

**Wireless Wearable Presence Tag  
with Emergency Button**

**Z308**

**User Manual**

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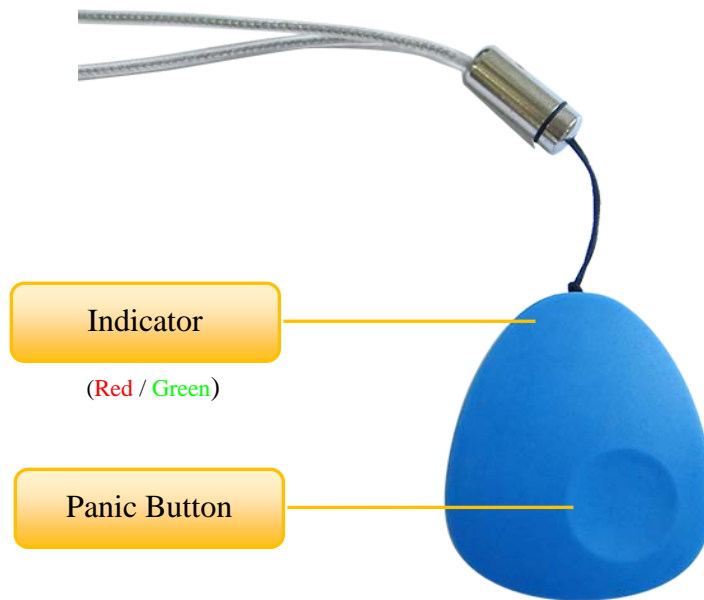
# 1.Introduction

Z308, a wearable presence tag, acts as an IAS device for minor children/aged-care use. It is an ideal product to detect one's presence within/ out of the network coverage for safety purpose. Z308 periodically sends presence/absence report to keep a close watch on those who wear it. Z308 also works as an emergency button. When users ask for urgent assistance, simply push the button, and Z308 will send the alarm message to the command center. The Warning Device will send out alarm sound or lighting alert for immediate help.

## **ZigBee Wireless Technology**

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.Appearance



## 3. Features

- Fully IEEE 802.15.4 compliant
- Utilizes 2.4GHz ISM band; up to 16 channels
- IP Rating: IP52
- Power supply: 1 x CR2450 3.0V battery
- Communication transmission is up to 210 meters linear distance in open field
- Easy installation and configuration

## 4.Installation



## 5.Setting up Z308

### 5-1. Power On

Without external power supply, the product uses internal 3V button battery for power supply.

Step1. Open the battery back cover

Step2. Take a CR2450 button battery, put the negative pole upward into the battery base

Step3. Cover the back cover and lock the screws

Step4. Long press the alarm key for 3 seconds, and the LED lights flash once respectively, indicating that the power on is successful

### 5-2. Turn On/ Turn Off Z308

To manually turn on or turn off Z308, please use the following instructions:

**Turn it on:** Press and hold the Panic Button for 3 seconds. The indicators will flash once, and the device is ready to be used.

**Turn it off:** Press and hold the Panic Button for 6 seconds. The indicator will flash red 10 times within 5 seconds. Within the 5-second period of time, press the Panic Button again to turn it off.

### 5-3. Join the ZigBee Network

After Z308 is turned on, it will search for an existing ZigBee network and send a request to join the network automatically. While Z308 is under the coverage from a coordinator or a router whose permit-join feature is enabled, Z308 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 Z308. It will start to search and join the network.

Step3. Press and hold button for three seconds to search a network to join.

Step4. The indicator will flash green 5 times after it is joined successfully. Otherwise, the indicator will not flash.

Step5. When Z308 can not join a network in 3 minutes, it will go into off mode. To ask for joining Network again, press and hold button for 3 seconds.

- After joining a network, Z308 would try to enroll in the ZigBee security system. Please make sure Z308 and CIE (Control and Indicating Equipment) device have enough power.

#### **5-4. Enroll in the ZigBee Security System**

Z308 is a Zone device in the ZigBee security system. Right after Z308 join the ZigBee network, it will automatically find out a CIE (Control and Indicating Equipment) device 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 indicator flashes red twice.
- B. There is a compatible CIE device in the network, but it is failed to enroll  
→ the indicator flashes red 4 times. Users can reboot Z308 to initiate the registration.
- C. The enrollment is completed  
→ the indicator flashes red 6 times.

Note:

Users had better NOT enroll multiple Zone devices at the same time to prevent registration failure.

#### **5-5. Sleeping Mode**

Z308 is designed to go into sleeping mode for power-saving in some situations:

- A. While the device is in the network → the sleeping period is 5 minutes; it will wake up every 5 minutes to keep online.
- B. Once Z308 was joined to a network and by any chance the network is no longer existed or the device is out of the network → Z308 will wake up every 5 minutes to find the network it joined before.

It never keeps in sleeping mode and continues to find out a network every 5 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 turn off the device.

## 5-6. Wake Up Z308

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

Step1. Press and hold the *Panic Button* for 3 seconds. Release the button when the indicator flashes red once.

Step2. The indicator flashes green 5 times when Z308 is online.

Step3. Z308 will broadcast the device data to the ZigBee network.

Z308 would be in active status for 2 minutes for communication.

## 5-7. Panic Button

- Z308's Zone Type: Key Fob (ID: 0x0115)
- The value of Alarm2 is 1 when sending alarm message.

Under the circumstances that Z308 has enrolled to the security system, it will send the alarm message to the command center (and the bound devices with ID: 0x0500) after pressing the *Panic Button*. The Warning Device will send out alarm sound or lighting alert for immediate help.

Under the circumstances that Z308 hasn't enrolled to the security system, it will try enroll in a security system after pressing the *Panic Button*. After the enrollment, Z308 will send the alarm message to the command center.

ZoneStatusChange commands: 0x00.

The command list:

Bits: 8	8	8	var	
Frame control	Transaction Sequence number	Command identifier	Frame payload	
			16-Bit Enumeration	8-Bit Enumeration
0x09		0x00	ZoneStatus	ExtendedStatus

(ClusterID: 0x 0500)



Values of the ZoneStatus payload

ZoneStatus Attribute Bit Number	Meaning	Values
0	Alarm1	1 – opened or alarmed 0 – closed or not alarmed
1	Alarm2	1 – opened or alarmed 0 – closed or not alarmed
2	Tamper	1 – Tampered 0 – Not tampered
3	Battery	1 – Low battery 0 – Battery OK
4	Supervision reports	1 – Reports 0 – Does not report
5	Restore reports	1 – Reports restore 0 – Does not report restore
6	Trouble	1 – Trouble/Failure 0 – OK
7	AC (mains)	1 – AC/Mains fault 0 – AC/Mains OK
8-15	Reserved	

Values of the ExtendedStatus payload

ExtendedStatus Attribute Bit Number	Meaning	Values
0-6	ZoneID	
7	ZoneStatusChange Or Heartbeat	1 – HeartBeat 0 – ZoneStatusChange

## 5-8. Presence Tag

Z308 works as a presence tag. It is an ideal product to detect one's presence within/ out of the network coverage for safety purpose. Z308 periodically sends presence/absence report to keep a close watch on those who wear it. The bound devices (with ID: 0xFE60) could calculate Z308's location based on the RSSI values between Router Devices and Z308.

The command list:

Bits:8	16	8	8	var					
Frame control	Manufacturer code	Transaction Sequence number	Command identifier	Frame payload					
				Count	Node ID	RSSI	...	Node ID	RSSI
0x05	0x109F		0x5F	Byte	2byte	Signed			

(Clusterid : 0x FE60)

## 5-9. HeartBeat Technique

In a security system, it is important that Zone devices 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 Z308 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.

## 5-10. Battery

When the operating voltage is lower than 2.1V, the indicator will flash red once. Z308 will send a low-power report to the ZigBee network.

The related data:

- Power configuration cluster (ID: 0x0001)
- Battery voltage attribute (ID: 0x0020)
- Battery alarm state attribute (ID: 0x003E)

Function of indicating remaining battery power:

In the zone status change notification alarm command sent by Z308 to CIE, the percentage value of the remaining battery power is placed in the high byte of zone status. CIE can understand the battery power of Z308 after receiving it.

## **5-11. Restore to Factory Setting**

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

Step1. Press and hold the Panic Button or 15 seconds.

Step2. Release the button after the indicator shows fast red flashes.

Step3. After 10 red flashes, it will go into turn-off mode. The indicator will be Off.

## **5-12. Offline Activation**

If Z308 disconnecting from the network, it will wake up every 5 minutes to try re-joined the network.

It also can manual trigger Z308 to re-join the network in the following two ways.

1. Press the panic button 3 seconds and red indicator flash once than device would try re-joined network.
2. Press the panic button once to alarm and device would try re-joined network.

## 6. Home Automation Clusters for Z308

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 Z308.

1.End Point(s) : 0x01:

2.Device ID : IAS Zone ( 0x0402 )

3.EndPoint Cluster ID

Cluster ID for Z308	
Server side	Client side
<b>EP 0x01 (Device ID: IAS Zone(0x0402) )</b>	
Basic(0x0000)	None
Power configuration(0x0001)	
Identify(0x0003)	
IAS zone ( 0x0500)	
Commissioning( 0x0015)	
Poll Control ( 0x0020 )	
Diagnostics ( 0x0B05 )	

This lists the attributes of the basic information.

(1) 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	0x38	O
0x0003	<i>HWVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x02	O
0x0004	<i>Manufacturer Name</i>	Character string	0 – 32 bytes	Read only	netvox	O
0x0005	<i>Model Identifier</i>	Character string	0 – 32 bytes	Read only	Z308E3ED	O
0x0006	<i>DateCode</i>	Character string	0 – 16 bytes	Read only	20160113	O
0x0007	<i>PowerSource</i>	8-bit Enumeration	0x00 – 0xff	Read only	0x03	M
0x0010	<i>Location Description</i>	Character string	0 – 16 bytes	Read/write		O
0x0011	<i>Physical Environment</i>	8-bit Enumeration	0x00 – 0xff	Read/write	0x00	O
0x0012	<i>Device Enabled</i>	Boolean	0x00 – 0x01	Read/write	0x01	M

(2) Attributes of the Power Configuration Information

<b>Identifier</b>	<b>Name</b>	<b>Type</b>	<b>Range</b>	<b>Access</b>	<b>Default</b>	<b>Mandatory / Optional</b>
0x0020	Battery voltage	Unsigned 8-bit integer	0x00 – 0xff	Read / write	--	O
0x0031	BatterySize	8-bit Enumeration	0x00 – 0xff	Read / write	2	O
0x0033	Battery Quantity	Unsigned 8-bit integer	0x00 – 0xff	Read / write	1	O
0x0035	Battery AlarmMask	Bitmap (8-bits)	0000 000x	Read / write	0000 0000	O
0x0036	Battery VoltageMin Threshold	Unsigned 8-bit integer	0x00 – 0xff	Read / write	0x15	O
0x0037	Battery Voltage Threshold1	Unsigned 8-bit integer	0x00 – 0xff	Read / write	0x16	O
0x0038	Battery Voltage Threshold2	Unsigned 8-bit integer	0x00 – 0xff	Read / write	0x17	O
0x0039	Battery Voltage Threshold3	Unsigned 8-bit integer	0x00 – 0xff	Read / write	0x18	O

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x003e	<i>BatteryAlarm State</i>	32-bit Bitmap	0x00... x	Read	0x000... 0	O

## 7. Related Netvox Devices

- Z201B: ZigBee HA Coordinator with CIE



## 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.

## 9. 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.



## 10. CE Certification Statement

Note:

1. Use the product in the environment with the temperature between -10°C and 50°C.

For the following equipment:

**CE 0700**

Is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC,  
The equipment was passed. The test was performed according to the following European standards:

**EN 301 489-1 V1.9.2: 2011-09**

**ETSI EN 301 489-17 V2.1.1: 2009-05**

**ETSI EN 300 328 V1.7.1:2006-10**

**EN62311:2008**

**EN 60950-1:2006+A11:2009+A1:2010+A12:2011**

**CAUTION  
RISK OF EXPLOSION IF BATTERY IS REPLACED  
BY AN INCORRECT TYPE.  
DISPOSE OF USED BATTERIES ACCORDING  
TO THE INSTRUCTIONS**