DATACOM

DmSwitch Installation Guide

Revision History

Revision 1.4 2006/10/20

204.4088.04

Warranty

This product is guaranteed to be free against manufacturing and raw material defects, during the period specified in the sales receipt.

The warranty includes only the repair and replacement of components or defective parts, free of charge. The warranty does not cover damages caused by any one of the following conditions: improper use, energy failures, natural phenomena (lightning, for example), failure in equipments connected to this product, improper grounding or repairs done by DATACOM unauthorized personnel.

This warranty does not cover repairs done at the customer's site. All equipments must be sent to DATACOM to be repaired.

Quality Management System
certified by DQS according to ISO9001
Register number (287097 QM)

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Chapter 1. Introduction

1.1. Overview

The DmSwitch 3x24Fx is a member of the DATACOM DmSwitch 3000 family. The DmSwitch 3000 is a family of Metro Ethernet Switches with L2 and L3 wire-speed comutation capability, MPLS features, that allow its utilization as a Label Edge Router, and many QoS L2-L7 facilities, ensuring bandwidth control and priority management.

The DmSwitch 3x24Fx is a stackable and manageable switch. Its stacking ports allow the connection of up to eight switches in a stack configuration. It can also be used in a standalone mode. The switch can be managed through DmView, Telnet/SSH, Web or SNMP.

The F1/F2 Switch versions are equipped with 24 10BASE-T/100BASE-TX and 4 GBE combo ports (10/100/1000Base-T or SFP). The F3 Switch version is equiped with 24 100BASE-FX and 4 GBE combo ports (10/100/1000Base-T or SFP). They are unshielded twisted pair (UTP) cable ports and Auto MDI/MDI-X, allowing the use of either straight or crossover twisted-pair cables. It means the switch can be used to connect to other switches, hubs, routers, PCs and many other networking equipment.

Figure 1-1. Overview of the DmSwitch F1/F2 3000

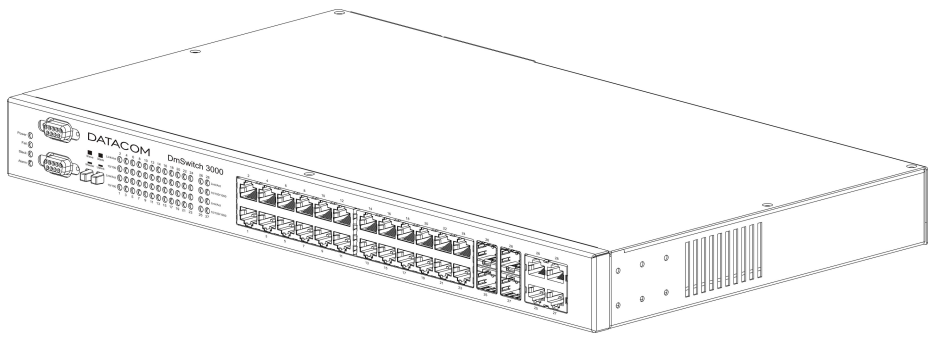
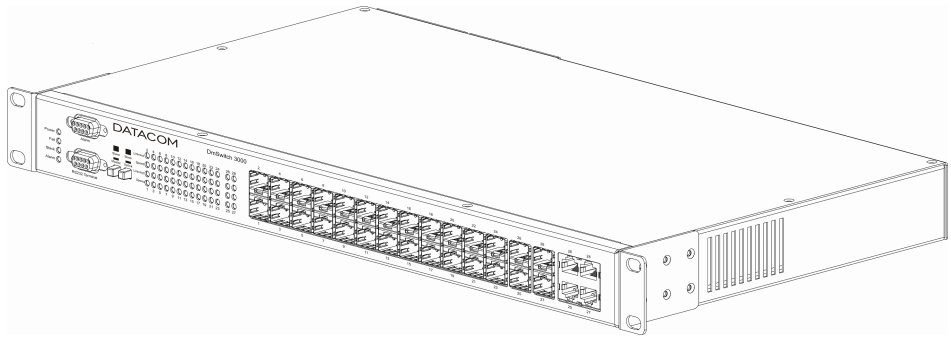


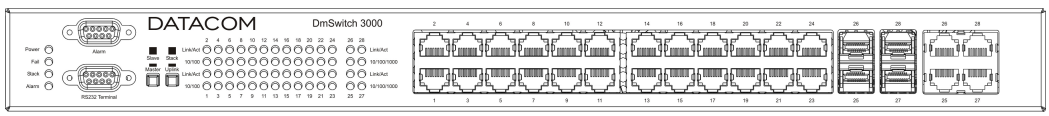
Figure 1-2. Overview of the DmSwitch F3 3000



1.2. Front Panel Description

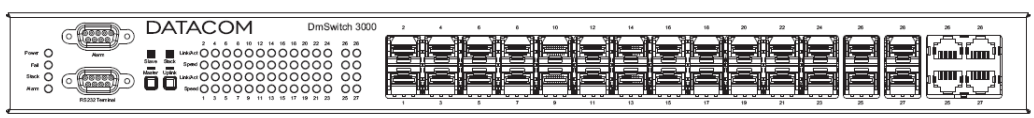
The front panel of the DmSwitch F1/F2 contains 24 10BASE-T/100BASE-TX ports, 4 10/100/1000Base-T /SFP combo ports, an RS-232 console port, an alarm port and two buttons for changing stacking options.

Figure 1-3. DmSwitch F1/F2 Front Panel



The front panel of the DmSwitch F3 contains 24 100BASE-FX SFP ports, 4 10/100/1000Base-T /SFP combo ports, an RS-232 console port, an alarm port and two buttons for changing stacking options.

Figure 1-4. DmSwitch F3 Front Panel



1.2.1. System Status LEDs

The System Status LEDs on the front panel can be used to monitor system activity. Following Figure shows where the leds are located and the table below indicates the system status acording to each led's condition.

Figure 1-5. System LEDs Location

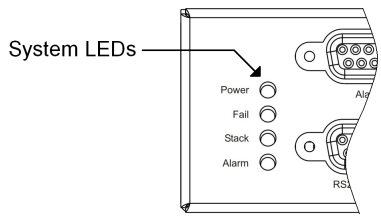


Table 1-1. System LEDs

LED	CONDITION	STATUS
Power	ON	System is powered on
	OFF	System is powered off
Fail	ON	Indicates hardware failure
	OFF	System is operating normally
Stack	Blinking	Switch is operating in stack mode (master)
	ON	Switch is operating in stack mode (slave)
	OFF	Switch is operating in standalone mode
Alarm	ON	System Alarm is active
	OFF	System Alarm is inactive

1.2.2. Port Leds

Port Leds indicate data activity and speed on each port. Their location is shown on next Figure and their status on the table below.

Figure 1-6. Port LEDs Location

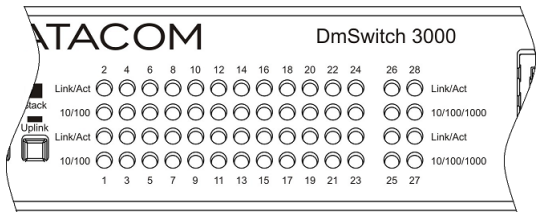


Table 1-2. Port LEDs

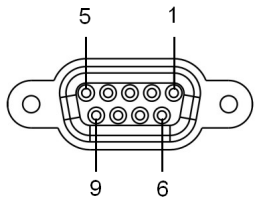
LED	CONDITION	SYSTEM STATUS
Ports 1 to 24 - Fast Ethernet		
Link/Act	ON/Blinking	Connection established. Blinking indicates port activity.
	OFF	No connection established.
10/100 (F2), Speed (F3)	ON	Indicates that a 10Mbps connection was established (when Link/Act is ON/Blinking).
	OFF	Indicates that a 100Mbps connection was established.
Ports 25 to 28 - Gigabit Ethernet		
Link/Act	ON/Blinking	Connection established. Blinking indicates port activity.
	OFF	No connection established.
10/100/1000 (F2), Speed (F3)	ON	indicates that a 10/100Mbps connection was established (when Link/Act is ON/Blinking).
	OFF	Indicates that a 1000Mbps connection was established.

1.2.3. Console and Alarm Ports

The switch contains two DB9 connectors on its front panel. The upper connector is the Alarm port and the lower is the Console port.

The pin-out of both console and alarm ports are shown in the next figure.

Figure 1-7. Console and Alarm Port Pins Order



The Alarm port contains 3 alarm inputs and 1 alarm output. The inputs accept voltage differences from 8V to 60V (indicating alarm on) or less than 8V (indicating alarm off).

The Alarm output works as follows. In an alarm situation or when the device is powered off, pin 4 (common) is short-circuited with pin 9 (NF). When alarm is off, the pin 4 turns to a short circuit with pin 5 (NA), while pin 9 keeps isolated.

Alarm pin assignments are provided on the following table:

Table 1-3. Alarm Port Pins Assignments

Input/Output	Pin Name	DB9 Pin Number
Alarm Inputs		
Alarm Input #1	Common	6
	Input	1
Alarm Input #2	Common	7
	Input	2
Alarm Input #3	Common	8
	Input	3
Alarm Output		
Alarm Output #1	Common	4
	NA	5
	NF	9

Next table shows the Console Port pin assignments:

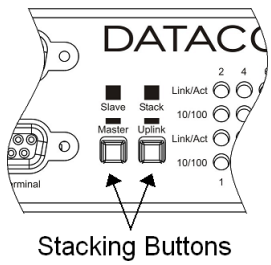
Table 1-4. Console Port Pins Assignments

Serial Port Pin Name	Pin Number
RX	3
TX	2
GND	4 and 5

1.2.4. Slave/Master and Stack/Uplink Buttons

DmSwitch contains two buttons to control stacking. When pressed, the Stack/Uplink button makes the Switch operate in standalone mode, allowing the ports 27 and 28 to be used as normal Ethernet ports instead of stacking ports. When stacking mode is selected, the Slave/Master button selects one switch in the stack to operate as the master. The entire stack will be managed by this unit.

Figure 1-8. Stacking Buttons Location



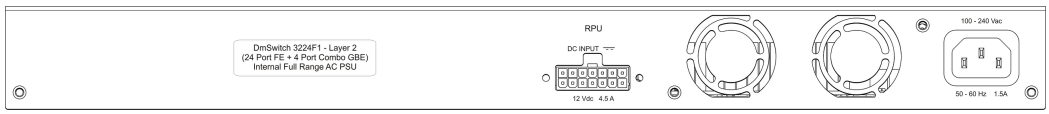
1.3. Rear Panel Description

The Rear Panel is described separately for the F1, F2 and F3 versions below.

1.3.1. DmSwitch F1 Rear Panel

The DmSwitch F1 Rear Panel contains one AC power connector and one Redundant Power Unit (RPU) outlet.

Figure 1-9. DmSwitch F1 Rear Panel



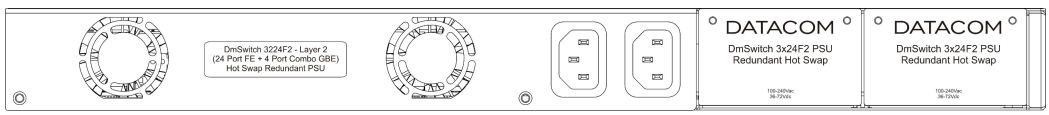
The AC power input accepts any suply voltage in the range from 100~240 VAC at 50~60 Hz. An optional external 12VDC RPU can be used by connecting it to the RPU outlet.

> **Warning**
>
> Use only a DATACOM DmSwitch 3000 RPU to guarantee that only the main power unit suplies power to the system when both main AC suply and RPU are connected at the same time!

1.3.2. DmSwitch F2 Rear Panel

The DmSwitch F2 Rear Panel contains two AC/DC power connectors and two sites for Datacom Redundant Hot Swap Power Units.

Figure 1-10. DmSwitch F2 Rear Panel

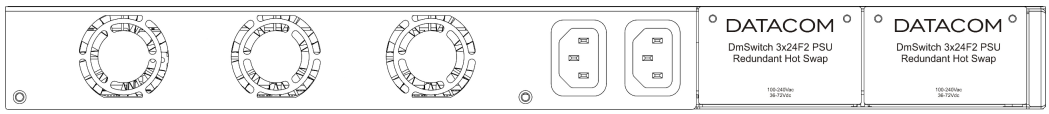


The AC/DC power inputs accept any suply voltage in the range from 100~240 VAC at 50~60 Hz and 36~72VDC. Each connector suplies one Power Unit. The use of a redundant power unit is optional. The switch is able to operate with a single unit.

1.3.3. DmSwitch F3 Rear Panel

The DmSwitch F3 Rear Panel contains two AC/DC power connectors and two sites for Datacom Redundant Hot Swap Power Units.

Figure 1-11. DmSwitch F3 Rear Panel



The AC/DC power inputs accept any suply voltage in the range from 100~240 VAC at 50~60 Hz and 36~72VDC. Each connector suplies one Power Unit. The use of a redundant power unit is optional. The switch is able to operate with a single unit.

Chapter 2. Switch Installation

2.1. Package Contents

- One Stackable DmSwitch 3x24Fx
- Two mounting brackets already attached to the switch
- One AC power cord

Be sure you have received all the content listed above and check the items for damage. If there's something missing or damaged, contact DATACOM for assistance.

2.2. Installation Guidelines

Before you choose a location to install the switch, make sure to follow the guidelines below:

- Choose a location where you can easily access the RJ-45 ports and that allows the LEDs to be visible.
- The site's temperature should be kept within 0 to 50 degrees Celsius and its humidity within 10 to 90%, non-condensing.
- Do not restrict airflow by providing approximately 5 centimeters (2 inches) of space on all sides of the device.
- Locate the switch near a power source.

2.3. Installing the Switch without a Rack

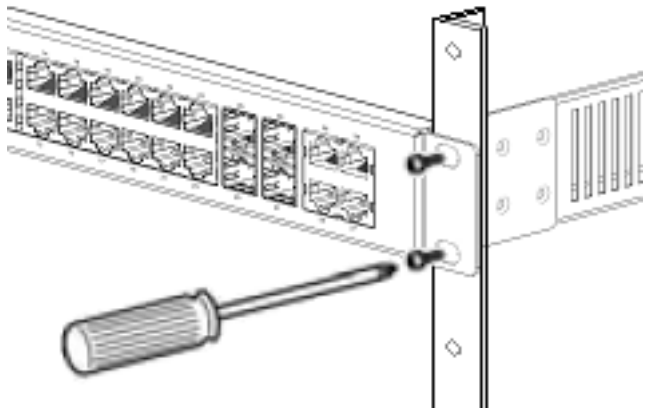
To use the switch outside a rack, you may want to remove the side brackets that come attached to the switch. Use a Phillips screwdriver to remove them.

After removing the brackets, choose a flat surface near an AC power source to place the switch.

2.4. Installing the Switch in a Rack

The switch can be installed in a 19" rack. The brackets used to fix the device already come attached to the switch. To install the switch in a rack, use the following procedure and refer to the figure below:

Figure 2-1. Rack Mounting



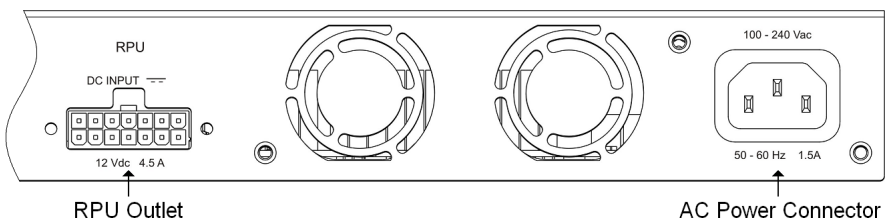
1. Place the switch in the rack.
2. Insert two screws (not provided) on each bracket to secure the switch in the rack.

2.5. Powering the Switch

After installing the switch, plug one end of a IEC-320 standard power cable into the AC receptacle located at the rear panel of the switch and the other end into the local power source outlet. The Power LED should light, indicating the switch is correctly powered.

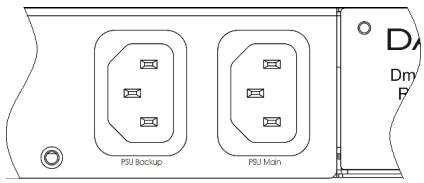
In the DmSwitch F1 version, you can choose to suply the switch with a RPU. To do so, connect the RPU into the RPU outlet located at the rear panel of the switch.

Figure 2-2. DmSwitch F1 Power Connectors



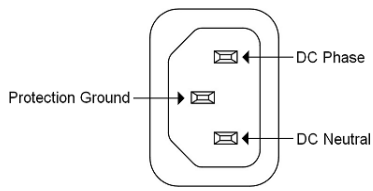
The DmSwitch F2 has two AC/DC power connectors at the rear panel, one for each power source. If you are using both redundant power units, use two power cables to connect them.

Figure 2-3. DmSwitch F2 Power Connectors



If DC power is used, the power cable should be cut close to the AC sockets connection plug and connected in a way that the socket central pin corresponds to ground protection and the other 2 pins supply the power, as seen in the next Figure. The equipment shelf is connected directly to protection ground.

Figure 2-4. AC/DC Power Suply Connector



2.6. Installing/Removing a F2/F3 version Hot-Swap Power Unit

The DmSwitch F2/F3 versions are able to work with one or two Hot-Swap Power Units. Follow the next instructions to install or remove a Power Unit:

Installing a Power Unit:

1. Use a Phillips screwdriver to remove the screws that attach the protection panel of the Power Unit's site (if present).
2. Insert the RPU into the slot and slide it through the track. Press it firmly to ensure it is properly placed.
3. Use your hand to attach the two silverplated screws placed on the Power Unit's panel to secure it on its slot.

Removing a Power Unit:

1. Use your hand to detach the two silverplated screws placed on the Power Unit's panel.
2. Pull the RPU, using the screws as knobs, and remove it outside the slot.
3. If no other Power Unit is to be put into the same slot, attach the protection panel (if you have one) using a Phillips screwdriver.

Chapter 3. Making Connections

3.1. Connecting Devices through RJ-45 Ports

The DmSwitch 3000 can be connected to 10, 100 or 1000 Mbps devices. It's ports accept automatic MDI/MDI-X configuration, so either cross or straight cables can be used.

Use Unshielded Twisted-Pair (UTP) or Shielded Twisted-Pair (STP) cables with RJ-45 connectors. Connect one end of the cable directly into the switch port and the other end into the networking device.

Check the table bellow to make sure the cables you are using in your network are the correct ones.

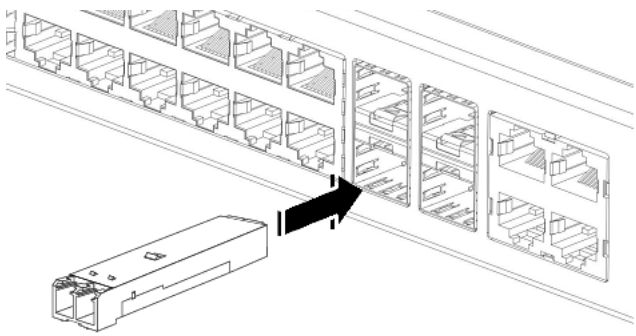
Table 3-1. Cable Category

Connection	UTP Category
10BASE-T	3 or better
100BASE-TX	5 or better
1000BASE-T	5 or better

3.2. Connecting a SFP Module

The use of a SFP transceiver is optional. It is not included in the package. Follow the next instructions to install a SFP module properly:

Figure 3-1. SFP Module Installation



1. Insert the SFP transceiver into one of the four switch module bays. There's only one orientation that the module can be plugged. The optical connector should face outward and the slot connector, down.
2. Slide the module into the slot and press firmly to ensure it seats into place.

Note: When a SFP port is used, its correspondent 10/100/1000BASE-T port is automaticaly disabled.

Note: Installing or removing a SFP module can be done without powering off the switch. SFP transceivers are hot-swappable. But make sure there are no network optic cables connected to the module before removing it!

The SFP modules that can be used with DmSwitch and each correspondent maximum cable lenght are described in the table bellow:

Table 3-2. SFP Modules

SFP Module	Fiber Type	Maximum Lenght
1000BASE-SX	multimode	550m
1000BASE-LX	singlemode	10km
1000BASE-LH	singlemode	70km
1000BASE-LZ	singlemode	110km

Warning

Signals over fiber optic cables are transmitted via lasers. Although the lasers are compliant with the requirements of Class 1 Laser Products and are eye safe in normal conditions, never look direclty at a transmit port when it's turned on!

3.3. Connecting the Switch in a Stack Configuration

DmSwitch supports two stacking topology configurations, the line and the ring topologies. In line-topology, there's one cable connecting each switch to its neighbour. In ring-topology, a redundant path is formed by an extra cable connecting the bottom switch to the top switch of the stack.

Stacking connections should be made using 27 and 28 10/100/1000Base-T ports only and category 5 or better UTP/STP cables.

Figure 3-2. Stacking Cable Connection

Appendix A. Technical Specifications

A.1. Physical and Environmental

Table A-1. Physical and Environmental Specifications

Power Consumption	DmSwitch F1: 62.5 Watts maximum
	DmSwitch F2: 61.0 Watts maximum
	DmSwitch F3: 75.0 Watts maximum
Operating Temperature	-10 to 65 degrees Celsius
Storage Temperature	-40 to 70 degrees Celsius
Humidity	10 to 90% non condensing
Dimensions	Without mounting brackets:
	DmSwitch F1: 43mm height, 440mm width, 230mm depth
	DmSwitch F2: 43mm height, 440mm width, 251mm depth
	DmSwitch F3: 43mm height, 440mm width, 251mm depth
	With mounting brackets:
	DmSwitch F1: 43mm height, 483mm width, 230mm depth
	DmSwitch F2: 43mm height, 483mm width, 251mm depth
	DmSwitch F3: 43mm height, 483mm width, 251mm depth
Weight	DmSwitch F1: 2.96kg
	DmSwitch F2: 3.34kg
	DmSwitch F2 with RPU: 3.625kg
	DmSwitch F3: 3.58kg
	DmSwitch F3 with RPU: 3.865kg

Appendix B. SFP Modules

Types of SFP Modules that DmSwitch 3000 family uses:

B.1. Unidirectional modules

- Features:
  - Duplex LC connector
  - Hot Pluggable
  - Supply Voltage 3.3Volts
  - Case Operating Temperature 0-70 degrees Celsius
  - Output Eye Compliant with IEEE802.3z
  - Compliant with SFF8472 diagnostic monitoring interface
  - Compliant with IEEE802.3z Gigabit Ethernet Standard
  - Class 1 Laser Product (compliant with EN 60825-1)

Table B-1. 1000BASE-SX multimode 550m

Parameter	Value	Units
Wavelength operation	850	nm
Spectral Width (-20dB)	0.85	nm
Output Optical Power 62.5/125, 50/125 micrometers fiber	-9.5	dBm
Optical Input Power-maximum	-1	dBm
Optical Input Power-minimum (Sensitivity)	-18	dBm

Table B-2. 1000BASE-LX singlemode 10km

Parameter	Value	Units
Wavelength operation	1310	nm
Spectral Width (-20dB)	2.5	nm

Output Optical Power 9/125 micrometers fiber	-9.5	dBm
Optical Input Power-maximum	-3	dBm
Optical Input Power-minimum (Sensitivity)	-20	dBm

Table B-3. 1000BASE-LX+ singlemode 30km

Parameter	Value	Units
Wavelength operation	1310	nm
Spectral Width (-20dB)	1	nm
Output Optical Power 9/125 micrometers fiber	-4	dBm
Optical Input Power-maximum	-3	dBm
Optical Input Power-minimum (Sensitivity)	-23	dBm
Minimum atenuation for looping output with input	6	dBm

Table B-4. 1000BASE-LH singlemode 70km

Parameter	Value	Units
Wavelength operation	1550	nm
Spectral Width (-20dB)	1	nm
Output Optical Power 9/125 micrometers fiber	0	dBm
Optical Input Power-maximum	-3	dBm
Optical Input Power-minimum (Sensitivity)	-24	dBm
Minimum atenuation for looping output with input	7	dBm

Table B-5. 1000BASE-LZ singlemode 110km

Parameter	Value	Units
Wavelength operation	1550	Nm
Spectral Width (-20dB)	1	Nm
Output Optical Power 9/125 micrometers fiber	0	dBm
Optical Input Power-maximum	-8	dBm

Optical Input Power-minimum (Sensitivity)	-30	dBm
Minimum atenuation for looping output with input	13	dBm

B.2. Bidirectional modules

- Features:
  - Simplex LC connector
  - Hot Pluggable
  - Supply Voltage 3.3Volts
  - Case Operating Temperature 0-70 degrees Celsius
  - Output Eye Compliant with IEEE802.3z
  - Compliant with SFF8472 diagnostic monitoring interface
  - Compliant with IEEE802.3z Gigabit Ethernet Standard
  - Class 1 Laser Product (compliant with EN 60825-1)

Table B-6. 1000BaseBX20-U singlemode 20Km

Parameter	Value	Units
Wavelength operation (tx)	1310	nm
Wavelength operation (rx)	1550	nm
Spectral Width (-20dB)	2.5	dBm
Output Optical Power 9/125 micrometers fiber	-8	dBm
Optical Input Power-maximum	-2	dBm
Optical Input Power-minimum (Sensitivity)	-23	dBm

Table B-7. 1000BaseBX20-D singlemode 20Km

Parameter	Value	Units

Wavelength operation (tx)	1550	nm
Wavelength operation (rx)	1310	nm
Spectral Width (-20dB)	2.5	dBm
Output Optical Power 9/125 micrometers fiber	-8	dBm
Optical Input Power-maximum	-2	dBm
Optical Input Power-minimum (Sensitivity)	-23	dBm

Table B-8. 1000BaseBX60-U singlemode 60Km

Parameter	Value	Units
Wavelength operation (tx)	1310	Nm
Wavelength operation (rx)	1550	Nm
Spectral Width (-20dB)	1	dBm
Output Optical Power 9/125 micrometers fiber	0	dBm
Optical Input Power-maximum	-1	dBm
Optical Input Power-minimum (Sensitivity)	-24	dBm
Minimum atenuation for looping output with input	6	dBm

Table B-9. 1000BaseBX60-D singlemode 60Km

Parameter	Value	Units
Wavelength operation (tx)	1550	nm
Wavelength operation (rx)	1310	nm
Spectral Width (-20dB)	1	dBm
Output Optical Power 9/125 micrometers fiber	-2	dBm
Optical Input Power-maximum	-1	dBm
Optical Input Power-minimum (Sensitivity)	-25	dBm
Minimum atenuation for looping output with input	5	dBm

B.3. CWDM modules

- Features:
  - Duplex LC connector
  - Hot Pluggable
  - Supply Voltage 3.3Volts
  - Case Operating Temperature 0-70 degrees Celsius
  - Output Eye Compliant with IEEE802.3z
  - Compliant with SFF8472 diagnostic monitoring interface
  - Compliant with IEEE802.3z Gigabit Ethernet Standard
  - Class 1 Laser Product (compliant with EN 60825-1)

- For 1310 series you can choose these center wavelengths:
  - 1270nm, 1290nm, 1310nm, 1330nm, 1350nm, 1370nm, 1390nm, 1410nm, 1430nm, 1450nm.

- For 1550 series you can choose these center wavelengths:
  - 1470nm, 1490nm, 1510nm, 1530nm, 1550nm, 1570nm, 1610Nm

Table B-10. 1310nm-19dB margin

Parameter	Value	Units
Wavelength operation	1270~1450	nm
Spectral Width (-20dB)	1	nm
Output Optical Power 9/125 micrometers fiber	-4	dBm
Optical Input Power-maximum	-3	dBm
Optical Input Power-minimum (Sensitivity)	-23	dBm
Minimum atenuation for looping output with input	4	dBm

Table B-11. 1550nm-19dB margin

Parameter	Value	Units
Wavelength operation	1470~1610	nm
Spectral Width (-20dB)	1	nm
Output Optical Power 9/125 micrometers fiber	-4	dBm
Optical Input Power-maximum	-3	dBm
Optical Input Power-minimum (Sensitivity)	-24	dBm
Minimum atenuation for looping output with input	4	dBm

Table B-12. 1310nm-23dB margin

Parameter	Value	Units
Wavelength operation	1270~1450	nm
Spectral Width (-20dB)	1	nm
Output Optical Power 9/125 micrometers fiber	-1	dBm
Optical Input Power-maximum	-3	dBm
Optical Input Power-minimum (Sensitivity)	-24	dBm
Minimum atenuation for looping output with input	7	dBm

Table B-13. 1550nm-23dB margin

Parameter	Value	Units
Wavelength operation	1470~1610	nm
Spectral Width (-20dB)	1	nm
Output Optical Power 9/125 micrometers fiber	-1	dBm
Optical Input Power-maximum	-3	dBm
Optical Input Power-minimum (Sensitivity)	-24	dBm
Minimum atenuation for looping output with input	7	dBm

Table B-14. 1310nm-27dB margin

Parameter	Value	Units

Wavelength operation	1270~1450	nm
Spectral Width (-20dB)	1	nm
Output Optical Power 9/125 micrometers fiber	0	dBm
Optical Input Power-maximum	0	dBm
Optical Input Power-minimum (Sensitivity)	-27	dBm
Minimum atenuation for looping output with input	5	dBm

Table B-15. 1550nm-27dB margin

Parameter	Value	Units
Wavelength operation	1470~1610	Nm
Spectral Width (-20dB)	1	Nm
Output Optical Power 9/125 micrometers fiber	0	dBm
Optical Input Power-maximum	0	dBm
Optical Input Power-minimum (Sensitivity)	-27	dBm
Minimum atenuation for looping output with input	5	dBm

Table B-16. 1310nm-30dB margin

Parameter	Value	Units
Wavelength operation	1270~1450	nm
Spectral Width (-20dB)	1	nm
Output Optical Power 9/125 micrometers fiber	-1	dBm
Optical Input Power-maximum	-8	dBm
Optical Input Power-minimum (Sensitivity)	-30	dBm
Minimum atenuation for looping output with input	13	dBm

Table B-17. 1550nm-30dB margin

Parameter	Value	Units
Wavelength operation	1470~1610	nm
Spectral Width (-20dB)	1	nm

Output Optical Power 9/125 micrometers fiber	-1	dBm
Optical Input Power-maximum	-8	dBm
Optical Input Power-minimum (Sensitivity)	-30	dBm
Minimum atenuation for looping output with input	13	dBm