

SNR-R7204 Router Hardware Installation Manual

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Chapter 1 7204 Router Overview

1.1 Introduction

7204 high-end routers are developed by our company for telecom carriers and enterprise's core network. Its design is industry-edging, market-oriented and experience-/technology-blossomy.

7204 hi-end router marks its large capacity, multiservice support, flexible configuration and strong network environment compatibility. 7204 router has four Gigabit-Ethernet optical-electrical-multiplexed service channels, one Ethernet 100M debugging port and one console port.

1.2 Technology Traits

- Strong data-processing ability

The hi-performance network processor and the advanced bus technology are adopted, which makes sure that the router functions well in the hi-speed network.

- High security

The overall firewall technology and the VPN technology secure data transmission.

- Various routing protocols

Supporting multiple routing protocols makes sure of the routing information redistribution between different routing protocols.

- Flow management policy

Multiple queue algorithms are supported, which secures the bandwidth demand of the key service.

- High performance-price ratio

The high performance-price ratio fully secures users' investment.

- Chinese/English website supporting

The Chinese/English online help is supported, which facilitates domestic/oversea users.

1.3 Hardware Performance Index

Table 1-1 7204 router's hardware characteristics

Memory	Flash Memory: 8M Bytes; DDR SDRAM: 512Mbytes; QDR SRAM: 8M Bytes;
Fixed configuration	Four Ethernet 10/100/1000M ports (SFP and the electric port mode are provided meanwhile) The LINK and ACT indicators are provided. One Ethernet 10/100M port (only the electric port is provided)

	The LINK and ACT indicators are provided. One console port without indicator		
Specifications	442.5mm×374mm×44mm		
Working temperature/humidity	0°C-40°C; 10%-85%; no condensation		
Storage temperature/humidity	-20°C-65°C; 5%-95%; no condensation		
Power characteristics	AC power	Input voltage:	100-240V
		Input frequency:	47-63Hz
		Input current:	1A/230V
Power consumption	Up to 60W		

1.4 Appearance of 7204 Router

The front template of the 7204 router is shown the following figure:

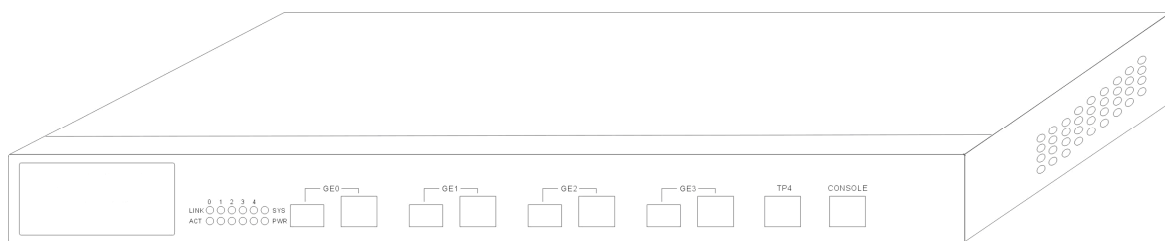


Figure 1-1 Front template of the 7204 router

The back template of 7204 router is shown in the following figure:

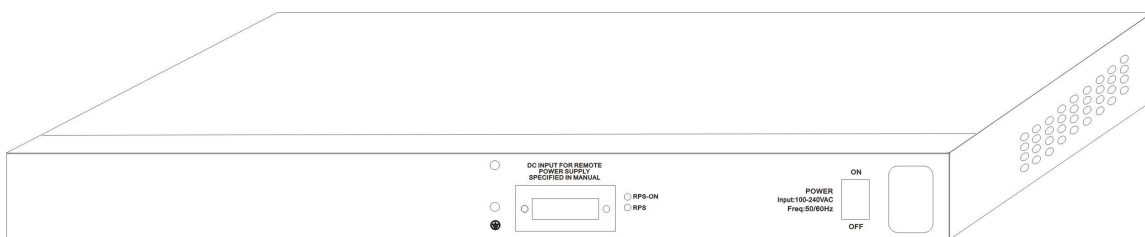


Figure 1-2 Back template of the 7204 router

1.5 Hull

The router's hull is 19 Inch wide, 1U high, electromagnet compatible and 3C supportive.

1.6 Ventilation and Cooling System

7204 router runs in a working temperature between 0 and 40°C. The appearance temperature of the device cannot exceed 50-80% of the highest temperature and the

reliability demands of the device must be satisfied. Of course, security and maintenance ability must be considered at the same time.

The cooling system of the device must take the two-side heat cooling design. In some cases, the fan is needed to cool the heat mandatorily, ensuring the router runs in the regulated environment.

1.7 ROHS Description

Parts	Toxic or harmful substances or elements					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Chasis	X	X	X	X	X	X
Rack	X	X	X	X	X	X
Baseboard	X	X	X	X	X	X
Module	X	X	X	X	X	X
Interface Card	X	X	X	X	X	X
O: The toxic or harmful substances' levels in each homogeneous materials of each part, are under the limitation of SJ/T 11363—2006 regulation X: The toxic or harmful substances' levels at least in one homogeneous materials of one part, exceed the limitation of SJ/T 11363—2006 regulation						



Chapter 2 Installation Preparation

2.1 Safety Advice

To prevent personnel and devices from harms, read safety advices in the manual before you install the 7204 router.



The following safety advices do not cover all potential dangers.

2.1.1 Safety Advices for System Installation

- Keep the hull clean and dustless.
- Before dismantling the hull, please shut down all powers and dial out all power sources and cables.

2.1.2 Safety Advices for Removal

Follow the following advices when you move the device:

- When you move the device, do not hurt your feet or your waist.
- Before moving the device, cut off all power sources and dial out all cables.



When moving the device, do not hold the template, power handle or ventilation hole. The right operation is to hold the bottom of the device with two hands.

2.1.3 Electricity Security

- Check potential dangers in the working area, such as ungrounded power source, unreliable power grounding and wet ground.
- Before installation, know the location of the emergency power switch indoors. If trouble occurs, cut off the power.
- Try to avoid maintaining the devices alone.
- When the power is cut off, check the devices carefully.
- Do not put the device in moist environment or let liquid substance into the hull.

2.1.4 Laser Security

When the optical-fiber transceiver works, you should make sure that the port connects the optical-fiber cable and that the port is stuffed by the anti-dust lid.

Do not watch the laser interface directly.

2.2 Requirements for Location Place

7204 router must be installed indoors. To secure its normal running and expand its lifespan, the following requirements for the installation place must be satisfied:

2.2.1 Ventilation Requirements

The ventilation of the device must guarantee a space reservation at the ventilation hole, enabling the cooling system to work normally. After all types of cables are connected, you should bind them together to prevent them from stuffing the ventilation hole.

2.2.2 Temperature and Humidity

To guarantee the normal function and lifespan of 7204 router, you should maintain a certain temperature and humidity in the machine room.

If the temperature and humidity in the machine room is unsuitable for a long time, the device may get damaged.

- In a relatively high humid environment, the insulation material may not insulate well, or even have current leakage. In some cases, the mechanic performance of the material and mental parts' erosion may occur.
- In a relatively low humid environment, the insulation slice may be dried, shrink and easily generate static; hence, the circuits on the device may get damaged.
- The higher the temperature is, the higher the danger is. The reliability of the router, hence, will greatly be affected and the aging process of the router will greatly accelerate.

The router's requirements for temperature and humidity are shown in table 2-1:

Table 2-1 7204 router's requirements for temperature and humidity

Temperature		Relative Humidity	
Long-term function	Short-term function	Long-term function	Short-term function
15°C~30°C	0°C~45°C	40%~65%	10%~90%



Notes

The measurement should be taken at 1.5m high and 0.4m ahead of the front template when the bracket has no shield panes.

The short-term function means that the router cannot continuously run over 48 hours or 15 days discontinuously each year.

The extremely bad working environment means the temperature and humidity when trouble occurs in the air-conditioning system. The router takes five years to restore.

2.2.3 Cleanness Requirements

Dust is a danger for device's function. If there are lots of dusts in the router's hull, the static may be absorbed and therefore the metal pointer may not be well touched, especially when the indoor humidity is relatively high. The dust volume and particle diameter in the machine room are shown in table 2-2.

Table 2-2 Dust volume and particle diameter in the machine room

Maximum diameter (μm)	0.5	1	3	5
Maximum thickness (particle/m ³)	1.4 x 10 ⁵	7 x 10 ⁵	2.4 x 10 ⁵	1.3 x 10 ⁵

Besides the dust, the device has severe demands for the salt/acid/sulfide percentage in the air. These vicious substances will accelerate metal's erosion and the aging process of some parts. Hence, vicious gases (SO_2 , H_2S , NO_2 , and CL_2) must be prevented from entering the computer room. The details about the average/maximum vicious gas ratio in the air are shown in table 2-3.

Table 2-3 Average/maximum vicious gas ratio in the air

Gas	Average ratio (mg/m)	Average ratio (mg/m)
SO_2	0.2	1.5
H_2S	0.006	0.03
NO_2	0.04	0.15
NH_3	0.05	0.15
CL_2	0.01	0.3

2.2.4 Power Requirements

The following shows the requirements for the AC current:

Input AC voltage: $220\text{V} \pm 20\%$, $50\text{Hz} \pm 10\%$

Power: 60W

2.3 Grounding Requirements for the System

The nice grounding system is a solid base for 7204 router to function reliably, and a prima premise for thunder attack prevention and anti-jamming. Please carefully check the grounding conditions of the installation site according to the requirements of grounding regulations, and get the grounding well done according to actual situation.

2.4 Requirements for System Connection

2.4.1 Safe Grounding

The AC-adopted device must be grounded through the yellow-green grounding line, or the electric shock may occur when the insulation resistance between power source and hull gets small.

2.4.2 Thunder Grounding

The anti-thunder system is an independent system among facilities, consisting of the lightning rod, the underground conductor and the connector for the grounding system. The grounding system is used together with the grounding device for the yellow-green safety grounding line. The lightning discharge grounding is just for facilities, not for devices.

2.4.3 Electromagnetic-Compatible Grounding

The groundings which are oriented for electromagnetic compatibility include the shielded grounding, filter grounding, noise/interruption limitation and level reference. The grounding resistance must be less than 1Ω .

2.5 Installation Tools

Table 2-4 Tools and meters

Regular tools	Crossed screwdriver, common screwdriver, cables, optical-fiber cables, bolts and pincer
Specific tools	Static-proof tools



7204 router has no accessory toolkit and users need prepare for these tools.

2.6 Requirements for Unpacking & Goods Examination

The routers are delivered according to the order contract, so the buyer has to unpack and check the routers according to the order contract.

The inspection must comply with the order contract and the packing list, which is to check whether the packaging is complete and whether the packing list accords to the goods.

Note:

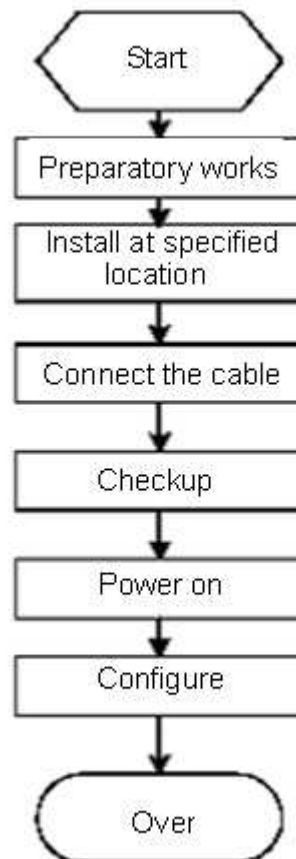
- 1) When you plug or dial out the power line, keep the power line horizontal with the power socket.
- 2) When the lifetime of our products ends, handle them according to state laws and regulations, or send these products to our company for collective processing.

Chapter 3 Router Installation

Caution:

Only professionals are allowed to install or replace the devices of the router.

3.1 Installation Procedure of 7204 Router



3.2 Preparation Before Installation

Prepare the following things before the router is installed:

- Check whether ventilation is nice at the installation site.
- Check whether the power source and the air flow at the installation site are prepared according to corresponding requirements.
- Check whether the cables are prepared well for the power source and relative network.
- Check whether the rated power source can be obtained.

3.3 Installing the Router's Hull

The hull of the router can be installed on the desk or can be fixed to other cabinets.

- Installing the hull on the desk
- Installing the hull on the cabinet

3.3.1 Installing the Hull on the Desk

7204 router can be directly put on the smooth and safe desk.

Note:

Do not put heavy things on the top of the router.

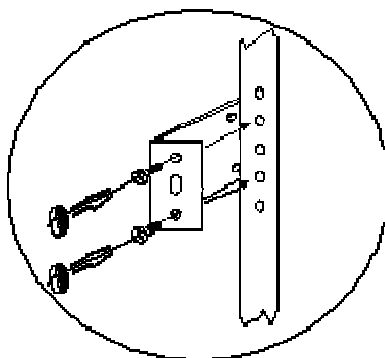
3.3.2 Installing the Hull on the Cabinet

The hull of the router is fixed on the cabinet through the brackets.

Note:

The previous example only describes how to install the router's hull on one side of a bracket. The installation on the other side of the bracket is same.

After the brackets are installed, install the router on the cabinet. See the following figure:



3.4 Connecting the System and the Ground

GND of the router must be grounding. To guarantee the grounding of the system, the GND port must be connected by to the ground by connecting a line through the grounding column and the summary slot of the bracket.

3.5 Checking After Installation

3.5.1 Checking the Cabinet

- Check whether outside power supply matches up with the switchboard of the cabinet.
- After the router is installed, check whether the front/reel cabinet doors can be closed.
- Make sure that the cabinet is so fixed that it cannot be removed or fall down.
- Make sure that the router has been installed and fixed well in the cabinet and that all cables are also fixed on the cabinet.

3.5.2 Checking Cable Connection

- Make sure that the optical-fiber cable and the cable match the ports.
- Check whether the cables are bound correctly.

3.5.3 Checking the Power Source

- Check whether the power line is well touched and complies with the security requirements.
- Open the switch of the power source and check whether the power module works normally.

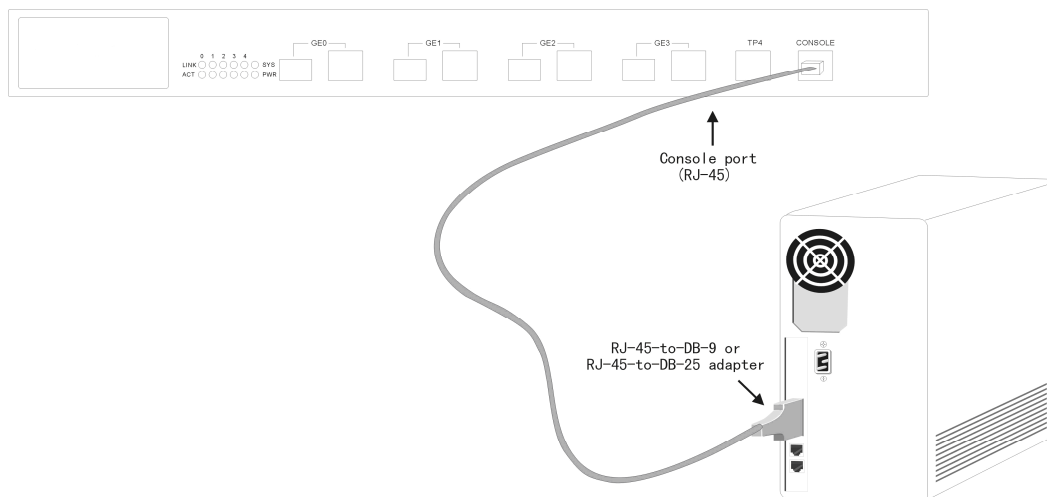
3.6 Connecting the Console Port

7204 router has one console port. Its attributes and usage method are described in this section.

3.6.1 Connecting the Console Port

Its console port has a rate of 300bps to 115200bps and a standard RJ45 plug and the parity check is an option for the console port. However, the console port has no indicator. Before configuring and monitoring the router, you must connect the console port and the terminal (such as STAR-510G⁺) or PC's serial port through specific monitor cable and then run terminal imitation software (Windows super-terminal). The cable is provided according to the host. The communication parameters of the terminal serial port can be set to a rate of 9600bps, eight data bits, one stop bit, no sum check bit and traffic control.

1. Connecting the console port of 7204 router and the computer:



The RJ45 connector of the console port is shown in the following figure. The RJ45 plug corresponds to the RJ45 socket, whose pins can be aligned from left to right with the value from 1 to 8.

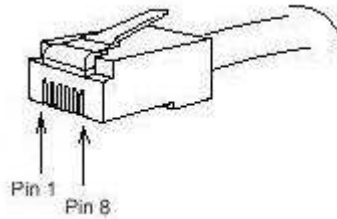


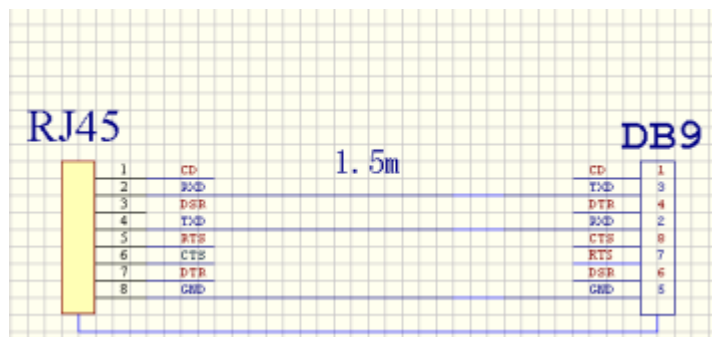
Figure 3-1 RJ-45 connector

Definition of the pins of the console port:

No.	Name	Symbol	Remarks
1	Carrier Detecting	CD	It is used to connect the Modem.
2	Data receiving	RXD	Input
3	Data-line device ready	DSR	It is used to connect the Modem.
4	Data transmitting	TXD	Output
5	Transmission requesting	RTS	It is used to connect the Modem.
6	Transmission allowable	CTS	It is used to connect the Modem.
7	Data terminal ready	DTR	It is used to connect the Modem.
8	Signal ground	SG	

2. Outside line connection of the console port of 7204 router

Otherwise, the single-pass problem will arise on the super terminal. The cable is used to connect the console port of the 7204 router and the outside console terminal device. One end of the cable is a 8-pin RJ45 plug and the other end is a 9-hole plug (DB9). The RJ45 plug is put into the socket of the console port on 7204 router. This console cable can be provided by our company. It is numbered as RLC0301.



3.7 Establishing the Configuration Environment

3.7.1 Establish the Local Configuration Environment Through the Console Port

To establish the local configuration environment, you need connect the serial interface of PC and the console port of 7204 router.

- 1) Run the terminal imitation program on PC. If you have never run this kind of program before, you need to click **program->affix->super terminal** and then the page shown in figure 3-2 appears.



Figure 3-2 Establishing a connection

- 2) Set the connection ports on the page shown in figure 3-3.



Figure 3-3 Setting the connection port

- 3) Set the maximum baud rate to **9600**, data bit to **8**, parity check and flow control to **none**, and stop bit to **1**, as shown in figure 4-4.

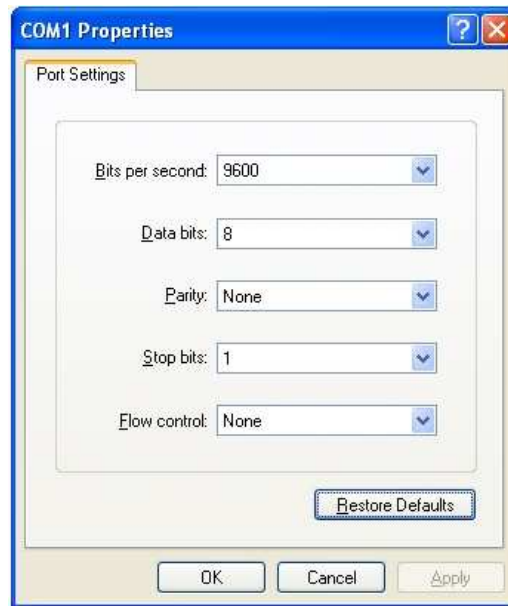


Figure 3-4 Setting communication parameters about the port

Chapter 4 Hardware Fault Analysis

The part describes how to remove the fault from the router.

4.1 Fault Separation

The key for resolving the systematic faults is to separate the fault from the system. You can compare what the system is doing with what the system should do to detect the fault. You need to check the following subsystems:

- Power source—power source, cable and fan
- Port, cable and connection—ports on the front template of the router and the cables connecting these ports

4.1.1 Power-Related Trouble

Do the following checkups to help remove the fault:

- The power on-off is located at “ON”.
- If the router is too hot, check whether the air outlet and air inlet are clean and then do relative operations in section “Requirements for Common Locations”. The working temperature of the router is from 0 to 40 Celsius degrees.
- If the router cannot be started, check whether the LED indicator is on.

4.1.2 Faults Relative with Port, Cable and Connection

Do the following checkups to help remove the fault:

- 1) Check the cable if the router cannot find the port.
- 2) If the power on-off is at the “ON” location, check the power source and the power cable.

4.1.3 Abnormal Troubles of the System

Do the following checkups to help remove the fault:

- Check whether the PWR indicator is on.
- If the console port does not work after the system is started up, check whether the console port is set to a baud rate of 9600 bps, eight data bits, no sum check bit, one stop bit and no traffic control.

4.2 Indicator Description

The LED indicator shows that the router is running. The following table shows the indicators of 7204 router and their description:

No.	Abbrev.	Description
1	LINK	It is on when the Ethernet port is connected normally. It is off when the Ethernet port is disconnected.

2	ACT	It flickers when data is received and transmitted on the Ethernet port.
3	POWER	If it is on, the power source runs normally.
4	SYS	It is on when the system is normally started.