NSR120 Perimeter Security Radar Instruction Manual

Catalog

1.Product introduction

NSR120 perimeter security radar is a compact 77 GHz ISM band millimeter wave radar specifically engineered for perimeter security applications, featuring a long detection range, high sensitivity, robust performance in diverse environments, stable operation, ease of integration, and excellent cost-effectiveness. It can proactively report intrusion targets, classify humans and vehicles through advanced signal processing and pattern recognition, and effectively filter out nuisances such as birds and small animals.

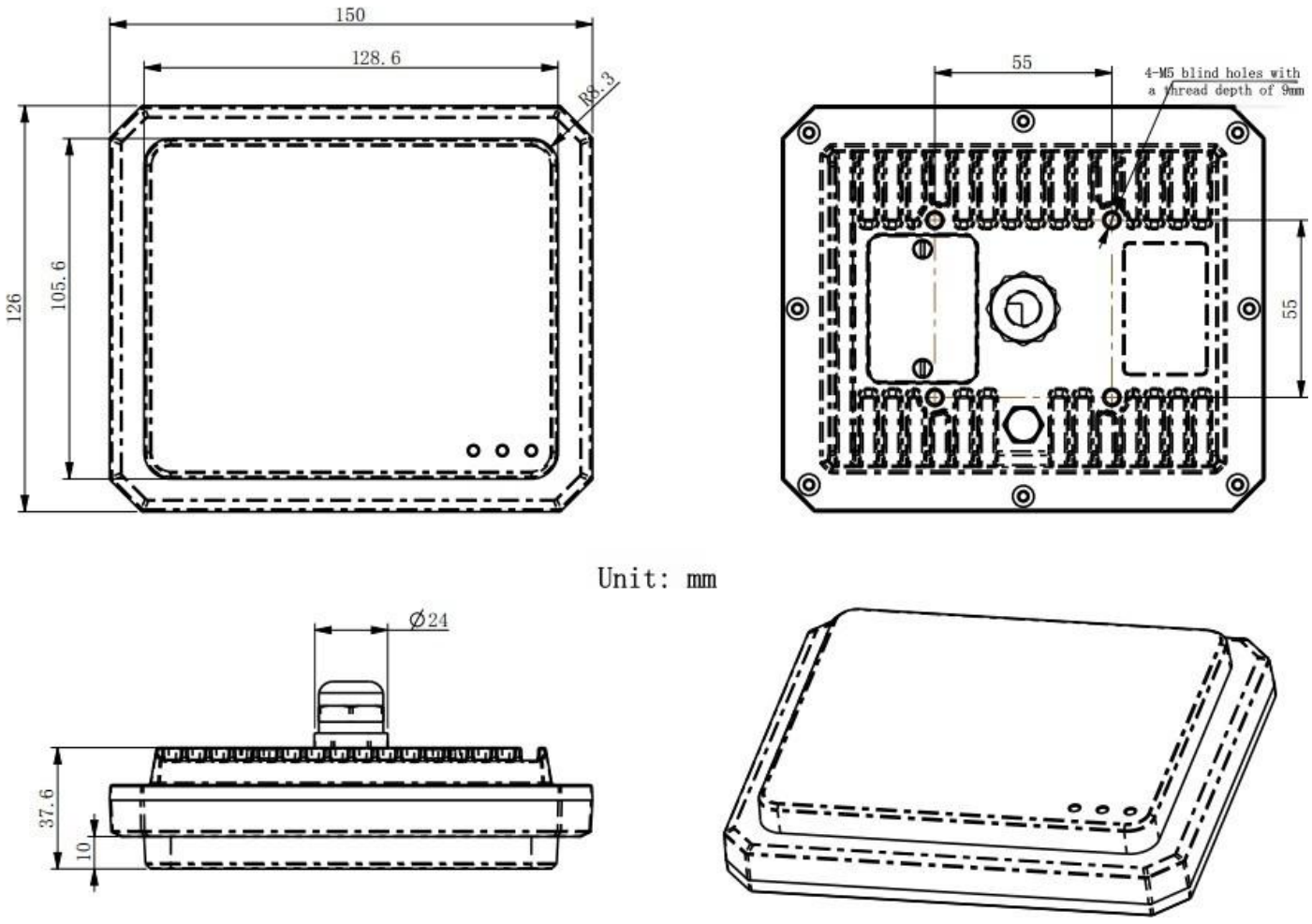


Figure 1 Outline of NSR120

Precautions for Product Use

(1) The nsr120 needs to be installed on a stable support when in use;

(2) When the nsr120 is in use, the direction of the connecting line is shown in Figure 2, and the antenna surface is

installed perpendicular to the ground;

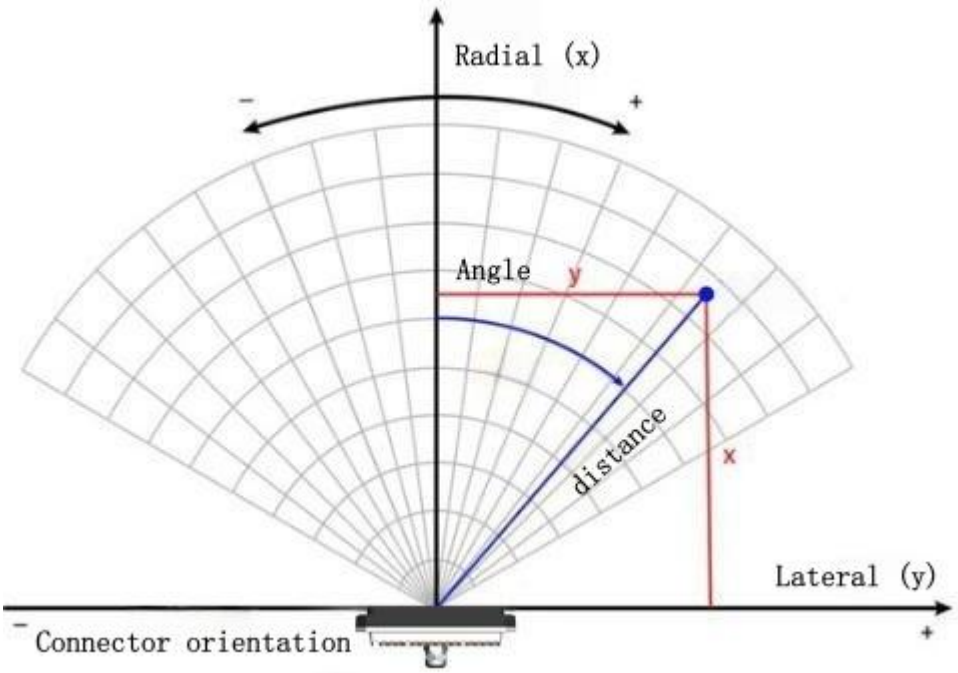


Fig. 2 Illustration of Radar Direction

(1) There shall be no strong reflectors such as a large number of metals within the detection range.

If you encounter problems that can not be solved in the installation process, please contact the customer service staff of Nanoradar, we will serve you wholeheartedly!

3 Use It Quickly

3.1 Installation Instructions

The radar is installed right in front of the monitoring area, and the radar antenna faces the center of the quasi-perimeter area:

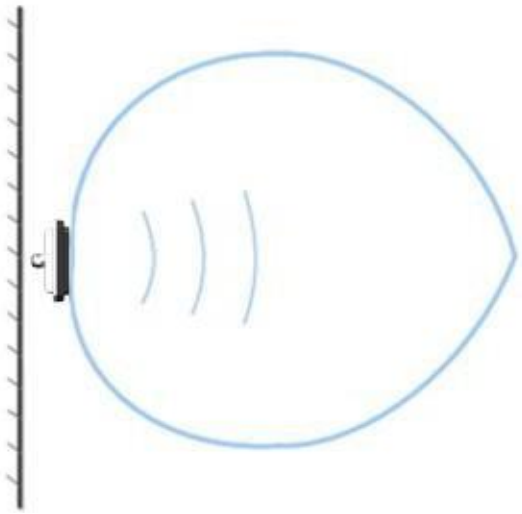


Figure 3 Installation direction of NSR60W

In order to ensure the detection accuracy of the radar, the radar detection plane is generally installed perpendicular to the detection area, and a certain installation height is required, which is generally recommended to be 1 ~ 3m.

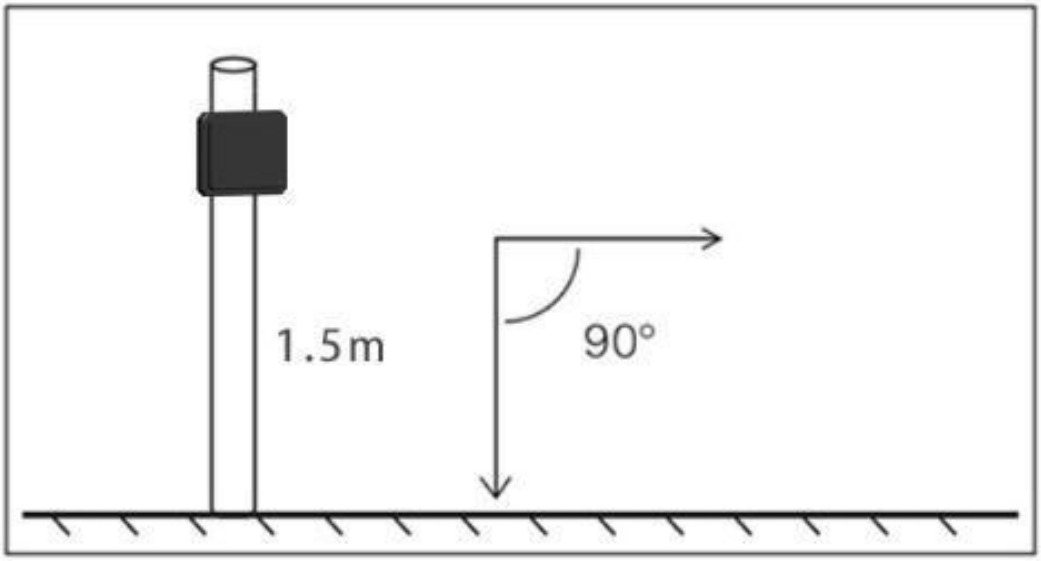


Figure 4 Installation diagram of NSR60W

Figure 5 Schematic diagram of NSR120 error installation

The correct way to install the radar is that the led lamp is in the lower right corner facing the radar, as shown in the following figure:

Figure 6 Diagram of correct installation of NSR120

3.2 Quick Start

(1) Refer to the "How to wire" Section, connect the alarm equipment to the radar control signal line; for example, connect the switch trigger of the acousto-optic alarm equipment to No1 and com1; where no means normally open, that is, the circuit is disconnected under normal conditions, that is, the resistance is infinite; NC means normally closed, that is, the circuit is closed under normal conditions, that is, the resistance is 0;

(2) Refer to "Defense Zone Settings" to draw the alarm defense zone; for example, select "Defense Zone 1", select the defense zone function as "Enable", and then draw the defense zone;

(3) Set the time period by referring to Time Period Setting. For example, set Time Period 1, the start time is 00:00, and the end time is 24:00;

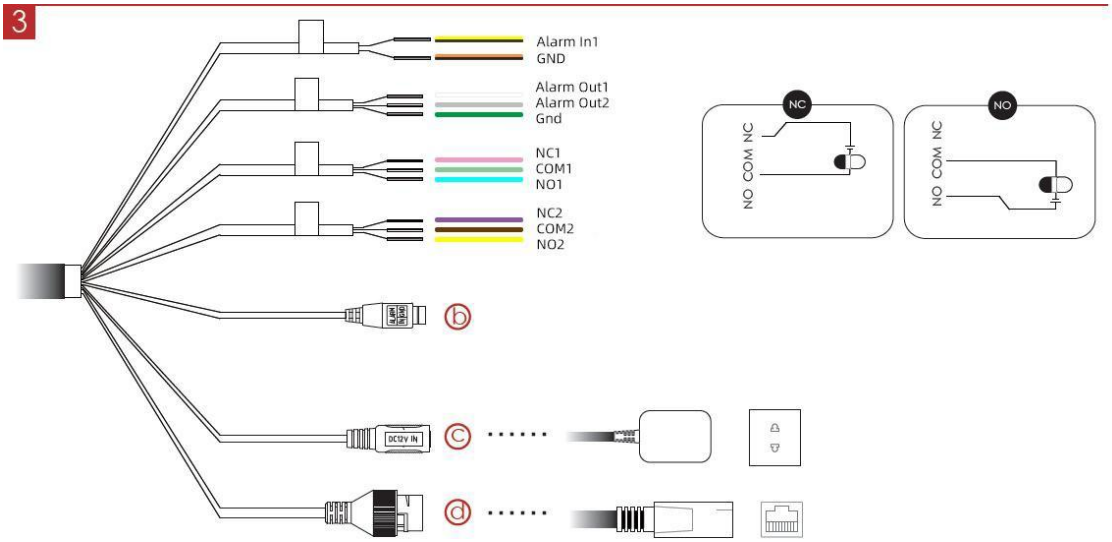
(4) Refer to "Channel Setting" to set the channel corresponding to the radar control signal line; for example, bind channel 3 (corresponding to No1 and nc1) to "Defense Zone 1" and "Time Period 1", and set the alarm duration to 5 (seconds);

(5) Connect the power cord;

(6) After approximately two minutes, the radar will complete its startup. Once a target enters the alarm zone, the connected alarm equipment will trigger.

3.3 How to Wire

Wiring Diagram:



Channel 1 control Alarm _ out _ 1,

Channel 2 controls Alarm _ out _ 2,

Channel 3 controls Relay _ out _ 1 (NC1, NO1,

COM1); Channel 4 controls Relay _ out _ 2

(NC2, NO2, COM2);

Relay_Out_1 and Relay_Out_2 are synchronized relays, meaning their on/off states

are always identical; Control signal line status relationship:

Channel number	Alarm or not	Signal line to com/GND resistor
1	Yes	Alarm Out 1:0
	No	Alarm Out 1:∞
2	Yes	Alarm Out 2:0
	No	Alarm Out 2:∞
3	Yes	N01:0，NO2:0, NC1：∞, NC2:∞
	No	N01:∞，NO2:∞, NC1：0, NC2:0
4	Yes	N01:0，NO2:0, NC1：∞, NC2:∞
	No	N01:∞，NO2:∞, NC1：0, NC2:0

For the channel number alarm function, refer to "Channel Settings" below.

Before setting and switching different radar devices, you need to clear the browser cache.

3.4 Interface Login

Open a web browser (e.g., Google Chrome, Microsoft Edge) : http://192.168.10.123(Default IP address of radar), user name "admin", password "admin", click to log in.

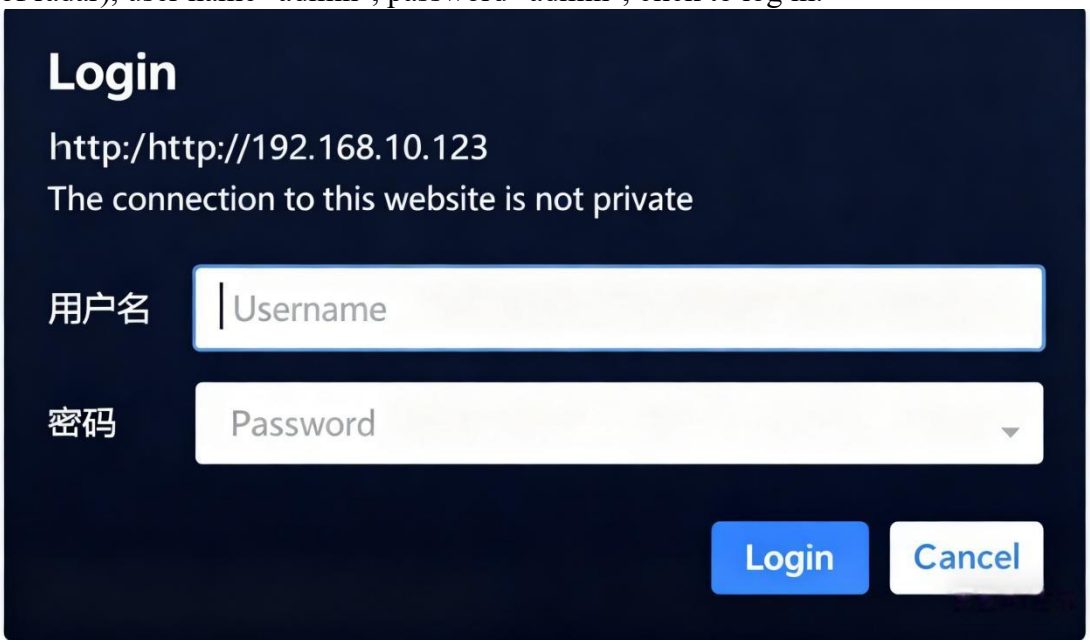
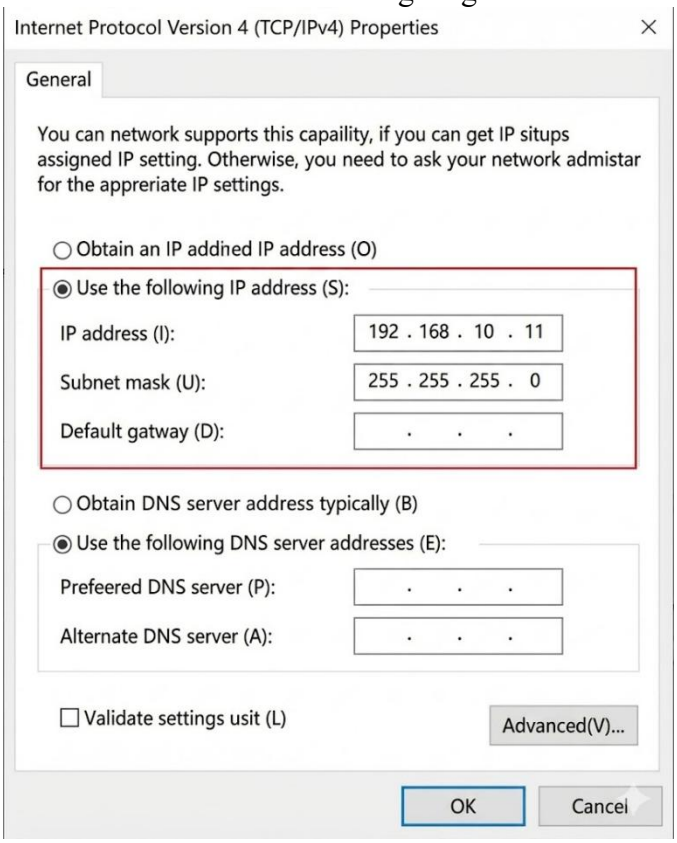


Figure 7 Login Interface

Note: before logging in, please make sure that the computer IP address and the gateway are in the same network segment as the radar IP address, and the radar IP address and the computer IP address are in the same network segment (in the local area network).

The radar's IP address must be unique and different from any other device on the network. The correct network configuration is shown in the following diagram:



3.5 Map Settings

Select Map Settings in the preview menu, and select the required picture in the file as the map of the defense area. The picture is in.png format. If it does not take effect after uploading, please refresh the browser. If it still does not take effect, please clear the browser cache, and then reopen the browser and try again.

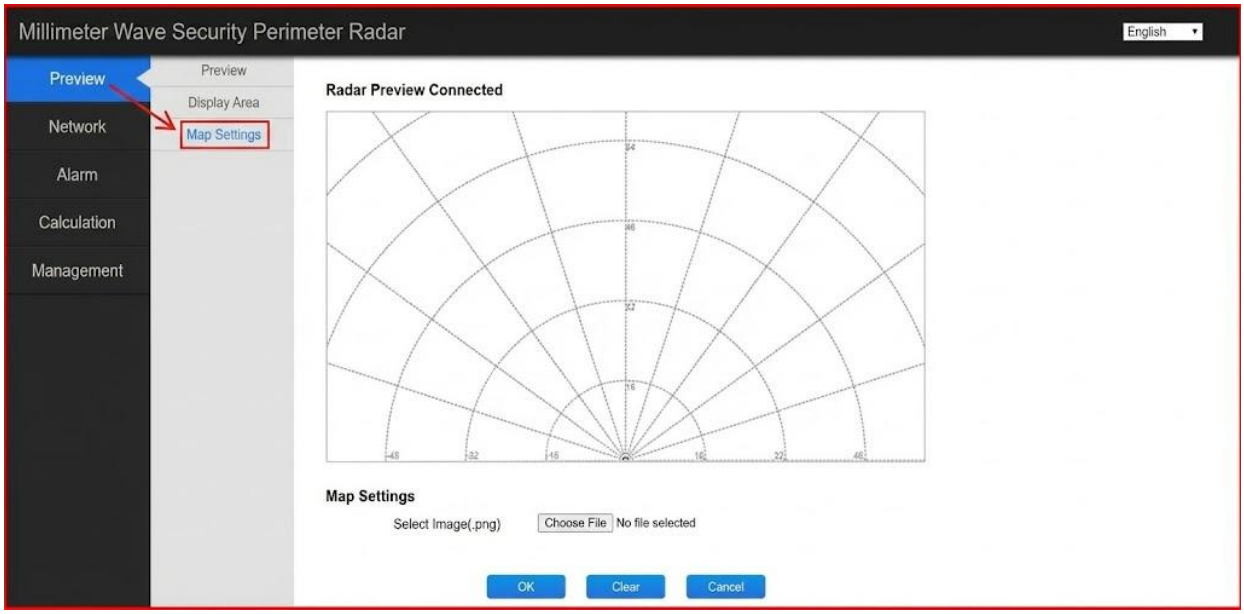


Figure 8 Map interface

3.6 Alarm Setting (step 1 Alarm Area, Step 2 Alarm Period, Step 3 Alarm Output)

3.6.1 Defense Area Drawing

To draw the defense area, you need to select the defense area and the defense area type first. Currently, the drawing of 6 defense areas is supported; Select the alarm area in the alarm menu, and then click the draw zone button. Move the mouse into the drawing area, and the cursor will change to the drawing state (such as the cross cursor). During the drawing process, you can use the cancel function of the right-click menu in the drawing area. When the drawing is finished, you need to use the end function of the right-click menu.

Star dreawing: Start drawing. Start drawing the first defense zone. Same function as the Draw Defense Zone button. End dreawing: Finish drawing. Finish drawing. Undo: Undo the function of the previous step of drawing the defense area.

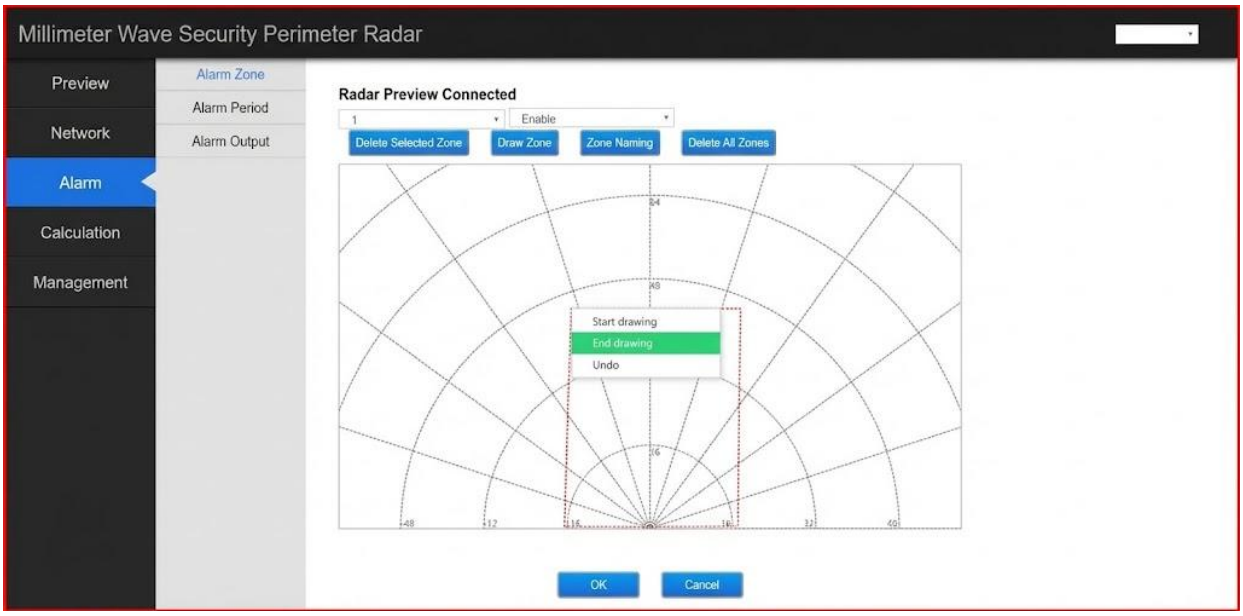


Figure 9 Defense Area Configuration

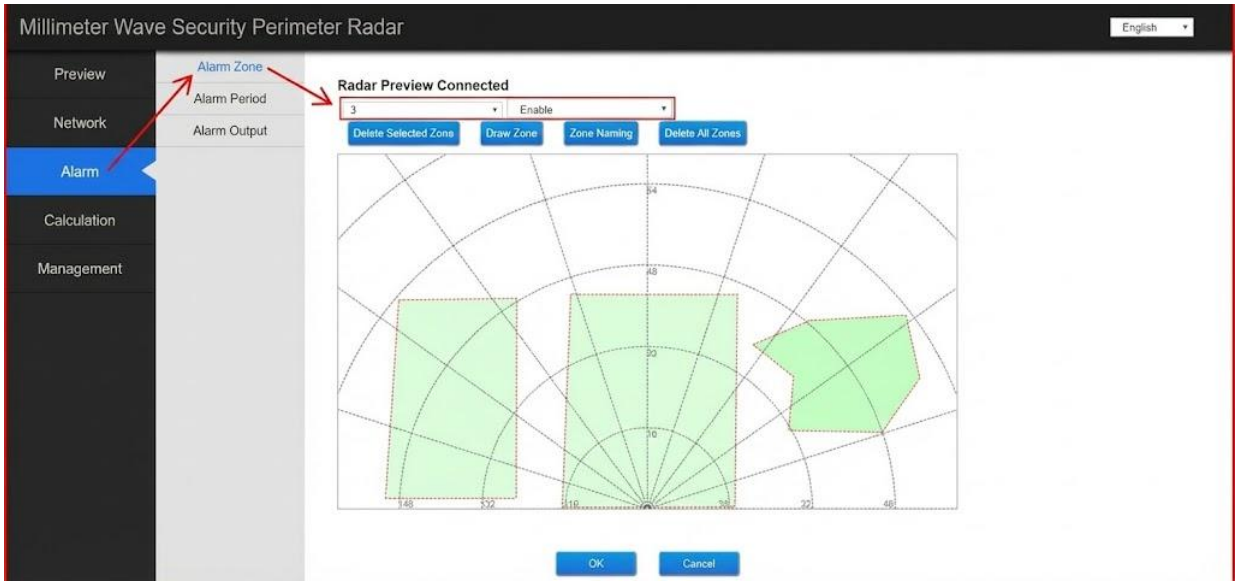


Figure 10 Multi-defense zone configuration

3.6.2 Defense Zone Deletion

Select the alarm area in the alarm menu, first select a certain defense area (see the defense area drawing for the method), and then click to delete the selected defense area to delete a single defense area; you can also directly click to delete all defense areas.

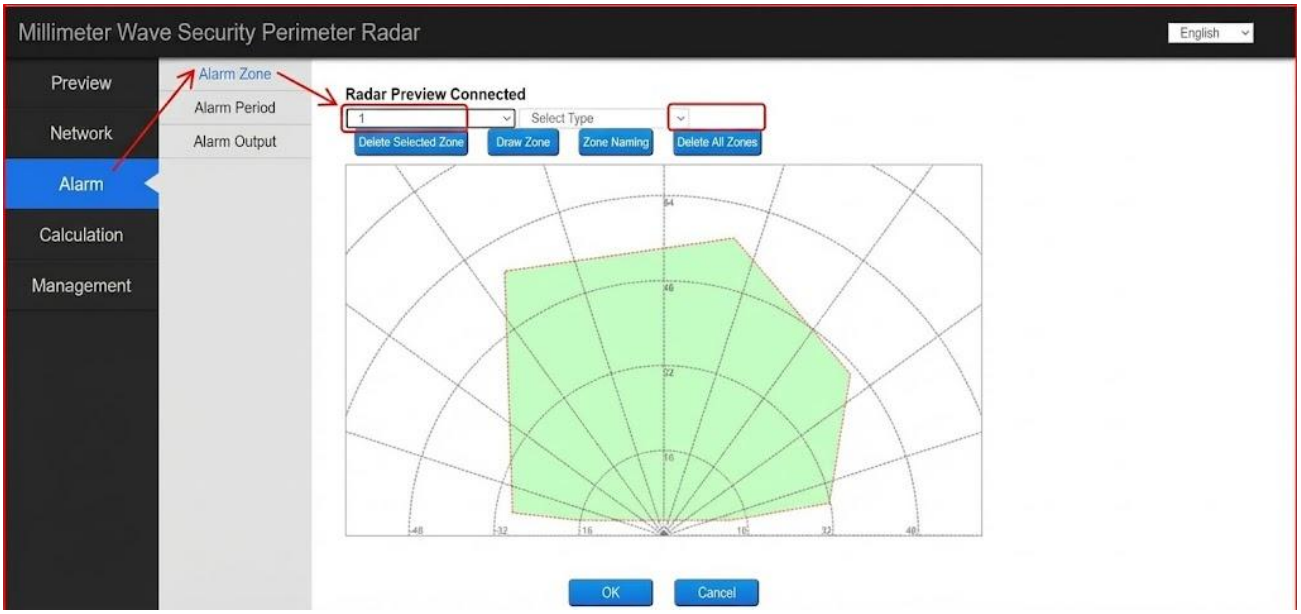


Figure 11 Defense Area Deletion

3.6.3 Time Period Settings

Four time periods can be set, and each time period has two input boxes for start and end time. The time period is used for alarm port binding, and the port bound with a certain time period can trigger the event only in the corresponding time period (the RTC clock synchronization function will be added later, and the power failure will not affect the setting of the alarm time period).

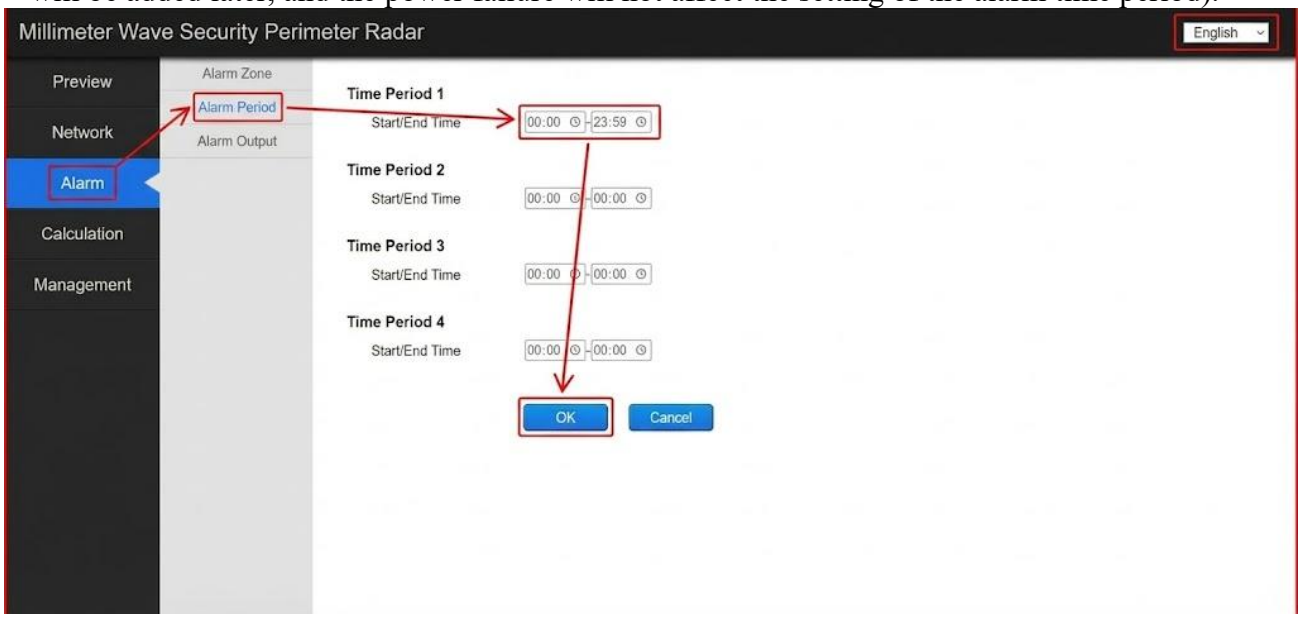


Fig. 12 Alarm Period Configuration

3.6.4 Alarm Output

The radar has 4 alarm output channels, and each channel supports independent configuration. Select the alarm output option in the alarm menu, and 4 channels can be configured; Relays, optocouplers and line sequences corresponding to output channels are as follows:

Output channel 1 (optocoupler output 1): gray note black Alam Out1 _ M, orange note black Alam Out1 _ N; output channel 2 (optocoupler output 2):

yellow note white Alam Out2 _ M, yellow note black Alam Out2 _ N;

Output channel 3 (relay output 1): relay Out1 pink = NC1, light green = COM1, brown = NO1; Output channel 4 (relay output 2): relay Out2 purple = NC2, brown-black = COM2, gray = NO2;

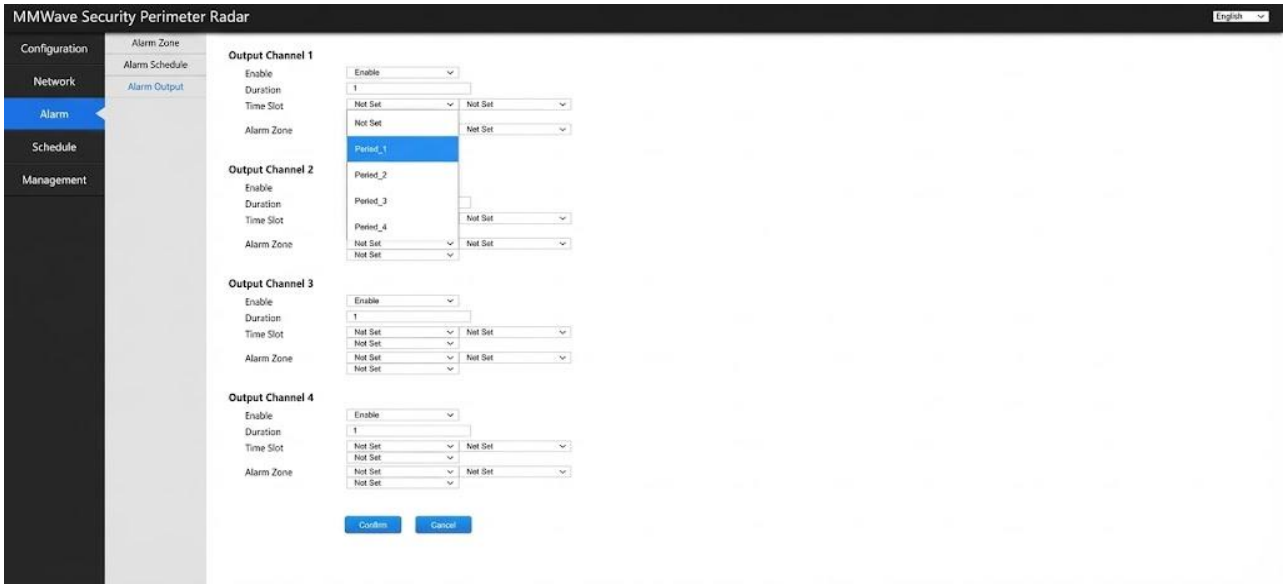


Figure 12 Alarm Output Configuration

3.6.5 Alarm Principle

The radar has four alarm output channels, each of which can be enabled, bound to the alarm period, bound to the alarm area, and set to the alarm duration. The alarm period and the alarm area can be bound to three at the same time;

The setting takes effect after restart;

After the setting comes into effect, each alarm output channel of the radar will output an alarm signal for the corresponding alarm duration if a target enters the corresponding alarm area in the corresponding alarm period when the channel is enabled;

3.7 Masked area drawing (not supported temporarily)

Shielding area drawing is the same as alarm area drawing. The difference is that "Enable" is changed to "Disable". Currently, drawing of 3 shielding areas is supported; Select the alarm area in the alarm menu, and then click the draw zone button. Move the mouse into the drawing area, and the cursor will change to the drawing state (such as the cross cursor). During the drawing process, you can use the cancel function of the right-click menu in the drawing area. After the drawing is finished, you need to use the end function of the right-click menu. Click "OK" until "Setting succeeded" is displayed. The function of the shielding area is to filter out the fixed virtual spots within the radar detection rang

Figure 13 Shielded Area Configuration

3.8 Modify the IP Address

Radar default IP addr http://192.168.10.123Users can modify the radar IP address according to their own needs to ensure that the radar IP address, gateway and computer IP address are in the same network segment.

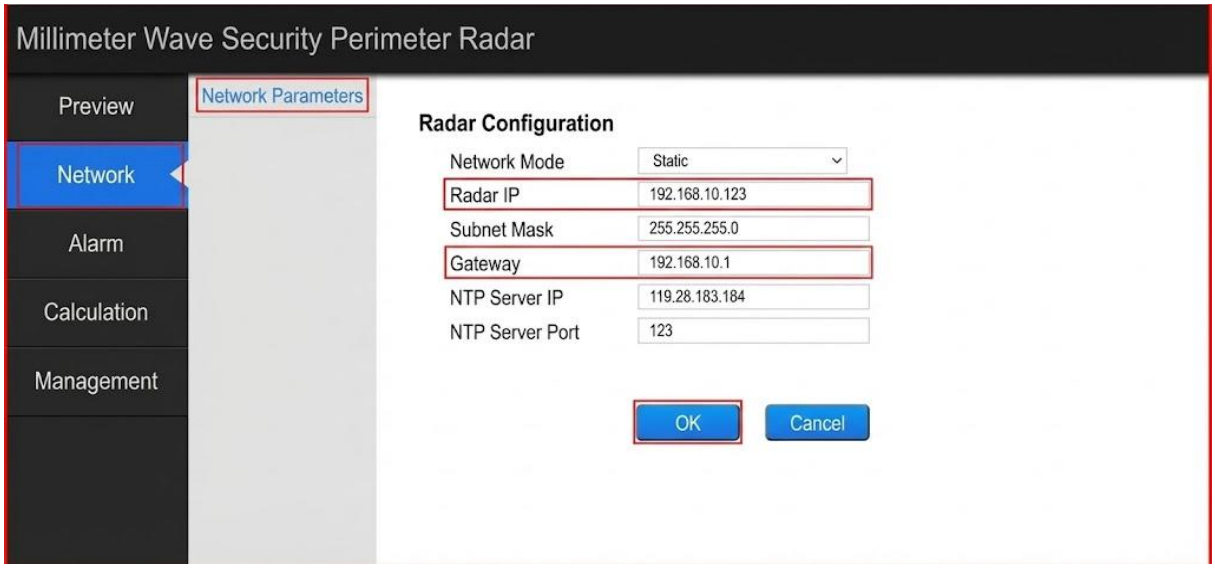


Figure 14 IP address modification

3.9 Algorithm Parameter Setting

Detection sensitivity: adjustable in the range of 1-10, 5 by default. The larger the value is, A higher value increases the radar's sensitivity, which may also increase the probability of false alarms; This function is reflected in a certain difference in the test distance of large-angle targets.

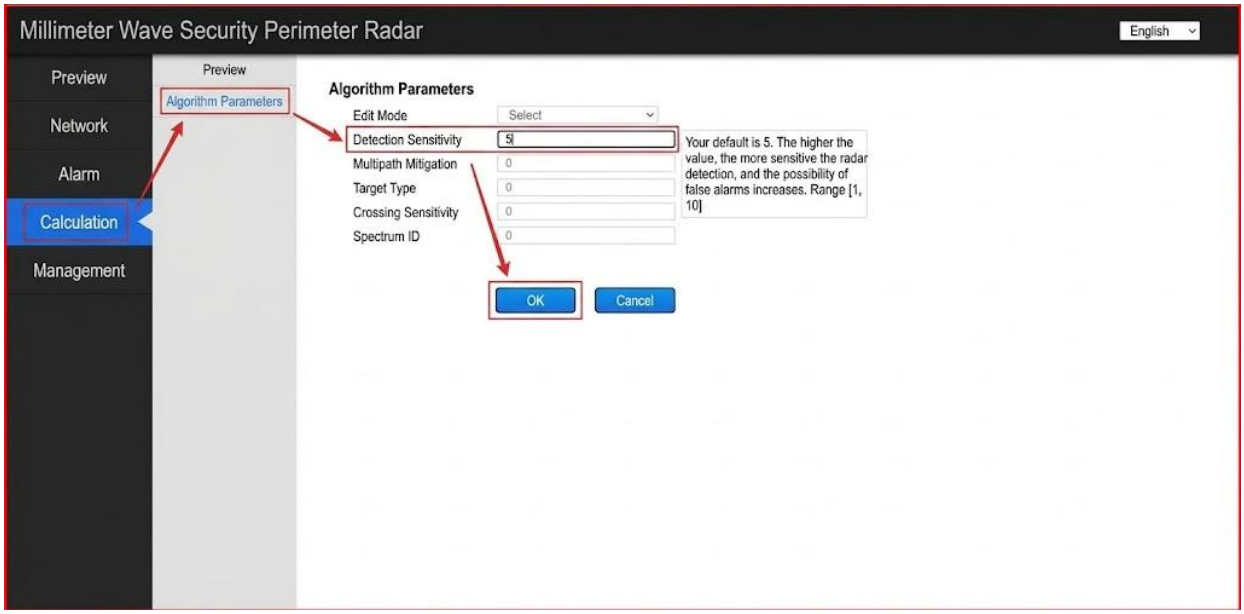


Fig. 15 Configuration of detection sensitivity

The radar algorithm parameter is mainly to set the detection sensitivity, which is divided into four gears (1, 2, 3, 4), and 5 and above are equal to the sensitivity of 4.

1. The detection sensitivity mainly affects the detection radial distance and traverse distance of the radar.

2. The larger the value of detection sensitivity is, the more sensitive the radar is to detect the target, and the corresponding virtual scene will increase.

Frequency Channel Selection: This function helps to mitigate potential co-channel interference by allowing the radar to operate on different frequency sub-bands. It is mainly divided into three frequency bands, which can be accessed through the web

After the setting of [calculation]- [algorithm

parameter]- [wrong frequency ID] at the

end is completed, the primary radar must be

restarted to take effect.

The NSR120 supports three frequency channels: ID0 (76.00 - 76.29 GHz), ID1 (76.29 - 76.65 GHz), and ID2 (76.65 - 77.00 GHz).

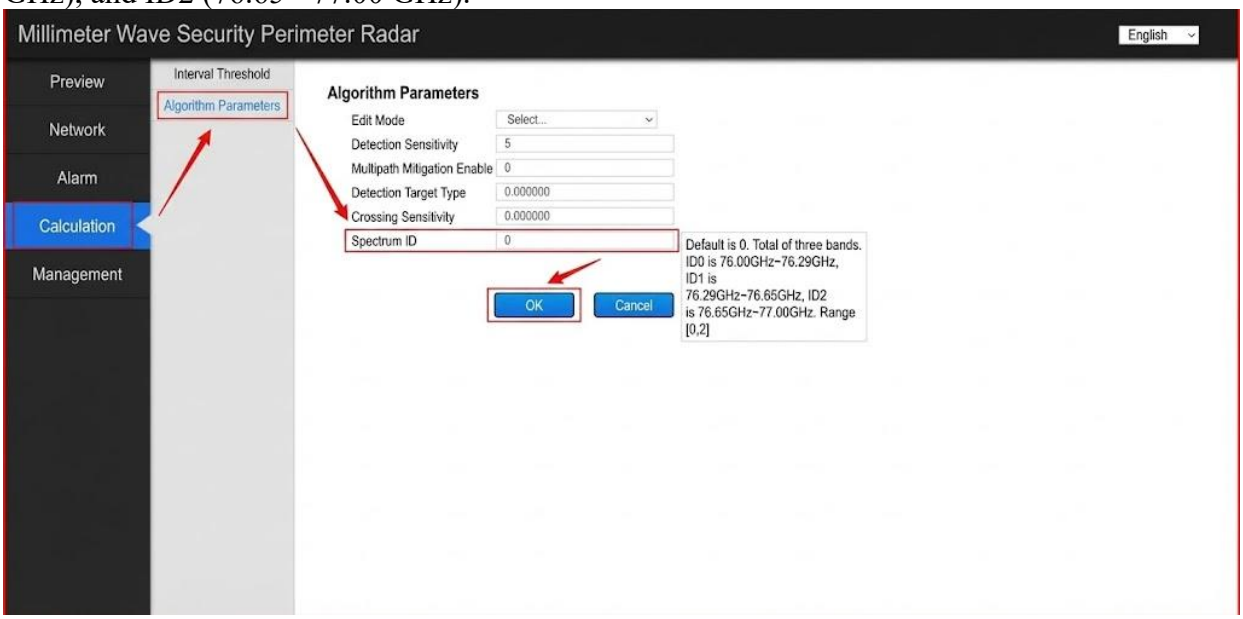


Figure 16 Setting of wrong frequency ID function

3.10 Firmware Upgrade

NSR120 System Upgrade: ... The upgrade process takes approximately five minutes. Do not power off the device until the web interface displays "Upgrade Succeeded".

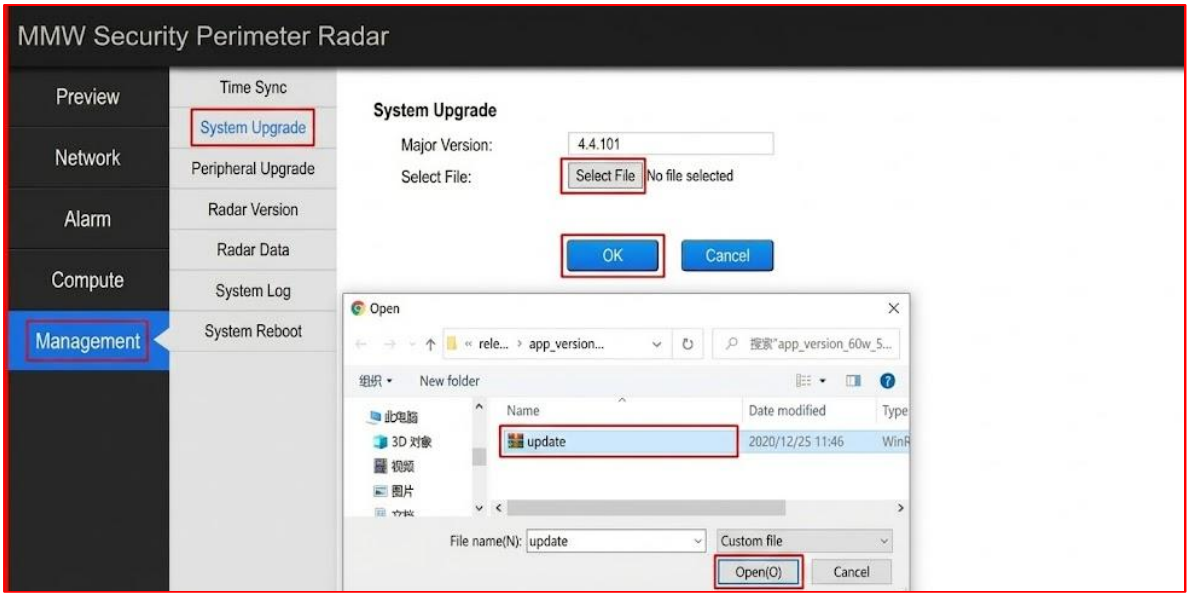


Figure 17 System Upgrade

NSR120 radar firmware upgrade: click Management-Peripheral Upgrade-Select File-Select the upgrade file with the suffix of.bin (it needs to be renamed as up grade before upgrade), and click OK until the Web interface displays "Upgrade succeeded".

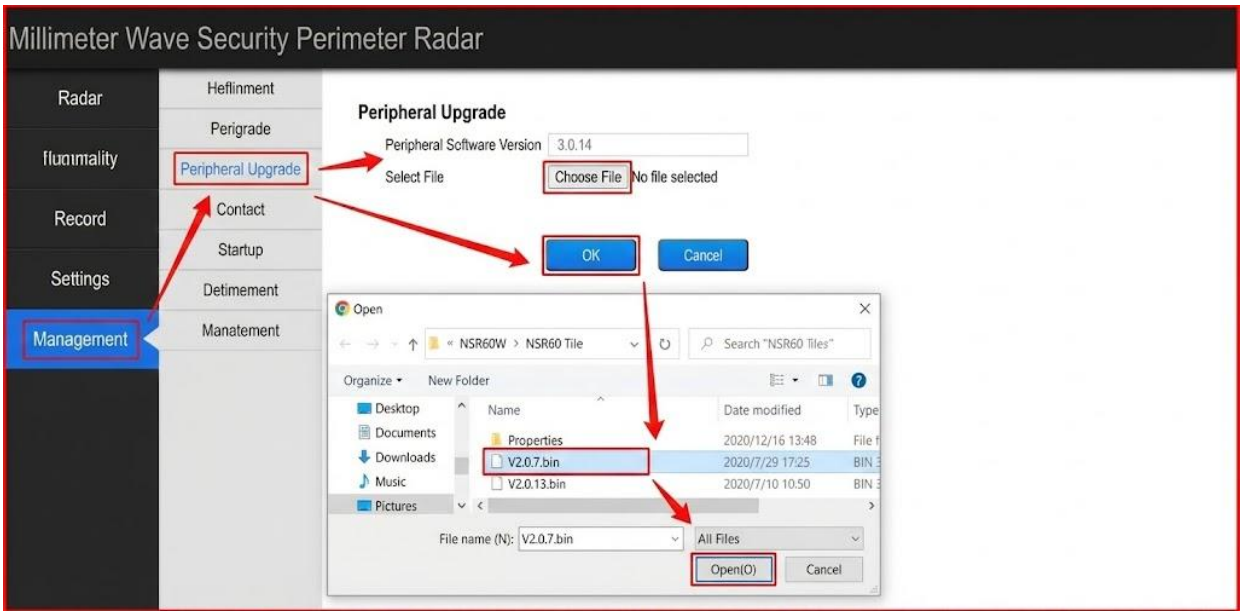


Figure 18 Radar upgrade

3.11 Radar Version

The version information of the radar can be obtained intuitively through the list interface, and the algorithm version (peripheral) will be upgraded in the subsequent optimization.

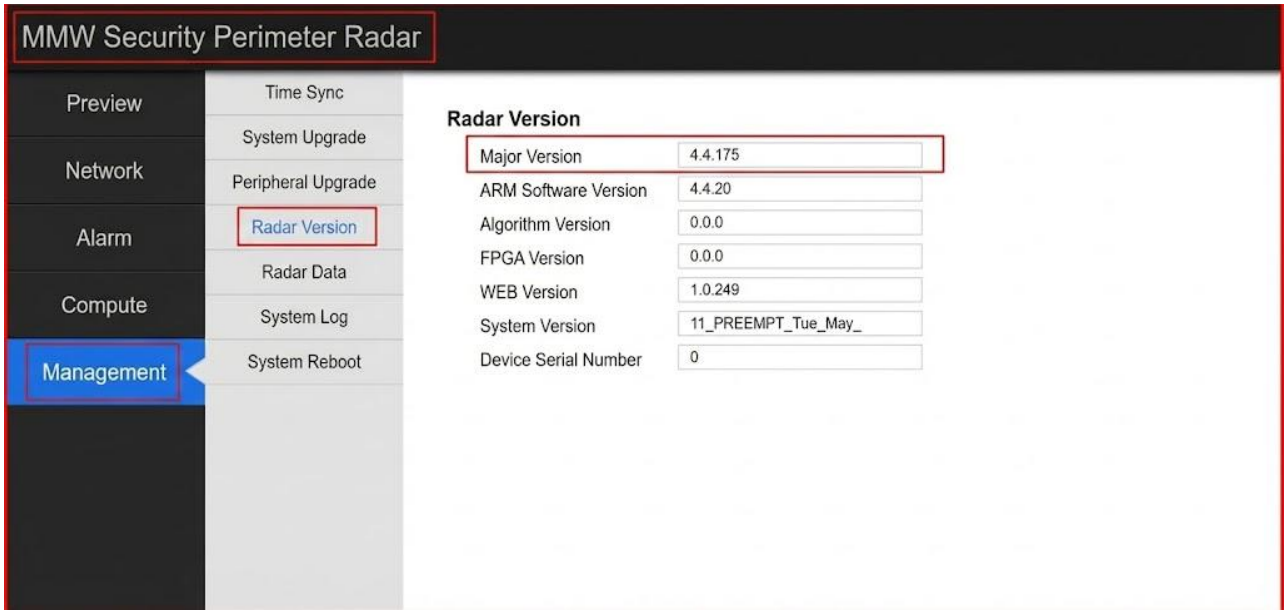


Figure 19 Main version of radar (system upgrade)

3.12 The System Restarts

The radar can be restarted by software, except for the method of direct power-off restart (i.e. hard restart). Refresh and reset the radar data without affecting the saved data.

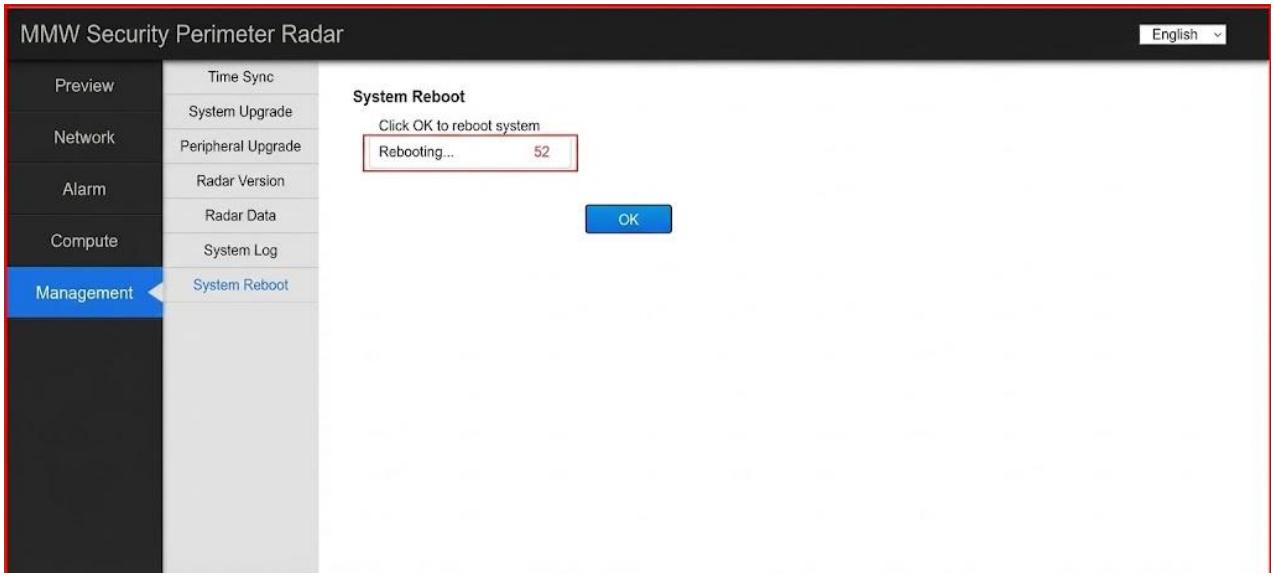


Figure 20 System Restart

4 Frequently Asked Questions (FAQ)

1） There is no response when it is powered on?

Whether the buzzer gives a long sound when the radar is powered on. If you do not hear it, check that the power cord is secure. Check whether the radar power line polarity is correct, and whether the radar power supply voltage (DC 12 V) and working current (current not less than 2a) are normal;

2） The radar powers on normally, but fails to detect targets.

Check whether the installation direction of the radar is correct by referring to the "Structure Direction Definition"; use the special FMCW simulator to check whether the radar output is normal.

3） The radar outputs a target signal even when the detection area is clear.

Please check whether the installation position of the radar is aligned with the target area, causing the radar to be interfered by the surrounding objects; Confirm whether the radar installation pole vibrates, and check whether the grounding is reasonable.