# User Manual

AXEND, Inc.

2637 Manhattan Beach Blvd, Redondo Beach, Los Angeles, CA 90278, USA

# Perimeter security radar

**Series:AXPR200、TXPR200**

**Applicable Model:** **AXPR200-P、TXPR200-P**

**AXPR200-L、TXPR200-L**

**AXPR200-W、TXPR200-W**

# Installation Guide

July 29th 2024

V1. 3

## Revision Table

| Rev | Date | Change description |
|---|---|---|
| 1.0 | Mar 15th 2024 | Creation |
| 1.1 | Apr 9th 2024 | Fix |
| 1.2 | May 22nd 2024 | Fix |
| 1.3 | July29th 2024 | Packing List、FQA etc |

## Important

Please read this document carefully before you use the device or the service we provide. Please keep the documents for future reference. Failure to follow the instruction may seriously affect the effectiveness of the product, and damages may be caused to the device.

## Safety

The product shall be grounded properly.

The power supply used for this product must have a rated output voltage with a voltage range of 8-14V DC.

Use only accessories that comply with our technical documents.

Keep the device away from any corrosive liquids and hot surfaces.

## Warnings

Do not attempt to repair, disassemble, or modify the product without our authorization.

To clean the device, wipe the surface with a clean, soft cloth. Do not use alcohol or detergent.

## Warranty and service

When you purchase a new or certified refurbished device, we warrant the device against defects in materials and workmanship under ordinary consumer use for 1 year from the date of original purchase. The limited warranty applies only to hardware components of the devices that are not subjected to accidents, misuse, neglect, damages of any kind, alteration, repair or commercial use.

## Support

For any technical support, please contact your reseller.

## Table of Contents

# 1. Product overview

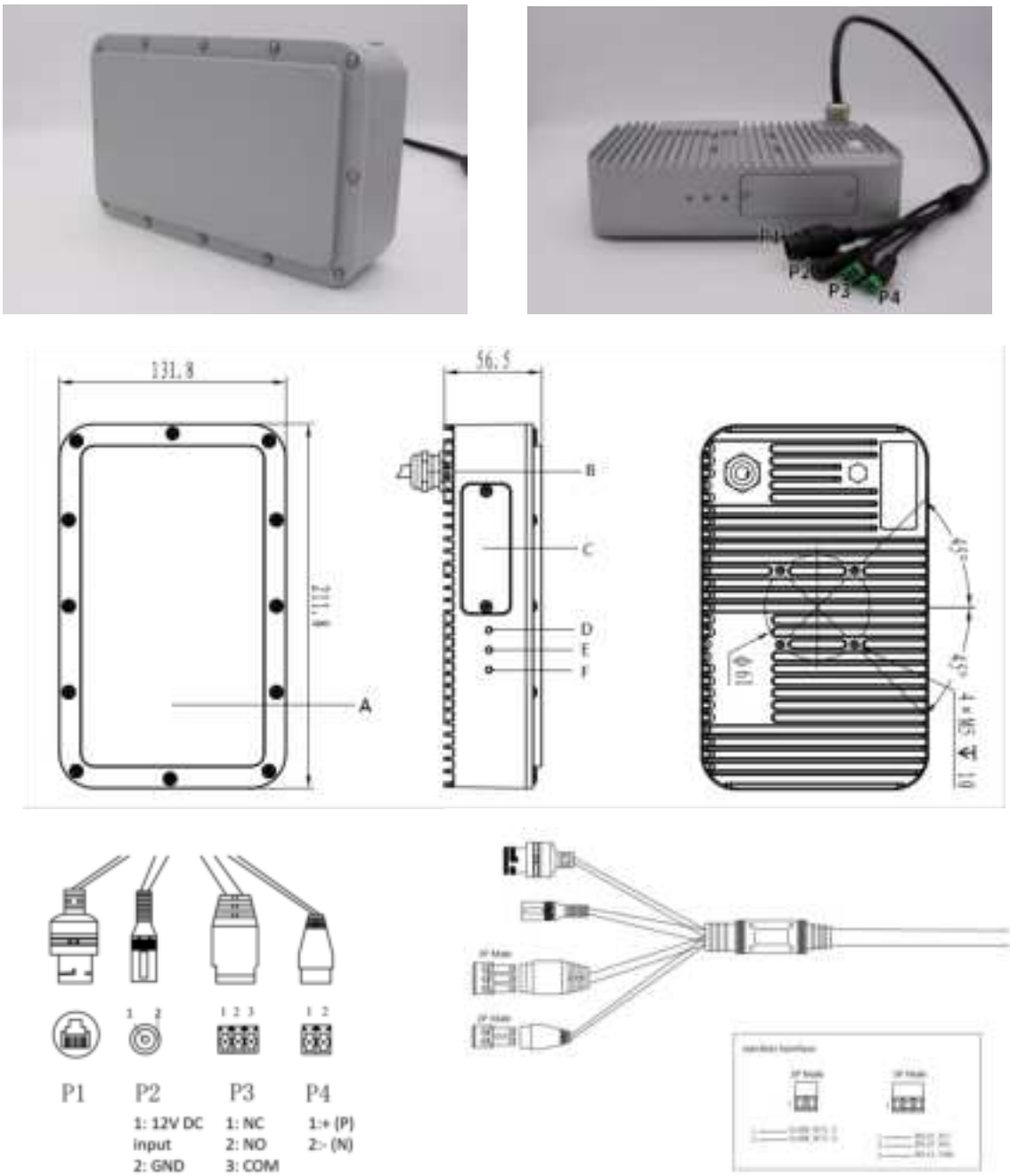


**Figure 1 The Security Radar and product overview (unit: mm)**

A. Radar antenna plane.
B. Cable.See **Table** 1 for specifications.
C. Micro SD card slot cover.
D. Power LED: Red LED for normal power connection.
E. System status LED: LED flashes blue for normal operation.

F. Intrusion alert LED: LED flashes yellow when targets are detected within the FOV (field of view) .

**Table 1 Cable specifications**

| Cable | Name | Specification |
|---|---|---|
| P1 | Network connector | RJ45 Ethernet connector with Power over Ethernet (PoE in) IEEE802.3at , max 24W. Use this connector for data transmission or to provide power to the radar. |
| P2 | Power connector | 12V DC Power connector. (8-14V) |
| P3 | Relay output | Rating: 2A/30VDC, 0.5A/125AC. Used with external devices such as sirens, speakers and PTZ. Factory setting: OFF.<br>Pin description: 1: NC; 2: NO; 3: COM.<br>Cautions: NC: Normal Close ;NO: Normal Open; |
| P4 | Optocoupler output | GPIO optocoupler. Rating: 50mA / 80V.<br>Pin description: 1:+(P); 2: -(N) |

CAUTIONS

- **Risk of water leaks. Please use water resistant connectors.**
- **DO NOT power the product with both the PoE and DC.**

# 2. Packing list

**Table 2 Packing list**

| Serial | Item | Specfication | Qty | Remark |
|---|---|---|---|---|
| 1 | Radar | TXPR200-P/TXPR200-L/TXPR200-W | 1 | |
| 2 | Installation Manual | | 1 | e-copy |
| 3 | Configuration Manual | | 1 | e-copy |
| 4 | Bracket | | - | Optional |
| 5 | Power Adapter | 12V，2A | - | Optional |
| 6 | Test Report | | - | Optional |
| 7 | Pass Certificate | | 1 | |
| 8 | Packlist | | 1 | |
| 9 | Male connectors | | 2 | |
| 10 | Carton Package | | 1 | |

## 3. Where to install the product

**Where and how to install the radar is very important, as it will greatly affect the radar performance.**

1) The radar must be securely mounted on the wall or on a pole or without any vibration. Do not install the radars on top of swaying fences or poles otherwise the radar may not work properly.
2) Make sure there is no obstacle to block the view of the radar, like trees, walls, light poles or building. Any solid objects within the field of view like a wall will cause blank spots.
3) Metal objects or concrete walls in the field of view may reflect radar waves and therefore affect the performance. Please avoid buildings and metal objects such as fences within or next to the FOV.
4) The radar is designed for open area monitoring and not suitable for indoor applications.
5) Due to the narrow angle of the radar beam, please be extra careful when adjusting the angle during installation and make sure that the radar is directing toward the area to be monitored. It is recommended that middle of the radar is aligned to the center line of the alert zone within a ±0.5° (max.) difference.
6) It is recommended to use a gradienter to confirm the installation angle. Please install the radar at upright position within no more than 0.5° difference to the level, and the radar facing forward to the zone with a tiny tilt angle.
7) It is recommended to install the radar 1.5-3m above the ground and the LED indicators should be on the bottom of the radar.

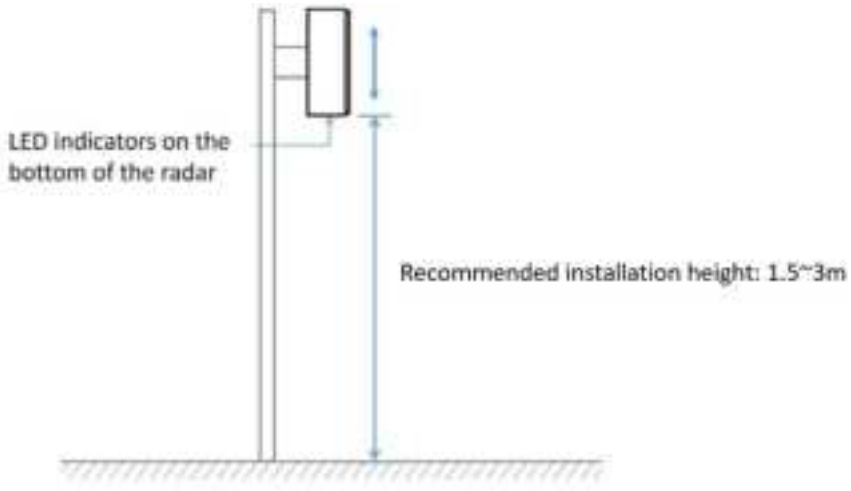


**Figure 2 Radar recommended to be installed vertically at 1.5~3m.**

## 4. Detection Range

Please note that the performance of the radar is affected by both the scene and the target type.

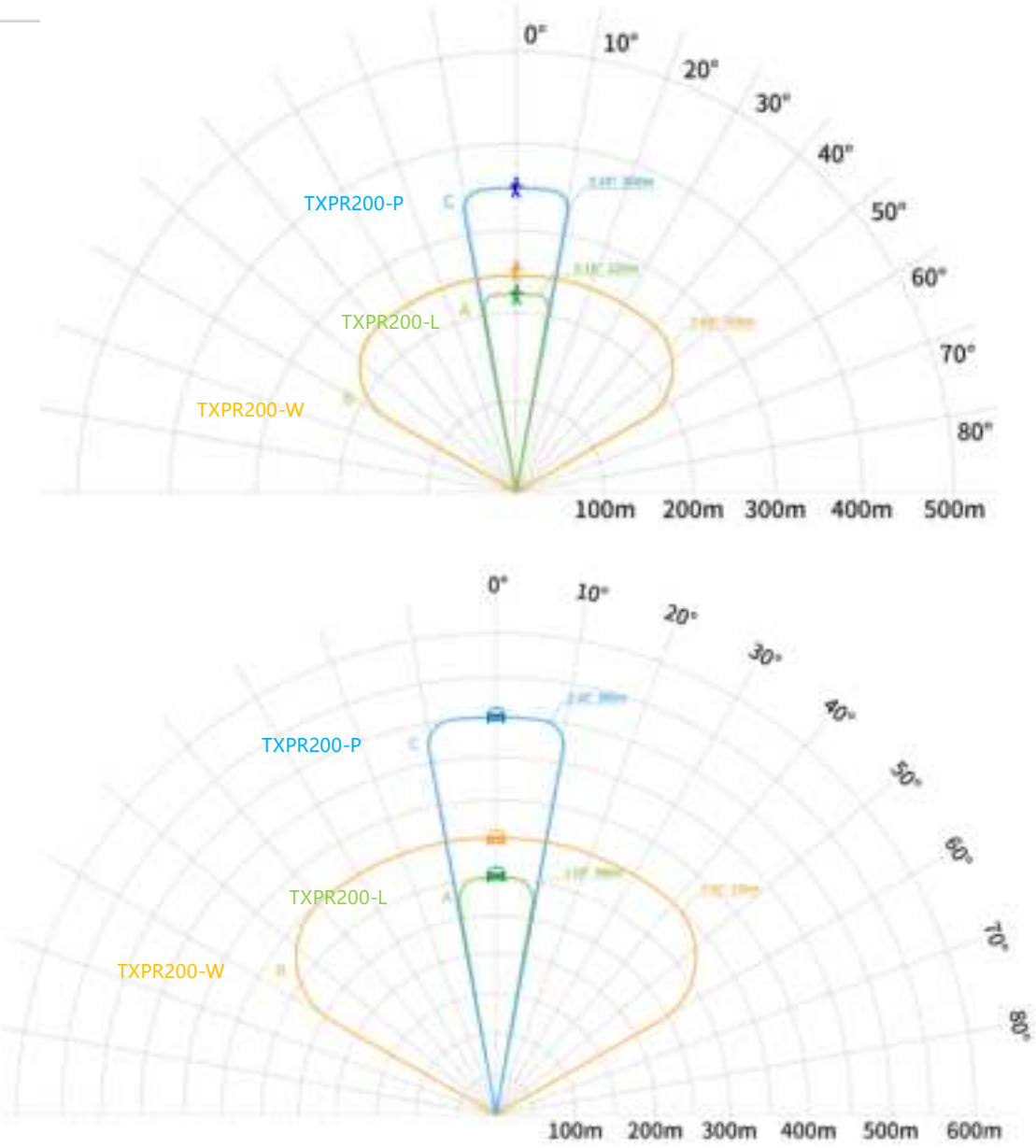


**Figure 3 Detection range of the security radar.**

## 5. How to install the radar

1) **Secure the radar.** Mount the radar on the wall or the pole using a mounting bracket. The mounting bracket is not in the package. It is recommended to use the mounting bracket as illustrated in Figure 4 to mount the radar. Please note that it is very important to firmly secure the radar and avoid any vibration.
2) **Cable connection.** Connect the network cable (P1) and the power cable (P2).

3) **Power ON.** Make sure that the power and system status LED indicators are in the right conditions. (The system LED flashes blue and the power LED is constantly red. If there is no blue LED, then the system fails.)

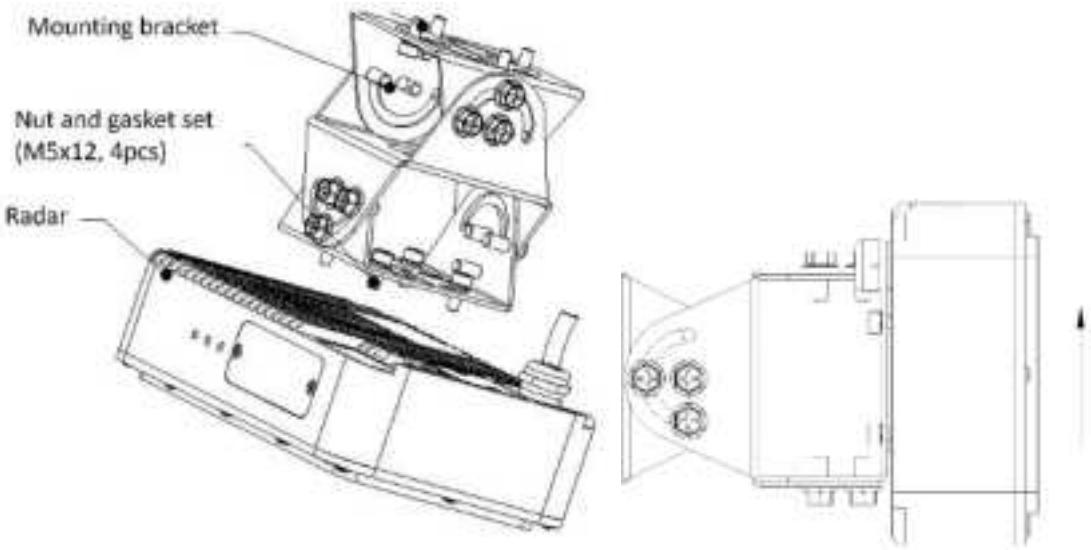


**Figure 4 Example of the mounting bracket**

CAUTIONS

- **Where and how to install the radar is very important, as it will greatly affect the radar performance. Please follow the instructions carefully.**
- **Please note that DO NOT power the device with both PoE and DC power. Otherwise the device may be damaged.**
- **Please note that there are water leak risks. Please use water resistant connectors.**

## 6. PoE connection steps

To power the radar with PoE, please use a switch with PoE function.

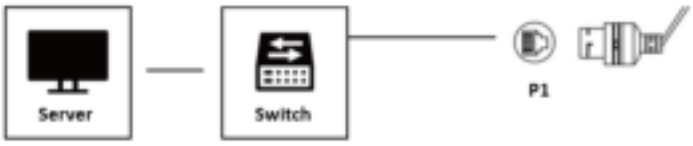


**Figure 5 Using PoE to power up the device**

CAUTIONS

- **DO NOT power the product with both the PoE and DC.**

## 7. How to connect the radar with a siren or a PTZ camera

**Figure 6** gives an example of connecting a siren to the radar via the P3 Relay connector, and **Figure 7** shows how to use the radar to direct a PTZ camera. See Section 1 for the connector specification. Please refer to the document **Security Radar System Configuration** to see how to set up the Relay parameters.

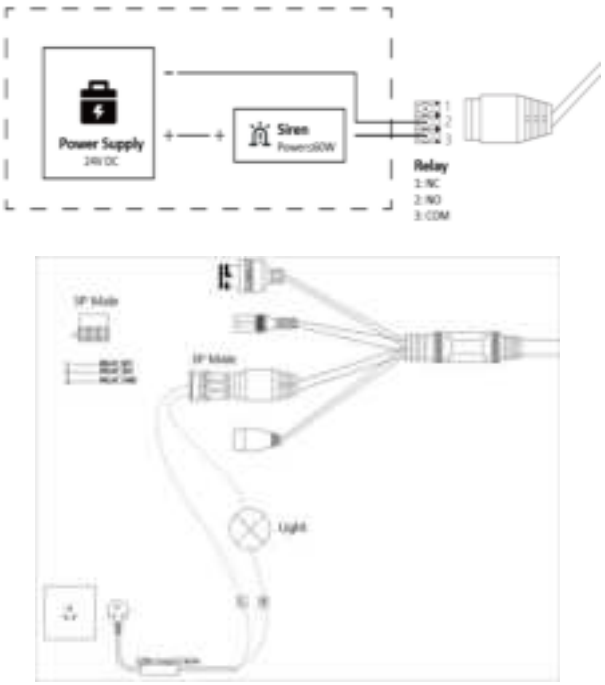


**Figure 6 Diagram of connecting a Siren to the radar using the relay connector P3.**

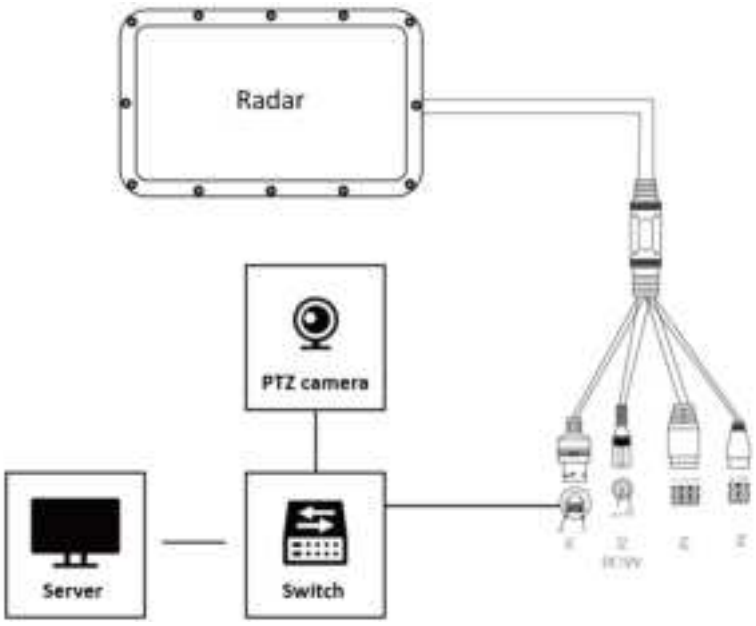

**Figure 7 Diagram of directing a PTZ camera using the radar. (Please note that in this example, the switch has PoE function. Otherwise the radar has to be connected to a DC power.)**

CAUTIONS

- **DO NOT power the product with both the PoE and DC.**

## 8. Find the device on the network

Please use the **DeviceSearch** software to find the radar on the network. It will show the radar's IP address. It is recommended to turn off the firewall of the computer.

Click Refresh that is on the top right corner of the software to show all the devices that is on the network with network parameters. See **Figure 8** .

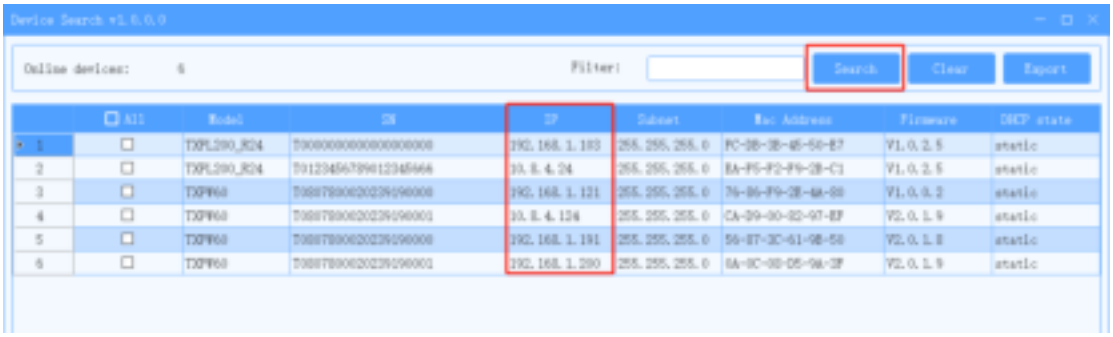

**Figure 8 Use the software RadarDeviceSearch to Find the radars on the network**

If you want to save the parameters, click to select the devices in interest, and click export on the top right corner of the software to save the file.

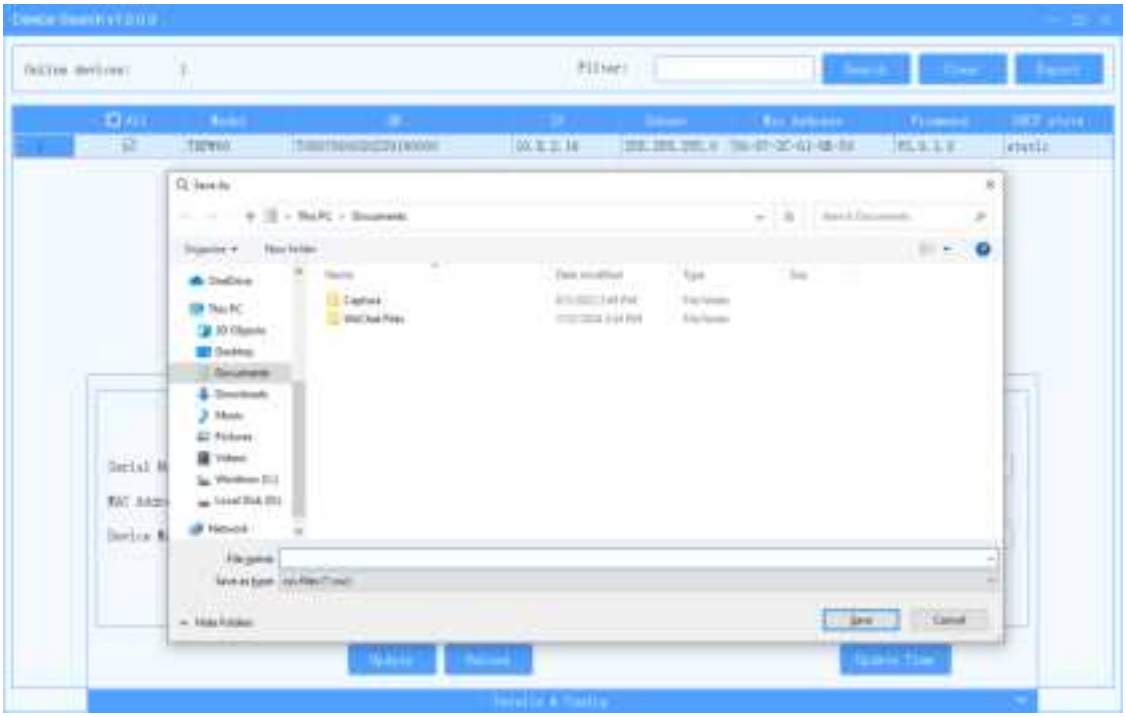

**Figure 9 To save the network parameters of the radars**

## 9. Reboot the device

You can either reboot the radar by powering it off for more than 10s and powering it back on again. Alternatively, you can reboot it in the web-based interface. See document **Security Radar System Configuration**.

## 10. FQA

Q1: How to identify if the installation angle is correct?

A1:

1) Make sure the horizontal angel differs within 1°.
2) Make sure the tilt angel differs within 1° around.
3) Please use a level gauge or some tool to measure the installation angle.

Q2: No LED light from radar bottom?

A2:

1) Please check the installation and make sure the LED lights are at the bottom.
2) Check the power supply and make sure the power is on and right.

Q3: Failed to access web configuration page?

A3:

1) Please check if the IP is in the same LAN.
2) If the default IP 192.168.8.100 conflict with other device.

Q4: No relay alarm output?

A4:

1) Please check if the wiring is correct.

2) Please check if the input device is connected with power.

3) If there is still no output, please check on radar web configuration and if the output is activated.

# Perimeter security radar

**Series：AXPR200、TXPR200**

**Applicable Model:AXPR200-P、TXPR200-P**

**AXPR200-L、TXPR200-L**

**AXPR200-W、TXPR200-W**

# System Configuration

Aug 8th 2024

V1. 2

## Revision Table

| Rev | Date | Change description |
|---|---|---|
| - | AUG 7th 2023 | Creation |
| 1.1 | July 19th 2024 | Update the image etc. |
| 1.2 | Aug 8th 2024 | How to set up the alarm time period. |
| | | |

## Important

Please read this document carefully before you use the device or the service we provide. Please keep the documents for future reference. Failure to follow the instruction may seriously affect the effectiveness of the product, and damages may be caused to the device.

## Safety

The product shall be grounded properly.

The power supply used for this product must have a rated output voltage with a voltage range of 8-14V DC.

Use only accessories that comply with our technical documents.

Keep the device away from any corrosive liquids and hot surfaces.

## Warnings

Do not attempt to repair, disassemble, or modify the product without our authorization.

To clean the device, wipe the surface with a clean, soft cloth. Do not use alcohol or detergent.

## Warranty and service

When you purchase a new or certified refurbished device, we warrant the device against defects in materials and workmanship under ordinary consumer use for 1 year from the date of original purchase. The limited warranty applies only to hardware components of the devices that are not subjected to accidents, misuse, neglect, damages of any kind, alteration, repair or commercial use.

## Support

For any technical support, please contact your reseller.

# Table of Contents

# 1. Before you start

## 1.1. Production installation

Please install the product as instructed by the Installation Guide. Power up the product and connect it to the network. You can then connect the product to your network and set it up using our web-based interface.

## 1.2. Computer and browser request

The web-based interface of our product can run a 32/64-bit computer system or a Mac system. It is recommended to use Chrome.

Please turn off the firewall. Otherwise you may not be able to find the device in your network. (See **Appendix I：** How to turn off the firewall of your computer.)

## 1.3. Set up the computer IP address

The product will report data to a fixed IP. The default IP address is 192.168.8.100. Make sure that your computer and the product are:

1) Connected to the same LAN;

2) On the same subnet 192.168.8.xxx. See **Appendix II：** How to set up the computer IP.

If you forget the IP of your product, see **Section 4** Find the device on the network.

# 2. Quick start

Please follow the steps below for a quick start:

1) Setup computer IP. See **Appendix II：** How to set up the computer IP.

2) Log in the Web client. See **Section 3.1**.

3) Setup the product network. See **Section 3.4**.

4) Edit alarm zone. See **Section 3.5**.

# 3. Web client and system configuration

Please note that for different models, the web client may be slightly different.

## 3.1. Log in to the web client

In your web browser, enter the product IP address (192.168.8.100) to log in to the web-based interface. The default username and password are all **admin**. The user can switch between Chinese and English languages in the top right corner of the web interface.


**Figure 1 Web Login Interface.**

## 3.2. Navigation

**Preview**: Real-time Intrusion alarms with target tracks (radar) will be demonstrated in this panel.

**Network**: To set up the product network configuration, including TCP/IP, DNS config,and NTP.

**Alarm**: To set up alarm zones ,alarm time period, and parameters related to GPIO and relays.

**Algorithm**: To set up radar sensitivity and scenarios.

**General**: To check system information including radar version, serial number, heartbeat ID, CPU temperature, etc. The user can also upgrade the product, call out system logs in this panel.

## 3.3. Preview Page Setup

1) Adjust the preview area

Go to **Preview**.

Adjust the size and layout in the **Show Area Settings**.

Click **Confirm** to save the settings.

2) Radar location identification

Please note that the radar location is at (0,0).

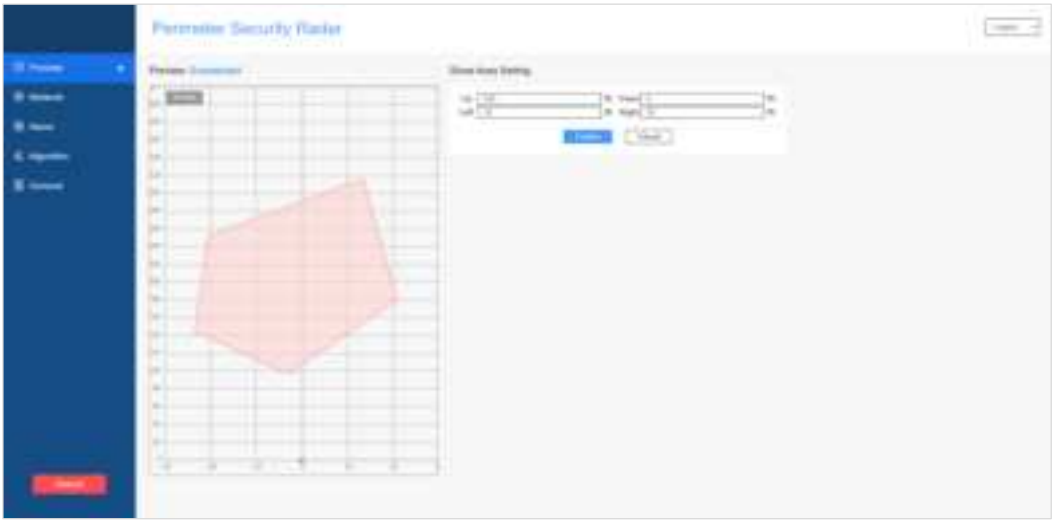

**Figure 2 Home Page Preview**

## 3.4. How to set up the product Network

Go to **Network** Page to set up the network, DNS, and NTP.See **Figure 3**.

### 3.4.1. Network Configuration

#### 3.4.1.1. Static IP Mode

In the **Network > Network Configuration > Mode** section:

1) Select the **Static** option.

2) Enter IP information(default IP is 192.168.8.100) 、 subnet mask and gateway.

3) Click Confirm to save the configuration.

### 3.4.1.2. Dynamic IP Mode

In **Network > Network Configuration > Mode** section:

1) Select the **DHCP** option.

2) Click **Confirm** to save.

3) The system will auto-assign an IP address to the radar. Please ensure the device is connected to the internal network before enabling this mode.

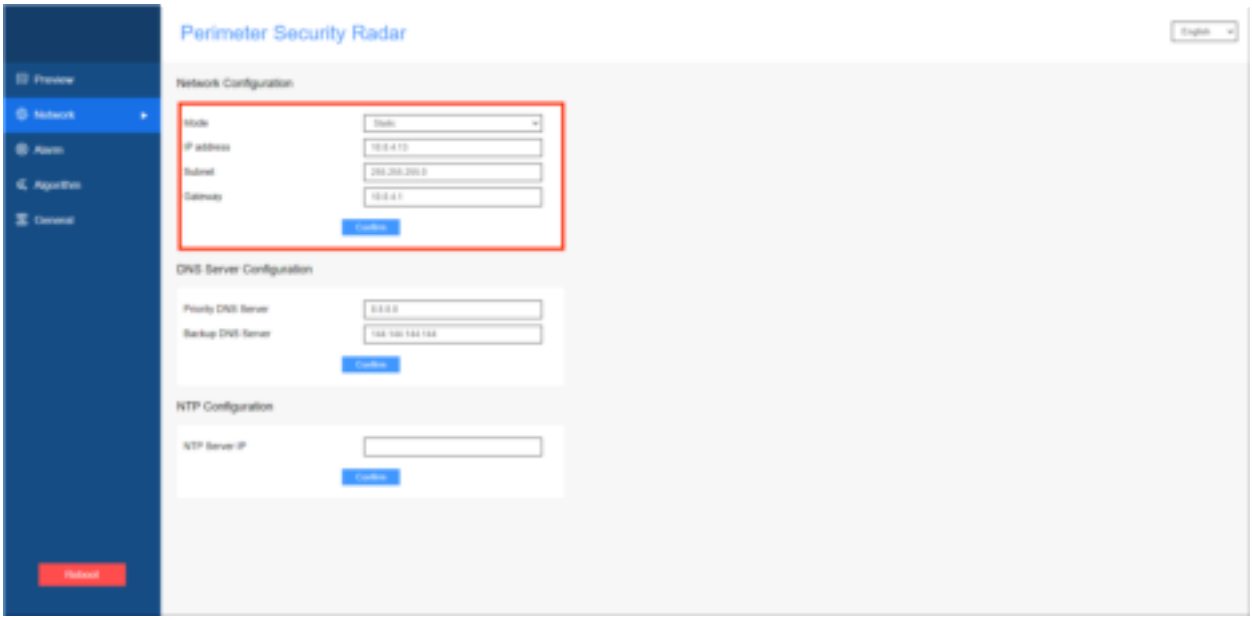


**Figure 3 IP Configuration**

CAUTIONS

- **Once you' ve changed the product IP, it is necessary to edit the computer' s IP accordingly to make sure they are in the same segment. Log out of the web interface and log in again.**

### 3.4.2. NTP settings

In **Network** > **NTP Configuration** to setup the NTP Server address of the device.Click **Confirm** to save your settings. The time of the device will be automatically synced to the NTP Server.

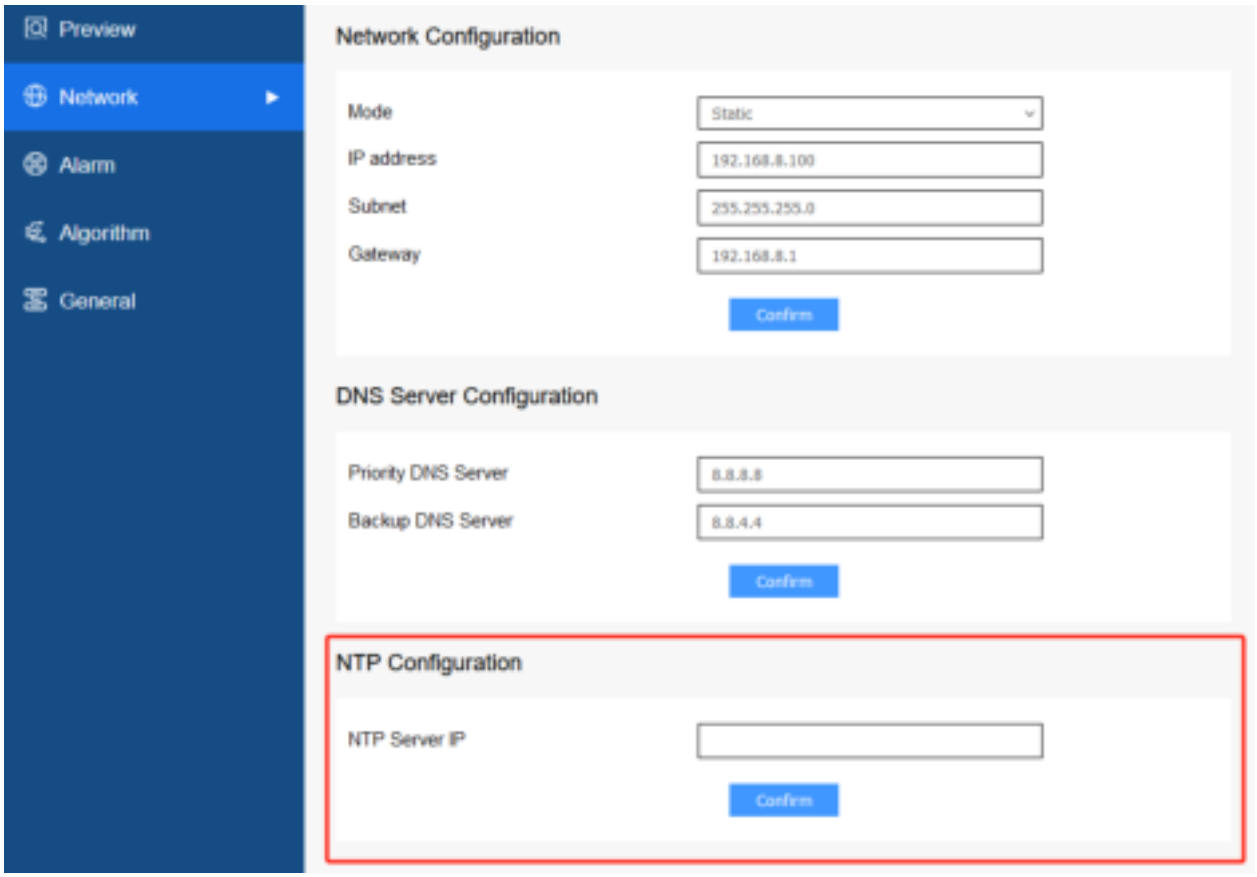


**Figure 4 NTP Configuration**

## 3.5. How to edit the alarm zone

There are two types of Alarm zones, the **include zone** (in color red) and the **exclude zone** (in color green).

1) **Include zones** are where the user wants to detect intrusion events, such as entrances or around the facility.

2) **Exclude zones** are where no alarm will be triggered even if there are intruders. The exclude zones are usually used to filter the false alerts, such as those generated around trees and bushes, or large areas that are prone to radar reflection, to improve user experience.

3) Default Settings

- Initial Configuration: By default,an alarm zone is preset with a rectangular area.
- Custom Settings: Users can manually create and adjust the size and shape of the include zones and exclude zones according to actual needs.

4) Editing and Management

- Interface Operation: Through the Web interface, users can conveniently edit and manage up to 8 different alarm zones. This includes adjusting the position, size, and type (include zone or exclude zone) of the alarm zones.
- Optimization Suggestions: Regularly check and update the settings of the alarm zones to adapt to environmental changes and monitoring needs.

#### 3.5.1.1. To add an alarm zone

Please follow the steps below to add an alarm zone. The include zone will be red and the exclude zone will be green.

1) Go to **Alarm**>**Alarm Zone**.

2) Choose a numeric identifier in the **Choose zone** section, to specify which alarm zone you wish to edit.

3) Choose the **Enable** option in the **Status** section to ensures that the selected area will be active.

4) Choose the **Include Zone** or **Exclude Zone** option in the **Type** section.

5) Click the **Draw** button to enter the mode where you can define the boundaries of the alarm zone.

6) Using the left mouse button, click on the preview display located on the left side of the interface to start forming a polygon. Create a shape with at least 3 vertices but no more than 7 to outline the alarm zone. Each vertex you set will determine the precision and shape of the monitored area.

7) Once you have finished drawing the alarm zone, right-click and select **End Drawing** to finalize the area.

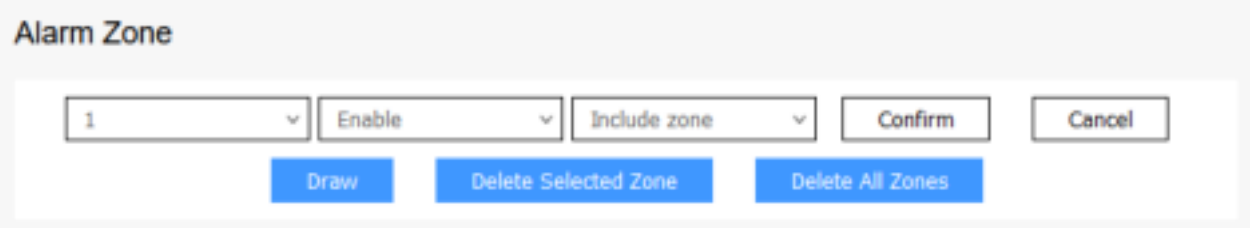


**Figure 5 Add an Include zone**

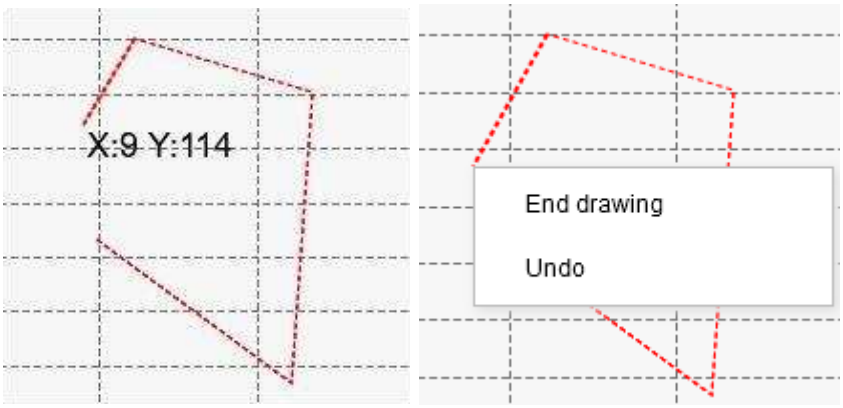


**Figure 6 Draw Include/Exclude zone**

3.5.1.2. To disable an alarm zone

1) Go to **Alarm**>**Alarm Zone** and select an existing alarm zone number identifier in the **Choose zone** section.

2) Choose the **Disable** option in the **Status** section.

3) Click **Confirm** to save the settings, this operation will disable the selected alarm zone, making it no longer effective (invalid).

3.5.1.3. To delete an alarm zone

1) Go to **Alarm**>**Alarm Zone**.

2) **Delete an alarm zone**: Click to select the alarm zone that you want to delete. Click **Delete the Alarm Zone** to delete it.

3) **Delete all alarm zones**: Click the **Delete all Alarm Zones** button to delete them.

## 3.6. How to set up the alarm time period

The settings apply to GPIO and relay settings for alarm outputs. Outside of the alarm periods, GPIO and relays do not operate. Please note that radar target outputs are not affected by alarm period settings.

To configure alarm periods:

1) Go to **Alarm**>**Time Period**.

2) Set the start and end times for each period (the system supports setting up to 4 different alarm periods to meet various surveillance needs)

3) Click the **Confirm** button to save the settings.

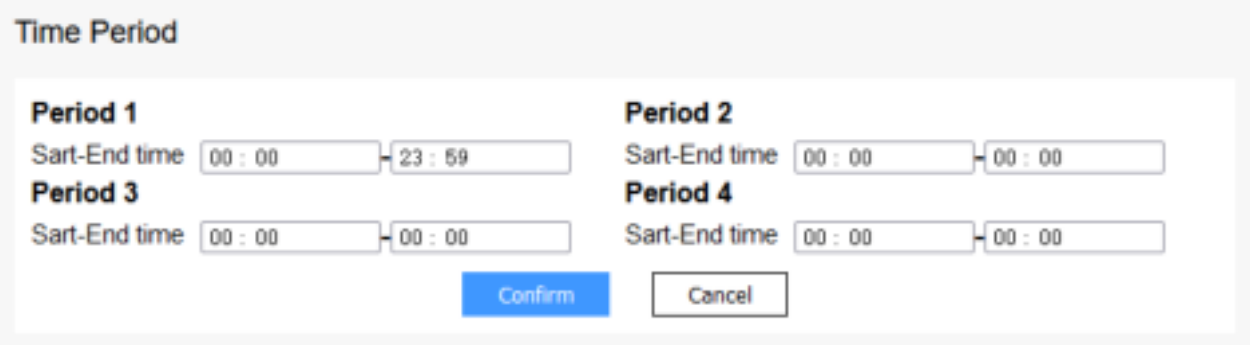


**Figure 7 Set up alarm time period**

## 3.7. How to set up the alarm output settings

Alarm output is divided into 4 channels; 2 relays and 2 GPIO. (Be noted that default version is only with 1 replay and 1 GPIO activated. )

Select the status of channel 1: enable and then select the time period for alarm, and finally select the alarm zone. After settings are done, click confirm and it will take effect.

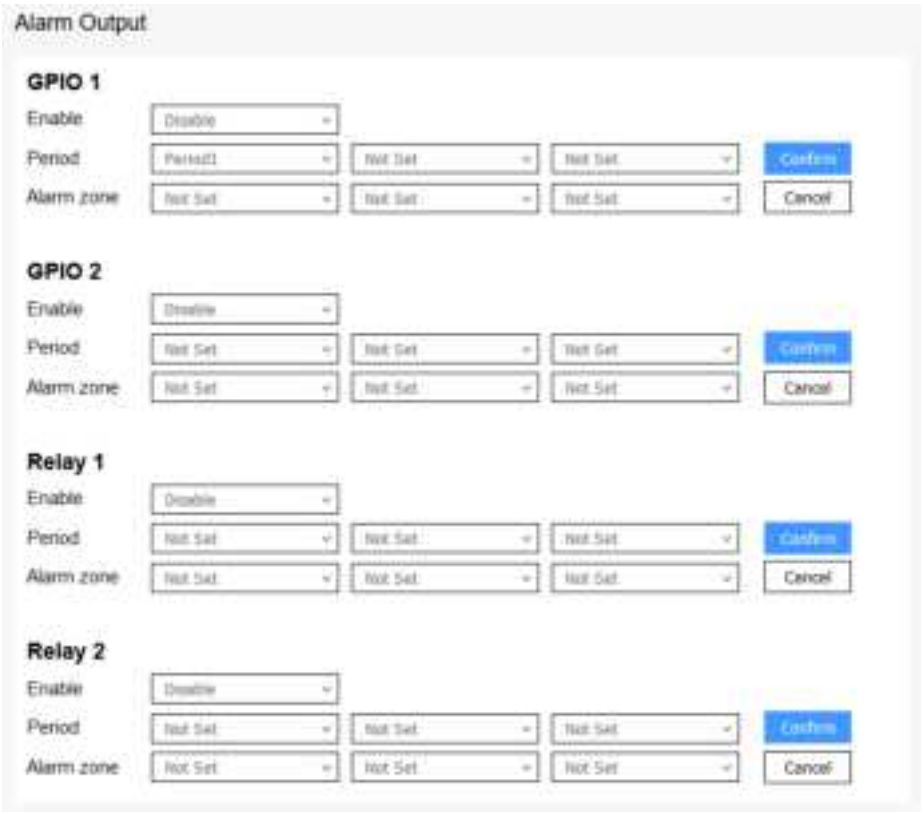


**Figure 8 Alarm Output Settings**

As shown in **Figure 9**, the device connected to GPIO 1 will be activated when the system detects a target only within Alarm Zones 1 and 2 during time periods 2, 3, and 4.

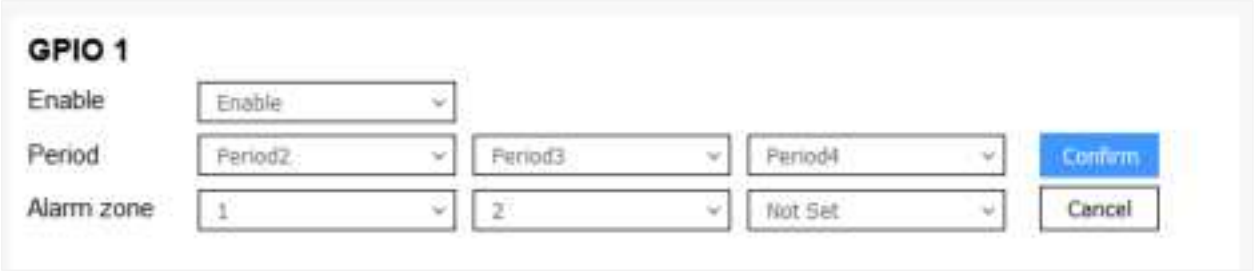


**Figure 9 An example of GPIO 1 settings.**

## 3.8. How to set up the Algorithm Settings

This is for setting up the sensitivity and scenario of the radar for intelligent back-end signal processing and smart pattern recognition algorithm.

### 3.8.1. Sensitivityt

Here you can set up the sensitivity for the radar default is 5(1: lowest; 10: highest) . When settings are changed a prompt will pop-up.

### 3.8.2. Scenarios

You can select the location of the radar where it has been installed. When scenario has been changed a prompt will pop-up.

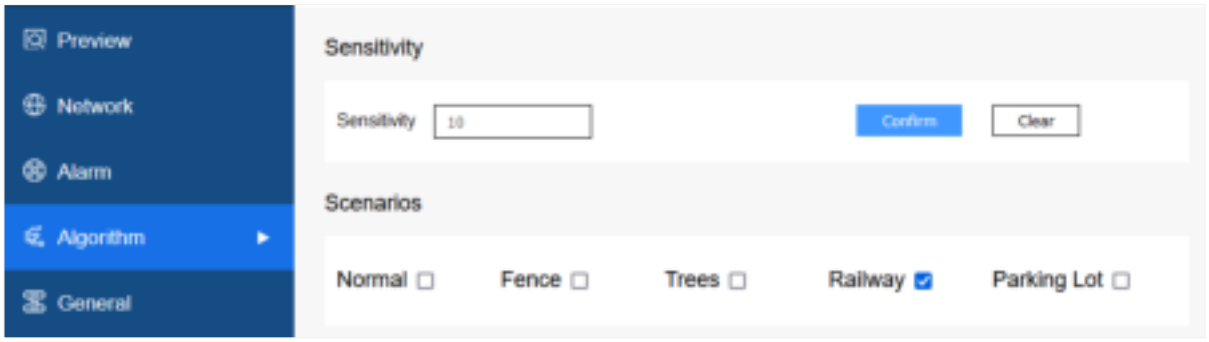


**Figure 10 Algorithm settings.**

## 3.9. Product and Information

Go to **General.**You can view radar version (firmware version), serial number (SN), and device status (heart-beat ID and CPU temperature) about the radar.


**Figure 11 Radar Information.**

## 3.10. How to Upgrade the product

1) Go to **General**>**System Upgrade**.

2) Click **Open** and select the upgrade package.

3) Click **Confirm** to start the upgrade.

4) The radar will automatically **restart** if the upgrade is successful. .

- Please wait patiently until the power indicator light stays red and the operation indicator light blinks blue, indicating that the radar has successfully restarted and entered standby mode.

- After the radar fully starts up, you will need to log out of the web interface and log in again after the upgrade.

CAUTIONS

- **Before you update the device, please make sure that the update file is correct and compatible with the hardware model.**
- **Please do not interrupt the update or power off the product during the entire process, otherwise you may damage the device.**

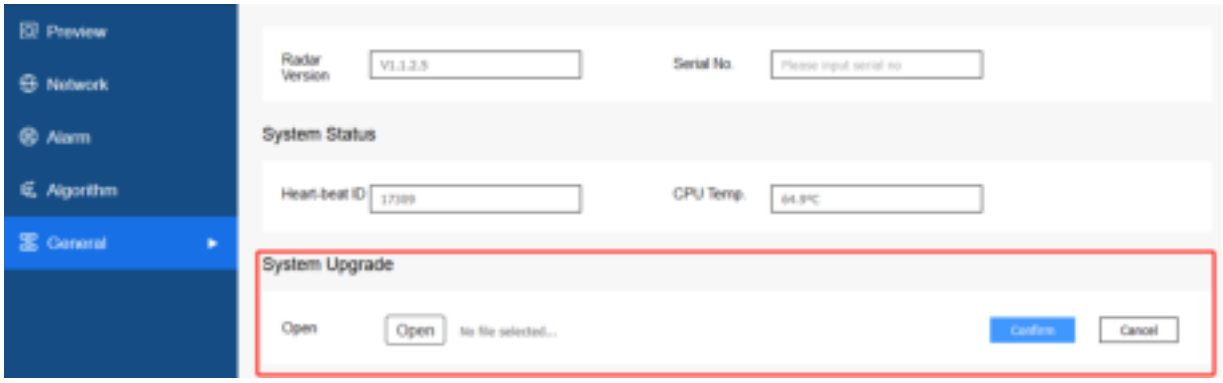


**Figure 12 System Upgrade.**

## 3.11. Time Calibration

To ensure the accuracy of the radar system's time, synchronizing with the server or management computer's time is crucial.

**Operation Steps:**

1) Access the time calibration page: Go to **General** > **Time Calibration**.
2) Compare times: The interface will display the current computer time and radar time.

3) Execute time calibration:
   - If a discrepancy is found, click the **sync** button.
   - The radar time will automatically adjust to match the computer's time.
4) Re-login:
   - After completing time synchronization, re-login to the Web interface to ensure the settings take effect.

CAUTIONS

- **Please note that the local time of the computer has to be accurate when you calibrate the NTP. Please repeat the time calibration regularly to avoid system errors due to incorrect system time such as system logs.**


**Figure 13 Time Calibration.**

## 3.12. Multi-Radar Deployment and Frequency Settings

When implementing a multi-radar monitoring system in an area, there may be overlap between the signal coverage areas of each radar. To ensure optimal performance and minimize signal interference, it is recommended to assign different operating frequencies to adjacent radar devices, as shown in .

**Operation Steps:**

1) Access frequency settings: Go to **General** > **Frequency** Options.

2) Select frequency: Choose a unique frequency for each radar to avoid or minimize interference caused by signal overlap.

3) Save settings: After adjusting frequencies, click **Confirm** to save the settings.

4) Restart system: Changes will take effect after the system restarts. Please ensure all related radar devices are restarted to apply the new frequency settings.

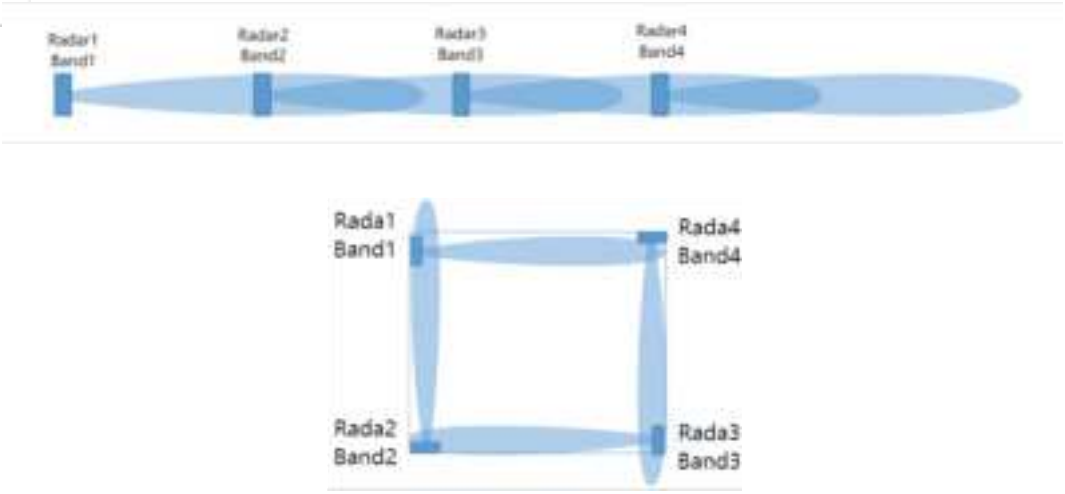


**Figure 14 Multi-Radar Deployment Example.**

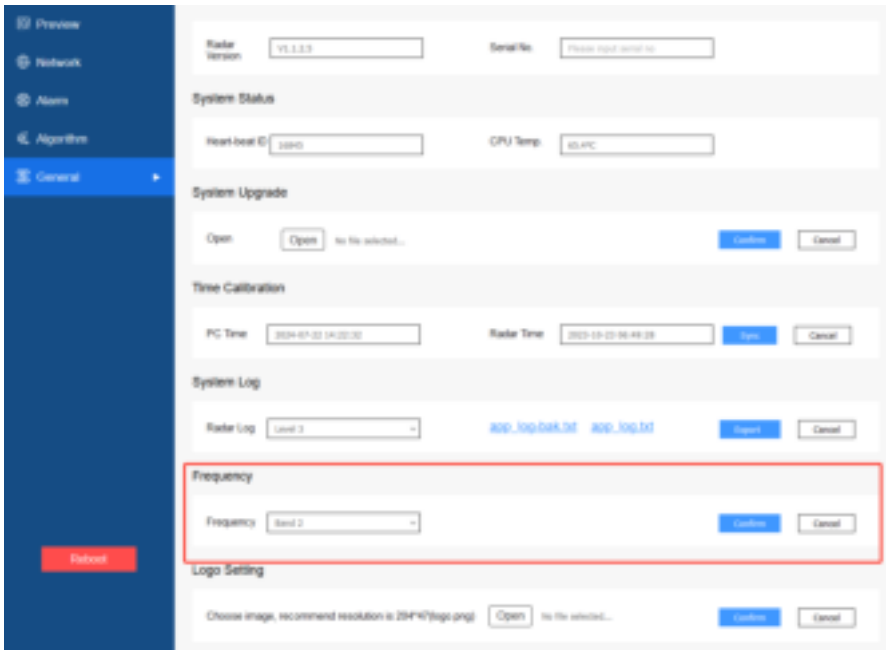


**Figure 15 Radar Frequency Settings.**

## 3.13. LOGO Setting

The system supports customizing the user interface, currently allowing for custom LOGO setting.

**Operation Steps:**

1) Access LOGO setting: Go to **General** > **LOGO Setting** Options.
2) Upload LOGO image:
   - Click the **Open** button, browse and select the desired LOGO image to upload.

- The selected image should meet the following requirements: resolution of 204x47 pixels, in PNG format.

3) Save settings:
   - After selecting the image, click the **Confirm** button to save the settings.
   - The newly uploaded LOGO will replace the original default LOGO.

CAUTIONS

➢ **Ensure that the selected image's resolution and format meet the requirements; otherwise, it may lead to display errors or failure to upload.**

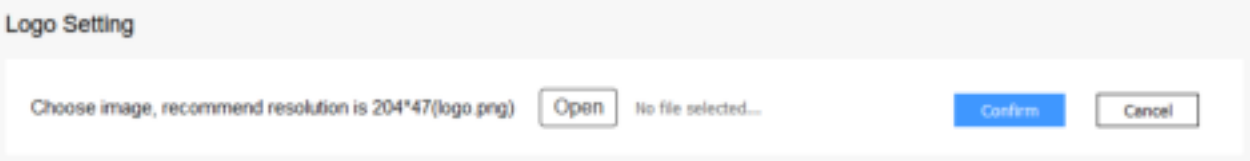


**Figure 16 Logo Setting.**

## 3.14. Reboot the device

You can either reboot the radar by powering it off for more than 10s and powering it back on again. Alternatively, you can reboot it in the web-based interface by clich the **Reboot** button.

## 3.15. Factory setting

Click **Set to Default** to reset the product to factory settings. Please note that once you've reset the product, everything but the firmware, IP address and alarm zones will be returned to factory setting.

# 4. Find the device on the network

Please use the **Device Search** software to find the product on the network. It will show the product's IP address. It is recommended to turn off the firewall of the computer, and the computer has to be connected to the same LAN as the product.

Click **Search** that is on the top right corner of the software to show all the devices that is on the network with network parameters. See **Figure 17** .

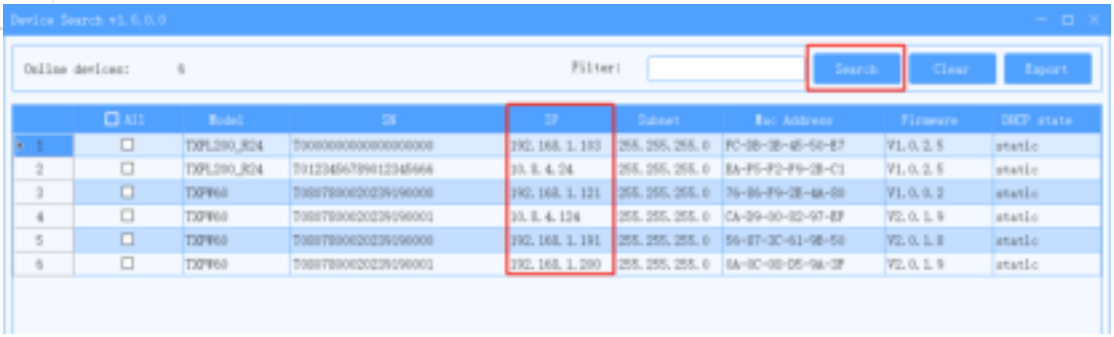

**Figure 17 Use the software Rada rDevice Search to Find the products on the network**

If you want to save the parameters, click to select the devices in interest, and click **Export** on the top right corner of the software to save the file. See **Figure 18**.

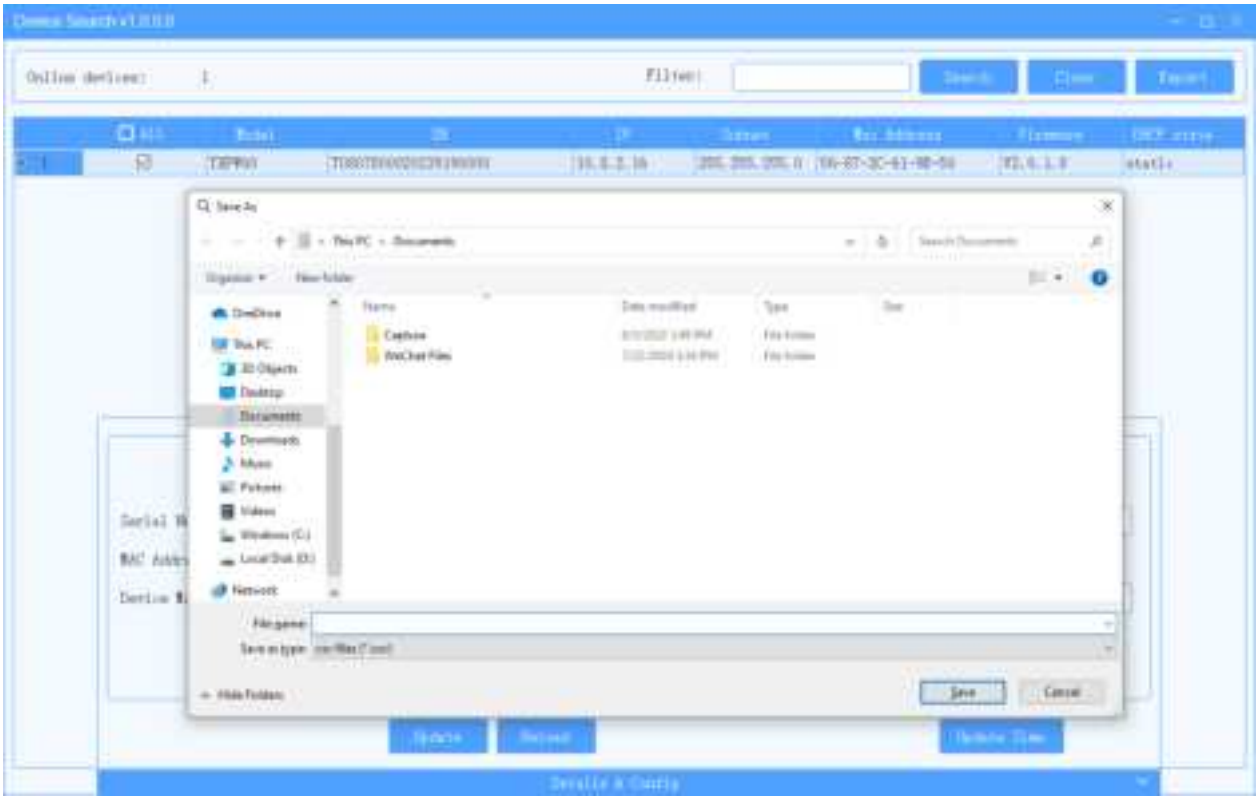

**Figure 18 Use the software RadarDeviceSearch to Find the radars on the network**

# 5. FAQs

**Q1: The device does not alarm when powered on.**

A1: If the operating voltage is unstable when the device is powered on, the system may not start normally. Disconnecting and rebooting the power can usually resolve this issue.

**Q2: The radar does not display targets.**

A2:

1) Please confirm whether there are any obstacles in the installation environment blocking the radar;

2) Check if the local IP address of the computer is on the same network segment as the radar;

3) Verify that the radar's antenna is facing the detection area;

4) Check if the radar's IP address (default is 192.168.8.100) conflicts with other radars or devices.

**Q3: The detection range of the radar is short.**

A3: The elevation or azimuth angle of the radar may not be correct and needs to be readjusted.

**Q4: Unable to log in to the Web interface using the IP.**

A4:

1) Check if the computer can "ping" the device to ensure it is on the same IP network;

2) Confirm whether the device's IP address has been changed;

3) Verify if the radar is operating normally, as it requires about 1 minute to start up.

# Appendix I：How to turn off the firewall of your computer

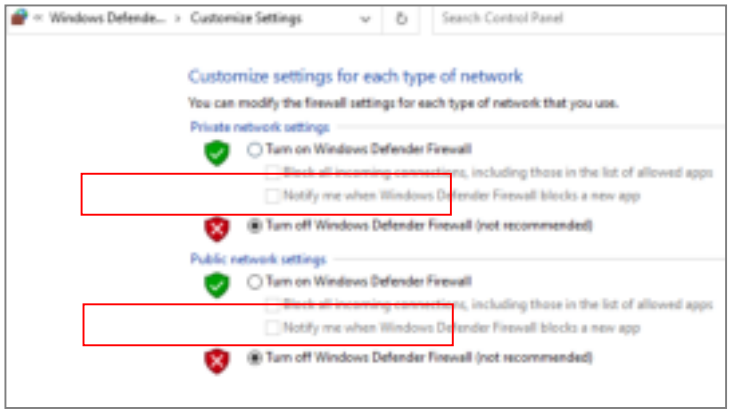


**Figure 19 To turn off the firewall of your computer**

# Appendix II：How to set up the computer IP

Follow **Figure 20** and **Figure 21** to set up your computer IP. Please make sure it is in the same subnet as the product.

**Figure 20 To set the computer IP**

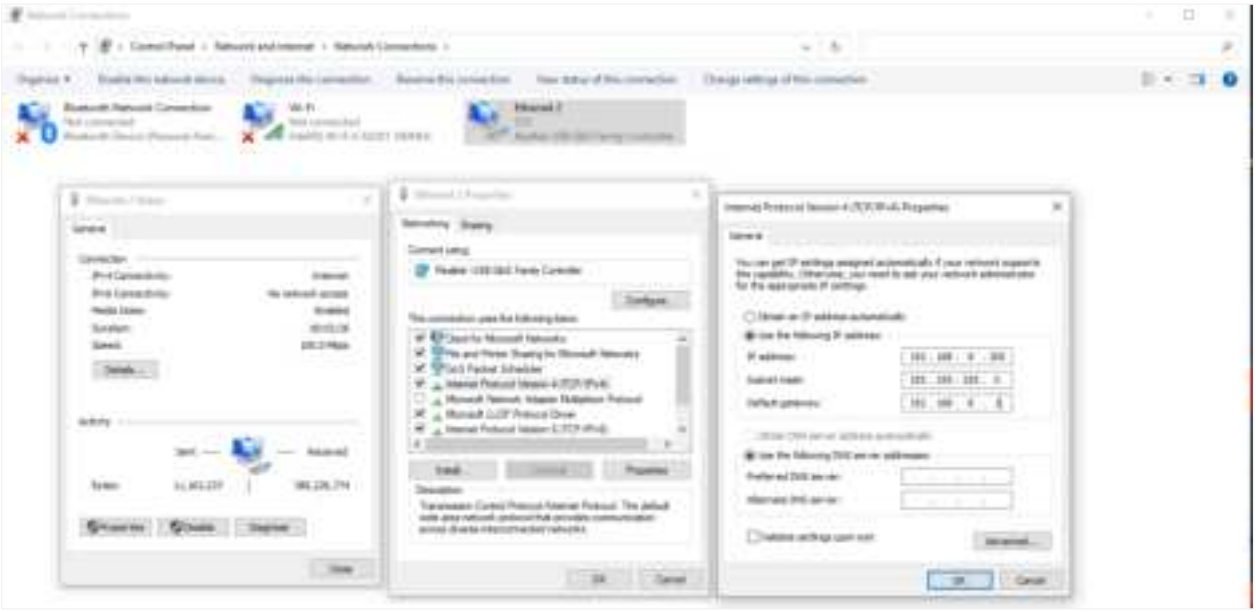

**Figure 21 To set the computer IP**

Check the network connection. Click windows+R to call for the Run window. Enter ping 192.168.1.200-t (device IP) to check the connection. If the connection is clear, the user will see the message as shown in **Figure 22**.

**Figure 22 To ping the product using the computer to check the network connection.**

FCC Statement

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

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.

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.

Note : 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.