



ZXR10 ZSR V2

Intelligent Integrated Multi-Service Router

Hardware Description

Version: 2.00.20

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About This Manual

Purpose

This manual describes the hardware structure, components, system configurations, performance, physical parameters and supported boards and cables of the ZXR10 ZSR V2 series routers.

Intended Audience

This manual is intended for:

- Network planning engineers
- Equipment installation engineers
- Installation supervision engineers

What Is in This Manual



This manual contains the following chapters and appendixes.

Chapter 1, Hardware Overview	Describes the hardware overview of the ZXR10 ZSR V2 series routers.
Chapter 2, ZXR10 3800-8 Chassis	Describes the structure, components, slots, system parameters, power supplies, and the heat dissipation system of the ZXR10 3800-8 chassis.
Chapter 3, ZXR10 2800-4 Chassis	Describes the structure, components, slot layout, system parameters, power supplies, and the heat dissipation system of the ZXR10 2800-4 chassis.
Chapter 4, ZXR10 1800-2S Chassis	Describes the structure, components, slot layout, system parameters, power supplies, and the heat dissipation system of the ZXR10 1800-2S chassis.
Chapter 5, ZXR10 2800-3E Chassis	Describes the structure, slot deployment, system parameters, power modules, and fan modules of a ZXR10 2800-3E chassis.
Chapter 6, ZXR10 1800-2E Chassis	Describes the structure, slot deployment, system parameters, power modules, and fan modules of a ZXR10 1800-2E chassis.
Chapter 7, MPFU	Describes the MPFU supported by all ZXR10 ZSR V2 series routers.
Chapter 8, General Processing Boards	Describes general processing boards that the ZXR10 ZSR V2 series routers support.

Chapter 9, Line Interface Boards	Describes the line interface boards supported by all ZXR10 ZSR V2 series routers.
Chapter 10, Cables	Describes the power cables, protective grounding cables, and signal cables of the ZXR10 ZSR V2 series routers.
Appendix A, Board Quick Table (Weight and Power Consumption)	Describes the weight and power consumption of the boards supported by the ZXR10 ZSR V2 series routers.
Appendix B, Optical Modules Quick Table	Describes the information of the optical modules supported by the ZXR10 ZSR V2 series routers.

Conventions

This manual uses the following conventions.

<i>Italics</i>	Variables in commands. It may also refer to other related manuals and documents.
Bold	Menus, menu options, function names, input fields, option button names, check boxes, drop-down lists, dialog box names, window names, parameters, and commands.
Constant width	Text that you type, program codes, filenames, directory names, and function names.
[]	Optional parameters.
{ }	Mandatory parameters.
	Separates individual parameters in a series of parameters.
	Warning: indicates a potentially hazardous situation. Failure to comply can result in serious injury, equipment damage, or interruption of major services.
	Caution: indicates a potentially hazardous situation. Failure to comply can result in moderate injury, equipment damage, or interruption of minor services.
	Note: provides additional information about a certain topic.

Chapter 1

Hardware Overview

For the major hardware components and models of the ZXR10 ZSR V2, refer to [Table 1-1](#). The components vary with the network scale and capacity. Determine the configuration according to your actual requirements.

Table 1-1 Component Models

Component	Model	Description
Cabinet	-	Used as required. The ZXR10 1800-2S is a desktop product, the ZXR10 1800-2E and ZXR10 2800-3E can be installed on a desktop or in a cabinet, while the ZXR10 2800-4 and ZXR10 3800-8 can be installed in an IEC297 standard cabinet or ETSI standard cabinet.
Shelf	ZXR10 3800-8 Chassis ZXR10 2800-4 Chassis ZXR10 1800-2S Chassis	Contains chassis structure, power supply module, fan and dust screen module and LCD module.
MPFU	Refer to Chapter 7 MPFU .	Contains MPFU.
General processing boards	Refer to Chapter 8 General Processing Boards .	General processing boards that the ZXR10 ZSR V2 series routers support.
Line Interface Boards	Refer to Chapter 9 Line Interface Boards .	Contains line interface boards.
Cable	Refer to Chapter 10 Cables .	Contains power cables, grounding cables and signal cables.

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Chapter 2

ZXR10 3800-8 Chassis

The ZXR10 ZSR V2 series routers are highly flexible by using the modular structure, and the boards and components are hot swappable. The entire router consists of the chassis, backplane, MPFU, line interface boards, power supply modules, and fan modules.

The ZXR10 3800-8 chassis uses the plate metal structure. The boards, power supply modules, and fan modules are installed on the front panel, and the front leading-out mode (optical fiber interfaces) is used. The width of the ZXR10 3800-8 chassis complies with the 19-inch standard and can be installed in IEC297 or ETSI standard cabinets.

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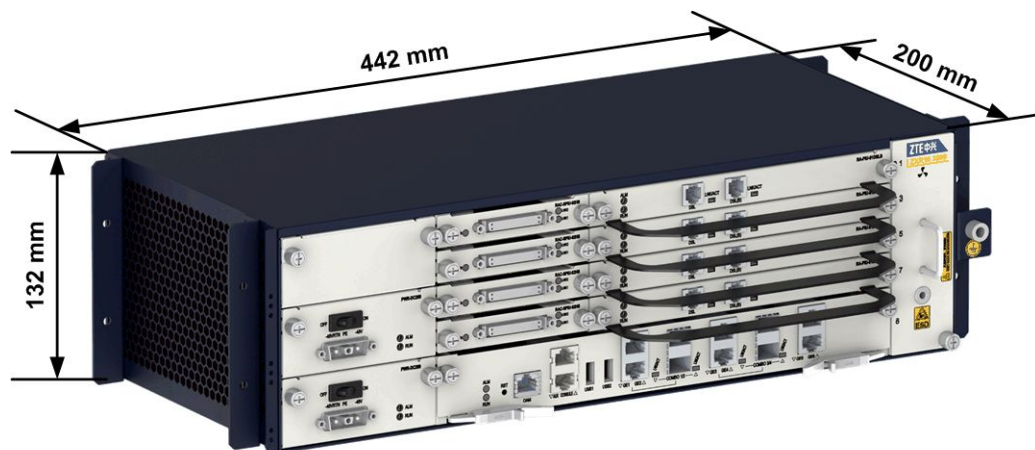
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2.1 Structure

2.1.1 Overview and Structure

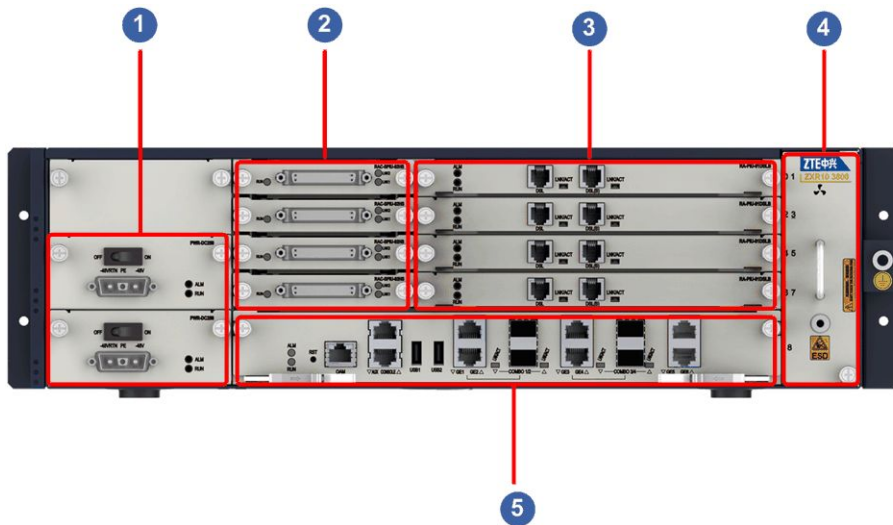
The height of the ZXR10 3800-8 chassis is 3U (1U = 1.75 in. = 44.45 mm), and the dimensions (width × height × depth) are 17.41 in. × 5.20 in. × 7.88 in. (442 mm × 132 mm × 200 mm). For the main components of the ZXR10 3800-8 chassis, see [Figure 2-1](#).

Figure 2-1 Main Components on the Front Side of the ZXR10 3800-8 Chassis



For the front view of the ZXR10 3800-8 chassis, see [Figure 2-2](#).

Figure 2-2 Front View of the ZXR10 3800-8 Chassis



- 1. Power supply module
- 2. SPIU line interface board slots
- 3. PIU/DPIU line interface board slots
- 4. Fan module
- 5. MPFU slots

For a description of the main components of the ZXR10 3800-8 chassis, refer to [Table 2-1](#).

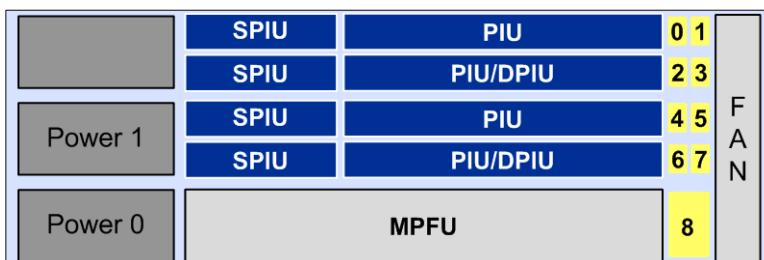
Table 2-1 Description of the Main Components of the ZXR10 3800-8 Chassis

Component Name	Description
Board area	The ZXR10 3800-8 provides one slot for the main control forwarding board and at most eight slots for line interfaces.
Power supply module	The ZXR10 3800-8 provides two slots for power modules. You can configure one or two power modules.
Fan module	The ZXR10 3800-8 provides one vertically installed fan module.

2.1.2 Slot Layout

For a front view of the ZXR10 3800-8 chassis, see [Figure 2-3](#).

Figure 2-3 Front View of the ZXR10 3800-8 Chassis



The ZXR10 3800-8 chassis provides nine service slots and boards are horizontally installed in the chassis.

- The MPFU is installed in slot 8.
- PIUs/DPIUs and SPIUs are installed in slots 0 to 7.

The SPIU slots are applicable to SPIU boards. The PIU slots are applicable to PIU boards. The DPIU board uses two slots, including one PIU slot and its neighboring PIU/DPIU slot.

2.1.3 System Parameters

For the system parameters of the ZXR10 3800-8, refer to [Table 2-2](#).

Table 2-2 System Parameters of the ZXR10 3800-8

Parameter		Specification
Physical parameter	Dimensions (width × height × depth)	17.41 in. × 5.20 in. × 7.88 in. (442 mm × 132 mm × 200 mm)
	Weight (full configuration)	< 25.4 lb. (11.5 kg)
	Maximum power consumption	< 240 W
Storage capacity	Memory	2 GB
	FLASH	4 GB
Slot	Total number of slots	9
	Number of PIU slots	8
DC power (single)	Redundancy mode	1+1 redundancy, supporting AC and DC mixed power supply
	Maximum output power	250 W
	Rated input voltage	-60 V DC to -48 V DC
	Input voltage range	-72 V DC to -38 V DC
AC power (single)	Redundancy mode	1+1 redundancy, supporting AC and DC mixed power supply
	Rated input voltage	100 V AC to 240 V AC
	Input frequency range	50 Hz to 60 Hz
	Rated output power per module	250 W
Heat dissipation system	Number of fan modules	1
Grounding resistance		Resistance of joint grounding < 5 Ω

2.2 Power Supply

The ZXR10 ZSR V2 series routers support 100 V to 240 V, 50 Hz to 60 Hz AC power supply and -72 V to -38 V DC power supply. The ZXR10 3800-8 supports AC and DC mixed power supplies operating in 1+1 redundancy mode, and the power supply modules are hot swappable.

A power supply module provides the following functions:

- Input/output over/under voltage alarm and protection.
- Output over current alarm and protection.
- Temperature alarm and overheating protection.



Caution!

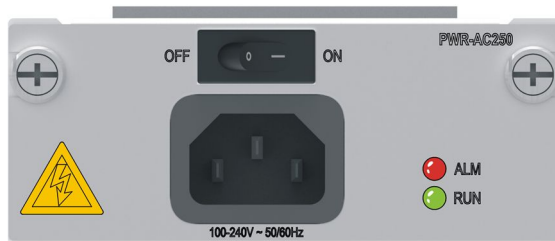
Please disconnect all power supply before servicing.

2.2.1 AC Power Supply Module

Panel

For the front view of the AC power supply module of the ZXR10 3800-8, see [Figure 2-4](#).

Figure 2-4 Panel of the AC Power Supply Module



Indicators

For a description of the ZXR10 3800-8 AC power supply indicators, refer to [Table 2-3](#).

Table 2-3 Indicator Descriptions for the ZXR10 3800-8 AC Power Supply Module

Indicator	Number	Color	Description
RUN	1	Green	Indicates that the power supply module operates properly.
ALM	1	Red	Indicates that the power supply module has an alarm.

Buttons

There is one power button on the ZXR10 3800-8 AC power supply module. For a description of the button, refer to [Table 2-4](#).

Table 2-4 Power Button Description for the ZXR10 3800-8 AC Power Supply Module

Button	Description
ON (—)	Powers on the power supply module.
OFF (O)	Powers off the power supply module.

Technical Parameters

For the technical parameters of the AC power rectifier of the ZXR10 3800-8, refer to [Table 2-5](#).

Table 2-5 Technical Parameters of the AC Power Rectifier of the ZXR10 3800-8

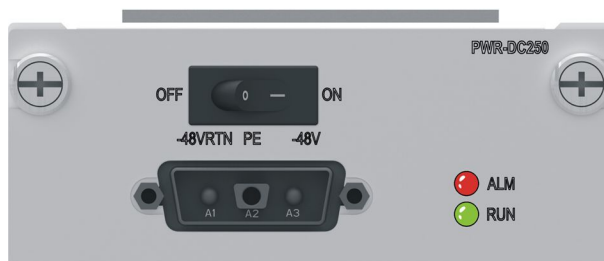
Parameter	Specification
Dimensions (height × width × depth)	3.15 in. × 1.57 in. × 6.89 in. (80 mm ×40 mm ×175 mm)
Weight	0.68 kg
Input voltage range	100 V AC to 240 V AC
AC input frequency	50 Hz to 60 Hz
Rated output power	250 W

2.2.2 DC Power Supply Module

Panel

For the front view of the DC power supply module of the ZXR10 3800-8, see [Figure 2-5](#).

Figure 2-5 Panel of the DC Power Supply Module



Indicators

For a description of the ZXR10 3800-8 DC power supply indicators, refer to [Table 2-6](#).

Table 2-6 Indicator Descriptions for the ZXR10 3800-8 DC Power Supply Module

Indicator	Number	Color	Description
RUN	1	Green	Indicates that the power supply module operates properly.
ALM	1	Red	Indicates that the power supply module has an alarm.

Buttons

There is one power button on the ZXR10 3800-8 DC power supply module. For a description of the button, refer to [Table 2-7](#).

Table 2-7 Power Button Description for the ZXR10 3800-8 DC Power Supply Module

Button	Description
ON (—)	Powers on the power supply module.
OFF (O)	Powers off the power supply module.

Technical Parameters

For the technical parameters of the DC power supply module of the ZXR10 3800-8, refer to [Table 2-8](#).

Table 2-8 Technical Parameters of the DC Power Supply Module of the ZXR10 3800-8

Parameter	Specification
Dimensions (height × width × depth)	3.15 in. × 1.57 in. × 6.89 in. (80 mm ×40 mm ×175 mm)
Weight	1.45 lb. (0.52 kg)
Input voltage range	-72 V DC to -48 V DC
Maximum output power	250 W
Rated input current	8.5 A

2.3 FAN Module

There is a vertical fan module in the ZXR10 3800-8 chassis, which consists of four fans. The cool air enters the chassis from its lateral side, flows to the boards and power supply modules, and then is blown out from the other side.

The fan module can automatically adjust the fan speed according to the equipment operation and supports the status monitoring and alarm functions.

For the technical specifications of the ZXR10 3800-8 fan module, refer to [Table 2-9](#).

Table 2-9 ZXR10 3800-8 Fan Specifications

Parameter	Specification
Size (W × H × D)	40.8 mm ×125.7 mm ×186 mm
Weight	0.62 kg
Power consumption	45 W
Maximum wind pressure	23 mmH ₂ O
Maximum wind	287 CFM
Maximum noise	60 dBA
Operation voltage	12 V

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Chapter 3

ZXR10 2800-4 Chassis

The ZXR10 ZSR V2 series routers are highly flexible by using the modular structure, and the boards and components are hot swappable. The entire router consists of the chassis, backplane, MPFU, line interface boards, power supply modules, and fan modules.

The ZXR10 2800-4 chassis uses the plate metal structure. The boards, power supply modules, and fan modules are installed on the front panel, and the front leading-out mode (optical fiber interfaces) is used. The width of the ZXR10 2800-4 chassis complies with the 19-inch standard and can be installed in IEC297 or ETSI standard cabinets.

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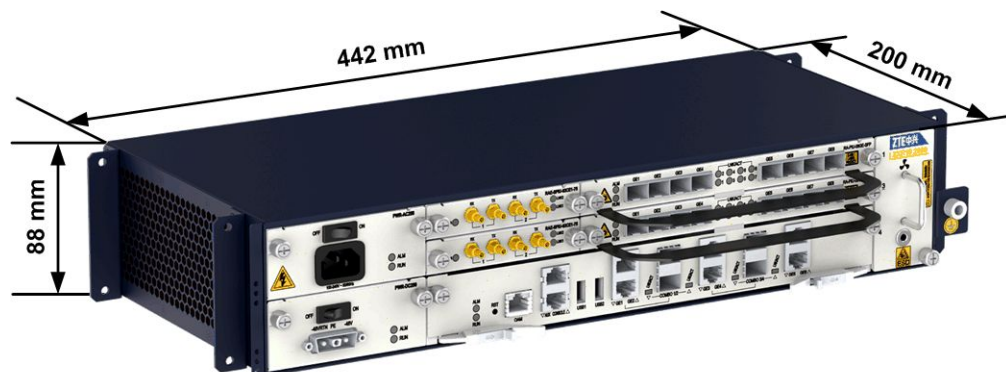
Structure	3-1
Power Supply	3-3
Fan	3-6

3.1 Structure

3.1.1 Overview and Structure

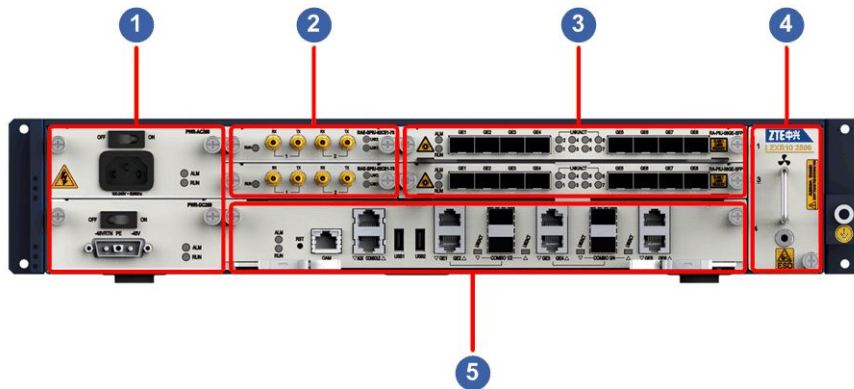
The height of the ZXR10 2800-4 chassis is 2U (1U = 1.75 in. = 44.45 mm), and the dimensions (width × height × depth) are 17.41 in. × 3.46 in. × 7.88 in. (442 mm × 88 mm × 200 mm). For the main components of the ZXR10 2800-4 chassis, see [Figure 3-1](#).

Figure 3-1 Main Components on the Front Side of the ZXR10 2800-4 Chassis



For the front view of the ZXR10 2800-4 chassis, see [Figure 3-2](#).

Figure 3-2 Front View of the ZXR10 2800-4 Chassis



- 1. Power supply module
- 2. SPIU line interface board slots
- 3. PIU/DPIU line interface board slots
- 4. Fan module
- 5. MPFU slots

For a description of the main components of the ZXR10 2800-4 chassis, refer to [Table 3-1](#).

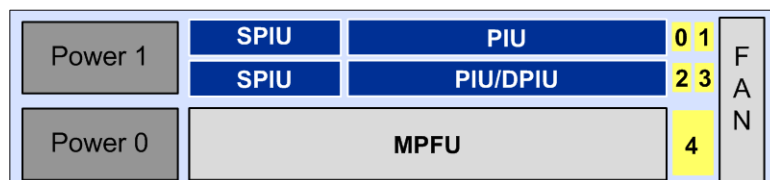
Table 3-1 Description of the Main Components of the ZXR10 2800-4 Chassis

Component Name	Description
Board area	The ZXR10 2800-4 provides one slot for the main control forwarding board and at most four slots for line interfaces.
Power supply module	The ZXR10 2800-4 provides two slots for power modules. You can configure one or two power modules.
Fan module	The ZXR10 2800-4 provides one vertically installed fan module.

3.1.2 Slot Layout

For a front view of the ZXR10 2800-4 chassis, see [Figure 3-3](#).

Figure 3-3 Front View of the ZXR10 2800-4 Chassis



The ZXR10 2800-4 chassis provides five service slots and boards are horizontally installed in the chassis.

- The MPFU is installed in slot 4.
- PIUs/DPIUs and SPIUs are installed in slots 0 to 3.

The SPIU slots are applicable to SPIU boards. The PIU slots are applicable to PIU boards. The DPIU board uses two slots, including one PIU slot and its neighboring PIU/DPIU slot.

3.1.3 System Parameters

For the system parameters of the ZXR10 2800-4, refer to [Table 3-2](#).

Table 3-2 System Parameters of the ZXR10 2800-4

Parameter		Specification
Physical parameter	Dimensions (width × height × depth)	17.41 in. × 3.46 in. × 7.88 in. (442 mm × 88 mm × 200 mm)
	Weight (full configuration)	< 19.0 lb. (8.6 kg)
	Maximum power consumption	< 160 W
Storage capacity	Memory	2 GB
	FLASH	4 GB
Slot	Total number of slots	5
	Number of PIU slots	4
DC power (single)	Redundancy mode	1+1 redundancy, supporting AC and DC mixed power supply
	Maximum output power	250 W
	Rated input voltage	-60 V DC to -48 V DC
	Input voltage range	-72 V DC to -38 V DC
AC power (single)	Redundancy mode	1+1 redundancy, supporting AC and DC mixed power supply
	Rated input voltage	100 V AC to 240 V AC
	Input frequency range	50 Hz to 60 Hz
	Rated output power per module	250 W
Heat dissipation system	Number of fan modules	1
Grounding resistance		Resistance of joint grounding < 5 Ω

3.2 Power Supply

The ZXR10 ZSR V2 series routers support 100 V to 240 V, 50 Hz to 60 Hz AC power supply and -72 V to -38 V DC power supply. The ZXR10 2800-4 supports AC and DC mixed power supplies operating in 1+1 redundancy mode, and the power supply modules are hot swappable.

A power supply module provides the following functions:

- Input/output over/under voltage alarm and protection.
- Output over current alarm and protection.
- Temperature alarm and overheating protection.



Caution!

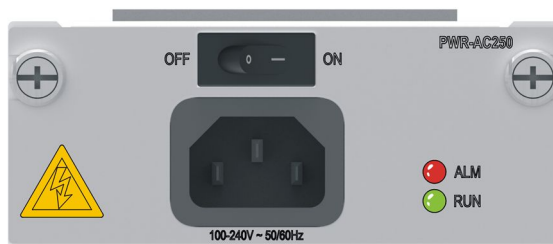
Please disconnect all power supply before servicing.

3.2.1 AC Power Supply Module

Panel

For the front view of the AC power supply module of the ZXR10 2800-4, see [Figure 3-4](#).

Figure 3-4 Panel of the AC Power Supply Module



Indicators

For a description of the ZXR10 2800-4 AC power supply indicators, refer to [Table 3-3](#).

Table 3-3 Indicator Descriptions for the ZXR10 2800-4 AC Power Supply Module

Indicator	Number	Color	Description
RUN	1	Green	Indicates that the power supply module operates properly.
ALM	1	Red	Indicates that the power supply module has an alarm.

Buttons

There is one power button on the ZXR10 2800-4 AC power supply module. For a description of the button, refer to [Table 3-4](#).

Table 3-4 Power Button Description for the ZXR10 2800-4 AC Power Supply Module

Button	Description
ON (—)	Powers on the power supply module.

Button	Description
OFF (O)	Powers off the power supply module.

Technical Parameters

For the technical parameters of the AC power rectifier of the ZXR10 2800-4, refer to [Table 3-5](#).

Table 3-5 Technical Parameters of the AC Power Rectifier of the ZXR10 2800-4

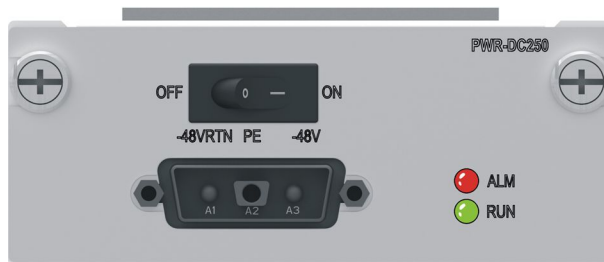
Parameter	Specification
Dimensions (height × width × depth)	3.15 in. × 1.57 in. × 6.89 in. (80 mm ×40 mm ×175 mm)
Weight	0.68 kg
Input voltage range	100 V AC to 240 V AC
AC input frequency	50 Hz to 60 Hz
Rated output power	250 W

3.2.2 DC Power Supply Module

Panel

For the front view of the DC power supply module of the ZXR10 2800-4, see [Figure 3-5](#).

Figure 3-5 Panel of the DC Power Supply Module



Indicators

For a description of the ZXR10 2800-4 DC power supply indicators, refer to [Table 3-6](#).

Table 3-6 Indicator Descriptions for the ZXR10 2800-4 DC Power Supply Module

Indicator	Number	Color	Description
RUN	1	Green	Indicates that the power supply module operates properly.
ALM	1	Red	Indicates that the power supply module has an alarm.

Buttons

There is one power button on the ZXR10 2800-4 DC power supply module. For a description of the button, refer to [Table 3-7](#).

Table 3-7 Power Button Description for the ZXR10 2800-4 DC Power Supply Module

Button	Description
ON (—)	Powers on the power supply module.
OFF (O)	Powers off the power supply module.

Technical Parameters

For the technical parameters of the DC power supply module of the ZXR10 2800-4, refer to [Table 3-8](#).

Table 3-8 Technical Parameters of the DC Power Supply Module of the ZXR10 2800-4

Parameter	Specification
Dimensions (height × width × depth)	3.15 in. × 1.57 in. × 6.89 in. (80 mm ×40 mm ×175 mm)
Weight	1.45 lb. (0.52 kg)
Input voltage range	-72 V DC to -38 V DC
Maximum output power	250 W
Rated input current	8.5 A

3.3 Fan

There is a vertical fan module in the ZXR10 2800-4 chassis, which consists of two fans. The cool air enters the chassis from its lateral side, flows to the boards and power supply modules, and then is blown out from the other side.

The fan module can automatically adjust the fan speed according to the equipment operation and supports the status monitoring and alarm functions.

For the technical specifications of the ZXR10 2800-4 fan module, refer to [Table 3-9](#).

Table 3-9 ZXR10 2800-4 Fan Specifications

Parameter	Specification
Size (W × H × D)	40.8 mm ×81.1 mm ×186 mm
Weight	0.44 kg
Power consumption	30 W
Maximum wind pressure	23 mmH ₂ O
Maximum wind	191 CFM

Parameter	Specification
Maximum noise	58 dBA
Operation voltage	12 V

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Chapter 4

ZXR10 1800-2S Chassis

The ZXR10 ZSR V2 series routers are highly flexible by using the modular structure, and the boards and components are hot swappable. The entire router consists of the chassis, backplane, MPFU, line interface boards, power supply modules, and fan modules.

The ZXR10 1800-2S is a desktop product. The power supply module and MPFU are fixed in the chassis. The service boards are installed on the rear panel and the rear leading-out mode is used.

The ZXR10 1800-2S has two extension types configured with wireless modules: ZXR10 1800-2S(G) and ZXR10 1800-2S(W).

- The ZXR10 1800-2S(G) has a built-in LTE module, where a SIM card slot is available for supporting GSM, WCDMA, TD-SCDMA, or LTE networks.
- The ZXR10 1800-2S(W) has a built-in WiFi module for supporting the WiFi function.

Table of Contents

Structure	4-1
Power Supply	4-6

4.1 Structure

4.1.1 Overview and Structure

Overview

The height of the ZXR10 1800-2S chassis (excluding the antenna) is 1U (1U = 44.45 mm), and the dimension (width × height × depth) 380 mm × 43.6 mm × 200 mm. For a description of the main components of the ZXR10 1800-2S, refer to [Table 4-1](#).

Table 4-1 Descriptions of the Main Components of the ZXR10 1800-2S

Component Name	Description
Board area	The ZXR10 1800-2S provides a maximum of two line interface card slots.
MPFU	The MPFU of the ZXR10 1800-2S is integrated into the chassis and cannot be removed.
Power supply module	The power supply module of the ZXR10 1800-2S is integrated on the device, and cannot be removed or installed.

Front Panel

Figure 4-1 shows the front view of the ZXR10 1800-2S.

Figure 4-1 ZXR10 1800-2S Front View



Note:

Both of the ZXR10 1800-2S(G) and the ZXR10 1800-2S(W) support the wireless function. Each of them is configured with a wireless module and a pair of antennas. If no wireless module is configured, the chassis has no antenna.

Figure 4-2 shows the panel view of the ZXR10 1800-2S.

Figure 4-2 ZXR10 1800-2S Front Panel



For a description of the ZXR10 1800-2S front panel, refer to [Table 4-2](#).

Table 4-2 ZXR10 1800-2S Front Panel Descriptions

Component	Silk Screen Name	Description
USB interfaces	USB1	USB 2.0 interface, used for storing installation packages and other data, supporting 3G extension and commissioning through USB.
	USB2	

Component	Silk Screen Name	Description
Indicators	ALM	Alarm indicator, red.
	PWR	Power supply indicator, green.
	SYS	System operation indicator, green.
	WIFI/WWAN	Wireless operation indicator, green <ul style="list-style-type: none"> ● If a WiFi module is configured, WIFI is displayed on the indicator label. This indicator indicates whether the WiFi function operates properly. ● If an LTE module is configured, WWAN is displayed on the indicator label. This indicator indicates whether the LTE function operates properly.
Buttons	RST	Reset button.
	WIFI	WiFi function button, which is available only on the chassis of the ZXR10 1800-2S(W).
	WPS	WiFi connection reestablishment button, which is available only on the chassis of the ZXR10 1800-2S(W).



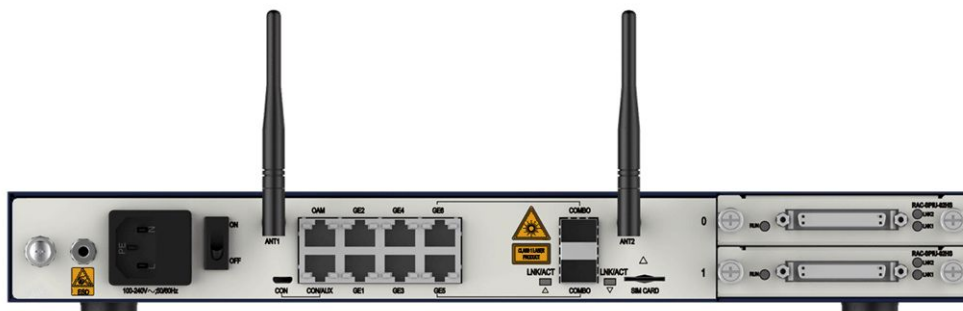
Note:

The ZXR10 1800-2S without any wireless module does not have the **WIFI** indicator, **WIFI** button, or **WPS** button.

Rear Panel

Figure 4-3 shows the rear panel of the ZXR10 1800-2S.

Figure 4-3 ZXR10 1800-2S Rear Panel





Note:

Both of the ZXR10 1800-2S(G) and the ZXR10 1800-2S(W) support the wireless function. Each of them is configured with a wireless module and a pair of antennas. If no wireless module is configured, the chassis has no antenna.

For a description of the ZXR10 1800-2S rear panel, refer to [Table 4-3](#).

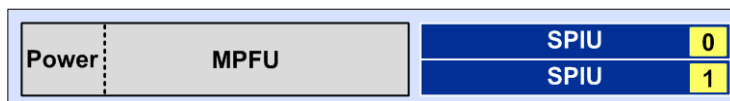
Table 4-3 ZXR10 1800-2S Rear Panel Descriptions

Component	Silk Screen Name	Description
ANT1-2	Antenna interface	Antenna slot, where an antenna is installed if a wireless module is configured.
OAM	Network interface (RJ45)	Network port (10M/100M/1000M) used for system maintenance and program downloading.
CON	Micro USB interface	Micro USB console interface. The functions are the same as those of the RJ45 CON/AUX interface. Either of the Micro USB console interface or the RJ45 CON/AUX interface is used. The priority is high.
CON/AUX	Serial port (RJ45)	Debugging port for system management and configuration.
GE1-4	GE electrical interface	4 GE electrical interfaces.
COMBO, GE5-6	Combo interface	2 electrical/optical combo interfaces.
SIM CARD	SIM card interface	SIM card interface for supporting GSM, CDMA2000, WCDMA, TD-SCDMA, or LTE networks.
LNK/ACT	Indicator	Link status indicators in green for the two Combo interfaces.

4.1.2 Slot Layout

For a front view of the ZXR10 1800-2S chassis, see [Figure 4-4](#).

Figure 4-4 Front View of the ZXR10 1800-2S Chassis



The ZXR10 1800-2S chassis provides two service slots and boards are horizontally installed in the chassis.

- Both the power module and the MPFU are integrated into the device. They cannot be removed.
- SPIUs are installed in slots 0 and 1.

4.1.3 System Parameters

For the system parameters of the ZXR10 1800-2S, refer to [Table 4-4](#).

Table 4-4 System Parameters of the ZXR10 1800-2S

Parameter		Specification
Physical parameter	Dimensions (width × height × depth)	14.96 in. × 1.72 in. × 7.88 in. (380 mm × 43.6 mm × 200 mm)
	Weight (full configuration)	< 6.83 lb. (3.10 kg)
	Maximum power consumption	< 55 W
WiFi function	Supported frequency band	2.4 G
	Supported system standard	IEEE 802.11b/g/n
Storage capacity	Memory	2 GB
	FLASH	1 GB
Slot	Total number of slots	2
	Number of PIU slots	2
DC power (single)	Maximum output power	60 W
	Rated input voltage	-60 V DC to -48 V DC
	Input voltage range	-72 V DC to -38 V DC
AC power (single)	Rated input voltage	100 V AC to 240 V AC
	Input frequency range	50 Hz –60 Hz
	Rated output power per module	60 W
Grounding resistance		Resistance of joint grounding < 5 Ω

4.2 Power Supply

Function

The ZXR10 ZSR V2 series routers support 100 V to 240 V, 50 Hz to 60 Hz AC power supply and -72 V to -38 V DC power supply. The ZXR10 1800-2S uses either one AC power supply or one DC power supply, and the power supply modules are not hot swappable.

A power supply module provides the following functions:

- Input/output over/under voltage alarm and protection.
- Output over current alarm and protection.
- Temperature alarm and overheating protection.

Buttons

There is one power button on the ZXR10 1800-2S power supply module, see [Figure 4-5](#). For a description of the button, refer to [Table 4-5](#).

Figure 4-5 Power Button



Table 4-5 Power Button Description for the ZXR10 1800-2S AC Power Supply Module

Button	Description
ON	Powers on the power supply module.
OFF	Powers off the power supply module.

Technical Parameters

For the technical parameters of the AC power rectifier of the ZXR10 1800-2S, refer to [Table 4-6](#).

Table 4-6 Technical Parameters of the AC Power Rectifier of the ZXR10 1800-2S

Parameter	Specification
Input voltage range	100 V AC to 240 V AC
AC input frequency	50 Hz – 60 Hz
Rated output power	60 W

For the technical parameters of the DC power rectifier of the ZXR10 1800-2S, refer to [Table 4-7](#).

Table 4-7 Technical Parameters of the DC Power Rectifier of the ZXR10 1800-2S

Parameter	Specification
Input voltage range	-72 V DC to -38 V DC
Rated output power	60 W

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Chapter 5

ZXR10 2800-3E Chassis

The ZXR10 ZSR V2 serial routers have a structure designed based on modularization. The boards and components support online hot swapping and have a flexible expendability. A ZXR10 2800-3E chassis is composed of a subrack, a backplane, a controlling and transferring unit, line interface boards, power modules, and fan modules.

The ZXR10 2800-3E subrack has a sheet metal structure. Wherein the controlling and transferring unit and fan modules are fixed on a ZXR10 ZSR V2 router, the service board and power modules are installed at the back, cables are led out from the back, and three line interface boards can be installed. The entire ZXR10 2800-3E chassis has a standard width of 19" and can be installed into a standard IEC297 cabinet or an [ETSI](#) cabinet.

A ZXR10 2800-3E(G) submodel can be derived from a ZXR10 2800-3E chassis by expanding the wireless function module. The ZXR10 2800-3E(G) submodel has a 3G or LTE module inside and a slot for a SIM card on the panel, supporting a GSM, WCDMA, TD-SCDMA, or LTE network.

Table of Contents

Structure	5-1
Power Supplies	5-5

5.1 Structure

5.1.1 Overview and Structure

Overview

A chassis of a ZXR10 2800-3E router has a height (without the antenna) of about 1 U (1U=44.45 mm), and a dimension of 442 mm × 44 mm × 440 mm (width × height × depth). For its components and descriptions, refer to [Table 5-1](#).

Table 5-1 Main Components of a ZXR10 2800-3E Chassis

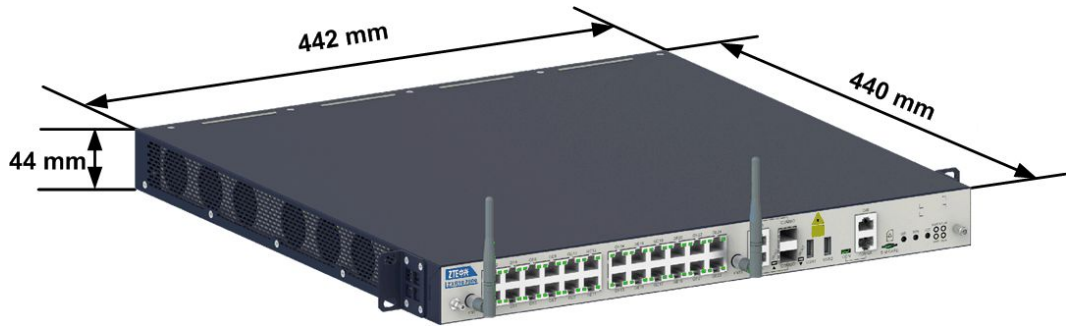
Component	Description
Controlling and transferring board	Integrated on the router and cannot be plugged or unplugged.
Boards	The ZXR10 2800-3E chassis provides three slots for line interface boards.
Power modules	The ZXR10 2800-3E chassis provides two slots for one or two power modules.

Front Panel

The following describes the front view and front panel of a ZXR10 2800-3E chassis.

- [Figure 5-1](#) shows the front view of a ZXR10 2800-3E chassis.

Figure 5-1 Front Structure Graph for a ZXR10 2800-3E Chassis

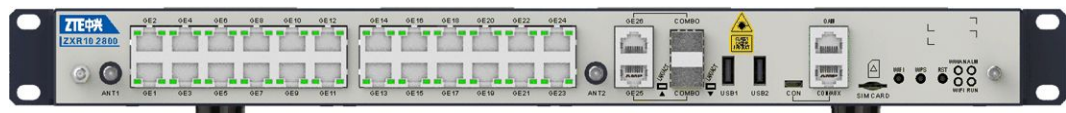


Note:

The ZXR10 2800-3E(G) submodel of the ZXR10 2800-3E chassis supports the wireless function, with a built-in wireless module and antennas. If the wireless module is not configured, the chassis does not have an antenna.

- [Figure 5-2](#) shows the front panel of a ZXR10 2800-3E chassis.

Figure 5-2 Front Panel of a ZXR10 2800-3E Chassis



For a description of the front panel, refer to [Table 5-2](#).

Table 5-2 Descriptions of Interfaces on the Front Panel of a ZXR10 2800-3E Chassis

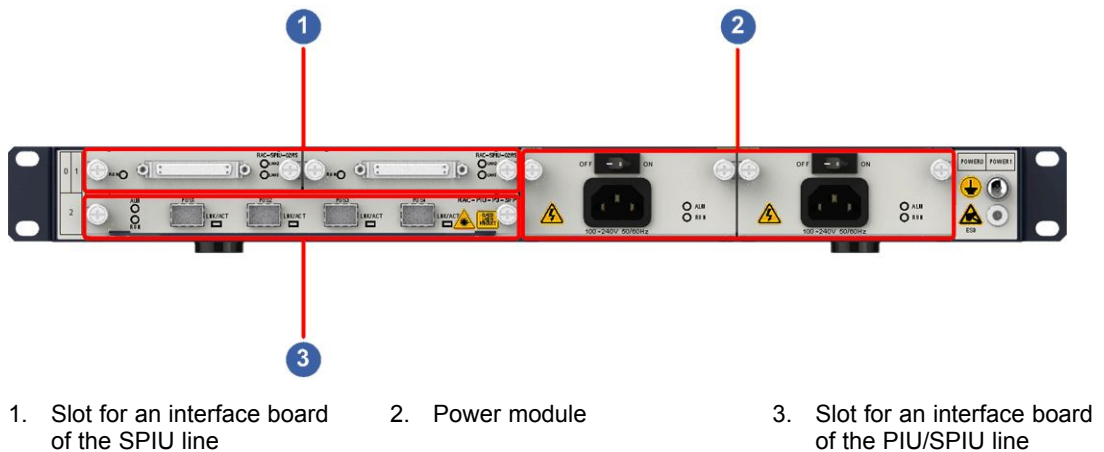
Part Type	Description
Antenna interface	Antenna slot.
GE interface	24 GE electrical interfaces, supporting the route switching function.
COMBO interfaces	Two Combo interfaces.
USB interfaces	USB2.0 interfaces, which are used to store applications and other data and support commissioning.
Network interface (RJ45)	Maintenance network interface (10M/100M/1000M), which is used for system control and application download.

Part Type	Description
Micro USB interfaces	Console interfaces of the Micro USB model, which have the same functions as those of the CON/AUX interfaces of the RJ45 model but a higher priority. Select either one.
Serial interface (RJ45)	Debugging serial interfaces (Console/AUX interfaces) of the RJ45 model, which are used for device management and function configuration.
Interface for a SIM card	Interface for a 3G or LTE SIM card.
Buttons	WIFI function button.
	Button for re-establishing a WIFI connection.
	System reset button.
Indicators	Green indicators for link status of two Combo interfaces.
	Red indicator for system faults.
	Green indicator for system operation status.
	Green indicator for the operation status of the 3G or LTE network.

Back Panel

Figure 5-3 shows the back panel of a ZXR10 2800-3E chassis.

Figure 5-3 Back Panel of a ZXR10 2800-3E Chassis



5.1.2 Slot Deployment

Figure 5-4 shows slots and slot IDs on the back of a ZXR10 2800-3E chassis.

Figure 5-4 Slots on the Back of a ZXR10 2800-3E Chassis



A ZXR10 2800-3E chassis has a structure suitable for horizontal installation. Three service board slots are designed for the chassis, which are numbered as 0-2 in order. Wherein:

- Slot 0 is used for an SPIU interface board.
- Slot 1 is used an SPIU interface board.
- Slot 2 is used a PIU or DPIU interface board.

5.1.3 System Parameters

For system parameters of a ZXR10 2800-3E chassis, refer to [Table 5-3](#).

Table 5-3 System Parameters of a ZXR10 2800-3E Chassis

Item	Physical Parameters	
Physical Parameters	Dimension (width × height × depth)	17.41 in. × 1.73 in. × 17.32 in. (442 mm × 44 mm × 440 mm)
	Weight (with full configuration)	< 19.0 lb. (8.6 kg)
	Maximum power consumption	< 120 W
Storage capacity	Memory	2 GB
	Flash	4 GB
Slot	Number of slots	5
	Number of slots for line interface boards	3
DC power (single)	Redundancy backup	1+1 redundancy backup, supporting both AC and DC powers.
	Rated output power	250 W
	Rated input voltage	From -60 V DC to -48 V DC
	Range of the maximum input voltage	From -72 V DC to -38 V DC
AC power (single)	Redundancy backup	1+1 redundancy backup, supporting both AC and DC powers.
	Rated input voltage	100 V AC–240 V AC
	Range of the input frequency	50 Hz–60 Hz
	Rated output power	250 W
Grounding resistance		Grounding resistance with common earthing, which is lower than 5 Ω.

5.2 Power Supplies

ZXR10 ZSR V2 serial routers support a voltage within the range of 100 V–240 V, AC power of 50 Hz–60 Hz, and DC power from -38 V to -72 V. The 1+1 dual-power redundancy mode and power supply swapping are available.

The power modules have the following functions:

- Alarms are generated due to a high input or output voltage.
- Alarms are generated due to a high output current.
- Alarms are generated due to a high or low temperature.



Caution!

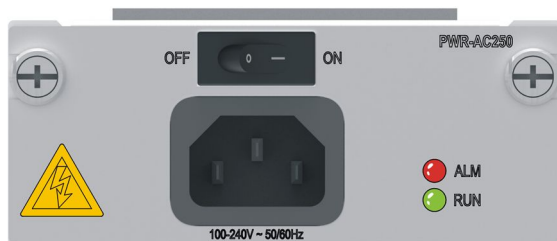
Turn off both power supplies before installing and maintaining the ZXR10 ZSR V2.

5.2.1 AC Power Module

Panel

Figure 5-5 shows the panel of the AC power module of a ZXR10 2800-3E chassis.

Figure 5-5 Panel of the AC Power Module



Indicators

For functions of the indicators on the AC power module of the ZXR10 2800-3E chassis, refer to Table 5-4.

Table 5-4 Functions of the Indicators on the Panel of the AC Power Module of the ZXR10 2800-3E Chassis

Indicator	Number	Color	Description
RUN	1	Green	The power module is operating properly.
ALM	1	Red	The power module is operating improperly.

Buttons

For functions of the power buttons on the AC power module of the ZXR10 2800-3E chassis, refer to Table 5-5.

Table 5-5 Functions of the Power Buttons of the AC Power Module of the ZXR10 2800-3E Chassis

Button	Description
ON (—)	Dial the button to ON to turn on the module.
OFF (O)	Dial the button to OFF to turn off the power.

Technical Parameters

For technical parameters of a rectifier of the AC power module of the ZXR10 2800-3E chassis, refer to [Table 5-6](#).

Table 5-6 Technical Parameters of the AC Power of the ZXR10 2800-3E Chassis

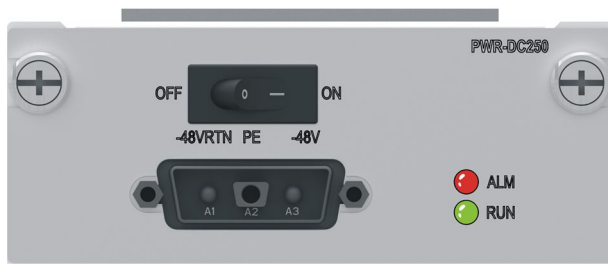
Parameter	Description
Dimension (width × height × depth)	3.15 in. × 1.57 in. × 6.89 in. (80 mm ×40 mm ×175 mm)
Weight	0.68 kg
Range of the input voltage	100 V AC–240 V AC
Input AC frequency	50 Hz–60 Hz
Rated output power	250 W

5.2.2 DC Power Module

Panel

[Figure 5-6](#) shows the panel of the DC power module of a ZXR10 2800-3E chassis.

Figure 5-6 Panel of the DC Power Module



Indicators

For functions of the indicators on the DC power module of the ZXR10 2800-3E chassis, refer to [Table 5-7](#).

Table 5-7 Functions of the Indicators on the Panel of the DC Power Module of the ZXR10 2800-3E Chassis

Indicator	Number	Color	Description
RUN	1	Green	The power module is operating properly.
ALM	1	Red	The power module is operating improperly.

Buttons

For functions of the power buttons on the DC power module of the ZXR10 2800-3E chassis, refer to [Table 5-8](#).

Table 5-8 Functions of the Power Buttons of the DC Power Module of the ZXR10 2800-3E Chassis

Button	Description
ON (—)	Dial the button to ON to turn on the module.
OFF (O)	Dial the button to OFF to turn off the power.

Technical Parameters

For technical parameters of the DC power module of the ZXR10 2800-3E chassis, refer to [Table 5-9](#).

Table 5-9 Technical Parameters of the DC Power Module of the ZXR10 2800-3E Chassis

Parameter	Description
Dimension (width × height × depth)	3.15 in. × 1.57 in. × 6.89 in. (80 mm ×40 mm ×175 mm)
Weight	0.52 kg
Range of the input voltage	From -72 V DC to -38 V DC
Rated output power	250 W
Rated input current	8.5 A

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Chapter 6

ZXR10 1800-2E Chassis

ZXR10 ZSR V2 series routers have a modular structure. The boards and components support hot swapping and have flexible expandability. A ZXR10 2800-3E chassis is composed of a subrack, a backplane, a controlling and transferring unit, line interface boards, power modules, and fan modules.

A ZXR10 1800-2E subrack has a sheet metal structure. The controlling and transferring unit and fan modules are fixed on the router, service board and power modules are installed at the back, cables are led out from the back, and two line interface boards can be installed.

A ZXR10 1800-2E chassis has a standard width of 19" and can be installed into a standard IEC297 cabinet or an [ETSI](#) cabinet.

A ZXR10 1800-2E(G) submodel can be derived from a ZXR10 1800-2E chassis by expanding the wireless function module. A ZXR10 1800-2E(G) has a 3G or LTE module inside and a slot for a SIM card on the panel, supporting a GSM, WCDMA, TD-SCDMA, or LTE network.

Table of Contents

Structure	6-1
Power Supplies	6-4

6.1 Structure

6.1.1 Overview and Structure

Overview

A chassis of a ZXR10 1800-2E router has a height (without the antenna) of about 1 U (1U=44.45 mm), and a dimension of 442 mm × 44 mm × 440 mm (width × height × depth). For its components and descriptions, refer to [Table 6-1](#).

Table 6-1 Main Components of a ZXR10 1800-2E Chassis

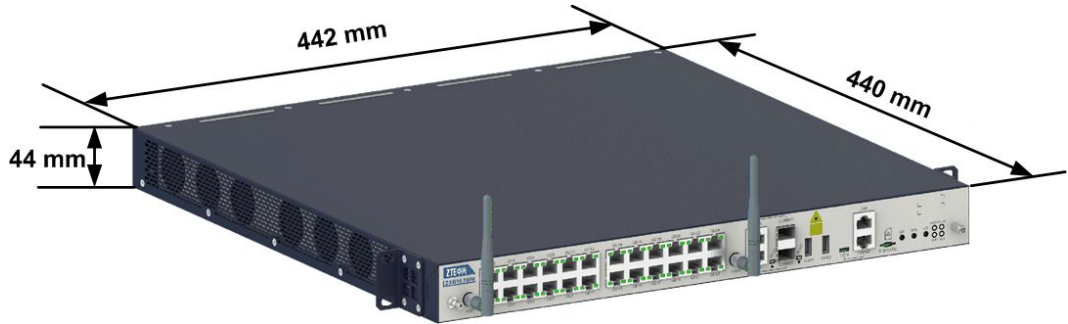
Component	Description
Controlling and transferring board	The controlling and transferring board of a ZXR10 1800-2E chassis is integrated on the router and cannot be plugged or unplugged.
Board	The ZXR10 1800-2E chassis provides two slots for line interface boards.
Power module	The ZXR10 1800-2E chassis provides two slots for one or two power modules.

Front View

The following describes the structure of a ZXR10 1800-2E chassis and its front panel.

- [Figure 6-1](#) shows the front view of a ZXR10 1800-2E chassis.

Figure 6-1 Front View of a ZXR10 1800-2E Chassis



Note:

The ZXR10 1800-2E(G) submodel of the ZXR10 1800-2E chassis supports the wireless function, with a built-in wireless module and an antenna. If the wireless module is not configured, the chassis does not have an antenna.

- [Figure 6-2](#) shows the front panel of a ZXR10 1800-2E chassis.

Figure 6-2 Front Panel of a ZXR10 1800-2E Chassis



For a description of the front panel, refer to [Table 6-2](#).

Table 6-2 Descriptions of Interfaces on the Front Panel of a ZXR10 1800-2E Chassis

Component Type	Description
Antenna interfaces	Antenna slots.
GE interfaces	24 GE electrical interfaces.
COMBO interfaces	Two Combo interfaces.
USB interfaces	USB2.0 interfaces, which are used to store applications and other data and support commissioning.
Network interfaces (RJ45)	Maintenance network interfaces (10M/100M/1000M), which are used to control the system and download applications.

Component Type	Description
Micro USB interfaces	Console interfaces of the Micro USB model, which have the same functions as those of the CON/AUX interfaces of the RJ45 model but a higher priority. Select either one.
Serial interfaces (RJ45)	Debugging serial interfaces (Console/AUX interfaces) of the RJ45 model, which are used to manage routers and configure functions.
Interface for a SIM card	Interface for a 3G or LTE SIM card.
Buttons	WIFI function button.
	Button for re-establishing a WIFI connection.
	System reset button.
Indicators	Green indicators for link statuses of two Combo interfaces.
	Red indicator for system faults.
	Green indicator for system operation status.
	Green indicator for the operation status of a 3G or LTE network.

Back Panel

Figure 6-3 shows the back panel of a ZXR10 1800-2E chassis.

Figure 6-3 Back Panel of a ZXR10 1800-2E Chassis

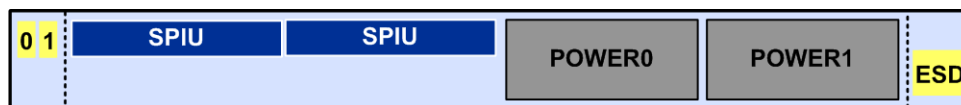


1. Slots for SPIU line interface boards
2. Power modules

6.1.2 Slots

Figure 6-4 shows slots and slot IDs on the back of a ZXR10 1800-2E chassis.

Figure 6-4 Slots on the Back of a ZXR10 1800-2E Chassis



A ZXR10 1800-2E chassis has a structure suitable for horizontal installation. Two service board slots are designed for the chassis, which are numbered as 0-1 in order. Slots 0 and 1 are used to install SPIU interface boards.

6.1.3 System Parameters

For system parameters of a ZXR10 1800-2E router, refer to [Table 6-3](#).

Table 6-3 System Parameters of a ZXR10 1800-2E Chassis

Item		Physical Parameters
Physical Parameters	Dimension (width × height × depth)	17.41 in. × 1.73 in. × 17.32 in. (442 mm × 44 mm × 440 mm)
	Weight (with full configuration)	< 19.0 lb. (8.6 kg)
	Maximum power consumption	< 80 W
Storage capacity	Memory	2 GB
	FLASH	1 GB
Slot	Number of slots	4
	Number of slots for line interface boards	2
DC power (single)	Redundancy backup	1+1 redundancy backup, supporting both AC and DC
	Rated output power	250 W
	Rated input voltage	From -60 V DC to -48 V DC
	Range of the maximum input voltage	From -72 V DC to -38 V DC
AC power (single)	Redundancy backup	1+1 redundancy backup, supporting both AC and DC
	Rated input voltage	100 V AC–240 V AC
	Range of the input frequency	50 Hz–60 Hz
	Rated output power	250 W
Grounding resistance		Grounding resistance with common earthing, which is lower than 5 Ω

6.2 Power Supplies

ZXR10 ZSR V2 serial routers support a voltage within the range of 100 V–240 V, AC power of 50 Hz–60 Hz, and DC power from -38 V to -72 V. The 1+1 dual-power redundancy mode and power supply swapping are available.

The power modules have the following functions:

- Alarms are generated due to a high or low input or output voltage.

- Alarms are generated due to a high output current.
- Alarms are generated due to a high or low temperature.



Caution!

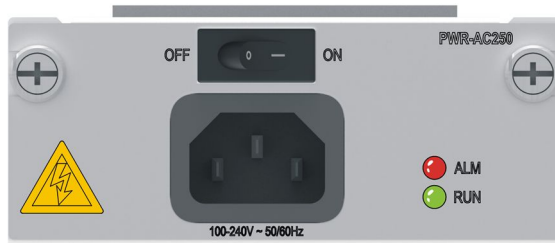
Turn off both power supplies before installing and maintaining the ZXR10 ZSR V2.

6.2.1 AC Power Module

Panel

Figure 6-5 shows the panel of the AC power module of a ZXR10 1800-2E chassis.

Figure 6-5 Panel of the AC Power Module



Indicators

For functions of the indicators on the AC power module of the ZXR10 1800-2E chassis, refer to Table 6-4.

Table 6-4 Functions of the Indicators on the Panel of the AC Power Module of the ZXR10 1800-2E Chassis

Indicator	Number	Color	Description
RUN	1	Green	The power module is operating properly.
ALM	1	Red	The power module is operating improperly.

Buttons

For functions of the power buttons on the AC power module of the ZXR10 1800-2E chassis, refer to Table 6-5.

Table 6-5 Functions of the Power Buttons of the AC Power Module of the ZXR10 1800-2E Chassis

Button	Description
ON (—)	Dial the button to ON to turn on the module.
OFF (O)	Dial the button to OFF to turn off the power.

Technical Parameters

For technical parameters of the rectifier of the AC power module of the ZXR10 1800-2E chassis, refer to [Table 6-6](#).

Table 6-6 Technical Parameters of the AC Power of the ZXR10 1800-2E Chassis

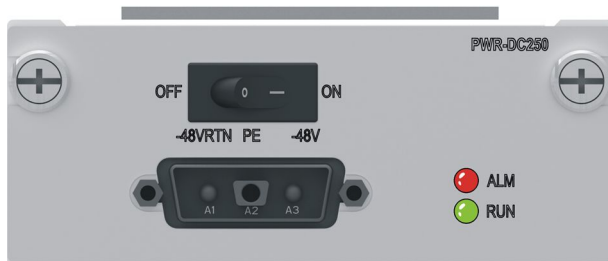
Parameter	Description
Dimension (width × height × depth)	3.15 in. × 1.57 in. × 6.89 in. (80 mm ×40 mm ×175 mm)
Weight	0.68 kg
Range of the input voltage	100 V AC–240 V AC
Input AC frequency	50 Hz–60 Hz
Rated output power	250 W

6.2.2 DC Power Module

Panel

[Figure 6-6](#) shows the panel of the DC power module of a ZXR10 1800-2E chassis.

Figure 6-6 Panel of the DC Power Module



Indicators

For functions of the indicators on the DC power module of the ZXR10 1800-2E chassis, refer to [Table 6-7](#).

Table 6-7 Functions of the Indicators on the Panel of the DC Power Module of the ZXR10 1800-2E Chassis

Indicator	Number	Color	Description
RUN	1	Green	The power module is operating properly.
ALM	1	Red	The power module is operating improperly.

Buttons

For functions of the power buttons on the DC power module of the ZXR10 1800-2E chassis, refer to [Table 6-8](#).

Table 6-8 Functions of the Power Buttons of the DC Power Module of the ZXR10 1800-2E Chassis

Button	Description
ON (—)	Dial the button to ON to turn on the module.
OFF (O)	Dial the button to OFF to turn off the power.

Technical Parameters

For technical parameters of the DC power module of the ZXR10 1800-2E chassis, refer to [Table 6-9](#).

Table 6-9 Technical Parameters of the DC Power Module of the ZXR10 1800-2E Chassis

Parameter	Description
Dimension (width × height × depth)	3.15 in. × 1.57 in. × 6.89 in. (80 mm ×40 mm ×175 mm)
Weight	0.52 kg
Range of the input voltage	From -72 V DC to -38 V DC
Rated output power	250 W
Rated input current	8.5 A

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Chapter 7

MPFU

The Management and Packet Forwarding Unit (MPFU) is the control node of the router. The MPFU forwards packets and manages and maintains the entire device.

The MPFU consists of the packet forwarding module, management and control module, clock processing module, and alarm monitoring module. It forwards packets, and manages the system clock source, control plane, system maintenance plane and environmental monitoring plane.

- The packet forwarding module classifies and forwards the packets that the line interface boards receive and controls the packet traffic.
- The management and control module provides the following functions:
 - Processes protocols and signaling messages to control and notify the system status. The route protocol control layer and the configuration and operation layer are separated to enhance the control layer stability and equipment manageability.
 - Configures and maintains the system status. It provides the system data configuration and upgrade functions and system operation logs. It supports two types of management interfaces: serial port and RJ45 port.
- The alarm monitoring module monitors the operation conditions of the boards, power supply modules, and fan modules and generates alarms when necessary. It provides a user-friendly man-machine interface through the [CLI](#) or [SNMP](#) network management system.

The MPFU of the ZXR10 2800-3E, ZXR10 1800-2E or ZXR10 1800-2S is integrated into the chassis and cannot be removed.

The MPFU boards of the ZXR10 2800-4 and ZXR10 3800-8 can be divided into three types: RAC-2838-MPFU-A, RAC-2838-MPFU-B, and RAC-2838-MPFU-C.

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7.1 RAC-2838-MPFU-A

Overview

RAC-2838-MPFU-A is the type A MPFU of the ZXR10 2800-4 and ZXR10 3800-8. The MPFU provides the following functions:

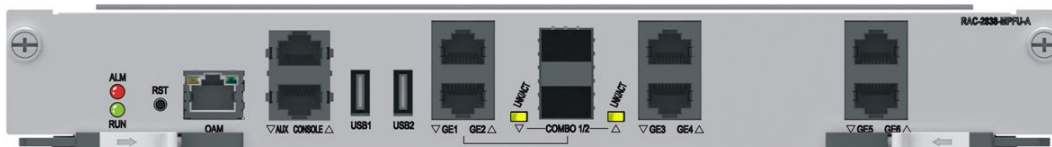
- Supports hot swapping with a modular structure.

- Supports separation of the forwarding plane and control plane.

Panel

For the panel of the RAC-2838-MPFU-A, see [Figure 7-1](#).

Figure 7-1 Panel of the RAC-2838-MPFU-A



Interfaces

For a description of the interfaces of the RAC-2838-MPFU-A, refer to [Table 7-1](#).

Table 7-1 Description of the Interfaces of the RAC-2838-MPFU-A

Interface Type	Silk Screen Name	Description
Network interface (RJ45)	OAM	Network port (10M/100M/1000M) used for system maintenance and program downloading
Serial port (RJ45)	CONSOLE	Debugging port for system management and configuration
	AUX	Debugging serial port of a PIU and Modem convergence port
USB interface	USB1	USB2.0 interface, which transmits the program data and other data
	USB2	
GE electronic interface	GE3-6	Four GE electronic interfaces
COMBO interface	COMBO1/2, GE1-2	Two COMBO interfaces

Indicators

For a description of the LED indicators on the panel of the RAC-2838-MPFU-A, refer to [Table 7-2](#).

Table 7-2 Indicator Descriptions for the RAC-2838-MPFU-A

Indicator	Number	Color	Description
RUN	1	Green	The indicator is lit when the board is operating properly.
ALM	1	Red	The indicator is lit if the board is not operating properly.
LINK/ACT	2	Green	Link state indicators of COMBO interfaces.

Buttons

For a description of the RST button on the panel of the RAC-2838-MPFU-A, refer to [Table 7-3](#).

Table 7-3 RST Button Description for the RAC-2838-MPFU-A

Button	Description
RST	Resets the board.

Technical Parameters

For the technical parameters of the RAC-2838-MPFU-A, refer to [Table 7-4](#).

Table 7-4 Technical Parameters of the RAC-2838-MPFU-A

Parameter	Specification
Silk screen name	RAC-2838-MPFU-A
Dimensions (H × W × D)	11.7 in. × 1.58 in. × 6.9 in. (296.3 mm × 40.24 mm × 175 mm)
Power consumption	35 W
Weight	2.38 lb. (1.08 kg)

7.2 RAC-2838-MPFU-B/RAC-2838-MPFU-C

Overview

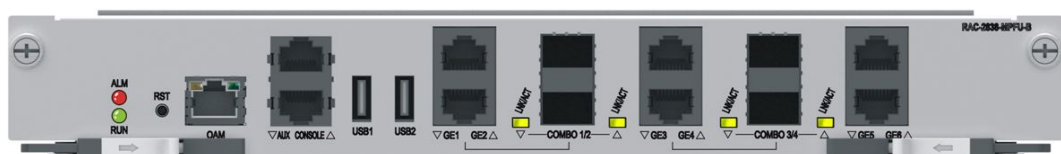
The RAC-2838-MPFU-B and RAC-2838-MPFU-C are MPFU boards of the ZXR10 2800-4 and ZXR10 3800-8.

- The RAC-2838-MPFU-B and RAC-2838-MPFU-C with different forwarding capacity are provided for the ZXR10 2800-4 and ZXR10 3800-8.
- Both of them support hot swapping with a modular structure.
- Both of them support separation of the forwarding plane and control plane.

Panel

The RAC-2838-MPFU-B and RAC-2838-MPFU-C have the same overview except the silk screen name. For an overview of the RAC-2838-MPFU-B/RAC-2838-MPFU-C, see [Figure 7-2](#).

Figure 7-2 RAC-2838-MPFU-B and RAC-2838-MPFU-C



Interfaces

For a description of the interfaces of the RAC-2838-MPFU-B/RAC-2838-MPFU-C, refer to [Table 7-5](#).

Table 7-5 Description of the Interfaces of the RAC-2838-MPFU-B/RAC-2838-MPFU-C

Interface Type	Silk Screen Name	Description
Network interface (RJ45)	OAM	Network port (10M/100M/1000M) used for system maintenance and program downloading
Serial port (RJ45)	CONSOLE	Debugging port for system management and configuration
	AUX	Debugging serial port of a PIU and Modem convergence port
USB interface	USB1	USB2.0 interface, which transmits the program data and other data
	USB2	
GE electronic interface	GE5-6	Two GE electronic interfaces
COMBO interface	COMBO1/2, COMBO3/4, GE1-4	Four COMBO interfaces

Indicators

For a description of the LED indicators on the panel of the RAC-2838-MPFU-B/RAC-2838-MPFU-C, refer to [Table 7-6](#).

Table 7-6 Description of the Indicators on the Panel of the RAC-2838-MPFU-B/RAC-2838-MPFU-C

Indicator	Number	Color	Description
RUN	1	Green	The indicator is lit when the board is operating properly.
ALM	1	Red	The indicator is lit if the board is not operating properly.
LINK/ACT	4	Green	Link state indicators of COMBO interfaces.

Buttons

For a description of the RST button on the panel of the RAC-2838-MPFU-B/RAC-2838-MPFU-C, refer to [Table 7-7](#).

Table 7-7 Description of the RST Button on the Panel of the RAC-2838-MPFU-B/RAC-2838-MPFU-C

Button	Description
RST	Resets the board.

Technical Parameters

For the technical parameters of the RAC-2838-MPFU-B/RAC-2838-MPFU-C, refer to [Table 7-8](#).

Table 7-8 Technical Parameters of the RAC-2838-MPFU-B/RAC-2838-MPFU-C

Parameter	Specification
Silk screen name	RAC-2838-MPFU-B/RAC-2838-MPFU-C
Dimensions (H × W × D)	11.7 in. × 1.58 in. × 6.9 in. (296.3 mm × 40.24 mm × 175 mm)
Power consumption	35 W
Weight	2.38 lb. (1.08 kg)

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Chapter 8

General Processing Boards

General processing boards are installed in slots for full-height DPIU interface cards and used to classify and monitor messages from the main control board.

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RAC-DPIU-OSU-A1	8-1
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8.1 RAC-DPIU-OSU-A1

Overview

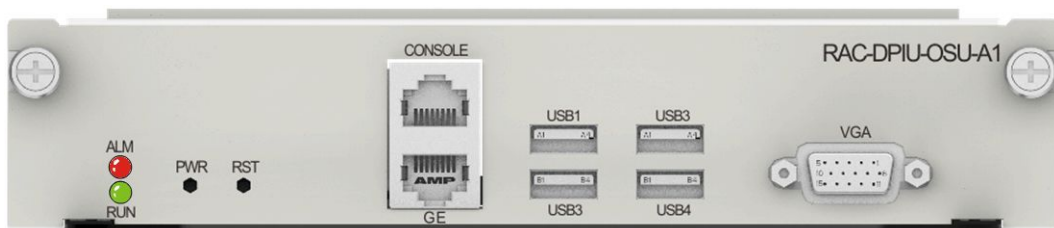
As the general processing board of the ZXR10 2800-4 and ZXR10 3800-8, an RAC-DPIU-OSU-A1 board is installed in a slot for a full-height DPIU interface card and has the following functions:

- Classifies, monitors, filters, and transfers received messages depending on applications.
- Provides four lines of high-speed serial interfaces for the internal gigabit Ethernet and one line of electrical interface for the external gigabit Ethernet.
- GE electrical interfaces support 10BASE-T/100BASE-TX/1000BASE-T.

Panel

For the panel of the RAC-DPIU-OSU-A1 board of the general processing board, see [Figure 8-1](#).

Figure 8-1 Panel of an RAC-DPIU-OSU-A1 Board



Interfaces

For a description of interfaces on the RAC-DPIU-OSU-A1 board, refer to [Table 8-1](#).

Table 8-1 Descriptions of Interfaces on the RAC-DPIU-OSU-A1 Board

Interface Type	Description
Network interface (RJ45)	Service network interface, a 10/100/1000BASE-T electrical interface.
Serial interface (RJ45)	Serial interface interconnected with a PC.
VGA interface (DB15)	X86 VGA output interface.
USB interfaces	USB2.0 interfaces used to install the X86 system.

Indicators

The RAC-DPIU-OSU-A1 board provides multiple LED indicators on its panel. For their functions, refer to [Table 8-2](#).

Table 8-2 Functions of the Indicators on the Panel of the RAC-DPIU-OSU-A1 Board

Indicator	Color	Description
ALM	Red	If this indicator is solid on or flashing, the board is faulty.
RUN	Green	Indicates that the board is operating properly.

Buttons

The RAC-DPIU-OSU-A1 board provides two buttons on its panel. For their functions, refer to [Table 8-3](#).

Table 8-3 Functions of the Buttons on the Panel of the RAC-DPIU-OSU-A1 Board

Button	Description
RST	Board reset button
PWR	Board power button

Technical Parameters

For technical parameters of the RAC-DPIU-OSU-A1 board, refer to [Table 8-4](#).

Table 8-4 Technical Parameters of the RAC-DPIU-OSU-A1 Board

Parameter	Description
Board name silk screen	RAC-DPIU-OSU-A1
Dimension (width × height × depth)	7.76 in. × 1.58 in. × 6.9 in. (197.2 mm × 40.24 mm × 175 mm)
Power consumption	40 W
Weight	2.71 lb. (1.23 kg)
Memory	Default capacity (byte) 4 G or 8 G (optional)
Hard disk	Default capacity (byte) 500 G or 1 T (optional)

8.2 RAC-DPIU-OSU-A2

Overview

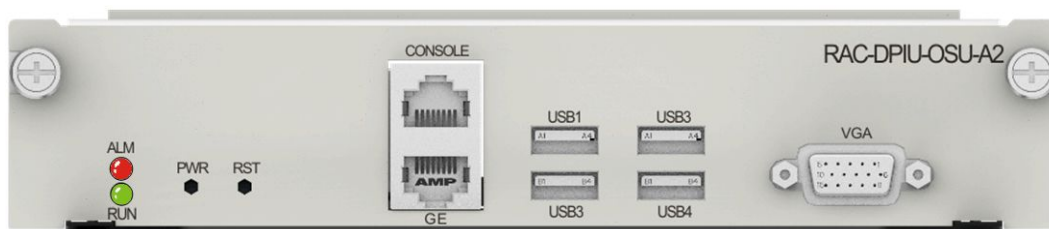
As the general processing board of the ZXR10 2800-4 and ZXR10 3800-8, an RAC-DPIU-OSU-A2 board is installed in a slot for a full-height DPIU interface card and has the following functions:

- Classifies, monitors, filters, and transfers received messages depending on applications.
- Provides four lines of high-speed serial interfaces for the internal gigabit Ethernet and one line of electrical interface for the external gigabit Ethernet.
- GE electrical interfaces support 10BASE-T/100BASE-TX/1000BASE-T.

Panel

For the panel of the RAC-DPIU-OSU-A2 board of the general processing board, see [Figure 8-2](#).

Figure 8-2 Panel of an RAC-DPIU-OSU-A2 Board



Interfaces

For a description of interfaces on the RAC-DPIU-OSU-A2 board, refer to [Table 8-5](#).

Table 8-5 Description of Interfaces on the RAC-DPIU-OSU-A2 Board

Interface Type	Description
Network interface (RJ45)	Service network interface, a 10/100/1000BASE-T electrical interface.
Serial interface (RJ45)	Serial interface interconnected with a PC.
VGA interface (DB15)	X86 VGA output interface.
USB interfaces	USB2.0 interfaces used to install the X86 system.

Indicator

The RAC-DPIU-OSU-A2 board provides multiple LED indicators on its panel. For their functions, refer to [Table 8-6](#).

Table 8-6 Functions of the Indicators on the Panel of the RAC-DPIU-OSU-A2 Board

Indicator	Color	Description
ALM	Red	If this indicator is solid on or flashing, the board is faulty.
RUN	Green	Indicates that the board is operating properly.

Button

The RAC-DPIU-OSU-A2 board provides two buttons on its panel. For their functions, refer to [Table 8-7](#).

Table 8-7 Functions of the Buttons on the Panel of the RAC-DPIU-OSU-A2 Board

Button	Description
RST	Board reset button
PWR	Board power button

Technical Parameters

For technical parameters of the RAC-DPIU-OSU-A2 board, refer to [Table 8-8](#).

Table 8-8 Technical Parameters of the RAC-DPIU-OSU-A2 Board

Parameter	Description
Board name silk screen	RAC-DPIU-OSU-A2
Dimension (width × height × depth)	7.76 in. × 1.58 in. × 6.9 in. (197.2 mm × 40.24 mm × 175 mm)
Power consumption	40 W
Weight	2.71 lb. (1.23 kg)
Memory	Default capacity (byte)
	4 G or 8 G (optional)
Hard disk	Default capacity (byte)
	500 G or 1 T (optional)

8.3 RAC-DPIU-FW-A

Overview

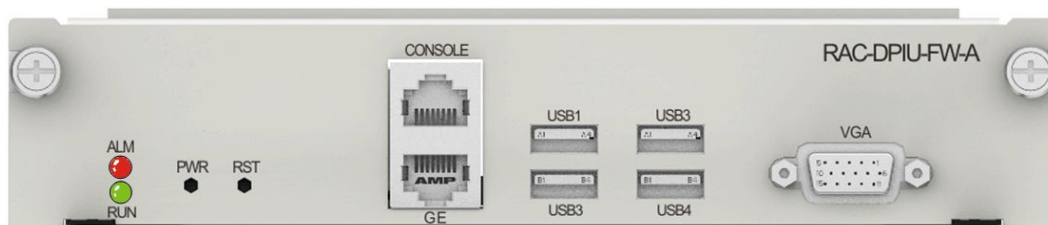
As a firewall board of the ZXR10 3800-8 and ZXR10 2800-4, an RAC-DPIU-FW-A board is installed in a slot for a full-height DPIU interface card and has the following functions:

- Classifies, monitors, filters, and transfers received messages depending on applications.
- Provides four lines of high-speed serial interfaces for the internal gigabit Ethernet and one line of electrical interface for the external gigabit Ethernet.
- GE electrical interfaces support 10BASE-T/100BASE-TX/1000BASE-T.

Panel

For the panel of the RAC-DPIU-FW-A board, see [Figure 8-3](#).

Figure 8-3 Panel of an RAC-DPIU-FW-A Board



Interfaces

For a description of interfaces on a RAC-DPIU-FW-A board, refer to [Table 8-9](#).

Table 8-9 Description of Interfaces on an RAC-DPIU-FW-A Board

Interface Type	Description
Network interface (RJ45)	Service network interface, a 10/100/1000BASE-T electrical interface.
Serial interface (RJ45)	Serial interface interconnected with a PC.
VGA interface (DB15)	X86 VGA output interface.
USB interfaces	USB2.0 interfaces used to install the X86 system.

Indicators

For functions of LED indicators on the panel of a RAC-DPIU-FW-A board, refer to [Table 8-10](#).

Table 8-10 Functions of Indicators on the Panel of an RAC-DPIU-FW-A Board

Indicator	Color	Description
ALM	Red	If this indicator is solid on or flashing, the board is faulty.
RUN	Green	Indicates that the board is operating properly.

Buttons

An RAC-DPIU-FW-A board has two buttons on its panel. For their functions, refer to [Table 8-11](#).

Table 8-11 Functions of Buttons on the Panel of an RAC-DPIU-FW-A Board

Button	Description
RST	Board reset button.
PWR	Board power button.

Technical Parameters

For technical parameters of an RAC-DPIU-FW-A board, refer to [Table 8-12](#).

Table 8-12 Technical Parameters of an RAC-DPIU-FW-A Board

Parameter		Description
Board name silk screen		RAC-DPIU-FW-A
Dimension (width × height × depth)		7.76 in. × 1.58 in. × 6.9 in. (197.2 mm × 40.24 mm × 175 mm)
Power consumption		35 W
Weight		2.31 lb. (1.05 kg)
Memory	Default capacity (byte)	4 G or 8 G (optional)
Hard disk	Default capacity (byte)	2 G

Chapter 9

Line Interface Boards

A line interface board is an external interface of a wire-speed router and implements the access of interfaces of various rates and types. The board provides one or more high-speed network interfaces. The ZXR10 ZSR V2 provides various line interface boards and supports various interface rates and port density to meet the requirements of different networks and services.

For the types of line interface boards that the ZXR10 ZSR V2 series routers support, refer to [Table 9-1](#).

Table 9-1 Line Interface Board Types

Type	Dimensions (Width × Height × Depth)	Applicable Device	Slot
DPIU (full-height)	7.76 in. × 1.58 in. × 6.9 in. (197.2 mm × 40.24 mm × 175 mm)	3800-8, 2800-4	3800-8: combined slots 1 and 3, or combined slots 5 and 7 2800-4: combined slots 1 and 3
DPIU (full-height)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)	3800-8, 2800-4, 2800-3E	3800-8: slot 3 or 7 2800-4: slot 3 2800-3E: slots 2
PIU	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)	3800-8, 2800-4, 2800-3E	3800-8: slot 1, 3, 5, or 7 2800-4: slot 1 or 3 2800-3E: slot 2
SPIU	3.86 in. × 0.79 in. × 6.9 in. (98.1 mm × 19.92 mm × 175 mm)	3800-8, 2800-4, 1800-2S, 2800-3E, 1800-2E	3800-8: slot 0, 2, 4, or 6 2800-4: slot 0 or 2 1800-2S: slot 0 or 1 2800-3E: slot 0 or 1 1800-2E: slot 0 or 1

The DPIU is a fast-speed interface board, and the PIU and SPIU are common-speed interface boards. The ZXR10 2800-4 and ZXR10 3800-8 support the combination of different types of line interface boards.

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RAC-PIU-04SHDSL.....	9-15
RAC-PIU-04HS.....	9-16
RAC-PIU-04CE1-75.....	9-18
RAC-PIU-04CE1-120.....	9-19
RAC-PIU-04UE1-75.....	9-21
RAC-PIU-04UE1-120.....	9-22
RAC-PIU-16CE1.....	9-23
RAC-PIU-16CE1-CES.....	9-25
RAC-PIU-01P12-SFP.....	9-26
RAC-PIU-02P3-SFP.....	9-28
RAC-PIU-04P3-SFP.....	9-29
RAC-PIU-02CP3-SFP.....	9-31
RAC-PIU-04CP3-SFP.....	9-32
RAC-PIU-04GE-SFP.....	9-34
RAC-PIU-08GE-SFP.....	9-35
RAC-PIU-05GE-4E1SFP.....	9-36
RAC-PIU-09GE-8E1SFP.....	9-39
RAC-PIU-08FE1GE-1SFP.....	9-41
RAC-DPIU-16GE-12SFP4E.....	9-43
RAC-DPIU-01XGE-SFP+.....	9-45

9.1 RAC-SPIU-02CE1-75

Overview

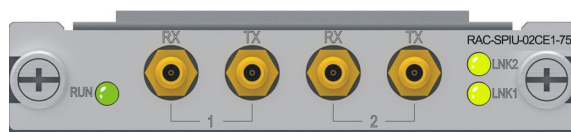
RAC-SPIU-02CE1-75 board provides the following functions:

- Provides two channelized/unchannelized E1 (75 ohm) interfaces.
- Restores the line clock and providing it to an MPFU board for reference.
- Supports the processing of various services, such as PPP and ML-PPP.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-SPIU-02CE1-75 board, see [Figure 9-1](#).

Figure 9-1 Front Panel of the RAC-SPIU-02CE1-75 Board



Interface Property

The RAC-SPIU-02CE1-75 board provides micro coaxial interfaces, and it only supports 75 ohm non-balanced E1 interfaces. For a description of the interface properties, refer to [Table 9-2](#).

Table 9-2 Interface Properties of the RAC-SPIU-02CE1-75 Board

Property	Description
Connector type	Micro coaxial
Operational mode	Full duplex
Applied standard	ITU-T G.703, G.704
Supported link protocol	PPP, ML-PPP, HDLC, FR
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-SPIU-02CE1-75 board, refer to [Table 9-3](#).

Table 9-3 Description of the Indicators on the Panel of the RAC-SPIU-02CE1-75 Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
LNK1/LNK2	Green	The indicator is lit when the link is operating properly, and is not lit when the link is idle.

Technical Parameters

For the technical parameters of the RAC-SPIU-02CE1-75 board, refer to [Table 9-4](#).

Table 9-4 Technical Parameters of the RAC-SPIU-02CE1-75 Board

Parameter	Specification
Silk screen name	RAC-SPIU-02CE1-75
Dimensions (W × H × D)	3.86 in. × 0.79 in. × 6.9 in. (98.1 mm × 19.92 mm × 175 mm)
Power consumption	6 W
Weight	0.53 lb. (0.24 kg)
Rate	2.048 Mbps×2

9.2 RAC-SPIU-02UE1-75

Overview

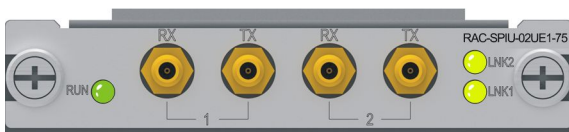
RAC-SPIU-02UE1-75 board provides the following functions:

- Provides two unchannelized E1 (75 ohm) interfaces.
- Restores the line clock and providing it to an MPFU board for reference.
- Supports the processing of various services, such as PPP and ML-PPP.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-SPIU-02UE1-75 board, see [Figure 9-2](#).

Figure 9-2 Front Panel of the RAC-SPIU-02UE1-75 Board



Interface Property

The RAC-SPIU-02UE1-75 board provides micro coaxial interfaces, and it only supports 75 ohm non-balanced E1 interfaces. For a description of the interface properties, refer to [Table 9-5](#).

Table 9-5 Interface Properties of the RAC-SPIU-02UE1-75 Board

Property	Description
Connector type	Micro coaxial
Operational mode	Full duplex
Applied standard	ITU-T G.703, G.704
Supported link protocol	PPP, ML-PPP, HDLC, FR
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-SPIU-02UE1-75 board, refer to [Table 9-6](#).

Table 9-6 Description of the Indicators on the Panel of the RAC-SPIU-02UE1-75 Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
LNK1/LNK2	Green	The indicator is lit when the link is operating properly, and is not lit when the link is idle.

Technical Parameters

For the technical parameters of the RAC-SPIU-02UE1-75 board, refer to [Table 9-7](#).

Table 9-7 Technical Parameters of the RAC-SPIU-02UE1-75 Board

Parameter	Specification
Silk screen name	RAC-SPIU-02UE1-75
Dimensions (W ×H × D)	3.86 in. × 0.79 in. × 6.9 in. (98.1 mm ×19.92 mm ×175 mm)
Power consumption	6 W
Weight	0.53 lb. (0.24 kg)
Rate	2.048 Mbps×2

9.3 RAC-SPIU-02CE1-120

Overview

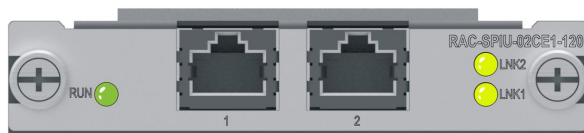
RAC-SPIU-02CE1-120 board provides the following functions:

- Provides two channelized/unchannelized E1 (120 ohm) interfaces.
- Restores the line clock and providing it to an MPFU board for reference.
- Supports the processing of various services, such as PPP and ML-PPP.
- Supports hot swapping.
- Supports board information query and temperature monitoring.
- Supports the delayed power-on function.

When the router is powered on, all the boards are started up, causing a high pressure on the power supply. The delayed power-on function can reduce the electric current impact caused by the boards and protect components from damage due to the instantaneous surge current.

Panel

For the panel of the RAC-SPIU-02CE1-120 board, see [Figure 9-3](#).

Figure 9-3 Front Panel of the RAC-SPIU-02CE1-120 Board

Interface Property

The RAC-SPIU-02CE1-120 board provides RJ48 interfaces, and it only supports 120 ohm E1 interfaces. For a description of the interface properties, refer to [Table 9-8](#).

Table 9-8 Interface Properties of the RAC-SPIU-02CE1-120 Board

Property	Description
Connector type	RJ48

Property	Description
Operational mode	Full duplex
Applied standard	ITU-T G.703, G.704
Supported link protocol	PPP, ML-PPP, HDLC, FR
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-SPIU-02CE1-120 board, refer to [Table 9-9](#).

Table 9-9 Description of the Indicators on the Panel of the RAC-SPIU-02CE1-120 Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
LNK1/LNK2	Green	The indicator is lit when the link is operating properly, and is not lit when the link is idle.

Technical Parameters

For the technical parameters of the RAC-SPIU-02CE1-120 board, refer to [Table 9-10](#).

Table 9-10 Technical Parameters of the RAC-SPIU-02CE1-120 Board

Parameter	Specification
Silk screen name	RAC-SPIU-02CE1-120
Dimensions (W × H × D)	3.86 in. × 0.79 in. × 6.9 in. (98.1 mm × 19.92 mm × 175 mm)
Power consumption	6 W
Weight	0.53 lb. (0.24 kg)
Rate	2.048 Mbps×2

9.4 RAC-SPIU-02UE1-120

Overview

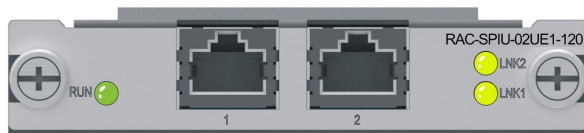
RAC-SPIU-02UE1-120 board provides the following functions:

- Provides two unchannelized E1 (120 ohm) interfaces.
- Restores the line clock and providing it to an MPFU board for reference.
- Supports the processing of various services, such as PPP and ML-PPP.
- Supports hot swapping.
- Supports board information query and temperature monitoring.
- Supports the delayed power-on function.

Panel

For the panel of the RAC-SPIU-02UE1-120 board, see [Figure 9-4](#).

Figure 9-4 Front Panel of the RAC-SPIU-02UE1-120 Board



Interface Property

The RAC-SPIU-02UE1-120 board provides RJ48 interfaces, and it only supports 120 ohm E1 interfaces. For a description of the interface properties, refer to [Table 9-11](#).

Table 9-11 Interface Properties of the RAC-SPIU-02UE1-120 Board

Property	Description
Connector type	RJ48
Operational mode	Full duplex
Applied standard	ITU-T G.703, G.704
Supported link protocol	PPP, ML-PPP, HDLC, FR
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-SPIU-02UE1-120 board, refer to [Table 9-12](#).

Table 9-12 Description of the Indicators on the Panel of the RAC-SPIU-02UE1-120 Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
LNK1/LNK2	Green	The indicator is lit when the link is operating properly, and is not lit when the link is idle.

Technical Parameters

For the technical parameters of the RAC-SPIU-02UE1-120 board, refer to [Table 9-13](#).

Table 9-13 Technical Parameters of the RAC-SPIU-02UE1-120 Board

Parameter	Specification
Silk screen name	RAC-SPIU-02UE1-120
Dimensions (W ×H × D)	3.86 in. × 0.79 in. × 6.9 in. (98.1 mm ×19.92 mm ×175 mm)
Power consumption	6 W
Weight	0.53 lb. (0.24 kg)

Parameter	Specification
Rate	2.048 Mbps×2

9.5 RAC-SPIU-02HS

Overview

RAC-SPIU-02HS board provides the following functions:

- Provides 2-wire serial ports supporting asynchronous or synchronous data transmission mode.
 - For synchronous data transmission mode, the ports can be connected to [DTEs](#) or [DCEs](#). The circuit side supports the V.24, V.35 or X.21 interfaces. The V.24 interface supports a maximum rate of 115.2 Kbps. The V.35 interface supports a maximum rate of 4.096 Mbps. The X.21 interface supports a maximum rate of 48 Kbps.
 - Asynchronous data transmission mode supports the RS232 interface that supports a maximum rate of 115.2 Kbps.
- Supports the processing of various services, such as [PPP](#) and [HDLC](#).
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-SPIU-02HS board, see [Figure 9-5](#).

Figure 9-5 Front Panel of the RAC-SPIU-02HS Board



Interface Property

For a description of the interface properties, refer to [Table 9-14](#).

Table 9-14 Interface Properties of the RAC-SPIU-02HS Board

Property	Description
Connector type	DB50
Operational mode	Asynchronous or synchronous
Applied standard	V.24, V.35, X.21, or RS232
Supported link protocol	PPP , HDLC, and FR

Property	Description
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-SPIU-02HS board, refer to [Table 9-15](#).

Table 9-15 Description of the Indicators on the Panel of the RAC-SPIU-02HS Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
LNK1/LNK2	Green	The indicator is lit when the link is operating properly, and is not lit when the link is idle.

Technical Parameters

For the technical parameters of the RAC-SPIU-02HS board, refer to [Table 9-16](#).

Table 9-16 Technical Parameters of the RAC-SPIU-02HS Board

Parameter	Specification
Silk screen name	RAC-SPIU-02HS
Dimensions (W × H × D)	3.86 in. × 0.79 in. × 6.9 in. (98.1 mm × 19.92 mm × 175 mm)
Power consumption	7 W
Weight	0.46 lb. (0.21 kg)
Rate	Multiple rates, up to 4.096 Mbps.

9.6 RAC-SPIU-04GE

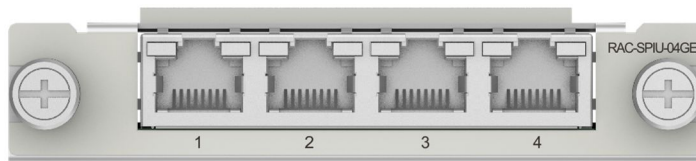
Overview

An RAC-SPIU-04GE board has the following functions:

- Provides four lines of electrical interfaces for gigabit Ethernet interface cards.
- Supports self-adaptive 10/100/1000BASE-T.
- Supports hop swapping of boards.
- Supports board temperature detection and board ID read.

Panel

For the panel of an RAC-SPIU-04GE board, see [Figure 9-6](#).

Figure 9-6 Front Panel of an RAC-SPIU-04GE Board

Attributes of Interfaces

An RAC-SPIU-04GE board provides electrical interfaces. For attributes of these electrical interfaces, refer to [Table 9-17](#).

Table 9-17 Attributes of Interfaces on an RAC-SPIU-04GE Board

Description	Description
Interface Type	RJ45
Working Mode	Full duplex, and half duplex
Standard	IEEE 802.3z Gigabit Ethernet standard
Link protocol	Ethernet frame
Network protocol	IP

Indicators

For functions of indicators on the panel of the RAC-SPIU-04GE board, refer to [Table 9-18](#).

Table 9-18 Description of Functions of the Indicators on the Panel of the RAC-SPIU-04GE Board

Indicator	Color	Description
Electrical interface indicator	Green and yellow	<p>Four groups of link status/data communication indicators for GE electrical interfaces:</p> <ul style="list-style-type: none"> ● If the link is properly connected, the indicator in the top right corner of the interface turns solid green. ● If data is transmitted on the board, the indicator in the top right corner of the interface flashes yellow. ● If no data is transmitted and no link is connected, the indicator turns off.

Technical Parameters

For technical parameters of an RAC-SPIU-04GE board, refer to [Table 9-19](#).

Table 9-19 Technical Parameters of an RAC-SPIU-04GE Board

Parameter	Description
Board name silk screen	RAC-SPIU-04GE
Dimension (width × height × depth)	3.86 in. × 0.79 in. × 6.9 in. (98.1 mm × 19.92 mm × 175 mm)

Parameter	Description
Power consumption	7 W
Weight	0.22 lb. (0.1 kg)
Rate	1 GE×4

9.7 RAC-PIU-LTE

Overview

The RAC-PIU-LTE is a 3G/LTE interface board for the ZXR10 2800-4 and ZXR10 3800-8. It supports 3G/LTE radio network access. It can operate as the primary or secondary link for enterprises to access the Internet to transfer audio, data, and video files.

- Supports TD-LTE, FDD-LTE, TD-SCDMA, WCDMA, and HSPA+.
- Supports the frequency bands of multiple networks, including:
 - GSM/GPRS Quad Band (850, 900, 1800, and 1900)
 - TD-SCDMA B34, and B39
 - WCDMA B1, B2, and B5
 - LTE B38, B39, B40, and B41
 - LTE FDD B1, B2, B3, B5, and B7
 - GPS L1
- Supports different network speeds for different networks.
 - For FDD-LTE and TD-LTE, the board supports network speeds of 100 Mbps and 50 Mbps.
 - For TD-SCDMA, the board supports network speeds of 2.8 Mbps and 2.2 Mbps.
 - For WCDMA DC-HSPA+, the board supports network speeds of 42 Mbps and 5.7 Mbps.
 - For WCDMA HSDPA, the board supports network speeds of 21 Mbps and 5.76 Mbps.
- Supports hot-swapping.

Panel

Figure 9-7 shows the panel of the RAC-PIU-LTE board.

Figure 9-7 RAC-PIU-LTE Board Panel



Interface Attribute

The RAC-PIU-LTE board transfers data through the radio signals on the Sub-Miniature-A (SMA) interface (whip omnidirectional antenna). The panel has no other external interfaces.



Note:

The SMA is a common model of antenna interfaces.

Indicators

For a description of the indicators on the panel of the RAC-PIU-LTE board, refer to [Table 9-20](#).

Table 9-20 RAC-PIU-LTE Board Indicator Descriptions

Indicator	Color	Description
RUN	Green	Operational status indicator. It is on when the board is operating properly.
ALM	Red	Alarm indicator. It is on if the board has an alarm.
WWAN	Green	Radio network access indicator. It flashes when the board tries to access a radio network. It is on when the board accesses the radio network successfully. It is off if the board fails to access the radio network.
RSSI	Green	Signal strength indicator. <ul style="list-style-type: none"> ● RSSI \leq -100 dbm: There is no signal. The indicator is off. ● $-99 \text{ dbm} \leq \text{RSSI} \leq -90 \text{ dbm}$: The signal is weak. The indicator flashes. ● RSSI \geq -89 dbm: The signal is strong. The indicator is on.
3G	Green	3G signal indicator. It is on after the board accesses a 3G network.
LTE	Green	LTE signal indicator. It is on after the board accesses an LTE network.

Technical Specifications

For a description of the technical specifications of the RAC-PIU-LTE board, refer to [Table 9-21](#).

Table 9-21 RAC-PIU-LTE Board Technical Specifications

Parameter	Descriptions
Silk screen name	RAC-PIU-LTE
Dimensions (Width × Height × Depth)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	7 W
Weight	1.23 lb. (0.56 kg)

9.8 RAC-PIU-01DSL

Overview

RAC-PIU-01DSL board provides the following functions:

- Provides one [DSL](#) interface, which supports the VDSL2/ADSL2+ mode.
- Provides one DSL (B) interface, which supports to be bound with the DSL interface.

For single-interface access, the DSL interface is used. For dual-interface access, both the DSL and DSL (B) interfaces are used and it is not allowed to use the DSL (B) interface only.

- Supports the Dying Gasp function.

It is a power-down alarm function. When the input voltage cannot meet the normal operation requirement, the board generates an alarm with the last electric energy.

- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-01DSL board, see [Figure 9-8](#).

Figure 9-8 Front Panel of the RAC-PIU-01DSL Board

Interface Property

For a description of the interface properties, refer to [Table 9-22](#).

Table 9-22 Interface Properties of the RAC-PIU-01DSL Board

Property	Description
Connector type	RJ-11 interface, which can be connected to a DSLAM through a common telephone cable

Property	Description
Operational mode	VDSL2/ADSL2+ mode
Applied standard	VDSL: <ul style="list-style-type: none"> ● ITU-T G.993.2 (VDSL2) ● ITU-T G.993.5 (G.vector) ADSL: <ul style="list-style-type: none"> ● ITU-T G.992.1 (G.dmt), Annex A, B, and C ● ITU-T G.992.2 (G.lite), Annex A and C ● ANSI T1.413 ● ITU-T G.992.3 (ADSL2), Annex A, B, C, L, and M ● ITU-T G.992.5 (ADSL2+), Annex A, B, C, and M
Supported link protocol	ATM, PTM
Supported network protocol	PPPoEoA, IPoEoA

Indicators

For a description of the indicators of the RAC-PIU-01DSL2 board, refer to [Table 9-23](#).

Table 9-23 Description of the Indicators on the Panel of the RAC-PIU-01DSL2 Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	Alarm indicator, which is lit when the board has an alarm.
LNK/ACT	Green, Yellow	Link status/data transmission indicator: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-01DSL2 board, refer to [Table 9-24](#).

Table 9-24 Technical Parameters of the RAC-PIU-01DSL2 Board

Parameter	Specification
Silk screen name	RAC-PIU-01DSL2
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	16 W
Weight	0.88 lb. (0.4 kg)

Parameter	Specification
Rate	In ADSL2+ full rate mode (ITU-T 992.5): The downlink rate can reach 24 Mbps and the uplink rate can reach 1 Mbps. In VDSL2 mode (ITU-T 993.2): The downlink rate can reach 100 Mbps and the uplink rate can reach 50 Mbps.

9.9 RAC-PIU-04SHDSL

Overview

RAC-PIU-04SHDSL board provides the following functions:

- Provides one G.SHDSL (SHDSL group) interface, which provides four SHDSL electrical interfaces.

Symmetric High bit rate Digital Subscriber Line (SHDSL) evolves from HDSL and complies with the ITU-T G.991.2 and G.994.2 standards. Only one pair of telephone lines are required for data transmission, which reduces the requirement on copper wire resources. SHDSL uses the TC-PAM16/32/64 coding mode, where a greater number represents a faster transmission speed. It can be used for audio, video, and data transmission.

- Supports the ATM and EFM protocol encapsulation modes.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-04SHDSL board, see [Figure 9-9](#).

Figure 9-9 Front Panel of the RAC-PIU-04SHDSL board



Interface Properties

For a description of the interface properties, refer to [Table 9-25](#).

Table 9-25 Interface Properties of the RAC-PIU-04SHDSL Board

Property	Description
Connector type	RJ45 interface, connected to four RJ11 interfaces at the peer end
Operational mode	Full duplex
Applied standard	ITU-T G.991.2

Property	Description
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-04SHDSL board, refer to [Table 9-26](#).

Table 9-26 Description of the Indicators on the Panel of the RAC-PIU-04SHDSL Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK/ACT	Green, Yellow	Link status/data transmission indicator: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-04SHDSL board, refer to [Table 9-27](#).

Table 9-27 Technical Parameters of the RAC-PIU-04SHDSL Board

Parameter	Specification
Silk screen name	RAC-PIU-04SHDSL
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	10 W
Weight	1.19 lb. (0.54 kg)
Rate	5.696 Mbit/s/pair

9.10 RAC-PIU-04HS

Overview

RAC-PIU-04HS board provides the following functions:

- Provides 4-wire serial ports supporting asynchronous or synchronous data transmission mode.
 - For synchronous data transmission mode, the ports can be connected to [DTEs](#) or [DCEs](#). The circuit side supports the V.24, V.35, or X.21 interfaces. The V.24 interface supports a maximum rate of 115.2 Kbps. The V.35 interface supports

a maximum rate of 4.096 Mbps. The X.21 interface supports a maximum rate of 48 Kbps.

→ Asynchronous data transmission mode supports the RS232 interface that supports a maximum rate of 115.2 Kbps.

- Supports the processing of various services, such as PPP and HDLC.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-04HS board, see [Figure 9-10](#).

Figure 9-10 Front Panel of the RAC-PIU-04HS Board



Interface Property

For a description of the interface properties, refer to [Table 9-28](#).

Table 9-28 Interface Properties of the RAC-PIU-04HS Board

Property	Description
Connector type	DB50
Operational mode	Asynchronous or synchronous
Applied standard	V.24, V.35, X.21 or RS232
Supported link protocol	PPP, HDLC or FR
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-04HS board, refer to [Table 9-29](#).

Table 9-29 Description of the Indicators on the Panel of the RAC-PIU-04HS Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK1–LNK4	Green	The indicator is lit when the link is operating properly, and is not lit when the link is idle.

Technical Parameters

For the technical parameters of the RAC-PIU-04HS board, refer to [Table 9-30](#).

Table 9-30 Technical Parameters of the RAC-PIU-04HS Board

Parameter	Specification
Silk screen name	RAC-PIU-04HS
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	10 W
Weight	1.19 lb. (0.54 kg)
Rate	1200 bps–4.096 Mbps × 4

9.11 RAC-PIU-04CE1-75

Overview

RAC-PIU-04CE1-75 board provides the following functions:

- Provides four channelized/unchannelized E1 (75 ohm) interfaces.
- Restores the line clock and providing it to an MPFU board for reference.
- Supports the processing of various services, such as [PPP](#) and [ML-PPP](#).
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-04CE1-75 board, see [Figure 9-11](#).

Figure 9-11 Front Panel of the RAC-PIU-04CE1-75 Board

Interface Property

The RAC-PIU-04CE1-75 board provides micro coaxial interfaces, and it only supports 75 ohm non-balanced E1 interfaces. For a description of the interface properties, refer to [Table 9-31](#).

Table 9-31 Interface Properties of the RAC-PIU-04CE1-75 Board

Property	Description
Connector type	Micro coaxial
Operational mode	Full duplex
Applied standard	ITU-T G.703 , G.704
Supported link protocol	PPP , ML-PPP , HDLC , FR

Property	Description
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-04CE1-75 board, refer to [Table 9-32](#).

Table 9-32 Description of the Indicators on the Panel of the RAC-PIU-04CE1-75 Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK1–LNK4	Green	The indicator is lit when the link is operating properly, and is not lit when the link is idle.

Technical Parameters

For the technical parameters of the RAC-PIU-04CE1-75 board, refer to [Table 9-33](#).

Table 9-33 Technical Parameters of the RAC-PIU-04CE1-75 Board

Parameter	Specification
Silk screen name	RAC-PIU-04CE1-75
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	11 W
Weight	1.19 lb. (0.54 kg)
Rate	2.048 Mbps × 4

9.12 RAC-PIU-04CE1-120

Overview

RAC-PIU-04CE1-120 board provides the following functions:

- Provides four channelized/unchannelized E1 (120 ohm) interfaces.
- Restores the line clock and providing it to an MPFU board for reference.
- Supports the processing of various services, such as [PPP](#) and [ML-PPP](#).
- Supports hot swapping.
- Supports board information query and temperature monitoring.
- Supports the delayed power-on function.

Panel

For the panel of the RAC-PIU-04CE1-120 board, see [Figure 9-12](#).

Figure 9-12 Front Panel of the RAC-PIU-04CE1-120 Board

Interface Property

The RAC-PIU-04CE1-120 board provides RJ48 interfaces, and it only supports 120 ohm E1 interfaces. For a description of the interface properties, refer to [Table 9-34](#).

Table 9-34 Interface Properties of the RAC-PIU-04CE1-120 Board

Property	Description
Connector type	RJ48
Operational mode	Full duplex
Applied standard	ITU-T G.703, G.704
Supported link protocol	PPP, ML-PPP, HDLC, FR
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-04CE1-120 board, refer to [Table 9-35](#).

Table 9-35 Description of the Indicators on the Panel of the RAC-PIU-04CE1-120 Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK1–LNK4	Green	The indicator is lit when the link is operating properly, and is not lit when the link is idle.

Technical Parameters

For the technical parameters of the RAC-PIU-04CE1-120 board, refer to [Table 9-36](#).

Table 9-36 Technical Parameters of the RAC-PIU-04CE1-120 Board

Parameter	Specification
Silk screen name	RAC-PIU-04CE1-120
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	11 W
Weight	1.19 lb. (0.54 kg)
Rate	2.048 Mbps × 4

9.13 RAC-PIU-04UE1-75

Overview

RAC-PIU-04UE1-75 board provides the following functions:

- Provides four unchannelized E1 (75 ohm) interfaces.
- Restores the line clock and providing it to an MPFU board for reference.
- Supports the processing of various services, such as [PPP](#) and [ML-PPP](#).
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-04UE1-75 board, see [Figure 9-13](#).

Figure 9-13 Front Panel of the RAC-PIU-04UE1-75 Board



Interface Property

The RAC-PIU-04UE1-75 board provides micro coaxial interfaces, and it only supports 75 ohm non-balanced E1 interfaces. For a description of the interface properties, refer to [Table 9-37](#).

Table 9-37 Interface Properties of the RAC-PIU-04UE1-75 Board

Property	Description
Connector type	Micro coaxial
Operational mode	Full duplex
Applied standard	ITU-T G.703 , G.704
Supported link protocol	PPP , ML-PPP , HDLC , FR
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-04UE1-75 board, refer to [Table 9-38](#).

Table 9-38 Description of the Indicators on the Panel of the RAC-PIU-04UE1-75 Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.

Indicator	Color	Description
LNK1-LNK4	Green	The indicator is lit when the link is operating properly, and is not lit when the link is idle.

Technical Parameters

For the technical parameters of the RAC-PIU-04UE1-75 board, refer to [Table 9-39](#).

Table 9-39 Technical Parameters of the RAC-PIU-04UE1-75 Board

Parameter	Specification
Silk screen name	RAC-PIU-04UE1-75
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	11 W
Weight	1.19 lb. (0.54 kg)
Rate	2.048 Mbps × 4

9.14 RAC-PIU-04UE1-120

Overview

RAC-PIU-04UE1-120 board provides the following functions:

- Provides four unchannelized E1 (120 ohm) interfaces.
- Restores the line clock and providing it to an MPFU board for reference.
- Supports the processing of various services, such as [PPP](#) and [ML-PPP](#).
- Supports hot swapping.
- Supports board information query and temperature monitoring.
- Supports the delayed power-on function.

Panel

For the panel of the RAC-PIU-04UE1-120 board, see [Figure 9-14](#).

Figure 9-14 Front Panel of the RAC-PIU-04UE1-120 Board



Interface Property

The RAC-PIU-04UE1-120 board provides RJ48 interfaces, and it only supports 120 ohm E1 interfaces. For a description of the interface properties, refer to [Table 9-40](#).

Table 9-40 Interface Properties of the RAC-PIU-04UE1-120 Board

Property	Description
Connector type	RJ48
Operational mode	Full duplex
Applied standard	ITU-T G.703, G.704
Supported link protocol	PPP, ML-PPP, HDLC, FR
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-04UE1-120 board, refer to [Table 9-41](#).

Table 9-41 Description of the Indicators on the Panel of the RAC-PIU-04UE1-120 Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK1–LNK4	Green	The indicator is lit when the link is operating properly, and is not lit when the link is idle.

Technical Parameters

For the technical parameters of the RAC-PIU-04UE1-120 board, refer to [Table 9-42](#).

Table 9-42 Technical Parameters of the RAC-PIU-04UE1-120 Board

Parameter	Specification
Silk screen name	RAC-PIU-04UE1-120
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	11 W
Weight	1.19 lb. (0.54 kg)
Rate	2.048 Mbps × 4

9.15 RAC-PIU-16CE1

Overview

RAC-PIU-16CE1 board provides the following functions:

- Provides 16 channelized/unchannelized E1 interfaces.
- Supports the processing of various services, such as PPP and ML-PPP.
- Supports hot swapping.

- Supports board information query and temperature monitoring.
- Supports the 75 Ω or 120 Ω configuration.

The board provides jumpers X6, X9, and X10 to configure the interface resistance to 75 Ω or 120 Ω . By default, the interface resistance is 75 Ω . For the interface resistance configuration, refer to the following table.

Jumper	75 Ω	120 Ω
X6	2-3: ON	1-2: ON
X9 and X10	ON	OFF



Caution!

The jumper configuration can be performed by professionals only.

Panel

For the panel of the RAC-PIU-16CE1 board, see [Figure 9-15](#).

Figure 9-15 Front Panel of the RAC-PIU-16CE1 Board



Interface Properties

For the interface properties of the RAC-PIU-16CE1 board, refer to [Table 9-43](#).

Table 9-43 Interface Properties of the RAC-PIU-16CE1 Board

Property	Description
Connector type	DB50
Operational mode	Full duplex
Applied standard	ITU-T G.703, G.704
Supported link protocol	PPP, ML-PPP, HDLC, FR
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-16CE1 board, refer to [Table 9-44](#).

Table 9-44 Description of the Indicators on the Panel of the RAC-PIU-16CE1 Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.

Technical Parameters

For the technical parameters of the RAC-PIU-16CE1 board, refer to [Table 9-45](#).

Table 9-45 Technical Parameters of the RAC-PIU-16CE1 Board

Parameter	Specification
Silk screen name	RAC-PIU-16CE1
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	16 W
Weight	1.19 lb. (0.54 kg)
Rate	2.048 Mbps × 16

9.16 RAC-PIU-16CE1-CES

Overview

RAC-PIU-16CE1-CES board provides the following functions:

- Provides 16 channelized/unchannelized E1 interfaces.
- Supports the processing of various services, such as [TDM](#), [PPP](#) and [ML-PPP](#).
- Supports hot swapping.
- Supports board information query and temperature monitoring.
- Supports the 75 Ω or 120 Ω configuration.

Panel

For the panel of the RAC-PIU-16CE1-CES board, see [Figure 9-16](#).

Figure 9-16 Front Panel of the RAC-PIU-16CE1-CES Board

Interface Properties

For the interface properties of the RAC-PIU-16CE1-CES board, refer to [Table 9-46](#).

Table 9-46 Interface Properties of the RAC-PIU-16CE1-CES Board

Property	Description
Connector type	DB50
Operational mode	Full duplex
Applied standard	ITU-T G.703, G.704
Supported link protocol	TDM

Indicators

For a description of the indicators of the RAC-PIU-16CE1-CES board, refer to [Table 9-47](#).

Table 9-47 Description of the Indicators on the Panel of the RAC-PIU-16CE1-CES Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.

Technical Parameters

For the technical parameters of the RAC-PIU-16CE1-CES board, refer to [Table 9-48](#).

Table 9-48 Technical Parameters of the RAC-PIU-16CE1-CES Board

Parameter	Specification
Silk screen name	RAC-PIU-16CE1-CES
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	16 W
Weight	1.19 lb. (0.54 kg)
Rate	2.048 Mbps × 16

9.17 RAC-PIU-01P12-SFP

Overview

RAC-PIU-01P12-SFP board provides the following functions:

- Supports 1-wire OC-12/STM-4 POS applications.
- Supports the processing of various services, such as PPP and HDLC.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-01P12-SFP board, see [Figure 9-17](#).

Figure 9-17 Front Panel of the RAC-PIU-01P12-SFP Board



Interface Property

The RAC-PIU-01P12-SFP board uses SFP optical modules. For a description of the interface properties, refer to [Table 9-49](#).

Table 9-49 Interface Properties of the RAC-PIU-01P12-SFP Board

Property	Description
Connector type	LC-type SFP optical module interface
Operational mode	Full duplex
Applied standard	SONET GR-253-CORE/ITU-T G.707
Supported link protocol	PPP, HDLC, FR, POSGROUP
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-01P12-SFP board, refer to [Table 9-50](#).

Table 9-50 Description of the Indicators on the Panel of the RAC-PIU-01P12-SFP Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK/ACT	Green/Yellow	Link status/data transmission indicator: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-01P12-SFP board, refer to [Table 9-51](#).

Table 9-51 Technical Parameters of the RAC-PIU-01P12-SFP Board

Parameter	Specification
Silk screen name	RAC-PIU-01P12-SFP
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	16 W

Parameter	Specification
Weight	1.19 lb. (0.54 kg)
Rate	622.08 Mbps

9.18 RAC-PIU-02P3-SFP

Overview

RAC-PIU-02P3-SFP board provides the following functions:

- Supports 2-wire OC-3/STM-1 POS applications.
- Supports the processing of various services, such as PPP and HDLC.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-02P3-SFP board, see [Figure 9-18](#).

Figure 9-18 Front Panel of the RAC-PIU-02P3-SFP Board



Interface Property

The RAC-PIU-02P3-SFP board uses SFP optical modules. For a description of the interface properties, refer to [Table 9-52](#).

Table 9-52 Interface Properties of the RAC-PIU-02P3-SFP Board

Property	Description
Connector type	LC-type SFP optical module interface
Operational mode	Full duplex
Applied standard	SONET GR-253-CORE/ITU-T G.707
Supported link protocol	PPP, HDLC, FR, POSGROUP
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-02P3-SFP board, refer to [Table 9-53](#).

Table 9-53 Description of the Indicators on the Panel of the RAC-PIU-02P3-SFP Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK/ACT	Green/Yellow	Link status/data transmission indicator: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-02P3-SFP board, refer to [Table 9-54](#).

Table 9-54 Technical Parameters of the RAC-PIU-02P3-SFP Board

Parameter	Specification
Silk screen name	RAC-PIU-02P3-SFP
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	16.5 W
Weight	1.19 lb. (0.54 kg)
Rate	155.52 Mbps × 2

9.19 RAC-PIU-04P3-SFP

Overview

RAC-PIU-04P3-SFP board provides the following functions:

- Provides four OC-3/STM-1 interfaces to implement POS applications.
- Supports the processing of various services, such as [PPP](#) and [HDLC](#).
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-04P3-SFP board, see [Figure 9-19](#).

Figure 9-19 Front Panel of the RAC-PIU-04P3-SFP Board

Interface Properties

The RAC-PIU-04P3-SFP board uses SFP optical modules. For a description of the interface properties, refer to [Table 9-55](#).

Table 9-55 Interface Properties of the RAC-PIU-04P3-SFP Board

Property	Description
Connector type	LC-type SFP optical module interface
Operational mode	Full duplex
Applied standard	SONET GR-253-CORE/ITU-T G.707
Supported link protocol	PPP, HDLC, FR, POSGROUP
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-04P3-SFP board, refer to [Table 9-56](#).

Table 9-56 Description of the Indicators on the Panel of the RAC-PIU-04P3-SFP Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK/ACT	Green/Yellow	Link status/data transmission indicator: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-04P3-SFP board, refer to [Table 9-57](#).

Table 9-57 Technical Parameters of the RAC-PIU-04P3-SFP Board

Parameter	Specification
Silk screen name	RAC-PIU-04P3-SFP
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	18 W
Weight	1.19 lb. (0.54 kg)
Rate	155.52 Mbps × 4

9.20 RAC-PIU-02CP3-SFP

Overview

RAC-PIU-02CP3-SFP board provides the following functions:

- Supports 2-wire channelized OC-3/STM-1 POS applications.
- Restores the optical channel data clock and providing it to an MPFU board for reference.
- Supports the processing of various services, such as PPP and HDLC.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-02CP3-SFP board, see [Figure 9-20](#).

Figure 9-20 Front Panel of the RAC-PIU-02CP3-SFP Board



Interface Property

The RAC-PIU-02CP3-SFP board uses SFP optical modules. For a description of the interface properties, refer to [Table 9-58](#).

Table 9-58 Interface Properties of the RAC-PIU-02CP3-SFP Board

Property	Description
Connector type	LC-type SFP optical module interface
Operational mode	Full duplex
Applied standard	SONET GR-253-CORE/ITU-T G.707
Supported link protocol	PPP, HDLC, FR, MPPP
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-02CP3-SFP board, refer to [Table 9-59](#).

Table 9-59 Description of the Indicators on the Panel of the RAC-PIU-02CP3-SFP Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.

Indicator	Color	Description
LNK/ACT	Green/Yellow	Link status/data transmission indicator: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-02CP3-SFP board, refer to [Table 9-60](#).

Table 9-60 Technical Parameters of the RAC-PIU-02CP3-SFP Board

Parameter	Specification
Silk screen name	RAC-PIU-02CP3-SFP
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	16.5 W
Weight	1.19 lb. (0.54 kg)
Rate	155.52 Mbps × 2

9.21 RAC-PIU-04CP3-SFP

Overview

RAC-PIU-04CP3-SFP board provides the following functions:

- Provides four channelized OC3/STM-1 interfaces to implement Packet Over [SONET/SDH](#) applications.
- Restores the optical channel data clock and provides it to an MPFU board for reference.
- Supports the processing of various services, such as [PPP](#) and [HDLC](#).
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-04CP3-SFP board, see [Figure 9-21](#).

Figure 9-21 Front Panel of the RAC-PIU-04CP3-SFP Board



Interface Properties

The RAC-PIU-04CP3-SFP board uses SFP optical modules. For a description of the interface properties, refer to [Table 9-61](#).

Table 9-61 Interface Properties of the RAC-PIU-04CP3-SFP Board

Property	Description
Connector type	LC-type SFP optical module interface
Operational mode	Full duplex
Applied standard	SONET GR-253-CORE/ITU-T G.707
Supported link protocol	PPP, HDLC, FR, MPPP
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-04CP3-SFP board, refer to [Table 9-62](#).

Table 9-62 Description of the Indicators on the Panel of the RAC-PIU-04CP3-SFP Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK/ACT	Green/Yellow	Link status/data transmission indicator: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-04CP3-SFP board, refer to [Table 9-63](#).

Table 9-63 Technical Parameters of the RAC-PIU-04CP3-SFP Board

Parameter	Specification
Silk screen name	RAC-PIU-04CP3-SFP
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	18 W
Weight	1.19 lb. (0.54 kg)
Rate	155.52 Mbps × 4

9.22 RAC-PIU-04GE-SFP

Overview

RAC-PIU-04GE-SFP board provides the following functions:

- Provides four GE optical interfaces which support 1000BASE-X.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-04GE-SFP board, see [Figure 9-22](#).

Figure 9-22 Front Panel of the RAC-PIU-04GE-SFP Board



Interface Properties

The RAC-PIU-04GE-SFP board uses SFP optical modules. For a description of the interface properties, refer to [Table 9-64](#).

Table 9-64 Interface Properties of the RAC-PIU-04GE-SFP Board

Property	Description
Connector type	LC-type SFP optical module interface
Operational mode	Full duplex
Applied standard	IEEE802.3z Gigabit Ethernet standard
Supported link protocol	Ethernet Frame
Supported network protocol	Ethernet

Indicators

For a description of the indicators of the RAC-PIU-04GE-SFP board, refer to [Table 9-65](#).

Table 9-65 Description of the Indicators on the Panel of the RAC-PIU-04GE-SFP Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.

Indicator	Color	Description
LNK/ACT	Green/Yellow	Link status/data transmission indicator: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-04GE-SFP board, refer to [Table 9-66](#).

Table 9-66 Technical Parameters of the RAC-PIU-04GE-SFP Board

Parameter	Specification
Silk screen name	RAC-PIU-04GE-SFP
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	13 W
Weight	1.19 lb. (0.54 kg)
Rate	1 GE×4

9.23 RAC-PIU-08GE-SFP

Overview

RAC-PIU-08GE-SFP board provides the following functions:

- Provides eight GE optical interfaces which support 1000BASE-X.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-08GE-SFP board, see [Figure 9-23](#).

Figure 9-23 Front Panel of the RAC-PIU-08GE-SFP Board



Interface Properties

The RAC-PIU-08GE-SFP board uses SFP optical modules. For a description of the interface properties, refer to [Table 9-67](#).

Table 9-67 Interface Properties of the RAC-PIU-08GE-SFP Board

Property	Description
Connector type	LC-type SFP optical module interface
Operational mode	Full duplex
Applied standard	IEEE 802.3z Gigabit Ethernet standard
Supported link protocol	Ethernet Frame
Supported network protocol	Ethernet

Indicators

For a description of the indicators of the RAC-PIU-08GE-SFP board, refer to [Table 9-68](#).

Table 9-68 Description of the Indicators on the Panel of the RAC-PIU-08GE-SFP Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK	Green	Link status/data transmission indicator: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-08GE-SFP board, refer to [Table 9-69](#).

Table 9-69 Technical Parameters of the RAC-PIU-08GE-SFP Board

Parameter	Specification
Silk screen name	RAC-PIU-08GE-SFP
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	15 W
Weight	1.19 lb. (0.54 kg)
Rate	1 GE × 8

9.24 RAC-PIU-05GE-4E1SFP

Overview

RAC-PIU-05GE-4E1SFP board provides the following functions:

- Provides four GE electrical interfaces and one GE optical interface.
- The GE electrical interfaces support 10BASE-T/100BASE-TX/1000BASE-TX and the GE optical interface supports 1000BASE-X.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-05GE-4E1SFP board, see [Figure 9-24](#).

Figure 9-24 Front Panel of the RAC-PIU-05GE-4E1SFP Board



Interface Properties

The RAC-PIU-05GE-4E1SFP board provides electrical and optical interfaces (GE1–GE5), which are not distinguished by silk screen name. They can be distinguished by the interface overview and indicators.

For a description of the GE electrical interface properties of the RAC-PIU-05GE-4E1SFP board, refer to [Table 9-70](#).

Table 9-70 GE Electrical Interface Properties of the RAC-PIU-05GE-4E1SFP Board

Property	Description
Connector type	RJ-45
Operational mode	Full duplex, Half duplex
Applied standard	IEEE 802.3z Gigabit Ethernet standard
Supported frame format	Ethernet frame
Supported network protocol	IP

The RAC-PIU-05GE-4E1SFP board uses SFP optical modules. For a description of the optical interface properties, refer to [Table 9-71](#).

Table 9-71 Optical Interface Properties of the RAC-PIU-05GE-4E1SFP Board

Property	Description
Connector type	LC-type SFP optical module interface
Operational mode	Full duplex
Applied standard	IEEE 802.3z Gigabit Ethernet standard
Supported frame format	Ethernet frame

Property	Description
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-05GE-4E1SFP board, refer to [Table 9-72](#).

Table 9-72 Description of the Indicators on the Panel of the RAC-PIU-05GE-4E1SFP Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
Electrical port indicator	Green/Yellow	Link status/data transmission indicators for four GE electrical interfaces: <ul style="list-style-type: none"> ● If the link is normal, the right green indicator is lit. ● If data is being transmitted, the left yellow indicator flashes. ● If there is no data being transmitted or no connection, the indicators are not lit.
LNK/ACT	Green/Yellow	Link status/data transmission indicators for the GE optical interface: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-05GE-4E1SFP board, refer to [Table 9-73](#).

Table 9-73 Technical Parameters of the RAC-PIU-05GE-4E1SFP Board

Parameter	Specification
Silk screen name	RAC-PIU-05GE-4E1SFP
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	11 W
Weight	0.88 lb. (0.4 kg)
Rate	1 GE × 5

9.25 RAC-PIU-09GE-8E1SFP

Overview

RAC-PIU-09GE-8E1SFP board provides the following functions:

- Provides eight GE electrical interfaces and one GE optical interface.
- The GE electrical interfaces support 10BASE-T/100BASE-TX/1000BASE-TX and the GE optical interface supports 1000BASE-X.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-09GE-8E1SFP board, see [Figure 9-25](#).

Figure 9-25 Front Panel of the RAC-PIU-09GE-8E1SFP Board



Interface Properties

The RAC-PIU-09GE-8E1SFP board provides electrical and optical interfaces (GE1–GE9), which are not distinguished by silk screen name. They can be distinguished by the interface overview and indicators.

For a description of the GE electrical interface properties of the RAC-PIU-09GE-8E1SFP board, refer to [Table 9-74](#).

Table 9-74 GE Electrical Interface Properties of the RAC-PIU-09GE-8E1SFP Board

Property	Description
Connector type	RJ45
Operational mode	Full duplex, Half duplex
Applied standard	IEEE 802.3z Gigabit Ethernet standard
Supported frame format	Ethernet frame
Supported network protocol	IP

The RAC-PIU-09GE-8E1SFP board uses SFP optical modules. For a description of the optical interface properties, refer to [Table 9-75](#).

Table 9-75 Optical Interface Properties of the RAC-PIU-09GE-8E1SFP Board

Property	Description
Connector type	LC-type SFP optical module interface

Property	Description
Operational mode	Full duplex
Applied standard	IEEE 802.3z Gigabit Ethernet standard
Supported frame format	Ethernet frame
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-09GE-8E1SFP board, refer to [Table 9-76](#).

Table 9-76 Description of the Indicators on the Panel of the RAC-PIU-09GE-8E1SFP Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
Electrical port indicator	Green/Yellow	Link status/data transmission indicators for four GE electrical interfaces: <ul style="list-style-type: none"> ● If the link is normal, the right green indicator is lit. ● If data is being transmitted, the left yellow indicator flashes. ● If there is no data being transmitted or no connection, the indicators are not lit.
LNK/ACT	Green/Yellow	Link status/data transmission indicators for the GE optical interface: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-09GE-8E1SFP board, refer to [Table 9-77](#).

Table 9-77 Technical Parameters of the RAC-PIU-09GE-8E1SFP Board

Parameter	Specification
Silk screen name	RAC-PIU-09GE-8E1SFP
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	12 W
Weight	1.19 lb. (0.54 kg)
Rate	1 GE × 9

9.26 RAC-PIU-08FE1GE-1SFP

Overview

RAC-PIU-08FE1GE-1SFP board provides the following functions:

- Provides eight FE electrical interfaces and one GE optical interface.
- The FE electrical interfaces support 100BASE-TX and the GE optical interface supports 1000BASE-X.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-PIU-08FE1GE-1SFP board, see [Figure 9-26](#).

Figure 9-26 Front Panel of the RAC-PIU-08FE1GE-1SFP Board



Interface Properties

The RAC-PIU-08FE1GE-1SFP board provides electrical and optical interfaces (FE1–FE8, GE1), which are distinguished by silk screen name. They can be also distinguished by the interface overview and indicators.

For a description of the FE electrical interface properties of the RAC-PIU-08FE1GE-1SFP board, refer to [Table 9-78](#).

Table 9-78 GE Electrical Interface Properties of the RAC-PIU-08FE1GE-1SFP Board

Property	Description
Connector type	RJ45
Operational mode	Full duplex, Half duplex
Applied standard	IEEE 802.3u Fast Ethernet standard
Supported frame format	Ethernet frame
Supported network protocol	IP

The RAC-PIU-08FE1GE-1SFP board uses SFP optical modules. For a description of the optical interface properties, refer to [Table 9-79](#).

Table 9-79 Optical Interface Properties of the RAC-PIU-08FE1GE-1SFP Board

Property	Description
Connector type	LC-type SFP optical module interface

Property	Description
Operational mode	Full duplex
Applied standard	IEEE 802.3z Gigabit Ethernet standard
Supported frame format	Ethernet frame
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-PIU-08FE1GE-1SFP board, refer to [Table 9-80](#).

Table 9-80 Description of the Indicators on the Panel of the RAC-PIU-08FE1GE-1SFP Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
Electrical port indicator	Green/Yellow	Link status/data transmission indicators for four GE electrical interfaces: <ul style="list-style-type: none"> ● If the link is normal, the right green indicator is lit. ● If data is being transmitted, the left yellow indicator flashes. ● If there is no data being transmitted or no connection, the indicators are not lit.
LNK/ACT	Green/Yellow	Link status/data transmission indicators for the GE optical interface: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-PIU-08FE1GE-1SFP board, refer to [Table 9-81](#).

Table 9-81 Technical Parameters of the RAC-PIU-08FE1GE-1SFP Board

Parameter	Specification
Silk screen name	RAC-PIU-08FE1GE-1SFP
Dimensions (W × H × D)	7.76 in. × 0.79 in. × 6.9 in. (197.2 mm × 19.92 mm × 175 mm)
Power consumption	11 W
Weight	1.19 lb. (0.54 kg)
Rate	1 GE × 1, 1FE × 8

9.27 RAC-DPIU-16GE-12SFP4E

Overview

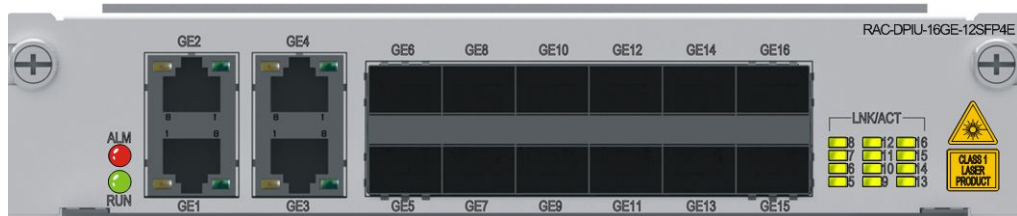
RAC-DPIU-16GE-12SFP4E board provides the following functions:

- Provides four GE electrical interfaces and twelve GE optical interface.
- The GE electrical interfaces support 10BASE-T/100BASE-TX/1000BASE-T and the GE optical interfaces support 1000BASE-X/100BASE-FX.
- Supports hot swapping.
- Supports board information query and temperature monitoring.

Panel

For the panel of the RAC-DPIU-16GE-12SFP4E board, see [Figure 9-27](#).

Figure 9-27 Front Panel of the RAC-DPIU-16GE-12SFP4E Board



Interface Properties

The RAC-DPIU-16GE-12SFP4E board provides electrical and optical interfaces (GE1–GE16), which are not distinguished by silk screen name. They can be distinguished by the interface overview and indicators.

For a description of the GE electrical interface properties of the RAC-DPIU-16GE-12SFP4E board, refer to [Table 9-82](#).

Table 9-82 GE Electrical Interface Properties of the RAC-DPIU-16GE-12SFP4E Board

Property	Description
Connector type	RJ45
Operational mode	Full duplex, Half duplex
Applied standard	IEEE 802.3z Gigabit Ethernet standard
Supported frame format	Ethernet frame
Supported network protocol	IP

The RAC-DPIU-16GE-12SFP4E board uses SFP optical modules. For a description of the optical interface properties, refer to [Table 9-83](#).

Table 9-83 Optical Interface Properties of the RAC-DPIU-16GE-12SFP4E Board

Property	Description
Connector type	LC-type SFP optical module interface
Operational mode	Full duplex
Applied standard	IEEE 802.3z Gigabit Ethernet standard
Supported frame format	Ethernet frame
Supported network protocol	IP

Indicators

For a description of the indicators of the RAC-DPIU-16GE-12SFP4E board, refer to [Table 9-84](#).

Table 9-84 Description of the Indicators on the Panel of the RAC-DPIU-16GE-12SFP4E Board

Indicator	Color	Description
RUN	Green	The indicator is lit when the board is operating properly.
ALM	Red	The indicator is lit if the board produces an alarm.
Electrical port indicator	Green/Yellow	Link status/data transmission indicators for four GE electrical interfaces: <ul style="list-style-type: none"> ● If the link is normal, the right green indicator is lit. ● If data is being transmitted, the left yellow indicator flashes. ● If there is no data being transmitted or no connection, the indicators are not lit.
LNK/ACT	Green/Yellow	Link status/data transmission indicators for 12 GE optical interfaces: <ul style="list-style-type: none"> ● If the link is normal, the indicator is lit in green. ● If data is being transmitted, the indicator flashes in yellow. ● If there is no data being transmitted or no connection, the indicator is not lit.

Technical Parameters

For the technical parameters of the RAC-DPIU-16GE-12SFP4E board, refer to [Table 9-85](#).

Table 9-85 Technical Parameters of the RAC-DPIU-16GE-12SFP4E Board

Parameter	Specification
Silk screen name	RAC-DPIU-16GE-12SFP4E
Dimensions (W × H × D)	7.76 in. × 1.58 in. × 6.9 in. (197.2 mm × 40.24 mm × 175 mm)
Power consumption	36 W
Weight	0.6 kg

Parameter	Specification
Rate	1 GE×16

9.28 RAC-DPIU-01XGE-SFP+

Overview

The silk screen name of the 1-port XGE interface board is RAC-DPIU-01XGE-SFP+, which supports 10GE applications. It provides the following functions:

- Provides one 10GE LAN/WAN SFP+ optical interface, which supports 10G LAN/10G WAN.
- Supports power ramp on control and hot swapping
- Supports temperature measurement and board ID reading.

Panel

For the panel of the RAC-DPIU-01XGE-SFP+ board, see [Figure 9-28](#).

Figure 9-28 Front Panel of the RAC-DPIU-01XGE-SFP+ Board



Interface Property

The RAC-DPIU-01XGE-SFP+ board uses SFP+ optical modules. For a description of the interface properties, refer to [Table 9-86](#).

Table 9-86 Interface Properties of the RAC-DPIU-01XGE-SFP+ Board

Property	Description
Connector type	LC
Optical interface property	Determined by the attributes of the selected SFP+ optical module
Operational mode	Full duplex
Applied standard	IEEE802.3ae
Supported link protocol	Ethernet frame/SONET/SDH
Supported network protocol	IP

Indicators

On the panel of the RAC-DPIU-01XGE-SFP+ board, there are two board operation indicators (RUN and ALM) and one port operation indicators (LNK/ACT, green/yellow). For a description of the indicators, refer to [Table 9-87](#).

Table 9-87 Description of the Indicators on the Panel of the RAC-DPIU-01XGE-SFP+ Board

Indicator	Color	Description
RUN	Green	The indicator flashes once per second if the board operates properly.
ALM	Red	The indicator is lit if the board produces an alarm.
LNK/ACT	Green/Yellow	Optical port operation indicator. The green indicator is lit if the port is in link up status, and the yellow indicator flashes if there is traffic.

Technical Parameters

For the technical parameters of the RAC-DPIU-01XGE-SFP+ board, refer to [Table 9-88](#).

Table 9-88 Technical Parameters of the RAC-DPIU-01XGE-SFP+ Board

Parameter	Specification
Silk screen name	RAC-DPIU-01XGE-SFP+
Dimensions (H × W × D)	0.78 in. × 7.77 in. × 6.9 in (19.92 mm × 197.2 mm × 175 mm)
Power consumption	16 W
Weight	0.68 kg
Rate	10G×1

Chapter 10

Cables

For cables commonly used by the ZXR10 ZSR V2 router, refer to [Table 10-1](#).

Table 10-1 Common Cables of the ZXR10 ZSR V2 Router

Classification	Cable Type	Function
Power cables and grounding cables	DC power cable	Used when DC power is supplied to a device.
	AC power cable	Used when AC power is supplied to a device.
	Grounding cable	Connects a cabinet, chassis, or cabinet door to the ground to guarantee safe power supply.
Signal cables	AUX cable	Connects the AUX port of a device to a Modem for transmitting device configuration data.
	Console cable	Connects the Console port of a device to the serial port of the control console for transmitting device configuration data.
	Ethernet cable	Used for Ethernet communication between devices or between a device and a terminal.
	Optical fiber	Used for high-speed communication between devices.
	SHDSL cable	Transmits multiple types of signals, including voice, data, and video signals.
	Synchronous/Asynchronous serial cable	Transmits synchronous/asynchronous signals.
	E1 trunk cable	Transmits E1 trunk signals.

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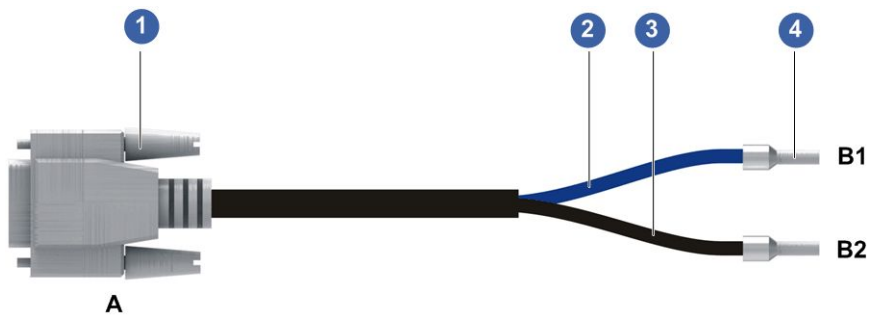
Power Cables and Grounding Cables.....	10-1
Signal Cables	10-4

10.1 Power Cables and Grounding Cables

10.1.1 DC Power Cables

A DC power cable of the ZXR10 ZSR V2 is a black/blue fire-retardant PVC insulated cable, see [Figure 10-1](#).

Figure 10-1 DC Power Cable



- 1. D-type 3-core straight solder connector (hole + pin + hole, with protective edges)
- 2. 12 A WG blue multi-strand heat-resistant cable
- 3. 12 A WG black UL1015 cable
- 4. Pre-insulated tube terminal

For the relationship between DC power cable core wires and pin positions, refer to [Table 10-2](#).

Table 10-2 Core Wires of a DC Power Cable

End A	Color	End B	Tag
A1	Black	B2	-48 V RTN
A3	Blue	B1	-48 V



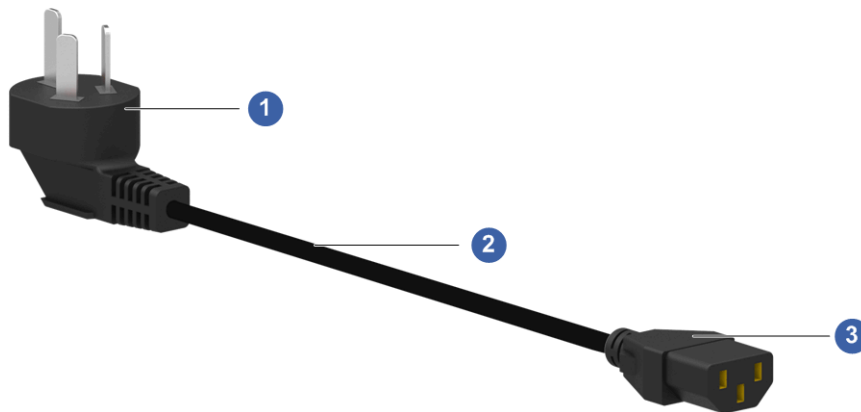
Caution!

DC power cables of the ZXR10 ZSR V2 are dedicated cables. It is forbidden to use them for other purposes.

10.1.2 AC Power Cables

For the overview of an AC power cable of the ZXR10 ZSR V2, see [Figure 10-2](#).

Figure 10-2 AC Power Cable



1. 10 A international standard 3-pin flat male plug
2. 3 × 0.75 mm² power cable (with 3C certification)
3. 10 A international standard T-shaped female plug

For the models and specifications of the AC power cables of the ZXR10 ZSR V2, refer to [Table 10-3](#).

Table 10-3 Technical Parameters of an AC Power Cable

Item	Description
Terminal model	10 A international standard 3-pin flat male plug
	10 A international standard T-shaped female plug
Cable model	3 × 0.0012 sq. in. (0.75 mm ²), with 3C certification

10.1.3 Grounding Cables

Grounding cables connect a cabinet, chassis, or cabinet door to the ground to guarantee safe power supply.

A grounding cable is a yellow green copper-core cable, see [Figure 10-3](#)

Figure 10-3 Overview of a Protective Grounding Cable



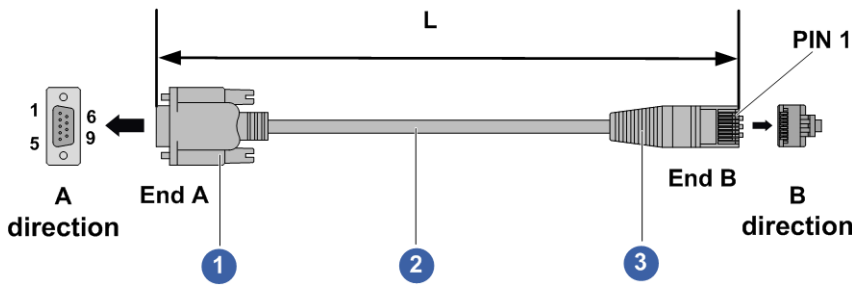
10.2 Signal Cables

10.2.1 AUX Cables

The AUX cable is an 8-core shielded cable. One end of the cable is an RJ45 connector connecting to the MPU AUX interface. The other end connects to the computer serial port.

For an AUX cable connected to the DB9 port, see [Figure 10-4](#).

Figure 10-4 AUX Cable (DB9)



- 1. D-type 9-core straight plastic injection mold (hole)
- 2. CAT 5e network cable
- 3. 8P8C straight cable crimp shielded plug

For the relationship between AUX cable (DB9) core wires and pin positions, refer to [Table 10-4](#).

Table 10-4 Core Wires of an AUX Cable

RJ45 Pin	PCB AUX Signal	Signal Direction	DB9 Pin	PC DB9 (Hole) Signal	Modem DB-9 (Pin) Pin	Modem DB-9 (Pin) Signal
1	CTS	←	7	RTS	8	CTS
2	DTR	→	6	DSR	4	DTR
3	TXD	→	2	RXD	3	TXD
4	DCD	←	1	DCD	1	DCD
5	GND	—	5	GND	5	GND
6	RXD	←	3	TXD	2	RXD

RJ45 Pin	PCB AUX Signal	Signal Direction	DB9 Pin	PC DB9 (Hole) Signal	Modem DB-9 (Pin) Pin	Modem DB-9 (Pin) Signal
7	DSR	←	4	DTR	6	DSR
8	RTS	→	8	CTS	7	RTS

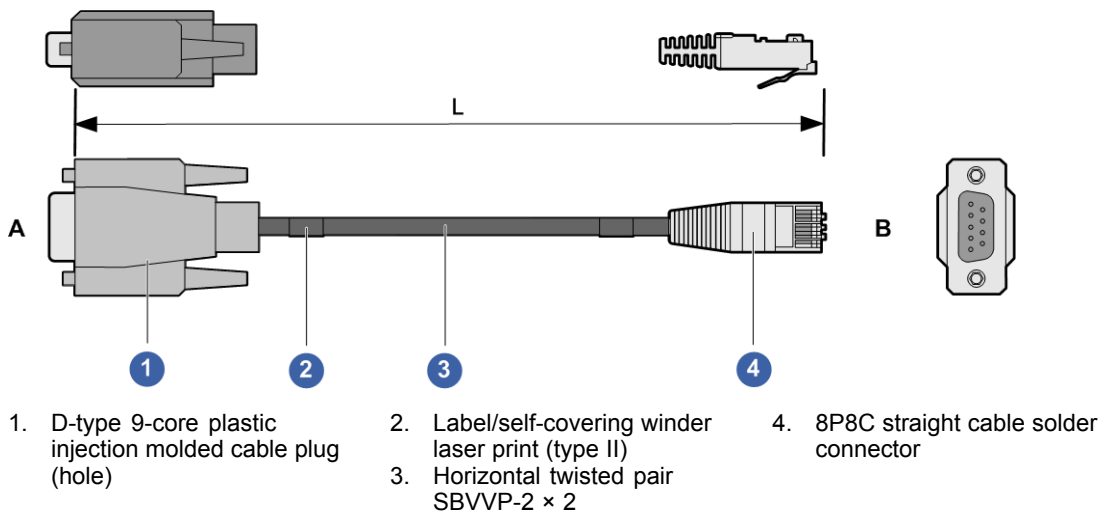
10.2.2 Console Cables

Connecting the ZXR10 ZSR V2 console port to the console serial port, the console cable transmits device configuration data.

The console communication cable is an 8-core shielded cable. One end of the cable is an RJ45 connector connecting to the MPU console port. The other end connects to the server serial port.

For the overview of the console cable, see [Figure 10-5](#).

Figure 10-5 Console Cable Structure



For the relationship between console cable core wires and pin positions, refer to [Table 10-5](#).

Table 10-5 Core Wires of a Console Cable

RJ45 Pin	PCB CONSOLE Signal	Signal Direction	DB9 Pin	PC DB9 (Hole) Signal
1	No signal in case of three wires	←	7	RTS
2	No signal in case of three wires	→	6	DSR
3	TXD	→	2	RXD
4	GND	←	1	DCD

RJ45 Pin	PCB CONSOLE Signal	Signal Direction	DB9 Pin	PC DB9 (Hole) Signal
5	GND	—	5	GND
6	RXD	←	3	TXD
7	DSR	←	4	DTR
8	RTS	→	8	CTS

10.2.3 Ethernet Cables

There are two types of Ethernet cables, crossover cables and straight-through cables.

Straight-through Ethernet cables are used in the following cases:

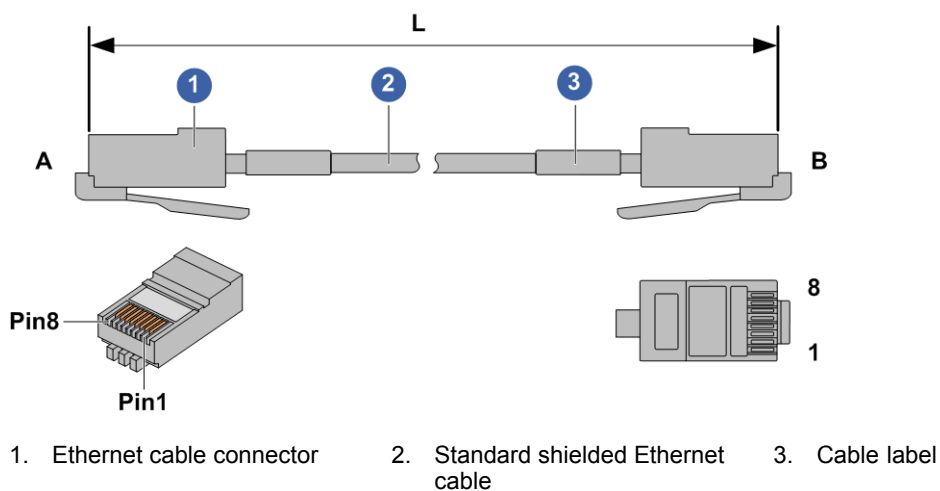
- Ethernet connection between ZXR10 ZSR V2 and a line concentrator.
- Ethernet connection between ZXR10 ZSR V2 and an Ethernet switch.
- Ethernet connection between a computer and a line concentrator.
- Ethernet connection between a computer and an Ethernet switch.

Crossover Ethernet cables are used in the following cases:

- Ethernet connection between two ZXR10 ZSR V2 devices.
- Ethernet connection between ZXR10 ZSR V2 and a computer Ethernet card.
- Ethernet connection between two line concentrators.
- Ethernet connection between a line concentrator and an Ethernet switch.
- Ethernet connection between two Ethernet switches.
- Ethernet card connection between two computers.

An Ethernet cable consists of RJ45 connectors and an eight-wire twisted pair cable. For an overview of the Ethernet cable, see [Figure 10-6](#).

Figure 10-6 Ethernet cable



For the wiring sequence of the straight-through Ethernet cable, refer to [Table 10-6](#).

Table 10-6 Wiring Sequence of the Straight-Through Ethernet Cable

Color	End A	End B	Color
White/orange	1	1	White/orange
Orange	2	2	Orange
White/green	3	3	White/green
Blue	4	4	Blue
White/blue	5	5	White/blue
Green	6	6	Green
White/brown	7	7	White/brown
Brown	8	8	Brown

For the wiring sequence of the cross-over Ethernet cable, refer to [Table 10-7](#).

Table 10-7 Wiring Sequence of the Cross-Over Ethernet Cable

Color	End A	End B	Color
White/orange	1	3	White/green
Orange	2	6	Green
White/green	3	1	White/orange
Blue	4	4	Blue
White/blue	5	5	White/blue
Green	6	2	Orange
White/brown	7	7	White/brown
Brown	8	8	Brown

For the technical parameters of the Ethernet cable, refer to [Table 10-8](#).

Table 10-8 Technical Parameters of the Ethernet Cable

Cable connector	8P8C straight cable crimp connector
Model	E5088-001023
Technical parameter	Rated current: 1.5 A, rated voltage: 125 V, connected to ASG24-28# gauge round wires

10.2.4 Optical Fibers

Overview

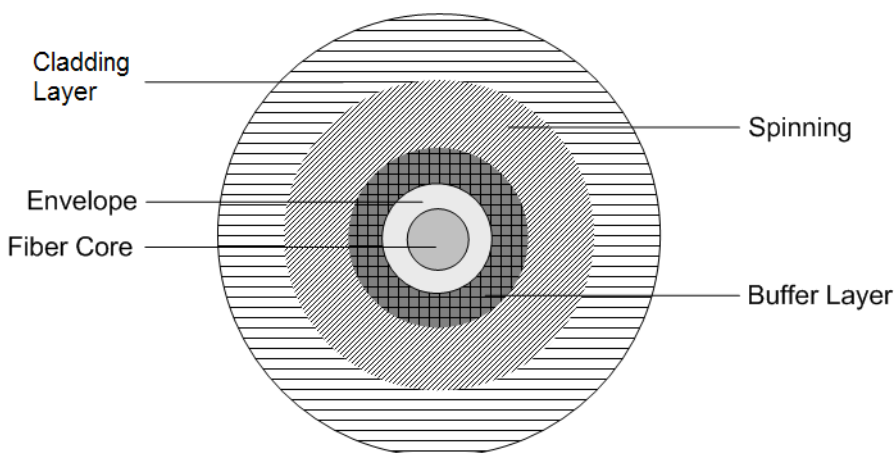
The optical fiber is a communication medium that uses a bundle of thin glass rods to transmit the modulated light. There are two types of optical fibers, single-mode optical

fibers and multimode optical fibers. The user may select one in accordance with the particular situation.

- Multimode optical fiber: Transmits signals by using multiple modes of light (for short-distance transmission).
- Single-mode optical fiber: Transmits signals by using a single mode of light (for long-distance transmission).

Each optical fiber is composed of the fiber core, cladding layer, buffer layer, strengthening layer, and the outer jacket. For the physical cross-sectional area of a fiber cable, see Figure 10-7.

Figure 10-7 Optical Fiber Cross-sectional Area



The fiber core is the optical transmission component located at the core. It is made of silicon or glass. The chemical compositions of a fiber core are partially different from those of the cladding layer, so that the light entering at a specified angle is reflected continuously by the fiber core and cladding layer. Therefore, light remains in the fiber core during the whole transmission process.

Optical Fiber Connectors

Selection of optical fiber connectors depends on the operating environment and devices. The ZXR10 ZSR V2 router uses the following types of optical fiber connectors:

- LC connector
- SC connector
- FC connector

Connectors at the two ends of the optical fiber can be of the same type or different types. For the connector pairing and usage, refer to Table 10-9.

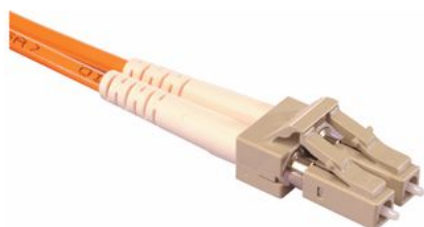
Table 10-9 Optical Fiber Connector Pairing and Usage

Device-end Connector type	Opposite-end Connector type	Cable Type	Cable Usage
LC	FC	Single-mode indoor optical fiber	Connection between a device interface line card and ODF

Device-end Connector type	Opposite-end Connector type	Cable Type	Cable Usage
LC	LC	Single-mode indoor optical fiber	Connection between interface line cards
LC	SC	Multimode indoor optical fiber	Connection between interface line cards
LC	SC	Single-mode indoor optical fiber	Connection between an interface line card and other types of devices
LC	LC	Multimode indoor optical fiber	Connection between an interface line card and other types of devices

Interface boards of the ZXR10 ZSR V2 mainly use LC-type connectors, see [Figure 10-8](#).

Figure 10-8 LC-type Fiber Connector

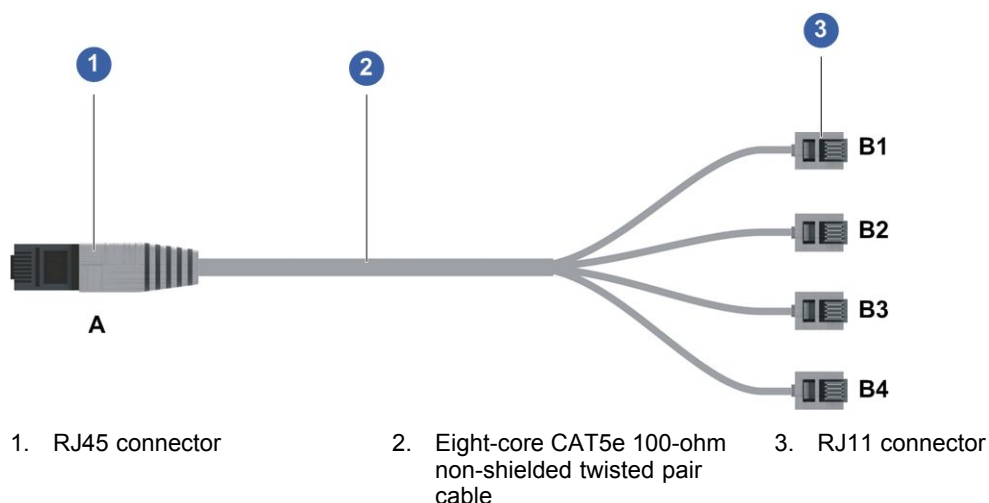


10.2.5 SHDSL Cables

An **SHDSL** cable is an eight-core CAT5e 100-ohm non-shielded twisted pair cable. One end is connected to one RJ45 connector, and the other end is connected to four RJ11 connectors. The SHDSL cables can be used for transmitting multiple types of signals, including voice, data, and video signals.

For an overview of the SHDSL cable, see [Figure 10-9](#).

Figure 10-9 SHDSL Cable



An SHDSL cable provides four ports (two wires for each port) at the RJ11 connector side. For the wiring sequence of the SHDSL cable, refer to [Table 10-10](#).

Table 10-10 Wiring Sequence of the SHDSL Cable

Pin Number at End A	Color	Pin Number at End B		Label
4 (Line0 A)	White/green	3	B1	port 1
5 (Line0 B)	Green	4		
1 (Line1 A)	White/orange	3	B2	port 2
2 (Line1 B)	Orange	4		
3 (Line2 A)	White/blue	3	B3	port 3
6 (Line2 B)	Blue	4		
7 (Line3 A)	White/brown	3	B4	port 4
8 (Line3 B)	Brown	4		

For the technical parameters of the SHDSL cable, refer to [Table 10-11](#).

Table 10-11 Technical Parameters of the SHDSL Cable

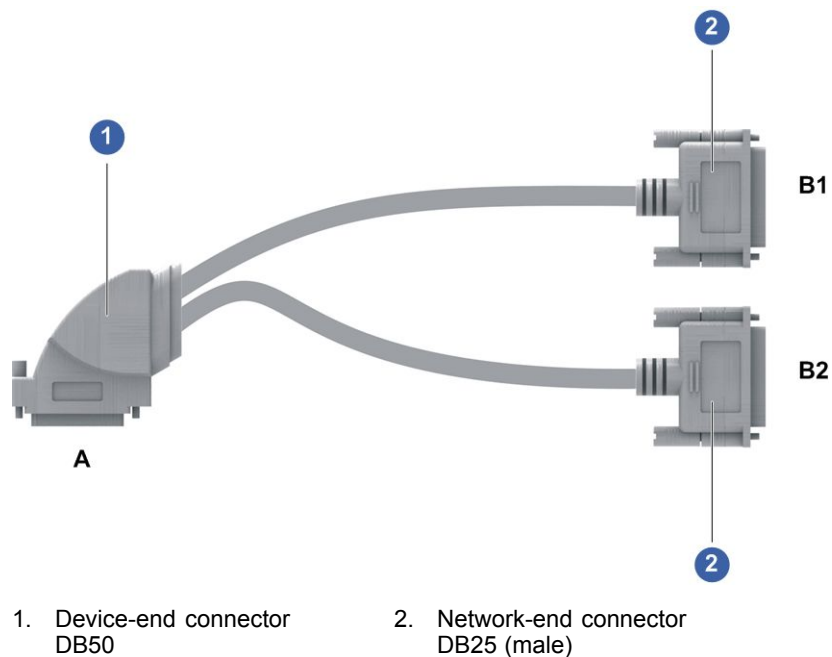
Parameter	Specification
Impedance	100 ohms
Cable type	Symmetric CAT5e twisted pair cable
Wire gauge (inner conductor)	24AWG
Core	8

10.2.6 Synchronous/Asynchronous Serial Cable

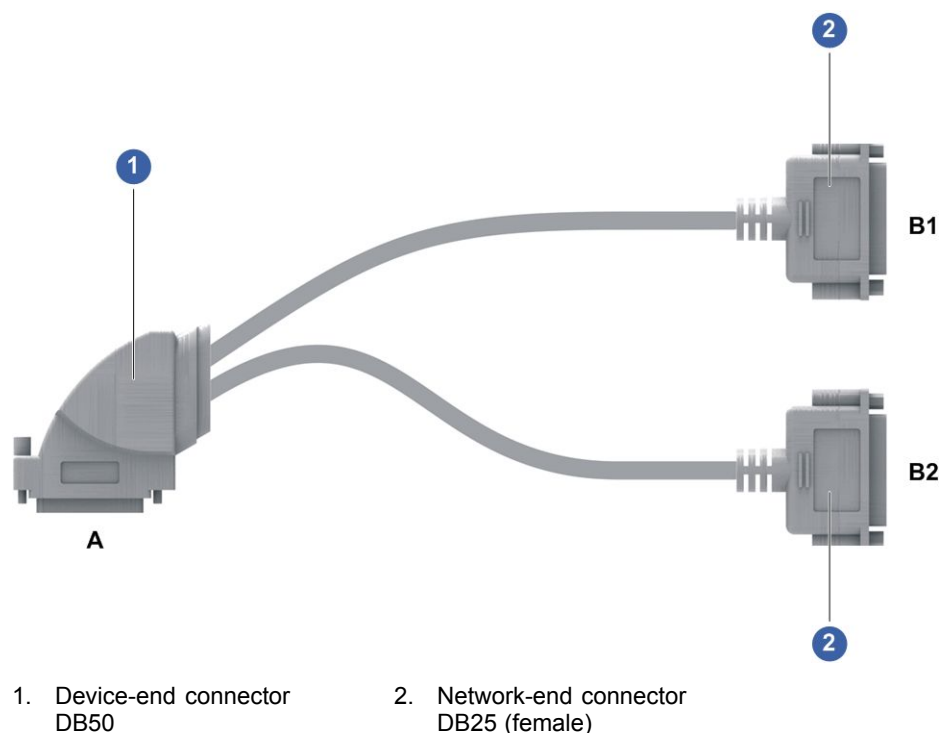
The ZXR10 ZSR V2 series routers use synchronous or asynchronous serial cables to transmit synchronous or asynchronous signals. The serial cables can be divided into the following types:

- V.35/V.24 DTE cable (RA-DTE-DB50-DB25): A DB25 male connector is used at the network end.
- V.35/V.24 DCE cable (RA-DCE-DB50-DB25): A DB25 female connector is used at the network end.
- V.35/V.24 DTE cable (RA-DTE-DB50-34pole): A 34pole male connector is used at the network end.
- V.35/V.24 DCE cable (RA-DCE-DB50-34pole): A 34pole female connector is used at the network end.

For an overview of the V.35/V.24 DTE cable (RA-DTE-DB50-DB25), see [Figure 10-10](#).

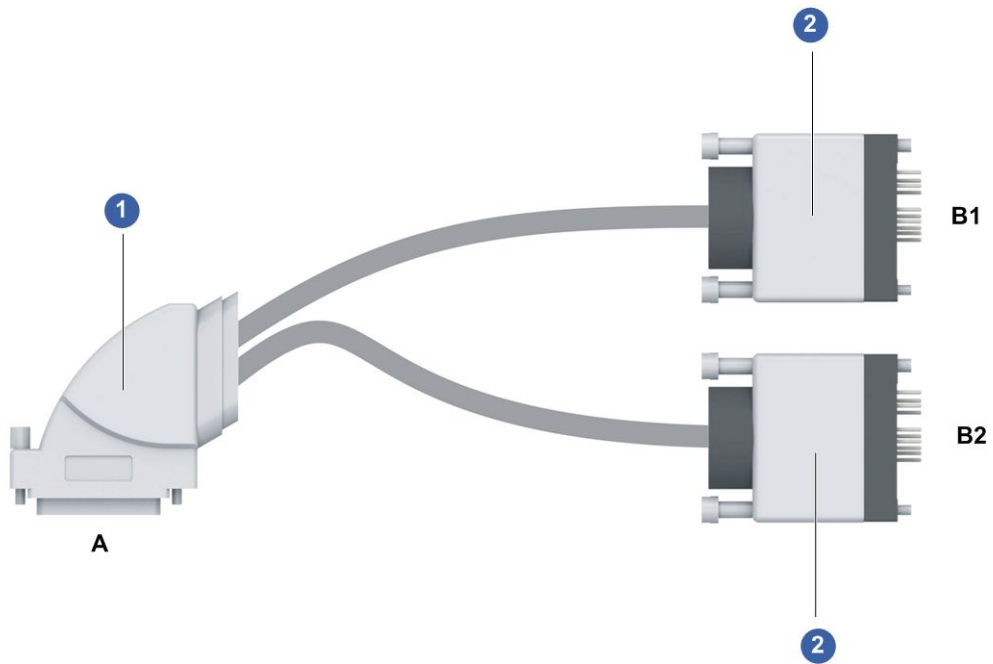
Figure 10-10 V.35/V.24 DTE Cable (RA-DTE-DB50-DB25)

For an overview of the V.35/V.24 DCE cable (RA-DCE-DB50-DB25), see [Figure 10-11](#).

Figure 10-11 V.35/V.24 DCE Cable (RA-DCE-DB50-DB25)

For an overview of the V.35/V.24 DTE cable (RA-DTE-DB50-34pole), see [Figure 10-12](#).

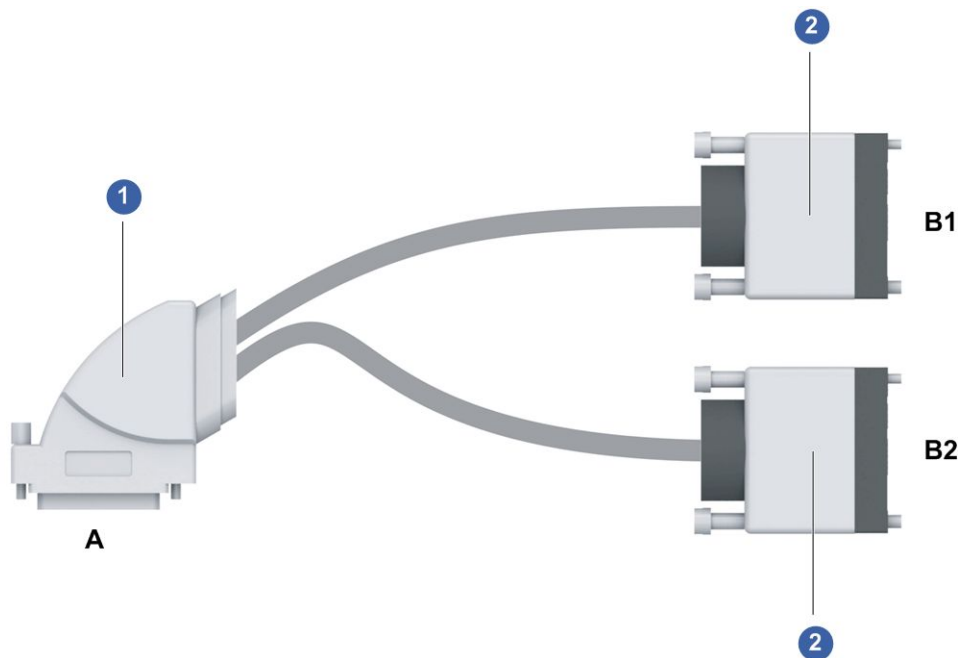
Figure 10-12 V.35/V.24 DTE Cable (RA-DTE-DB50-34pole)



- 1. Device-end connector DB50
- 2. Network-end connector 34pole (male)

For an overview of the V.35/V.24 DCE cable (RA-DCE-DB50-34pole), see [Figure 10-13](#).

Figure 10-13 V.35/V.24 DCE Cable (RA-DCE-DB50-34pole)



- 1. Device-end connector DB50
- 2. Network-end connector 34pole (female)

For a description of the synchronous/asynchronous serial cable types, refer to [Table 10-12](#).

Table 10-12 Synchronous/Asynchronous Serial Cable Types

Synchronous/Asynchronous Serial Cable	Device-End Connector	Network-End Connector
V.35/V.24 DTE cable (RA-DTE-DB50-DB25)	DB50	DB25 male connector
V.35/V.24 DCE cable (RA-DCE-DB50-DB25)	DB50	DB25 female connector
V.35/V.24 DTE cable (RA-DTE-DB50-34pole)	DB50	34pole male connector
V.35/V.24 DCE cable (RA-DCE-DB50-34pole)	DB50	34pole female connector

10.2.7 E1 Trunk Cable

Overview

The E1 trunk cables that the RAC-PIU-16CE1 and RAC-PIU-16CE1-CES boards of the ZXR10 ZSR V2 series routers use can be divided into the following types:

- 75 Ω unbalanced coaxial cable

If the interface resistance of the RAC-PIU-16CE1 or RAC-PIU-16CE1-CES board is configured to 75 Ω , the 75 Ω unbalanced coaxial cable is used as the E1 trunk cable.

- 120 Ω balanced twisted-pair cable

If the interface resistance of the RAC-PIU-16CE1 or RAC-PIU-16CE1-CES board is configured to 120 Ω , the 120 Ω balanced twisted-pair cable is used as the E1 trunk cable.

For the E1 trunk cable connections, refer to [Table 10-13](#).

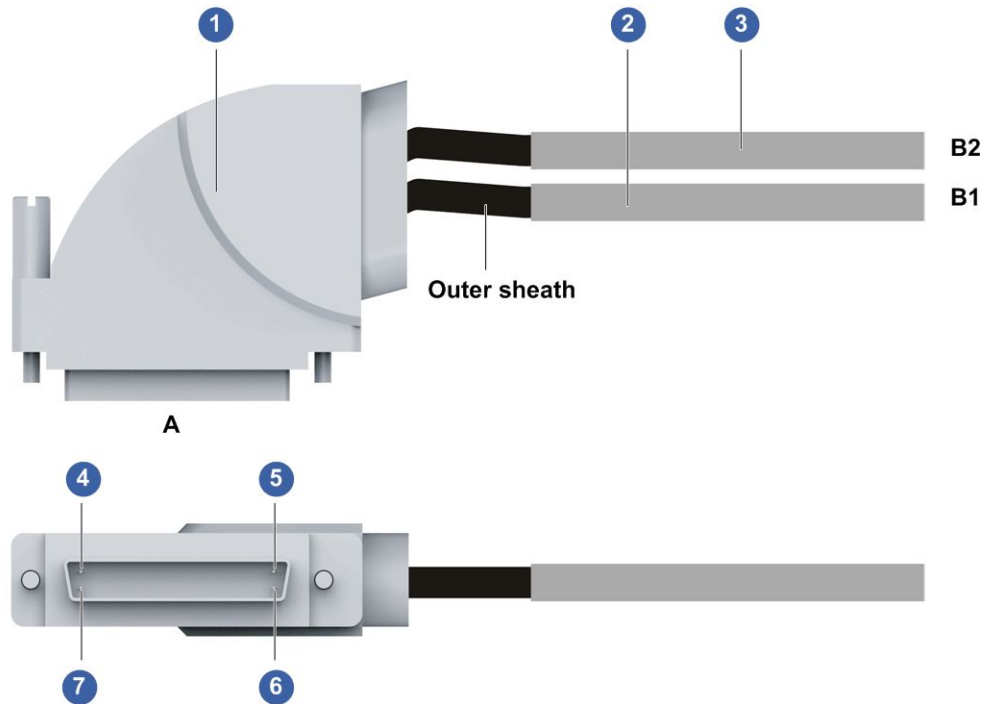
Table 10-13 E1 Trunk Cable Connections

Synchronous/Asynchronous Serial Cable	Device-End Connector	Network-End Connector
75 Ω unbalanced coaxial cable	DB50	Sixteen coaxial cables in two groups, connected to the connectors as required
120 Ω balanced twisted-pair cable	DB50	Sixteen twisted-pair cables in two groups, connected to the connectors as required

75 Ω Unbalanced Coaxial Cable

For an overview of the 75 Ω unbalanced coaxial cable, see [Figure 10-14](#).

Figure 10-14 75 Ω Unbalanced Coaxial Cable



- | | | |
|-------------------------------|---------------------------|--------------------|
| 1. Device-end DB 50 connector | 3. 8-core micro-coaxial B | 6. Pin 50 at end A |
| 2. 8-core micro-coaxial A | 4. Pin 1 at end A | 7. Pin 26 at end A |
| | 5. Pin 25 at end A | |

For the correspondence relationships between the end-A pins and the end-B1 cores of the 75 Ω unbalanced coaxial cable, refer to [Table 10-14](#).

Table 10-14 Correspondence Relationships Between the End-A Pins and End-B1 Cores of the 75 Ω Unbalanced Coaxial Cable

Pin at End A	End B1 (Eight-Core Micro-Coaxial A)	Signal
25	A-1 core	R1+
50	A-1 shield	R1-
24	A-2 core	T1+
49	A-2 shield	T1-
23	A-3 core	R2+
48	A-3 shield	R2-
22	A-4 core	T2+
47	A-4 shield	T2-
21	A-5 core	R3+
46	A-5 shield	R3-
20	A-6 core	T3+
45	A-6 shield	T3-

Pin at End A	End B1 (Eight-Core Micro-Coaxial A)	Signal
19	A-7 core	R4+
44	A-7 shield	R4-
18	A-8 core	T4+
43	A-8 shield	T4-

For the correspondence relationships between the end-A pins and the end-B2 cores of the 75 Ω unbalanced coaxial cable, refer to [Table 10-15](#).

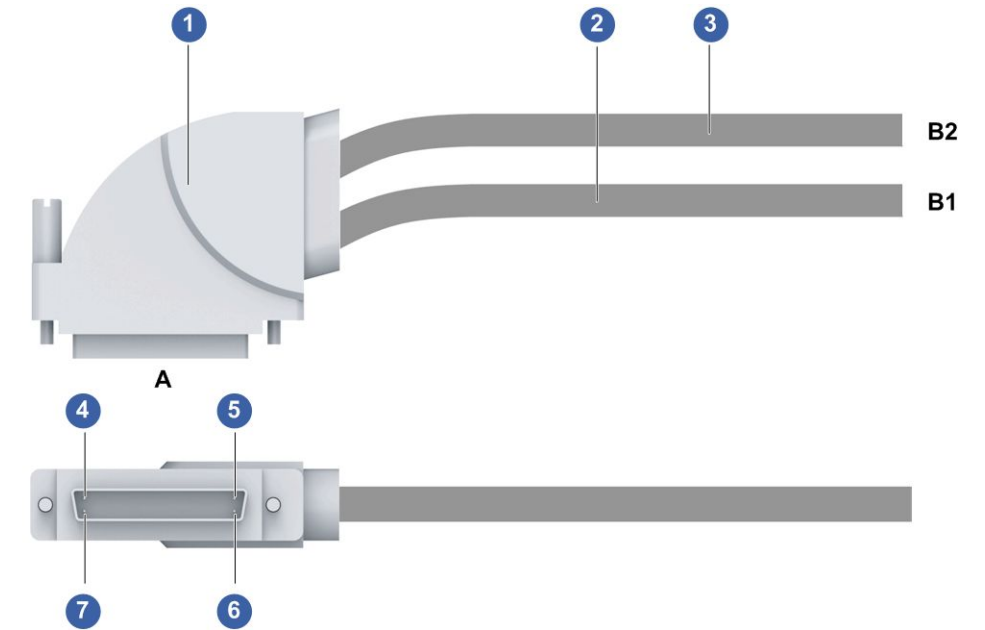
Table 10-15 Correspondence Relationships Between the End-A Pins and End-B2 Cores of the 75 Ω Unbalanced Coaxial Cable

Pin at End A	End B2 (Eight-Core Micro-Coaxial B)	Signal
17	B-1 core	R5+
42	B-1 shield	R5-
16	B-2 core	T5+
41	B-2 shield	T5-
15	B-3 core	R6+
40	B-3 shield	R6-
14	B-4 core	T6+
39	B-4 shield	T6-
13	B-5 core	R7+
38	B-5 shield	R7-
12	B-6 core	T7+
37	B-6 shield	T7-
11	B-7 core	R8+
36	B-7 shield	R8-
10	B-8 core	T8+
35	B-8 shield	T8-

120 Ω Balanced Twisted-Pair Cable

For an overview of the 120 Ω balanced twisted-pair cable, see [Figure 10-15](#).

Figure 10-15 120 Ω Balanced Twisted-Pair Cable



- 1. Device-end connector DB50
- 2. 8-core micro-coaxial A
- 3. 8-core micro-coaxial B
- 4. Pin 1 at end A
- 5. Pin 25 at end A
- 6. Pin 50 at end A
- 7. Pin 26 at end A

For the correspondence relationships between the end-A pins and the end-B1 cores of the 120 Ω balanced twisted-pair cable, refer to Table 10-16.

Table 10-16 Correspondence Relationships Between the End-A Pins and End-B1 Cores of the 120 Ω Balanced Twisted-Pair Cable

Pin at End A	End B1 (16-Core Cable A)		Signal
25	Blue	Twisted pair	R1+
50	White		R1-
24	Orange	Twisted pair	T1+
49	White		T1-
23	Green	Twisted pair	R2+
48	White		R2-
22	Brown	Twisted pair	T2+
47	White		T2-
21	Grey	Twisted pair	R3+
46	White		R3-
20	Blue	Twisted pair	T3+
45	Red		T3-
19	Orange	Twisted pair	R4+
44	Red		R4-

Pin at End A	End B1 (16-Core Cable A)		Signal
18	Green	Twisted pair	T4+
43	Red		T4-

For the correspondence relationships between the end-A pins and the end-B2 cores of the 120 Ω balanced twisted-pair cable, refer to [Table 10-17](#).

Table 10-17 Correspondence Relationships Between the End-A Pins and End-B2 Cores of the 120 Ω Balanced Twisted-Pair Cable

Pin at End A	End B2 (16-Core Cable B)		Signal
17	Blue	Twisted pair	R5+
42	White		R5-
16	Orange	Twisted pair	T5+
41	White		T5-
15	Green	Twisted pair	R6+
40	White		R6-
14	Brown	Twisted pair	T6+
39	White		T6-
13	Grey	Twisted pair	R7+
38	White		R7-
12	Blue	Twisted pair	T7+
37	Red		T7-
11	Orange	Twisted pair	R8+
36	Red		R8-
10	Green	Twisted pair	T8+
35	Red		T8-

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Appendix A

Board Quick Table (Weight and Power Consumption)

For the weight and power consumption of the boards supported by the ZXR10 ZSR V2 series routers, refer to [Table A-1](#).

Table A-1 Board Weight and Power Consumption of the ZXR10 ZSR V2 Series Routers

Board Type	Silk Screen Name	Weight	Power Consumption
MPFU	RAC-2838-MPFU-A	2.38 lb. (1.08 kg)	35 W
	RAC-2838-MPFU-B	2.38 lb. (1.08 kg)	35 W
	RAC-2838-MPFU-C	2.38 lb. (1.08 kg)	35 W
General processing board	RAE-DPIU-OSU-A1	2.71 lb. (1.23 kg)	40 W
	RAE-DPIU-OSU-A2	2.71 lb. (1.23 kg)	40 W
	RAE-DPIU-FW-A	2.31 lb. (1.05 kg)	35 W
PIU	RAC-SPIU-02CE1-75	0.53 lb. (0.24 kg)	6 W
	RAC-SPIU-02CE1-120	0.53 lb. (0.24 kg)	6 W
	RAC-SPIU-02UE1-75	0.53 lb. (0.24 kg)	6 W
	RAC-SPIU-02UE1-120	0.53 lb. (0.24 kg)	6 W
	RAC-SPIU-02HS	0.46 lb. (0.21 kg)	7 W
	RAC-SPIU-04GE	0.22 lb. (0.1 kg)	7 W
	RAC-PIU-LTE	1.23 lb. (0.56 kg)	7 W
	RAC-PIU-01DSL	0.88 lb. (0.4 kg)	16 W
	RAC-PIU-04SHDSL	1.19 lb. (0.54 kg)	10 W
	RAC-PIU-04HS	1.19 lb. (0.54 kg)	10 W
	RAC-PIU-04CE1-75	1.19 lb. (0.54 kg)	11 W
	RAC-PIU-04CE1-120	1.19 lb. (0.54 kg)	11 W
	RAC-PIU-04UE1-75	1.19 lb. (0.54 kg)	11 W
	RAC-PIU-04UE1-120	1.19 lb. (0.54 kg)	11 W
	RAC-PIU-16CE1	1.19 lb. (0.54 kg)	16 W
	RAC-PIU-16CE1-CES	1.19 lb. (0.54 kg)	16 W
	RAC-PIU-01P12-SFP	1.19 lb. (0.54 kg)	16 W

Board Type	Silk Screen Name	Weight	Power Consumption
	RAC-PIU-02P3-SFP	1.19 lb. (0.54 kg)	16.5 W
	RAC-PIU-04P3-SFP	1.19 lb. (0.54 kg)	18 W
	RAC-PIU-02CP3-SFP	1.19 lb. (0.54 kg)	16.5 W
	RAC-PIU-04CP3-SFP	1.19 lb. (0.54 kg)	18 W
	RAC-PIU-04GE-SFP	1.19 lb. (0.54 kg)	13 W
	RAC-PIU-08GE-SFP	1.19 lb. (0.54 kg)	15 W
	RAC-PIU-05GE-4E1SFP	0.88 lb. (0.4 kg)	11 W
	RAC-PIU-09GE-8E1SFP	1.19 lb. (0.54 kg)	12 W
	RAC-PIU-08FE1GE-1SFP	1.19 lb. (0.54 kg)	11 W
	RAC-DPIU-16GE-12SFP4E	1.32 lb. (0.6 kg)	36 W
	RAC-DPIU-01XGE-SFP+	1.50 lb. (0.68 kg)	16 W


Appendix B

Optical Modules Quick Table

Overview

ZXR10 ZSR V2 routers use the SFP optical modules , refer to [Table B-1](#).

Table B-1 SFP Optical Modules

Type	Example
SFP (Small Form-factor Pluggable)	

Indicators

An optical module always has the ACT and LNK indicators. For indicator descriptions, refer to [Table B-2](#).

Table B-2 Optical Module Indicator Descriptions

Indicator	Color	Description
ACT	Green	Transmission status indicator of an optical port. When data is being transmitted, this indicator flashes.
LNK	Green	Physical connection status indicator of an optical port. If the physical connection of the optical port is normal, this indicator is on. Otherwise, this indicator is off.

SFP Attributes

For the attributes of an 155 M SFP optical module, refer to [Table B-3](#).

Table B-3 155 M SFP Attributes

Attribute	Parameters				
Transmission distance (km)	2	15	40	80	100
Central wavelength (nm)	1310	1310	1310	1550	1310
Reference wavelength range (nm)	1260~1570	1261~1360	1263~1360	1480~1580	1480~1580
Transmitting optical power range (dBm)	-19~-14	-15~-8	-5~0	-5~0	0~5

Attribute	Parameters				
Receiving sensitivity (dBm)	-30	-28	-34	-34	-34
Overload optical power (dBm)	-10	-8	-10	-10	-10
Fiber type	Multi mode	Single mode	Single mode	Single mode	Single mode
Interface type	LC-SFP	LC-SFP	LC-SFP	LC-SFP	LC-SFP

For the attributes of an 622 M SFP optical module, refer to [Table B-4](#).

Table B-4 622 M SFP Attributes

Attribute	Parameters		
Transmission distance (km)	15	40	80
Central wavelength (nm)	1310	1310	1550
Reference wavelength range (nm)	1274~1356	1280~1335	1480~1580
Transmitting optical power range (dBm)	-15~-8	-3~-2	-3~-2
Receiving sensitivity (dBm)	-28	-28	-28
Overload optical power (dBm)	-8	-8	-8
Fiber type	Single mode	Single mode	Single mode
Interface type	LC-SFP	LC-SFP	LC-SFP

For the attributes of an 1.25 G SFP optical module, refer to [Table B-5](#).

Table B-5 1.25 G SFP Attributes

Attribute	Parameters					
Transmission distance (km)	0.5	10	40	40	80	120
Central wavelength (nm)	850	1310	1310	1550	1550	1550
Reference wavelength range (nm)	770~860	1260~1360	1260~1360	1480~1580	1480~1580	1480~1580

Attribute	Parameters					
Transmitting optical power range (dBm)	-9.5~-3	-11.5~-3	-4.5~5	-5~0	-2~5	0~5
Receiving sensitivity (dBm)	-17	-19	-22	-22	-22	-30
Overload optical power (dBm)	0	-3	-5	-3	-5	-9
Fiber type	Multi mode	Single mode	Single mode	Single mode	Single mode	Single mode
Interface type	LC-SFP	LC-SFP	LC-SFP	LC-SFP	LC-SFP	LC-SFP

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Glossary

ATM

- Asynchronous Transfer Mode

CLI

- Command Line Interface

DCE

- Data Circuit-terminating Equipment

DSL

- Digital Subscriber Line

DSLAM

- Digital Subscriber Line Access Multiplexer

DTE

- Data Terminal Equipment

EFM

- Ethernet in the First Mile

ETSI

- European Telecommunications Standards Institute

FR

- Frame Relay

HDLC

- High-level Data Link Control

IEC

- International Electrotechnical Commission

IEEE

- Institute of Electrical and Electronics Engineers

IP

- Internet Protocol

ITU-T

- International Telecommunication Union - Telecommunication Standardization Sector

ML-PPP

- Multilink-Point to Point Protocol

ODF

- Optical Distribution Frame

POS

- Packet Over SONET/SDH

PPP

- Point to Point Protocol

RSSI

- Received Signal Strength Indicator

SDH

- Synchronous Digital Hierarchy

SHDSL

- Single-pair High Digital Subscriber Line

SNMP

- Simple Network Management Protocol

SONET

- Synchronous Optical Network

TDM

- Time Division Multiplexing