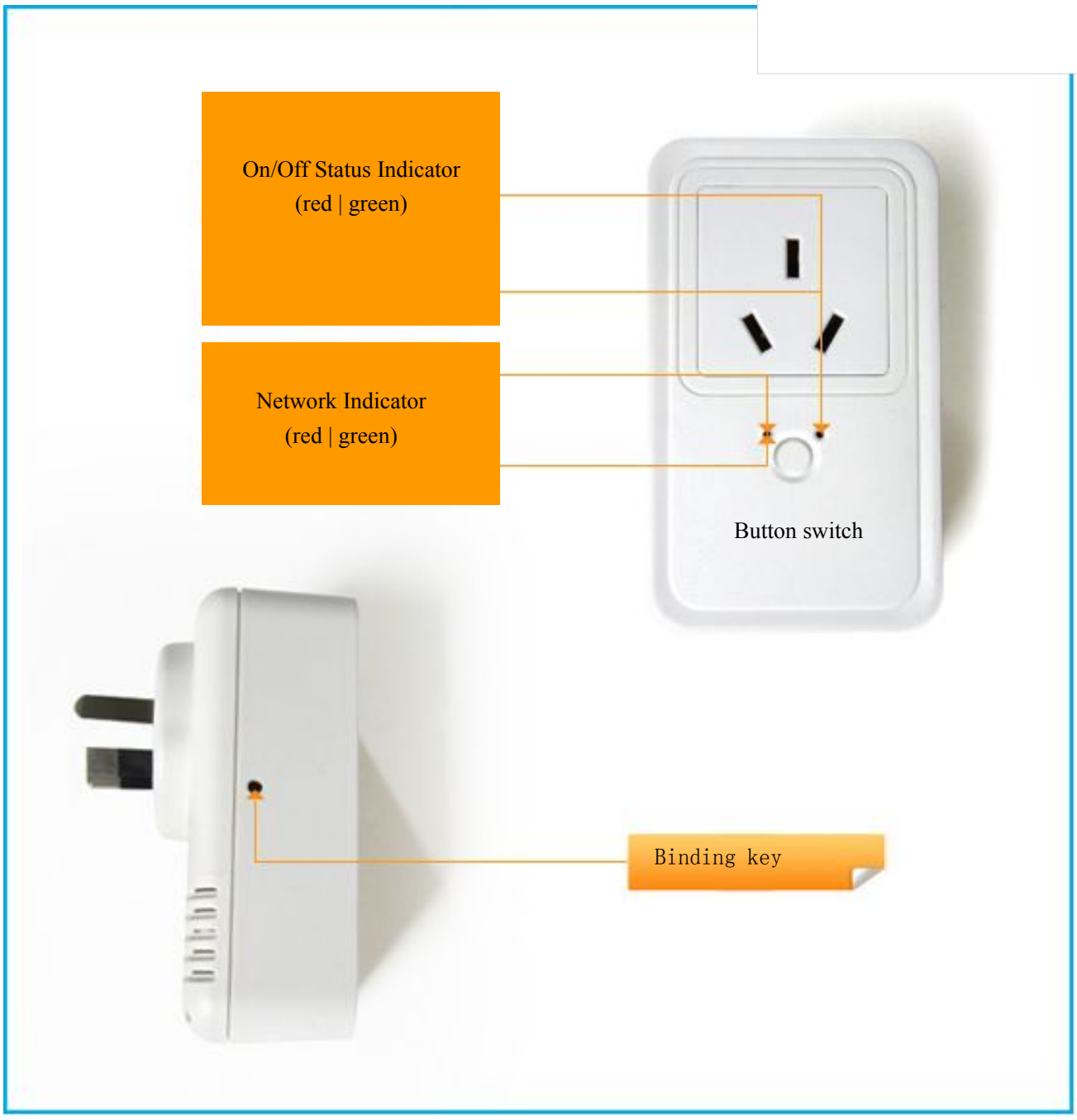
20150105
FW V5.0
HW V1.3

Z809B

Other Netvox related devices

Switch controller

- Simple controller Z501 *series*
- Multiple/Scene controller Z503
- Wall switch ZB02 *series*
- Light sensing switch Z302B



Introduction

NETVOX Z809B is a ZigBee Home Automation enabled power socket with level control and 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 soft on/off switch or switched wirelessly through a paired remote controller. 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)
- ✓ Utilizes 2.4GHz ISM band, up to 16 channels
- ✓ Up to 150 meters non-obstacle wireless transmission distance
- ✓ 100~240VAC, 50/60HZ input power
- ✓ Resistive load max: 3A/220VAC
- ✓ Consumption monitoring range 50mA to 3A, with ±1% accuracy
- ✓ Up to 150 meters non-obstacle wireless transmission distance
- ✓ Simple operation and device configuration
- ✓ Operating Ambient: -10 °C to 50°C / 5~85% RH max.
- ✓ Storage Ambient: -40 °C to 85°C

Setting up the Z809B and network

Setting Up Summary

(1) Startup and network association
(2) Bind the device with other device where applicable (i.e. bind it with a ZigBee switch for wireless control).
(3) It is ready to be used.

Step 1. Startup and Network Association

To allow Z809B to function, it must first join to a ZigBee network. When it is given powered it will automatically start searching for an existed network. So before you give power to Z809B, please make sure it is within the wireless coverage distance (150 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 Z809B is powered on Z809B will automatically join to the network.

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

Operation:

Make sure you have detached any home appliance from Z809B. And also restore the device back to its factory default setting. Refer to Restore to factory setting section.
Step 1: Make sure you have open up permit-join function (valid for 60 seconds) of a coordinator or a router
Step 2: Now plug in Z809B into AC power socket to power it. Z809B device will start to search for the network within reach.
Step 3: if joining is successful, the green network light will turn solid lit.

Note: please also refer to Absent of Coordinator Indication section of the manual.

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

To wirelessly control Z809B, it is required to pair with ZigBee enabled on/off/level controller. If you do not wish to control Z817B with a remote or a switch, you may skip this step and go to How to use Z809B.

Pairing operation:

1). Hold press the binding key for 3 seconds until you see the network indicator flash green once while it sends binding request to the air.

2). Likewise, do the same on the level switch to exchange binding according to the instructions of that device

3). When binding is successful the green indicator on Z809B will flash 5 times then return to solid lit. If successful you should be able to wireless control Z809B. Otherwise it flashes quickly 10 times indicating pairing unsuccessful.

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 operation, the two devices will remove the binding information stored..*

How to use Z809B

Dimmer

Z809B is only suitable for dimming use. Application such as light level control is applicable where dimmable light bulbs are used. Non-dimmable light bulbs are not to be used with this device as the dimming effect will not be obvious.

Remote control

When the device has joined to the network and paired (see Device pairing for On/Off/Level control) with a remote controller the device is ready to be used. Z809B should now be able to responds to on, off, level control command from a wireless remote controller.

Operation: If the Z809B device is properly paired with a switch device, you should see Z809B respond to on or off instruction wirelessly.

When the Off button is press twice and then press On button once, Z809B will stay Off. This is to prevent from accidental turning the device on.

Manual switch

When the button switch is pressed, Z809B increases the output by 1/8th. As you keep pressing until it passes the brightest, Z809B will decrement the output until its output is totally turned off.

The On/Off status indicator turns red when the output is totally Off or green when output is On.

Absent of Coordinator Indication

A ZigBee network required a coordinator to maintain network and other services. Z809B would indicate to the user of whether the coordinator is present or is within the effective signal transmission by means of LED indication.

After Z809B joined to a network, it checks once every 10 minutes for the coordinator. After 3 detecting attempts that the coordinator is not within the effective range, its network indicator will flash 30 times in green. In the normal operation, the network indicator stays solid green without flashing.

Permit other device to join

Z809B 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 Z809B 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 on Z809B or on other router device to allow new devices (a router or an end device) to join.

Operation:

1. **Short press the binding key once**.
2. The permit join is now enabled for 60 seconds and the green network indicator will flash 60 times.
3. Z809B 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.

Power Consumption Reporting

When the load is attached to the device, the embedded meter reads the supplied current drawn overtime. Z809B reports the readings to a paired target device normally an in-home display or consumption data logger. Ensure that you go through *Consumption reporting* and also *Configure reporting time interval* described in ZiG-BUTLER page, otherwise Z809B will not sent consumption reading properly when misconfigured. Z809B can report the consumption reading to Netvox's ZiG-BUTLER or to any 3rd party in-home display.

If target device pairing is ***not*** done (refer to *Consumption reporting in ZiG-BUTLER section)*, Z809B will, by default, report at time interval of 180s minimum or 300s maximum. The reportable change is 2048.

Units

Power drawn overtime is measured. Current (unit mA), Voltage (unit V), Power (unit kW) and Energy (unit kWh). Z809B 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 Resetting Power Consumption Summation section bellow.

Possible reading losses

Z809B stores the reading to the memory at every 30 seconds and 15 seconds for some Z809B. If power is disconnected from power source, the reading in the temporal buffer will not be recorded.

Reading accuracy

If the output current is above 50mA, the reading accuracy of current, voltage, power and energy is ±1%. Current detection range is between 50mA to 3A.

Resetting Power Consumption Summation

Z809B updates and stores the last energy reading in kwh. 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 then release the key when the green network indicator flashes 4 times, *within 2 seconds*, short press the button switch once. If successful the green network indicator will flash once.

Restore to factory setting

Z809B is capable of storing and saving includes network routing information. If you wish to remove Z809B 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.

*notes: restore Z809B back to factory default will not reset power consumption summation. Please refer to Resetting Power Consumption Summation section above.

Operation

1. While the device is given power, **hold press** the binding key for 15 seconds then release the key when the green network indicator flashes 3 times then, *within 2 seconds*, short press the button switch once.
2. If restore to factory setting is successful, you should see the indicator light flashes 10 times.

Soon the device will reboot by 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.

Power Overload

Upon detecting current exceeds 5A, the output will be switched off within 30 seconds.

Summary of Key function and corresponding display

Function	Key	Display
Restore to factory setting	Hold press binding key 15s then within 2s press test button once.	3 flashes (hold press binding key) Then 10 flashes if successful
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 test button once.	4 flashes (hold press binding key) 1 flash (test button once)
Device Pairing	Hold press binding key 3s.	1 flash (hold press binding key) 5 flashes if successful, otherwise flashes quickly 10 times

Configuration setting

As mentioned in How to use Z809B section, when the Off button is press twice and then press On button once, Z809B will stay Off. This is to prevent from accidentally turning the device on. This is a factory default setting. Programmer may, however, overwrite this setting permanently by setting On Level attribute to any value between 0x00 to 0xFE. 0xFF is the factory default.

Installation Notes:

1、Z809B stores power consumption data once every 30 seconds, thus the power data of last 30 seconds before power-fail could probably be lost.（24C01, 30 seconds; 24C02, 15 seconds….）

2、Z809B is designed as a light dimmer. No other electric appliances but dimmable lights can be attached to this product.

3、Z809B is not a waterproof product, use it indoor only.

4、Load Protection: The current is over 3A → it will be off-load in 2 seconds.

5、After it is off-load, the Bit1 (Current OverLoad) of the parameter ACAlarmsMask will be checked:

Bit1 (Current OverLoad) is 1 → it sends the alarm message;

Bit1 (Current OverLoad) is 0 → it doesn’t send the alarm message

When it sends the alarm message → AlarmCluster = 0x0B04; AlarmCode = 0xF0; indicator flashes **10 times**.

6、Z809B is using PWM dimming with leading Triac technology. Please DO NOT use improper light/lamp/device or it may cause damages. For example, regular LED lamp which does not support dimmer features, gas-discharge lamp, home appliance, computer, or on-off relay is not supported.

7、The maximum electrical load of Z809B:

a. Resistive Load (incandescent light bulb): 3A/600W.

b. Dimmable fluorescent lamp or dimmable LED lamp: 100W. Parallel connection is not recommended.

c. DO NOT connect coil transformer for dimming.

Clusters of Home Automation for Z809B

1.End Point(s)：0x01
2.Device ID：Dimmer Light (0x0101)
3.EndPoint Cluster ID

Cluster ID for Z809B	
Server side	**Client side**
EP 0x01 (Device ID: Dimmer Light (0x0101)	
Basic（0x0000）	*None*
Identify (0x0003)	
Groups (0x0004)	
Scenes (0x0005)	
On/Off (0x0006)	
Level Control (0x0008)	
Commission（0x0015）	
Electrical Measurement（0x0B04）	
Diagnostics(0x0B05)	
Simple Metering（0x0702）	

Attributes of the Basic Device Information attribute set

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	*ZCLVersion*	8-bit Unsigned integer	0x00 –0xff	Read only	0x03	M
0x0001	*ApplicationVersion*	8-bit Unsigned integer	0x00 –0xff	Read only	0x32	O
0x0002	*StackVersion*	8-bit Unsigned integer	0x00 –0xff	Read only	0x35	O
0x0003	*HWVersion*	8-bit Unsigned integer	0x00 –0xff	Read only	0x0D	O

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0004	*ManufacturerName*	Character string	0 – 32 Bytes	Read only	netvox	O
0x0005	*ModelIdentifier*	Character string	0 – 32bytes	Read only	Z809BE 3R	O
0x0006	*DateCode*	Character string	0 – 16 bytes	Read only	20141121	O
0x0007	*PowerSource*	8-bit Enumeration	0x00 –0xff	Read only	0x01	M

Attributes of the Group server cluster

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	*NameSupport*	8-bit bitmap	10000000	Read Only	0x80	*M*

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.

- This device can be only used with dimmable bulb/light.
- 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 my 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.