



ZigBee™ - IAS Warning Device

User Manual

ZigBee IAS Warning Device

Model: Z602B

20131127
FW V2.1 (20131127)
HW V0.3

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1. Introduction

Netvox Z602B, a Warning Device, acts as a Router Device in ZigBee network. It is a siren used in emergency case and based on ZigBee HA standard. It can join the ZigBee network and register itself into the security center (IAS CIE device). Once it receives the alarm message, it will generate both the alert sound and the visible LED indicator. There are four different sounds: fire alert, emergency alert, burglar alert, and doorbell sounds. Z602B is also equipped with GSM module. When the alert occurs, it sends the SMS and calls users for the notification. It is mainly powered using DC 12V and has backup power supply from 3 x AAA Ni-MH rechargeable batteries.

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: DC 12V
- Backup power supply: 3 x AAA Ni-MH rechargeable batteries
- Operating consumption: $\leq 200\text{mA}$
- Standby consumption: $\leq 43\text{mA}$
- 4 different sounds: fire alert, emergency alert, burglar alert, and doorbell sounds
- SMS/calling for the notification
- Up to 120 meters wireless transmission range in non-obstacle space
- Easy installation and configuration

4. Installation Diagram

- This device is NOT truly waterproof/ resistant and is for indoor use.
- Z602B is equipped with GSM module. Please install it at the location that has good GSM signal.

5. Setting up Z602B

5.1. Join the ZigBee Network

After Z602B is powered on, it will search for an existing ZigBee network and send a request to join the network automatically. While Z602B is under the coverage from a coordinator or a router whose **permit-join feature is enabled**, Z602B will be permitted to join the network. Typically, the default permit-join period of time is 60 seconds. Please refer to the following steps to complete the join:

- 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. Power on Z602B. It will start to search and join the network.

After Z602B is joined successfully, the Network Indicator will flash **once** and then stay ON. Moreover, it will generate a long sound. When it is failed to join the network, the indicator will stay OFF.

5.2. Permit-Join

Z602B is designed to work as a router. To allow other devices to join the ZigBee network, users could enable the Permit-Join feature using the tips:

- A. Press the *Binding Key* to enable the Permit-Join feature. The Network Indicator will flash per second.
- B. The default Permit-Join period of time is 60 seconds.

5.3. Binding

Z602B can be bound with Z312 to work as a doorbell.

- Step1. Press and hold the *Binding Key* for 3 seconds.
- Step2. Release the *Binding Key* when the network indicator flashes **once**.
- Step3. Enable the binding feature of Z312.
- Step4. The indicator flashes **5 times** after the binding is completed; otherwise, it will flash **10 times**.

5.4. Enroll in the ZigBee Security System

Z602B is a Warning Device in the ZigBee security system. Right after Z602B join the ZigBee network, it will automatically find out a CIE (Control and Indicating Equipment) device (i.e. Netvox Z201B) and send a registration request to the CIE device to enroll in the security system. The enrollment has these 3 situations:

- A. There is no CIE device or no compatible CIE device in the network → the Status Indicator flashes **twice**.
- B. There is a compatible CIE device in the network, but it is failed to enroll → the Status Indicator flashes **4 times**.
- C. The enrollment is completed → the Status Indicator flashes **6 times**.

5.5. Alarm

Z602B is a siren used in emergency case. Once it receives the alarm message, it will generate both the alert sound and the visible LED indicator. There are four different sounds:

- A. Fire Alert
 - B. Emergency Alert
 - C. Burglar Alert
 - D. Doorbell Sound
- When Z602B receives the stop-warning command or disarm command, it will stop the alert/sound.
 - Except the 4 conditions above, Z602B will only generate visible indicator notification. For example, Z602B's indicators will flash without sounds for notifications when other devices in the system are malfunctioned or broken.
 - Under the circumstances that the security system is armed, Z602B will generate Burglar Alert when the door contacts sensor (such as Z602B or Z311A) is triggered. Under the circumstances that the security system is disarmed, Z602B will generate Doorbell Sound when the door contacts sensor is triggered.
 - The default maximum period of time for generating alert/sound is 4-minute.
 - While arming the security system:
Z602B will generate one long sound, and the indicators will flash **once**.
 - While disarming the security system:
Z602B will generate two short sounds, and the indicators will flash **twice**.

5.6. GSM

After users install the SIM card and power on Z602B, it will start to initial the GSM feature. When the initialization is completed, it will generate 3 short sounds, and the GSM feature is ready to use.

- Controlling via cell phone:
 - A. Through phone calls:
Users are able to dial to the GSM module of Z602B. When Z602B receives the phone call, it will generate a “DU” sound, and the Status Indicator will flash **once**. After 5 ring tones, Z602B will answer the phone call automatically. Users could do conversations over Z602B.
 - B. Through SMS:
Users are able to arm/disarm the security system via text message.
To arm → text **arm*password#**
To disarm → text **disarm*password#**
The default password is 1234.
 - Users arm/disarm the system through SMS successfully → Z602B will send a successfully-setup text message back to the users.
 - Users send the wrong text format → Z602B will not reply the users, and the Status Indicator would flash **3 times**.
 - The text format is correct, but the password is wrong → Z602B will send a failed-to-setup message to the users, and the Status Indicator would flash **3 times**.

- The text format and the password both are correct, but it is unsuccessful to arm/disarm the system → Z602B will send a failed-to-setup message to the users, and the Status Indicator would flash **3 times**.
- Users send the text message with wrong password for **3 times** → Z602B will send a wrong-password message to the users, and the SMS feature will be disabled until users reboot Z602B.

When the storage for SMS is full, Z602B will delete all the saved messages automatically. The Status Indicator will flash **twice** when all the messages are deleted.

For more detailed settings of GSM feature, please refer to the [7. ZIG-BUTLER](#) section.

5.7. HeartBeat Technique

In a security system, it is important for devices to report the conditions to the central security unit (the CIE device). To meet this need, Netvox came up with a technique called “**HeartBeat**”.

Right after Z602B enrolls to a security system, it sends a HeartBeat signal to the CIE device. Afterward, it will send HeartBeat data every hour by default settings.

5.8. Battery

- After Z602B joins a network, it checks the battery status every 10-minute.
- Under the circumstance that the DC 12V is plugged, it will be recharged for 16 hours when battery voltage is between 1.8V and 3.6V. While recharging, the Alarm/Status Indicator will stay ON. After fully charged, the Alarm/Status Indicator will be OFF.
- Under the circumstance that the DC 12V is unplugged, the Alarm/Status Indicator will flash **20 times** when the operating voltage is between 2.8V and 3.6V. Z602B will also send a low-power report to the CIE device.
- **Users can only use AAA Ni-MH rechargeable batteries for Z602B.**

5.9. Restore to Factory Setting

While Z602B is unable to communicate with its enrolled CIE device or users would like Z602B to join a new network, a factory reset is required. To restore it to factory setting, please follow the steps:

Step1. Power off Z602B.

Step2. Press and hold the *Setting Key*, and then power on Z602B.

Step3. After Z602B generate 2 doorbell sounds and the indicator shows fast flashes, release the button to complete the restore.

After the factory restore, reboot Z602B to initiate it.

5.10. Summary of Notification

Powered on	Network Indicator flashes once with 1 sound
Join the network successfully	Network Indicator stays ON with 1 long sound
Failed to join the network	Network Indicator stays OFF
Permit-join feature is enabled	Network Indicator flashes for 60 seconds
Enroll in the security system successfully	Status Indicator flashes 6 times
Failed to enroll (there is a CIE device in the network)	Status Indicator flashes 4 times
Failed to enroll (there is no CIE device in the network)	Status Indicator flashes twice
Binding feature is enabled	Status Indicator flashes once
The binding is successful	Status Indicator flashes 5 times
The binding is failed	Status Indicator flashes 10 times
Restoring	Status Indicator flashes 3 times with 2 doorbell sounds
Restore is completed	Status Indicator generates fast flashes
Identify	Status Indicator flashes 5 times
Disarm	Alarm Indicators flash twice with 2 short sounds
Arm	Alarm Indicators flash once with 1 long sound
Announce	Network Indicator flashes 5 times
Battery is low-power without DC 12V	Status Indicator flashes 20 times
Battery is low-power with DC 12V (recharging)	Alarm/Status Indicator stays ON
Battery is fully charged	Alarm/Status Indicator is OFF
Fire/Burglar/Emergency alarm	Alarm Indicators flashes with Fire/Burglar/Emergency alert
Doorbell	Alarm Indicators flashes with doorbell sound
All saved text messages are deleted	Status Indicator flashes twice
GSM module receives a call	Status Indicator flashes once
Text format is correct, but it is failed to arm/disarm	Status slowly flashes 3 times
Wrong text format	Status rapidly flashes 3 times

6. Home Automation Clusters for Z602B

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 Z602B.

1. End Point(s) : 0x01:
2. Device ID : IAS Warning Device (0x0403)
3. EndPoint Cluster ID

Server side	Client side
EP : 0x01 (Device ID : IAS Warning Device (0x0403))	
Basic(0x0000)	IAS ACE(0x0501)
Identify(0x0003)	
IAS WD(0x0502)	None

IAS ZONE(0x0500)	None
Commissioning(0x0015)	
Optional	

This lists the attributes of the basic information.

Attributes of the Basic Information

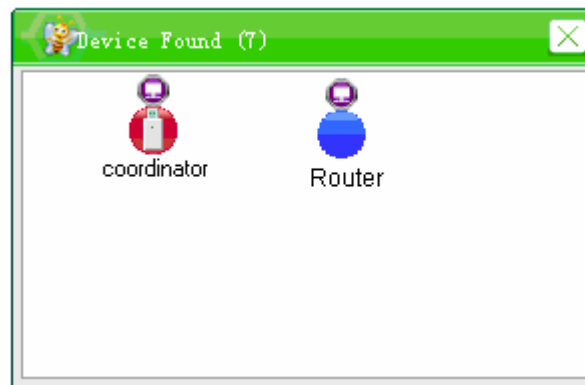
Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>ZCLVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x03	M
0x0001	<i>ApplicationVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x14	O
0x0002	<i>StackVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x2F	O
0x0003	<i>HWVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x03	O
0x0004	<i>ManufacturerName</i>	Character string	0 – 17 bytes	Read only	netvox	O
0x0005	<i>ModelIdentifier</i>	Character string	0 – 17bytes	Read only	Z602B E3R	O
0x0006	<i>DateCode</i>	Character string	0 – 17 bytes	Read only	2013.11 .27	O
0x0007	<i>PowerSource</i>	8-bit Enumeration	0x00 – 0xff	Read only	0x84	M
0x0010	<i>LocationDescription</i>	Character string	0 – 17 bytes	Read/write		O
0x0011	<i>PhysicalEnvironment</i>	8-bit Enumeration	0x00 – 0xff	Read/write	0x00	O
0x0012	<i>DeviceEnabled</i>	Boolean	0x00 – 0 0x01	Read/write	0x01	M

7. ZiG-BUTLER

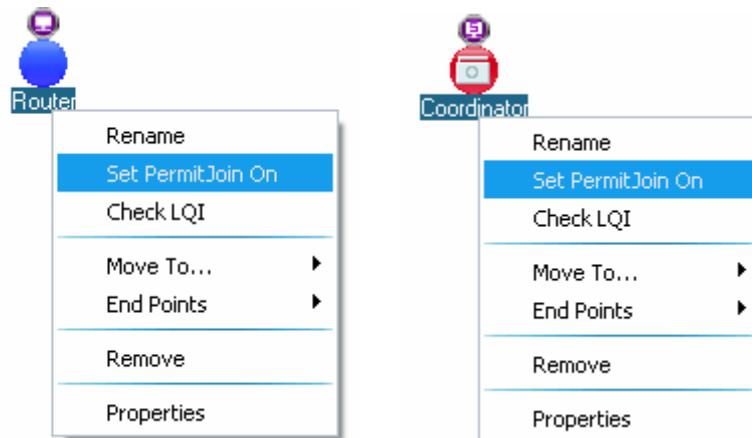
ZiG-BUTLER is an exclusive program which allows users to easily control the devices, such as enable permit-join feature, wirelessly through computer or laptop. Of course, any other 3rd party ZigBee enabled software is also applicable. The system needs a Z103 USB dongle or a Z202 ZigBee gateway to communicate with the ZigBee network.

7.1. Join Z602B 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**.



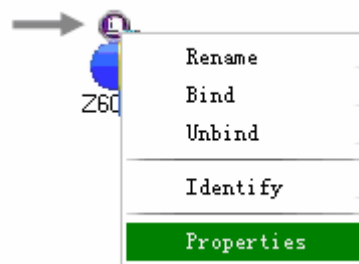
After Z602B has successfully joined, the Z602B icon will be appeared in ZiG-BUTLER.



7.2. Basic Configurations

Users can configure the settings by the following steps:

Right click on the circle above Z602B icon and select **Properties**.



- Maximum period of time for generating alert/sound

Max Duration

240 Seconds

Set Max duration

- Assign Z602B to a Preferred CIE Device

IAS CIE ADDRESS:

Z103B

IEEE Address 00137A0000004B1A

Set IAS_CIE_ADDRESS

- Set up HeartBeat interval

HeartBeat Period

1 Hour

0 Minute

0 Second

Set HeartBeat

- Alert/sound test

Stop Warning

Fire Warning Test

Burglar Warning Test

Emergency Warning Test

Trouble Test

Doorbell Test

Squawk

7.3. GSM Settings

Through ZiG-BUTLER, users are able to set up the GSM features.

Warning Device Info

General Advance **Tel and SMS** Extra Attr

Tel while Alarm

Tel No1 1

Tel No2

Tel No3

Get 4

Set

Send SMS while Alarm

Tel No1 2

Tel No2

Tel No3

Change PWD 5

GSM Rssi 6 10

Alarm SMS Info

Burglar

Fire 3

Emergency

Call Phone 7

Send SMS

Apply Refresh Close

- 1 → the phone numbers Z602B will call out when the alarms occur. The phone number doesn't need to include the country code. Maximum length: 16 digits.
- 2 → the phone numbers Z602B will text out when the alarms occur. The phone number needs to include the country code (ex. Taiwan: +886). Maximum length: 16 digits.
- 3 → the text messages Z602B will send out when the alarms occur. Maximum length: 50 characters.
- 4. Get → acquire the previous setting and the GSM signal strength.
- 4. Set → save the current setting.
- 5 → change the password of text message for arming/disarming.
- 6 → GSM signal strength (0~31). 10 or above Rssi is recommended for using GSM features.
- 7 → call/SMS test.

While the alarm is triggered, Z602B will send the text messages to all the phone numbers in “Send SMS while Alarm”. After sending SMS, Z602B will dial out the phone numbers in “Tel while Alarm” sequentially. Z602B calls the 1st phone number first; calls the 2nd phone number when the 1st one doesn't answer; and then calls the 3rd phone number when the 2nd one doesn't answer.

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.

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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.