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**ZigBee™-Switch Ctrl Unit w/t Consumption Monitoring**

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## **User Manual**

# **Ceiling Mounted PIR Switch Unit with Consumption Display**

**Model: Z817C**

**Energy Consumption Monitoring Series**

For Home Automation

20130419

FW V1.3

HW V1.3

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

# Switch Control Unit

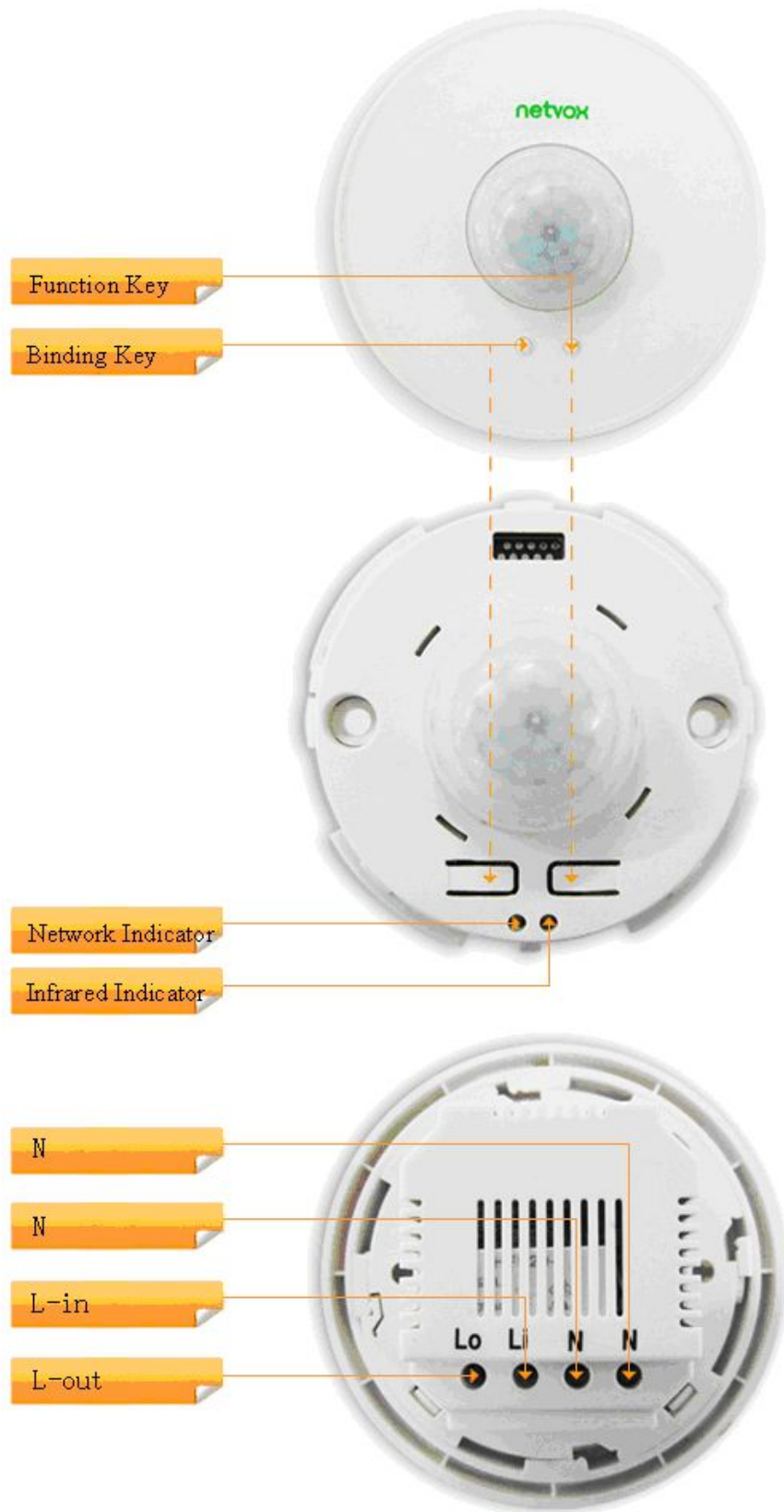


Figure: Z817C

## Introduction

NETVOX Z817C is a ZigBee Home Automation enabled ceiling-mounted infrared power switch unit with power/energy/current/voltage consumption monitoring. When motion is detected, it switches on the attached load for 30 seconds then switch off if not further motion is detected.

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 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
- ✓ Utilizes 2.4GHz ISM band, up to 16 channels
- ✓ 100~240VAC, 50/60HZ input power
- ✓ Up to 70 meters non-obstacle wireless transmission distance
- ✓ Simple operation and device configuration

## Setting up the Z817C 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 Z817C 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 Z817C 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 Z817C is powered on Z817C 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 home appliance from Z817C.

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

Step 2: Connect AC power source to Z817C to power it. Z817C device will start to search for the network within reach. LED will flashing to indicate it is searching for a channel around the area to join.

Step 3: The indicator on the Z817C will turn non-flashing indicates network join is successful otherwise the indicator stays flashing in searching for a network. Make sure that the permit-join of a router or coordinator is enabled.

## Step 2. Device pairing (binding)

To wirelessly control Z817C, it is required to pair with ZigBee enabled on/off/toggle remote controller. If you do not wish to control Z817C with a remote, you may skip this step and go to [How to use Z817C](#).

### Pairing operation:

- 1). Operate binding on the remote controller. (*refer to the other device user manual for binding details*)
- 2). Likewise, do the same on Z817C to exchange binding. Hold press the binding key for **3 seconds**, release the key until you see the network indicator flashes once while it sends binding request to the air.

When binding is successful the network indicator on Z817C will flash slow 5 times then turn non-flashing solid, otherwise it flashes 10 times indicating unsuccessful then turn non-flashing solid

**To remove pairing setting:** repeat the pairing operation the 2<sup>nd</sup> time will *remove the binding setting and information stored*.

## How to use Z817C

### *PIR Motion Detect*

When motion is detected, it switches ON the attached load for 30 seconds then switch off if no further motion is detected. If further motion is detected, 30 seconds will be recounted.

### *Remote control*

When the device has joined to the network and paired (see [Device pairing](#)) with a remote controller the device is ready to be controlled wirelessly. Z817C should now be able to responds to on, off, toggle control command from a wireless remote controller.

**Operation:** If the Z817C device is properly paired with a switch device, you should see the AC output responds to on or off instruction wirelessly.

## Power Consumption Reporting

Z817C can report the consumption reading to Netvox's ZiG-BUTLER or to any 3<sup>rd</sup> party in-home display. When the load is attached to the device, the embedded meter reads the supplied current drawn overtime. Z817C reports the readings to the matched device. [Reporting time interval configuration followed by device matching is required.](#)

If you have ZiG-BUTLER and uses USB dongle or Z202 gateway then you should go to [Consumption Reporting](#) subsection under [ZiG-BUTLER](#) page.

Power drawn overtime is measured. Current ([unit mA](#)), Voltage ([unit V](#)), Power ([unit W](#)) and Energy ([unit WH](#)). Z817C stores a new value is 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 bellow.

## Permit other device to join

Z817C 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 Z817C 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 Z817C 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 network indicator light will flash 60 times.
3. Z817C 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.

## Return-Zero the consumption reading

User may want to return the reading back to zero when wish

User may also do the same through ZiG-BUTLER PC based software. Refer to ZiG-BUTLER section.

### Operation:

**Step 1.** Hold press the binding key for **20 seconds** until network indicator flashes once then release the key. Then within 2 seconds short press any key to force it to return to zero.

**Step 2.** If zeroing setting is **successful**, the network indicator will flash once.

## Restore to factory setting

Z817C is capable of storing and saving includes network routing information. If you wish to remove Z817C 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. There are 2 ways to restore the device:

### Operation1

Hold press the binding key for **15 seconds** until network indicator flashes once then release the key. Then within 2 seconds short press any key to force it to reset. If restore to factory setting is **successful**, the network indicator light flashes **quickly 10 times**. Now the device has restored to the factory setting.

### Operation2

Power off Z817C first. Hold press the binding key, and then power on it.

Z817C will reboot. Soon the device will enter network search to attempt to join to a new network. Refer to [Network Association](#) section of this manual.

## IR Coverage Range

Sensing angle	115°		
Sensing area	OC (Height)	3m	5m
	AB (Length)	9m	10m
	<p>The diagram illustrates the IR coverage range. A sensor is mounted on a ceiling at point O. The sensing angle is 115°. The sensor is 3m above a floor (OC) and 5m above a lower floor (O'C'). The coverage area on the floor is a chord AB of length 9m. The lower floor coverage area is a larger chord A'B' of length 10m. The vertical distance from the sensor to the lower floor is h'=5m, and the vertical distance to the upper floor is h=3m.</p>		
Sensitivity	<ul style="list-style-type: none"> <li>Z817C has the worst sensing sensitivity for vertical movement, like O→C.</li> <li>Z817C has the best sensitivity for horizontal movement, like A→B.</li> </ul>		
Installation Considerations	<ul style="list-style-type: none"> <li>Do not aim the passive infrared sensor to a heat or cold source.</li> <li>The sensor should not face open door/windows as sunlight will affect its operation.</li> <li>The sensor must be mounted on a vibration-free surface.</li> </ul>		



## Clusters of Home Automation for Z817C

Home Automation device feature is defined by the endpoint which contains functional clusters. Table 1 lists clusters for the endpoint of Z817C

Table 1: Clusters supported by the endpoint

Cluster ID for Z817C	
Server side	Client side
<b>EP 0X0A (Device ID: Temperature Sensor (0x0302) )</b>	
Basic(0x0000)	<i>None</i>
Group(0x0004)	
Identify(0x0003)	
Scene(0x0005)	
On/Off(0x0006)	
Commissioning(0x0015)	
Meter(0x0702)	

### Attributes of the Basic Information

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>ZCLVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x03	M
0x0001	<i>ApplicationVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x0D	O
0x0002	<i>StackVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x2D	O
0x0003	<i>HWVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x0D	O
0x0004	<i>ManufacturerName</i>	Character string	0 – 32 bytes	Read only	netvox	O
0x0005	<i>ModelIdentifier</i>	Character string	0 – 32 bytes	Read only	Z817CE3R	O
0x0006	<i>DateCode</i>	Character string	0 – 16 bytes	Read only	201201009	O

0x0007	<i>PowerSource</i>	8-bit Enumeration	0x00 – 0xff	Read only	0x01	M
0x0010	<i>LocationDescription</i>	Character string	0 – 16 bytes	Read/write	--	O
0x0011	<i>PhysicalEnvironment</i>	8-bit Enumeration	0x00 – 0xff	Read/write	0x00	O
0x0012	<i>DeviceEnabled</i>	Boolean	0x00 – 0x01	Read/write	0x01	M
0xE001	NetvoxInternalApplicationVersion	8-bit Unsigned integer	0x00 – 0xff	Read only	0x0B	O
0xE002	NetvoxInternalDate Code	Character string	0 – 16 bytes	Read only	20120905	O

Netvox Proprietary Meter Cluster (0x0702) contains  
Current (unit mA), Voltage (unit V), Power (unit W) and Energy(unit WH).

## 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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