ZXA10 C320

Optical Access Convergence Equipment

Hardware Description

Version: V2.0.0

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Revision History

Revision No.	Revision Date	Revision Reason
R1.0	2013-08-31	First edition

Serial Number: SJ-20130520170233-004

Publishing Date: 2013-08-31 (R1.0)

Contents

About This Manual

Purpose

The ZXA10 C320 Optical Access Convergence Equipment (ZXA10 C320 for short) is a 2U-height OLT device, which satisfies the market requirement for small-capacity OLTs.

This manual describes the hardware structure of the ZXA10 C320.

Intended Audience

This manual is intended for:

- Planning engineer
- Installation supervision engineer
- Debugging engineer

What Is in This Manual

This manual contains the following chapters:

Chapter	Summary
1, Shelf	Describes the shelf structure and configurations.
2, Cards	Describes the cards.
3, Cables	Describes the cables.

Chapter 1
Shelf

Appearance

The ZXA10 C320 shelf is a 19-inch shelf with 2 U in height. Figure 1-1 shows the appearance of the ZXA10 C320 shelf.

Figure 1-1 Shelf Appearance

Configurations

Figure 1-2 shows the configurations of the shelf.

Figure 1-2 Shelf Configurations

Fan	PON interface card/P2P interface card		1
	PON interface card/P2P interface card		2
	Switching and control cad 3	Switching and control cad 4	

NOTE **Note:**

When the ZXA10 C320 uses AC power supply, the AC power card PRAM is installed in slot 3.

Technical Specifications

Table 1-1 lists the technical specifications of the shelf.

1-1

Table 1-1 Technical Specifications of the Shelf

Item	Specification
Dimensions	86.1 mm × 482.6 mm × 270 mm (height × width × depth)
Weight	2.5 kg (empty) 6.9 kg (full configuration)

Chapter 2
Cards

The ZXA10 C320 is composed of cards and a fan unit, see Table 2-1.

Table 2-1 Card List

Name	Description	Function	Interface
SMXA	Switching and control card	Controls the system and switches services. Provides power supply to the system.	One out-of-band Network Management (NM) interface One debugging serial port One 10GE optical interface (can be configured as one GE optical interface) One GE optical interface One GE electrical interface One environment monitoring interface One -48 V DC power interface
GTGH	16-port GPON interface card	Provides GPON access.	16 GPON interfaces
GTGO	8-port GPON interface card	Provides GPON access.	8 GPON interfaces
FTGK	48-port P2P interface card	Provides P2P access.	48 GE/FE interfaces
PRAM	AC power card	Provides power supply to the system.	One AC power input interface One DC power output interface One battery interface One temperature sensor interface
MWMT	Backplane	Provides the electrical interconnection of each card in the system.	-
FAN-C320	Fan unit	Provides ventilation for the system.	-

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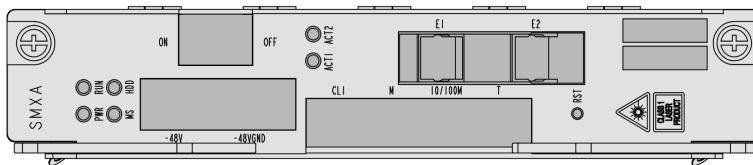
2-1

2.1 SMXA Card

Overview

The switching and control card SMXA is the service switching, management, and control center of the ZXA10 C320.

Panel

Figure 2-1 shows the panel of the SMXA card.

Figure 2-1 The SMXA Panel

Indicators

Table 2-2 describes the indicators on the SMXA card.

Table 2-2 SMXA Indicators Description

Indicator	Status	Description
PWR	LED is OFF.	The power of the equipment is not supplied from the panel, but can be supplied from the backplane.
	Green LED is ON.	The power supply from the panel is proper.
	Red LED is ON.	The power supply from the panel is proper.
RUN	LED is OFF.	The card is not powered on, or the Central Processing Unit (CPU) is not started.
	Green LED flashes slowly (0.5 Hz).	The card runs properly.
	Green LED is ON.	- The card passes the self test, but fails to obtain data from the switching and control card or NMS. - The card is running the booting program, or is downloading a software version from the switching and control card. - The card cannot operate because there is no legal software version.

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Indicator	Status	Description
	Green LED flashes quickly.	The card is downloading data from the switching and control card or the NMS.
	Red LED is ON.	● A serious fault occurs to the hardware of the card (such as, the card fails to pass the self test, or the software version is incompatible with the hardware version). ● The NMS is sending a restarting command.
	Red LED flashes slowly (0.5 Hz).	This card should not be inserted in this slot (different from the configuration on the NMS).
	Yellow LED flashes slowly (0.5 Hz).	The software version of the card is incompatible with that of the switching and control card (auto-update function is not configured on the card). The services are proper.
MS	Green LED is ON.	The card is a master card (active).
	LED is OFF.	The card is a slave card (backup).
HDD	Red LED is ON.	The card is operating the flash. Card plug-in/plug-out is not allowed.
ACT1 – ACT2	LED is OFF.	The optical interface is disconnected or the links are disconnected.
	Green LED is ON.	Links are established on the optical interface.
	Green LED flashes.	The optical interface is receiving and sending data.

Interfaces

Table 2-3 describes the interfaces on the SMXA panel.

Table 2-3 SMXA Interfaces Description

Interface	Description
CLI	The local debugging serial interface
10/100M	The out-of-band NM interface
M	The environment monitoring interface
T	The GE electrical interface
E1	The GE optical interface
E2	The 10GE or GE optical interface
-48V/-48VGND	The -48 V power socket

Buttons

Table 2-4 describes the buttons on the SMXA panel.

Table 2-4 SMXA Buttons Description

Button	Description
ON/OFF	To enable/disable the power supply of the equipment
RST	To reset the card

Principle Diagram

Figure 2-2 shows the principle diagram of the SMXA card.

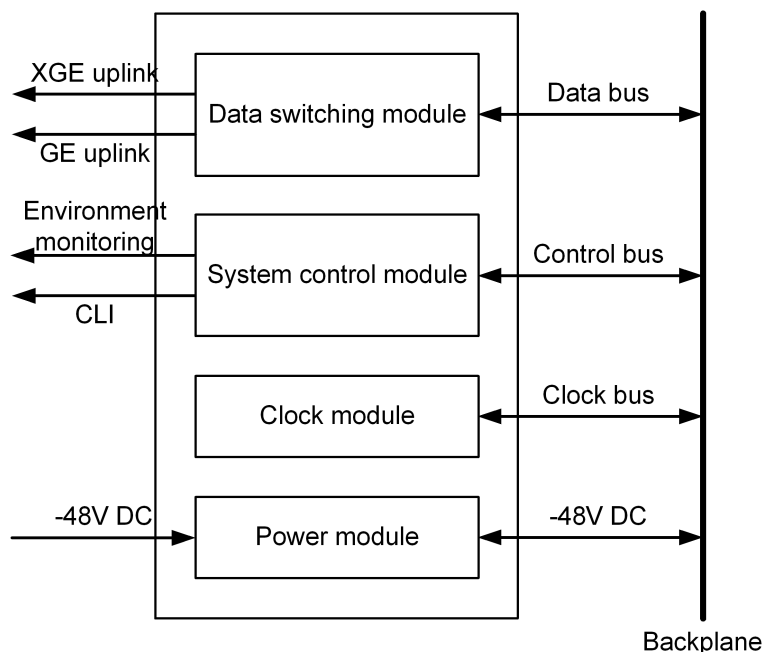**Figure 2-2 SMXA Principle Diagram**

Table 2-5 describes the module functions of switching and control cards.

Table 2-5 Switching and Control Card Module Functions

Module	Function
Switching module	The switching center of data service, implements data switching, Ethernet, VLAN, multicast, IP route, QoS, and security functions.
Management and control module	Consists of control software, protocol processing software, overhead processing, Ethernet switching chip, and control CPU, provides interfaces for cards to forcedly download versions and reset hardware/software , provides online detection for cards, implements fan detection and control functions.
Clock module	Processes system clock and time, complies with ITU-T G.8262, G.8264, and G.781.
Power module	Provides input interface for DC power, provides power protection, monitoring, filtering functions, including lightning-proof, power filtering, and prevention of overload/underload .

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Technical Specifications

Table 2-6 lists the technical specifications of the SMXA card.

Table 2-6 Technical Specification of SMXA

Item	Specification
Power consumption	27.5 W
Dimensions	200.25 mm × 37 mm × 225 mm (height × width × depth)
Weight	1.14 kg

2.2 GPON Interface Cards

Overview

The GPON interface cards provide GPON access. The ZXA10 C320 supports the following GPON interface cards:

● GTGH: 16-port GPON interface card
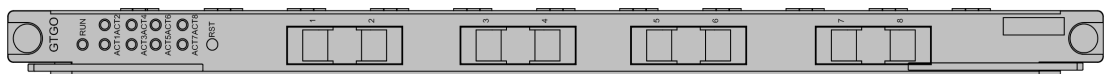● GTGO: 8-port GPON interface card

Panel

Figure 2-3Figure 2-4, and Figure 2-4 show the GPON interface card panels.

Figure 2-3 GTGH Panel

Figure 2-4 GTGO Panel

Indicators

Table 2-7 describes the indicators of the GPON interface cards.

Table 2-7 GPON Interface Cards Indicator Description

Indicator	Status	Description
RUN	LED is OFF.	• The card is powered off. • The card does not match. • CPU is not started.
	Green LED is ON.	The card self-checking completes but fails to receive data from the switching and control card or NM.
	Green LED flashes quickly.	The card is downloading data from the network management server.
	Green LED flashes slowly (0.5 Hz).	The card runs properly.
	Red LED is ON.	The card hardware is faulty.
	Red LED flashes slowly (0.5 Hz).	The card is installed in the wrong slot.
	Yellow LED flashes slowly (0.5 Hz).	The software version of the card does not match that of the switching and control card. Auto-update is not configured on the card.
ACT*i* (i = 1–16)	LED is OFF.	• No ONU is configured on the GPON interface. • The GPON interface has no optical module installed. • The GPON interface is shutdown. • The GPON interface is TypeB protection port.
	Green LED flashes.	The GPON interface and connected ONUs work properly.
	Red LED is ON.	The GPON interface has LOS alarms.

Interfaces

GPON interface cards provide 16/8 GPON interfaces.

Button

The **RST** button is used for resetting card.

Principle Diagram

Figure 2-5 shows the principle diagram of the GPON interface cards.
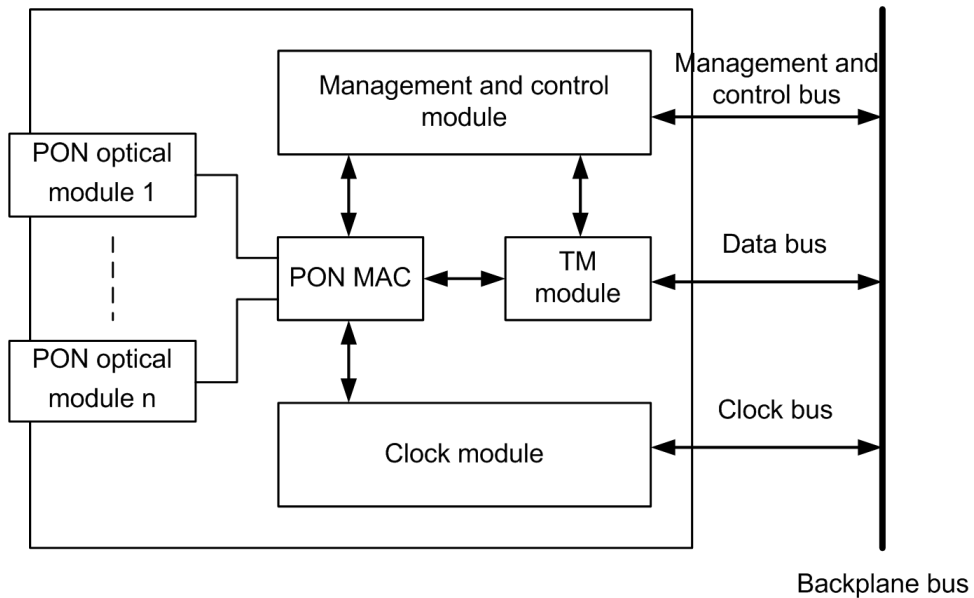
Figure 2-5 GPON Interface Cards Principle Diagram

Backplane bus

Table 2-8 describes the module functions of GPON interface cards.

Table 2-8 GPON Interface Cards Module Functions

Module	Function
Management and control module	Manages and controls the card, implement card configuration.
PON MAC module	Implement the PON functions defined by ITU-T G.984.3.
TM module	Processes data in service layer, including bandwidth management and QoS process, satisfies the SLA requirement. The process function is compatible with TR156.
PON optical module	Provides PON-C optical interface, complies with ITU-T G.984.2.
Clock module	Process system clock, complies with ITU-T G.8262, G.8264, and G.781.

Technical Specifications

Table 2-9 lists technical specifications of the GPON interface cards.

Table 2-9 GPON Interface Cards Technical Specifications

Item	Specification
Power consumption	GTGH: 55 W GTGO: 30 W
Dimensions	395.5 mm × 22.5 mm × 225 mm (Height × Width × Depth)
Weight	GTGH: 1.000 kg GTGO: 0.925 kg

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2.3 P2P Interface Card

Overview

The FTGK card is a 48-port P2P interface card. It uses WDM technology and single optical fiber for transmitting and receiving.

Panel

Figure 2-6 shows the FTGK panel.

Figure 2-6 FTGK Panel

Indicator

Table 2-10 describes the indicators of the FTGK card.

Table 2-10 FTGK Indicator Description

Indicator	Status	Description
RUN	LED is OFF.	The card is powered off, or CPU is not started.
	Green LED is ON.	● The card passes the self test, but fails to obtain data from the switching and control card or NMS. ● The card is running the booting program, or is downloading a software version from the switching and control card. ● The card cannot operate because there is no legal software version.
	Green LED flashes quickly.	The card is downloading data from the switching and control card or the NMS.
	Green LED flashes slowly (0.5 Hz).	The card runs properly.
	Red LED is ON.	● A serious fault occurs to the hardware of the card (such as, the card fails to pass the self test, or the software version is incompatible with the hardware version). ● The NMS is sending a restarting command.
	Red LED flashes slowly (0.5 Hz).	This card should not be inserted in this slot (different from the configuration of the NMS).
	Yellow LED flashes slowly (0.5 Hz).	The software version of the card is incompatible with that of the switching and control card (auto-update function is not configured on the card). The services are proper.

Indicator	Status	Description
LED*i* (i = 1 – 48)	LED is OFF.	No. i GE/FE optical port is not connected.
	Green LED is ON.	No. i GE/FE optical port is connected (LINK).
	Green LED flashes.	No. i GE/FE optical port is sending and receiving the data (ACTIVE).

Interface

The FTGK card provides 48 FE/GE optical interfaces (24 ports, each port provides 2 interfaces).

Principle Diagram

Figure 2-7 shows the principle diagram of the FTGK card.
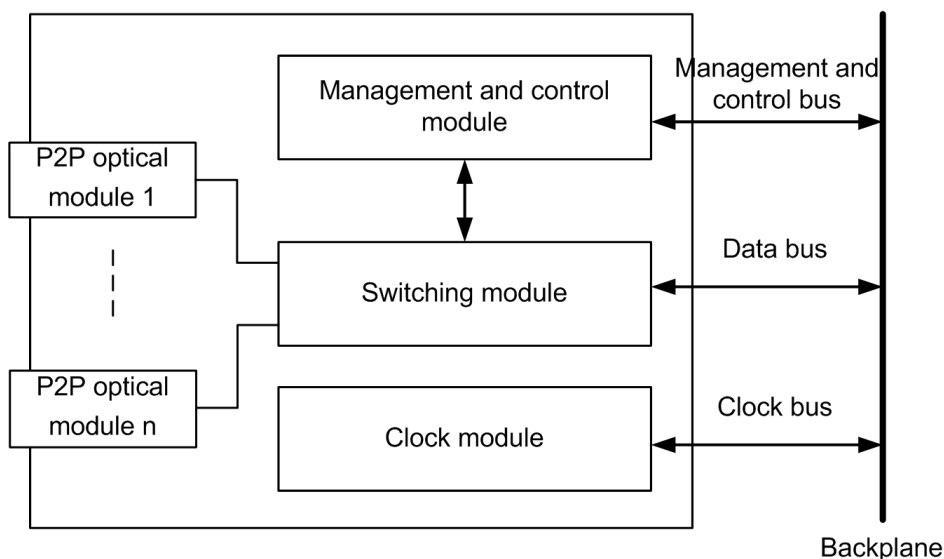
Figure 2-7 FTGK Principle Diagram

Table 2-11 describes the module functions of the FTGK card.

Table 2-11 FTGK Module Function

Module	Function
Management and control module	Implements card configuration, traffic management and optical module management, and status detection of optical module.
Switching module	Implements conversion of optical module and backplane bus, implements VLAN and Ethernet functions.
Clock module	Supports all optical interface to use system clock for clock synchronization. When the card is used for uplink, the synchronized clock from the optical port is sent to the switching and control card works as the system clock.
P2P optical module	Provides GE/FE optical interface.

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Technical Specification

Table 2-12 lists technical specifications of the FTGK card.

Table 2-12 FTGK Technical Specification

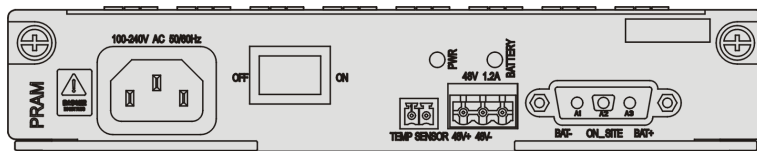| Item	Specification
Power consumption	85 W
Dimensions	395.5 mm × 22.5 mm × 225 mm (Height × Width × Depth)
Weight	1.51 kg

2.4 Power Card

Overview

The power card PRAM card uses 110 V or 220 V AC power and provides power supply to each card.

Panel

Figure 2-8 shows the PRAM card panel.

Figure 2-8 PRAM Panel

Indicators

Table 2-13 describes the indicators of the PRAM card.

Table 2-13 PRAM Indicator Description

Indicator	Status	Description
PWR	Green LED is on.	Power is on.
	Green LED is off	Power is abnormal.
BATTERY	Green LED is on.	The battery works properly.
	Green LED flashes quickly.	The battery is discharging, or the battery is reversely connected.
	Green LED is off.	The battery is not available.

Interfaces

Table 2-14 describes the interfaces of the PRAM card.

Table 2-14 PRAM Interface Description

Interface	Description
AC power interface (100-240V AC 50/60HZ)	Connects to 110 V/220 V AC power.
DC power interface (48V 1.2A)	Provides -48 V DC output. **48V+** connects to -48 V. **48-** connects to -48 V RTN (-48 V ground).
Battery interface	Connects to a storage battery. **BAT-** connects to the negative of the battery. **BAT+** connects to the positive of the battery.
TEMP SENSOR	Connects to a temperature sensor, for battery temperature compensation. Without a temperature sensor, the default temperature is set to 25 ℃ and the floating charge voltage is 53.5 V.

Button

Table 2-15 describes the button on the PRAM panel.

Table 2-15 PRAM Button Description

Button	Description
ON/OFF	To enable/disable the power supply of the equipment

Principle Diagram

Figure 2-9 shows the principle diagram of the PRAM card.
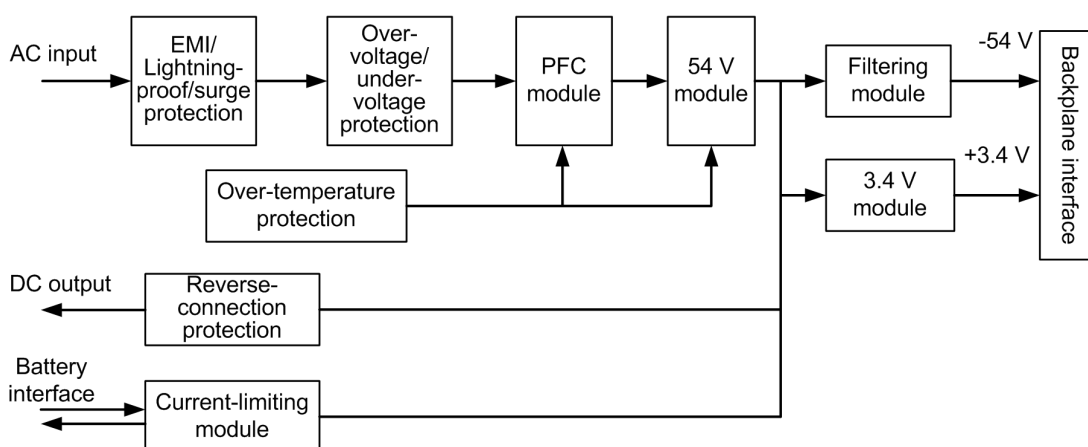
Figure 2-9 PRAM Principle Diagram

Table 2-16 describes functions of each module of the PRAM card.

Table 2-16 PRAM Module Functions

Module	Function
EMI/lightning-proof/surge protection	Implements the power input EMI (Electromagnetic Interference) filter, lightning-proof, and surge protection.
Over-voltage/under-voltage protection	Implements the power input over-voltage/under-voltage protection.
PFC module	Implements PFC (Power Factor Correction) function.
54 V module	Implements the conversion from AC voltage to 54 V DC voltage.
Over-temperature protection	Implements over-temperature protection, protecting the card from high temperature.
3.4 V module	Implements 3.4 V DC power output.
Current-limiting module	Implements the charge management and power-off management.

Technical Specifications

Table 2-17 lists technical specifications of the PRAM card.

Table 2-17 PRAM Technical Specifications

Item	Specification
Power consumption	13.2 W
Dimensions	197.75 mm × 25 mm × 225 mm (Height × Width × Depth)
Weight	1.346 kg

2.5 Backplane

Overview

The ZXA10 C320 uses backplane to connect the cards together.

Interfaces

The backplane provides the following interfaces:

- The interface for switching and control card
- The interface for the PON interface card or P2P interface card
- Power socket interface
- Fan socket interface

Technical Specifications

Table 2-18 lists the technical specifications of the backplane.

Table 2-18 Backplane Technical Specifications

Item	Specification
Power consumption	-
Dimensions	81 mm × 411 mm × 4.7 mm (height × width × depth)
Weight	0.395 kg

2.6 Fan Unit

Functional Modules

The fan unit consists of the following functional modules:

- Power filtering and protection modules, including the lightning protection module, anti-reverse-connection protection module, over-voltage protection module, and the delayed-start module.
- The fan control module
- The fan status detection module

Indicators

Table 2-19 describes the indicators of the fan unit.

Table 2-19 Description on the Indicators of the Fan Unit

Indicator	Status	Description
RUN	Green LED is ON.	The fan runs properly.
ALM	Red LED flashes.	The fan is faulty.

Technical Specifications

Table 2-20 lists the technical specifications of the fan unit.

Table 2-20 Technical Specifications of the Fan Unit

Item	Specification
Power consumption	20 W
Dimensions	84.3 mm × 35.8 mm × 247.9 mm(height × width × depth)
Weight	0.425 kg

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Chapter 3
Cables

Table 3-1 lists the cables used by the ZXA10 C320.

Table 3-1 ZXA10 C320 Cables

| Cable	Description
Power cable	Connects -48 V DC power to the ZXA10 C320.
Network cable	Connects to an Ethernet electrical interface.
Serial port cable	Connects the serial port of a maintenance computer to the **CLI** interface on the ZXA10 C320.
Fiber pigtail	Connects optical fibers to an Ethernet optical interface or PON interface.

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3.1 Power Cable

Cable Structure

Figure 3-1 shows the structure of 3-core power cable.

Figure 3-1 Power Cable Structure
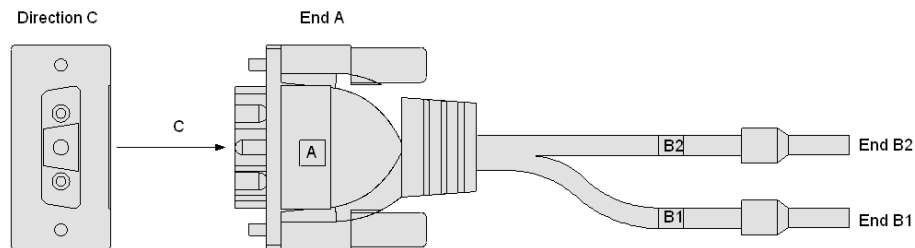
Cable Connection

End A of the power cable is connected to the ZXA10 C320 shelf, supplying the power to the shelf. End B of the power cable is connected to the DC terminal of the power distributor.

3.2 Network Cable

Cable Structure

Network cables are cat-5 cables with two ends of RJ45 connectors, see Figure 3-2.

Figure 3-2 Network Cable Structure
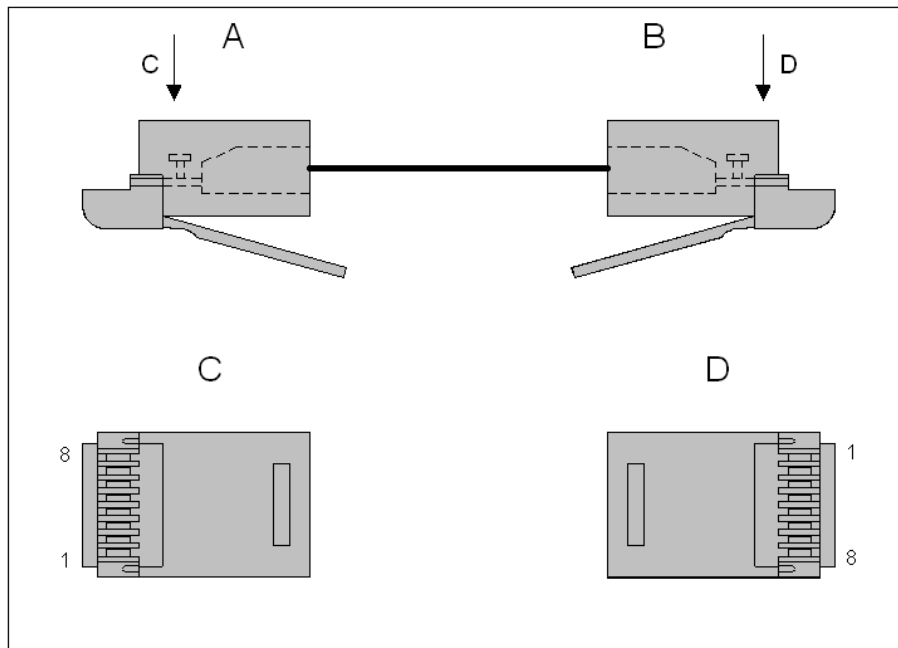
Pin Connections

Table 3-2 lists the pin connections of a network cable.

Table 3-2 Pin Connections of a Network cable

| End A	End B	Signal
RJ45_1	RJ45_3 (Crossover)	TPOP
	RJ45_1 (Straight-through)	
RJ45_2	RJ45_6 (Crossover)	TPOP
	RJ45_2 (Straight-through)	
RJ45_3	RJ45_1 (Crossover)	TPIP
	RJ45_3 (Straight-through)	
RJ45_6	RJ45_2 (Crossover)	TPIN
	RJ45_6 (Straight-through)	

Note:

The network cable cannot be longer than 100 m.

3.3 Serial Port Cable

Cable Structure

Figure 3-3 shows the serial port cable structure. End A is a RJ45 connector and End B is a DB9 connector.

Figure 3-3 Serial Port Cable Structure
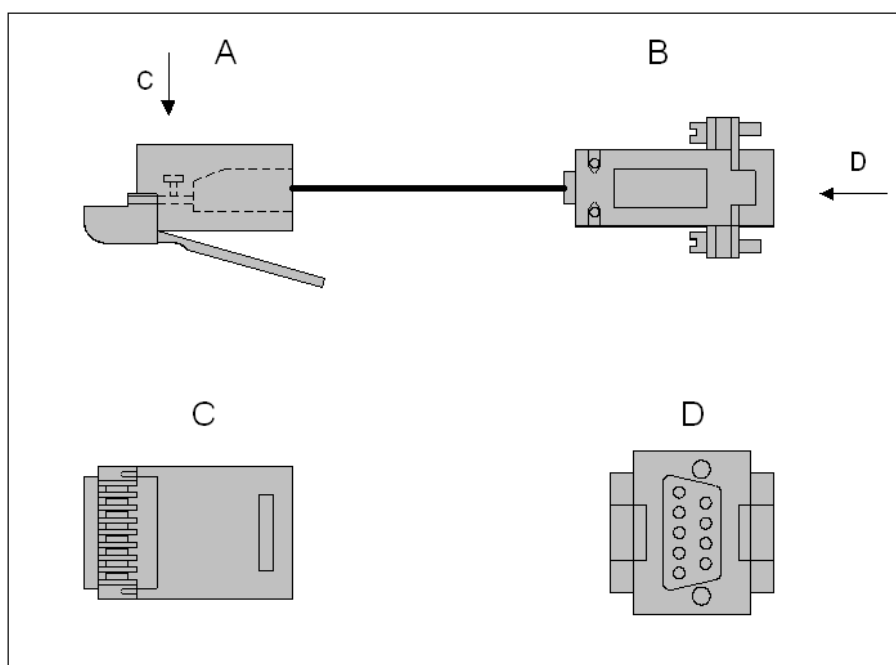
Pin Connections

Table 3-3 lists pin connections of the serial port cable.

Table 3-3 Pin Connections of the Serial Port Cable

End A	End B
3	3
4	5
5	5
6	2
Note: Other pins are null.	

3-3

3.4 Fiber Pigtail

Cable Description

A fiber pigtail is a single short fiber which connects the optical interface or the optical adapter on the ODF. A fiber pigtail has optical connectors at both ends.

Connector Description

Table 3-4 describes the optical connectors.

Table 3-4 Optical Connector

Type	Description	Image	Interface
LC/PC	Lucent connector (for physical contact), with regular polish quality		Ethernet optical interface
SC/PC	Square optical connector (for physical contact), with regular polish quality		PON optical interface

Glossary

AC
  - Alternating Current

CPU
  - Central Processing Unit

DC
  - Direct Current

EMI
  - Electromagnetic Interference

FE
  - Fast Ethernet

GE
  - Gigabit Ethernet

GPON
  - Gigabit Passive Optical Network

IP
  - Internet Protocol

LOS
  - Loss Of Signal

MAC
  - Media Access Control

NM
  - Network Management

ODF
  - Optical Distribution Frame

P2P
  - Point to Point

PFC
  - Power Factor Correction

PON
  - Passive Optical Network

QoS
  - Quality of Service

SLA
  - Service Level Agreement

I

TM
  - TrafficManagement

VLAN
  - Virtual Local Area Network

WDM
  - Wavelength Division Multiplexing