

MAIPU

MyAir AirM WNC6600 Series Wired and Wireless Integrated Controller

Installation Manual

V1.0

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Security Statement

Important! Before powering on and starting the product, please read the security and compatibility information of the product.

Environmental protection

This product has been designed to comply with the environmental protection requirements. The storage, use, and disposal of this product must meet the applicable national laws and regulations.

Preface

Manual Introduction

This manual first describes the appearance and hardware of MyAir AirM WNC6600 Series controller; secondly, describes the installation preparations and installation methods of MyAir AirM WNC6600 Series controller; at last, describes the basic using methods and daily maintenance of MyAir AirM WNC6600 Series controller from the aspects of powering on and running the device, troubleshooting and device maintenance.

Product Versions

The corresponding product versions of the manual are as follows:

Product Name	Product Version
MyAir AirM WNC6600 series wired and wireless integrated controller	WNC6600-100-AC (V1)
	WNC6600-500-AC (V1)
	WNC6600-1000-AC (V1)

Audience

This documentation is intended for:

- Hardware installation engineers
- Commissioning engineers
- Field maintenance engineers
- System maintenance engineers

Conventions

Conventions of screen output format:

Format	Description
Screen print	Represents the output information of the screen
Keywords of Screen print	The red part represents the key information in the screen output

Symbol conventions:

Format	Description
 Note	An alert that contains additional or supplementary information.
 Caution	An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.
 Warning	An alert that calls attention to important information that if not understood or followed can result in personal injury or device damage.

Command conventions:

Convention	Description
Boldface	Bold text represents commands and keywords that you enter literally as shown.
<i>Italic</i>	Italic text represents arguments that you replace with actual values.
[]	Square brackets enclose syntax choices (keywords or arguments) that are optional.
{ x y ... }	Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.
[x y ...]	Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.
{ x y ... } *	Asterisk marked braces enclose a set of required syntax choices separated by vertical bars, from which you select at least one.
&<1-n>	The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times.
#	A line that starts with a pound (#) sign is comments.

The icons used in the manual and the meanings:

Icon	Description
	Represents a generic switch

Supporting Manuals of Product

The supporting manuals of the product:

Manual name	Overview
<i>MyAir AirM WNC6600 Series Wired and Wireless Integrated</i>	Describes the device hardware specifications and installation

Manual name	Overview
<i>Controller Installation Manual</i>	methods, guiding you to install the device
<i>MyAir AirM WNC6600 Series Wired and Wireless Integrated Controller Configuration Manual</i>	Describes the configuration methods and configuration steps of the device software functions, providing typical cases for reference
<i>MyAir AirM WNC6600 Series Wired and Wireless Integrated Controller Command Manual</i>	Describes the device commands, equivalent to command dictionary, convenient for searching for the function of each command
<i>MyAir AirM WNC6600 Series Wired and Wireless Integrated Controller Troubleshooting</i>	Describes how to handle with the typical faults and problems of the device in the daily maintenance

Obtaining Documentation

You can access the most up-to-date Maipu product documentation on the World Wide Web at www.maipu.com.

Technical Support

- Technical supporting hotline: 400-886-8669
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Documentation Feedback

You can feed back your opinions and suggestions by:

- Email: techsupport@maipu.com
- Technical hotline: 400-886-8669

We appreciate your comments.

Revision Records

Version	Revision Date	Revised Content
V1.0	2014-06-30	First formal release

Contents

Preface	3
1 Product Introduction	9
1.1 Product Models.....	9
1.2 Product Appearance and Dimension.....	10
1.2.1 WNC6600-100-AC Appearance.....	10
1.2.2 WNC6600-500-AC Appearance.....	11
1.2.3 WNC6600-1000-AC Appearance.....	12
1.3 Optional Power Modules.....	13
1.3.1 AD250-1S005E (V1) Power Module.....	13
1.3.2 DD500-5D005E (V1) Power Module.....	13
1.4 Device Air Passage.....	14
1.5 Physical Parameters.....	14
2 Installation Preparations	16
2.1 Safety Precautions.....	16
2.1.1 General Safety.....	16
2.1.2 Electrical Safety.....	16
2.1.3 Static Safety.....	17
2.1.4 Handling Safety.....	18
2.1.5 Laser Safety.....	18
2.2 Check Device Running Environment.....	18
2.2.1 Check Equipment Room Conditions.....	18
2.2.2 Check Power Supply System.....	18
2.3 Open-Package and Inspection.....	19
2.3.1 Open Device Package.....	19
2.3.2 Open-Package Inspection.....	19
3 Device Installation	20
3.1 Install Device to Cabinet.....	20
3.1.1 Installation Preparations.....	20
3.1.2 Install Hanging Ears to Switch.....	20
3.1.3 Install Device to Cabinet.....	21
3.1.4 Installation Check.....	22
3.2 Install Device to Desktop.....	23
3.4 Install Power Module (Optional).....	25
3.4.1 Installation Preparations.....	25
3.4.2 Install Power System.....	25

3.5 Connect Power Cable	26
3.5.1 Installation Preparations	26
3.5.2 Connect AC Power Cable	26
3.5.3 Connect DC Power Cable	26
4 Power on and Run Device.....	29
4.1 Log into Device	29
4.1.1 Connect Configuration Cable.....	29
4.1.2 Set PC HyperTerminal Parameters	31
4.1.3 Power on and Start	33
4.1.4 Check after Power on	34
4.2 Access Network.....	34
4.2.1 Access Network via Ethernet Twisted Pair	34
4.2.2 Access Network via Fiber.....	35
4.3 Hardware Management.....	38
4.3.1 View Software and Hardware Version Information of Device.....	38
4.3.2 View Status Information of Power Module	39
4.3.3 View System Environment Temperature Information.....	40
4.3.5 View Fan Status Information.....	40
4.3.5 View Pluggable Optical Module Information	41
5 Device Maintenance and Troubleshooting	44
5.1 Troubleshooting of Configuration System.....	44
5.1.1 Troubleshooting about no Display on Terminal	44
5.1.2 Troubleshooting about Messy Code on Terminal	45
5.2 Troubleshooting about Power	45
5.2.1 Fixed Power Troubleshooting	45
5.2.2 Modular Power Troubleshooting	46
5.3 Device Maintenance.....	46
5.3.1 Change Power Module.....	47
5.3.2 Change Swappable Optical Module.....	48
5.4 Get Technical Supporting	50
Appendix.....	52
A Specifications of General Interfaces	52
A.1 Console Port Attribute	52
A.2 USB Console Port Attribute.....	52
A.3 USB Port Attribute	53
A.4 10Base-T/100Base-TX/1000Base-T-RJ45 Electrical Port Attributes	53
A.5 10Base-T/100Base-TX-RJ45 POE+ Interface Attributes	54
A.6 1000Base-X-SFP Optical Port Attributes.....	54
A.7 COMBO Interface Attributes	54
A.8 10G Ethernet Optical Port Attributes.....	55
B Device Indicators	55
B.1 System Status Indicators	55
B.2 Interface Status Indicator.....	56
B.3 Power Module Status Indicator	57

C Interface Cable Specifications.....	58
C.1 Ethernet Electrical Port Cables	58
C.2 Console Port (EIA/TIA-232) Adapter Cable Sequence	58
C.3 USB Console Port Adapter Cable.....	59
C.4 100Base-FX 100M Optical Module Model and Corresponding Cable.....	59
C.5 1000Base-X GE Optical Module Model and Corresponding Interface Cable.....	60
C.6 10 GE Optical Module Model and Corresponding Interface Cable.....	61
D Device Running Environment Requirement	62
D.1 Environment Requirement of Equipment Room	62
D.2 Requirements for Power Supply.....	64
E Device Grounding Specification and Protection.....	66
E.1 Device Grounding Specifications	66
E.2 Device Protection.....	69
F Environmental Substance Statement	72

1 Product Introduction

MyAir AirM WNC6600 series wired and wireless integrated controller is the wireless controller developed by Maipu, providing the powerful WLAN access control function for middle and large WLAN.

The chapter mainly introduces the product specifications of WNC6600, including:

[1.1 Product Models](#)

[1.2 Product Appearance and Dimension](#)

[1.3 Optional Power Modules](#)

[1.4 Device Air Passage](#)

[1.5 Physical Parameters](#)

1.1 Product Models

To meet the requirements of different customers, WNC6600 provides three product models, as shown in the following table:

TABLE1-1 PRODUCT MODELS

Product Model	Supported Interface and Description
WNC6600-100-AC	24 10/100Base-T electrical ports, two COMBO ports (10/100/1000Base-T+100Base-FX/1000Base-X), one DC0 port (10/100/100Base-T), one CONSOLE port (RJ45), one USB interface, one Micro SD interface (inbuilt), fixed single power, 128 manageable APs at most. The first eight 10/100Base-T electrical interfaces: Each port supports 15.4W/30W POE power supply. The whole device supports 8*15.4W or 4*30W POE power supply at most.
WNC6600-500-AC	12 10/100/1000Base-T electrical ports, 12 COMBO ports (10/100/1000Base-T+100Base-FX/1000Base-X), two Gigabit optical interfaces (SFP+/1000BASE-X), one DC0 port (10/100/100Base-T), one CONSOLE port (RJ45/Micro USB), one USB interface, one SD interface, modular dual power, 512 manageable APs at most
WNC6600-1000-AC	12 10/100/1000Base-T electrical ports, 12 COMBO ports (10/100/1000Base-T+100Base-FX/1000Base-X), two Gigabit optical interfaces (SFP+/1000BASE-X), one DC0 port (10/100/100Base-T), one CONSOLE port (RJ45/Micro USB), one USB interface, one SD interface, modular dual power, 1024 manageable APs at most

1.2 Product Appearance and Dimension

WNC6600 adopts centralized hardware platform. All product modules of the series adopt 1U standard desk-top architecture. Different product models have different chassis depths.

TABLE1-2 PRODUCT DIMENSION

Product Model	Dimension
WNC6600-100-AC	442mm * 380mm*44.2mm (W x D x H)
WNC6600-500-AC	440mm *420mm*44.2mm (W x D x H)
WNC6600-1000-AC	

1.2.1 WNC6600-100-AC Appearance

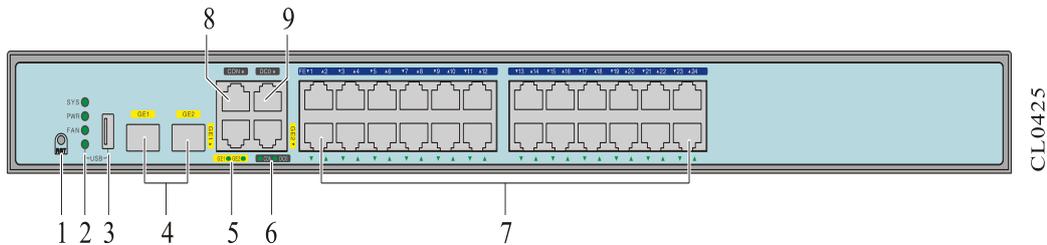


FIGURE 1-1 FRONT PANEL DIAGRAM OF WNC6600-100-A

1: Reset button (Press the reset button for 3s and then the whole device restarts and clears the user configuration)	2: Device status indicator SYS : system status PWR : power status FAN : fan status USB : USB interface status
3 : USB port	4. Combo port (10/100/1000Base-T+100BASE-FX/1000Base-X)
5 : Combo port status indicator	6 : Port status indicator CON : Console port status indicator DC0 : DC0 port status indicator
7 : 10/100BASE-T electrical interface	8 : Console port
9 : DC0 port (10/100/1000Base-T)	

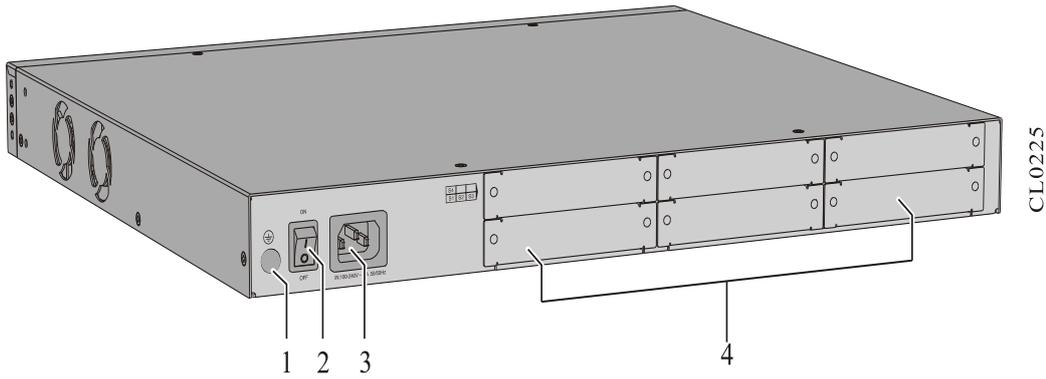


FIGURE1-2 BACK BOARD DIAGRAM OF WNC6600-100-AC

1. Ground terminal	2: Power switch
3: AC power socket	4: Air baffle

1.2.2 WNC6600-500-AC Appearance

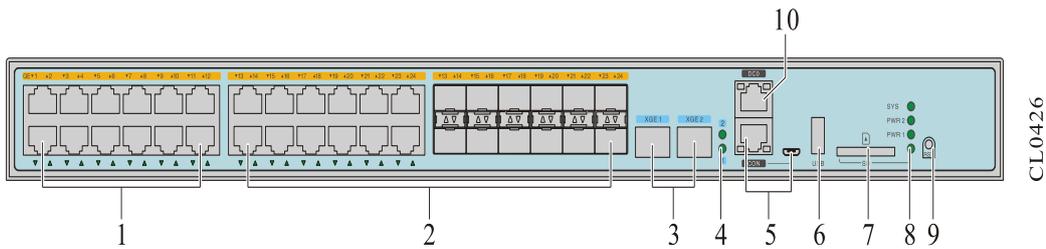


FIGURE 1-3 FRONT PANEL DIAGRAM OF WNC6600-500-AC

1: 10/100/1000Base-T electrical interface	2 : Combo port (10/100/1000Base-T+100BASE-FX/1000Base-X)
3: Gigabit SFP+ optical interface (SFP+/1000Base-X)	4: Gigabit optical interface status indicator
5 : Console port (Micro USB/RS232)	6 : USB port
7: SD card	8: Device status indicator SYS: system status PWR2: the status of power 2 PWR1: the status of power 1 SD: SD card status indicator
9: Reset button (Press the reset button for 3s and then the whole device restarts and clears the user configuration)	10: DC0 port (10/100/1000Base-T)

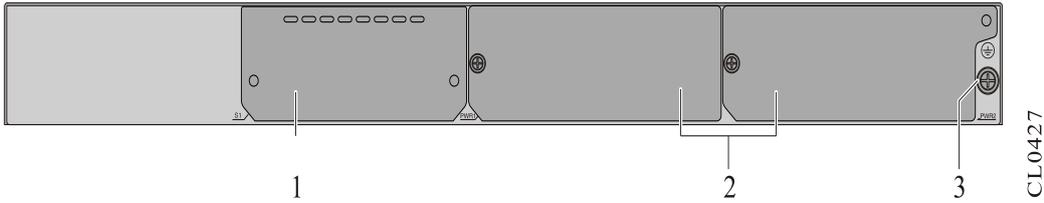


FIGURE 1-4 BACK BOARD DIAGRAM OF WNC6600-500-AC

1. Air baffle	2. Modular power (PWR1, PWR2)
3. Ground terminal	

1.2.3 WNC6600-1000-AC Appearance

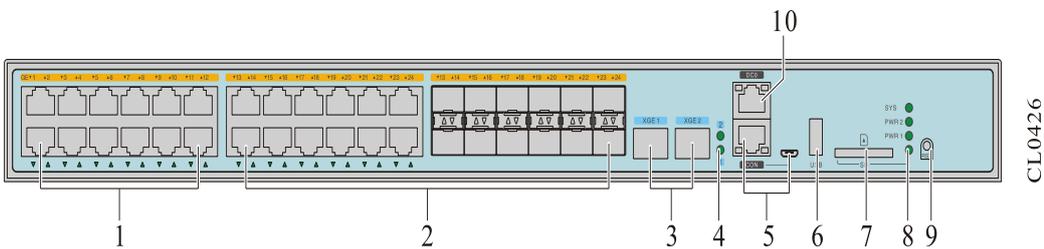


FIGURE 1-5 FRONT PANEL DIAGRAM OF WNC6600-1000-AC

1 : 10/100/1000Base-T electrical interface	2: Combo port (10/100/1000Base-T+100BASE-FX/1000Base-X)
3 : Gigabit SFP+ optical interface (SFP+/1000Base-X)	4 : Gigabit optical interface status indicator
Console port (Micro USB/RS232)	USB port
5 : SD card	6 : Device status indicator SYS: system status PWR2: the status of power 2 PWR1: the status of power 1 SD: SD card status indicator
7 : Reset button (Press the reset button for 3s and then the whole device restarts and clears the user configuration)	8: DC0 port (10/100/1000Base-T)

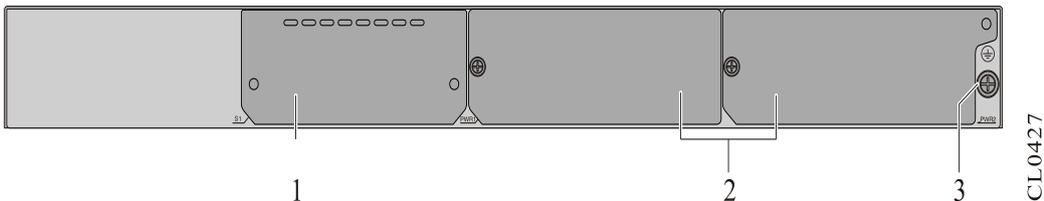


FIGURE 1-6 BACK PANEL DIAGRAM OF WNC6600-1000-AC

1. Air baffle	2. Modular power (PWR1, PWR2)
3. Ground terminal	

1.3 Optional Power Modules

WNC6600-500-AC and WNC6600-1000-AC provide two power slots and support two powers working concurrently, used to back up the system power. Currently, the modular power models and functions supported by the two devices are described in the following table:

TABLE 1-3 POWER MODULE SUPPORTED BY WNC6600-500/1000-AC

Model	Name	Remarks
AD250-1S005E (V1)	250W AC power	100V-240V (3.5A) AC input, 12V (21A) DC output, that is, output power 250W
DD500-5D005E (V1)	500W DC power	-40V – -57V (15A) DC input, 12V (10A) DC output, -53V (7A) DC output. -53V power is the reserved PoE power, not used by the product.

1.3.1 AD250-1S005E (V1) Power Module

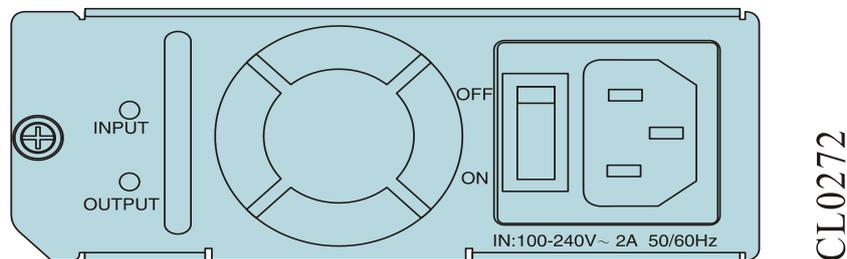


FIGURE 1-7 PANEL DIAGRAM OF AD250-1S005E (V1) POWER MODULE

1.3.2 DD500-5D005E (V1) Power Module

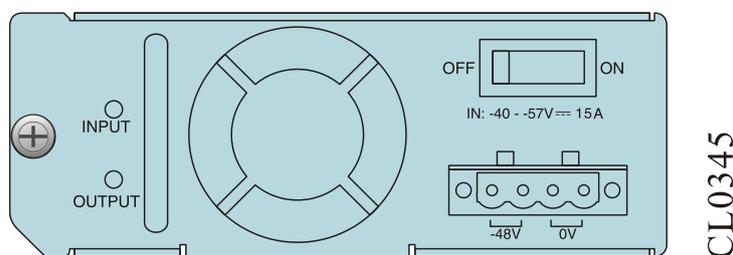


FIGURE 1-8 PANEL DIAGRAM OF DD500-5D005E (V1) POWER MODULE

Note

- Only WNC6600-500-AC and WNC6600-1000-AC adopts the modular power and WNC6600-100-AC adopts the inbuilt power.
- WNC6600-500-AC and WNC6600-1000-AC support dual-power 1+1 redundancy backup of the same model and current sharing and do not support the mixing of the DC and AC power modules.
- For the meaning of the modular power indicators, refer to Appendix B-3 Power Module Status Indicator Description.

1.4 Device Air Passage

The right and left sides of the wireless controller are the air inlet and outlet, as shown in the following figure. The right and left sides of the device should have the enough spaces (it should be no less than 60mm) for good ventilation.

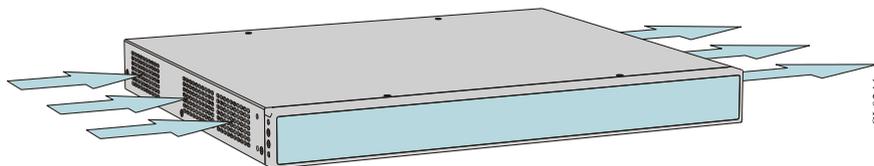


FIGURE 1-9 DEVICE AIR PASSAGE DIAGRAM

1.5 Physical Parameters

TABLE 1-4 PHYSICAL PARAMETERS

Item	Description	
Appearance dimension (W x D x H)	WNC6600-100-AC	440mm x 380mm x 44.2mm
	WNC6600-500-AC	440mm x 420mm x 44.2mm
	WNC6600-1000-AC	
Max. Power (full-configured)	WNC6600-100-AC	Static power: 39.2W Dissipation power (with POE): 58W POE power: 123.2W
	WNC6600-500-AC	85W
	WNC6600-1000-AC	85W
The weight of the whole device	WNC6600-100-AC	4.74Kg
	WNC6600-500-AC	7.32Kg (configured with two AD250-1S005E powers)

Item	Description	
		7.46Kg (configured with two DD500-5D005E powers)
	WNC6600-1000-AC	7.32Kg (configured with two AD250-1S005E powers) 7.46Kg (configured with two DD500-5D005E powers)
The weight of the modular power	AD250-1S005E	1.06Kg
	DD500-5D005E	1.14Kg
Rated input voltage	AC: 100-240V 50/60Hz DC: -40--57V	
Short-term work temperature	-5°C~55°C	
Long-term work temperature	0°C~45°C	
Long-term work humidity	10%~90%	

 **Note**

- The short-term working condition means less than 48h work continuously and less than 15-day work for the annual total.

2 Installation Preparations

This chapter describes the preparations before installing the devices and the related work, including:

[2.1 Safety Precautions](#)

[2.2 Check Device Running Environment](#)

[2.3 Open-Package and Inspection](#)

Note

- When the device is delivered, there is the packing list. Please confirm whether the accessories are complete and good according to the items in the packing list. If there is damaged or loss, please contact Maipu technical staff to change.
-

2.1 Safety Precautions

2.1.1 General Safety

Caution

- Ensure that the ground of the installation place is dry and smooth and you have made the anti-skidding measures.
 - Keep the device clean and dust-free; do not place the device in the damp place.
 - When moving the device, avoid that the body is scratched by the sharp part of the equipment.
-

2.1.2 Electrical Safety

Caution

- Please check whether there are potential dangers. For example, the power is not grounded, power supply grounding is not reliable, and the ground is wet.
 - Before installation, get to know the location of the emergency power switch in the room;
-

when there is an accident, cut off the emergency power switch at first.

- Before moving the chassis, be sure to unplug all external cables (including power cable).
 - When maintaining with power, it is recommended that there are two or more persons in the field.
 - When closing the power, ensure that the neutral line and live line are disconnected.
-

2.1.3 Static Safety

To avoid the static from damaging the electronic parts of the wireless controller, we need to take the anti-static measures.

Caution

- When installing the components of the wireless controller, especially installing the components with the circuit board (such as board), we should wear anti-static wrists.
 - When holding the circuit board, please hold the edge of the circuit board and do not touch the components or printed circuit.
 - For the security, please check the resistance of the anti-static wrists. The resistance between the body and the ground should be 1-10 megohms.
-

The using steps of the anti-static wrists are as follows:

- Step 1: Put his hand into the anti-static wrist.
- Step 2: Tighten the fastener and confirm that the piece metal on the anti-static wrist is well contacted with the skin.
- Step 3: Clip the alligator clip of the anti-static wrist to the grounding screw of the device.
- Step 4: Confirm that the anti-static wrist well-grounded.

The using method of the anti-static wrist is as shown in the following figure.

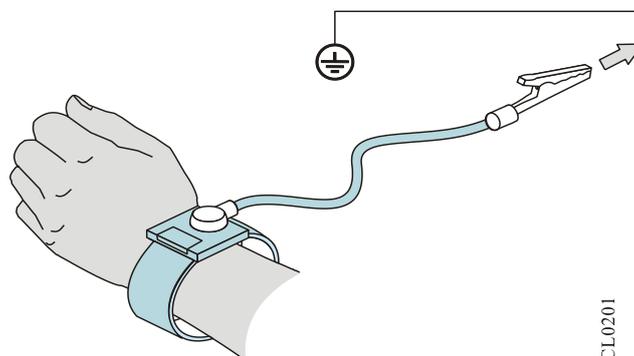


FIGURE 2-1 USING METHOD DIAGRAM OF ANTI-STATIC WRISTS

2.1.4 Handling Safety

- Before handling or moving the device, unplug all external cables (including power cable).
- If the moving distance is long, it is recommended to use the professional mechanical handling tools.

2.1.5 Laser Safety

For the wireless controller with the optical port, avoid directly viewing the laser beam from the optical module inside.

Warning

- Viewing the laser beam from the optical module inside directly may damage your eyes.
-

2.2 Check Device Running Environment

2.2.1 Check Equipment Room Conditions

To ensure the normal running of the device, take the corresponding measures to meet the environment requirement of the device running:

- Air conditioning and ventilation system can ensure the normal running temperature and humidity conditions of the device. For details, refer to [Environment Requirements of Equipment Room](#).
- The good grounding is the basis of the device running and the important guarantee conditions of preventing lightning and resisting interference. Ensure that grounding meets the grounding specifications. For details, refer to [Device Grounding Specifications](#).
- Confirm whether there is enough installation space and handling channel space.
- Ensure that the cleanness of the equipment room meets the requirement. Do not place the device in the environment with lots of dust, such as being renovated.

2.2.2 Check Power Supply System

The good power system is the basis of the wireless controller starting and stable running. The series wireless controller is the desk-top device and is configured with power when leaving the factory, so you just need to check the power system of the installation place.

Ensure that the power supply system of the installation place is stable and can meet the parameter requirement of the wireless controller device, such as input mode and rated input voltage. For details, refer to [Power Condition Requirements](#).

Note

- For the power consumption data of the device, refer to [Physical Parameters](#).
-

2.3 Open-Package and Inspection

2.3.1 Open Device Package

The desk-top wireless controller adopts the carton packaging. The box comprises the carton, plastic bags, protection EPE and other packaging materials. The open-package steps are as follows:

- Step 1: View the carton label, and confirm the device model.
- Step 2: Use a paper knife to gash the tape along the lid commissure; be careful when using the knife and do not insert too deep to avoid damaging equipment inside.
- Step 3: Open the carton, remove the foam board, and then you can get out of the device.

2.3.2 Open-Package Inspection

- Step 1: Get the equipment list.
- Step 2: According to the equipment list and the device label, check whether the device is correct.
- Step 3: According to the equipment list, check whether the device and other accessories are complete.

Note

- Keep the accessories in the accessory box and do not lose.
-

3 Device Installation

This chapter describes the device installation, including:

[3.1 Install Device to Cabinet](#)

[3.2 Install Device to Desktop](#)

[3.3 Ground the Device](#)

[3.4 Install Power Module \(Optional\)](#)

[3.5 Connect Power Cable](#)

[3.6 Check after Installation](#)

3.1 Install Device to Cabinet

This section describes how to install the device to the 19-inch standard cabinet.

3.1.1 Installation Preparations

- WNC6600 is 1U high and the user can fix the device via one pair of hanging ears.
- Check the grounding and stability of the cabinet and ensure that there is no obstacle inside and around the cabinet affecting the device installation

Note

- 1U is 44.45mm. Here, U is short for Rack Unit.
-

3.1.2 Install Hanging Ears to Switch

Step 1: When installing the hanging ears to the chassis, make the ears align with the fixed screw holes of the device and the screw holes on the chassis side panel, as shown in the following figure:

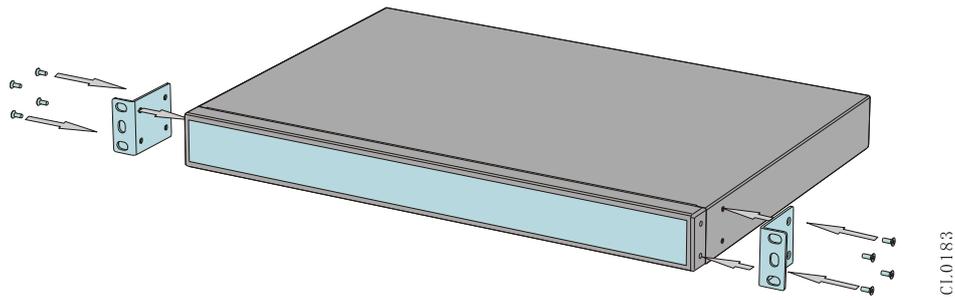


FIGURE 3-1 INSTALL HANGING EARS TO THE DEVICE

Step 2: Tighten the screw clockwise, so that the hanging ears are fixed to the chassis. After the installation is complete, it is as shown in the following figure:

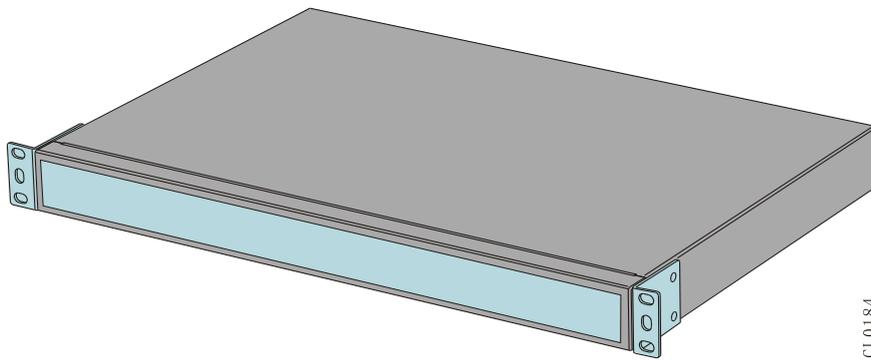


FIGURE 3-2 INSTALLING HANGING EARS IS COMPLETE

3.1.3 Install Device to Cabinet

Caution

- Before installing the device to the cabinet, ensure that the cabinet is installed with the slide (tray) and the slide (tray) can support the weight of the device and the accessories.
-

The following describes the steps of installing the device to cabinet:

- Step 1: Wear the anti-static wrist strap, and check the grounding and stability of the cabinet.
- Step 2: Use the ears to compare and get the location of the floating nuts on the square holes of the cabinet column and mark it.
- Step 3: At the marked location, install the floating nuts, as shown in the following figure:

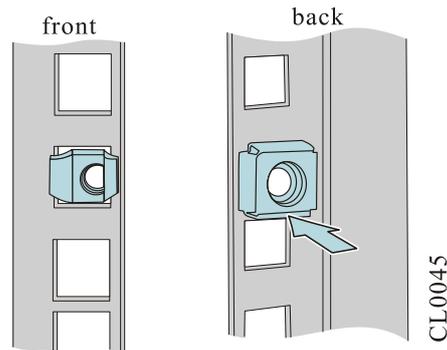


FIGURE 3-3 INSTALL FLOATING NUTS

- Step 4: Use the screws to fix the hanging ears at the two sides of the wireless controller. For installation method, refer to [Install Hanging Ears to Device](#).
- Step 5: According to the actuality and the installation location of the hanging ears, move the device along the cabinet to the appropriate location.
- Step 6: Use the screws meeting the installation dimension of the cabinet (the device does not have the screws for installing on the cabinet; the screws are provided by the manufacturer of the cabinet, the surface gets the anti-rust processing, and the screws match with the floating nuts) to fix the device with the square holes of the cabinet column via the hanging ears. The installation methods are as shown in the following figure. Pay attention to keep the location level and firm.

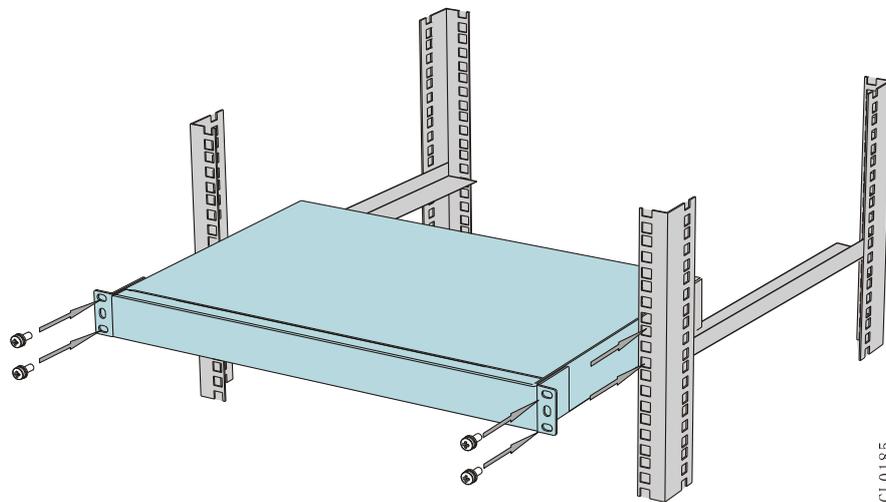


FIGURE 3-4 INSTALL DEVICE TO CABINET

3.1.4 Installation Check

After installing the device to the cabinet, check according to the following items. It is required that the listed items are normal.

- The installation location of the device is correct.
- The hanging ears of the device are well fixed with the cabinet.

- There is enough space around the device for radiating.

3.2 Install Device to Desktop

Place the device on the clean workbench. The operation is simple and the installation process is as follows:

- Step 1: Place the device upside down carefully. Use the dry soft cloth to clean the round holes on the backplane of the chassis and ensure that there is no oil or dust adsorption.
- Step 2: Remove the four mats from the paste sheet and paste to the four round holes on the backplane of the chassis, as shown in the following figure:

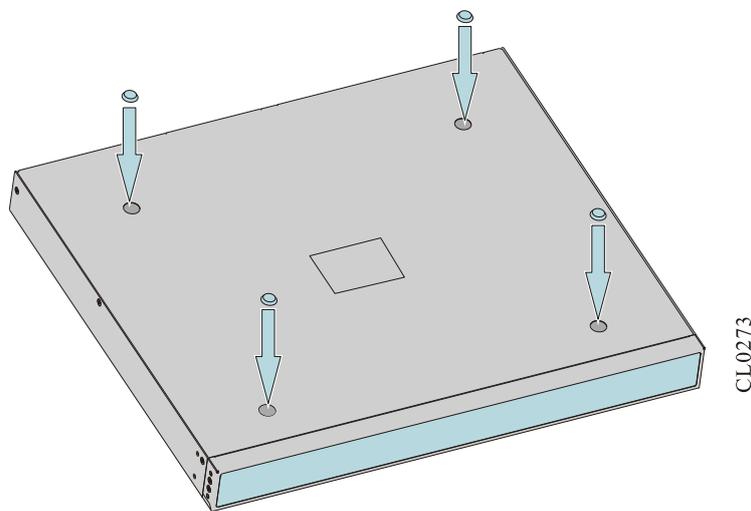


FIGURE 3-5 INSTALL RUBBER FEET ON 1U DEVICE

- Step 3: Place the device upright on the workbench.

! Caution

- Ensure the stability and well-grounding of the workbench.
 - There is 10cm radiating space around the device.
 - Do not place heavy things on the device.
-

3.3 Ground the Device

Usually, there is the grounding bar on the cabinet and we can connect the grounding cable of the device to the grounding bar.

Note

- Please use the grounding cable carried by the device.

The steps of installing the grounding cable are as follows:

- Step 1: Remove the grounding screws on the chassis of the device.
- Step 2: Bind the wiring terminal of the grounding wire carried by the device to the grounding screws of the chassis.
- Step 3: Install the grounding screws with the grounding wire to the grounding holes and tighten it.
- Step 4: Use the same method to install the other side of the ground cable to the grounding terminal of the cabinet.

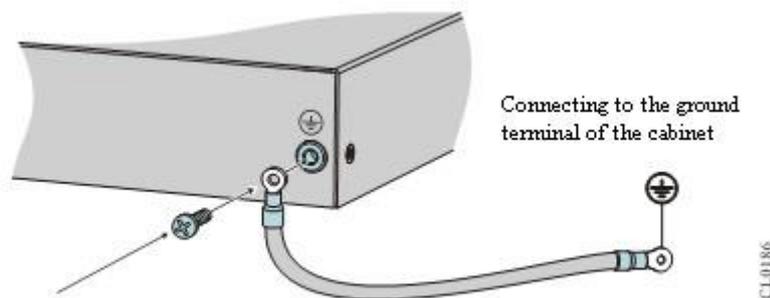


FIGURE 3-6 CONNECT THE GROUND WIRE

Caution

- If there is no appropriate grounding point on the cabinet, we also can connect the grounding wire of the device to other grounding bar of the installation place.
- Fire hose and lightning rod grounding of the building are not the proper grounding location; the grounding wire of the device should be connected to the engineering grounding of the equipment room.

Warning

- To ensure the safety of the personnel and equipment, the device should be well-grounded and the resistance between the device chassis and the ground should be smaller than 1Ω .

3.4 Install Power Module (Optional)

For the module power adopted by WNC6600-500-AC and WNC6600-1000-AC, operate according to the following steps; for the inbuilt power adopted by WNC6600-100-AC, it is already installed when leaving the factory and skip the chapter.

3.4.1 Installation Preparations

- Wear the antistatic wrist and confirm that the anti-static wrist is well-grounded.
- If the installation location has the filler panel, please remove the filler panel first.

! Caution

- When moving the power module, please use the hands to hold the bottom of the component and do not carry the handle of the component to move.
 - When installing the power module, confirm that the installed component is powered off.
-

3.4.2 Install Power System

- Step 1: Use the hands to pull the handle of the power module and push the power module along the guide grooves slowly and horizontally until the back of the power module well contacts with the backplane of the chassis.
- Step 2: Use the screwdriver to tighten the fixing screws of the power supply module fixing screws. Install the power module as shown in the following figure.

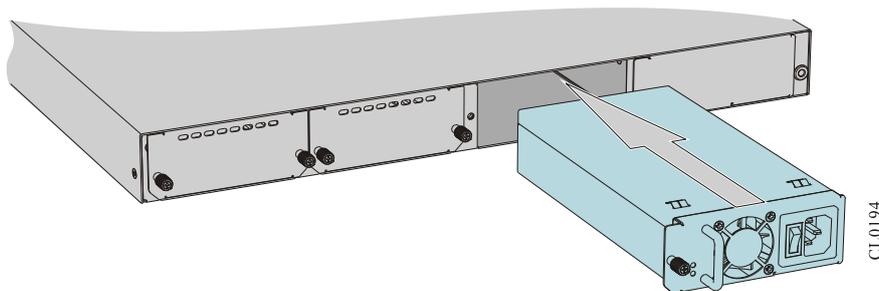


FIGURE 3-7 INSTALL POWER MODULE

3.5 Connect Power Cable

3.5.1 Installation Preparations

Considering the lightning protection requirement of the device, it is recommended that the AC power reaches the better lightning protection effect via the external lightning equipment when bringing in the device.

Caution

- Before connecting the power cable, confirm that the power switch is OFF (only for the pluggable power).
-

3.5.2 Connect AC Power Cable

Step 1: Connect one side of the AC power cable to the AC power interface of the back panel of the device chassis, as shown in the following figure.

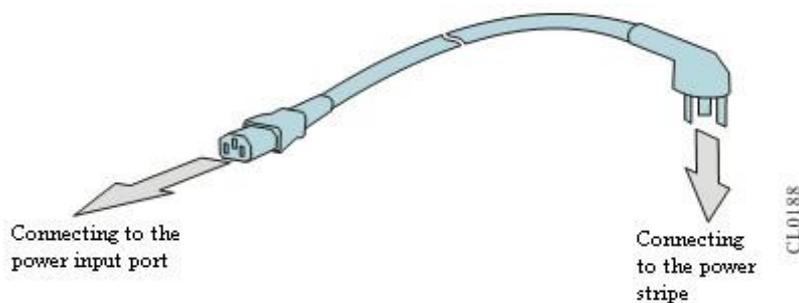


FIGURE 3-8 CONNECT AC POWER CABLE

Step 2: Insert the other side of the AC power cable to the socket of the external AC power system.

3.5.3 Connect DC Power Cable

Step 1: Check and ensure that the power switch on the power module is turned off.

Step 2: Use a slotted screwdriver to loosen the fixed terminal on the wiring terminal. Connect 0V and -48V terminals on one side of the DC power cable respectively to the corresponding terminal on the power strip. Then, use a slotted screwdriver to fasten the fixed screw of the wiring terminal.

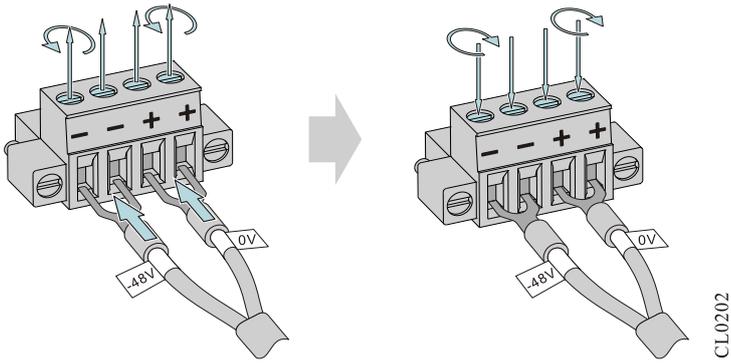


FIGURE 3-9 CONNECT DC POWER AND FIX THE SCREW

Step 3: Insert the connected connector with the wire to the DC jacket socket on the device.

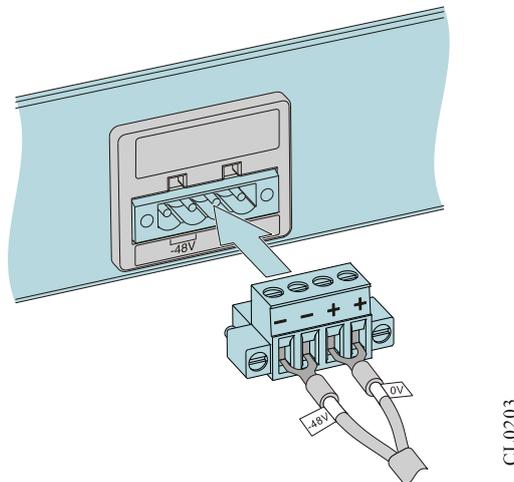


FIGURE 3-10 INSERT THE DC POWER CABLE TERMINAL TO THE DEVICE

Step 4: Rotate the screws on the two sides of the DC power cable terminal to right and then fasten and fix the screws.

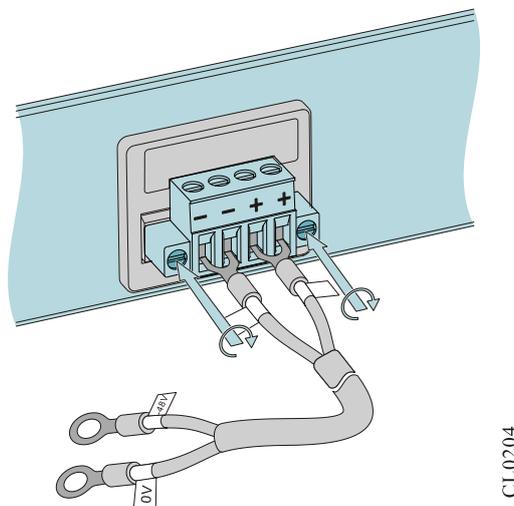


FIGURE 3-11 FASTEN THE DC POWER CABLE TERMINAL

Step 5: Connect two terminals on the other side of the DC power cable respectively to the DC power strip in the cabinet. (Check and ensure that the polarity of the power cable is correctly installed.) Then the installation completes.

3.7 Check after Installation

- Confirm that the ground wire is connected correctly.
- Confirm that the power module is installed.
- Confirm that the power cable is connected correctly.

Warning

- Before checking whether the installation is correct, please confirm that the power is closed, avoiding that the connection error damages the body or component.
-

4 Power on and Run Device

The chapter describes the related operations of powering on and running the device, containing the following contents:

[4.1 Log into Device](#)

[4.2 Access Network](#)

[4.3 Hardware Management](#)

4.1 Log into Device

When logging into the device for the first time, you can only log in via Console port. This is the most basic mode of logging into the device and also the basis of configuring other login modes.

4.1.1 Connect Configuration Cable

WNC6600-500-AC and WNC6600-1000-AC provide two serial ports (EIA/TIA-232 and Micro USB 2.0). With the two ports, the user can adopt the PC (or laptop) with the RS-232 serial port (or USB interface) to configure the wireless controller. WNC6600-100-AC provides one serial port (EIA/TIA-232). With the port, the user can adopt the PC (or laptop) with the RS-232 serial port (or USB interface) to configure the wireless controller.

To configure the wireless controller via the PC (or laptop), connect according to the following steps:

- Step 1: Prepare one PC (or laptop). Confirm that the PC (or laptop) has the RS-232 serial port (or USB interface).
- Step 2: After confirming that the wireless controller or PC (or laptop) is powered off, connect the RS-232 serial port (or USB interface) of the PC (or laptop) with the RJ45 serial port (or Micro USB serial port) of the wireless controller via the configuration cable.

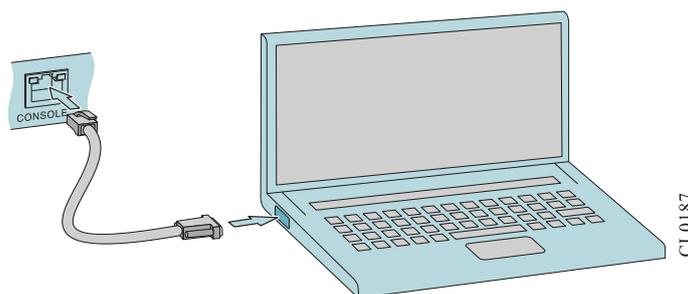


FIGURE 4-1 CONNECT WIRELESS CONTROLLER AND PC VIA RS-232 SERIAL PORT

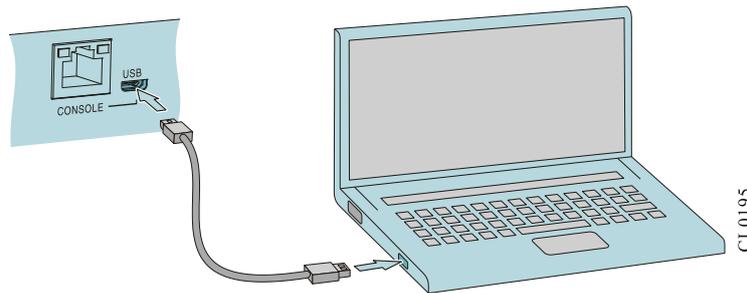


FIGURE 4-2 CONNECT WIRELESS CONTROLLER AND PC VIA USB SERIAL PORT

Note

- The configuration cable used by RS-232 serial port (configured with the device) is one eight-core unshielded cable. One side is the crimped RJ-45 plug, inserted to the Console port of the device; the other side is one DB-9 (female), inserted to the nine-core (male) serial port socket of the PC (or laptop), as shown in Figure 4-1.
- The configuration cable used by the USB serial port is one four-core unshielded cable. One side is Micro USB 5P (male) interface, inserted to the Micro USB Console port of the device; the other side is with one USB AM interface, inserted to the USB interface of the PC (or laptop), as shown in Figure 4-2.
- Before using Micro USB serial port, please install the Micro USB serial port driver. The driver name and the save path are as follows:

Driver name: UART_USB_driver

Driver save path:

http://www.maipu.cn/support/bullet/show.asp?ga_id=2282&catalog=1&nodeid=0&product_id=0&info_tpy=0&Imp=&Keyword=&Timerange=5&read=&search=1&page=

Caution

- When the PC is connected with the wireless controller via the configuration cable, first connect the DB-9 side (or USB AM side) of the configuration cable to the PC and then connect the RJ-45 side (or Micro USB 5P side) of the configuration cable to the Console port of the wireless controller.
- When removing the configuration cable that connect the PC (or laptop) with the wireless controller, first remove the RJ-45 side (Micro USB 5P side) of the configuration cable, and then remove the DB-9 side (or USB AM side) of the configuration cable.
- Automatically switch between the RS-232 serial port and Micro USB serial port. They cannot be used at the same time. If connecting the two ports with the PC at the same time, the wireless controller communicates with the PC via the RS-232 serial port by default.

4.1.2 Set PC HyperTerminal Parameters

The following takes running Windows XP HyperTerminal on the PC (or laptop) as an example to describe the setting of the serial port parameters of the PC (or laptop).

- Step 1: Enable the PC (or laptop), select **Start > All Programs > Accessories > Communication > HyperTerminal**, and click  to set up the new connection and display the interface of **Connection Description** as shown in Figure 4-3.



FIGURE 4-3 HYPERTERMINAL CONNECTION DESCRIPTION INTERFACE

- Step 2: On the **Connection Description** interface, input the new connection name and click **OK** to display the window as shown in Figure 4-4. Select the serial port used by the connection in the **Use when connecting**.



FIGURE 4-4 THE SETTING OF THE SERIAL PORT USED BY CONNECTING HYPERTERMINAL

Step 3: After selecting the serial port, click **OK** to display the interface of setting the serial port parameters as shown in Figure 4-5. Set the baud rate as 9600, data bit as 8, parity check as none, stop bit as 1 and data flow control as none.

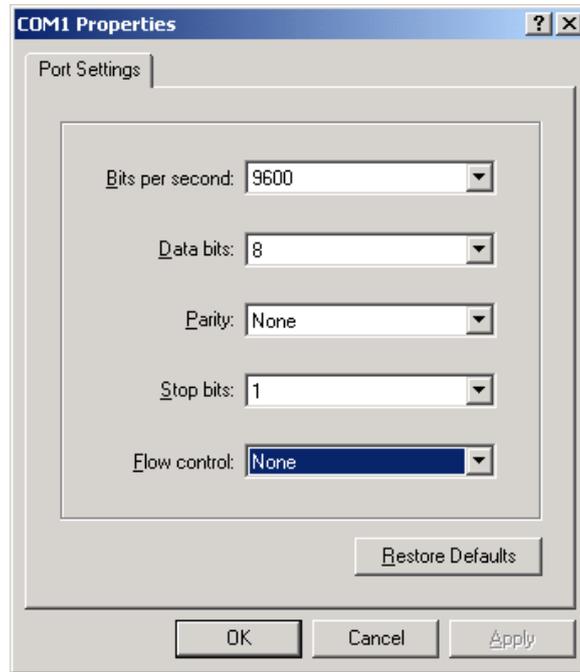


FIGURE 4-5 SERIAL PORT PARAMETER SETTING

Step 4: After setting the serial port parameters, click **OK** to enter the HyperTerminal interface.

Step 5: In the HyperTerminal attribute dialog box, select **Property** to enter the property window. Click **Setting** in the property window to enter the window of setting the property as shown in Figure 4-6. Select the terminal emulation as VT100 and then click **OK**.

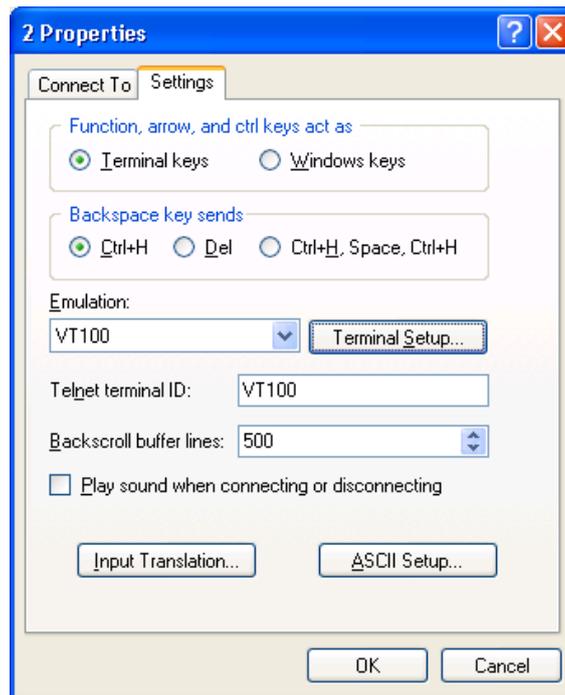


FIGURE 4-6 THE SETTING OF THE TERMINAL EMULATION

4.1.3 Power on and Start

Check before Power on

Check the device before power-on:

- The interface cables, power cables, and ground wires are connected correctly.
- Power supply voltage meets the power requirement of the device. For details, refer to [Requirements for Power Supply](#).
- The configuration cable is connected correctly; the PC for configuration is enabled; the setting of the terminal parameters is complete.

! Caution

- Before the wireless controller is powered on, confirm the location of the power switch of the equipment room where the device is located, so as to cut off the power in time when there is accident.

Power on Device

Power on according to the following order:

- Enable the power supply system switch of the device.

- Enable the power switch of the device.

After the device is power on and started, the configuration terminal displays some basic manufacturing information of the device. The following takes WNC6600-100-AC as an example:

```
MyAir AirM (R) Operating System Software
WNC6600-100 system image file (flash0: /flash/wpl-g-6.4.2.5.16.pck), version mpu-6.4.2.5.16, Compiled
on May 9 2014, 03:19:12
Copyright (C) 2013 Maipu Communication Technology Co., Ltd. All Rights Reserved.

System ID           : 005555555500
Hardware Model      : WNC6600-100 with 2048 MBytes SDRAM, 64 MBytes flash
Hardware Version    : 001 (Hotswap Unsupported)
MPU CPLD Version    : 102
Monitor Version     : 1.32
Software Version    : mpu-6.4.2.5.16
Software Image File : flash0: /flash/wpl-g-6.4.2.5.16.pck
Compiled           : May 9 2014, 03:19:12
```

Note

- The above displayed information on the start interface is just for reference. Please refer to the actual display.
-

4.1.4 Check after Power on

Power on the device. After loading all cards, check as follows to ensure that the later configuration work can be done normally:

- After the device is powered on, the ventilation system works and check whether there is the sound of the fan rotation and whether there is air discharged from the ventilation holes of the device.
 - View whether the indicators on the device are normal. For details, refer to Appendix B
-

Caution

- Different models of wired and wireless integrated controller have different indicators. For details, refer to [Product Appearance and Dimension](#).
-

4.2 Access Network

4.2.1 Access Network via Ethernet Twisted Pair

The 10/100/1000Base-T electrical port of the device adopts the RJ-45 connector. The port supports MDI/MDIX auto-sensing and adopts class-5 or above twisted-pair to connect the network.

Connection steps:

- Step 1: Insert one side of the Ethernet twisted pair to the Ethernet electrical port of the wired and wireless integrated controller (RJ-45 port).
- Step 2: Insert the other side of the Ethernet twisted pair to the RJ-45 port of the device connected to the network device.

Note

- WNC6600 does not carry Ethernet twisted pair. Please prepare the desired cables by self in advance.
-

4.2.2 Access Network via Fiber

For the SFP, SFP+ optical port of the wired and wireless integrated controller, you can use the fiber to connect the network. Before connecting fiber, first install the optical module to the wired and wireless integrated controller and then insert the fiber connector to the optical module. The appearance of the general LC fiber connector is as shown in Figure 4-7:

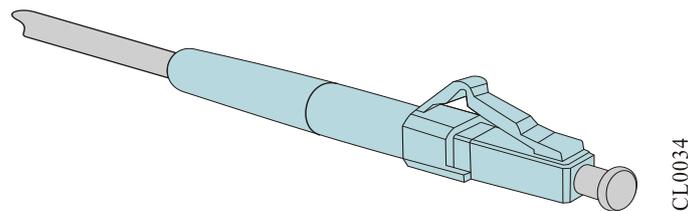


FIGURE 4-7 LC FIBER CONNECTOR

Install Optical Module

The installation of the SFP module is consistent with that of the SFP+ module. The following takes the SFP module as an example. The steps are as follows:

- Step 1: Wear the anti-static wrist and confirm that the anti-static wrist is well contacted with the skin and well-grounded.
- Step 2: Pull out the dust plug on the optical port of the wireless controller, as shown in Figure 4-8.
- Step 3: Get the SFP module out from the packing box. The diagram of the SFP module is as shown in Figure 4-9 Use the hands to hold the two sides of the SFP module and push it into the interface slot of the wired and wireless integrated controller horizontally until the SFP module is close-contact with the slot (you can feel that the shrapnel at the top and bottom of the SFP module stuck the interface slot), as shown in Figure 4-10.

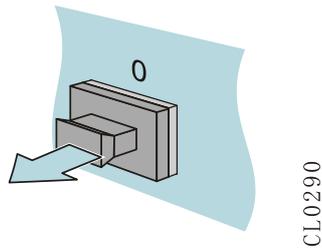


FIGURE 4-8 PULL OUT THE DUST PLUG

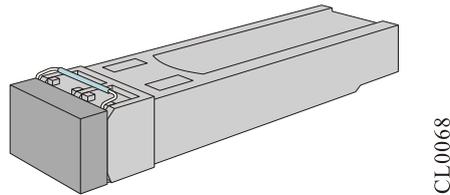


FIGURE 4-9 SFP MODULE

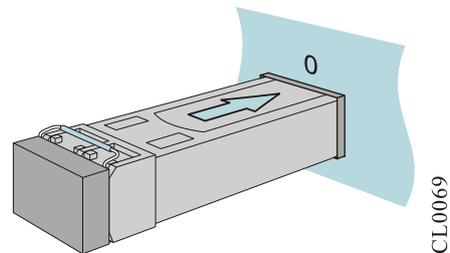


FIGURE 4-10 INSTALL SFP MODULE

Caution

- Before installing the fiber, do not pull out the protection rubber stopper on the SFP module.
 - For the unused optical port, do not unplug the dust plug on the optical port of the wireless controller.
 - It is recommended not to insert the SFP module with the fiber into the interface slot directly. Please install after unplugging the fiber.
 - When installing the SFP module, do not use the hands to touch the gold-finger of the SFP module directly.
 - The TX wire should connect to the RX wire of the peer device; the RX wire should be connected to the TX wire of the peer device.
-

Connect Fiber on Optical Module

- Step 1: Wear the anti-static wrist and confirm that the anti-static wrist is well contacted with the skin and well-grounded.
- Step 2: Remove the dust cap of the fiber connector, as shown in Figure 4-11.

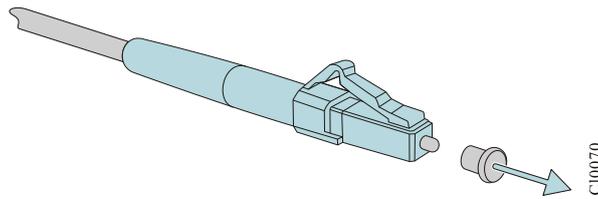


FIGURE 4-11 REMOVE FIBER DUST CONNECTOR

Step 3: Remove the dust cap of the SFP module, as shown in Figure 4-12.

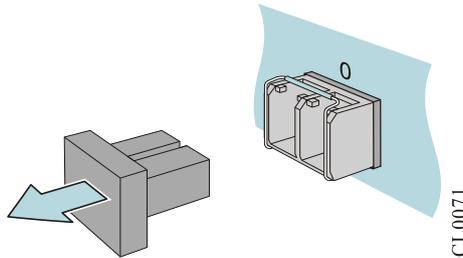


FIGURE 4-12 REMOVE DUST CAP OF THE SFP MODULE

Step 4: Insert the prepared fibers to the ports of the optical module in order, as shown in Figure 4-13.

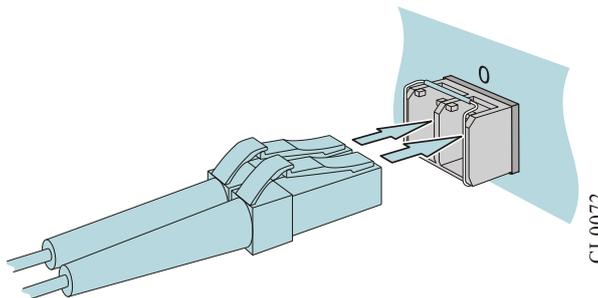


FIGURE 4-13 CONNECT FIBERS

Step 5: Connect the other side of the fiber to the peer device.

Caution

- When using the uni-directional dual fiber to connect the optical module, pay attention to make the receiving and sending signals of the modules at the two sides cross-connected.
 - If the fiber connector ferrule has dust, please use the air-laid paper to stick the absolute alcohol and clean the face of the fiber connector ferrule.
-

4.3 Hardware Management

This section describes various hardware management functions of the device. With the function interfaces, the user can conveniently view the software and hardware version information of the device, as well as the work status information of the hardware modules.

4.3.1 View Software and Hardware Version Information of Device

You can use the **show version** command to view the software and hardware version information, including system serial number, hardware general information, hardware main board version, hardware CPLD version, Monitor version, software version and other information. The following takes WNC6600-100-AC as an example.

Command: **wnc#show version**

Display as follows:

```
wnc#show version
      MyAir AirM (R) Operating System Software
WNC6600-100 system image file (flash0: /flash/wpl-g-6.4.2.5.18.pck), version mpu-6.4.2.5.18, Compiled
on May 21 2014, 03:32:37
Copyright (C) 2013 Maipu Communication Technology Co., Ltd. All Rights Reserved.

WNC6600-100 Version Information
  System ID       : 00017a78ab98
  Hardware Model  : WNC6600-100 with 2048 MBytes SDRAM, 64 MBytes flash
  Hardware Version : 001 (Hotswap Unsupported)
  MPU CPLD Version : 102
  Monitor Version  : 1.35
  Software Version : mpu-6.4.2.5.18
  Software Image File : flash0: /flash/wpl-g-6.4.2.5.18.pck
  Compiled        : May 21 2014, 03:32:37

System Uptime is 0 hour 1 minute 38 seconds
```

TABLE 4-1 KEY FIELD DESCRIPTION OF THE INFORMATION DISPLAYED VIA SHOW VERSION

Field	Description
System ID	The serial number of the device, provided by the device supplier
Hardware Model	The device model and the configured memory and FLASH capacity information
Hardware Version	Hardware version number
MPU CPLD Version	Hardware CPLD version number
Monitor Version	Monitor version number
Software Version	Software version number
Software Image File	Software mirror file name

4.3.2 View Status Information of Power Module

You can use the **show system power** command to view the information of the power used on the device, including the online information of the power, status information, alarm information, serial number, power module plugging count, and error count during power plugging. Wherein, the fixed power will only display the online information, status information, and alarm information.

Command: **wnc#show system power**

The fixed power is displayed as follows:

```
wnc#show system power
System Power Information(Power 1 - ONLINE)
-----
                Status:  Normal
                Description:
-----
STATISTICS:      1 IN, 0 OUT, 0 IERR, 0 OERR
```

The modular power is displayed as follows:

```
System Power Information(Power 1 - ONLINE)
-----
                Status:  Normal
                Last-Alarm: Normal
                Serial No.: N/A
                Description: N/A
                System power: Normal
                Power Input: Normal
-----
STATISTICS:      1 IN, 0 OUT, 0 IERR, 0 OERR

System Power Information(Power 2 - ONLINE)
-----
                Status:  Normal
                Last-Alarm: Normal
                Serial No.: N/A
                Description: N/A
                System power: Normal
                Power Input: Normal
-----
STATISTICS:      1 IN, 0 OUT, 0 IERR, 0 OERR
```

TABLE 4-3 KEY FIELD DESCRIPTION OF THE INFORMATION DISPLAYED VIA SHOW SYSTEM POWER

Field	Description
System Power Information (Power 2 - ONLINE)	System power information (power module 2 is online)
Status	Power module status
Last-Alarm	Power module alarm
Serial No.	Power module serial number
System power	System power output status
Power Input	Power module input status

Field	Description
STATISTICS	The plugging times of the power module and the error plugging times. For example, 1 IN, 0 IERR, 0 OUT, 0 OERR means that the power module is inserted correctly for once.

 **Note**

- Only the pluggable power can display the power input status.

4.3.3 View System Environment Temperature Information

You can use the **show environment** command to view the temperature information of the device board card and the main chips on the device board card.

Command: **wnc#show environment**

Display as follows:

```
MPU chip temperature is 62°C
MPU board temperature is 50°C
MPU poe temperature is 0°C
```

4.3.5 View Fan Status Information

You can use the **show system fan** command to view the information of the fan used on the device, including the fan location information, fan speed, fan work status, plugging times of the fan module, error plugging times, and other information.

Command: **wnc#show system fan**

Display as follows:

```
wnc#show system fan
System FAN Information(Fan 1 - ONLINE)
-----
          Status:   Normal
Description:
          Speed Rate: 52%
-----
STATISTICS:          1 IN, 0 OUT, 0 IERR, 0 OERR
```

TABLE 4-3 KEY FIELD DESCRIPTION OF THE INFORMATION DISPLAYED VIA SHOW SYSTEM FAN

Field	Description
System FAN Information(Fan 1 - ONLINE)	System fan information (fan 1, the status is online)

Field	Description
Status	Fan status information
Fan-Speed	Fan speed percentage

4.3.5 View Pluggable Optical Module Information

You can use the **show optical all** command to view the work parameters of all optical modules used on the device.

Command: **wnc#show optical all**

Display as follows:

Name	BitRate	VendorName	LaserWaveLen(nm)	Temperature(C)	Voltage(V)	TxPower(dBm)	RxPower(dBm)
gi0/1	1.25G	TRIXON INC.	850	----	----	----	----
gi0/2	1.25G	EOPTOLINK INC	850	----	----	----	----

TABLE 4-4 KEY FIELD DESCRIPTION OF THE INFORMATION DISPLAYED VIA SHOW OPTICAL ALL

Field	Description
Name	The name of the port where the optical module is located, such as gigabitethernet1/1
BitRate	The rate information of the optical module
VendorName	The name of the manufacturer of the optical module
LaserWaveLen(nm)	The center wavelength of the sent laser
Temperature(C)	The temperature of the optical module (only for the optical module supporting the DDMI function)
Voltage(V)	The work voltage of the optical module (only for the optical module supporting the DDMI function)
TxPower(dBm)	The sending power of the optical module (only for the optical module supporting the DDMI function)
RxPower(dBm)	The receiving power of the optical module (only for the optical module supporting the DDMI function)

Besides, you can use the following commands to view the details of the inserted optical module on one specified port of the device, including the optical module name, interface type, supplier name, optical module model, optical module serial number, the production date of the optical module, the sending power of the optical module and so on. If the used optical module supports the DDMI function, you can use the command to get the internal monitor parameters

Field	Description
Monitor Parameters	<p>Monitor parameters (only for the optical module supporting the DDMI function)</p> <ul style="list-style-type: none"> ● Temperature/Alarm-High/Alarm-low/Warning-High/Warning-Low Temperature/alarm upper threshold/alarm lower threshold/warning upper threshold/warning lower threshold ● Voltage/Alarm-High/Alarm-low/Warning-High/Warning-Low Voltage/alarm upper threshold/alarm lower threshold/warning upper threshold/warning lower threshold ● Tx Bias/Alarm-High/Alarm-low/Warning-High/Warning-Low Tx bias current/alarm upper threshold/alarm lower threshold/warning upper threshold/warning lower threshold ● RxPower /Alarm-High/Alarm-low/Warning-High/Warning-Low Rx optical power/alarm upper threshold/alarm lower threshold/warning upper threshold/warning lower threshold ● TxPower /Alarm-High/Alarm-low/Warning-High/Warning-Low Tx optical power/alarm upper threshold/alarm lower threshold/warning upper threshold/warning lower threshold

5 Device Maintenance and Troubleshooting

This chapter describes how to exclude the installation failure of WNC6600 and the maintenance of the device module, including:

[5.1 Troubleshooting of Configuration System](#)

[5.2 Troubleshooting about Power](#)

[5.3 Device Maintenance](#)

[5.4 Get Technical Supporting](#)

5.1 Troubleshooting of Configuration System

After the device is powered on and if the system is normal, the start information is displayed on the configuration terminal. If the configuration system fails, there may be no display or messy code on the configuration terminal.

5.1.1 Troubleshooting about no Display on Terminal

If there is no display information on the configuration terminal after being powered on, check according to the following steps:

- Step 1: Check whether the power system of the device works normally (view whether the power indicator on the panel is always on. If no, it indicates that the power is abnormal). For details, refer to [System Status Indicators](#).
- Step 2: Check whether the configuration cable is connected to Console port.
- Step 3: Check whether the indicator of the device works normally (On the interface of the configuration terminal, press Enter to view whether the TXD and RXD indicators of the RJ45 CONSOLE port flash). For details, refer to [Interface Status Indicator](#).

If no problem is found in the above checks, there may be the following reasons:

1. The serial port connected to the configuration cable is wrong (the actual selected serial port is not consistent with the set serial port of the terminal).
2. The setting of the configuration terminal parameters is wrong (the parameter requirement: set the baud rate as 9600, data bit as 8, parity check as none, stop bit as 1, traffic control as none, and select the terminal emulation as VT100). For details, refer to [Set PC HyperTerminal Parameters](#).
3. There is something wrong with the configuration cable and you can try to change the configuration cable.

5.1.2 Troubleshooting about Messy Code on Terminal

If messy code is displayed on the configuration terminal, maybe the setting of the configuration terminal parameters is wrong (set the baud rate as 9600, data bit as 8, parity check as none, stop bit as 1, traffic control as none, and select the terminal emulation as VT100), and please check correspondingly. For details, refer to [Set PC HyperTerminal Parameters](#).

5.2 Troubleshooting about Power

There are two power status indicators on the front panel of WNC6600-500-AC and WNC6600-1000-AC, used to indicate the work status of the power modules. For details, refer to [System Status Indicators](#).

WNC6600-500-AC and WNC6600-1000-AC adopt the modular power. There are two power status indicators on the panel of the modular power, used to indicate the status of the modular power. For details, refer to [Power Module Status Indicator](#).

5.2.1 Fixed Power Troubleshooting

WNC6600-100-AC indicator is off, indicating that there is something wrong with the power of the device. Please perform troubleshooting according to the following steps:

- Step 1: Check the power supply system connected to the device, and confirm whether the power supply system supplies power normally and whether the voltage is normal.
- Step 2: Check the connection of the power cable on the faulty inbuilt power slot; remove and install the power cable to confirm whether the power cable is loose.
- Step 3: Change the power cable of the faulty inbuilt power and then check whether the indicator of the power module can recover normally. If yes, it can be confirmed that the previous power cable connected to the inbuilt power is damaged. If no, please contact the agent or local technical service engineers.

5.2.2 Modular Power Troubleshooting

The PWR1 or PWR2 indicator on the front panel of WNC6600-500-AC and WNC6600-1000-AC is off, indicating that there is something wrong with the power module of the device. Please perform troubleshooting according to the following steps:

- Step 1: Check whether the "INPUT" indicator of the faulty power is green (indicating that the power system is normal). If no, check the power system connected to the device and confirm whether the power supply system can provide power normally and whether the voltage is normal.
- Step 2: Check the connection of the power cable on the faulty inbuilt power slot; re-swap the power cable to confirm whether the power cable is loose.
- Step 3: Change the power cable of the faulty power module and then check whether the input indicator of the power module recovers normally.
- Step 4: If the "INPUT" indicator of the power is green and "OUTPUT" is red, check whether the power module switch is open and in the "ON" state.
- Step 5: Check the installation of the faulty power module and confirm that the power module and the device main-board are connected reliably.
- Step 6: Make the switch of the device to "OFF"; unplug the faulty power module and view the connectors to check whether the pins are bent or off.
- Step 7: If the connectors are normal, switch the power module to another power slot to view whether it can work normally. If yes, it indicates that the previous power slot may be damaged. If no, perform the next step. (Before powering off the device, confirm whether the services can be interrupted)
- Step 8: Use the same model of the power module to install on the previous power slot and connect the same power input side to check whether the power module can work normally. If yes, the previous power module may be damaged, and please contact the agent or local technical service engineers to change.

5.3 Device Maintenance

The device maintenance mainly refers to the changing of the module, including power module and pluggable optical module.

Caution

- Keep the replaced hardware module and it is recommended to place it in the anti-static bag or the packing box.
-

5.3.1 Change Power Module

WNC6600-100-AC series adopt the inbuilt power, so changing the power module is just for WNC6600-500-AC and WNC6600-1000-AC.

Preparation before Changing

- Step 1: Wear the anti-static wrist and confirm that the anti-static wrist is well-grounded.
- Step 2: Close the power switch of the power module (set the switch to OFF).
- Step 3: Unplug the power connection cable on the power module.

Caution

- The power module supports hot-plugging and you can change the power when running. Please ensure safety.
 - Do not touch any terminal marked with power or maybe with power, avoiding the risk of electric shock.
-

Change Power Module

The steps of changing the power module are as follows:

- Step 1: Wear the anti-static wrist and use a screwdriver to loosen the captive screws on the power module, as shown in Figure 5-1.

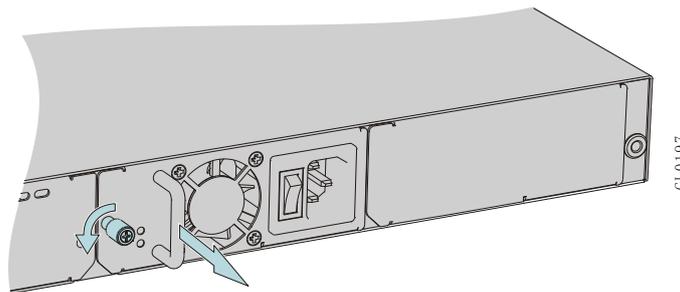


FIGURE 5-1 DISASSEMBLE THE POWER

- Step 2: Use one hand to hold the handle of the power module and the other hand to hold the bottom of the power module to pull out the power module from the device guide slot slowly, as shown in Figure 5-2:

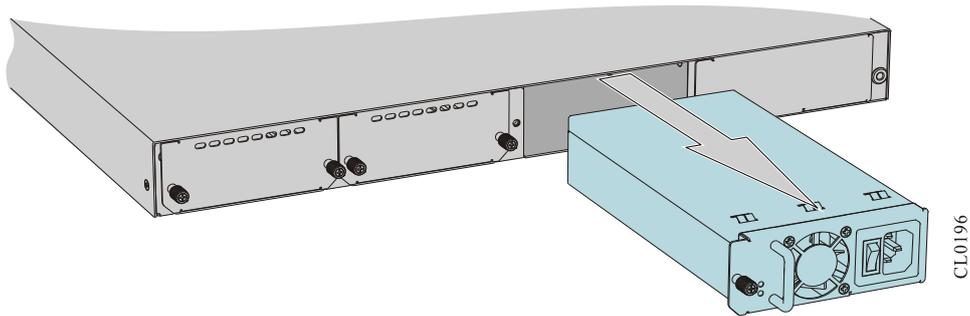


FIGURE 5-2 PULL PUT THE POWER MODULE

Step 3: Put the removed power module on the anti-static mat or the packing box.

Step 4: Push another power module along the guide slot slowly and horizontally until the back of the power module well contacts with the main board slot, as shown in Figure 5-3:

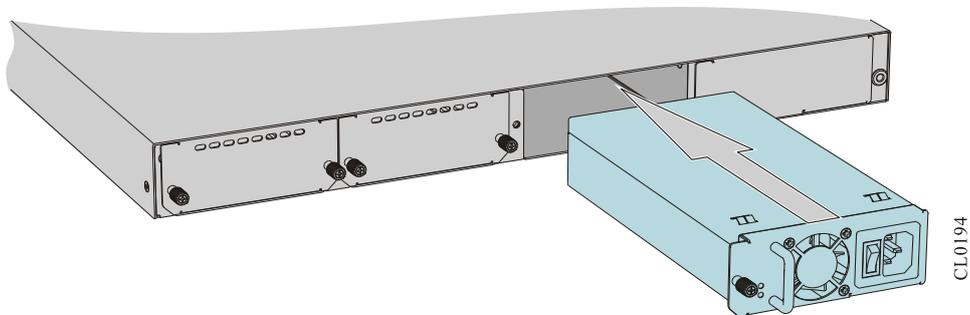


FIGURE 5-3 INSERT THE POWER MODULE

Step 5: Use the screwdriver to tighten the captive screw on the power module.

5.3.2 Change Swappable Optical Module

The process of changing the SFP module is consistent with that of changing the SFP+ module. The following takes the SFP module as an example.

Warning

- When installing or un-installing the SFP module, do not use the hands to touch the gold finger part of the SFP module directly.
 - Do not directly stare at the fiber connection holes of the optical module when the fiber is pulled down, but the optical module is not pulled out.
-

Step 1: Wear the anti-static wrist and pull out the fiber connected to the SFP module.

Step 2: Pull the handle of the SFP module down to the horizontal position, and then pull out the SFP module. The diagram of un-installing the SFP module is as shown in

Figure 5-4.

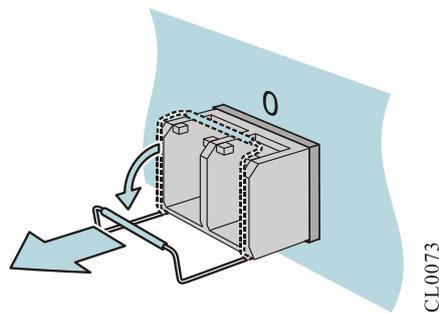


FIGURE 5-4 UNINSTALL SFP MODULE

Step 3: Fit the removed SFP module with the dust cap and put it in the anti-static bag or packing box. The diagram of installing the dust cap for the SFP module is as shown in Figure 5-8.

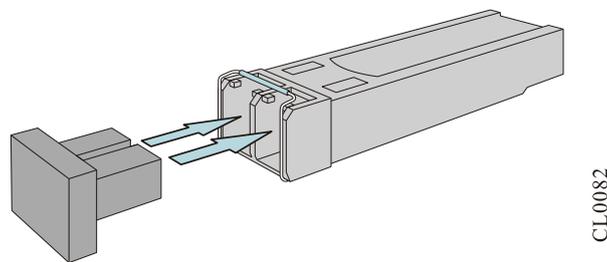


FIGURE 5-5 INSTALL DUST CAP FOR SFP MODULE

Step 4: Up-turn the handle of the installed SFP module to the vertical position to lock the buckle at the top of the module. Use the hands to hold the two sides of the SFP module and push it into the SFP slot horizontally until the SFP module closely-contacts with the slot (you can feel that the shrapnel at the bottom and top of the SFP module locks the SFP slot). The diagram of installing the SFP module is as shown in Figure 5-6.

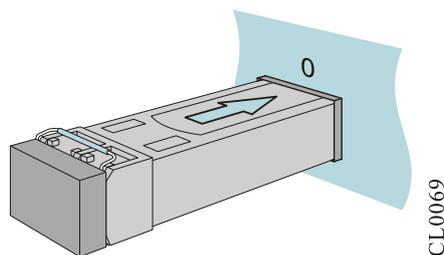


FIGURE 5-6 INSTALL SFP MODULE

Step 5: Remove the dust cap. The diagram of removing the dust cap of the SFP module is as shown in Figure 5-7

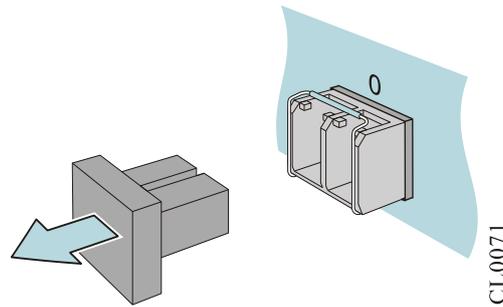


FIGURE 5-7 REMOVE DUST CAP OF SFP MODULE

Step 6: Insert the fibers into the SFP ports in order. The diagram of connecting the SFP to the fiber is as shown in Figure 5-8.

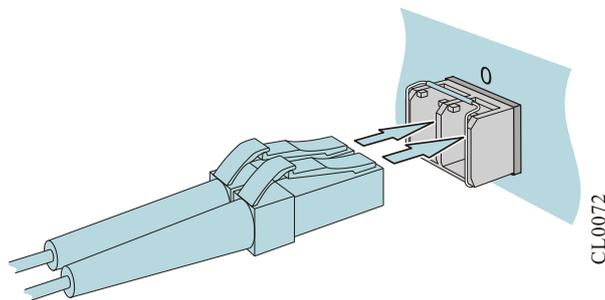


FIGURE 5-8 CONNECT SFP TO FIBER

 **Note**

- It is suggested not to insert the SFP module with the fiber into the slot directly. Please first pull out the fiber and then install.
-

5.4 Get Technical Supporting

If the fault cannot be removed via the above contents of the chapter, please contact the agent or local technical engineers in time. Before you contact the customer service, please prepare the following information, which is convenient for the customer service staff to help you solve the problem.

1. The arrival time of the device
2. The serial number of the chassis (labeled on the chassis)
3. Software version number (it can be viewed via **show version** in the command line view)
4. Maintenance agreement or warranty card
5. Simple description of the fault problem

6. Simple introduction of the taken troubleshooting steps

You can contact the customer service via the customer service hotline and you can also search for help via the website or email.

Customer service: 400-886-8669

Website: <http://www.maipu.com>

E-mail: techsupport@maipu.com

Appendix

A Specifications of General Interfaces

Describe the attributes of the device interfaces.

A.1 Console Port Attribute

WNC6600 provides one Console port complying with EIA/TIA-232 asynchronization serial specifications. With the interface, the user can complete the local configuration for the device. For the attributes of USB Console port, refer to Appendix table A-2:

APPENDIX TABLE A-1 THE ATTRIBUTES OF CONSOLE PORT

Attribute	Description
Interface standard	Asynchronous EIA/TIA-232
Connector type	RJ45
Rate	9600bit/s-115200bit/s (the default value is 9600bit/s)
Supported services	Connected with the serial port of the local terminal (such as PC), and run the terminal emulation program on the terminal

A.2 USB Console Port Attribute

WNC6600-500-AC and WNC6600-1000-AC provide one USB Console port complying with USB2.0 specifications. With the interface, the user can complete the local configuration for the device. For the attributes of Console port, refer to the appendix table A-2:

APPENDIX TABLE A-2 THE ATTRIBUTES OF THE USB CONSOLE PORT

Attribute	Description
Interface standard	USB2.0
Connector type	Micro USB

Attribute	Description
Rate	12Mbps
Supported services	Connected with the USB of local terminal (PC) and run the terminal emulation program on the terminal (the range of the baud rate is 9600bit/s-115200bit/s (the default value is 9600bit/s))

Note

- To use the USB console port, you need to install the drive software on the local terminal (PC).

A.3 USB Port Attribute

WNC6600 provides one USB interface complying with USB2.0 specifications. With the interface, the user can complete the local configuration for the device or expand the storing space. For the attributes of USB interface, refer to appendix table A-3:

APPENDIX TABLE A-3 THE ATTRIBUTES OF USB PORT

Attribute	Description
Interface standard	USB2.0
Connector type	USB
Interface rate	12Mbps
Supported services	Upgrade configuration via the USB or expand storing space

A.4 10Base-T/100Base-TX/1000Base-T-RJ45 Electrical Port Attributes

APPENDIX TABLE A-4 10BASE-T/100BASE-TX/1000BASE-T-RJ45 ELECTRICAL PORT ATTRIBUTES

Attribute	Description
Interface standard	IEEE 802.3, IEEE802.3u, IEEE802.3ab
Connector type	RJ45
Work mode	10Mbps/100Mbps/1000Mbps Half-duplex/full-duplex/auto-negotiation

Attribute	Description
Maximum transmission distance	100m
Specifications of used cable	Category-5 or above twisted pair

A.5 10Base-T/100Base-TX-RJ45 POE+ Interface Attributes

APPENDIX TABLE A-5 POE+ INTERFACE ATTRIBUTES

Attribute	Description
Interface standard	IEEE 802.3-af, IEEE 802.3-at
Work mode	Auto identify PD/forced power supply
Interface type	RJ45
Power supply line sequence	48V(4), 48V(5), 0V(7), 0V(8)

A.6 1000Base-X-SFP Optical Port Attributes

APPENDIX TABLE A-6 1000BASE-X-SFP OPTICAL PORT ATTRIBUTES

Attribute	Description
Interface standard	IEEE 802.3ab
Supported optical module model	SFP
User interface type of optical module	LC
Supported SFP interface	Support 1000Base-X

A.7 COMBO Interface Attributes

APPENDIX TABLE A-7 SFP ATTRIBUTES OF COMBO INTERFACE

Attribute	Description
Interface standard	IEEE 802.3u IEEE 802.3ab
Supported optical module model	SFP

Attribute	Description
User interface type of optical module	LC
Supported SFP interface	Support 100Base-FX Support 1000Base-X

A.8 10G Ethernet Optical Port Attributes

APPENDIX TABLE A-8 10G ETHERNET OPTICAL PORT ATTRIBUTES

Attribute	Description
Interface standard	IEEE 802.3ae
Supported optical module model	SFP+
User interface type of optical module	LC
Support SFP+ interface/SFP interface	Support 1000Base-X Support 10GBase-SR Support 10GBase-LR

B Device Indicators

B.1 System Status Indicators

With the system status indicator, we can initially judge the work status of the device. For details, refer to appendix table B-1:

APPENDIX TABLE B-1 DEVICE SYSTEM STATUS INDICATOR DESCRIPTION

Indicator Type	Indicator Name	Indicator Color	Status
System status indicator	SYS	Green	Quickly flash (5Hz flash frequency): Indicate that the hardware starts to work after power-on; Slowly flash (0.5Hz flash frequency): Indicate that the system works normally Always on/off: Indicate that the system works abnormally.
Power status indicator	PWR1	Green	Always on: Power 1 works normally; Off: Power 1 works abnormally

Indicator Type	Indicator Name	Indicator Color	Status
	PWR2	Green	Always on: Power 2 works normally; Off: Power 2 works abnormally
	PWR	Green	Always on: power works normally; Off: power works abnormally.
Fan status indicator	FAN	Green	On: The device fan module works normally Off: The device fan module alarms
USB status indicator	USB	Green	Flash: There is data received and sent On: USB is loaded Off: no USB
SD card status indicator	SD	Green	Off: no SD card inserted On: There is SD card inserted Flash: The SD card has data reading and writing.

B.2 Interface Status Indicator

With the interface status indicator, we can judge the interface work status of the device. For details, refer to appendix table B-2:

APPENDIX TABLE B-2 STATUS INDICATOR OF DEVICE INTERFACE

Indicator Type	Indicator Name	Indicator Color	Status
Serial port indicator	TXD	Yellow	Flash: The serial port has data sent out Off: The serial port does not have data sent out
	RXD	Green	Flash: The serial port has data received Off: The serial port does not have data received
	ACT	Green	Flash: The serial port has data sent and received Off: The serial port does not set up connection
Port status indicator	LINK/ACT	Green	Always on: Ethernet port sets up

Indicator Type	Indicator Name	Indicator Color	Status
1			connection successfully Flash: Ethernet port has data sent and received Off: Ethernet port does not set up connection
Port status indicator 2	SPEED	Yellow	On: The rate is 1000M Off: The rate is 10/100M
	LINK/ACTIVITY	Green	Always on: Ethernet port sets up connection successfully Flash: Ethernet port has data sent and received Off: Ethernet port does not set up connection

B.3 Power Module Status Indicator

With the power module status indicator, we can judge the interface work status of the device. For details, refer to appendix table B-3:

APPENDIX TABLE B-3 POWER MODULE STATUS INDICATOR

Indicator Type	Indicator Name	Indicator Color	Status
Power input status indicator	INPUT	Dual-color light (red, green)	Green and always on: The power input is normal; Red and always on: The power input is abnormal; Off: The power input is not connected
Power output status indicator	OUTPUT	Dual-color light (red, green)	Green and always on: The power output is normal; Red and always on: The power output is abnormal or the fan does not turn; Off: The power input is not connected.

C Interface Cable Specifications

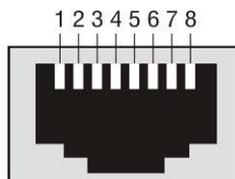
C.1 Ethernet Electrical Port Cables

It is recommended that the Ethernet interface cable of WNC6600 series wired and wireless integrated controller is eight-core un-shielded category-5 or above straight-through twisted pair.

APPENDIX TABLE C-1 CONNECTION RELATION TABLE OF RJ45 STRAIGHT-THROUGH CABLE (CATEGORY-5 TWISTED PAIR)

RJ45	Signal	Direction	RJ45	Description	Length
1	TRD0+	↔	1	Twisted pair 1	Support 100m
2	TRD0-	↔	2		
3	TRD1+	↔	3	Twisted pair 2	
6	TRD1-	↔	6		
4	TRD2+	↔	4	Twisted pair 3	
5	TRD2-	↔	5		
7	TRD3+	↔	7	Twisted pair 4	
8	TRD3-	↔	8		

The line sequence of Ethernet RJ45 port is as shown in appendix figure C-1:



APPENDIX FIGURE C-1 RJ45 SOCKET DIAGRAM

C.2 Console Port (EIA/TIA-232) Adapter Cable Sequence

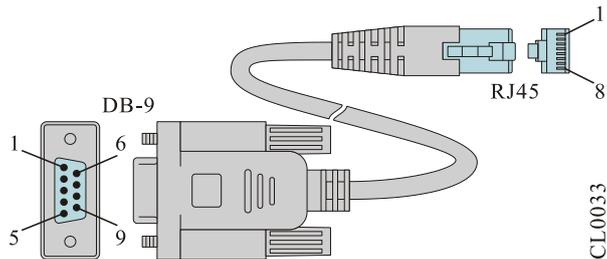
The internal signal connection relation of the console port (EIA/TIA-232) adapter cable is as shown in appendix table C-2:

APPENDIX TABLE C-2 ADAPTER CABLE CONNECTION RELATION OF CONSOLE PORT (EIA/TIA-232)

RJ-45	Signal	Direction	DB-9
-------	--------	-----------	------

RJ-45	Signal	Direction	DB-9
1	RTS	→	8
2	DTR	→	6
3	TXD	→	2
4	GND	---	5
5	NC	---	---
6	RXD	←	3
7	DSR	←	4
8	CTS	←	7
---	---	---	1
---	---	---	9

The appearance of Console port (EIA/TIA-232) adapter cable is as shown in appendix figure C-2:



APPENDIX FIGURE C-2 CONSOLE PORT (EIA/TIA-232) ADAPTER CABLE DIAGRAM

C.3 USB Console Port Adapter Cable

The adapter cable of USB Console port is the universal standard USB-Micro USB adapter cable.

C.4 100Base-FX 100M Optical Module Model and Corresponding Cable

APPENDIX TABLE C-3 100BASE-FX SFP 100M OPTICAL MODULE MODEL AND CORRESPONDING INTERFACE CABLE

Optical Module Model	Center Wavelength	User Interface	Interface Cable Specification	Max. Transmission Distance	Remarks
EOLS-1303-20D	1310nm	LC	9/125μm single-mode fiber	20KM	—

Optical Module Model	Center Wavelength	User Interface	Interface Cable Specification	Max. Transmission Distance	Remarks
SFP-S2-L03P3(E1)	1310nm	LC	9/125 μ m single-mode fiber	20KM	Support DDMI
SFP-S4-L03P3	1310nm	LC	9/125 μ m single-mode fiber	40KM	—
SFP-S8-L03P5	1550nm	LC	9/125 μ m single-mode fiber	80KM	—
SFP-S1-L03P35	TX: 1310nm RX: 1550nm	LC	9/125 μ m bi-directional single-fiber single-mode	10KM	The two models of modules need to be used in pairs
SFP-S1-L03P53	TX: 1550nm RX: 1310nm	LC	9/125 μ m bi-directional single-fiber single-mode	10KM	

C.5 1000Base-X GE Optical Module Model and Corresponding Interface Cable

APPENDIX TABLE C-4 1000BASE-X SFP GE OPTICAL MODULE MODEL AND CORRESPONDING INTERFACE CABLE

Optical Module Model	Center Wavelength	User Interface	Interface Cable Specification	Max. Transmission Distance	Remarks
SFP-M1-L24P8	850nm	LC	50/125 μ m multi-mode fiber	500M	—
			62.5/125 μ m multi-mode fiber	275M	—
SFP-S2-L24P3	1310nm	LC	9/125 μ m single-mode fiber	20KM	—
SFP-S2-L24P3 (E1)	1310nm	LC	9/125 μ m single-mode fiber	20KM	Support DDMI
SFP-S4-L24P3	1310nm	LC	9/125 μ m single-mode fiber	40KM	—
SFP-S4-L24P5	1550nm	LC	9/125 μ m single-mode fiber	40KM	—
SFP-S4-L24P5(V2)	1550nm	LC	9/125 μ m single-mode fiber	40KM	Support DDMI

Optical Module Model	Center Wavelength	User Interface	Interface Cable Specification	Max. Transmission Distance	Remarks
SFP-S8-L24P5	1550nm	LC	9/125μm single-mode fiber	80KM	—
SFP-S12-L24P5	1550nm	LC	9/125μm single-mode fiber	120KM	—
SFP-S1-L24P35	TX: 1310nm RX: 1550nm	LC	9/125μm bi-directional single-fiber single-mode	10KM	The two models of modules need to be used in pairs
SFP-S1-L24P53	TX: 1550nm RX: 1310nm	LC	9/125μm bi-directional single-fiber single-mode	10KM	

C.6 10 GE Optical Module Model and Corresponding Interface Cable

APPENDIX TABLE C-5 10GBASE-X SFP+ 10 GE OPTICAL MODULE MODEL AND CORRESPONDING INTERFACE CABLE

Optical Module Model	Center Wavelength	User Interface Type	Interface Cable Specification	Maximum Transmission Distance
SFP-M1-L192P8	850nm	LC	50/125μm multi-mode fiber	300M
SFP-S1-L192P3	1310nm	LC	9/125μm single-mode fiber	10KM
SFP-S4-L192P5	1550nm	LC	9/125μm single-mode fiber	40KM

Note

- It is recommended to use Maipu SFP module on WNC6600 series wired and wireless integrated controller.
- The above information is just for reference. For details, refer to Maipu market staff or technical support staff.

D Device Running Environment Requirement

D.1 Environment Requirement of Equipment Room

D.1.1 Building Requirement of Equipment Room

It is recommended that the equipment room adopts the anti-static floor, which is dust-free. It is required to lay the static floor. The laying of the floor plate should be tight and sturdy and the level error per square meter should be less than 2mm. When there is no raised floor, lay the static conductive ground material (the volume resistivity should be $1.0 \times 10^7 \Omega \cdot \text{m} - 1.0 \times 10^{10} \Omega \cdot \text{m}$). The static conductive ground material or raised floor should be static grounding. We can use the current limiting resistor and connection line to connect with the grounding device. The resistance of the current limiting resistor is $1\text{M}\Omega$.

D.1.2 Temperature/Humidity Requirement

To ensure that the device can work normally, it is recommended to maintain a certain temperature and humidity in the equipment room. For details, refer to [Physical Parameters](#).

Caution

- If the temperature is too high, the reliability of the device reduces greatly. The long-time high temperature affects the life and speeds up the aging of insulation materials.
- When the device enters the high-temperature environment from the low-temperature environment and if there is condensed water on the device, be sure to take some measures (such as drying and airing) before the device is powered on, so as to prevent the internal components of the device from short-circuit and being burned.
- Measuring points of the working temperature and humidity of the device in the equipment room mean the values measured from the floor above 1.5 m and 0.4 m from the front of the rack when there are no protection boards;
- If the humidity in the equipment room is too high for long time, it causes the poor insulation and even electricity leak of insulation materials easily. Sometimes, the mechanical performances of materials change and the metal parts are corroded easily, too.
- If the relative humidity in the equipment room is too low, insulation pads shrink, which causes the fastened screws loose. Meanwhile, in dry environment, static electricity appears easily, which harms the circuits on the device.

D.1.3 Load-bearing Requirement

According to the actual weight of the installed device and its accessories, access the ground load-bearing requirement and ensure that the ground load-bearing capability of the installation

place meets the requirement. For the weights of the device components, refer to [Physical Parameters](#).

D.1.4 Space Requirement

To ensure that there is enough operation space for moving the chassis and plugging the module, it is recommended that the aisle width of the equipment room is no less than 0.8m. If installing the device in the cabinet, the net height of the equipment room cannot be less than 3m.

To be convenient for cooling and maintaining the device, do not install the device against the wall. The front and rear space of the device should be no less than 0.7m.

D.1.5 Cleanliness Requirement

Dust is harmful for the device operation. Dust causes electrostatic absorption, which makes the poor contact of metal connectors. Electrostatic absorption appears especially when the temperature and humidity are lower, which affects the device life and easily causes communication fault. The requirement for the dust content and particle diameter in the equipment room is as shown in appendix table D-1:

APPENDIX TABLE D-1 DUST REQUIREMENT FOR EQUIPMENT ROOM

Max. Diameter (μm)	0.5	1	3	5
Max. density (tablets/m ³)	1.4×10 ⁷	7×10 ⁵	2.4×10 ⁵	1.3×10 ⁵

Caution

- If there is no visible dust on the desk within three days, it meets the cleanliness requirement.

Apart from dust, the equipment room has the strict requirements for salts, acids, and sulfides contained in the air, because these harmful gases speed up the eroding of metals and the aging of some components.

We should prevent the harmful gases, such as SO₂, H₂S, NO₂, NH₃ and Cl₂, from entering the equipment room. The specific limited values are as shown in appendix table D-2:

APPENDIX TABLE D-2 LIMITATIONS FOR THE HARMFUL GASES IN THE EQUIPMENT ROOM

Gas	Max. (mg/m ³)
SO ₂	0.2
H ₂ S	0.006
NH ₃	0.05

Gas	Max. (mg/m ³)
Cl ₂	0.01

D.1.6 Anti-interference Requirement

The various interference sources no matter from the exterior of devices or application systems or from the interior affect the devices through capacitance coupling, inductance coupling, electromagnetic radiation, public impedance (including grounding system) and lead (such as power lines, signal lines and output lines). Therefore, pay attention to the following:

Caution

- Take valid anti-grid disturbance measures for the power system.
- The working place of the device had better not be used with the grounding settings of power devices or anti-lightening grounding settings and the distance between them had better be as long as possible.
- Be away from the strong power radio transmitters, radar transmitter, and high frequency high-current equipment; take electromagnetic shielding methods when necessary.

D.1.7 Grounding Requirement

The well grounding system is the basis for the device to run stably and reliably, and the important guarantee for anti-lightning, anti-jamming, and anti-static of the device. The user should provide the well grounding system for the device. The resistance between the device chassis and the ground should be smaller than 1ohm.

D.2 Requirements for Power Supply

D.2.1 AC Power Supply Requirement

Caution

- The low-voltage power supply system should adopt the three-phase five-wire or single-phase three-wire system. The voltage of the low-voltage power supply system is 110V/220V and the frequency is 50Hz/60Hz.
- It is required to adopt the un-interruptible power, such as UPS, as the AC backup power supply. The AC backup power and AC should keep the same phase and the switching time with the AC should be smaller than 10ms. Otherwise, the device may restart or reset.
- The AC capacity of the equipment room should consider the work current and faulty current of the device. Ensure that the independent device has the independent AC power distribution protection device. The configuration protection switch should be larger than the protection switch of the post powered device.

The power input range of the device using the AC power is as shown in appendix table D-3:

APPENDIX TABLE D-3 AC POWER SUPPLY REQUIREMENT

Item	Index
Input voltage range	100-240V
Input frequency range	50-60Hz

Caution

- AC wire should adopt the flame-retardant wire. The wire layout should be done according to *Code for fire protection design of tall buildings GB50045-95*. The low-voltage distribution is done according to *Specifications for the design of low-voltage electric power distribution systems GB50045-95*.

D.2.2 AC Power Supply Suggestions

Suggestions for AC power supply:

- If the AC directly provides power for the device, the power supply voltage exceeds -10% to 5% of the rated voltage, or exceeds the permitted voltage range of the device. We should adopt the voltage regulator to meet the requirement.
- It is required that the AC uninterruptible or transient communication load should adopt the UPS power supply system or inverter power supply system to provide power.
- When the AC becomes abnormal, to ensure the important communication load and important power load, the telecommunications site should be configured with the generator set as the self power supply. The capacity should be no less than 1.5-2 multiples of the total capacity of the AC uninterruptible powered device.

D2.3 DC Power Supply Requirement

The DC power supply mode should ensure stable and reliable power supply. The power should be deployed near the device to ensure the DC feeder line as short as possible. The requirement for the DC power is shown in Table D-4:

APPENDIX TABLE 0-5 DC POWER SUPPLY REQUIREMENT

Item	Index
-48 V input voltage fluctuation range	-40V to -57V
Capability of DC power supply bearing the surge current	$> 1.5 \times$ rated load current
Power-on and power-off overshoot amplitude	\leq DC output voltage $\pm 5\%$
Peak-to-peak value noise voltage	$\leq 200\text{mV}$
Dynamic response	Recovery time $< 200\text{ms}$

Item	Index
	Overshoot value \leq DC output voltage setting value \pm 5%

D2.4 DC Power Supply Suggestions

Suggestions for DC power supply:

- The decentralized power supply mode is recommended. Use multiple DC power supply systems and deploy power devices at multiple sites.
- Adopt the standard DC power supply system and set the communication power system output voltage to reach the required output voltage range.
- Configure the total capacity of the High-frequency switch rectifier to satisfy the communication load power and the charging power of the storage battery. Configure the number of rectifier modules in the redundancy mode.
- Install the storage battery in two groups or multiple groups. The total capacity is determined by the time of the storage battery supplying power to the load independently.

E Device Grounding Specification and Protection

E.1 Device Grounding Specifications

The grounding specifications include universal grounding specification, building grounding specifications of equipment room, device grounding specifications, grounding specifications of communication power, and grounding wire laying specifications.

E.1.1 Universal Grounding Specifications

The universal grounding specifications are as shown in appendix table E-1:

APPENDIX TABLE E-1 UNIVERSAL GROUNDING SPECIFICATIONS

No.	Description
1	Grounding design should comply with the voltage sharing and equipotential principle, that is, the work grounding and protect grounding (including the shielded grounding and lightning grounding of distribution frame) share one group of grounding.
2	The cabling rack, hanging metal frame, rack or cabinet, metal ventilation pipe, metal doors and windows in the equipment room should be connected to the earth for protection.
3	The unpowered metal parts of the device should be connected to the earth for protection.
4	Ensure that the grounding wire well contacts with the protection grounding bar of the equipment room.

No.	Description
5	Do not use other device as an integral part of the grounding wire in electrical communication.

E.1.2 Building Grounding Specifications of Equipment Room

The specific requirements for the building grounding specifications of the equipment room:

The grounding resistance of the integrated communication building should be no more than 1ohm; in the common communication site, it should be smaller than 5ohm (for the area with high soil resistivity, it can be raised to 10ohm).

E.1.3 Device Grounding Specifications

The device grounding specifications are as shown in appendix table E-2:

APPENDIX TABLE E-2 DEVICE GROUNDING SPECIFICATIONS

No.	Description
1	The communications devices and corollary equipment (mobile base station, transmission, switching, power, and so on) in the equipment room should be connected to the earth for protection. The protection groundings of the devices should be integrated to one total grounding bar. The protection groundings of the devices in the same equipment room should be integrated to the protection grounding bar of the same equipment room.
2	The protection ground (PGND) of the device should be connected to the nearest protection grounding bar provided by the consumer. The short-circuit wire should be yellow and green plastic insulated copper wire 2.5mm ² above.
3	There is the ground terminal and ground symbol below the front, back and side doors of the cabinet, which should be connected to the ground terminals of the cabinet via the connection cable with the cross-sectional area no less than 2.5mm ² respectively.
4	The metal components of the device cabinet should have good conductivity. The metal component connections of the cabinet cannot be painted with the insulation paint.
5	The frame body of the same line cabinet is interconnected closely via the top fastening bolts and washers. Do not spray at the 30mm*50mm rectangular surface around the connection hole of the fastening bolts, but we should do the anti-rust and anti-corrosion treatment. Washers and nuts should also be color zinc plated to ensure good electrical contact.
6	When combining the cabinets of the same type, the ground bus bars of the neighboring cabinets (if any) need to be interconnected via the bus bar short-circuit cable. The cross-sectional area of the short-circuit cable is 6mm ² and the length is no more than 300mm. Connect the two ends to the ground bus bar terminals of the neighboring cabinets respectively and tighten.

E.1.4 Grounding Specifications of Communication Power

The grounding specifications of the communication power are as shown in appendix table E-3:

APPENDIX TABLE E-3 GROUNDING SPECIFICATIONS OF COMMUNICATION POWER

No.	Description
1	The AC power supply system of the communication equipment room should adopt the TN-S power supply mode.
2	At the entrance of the AC power wire entering the equipment room, we should configure the AC power mine (C-class mine) with the discharge current no less than 20KA.
3	The protection ground of the communications power should share one group of ground body with the protection ground of the communication device. When the communication power and the communication device are at the same equipment room, they should share the protection ground bar of the same equipment room.
4	AC power port should be added with lightning protection circuit.
5	The positive polarity of -48V DC power should be grounded at the DC power output site.
6	The working ground and PGND of the DC power should share the same grounding body with the communication device PGND. When the communication power and the communication device are in the same equipment room, it is recommended for them to share the same protection grounding bar in the same equipment room.
7	The DC power port should ass surge protection circuit.

E.1.5 Laying Specifications of Ground Wires

The laying specifications of the ground wire are as shown in appendix table E-4:

APPENDIX TABLE E-4 LAYING SPECIFICATIONS OF GROUND WIRE

No.	Description
1	Ground lead should not be intertwined or parallel with the signal line.
2	Grounding cable cannot be led aially, but should be buried in the earth or routed indoor.
3	On the protection ground wire, prohibit the connectors; prohibit installing the switch or fuse.
4	The protection ground wire should adopt the yellow and green plastic insulated copper wire.
5	The neutral line of the AC power cable in the equipment room cannot be connected with the protection ground of the transmission and communication devices in the equipment room.
6	The length of the protection ground wire should not exceed 45m, but should be as short as possible. When exceeding 45m, it is required that the consumer re-sets the ground row at the nearest.

E.2 Device Protection

This section mainly describes the precautions for the lightning protection of the device during installation.

E.2.1 General Requirement of Lightning Protection Wires

The device cables can be divided to indoor cables and outdoor cables according to the location of connecting the terminal. They have different requirements for the wiring in the lightning protection design.

Caution

- Communication connection cable should be routed indoors, which can effectively reduce the damage rate of the induction lightning of the device. The Ethernet cable is the interconnection line of the indoor signals and should not be overhead outdoors.
-

The general requirements for the wiring of the indoor cables:

- The cable installation is required to be done by category, avoiding that the cables of different categories are bundled with each other.
- It is recommended that the cable is bundled with one line deduction every 100 mm, strengthening the combing and fixing.
- The ground wire should be as short and thick as possible. The connection of the ground wire and grounding bar needs to use the screw to tighten or welding and preservative treatment.

The general requirements for the wiring of the outdoor cables:

- If the actual conditions cannot meet the indoor wiring, the outdoor cables should be laid and buried (introduced to the indoor from the underground).
- If you cannot lay and bury all outdoor cables, the aerial cables should be dressed with the metal pipes 15m before entering the indoor. The two sides of the metal pipe are grounded and we should install the signal mine at the corresponding interface of the device after the cable enters the indoor.
- If using the shielded cable, ensure that the shielded layer well contacts with the metal shell of the device at the device interface. We should install the signal mine at the corresponding interface of the device after the cable enters the indoor.
- When the outdoor cable without any protection is connected to the device, we should install the signal mine at the corresponding port.
- When laying the fibers, it is required that the wiring is smooth and the bundling the neat. It is required that the internal core wire is grounded before the outdoor fiber enters the indoor. The fiber cannot be stretched or bundled too tightly.

E.2.2 Installation Method of Cable Wiring

Installation Method of Power Cable

One end of the power cable is connected to the device and the other end is connected to the power strip or lightning protection bar. The excessive part is folded to the shape of S and fixed in the chassis. Keep a distance of more than 20cm with other cables.

Installation Method of Cables

The signal cables should be installed and bundled by indoor and outdoor, drawn from the outlet holes of different chassis to the user terminal or cascading device.

Precautions for Using Fiber

Caution

- When using the fiber to connect the network device, first confirm whether the type of the optical connector and the fiber type conform to the used optical port type.
 - Before connecting the fiber, first confirm that the optical power of the receiving end does not exceed the upper threshold of the receiving optical power of the optical module. Otherwise, it may burn the optical module.
 - If the optical port is not connected to the optical connector, please be sure to wear a protective cap.
 - If the optical port is not connected to the optical connector and the protective cap is opened, maybe some invisible rays emitted from the optical port, so you do not directly look at the optical port.
 - The fiber connector should have the safe and reliable packaging and the connector should have the dust cap. When not using, the fiber connector should wear the dust cap, avoiding scratching the end face of the insert core of the fiber connector, and affecting the performance index. If the dust cap is too loose or polluted, change it in time.
 - Before connection, we should use the dust-free paper to soak the absolute alcohol and wipe the end face of the insert core of the fiber connector. You can wipe in one direction only and you also need to wipe the end face of the peer fiber connector.
 - When connecting, you cannot twist or bend the fiber. After installation, the bent radius of the fiber cannot be smaller than 40 mm (In dynamic bending case, the minimum bend radius is 20D; in the static bending case, the minimum bend radius is 10D; D is the fiber sheath diameter).
 - If the fiber needs to pass through the metal board hole when connecting, the metal board hole should have the smooth and fully-filleted surface (the filleting radius should be no less than 2 mm). When passing through the metal board hole and turning along the sharp edge of the structural part, we should add the protective sleeve or pad.
 - Be careful when plugging the connector and avoid damaging the connector or fracturing the fiber because of too much force. Avoid pulling, pressing, and extruding the fiber. The permitted maximum tensile force and crush force of the fiber are as shown in appendix table E-5.
-

APPENDIX TABLE E-5 PERMITTED FORCE OF THE FIBER

Force Time	Tensile Force (N)	Crush Force (N/100mm)
Short-term force	150	500
Long-term force	80	100

Installation Method of Fiber

After the fiber is drawn out from the optical port, the fiber directly connected to the photoelectric converter can be coiled to hang in the inner side of the chassis. The fiber cascaded with other devices should slip over the PVC pipe to draw out, avoiding traction and stretching.

! Caution

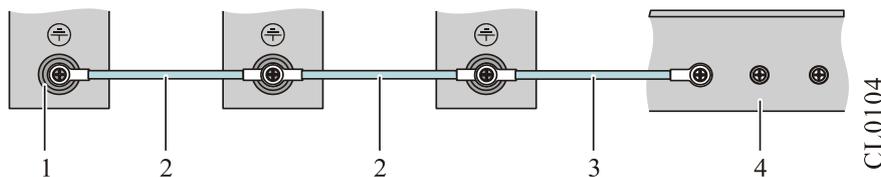
- Fiber itself does not belong to the conductor, and it does not sense or transduce the over-voltage, but the strengthen core of the fiber optic cable (the armored component installed to prevent the fiber from being affected by the environment event) can easily sense and transduce the lightning overvoltage, so we should treat properly. It is recommended that the user performs the ground protection at the user end of the fiber optic cable.

E.2.3 Equipotential Connection Requirement and Method

The interconnected devices in the same work range need the equipotential connection. For example, the interconnected devices, the metal sheath of the cable, power supply PE line, and the installed metal structure should ensure the equipotential connection.

Device Equipotential Connection Mode

For the equipotential connection of the interconnected devices, refer to figure E-1. After connection, use the multimeter to measure whether each equipotential connection point well contacts and the impedance is low enough.



APPENDIX FIGURE E-1 CONNECTION DIAGRAM OF DEVICE EQUIPOTENTIAL

1. Device ground terminal	2. Device equipotential connection line
3. Ground protection cable	4. Ground bar

F Environmental Substance Statement

APPENDIX TABLE F-1 TOXIC AND HAZARDOUS SUBSTANCE NAME AND CONTENT

Part Name ¹	Toxic and Hazardous Substance or Element					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Printed circuit board component ²	×	○	○	○	○	○
Switch power	×	○	○	○	×	×
Cabinet/frame (metal)	○	○	○	○	○	○
Chassis mat	○	○	○	○	×	×
Screw	×	○	×	○	○	○
Dust cover (Plastic)	×	×	×	×	×	×
Radiator	○	○	○	○	○	○
Fan	○	○	○	○	○	○
Cable	×	×	×	×	×	×
Lithium battery	○	○	○	○	○	○

○: It indicates that the content of the toxic and hazardous substance in all homogeneous materials of the component is below the limit requirement in SJ/T11363-2006 standard.

×: It indicates that the content of the toxic and hazardous substance in at least one homogeneous material of the component exceeds the limit requirement in SJ/T11363-2006 standard.

In the environmental protection use period, only strictly complying with the using conditions in the environmental protection use period, the environmental substances or elements contained in the product do not leak or mutate.

The environmental protection use period of the Li battery of the product is 5 years; the environmental protection use period of the other components is 50 years.

For the use conditions of the product in the environmental protection use period, refer to the requirements for the use environment in the product manuals.

Note 1: In the statement, list all components that may be configured in Maipu products. For the actual components contained in each product, please prevail in kind.

Note 2: PCB components include the printed circuit boards and the formed IC devices and the discrete devices, such as resistors, capacitors, integrated circuits, and connectors.