



ZigBee™- Wireless Power Meter

User Manual

Wireless Power Meter

Model: Z821

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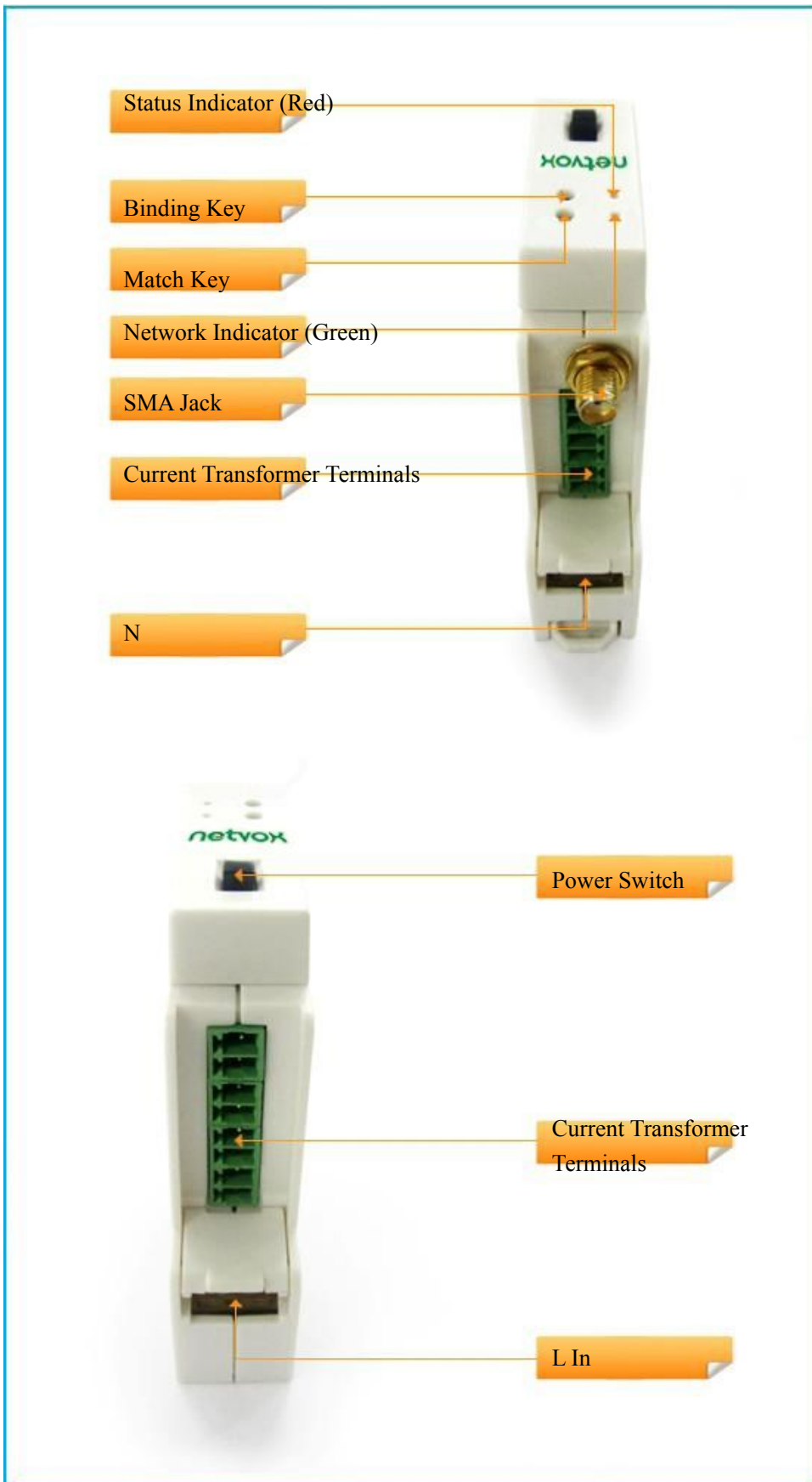
1. Introduction

Z821, the ZigBee compact-size multi-port CT (current transformer) type power meter, acts as a router in ZigBee network. Z821 is the only one for independent monitoring and measurement of up to 7 single-phase AC outlets in the world. It is fully IEEE 802.15.4 compliant and utilizes 2.4GHz ISM band. With high measurement accuracy $\pm 0.5\% \sim 1\%$, Z821 has the most advanced performance and is an ideal product to know the whole power and energy consumption such as load current, load voltage, power, or energy.

What is ZigBee?

ZigBee is a short range wireless transmission technology based on IEEE802.15.4 standard and supports multiple network topologies such as point-to-point, point-to-multipoint, and mesh networks. It is defined for a general-purpose, cost-effective, low-power-consumption, low-data-rate, and easy-to-install wireless solution for industrial control, embedded sensing, medical data collection, smoke and intruder warning, building automation and home automation, etc.

2. Product Appearance





3. Specification

- Fully IEEE 802.15.4 compliant (ZigBee Pro)
- Utilizes 2.4GHz ISM band; up to 16 channels
- Power supply: 100~240VAC, 50/60Hz
- Power consumption: 18mA/230VAC, 1.2W
- Basic accuracy: $< \pm 1\%$
- Measuring Range: 7 single CTs; 60A x 1/ 30A x 6
- Transmission range: Up to 280 meters
- Easy installation and configuration

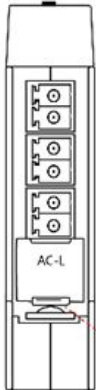
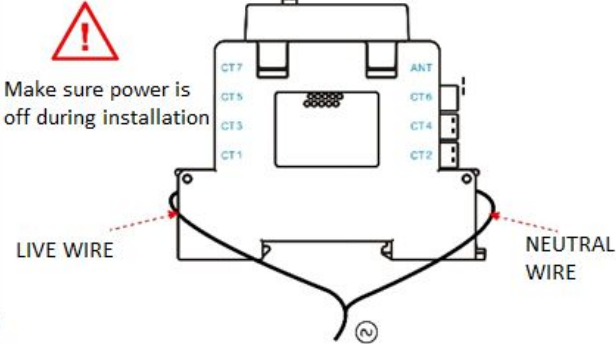
4. Installation

- This device is NOT truly waterproof/ resistant and is for indoor use.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Beware of potential hazards, wear personal protective equipment, and carefully inspect the work area for tools and objects that may have been left inside the equipment.

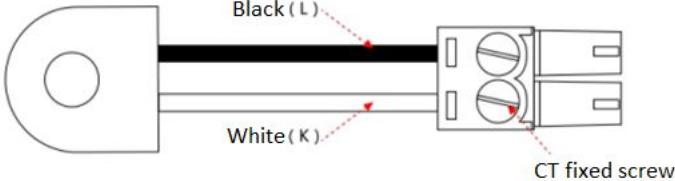
Install the power line (live wire) which you would like to measure with the Primary side. Next, connect the Secondary side to Z821 (k to k; l to l).

	
<p>The device is not water-proof, please place it indoor.</p>	<p>The device is to detect AC power.</p>

Z821 power wire installation is as shown below, AC-L connected to live line, AC-N then N line

 <p>1. Open with a screwdriver pry 2. Insert wire and tighten the screw</p>	 <p>Make sure power is off during installation</p>
<p>Firstly, open with a screwdriver pry and insert wire and then tighten the screw. AC-L connected to live line, AC-N then N line as shown in right-hand figure.</p>	

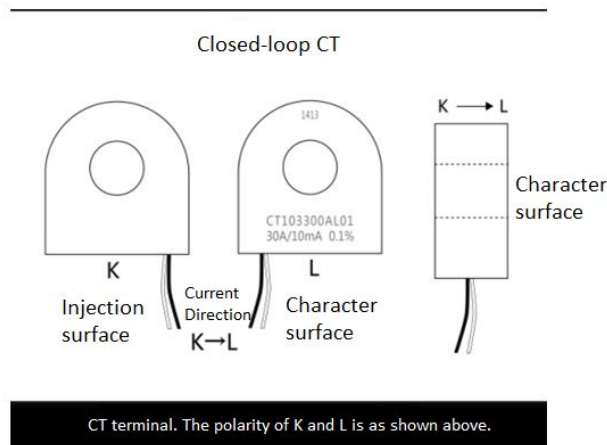
Install CT terminal of the black wire and white wire as below diagram:



Black (L)
White (K)
CT fixed screw

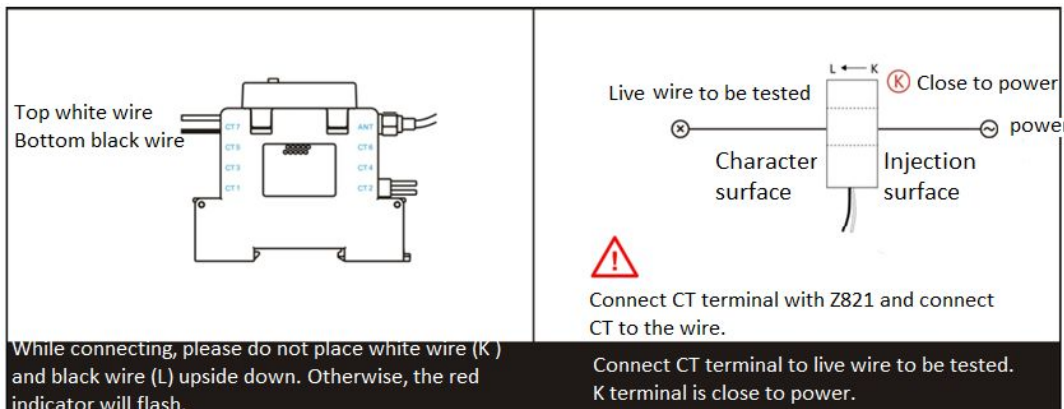
Unscrew CT fixed screw with screwdriver pry. Insert the wire, black wire on the top, white wire on the bottom and tighten screw.

CT terminals of the L and K polarity distinction are as follows:

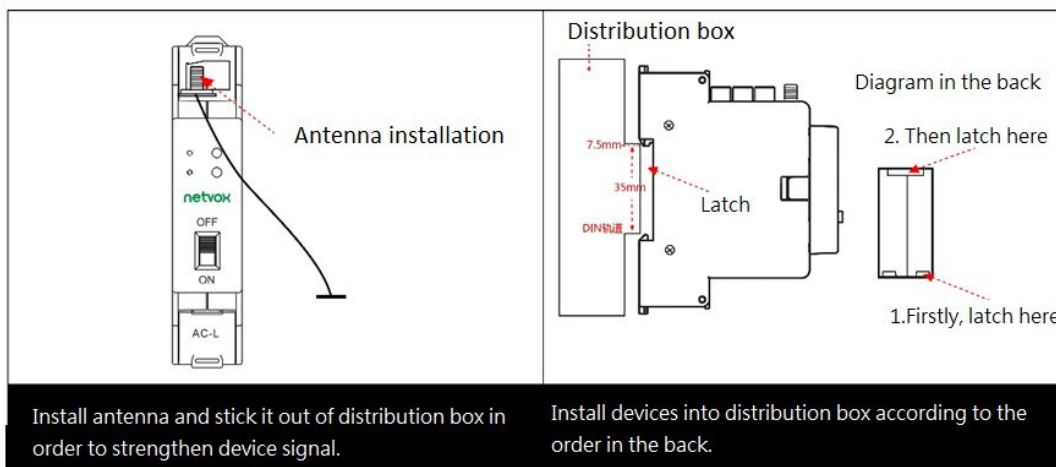


While connecting, use two wires (the color is white and black, representing the k and l terminals) of the secondary side of the CT to correspond to the character markers (k and l) on the Z821 housing.

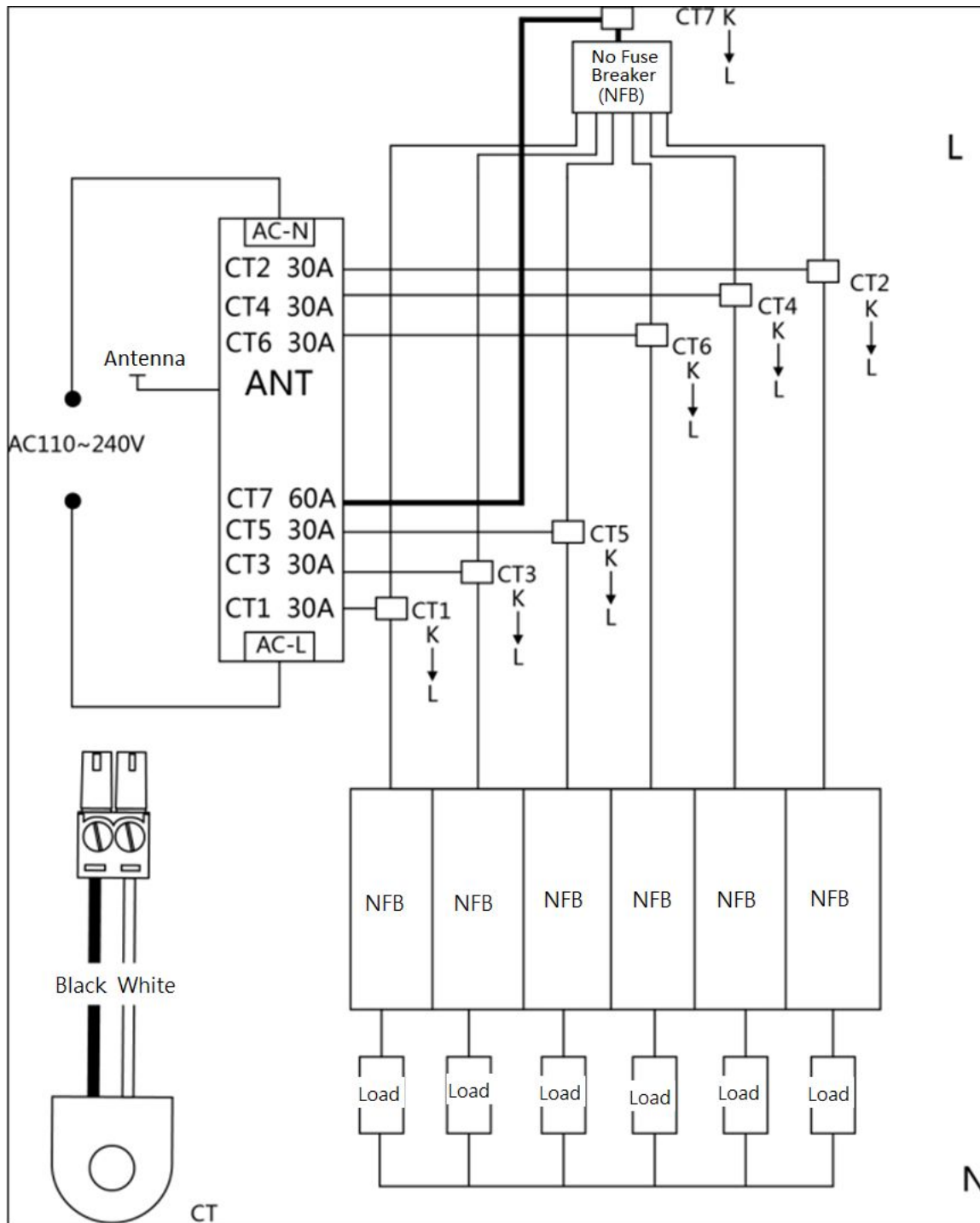
The AC power line goes through the CT center hole, and the CT K-side (injection surface) towards the power supply side, L side (character face) towards the load side.



Distribution box and antenna installation as follows:



The circuit is as follows after installation:



5. Setting up Z821

5-1. Join the ZigBee Network

After Z821 is turned on, it will search for an existing ZigBee network and send a request to join the network automatically. While Z821 is under the coverage from a coordinator or a router whose **permit-join feature is enabled**, Z821 will be permitted to join the network.

Step1. Enable the permit-join function (valid for 60 seconds) of a coordinator or a router (please refer to the user manual of the coordinator or the router to enable the permit-join feature).

Step2. Turn on Z821. It will start to search and join the network.

Step3. The indicator will flash **green once** when it finds out a network to join.

Step4. The network indicator will stay **green** after it is joined successfully. Otherwise, the indicator will be off.

5-2. Permit-Join

Z821 acts as a router in ZigBee network. After the permit-join feature is enabled, it allows other devices to join the network.

Step1. Press the *Binding Key*. The permit-join feature will be enabled for 60 seconds.

Step2. Within the period of 60 seconds, the network indicator flashes once per second.

Within the period of 60 seconds, press the *Binding Key* again to turn off the permit-join.

5-3. Power Measurement

Z821 is an ideal product to know the whole energy consumption of the building; even to measure every sub power meter to recognize how much energy is consumed by appliances in your home/office. Through ZigBee technology, users are able to acquire the data, like current, voltage, power, or energy, from Z821 wirelessly.

5-4. CT/ N Wire/ L Wire Connection Error Notification

When the connection of CT or N/L wire is incorrect, the Status Indicator will keep flashing **red**. In this case, we will get the wrong power consumption data.

5-5. Reset Power Consumption Summation

To reset the power consumption data, please follow the steps:

- Step1. Press and hold the *Binding Key* for 20 seconds. The status indicator will flash **4 times**.
 Step2. After releasing the Binding Key, press the *Match Key* within 2 seconds to complete the reset.

5-6. Restore to Factory Setting

To restore it to factory setting, please follow the steps:

- Step1. Press and hold the *Binding Key* for 15 seconds. The status indicator will flash **3 times**.
 Step2. After releasing the Binding Key, press the *Match Key* within 2 seconds to complete the restore.

6. Home Automation Clusters for Z821

A cluster is a set of related attributes and commands which are grouped together to provide a specific function. A simple example of a cluster would be the On/Off cluster which defines how an on/off switch behaves. This table lists the clusters which are supported by Z821.

Cluster ID for Z821	
Server side	Client side
Consumption Awareness	
Basic (0x0000)	<i>None</i>
Identify (0x0003)	
Commissioning (0x0015)	
Simple Metering (0x0702)	

Attribute ID for Simple Metering (0x0702)	
ATTRID	
Current (0xE000)	
Voltage (0xE001)	
Power (0xE002)	InstantaneousDemand (0x0400)
Energy (0xE003)	CurrentSummationDeliver (0x0000)

This lists the attributes of the basic information.

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>ZCLVersion</i>	8-bit Unsigned integer	0x00 –0xf f	Read only	0x03	M

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0001	<i>ApplicationVersion</i>	8-bit Unsigned integer	0x00 –0xf f	Read only	0x0A	O
0x0002	<i>StackVersion</i>	8-bit Unsigned integer	0x00 –0xf f	Read only	0x2F	O
0x0003	<i>HWVersion</i>	8-bit Unsigned integer	0x00 –0xf f	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	Z821E3R	O
0x0006	<i>DateCode</i>	Character string	0 – 16 bytes	Read only	20131025	O
0x0007	<i>PowerSource</i>	8-bit Enumeration	0x00 –0xf f	Read only	0x01	M
0x0010	<i>LocationDescription</i>	Character string	0 – 16bytes	Read/w rite	Empty string	O
0x0011	<i>PhysicalEnvironment</i>	8-bit Enumeration	0x00 –0xf f	Read/w rite	0x00	O
0x0012	<i>DeviceEnabled</i>	Boolean	0x00–0x0 1	Read/w rite	0x01	O

7. Related Netvox Devices

Z800: Power Socket with Power Consumption Monitoring



8. Important Maintenance Instructions

- Please keep the device in a dry place. Precipitation, humidity, and all types of liquids or moisture can contain minerals that corrode electronic circuits. In cases of accidental liquid spills to a device, please leave the device dry properly before storing or using.
- Do not use or store the device in dusty or dirty areas.
- Do not use or store the device in extremely hot temperatures. High temperatures may damage the device or battery.
- Do not use or store the device in extremely cold temperatures. When the device warms to its normal temperature, moisture can form inside the device and damage the device or battery.
- Do not drop, knock, or shake the device. Rough handling would break it.
- Do not use strong chemicals or washing to clean the device.
- Do not paint the device. Paint would cause improper operation.

Handle your device, battery, and accessories with care. The suggestions above help you keep your device operational. For damaged device, please contact the authorized service center in your area.