

User Manual

EmberLux Switch

Model: BLZ-US-01

Firmware: V0.6 and below

Hardware: V1.0 and below

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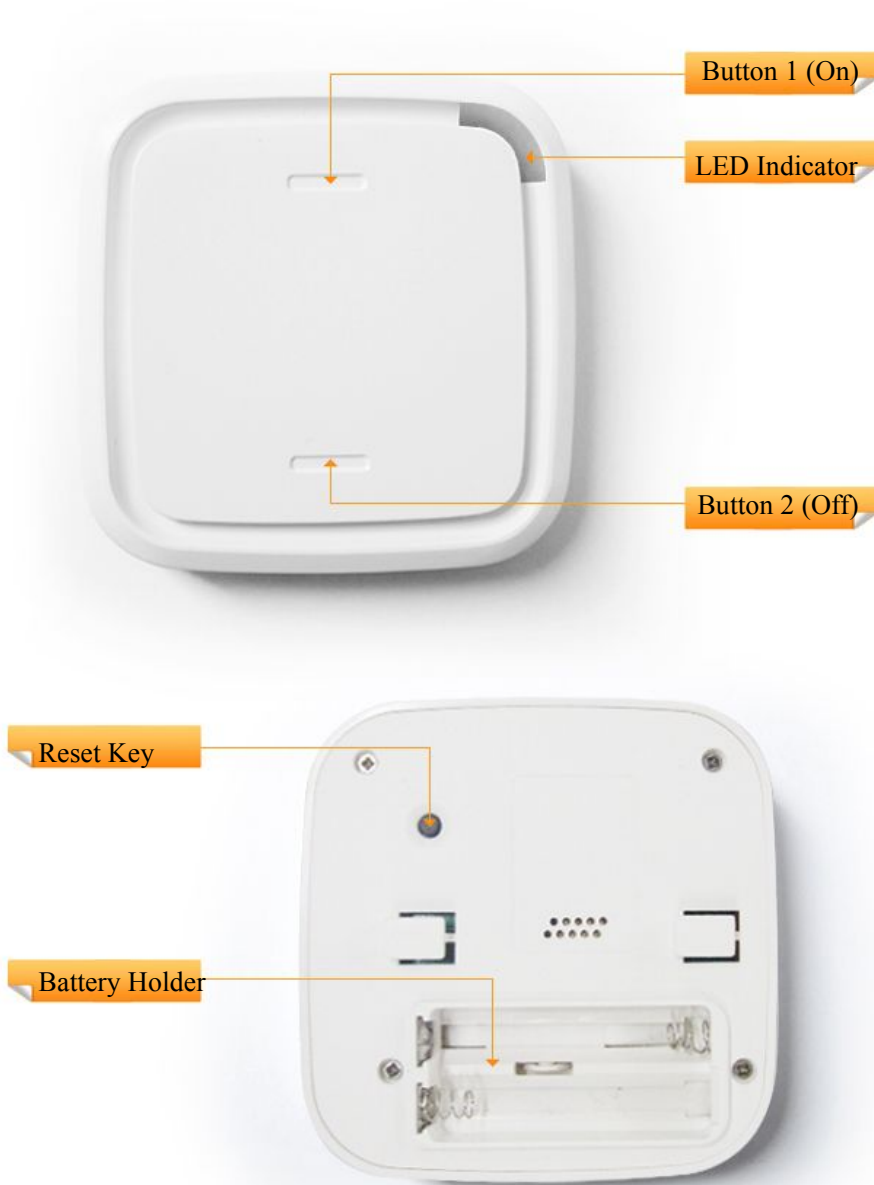
1. Introduction

Netvox BLZ-US-01 , a battery-powered wall switch, 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. BLZ-US-01 is featured to control the On/Off device or the dimmable device.

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: 2 x AAA batteries
- Up to 70 meters wireless transmission range in non-obstacle space
- Easy installation and configuration
- Operation temperature: -10 °C ~ 50 °C

4. Installation

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

5. Setting up BLZ-US-01

5-1. Join the ZigBee Network

After BLZ-US-01 is powered on or turned on, it will search for an existing ZigBee network and send a request to join the network automatically. While BLZ-US-01 is under the coverage from a coordinator or a router whose **permit-join feature is enabled**, BLZ-US-01 will be permitted to join the network.

- (1) 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).
- (2) Power on or turn on BLZ-US-01. It will start to search and join the network.
- (3) BLZ-US-01 will search the network every 3 seconds and attempts the searching for 60 times. Each searching will go with a **magenta** flash.
- (4) After 60 attempts, BLZ-US-01 will go into the sleeping mode. Please try step 1~2 to start the searching again.
- (5) The indicator will flash **cyan** for 5 minutes after it is joined successfully.
- (6) If the **magenta** flash stops and network indicator had no responds, it shows join fails. Please repeat (1)-(3).

5-2. Control

BLZ-US-01 can bind with on/off device and dimming device. Bind device can accept on/off or dimming

command from Z970A. For example, after BLZ-US-01 binds with Z809B successfully, press control button of BLZ-US-01 the bind device Z809B will receive command and act correspondingly (including normal bind and group bind).

A. On/Off control (0x0006)

- (1) Short press Button 1 (network indicator flash once for 0.5s)→ send the turn-on command.
- (2) Short press Button 2 (network indicator flash once for 0.5s)→ send the turn-off command.

B. Level/Dimming Control (0x0008)

- (1) Press and hold Button 1 over 1 second (network indicator flashes once for 0.5s)
→ send Step With On command→dimming up.
- (2) Press and hold Button 2 over 2 second (network indicator flashes once for 0.5s)
→ send the Step With Off command→dimming down.
- (3) Release Button → send the stop command (network indicator flashes once for 0.5s)
→dimming stops.

5-3. Sleeping Mode

BLZ-US-01 is designed to go into sleeping mode for power-saving in some situations:

- (1) While the device is in the network → the sleeping period is 5 minutes; it will wake up every 5 minutes to keep online.
- (2) When it doesn't find a network to join →BLZ-US-01 will go to sleeping mode. It will wake up every 15 minutes to search a network to join.
- (3) Once BLZ-US-01 was joined to a network and by any chance the network is no longer existed or the device is out of the network → BLZ-US-01 will wake up every 15 minutes to find the network it joined before and flash **magenta** once (on 500ms, off 500ms).

Status (3) would consume up to 30 times power spending compared to (1) & (2). To prevent this unwanted power consumption, we recommend that users remove the batteries to power off the device.

5-4. Turn On BLZ-US-01

For power saving, BLZ-US-01 is designed to get into sleeping mode when there is no activity for 2 minutes.

To manually turn on BLZ-US-01, press the Reset Key **once**.

- When BLZ-US-01 is first time used or after resetting → it will try to join the network.
- When BLZ-US-01 is in a ZigBee network → it will send out the device data, like IEEE address/Network address, and will be activated for 2 minutes.
- When BLZ-US-01 was in a ZigBee network, but by any change it is offline → it will start to rejoin the ZigBee network.

5-5. Battery

When the operating voltage is lower than 2.4V, BLZ-US-01 will send a low-power report to the ZigBee network.

5-6. Restore to Factory Setting

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

Step1. Remove the batteries to power off BLZ-US-01.

Step2. Press and hold the *Reset Key*, then power on BLZ-US-01 to complete the restore.

6. Home Automation Clusters for BLZ-US-01

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 BLZ-US-01.

1. End Point(s) : BLZ-US-01 : 0x01
2. Device ID : Dimmer Switch (0x0104)
3. End Point Cluster ID

Server side	Client side
Basic (0x0000)	
Power Configuration(0x0001)	
Identify (0x0003)	
On/off switch configuration(0x0007)	On/off (0x0006)
Commissioning (0x0015)	Level control (0x0008)
Poll Control(0x0020)	
Diagnostics(0x0B05)	

Attributes of the Basic Cluster Information

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>ZCLVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	03	M

0x0001	<i>ApplicationVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	03	O
0x0002	<i>StackVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	53	O
0x0003	<i>HWVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	01	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	Z970BE3ED	O
0x0006	<i>DateCode</i>	Character string	0 – 16 bytes	Read only	-	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	O

Attributes of the Power Configuration Information

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0020	<i>Battery voltage</i>	Unsigned 8-bit integer	0x00 – 0xff	Read / write		O
0x0031	<i>BatterySize</i>	8-bit Enumeration	0x00 – 0xff	Read / write	4	O
0x0033	<i>BatteryQuantity</i>	Unsigned	0x00 –	Read /	2	O

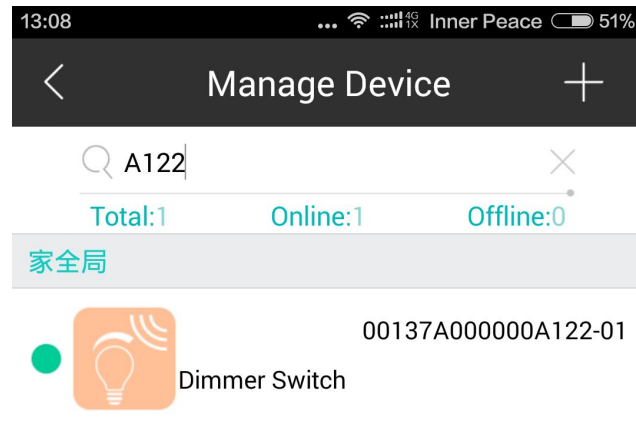
		8-bit integer	0xff	write		
0x0035	<i>BatteryAlarmMask</i>	Bitmap (8-bits)	0000 000x	Read / write	0000 0001	O
0x0036	<i>BatteryVoltageMinThreshhold</i>	Unsigned 8-bit integer	0x00 – 0xff	Read / write	24	O
0x0037	<i>BatteryVoltageThreshhold1</i>	Unsigned 8-bit integer	0x00 – 0xff	Read / write	25	O
0x0038	<i>BatteryVoltageThreshhold2</i>	Unsigned 8-bit integer	0x00 – 0xff	Read / write	26	O
0x0039	<i>BatteryVoltageThreshhold3</i>	Unsigned 8-bit integer	0x00 – 0xff	Read / write	27	O
0x003e	<i>BatteryAlarmState</i>	32-bit Bitmap	0x00... x	Read	0x000... 0	O

On/Off configuration cluster

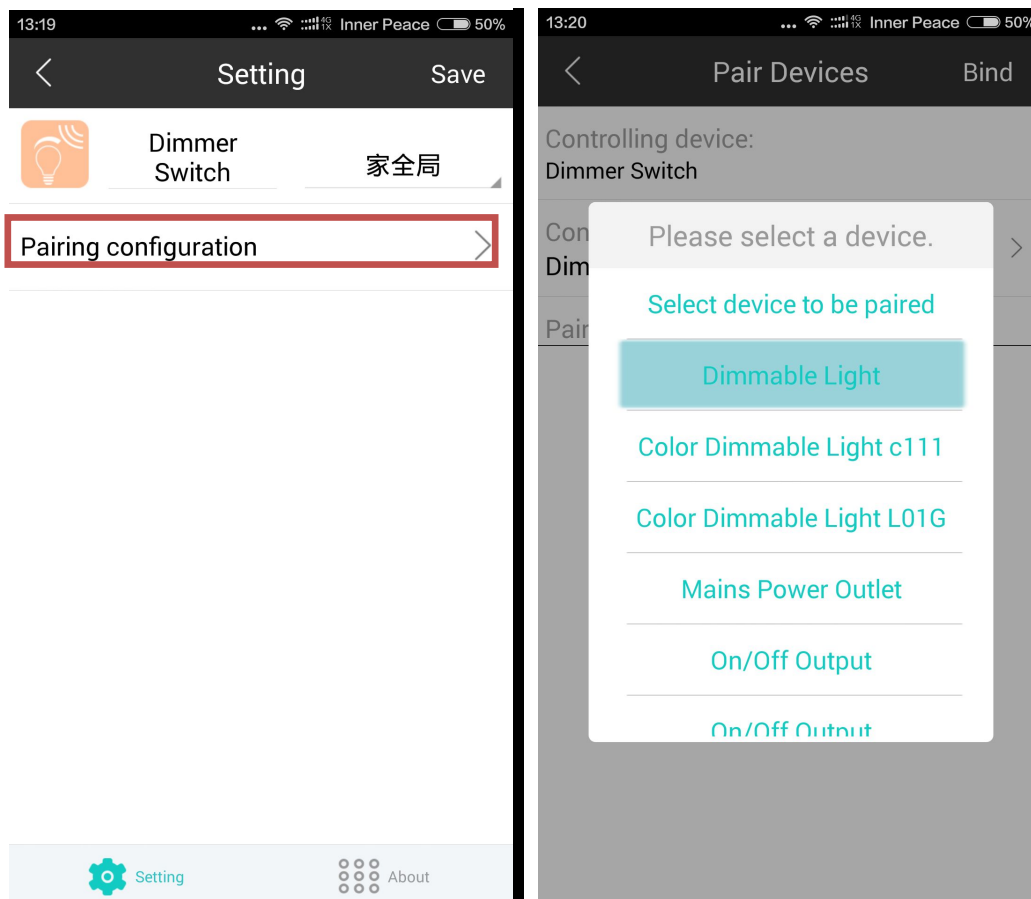
Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	SwitchType	8-bit Enumeration	0x00 – 0x01	Read only	0x00	M
0x0010	SwitchActions	8-bit Enumeration	0x00 – 0x02	Read	0x02	M

7. Netvox App control

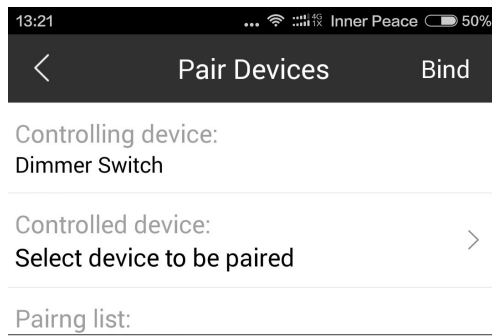
1. Add device to Netvox system, the added device list will show up in device management as below,



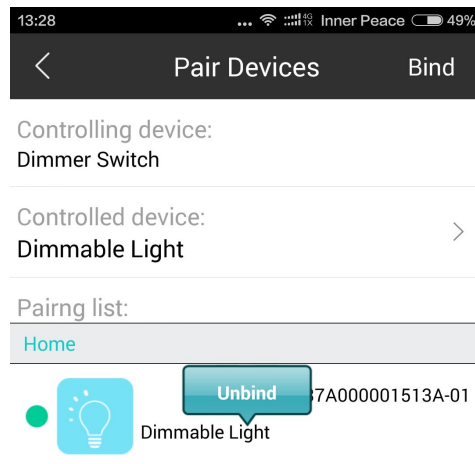
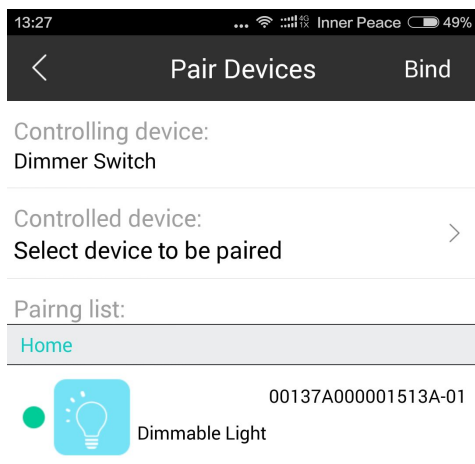
2. Click “Setting” into device interface as below:



Click “Pairing configuration” into binding interface. Click “Pair Devices ” (ex. LED dimmable light). Click “bind” on the right-top.(Note: before binding, users need to turn on ED for fear that ED is in sleeping mode which may cause binding fails.) When the binding is completed, App interface will show as below:



After binding, BLZ-US-01 is able to control dimming switch to turn on/off and adjust brightness. If users want to unbind device, long press bind device item, message “unbind” will show up as below on the left as below. (Note: before clicking “unbind”, users need to turn on ED.) After unbinding completely, item will disappear.



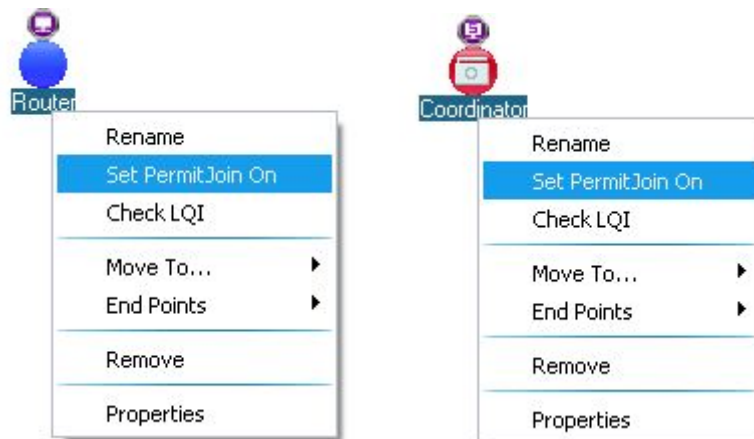
8. ZiG-BUTLER

8-1. Join BLZ-US-01 into the network

When ZiG-BUTLER sees a coordinator or a router device, it will show the icon.



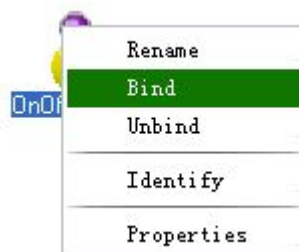
Right click on the icon of the coordinator or the router and choose **Set Permit Join On**.



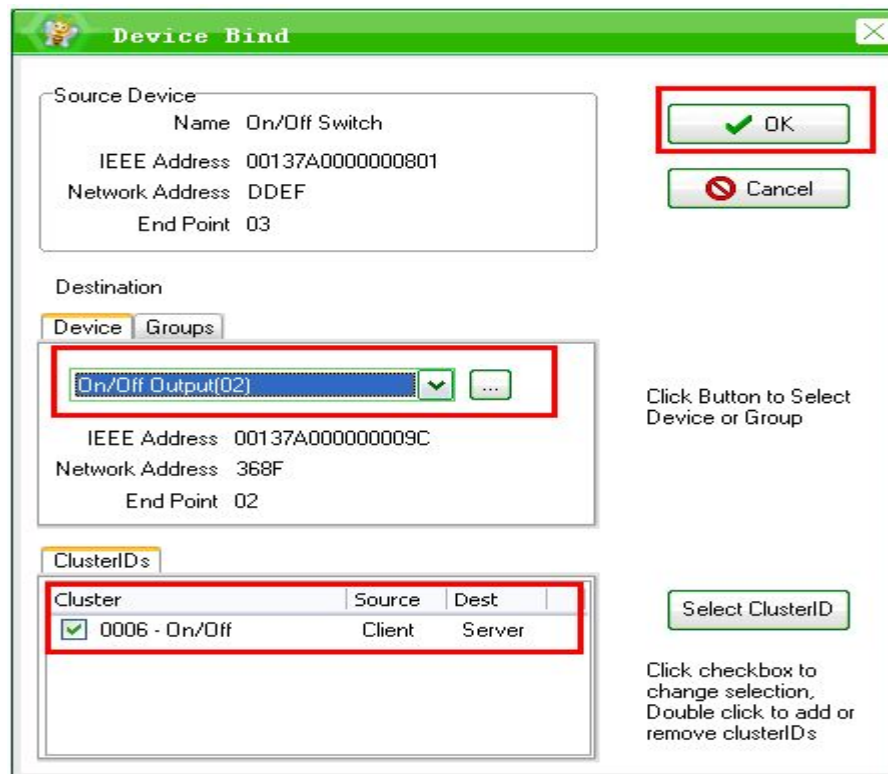
After BLZ-US-01 has successfully joined, the BLZ-US-01 icon will be appeared in ZiG-BUTLER.

8-2. Bind BLZ-US-01

(1) Right click on the End Point of BLZ-US-01 and select **Bind**.

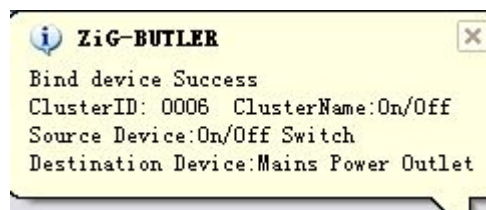


- (2) On the Device tab, select the device to which you would like to bind. Next, click **Select ClusterID**, choose the Cluster, and click **OK**.

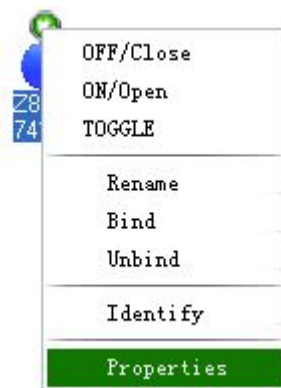


The information would be pop-up after the binding is completed.

Note: to bind the device via Zig-butler, please make sure BLZ-US-01 is on. We suggest to turn on BLZ-US-01 before binding.



- (3) Right click on the End Point of BLZ-US-01 and select **Properties** to view the binding information.

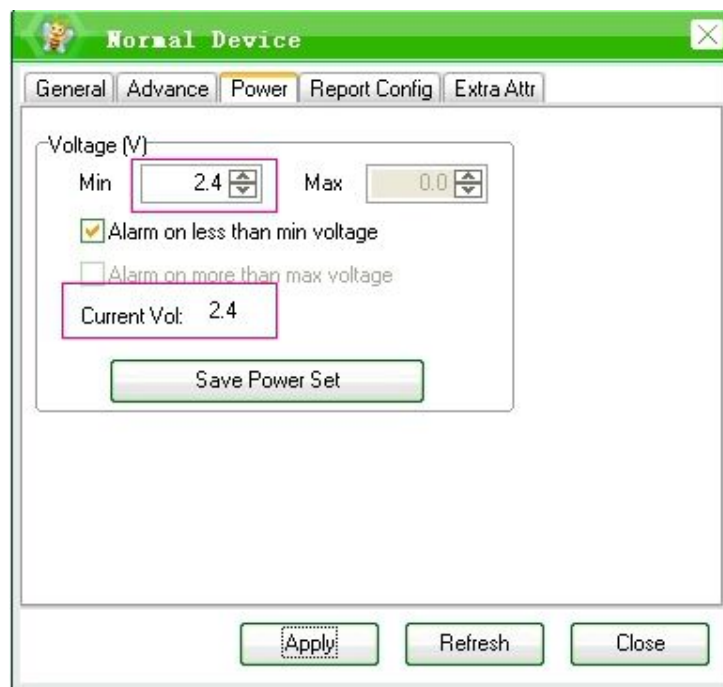


8-3. Power Consumption Report

(1) Right click on the End Point of BLZ-US-01 and select **Properties** to overview the power consumption.

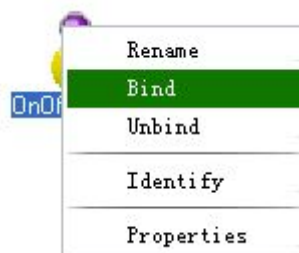


(2) In binding list, we can see bind request information of other devices. If bind device and BLZ-US-01 share the same cluster ID: 0001 of binding request. Then BLZ-US-01 will report data to the bind device. Below figures shows alarming range of voltage. The default minimum alarming voltage is 2.4V.



(3) BLZ-US-01 is able to send data to relate bind device via “Config Report” process.

Right click on the End Point of BLZ-US-01 and select **Bind**.



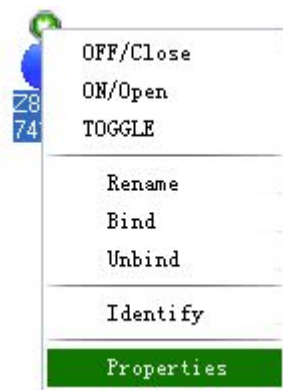
- (4) On the Device tab, select the device to which you would like to bind. Next, click **Select ClusterID**, choose the Cluster, and click **OK**.

Choose bind device sharing the same cluster ID: 0001 of binding request through “device”.

Select ClusterID

to choose cluster ID which is needed.

- (5) Right click on the End Point of BLZ-US-01 and select **Properties**.



- (6) On the **Report Config** tab, check Auto to modify the settings. Click **Set** to complete the setting. If there is no customized setting, the default 0X0020 shows as below:
- (a) 0X0020 default Min. 3600 seconds. Max. 3600 seconds. Reportable change = 0.
 - (b) 0X0035 default battery alarm mask = 1.
 - (c) 0X0036 default battery voltage min threshold=2.4V

The screenshot shows a software window titled 'Normal Device' with a green header bar. Below the header is a tabbed interface with five tabs: 'General', 'Advance', 'Power', 'Report Config' (which is selected and highlighted in orange), and 'Extra Attr'. The 'Report Config' tab contains a section labeled 'Voltage'. Inside this section, there are three input fields: 'Min' with the value '3600', 'Max' with the value '3600', and a unit selector set to 'sec'. To the right of these fields is a checked checkbox labeled 'Auto'. Below the 'Max' field is a 'Reportable change' field with the value '0.1'. A green 'Set' button is located to the right of the 'Reportable change' field. At the bottom of the window, there are three buttons: 'Apply', 'Refresh', and 'Close'.

(7) Click set to customize:

- Min: the minimum reporting internal (second)
- Max: the maximum reporting internal (second)
- Reportable change: BLZ-US-01 reports data instantly when the change rate is more than this value.

Report setting interval 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,

Z809A will report very densely to block up the network.

(2)Yellow areas are not suggested.

(3) Reportable change unit: V.

(4) Once binding completes, BLZ-US-01 will send data report to bind device. Default min. and max. is 3600 seconds. While BLZ-US-01 detects low voltage, it will send warning.

(5) Low voltage waning mode 0X003E and voltage ID 0X0020 share the same cluster 0x0001.

Once binding with cluster 0x0001, there is no need to bind 0X003E and 0X0020 again.

9. Related Netvox Devices

- Z806: Output Unit



- ZC06: Dimmable LED Tube



10. 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.

FCC Statement:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.