MP1800 Router Install Manual

V1.0

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<table>
<tr><td>Document Title</td><td colspan="4">MP1800 Router Install Manual V1.0</td></tr>
<tr><td>Product Version</td><td colspan="2"></td><td>Document Revision Number</td><td>1.0</td></tr>
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☐ Improve Contents ☐ Add more step-by-step procedures/tutorials
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Production Introduction

MP1800 is one new multi-service router developed by Maipu, integrating the routing technology, switching technology, security technology, 3G, WLAN, traffic control, and network-surf monitoring. It is the MeIN (Multi-service Edge-Intelligent Network) edge network device with high cost-effective and complete functions. It adopts the fixed configuration and modular design. The fixed configuration meets the cable and fiber broadband access. The modules are expanded to provide 3G, xDSL, PON, V24/V35, E1/CE1, and ISDN broadband and narrowband access capabilities, as well as the load balance mechanism of various access combinations.

Product Features

- Wired and wireless integration, supporting 3G and WLAN access and inter-connecting with the wired network seamlessly
- Routing and switching integration, supporting two Ethernet WAN ports + 4/8 Ethernet LAN ports
- Broadband and narrowband integration, supporting N*64K-100M WAN link interface and directly supporting optical interface uplink
- WAN and LAN integration; the software function completely supports controlling and managing WAN and LAN in a centralized manner
- Data and voice integration, supporting data multi-service development and VoIP function and can be expended as IPPBX further
- Information and communication integration, supporting rich value-added application and network application monitoring

Hardware Features

MP1800 Series Multi-service Router Appearance

MP1800 multi-service access router

Front and Back Panels of MP1800 Series Multi-service Router

Front and back panels of RM1800-21-AC router

Front and back panels of RM1800-22-AC router

Front and back panels of RM1800-23-AC router

Front and back panels of RM1800-31-AC router

Front and back panels of RM1800-31W-AC router

Front and back panels of RM1800-31W-DC48 router

Front and back panels of RM1800-35-AC router

Front and back panels of RM1800-35W-AC router

Front and back panels of RM1800-36W-AC router

Front and back panels of RM1800-36-AC router

The meanings of the indicators on the front and back panels of the above routers:

SYS & PWR (system and power)

- SYS: system status indicator; after the system loads successfully, the indicator flashes slowly;
- PWR: system power indicator; when the 5V power works normally, the indicator becomes on;

CONSOLE (console port)

- TXD: data sending indicator of the console port
- RXD: data receiving indicator of the console port

FETH0 (WAN Ethernet 0)

- 100M: data rate indicator of 10/100M Ethernet port; on for 100M and off for 10M;
- LINK/ACT: Ethernet port connection/data receiving and sending indicator

FETH1 (WAN Ethernet 1)

- 100M: data rate indicator of 10/100M Ethernet port; on for 100M and off for 10M;
- LINK/ACT: Ethernet port connection/data receiving and sending indicator

LAN Ethernet port 0-7

RM1800-21-AC, RM1800-22-AC, RM1800-23-AC, RM1800-31-AC, RM1800-31W-AC, RM1800-31W-DC48:

- Yellow light (left): data rate indicator of 10/100M Ethernet port; on for 100M and off for 10M;
- Green light (right): data receiving and sending indicator of Ethernet port

RM1800-35-AC, RM1800-35W-AC, RM1800-36-AC, RM1800-36W-AC:

- Yellow light (left): data rate indicator of 100/1000M Ethernet port; on for 1000M and off for 100M;
- Green light (right): data receiving and sending indicator of Ethernet port

The description of the interfaces:

The interfaces on the front panel of MP1800

Device Type	**Interface**	**Interface Type**	**Description**
RM1800-21-AC	CONSOLE	RJ45	Console port
	WAN port	RJ45	One 100M Ethernet electric port
	LAN port	RJ45	Four 100M Ethernet electric ports
RM1800-22-AC	CONSOLE	RJ45	Console port
	WAN port	RJ45	Two 100M Ethernet electric ports
	LAN port	RJ45	Four 100M Ethernet electric ports
	USB port	USB interface	One USB interface
RM1800-23-AC	CONSOLE	RJ45	Console port
	WAN port	RJ45	Two 100M Ethernet electric ports
	USB port	USB interface	One USB interface
RM1800-31-AC RM1800-31W-AC RM1800-31W-DC48	CONSOLE	RJ45	Console port
	WAN port	RJ45	Two 100M Ethernet electric ports
	LAN port	RJ45	Eight 100M Ethernet ports
	USB port	USB interface	One USB interface

RM1800-35-AC RM1800-35W-AC	CONSOLE	RJ45	Console port
	WAN port	RJ45	Two 100M Ethernet electric ports
	LAN port	RJ45	Four 1000M Ethernet electric ports
	USB port	USB interface	One USB interface
RM1800-36-AC RM1800-36W-AC	CONSOLE	RJ45	Console port
	WAN port	SFP	Two 100M Ethernet electric ports
	LAN port	RJ45	Four 1000M Ethernet electric ports
	USB port	USB interface	One USB interface

The interfaces on the back panel of the MP1800 series router

Interface	**Interface Type**	**Description**	**Corresponding slot**
ON/OFF		The power switch, ON or OFF	
IN		AC: 100-240V Max. Current: 1A	
		DC: -57- -40V Max. current: 2A	
SLOT3	The interface type depends on the interface module.	Bus slot	Multi-function module
SLOT2	The interface type depends on the interface module.	Bus slot	Multi-function module
SLOT1	The interface type depends on the interface module.	Bus slot	Multi-function module

System Description of MP1800 Series Multi-service Access Router

The basic configuration and working environment of MP1800 router are as follows:

MP1800 router system

Item	Description	
Console port	One (RJ45), asyn DTE working mode	
Ethernet port	Two 10/100M fast Ethernet ports (RJ45), except for RM1800-21-AC One 10/100M fast Ethernet port (RJ45), RM1800-21-AC	
High-speed multi-function slot	Three high-speed multi-function slots	
USB high-speed interface	One (except for RM1800-21-AC)	
Processor	High-speed RISC processor	
FLASH	32Mbyte	
SDRAM	256Mbyte	
Domension (W×D×H)	RM1800-21-AC RM1800-22-AC RM1800-23-AC RM1800-35-AC RM1800-35W-AC RM1800-36-AC RM1800-36W-AC	340 x 260 x 43.8
	RM1800-31-AC RM1800-31W-AC RM1800-31W-DC48	340 x 300 x 43.8
Max. weight	<4.5 Kg	
Input voltage	AC 100-240V, 50/60Hz	
	DC -57- -40V	
Environment temperature	Working temperature for a long term: 5～40℃ Working temperature for a short term (48 hours): -5～45℃	
Environment humidity	10-90% no-condensing	

Rated power	50W
Max. power	36W±10% (RM1800-31-AC, RM1800-31W-AC, RM1800-31W-DC48); 30W±10% (RM1800-21-AC, RM1800-22-AC, RM1800-23-AC, RM1800-35-AC, RM1800-35W-AC); 26W±10% (RM1800-36-AC, RM1800-36W-AC)

Slots of MP1800 Series Multi-service Access Router

Slots of MP1800 series router

Device Type	Description
RM1800-21-AC RM1800-23-AC	RM2-1STA, 8AX, 1/2VoS, 1/2VoP, and 4S1O modules are suitable for slot 1, slot 2, and slot 3. RM2-1SAE module is suitable for slot 1 and slot 2. RM2-1E1 and 1CE1 modules are suitable for slot 1. RM2-1ADSL and xGSHDSL modules are suitable for slot 2.
RM1800-22-AC	RM2-1STA, 8AX, 1/2VoS, 1/2VoP, and 4S1O modules are suitable for slot 1, slot 2, and slot 3. RM2-1SAE module is suitable for slot 1 and slot 2. RM2-1E1 and 1CE1 modules are suitable for slot 1. RM2-1ADSL and xGSHDSL modules are suitable for slot 2., but when the modules are inserted, WAN2 (FE1) on the front panel is unavailable. The 3G module of RM2 is suitable for slot 3.
RM1800-35W-AC RM1800-35-AC RM1800-31-AC RM1800-31W-AC RM1800-31W-DC48	RM2-1STA, 8AX, 1/2VoS, 1/2VoP, and 4S1O modules are suitable for slot 1, slot 2, and slot 3. RM2-1SAE module is suitable for slot 1 and slot 2. RM2-1E1 and 1CE1 modules are suitable for slot 1. RM2-1ADSL and xGSHDSL modules are suitable for slot 2., but when the modules are inserted, WAN2 (FE1) on the front panel is unavailable. The 3G module of RM2 is suitable for slot 3.
RM1800-36W-AC RM1800-36-AC	RM2-1STA, 8AX, 1/2VoS, 1/2VoP, and 4S1O modules are suitable for slot 1, slot 2, and slot 3. RM2-1SAE module is suitable for slot 1 and slot 2. RM2-1E1 and 1CE1 modules are suitable for slot 1. The 3G module of RM2 is suitable for slot 3.

Modules

MP1800 router is a modular router. It provides three slots. Currently, the available modules include 1SAE, 1CE1, 1E1, 1STA, 8AX, 1VOP, 2VOP, 1VOS, 2VOS, 4S1O, 1ADSL, 2SHDSL, 4SHDSL, 3G-CDMA, 3G-GSM, and 3G-TD. This chapter describes several common modules.

Sync/Async Serial Interface Module (SAE) Series

1-port High-speed V.24/V.35 Serial Module (1SAE)

1SAE module is used for MP1800 router. 1SAE completes 1-port sync/async serial data flow – receiving/sending and processing. The port operates in synchronous mode:

DCE mode: 2.048Mbps

DTE mode: 8 Mbps

The port in asynchronous mode operates 115.2Kbps. The default working mode of MP1800 router sync/async serial interface is sync. The sync serial interface is in DTE or DCE mode. In DTE mode, it receives external DCE clock such as external sync modem. In DCE mode, the router provides clock. The V24/V35 mode switch functions via the buttons on the panel.

1SAE Interface Module

1-port high-speed V.24/V.35 serial module (1SAE)

Cables of 1SAE Interface Module

1SAE interface cable is V35 common DTE cable and V24 straight-through DTE cable.

1SAE Interface Attributes

1-port high-speed V.24/V.35 serial module (1SAE) attributes:

<table>
<tr><th rowspan="2">Attributes</th><th colspan="3">Description</th></tr>
<tr><td colspan="2">Sync</td><td>Async</td></tr>
<tr><td>Tie-in</td><td colspan="2">DB25-DB25</td><td>DB25-DB25</td></tr>
<tr><td rowspan="2">Interface standard & working mode</td><td>V.24</td><td>V.35</td><td rowspan="2">EIA/TIA-232</td></tr>
<tr><td>DTE
DCE</td><td>DTE
DCE</td></tr>
<tr><td>Minimum baud rate (bps)</td><td>1200</td><td>1200</td><td>300</td></tr>
<tr><td>Maximum baud rate (bps)</td><td>128K</td><td>8M</td><td>115.2K</td></tr>
<tr><td rowspan="2">Supported protocol & service</td><td colspan="2" rowspan="2">X25
HDLC
PPP
SLIP
FR
LAPB</td><td>Dialup
Backup</td></tr>
<tr><td>HDLC
PPP
SLIP</td></tr>
</table>

Channelized E1 Module (CE1)

1-port Channelized E1 Module (1CE1)

The 1-port channelized E1 module provides the ports for receiving, sending and processing 1984K multi-timeslot data flow. As CE1 interface, it divides slot 1-31 to different groups and each group of timeslots serves as one interface after binding.

1CE1 Interface Module Appearance & Indicators

1-port channelized E1 module (1CE1)

The meanings of the indicators:

LOS	**On:** Cannot check frame sync signal **Off:** After sync

Cables of 1CE1 Interface Module

1CE1 matches BNC pin coaxial cable and RJ45-RJ45 straight-through twisted-pair.

1CE1 Interface Attributes

1-port Channelized E1 (1CE1) inetrface attributes:

Attributes	Description
Interface	BNC, RJ45 (can not be used together)
Interface number	1 group
Interface standard	G.703
Supported protocol	PPP X.25 HDLC FR

Non-channelized E1 (E1) Series

1-port Non-channelized E1 Module (1E1)

The 1-port non-channelized E1 module provides a data transmission port with 2.048Mbit/s bandwidth. E1 is the same as CE1. It can be divided into 32 timeslots, and timeslot 0 of E1 can be used to transmit data in unframed mode to realize 2M transparent transmissions.

1E1 Interface Module Appearance and Indicators

The appearance of the 1E1 interface module:

1-port non-channelized E1 module (1E1)

The meanings of the indicators:

LOS	**On:** Transparent 2M transmission **On:** Non-transparent and cannot check frame sync signal **Off:** After sync

Cables of 1E1 Interface Module

1E1 matches BNC pin coaxial cable and RJ45-RJ45 straight-through twisted-pair.

1E1 Interface Attributes

1-port non-channelized E1 (1E1) interface attributes:

Attributes	Description
Interface	BNC, RJ45 (cannot be used together)
Interface number	1 group
Interface standard	G.703
Supported service	X.25 FR
Supported protocol	PPP HDLC

IP Phone Module (VOP/VOS) Series

IP Phone Module of 1-port IP Phone (1VOP)

1-port IP phone module accesses any telephone via IP network. The user can make free phone calls via the constructed IP network.

1VOP Interface Module Appearance & Indicators

The appearance of 1VOP interface module:

1-port IP phone module (1VOP)

The meanings of the indicators:

V1	IP phone module indicator, and the light is on during the call
V2	Maybe the 1VOP module does not have the indicator, and if yes, the indicator is not on forever.

Cables of 1VOP Interface Module

The cables of the 1VOP module are RJ45 (4, 5 signal cable) and RJ11 phone wire.

1VOP Interface Attributes

1-port IP phone module (1VOP) interface attributes:

Attributes	Description
Interface	RJ45 jack
Interface number	1
Supported protocol	H.225 H.245 RTP RTCP G.711 G.723 G.729

IP Phone Module of 2-port Phone (2VOP)

The 2-port IP phone module accesses any call in IP network via dialup. The user can make free phone calls via the constructed IP network.

2VOP Interface Module Appearance & Indicators

The appearance of the 2VOP interface module:

The meanings of the indicators:

V1	IP phone module indicator **It is on during the call a**fter pickup.
V2	IP phone module indicator **It is on during the call a**fter pickup.

Cables of 2VOP Interface Module

The cable of the 2VOP module is RJ45 external cable.

2VOP Interface Attributes

2-port IP phone module (2VOP) interface attributes

Attributes	**Description**
Interface	RJ45 jack (two RJ11 plugs)
Interface quantity	2 (RJ11)
Supported protocols	·H.225 ·H.245 ·RTP ·G.711 ·G.723 ·G.729

IP Phone Module of 1-port Switch (1VOS)

The IP phone module of the 1-port switch accesses any phone in IP network via dialup or secondary dialup. The user can make free phone call via the constructed IP network.

1VOS Interface Module Appearance & Indicators

The appearance of the 1VOS interface module:

The meanings of the indicators:

V1	IP phone module indicator, and the indicator is on during the call
V2	Maybe the 1VOS module does not have the indicator, and if yes, the indicator is not on forever.

Cables of 1VOS Interface Module

The cables of the 1VOS module are RJ45 (4, 5 signal cable) and RJ11 phone wire.

1VOS Interface Attributes

The 1-port switch IP phone module (1VOS) interface attributes:

Attribute	**Description**
Interface	RJ45 jack
Interface quantity	1
Supported protocols	·H.225 ·H.245 ·RTP ·G.711 ·G.723 ·G.729

IP Phone Module of 2-port Switch (2VOS)

The IP phone module of the 2-port switch accesses any phone in IP network via dialup or secondary dialup. The user can make free phone call via the constructed IP network.

2VOS Interface Module Appearance & Indicators

The appearance of the 2VOS interface module:

The meanings of the indicators:

V1	IP phone module indicator **It is on during the call.**
V2	IP phone module indicator **It is on during the call.**

Cables of 2VOS Interface Module

The cable of the 2VOS module is the RJ45 external line.

2VOS Module Interface Attributes

2-port switch IP phone module (2VOS) interface attributes

Attributes	**Description**
Interface	RJ45 jack (two RJ11 plugs)
Interface quantity	2 (RJ11)
Supported protocols	·H.225 ·H.245 ·RTP ·G.711 ·G.723 ·G.729

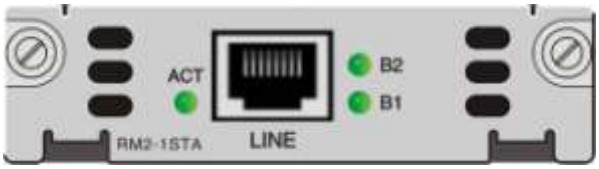
ISDN S/T Module (STA) Series

1-port ISDN S/T Module (1STA)

1-port ISDN S/T (1STA) module can realize the 64K or 128K high-speed access and backup. It is the hardware upgrade version of the 1-port ISDN S/T (1ST) with the better slot compatibility and is compatible with the former software/hardware functions.

1STA Interface Module Appearance & Indicators

The appearance of 1STA interface module:



The meanings of the indicators:

ACT	Activated indicator; it is on when running normally.
B1	B1 channel indicator; it is on when using the channel B1, that is, rate is B1=64K or B1+B2=128K.
B2	B2 channel indicator; it is on when using the channel B2, that is, rate is B2=64K or B1+B2=128K.

Cables of 1STA Interface Module

The 1STA cable is the RJ45 direct-connected cable.

1STA Module Interface Attributes

The interface attributes of the 1STA module:

Attribute	**Description**
Tie-in	RJ45
Tie-in quantity	1
Supported protocol	PPP

Asyn Serial Module (A) Series

8-asyn Serial Module (8AX)

8-asyn serial module is to receive and send the data flow of the 8-port asyn interface. The maximum rate of each port can reach 115.2K only when running in the asyn mode.

8AX Interface Module Appearance

The appearance of the 8AX interface module:

Cables of 8AX Interface Module

The cable of the 8AX module is 8-asyn serial cable.

Interface Attributes of 8AX Interface Module

The interface attributes of the 8AX module:

Attribute	**Description**
Tie-in	DB60
Interface standard	RS-232
Min. baud rate (bps)	300
Max. baud rate (bps)	115.2K
Supported services	Connecting terminals (with the terminal number fixing function); Connecting ATM; Connecting PC workstation; Connecting router; Connecting frequency-band or base-band modem; PC or router dialup access; Other serial devices;
Supported protocols	·X.25 ·HDLC ·PPP ·SLIP

ADSL Module

RM2-1ADSL module is used by MP1800 series multi-service access router, connecting to Internet via one RJ11 interface.

The appearance of the ADSL interface module:

RM2-1ADSL panel

The physical ports on the RM2-1ADSL module panel is RJ11, connecting the telephone twisted-pair to access Internet. The module panel has two indicators, that is, Link and ACT. When the Link indicator is off, it means that the interface is not connected; when Link is on, it indicates that the interface is connected. When ACT is off, it indicates that the interface does not have data sent or sent; when ACT flashes, it indicates that the interface has data sent and received.

G.SHDSL Series Module

2-port G.SHDSL

RM2-2SHDSLmodule is used by MP1800 series multi-service access router, realizing 2-port access Internet via one RJ45 interface.

The appearance of the G.SHDSL interface module:

G.SHDSL panel

The physical port on the RM2-2SHDSL module panel is RJ45, connecting 2-port telephone twisted-pair to access Internet. There are three indicators on the module panel, that is, EN indicator and two status indicators, indicating the status of the card.

4-port G.SHDSL

RM2-4SHDSL module is used by MP1800 series multi-service access router, realizing 4-port access Internet via one RJ45 interface.

The appearance of the G.SHDSL interface module:

G.SHDSL panel

The physical port on the RM2-2SHDSL module panel is RJ45, connecting 4-port telephone twisted-pair to access Internet. There are five indicators on the module panel, that is, EN indicator and four status indicators, indicating the status of the card.

Interface Attributes of G.SHDSL Interface Module

The interface attributes of the G.SHDSL module:

Attribute	Description
Interface	RJ45 jack
Interface quantity	2 or 4
Supported protocols	·ITU G.hs (ITU-T G.994.1) ·ITU G.shdsl (ITU-T G.991.2) ·ITU G.shdls.bis (ITU-T G.991.2 (2004))

4S1O Module

RM2-4S1O module is used for the phone analog access and local external access. The physical ports on the RM2-4S1O module panel include four RJ11. Port 0 is the shared port of FXO and FXS0, and the other three ports are FXS analog access port 1-3.

4S1O Interface Module Appearance

The appearance of the 4S1O interface module:

RM2-4S1O panel

Cables of 4S1O Interface Module

The cable of the 4S1O module is RJ11 cable.

Note: If port 0 is connected to FXO port, the special junction box is needed, which is 1 input and 2 output. The input is mixed port; the output are one FXO port and one FXS port.

4S1O Module Interface Attributes

The interface attributes of the 4S1O module:

Attribute	**Description**
Interface	RJ45 jack
Interface quantity	5
Supported protocols	·H.225 ·H.245 ·RTP ·G.711 ·G.723 ·G.729

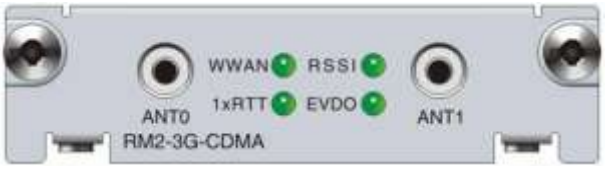
3G Series Module

RM2-3G module realizes the wireless 3G Internet function. The module is suitable for SLOT3. It includes RM2-3G-CDMA, RM2-3G-GSM, and RM2-3G-TD. ANTO and ANT1 on the front panel are the antenna pedestal of the 3G module.

RM2-3G-CDMA

RM2-3G-CDMA module needs to insert the CDMA2000 3G module and UIM card.

The appearance of the RM2-3G-CDMA module:



RM2-3G-CDMA panel

The meanings of the indicators on RM2-3G-CDMA module

WWLAN	Green	Off: power-off
		On: power-on
RSSI	Green	Off: weak signal <= -116dBm
		On: Strong signal >= -78dBm
		Flash: -78dBm > middle/low signal > -116dBm
1xRTT	Green	Off: no 1xRTT service
		On: with 1xRTT service
EVDO	Green	Off: no EVDO service
		On: with EVDO service

RM2-3G-GSM

RM2-3G-GSM module needs to insert the WCDMA 3G module and USIM card.

The appearance of the RM2-3G-GSM module:

RM2-3G-GSM panel

The meanings of the indicators on RM2-3G-GSM module:

WWLAN	Green	Off: power-off
		On: with services, but not enter the data mode
		Flash slowly: Searching the service (4.75s off, 0.25s on); Flash quickly: with services and enter the data mode (the flash frequency depends on the received data traffic. The larger the

		data traffic, the more quickly the indicator flashes. When there is no traffic, the flash interval is 4s)
RSSI	Green	Off: weak signal <= -103dBm
		On: Strong signal >= -55dBm
		Flash: -55dBm > middle/low signal > -103dBm
UMTS	Green	Off: no GSM/GPRS service
		On: with GSM/GPRS service
HSDPA	Green	Off: no HSDPA service
		On: with HSDPA service

RM2-3G-TD

RM2-3G-TD module needs to insert the TD-SCDMA 3G module and USIM card.

The appearance of the RM2-3G-TD interface module:

RM2-3G-TD panel

The meanings of the indicators on RM2-3G-TD module:

WWLAN	Green		Off: power-off
			On: power-on
RSSI	Green	GSM/GPRS service	Off: weak signal <= -103dBm
			On: Strong signal >= -55dBm
			Flash: -55dBm > middle/low signal > -103dBm
		TDSCDMA service	Off: weak signal <= -106dBm
			On: Strong signal >= -34dBm
			Flash: -34dBm > middle/low signal > -106dBm
UMTS	Green		Off: no GSM/GPRS service
			On: with GSM/GPRS service
HSDPA	Green		Off: no TD-SCDMA service
			On: with TD-SCDMA service

Installation Preparations

Security Suggestions

To avoid the harms on persons and equipments caused by various accidents, comply with the following:

- Keep the router far away from humid places and heat
- Ensure that router is well grounded
- Wear anti-static wrists during installation and maintenance
- Do not install, move and dismantle routers and modules during power on to avoid damages on persons and equipments
- Do not hot swap interface modules and interface cards of routers
- Connect the interface cables of routers correctly, especially do not connect phone lines (including ISDN lines) to serial ports
- Pay attention to the laser use security (for example, do not keep eyes open at the optical emitting mouth of LASER or the fiber connecter
- Use Uninterrupted Power Supply (UPS)
- Router AC power supply is soft start control switch, which does not cut the main return circuit of AC power supply. During installation, the external control switch of main return circuit needs to be connected so as to cut down power supply fast in case of accidents.

Environment Requirements

MP1800 series routers must be used indoor. To guarantee stable use of routers and prolong the life, the application scenario must meet the following requirements.

Temperature and Humidity

To ensure the service quality and life of MP1800 series routers, it is recommended to maintain a certain temperature and humidity in the computer lab. If the humidity in the computer lab is 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 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 router.

If the temperature is too high, the reliability of the router reduces greatly. The long-time high temperature affects the life and speeds up the aging of insulation materials.

The recommended temperature and humidity in computer room:

Temperature		**Relevant humidity**	
Long-term	Short-term	Long-term	Short-term
0～40℃	0～50℃	40%～65%	10%～90%

Note

- Measuring points of the working temperature and humidity of MP1800 in the computer 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.
- The short-term working condition means less than 48h continuously and less than 15 days for the annual total.
- Extreme adverse working environment means the environment temperature and humidity when the air-conditioning system in the computer room fails. Each time the normal work should be recovered within less than 5h.

Dust-free Environment

Dust is harmful for MP1800 operation. Dust causes static absorption, which makes the poor contact of metal pieces. Static absorption appears especially when the temperature and humidity are lower, which affects the device life and causes communication fault.

Dust requirements for the room:

Maximum diameter (μm)	0.5	1	3	5
Maximum concentration (contained particles per m^3)	1.4×10^7	7×10^5	2.4×10^5	1.3×10^5

Apart from dust, the router has strict requirements for SO2, H2S, NH3, and Cl2 in the room, because these harmful gases speed up the eroding of metals and the aging of some components.

The specific limitations are as follows:

Gas	Maximum value (mg/m3)
SO_2	0.2
H_2S	0.006
NH_3	0.05
Cl_2	0.01

Anti-static

MP1800 router takes lots of measures in anti-static, but when the static exceeds a certain volume, the circuits even the whole monitor are damaged.

For router communication, static electricity originates from external electric field of high-pressure like electricity cables and thunders, and internal system such as floor material and chassis structure. To prevent the damage caused by the static, do as follows:

- Ensure proper equipment grounding
- Maintain dustproof room
- Keep suitable temperature & humidity
- Wear anti-static equipment
- Place the disassembled circuit board on the anti static workstation and keep the face upturned or in the anti static bag

- When viewing or removing the disassembled circuit board, touch the edge of circuit board and avoid touching the components on the circuit board.

Electromagnetic Environment Requirements

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:

- Take anti-electric network interference for power system.
- The router working place had better not be used with the grounding settings of power devices or anti-thunder 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 equipments.
- Take electromagnetic shielding methods when necessary.

Anti-lightning

MP1800 router takes lots of measures in anti-lightning, but when the lightning exceeds a certain volume, the router may be damaged. To prevent the damages caused by lightning, do as follows:

- Ensure that the protect ground of the chassis is well grounded;
- Ensure that the grounding point of AC power supply jack is well grounded;
- Add power lightning arrester to the input end of the power supply, so as to improve the anti-lightning capability of the power supply;
- To improve the anti lightning capability, the MP7500 interface modules are connected to outdoor signal lines. You can add special anti-lightning equipment to the input end of signal lines.

Check Routers & Accessories

After ensuring the installation environment requirements are met, you can open the package. However, before installation, check whether the router and the accessories are complete according to the purchase order.

Tools & Equipment

Tools

- Slotted point screwdriver/cross point screwdriver
- Level, ruler or tapeline
- Anti-static equipment

Connected cables

- Cables in the package

Equipment

- HUB or Ethernet switch
- Configuration terminal (it can be PC)

System Installation

Preparations

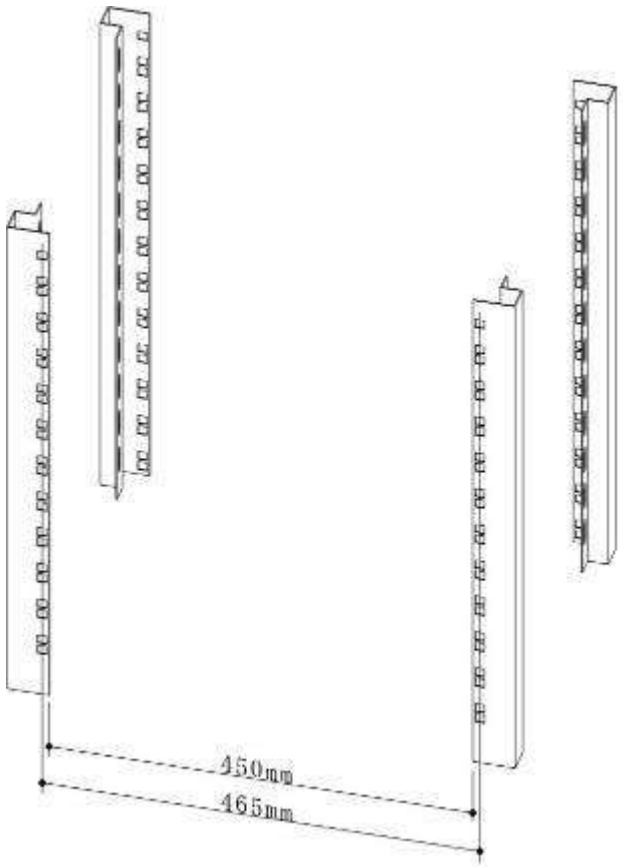
Tools

Before installation, prepare slotted point screwdriver/cross point screwdriver, level, ruler or tapeline, and anti-static equipment.

Cabinet Installation

Check Cabinet

After MP1800 router is configured with the private brackets, it can be installed and fixed normally on 19-inch standard cabinet. Before installing MP7500, reserve enough slot room.

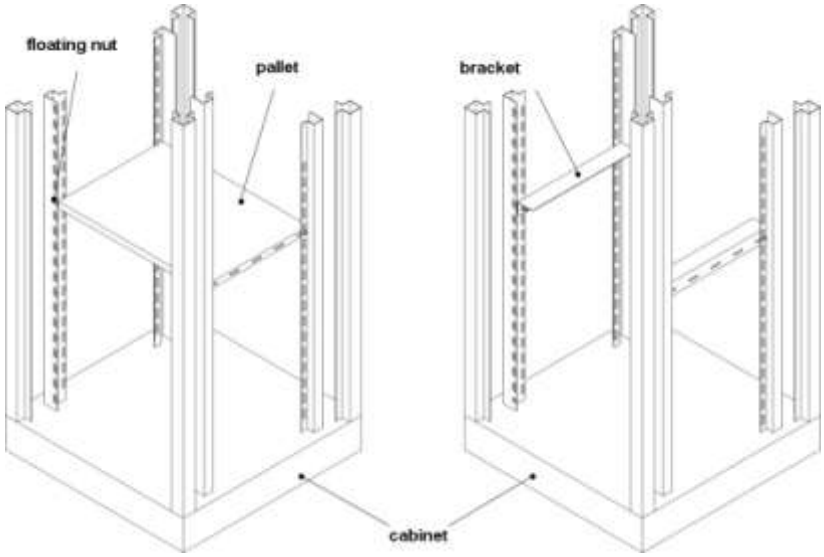


Center distance of the horizontal installation hole and net horizontal installation space

Use the level or tapeline to measure the center distance of the horizontal installation hole and net horizontal direction installation space of the cabinet.

Check whether the pallet bracket, floating nut, fixed screw, and baffle board on the cabinet are complete, which are the standard accessories. Different cabinets have different dimensions and shapes. Therefore, to add cabinet accessories, contact the supplier of the cabinet to provide genuine accessories.

The device must be installed on the pallets or trays (used in pairs) of the cabinet. Therefore, install the pallets or trays on the cabinet before installing the device as follows. Use the level to check whether the pallets or trays are horizontal. If not, adjust the fixed bolt of pallet or tray to make the pallet or tray horizontal and then fasten it.



Check whether the floating nut for fixing the device is installed in the square hole of the cabinet column. If not, insert the floating nut to the square hole according to the position of the pallet or tray.

It is required that one device is placed on a pallet or a bracket. It is not recommended to overlap more than three devices.

Check Device & Accessories

After ensuring the installation environment requirements are met, open the package and check whether the router and the accessories are complete according to the purchase order.

If there is some missing or damaged items in the package, contact the equipment dealer or sales.

During check, place router and accessories at safe place to avoid falling down or impacting; keep the router far away from the places with liquids, toxic gases and dust to avoid damages on the router.

When moving or checking the device, wear gloves to avoid the corrosion of metal parts caused by perspiration.

Keep all packaging materials for later use during transporting.

Install MP1800 on Cabinet

Install MP1800 multi-service access router in the cabinet:

Step 1: Wear the gloves and anti-static wrists, and make the anti-static wrists well grounded;

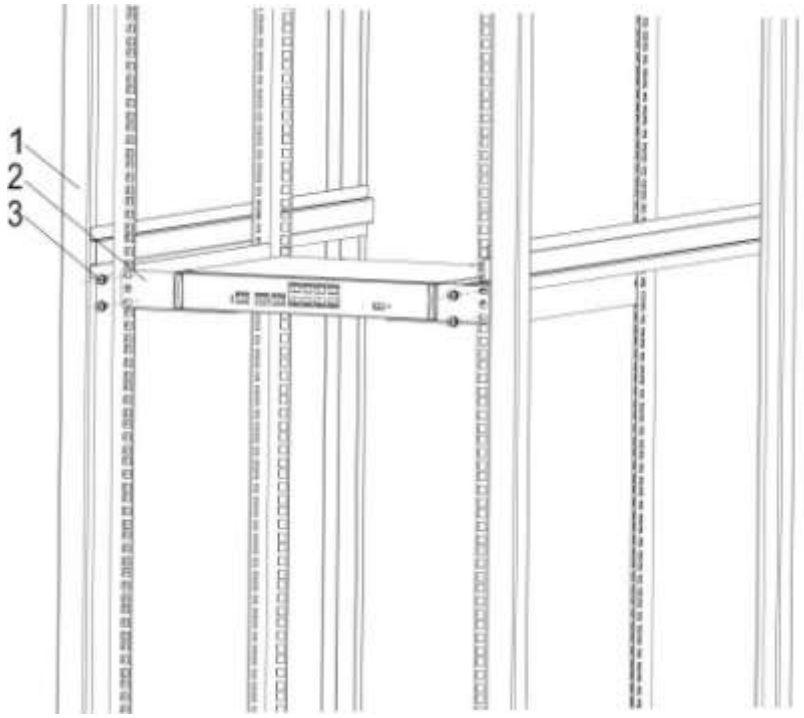
Step 2: Place the device on the fixed platform; make the installation holes of the rack aim at the corresponding hole at the sides of the device; use the screws to fix the rack at the two sides of the device.

Install device on the rack

Step 3: Make the front of the cabinet face the operator. Use two hands to hold the device stably and make the device keep horizontal. Place the device on the pallet or trays from the front of the cabinet. When placing the device, avoid the collision between the device and the cabinet column.

Step 4: Use two hands to push the device into the cabinet and make the bracket of the device close to the surface of the cabinet column.

Step 5: Use the screws to install the device on the column of the cabinet, as follows:



1: standard cabinet/rack 2: MP1800 host 3: Screw

Install host to cabinet

Step 6: Check whether the device is installed on the bracket fixedly and straight.

Step 7: Check whether the space between the installed devices and select the appropriate baffle to place between the devices and use the screw to fix the baffle on the shelf.

Caution

Installation suggestion:

When installing multiple kinds of devices on the same cabinet, install the heavy one close to the bottom to reduce the cabinet center gravity and improve stability.

To ensure the cooling space of the device when installing the device in the cabinet, it is recommended to reserve the 1U height between the devices. Install the configured baffle of the cabinet between the devices.

Install Device on Desk

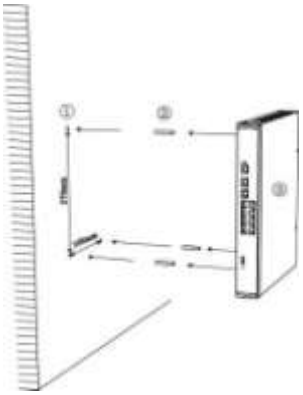
MP1800 has the features of small volume and no noise. The user can place the device on the office desk or other platform.

Caution

When MP1800 is installed on the office desk or platform, there should be 50cm space reserved around the device for ventilation and cooling. Do not place sundries or other devices on the router.

Install Device on Wall

The installation steps are as follows:



Install device on wall

Step 1: Use the impact drill to make the holes on the wall according to the dimension shown in the above figure;

Step 2: Embed the plastic expansion screw into the wall and there should be 3-4mm space between the screw end and the wall;

Step 3: Make the hang foot opening of MP1800 host aim at the expansion screw, push MP1800 slowly, and fix the device on the wall.

Caution

The depth of the hole drilled on the wall should be larger than the depth of the plastic expansion screw. The recommended external diameter of the screw is 4mm.

Connect Host Cables

This section describes how to connect the control board cable of MP1800 to the network: connecting to console port of the router.

MP1800 provides one EIA/TIA-232 asyn serial console port. With the interface, the user can adopt the character terminal with RS-232 serial port (usually, it is one common PC) to configure the router.

For the details about the connection and configuration, refer to the later chapters.

To configure the router via the terminal, connect as follows:

Step 1: Find one character terminal, which can be one standard terminal with RS-232 serial port or one common PC. Usually, it is the latter.

Step 2: When either the router or the character terminal is powered off, connect the RS-232 serial port of the character terminal to the console port of the router.

📖 **Note**

During connection, pay attention to the ID on the interface, avoiding inserting to other interface wrongly.

Connect Protection Ground Wire

The normal connection of MP1800 ground wire ensures protection against thunder and anti-jamming.

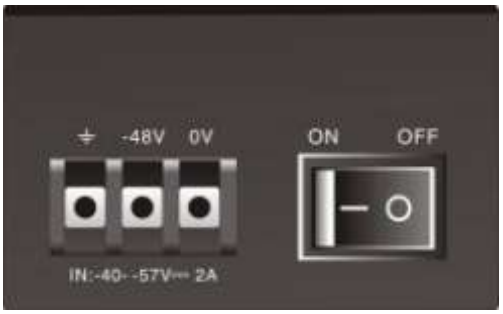
The AC input end of router power supply is connected to the AC noise filter, whose center is directly connected to the chassis. We call it chassis ground (that is protection ground). The chassis ground should be well grounded, so as to make the induction power and leaked power flow into the ground safely and improve the anti-electromagnetic interference feature of the device. Use one thick cable to connect the grounding point at the back of the chassis to the ground and the grounding resistance should be no more than 4Ω . If the router is installed on the 19-inch standard cabinet, the cabinet should also be grounded.

Connect Power Supply

MP1800 router adopts stable power supply switch system and has a low requirement for input AC. It supports 110V and 220V 50Hz AC. Different areas have different power supply systems.

Power Module	Input Parameter
AC power module	100V～240VAC, 50/60Hz, 1A
DC power module	-40V—-57V, 2A

Power ports of AC device



Power ports of DC device

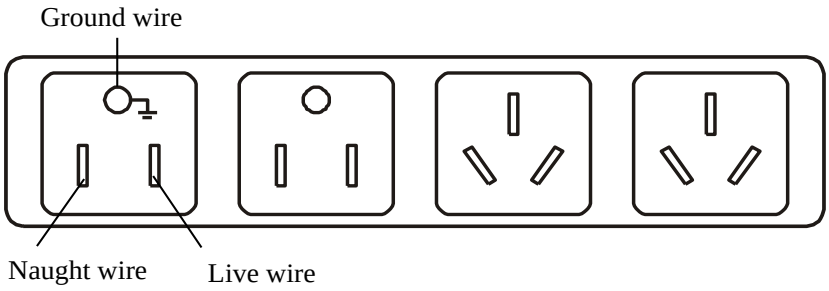
When connecting power supply, use the below suggested power supply jack or MIM PC power supply jack for reliable grounding. When laying cables for buildings, the ground wires of the power supply system have been installed underground. Users should ensure the reliable grounding and make the corresponding processing.

The input wire of the DC power is the private three-core DC wire. Use the fork lug to connect the American standard DC terminal block (8.25 distance, M3 screw). The method of connecting the cables is as follows:

DC power cable connection relation

No.	**Color**	**Diameter**	**Corresponding end**
1	Blue wire	1mm²	-48V
2	Black wire	1mm²	0V
3	Yellow and green wire	1mm²	Protection ground

The following is the common AC power jack:



Connect the power supply as follows:

Step 1: Put the power supply switch of MP1800 to OFF. For AC router, connect one side of AC power supply cable to the AC power input end of the back panel of the router and another side to power supply jack; for DC router, connect the power cable to the post according to the description of panel silk screen on the interface.

Step 2: Put power supply switch to ON.

Step 3: Check whether the power supply indicator of the front panel is on. If not, repeat step 1 and 2.

📖 **Note**

If the power supply indicator is not on after repeating the above steps, contact the agent.

Module Installation

Connect 1SAE Interface Cable

This section describes the precautions of 1SAE module and cable connection.

Precautions

Before connecting syn/asyn serial port, ensure the following:

The type of the device connecting syn/asyn serial port, that is, syn/asyn, DTE/DCE; The signal standard, baud rate and sync clock required by the access device.

1. Introduction to DTE and DCE

Usually, syn/asyn serial port is connected to the external Modem or TA (terminal adapter) and serves as the dialup interface. Just select the appropriate baud rate. The syn serial port can work in DTE and DCE modes. The two devices that are directly connected should work in DTE and DCE mode respectively. The DCE device provides the syn clock and specifies the communication rate, while the DTE device accepts the syn clock and communicates according to the specified baud rate. Usually, the router serves as DTE device. Whether the type of the device connected to the router is DTE or DCE refers to the MP1800 manuals.

Typical DTE and DCE devices

Device Type	**Interface Type**	**Typical Device**
DTE	Pin type	PC Router
DCE	Hole type	MODEM Multiplexer CSU/DSU

2. Rate and transmission distance

Sync/async serial supports different signal standards and baud rate in different working modes. Choose cables according to prevailing actual conditions. The maximum transmission distance of the signals and the set BR depend on the selected cables.

V.24 cable rate and transmission distance:

BR (bps)	**Max. transmission distance (m)**
2400	60
4800	60
9600	30
19200	30
38400	20
64000	20
115200	10

V.35 cable rate and transmission distance:

BR (bps)	**Max. transmission distance (m)**

2400	1250
4800	625
9600	312
19200	156
38400	78
56000	60
64000	50
2048000	30

🕮 **Note**

When adopting EIA/TIA-232 cable, BR rate should not be over 64Kbps in syn mode.

Connect 1SAE Module Interface Cable

Connect the cables of syn/asyn serial port module as follows:

Step 1: Insert one side of DB-25 to the DB-25-interface of the 1SAE module and then screw down fixed knob to fix the cable on the DB-25-interface of the 1SAE module.

Step 2: Connect another DB25 interface to V.24-V.35 (DB-25, M-34) cable and then connect to the following equipment:

1. If WAN is DDN line, connect (V.35 cable) to digital Modem V.35 interface.
2. If WAN is dialup line, connect (V.24 cable) to analog Modem serial port.

🕮 **Note**

When connecting, pay attention to the ID on the interface, avoiding inserting into other interface and damaging the module or router host.

Connect 1CE1/1E1 Module Interface Cable

Connect 1CE1/E1 interface according to the following steps:

Step 1: Connect one side of BNC plug to the BNC interface of 1CE1/E1 module.

Step 2: Connect another side to the equipment.

TX cable should be connected with the RX cable of the peer device. The RX cable should be connected with TX cable of the peer device.

Step 3: After power on, check LOS status of 1CE1/E1 module. If indicator is on, it indicates that the circuit fails and signal loses sync, so check the line. In E1 transparent 2M mode, LOS is always on.

Connect with RJ45-RJ45 straight-through twisted-pair if you are using RJ45 interface. BNC and RJ45 cannot be used at the same time.

📖 **Note**

1. When connecting, pay attention to the ID on the interface, avoiding inserting into other interface and damaging the module or router host.
2. For the E1 module, the LOS is on in the transparent 2M mode; in non-transparent 2M mode, LOS is on when not finding the frame synchronous signal and then becomes off after synchronization.

Connect 1VOP/2VOP Module Interface Cable

Connect the cables of the VOP module as follows:

Step 1: Insert the telephone line to the RJ11/RJ45 interface of 1VOP/2VOP and the other side to the telephone.

Step 2: During the call, pay attention to the indicator on the back panel of the 1VOS/2VOS card. The indicator of each channel should be on during the call and the Active light of the slot on the front panel should also be on. Otherwise, contact the agent.

📖 **Note**

When connecting, pay attention to the ID on the interface, avoiding inserting into other interface and damaging the module or router host.

Connect 1VOS/2VOS Module Interface Cable

Connect the cable of the VOS module as follows:

Step 1: Connect the phone cable to the RJ11/RJ45 interface of 1VOS/2VOS and the other side to the small switch or external junction box.
Step 2: During the call, pay attention to the indicator on the back panel of the 1VOS/2VOS card. The indicator of each channel should be on during the call and the Active light of the slot on the front panel should also be on. Otherwise, contact the agent.

📖 **Note**

When connecting, pay attention to the ID on the interface, avoiding inserting into other interface and damaging the module or router host.

Connect 1ST Module Interface Cable

Connect the cables of the 1ST module as follows:
Step 1: Insert the RJ45 plug of the 1ST module interface cable to the RJ45 jack;
Step 2: Connect the other side of the interface cable to the corresponding device wire.

Connect 8AX Module Interface Cable

Connect the cables of the 8AX module as follows:
Step 1: Connect the DB60 plug of the 8AX module interface cable to the jack of the module. Pay attention to the positive and negative directions of the connector. Tighten the knob to fix the cable on the jack of the 8AX module.
Step 2: Connect theRJ45 interface of the cable to the corresponding device.

Connect ADSL Module Interface Cable

Step 1: Connect the RJ11 plug of the ADSL module interface cable to the RJ11 jack.
Step 2: Connect the other side of the RJ11 plug to the corresponding device.

Connect G.SHDSL Module Interface Cable

Step 1: Connect the RJ45 plug of the G.SHDSL module interface cable to the RJ45 jack.

Step 2: Connect the other side of the RJ45 plug to the corresponding device.

Connect 4S1O Module Interface Cable

Step 1: Connect the RJ11 plug of the 4S1O module interface cable to the RJ11 jack.

Step 2: Connect the other side of the RJ11 plug to the telephone (To connect the FXO port, first connect the private junction box and then connect the external line via the output FXO port of the junction box).

Cables

Ethernet Interface Cable

Ethernet interface cable of MP1800 router adopts 8-core non-screen twisted pair. In 10BASE-T and 100BASE-TX mode, silver plate 1 and 2 are the sending ends; silver plate 3 and 6 are the sending ends. In 1000BASE-T mode, silver plate 1, 2, 3, 4, 5, 6, 7, and 8 are all used for receiving and sending signals.

The connection relation of RJ45 straight-through cable (type-5 twisted-pair):

RJ45	Signal	Direction	RJ45	Description	Length
1	TX0+	—>	1	Twisted-pair 1	2m
2	TX0-	—>	2		
3	RX0+	<—	3	Twisted-pair 2	
6	RX0-	<—	6		
4	----	----	4	Twisted-pair 3	
5	----	----	5		
7	----	----	7	Twisted-pair 4	
8	----	----	8		

The connection relation of RJ45 straight-through cable (type-5 twisted-pair): in 1000BASE-T mode

RJ45	Signal	Direction	RJ45	Description	Length
1	TRD0+	<—>	1	Twisted-pair 1	2m
2	TRD0-	<—>	2		
3	TRD1+	<—>	3	Twisted-pair 2	
6	TRD1-	<—>	6		

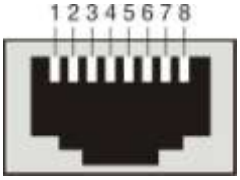
4	TRD2+	<—>	4	Twisted-pair 3	
5	TRD2-	<—>	5		
7	TRD3+	<—>	7	Twisted-pair 4	
8	TRD3-	<—>	8		

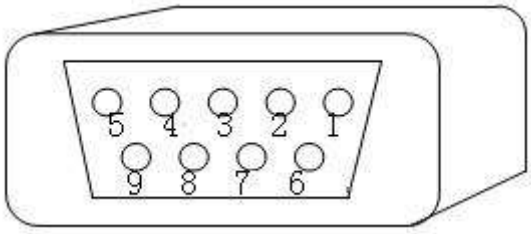
Ethernet Optical Interface Cable

The Ethernet optical interface cable of MP1800 is the single-mode or multi-mode fiber pf the LC interface.

Console Port Cable

MP1800 console port cable is connected with PC 9-core serial jack, and it is 8-core non-screen cable. One side is RJ45 plug and another is DB9 (hole).





RJ45 jack Standard DB9 interface

The connection relation of the console interface cable:

RJ45	Signal	Direction	DB9	Length
1	CTS	—>	8	3m
2	DSR	—>	6	
3	RXD	—>	2	
4	GND	---	5	
5	---	---	---	
6	TXD	<—	3	
7	DTR	<—	4	
8	RTS	<—	7	

	---	---	1	
	---	---	9	