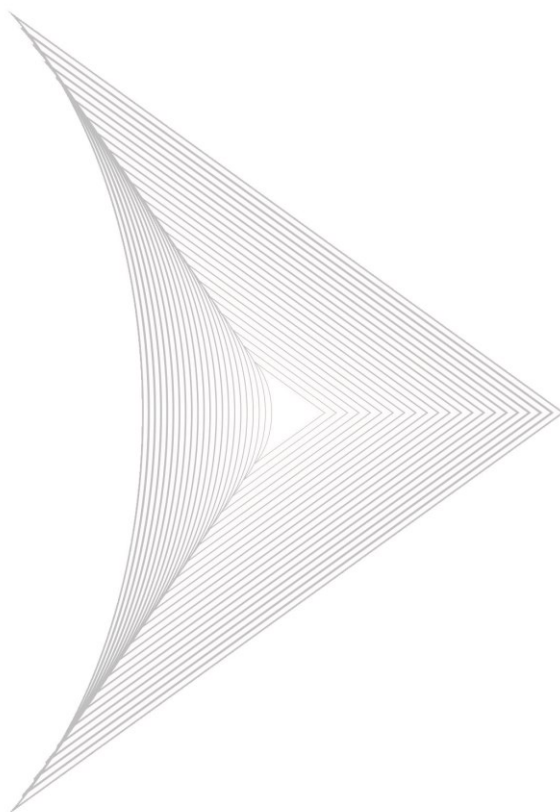




H20RN-2000.V2 Series ▼
IP/MPLS
Aggregation Platforms
Hardware Description



Beijing Huahuan Electronics Co.,Ltd.

H20RN-2000.V2 Series
IP/MPLS Aggregation Platforms

Hardware Description

Beijing Huahuan Electronics Co., Ltd.
Oct.2019

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1 Overview

H20RN-2000.V2 Series IP/MPLS Aggregation Platforms use routing architecture, solve the network smooth evolution, equipment interconnection and interoperability, and realize the end-to-end clock scheme. It supports L2/L3 protocol and builds reliable carrier-level packet switching network.

H20RN-2000.V2 series IP/MPLS aggregation platforms include H20RN-2000.V2 and H20RN-2000L.V2, which are composed of aggregation cards and tributary cards, using 2U/1U chassis. Aggregation cards include dual-power cards, network management aggregation card, and fan card; tributary cards include 16E1 interface card, 10GE interface card, STM-1 interface emulation card and 8GE interface card.

2 Architecture and Introduction

2.1 Configurations

H20RN-2000.V2 series IP/MPLS aggregation platforms are composed of cards from aggregation side and tributary side, including 2 hot-backup power cards (PWR48150/PWR22150/PWR4875/PWR2275) or (PWR22/PWR48), 2 master-control switching cards (MX01/PMX01), and 1 fan card (FAN02). Tributary cards include 2×10GE interface card (XGE02/XGE02G/TU02), 16E1 emulation card (EC16), STM-1 interface emulation card (SC01QE), 8GE interface card (GE08/GU08/GE08G/ GE08E/GU08E). All of those cards support hot swap, besides, the fan card supports speed control function, that is, the fan can adjust its state according to the internal temperature and provide the high temperature alarm, so as to ensure the reliability of the heat dissipation.

Figure 2-1 The H20RN-2000.V2 chassis slot allocation diagram

7	8	PWR2	FAN
5	6		
3	4	PWR1	
1	2		

Table 2-1 The H20RN-2000.V2 card configuration list

Card type	Card name	Slot limit
NM+PX card	MX01/PMX01	Slot 1, 2
2×10GE card	XGE02/XGE02G/TU02	Slot 3-6

Card type	Card name	Slot limit
8GE card	GE08/GU08/GE08G/ GE08E/GU08E	Slot 3-8
16E1 emulation card	EC16	Slot 3-8
STM-1 interface emulation card	SC01QE	Slot 3-8
-48V power card	PWR48150/PWR48	Slot PWR1, PWR2
220V power card	PWR22150/PWR22	Slot PWR1, PWR2
Fan card	FAN02	FAN slot


NOTE

When 2*10GE card is inserted in slot 7, it only supports 1 10G interface.

Figure 2-2 The H20RN-2000L.V2 chassis slot allocation diagram

3	4	PWR2	FAN
1	2	PWR1	

Table 2-2 The H20RN-2000L.V2 card configuration list

Card type	Card name	Slot limit
NM+PX card	MX01/PMX01	Slot 2
2×10GE card	XGE02/XGE02G	Slot 1, 3, 4
8GE card	GE08/GU08/GE08G/G E08E/GU08E	Slot 1, 3, 4
16E1 emulation card	EC16	Slot 1, 3, 4
STM-1 interface emulation card	SC01QE	Slot 1, 3, 4

Card type	Card name	Slot limit
-48V power card	PWR4875	Slot PWR1, PWR2
220V power card	PWR2275	Slot PWR1, PWR2
Fan card	FAN02	Fan slot

2.2 Architecture

The front panel diagram of H20RN-2000.V2 series is shown in Figure 2-3 and Figure 2-4.

Figure 2-3 Front panel diagram of H20RN-2000.V2 series devices

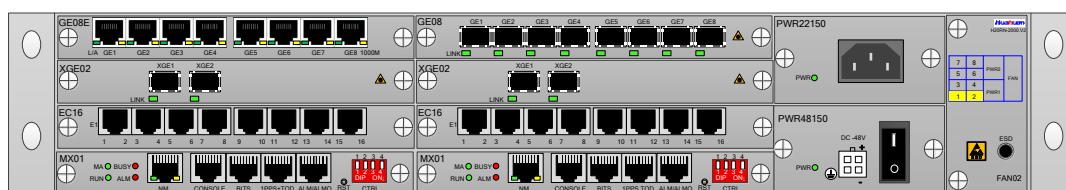
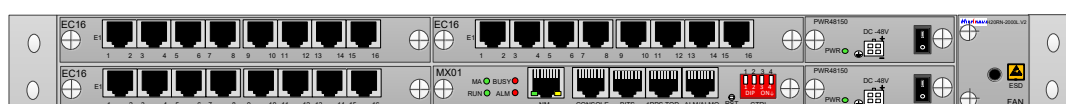


Figure 2-4 Front panel diagram of H20RN-2000L.V2 series devices



2.2.1 LED

The LED functional descriptions on the front panel of H20RN-2000.V2 series IP/MPLS aggregation platforms are shown in Table 2-3.

Table 2-3 The LED functional descriptions of H20RN-2000.V2 series IP/MPLS aggregation platforms

Mark	Color	Functional description
RUN	Green	Device running indication (flash frequency 1s): Blink: running normally Off: running abnormally
MA	Green	Master/standby status indication: On: at master status Off: at standby status
ALM	Red	Alarm state indication: On: alarm occurs Off: no alarm occurs
BUSY	Red	System cards data synchronization indication: On: data is synchronizing between system cards Off: no data is synchronized between system cards
Green LED at NM port	Green	Ethernet port Link and Active indication: On: Ethernet port has built connection Blink: Ethernet port has data received or sent Off: Ethernet port has not built connection
Yellow LED at NM port	Yellow	Ethernet port Speed indication: On: port Link rate is 100M Off: port Link rate is 10M or not connected Blink: Ethernet port has data received or sent
LINK at optical	Green	Ethernet optical port Link state indication: On: port Link Up

Mark	Color	Functional description
port		Off: port Link Down
PWR	Green	Device power state indication: On: running normally Off: running abnormally or unconnected

2.2.2 Device Ports

Ethernet Electrical Port

GE08E/GU08E provides 8 GE electrical ports, using standard RJ-45 socket. RJ-45 connector diagram and pin definition is shown in Figure 2-5. The socket definition of GE port is shown in Table 2-4.

Figure 2-5 RJ-45 connector pin number diagram

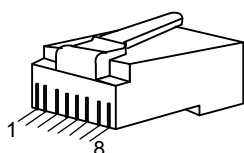


Table 2-4 RJ-45 socket definition at GE port

Pin	1	2	3	4	5	6	7	8
Definition	BI_A +	BI_A-	BI_B+	BI_C+	BI_C-	BI_B-	BI_D +	BI_D -

Note: BI stand for bidirectional.



Ethernet electrical port of H20RN-2000.V2 series platforms can automatically detect the transceiver line order of the connected network cable and make adaption. So the port can be used whether the Ethernet interface is MDI or MDI-X and whether the network cable used is crossover or straight-through.

Ethernet Optical Port

On the H20RN-2000.V2 series platforms, GE08/GE08G/GU08 provides 8 GE optical ports; XGE02/XGE02G/TU02 provides 2 10GE optical ports. There is a 10GE port on the rear panel of slot7. GE optical ports use LC dual-fiber SFP optical module and single-fiber SFP optical module is also selectable. 10 GE optical ports use LC dual-fiber SFP+optical module and single-fiber SFP+optical module is also selectable. When using single-fiber transceiver module, only one optical port exists. The wavelength of single-fiber module is its emission wavelength. When connector is inserted into optical transceiver module socket, the latching tab should be aligned to the correspondent notch. The bending radius of pigtail fiber should be not less than 50mm. When optical fiber connector is inserted or pulled, do not directly pull the optical fiber. Please reserve the protection plug on SFP optical module. When no optical fiber is connected, please ensure that the protection plug is inserted to prevent dust from entering.



CAUTION

Single-fiber devices with the same emission wavelength cannot interwork. So when single-fiber devices are interworked, the devices with matched emission wavelengths should be used.

E1 Port

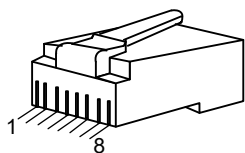
On the H20RN-2000.V2 series platforms, EC16 card supports 16 E1 ports whose impedance support 75Ω and 120Ω. E1 port uses dual-E1 socket. Each E1 port is corresponding to 2-channel E1. See signal definition in Table 2-5.

Table 2-5 Dual-E1 socket E1 signal pin definition

Dual-E1 socket pin	E1 connection	Twisted-pair	Recommended twisted-pair color
1	E1_IN (1) -	Paired	Blue
2	E1_IN (1) +		Blue-white

Dual-E1 socket pin	E1 connection	Twisted-pair	Recommended twisted-pair color
3	E1_OUT (1) +	Paired	Orange
4	E1_OUT (1) -		Orange-white
5	E1_IN (2) -	Paired	Green
6	E1_IN (2) +		Green-white
7	E1_OUT (2) +	Paired	Brown
8	E1_OUT (2) -		Brown-white

Figure 2-6 Dual-E1 connector diagram



When 120 Ω impedance is used, E1 port can directly use dual-E1 connector crimped with 120 Ω twisted pair. When a cable is being made, please ensure the input and output line pairs respectively use a twisted pair, or interference would be introduced. When 75 Ω impedance is used, E1 port requires the help of accessory cable ZJN. BH4.850.123 or ZJN. BH4.850.107 to realize the conversion from dual-E1 connector to BNC socket. **Output BNC shell is grounded, but input shell is not grounded.**

4 groups of K1~K4 DIP switches in the circuit board are used to set E1 port impedance, as shown in Table 2-6.

Table 2-6 E1 port DIP definitions

DIP	Definition	Remark
K1_1/K1_2	ON/ON: selects 75 Ω in the 1 st E1 channel OFF/OFF: selects 120 Ω in the 1 st E1 channel	8-position DIP switches of K1 control 1~4 E1

DIP	Definition	Remark
K1_3/K1_4	ON/ON: selects 75 Ω in the 2 nd E1 channel OFF/OFF: selects 120 Ω in the 2 nd E1 channel	impedance selections
K1_5/K1_6	ON/ON: selects 75 Ω in the 3 rd E1 channel OFF/OFF: selects 120 Ω in the 3 rd E1 channel	
K1_7/K1_8	ON/ON: selects 75 Ω in the 4 th E1 channel OFF/OFF: selects 120 Ω in the 4 th E1 channel	
K2_1/K2_2	ON/ON: selects 75 Ω in the 5 th E1 channel OFF/OFF: selects 120 Ω in the 5 th E1 channel	8-position DIP switches of K2 control 5~8 E1 impedance selections
K2_3/K2_4	ON/ON: selects 75 Ω in the 6 th E1 channel OFF/OFF: selects 120 Ω in the 6 th E1 channel	
K2_5/K2_6	ON/ON: selects 75 Ω in the 7 th E1 channel OFF/OFF: selects 120 Ω in the 7 th E1 channel	
K2_7/K2_8	ON/ON: selects 75 Ω in the 8 th E1 channel OFF/OFF: selects 120 Ω in the 8 th E1 channel	
K3_1/K3_2	ON/ON: selects 75 Ω in the 9 th E1 channel OFF/OFF: selects 120 Ω in the 9 th E1 channel	8-position DIP switches of K3 control 9~12 E1 impedance selections
K3_3/K3_4	ON/ON: selects 75 Ω in the 10 th E1 channel OFF/OFF: selects 120 Ω in the 10 th E1 channel	
K3_5/K3_6	ON/ON: selects 75 Ω in the 11 th E1 channel OFF/OFF: selects 120 Ω in the 11 th E1 channel	

DIP	Definition	Remark
K3_7/K3_8	ON/ON: selects 75 Ω in the 12 th E1 channel OFF/OFF: selects 120 Ω in the 12 th E1 channel	
K4_1/K4_2	ON/ON: selects 75 Ω in the 13 th E1 channel OFF/OFF: selects 120 Ω in the 13 th E1 channel	8-position DIP switches of K4 control 13~16 E1 impedance selections
K4_3/K4_4	ON/ON: selects 75 Ω in the 14 th E1 channel OFF/OFF: selects 120 Ω in the 14 th E1 channel	
K4_5/K4_6	ON/ON: selects 75 Ω in the 15 th E1 channel OFF/OFF: selects 120 Ω in the 15 th E1 channel	
K4_7/K4_8	ON/ON: selects 75 Ω in the 16 th E1 channel OFF/OFF: selects 120 Ω in the 16 th E1 channel	

STM-1 Port

The optical port of SC01QE uses LC/PC dual-fiber SFP optical module. Single-fiber SFP optical module is also required to use the optical Ethernet. When using single-fiber transceiver module, there is only one optical fiber port. The optical port supports LAS (laser automatic shutdown) function.

External Clock Input/output Port

MX01/PXM01 card of H20RN-2000.V2 series platforms provides 1-channel of external clock input\output port, supporting 2MHz, 2Mbit/s clock mode. It is marked with “BITS”, using RJ45 socket. RJ-45 connector diagram and pin definition are shown in Figure 2-5 and Table 2-7.

Table 2-7 Definition of H20RN-2000.V2 series platforms external clock input\output ports

Pin	Definition	Description
1	IN+	IN is Rx OUT is Tx
2	IN-	
3	CGND	
4	OUT+	
5	OUT-	
6	CGND	
7	-	
8	-	

External Time Synchronization Port

On the H20RN-2000.V2 series platforms, MX01/PXM01 card provides one 1PPS TOD port, with configurable input and output, labeled “1PPS TOD”. It uses RJ45 connector as shown in Figure 2-5, pin definition is shown in Table 2-8.

Table 2-8 External time synchronization port definition of H20RN-2000.V2 series platforms

Pin	Definition	Description
1	-	-
2	-	-
3	RS-422_1_N	1PPS -
4	GND	GND
5	GND	GND

Pin	Definition	Description
6	RS-422_1_P	1PPS+
7	RS-422_2_N	TOD time information
8	RS-422_2_P	TOD time information

Reset Button

On the H20RN-2000.V2 series platforms, there is a reset button marked with “RST” on the front panel of MX01/PXM01 card, which can reset the system manually, as shown in Figure 2-7.

Figure 2-7 Reset button



Management Port

On the H20RN-2000.V2 series platforms, MX01/PXM01 card provides 1 NM port and 1 CONSOLE port as their network management ports, marks and definitions are shown in Table 2-9. Network management ports use standard RJ-45 socket whose connector diagram is shown in Figure 2-5, NM is the FE electrical port; see its socket definition in Table 2-10, CONSOLE port pin definition is shown in Table 2-11.

Table 2-9 Marks and definitions of management ports

Mark	Definition
NM	Out-of-band management port, using Telnet, EzView to manage device
CONSOLE	RS232 management port, using hyper terminal to manage device

Table 2-10 RJ-45 socket definition at NM port

Pin	1	2	3	4	5	6	7	8
Definition	TxD+	TxD-	RxD+	—	—	RxD-	—	—

Table 2-11 RJ-45 socket definition at Console port

Pin	1	2	3	4	5	6	7	8
Definition	-	-	TxD	GND	GND	RxD	-	-

DIP Control

On the H20RN-2000.V2 series platforms, MX01/PXM01 card provides 1 group of 4-position DIP switches, the definitions of DIP switches are shown in Table 2-12. The “ON” in the table is the ON in the DIP switch.

Table 2-12 4-position DIP switches setting mode

DIP	Mark	Descriptions
DIP-1	1	Switch down (ON): zero-touch configuration
DIP-2	2	Card confirmation
DIP-3	3	Configuration synchronization
DIP-4	4	Reserved

Power Port

The device uses dual ~220V AC, dual -48V DC and ~220V AC+-48V DC for power supply. It supports 1+1 protection and online replacement. Users can select the power type according to their needs.

For ~220V AC power supply, connect IEC compliant power cord to ~220V AC power socket for power connection, and the middle electrode of the AC power socket is protection ground.



CAUTION

For the user's safety, when using ~220V AC power supply, the power socket must have good protection ground connection. When using -48V DC power supply, protection ground should also be connected.

2.2.3 Fan

In order to improve the whole performance of the system, H20RN-2000.V2 series platforms configure the fan card on the rightmost of the chassis which has 2 round fans in total. H20RN-2000.V2 series platforms support the fan speed detection function, when any round fan works abnormally, fan alarm indicator light will be on, at the same time, and the corresponding alarm will be displayed on the network management interface. Users need to detect timely, and replace the fan card. Fan card provides an earth jack, which is used for antistatic protection.

2.3 Cable Introduction

2.3.1 DB9-RJ45 Serial Port Cable (ZJN.BH4.851.105A)

Introduction

H20RN-2000.V2 series platforms are delivered with Console serial port cable, which can be connected to the RJ45 Console interface and allow us to log in to the device. The serial port cable is used to connect the Console interface of the device and the RS-232 serial interface of the maintenance console and transmit configuration data. The maintenance Console implements local debugging and maintenance through the Console interface.

Connectors at two ends of the cable are as below:

- RJ45 connector: connect to the Console/RS232 port of the device;
- DB9-F connector: used to connect the RS-232 serial port of PC machine.

Appearance

Figure 2-8 shows the DB9-RJ45 serial port cable.

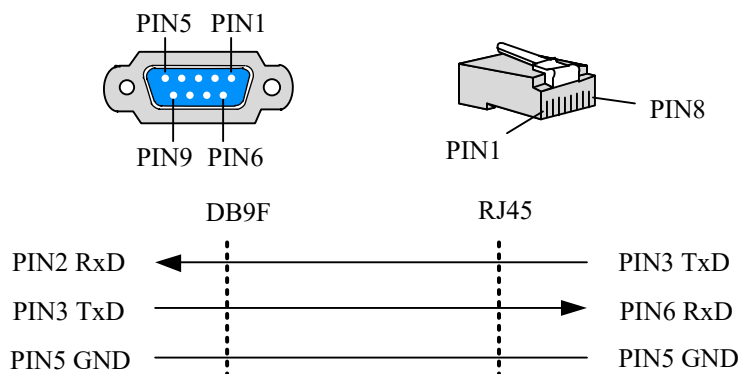
Figure 2-8 DB9-RJ45 serial port cable



Pin Assignments

Figure 2-9 shows pin assignments of the RS-232 serial port and RJ45 Ethernet port.

Figure 2-9 Pin assignments



Technical Specifications

Table 2-13 lists technical specifications of DB9-RJ45 serial port cable.

Table 2-13 Technical specifications of DB9-RJ45 serial port cable

Item	Description
Name	DB9-RJ45 serial port cable

Item	Description
Type	CAT5 Unshielded Twisted Pair (UTP-5, UTP-5e) and STP (Shielded Twisted Pair)
Connector	DB9 female connector and RJ45 connector
Length	2m

2.3.2 Fiber and Connector (LC/PC)

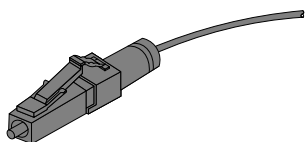
Introduction

Device supports single-mode or multi-mode fiber.

Appearance

LC/PC fiber connector used by H20RN-2000.V2 series platforms is shown in Figure 2-10.

Figure 2-10 LC/PC fiber connector



When connecting or removing the LC/PC optical connector, align the connector with the optical port, and do not rotate the fiber. Note the following points:

- To insert the fiber, align the head of the fiber jumper with the optical port and insert the optical fiber into the port gently.
- To remove the fiber, press the latch on the connector, and pull the fiber out.

2.3.3 Ethernet Cable

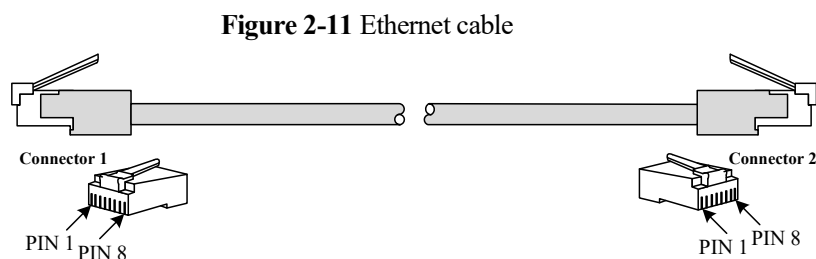
Introduction

- Used to connect the Ethernet electrical interface with other devices.
- Used to connect the Ethernet monitoring interface on NM card with network interface on NM PC machine.

The Ethernet interfaces on the H20RN-2000.V2 series platforms are self-adaptive to straight-through cable mode and crossover cable mode. Both of them can be used to connect Ethernet electrical interface.

Appearance and Structure

Figure 2-11 shows the Ethernet cable.



Pin Assignments

Ethernet cables are classified into straight-through cables and crossover cables:

- Straight through cable: EIA/TIA 568B standard line orders are used at both RJ45 connectors crimped twisted pairs.
- Crossover cable: EIA/TIA 568A standard line order is used at one RJ45 connector crimped twisted pairs, while EIA/TIA 568B standard line order is used at the other end.

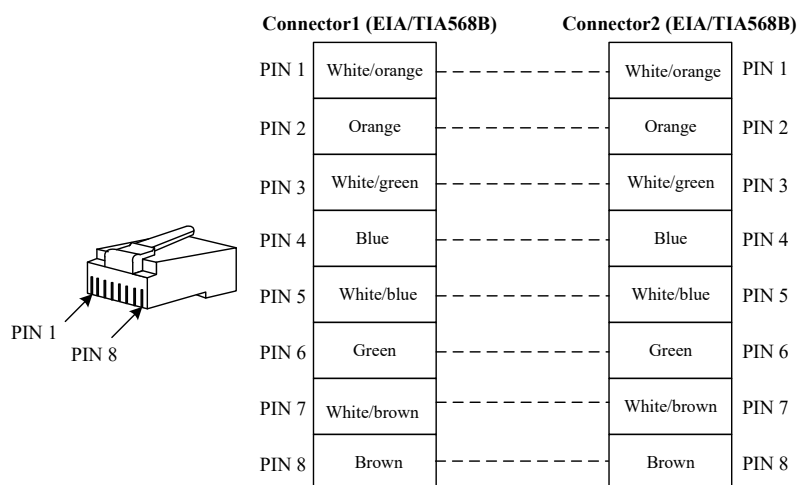
Table 2-14 lists the line orders of EIA/TIA 568A and EIA/TIA 568B standards.

Table 2-14 Line orders of EIA/TIA 568A and EIA/TIA 568B standards

Connector (RJ45)	EIA/TIA568A	EIA/TIA568B
PIN 1	White/Green	White/Orange
PIN 2	Green	Orange
PIN 3	White/Orange	White/Green
PIN 4	Blue	Blue
PIN 5	White/Blue	White/Blue
PIN 6	Orange	Green
PIN 7	White/Brown	White/Brown
PIN 8	Brown	Brown

Both RJ45 connectors of the straight through cable follow EIA/TIA568B standard line order, as shown in Figure 2-12.

Figure 2-12 Line order of the straight-through cable



RJ45 connectors on both ends of crossover cable need to use different standard line orders, usually one RJ45 connector follows EIA/TIA568A standard; the other RJ45 connector follows

EIA/TIA568B standard.

The line order of the 100 Mbit/s crossover cable is different from that of the 1000 Mbit/s crossover cable. Diagrams of cable connection are shown in Figure 2-13 and Figure 2-14.

Figure 2-13 Line order of the 100 Mbit/s crossover cable

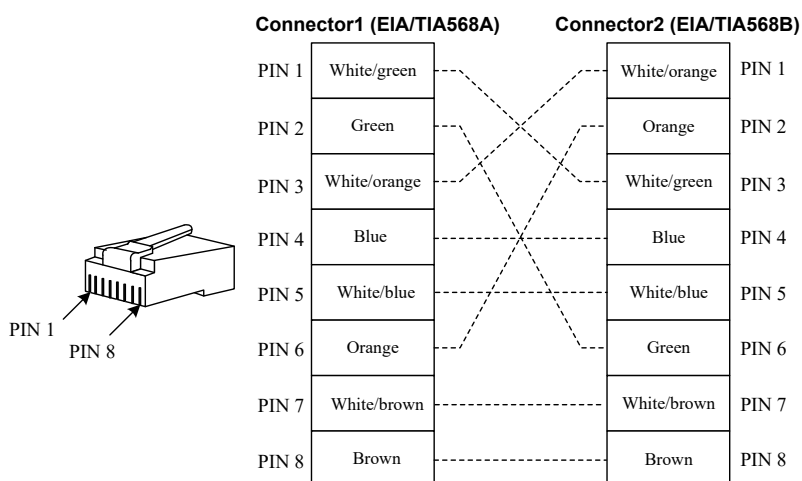
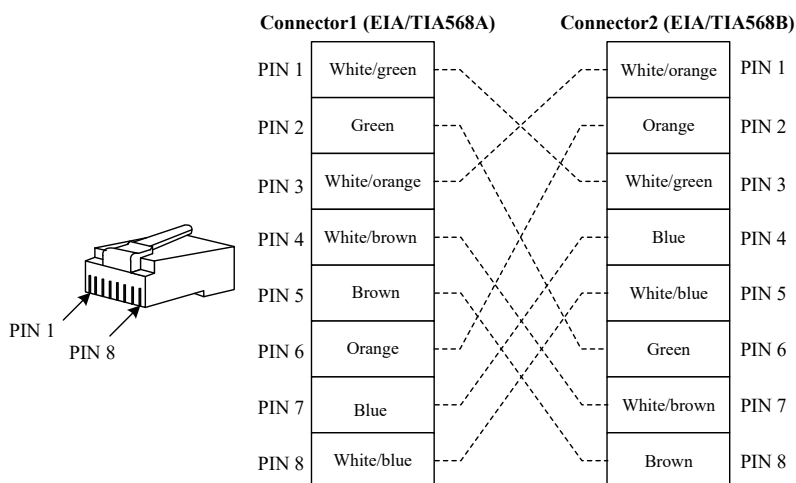


Figure 2-14 Line order of the 1000 Mbit/s crossover cable



NOTE

1000Mbit/s crossover cable uses all 8 pins. The crossover is PIN1 to PIN3, PIN2 to PIN6, PIN4 to PIN7, and PIN5 to PIN8.

Technical Specifications

Table 2-15 lists technical specifications of the Ethernet cable.

Table 2-15 Technical specifications of the Ethernet cable

Item	Description
Connector type	RJ45 connector (crystal head)
Cable type	Category 5 unshielded twisted pair (UTP-5) or shielded twisted pair (STP)
Color	Dark grey
Characteristic impedance	100.0Ω
Inner conductor wire diameter	0.510mm
Breakdown voltage	500.0V
Inner conductor DC impedance	93.8Ω/km
Quantity of cores	8
Frequency range	0~100MHz
Frequency attenuation	22dB/100m@100MHz

2.3.4 AC Power Cable

Application

AC power cable transports AC power from power distribution equipment to AC power supply socket, and then transmits power to the entire device.

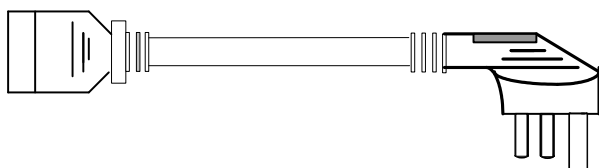
The selections of AC power cables are different according to local standards, as shown in Table 2-16.

Table 2-16 AC power supply cable list

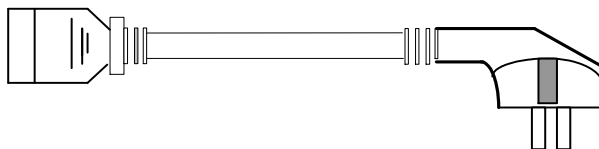
Regional standard	Cable type
Chinese standard	BH4.855.035-A
German standard	BH4.855.035-B
American standard	BH4.855.035-C
South Africa standard	BH4.855.035-D
Japanese standard	BH4.855.035-E
British standard	BH4.855.035-F
North American standard	BH4.855.035-G

Appearance and Structure

The AC power cable which meets Chinese standard is composed of Chinese standard three-plug connector and pins terminal, as shown in Figure 2-15.

Figure 2-15 Chinese standard AC power cable (BH4.855.035-A)


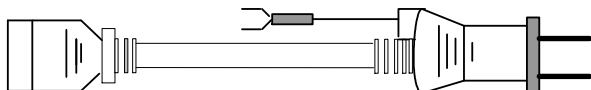
The AC power cable which meets German standard is composed of German standard French-mode two-plug connector and pins terminal, as shown in Figure 2-16.

Figure 2-16 German standard AC power cable (BH4.855.035-B)


The AC power cable which meets American standard is composed of American standard

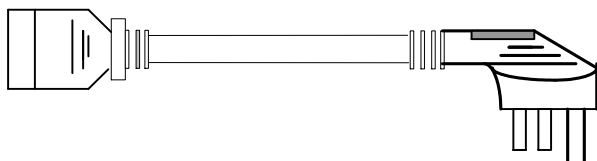
two-plug connector and pins terminal, as shown in Figure 2-17.

Figure 2-17 American standard AC power cable (BH4.855.035-C)



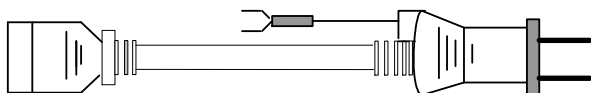
The AC power cable which meets South Africa standard is composed of South Africa standard three-plug connector and pins terminal, as shown in Figure 2-18.

Figure 2-18 South Africa AC power cable (BH4.855.035-D)



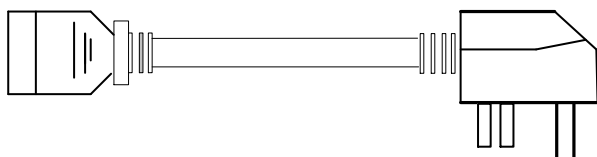
The AC power cable which meets Japanese standard is composed of Japanese standard two-plug connector and pins terminal, as shown in Figure 2-19.

Figure 2-19 Japanese standard AC power cable (BH4.855.035-E)



The AC power cable which meets British standard is composed of British standard three-plug connector and pins terminal, as shown in Figure 2-20.

Figure 2-20 British standard AC power cable (BH4.855.035-F)



The AC power cable which meets North American standard is composed of North American standard three-plug connector and pins terminal, as shown in Figure 2-21.

Figure 2-21 North American AC power cable (BH4.855.035-G)



Technical Specifications

Table 2-17 lists technical specifications of AC power cable.

Table 2-17 Technical specifications of AC power cable

Item	Description
Cable type	Electronic and electrical cable
Color	Black
Diameter	$\geq 0.5\text{mm}^2$

2.3.5 DC Power Cable (ZJN.BH4.855.079)

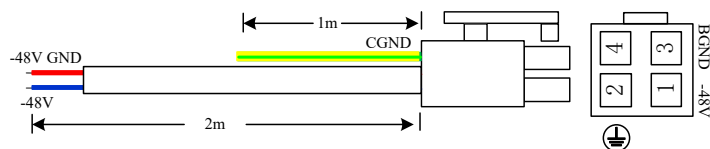
Application

DC power cable transports -48V DC power from power distribution equipment to DC power supply socket, and then transmits power to the entire device.

Appearance

The DC power cable is composed of 2×2 connector and power cables, as shown in Figure 2-22.

Figure 2-22 DC power cable



Pin Assignments

Table 2-18 lists DC power cable pin assignments.

Table 2-18 DC power cable pin assignments

PIN	Color	Signal definition
1	Blue	-48V
2	Yellow-green	 CGND
3	Red	-48V GND
4	-	-

2.3.6 Protection Ground Cable (ZJN.BH4.851.134)

Introduction



CAUTION

Connecting the protection ground cable properly is an important guarantee to lightning protection, shock proof, and anti-interference.

When installing and using the device, ensure that the grounding cable is properly connected; otherwise, personnel injury or equipment damage may be caused.

Appearance

The protection ground cable is composed of wiring terminals and the coaxial cable. The wiring terminal is usually an OT bare-press terminal. The coaxial cable is yellow/green copper burn-resistant cable. Figure 2-23 shows the grounding cable.

Figure 2-23 The grounding cable diagram

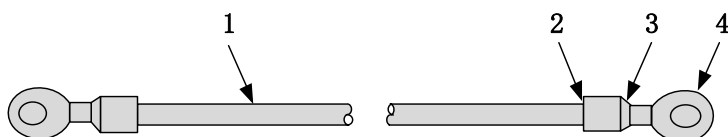


Table 2-19 Grounding cable structure list

Number	Name
1	Wire
2	Strip end (connected to the OT terminal)
3	Insulating sheath
4	OT terminal

Technical Specifications

Table 2-20 lists technical specifications of the grounding cable.

Table 2-20 Technical specifications of the grounding cable

Item	Description
Cable type	Electronic and electrical cable
Cable length	0.4 m
Color	Yellow and green
Connector type	OT/OT
Inner conductor cable standard	Cross-sectional area $\approx 0.75 \text{ mm}^2$
Maximum current	7.5 A

2.3.7 Dual-E1 Socket Cable

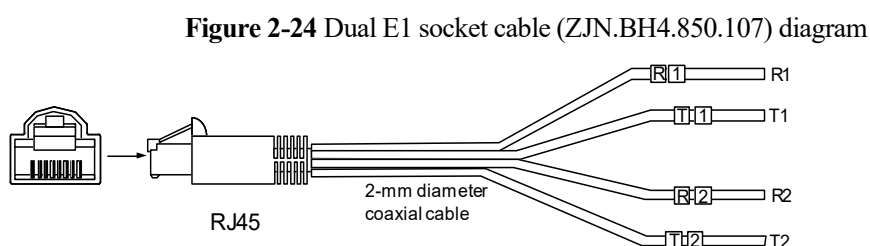
Introduction and Type

Dual-E1 socket cable is used to connect to the 75Ω E1 port of the device.

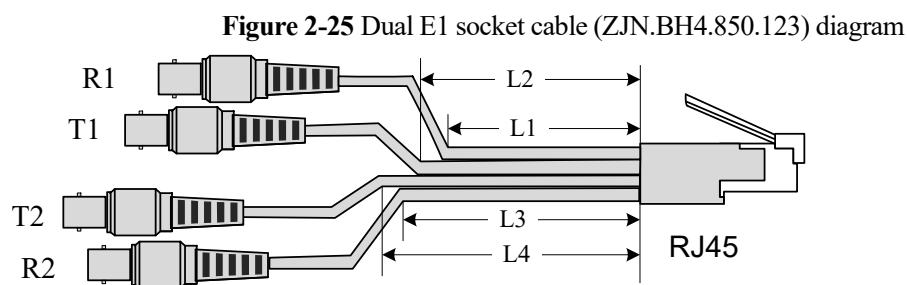
ZJN.BH4.850.107 and ZJN.BH4.850.123 can be configured according to user's need.

Appearance

Dual E1 socket cable (ZJN.BH4.850.107) diagram is shown in Figure 2-24.



Dual E1 socket cable (ZJN.BH4.850.123) is composed of 1 RJ45 crystal head and 4 BNC heads, whose appearance diagram is shown in Figure 2-25.



Pin Assignments

Table 2-5 shows pin assignments of dual E1 socket cable.

Technical Specifications

Table 2-21 shows technical specifications of dual E1 socket cable (ZJN.BH4.850.107).

Table 2-21 Technical specifications of E1 cable (ZJN.BH4.850.107)

Item	Description
Cable type	Coaxial cable
Cable length	10m
Color	Grayish white
Connector type	RJ-48C crystal head
Gauge	SYV-75-2
Characteristic impedance	75Ω
Diameter	2mm
Maximum current	28A

Table 2-22 shows technical specifications of dual E1 socket cable (ZJN.BH4.850.123).

Table 2-22 Technical specifications of E1 cable (ZJN.BH4.850.123)

Item	Description
Cable name	RJ45/BNC connector adapter cable
Cable type	SYV75-2-1 (diameter: 2mm, coaxial cable)
Connector	RJ45 crystal head, BNC head
Cable length	L1=20cm; L2=25cm; L3=30cm; L4=35cm

3 Technical Specifications

3.1 Monitoring Interface

Specifications	Instruction
Ethernet monitoring interface	10/100Base-T Ethernet MDI interface
CONSOLE interface	RS232 interface
Protocol	SNMP
Connector	RJ-45

3.2 10/100/1000Base-Tx Interface

Specifications	Instruction
Interface rate	10M/100M/1000M
Interface specifications	Complying with IEEE 802.3, IEEE-802.3u, IEEE 802.1Q, IEEE 802.1p

Specifications	Instruction
Working mode	Auto-negotiation or manual 10/100/1000M full-duplex, 10/100 half-duplex
Interface connector	RJ-45

3.3 100/1000Base-SX/LX Interface

Specifications	Instruction
Interface specifications	IEEE 802.3z
Interface rate	100M/1000M
Working mode	Auto-negotiation, 1000M full-duplex, 100M full-duplex
Interface connector	SFP socket (supporting SR/LR/ER/ZR with 850nm, 1310nm, 1550nm)
Optical interface technical parameters	Determined by optical module

3.4 10GBase-SX/LX Interface

Specifications	Instruction
Interface specifications	Complying with IEEE802.3, IEEE 802.3ae, IEEE 802.1Q, IEEE 802.1p, IEEE802.1ad, IEEE802.1d, IEEE802.1w, IEEE802.3ad, IEEE802.3ah, IEEE802.1ag, Y1731

Specifications	Instruction
Interface rate	10GE
Working mode	Auto-negotiation
Interface connector	SFP+ socket (supporting SR/LR/ER/ZR with 850nm, 1310nm, 1550nm)
Optical interface technical parameters	Determined by optical module

3.5 E1 Signal Interface

E1 interface specifications	
Bit rate	2.048 Mbps $\pm$ 50ppm
Line code format	HDB3
Impedance	75 Ω unbalanced interface/120 Ω balanced interface
Connector	RJ-45, dual-E1 socket
Interface specification	G.703

3.6 STM-1 Optial Interface

STM-1 interface specifications	
Bit rate	155520kbit/s $\pm$ 4.6ppm
Line code format	Scramble NRZ

STM-1 interface specifications	
Optical interface technical parameters	Determined by optical module

3.7 External Clock Input/output Interface

Specifications	Instruction
External clock input	2MHz, 2Mbit/s
External clock output	2MHz, 2Mbit/s
Connector	RJ45 socket
Interface specification	G.703

3.8 External Time Synchronization Interface

Specifications	Instruction
Electrical specification	RS422
Interface connector	RJ-45 socket

3.9 Power Voltage

Specifications	Instruction
Voltage	DC -48V (-36V~-72V) AC ~220V (165V~265V)

3.10 Power Consumption

Specifications	Instruction
Power consumption	≤150W

3.11 Operation Environment

Specifications	Instruction
Operation temperature	-5°C~55°C
Storage temperature	-25°C~60°C
Relative humidity	5%~95%RH (non-condensing, non-frost)

3.12 Chassis Size

Specifications	Instruction
Size	H20RN-2000.V2 W×D×H (mm): 443×252×89 H20RN-2000L.V2 W×D×H (mm): 430×254×44

3.13 Device Weight

Specifications	Instruction
Weight	≤7.6kg

4 Appendix1 General Card Introduction

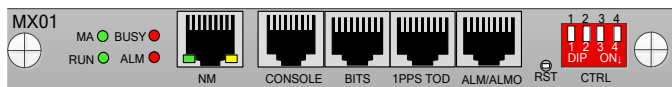
NOTE

For the installation of equipment, please refer to the *H2ORN-2000.V2 Series IP/MPLS Aggregation Platforms Quick Installation Guide*.

4.1 NM+PX Card (MX01)

NM+PX card is a master-control switching card, which is inserted into slot1 or slot2. There are four LEDs located on its front panel: RUN, ALM, MA and BUSY. NM+PX card provides 1 NM port, 1 CONSOLE port, 1 reset button and 1 group of 4-position DIP switches. Besides, MX01 provides 1 external clock input/output port, supporting 2MHz and 2Mbit/s clock mode. It has a 1PPS+TOD port and an alarm output port.

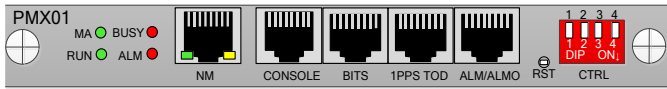
Figure 4-1 NM+PX card (MX01)



4.2 NM+PX Card (PMX01)

PMX01 is similar to MX01; please refer to 4.1 NM+PX Card (MX01) for detailed descriptions.

Figure 4-2 NM+PX card (PMX01)



4.3 2×10GE Card (XGE02/XGE02G/TU02)

2×10GE card is a 10GE optical port card. It provides 2 10GE optical ports, each of which has one LINK LED.

Figure 4-3 2×10GE card (XGE02)

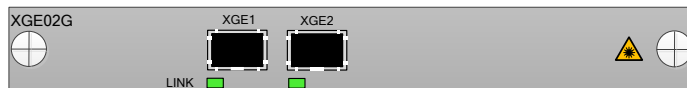


Figure 4-4 2×10GE card (XGE02G)

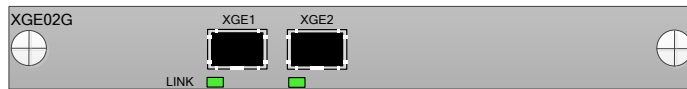


Figure 4-5 2×10GE card (TU02)



4.4 8GE Card (GE08/GE08G/GU08)

8GE card provides 8 GE optical ports, each of which has one LINK LED.

Figure 4-6 8GE card (GE08)

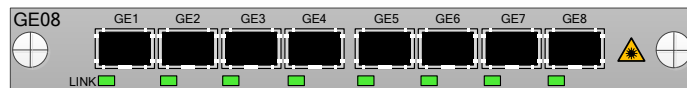


Figure 4-7 8GE card (GE08G)



Figure 4-8 8GE card (GU08)



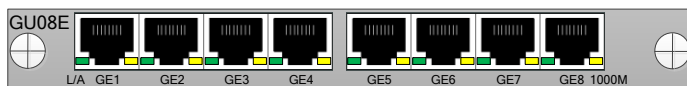
4.5 8GE Card (GE08E/GU08E)

8GE card provides 8 GE electrical ports.

Figure 4-9 8GE card (GE08E)



Figure 4-10 8GE card (GU08E)



4.6 16E1 Emulation Card (EC16)

16E1 emulation card supports transmitting 16 E1 signals, using RJ45 ports.

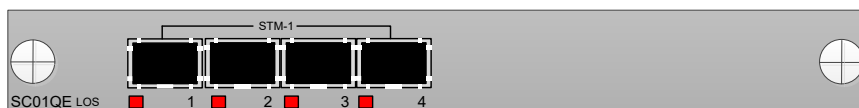
Figure 4-11 16E1 emulation card (EC16)



4.7 STM-1 Interface Emulation Card (SC01QE)

STM-1 interface emulation card (SC01Q) supports 4 STM-1 SFP optical ports.

Figure 4-12 STM-1 interface emulation card (SC01QE)



4.8 Power Card

(PWR48150/PWR22150/PWR4875/PWR2275)

Power card is used to provide working power and fan power for each card. One appropriate power card is capable of providing the power supply for the whole H20RN-2000.V2 series platforms. In order to improve the device reliability, user can configure 2 power cards to provide 1+1 hot backup.

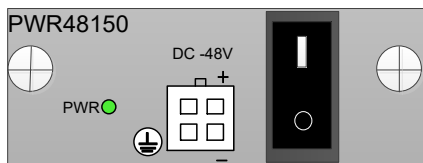
Power cards PWR48150/PWR22150 are used in H20RN-2000.V2, Power cards PWR4875/PWR2275 are used in H20RN-2000L.V2.

Table 4-1 Power card introduction

Power cards	Input voltage	Output power
PWR22150	~220V	150W
PWR2275	~220V	75W
PWR48150	-48V	150W
PWR4875	-48V	75W

Each H20RN-2000 can be configured with 2 power cards (insert into PWR slots): DC+DC power cards, AC+AC power cards or DC+AC power cards. The chassis of H20RN-2000 is configured with the fan to lower the working temperature of power card, so as to extend its working life.

Figure 4-13 Power card (-48V DC)



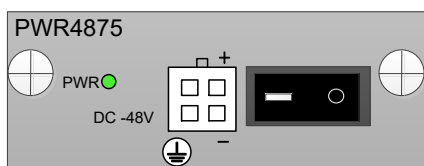
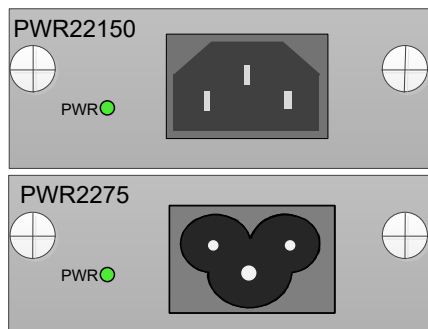


Figure 4-14 Power card ($\sim 220V$ AC)



4.9 Power Card (PWR48/PWR22)

Please refer to 4.8 Power Card (PWR48150/PWR22150/PWR4875/PWR2275) for detailed descriptions.

Figure 4-15 Power card (DC -48V)

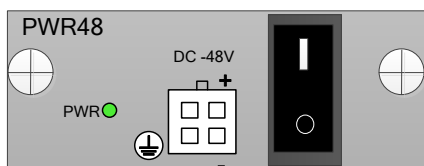


Figure 4-16 Power card (AC $\sim 220V$)



4.10 FAN Card (FAN02/FAN)

H20RN-2000.V2

Fan card is used to lower the working temperature of power card, so as to extend its working life. User can monitor the fan running state through NMS, if the fan fault alarm is displayed on the network management interface, user needs to detect the fan timely and replace the fan.

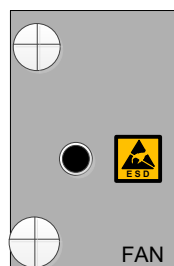
Figure 4-17 Fan card (FAN02)



H20RN-2000L.V2

Fan card is used to lower the working temperature of power card, so as to extend its working life. User can monitor the fan running state through NMS, if the fan fault alarm is displayed on the network management interface, user needs to detect the fan timely and replace the fan.

Figure 4-18 Fan card (FAN)



5

Appendix2 Terms and Abbreviations

This chapter introduces terms and abbreviations involved in this user’s manual.

- Terms
- Abbreviations

Terms

E

Ear hanging	Ear hanging is a component located on the side of the chassis, used to install the chassis into the cabinet.
-------------	--

L

Label	Label is the Identification for cable, chassis and alarm.
-------	---

M

Multi-mode Fiber	Multi-mode can be transmitted in one fiber
------------------	--

P

Protection Ground Wire	Protection ground wire is used to connect device with the protection ground. Usually, it is a yellow-green coaxial wire.
------------------------	--

Abbreviations**A**

AC	Alternating Current
----	---------------------

D

DC	Direct Current
----	----------------

E

ESD	Electro Static Discharge
-----	--------------------------

F

FE	Fast Ethernet
----	---------------

G

GE	Gigabit Ethernet
----	------------------

I

IEC	International Electro technical Commission
-----	--

IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
ITU-T	International Telecommunications Union - Telecommunication Standardization Sector

M

MDI	Medium Dependent Interface
MDI-X	Medium Dependent Interface cross-over

R

RH	Relative Humidity
----	-------------------

U

UNI	User Network Interface
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