

VDSL2 DSLAM U3024B Installation Guide



Table of Content

Table of Content.....	2
Overview	3
Features.....	4
The Component Check List	5
Front View of System.....	6
Interface	6
Management and Control Block	9
Console Port	9
RST	9
PWR / ACT / FAN LED	10
FAN Module (Built-in)	10
FAN Ventilation Hole	10
Installation Place.....	11
Installation	12
Console connection	14
IP Address Setup.....	15
Specification.....	16
Cable Specifications	20
Telco Cable.....	20
Twisted Pair Cable.....	20
Fiber Optic Cable	21

Overview

The VDSL2 system of ubiQuoss is high performance set of DSLAM and CPEs which enables highest possible traffic bandwidth of 100Mbps (both way, at peak rate). The system can be applied to optical fiber or Ethernet base subscriber network where it executes the functions of concentration and switching. The VDSL2 DSLAM is usually placed at regional office, MDF room of MTU/MDU or various forms of outdoor containers.

The VDSL2 system of ubiQuoss is connected to user device via VDSL2 modem. By using of the layer 2 Ethernet switching function the system can be integrated into any forms of small or medium size networks. With the feature of hardware based multicasting function like IGMP (Internet Group Management Protocol) snooping, the system can effectively support real time streaming services which are core requirements for next generation multimedia applications.

ubiQuoss' VDSL2 system can support differentiated TPS services according to SLA (Service Level Agreement) based upon its powerful bandwidth management function and QoS (Quality-of-Service) handling ability.

ubiQuoss' VDSL2 system has equipped VDSL2 service interface based upon DMT technology which guarantees 100/100 Mbps up/down symmetrical communication. The available bandwidth the system can guarantee varies according to the implemented profiles, and the highest rate is 100Mbps at maximum in both Uplink and Downlink individually (symmetrical mode).

ubiQuoss' VDSL2 system is an IP based VDSL system having Layer2 switching function. Thus it supports all the variety of L2 switches including VLAN, Rate limit, Port trunking, Port mirroring, IGMP Snooping, Packet filtering.

Features

- 19" Rack mountable
- Fully compliant with VDSL2 standards and band plans(8a/b, 12/a/b, 17a, 30a)
- Layer 2+/Layer 3 aware switch
- Over-voltage protection circuits
- Total 4-port Gigabit Ethernet uplink
 - 2 port fixed 10/100/1000Base-T
 - 1 uplink expansion module (2 ports /module)
- External alarms & external FAN control interface
- Uplink stacking(Daisy-chain)
- Profile auto switching
- Dying gasp
- OLR(On Line Reconfiguration)
- Low power consumption(including power supply efficiency)
 - 2.9W/port @ system total (U3024B)
 - 1.7W/port @ VDSL line (U3024B)
- IPv4/IPv6 dual stack

The Component Check List

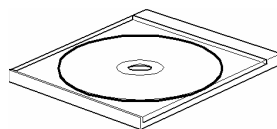
Please check the components of the system before starting installation of U3024B.

Please check if the following items are all included in the package.

- U3024B system main body
- AC INLET CABLE
- Installation guide and user guide of U3024B
- Serial cable: To connect to the management terminal
- Brackets and screws for Rack mounting



ubiQuoss C3024B



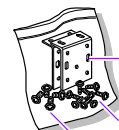
User's Guide



Console cable (RJ45-DB9)



Power cable (AC)



Rack brackets (2)

Pan-head screws (8)

Binder-head screws (4)

Figure 1. The Component Check List

Front View of System

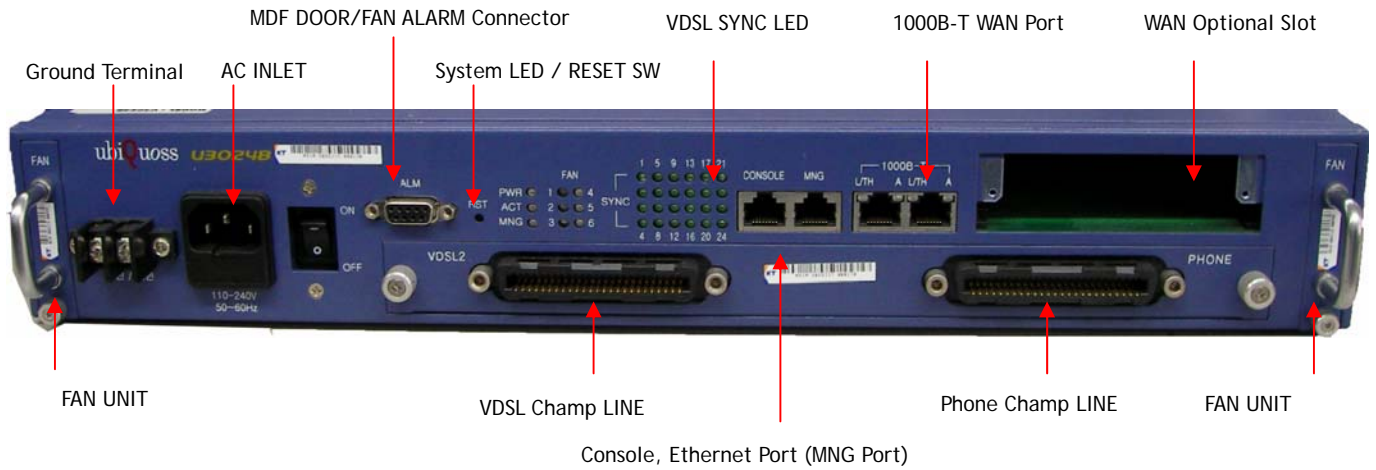


Figure 2. Front view of U3024B system

Interface

WAN Block

U3024B provides two 1000-T Ethernet (WAN) PORTs to send the data with connecting the existing Ethernet port.

It is possible to configure flexible WAN network per extended option module.

It supports LINK, ACT, AND THRESHOLD LED per each port.



Figure 3. WAN PORT Block

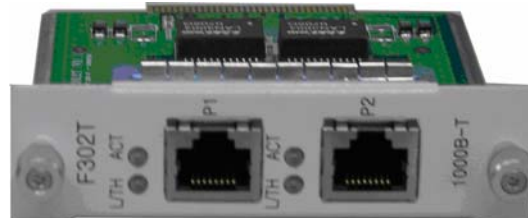
U3024B supports flexible WAN slot according to WAN network environment. The following figures show the each option module.



SM-15 LC TYPE



1000B-X SFP TYPE



1000B-T TYPE

You can install or uninstall the option modules according to the WAN network type.

The following table describes the each port LED of option module.

Table 1. WAN PORT LED

LED	Color	Function
LINK/TH	ON (Green)	Ethernet link ON
	OFF	Ethernet link OFF
ACT	Blink	Ethernet Data Stream
	OFF	No stream of Ethernet Data
EQP	ON(Green)	SFP MODULE EQUIP status
	OFF	SFP MODULE NOT EQUIP status

VDSL2 / PHONE Block

VDSL2 line block and PHONE block use 24 ports Champ Connector.

- VDSL2 CHAMP CONNECTOR => DATA SERVICE
- PHONE CHAMP CONNECTOR => VOICE SERVICE



Figure 4. VDSL2 / PHONE Block

Management and Control Block

- Serial (RS-232) Console port
- Management port : 100Base-TX
- RST (RESET BUTTON)
- PWR/ ACT LED
- 6 FAN Status LEDs



Figure 5. Management and Control Block

Console Port

The console port is used to connect a console terminal to U3024B directly for management purpose. The console cable (Serial cable) for connecting between the console port and the console terminal comes with the product. PC or workstation with terminal emulator program installed can be used as a Console Terminal. The following table shows the specification of the console port.

Table 2. Specification of console port

Item		Settings
Specification		UART
Baud Rate		9600 bps
Connector Type		RJ-45
Terminal Configuration	Data Bit	8 bit
	Stop Bit	1 bits
	Parity Bit	None
	Flow Control	None

RST

The reset button is for cold rebooting of the system. When a cold reboot is required for the system, please press this button using a thin material like a pen or a pin set.

PWR / ACT / FAN LED

The table below summarizes the LEDs for indicating the operation status of the System.

Table 3. PWR /ACT /FAN LEDs Description

LED	Activity	Function
PWR	ON (Green)	Power A normal status
	OFF	Power off status
ACT	ON (Green)	System NORMAL status
	ON (Orange)	System ABNORMAL status
FAN(1-6)	ON (Green)	FAN NORMAL status
	ON (Orange)	FAN ABNORMAL status
	OFF	FAN Manual Stop status

FAN Module (Built-in)

C3024B has two FAN modules. Each FAN module has 3 FANs. The FAN module allows to keep the internal temperature by turning ON/OFF after checking internal temperature periodically.

FAN Ventilation Hole

FAN ventilation hole is the part that blows out hot air inside of the equipment. Please pay attention not to block this hole when installing the equipment.

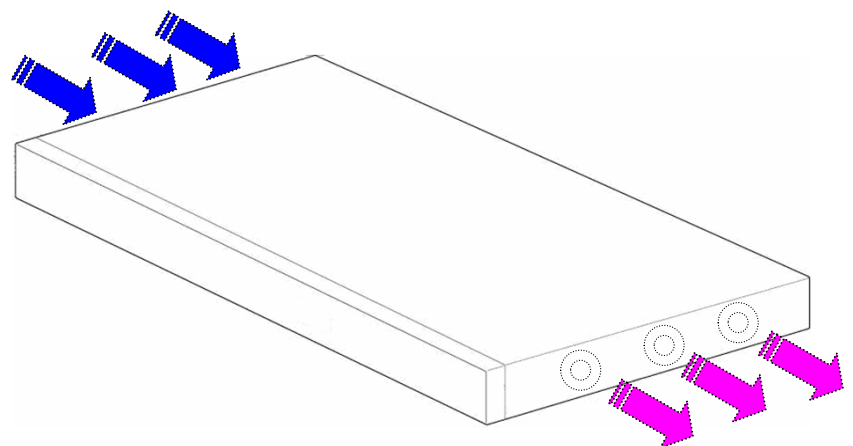


Figure 6. Air flow

Installation Place

U3024B is the product designed for indoor use. The equipment can be mounted on 19" standard Rack and the brackets for rack mounting are supplied together with the product in the package.

Please pay attention to the following points when installing the equipment.

- Please place the equipment in the location where power supply and cable wiring is convenient.
- Please keep the equipment from water or moisture.
- Please install the equipment in a clean environment where temperature and humidity control is available.
- Please secure enough space behind the equipment not to prevent air flow from the ventilation hole.
- The temperature should be kept 0 °C - 50 °C during the operation of the system.

Installation

For U3024B, the System main body, power adapter, and all other accessories are packed separately for shipment. Please follow the following steps for installation.

1. Check the components.
2. Decide the installation place, and place the U3024B main body. U3024B can be mounted on a 19" Rack. When mounting the equipment on a 19" Rack, please fix it to the rack using brackets for U3024B.

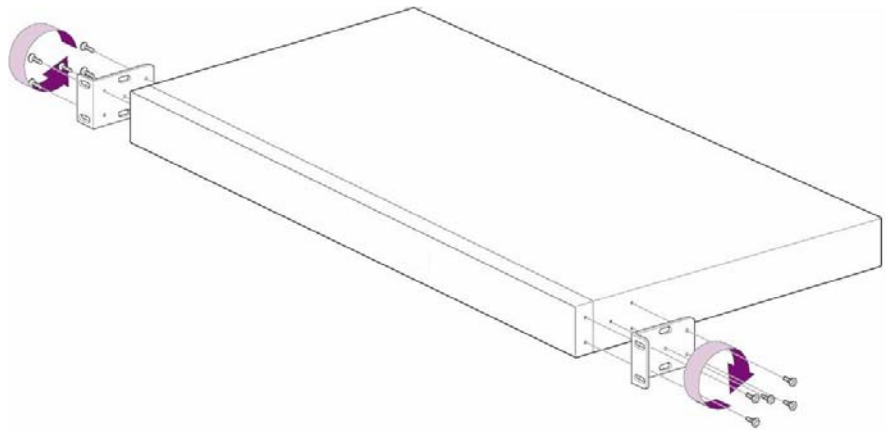
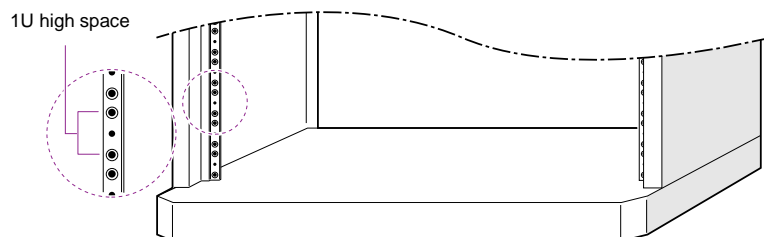


Figure 7. Mounting Brackets

3. Make sure that the 19-inch rack is placed on a convenient location for the system to be installed. And check to see if there is a 1U high space in the rack where the system can be installed.



4. If the equipment is not mounted on the Rack, please install the equipment on the place corresponding to the requirements of "2. Installation Place" section.

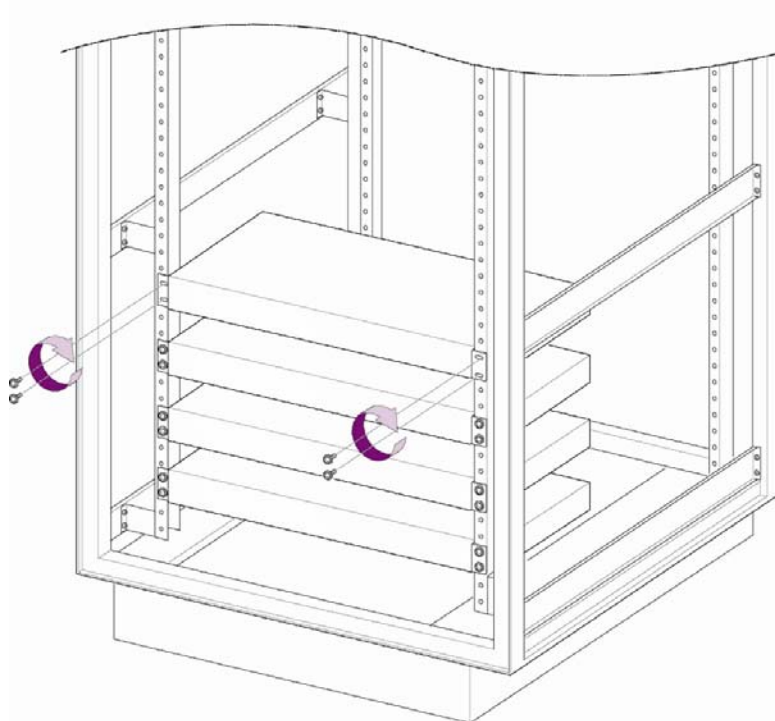


Figure 8. Mounting on the Rack

5. Connect power adapter and check power status LED on the front panel to see if the power is being supplied normally.
6. If system setup or check through console port is needed, please connect the console port to the management terminal.
7. Once the power is supplied normally, please check if each interface LEDs of U3024B is working normally.

Console connection

Operator can manage the system on site by connecting the RJ-45 type console port of U3024B to the console terminal. The configuration of terminal mode connected to the console port is as follows.

Table 4. Configuration of Terminal Mode

Item		Settings
Specification		UART
Baud Rate		9600 bps
Connector type		RJ-45
Terminal Configuration	Data Bit	8 bit
	Stop Bit	1 bits
	Parity Bit	None
	Flow Control	None

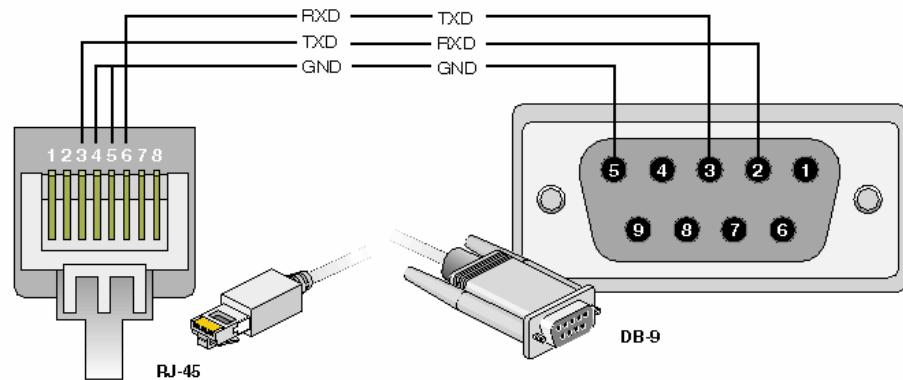


Figure 9. Console Cable Diagram

IP Address Setup

The operator can change the IP address according to the network configuration. IP address setup procedure of U3024B is as follows.

1. Connect a PC or workstation used as a management terminal to the Console port and run the terminal emulation program (for example, hyper terminal).
2. If a password input line appears, enter the password and press [Enter] key. The factory default id is "root" and the password is "premier".

```
Login: root
Password : *****
U3024B>enable
U3024B#
```

3. If the password is entered correctly, the U3024B# prompt appears.
4. IP address can also be set up in config terminal mode. To enter into the config terminal mode, please use the following command.

```
U3024B# config terminal
U3024B(config)#
```

5. Set the desired IP address along with subnet mask. The following shows an example of setting the IP address to 10.1.13.220.

```
U3024B (config)#int eth0
U3024B(config-if-eth0)# ip address 10.1.13.220/24
U3024B (config-if-eth0)#end
```

6. To view the IP address previously set, the mode should be changed to root mode.
7. In a U3024B# prompt, please use the following command to check the current IP address

```
U3024B# show ip interfaces brief
```

8. After checking if the IP address is correct set, please use the following command to save the IP address in the system.

```
U3024B# copy running-config startup-config
```

* For CLI menu items, please refer to a user guide manual.

Specification

Table 5. Specification

Item	U3024B
Picture	
System Specification	
System Architecture	Box type VDSL2 DSLAM - 1 AC or 1 DC - 24-port VDSL2 - Splitter for 24 subscribers(Modular, Hot-swap) - 2 FAN slot (U3024B only) - 1 Uplink slot(Hot-swap)
CPU	32KB I-cache/D-Cache memory
Memory	128MB Main Memory 32MB Flash Memory 2MB Boot Memory
Physical Dimension	19" Rack Mountable 482.6 * 250 * 66mm(W*H*D) Max. 6Kg
Environment Conditions	
Input Power & Frequency	AC: 110-220VAC/50-60Hz
Power Consumption	Max. 80W
Operating Temperature	-20 °C ~ 60 °C
Operating Humidity	10 ~ 90%
Storage Temperature	-20 °C ~ 70 °C
Media Interface	
Interface Type	Uplink (Max. 4 ports) - Default: 2-port 10/100/1000Base-TX - Expansion: 2-port 1000Base-X(SFP)/100Base-FX, 10/100/1000Base-TX Downlink - Fixed 28 VDSL2 ports(8-ports/Module)

Management	100Base-TX(RJ-45)
Console	RS-232C Serial Port(RJ-45)
Performance	
Switching Fabric	12.8Gbps non-blocking
Throughput	9.5Mbps wire-speed L2 Switching
Capacity	
MAC Address	16K MAC Management
VLAN	256 VLANs
Filtering	Access/Security Control filters
VDSL2 Specification	
VDSL2 Standard	<p>Fully compliant with VDSL2 standard</p> <p>Supports standard profiles(8a/b/c/d, 12/1/b, 17a, 30a)</p> <p>Line Coding: DMT</p> <p>Symmetric 4K FFT/IFFT engine</p> <p>Backward compatibility to VDSL1 specification</p> <p>64/65 and HDLC support including EFM pre-emption</p> <p>Multimode support(VDSL2, VDSL1, ADSL2+, ADSL)</p> <p>UPBO(Upstream Power Back-Off)</p> <p>HAM band rejection control</p> <p>Rate Adaptive @ 64kbps step</p> <p>Latency Path(Fast Path, Interleave Path)</p> <p>INP for Slow channel</p>
Services and Features	
L2 Functions	<p>VLAN: 256</p> <p>Multi VLAN</p> <p>Link Aggregation</p> <p>STP, PVST(per VLAN STP)</p> <p>Jumbo Frame Packet Support</p> <p>Port Trunking</p> <p>DHCP Relay</p>
Multicasting Protocol	<p>IGMP v2.0</p> <p>IGMP snooping(IGMP Fast-leave, IGMP reports suppression)</p> <p>IGMP Proxy</p> <p>No. of IGMP Group: 250</p>
QoS	<p>802.1p</p> <p>8 Queues</p> <p>Layer 1 ~ 4 based packet classification</p> <p>DSCP & CoS field Marking/Remarking</p>

	4 Queue per port SPQ WRR WFQ or DWRR
Bandwidth Management	Hardware based Symmetric and Asymmetric Bandwidth Management
Security	System access control by Packet Filtering - MAC Filtering, NetBEUI, NetBIOS, NBT Filtering, DHCP Filtering Subscriber Traffic control by ACLs(Access Control Lists) TCP Sync Attack protection TCP Port Scan Attack protection Broadcast storming prevention MAC flood guard ARP spoofing
Management	CLI, Telnet, TFTP, RMON, SNMP I/II, Sys log, EMS, Port Mirroring
OA&M	Supports power saving mode-Reduced power consumption Remote modem reset and remote Firmware download Loop-back function through EOC Provides Inventory records of modem including manufacturer, barcode, F/W version, model name. etc. Remote collection and reference of statistics on modem Checking-up for VDSL line status(Link speed, SNR, Link status, profile etc) Detection of modem power status: ON/OFF
Standards	
IEEE Standards	802.1D Spanning Tree Protocol 802.1p Priority Control 802.1Q VLAN 802.3ad Link Aggregation 802.3u 100Base-X Fast Ethernet 802.3x Flow Control
IETF Standards	RFC 1112 IGMP RFC 2131 DHCP RFC 2236 IGMP v2
Management Standards & MIB	RFC 783 TFTP RFC 854 Telnet RFC 1157 SNMP v1 RFC 1213 MIB-II RFC 1493 Bridge-MIB RFC 1757 RMON-MIB RFC 1902 SNMP v2 RFC 1907 SNMP-MIB

Software	
Security	Packet Filtering, Access List, VLAN
User Access Control	MAC Address filtering, Client number limit
IP Management	DHCP Server, DHCP Relay, DHCP Option 82(Circuit-ID, Remote-ID), DHCP Filtering
Transmission Mode	Half-Duplex and Full-Duplex
Switching	Store and forwarding
Management	CLI, ftp, Telnet, SNMP, RMON

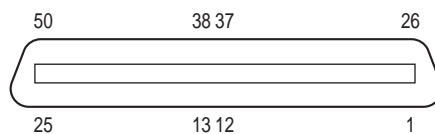
Cable Specifications

Telco Cable

Telco cables are made up of 25 twisted-pair cooper wires. One end of a Telco cable is 50-pin Champ connector and the other end of it is 50-pin Champ connector or wire wrapping pins.

Telco cable is variable according to its length. Before ordering cables, investigate the installation environment to choose proper length of cables. You can purchase this Telco cable from the product provider.

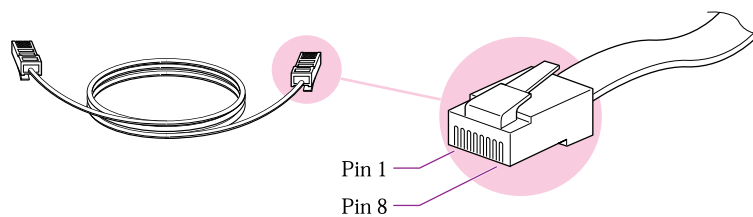
The figure below shows connector pin locations for the champ connectors of Telco cable.



Twisted Pair Cable

The **10/100/1000Base-T ports** on the **uplink modules** are connected by using twisted pair cables with RJ-45 connectors at both ends.

There are two types of twisted pair cables: UTP (unshielded twisted pair) cable and STP (shielded twisted pair) cable. The following figure shows a twisted pair cable with RJ-45 connectors at both ends.



According to the speed of devices to be connected: Category-3, 4, 5, 5+, 6

The category of twisted pair cable to be used is determined by the speed of the devices to be connected to RJ-45 port. In case of connecting with a device that operates at 10Mbps, category 3 and 4 cable is used. In case of connecting with a device that operates at 100Mbps, category 5 cable is used. In case of connecting with a device that operates at 1000Mbps, category 5+ or category 6 cable is used.

According to the kinds of devices to be connected: Straight-through, Crossover

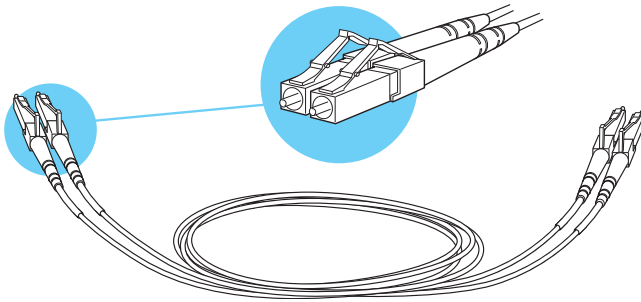
Either straight-through cable or crossover cable is used according to the kinds of devices to be connected to RJ-45 port. In case the device to be connected is such terminal (MDI) as PC equipped with NIC (Network Interface Card), straight-through cable is used. On the other hand, crossover cable is used for connecting the ports of network devices (MDI-X) such as hub or switch.

Fiber Optic Cable

The system modules with fiber optic ports are connected using fiber optic cables as follows:

Duplex LC Fiber Optic Cable

The cable used for connecting the 1000Base-SX/LX SFP ports on the uplink modules is fiber-optic cable with duplex LC connectors at both ends (transmitting/receiving wavelength: 1310nm).



Simplex SC Fiber Optic Cable

The cable used for connecting the 1000Base-PX SFP port on the module is fiber-optic cable with simplex SC connectors at both ends (transmitting/receiving wavelength: 1310/1490nm).

