

User Manual

ZigBee Remote

Model: Z501A

Firmware: V5.1
Hardware: V2.0

Table of Contents

1. Introduction.....	2
2. Product Appearance.....	3
3. Specification.....	4
4. Installation.....	5
5. Setting up Z501A.....	5
5-1. Join the ZigBee Network.....	5
5-2. Add Group (ZLL Network).....	6
5-3. Binding (HA Network).....	6
5-4. Store Scene.....	7
5-5. Control the Device Wirelessly.....	7
5.6. Sleeping Mode.....	8
5.7. Wake up Z501A.....	8
5.8. Battery.....	9
5-9. Restore to Factory Setting.....	9
5-10. Rejoin to Network.....	9
5-11. Report Configuration for Developer Only.....	9
7. Netvox App Control Interface.....	12
8. Related Devices.....	14
9. Important Maintenance Instructions.....	15

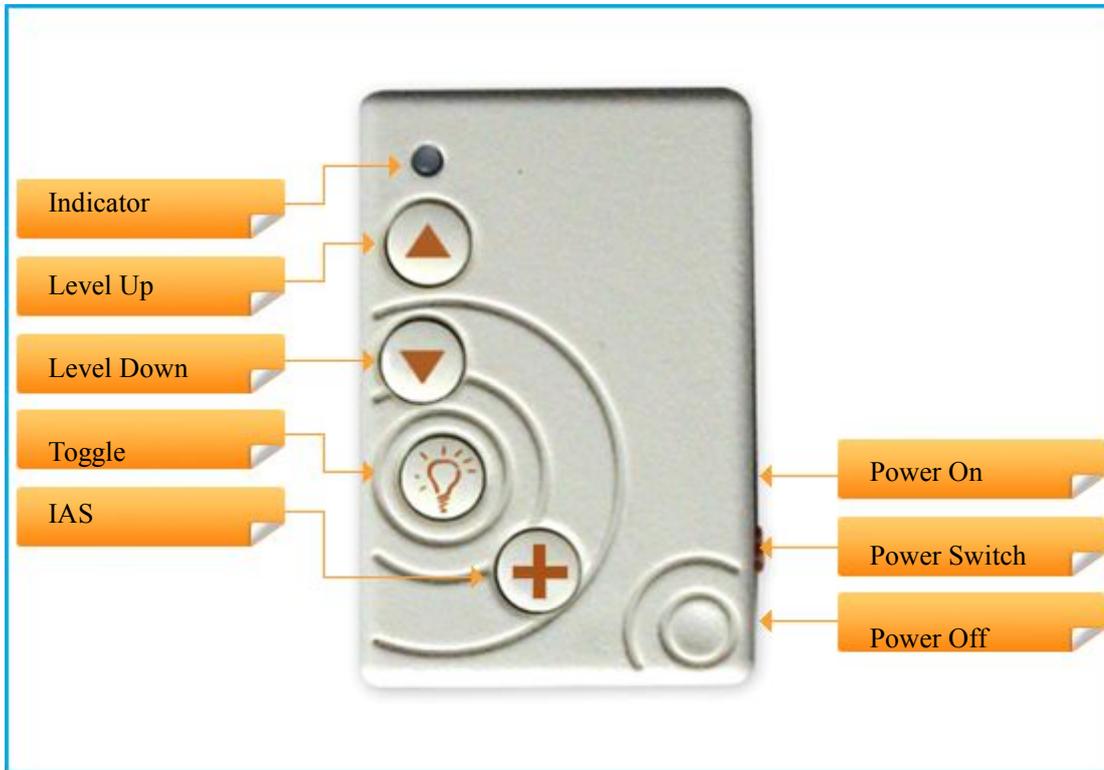
1. Introduction

Netvox Z501A, ZigBee remote controller, acts as an End Device in ZigBee network. It does not perform permit-join function as a coordinator or a router for other devices to join the network. Z501A can be bound with the On/Off or dimmer devices for users to control the devices wirelessly. It also equipped with an emergency button. When users ask for urgent assistance, simply push the button, and Z501A will send the alarm message to the command center. The Warning Device will send out alarm sound or lighting alert for immediate help.

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

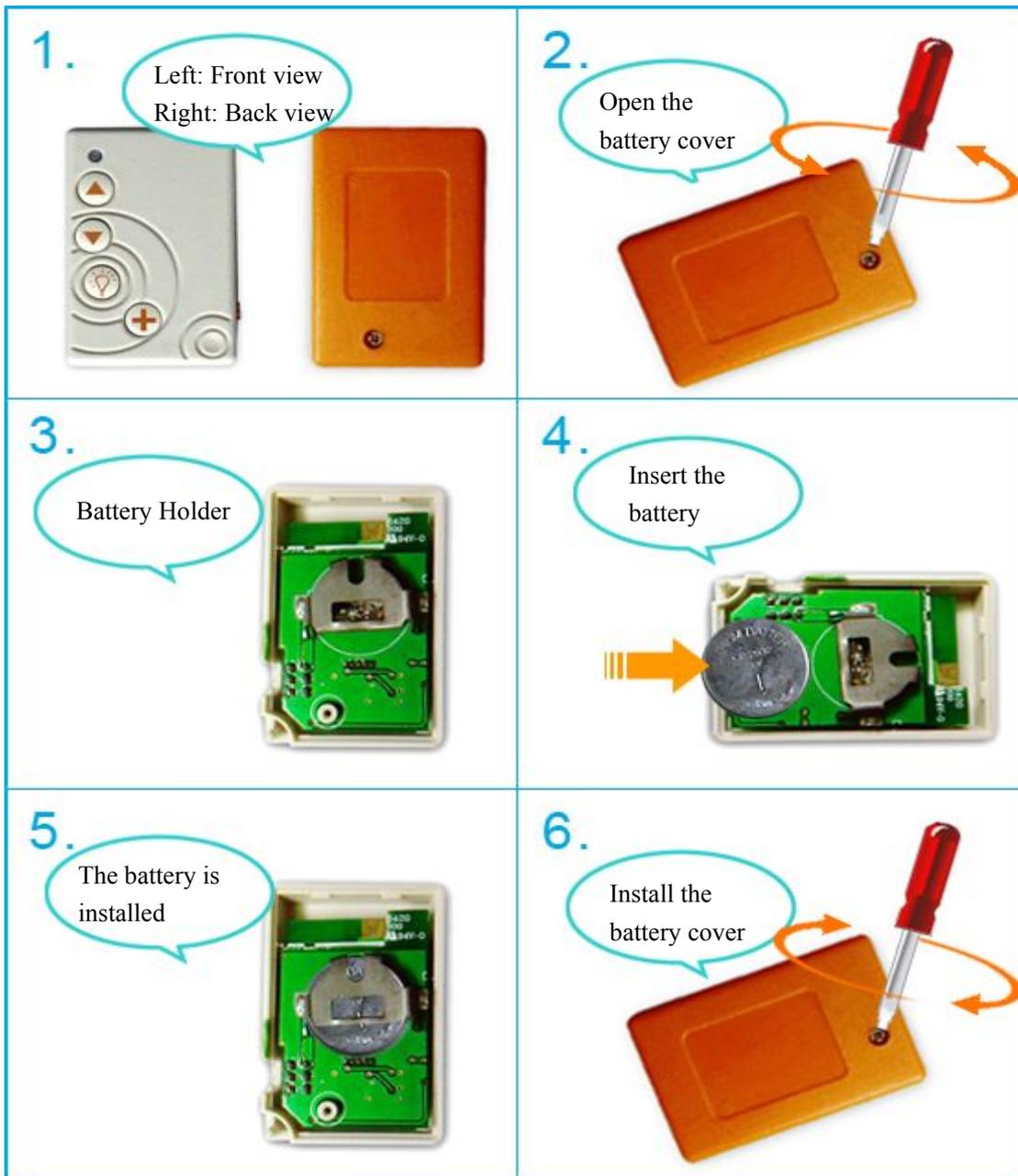


3. Specification

- Fully IEEE 802.15.4 compliant
- Utilizes 2.4GHz ISM band; up to 16 channels
- Power supply: 3V CR2032 button cell battery
- Operating consumption: $\leq 38\text{mA}$
- Standby consumption: $\leq 0.8\mu\text{A}$
- Up to 150 meters wireless transmission range in non-obstacle space
- Easy installation and configuration

4. Installation

- This device is NOT truly waterproof/ resistant and is for indoor use.



5. Setting up Z501A

5-1. Join the ZigBee Network

While Z501A is under the coverage from a coordinator or a router whose **permit-join feature is enabled**, Z501A 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. For HA network: Switch on Z501A. Press both  and  to search and join the network.

Step3. For ZLL network: Switch on Z501A. Press both  and  to search and join the network. After switching on Z501A, it will start to search and join **HA network** when no button is applied in **30 seconds**.

Step 4. The indicator will flash **5 times** after it is joined successfully. Otherwise, the indicator will stay **OFF**.

Step5. After joining to network successfully, Z501A will automatically register to CIE (control and indicating equipment). The indicator flashes 6 times to show success, otherwise, the indicator will flash 4 times.

Step 6. Z501A will enter sleeping mode if it fails to join network within 3minutes. Z501A will wake up every 15 minutes to try to join to network.

5-2. Add Group (ZLL Network)

To add the On/Off device into a group, please follow the steps:

Step1. Identify the On/Off devices which you would like to add.

Step2. Press and hold  for 2 seconds and then press  within 2 seconds to send the 'add group if identify' command. The group will be established.

5-3. Binding (HA Network)

Z501A can be bound with the device which supports On/Off cluster, Level Control cluster, or ACE cluster (such as Z903 or ZD01B).

On/Off/Level Control cluster:

Step1. Press and hold  for 2 seconds and then press  within 2 seconds to broadcast the binding request.

Step2. Enable the binding feature of the device which supports On/Off/Level Control cluster (ex. Z903 or ZD01B).

Step3. The indicator flashes **5 times** after the binding is completed; otherwise, the indicator flashes **10 times**.

5-4. Store Scene

To create and store the scene control, please follow the steps:

Step1. Identify the devices which you would like to control.

Step2. Press and hold  for 4 seconds and then press  /  /  /  within 2 seconds to create Scene 1, Scene 2, Scene 3, or Scene 4.

5-5. Control the Device Wirelessly

[ZLL Network] Group control:

- A. Press  to perform the Dimming-up control.
- B. Press  to perform the Dimming-down control.
- C. Press  to perform the toggle control.
- D. Press  to perform the emergency alarm.

[HA Network] After binding with the On/Off/Level Control cluster devices:

- A. Press  to control the On/Off feature.
- B. Press  to control the Dimming-up/Rolling-curtain-up feature.
- C. Press  to control the Dimming-down/Rolling-curtain-down feature.
- D. Press  to send the emergency alarm message to the command center. The Warning Device will send out alarm sound or lighting alert for immediate help.
- E. Press and hold  for 2 seconds to arm the security system.

F. Press and hold  for 2 seconds to disarm the security system.

[Scene Control] When pressing and holding “Toggle key” for 4 seconds, in the mean time, press below keys within 2 seconds:

A. Press  to perform Scene 1 control.

B. Press  to perform Scene 2 control.

C. Press  to perform Scene 3 control.

D. Press  to perform Scene 4 control.

• To switch to Scene control, press and hold  for 6 seconds.

• To switch to Group/Binding control, press and hold  for 8 seconds.

5.6. Sleeping Mode

Z501A is designed to go into sleeping mode for power-saving in some situations:

- When it doesn't find a network to join → Z501A will go to sleeping mode.
- While the device is in the network → the sleeping period is 5 minutes; it will wake up every 5 minutes to keep online.
- Once Z501A was joined to a network and by any chance the network is no longer existed or the device is out of the network → Z501A will wake up every 15 minutes to find the network it joined before. It never keeps in sleeping mode and continues to find its network every 15 minutes. This condition would consume up to 30 times power spending compared to normal-operating status. To prevent this unwanted power consumption, we recommend that users manually power off the device.

5.7. Wake up Z501A

When users would like to setup or acquire data from the device which is in sleeping mode, we have to wake

up the device. To wake up Z501A, press both  and . Z501A will broadcast the device

information such as IP address and IEEE address.

5.8. Battery

Low-power report: When the operating voltage is lower than 2.4V, Z501A will send a low-power report to the CIE device. The 4 battery attributes:

- BatteryVoltageMinThreshold: 2.1V
- BatteryVoltageThreshold1: 2.2V
- BatteryVoltageThreshold2: 2.3V
- BatteryVoltageThreshold3: 2.4V

When the battery voltage is lower than the VoltageThreshold, it will send the voltage alarm code:

- Lower than BatteryVoltageMinThreshold → sends the Alarmcode = 0x10
- Lower than BatteryVoltageThreshold1 → sends the Alarmcode = 0x11
- Lower than BatteryVoltageThreshold2 → sends the Alarmcode = 0x12
- Lower than BatteryVoltageThreshold3 → sends the Alarmcode = 0x13

Users are able to use these data to check the battery status:

- Power configuration cluster (ID:0x0001)
- Battery voltage attribute (ID:0x0020)

5-9. Restore to Factory Setting

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

Step1. Power off Z501A.



Step2. Press and hold both  and , and then power on Z501A.

Step3. After the indicator flashes **20 times**, reboot Z501A to complete the restore.

5-10. Rejoin to Network

When the router device is not working in the network, Z501A will immediately look for a new router to join back to network. If Z501A fails to rejoin back to original network, it will enter sleeping mode for 15 minutes. To manually add Z501A back to original network; activate Z501A and it will search the network to join Again.

5-11. Report Configuration for Developer Only

10 seconds after powering on, Z501A will detect battery voltage, if the device report has been previously configured, it will issue 1 or 2 reports within 1-60 seconds randomly on the device, and thereafter it will report according to the configuration.

If the device was already bound related report clusterID to report according to configuration, it would issue a corresponding report (Max! = 0xFFFF) immediately after completed configuration.

Battery voltage report Default: min = 3600s, max = 3600s, reportchange = 0.1,

Battery status report Default: min = 3600s, max = 0xFFFF (off), reportchange = 0.

Report setting table:

Min Interval (Unit:second)	Max Interval (Unit:second)	Reportable Change	Change rate \geq Reportable Change	Change rate $<$ Reportable Change
1-65534	1-65534	$\neq 0$	To report per Minimum interval	To report per Maximum interval
		0	To report per Minimum interval	To report per Minimum interval
0	1-65534	$\neq 0$	To report instantly	To report per Maximum interval
		0	To report per second	To report per second
1-65534	0	$\neq 0$	To report per Minimum interval	No report
		0	To report per Minimum interval	To report per Minimum interval
0	0	$\neq 0$	To report instantly	No report
		0	To report per second	To report per second
Any	65535	Any	Stop reporting	
65535	Any	Any	Stop reporting	

Note: (1) It is not suggested to set:

Min Interval =0,

Reportable Change=0.

Otherwise, Z501A will report very densely (every second) to block up the network.

(2) Different attributes have different units, please refer to the product specific instructions for units of reportable change.

6. Home Automation Clusters for Z501A

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 Z501A.

- 1、End Point(s) : 0x01 , 0x02
- 2、DEVICE ID : ZLL Non-color controller (0x0820) , ZLL Non-color controller (0x0820)
- 3、EndPoint Cluster ID :

Cluster ID for Z501A	
Server side	Client side
EP 0X01, EP 0X02(Device ID: Non-color controller (0x0820)	
Basic(0x0000)	On-Off(0x0006)
Power Configuration(0x0001)	Identify(0x0003)
Identify(0x0003)	Groups(0x0004)
	Scenes (0x0005)
	Level Control(0x0008)
ZLL Commissioning (0x10000)	ZLL Commissioning (0x10000)
Commissioning (0x0015)	IAS ACE (0x0501)
Poll Control (0x0020)	
Diagnostics (0x0B05)	

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	0x28	O
0x0002	<i>StackVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x33	O
0x0003	<i>HWVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x14	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	Z501AE3ED	O

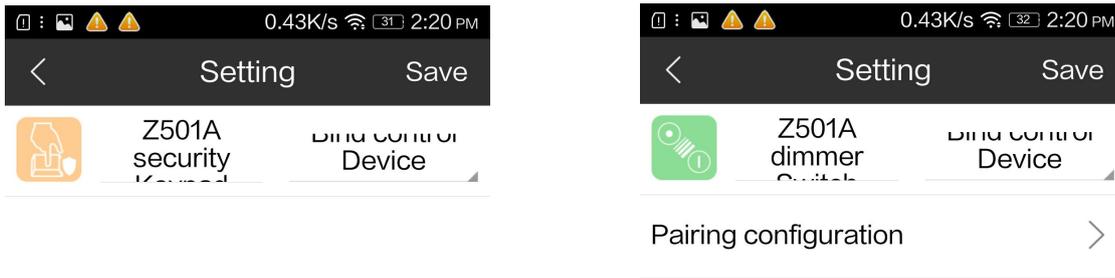
0x0006	<i>DateCode</i>	Character string	0 – 16 bytes	Read only	20140523	O
0x0007	<i>PowerSource</i>	8-bit Enumeration	0x00 – 0xff	Read only	0x03	M
0x0010	<i>LocationDescription</i>	Character string	0 – 16 bytes	Read/write	-	O
0x0011	<i>PhysicalEnvironment</i>	8-bit Enumeration	0x00 – 0xff	Read/write	0x00	O
0x0012	<i>DeviceEnabled</i>	Boolean	0x00–0x01	Read/write	0x01	M
0Xe001	<i>NetvoxInternalApplicationVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x28	O
0Xe002	NetvoxInternalDateCode	Character string	0- 16 bytes	Read only	20140523	O
0x4000	SW build id	Character string	0- 16 bytes	Read only	-	M

7. Netvox App Control Interface

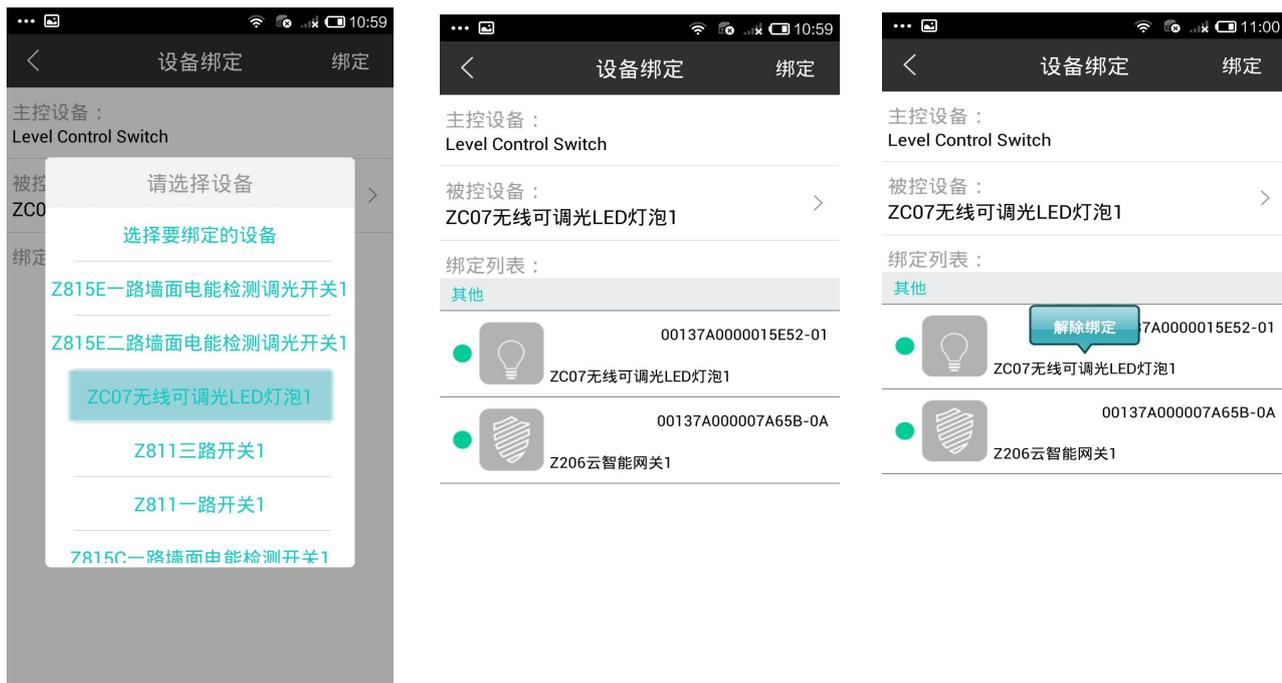
1. After joining in Netvox App system, device IEEE address will show up in device management interface. For example, Z501A (Level Control Switch) as shown below:



2. Select “Level Control Switch” to enter setting interface. In the setting interface, respectively, users can select the device to be bound with as shown below:

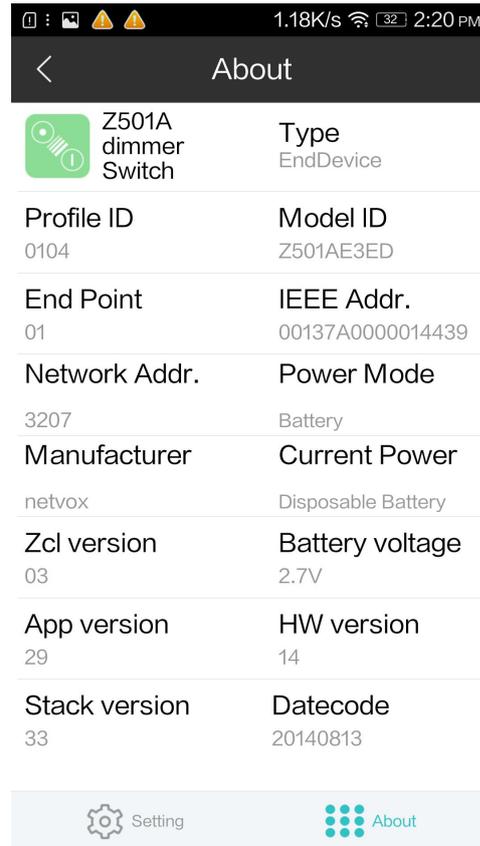
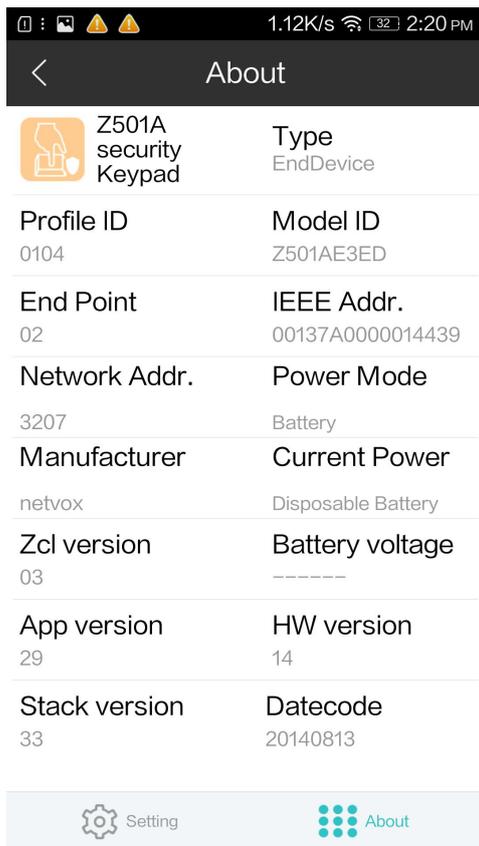


3. Enter device bind interface: Select the "controlled device" to binding devices. Select the device to be bound, such as wireless ZC07 dimmable LED bulb 1, and then click on the upper right corner to bind (before binding operation, make sure the device is in the activated state, if the device is in sleep mode, users need to activate the device). To unbind, touch and hold the bound device column till “unbind” shows up, click “unbind” (as shown below):



4. Click “Level Control Switch” into the basic information interface, by clicking on the bottom of the "Basic

Information "Settings" "About Device" interface to switch interfaces to check detail information of the device. As shown below.



8. Related Devices

Devices which are related to Z501A:



Z501C: ZigBee Remote



ZB02C: ZigBee Switch



Z806: ZigBee Output Unit



Z811: Wireless Switch Control

9. 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.