

DS-6210U5C4 Base Station Owner's Manual

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1. Checking Items in the Package

No.	Item	Qty. (PCS)
1	Base Station Controller Unit (BSCU)	1
2	Channel Unit (CHU)	4
3	Power Support Unit (PSU)	2
4	Fan Unit	1
5	Divider Unit (DIU)	1
6	Combiner Unit (COM)	1
7	Cabinet Kit	1

Figure 1-1 Packing List

2. Product Controls

 **Note**

Devices except for CHU, BSCU, PSU and ICB are optional.

2.1 Interface Units of 4-carrier Base Station

The interface units on the top of the cabinet consist of the antenna connector, extended interface board (EIB) and power supply interface. See [Figure 2-1](#).

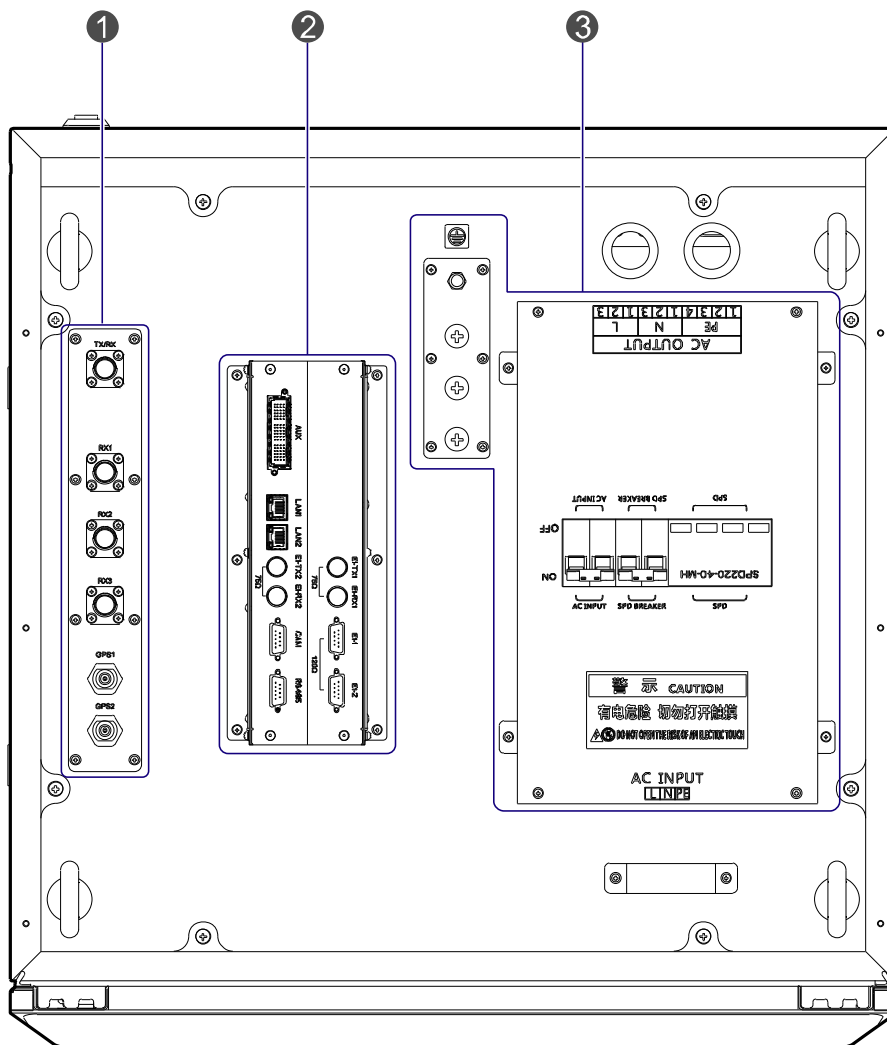


Figure 2-1 Interface Units of 4-carrier Base Station

No.	Name	Description
1	Antenna Connector	It contains the GPS antenna connector, RX antenna

No.	Name	Description
		connector and TX antenna connector.
2	EIB	It contains the core network interface, cabinet expansion interface and monitor interface.
3	Power Supply Interface	/

Table 2-1 Descriptions on Interface Units of 4-carrier Base Station

2.1.1 Antenna Connector

The antenna connector is illustrated below.

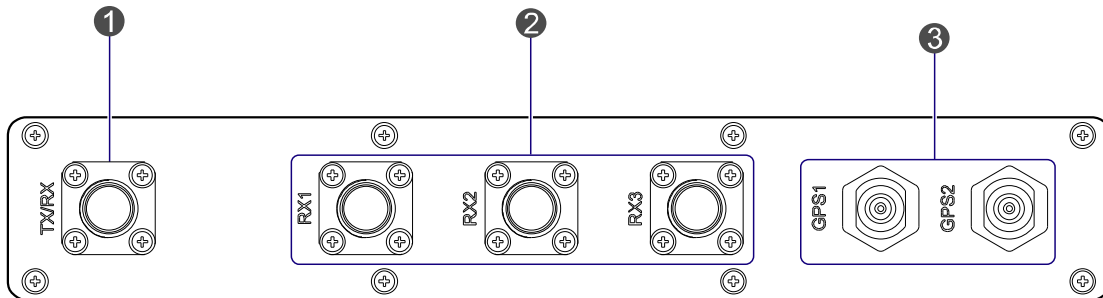


Figure 2-2 Antenna Connector of 4-carrier Base Station

No.	Name	Description
1	TX Antenna Connector	TX/RX N-connector (female)
2	RX Antenna Connector	RX1
		RX2
		RX3
3	GPS Antenna Connector	GPS1
		GPS2

Table 2-2 Descriptions on Antenna Connector of 4-carrier Base Station

2.1.2 EIB

The EIB is illustrated below.

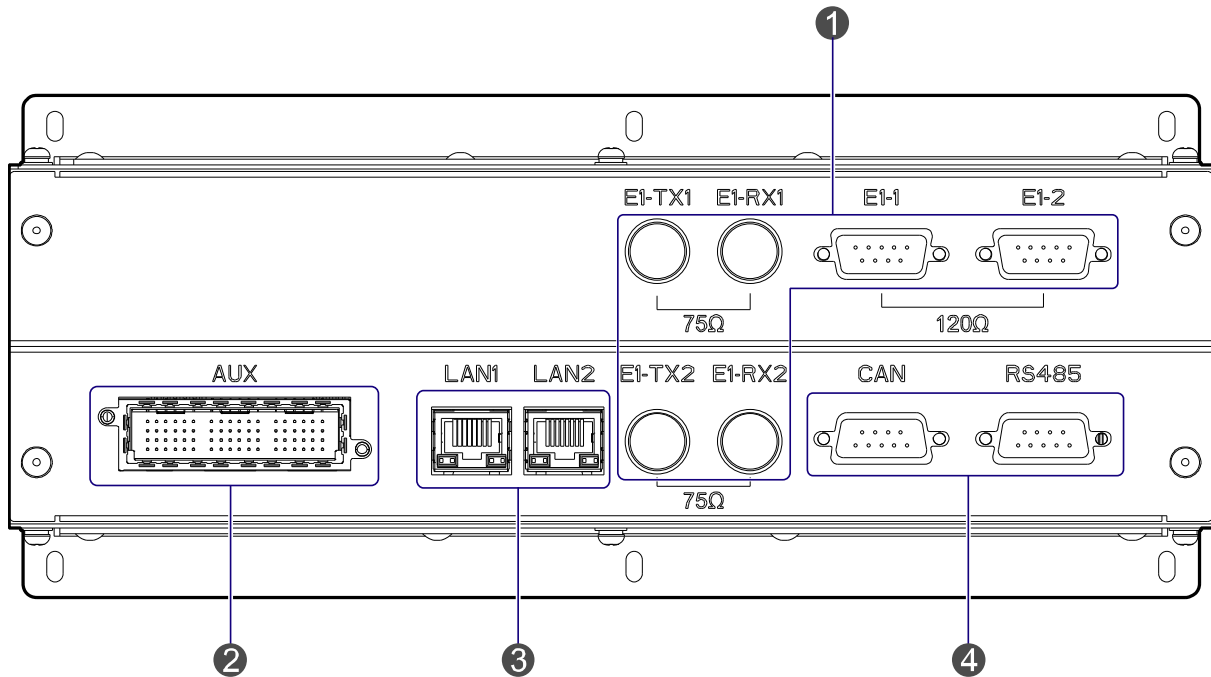


Figure 2-3 EIB of 4-carrier Base Station

No.	Name		Description
1	E1 Interface	E1-TX1	BNC-connector (female)
		E1-RX1	BNC-connector (female)
		E1-1	DB9-connector (female)
		E1-2	DB9-connector (female)
		E1-TX2	BNC-connector (female)
		E1-RX2	BNC-connector (female)
2	Cabinet Expansion Interface	AUX	Dedicated 72-pin interface
3	Ethernet Interface	LAN1	RJ-45 connector
		LAN2	RJ-45 connector
4	Monitor Interface	CAN	DB9-connector (female)
		RS485	DB9-connector (female)

Table 2-3 Descriptions on EIB of 4-carrier Base Station

Core Network Interface

The core network interface contains the 4-path E1 interface and 2-path Ethernet interface.

Cabinet Expansion Interface

The cabinet expansion interface has 8-path extended signals. It is applied to connect to four interconnect relay units of another cabinet, in case of interconnecting two cabinets.

Monitor Interface

The monitor interface includes one CAN-BUS interface and one RS485 interface.

2.1.3 Power Supply Interface

The power supply interface is illustrated below.

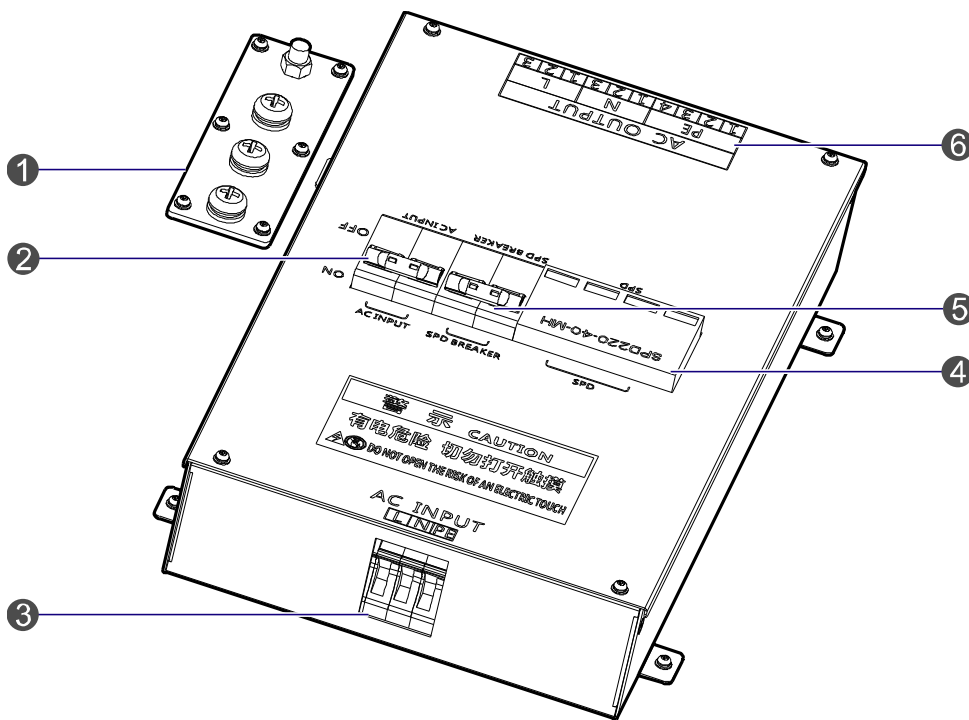


Figure 2-4 Power Supply Interface of 4-carrier Base Station

No.	Name	No.	Name
1	Ground Bar	2	AC Input Breaker
3	AC Input Terminal	4	Surge Protection Device (SPD)
5	SPD Breaker	6	AC Output Terminal

Table 2-4 Descriptions on Power Supply Interface of 4-carrier Base Station

2.2 Cartridge

In accordance with the IEC60297 standard, the cartridge is 19 inches in width and 7U in height. Each cartridge can accommodate four CHUs, two BSCUs and two PSUs.

The slot 5 and slot 6 of the main chassis are available for the BSCU. See [Figure 2-5](#).

C H U	C H U	C H U	C H U	B S C U	B S C U	P S U	P S U
01	02	03	04	05	06	07	08

Figure 2-5 Full Configuration for MC

2.3 Channel Unit (CHU)

The CHU logically includes power amplification, TX excitation unit, baseband signal processing unit and diversity receiver. See [Figure 2-6](#).

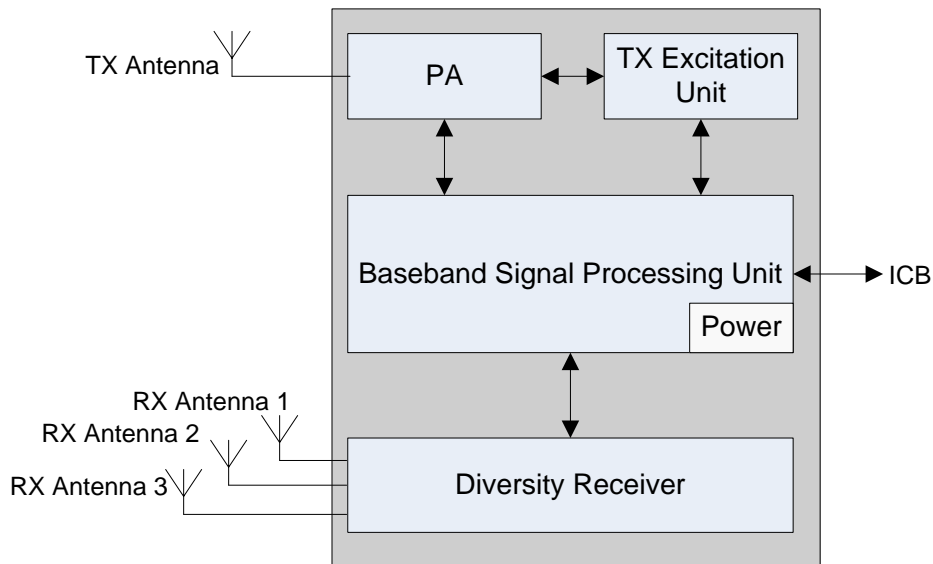


Figure 2-6 Logical Architecture of CHU

2.3.1 Function

The CHU processes and converts protocols on the physical layer and data link layer of the DMR air interface. Physically, it consists of channel control board (CHB), TX board (TXB) and RX board (RXB).

- CHB: capable of signaling processing, channel encoding/decoding, interleaving and de-interleaving, modulation/demodulation, RF signal loop-back test and fail-soft.
- TXB: capable of modulation, upward frequency conversion, filtering and D/A conversion from carrier baseband signal to RF signal, as well as the downlink signal amplification.
- RXB: capable of filtering, demodulation, downward frequency conversion, AGC and A/D conversion from three-path carrier signal to baseband signal, as well as uplink signal amplification.

2.3.2 Front Panel

The front panel of the CHU is illustrated below.

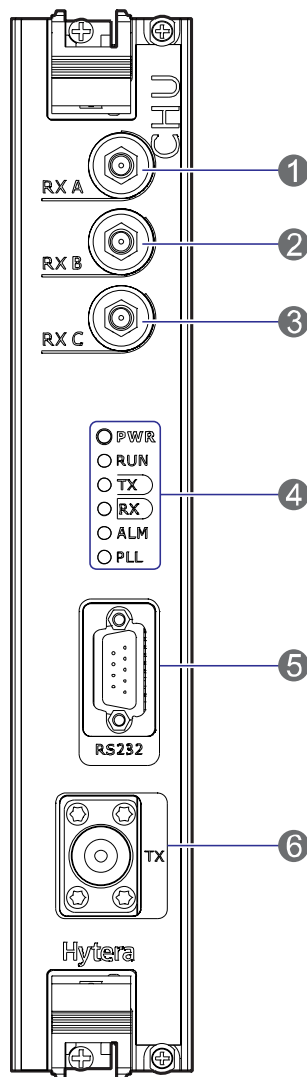


Figure 2-7 Front Panel of CHU

No.	Name	Description	Remarks
1	RXA	Diversity RX antenna input	SMA-connector (female)

No.	Name	Description	Remarks
2	RXB	RX antenna input	SMA-connector (female)
3	RXC	Diversity RX antenna input	SMA-connector (female)
4	LEDs	LED indicator	/
5	RS232	Debug interface	DB9-connector (female)
6	TX	Transmission	N-connector (female)

Table 2-5 Description on Front Panel of CHU

2.3.3 LED Indicator

The CHU indicators are described in [Table 2-6](#).

LED Indicator	Color	Status	Description (in working mode)	Description (in sleep mode)
PWR	Green	On	The CHU is powered on.	The CHU is powered on.
		Off	The CHU is powered off.	The CHU is powered off.
RUN	Green	Flashing	The CHU runs properly.	\
		Off	The CHU does not run properly.	The CHU is in sleep mode.
TX	Green	On	Data is present on downlink slot 2 of the CHU.	\
		Off	Data is present on downlink slot 1 of the CHU.	The CHU is in sleep mode.
RX	Green	On	Data is present on the uplink of the CHU.	Data is present on the uplink of the CHU.
		Off	No data is present on the uplink of the CHU.	No data is present on the uplink of the CHU.
ALM	Red	On	The CHU software is faulty.	The CHU software is faulty.
		Off	The CHU runs properly.	The CHU runs properly.
PLL	Red	On	An alarm is given for PLL unlock.	An alarm is given for PLL

LED Indicator	Color	Status	Description (in working mode)	Description (in sleep mode)
				unlock.
		Off	The CHU runs properly.	The CHU runs properly.

Table 2-6 Descriptions on CHU Indicators

Note

In sleep mode, the CHU can receive inbound data. However, if the downlink channel is in use, the CHU will turn to operation mode; if the downlink channel is released, the CHU will turn to sleep mode.

2.4 Base Station Controller Unit (BSCU)

The BSCU logically consists of GPS board, main control board, synchronizing buffer, Ethernet switch, micro processor unit and power supply. See Figure 2-8.

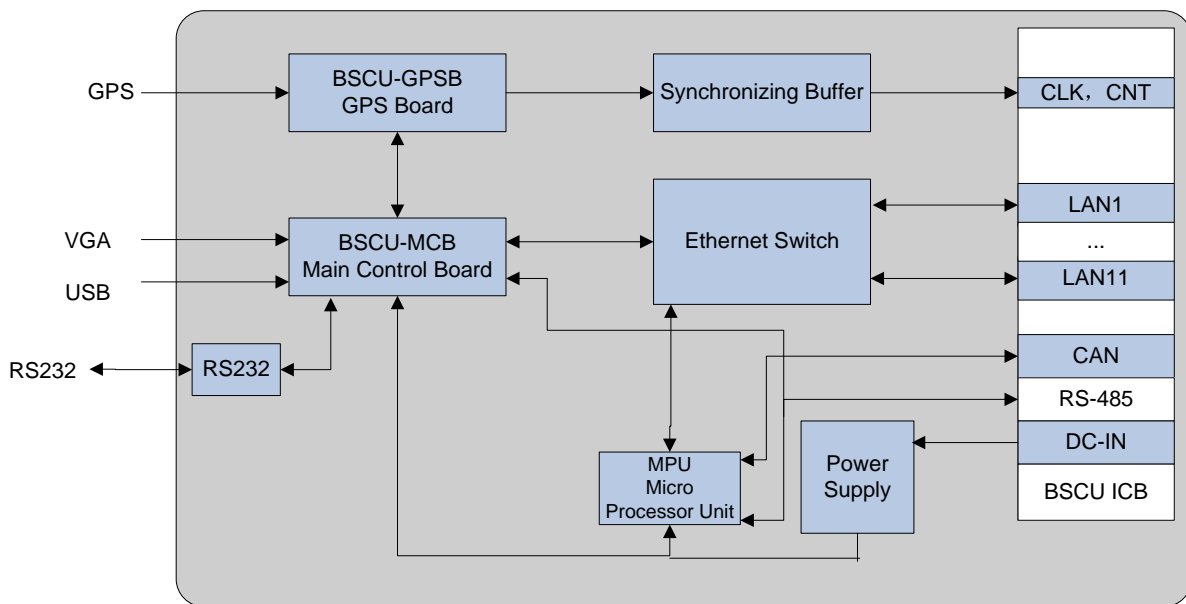


Figure 2-8 Logic Architecture of BSCU

2.4.1 Function

The BSCU is to manage the wireless link resources within the coverage and allocate them for different call services.

2.4.2 Front Panel

The front panel of the BSCU is illustrated below.

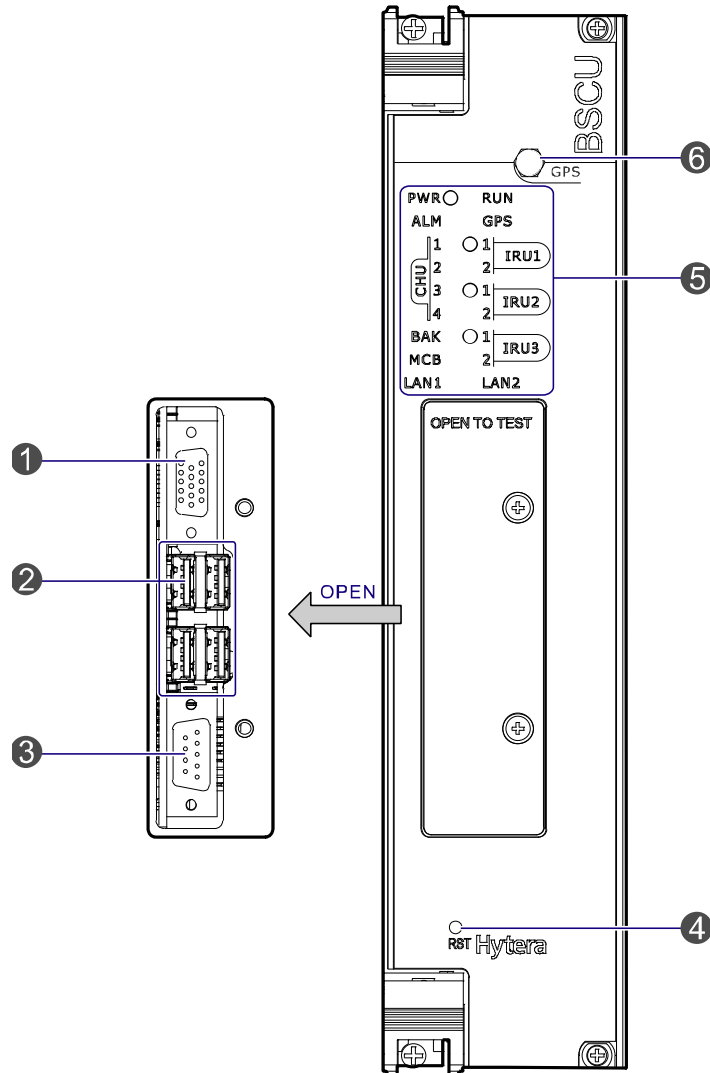


Figure 2-9 Front Panel of BSCU

No.	Name	Qty.	Description	Description
1	Video graphics array	1	For debugging	DB15-connector (female)
2	USB Interface	4	For debugging	A-connector (female)
3	RS232 Interface	1	For debugging	DB9-connector (male)

No.	Name	Qty.	Description	Description
4	RST Key	1	BSCU reset	/
5	LEDs	1	LED indicator	/
6	SMA Interface	1	GPS signal input	SMA-connector (female)

Table 2-7 Descriptions on Front Panel of BSCU

2.4.3 LED Indicator

The BSCU indicators are described in [Table 2-8](#).

LED Indicator	Color	Status	Description
PWR	Green	On	The BSCU is powered on.
		Off	The BSCU is powered off.
RUN	Green	Flashing rapidly	The BSCU is working in master mode.
		Flashing slowly	The BSCU is working in slave mode.
		Off	The BSCU is being initialized or malfunctions.
GPS	Green	Flashing	Functions are disabled locally.
		On	Functions are disabled via GPS.
		Off	Functions are enabled via GPS.
ALM	Red	On	The BSCU is alarming.
		Off	The BSCU works properly.
CHU1~4	Green	On	The link between BSCU and CHU is present.
		Flashing	Data is being transmitted or received over the link between BSCU and CHU.
		Off	The link is abnormal or not connected between BSCU and CHU.
IRU1~3	Green	On	The link between BSCU and IRU is present.
		Flashing	Data is being transmitted or received over the link

LED Indicator	Color	Status	Description
			between BSCU and IRU.
		Off	The link is abnormal or not connected between BSCU and IRU.
BAK	Green	On	The link between the standby BSCU and active BSCU is present.
		Flashing	Data is being transmitted or received over the link between the standby BSCU and active BSCU.
		Off	The link is abnormal or not connected between the standby BSCU and active BSCU.
MCB	Green	On	The link between BSCU and MCB is present.
		Flashing	Data is being transmitted or received over the link between BSCU and MCB.
		Off	The link is abnormal or not connected between BSCU and MCB.
LAN1~2	Green	On	The link between BSCU and LNA is present.
		Flashing	Data is being transmitted or received over the link between BSCU and LAN.
		Off	The link is abnormal or not connected between BSCU and LAN.

Table 2-8 Descriptions on BSCU Indicators

2.5 Power Supply Unit (PSU)

The PSU consists of power monitor board, power module and LED indicators.

2.5.1 Function

Functions are described in [Table 2-9](#).

No.	Item	Description
1	External Power Supply Input	90~264V AC 47~63Hz
2	Voltage Output (for main device)	13.5V DC
3	Voltage Output (for CHU PA)	HVCC (13.5V DC)
4	Voltage Output (for other CHU power supply)	LVCC (13.5V DC)
5	Voltage Output (for BSCU)	BSC_V (13.2V DC)
6	I/O Interface	It is connected to 2 BSCUs and outputs three channel signals. The first two are used for resetting PSU, and the last for installation status of PSU.
7	Monitor Interface	It is connected to 2 BSCUs.
		It is connected to 2 BSCUs.

Table 2-9 Descriptions on PSU

2.5.2 Front Panel

The front panel of the PSU is illustrated below.

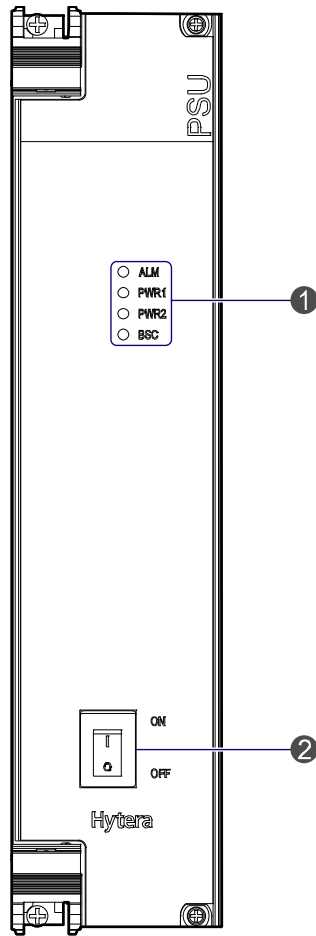


Figure 2-10 Front Panel of PSU

No.	Name	Qty.	Description
1	LEDs	1	LED indicator
2	ON/ OFF Switch	1	Power switch

Table 2-10 Descriptions on Front Panel of PSU

2.5.3 LED Indicator

The PSU indicators are described in [Table 2-11](#).

LED Indicator	Color	Status	Description
ALM	Red	Glowing solidly	A major alarm exists.
		Flashing	A minor alarm exists.
		Off	No alarm exists.

LED Indicator	Color	Status	Description
PWR1	Green	Glowing solidly	The first power module outputs normally.
		Flashing slowly	The first power module outputs HVCC or LVCC alarm.
		Flashing rapidly	The first power module outputs HVCC and LVCC alarm simultaneously.
		Off	The first power module is not installed.
PWR2	Green	Glowing solidly	The second power module outputs normally.
		Flashing slowly	The second power module outputs HVCC or LVCC alarm.
		Flashing rapidly	The second power module outputs HVCC and LVCC alarm simultaneously.
		Off	The second power module is not installed.
BSC	Green	Glowing solidly	The voltage for the BSC is normal.
		Flashing	An alarm is issued due to over-voltage or low voltage for the BSC.
		Off	The first or second power module is not installed.

Table 2-11 Descriptions on PSU Indicators

**Note**

The power module has two outputs including HVCC and LVCC.

2.6 Interconnect Backboard (ICB)

It connects the power, synchronization clock module, signaling gateway, voice and data gateway, monitor module and I/O interface.

2.6.1 Front View

The front side and interfaces of the ICB are described below.

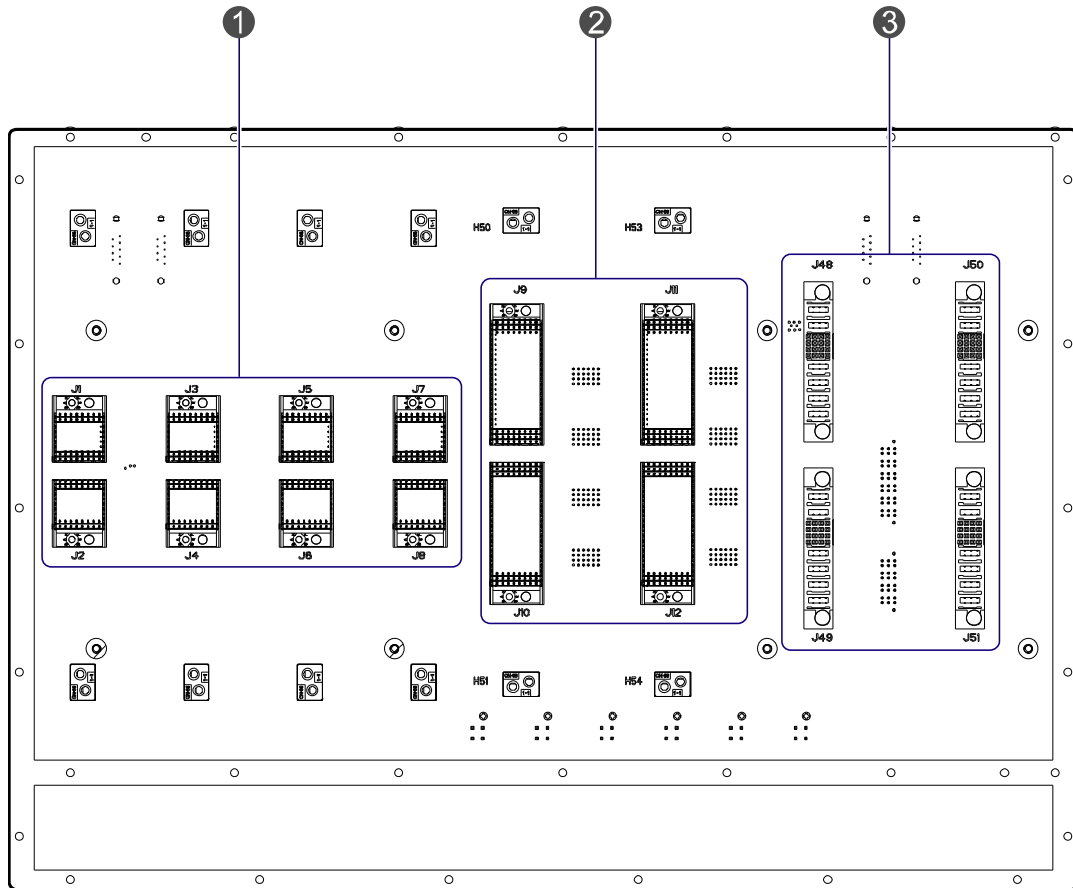


Figure 2-11 Front View of ICB

No.	Name	Qty.	Description
1	CHU Interface	4	For signal from CHU to ICB.
2	BSCU Interface	2	For signal from BSCU to ICB.
3	PSU Interface	2	For signal from PSU to ICB.

Table 2-12 Descriptions on Front Interfaces of ICB

2.6.2 Rear View

The rear view and interfaces of the ICB are described below.

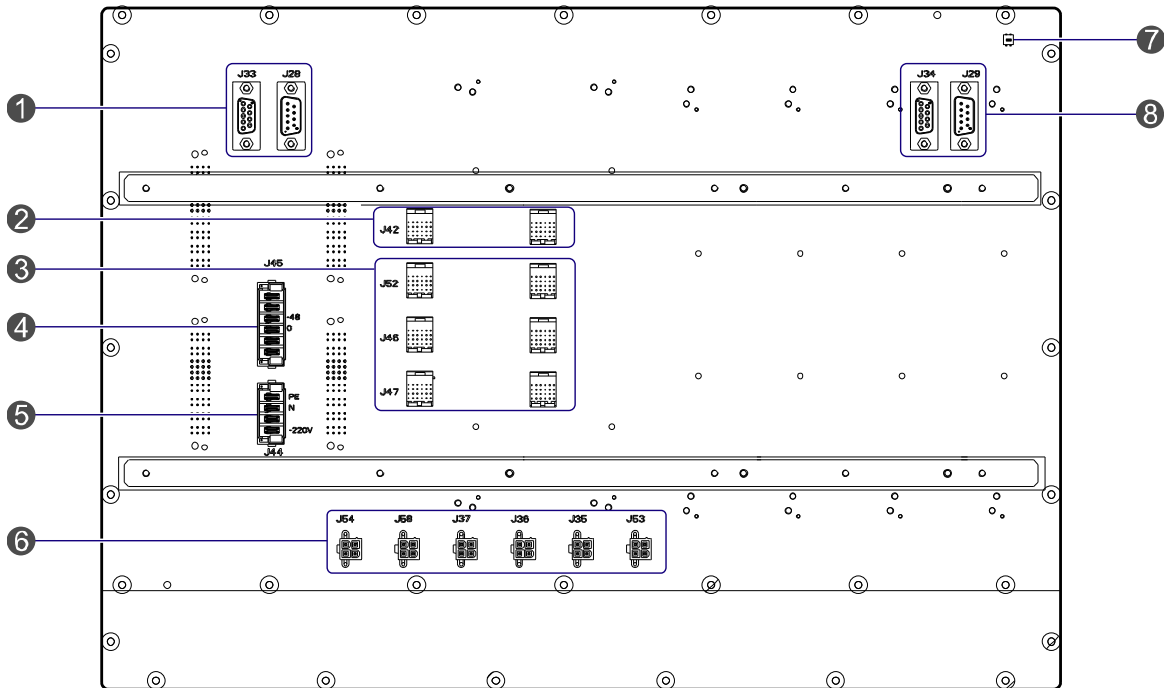


Figure 2-12 Rear View of ICB

No.	Name	Qty.	Description
1	Monitor Interconnection Interface	2	CAN-BUS, DB9-connector (male/female)
2	EC Interface	2	For interconnecting two cartridges in the cabinet.
3	EIB Interface	6	For interconnecting two EC cartridges and four IRUs between two cabinets. It also works as the signal interface from EIB to ICB in the core network interface board.
4	DC Power Inlet	1	DC power input: -48V
5	AC Power Inlet	1	AC power input: 110V/220V
6	Power Outlet	6	DC power (+13.2V) for FAN and DIU.
7	DIP Switch	1	For setting the cartridge address.
8	Monitor Interconnection Interface	2	RS485 bus, DB9-connector (male/female)

Table 2-13 Descriptions on Rear Interfaces of ICB

The settings of the DIP switch are described in [Table 2-14](#).

No.	4	3	2	1	Description	Note
1	X	ON	X	ON	Address for the main chassis	X: reserved.
2	X	ON	X	OFF	Address for the first extended chassis	
3	X	OFF	X	ON	Address for the second extended chassis	
4	X	OFF	X	OFF	Address for the third extended chassis	

Table 2-14 DIP Switch Settings for ICB

2.7 FAN

The FAN consists of a fan cartridge and a pluggable fan tray, and can accommodate six fans. In the fan tray, three temperature sensors are installed.

2.7.1 Front Panel

The front panel of the FAN is illustrated below.

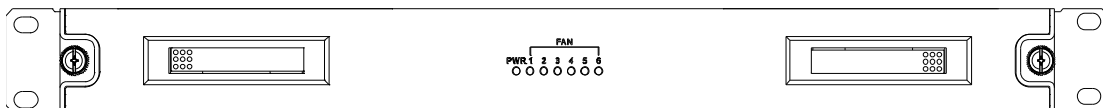


Figure 2-13 Front Panel of FAN

2.7.2 LED Indicator

The FAN indicators are described in [Table 2-15](#).

Name	Color	Status	Description
PWR	Red	On	The FAN is powered on.
		Off	The FAN is powered off.
1~6	Green	On	The fan works properly.
		Off	The fan is out of operation or not installed.

Name	Color	Status	Description
		Flashing	The fan is faulty.

Table 2-15 Descriptions on FAN Indicators

2.7.3 Rear Panel

The rear panel of the FAN is illustrated below.

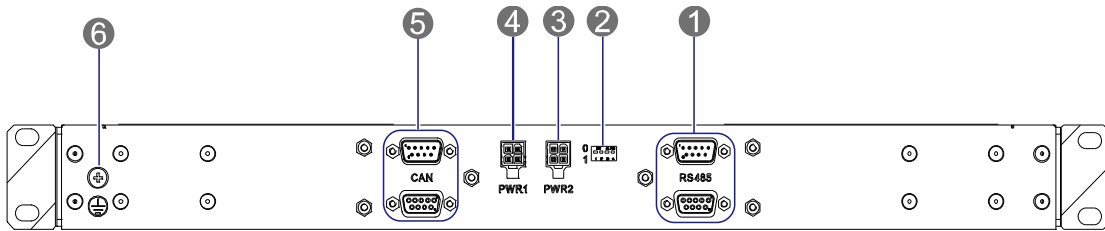


Figure 2-14 Rear Panel of FAN

No.	Name	Qty.	Description
1	RS485 Monitor Interface	2	For connecting ICB and DIU. DB9-connector (male/female)
2	DIP Switch	1	For setting the FAN address. For details, please refer to Table 2-17 .
3	Power Inlet 1	1	For connecting ICB.
4	Power Inlet 2	1	For connecting ICB.
5	CAN Monitor Interface	2	For connecting ICB and DIU. DB9-connector (male/female)
6	Ground Interface	1	/

Table 2-16 Descriptions on Rear Panel of FAN

The settings of the DIP switch are described in [Table 2-17](#).

No.	1	2	3	4	Description	Remarks
1	X	X	ON	ON	The first FAN address	X: reserved.
2	X	X	OFF	ON	The second FAN address	

No.	1	2	3	4	Description	Remarks
3	X	X	ON	OFF	The third FAN address	
4	X	X	OFF	OFF	The fourth FAN address	

Table 2-17 DIP Switch Settings for FAN

2.8 Divider Unit (DIU)

The DIU is 3U or 1U in height. The logical diagram is shown below.

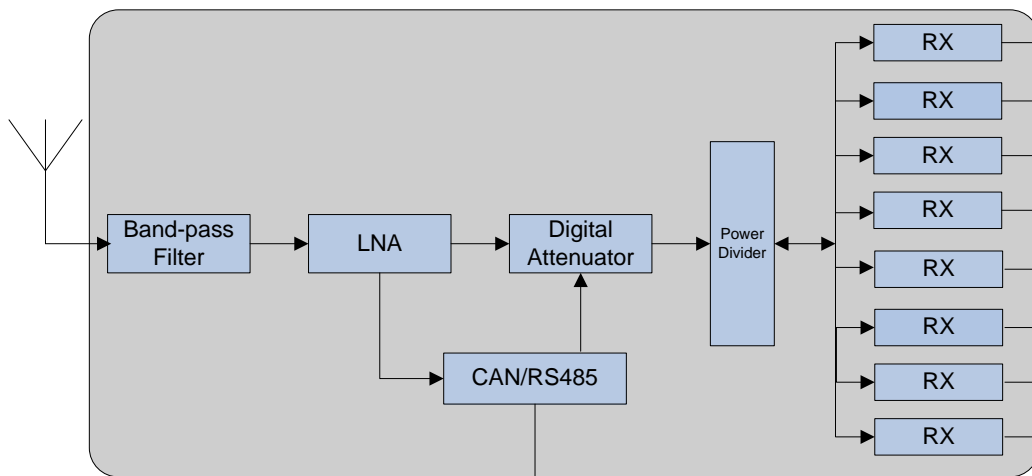


Figure 2-15 Logical Diagram of DIU

2.8.1 Function

The DIU is to assign the received signal to each transceiver.

2.8.2 Front Panel

The front panel of the DIU is illustrated below.

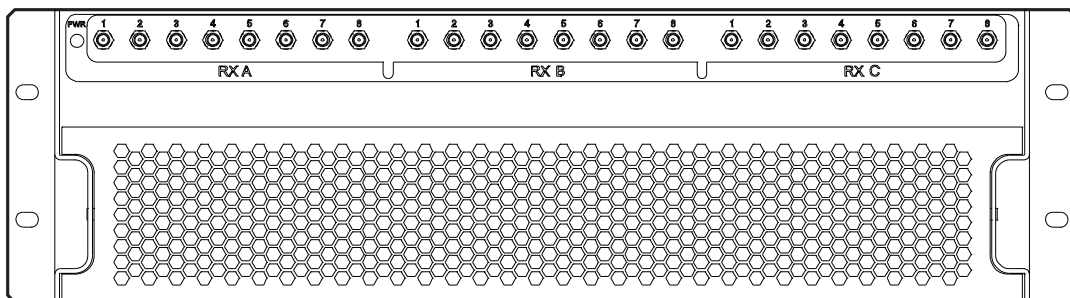


Figure 2-16 Front Panel of DIU

No.	Name	Qty.	Description	Remarks
1	RXA	8	Diversity RX antenna output	SMA-connector (female)
2	RXB	8	RX antenna output	SMA-connector (female)
3	RXC	8	Diversity RX antenna output	SMA-connector (female)

Table 2-18 Descriptions on Front Panel of DIU

2.8.3 Rear Panel

The rear panel of the DIU is illustrated below.

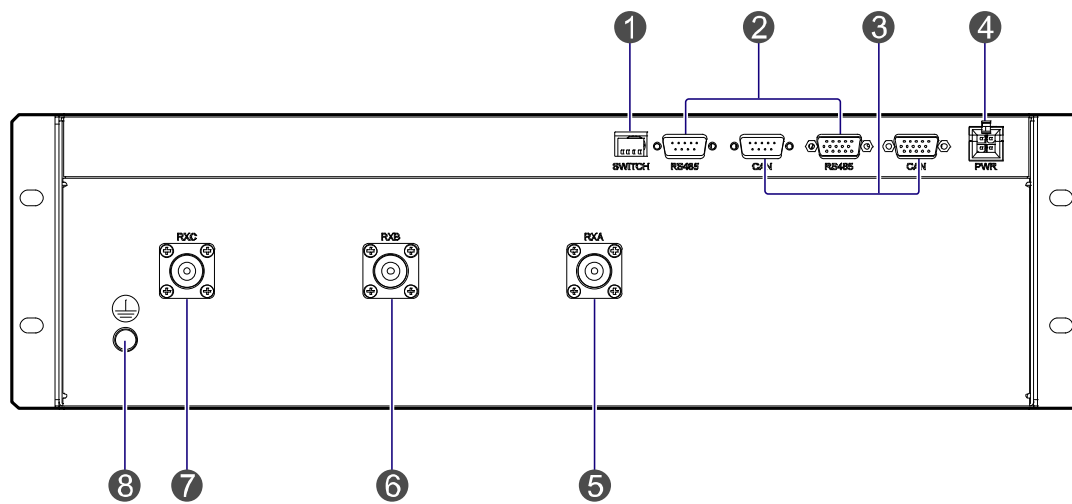


Figure 2-17 Rear Panel of DIU

No.	Name	Qty.	Description	Remarks
1	SWITCH	1	DIP switch	/
2	RS485	2	Monitor interface	/
3	CAN-BUS	2	Monitor interface	/
4	PWR	1	Power inlet	/
5	RXA	1	Diversity RX antenna A	N-connector (female)
6	RXB	1	RX antenna B	N-connector (female)
7	RXC	1	Diversity RX antenna C	N-connector (female)
8	⊕	1	Ground interface	

Table 2-19 Descriptions on Rear Panel of DIU

The settings of the DIU address are described in [Table 2-20](#).

No.	1	2	3	4	Description	Remarks
1	ON	ON	X	X	The first DIU address	X: reserved.
2	ON	OFF	X	X	The second DIU address	
3	OFF	ON	X	X	The third DIU address	
4	OFF	OFF	X	X	The fourth DIU address	

Table 2-20 DIU Address Settings

2.9 Router

2.9.1 Function

The router is a device that forwards message flow or packet data. However, if the IP-EI is employed, no router will be required.

2.9.2 Front Panel

The front panel of the router is illustrated below.

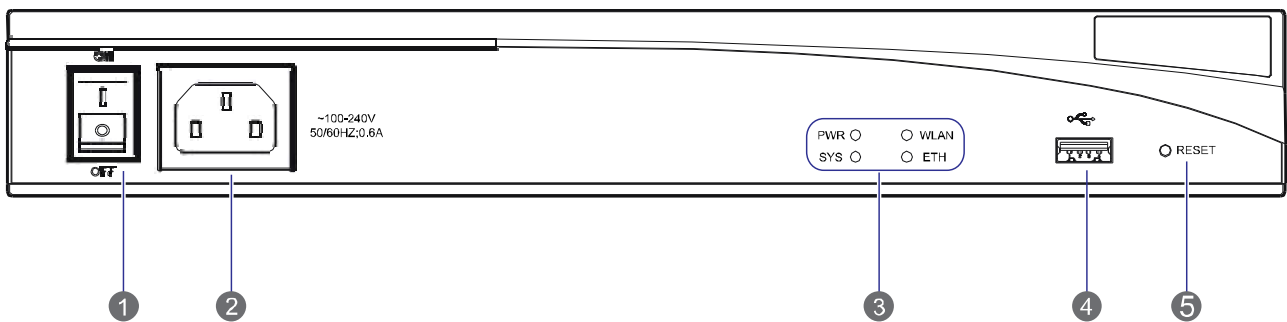


Figure 2-18 Front Panel of Router

No.	Name	No.	Name	No.	Name
1	Power Switch	2	Power Socket	3	LEDs
4	USB Interface	5	RESET Button	/	/

Table 2-21 Descriptions on Front Panel of Router

2.9.3 Rear Panel

The rear panel of the router is illustrated below.

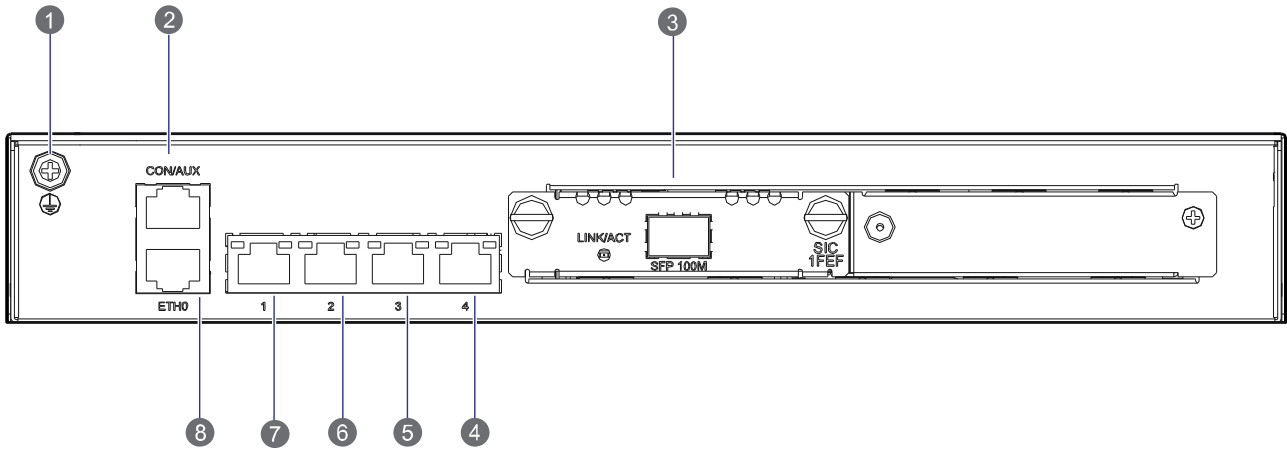


Figure 2-19 Rear Panel of Router

No.	Name	No.	Name
1	Ground Terminal	2	Console /Auxiliary Interface (CON/AUX)
3	Fixed Ethernet Interface 0	4	Fixed Switch Interface 1
5	Fixed Switch Interface 2	6	Fixed Switch Interface 3
7	Fixed Switch Interface 4	8	SIC/DSIC Slot

Table 2-22 Descriptions on Rear Panel of Router

2.9.4 LED Indicator

The router indicators are described in [Table 2-23](#).

Name		Status		Description	
Front Panel	PWR	On		The router is powered on.	
		Off		The router is powered off.	
	SYS	Green	Flashing rapidly		The router is starting.
			Flashing slowly		The router works properly.

Name		Status		Description
		Yellow	Flashing rapidly	The router is faulty.
		Off		The router does not work properly.
	ETH	On		A link is present.
		Flashing		Data is being transmitted or received.
		Off		No link is present.
	WLAN	Bootrom Startup	On	The extended BOOTROM is present.
			Flashing	The basic BOOTROM is present.
		Router Operation	Flashing rapidly	The router is operating under large traffic load.
			Flashing slowly	The router is operating normally.
			Off	The router is faulty.
	Rear Panel	LINK	On	A link is present.
Off			No link is present.	
ACT		Flashing	Data is being transmitted or received.	
		Off	No data is being transmitted or received.	

Table 2-23 Descriptions on Router Indicators

2.10 IP-E1

If a router is employed, no IP-E1 will be required.

2.10.1 Front Panel

The front panel of the IP-E1 is illustrated below.

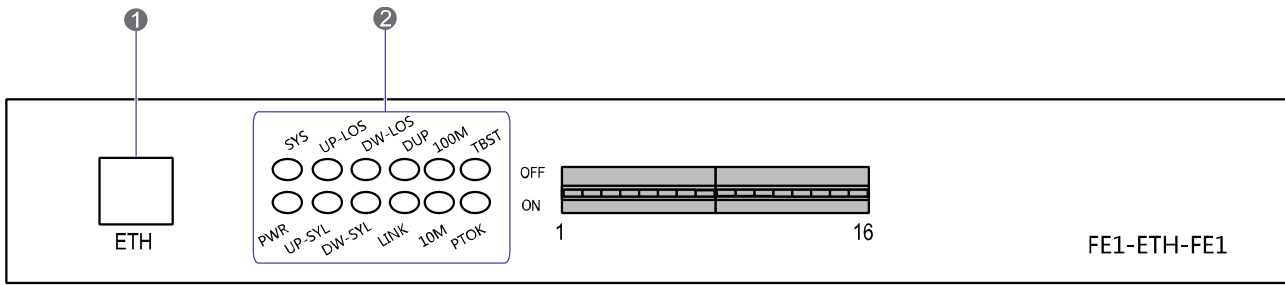


Figure 2-20 Front Panel of IP-E1

2.10.2 LED Indicator

The IP-E1 indicators are described in [Table 2-24](#).

LED Indicator	Name	Status	Description
PWR	Power Indicator	On	The IP-E1 is powered on.
		Off	The IP-E1 is powered off.
SYS	/	/	Reserved
LNK	Ethernet Indicator	On	The network link is connected properly.
		Off	The network link is disconnected.
DUP	Full Duplex/Half Duplex Indicator	On	The IP-E1 is working in full duplex mode.
		Off	The IP-E1 is working in half duplex mode.
100M	Operating Mode and Data TX/RX Indicator	On	A 100 Mbps link is present.
		Flashing	Data is being received or transmitted at a rate of 100Mbps.
10M	Operating Mode and Data TX/RX Indicator	On	A 10 Mbps link is present.
		Flashing	Data is being received or transmitted at a rate of 10Mbps.
LOS1	EI Uplink Alarm Indicator	On	The alarm of Local E1 uplink occurs.
		Off	No alarm exists.

Table 2-24 Descriptions on IP-E1 Indicators

2.10.3 Rear Panel

The rear panel of the IP-E1 is illustrated below.

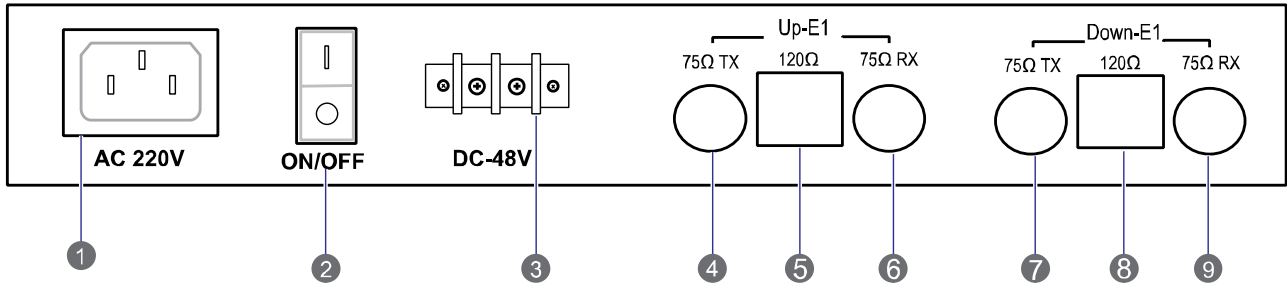


Figure 2-21 Rear Panel of IP-E1

No.	Name	Description
1	AC 220V	AC power inlet (optional)
2	ON/OFF	Power switch
3	DC -48V	DC power inlet (optional)
4	75Ω/Up(TX)	E1-75ohm unbalanced port, E1 signal output.
5	120Ω/Up	E1-120ohm unbalanced port, E1 signal input and output.
6	75Ω/Up(RX)	E1-75ohm unbalanced port, E1 signal input.
7	75Ω/Down(TX)	E1-75ohm unbalanced port, E1 signal output.
8	120Ω/ Down	E1-120ohm unbalanced port, E1 signal input and output.
9	75Ω/ Down(RX)	E1-75ohm unbalanced port, E1 signal input.

Table 2-25 Descriptions on Rear Panel of IP-E1

2.11 Combiner (COM)

The combiner is classified into broadband hybrid combiner, manual tune cavity combiner, and auto tune cavity combiner. The broadband hybrid combiner is applied to the 2-carrier base station, while the manual tune cavity combiner is applied to the base station with more than two carriers. The logical diagram of the 4-port combiner is shown in [Figure 2-22](#).

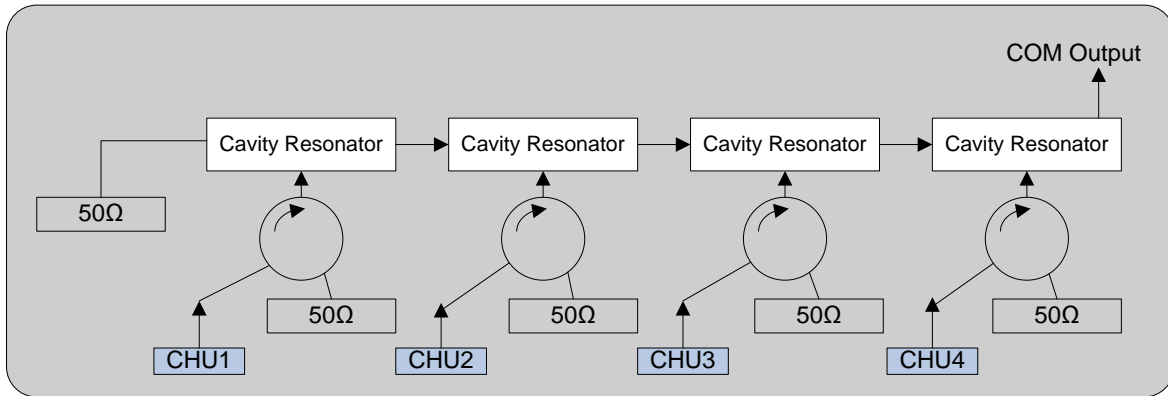


Figure 2-22 Logical Diagram of 4-port Combiner

Note

This section takes one type of combiner as an example.

2.11.1 Function

The combiner is used to integrate multiple carriers from the base station sub-system into one output port to transmit by an antenna.

2.11.2 Rear Panel

The rear panel of the COM is illustrated below.

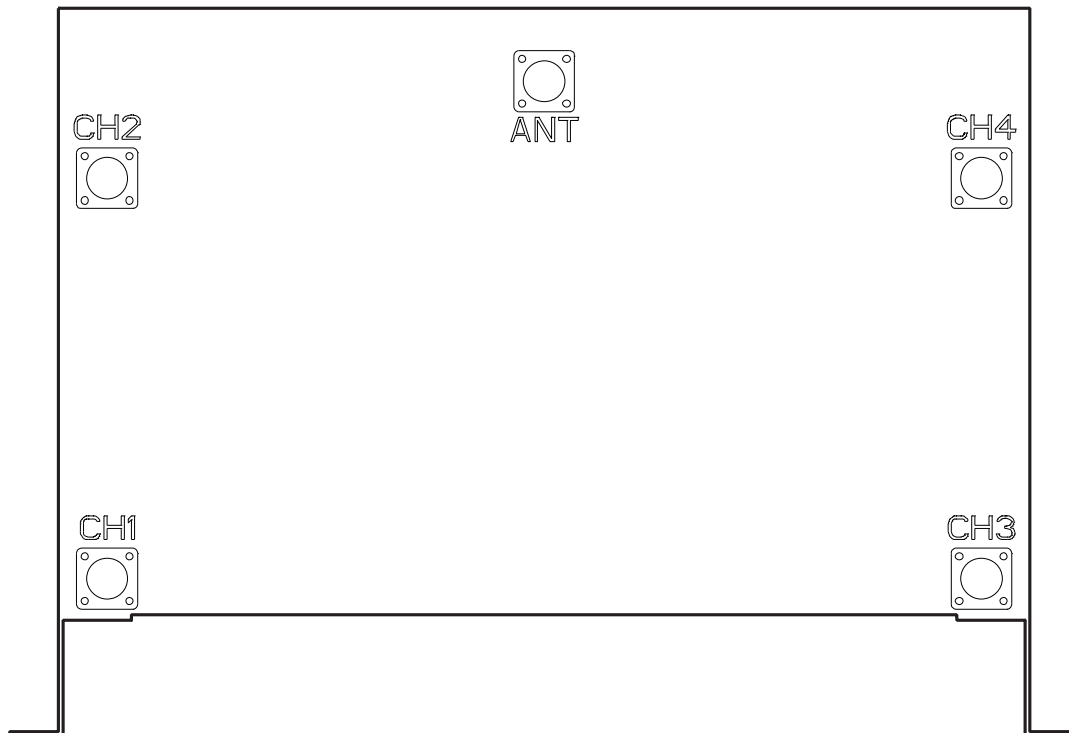


Figure 2-23 Rear Panel of COM

No.	Name	Description	Remarks
1	ANT	COM output	N-connector (female)
2	CH1	Carrier input 1	N-connector (female)
3	CH2	Carrier input 2	N-connector (female)
4	CH3	Carrier input 3	N-connector (female)
5	CH4	Carrier input 4	N-connector (female)

Table 2-26 Descriptions on Rear Panel of COM

3. Installation

3.1 Cable Layout

The cable layout of base station is shown [Figure 3-1](#).

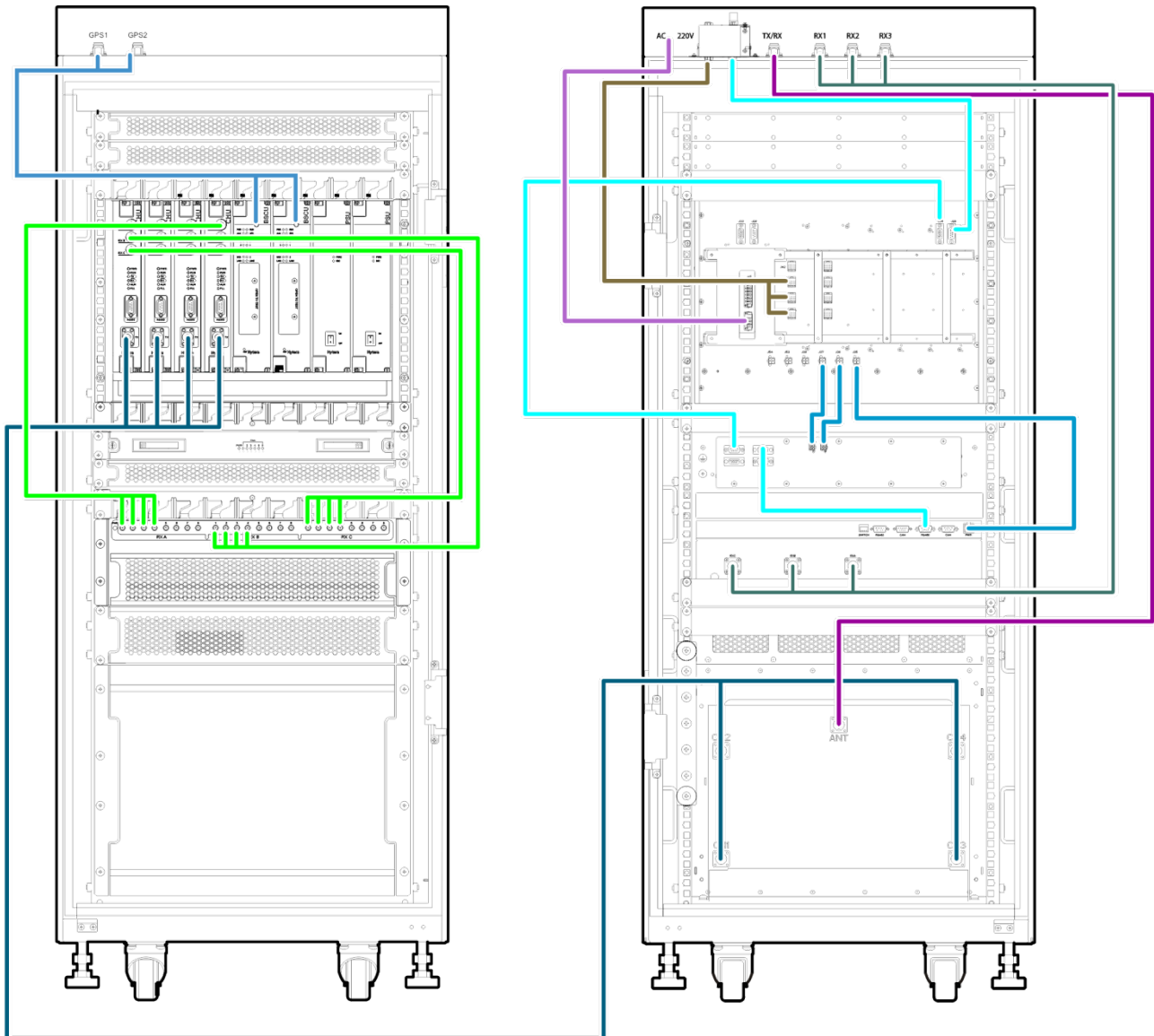


Figure 3-1 Cable Layout

3.2 Safety Information

To reduce the chance of accident, please read the safety precautions very carefully before installation, maintenance and operations.

3.2.1 Power Supply

Danger:

Some components of the power system carry hazardous voltage in operation. Direct contact or indirect contact through moist objects with these components will result in fatal injury.

- Never wear conductive objects such as watches, bracelets, rings and etc during operation.
- Do use special tools in high voltage and AC operation.
- Do keep moisture out of the power system during operation in moist environment.
- The equipment should be well earthed in time to avoid damage by lightning strikes in thunderstorm.
- Do turn off the power before assembly or disassembly
- Do verify the compliance of the cable and cable label prior to connection.
- Ensure that the equipment is well earthed before powering on.
- Turn off the power immediately when water or moisture is found on the cabinet,
- Make sure all switches of power distribution box are set to off before installation each module in the cabinet

3.2.2 Working at Heights

Warning:

Cautions shall be taken to prevent objects from falling during working at heights.

- Safety protection measures (e.g. wearing a hamlet or the safety belt) shall be taken.
- The heat-retaining clothes shall be worn before operation in cold areas.
- Make sure that the ladder is safe for use. Overweight on the ladder is strictly prohibited.
- Protective measures shall be taken if the slant of the ladder is more than 5m or the ladder is placed on a high ground (>3m)
- Handle and use all equipment and tools with care to avoid falling.

3.3 Installation Preparation

3.3.1 Technical Files

The following table lists the files associated with hardware installation.

File type	File Name	Description
Instructional file for installation	Network Planning Drawing	Provided by the R&D engineers or technical sales.
	Site Survey Report	It is filled by the investigation engineer on site.
Manuals	DS-6210U5C4 PDT Trunking System	Shipped with the equipment
	DS-6210U5C4 PDT Trunking Base Station Hardware Description Manual	
	DS-6210U5C4 PDT Trunking Base Station Service Manual	
Other files	Packing List	Shipped with the equipment

Table 3-1 Technical Files

3.3.2 Personnel

Only the adequately trained personnel with satisfactory knowledge of the system can carry out the installation and tuning. The number of installation persons is subject to engineering progress and environment.

3.3.3 Tools

The following tools and meter are required before installation.

General Tools	Claw hammer, slot type screwdriver, large Phillips screwdriver, wrench, paper knife, connector board and A type ladder.
Special Tools	ESD-preventive wrist strap, cable peeler and crimping pliers.
Meter	Multimeter

Table 3-2 Tools and Meter

3.4 Unpacking Inspection

3.4.1 Check before Unpacking

After the equipment arrives at the installation site, you should:

- Check against the packing list, including total amount, customer address, and etc.
- Contact us in case of any mistake.
- Check the packaging case is in good condition and not placed upside down.

If the outer package is damaged seriously or soaked, please contact us immediately.



Note:

To protect the equipment and investigate the cause, please properly keep the package box, equipment and packing materials, and take photo.

If the above check results are good, unpack and check the equipment.

3.4.2 Unpacking Wooden Case



Caution:

Keep the wooden case far away from intense shock during transportation.

Never touch the parts with dirty glove during transportation.

Tools	Claw hammer and straight screwdriver
-------	--------------------------------------

If space permitting, carry the wooden case into or near the computer room before unpacking. This can prevent the chassis from being damaged.

To unpack the wooden case, do as follows:

Step 1 Wear the ESD-preventive glove.

Step 2 Lay the wooden case horizontally on the ground. Do keep the side with frame down.

Step 3 Use a Claw hammer or a straight screwdriver to pry the tongue, as shown in [Figure 3-2](#).

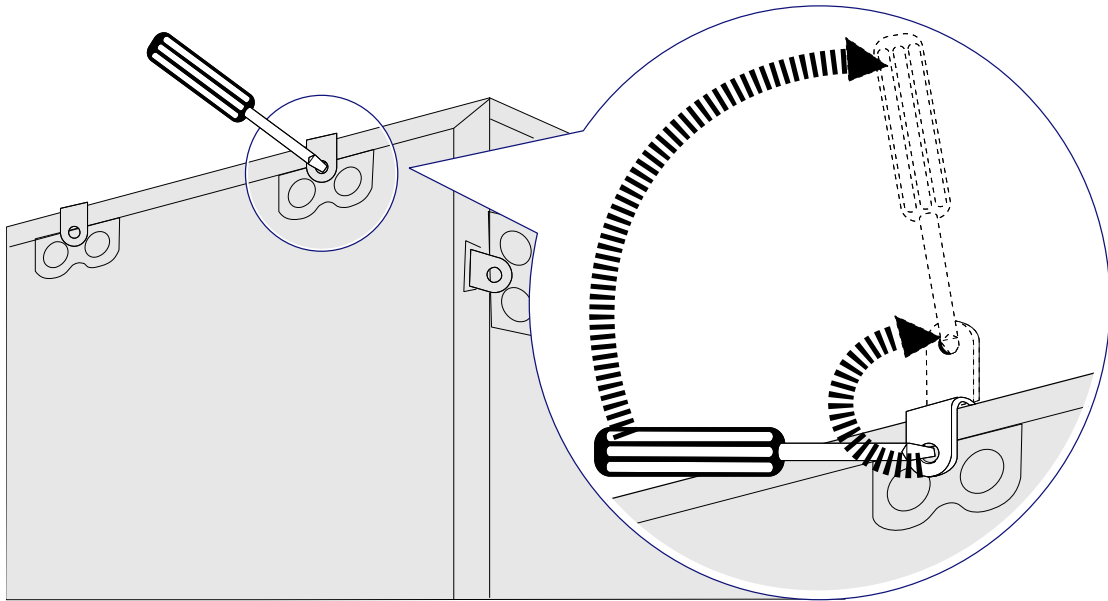


Figure 3-2 Removing the Cover

Step 4 Remove the cover. The wooden case may contain the carton or cabinet. As for the former, directly take out the carton from the wooden case and unpack as instructed in [3.4.3 Unpacking Cartons](#). As for the latter, proceed to the next steps.

Caution

Pay attention to the nails on the bottom cover, to avoid bodily injuries.

Step 5 Using the same method, remove the box surrounding the plank.

Step 6 Remove the foam plate.

Step 7 Slide the cabinet out of the wooden case slowly.

3.4.3 Unpacking Cartons

Tool	Paper knife
-------------	-------------

To open a carton, do as follows:

Step 1 Check the type and quantity of articles inside the carton according to labels, and cut the straps along the seam of the carton cover by the paper knife.

Caution:

Use moderate force to avoid damaging the articles inside.

Step 2 Remove the foam plates and articles.

3.4.4 Inspections

After unpacking all wooden cases and cartons, carefully check the name, type, quantity of goods against the Packing List, and then accept them.

3.5 Installing the Cabinet

3.5.1 Determine the Installation Position

Determine the installation position of the cabinet according to the installation chart. The available space for maintenance should be preserved and be no less than 600mm around the front and back door, as shown in [Figure 3-3](#) and [Figure 3-4](#).

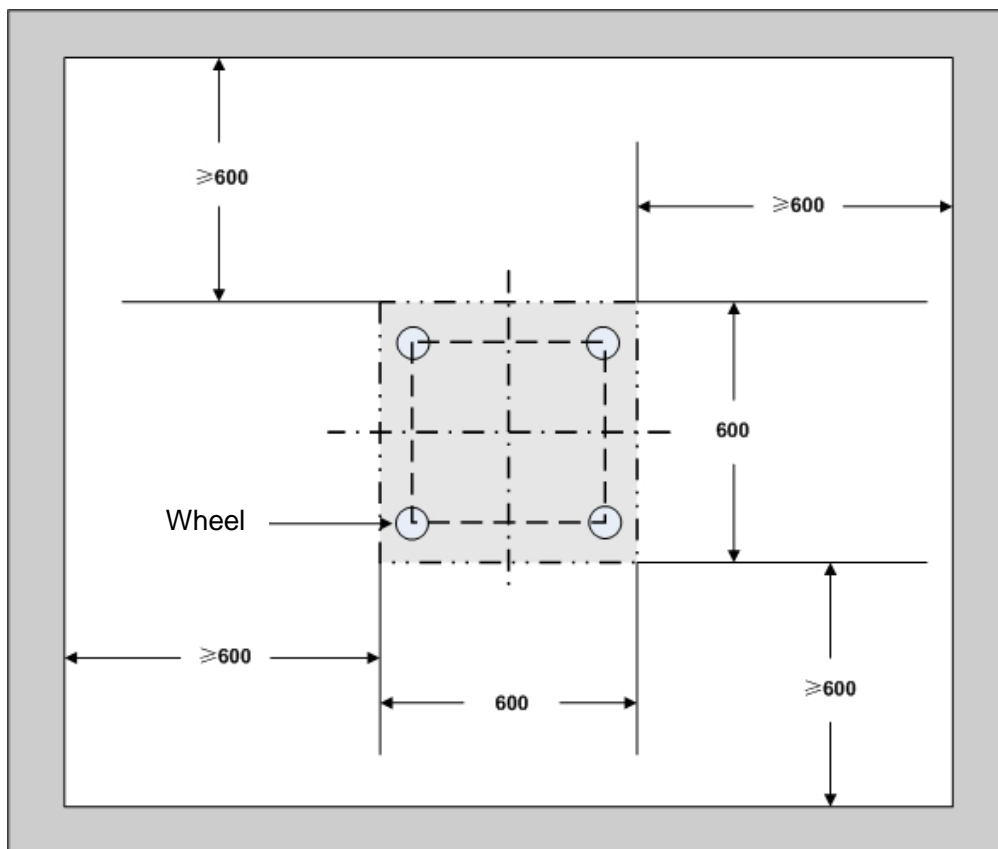


Figure 3-3 Layout of holes for a Single Cabinet

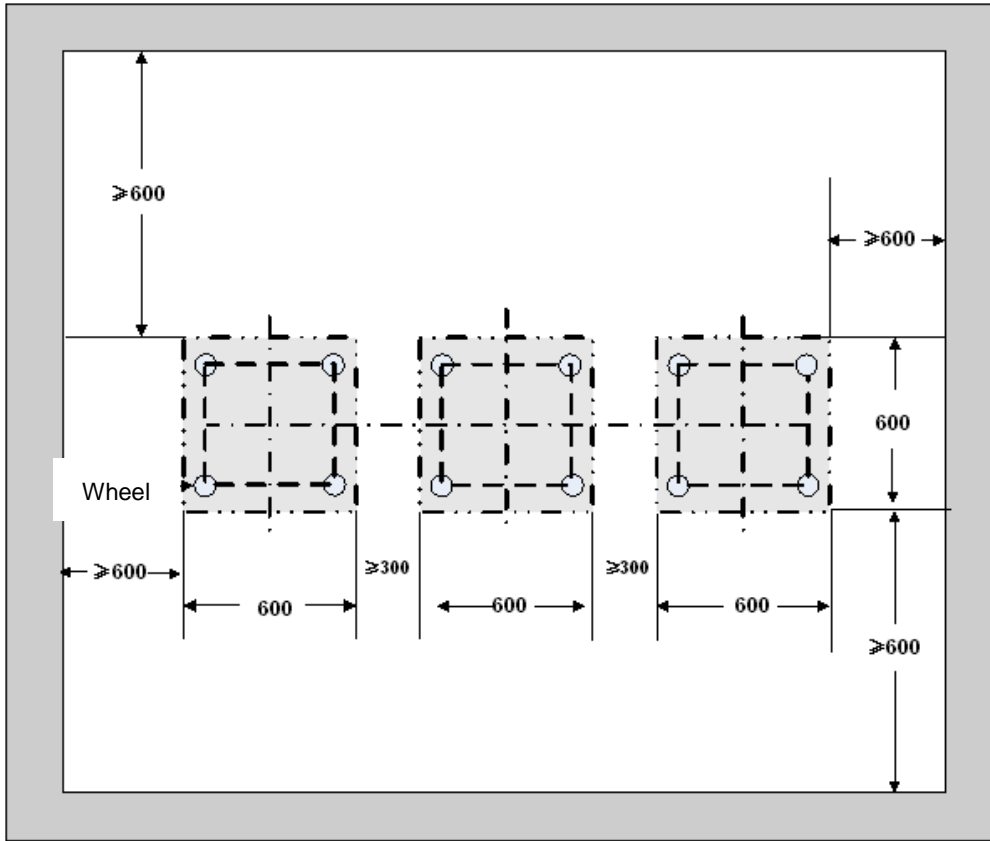


Figure 3-4 Layout of holes for Combined Cabinet

3.5.2 Installing the Cabinet

To install the cabinet, do as follows:

Step 1 Place the cabinet in the planned position.

Fix the cabinet by tightening four bolts at the bottom of the cabinet, as shown in [Figure 3-5](#).

1. Loosen the upper nut counter-clockwise by the spanner.
2. Loosen the lower nut counter-clockwise by the spanner and lift the cabinet to an appropriate height.
3. Tighten the upper nut and screw clockwise.

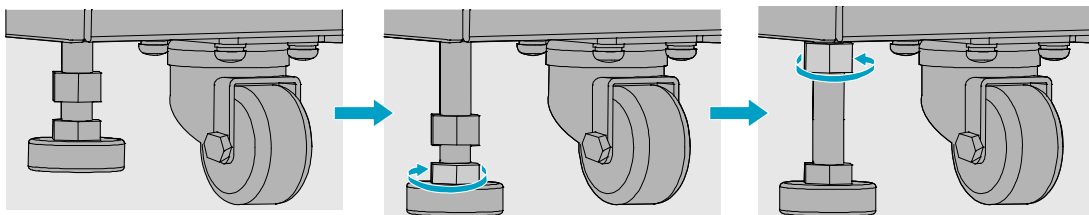


Figure 3-5 Tightening the Bolt

3.6 Installing Modules into the Cabinet

3.6.1 Module Layout

The position of all modules to be installed is shown in [Figure 3-6](#).

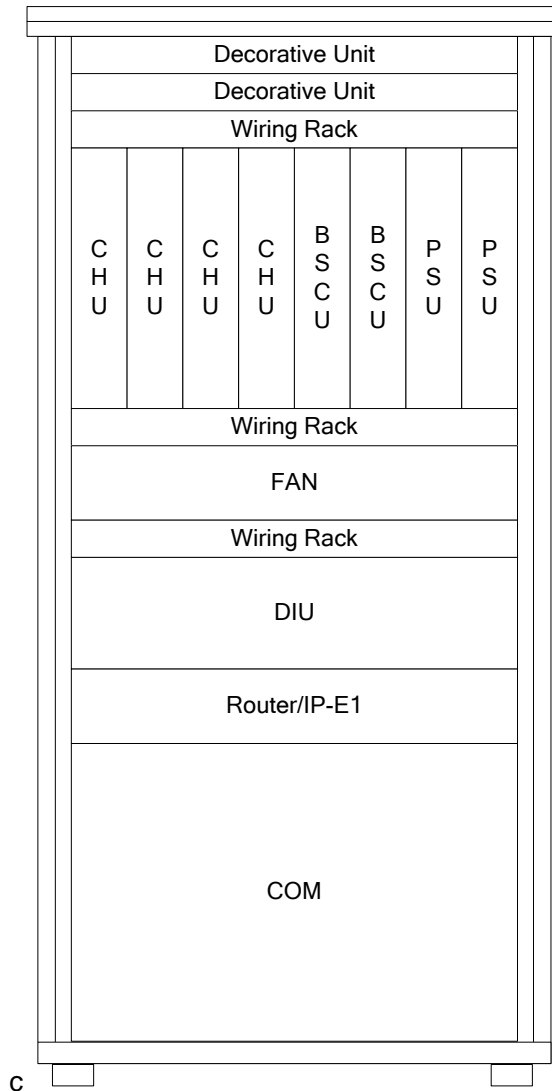


Figure 3-6 of Module Layout

3.6.2 Installation Procedures

Step 1 Open the front and back door, as shown in [Figure 3-7](#).

1. Unlock and remove the key in case of the keyhole in a horizontal position.
2. Firmly press **PUSH** until the door knob is bounced.
3. Turn the door knob to the right.

4. Pull the door knob outwards and open the cabinet door.

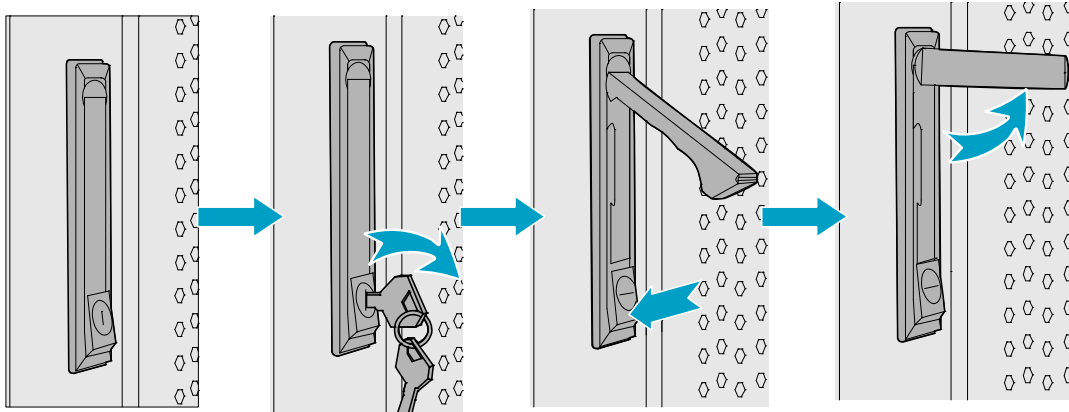


Figure 3-7 Opening the Cabinet Door

Step 2 Disassemble the side doors as shown in [Figure 3-9](#).

1. Remove the eight screws on the frame.
2. Press down on the two latches and pull out the side door outwards.

⚠ Caution:

Care shall be taken to avoid injuries upon pulling out the side door outwards.

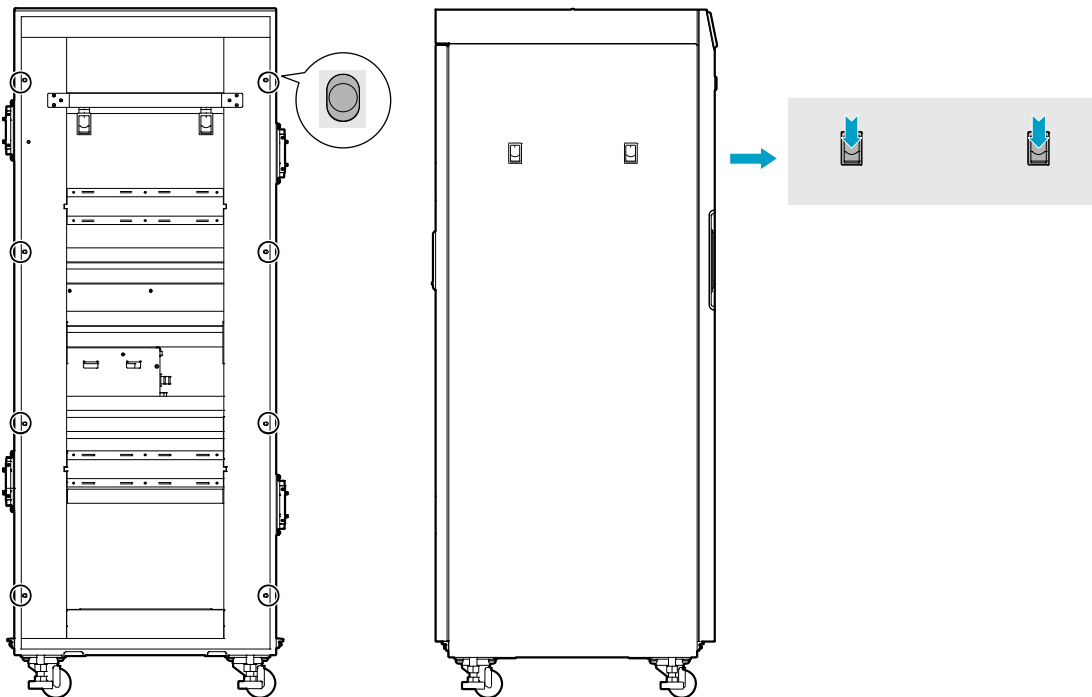


Figure 3-8 Disassembling the Side Door

Step 3 Insert the modules into the cartridge (take the BSCU installation for example)

 **Note:**

Make sure the power switch is set to OFF before installing the PSU.

1. Loosen the two ejectors as shown in [Figure 3-9](#).

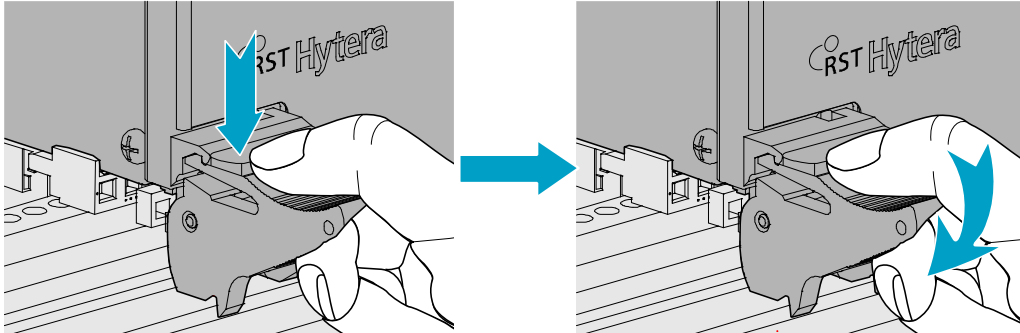


Figure 3-9 Loosening the Ejector

2. Slide the BSCU along the guide rails smoothly as shown in [Figure 3-10 \(1\)](#).
3. Perform the step 1 in a reverse way to lock the two ejectors.
4. Tighten the two screws on the two ejectors and the board respectively as shown in [Figure 3-10 \(2\)](#).

 **Note:**

Loosen the two ejectors and draw out the module in case of removing it during installation.

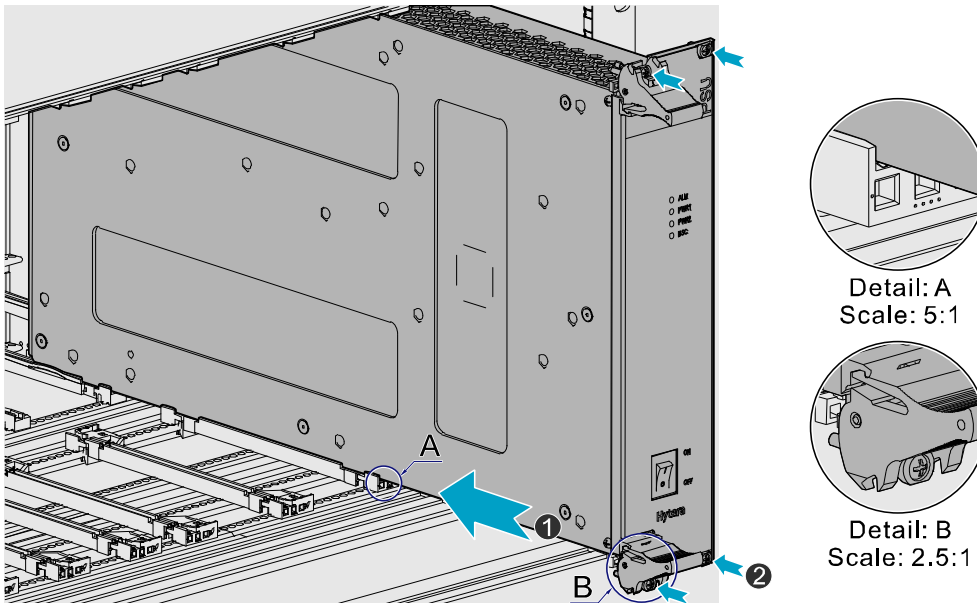


Figure 3-10 Installing the BSCU

Step 4 Install the FAN as shown in [Figure 3-11](#).

1. Slide the FAN along the guide rails smoothly until a click is heard.
2. Fasten the two screws on the ear of the FAN.

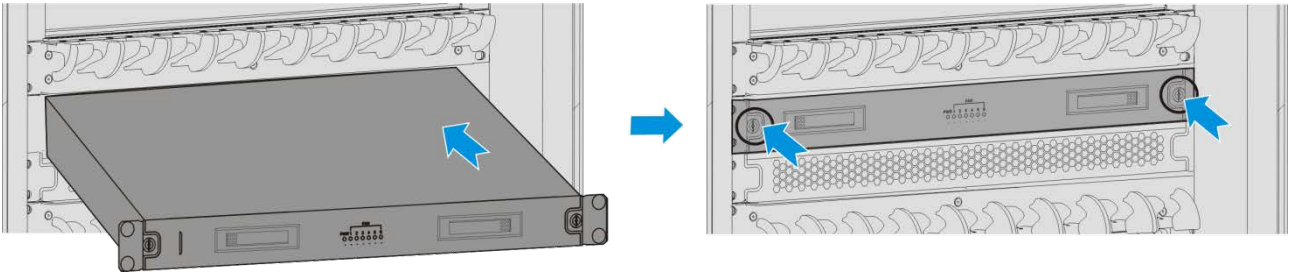


Figure 3-11 Installing the FAN



Figure 3-12 Removing the FAN

 **Note:**

During installation, if you have to take out the FAN, please first unfasten the screws, and then unlock the first panel, finally pull the FAN out. See [Figure 3-12](#).

Step 5 Install the DIU as shown in Figure 3-13.

1. Slide the DIU along the guide rails.
2. Fasten all screws to fix the DIU.

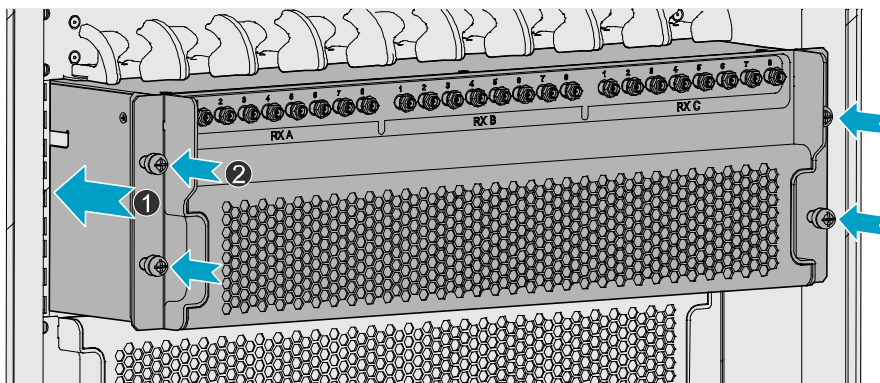


Figure 3-13 Installing the Divider Unit

Step 6 Install the COM as shown in Figure 3-14.

1. Slide the COM along the guide rails.
2. Fasten the four screws.

⚠ Caution:

Handle with care as the COM is heavy.

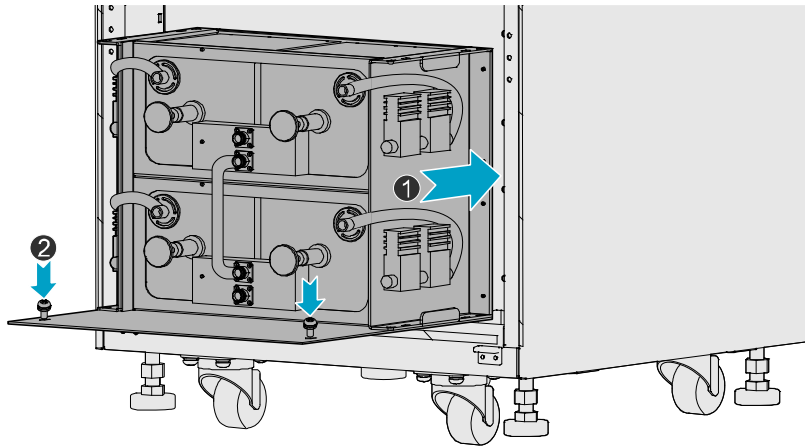


Figure 3-14 Installing the Combiner Unit

Step 7 Connect all cables as shown in [Figure 3-16](#).

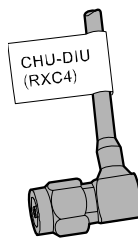


Figure 3-15 Cable Diagram

Step 8 Install the side doors.

1. Align the side door with the frame and firmly press the latch.
2. Fasten the eight screws.

3.7 Installing Cables

3.7.1 Equipment Status

The equipment shall be in the following status before connecting cables:

- The cabinet has been installed.
- All modules have been installed and the power switch is set to OFF.

3.7.2 Cables

Cables are described in [Table 3-3](#) and their positions are shown in [Figure 3-16](#). Installation positions

are located on top of the cabinet.

Name	Color	Remark
Base Station Ground Cable (40m)	Yellowish green	Lead, 16 mm ² , 49-core, and 450/750V, outer diameter: 8.1 Subject to the actual needs.
AC Power Cord (15m)	Black/white	3-core, 300/500V, 3*2.5 mm ² , Subject to the investigating data on the site
RF Jumpers (3 pcs)	Black	1/2 inch, N-Male to N-Male, 3Pcs

Table 3-3 Cables Description

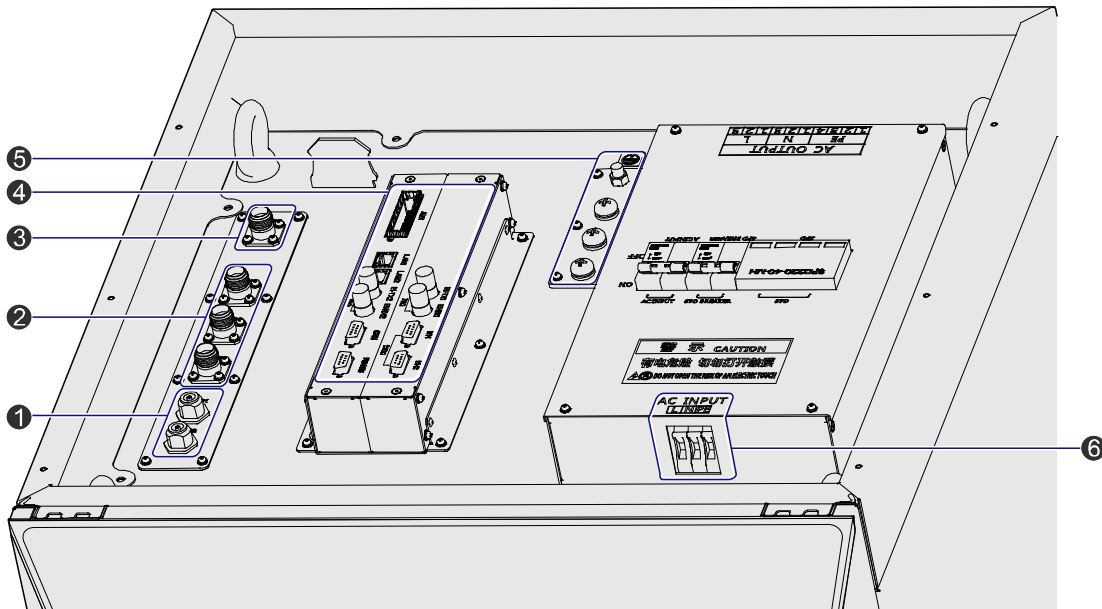


Figure 3-16 External Cable Connection

No.	Name	No.	Name
1	GPS Antenna Interface	2	RX Interface
3	TX Interface	4	Communication Interface
5	Ground Interface	6	Power Inlet

Table 3-4 Descriptions on the interface of external cable connection



Note:

- Install the power cable properly.
- Do handle the ground cable gently to avoid possible looseness during installation.

- The Disconnecter is available for shortcut between the live line and null line only.

3.8 Examination after Installation

3.8.1 Equipment Status

The equipment shall be in the following status prior to hardware examination.

- The cabinet has been installed.
- All modules have been installed.
- The external power has been installed and all cables have been connected.
- All switches of the power distribution box are set to OFF.

3.8.2 Examining the Cabinet

The following requirements shall be met after installation.

No.	Check Item
1	The position of the cabinet should conform to the design drawing.
2	All modules should be installed correctly.
3	All cables within the cabinet should be connected properly.
4	The side door should be installed and the grounding cables should be connected properly.
5	All screws should be tightened. Be sure to put flat washers and spring washers on all bolts correctly.
6	The cabinet should be placed horizontally and orderly.
7	The surface of the cabinet should be clean and well painted. No dust and other sundries are in the cabinet.
8	All labels should be correct, clear and not be missed.
9	The plastic dust cap on top of the cabinet should be installed properly.

Table 3-5 Checklist of Cabinet Installation

3.8.3 Examining Cables

The following requirements should be met after connection.

No.	Check Item
1	All cables should not be damaged.
2	All cables are one-piece cables, without any joint in the middle.
3	Excess grounding cables should be cut off.

Table 3-6 Checklist of Cables

3.8.4 Power On and Examination

Caution:

First measure the resistance of all power connectors and ground connectors using the multimeter and check whether short circuit occurs.

The procedures are described as follows:

- Step 1** Check the input voltage (220V) from the main power and whether the live line and null line connect correctly.
- Step 2** The switch of the Disconnecter in the BSIU is set to ON.
- Step 3** All switches of the PSU are set to ON.
- Step 4** Check whether all modules are powered properly.

Name	Normal Power Indication
CHU	The PWR indicator on the front panel glows and the ALM indicator goes out.
BSCU	The PWR indicator on the front panel glows and the ALM indicator goes out.
PSU	The PWR indicator on the front panel glows and the ALM indicator goes out.
FAN	The PWR indicator on the front panel glows.

Table 3-7 Checklist of Power Situation

Note:

If the LED on the front panel does not work correctly, please re-power it on or re-insert the module after disconnecting power. If it doesn't solve the problem, please contact us.

3.8.5 Environment Examination

The following table lists the check item of environment on site.

No.	Check Item
1	The equipment room should be clean and tidy.
2	No sundries should be placed in the grooves, at the bottom of the cabinet or around the cabinet.
3	The floor in the equipment room should be free from sundries.

Table 3-8 Checklist of Environment on Site

4. Basic Operations

4.1 Powering on

- Step 1** The external power supply is connected.
- Step 2** The switch of the Disconnecter is set to ON.
- Step 3** All switches of the PSU are set to ON.

4.2 Powering off

- Step 1** All switches of the PSU are set to OFF.
- Step 2** The switch of the Disconnecter is set to OFF.
- Step 3** Disconnect the external power supply.

5. Troubleshooting

Phenomena	Solution
The PWR LED does not light up.	Check the power supply.
The ALM LED on the PSU glows red.	Disconnect the power and replace the PSU.
The ALM LED on the CHU glows red.	Replace the CHU.
The ALM LED on the BSCU glows red.	Replace the BSCU.

Table 5-1 Troubleshooting

6. Routine Maintenance

6.1 Purpose

Routine maintenance is to ensure stable and reliable operation of the equipment. It can help to know the operation status of the equipment, so as to detect the potential troubles and remove them on time.

The routine maintenance should achieve the following objects:

- Remove all potential troubles to keep the system work properly.
- Ensure all performance and service specifications meet requirements.
- Ensure good collaboration with the entire network.
- Make sure that new equipment or the extended equipment accesses to the network properly.

6.2 Tasks

- Clean the equipment room regularly.
- Check the working status of the base station regularly. If the abnormal situation occurs, deal with it in time.
- Clean up the dust regularly.

A Abbreviations

Abbr.	Full Name
AGC	Auto Gain Control
BSCU	Base Station Controller Unit
BSCU-MB	Base Station Controller Unit Main Board
BSS	Base Station Sub-system
CAN	Controller Area Network
CC	Call Control
CCL	Call Control Layer
CHB	Channel Board
CHU	Channel Unit
COM	Combiner
CPCI	Compact Peripheral Component Interconnect
DIU	Divider Unit
DLL	Data Link Layer
EC	Extended Chassis
EIB	Extended Interface Board
ETSI	European Telecommunications Standards Institute
FAN	Fan Unit
GPI	General Purpose Input
GPIO	General Purpose Input Output
GPO	General Purpose Output
GPS	Global Positioning System
GPSB	GPS Clock Board

Abbr.	Full Name
ICB	Interconnect Backboard
IO	Input and Output
IRU	Interconnect Relay Unit
LLC	Logical Link Control
LNA	Low Noise Amplifier
MAC	Media Access Control
MC	Main Chassis
MCB	Main Control Board
MM	Mobile Management
MPSC	Machine-Frame Power Support Component
MPU	Micro Processor Unit
PAB	Power Amplifier Board
PCI	Peripheral Component Interconnect
PICMG	PCI Industrial Computer Manufacture's Group
PDT	Professional Digital Trunking
PSB	Package Switch Board
PSU	Power Support Unit
RFDS	Radio Frequency Distributing System
RT	Router
RXB	Receive Board
TDM	Time Division Multiplex
TMA	Tower Mounted Amplifier
TSCU	Trunking Station Control Unit
EXB	Excitation Board

Abbr.	Full Name
VGA	Video Graphics Array

FCC Warning:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an controlled environment .This equipment should be installed and operated with minimum distance 2.5 m between the radiator& your body.

Industry Canada

This device complies with Industry Canada licence-exempt RSS standard (s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The term "IC:" before the certification/registration number only signifies that the Industry Canada technical specifications were met.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that, the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

This product meets the applicable Industry Canada technical specifications.

Le présent matériel est conforme aux spécifications techniques applicables d'Industrie Canada.

This Class A digital apparatus complies with Canadian ICES-003.

IC Radiation Exposure Statement:

This equipment complies with IC RF radiation exposure limits set forth for an controlled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment should be installed and operated with minimum distance 2.5m between the radiator & your body.