

Nortel

Optical Metro 5100/5200

Installing Optical Metro 5200 Shelves and Components, Part 2 of 2

Standard Release 8.0 Issue 1 April 2005

What's inside...

- Connecting power
- Installing peripheral cables
- Installing circuit packs
- Fiber management
- Cleaning connectors

See Part 1 for the following:

- Observing safety guidelines
- Preparing for installation
- Installing a rack (19-inch or 23-inch)
- Installing Optical Metro 5200 shelves and equipment

Copyright © 2000–2005 Nortel Networks, All Rights Reserved

The information contained herein is the property of Nortel Networks and is strictly confidential. Except as expressly authorized in writing by Nortel Networks, the holder shall keep all information contained herein confidential, shall disclose the information only to its employees with a need to know, and shall protect the information, in whole or in part, from disclosure and dissemination to third parties with the same degree of care it uses to protect its own confidential information, but with no less than reasonable care. Except as expressly authorized in writing by Nortel Networks, the holder is granted no rights to use the information contained herein.

This information is provided “as is”, and Nortel Networks does not make or provide any warranty of any kind, expressed or implied, including any implied warranties of merchantability, non-infringement of third party intellectual property rights, and fitness for a particular purpose.

Nortel, the Nortel logo, the Globemark, and OPTera are trademarks of Nortel Networks.

HP and HP-UX are trademarks of Hewlett-Packard, Inc. Pentium is a trademark of Intel Corporation. Internet Explorer, Windows, and Windows NT are trademarks of Microsoft Corporation. Netscape Communicator is a trademark of Netscape Communications Corporation. Common Desktop Environment, Java, Solaris, and Ultra are trademarks of Sun Microsystems, Inc. UNIX is a trademark of X/Open Company Limited.

Printed in Canada and the United Kingdom

Contents

About this document	v
Audience for this document	vi
Optical Metro 5100/5200 library	vii
Technical assistance service telephone numbers	ix

Connecting power	5-1
-------------------------	------------

List of procedures

5-1	Connecting power leads to the power cards using ring lugs	5-5
5-2	Connecting alternating current power to a 3U APRS rectifier	5-13
5-3	Connecting wires to the direct current outputs of a 3U APRS rectifier	5-18
5-4	Connecting power leads to the Optical Trunk switch	5-24
5-5	Connecting power leads and grounding the ETS shelf	5-27
5-6	Connecting power to a Breaker Interface Panel (BIP)	5-34
5-7	Connecting power to an Ethernet Hub	5-38
5-8	Connecting power to an Equipment Inventory Unit	5-41
5-9	Testing the Optical Metro 5200 shelf power connections	5-44

Installing peripheral cables	6-1
-------------------------------------	------------

List of procedures

6-1	Connecting shelf alarms and telemetry equipment to the central office alarm system	6-3
6-2	Connecting an external power alarm to a 3U APRS rectifier	6-9
6-3	Connecting alarms on the Optical Trunk Switch	6-11
6-4	Connecting alarms on the Enhanced Trunk Switch	6-15
6-5	Connecting two shelves with a crossover Ethernet cable	6-21
6-6	Connecting two or more shelves to an Ethernet hub	6-26
6-7	Connecting the ETS shelf to the Optical Metro shelf using an Ethernet cable	6-31
6-8	Connecting to a data communications network	6-34
6-9	Connecting passive devices to the maintenance panel	6-36
6-10	Connecting passive devices to the Equipment Inventory Unit in new installations	6-56
6-11	Connecting passive devices to the Equipment Inventory Unit in existing installations	6-64
6-12	Connecting the Equipment Inventory Unit to the maintenance panel	6-68

Installing circuit packs 7-1**List of procedures**

- 7-1 Inserting circuit packs 7-3
- 7-2 Installing an ETS Comms module in an ETS shelf 7-6
- 7-3 Installing an ETS Switch module in an ETS shelf 7-8
- 7-4 Installing small form factor pluggable modules 7-12
- 7-5 Inserting filler cards 7-16

Fiber management 8-1**List of procedures**

- 8-1 Labeling cables and optical fibers 8-5
- 8-2 Guidelines for labeling the fibers and cables in an OFA installation kit 8-12
- 8-3 Guidelines for routing fiber in the Fiber Manager 8-17
- 8-4 Guidelines for routing fiber in a equipment drawer equipped with tray assemblies 8-22
- 8-5 Routing fibers for optical circuit packs 8-27
- 8-6 Routing fibers for the Muxponder circuit pack 8-30
- 8-7 Routing fibers from the OMX (Standard) tray 8-39
- 8-8 Routing fibers for the OMX 4CH + Fiber Manager or OMX 4CH Enhanced tray 8-44
- 8-9 Routing fibers for the OMX 16CH DWDM 8-49
- 8-10 Routing fibers for the ECT tray 8-55
- 8-11 Routing fibers for the OSC tray 8-58
- 8-12 Routing fibers for the OSC tray with dual taps 8-62
- 8-13 Routing fibers for the Transponder Protection Tray 8-66
- 8-14 Routing fibers for the patch panel 8-71
- 8-15 Routing fibers for the OMX 4CH CWDM or the OMX 4CH CWDM with dual taps 8-80
- 8-16 Routing fibers for the OMX 4CH ITU CWDM or OMX 8CH ITU CWDM 8-89
- 8-17 Routing fibers for the OMX 1CH OADM ITU CWDM or the OMX 4CH OADM ITU CWDM 8-95
- 8-18 Routing fiber for the Optical Trunk Switch 8-101
- 8-19 Routing fibers for the Enhanced Trunk Switch 8-103
- 8-20 Routing fibers for the PBE 8-105
- 8-21 Routing fibers for the 1310 nm Splitter/Coupler 8-109
- 8-22 Routing fibers for the C&L Splitter/Coupler 8-113
- 8-23 Routing fibers for the Discrete VOA 8-117
- 8-24 Routing fibers for a DSCM drawer 8-121

Cleaning connectors 9-1

Cleaning zones 9-1

List of procedures

- 9-1 Cleaning SC, LC, or FC-type connectors (simplex or duplex) 9-7
- 9-2 Cleaning MT-RJ connectors 9-11

- 9-3 Cleaning MPO connectors 9-13
- 9-4 Cleaning adapter housings and (when applicable) optical connectors on circuit packs 9-15
- 9-5 Cleaning the SFP adapter housing 9-19
- 9-6 Assessing cleanliness of the optical fiber end 9-24

About this document

This document provides the installation procedures for Nortel Optical Metro 5100/5200 Optical Metro 5200.

ATTENTION

This document is presented in two parts: Part 1 and Part 2. Each part has its own table of contents. The table of contents in Part 1 contains topics found in Part 1 only. The table of contents in Part 2 contains topics found in Part 2 only. Part 2 continues sequential chapter numbering from Part 1.

Installing Optical Metro 5200 Shelves and Components, Part 1, 323-1701-201, contains the following:

Chapter 1, “Observing safety guidelines”

Chapter 2, “Preparing for installation”

Chapter 3, “Installing a rack (19-inch or 23-inch)”

Chapter 4, “Installing Optical Metro 5200 shelves and equipment”

Installing Optical Metro 5200 Shelves and Components, Part 2, 323-1701-201, contains the following:

Chapter 5, “Connecting power”

Chapter 6, “Installing peripheral cables”

Chapter 7, “Installing circuit packs”

Chapter 8, “Fiber management”

Chapter 9, “Cleaning connectors”

This document provides procedures for installing shelves in a site, and installing components in an Optical Metro 5200.

This document contains the following information for the Optical Metro 5200:

- safety guidelines
- preparing for installation
- installing shelves and equipment

- connecting power
- installing peripheral cables
- installing circuit packs
- fiber management
- cleaning connectors

Audience for this document

This document is intended for the following audience:

- strategic and current planners
- provisioners
- installers
- transmission standards engineers
- field maintenance engineers
- system line-up and testing (SLAT) personnel
- maintenance technicians
- network administrators

Optical Metro 5100/5200 library

The Optical Metro 5100/5200 library consists of the *Nortel Optical Metro 5100/5200 Technical Publications*, NT0H65AM.

Technical Publications

The *Optical Metro 5100/5200 Nortel Technical Publications* (NTP) consist of descriptive information and procedures.

Descriptive information

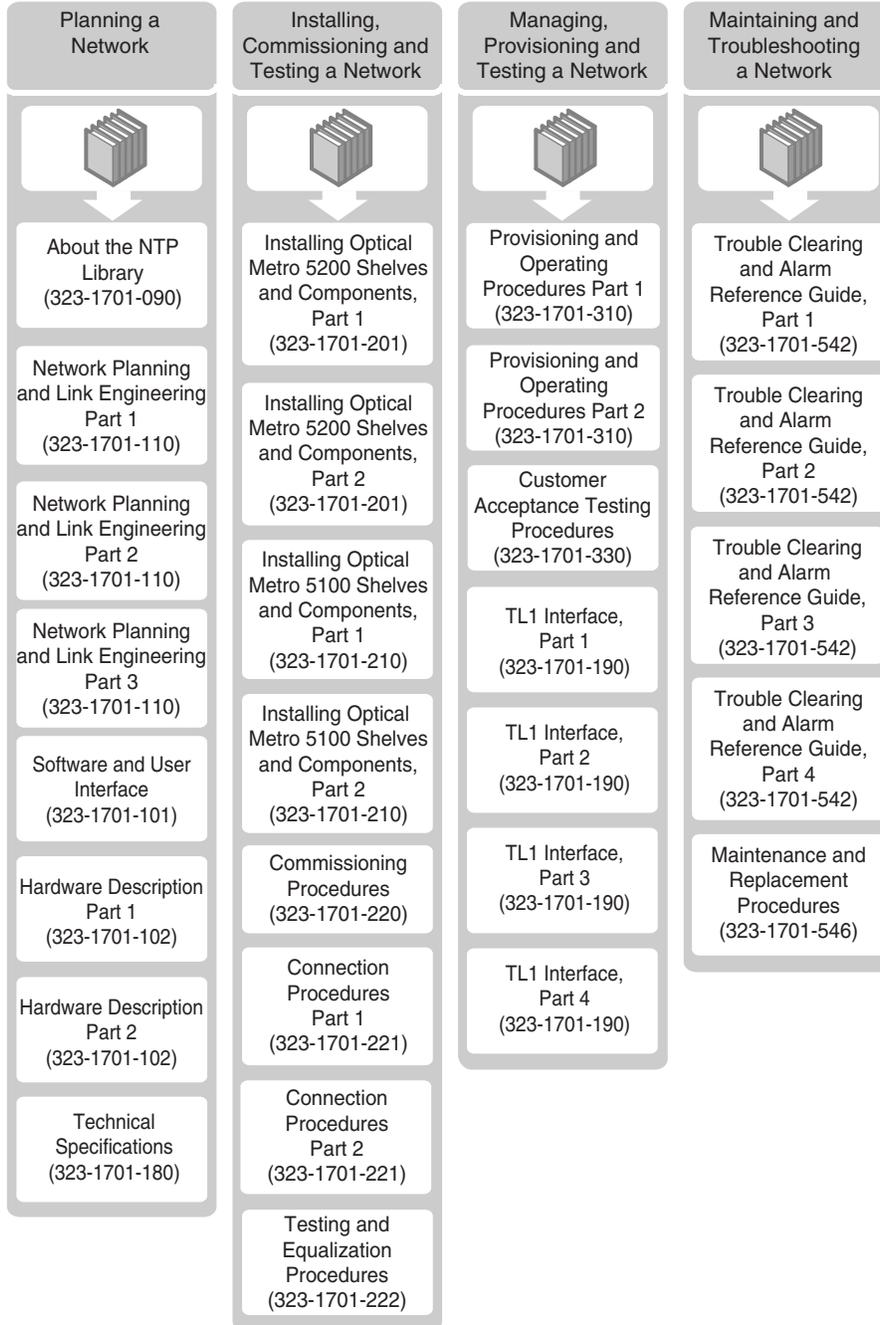
These NTPs provide detailed descriptive information about the Optical Metro 5100/5200 system, including system software and hardware descriptions, technical specifications, ordering information, and TL1 user information.

Procedures

These NTPs contain all procedures required to install, provision, and maintain the Optical Metro 5100/5200 system.

The following roadmap lists the documents in the Optical Metro 5100/5200 library.

OM2805p



Technical assistance service telephone numbers

For technical support and information from Nortel Networks, refer to the following table.

Technical Assistance Service	
<p>For service-affecting problems: For 24-hour emergency recovery or software upgrade support, that is, for:</p> <ul style="list-style-type: none"> • restoration of service for equipment that has been carrying traffic and is out of service • issues that prevent traffic protection switching • issues that prevent completion of software upgrades 	<p>North America: 1-800-4NORTEL (1-800-466-7835)</p> <p>International: 001-919-992-8300</p>
<p>For non-service-affecting problems: For 24-hour support on issues requiring immediate support or for 14-hour support (8 a.m. to 10 p.m. EST) on upgrade notification and non-urgent issues.</p>	<p>North America: 1-800-4NORTEL (1-800-466-7835)</p> <p>Note: You require an express routing code (ERC). To determine the ERC, see our corporate Web site at www.nortel.com. Click on the Express Routing Codes link.</p> <p>International: Varies according to country. For a list of telephone numbers, see our corporate Web site at www.nortel.com. Click on the Contact Us link.</p>
<p>Global software upgrade support:</p>	<p>North America: 1-800-4NORTEL (1-800-466-7835)</p> <p>International: Varies according to country. For a list of telephone numbers, see our corporate Web site at www.nortel.com. Click on the Contact Us link.</p>

Connecting power

Use the procedures in this chapter to make power connections to all the component parts of the Optical Metro 5100/5200 system.

Before you begin

Before you begin the procedures in this chapter, make sure that you have completed the procedures in the [“Installing Optical Metro 5200 shelves and equipment”](#) chapter in this book.

Requirements

[Table 5-1](#) lists the tools and materials needed to complete the procedures in this chapter.

Table 5-1
Tools and materials required to make power connections to a shelf

Item	Quantity	Supplied	√
Volt-ohm-multimeter (VOM)	1	no	
Wire crimper	1	no	
Wire strippers	1	no	
Phillips #1 screwdriver	1	no	
Phillips #2 screwdriver	1	no	
Phillips #8 pan head screws 8-32 x 1/4-in.	4	yes	
Flat head screwdriver (slotted) 3/32 in.	1	no	
Cable ties and lacing cord	2	no	
Ring lugs for 10 AWG copper wire	as required	no	
Ring lugs for 12 AWG copper wire	as required	no	
Single-hole (#6 screw) ring lugs for 12, 14, 16 or 18 AWG copper wire, depending on the powering wire size used (for the ETS powering connection)	8	no	

5-2 Connecting power

Table 5-1 (continued)
Tools and materials required to make power connections to a shelf

Item	Quantity	Supplied	√
Dual-hole ring lug for 10 AWG copper wire (for the ground connection to ETS dual ground connector)	2	yes, 1 already installed on the ETS shelf, and the other 1 part of the ETS installation kit	
24 AWG insulated copper wire (ETSI equivalent: 0.2 mm ²)	as required	no	
-48 V 10 AWG insulated stranded copper wire (See Note 1 : and Note 2 :)	as required	no	
0 V 10 AWG insulated stranded copper wire (See Note 1 : and Note 2 :)	as required	yes, part of the ETS installation kit	
18 AWG (0.8 mm ² , minimum size), 16 AWG, 14 AWG or 12 AWG (3.00 mm ² , maximum size) insulated stranded or solid copper wire (minimum) (for ETS power connection)	4 wires for the power connections	no	
10 AWG (5 mm ²) insulated stranded copper wire (for the ETS grounding connection)	1 wire for the grounding connection	yes, part of the ETS installation kit	
AC power cable with an IEC 60320-C19 (male) connector (Used to connect the ac power source to a 3U APRS rectifier unit. For ordering information, see the “Power cables” on page 13-95 in <i>Network Planning and Link Engineering</i> , 323-1701-110.)	1 or 2 (depending on the number of units installed in the chassis)	no	

Table 5-1 (continued)
Tools and materials required to make power connections to a shelf

Item	Quantity	Supplied	√
Ring lugs for 10 AWG cable wire (3U APRS dc power output cables).	2 or 4 (depending on the number of rectifier units installed in the chassis)	no	
3U APRS installation kit (NT0H44AH). For more information, see “Optical Metro 5100/5200 ordering information” on page 13-1 in <i>Network Planning and Link Engineering</i> , 323-1701-110.)	1 or 2 (depending on the number of rectifier units installed in the chassis)	no	
<p>Note 1: Two different insulation colors are used for the 10 AWG power cables. Follow the standard practice for your facility to assign wire color polarities when making dc power connections. In ANSI specifications, the -48V lead is Red, and the 0V return is Black. In ETSI specifications, the -48V lead is Blue, and the 0V return is Black.</p> <p>Note 2: Local standards may specify a different color coding than those listed in this book. Make sure to follow all local standards when performing these procedures.</p>			

Precautions



CAUTION

Risk of equipment damage

Make sure you know how to handle electronic components correctly before you begin installation procedures. Incorrect handling can cause damage to static-sensitive components.



CAUTION

Risk of shelf malfunction

Nortel Networks recommends that you do not use cellular phones at any Optical Metro 5200 site. The use of cellular phones in proximity to Optical Metro 5200 equipment can cause shelf malfunction.

Procedure list

Table 5-2 lists the procedures in this chapter.

Table 5-2
Power connection procedures

Procedure	Page	Comments	√
5-1 Connecting power leads to the power cards using ring lugs	5-5		
5-2 Connecting alternating current power to a 3U APRS rectifier	5-13		
5-3 Connecting wires to the direct current outputs of a 3U APRS rectifier	5-18		
5-4 Connecting power leads to the Optical Trunk switch	5-24		
5-5 Connecting power leads and grounding the ETS shelf	5-27		
5-6 Connecting power to a Breaker Interface Panel (BIP)	5-34		
5-7 Connecting power to an Ethernet Hub	5-38		
5-8 Connecting power to an Equipment Inventory Unit	5-41		
5-9 Testing the Optical Metro 5200 shelf power connections	5-44		

Procedure 5-1

Connecting power leads to the power cards using ring lugs

Follow this procedure to connect power leads to an Optical Metro 5100/5200 shelf.

Each Optical Metro 5100/5200 shelf has two power cards (A and B) located in the maintenance panel. Nortel Networks recommends that you use both power cards, and connect two power sources to each shelf. Use one power source as the primary power and the other as the backup. With a redundant power supply you can still supply power to the shelf if the primary source fails.

For more information on Optical Metro 5200 hardware, see *Hardware Description*, 323-1701-102.

Requirements

[Table 5-3](#) lists the tools and materials required to prepare two sets of power leads. You can attach a maximum of two sets of power leads for each Optical Metro 5100/5200 shelf.

Table 5-3
Tools and materials for preparing power feeds for cards with ring connectors

Item	Quantity	Supplied	√
Volt-ohm-multimeter (VOM)	1	no	
10 AWG insulated stranded copper wire	as required	no	
Wire crimping tool	1	no	
Wire strippers	1	no	
Ring lugs for 10 AWG copper wire	4	no	
Phillips #8 pan head screws 8-32 x 1/4-in.	4	yes	
Cable tie	2	no	
Wax string or lacing cord	as required	no	
Torque screwdriver	1	no	

—continued—

Precautions



DANGER

Risk of personal injury

Make sure you connect a ground wire to the shelf before you start this procedure. Failure to connect the ground wire can result in personal injury, damage to the equipment, or both.



CAUTION

Risk of equipment damage

Make sure you complete the following procedure correctly. If the polarity of both power feeds is not the same, you can damage the electrical components on the shelf.



CAUTION

Risk of equipment damage

Make sure that the Power A and Power B Breakers on the maintenance panel are in the OFF (O) position. Failure turn the Breakers off can result in damage to electrical components on the shelf.

Routing power cables

When routing power cables, follow these guidelines:

- When facing the frame, route the power cables along the left-hand side and secure them to the frame using tie-wraps or lacing cord.
- When routing power cables over metallic edges, wrap and secure NOMAX paper around the cables.
- See [Figure 5-1](#).

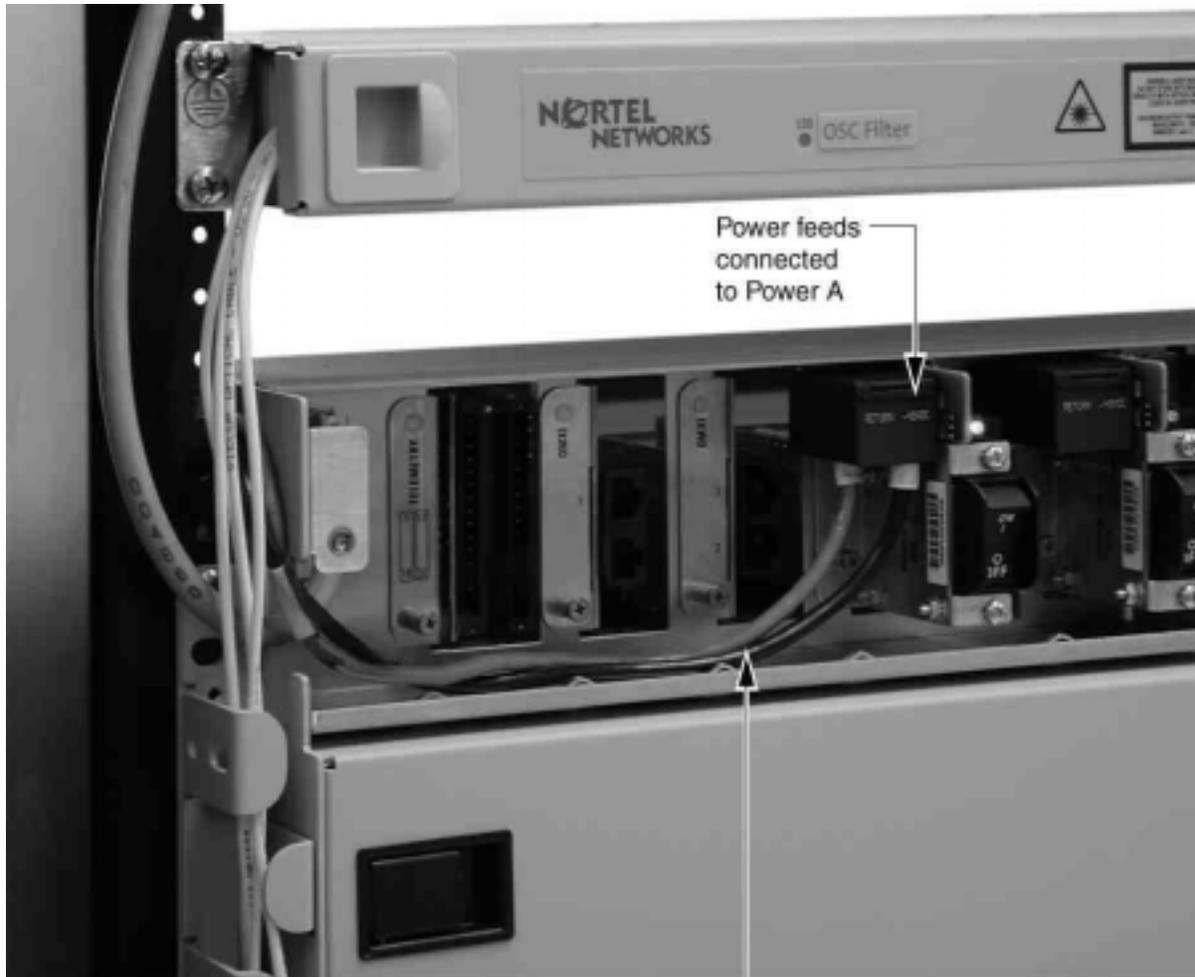
—continued—

Procedure 5-1 (continued)

Connecting power leads to the power cards using ring lugs

Figure 5-1
Routing the power feeds into the maintenance panel (Power A only)

OM1306p.jpg



Feeds are routed from the left side of the rack along the bottom of the maintenance panel to the power terminal

—continued—

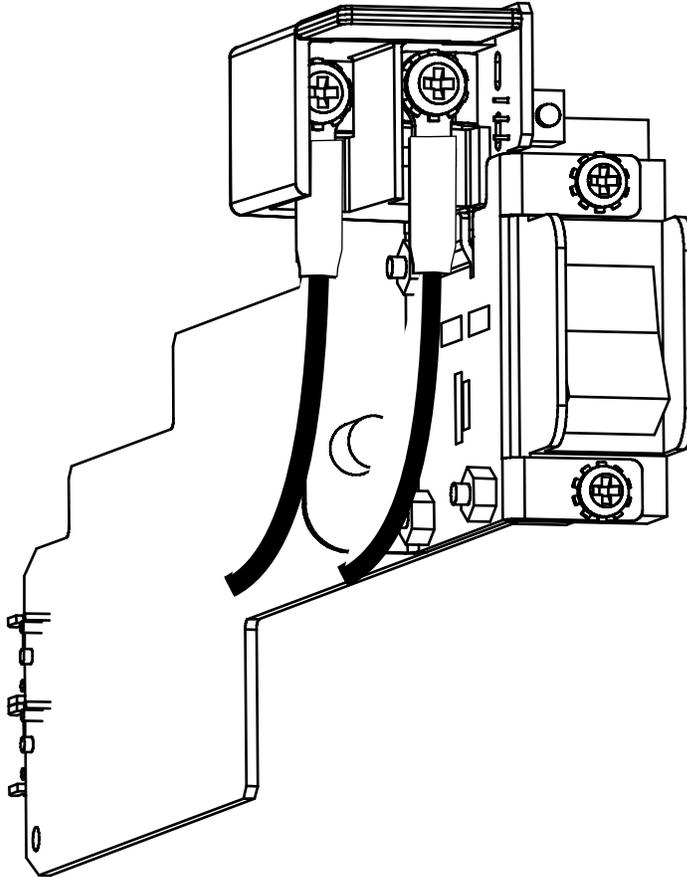
5-8 Connecting power

Procedure 5-1 (continued)

Connecting power leads to the power cards using ring lugs

Figure 5-2
Ring lugs for the power feed to one Optical Metro 5100/5200 power card

OM0358t



—continued—

Procedure 5-1 (continued)

Connecting power leads to the power cards using ring lugs

Action

Step	Action
------	--------

- 1 Make sure both power feeds have the correct electrical specifications.

Nominal operating ranges for power connections	Measured voltage
Across A (A -48V and A RET)	-40V to -60V
Across B (B -48V and B RET)	-40V to -60V
Note: For additional information regarding the operating ranges for the Optical Metro 5100/5200, see the “ Hardware specifications ” chapter in <i>Technical Specifications</i> , 323-1701-180.	

- 2 Ensure that the power leads that will connect with the Optical Metro 5200 shelf are off.



CAUTION

Risk of personal injury and equipment damage

Make sure both power feeds coming from the power sources are off. Make sure that the Power A and Power B breakers in the Optical Metro 5200 shelf maintenance panel are in the OFF (O) position.

- 3 If the left side of the maintenance panel is not open, loosen the thumbscrews and remove the cover to access the power cards. See [Figure 5-3 on page 5-11](#).
- 4 Measure two lengths of 10 AWG insulated stranded copper wire.
- 5 Use wire strippers to remove 7 mm (0.25 in.) of insulation from the ends of both 10 AWG power feed wires. See [Figure 5-4 on page 5-11](#).
- 6 Use the crimping tool to crimp a ring lug on the end of each wire.
- 7 Open the Power B terminal block by lifting the cover, as shown in [Figure 5-5 on page 5-12](#).
- 8 Route the B power feed from the left side of the shelf, along the bottom of the maintenance panel tray, to the connector on the Power B (right) card.

—continued—

5-10 Connecting power

Procedure 5-1 (continued)

Connecting power leads to the power cards using ring lugs

Step	Action
------	--------

- 9 Remove the screws from the terminal block.



CAUTION

Risk of equipment damage

Do not route power cables through the vertical fiber brackets of the shelf. If you route the power cables through the vertical fiber brackets, you can cause damage to the fiber-optic cables in the brackets.

- 10 Screw the ring lug with the -48 V dc battery voltage into the hole on the right side of the terminal block labelled -48 V. Tighten the screw to a torque value of 15 in-lb. (173 g-m).

Note 1: Two different insulation colors are used for the 10 AWG power cables. Follow the standard practice for your facility to assign wire color polarities when making dc power connections. In ANSI specifications, the -48V lead is Red. In ETSI specifications, the -48V lead is Blue.

Note 2: Local standards may specify a different color coding than those listed in this book. Make sure to follow all local standards when performing these procedures.

- 11 Screw the ring lug with the battery return into the hole on the left side of the terminal block labelled RET. Tighten the screw to a torque value of 15 in-lb. (173 g-m).

Note 1: Two different insulation colors are used for the 10 AWG power cables. Follow the standard practice for your facility to assign wire color polarities when making dc power connections. In ANSI and ETSI specifications, the 0V return is Black.

Note 2: Local standards may specify a different color coding than those listed in this book. Make sure to follow all local standards when performing these procedures.

- 12 Route the A power feed from the left side of the shelf, along the bottom of the maintenance panel tray, to the connector on the Power A (left) card.

- 13 Remove the screws from the terminal block.

- 14 Repeat [step 10](#) and [step 11](#) for the second power feed.

- 15 Make sure that there are no exposed wires from either power card touching other components and ensure the connections are secure.

—continued—

Procedure 5-1 (continued)

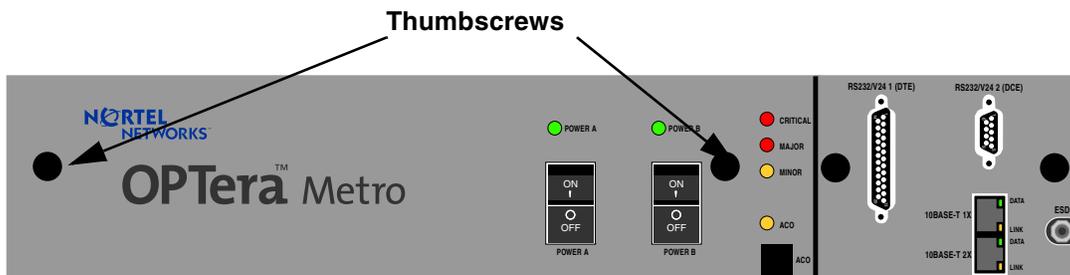
Connecting power leads to the power cards using ring lugs

Step	Action
16	If there is any noticeable movement of the contacts <ol style="list-style-type: none"> Make sure that the lugs are securely fastened to the ends of the wires. Make sure that the lugs are securely fastened to the connectors on the power card.
17	Apply voltage across the ring lugs and test the ring lugs in each of the terminal blocks with a VOM. Make sure that the power output and polarity are correct. <i>The Power indicator lamps of the connected power cards turn red when the polarity is correct.</i>
18	Close the terminal block cover. Make sure that the single notch on the cover fully engages the slot on the terminal block.
19	Fasten the power leads to the maintenance tray with a cable tie or wax string.
20	Reattach the left maintenance panel covers.

—end—

**Figure 5-3
Removing maintenance panel cover**

OM0146p



**Figure 5-4
Attaching ring lugs to a wire**

OM1324p

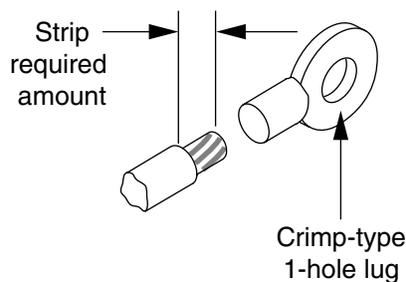
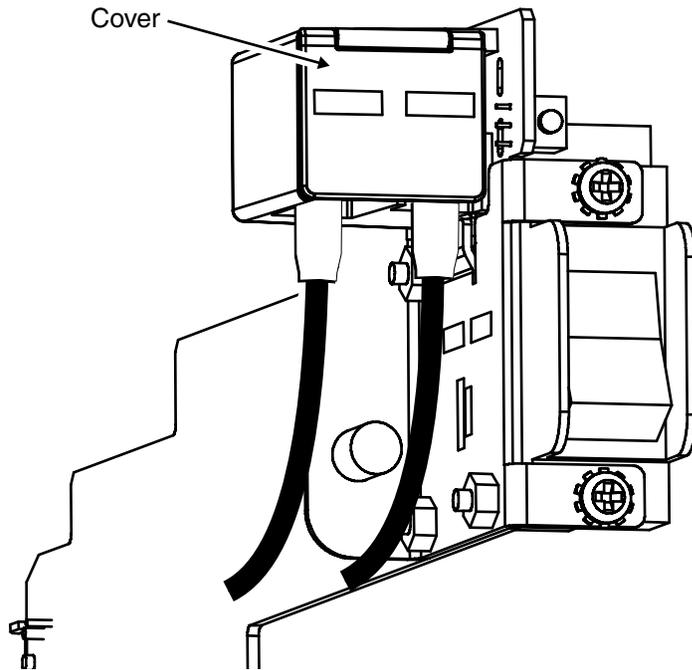


Figure 5-5
The terminal block cover

OM03571



Procedure 5-2

Connecting alternating current power to a 3U APRS rectifier

Follow this procedure to connect alternating current power to a 3U APRS rectifier (NT0H4311). If using another type of rectifier, consult manufacturer's instructions.

For more information on rectifiers, see [“Rectifiers”](#) in *Hardware Description*, 323-1701-102.

Requirements

[Table 5-4](#) lists the tools and materials required for this procedure

Table 5-4
Tools and materials for connecting alternating current power to a rectifier

Item	Quantity	Supplied	√
AC power cable with an IEC 60320-C19 (male) connector (Used to connect the ac power source to a 3U APRS rectifier unit. For ordering information, see the “Power cables” on page 13-95 in <i>Network Planning and Link Engineering</i> , 323-1701-110.)	1 or 2 (depending on the number of units installed in the chassis)	no	
Screwdriver	1	no	
Cable ties	as required	no	
Lacing cord or wax string	as required	no	
3U APRS installation kit (NT0H44AH). For more information, see “Optical Metro 5100/5200 ordering information” on page 13-1 in <i>Network Planning and Link Engineering</i> , 323-1701-110.)	1 or 2 (depending on the number of rectifier units installed in the chassis)	no	

—continued—

Procedure 5-2 (continued)

Connecting alternating current power to a 3U APRS rectifier

Precautions



DANGER

Risk of personal injury

Make sure that all power is off before you make connections on a rectifier. Do not handle live wires. If you handle live wires you can cause personal injury, damage to equipment, or both.



DANGER

Risk of electrical shock

The ac rectifiers require that the receptacles of the ac mains provide a ground/protective earth connection. The ground/protective earth conductor of the ac power cords must be connected to this ground/protective earth connection by way of a suitable plug in accordance with local and national electrical codes.

—continued—

Procedure 5-2 (continued)

Connecting alternating current power to a 3U APRS rectifier**DANGER****Risk of electrical shock**

The NT0H43DB and NT0H43DC ac power cords are provided with open wires at one end, and therefore require a plug to be installed for connection of the power cords to the ac mains. The selection of the plug, and the installation of the plug, must be performed by a qualified (certified or licensed) person in accordance with local and national electrical codes. A hazardous installation may result if the plugs are not wired correctly. Refer to [Table 5-5](#) for the pinouts when connecting a plug to the wires.

Table 5-5
Pinouts for NT0H43DB and NT0H43DC

Color	Designation	Description
NT0H43DB (North America)		
Solid black	L1	Line
Solid white	L2	Neutral
Solid green or green/yellow		Ground/protective Earth
NT0H43DC (International)		
Solid brown	L1	Line
Solid blue	L2	Neutral
Green/yellow		Ground/protective Earth

**CAUTION****Protect cables**

When routing power cables over metallic edges, wrap and secure NOMAX paper around the cables to protect them.

—continued—

Procedure 5-2 (continued)

Connecting alternating current power to a 3U APRS rectifier



CAUTION

Risk of equipment damage

Locate the ac power cords that provide power to the rectifier in such a way that the power cords are not subject to wear, abrasion, sharp edges, foot traffic, extreme temperatures, moisture, or other adverse wear conditions that may be detrimental to their long-term integrity. The cords are not intended for permanent connection to the ac power source by way of a junction box, but rather must connect to the ac mains by way of a suitable plug in accordance with local and national electrical codes.

ATTENTION

For redundant power supply, Nortel Networks recommends that both ac circuits be derived from the same ac phase. Consult your local and national safety codes if you are considering powering each rectifier from different ac phases.

Expected results

When you complete this procedure

- the rectifier is connected to alternating current power
- follow [Procedure 6-2 “Connecting an external power alarm to a 3U APRS rectifier”](#), in this book, to connect external power alarms to the rectifier

Action

Step	Action
1	Plug the power cord (IEC 320-C19, female) into the connector marked PS1 on the back of the rectifier chassis. See Figure 5-6 .
2	If you have installed a second rectifier, plug another power cord (IEC 320-C19, female) into the connector marked PS2.

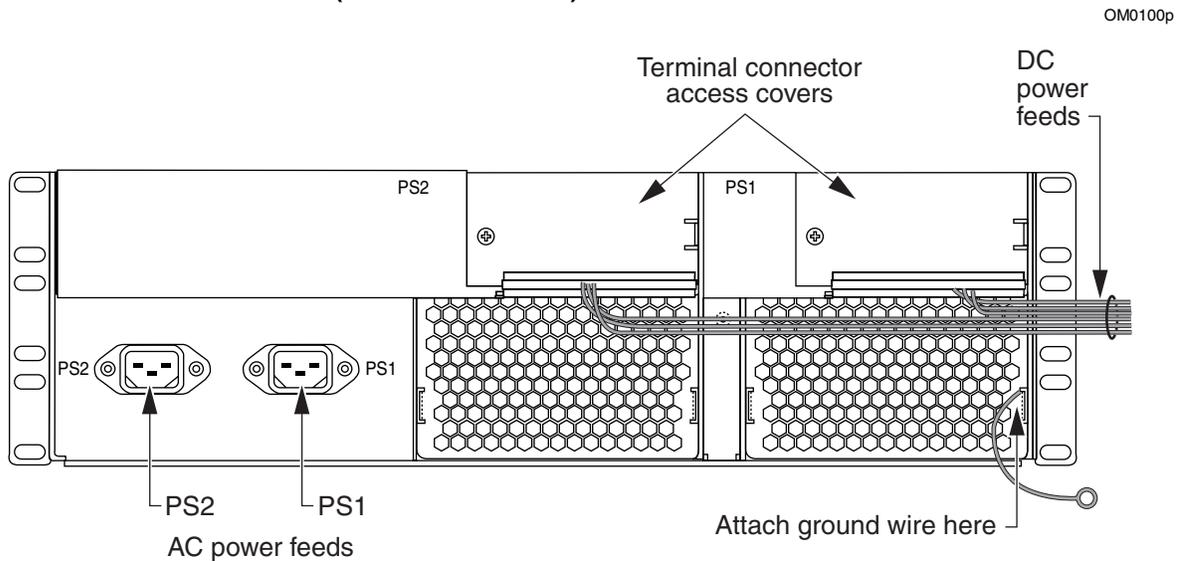
—continued—

Procedure 5-2 (continued)

Connecting alternating current power to a 3U APRS rectifier

Step	Action
3	Plug the other end of the power cord from step 1 (and if applicable step 2) into an approved alternating current power source. For approved specifications, see Table 1-41 in 323-1701-180, <i>Technical Specifications</i> .
4	Route the power cord along the left side of the frame and support it using tie wraps or lacing cord.
5	Continue by performing Procedure 5-3 Connecting wires to the direct current outputs of a 3U APRS rectifier on page 5-18.

Figure 5-6
Rectifier chassis—back view (with rectifier units)



—end—

Procedure 5-3

Connecting wires to the direct current outputs of a 3U APRS rectifier

You can connect a maximum of two Optical Metro 5200 shelves to one rectifier. To ensure a redundant power supply you can connect a single shelf to two different rectifiers. Use this procedure to connect direct current power cable outputs from a rectifier (NT0H4311). If using another type of rectifier, consult manufacturer's instructions.

For more information on rectifiers, see [“Rectifiers”](#) in *Hardware Description*, 323-1701-102.

Requirements

[Table 5-6](#) lists the tools and materials required for this procedure.

Table 5-6
Tools and materials for connecting direct current power cable outputs from a rectifier

Item	Quantity	Supplied	√
10 AWG insulated stranded copper wire	as required	no	
Wire crimping tool	1	no	
Ring lugs for 10 AWG copper wire	2	no	
Screwdriver	1	no	
Cable ties	as required	no	
Lacing cord or wax string	as required	no	
Torque wrench	1	no	
3U APRS installation kit (NT0H44AH). For more information, see “Optical Metro 5100/5200 ordering information” on page 13-1 in <i>Network Planning and Link Engineering</i> , 323-1701-110.)	1 or 2 (depending on the number of rectifier units installed in the chassis)	no	

—continued—

Procedure 5-3 (continued)

Connecting wires to the direct current outputs of a 3U APRS rectifier

Precautions



DANGER

Risk of personal injury

Make sure you connect a ground wire to the Optical Metro 5200 shelf before you start this procedure. Failure to connect the ground wire can result in personal injury, damage to the equipment, or both.



DANGER

Risk of personal injury

Make sure that all power to the rectifier, and the power feeds on the rectifier are off before you make connections. Do not handle live wires. If you handle live wires you can cause personal injury, damage to equipment, or both.



CAUTION

Risk of equipment damage

Make sure that the Power A and Power B switches on the Optical Metro 5200 maintenance panel are in the OFF (O) position. Failure to turn the switches off can result in damage to electrical components on the shelf.



CAUTION

Protect cables

When routing power cables over metallic edges, wrap and secure NOMAX paper around the cables to protect them.

Expected results

When you complete this procedure the cables are connected to the direct current outputs on the 3U APRS rectifier.

Action

Step	Action
------	--------

- | | |
|---|---|
| 1 | Make sure that the power switches on the rectifier chassis are in the Off position. See Figure 5-7 on page 5-22 . |
|---|---|

—continued—

Procedure 5-3 (continued)

Connecting wires to the direct current outputs of a 3U APRS rectifier

Step	Action
2	Remove the access cover to the terminal connector for PS1 at the back of the rectifier chassis. (For redundant power, also remove the access cover to the terminal connector for PS2.)
3	Locate the direct current terminal connectors. See Figure 5-9 on page 5-23 .
4	If not already done in Procedure 5-1 , measure two lengths of 10 AWG insulated stranded copper wire to reach from the direct current terminal connectors on the rectifier to the maintenance panel on the Optical Metro 5200 shelf to which the rectifier will supply power. Note: For redundant power, measure enough wire to connect the output of rectifier PS1 to power card A. Then measure enough wire to connect the output of rectifier PS2 to power card B. Figure 5-8 on page 5-22 shows a back view of the rectifier chassis.
5	Cut the wires to the required length.
6	Strip 7 mm (0.25 in.) of insulation from the end of the 10 AWG power cables.

ATTENTION

Two different insulation colors are used for the 10 AWG power cables. Follow the standard practice for your facility to assign wire color polarities when making dc power connections.

- | | |
|---|--|
| 7 | Crimp one circular lug to the end of each wire. |
| 8 | For each wire pair, remove the screws for the -48V and 0V (RET) from the direct current terminal connectors. |
| 9 | Connect the -48V 10 AWG power cable to -48V terminal to a torque value of 10 in-lb.

Note 1: Two different insulation colors are used for the 10 AWG power cables. Follow the standard practice for your facility to assign wire color polarities when making dc power connections. In ANSI specifications, the -48V lead is Red. In ETSI specifications, the -48V lead is Blue.

Note 2: Local standards may specify a different color coding than those listed in this book. Make sure to follow all local standards when performing these procedures. |

—continued—

Procedure 5-3 (continued)

Connecting wires to the direct current outputs of a 3U APRS rectifier

- | Step | Action |
|------|---|
| 10 | <p>Connect the 0V 10 AWG power cable to the 0V (RET) terminal to a torque value of 10 in-lb.</p> <p>Note 1: Two different insulation colors are used for the 10 AWG power cables. Follow the standard practice for your facility to assign wire color polarities when making dc power connections. In ANSI and ETSI specifications, the 0V return is Black.</p> <p>Note 2: Local standards may specify a different color coding than those listed in this book. Make sure to follow all local standards when performing these procedures.</p> |
| 11 | Repeat step 3 through step 10 to connect a second Optical Metro 5200 shelf to a 3U rectifier. |
| 12 | Re-install the access cover for PS1 and run the cable under the bottom of the access cover as shown in Figure 5-8 . (For redundant power, also re-install the access cover for PS2 and run the cable under the bottom of the access cover.) |



CAUTION
Protect cables

When routing power cables over metallic edges, wrap and secure NOMAX paper around the cables to protect them.

- | | |
|----|--|
| 13 | Route the direct current cables along the bottom of the rectifier chassis to the equipment rack and secure the cables using lacing cord or tie wraps. |
| 14 | Follow Procedure 5-1 to connect the power cables to the power cards. Follow Procedure 5-2 to connect alternating current power to the rectifier. |

—end—

Figure 5-7
3U APRS rectifier chassis—front view with power switches Off

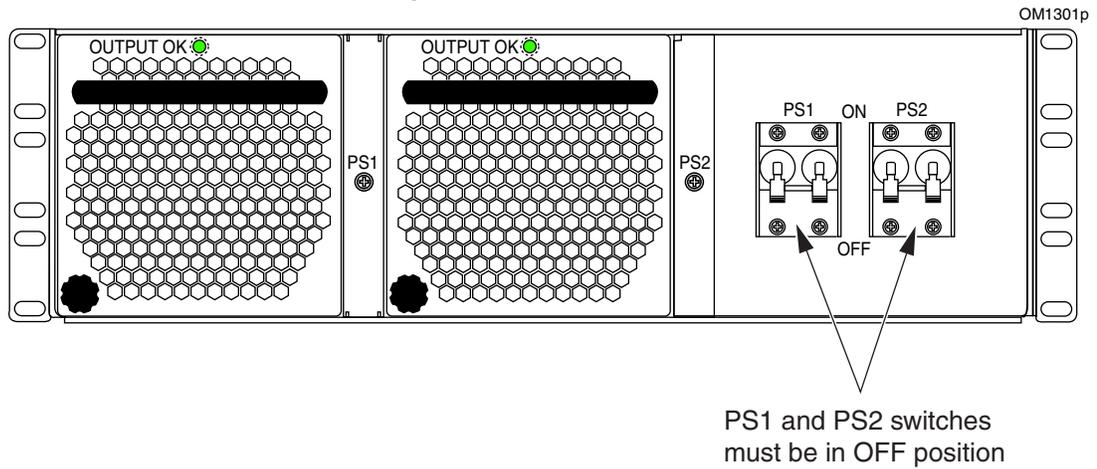


Figure 5-8
3U APRS rectifier—back view with dc power cables connected

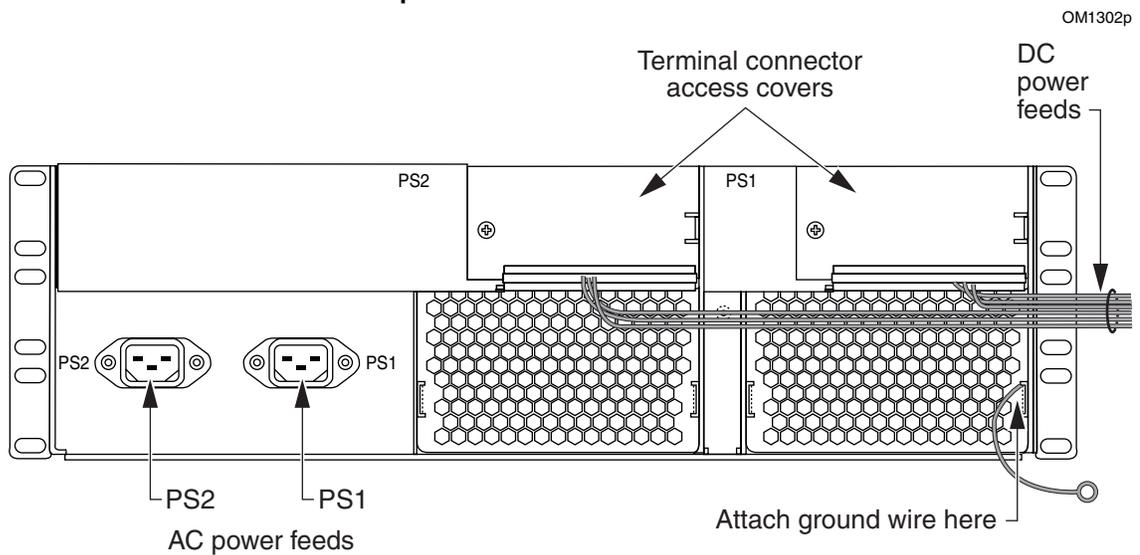
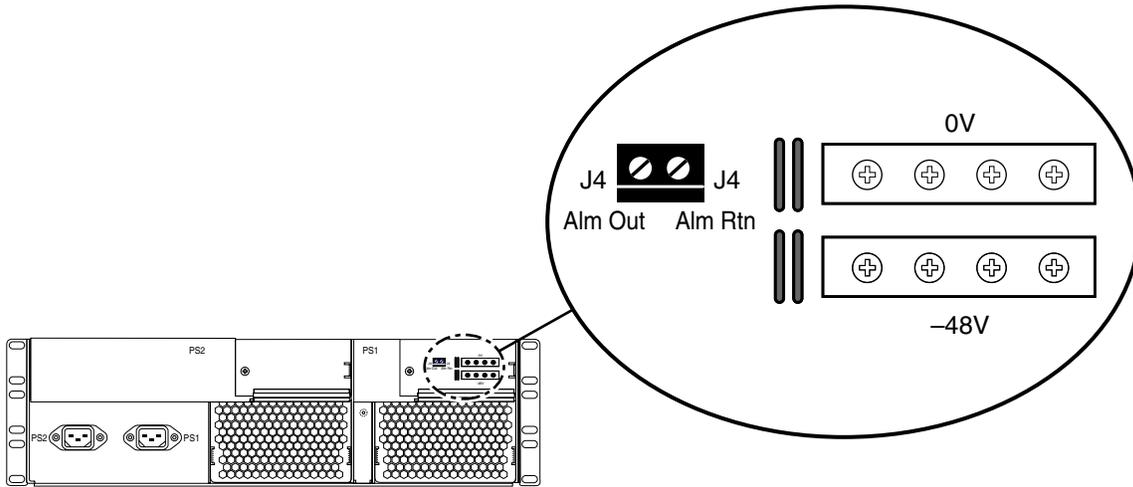


Figure 5-9
Rectifier terminals for alarm connections

OM0101p



Procedure 5-4 Connecting power leads to the Optical Trunk switch

Follow this procedure to make power connections to the Optical Trunk Switch. If the site uses a rectifier, you must use a 3U APRS rectifier with the OTS.

To make electrical connections from the Optical Trunk Switch to the power supply, follow the connector pin-out diagram on the back of the module.

For more information on the Optical Trunk Switch, see “[Optical Trunk Switch](#)” in *Hardware Description*, 323-1701-102.

Requirements

[Table 5-7](#) lists the tools and materials required for this procedure.

Table 5-7
Tools and materials for connecting power leads to the Optical Trunk Switch

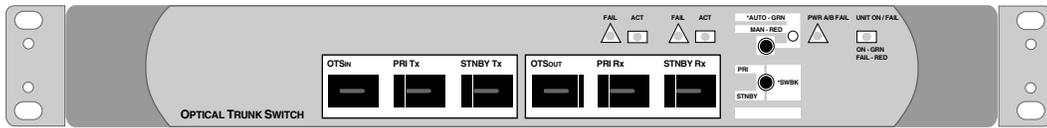
Item	Quantity	Supplied	√
14 AWG insulated stranded copper wire (see Note:)	as required	no	
Wire crimping tool	1	no	
Ring lugs for 14 AWG copper wire	4	no	
Screwdriver	1	no	
Cable ties	as required	no	
Lacing cord or wax string	as required	no	
<p>Note: Two different insulation colors are used for the 14 AWG power cables. Follow the standard practice for your facility to assign wire color polarities when making power connections. In ANSI specifications, the -48V lead is Red, and the 0V return is Black. In ETSI specifications, the -48V lead is Blue, and the 0V return is Black.</p>			

[Figure 5-10](#) shows the front panel of the Optical Trunk Switch.

—continued—

Procedure 5-4 (continued)
Connecting power leads to the Optical Trunk switch

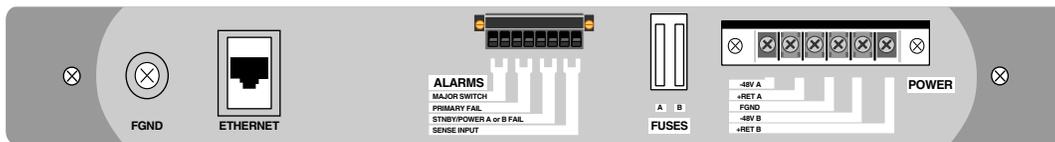
Figure 5-10
Front panel



OM0304

Figure 5-11 shows the back panel of the Optical Trunk Switch.

Figure 5-11
Back panel



OM0305p

Precautions



DANGER
Risk of personal injury
 Make sure that all power is off before you make connections on an Optical Trunk Switch. Do not handle live wires. If you handle live wires you can cause personal injury, damage to equipment, or both.

Action

Step	Action
1	Ensure that all power is off before making any power connections to the Optical Trunk Switch. Note: The power source providing DC power to the OTS (which needs to be turned off) can be either the 3U APRS rectifier or a secondary distribution panel (SDP). Power control should be controlled using a Breaker Interface Panel (BIP). By turning the breaker connected to the OTS off, power distribution is controlled.
2	Locate the power terminal block on the back of the Optical Trunk Switch.

—continued—

5-26 Connecting power

Procedure 5-4 (continued)

Connecting power leads to the Optical Trunk switch

- | Step | Action |
|------|---|
| 3 | Measure and cut one pair of 14 AWG insulated stranded copper wire to reach from the OTS terminal block connectors (-48V A and +RET A) to the primary power source.
Note: The primary power source is either the direct current power source or a rectifier. |
| 4 | Strip 7 mm (0.25 in.) of insulation from both ends of the cable and attach a 14 AWG single hole ring lug connector. |
| 5 | Make sure both power feeds have the correct electrical specifications. |

Nominal operating ranges for power connections	Measured voltage
Across A (A -48V and A RET)	-40V to -60V
Across B (B -48V and B RET)	-40V to -60V

Note: For additional information regarding the operating ranges for the OTS, see the [“Hardware specifications”](#) chapter in *Technical Specifications*, 323-1701-180.

- 6 Connect one end of the A power cables to the primary power source and the other end to the A power source on the OTS.
- 7 Repeat [step 3](#) through [step 6](#) for the B power source on the OTS.
- 8 Route and secure the OTS power cables along the side of the equipment rack using lacing cord or tie wraps.

Figure 5-12
Power connections for the Optical Trunk Switch

OM1305p.jpg.



—end—

Procedure 5-5

Connecting power leads and grounding the ETS shelf

Follow this procedure to make power connections and to ground the Enhanced Trunk Switch shelf. If the site uses a rectifier, you must use a 3U APRS rectifier with the ETS. Rectifiers are used to convert alternating current (ac) power to dc in order to provide -48Vdc power to the Optical Metro 5100/5200 system, when -48Vdc power source is not available.

To ground the ETS shelf, use the dual ground connector located at the rear of the ETS shelf. [Figure 5-13](#) shows the ETS shelf dual ground connector.

To make electrical connections from the ETS shelf to the dc power supply, follow the connector pin-out diagram on the 4-pin terminal block located on the rear of the unit. [Figure 5-14](#) shows the terminal block. [Table 5-9 on page 5-30](#) lists the power connector pin-out.

For more information on the “[Enhanced Trunk Switch](#)”, refer to the *Hardware Description*, 323-1701-102.

Requirements

The power supply source for the ETS shelf must meet the ETS shelf power specifications listed in *Technical Specifications*, 323-1701-180.

Note: The ETS is specified for -48Vdc typical, minimum of -40Vdc, max of -57Vdc operation. It is important to note that the ETS maximum power supply is not -75Vdc, as it is for the Optical Metro 5100/5200 system.

The Optical Metro 5200 rack must be grounded to the building’s earth ground system. To ground the rack, refer to the procedure “[Connecting the rack ground to the office ground](#)” on [page 3-14](#) . The ETS shelf must be grounded to the Optical Metro 5200 rack. The steps to ground the ETS shelf are part of this procedure.

—continued—

Procedure 5-5 (continued)

Connecting power leads and grounding the ETS shelf

Table 5-8 lists the tools and materials required for this procedure.

**Table 5-8
Tools and materials for connecting power leads and grounding the ETS shelf**

Item	Quantity	Supplied	√
18 AWG (0.8 mm ² , minimum size), 16 AWG, 14 AWG or 12 AWG (3.00 mm ² , maximum size) insulated stranded or solid copper wire (minimum) (see Note)	4 wires for the power connections	no	
10 AWG (5 mm ²) insulated stranded copper wire (see Note)	1 wire for the grounding connection	yes, part of the ETS installation kit	
Wire crimping tool	1	no	
Single-hole (#6 screw) ring lugs for 12, 14, 16 or 18 AWG copper wire, depending on the powering wire size used.	8	no	
Dual-hole ring lug for 10 AWG copper wire (for the ground connection to ETS dual ground connector)	2	yes, 1 already installed on the ETS shelf, and the other 1 part of the ETS installation kit	
Screwdriver	1	no	
Cable ties	as required	no	
Lacing cord or wax string	as required	no	
<p>Note: Two colors are used to distinguish the lead power cable from the return power cable. Follow the standard practice for your facility to assign wire color polarities when you make power connections. In ANSI specifications, the -48V lead is Red, and the 0V return is Black. In ETSI specifications, the -48V lead is Blue, and the 0V return is Black.</p>			

—continued—

Procedure 5-5 (continued)

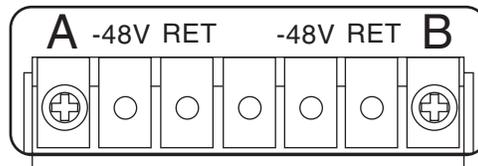
Connecting power leads and grounding the ETS shelf

Figure 5-13
Dual grounding point at the rear of the ETS shelf



OM2610p.jpg

Figure 5-14
Power terminal block at the rear of the ETS shelf



OM2436t

—continued—

Procedure 5-5 (continued)

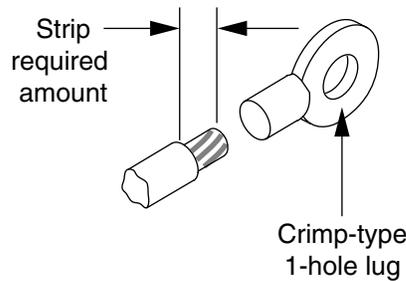
Connecting power leads and grounding the ETS shelf

Table 5-9
ETS Power terminal block pinout (from left to right)

Power supply	Pin	Function
A	-48V	Pin for making the electrical connection from the -48V dc source from supply A to the shelf.
	RET	Pin for making the return connection between the shelf and power supply A.
	Center Pin	Not used.
B	-48V	Pin for making the electrical connection from the -48V dc source from the supply B to the shelf.
	RET	Pin for making the return connection between the shelf and power supply B.

Figure 5-15
Attaching ring lugs

OM1324p



Precautions

	<p>DANGER Risk of personal injury</p> <p>Make sure that all power is off before you make connections on an Enhanced Trunk Switch shelf. Do not handle live wires. If you handle live wires you can cause personal injury, damage to equipment, or both.</p>
---	---

—continued—

Procedure 5-5 (continued)

Connecting power leads and grounding the ETS shelf

Action

Step	Action
1	<p>Make sure that all power is off before making any power connections to the Enhanced Trunk Switch shelf.</p> <p>Note: The power source providing DC power to the ETS (which must be turned off) can be either the 3U APRS rectifier or a secondary distribution panel (SDP). Power control must be controlled using a breaker interface panel (BIP). By turning the breaker connected to the ETS off, power distribution is controlled.</p>

Grounding the ETS shelf

- 2 Locate the dual ground connector point on the back of the Enhanced Trunk Switch (see [Figure 5-13](#)). To locate the dual ground connector on the ETS shelf, look for this symbol.



- 3 On the ETS dual ground connector, the dual hole ring lug is already attached. Unscrew both screws and remove the dual hole ring lug to be able to attach a wire to it.
- 4 Measure and cut one 10 AWG insulated stranded or solid copper wire to reach from the ETS ground connector and the Optical Metro 5200 rack grounding point. Strip 7 mm (0.25 in.) of insulation from both ends of the cable.
- 5 On one end of the wire, attach the 10 AWG single hole ring lug connector (see [Figure 5-15](#)). On the other end of the wire, attach a 10 AWG dual hole ring lug connector.
- 6 Connect the dual hole ring lug of the earth wire to the two ETS ground connector pins and tighten the screws.
- 7 Attach the other end of the earth wire to the Optical Metro 5200 rack grounding point. To locate the Optical Metro 5200 rack grounding point (see [Figure 5-16](#)).

—continued—

Procedure 5-5 (continued)

Connecting power leads and grounding the ETS shelf

Step	Action
------	--------

Making the power connections to the ETS shelf

- | | |
|----|---|
| 8 | Locate the power terminal block on the back of the Enhanced Trunk Switch (see Figure 5-14). |
| 9 | Loosen the screws that secure the plastic cover over the power terminal block. You do not have to completely remove the screws to remove the cover. |
| 10 | After you loosen the screws, slide the plastic cover off the power terminal block. |
| 11 | Measure and cut one pair of 18, 16, 14 or 12 AWG insulated stranded or solid copper wire to reach from the ETS power terminal block connectors (-48V and RET on the A side) to the primary power source.

Note: The primary power source is either the direct current power source or a rectifier. |
| 12 | Strip 7 mm (0.25 in.) of insulation from both ends of the cable and attach a the 18, 16, 14 or 12 AWG single hole ring lug connector (see Figure 5-15). |
| 13 | Make sure that both power feeds have the correct electrical specifications. |

Nominal operating ranges for power connections	Measured voltage
Across A side (-48V and RET)	-40V to -57V
Across B side (-48V and RET)	-40V to -57V
Note: For additional information regarding the operating ranges for the ETS, see the “Hardware specifications” chapter in <i>Technical Specifications</i> , 323-1701-180.	

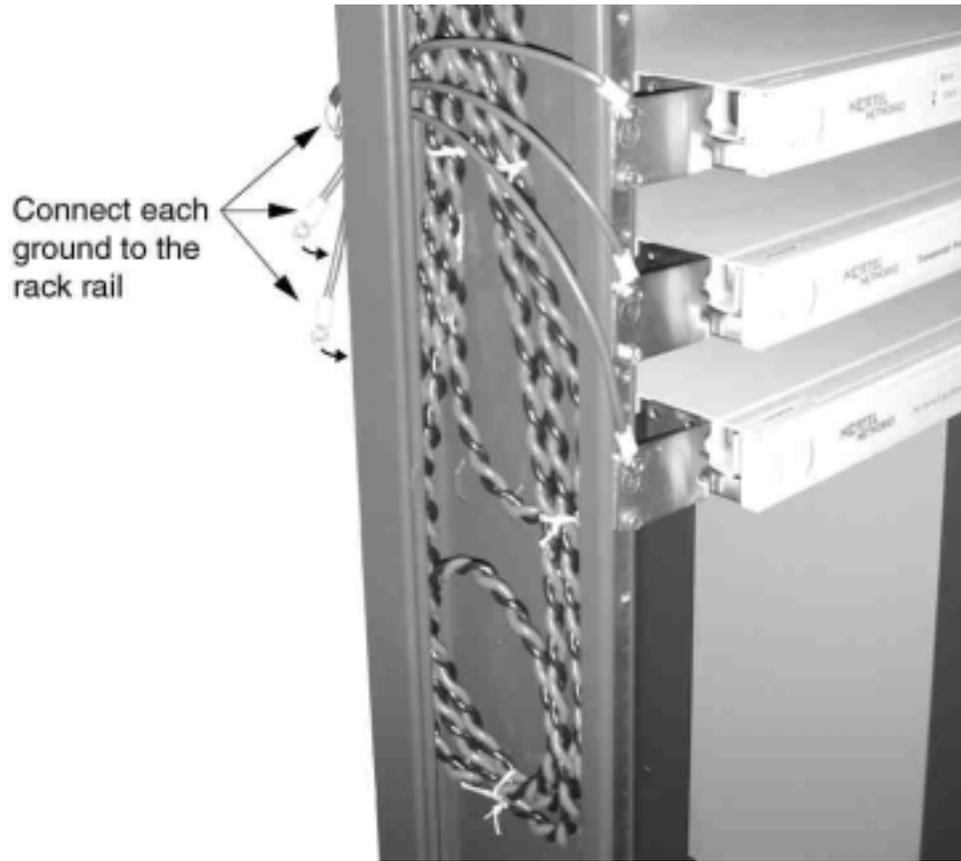
- | | |
|----|---|
| 14 | Using a screwdriver, loosen the retaining screws below the pins marked -48V and RET on the A side of the power terminal block. |
| 15 | On the A side, attach the end of one wire to the pin marked -48V and another to the pin marked RET. |
| 16 | Connect the ends of the power wires from the A side to the appropriate connectors on the power supply. |
| 17 | Repeat step 11 to step 16 for the B power source on the ETS. |
| 18 | Slide the plastic cover into place over the power terminal block. |
| 19 | Tighten the screws to secure the plastic cover to the unit. |
| 20 | Route and secure the ETS power and grounding cables along the side of the equipment rack using lacing cord or tie wraps. |
| 21 | You can now turn on the power to the ETS shelf.

Note: The power A and power B LEDs on the front of the ETS shelf are lit. |

—end—

Figure 5-16
Grounding point on the Optical Metro 5200 rack (side-front view of the rack)

OM1331t.jpg



Procedure 5-6

Connecting power to a Breaker Interface Panel (BIP)

Use this procedure to connect power to the Breaker Interface Panel (BIP) - NTN458RA. For more information on Optical Metro 5200 hardware, see *Hardware Description*, 323-1701-102.

Precautions



DANGER

Risk of personal injury

Make sure that all power is off before you make connections on a Breaker Interface Panel. Do not handle live wires. If you handle live wires you can cause personal injury, damage to equipment, or both.

Action

Step	Action
------	--------

Connecting power to the equipment frame (input wiring)

- Note:** Ensure you follow operating company guidelines when attaching input wiring.
- 1 Ensure that the input power is off and that all circuit breakers located on the front of the BIP are in the OFF (0 position) on both the A and B sides. No LEDs should be on.
 - 2 Crimp straight or angled, 2-hole compression lugs onto copper wires. Insulate lug barrels with UL94 V-0 rated heat shrink tubing.
 - 3 Remove plastic covers from both pairs of BATT and RTN input terminals.
 - 4 Clean all input terminals with a nonabrasive, nonmetallic pad.
 - 5 If required, lightly coat anti-oxidant on lugs and input BATT and RTN terminals, and then connect lugs to input terminals on back of breaker panel, as shown in the [Figure 5-18 on page 5-37](#) and [Figure 5-17 on page 5-36](#).
Note: Use a torque wrench to verify that torque has been applied correctly: tighten lugs to 20 in-lb (2.27 Nm).
 - 6 After connecting input lugs to both sides (Sides A and B), supply input power to Sides A and B.
Both PWR (power) LEDs (A and B) on front panel must light (green).
 - 7 Use a voltmeter to test voltage and polarity at input terminals of breaker panel.
 - 8 Re-attach plastic input terminal covers.

—continued—

Procedure 5-6 (continued)

Connecting power to a Breaker Interface Panel (BIP)

Step	Action
-------------	---------------

Testing input power

- | | |
|-----------|--|
| 9 | Turn off power to either Side A or B. |
| 10 | Verify that corresponding PWR (power) LED extinguishes. |
| 11 | Verify that ALARM LED turns red. |
| 12 | Repeat step 9 to step 11 on the other side not yet tested. |
| 13 | Shut-off all power to the breaker interface panel. |

Connecting power to the shelf

- | | |
|-----------|--|
| 14 | If you are connecting power to the shelf using ring lugs, then go to Connecting power leads to the power cards using ring lugs on page 5-5 . |
|-----------|--|

—end—

Figure 5-17
Breaker inter panel (BIP) - NTN458RA

EX1052p

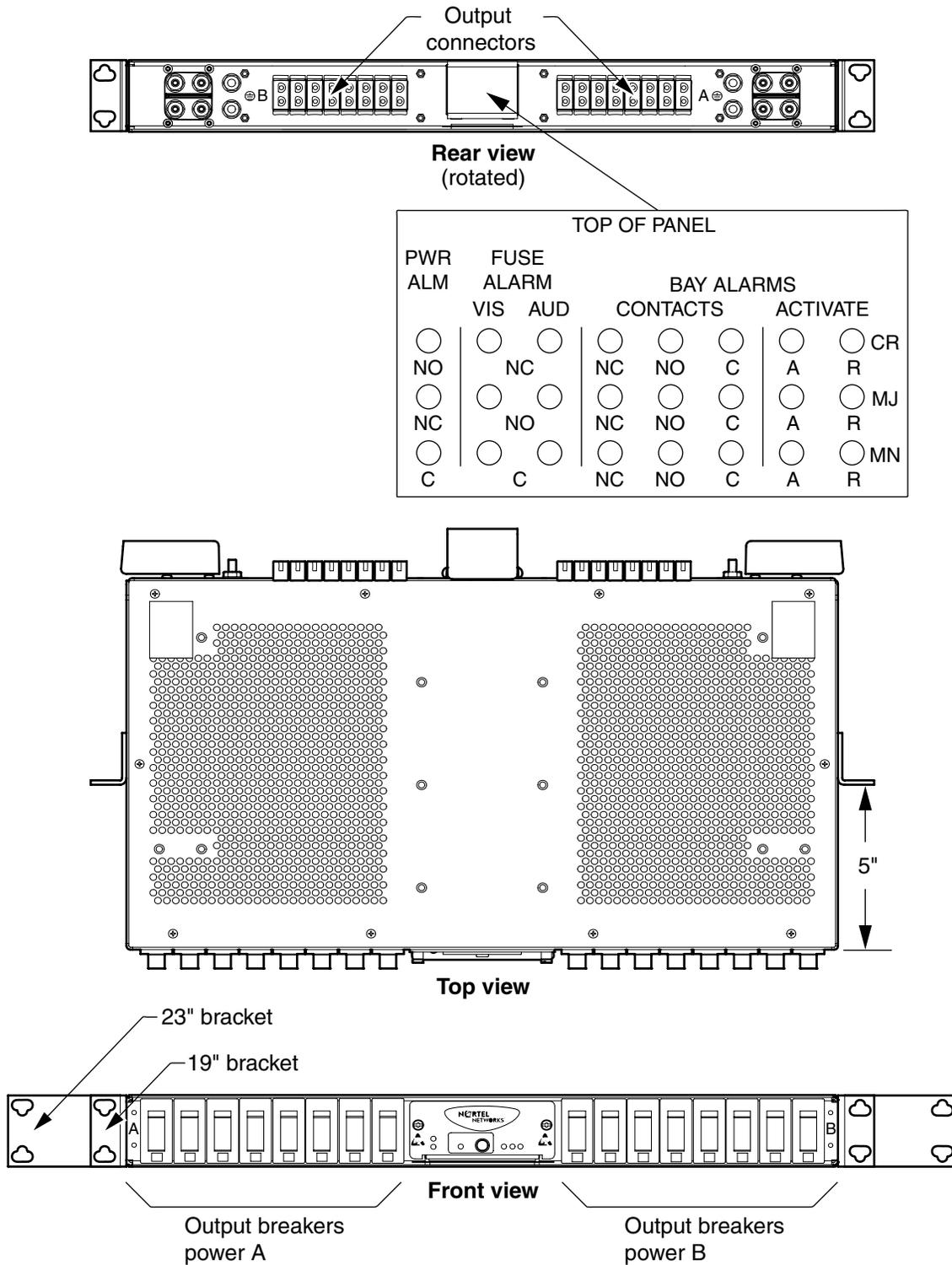
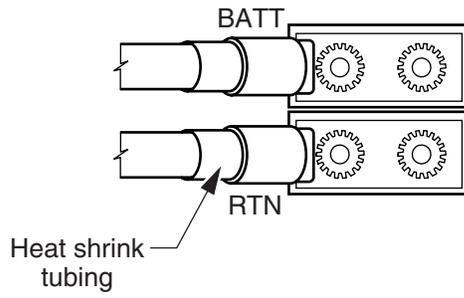


Figure 5-18
Lug connections on input battery and return terminals

OM2707p



Procedure 5-7 Connecting power to an Ethernet Hub

Use this procedure to connect power to the Ethernet Hub (NT0H43BB). For more information on the Ethernet Hub, see “Ethernet hub” in *Hardware Description*, 323-1701-102.

Requirements

Table 5-10 lists the tools and materials required for this procedure

Table 5-10
Tools and materials for connecting power to the Ethernet Hub (NT0H43BB)

Item	Quantity	Supplied	√
14 AWG insulated stranded copper wire (see Note:)	as required	no	
Wire crimping tool	1	no	
Single-hole ring lugs for 14 AWG copper wire	4	no	
Screwdriver	1	no	
Cable ties	as required	no	
Lacing cord or wax string	as required	no	
<p>Note: Two different insulation colors are used for the 14 AWG power cables. Follow the standard practice for your facility to assign wire color polarities when making power connections. In ANSI specifications, the -48V lead is Red, and the 0V return is Black. In ETSI specifications, the -48V lead is Blue, and the 0V return is Black.</p>			

Precautions

	<p>DANGER Risk of personal injury</p> <p>Make sure that all power is off before you make connections on an Ethernet Hub. Do not handle live wires. If you handle live wires you can cause personal injury, damage to equipment, or both.</p>
---	--

—continued—

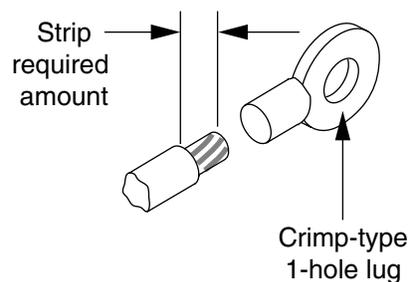
Procedure 5-7 (continued)

Connecting power to an Ethernet Hub**Action**

Step	Action
1	Use one pair of 14 AWG power cables to connect the primary power source to the A+ (-48 Vdc) and A- (0 Vdc (RTN)) terminals of the terminal block, as shown in Figure 5-20 (The primary power source is either the direct current power source, or a rectifier).
<div style="border: 1px solid black; padding: 10px; display: inline-block;">  <p>DANGER Risk of personal injury There is a risk of electrical shock when routing the power and making the power connections.</p> </div>	
2	Use the second set of 14 AWG power cables to route power from the redundant power source to the B+ (-48 Vdc) and B- (0 Vdc (RTN)) terminals on the Ethernet hub.
3	Strip 7 mm (0.25 in.) of insulation from both ends of the 14 AWG ground cable wire. See Figure 5-19 on page 5-39 .
4	Insert and attach each stripped end to a single hole ring lug.
5	Connect one end of the 14 AWG ground wire to the primary ground on the Ethernet hub. The primary ground is on the POWER A side.
6	Connect the other end of the ground wire to the site grounding point.
7	Use cable ties to tie the power cables and ground wire to the equipment rack as required.
8	Switch the circuit breakers for the primary and redundant -48 V dc power supplies to the ON position. Note: For acceptable voltage range, see Table 1-37 in <i>Technical Specifications</i> , 323-1701-180.
9	Check that the green power indicator LED (labelled PWR) turns ON.

—end—

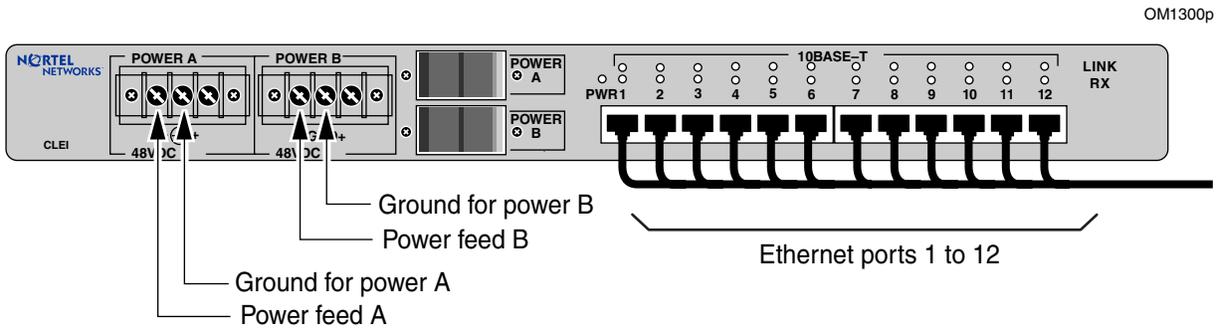
Figure 5-19
Attaching ring lugs



OM1324p

5-40 Connecting power

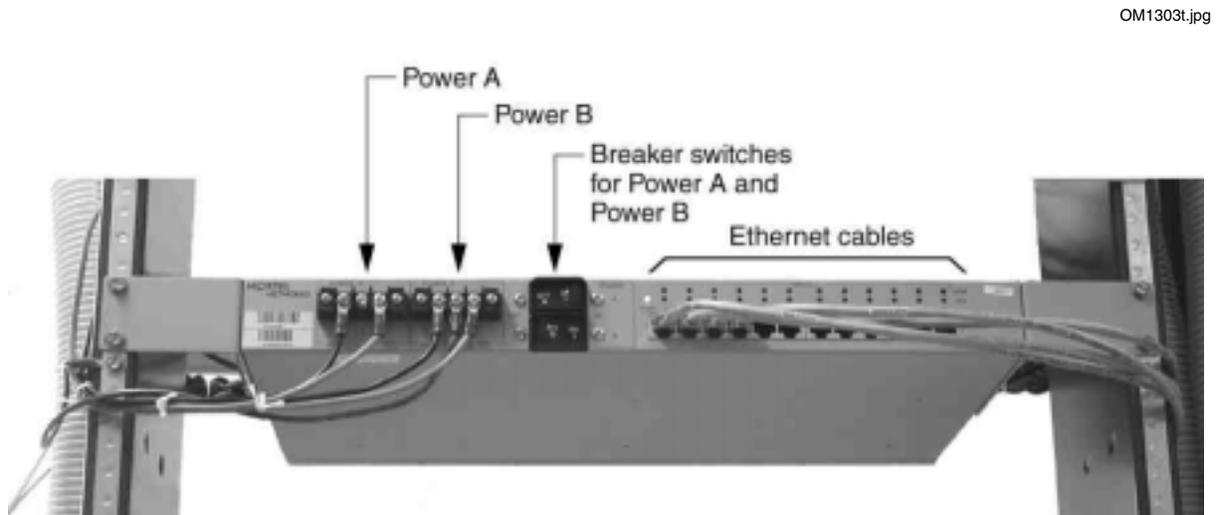
Figure 5-20
Ethernet hub



Note 1: Ethernet cables are routed out through to the right side of the rack at the front.

Note 2: Ground wires are routed and connected to the metallic grounding strips on the left side of the rack at the front.

Figure 5-21
Ethernet hub mounted in the Rack



Procedure 5-8

Connecting power to an Equipment Inventory Unit

Use this procedure to connect power to the Equipment Inventory Unit (EIU) (NT0H43HA). For more information on the Equipment Inventory Unit, see “[Equipment Inventory Unit](#)” in *Hardware Description*, 323-1701-102.

Requirements

[Table 5-11](#) lists the tools and materials required for this procedure.

Table 5-11
Tools and materials for connecting power leads to an EIU

Item	Quantity	Supplied	√
14-16, #8 stud ring terminal (for power)	4	yes	
14 AWG black wire (power)	2 x 9 ft	yes	
14 AWG red wire (power)	2 x 9 ft	yes	
#2 Phillips screwdriver	1	no	
5/16-inch socket (for hexhead screws)	1	no	
Torque wrench	1	no	
Wire crimping tool	1	no	
Cable ties	as required	no	
Lacing cord or wax string	as required	no	
<p>Note 1: Two different insulation colors are used for the 14 AWG power cables. Follow the standard practice for your facility to assign wire color polarities when making power connections. In ANSI specifications, the -48V lead is Red, and the 0V return is Black. In ETSI specifications, the -48V lead is Blue, and the 0V return is Black.</p> <p>Note 2: Screws on the EIU power terminal block must be tightened to a torque value of 10 in.-lb.</p>			

Precautions



DANGER

Risk of personal injury

Make sure that all power is off before you make connections on an Equipment Inventory Unit. Do not handle live wires. If you handle live wires you can cause personal injury, damage to equipment, or both.

—continued—

Procedure 5-8 (continued)

Connecting power to an Equipment Inventory Unit

Action

Step	Action
1	Ensure that the input power is off and that all circuit breakers located on the front of the Equipment Inventory Unit are in the OFF (0 position) on both the A and B sides. No LEDs should be on.
2	Locate the power terminal block on the front of the Equipment Inventory Unit (see Figure 5-23 .)

	<p>DANGER Risk of personal injury There is a risk of electrical shock when routing the power and making the power connections.</p>
---	--

3	Measure and cut one pair of 14 AWG insulated stranded copper wire to reach from the Equipment Inventory Unit terminal block connectors (-48 A and RET A) to the primary power source. Note: The primary power source is either the direct current power source or a rectifier.
4	Strip 7 mm (0.25 in.) of insulation from both ends of the cable and attach a 14 AWG single hole ring lug connector (see Figure 5-22).
5	Make sure both power feeds have the correct electrical specifications.

Nominal operating ranges for power connections	Measured voltage
Across A (A -48V and A RET)	-40V to -70V (typical is -48V)
Across B (B -48V and B RET)	-40V to -70V (typical is -48V)

Note: For additional information regarding the operating ranges for the Equipment Inventory Unit, see the [“Hardware specifications”](#) chapter in *Technical Specifications*, 323-1701-180.

6	Connect one end of the A power cables to the primary power source and the other end to the A power source on the Equipment Inventory Unit.
7	Repeat step 3 through step 6 for the B power source on the Equipment Inventory Unit.
8	Switch the circuit breakers located on the front of the Equipment Inventory Unit are in the ON (I position) on both the A and B sides.
9	Check that the green power indicator LEDs (labelled Power A and Power B) turn ON.

—continued—

Procedure 5-8 (continued)

Connecting power to an Equipment Inventory Unit

Step	Action
10	Route and secure the Equipment Inventory Unit power cables along the side of the equipment rack using lacing cord or tie wraps.

—end—

Figure 5-22
Attaching ring lugs to the ground wire

OM1324p

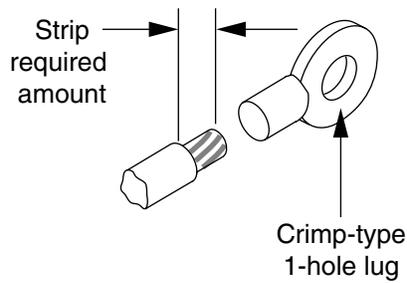
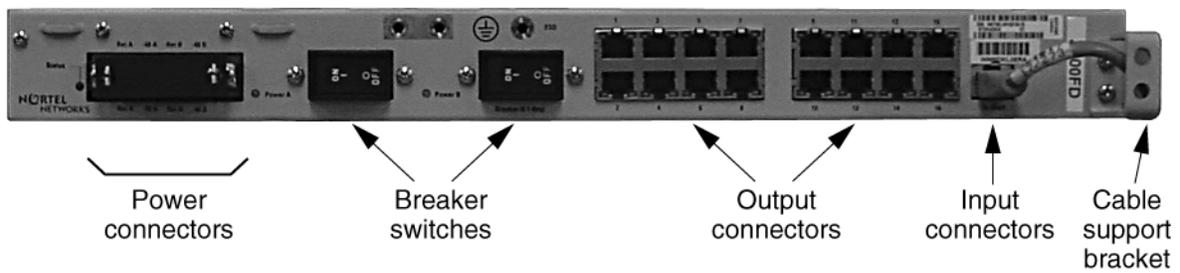


Figure 5-23
Front panel of the EIU

OM2372p.tif



Procedure 5-9 Testing the Optical Metro 5200 shelf power connections

Follow this procedure to test the power connections to the shelf.

Requirements

Remove the cover of the maintenance panel before you begin this procedure.

Action

Step	Action
1	Make sure that both power Breakers on the shelf are in the OFF (O) position.
2	Apply power to the power feeds that are entering the Optical Metro 5200 shelf. <i>The Power indicator lamps of the connected power cards turn red.</i>
3	Turn on Breaker A on the maintenance panel. <i>The Breaker A indicator lamp turns green and the fans of the cooling unit come on.</i>
4	Turn off Breaker A. <i>The Breaker A indicator lamp turns red and the fans of the cooling unit go off.</i>
5	Turn on Breaker B on the maintenance panel. <i>The Breaker B indicator lamp turns green and the fans of the cooling unit come on.</i>
6	Turn off Breaker B. <i>The Breaker B indicator lamp turns red and the fans of the cooling unit go off.</i>

—end—

Installing peripheral cables

Use the procedures in this chapter for the connections required to support data communications links between network elements in your Optical Metro 5200 network.

Requirements

Before you begin the procedures in this chapter, make sure that you have completed the necessary procedures in the [“Installing Optical Metro 5200 shelves and equipment”](#) chapter of this book.

In sites with only two shelves, you can connect the shelves using a 10Base-T Ethernet cable. In sites with more than two shelves, you must use an Ethernet hub to interconnect all the shelves.

For a site with one or more DWDM shelves and an OFA shelf, you can connect the OFA shelf to an adjacent DWDM shelf using an Ethernet cable.

Your system may require an additional LAN connection to enable you to monitor system management information from another site, depending on your network configuration.

Precautions

**CAUTION****Risk of equipment damage**

Make sure you know how to handle electronic components correctly before you begin installation procedures. Incorrect handling can cause damage to static-sensitive components.

**CAUTION****Risk of shelf malfunction**

Nortel Networks recommends that you do not use cellular phones at any Optical Metro 5200 site. The use of cellular phones in proximity to Optical Metro 5200 equipment can cause shelf malfunction.

Procedure list

Table 6-1 lists the procedures in this chapter. All procedure lists include a check box for you to keep track of where you are in an installation. Place a check mark in this column when you are performing the procedure.

Table 6-1
Data communications connections procedures

Procedure	Page	Comments	√
6-1 Connecting shelf alarms and telemetry equipment to the central office alarm system	6-3	Optional.	
6-2 Connecting an external power alarm to a 3U APRS rectifier	6-9	Required to monitor the power status of the 3U APRS rectifier modules.	
6-3 Connecting alarms on the Optical Trunk Switch	6-11	Required to monitor the status of the Optical Trunk Switch.	
6-4 Connecting alarms on the Enhanced Trunk Switch	6-15	Required to monitor the status of the Enhanced Trunk Switch.	
6-5 Connecting two shelves with a crossover Ethernet cable	6-21	Required.	
6-6 Connecting two or more shelves to an Ethernet hub	6-26	Required if you deploy an Ethernet hub.	
6-7 Connecting the ETS shelf to the Optical Metro shelf using an Ethernet cable	6-31	Required to allow communication to a remote ETS through the Optical Metro 5100/5200 communications network	
6-8 Connecting to a data communications network	6-34	Required to connect the Optical Metro 5200 network to a data communications network (DCN).	
6-9 Connecting passive devices to the maintenance panel	6-36	Required if you deploy passive devices.	
6-10 Connecting passive devices to the Equipment Inventory Unit in new installations	6-56	Required if you deployed an Equipment Inventory Unit in a new installation.	
6-11 Connecting passive devices to the Equipment Inventory Unit in existing installations	6-64	Required if you deployed an Equipment Inventory Unit in an existing installation.	
6-12 Connecting the Equipment Inventory Unit to the maintenance panel	6-68	Required if you deployed an Equipment Inventory Unit.	

Procedure 6-1

Connecting shelf alarms and telemetry equipment to the central office alarm system

Follow this procedure to connect Optical Metro 5200 shelf alarms, and telemetry equipment to the central office (CO) alarm system.

Note: The interfaces described in this procedure are intended for intrabuilding use only.

The central office alarms and telemetry (COTEL) interface card enables the alarms generated on the Optical Metro 5200 shelf to be connected to the central office alarms system. This interface card also allows you to connect telemetry equipment to the shelf, so that you can monitor and respond to environmental changes at the site.

When you complete this procedure

- the Optical Metro 5200 shelf is connected to the central office alarms system
- telemetry alarms are connected
- the ferrite bead is attached to the wires

For more information on Optical Metro 5200 hardware, see [“Optical Metro 5200 shelves”](#) in *Hardware Description*, 323-1701-102.

Requirements

[Table 6-2](#) lists the tools and materials required to connect the maintenance panel to telemetry equipment and to the central office alarm system.

—continued—

6-4 Installing peripheral cables

Procedure 6-1 (continued)

Connecting shelf alarms and telemetry equipment to the central office alarm system

Table 6-2
Tools and materials for connecting the maintenance panel to the central office alarm system

Item	Quantity	Supplied	√
Miniature slot screwdriver	1	no	
24 AWG insulated wire	as required	no	
16-pin connector	2	yes (with shelf installation kit)	
Wire strippers	1	no	
Ferrite bead	1	yes (with shelf installation kit)	

You must remove the left maintenance panel cover to access the connector of the COTEL card (labelled Telemetry), which is the first card on the left side of the maintenance panel.

Precautions



CAUTION

Risk of equipment damage

Do not remove interface cards from the area behind the maintenance panel cover. The cards in the maintenance panel must be removed or replaced by Nortel Networks [Technical support](#) personnel only.



CAUTION

Risk of equipment damage

Be sure to install the ferrite bead around the wires in the maintenance panel, to comply with Class B emissions requirements.

—continued—

 Procedure 6-1 (continued)

Connecting shelf alarms and telemetry equipment to the central office alarm system

Action

Step	Action
1	If the cover of the maintenance panel is not open, loosen the thumbscrews and remove the left maintenance panel cover to access the interface cards in the maintenance panel.
2	Locate the COTEL interface card and make sure that the 16-pin socket connectors are installed. Figure 6-1 on page 6-6 shows a COTEL card with the 16-pin socket connectors installed.
3	Loosen the retaining screws located at the top and bottom of the COTEL connector and remove the COTEL connector from the COTEL card.
4	Identify the pins on the connector that you want to connect to. Figure 6-2 on page 6-7 shows as an example a COTEL card with telemetry connections. Note 1: For pinout information, see Central office alarm and telemetry interface in the “Technical specifications” chapter in <i>Technical Specifications</i> , 323-1701-180. Note 2: The COTEL card is the first interface card on the left side of the shelf.
5	Strip 7 mm (0.25 in.) of insulation from the first 24 AWG wire that you want to insert in the connector.
6	Pry the spring clamp open. See Figure 6-3 on page 6-7 .
7	Insert the wire 10 mm (0.4 in.) into the bottom of the slot of the socket connector that corresponds to the signal you want to connect. See Figure 6-3 on page 6-7 .
8	Hold the wire in place and release the spring clamp on the side of the connector to secure the wire. See Figure 6-3 on page 6-7 .
9	Repeat steps 2 through 5 for the other connections you want to make.
10	Insert the connector into the connector socket on the front of the COTEL card. Make sure the wires are routed through the opening in the lower left side of the maintenance panel. See Figure 6-2 on page 6-7 .
11	Insert and tighten the retaining screws at the top and bottom of the connector.
12	Clamp the ferrite around the COTEL wires.

—continued—

6-6 Installing peripheral cables

Procedure 6-1 (continued)

Connecting shelf alarms and telemetry equipment to the central office alarm system

Step	Action
13	Place the ferrite in the maintenance panel, as shown in Figure 6-4 on page 6-8 . When grounding the shelf using a double hole compression lug, place the ferrite in front of the telemetry card. Note: One ferrite should be used until full and then incorporate a second ferrite as required. The ferrites can be mounted on top of each other, laced together.
14	Secure the wires from the COTEL connector with a cable tie or lacing cord to one of the tie-down points in the bottom the maintenance tray.
15	Route the wires from the COTEL connector through the opening in the lower left side of the maintenance panel. When facing the equipment rack, route and secure the wires from the connector along the left-hand side of the equipment rack using tie-wraps or lacing cord.
16	Repeat step 1 through step 15 for the other COTEL connector, if applicable.
17	Replace the left maintenance panel cover.

—end—

Figure 6-1
COTEL card with 16-pin socket connectors

OM0097s

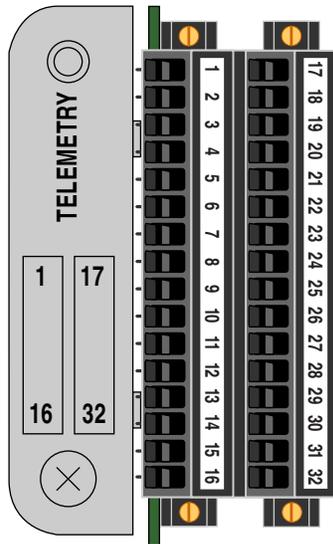


Figure 6-2
Telemetry connections on the COTEL card

OM0098t

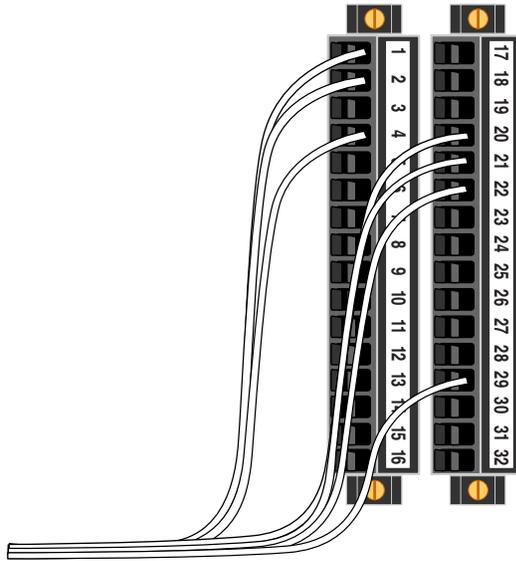


Figure 6-3
Inserting and securing a wire in the telemetry connector

OM0096t

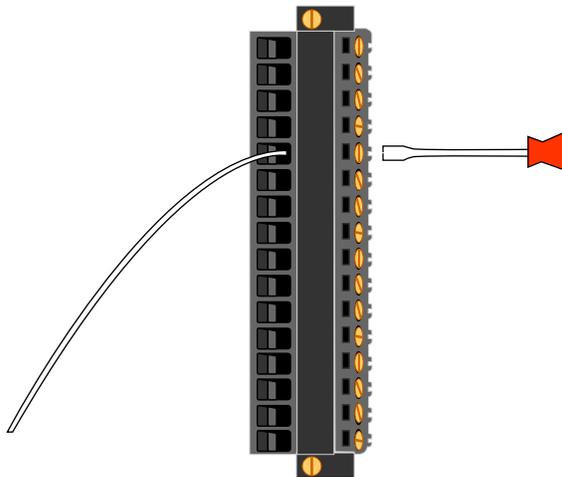
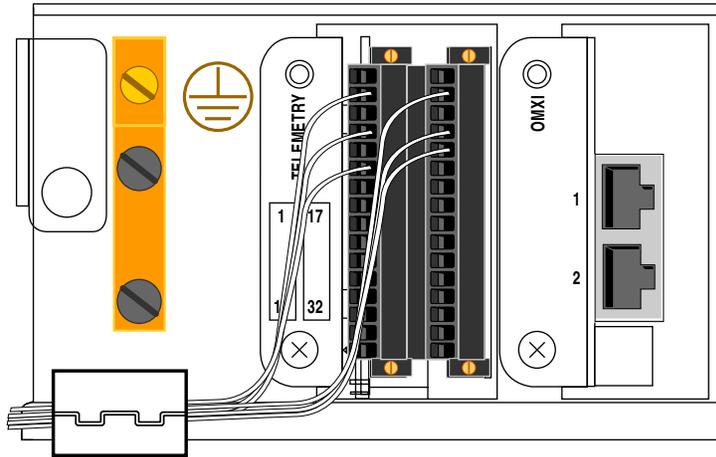


Figure 6-4
Connecting shelf alarms to the CO alarm system

OM0161t



Procedure 6-2

Connecting an external power alarm to a 3U APRS rectifier

Follow this procedure to connect an external power alarm from a 3U AC Power Rectifier Shelf (3U APRS) to the telemetry inputs of the Optical Metro 5200 shelf or external equipment.

Note: The interfaces described in this procedure are intended for intrabuilding use only.

For more information on rectifiers, see “Rectifiers” in *Hardware Description*, 323-1701-102.

Requirements

Table 6-3 lists the tools and materials required for connecting external power alarms to a rectifier.

Table 6-3
Tools and materials for connecting external power alarms to a rectifier

Item	Quantity	Supplied	√
Wire strippers	1	no	
24 AWG insulated copper wire (ETSI equivalent: 0.2 mm ²)	as required	no	
Flat head screwdriver (slotted) 3/32 in.	1	no	

Action

Step	Action
1	Locate the external alarm terminal block on the back of the rectifier chassis.
2	Measure and cut lengths of 24 AWG insulated copper wire to reach from the alarm terminal connectors on the rectifier to the maintenance panel on the Optical Metro 5200 shelf.
3	Strip 7 mm (0.25 in.) of insulation from the end of the 24 AWG alarm wires.

—continued—

6-10 Installing peripheral cables

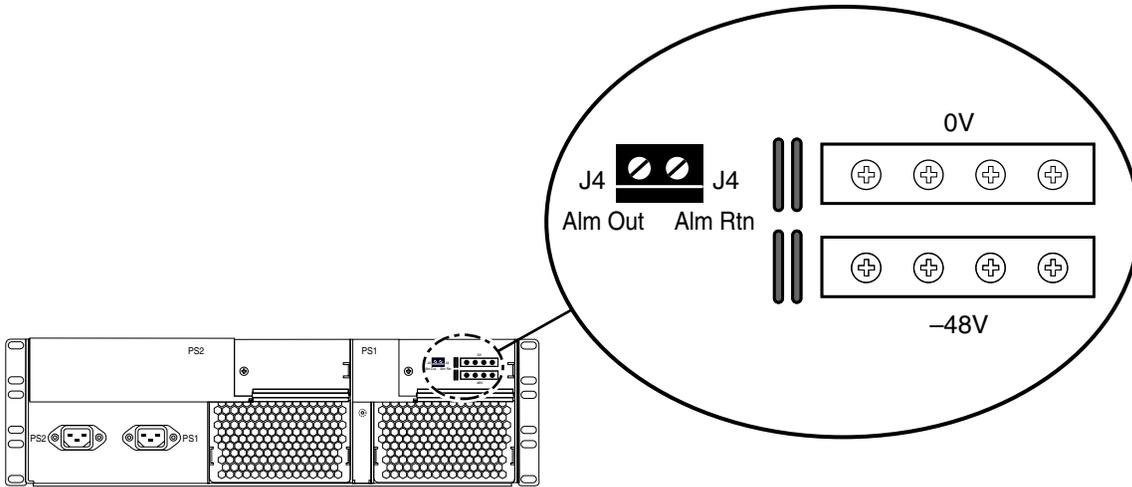
Procedure 6-2 (continued)

Connecting an external power alarm to a 3U APRS rectifier

Step	Action						
4	<p>Connect the alarm wires to the appropriate alarm connections on the rectifier alarm terminal block. Loosen the screws (they are not removable), and place the 24 AWG wire in the hole. Tighten the screw.</p> <p>Note: For pinout information consult the manufacturers installation documentation.</p>						
5	<p>Route the alarm wires along the bottom of the rectifier chassis to the equipment rack and secure the wires using lacing cord or tie wraps.</p>						
6	<table border="0"> <tr> <td style="vertical-align: top;">If you want to connect to</td> <td style="vertical-align: top;">Then</td> </tr> <tr> <td style="vertical-align: top;">the Optical Metro 5100/5200 COTEL card</td> <td style="vertical-align: top;">connect the other ends of the alarm wires to the telemetry inputs of the Optical Metro 5100/5200 COTEL card. Follow Procedure 6-1 on page 6-3 to connect wires to the COTEL card.</td> </tr> <tr> <td style="vertical-align: top;">external equipment</td> <td style="vertical-align: top;">refer to manufacturer's telemetry specifications.</td> </tr> </table>	If you want to connect to	Then	the Optical Metro 5100/5200 COTEL card	connect the other ends of the alarm wires to the telemetry inputs of the Optical Metro 5100/5200 COTEL card. Follow Procedure 6-1 on page 6-3 to connect wires to the COTEL card.	external equipment	refer to manufacturer's telemetry specifications.
If you want to connect to	Then						
the Optical Metro 5100/5200 COTEL card	connect the other ends of the alarm wires to the telemetry inputs of the Optical Metro 5100/5200 COTEL card. Follow Procedure 6-1 on page 6-3 to connect wires to the COTEL card.						
external equipment	refer to manufacturer's telemetry specifications.						
7	<p>Route and secure the wires along the side of the equipment rack using tie wraps or lacing cord to secure the wires.</p>						

Figure 6-5
Rectifier terminals for alarm connections

OM0101p



—end—

Procedure 6-3

Connecting alarms on the Optical Trunk Switch

Follow this procedure to make alarm connections from each Optical Trunk Switch to the Optical Metro 5200 COTEL (central office and telemetry) card.

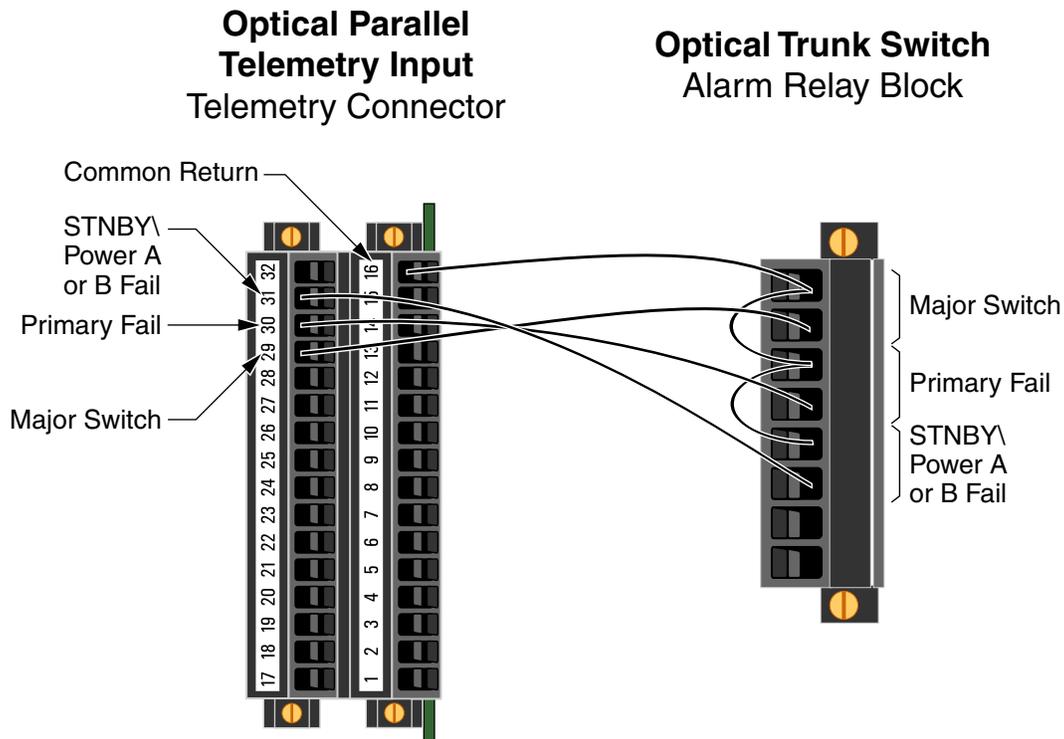
Note: The interfaces described in this procedure are intended for intrabuilding use only.

To make the alarm connections, follow the connector pin-out diagram on the back of the module. [Figure 6-6](#) shows how the alarm connections should be connected to the COTEL card.

For more information on the Optical Trunk Switch, see “[Optical Trunk Switch](#)” in *Hardware Description*, 323-1701-102.

Figure 6-6
Alarm connections

OM0303p.eps



—continued—

Procedure 6-3 (continued)

Connecting alarms on the Optical Trunk Switch**Requirements**

[Table 6-4](#) lists the tools and materials you need to make the alarm connections for the Optical Trunk Switch.

Table 6-4
Tools and materials for making alarm connections

Item	Quantity	Supplied	√
Miniature slot screwdriver	1	No	
24 AWG insulated wire	As required	No	
16-pin connector	2	Yes	
Wire strippers	1	No	

Action**Step Action**

- 1** If the cover of the Optical Metro 5200 maintenance panel is not open, loosen the thumbscrews and remove the left maintenance panel cover to access the interface cards in the maintenance panel.
- 2** Locate the COTEL interface card and identify the pins on the connector to which you want to connect. For pinout information, see 323-1701-180, *Technical Specifications*. [Figure 6-7 on page 6-13](#) shows an example of a COTEL card with telemetry connections.
 - a.** Connect the Major Switch pin on the back of the Optical Trunk Switch to pin 29 of the COTEL card
 - b.** Connect the Primary Fail pin on the back of the Optical Trunk Switch to pin 30 of the COTEL card.
 - c.** Connect the STNBY/Power A or B Fail pin on the back of the Optical Trunk Switch to pin 31 of the COTEL card.
 - d.** Connect one connection of each relay on the back of the Optical Trunk Switch to pin 16 of the COTEL card.
- 3** Strip 7 mm (0.25 in.) of insulation from the first 24 AWG wire that you want to insert in the connector.
- 4** Pry the spring clamp open. See [Figure 6-8 on page 6-14](#).
- 5** Insert the wire 10 mm (0.4 in.) into the bottom of the slot of the socket connector that corresponds to the signal you want to connect. See [Figure 6-8 on page 6-14](#).

—continued—

Procedure 6-3 (continued)

Connecting alarms on the Optical Trunk Switch

Step	Action
6	Hold the wire in place and release the spring clamp on the side of the connector to secure the wire. See Figure 6-8 .
7	When facing the frame, route and secure the wires from the Optical Trunk Switch to the COTEL card along the left-hand side of the frame using tie-wraps or lacing cord.
8	Replace the left maintenance panel cover.

—end—

Figure 6-7
COTEL card with 16-pin socket connectors

OM0097s

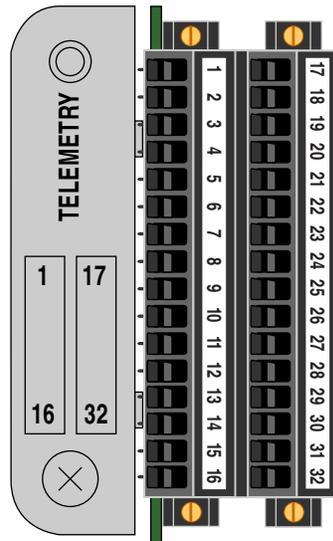
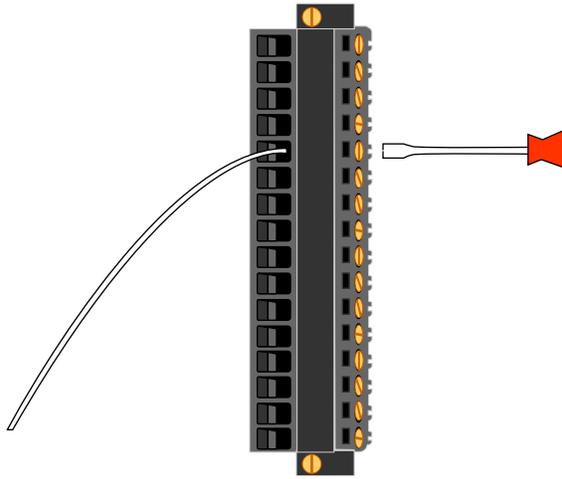


Figure 6-8
Inserting and securing a wire in the telemetry connector

OM0096t



Procedure 6-4

Connecting alarms on the Enhanced Trunk Switch

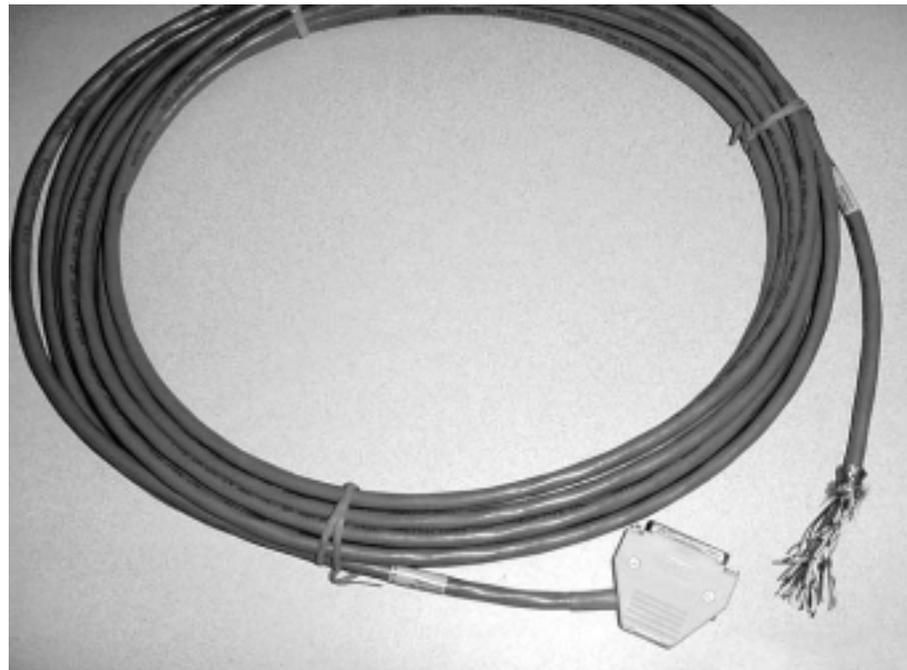
Follow this procedure to make alarm connections from each Enhanced Trunk Switch to the 16-pin socket connectors of the Optical Metro 5200 central office and telemetry (COTEL) card. This procedure is required to monitor the status of the Enhanced Trunk Switch alarms using the Optical Metro System Manager Interface.

Note: The interfaces described in this procedure are intended for intrabuilding use only.

To make the alarm connections, follow the connector pin-out of the ETS alarm telemetry block on the back of the ETS shelf. [Table 6-5](#) lists the pin assignment for the ETS alarm telemetry block and customized DB-25 cable (see [Figure 6-9](#)).

Figure 6-9
Customized DB-25 cable (NT0H43RA)

OM2594t.jpg



—continued—

Procedure 6-4 (continued)

Connecting alarms on the Enhanced Trunk Switch

Table 6-5
Pin assignment for the ETS alarm telemetry block and customized DB-25 cable

ETS alarm telemetry block pin number	Signal description	Color code of open-ended connector on customized DB-25 (NT0H43RA)	Internal connection of customized DB-25 cable
2	Critical alarm	brown	-
3	Slot A (left) major alarm	red	-
4	Slot A (left) minor alarm	orange	-
5	Power A fail alarm	yellow	-
6	Power B fail alarm	green	-
7	Fan 1 alarm	blue	-
8	Fan 2 alarm	violet	-
12	Slot B major alarm	white/brown	-
13	Slot B minor alarm	white/red	-
15	Critical alarm return	white/yellow	to pin 16
16	Slot A major alarm return	white/green	to pin 17
17	Slot A minor alarm return	white/blue	to pin 18
18	Power A fail alarm return	white/violet	to pin 19
19	Power B fail alarm return	white/silver	to pin 20
20	Fan 1 alarm return	white/black/brown	to pin 21
21	Fan 2 alarm return	white/black/red	to pin 24
24	Slot B major alarm return	white/brown/green	to pin 25
25	Slot B minor alarm return	white/brown/blue	(connected with all other ground pins)
<p>Note: The ETS Comms module is in slot A (left side of the ETS shelf) and the ETS Switch module is in slot B (right side of the ETS shelf).</p>			

—continued—

Procedure 6-4 (continued)

Connecting alarms on the Enhanced Trunk Switch

Since the Fan alarms, Power fail alarms and the ETS Switch alarms are reported through the ETS Comms (Slot A alarms) as alarms, Nortel Networks recommends that you connect only three of the alarms listed in [Table 6-5](#) as follows:

- Critical alarm
- Slot A major alarm
- Slot A Minor alarm

Note: The Optical Metro 5200 shelf maintenance panel includes four telemetry input ports.

This procedure requires the DB-25 customized cable (NT0H43RA), which can be ordered separately and which is also part of the ETS installation kit (NTUG90GH). The customized DB-25 cable is used to facilitate the connection from the ETS shelf alarm telemetry block to the Optical Metro 5200 maintenance panel (COTEL card).

For more information on the “[Enhanced Trunk Switch](#)”, refer to *Hardware Description*, 323-1701-102.

—continued—

Procedure 6-4 (continued)

Connecting alarms on the Enhanced Trunk Switch

Requirements

Table 6-6 lists the tools and materials required to make the alarm connections for the Enhanced Trunk Switch.

**Table 6-6
Tools and materials for making alarm connections**

Item	Quantity	Supplied	√
Miniature slot screwdriver	1	No	
Customized DV-25 cable (NT0H43RA)	1	Yes (part of the ETS installation kit [NTUG90GH] or separately orderable)	
Wire strippers	1	No	

Action

Step	Action
1	Locate the ETS shelf alarm telemetry block that is labeled sense alarm at the rear of the ETS shelf (DB-25 female connector).
2	Locate the Optical Metro 5200 maintenance panel where the telemetry connections are going to be made.
3	Take the customized DB-25 cable (NT0H43RA). Connect the male 25-pin connector of the customized cable to the ETS shelf alarm telemetry block located in step 1 . Use the miniature slot screw driver to tighten the connector on the port (on the left and right side).
4	If the cover of the Optical Metro 5200 maintenance panel is not open, loosen the thumbscrews and remove the left maintenance panel cover to access the interface cards in the maintenance panel.
5	Locate and carefully remove the two 16-pin connectors and locate the pins on the connectors to which you want to connect. For pinout information, see <i>Technical Specifications</i> , 323-1701-180.
6	On the customized DB-25 cable, strip 7 mm (0.25 in.) of insulation from the four open-ended wires that you want to insert into the 16-pin connector . As shown in Table 6-5 you will use the following open-ended wires: brown, red, orange and one of the return wires (many choices available because they are all interconnected in the DB-25 customized cable).

—continued—

Procedure 6-4 (continued)

Connecting alarms on the Enhanced Trunk Switch

Step	Action
7	Make the following connections. <ol style="list-style-type: none">Critical alarm: connect the brown open wire of the customized DB-25 cable to pin 31 of the 16-pin connector (telemetry input 3).Major alarm: connect the red open wire of the customized DB-25 cable to pin 30 of the 16-pin connector (telemetry input 2).Minor alarm: connect the orange open wire of the customized DB-25 cable to pin 29 of the 16-pin connector (telemetry input 1).Return: connect one of the return wires of the customized DB-25 cable to pin 16 of the 16-pin connector (common return). Several choices of return wires are available on the customized DB-25 cable. For more information, refer to Table 6-5.
8	On the 16-pin connector, pry open the spring clamp (see Figure 6-11 on page 6-20).
9	Insert the wire 10 mm (0.4 in.) into the bottom of the slot of the socket connector that corresponds to the signal you want to connect (see Figure 6-11 on page 6-20).
10	Hold the wire in place and release the spring clamp on the side of the connector to secure the wire (see Figure 6-11 on page 6-20).
11	When the four wires are connected, carefully replace the two 16-pin connectors in the maintenance panel.
12	Face the frame and route and secure the cable from the ETS to the 16-pin connectors along the left-hand side of the frame using tie-wraps or lacing cord.
13	Replace the shelf maintenance panel cover.
14	Use Procedure 1-9, "Configuring telemetry ports and alarms" in <i>Provisioning and Operating Procedures</i> , 323-1701-310, to provision telemetry input ports 1 to 3.

—end—

Figure 6-10
COTEL card with 16-pin socket connectors

OM0097s

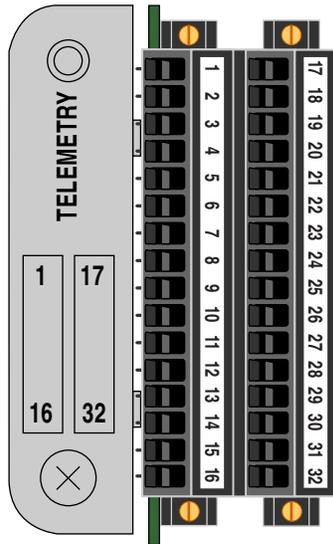
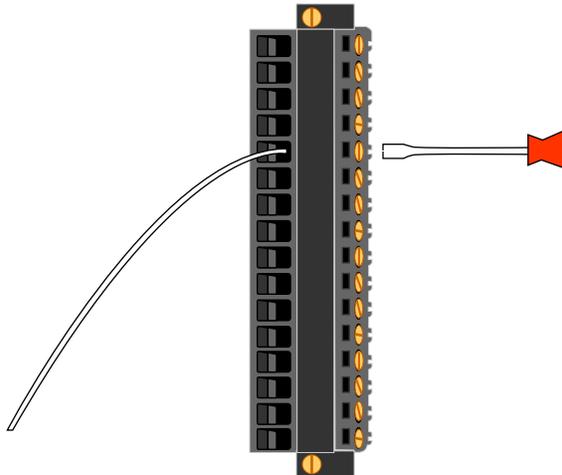


Figure 6-11
Inserting and securing a wire in the telemetry connector

OM0096t



Procedure 6-5

Connecting two shelves with a crossover Ethernet cable

Follow this procedure to set up messaging between Optical Metro 5200 shelves.

When you complete this procedure

- you can view system management information by connecting the System Manager computer to one Optical Metro 5200 shelf in the network
- the connection is made between two powered Optical Metro 5200 shelves and the Link indicator lamp next to each 10Base-T 2X port comes on and stays on

For more information on Optical Metro 5200 hardware, see [“Optical Metro 5200 shelves”](#) in *Hardware Description*, 323-1701-102.

Requirements

You need to determine the length and type of cross-over Ethernet cable in order to complete this procedure. See [Table 6-7](#) for cable types. For pinout information for cross-over cables, see [Cable pinouts and specifications on page 6-22](#).

Table 6-7
Ethernet cable types

Type of wiring	Length	Use
Cross-over (shielded)	2.15 m (7 ft.)	Used to connect two components in the same rack.
	4.5 m (15 ft.)	Used to connect two components in different racks.

—continued—

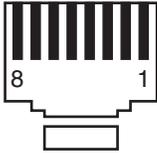
Procedure 6-5 (continued)

Connecting two shelves with a crossover Ethernet cable

Cable pinouts and specifications

See [Table 6-8](#) for signal connection information for the RJ45 plugs at each end of a cross-over cable.

Table 6-8
RJ45 (cross-over) cable specifications

RJ45 Plug	Pin (End 1)	Signal	Pin (End 2)
	1	RXD+	3
	2	RXD-	6
	3	TXD+	1
	4	no connection	no connection
	5	no connection	no connection
	6	TXD-	2
	7	no connection	no connection
	8	no connection	no connection

—continued—

Procedure 6-5 (continued)

Connecting two shelves with a crossover Ethernet cable

Action

Step	Action
1	You need to enable the 10Base-T 2X port as well as the 10Base-T 2X port alarm on both shelves which will be connected together with a cross-over Ethernet cable. By default, the 10Base-T 2X port is enabled and the 10Base-T 2X port alarm is disabled. To enable the 10Base-T 2X port, refer to Procedure 1-26, "Provisioning Ethernet and serial ports" in <i>Provisioning and Operating Procedures</i> , 323-1701-310. To enable the 10Base-T 2X port alarm, refer to Procedure 1-25, "Provisioning Ethernet port alarms" in <i>Provisioning and Operating Procedures</i> , 323-1701-310.
2	Plug one end of a shielded Ethernet cross-over cable into the 10Base-T 2X port of one Optical Metro 5200 shelf, as shown in Figure 6-12 .
3	Plug the other end of the shielded Ethernet cross-over cable into the 10Base-T 2X port of the second Optical Metro 5200 shelf. See Figure 6-13 on page 6-25 .

When the connection is made between two powered Optical Metro 5200 shelves, the Link indicator lamp next to each 10Base-T 2X port comes on and stays on.

—continued—

6-24 Installing peripheral cables

Procedure 6-5 (continued)

Connecting two shelves with a crossover Ethernet cable

Step	Action
4	Route and secure the Ethernet cross-over cable from the 10Base-T 2X port along the side of the frame using tie-wraps or lacing cord.



CAUTION

Risk of equipment damage

Do not route Ethernet cables through the vertical fiber brackets of the Optical Metro 5200 shelves. Doing so could cause damage to the fiber-optic cables in the brackets.

—end—

Figure 6-12
Setting up intershelf messaging—maintenance panel connectors

OM0147p

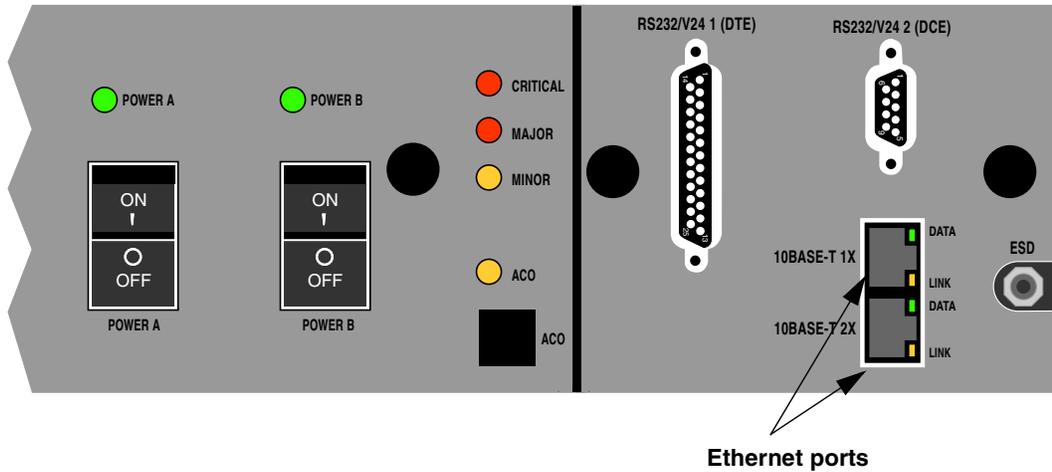
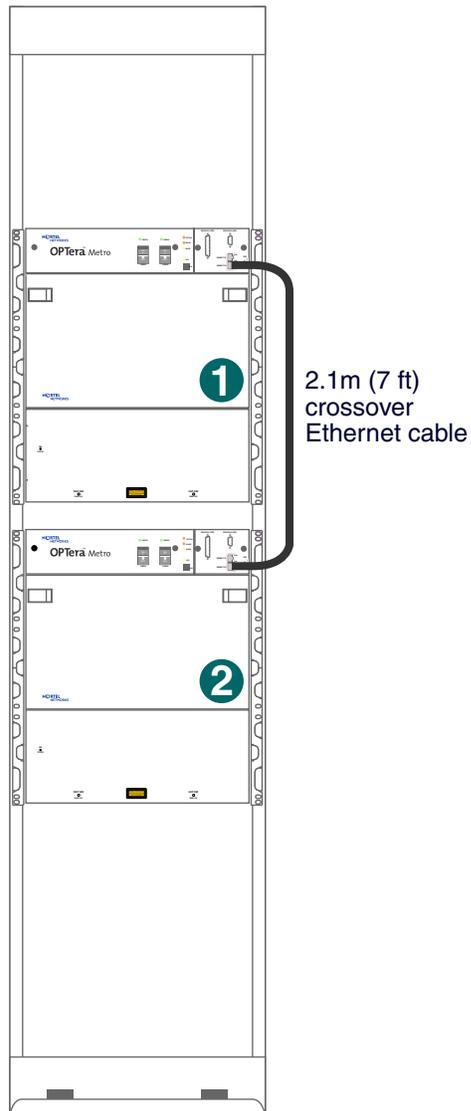


Figure 6-13
Ethernet cable requirements in a two-shelf site

OM0215t



Procedure 6-6

Connecting two or more shelves to an Ethernet hub

Follow this procedure to set up intershelf messaging in a site that is equipped with an Ethernet hub.

When you complete this procedure, intershelf messaging is set up and you can view system management information by connecting the System Manager computer to one Optical Metro 5200 shelf in the network.

For more information on Optical Metro 5200 hardware, see [“Optical Metro 5200 shelves”](#) in *Hardware Description*, 323-1701-102.

Requirements

If there are more than two shelves belonging to the same network installed at a site, you must connect the shelves through an Ethernet hub for intershelf messaging. You must use shielded Ethernet cross-over cables to connect the shelves to the Ethernet hub.

Before you begin this procedure, you must have completed [Procedure 4-11 “Installing an Ethernet hub”](#) in the [“Installing Optical Metro 5200 shelves and equipment”](#) chapter of this book.

You need to determine the quantity and type of Ethernet cables in order to complete this procedure. See [Table 6-9](#) for cable types. See [Table 6-10 on page 6-27](#) for your Ethernet equipment requirements. For pinout information for cross-over cables, see [Cable pinouts and specifications on page 6-27](#). Refer to [Figure 6-14 on page 6-30](#) for information about the correct lengths of Ethernet cables.

—continued—

Procedure 6-6 (continued)

Connecting two or more shelves to an Ethernet hub**Table 6-9**
Ethernet cable types

Type of wiring	Length	Use
Straight-through	2.75 m (9 ft.)	Used to connect an Optical Metro 5100/5200 shelf to the System Manager computer.
Cross-over (shielded)	2.15 m (7 ft.)	Used to connect two components in the same rack.
	4.5 m (15 ft.)	Used to connect two components in different racks.

Table 6-10
Ethernet cable requirements

Number of shelves at the site	Ethernet hub required?	Ethernet cables required			Number of shelves at the site
		Cross-over (shielded)		Straight-through	
		2.15 m (7 ft)	4.5 m (15 ft)	2.75 m (9 ft)	
2	no	1	N/A	1	2
3	yes	2 or 3	1 or 0	1	3
4	yes	3	1	1	4
5	yes	3	2	1	5
6	yes	3	3	1	6
7	yes	3	4	1	7
8	yes	3	5	1	8

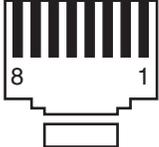
Cable pinouts and specifications

The maximum cable length is 100 m (300 ft). See [Table 6-11](#) for signal connection information for the RJ45 plugs at each end of a shielded Ethernet straight-through cable.

—continued—

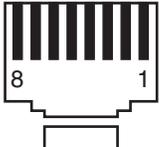
Procedure 6-6 (continued)

Connecting two or more shelves to an Ethernet hub**Table 6-11**
RJ45 (shielded Ethernet straight-through) cable specifications

RJ45 plug	Pin (End 1)	Signal	Pin (End 2)
	1	RXD+	1
	2	RXD-	2
	3	TXD+	3
	4	no connection	4
	5	no connection	5
	6	TXD-	6
	7	no connection	7
	8	no connection	8

See [Table 6-12](#) for signal connection information for the RJ45 plugs at each end of a cross-over cable. Use a shielded Ethernet cross-over cable to connect the 10Base-T 2X port on the maintenance panel to the Ethernet hub.

Table 6-12
RJ45 (Ethernet cross-over) cable specifications

RJ45 Plug	Pin (End 1)	Signal	Pin (End 2)
	1	RXD+	3
	2	RXD-	6
	3	TXD+	1
	4	no connection	no connection
	5	no connection	no connection
	6	TXD-	2
	7	no connection	no connection
	8	no connection	no connection

—continued—

Procedure 6-6 (continued)

Connecting two or more shelves to an Ethernet hub

Action

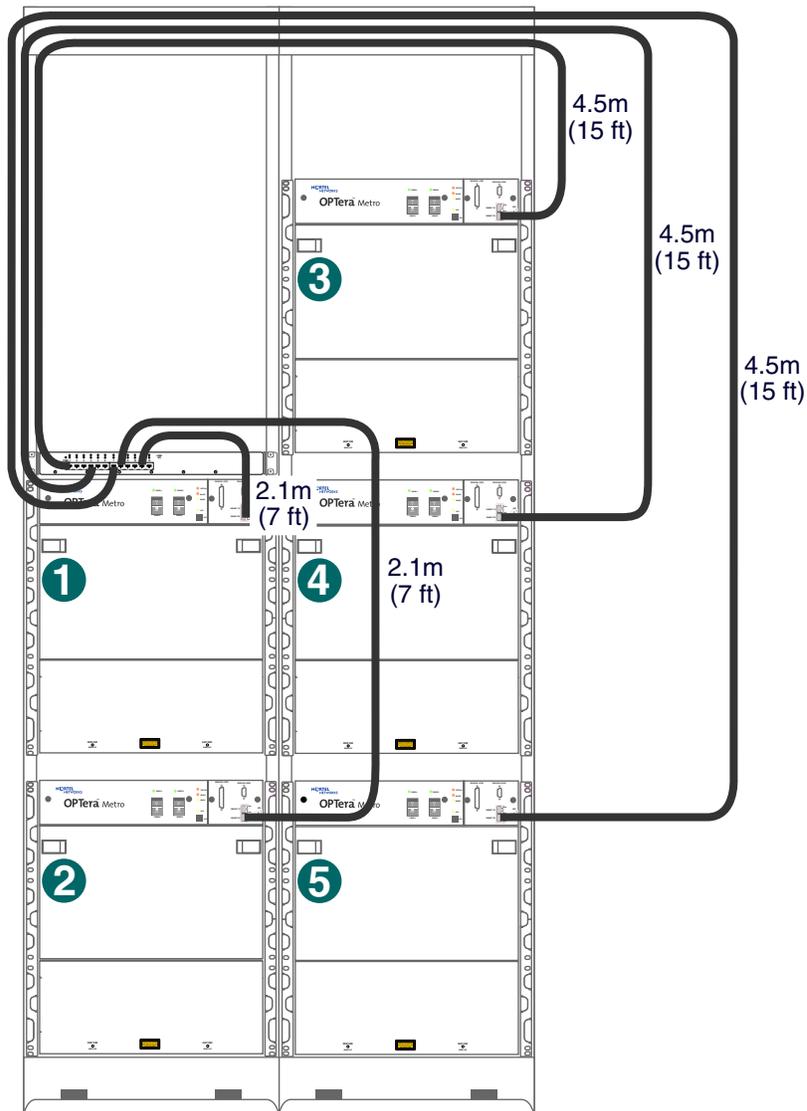
Step	Action
1	You need to enable the 10Base-T 2X port as well as the 10Base-T 2X port alarm. By default, the 10Base-T 2X port is enabled and the 10Base-T 2X port alarm is disabled. To enable the 10Base-T 2X port, refer to Procedure 1-26, "Provisioning Ethernet and serial ports" in <i>Provisioning and Operating Procedures</i> , 323-1701-310. To enable the 10Base-T 2X port alarm, refer to Procedure 1-25, "Provisioning Ethernet port alarms" in <i>Provisioning and Operating Procedures</i> , 323-1701-310.
2	Plug one end of a shielded Ethernet cross-over cable into an Ethernet port of the Ethernet hub.
3	Route the shielded Ethernet cross-over cable from the Ethernet hub to the destination Optical Metro 5200 shelf according to the layout in Figure 6-14 on page 6-30 .
	<div style="border: 1px solid black; padding: 5px;">  <p>CAUTION Risk of equipment damage Do not route Ethernet cables through the vertical fiber brackets of the Optical Metro 5200 shelves. Doing so can damage the optical fibers in the brackets.</p> </div>
4	Route and secure the Ethernet cross-over cable from the 10Base-T 2X port along the side of the frame using tie-wraps or lacing cord.
5	Plug the other end of the shielded Ethernet cross-over cable into the 10Base-T 2X port of the Optical Metro 5200 shelf.
6	Repeat steps 1 through 3 for all the Optical Metro 5200 shelves in the site that need to be connected to an Ethernet hub.

When you make the connection between a powered Optical Metro 5200 shelf and a powered Ethernet hub, the Link indicator lamp next to the 10Base-T 2X port of the shelf comes on and stays on.

—end—

Figure 6-14
Ethernet cable requirements in a multishelf site

OM0218p



Procedure 6-7

Connecting the ETS shelf to the Optical Metro shelf using an Ethernet cable

Follow this procedure to make an Ethernet connection between the Enhanced Trunk Switch shelf and the Optical Metro shelf. The connection being made in this procedure allows you to access remote ETS Switches and Comms modules. The communication to the remote ETS Switch and Comms module is through the Optical Metro 5100/5200 communications network. Perform this procedure to avoid having to connect the remote ETS shelves directly into the data communications network (DCN).

This procedure involves connecting the ETS shelf directly to the 10BASE-T 1X port of the Optical Metro shelf. However, you can also use an Ethernet hub as a middle access point for this Ethernet connection to the Optical Metro shelf. This procedure does not include steps for such a connection.

For more information on the “[Enhanced Trunk Switch](#)”, refer to *Hardware Description*, 323-1701-102.

—continued—

Procedure 6-7 (continued)

Connecting the ETS shelf to the Optical Metro shelf using an Ethernet cable

Requirements

Table 6-13 lists the tools and materials you need to make the Ethernet connection from the ETS shelf to the Optical Metro shelf.

**Table 6-13
Tools and materials for the Ethernet connection between the ETS shelf and the Optical Metro shelf**

Item	Quantity	Supplied	√
Straight shielded CAT5 Ethernet cable of the required length	1	No	

Action

Step Action

Note: This procedure involves connecting the ETS shelf directly to the 10BASE-T 1X port of the Optical Metro shelf. However, you can also use an Ethernet hub as a middle access point for this Ethernet connection to the Optical Metro shelf. For details on locating the required hub connections, contact your network administrator. (This procedure does not include steps for such a connection.)

- 1 Locate the Ethernet port that is labeled Ethernet at the rear of the ETS shelf.
- 2 Locate the Ethernet port that is labeled 10BASE-T 1X on the maintenance panel at the front right side of the Optical Metro 5100/5200 shelf.

Note: The 10BASE-T 1X port is located on the right side of the Optical Metro 5100/5200 shelf.

- 3 Select the straight Ethernet cable long enough to reach the ports identified in [step 1](#) and [step 2](#).
- 4 Connect one end of the Ethernet cable to the Ethernet port at the rear of the ETS shelf.
- 5 Route the Ethernet cable to the front of the rack, preferably using an external routing management device provided by the customer. If no routing management device is available, bring the Ethernet cable to the front of the rack and use the vertical fiber management brackets of the Optical Metro shelf to hold the Ethernet cable.
- 6 Route the Ethernet cable to the top or bottom of the rack using the Optical Metro shelf vertical fiber management brackets or any other routing management device provided by the customer.

Routing the Ethernet cable to the top or bottom of the rack depends on the location of the Optical Metro shelf where the Ethernet cable will be connected (the port identified in [step 2](#)).

—continued—

Procedure 6-7 (continued)

Connecting the ETS shelf to the Optical Metro shelf using an Ethernet cable

Step	Action
7	Route the Ethernet cable from the left to the right side of the shelf using the fiber management trough at the bottom of the Optical Metro 5200 shelf, or using an external fiber management device provided by the customer (used with Optical Metro 5200 or Optical Metro 5100 shelves).
8	On the right side of the Optical Metro shelf, use the shelf vertical fiber management brackets or any other routing management device provided by the customer to reach the Ethernet port 10BASE-T 1X identified in step 2 .
9	Connect the end of the Ethernet cable to the Ethernet port 10BASE-T 1X identified in step 2 .
10	Repeat this procedure for all the ETS shelves in the network, connecting each of them to an Optical Metro 5100/5200 shelf that is collocated with the ETS.

—end—

Procedure 6-8

Connecting to a data communications network

Follow this procedure to connect the Optical Metro 5200 network to a data communications network (DCN). When you complete this procedure, you can run the System Manager from a surveillance center or other remote management facility.

For more information on Optical Metro 5200 hardware, see “[Optical Metro 5200 shelves](#)” in *Hardware Description*, 323-1701-102.

Requirements

You must have a shielded Ethernet cross-over cable (RJ45 to RJ45) to connect Optical Metro 5200 shelves to a DCN. The cable is not supplied.

Action

Step	Action
1	You need to enable the 10Base-T 1X port alarm. To enable the 10Base-T 1X port alarm, refer to Procedure 1-25, “Provisioning Ethernet port alarms” in <i>Provisioning and Operating Procedures</i> , 323-1701-310.
2	Plug one end of a shielded Ethernet cross-over cable into a port on an Ethernet hub or router connected to a DCN.
3	Plug the other end of the shielded cable to the 10Base-T 1X port of an Optical Metro 5200 shelf or Ethernet hub in an Optical Metro 5200 site. Figure 6-15 shows the 10Base-T 1X port on the maintenance panel. <i>When you connect a powered Optical Metro 5200 shelf to a powered Ethernet hub, the Link indicator lamp next to the 10Base-T 1X port of the shelf comes on and stays on.</i>
4	Route and secure the Ethernet cross-over cable from the 10Base-T 1X port along the right-side of the frame using tie-wraps or lacing cord.



CAUTION

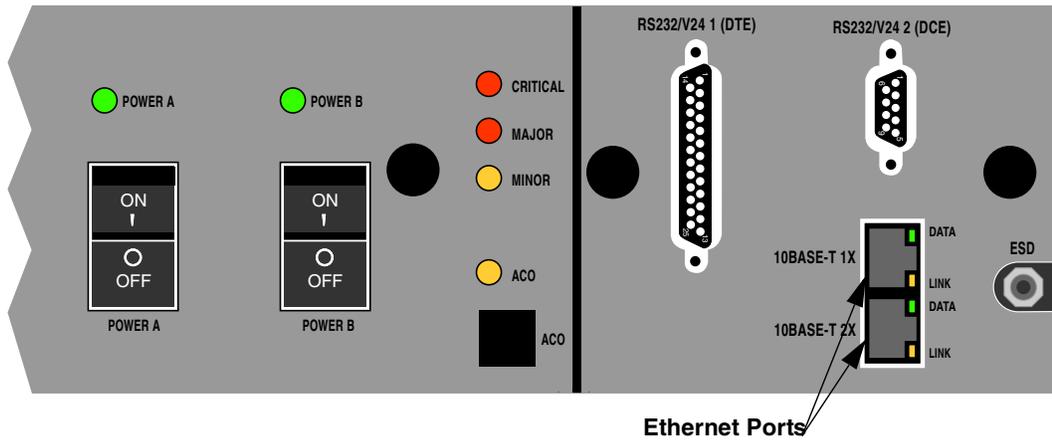
Risk of equipment damage

Do not route Ethernet cables through the vertical fiber brackets of the Optical Metro 5200 shelves. Doing so could cause damage to the fiber-optic cables in the brackets.

—end—

Figure 6-15
Connecting to a data communications network—maintenance panel connectors

OM0147p



Procedure 6-9

Connecting passive devices to the maintenance panel

Optical Metro 5100/5200 shelves support data communication between a shelf and the passive optical devices that are associated with the shelf. Inside the maintenance panel of each shelf are two OMX interface (OMXI) cards that allow the System Manager to inventory and monitor the equipment. Each passive optical device contains an identity card that carries information about that component. Data communication cables are used to connect an OMX, ECT, OMX 16CH DWDM, PBE, OSC splitter/coupler, OSC splitter/coupler with dual taps, C&L splitter/coupler, Transponder Protection Tray, VOA tray, or 1310 nm splitter/coupler to an OMXI port.

The Equipment Inventory Unit (EIU) can also be connected to an OMXI port on the maintenance panel. The Equipment Inventory Unit allows you to increase the number of optical passive devices that can be associated with a single Optical Metro 5200 shelf (from 4 to 19).

Refer to [Procedure 6-12, Connecting the Equipment Inventory Unit to the maintenance panel](#) to connect the EIU to the maintenance panel and [Procedure 6-10, Connecting passive devices to the Equipment Inventory Unit in new installations](#) to connect passive devices to the EIU.

Table 6-14 lists the specifications for each cable.

Table 6-14
Data communication cables

PEC	Length	Use
NT0H5731	Duplex RJ45-RJ45 1.15 m (45 in.)	Connect two OMX (Standard) trays to the maintenance panel
NT0H4345	Simplex RJ45-RJ45 1.5 m (60 in.)	Connect passive devices or Equipment Inventory Unit to the maintenance panel and connect passive devices to the Equipment Inventory Unit.
NT0H4403	Duplex RJ45-RJ45 0.77 m (30 in.)	Connect two ECT trays to the maintenance panel.
NT0H4322	Simplex RJ45-RJ45 2.98 m (117 in.)	Connect passive devices or Equipment Inventory Unit to the maintenance panel and connect passive devices to the Equipment Inventory Unit.

Follow this procedure to connect the data communications cable to the maintenance panel and route the data communications cable to the tray.

—continued—

Procedure 6-9 (continued)

Connecting passive devices to the maintenance panel

When you complete this procedure

- the data communications cable is connected to the optical multiplexer interface (OMXI) cards in the maintenance panel
- the ferrite bead is attached to the data communications cable
- the data communications cable is routed and connected in the equipment drawer

For more information on specific equipment drawers, see *Hardware Description*, 323-1701-102.

Requirements

Before you begin this procedure, you must have completed the procedures to mount an Optical Metro 5200 shelf in a rack or cabinet. Refer to the “[Installing Optical Metro 5200 shelves and equipment](#)” chapter of this book for the required procedures.

[Table 6-15](#) lists the tools and materials required for connecting and routing the data communications cable.

Table 6-15
Tools and materials for connecting and routing the data communications cable

Item	Quantity	Supplied	√
Data communications cable (see Table 6-14 for correct cable type)	1	yes (see Note)	
Ferrite bead	1	yes	
Cable tie (tie wrap) (P0567226)	1 for the OMX 16CH DWDM	no	
Note: The data communications cable is not provided with the OSC splitter/coupler with dual taps (NT0H57GA). For this component, the data communications cable must be ordered separately. For details, see “ Optical Metro 5100/5200 ordering information ” on page 13-1 in <i>Network Planning and Link Engineering</i> , 323-1701-110.			

—continued—

Procedure 6-9 (continued)

Connecting passive devices to the maintenance panel

Prepare the following two labels for the data communications cables:

- West 1
- East 1

Note: If you are connecting the cables to the bottom OMXI ports, prepare two labels that read West 2, and East 2.

Precautions

Be sure to install the ferrite bead around the cable in the maintenance panel, to comply with Class B emissions requirements (see [step 5](#)).

	<p>DANGER Invisible laser radiation The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.</p>
---	--

Action

Step	Action
1	If the maintenance panel is not open, loosen the thumbscrews and remove the left maintenance panel cover to access the interface cards.
2	Insert the end of the data communications cable with the short leads through the access slot in the left side of the maintenance panel. For a list of cable types, see Table 6-14 on page 6-36 .
3	Insert the WEST 1 connector in the OMXI port 1 (top) or 2 (bottom) on the left OMXI card in the maintenance panel, as shown in Figure 6-16 on page 6-41 .
4	Insert the EAST 1 connector in the OMXI port 1 (top) or 2 (bottom) on the right OMXI card in the maintenance panel, as shown in Figure 6-16 on page 6-41 .
5	Clamp the ferrite around the data communications cable.
6	Place the ferrite in the maintenance panel, as shown in Figure 6-16 on page 6-41 . When grounding the shelf using a double hole compression lug, place the ferrite in front of the telemetry card. <i>Note:</i> One ferrite should be used until full and then incorporate a second ferrite as required. The ferrites can be mounted one on top of each other, laced together.
7	Run the cables down the left side of the shelf through the vertical fiber brackets.

—continued—

 Procedure 6-9 (continued)

Connecting passive devices to the maintenance panel

Step	Action		
8	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> If you are connecting an OMX (Standard) an ECT an OMX 16CH DWDM any other piece of equipment </td> <td style="width: 50%; vertical-align: top;"> Then go to <hr style="width: 80%; margin-left: 0;"/> step 9 step 21 step 24 step 15 </td> </tr> </table>	If you are connecting an OMX (Standard) an ECT an OMX 16CH DWDM any other piece of equipment	Then go to <hr style="width: 80%; margin-left: 0;"/> step 9 step 21 step 24 step 15
If you are connecting an OMX (Standard) an ECT an OMX 16CH DWDM any other piece of equipment	Then go to <hr style="width: 80%; margin-left: 0;"/> step 9 step 21 step 24 step 15		
9	Run the shorter lead (west monitor) straight down the left vertical fiber bracket (see Figure 6-17 on page 6-42).		
10	Run the longer lead (east monitor) through the fiber management trough to the right side of the shelf and down the right vertical fiber bracket (see Figure 6-17 on page 6-42).		
11	Identify the east and west cables of the OMX cable assembly coming from the maintenance panel.		
12	Take the west OMX cable and insert the jack into the port on the west OMX tray installed in the left side of the drawer.		
13	Take the east OMX cable and insert the jack into the port on the east OMX installed in the right side of the drawer.		
14	Go to step 27 .		
15	Open the west equipment drawer by pressing and holding the two locking latches on the drawer and pulling the drawer toward you until it is fully open.		

—continued—

6-40 Installing peripheral cables

Procedure 6-9 (continued)

Connecting passive devices to the maintenance panel

Step	Action
16	<p>Insert the RJ45 connector into the port located at the front of the drawer, and route the cable, using the two tie-downs provided.</p> <p>For internal cable routing illustrations, see:</p> <ul style="list-style-type: none">• Figure 6-19 for OMX 4CH + Fiber Manager• Figure 6-20 for OMX 4CH CWDM and for OMX 4CH CWDM with dual taps• Figure 6-21 for OMX 4CH ITU CWDM• Figure 6-22 for OMX 8CH ITU CWDM• Figure 6-24 for PBE• Figure 6-25 for C&L splitter/coupler• Figure 6-26 for OSC tray - with optical tap• Figure 6-27 for OSC tray - without optical tap• Figure 6-28 for OSC tray - with dual taps• Figure 6-29 for Transponder Protection Tray (two-filter)• Figure 6-30 for Transponder Protection Tray (four-filter)• Figure 6-31 for 1310 nm splitter/coupler• Figure 6-32 for Discrete VOA

—continued—

Procedure 6-9 (continued)

Connecting passive devices to the maintenance panel

Step	Action
17	Close the drawer. Make sure that the cable does not pinch as you slide the drawer back into place.
18	Open the east equipment drawer.
19	Repeat step 16 and step 17 to connect the cable from the east OMXI port to the east equipment drawer.
20	Go to step 27 .
21	Insert the end of the ECT cable labelled East into the monitor port located on the left side of the east ECT. See Figure 6-33 on page 6-55 .
22	Insert the end of the second ECT cable labelled West into the monitor port located on the left side of the west ECT.
23	Go to step 27 .
24	Unscrew the two lock-screws on the top side (left and right) of the front panel to open the OMX 16CH DWDM drawer. Then, pull down the OMX 16CH DWDM front panel.
25	Insert the RJ45 connector into the port located in the middle of the OMX 16CH DWDM, just over the OTS fiber connectors. Route the cable over the fiber connector slider adapters on the right side of the OMX 16CH DWDM. The cable must go out of the module through the round aperture on the side of the OMX 16CH DWDM. Use a cable tie (tie wrap) to attach the data communications cable to the right top fastening hole inside the OMX 16CH DWDM. For internal cable routing illustration, see Figure 6-23 .
26	Close the OMX 16CH DWDM front panel by pulling up the panel, and securing the two external lock-screws.
27	Replace the maintenance panel cover.

—end—

Figure 6-16
OMX cable jacks in the maintenance panel

OM0150t

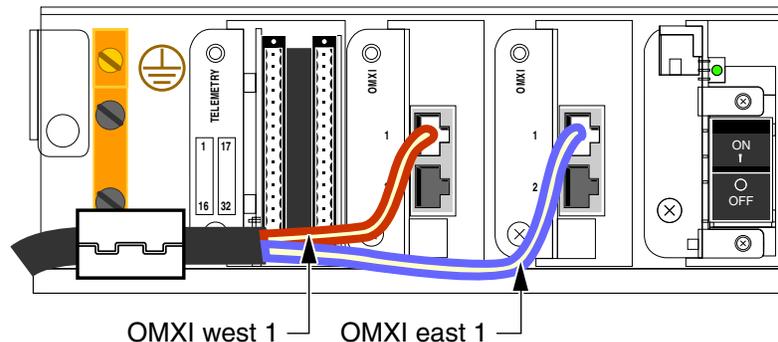


Figure 6-17
OMX (Standard) cable routing

OM0149p

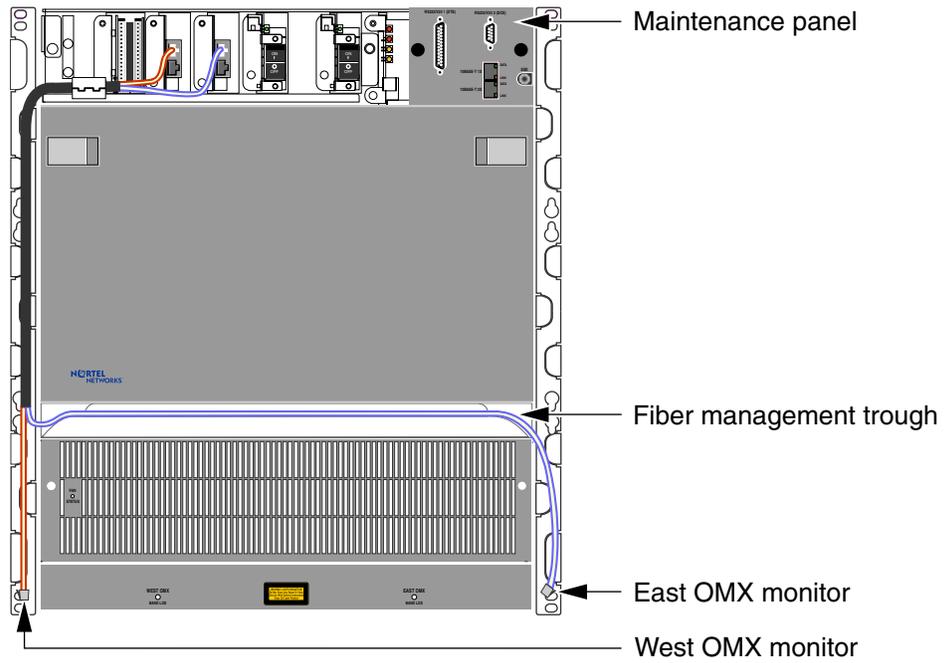


Figure 6-18
External routing of cables from the maintenance panel to the OMXs

OM0509p

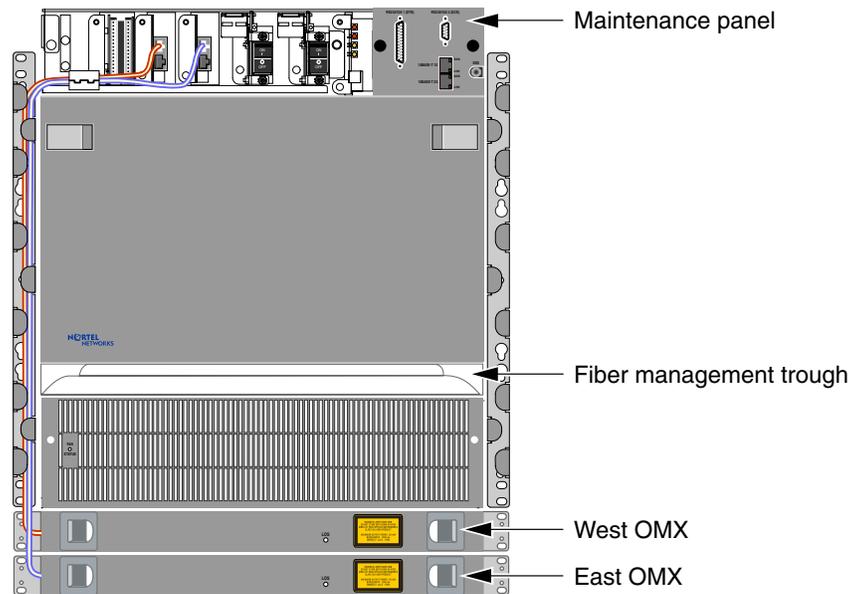
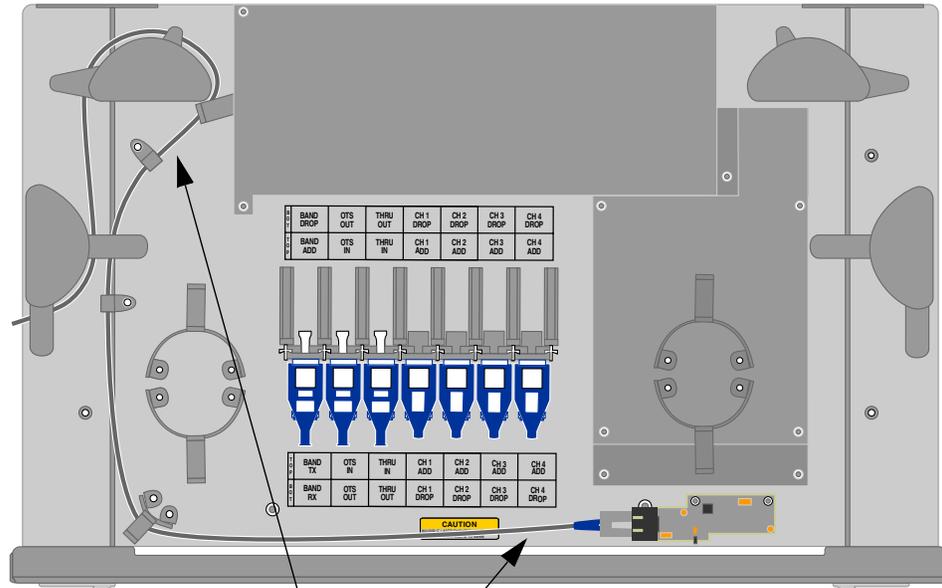


Figure 6-19
Internal routing of OMX 4CH + Fiber Manager maintenance cable

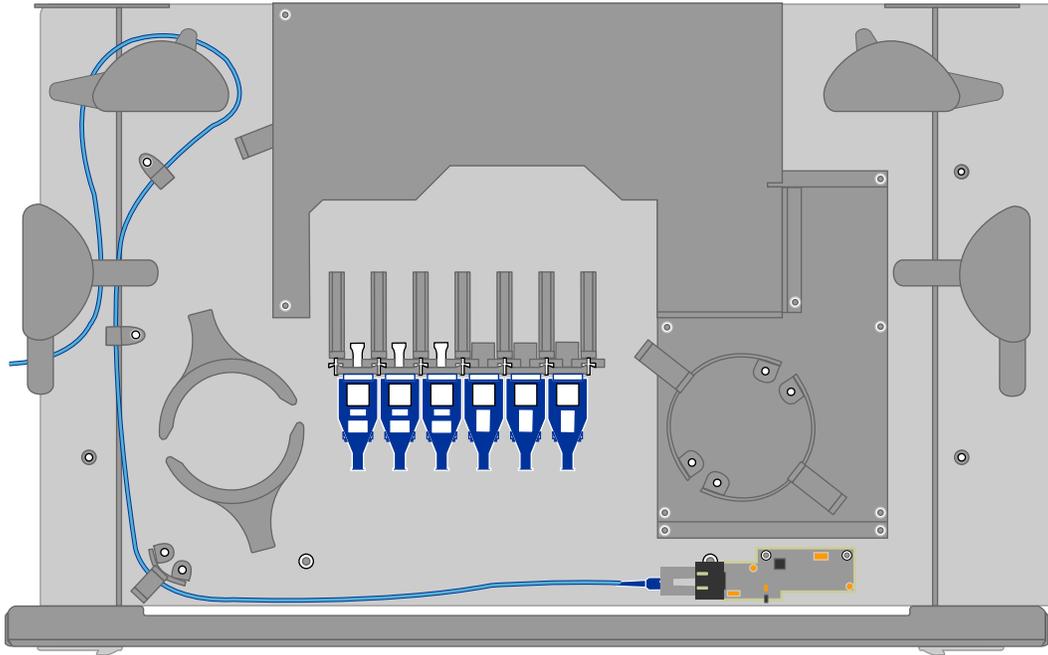
OM0509p



Data communication cable

Figure 6-20
Cable routing for the OMX 4CH CWDM

OM0940p



Note: Use the same cable routing for the OMX 4CH CWDM with dual taps as shown for the OMX 4CH CWDM. (The only difference is that the OMX 4CH CWDM with dual taps includes two monitor ports that are accessible from the outside front of the drawer.)

Figure 6-21
Cable routing for the OMX 4CH ITU CWDM

OM2136t

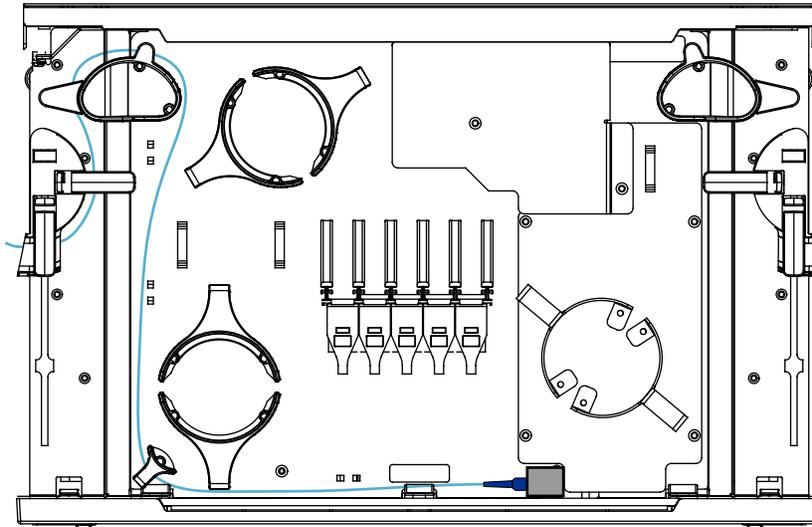


Figure 6-22
Cable routing for the OMX 8CH ITU CWDM

OM2137t

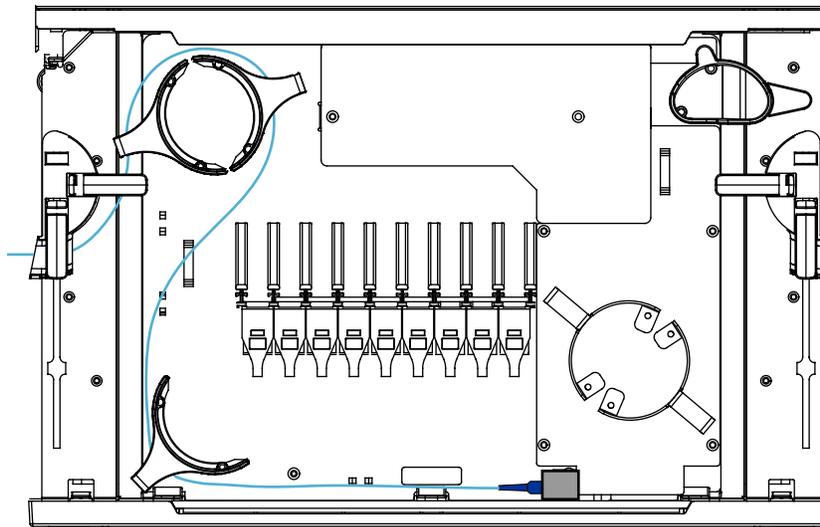


Figure 6-23
Cable routing for the OMX 16CH DWDM

OM2660p.jpg



Figure 6-24
Interior view of the PBE tray

OM1928p

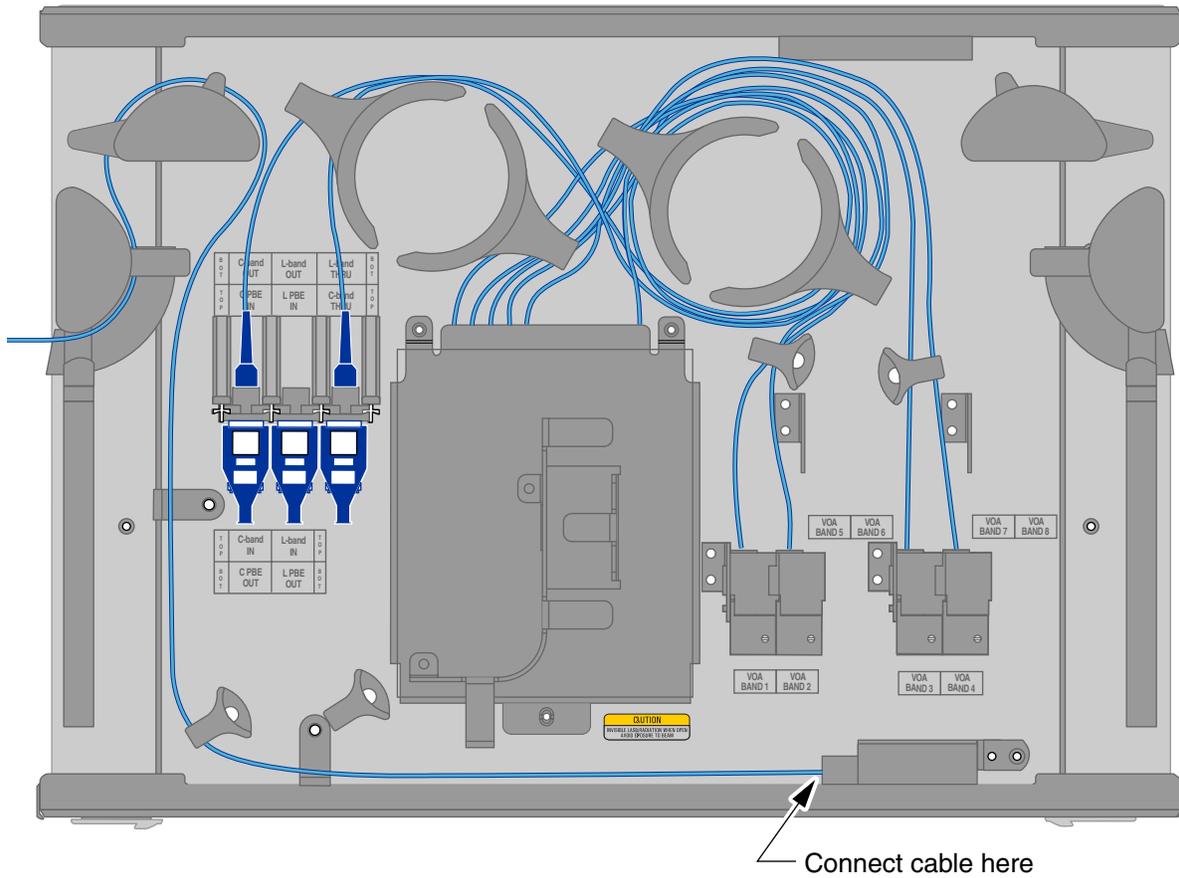


Figure 6-25
Interior view of the C&L splitter/coupler tray

OM2273t

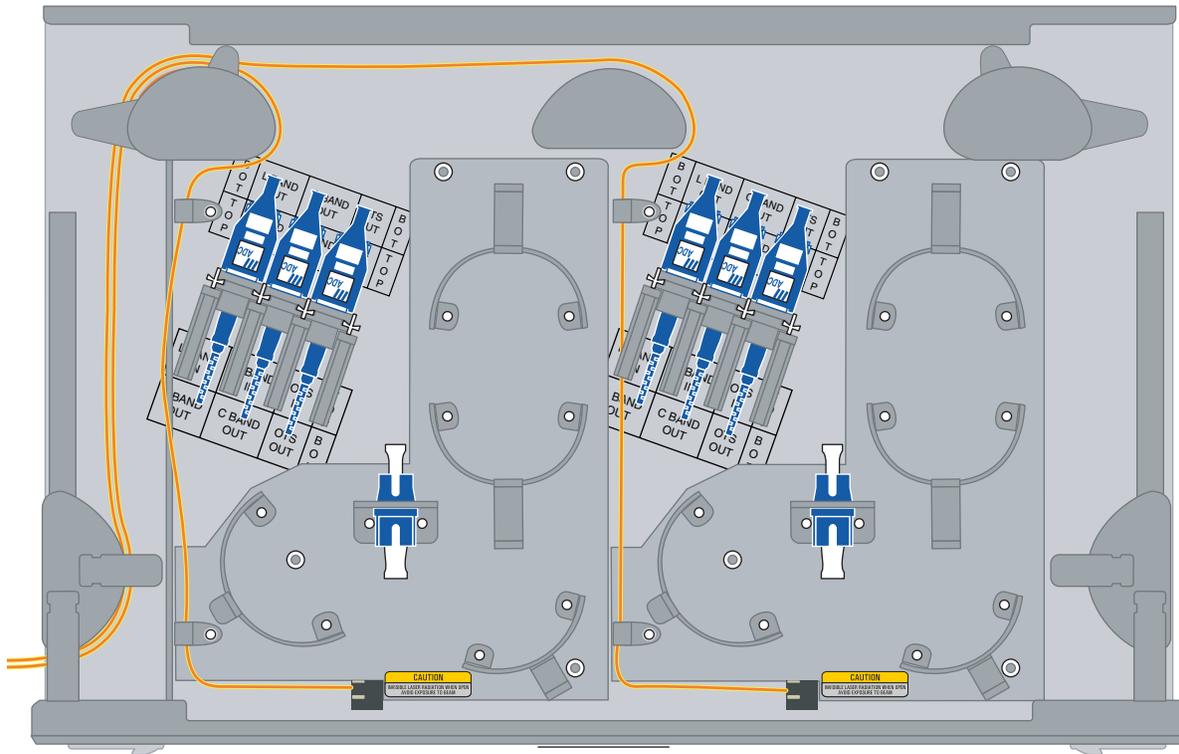
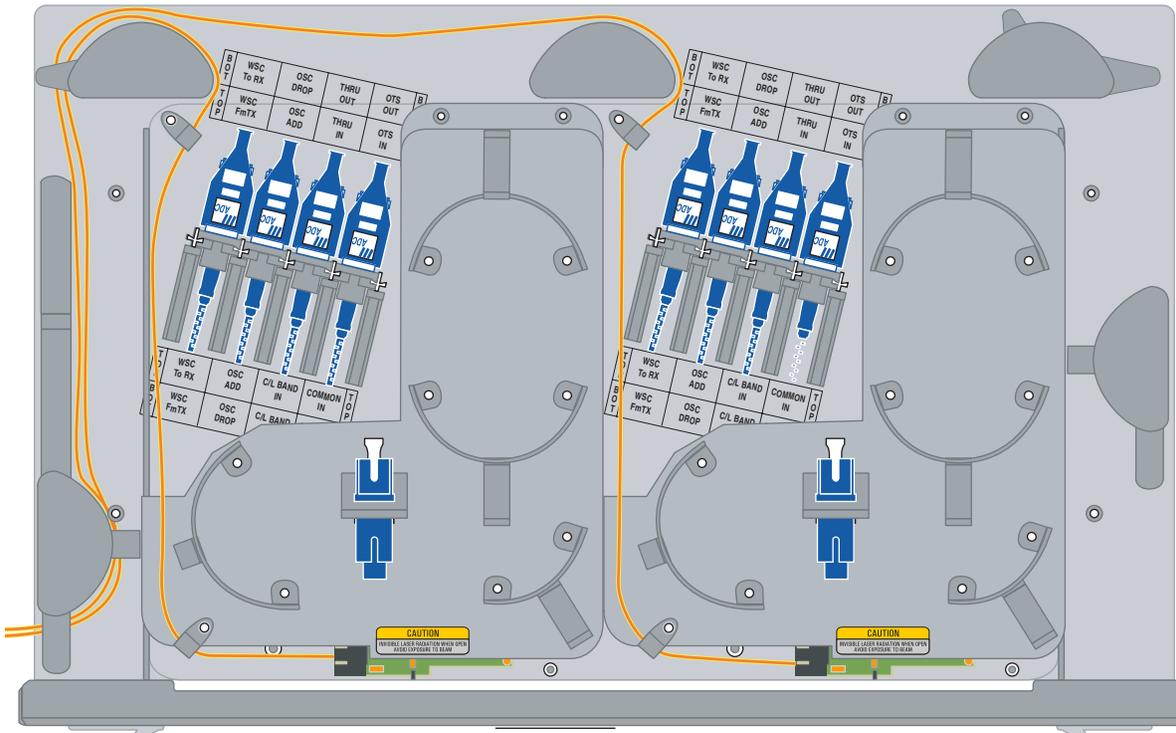


Figure 6-26
Interior view of the OSC tray - with optical tap

OM2274t



6-50 Installing peripheral cables

Figure 6-27
Interior view of the OSC tray - without optical tap

OM2275t

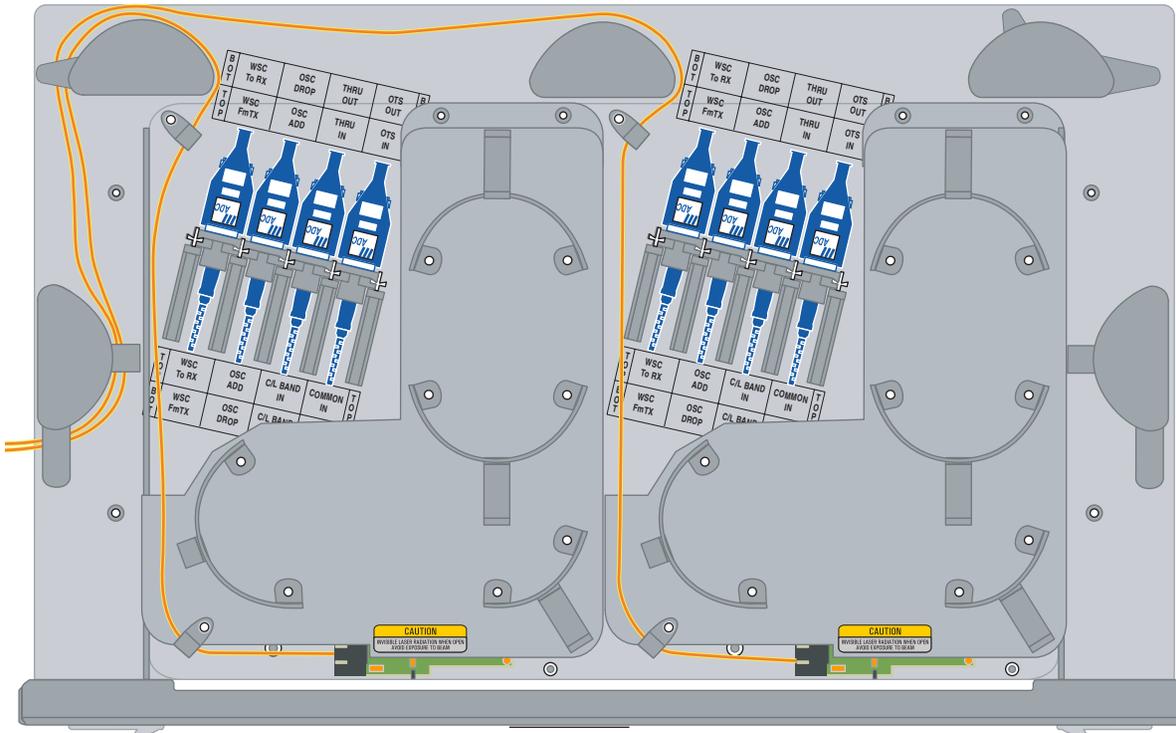


Figure 6-28
Interior view of the OSC splitter/coupler tray with dual taps

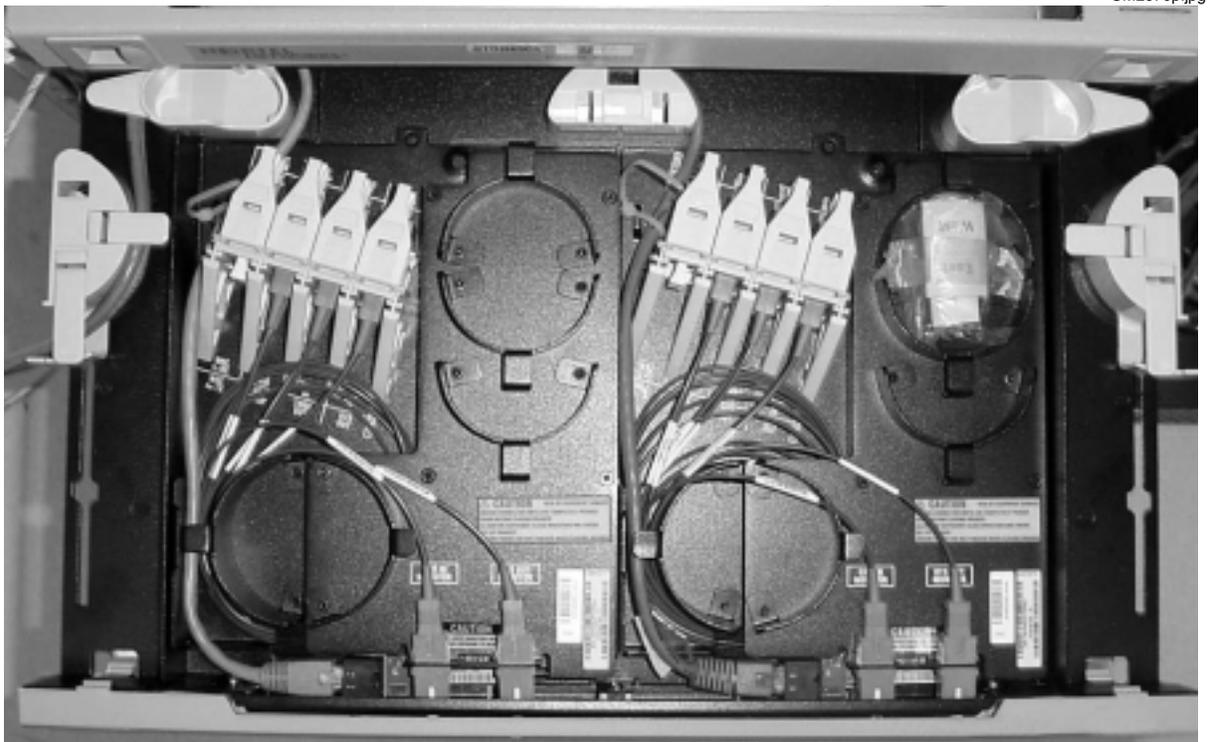


Figure 6-29
Interior view of the Transponder Protection Tray (four filter)

OM2276t

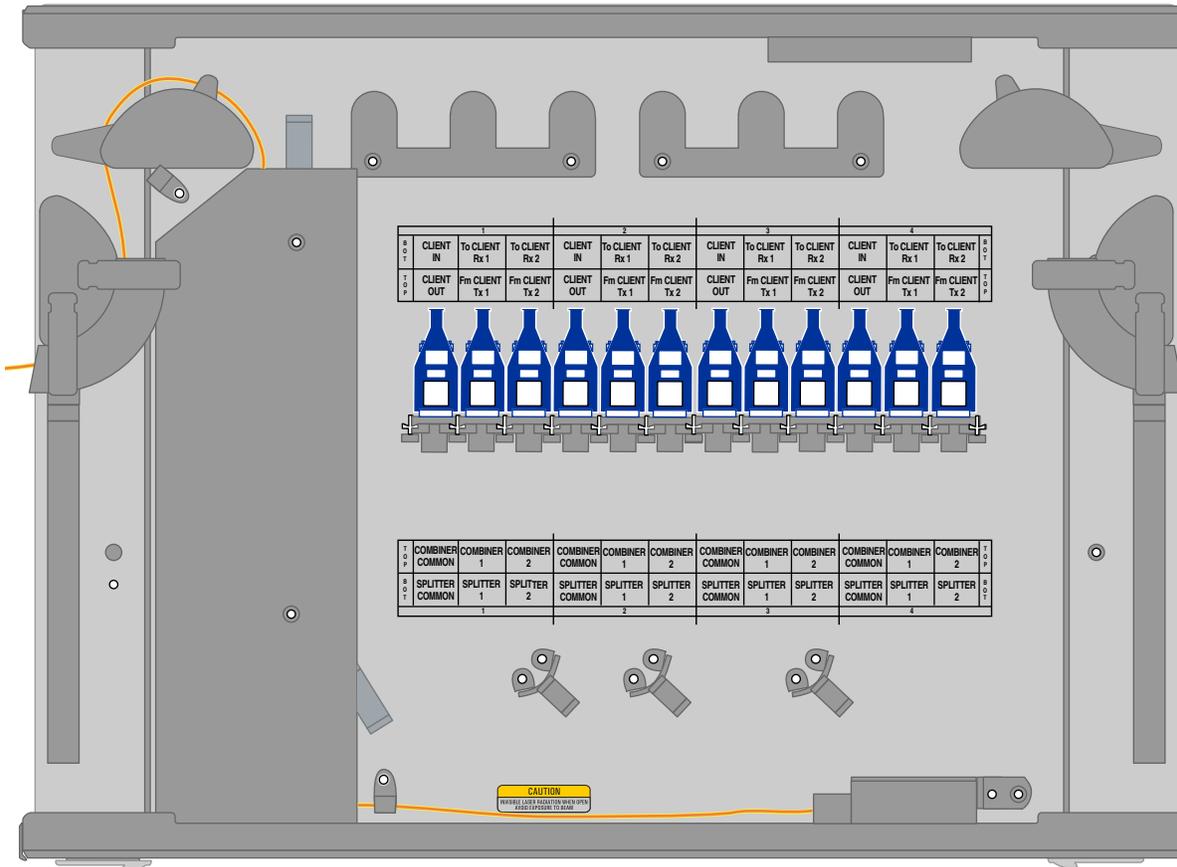


Figure 6-30
Interior view of the Transponder Protection Tray (two filter)

OM2277t

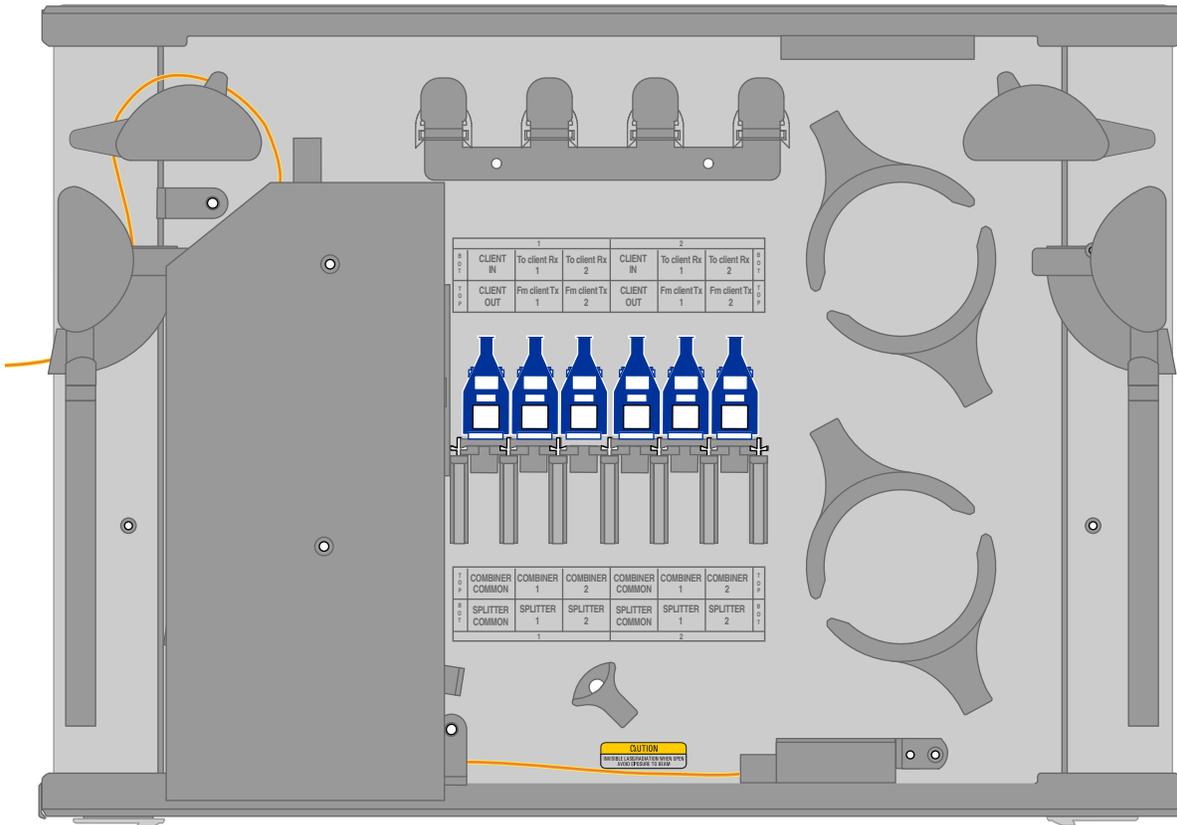


Figure 6-31
Interior view of the 1310 nm splitter/coupler tray

OM2272t

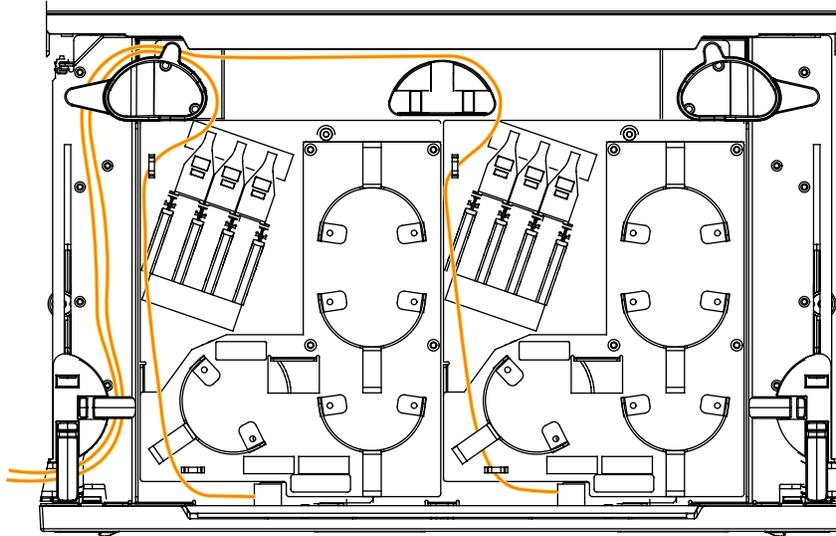


Figure 6-32
Interior view of the Discrete VOA tray

OM2287p

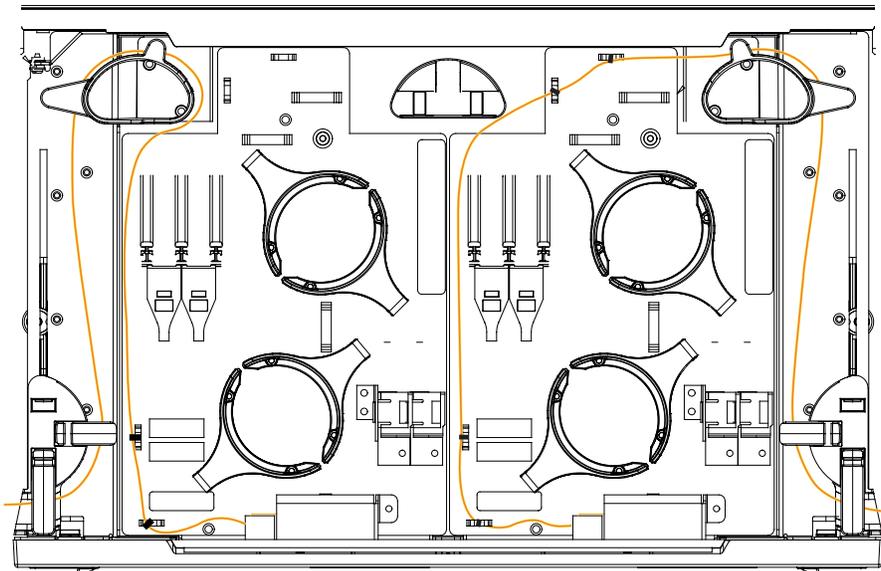
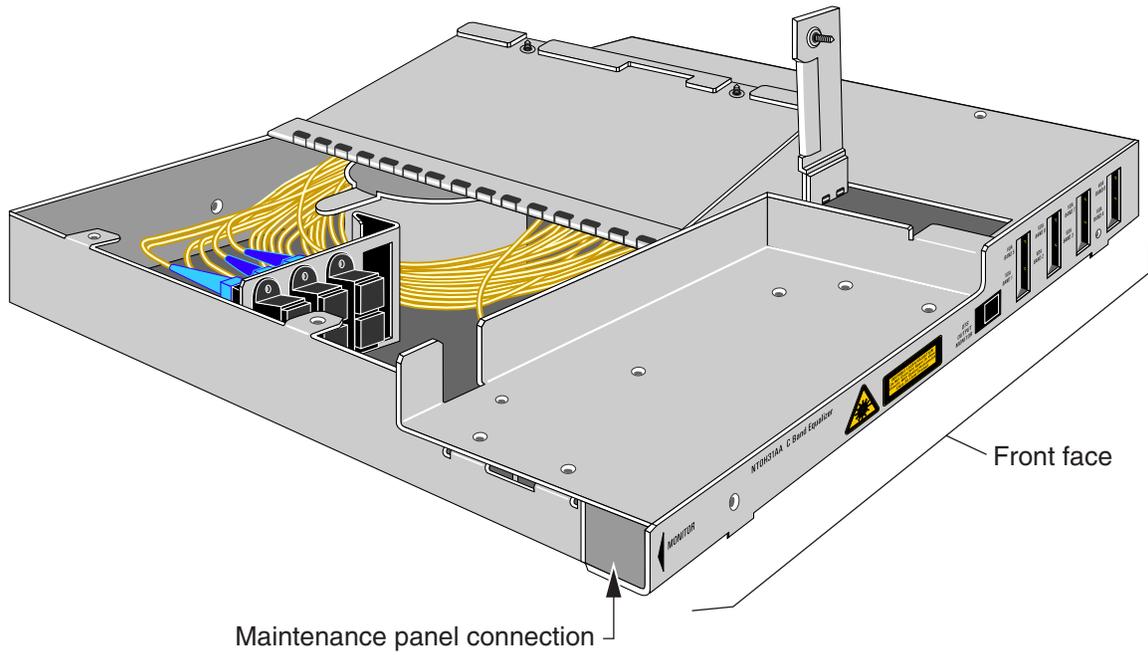


Figure 6-33
Interior view of the ECT tray

OM1363p



Procedure 6-10

Connecting passive devices to the Equipment Inventory Unit in new installations

Follow this procedure to connect the passive optical devices to the Equipment Inventory Unit (EIU) using the NT0H4322 cable (9.8 ft.) or the NT0H4345 cable (5 ft.) and route the cable to the tray.

For existing installations, refer to [Procedure 6-11, “Connecting passive devices to the Equipment Inventory Unit in existing installations”](#) on page 6-64.

Refer to [Procedure 6-12, “Connecting the Equipment Inventory Unit to the maintenance panel”](#) to connect the EIU to the maintenance panel.

The EIU drawer allows up to 16 passive devices to be inventoried per shelf. The EIU is connected to the shelf maintenance panel (Optical Metro 5200 or Optical Metro 5100), then the individual passive devices are connected to the EIU. The following passive devices may be connected to the EIU:

- OMX
- OMX 16CH DWDM
- ECT
- C&L splitter/coupler
- OSC splitter/coupler
- OSC splitter/coupler with dual optical taps
- Transponder Protection Tray (TPT)
- VOA tray
- 1310 nm splitter/coupler
- PBE

When you complete this procedure

- the EIU data communications cable (NT0H4322 or NT0H4345) is connected between the EIU and the passive device
- the data communications cable is routed and connected in the equipment drawer

For more information on specific equipment drawers, see *Hardware Description*, 323-1701-102.

—continued—

Procedure 6-10 (continued)

Connecting passive devices to the Equipment Inventory Unit in new installations**Requirements**

Before you begin this procedure, you must have completed the procedures to mount an Optical Metro 5200 shelf (12 U high) in a rack or cabinet. Also, you must have completed the procedure for mounting an EIU and the passive devices. Refer to the [“Installing Optical Metro 5200 shelves and equipment”](#) chapter of this book for the required procedures.

[Table 6-16](#) lists the tools and materials required for completing this procedure.

Table 6-16**Tools and materials for connecting and routing the data communications cable for the EIU**

Item	Quantity	Supplied	√
Data communications cable (NT0H4322 or NT0H4345)	1	yes (see Note 1)	
Labels (see Note 2)	as required	no	
Cable tie (tie wrap) (P0567226)	1 for the OMX 16CH DWDM	no	
<p>Note 1: The data communications cable is not provided with the OSC splitter/coupler with dual taps (NT0H57GA). For this components, the data communications cable must be ordered separately. For details, see “Optical Metro 5100/5200 ordering information” on page 13-1 in <i>Network Planning and Link Engineering</i>, 323-1701-110.</p> <p>Note 2: When connecting equipment to the EIU, it is recommended that you label the individual cables with the equipment type to which it is connected.</p> <p>Note 3: For details on these cables, see “Cables and optical patch cords” in <i>Hardware Description</i>, 323-1701-102.</p>			

—continued—

Procedure 6-10 (continued)

Connecting passive devices to the Equipment Inventory Unit in new installations

Precautions

	<p>DANGER Invisible laser radiation The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.</p>
---	--

Action

Step	Action
------	--------

- 1 Insert the data communications cable (NT0H4322 or NT0H4345) into the appropriate port on the front of the EIU (see [Figure 6-35 on page 6-63](#)).

	<p>CAUTION Risk of raising the “Unassigned OSID” alarm Bear in mind the EIU port/direction restrictions when you connect passive devices. Connect a west-facing passive device to ports 1 to 8 of an EIU. Connect an east-facing passive device to ports 9 to 16 of an EIU. If you connect passive devices to the incorrect port, the system raises the “Unassigned OSID” alarm.</p>
--	--

Note: It is recommended that you label the cable with the equipment type to which the cable will be connected.

- 2 Route the data communication cable from the right side of the EIU to the passive device drawer as follows.

If the passive device data communications port is located on the	Then go to
right side of the shelf	step 3
left side of the shelf	step 4

Note: For a list of data communications cable types, see [Table 6-14 on page 6-36](#).

—continued—

Procedure 6-10 (continued)

Connecting passive devices to the Equipment Inventory Unit in new installations

Step	Action												
3	<p>Route the data communication cable from the right side of the EIU to the passive device data communication port located on the right side of the shelf as follows:</p> <ol style="list-style-type: none"> a. On the right side of the EIU, use the cable management bracket to provide strain relief for the data communication cable connected to the EIU. b. Along the right side of the shelf, run the data communication cable through the vertical fiber brackets. <p>Go to step 5.</p>												
4	<p>Route the data communications cable from the right side of the EIU to the passive device data communications port located on the left side of the shelf as follows:</p> <ol style="list-style-type: none"> a. On the right side of the EIU, use the cable management bracket to provide strain relief for the data communications cable connected to the EIU. b. Along the right side of the shelf, run the data communications cable through the vertical fiber brackets. c. Run the data communications cable from the right side of the EIU to the left side of the passive device drawer using one of the following methods: <ul style="list-style-type: none"> — through the fiber management trough on any Optical Metro 5200 shelf (see Figure 6-34 on page 6-62) — through the cable trough at the top of the bay — through any other cable management hardware provided by the customer <p>Note: If the data communications cable (NT0H4322 or NT0H4345) is a bit too long, use the vertical fiber brackets on the left or right side of the shelf to store the slack (see Figure 6-34 on page 6-62).</p>												
5	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If you are connecting</th> <th style="text-align: left;">Then go to</th> </tr> </thead> <tbody> <tr> <td>an OMX (Standard) - west tray</td> <td>step 6</td> </tr> <tr> <td>an OMX (Standard) - east tray</td> <td>step 7</td> </tr> <tr> <td>an ECT</td> <td>step 11</td> </tr> <tr> <td>an OMX 16CH DWDM</td> <td>step 12</td> </tr> <tr> <td>any other piece of equipment</td> <td>step 8</td> </tr> </tbody> </table>	If you are connecting	Then go to	an OMX (Standard) - west tray	step 6	an OMX (Standard) - east tray	step 7	an ECT	step 11	an OMX 16CH DWDM	step 12	any other piece of equipment	step 8
If you are connecting	Then go to												
an OMX (Standard) - west tray	step 6												
an OMX (Standard) - east tray	step 7												
an ECT	step 11												
an OMX 16CH DWDM	step 12												
any other piece of equipment	step 8												

—continued—

Procedure 6-10 (continued)

Connecting passive devices to the Equipment Inventory Unit in new installations

Step	Action
6	<p>Insert the cable into the port on the west OMX tray installed in the left side of the drawer (see Figure 6-17 on page 6-42).</p> <p>You have completed this procedure.</p>
7	<p>Insert the cable into the port on the east OMX installed in the right side of the drawer.</p> <p>You have completed this procedure.</p>
8	<p>Open the equipment drawer by pressing and holding the two locking latches on the drawer and pulling the drawer toward you until it is fully open.</p>
9	<p>Insert the RJ45 connector into the port located at the front of the drawer, and route the cable, using the two tie-downs provided.</p> <p>For internal cable routing illustrations, see:</p> <ul style="list-style-type: none">• Figure 6-19 for OMX 4CH + Fiber Manager• Figure 6-20 for OMX 4CH CWDM and for OMX 4CH CWDM with dual taps• Figure 6-21 for OMX 4CH ITU CWDM• Figure 6-22 for OMX 8CH ITU CWDM• Figure 6-24 for PBE• Figure 6-25 for C&L splitter/coupler• Figure 6-26 for OSC tray - with optical tap• Figure 6-27 for OSC tray - without optical tap• Figure 6-28 for OSC tray - with dual optical taps• Figure 6-29 for Transponder Protection Tray (two-filter)• Figure 6-30 for Transponder Protection Tray (four-filter)• Figure 6-31 for 1310 nm splitter/coupler• Figure 6-32 for Discrete VOA
10	<p>Close the drawer. Make sure that the cable does not pinch as you slide the drawer back into place.</p> <p>You have completed this procedure.</p>
11	<p>Insert the cable into the monitor port located on the left side of the ECT. See Figure 6-33 on page 6-55.</p> <p>You have completed this procedure.</p>
12	<p>Unscrew the two lock-screws on the top side (left and right) of the front panel of the OMX 16CH DWDM drawer. Then pull down the OMX 16CH DWDM front panel.</p>

—continued—

Procedure 6-10 (continued)

Connecting passive devices to the Equipment Inventory Unit in new installations

- | Step | Action |
|-------------|--|
| 13 | <p>Insert the RJ45 connector into the port located in the middle of the OMX 16CH DWDM, just over the OTS fiber connectors. Route the cable over the fiber connector slider adapters on the right side of the OMX 16CH DWDM. The cable must exit the module through the round aperture on the side of the OMX 16CH DWDM. Use a cable tie (tie wrap) to attach the data communications cable to the right top fastening hole inside the OMX 16CH DWDM.</p> <p>For internal cable routing, see Figure 6-23.</p> |
| 14 | <p>Pull up the panel and secure the two external lock-screws to close the OMX 16CH DWDM front panel.</p> |

—end—

Figure 6-34
Routing the data communications cable right from the EIU and left into the passive device drawer

OM2408p

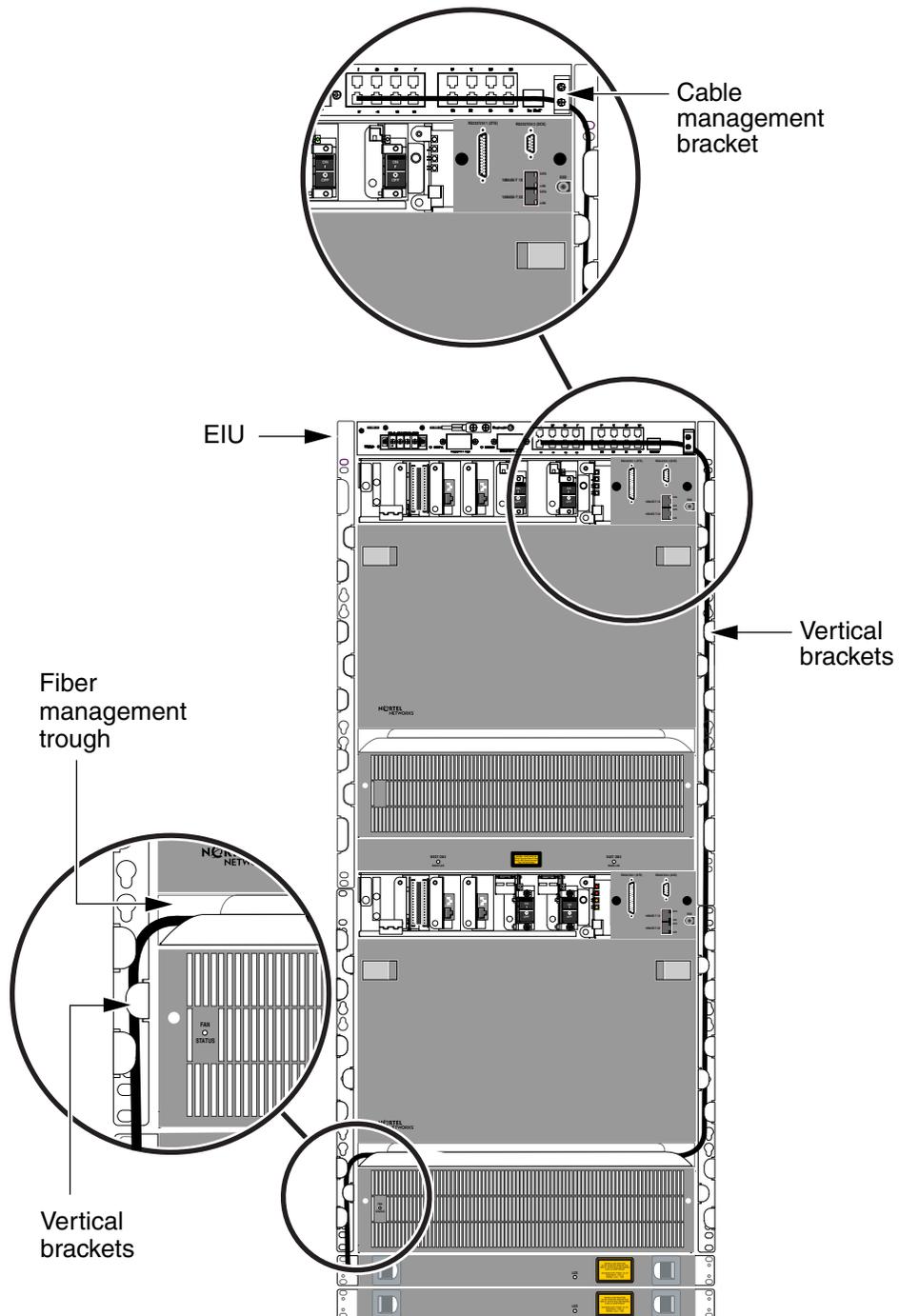
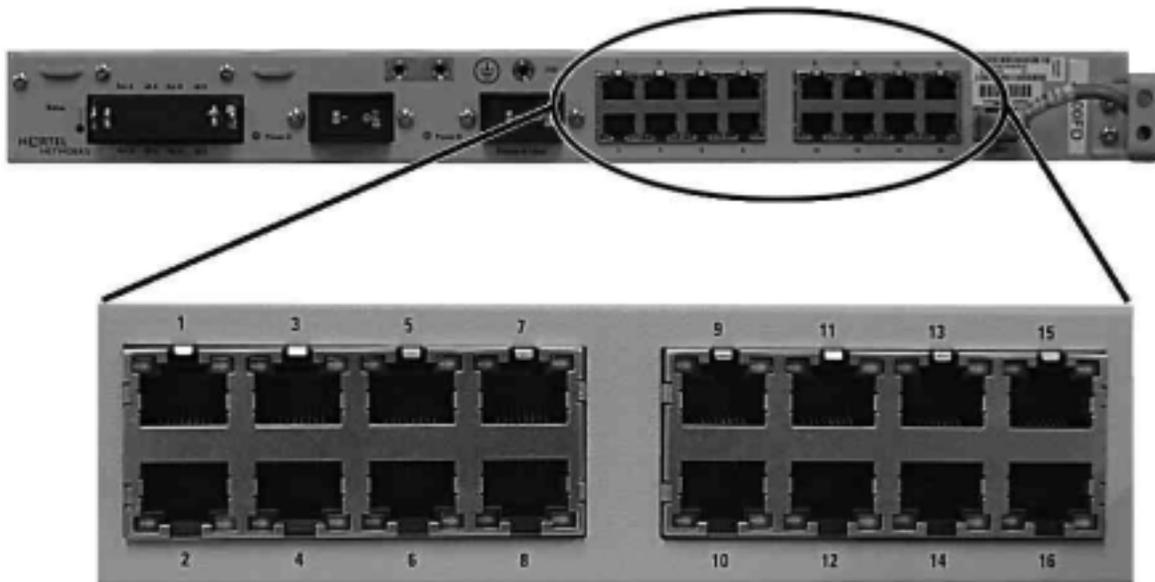


Figure 6-35
Front panel of the EIU

OM2371p.jpg



Note 1: Connect passive devices to the correct port; otherwise, the system raises the "Unassigned OSID" alarm.

Note 2: Connect a west-facing passive device to ports 1 to 8. Connect an east-facing passive device to ports 9 to 16.

Procedure 6-11

Connecting passive devices to the Equipment Inventory Unit in existing installations

Use this procedure to reconfigure existing connections between passive devices and the maintenance panel to connections from the passive devices to an Equipment Inventory Unit (EIU) connected to the maintenance panel.

For new installations, see [Procedure 6-10 “Connecting passive devices to the Equipment Inventory Unit in new installations”](#).

Requirements

Before you start this procedure, you must

- know which shelf in the rack the EIU will be connected to
- know which shelf maintenance panel port the EIU will be connected to
- know which passive devices will be connected to the EIU
- know which EIU port to connect the passive devices to

Note: The SMI software internally labels EIU ports 1 to 8 as “West plane” and EIU ports 9 to 16 as “East plane”. As a result, the “Unassigned Optical System Identifier” minor, nsa alarm is raised when the same band and DWDM type OMXs are connected to the same EIU plane. To avoid this, you can choose to connect the same band and same DWDM type OMXs in different EIU planes.

- have the correct number of data communications cables (NT0H4322 [9.8 ft.] or NT0H4345 [5 ft.]):
 - one data communication cable to connect the EIU to the shelf maintenance panel
 - one data communication cable for each passive device to connect the passive device to the EIU

Step	Action
1	Install the EIU in the same rack as the shelf and the equipment that will connect to the EIU. See Procedure 4-16 “Installing and grounding Equipment Inventory Unit (NT0H43HA)” in <i>Installing Optical Metro 5200 Shelves and Components</i> , 323-1701-201.

—continued—

Procedure 6-11 (continued)

Connecting passive devices to the Equipment Inventory Unit in existing installations

Step	Action
2	Connect power to the EIU. See Procedure 5-8 “Connecting power to an Equipment Inventory Unit” in <i>Installing Optical Metro 5200 Shelves and Components</i> , 323-1701-201.
3	<p>Deprovision the passive devices (currently connected to the shelf maintenance panel) that must be connected to the EIU as follows:</p> <ol style="list-style-type: none"> <li data-bbox="526 571 1412 659">a. In the System Manager, click on the Selected Shelves drop-down list, and double-click on the shelf connected to the passive device that you want to deprovision. <i>The System Manager updates the screen with data for the selected shelf.</i> <li data-bbox="526 718 1412 772">b. Click on the Selected Shelves drop-down list to return the screen to full view. <li data-bbox="526 793 993 823">c. Select the Equipment/Inventory tab. <li data-bbox="526 844 1412 932">d. Double-click on the line that contains the passive device that you want to deprovision. <i>The Optical Metro Inventory dialog box appears.</i> <li data-bbox="526 953 1412 1008">e. Take note of the values in the OSID and Description fields. These values are required later in the procedure. Note: Only OMXs have the OSID field. <li data-bbox="526 1066 1412 1121">f. In the State area of the Optical Metro Inventory dialog box, select OOS from the Administrative drop-down list. <li data-bbox="526 1142 954 1171">g. Click OK to close the dialog box. <i>The Confirm Inventory OOS dialog box appears.</i> <li data-bbox="526 1230 954 1260">h. Click Yes to confirm the change. <li data-bbox="526 1276 1341 1306">i. Right click on the passive device to be deleted from the inventory. <li data-bbox="526 1323 1016 1352">j. Select Delete from the drop-down list. <i>The Confirm Inventory Delete dialog box appears.</i> <li data-bbox="526 1398 954 1428">k. Click Yes to confirm the change. <li data-bbox="526 1444 1149 1474">l. Repeat substeps a. to k. for each passive device.
4	Disconnect and remove all data communication cables between the deprovisioned passive devices and the shelf maintenance panel.
5	Wait five minutes to allow the passive devices to be deleted from the Equipment Inventory screen. Note: At this point, the Equipment Inventory in the SMI can still display the passive devices.
6	Click the Refresh button to verify that the passive devices are no longer displayed in their respective Equipment Inventory screens.

—continued—

Procedure 6-11 (continued)

Connecting passive devices to the Equipment Inventory Unit in existing installations

Step	Action
7	Connect the Equipment Inventory Unit to the shelf maintenance panel. See Procedure 6-12 “Connecting the Equipment Inventory Unit to the maintenance panel” in <i>Installing Optical Metro 5200 Shelves and Components</i> , 323-1701-201.
8	Provision EIU data as follows: <ol style="list-style-type: none">In the System Manager, click on the Selected Shelves drop-down list, and double-click on the shelf connected to the EIU. <i>The System Manager updates the screen with data for the selected shelf.</i>Click on the Selected Shelves drop-down list to return the screen to full view.Select the Equipment/Inventory tab.Click on the Refresh button.Verify that the EIU Oper state is IS-NR.Right click on the EIU.Select Modify from the drop-down list. <i>The Optical Metro Inventory dialog box appears.</i>If necessary, in the Description field, enter a description.Click OK to close the dialog box.
9	Connect the passive devices to the Equipment Inventory Unit. See Procedure 6-10 “Connecting passive devices to the Equipment Inventory Unit in new installations” in <i>Installing Optical Metro 5200 Shelves and Components</i> , 323-1701-201.

—continued—

Procedure 6-11 (continued)

Connecting passive devices to the Equipment Inventory Unit in existing installations

Step	Action
10	Provision passive device data. <ol style="list-style-type: none">In the System Manager, click on the Selected Shelves drop-down list, and double-click on the shelf connected to the EIU. <i>The System Manager updates the screen with data for the selected shelf.</i>Click on the Selected Shelves drop-down list to return the screen to full view.Select the Equipment/Inventory tab.Click on the Refresh button.Double click on the EIU.Verify that the Oper state is IS-NR for all passive devices connected to the EIU.Double click on the passive device. <i>The Optical Metro Inventory dialog box appears.</i>If necessary, in the OSID field, enter an OSID. Note: Only OMXs have the OSID field.If necessary, in the Description field, enter a description.Click OK to close the dialog box.Repeat substep g. to j. for each passive device connected to the EIU.

—end—

Procedure 6-12

Connecting the Equipment Inventory Unit to the maintenance panel

Follow this procedure to connect the Equipment Inventory Unit (EUI) to the shelf maintenance panel using the NT0H4322 cable (9.8 ft.) or the NT0H4345 cable (5 ft.).

The Equipment Inventory Unit (EIU) drawer allows up to 16 passive devices to be inventoried per shelf. The EIU is connected to the shelf maintenance panel (Optical Metro 5200 or Optical Metro 5100), then the individual passive devices are connected to the EIU. Inside the maintenance panel of each shelf are two OMX interface (OMXI) cards that allow the System Manager to inventory and monitor the equipment.

When you complete this procedure

- the EIU data communications cable (NT0H4322 or NT0H4345) is connected between the EIU and the maintenance panel

For more information on specific equipment drawers, see *Hardware Description*, 323-1701-102.

Requirements

You must have completed the procedures to mount an Optical Metro 5200 shelf (12 U high) in a rack or cabinet, before you begin this procedure. Also, you must have completed the procedure for mounting an EIU. Refer to the [“Installing Optical Metro 5200 shelves and equipment”](#) chapter of this book for the required procedures.

[Table 6-17](#) lists the tools and materials required for completing this procedure.

Table 6-17
Tools and materials for connecting the EIU to the maintenance panel

Item	Quantity	Supplied	√
Data communications cable (NT0H4322 or NT0H4345)	1	yes	
Ferrite bead	1	yes (with shelf installation kit)	

—continued—

 Procedure 6-12 (continued)

Connecting the Equipment Inventory Unit to the maintenance panel

Precautions

DANGER
Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

Action

Step	Action
1	If the maintenance panel is not open, loosen the thumbscrews and remove the left maintenance panel cover to access the interface cards.
2	Insert one end of the data communications cable (NT0H4322 or NT0H4345) through the access slot in the left side of the maintenance panel.
3	Insert the connector in the OMXI port 1 (top) or 2 (bottom) on one of the OMXI cards in the maintenance panel. See Figure 6-37 on page 6-71 .
4	Clamp the ferrite around the data communications cable.
5	Place the ferrite in the maintenance panel, as shown in Figure 6-37 on page 6-71 . When grounding the shelf using a double hole compression lug, place the ferrite in front of the telemetry card.
	Note: One ferrite should be used until full and then incorporate a second ferrite as required. The ferrites can be mounted one on top of each other, laced together.

—continued—

6-70 Installing peripheral cables

Procedure 6-12 (continued)

Connecting the Equipment Inventory Unit to the maintenance panel

Step	Action
6	<p>Route the data communications cable from the shelf maintenance panel to the right side of the EIU as follows:</p> <ol style="list-style-type: none">Along the left side of the shelf, run the data communications cable through the vertical fiber brackets.Run the data communications cable from the left side of the shelf maintenance panel to the right side of the EIU using one of the following methods:<ul style="list-style-type: none">through the fiber management trough on any Optical Metro 5200 shelf (see Figure 6-36 on page 6-71)through the cable trough at the top of the baythrough any other cable management hardware provided by the customerAlong the right side of the shelf, run the data communications cable through the vertical fiber brackets to reach the EIU.On the right side of the EIU, use the cable management bracket to provide strain relief for the data communications cable that you are connecting to the EIU. <p>Note: If the data communications cable (NT0H4322 or NT0H4345) is a bit too long, use the vertical fiber brackets on the left or right side of the shelf to route the extra length (see Figure 6-36 on page 6-71).</p>
7	<p>Insert the other end of the data communications cable in the port labelled “To Shelf” on the front of the EIU (see Figure 6-38 on page 6-72).</p>

—end—

Figure 6-36
Routing the data communications cable right from the EIU and left into the maintenance panel

OM2409p

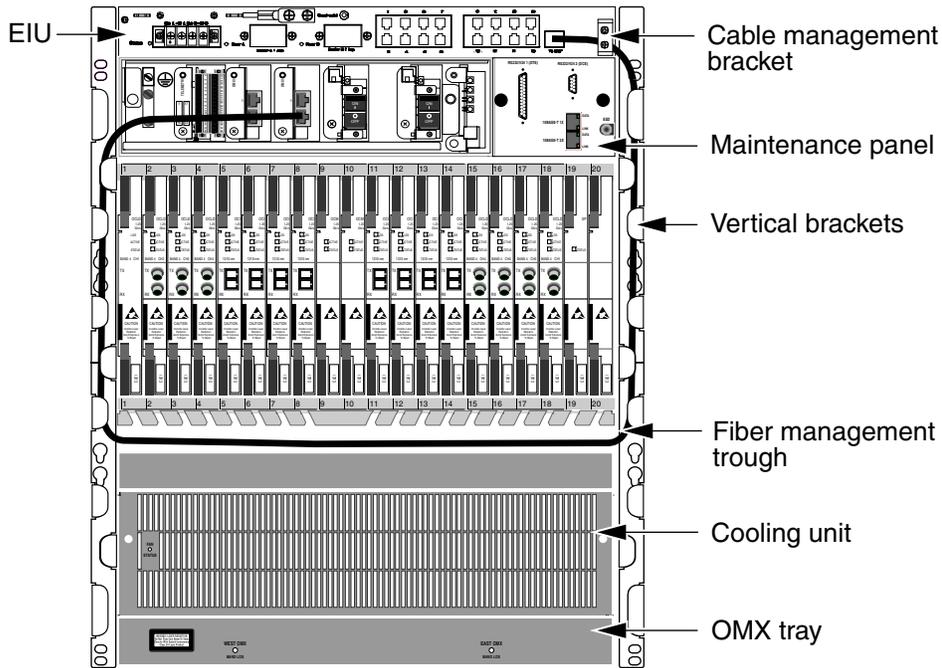
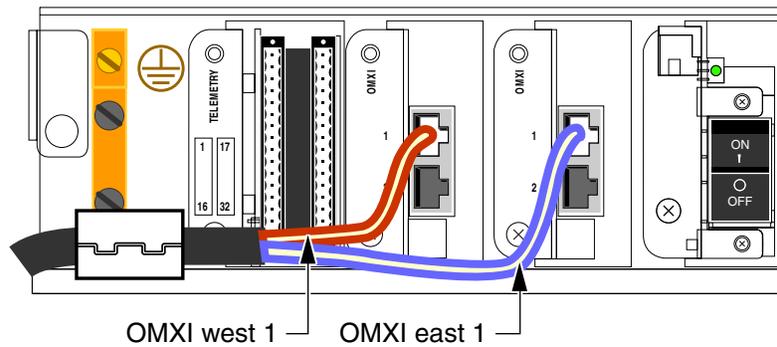


Figure 6-37
OMX cable jacks in the maintenance panel

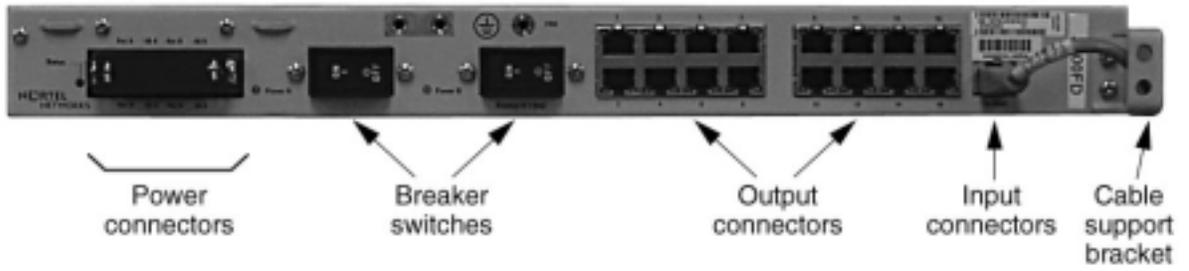
OM0150t



6-72 Installing peripheral cables

Figure 6-38
Front panel of the EIU

OM2371p.jpg



Installing circuit packs

Use the procedures in this chapter to install Optical Metro 5200 circuit packs, small form factor pluggable (SFP) modules, or filler cards.

Before you begin

Before you begin the procedures in this chapter, make sure that you have completed the necessary procedures in the [“Installing Optical Metro 5200 shelves and equipment”](#) chapter of this book.

Requirements

All tools and materials tables include a check box for you to ensure that you have all the required materials for an installation. [Table 7-1](#) lists the tools and materials that you need to complete the procedures in this chapter.

Table 7-1
Tools and materials required to install circuit packs

Item	Quantity	Supplied	√
Antistatic wrist strap	1	no	

Precautions



CAUTION

Risk of equipment damage

Make sure you know how to handle electronic components correctly before you begin installation procedures. Incorrect handling can cause damage to static-sensitive components.



CAUTION

Risk of shelf malfunction

Nortel Networks recommends that you do not use cellular phones at any Optical Metro 5200 site. The use of cellular phones in proximity to Optical Metro equipment can cause shelf malfunction.

Handling circuit packs

To avoid possible damage to circuit packs by electrostatic discharge (ESD), follow these precautions:

- Wear a grounded antistatic wrist strap when handling circuit packs.
- Keep circuit packs in their antistatic bags until you are ready to install them.
- Remove circuit packs from their antistatic bags and install them directly into the unit. Do not pass circuit packs to another person.
- If you need to put a circuit pack down, put the circuit pack back into its antistatic bag first.
- Handle circuit packs by their handles only. Do not touch the electronic components or any exposed printed circuitry.
- Limit your movement during installation to reduce the build-up of static electricity.

Procedure list

All procedure lists include a check box for you to keep track of where you are in an installation. Place a check mark in this column when you are performing the procedure. [Table 7-2](#) lists the procedures in this chapter.

Table 7-2
Circuit pack installation procedures

Procedure	Page	Comments	√
7-1 Inserting circuit packs	7-3	Required.	
7-2 Installing an ETS Comms module in an ETS shelf	7-6	Required when using an ETS.	
7-3 Installing an ETS Switch module in an ETS shelf	7-8	Required when using an ETS.	
7-4 Installing small form factor pluggable modules	7-12	Required when using a circuit pack with pluggable modules (for example, a Muxponder 10 Gbit/s GbE/FC circuit pack or Muxponder 10 Gbit/s GbE/FC VCAT circuit pack)	
7-5 Inserting filler cards	7-16	Required for all empty slots in a shelf. Slot 20 requires a filler card if your configuration does not include an OSC.	

Procedure 7-1

Inserting circuit packs

Follow this procedure to insert circuit packs in an Optical Metro 5200 shelf.

When you complete this procedure

- the circuit packs are inserted but are not seated in the Optical Metro 5200 shelf
- follow [Procedure 7-5](#) to install filler cards in all the empty slots in the shelf

Requirements

Before you begin this procedure:

- the Optical Metro 5200 shelf must be mounted in a rack or cabinet. Refer to the [“Installing Optical Metro 5200 shelves and equipment”](#) chapter of this book for the required procedures.
- You must wear an antistatic wrist strap throughout this procedure.
- If your network plan does not require circuit packs in all the slots, you must insert filler cards in the unused slots of the shelf.
- You must be familiar with circuit pack slot placement rules within a shelf. Refer to [“Site requirements and equipping rules”](#) in *Network Planning and Link Engineering*, 323-1701-110.
- You must be familiar with circuit pack compatibility rules. Refer to [“General circuit pack information”](#) in *Hardware Description*, 323-1701-102.

Precautions

Inspect the backplane to make sure that connector pins are straight and that the backplane is free of any packaging materials or other debris. You can then insert circuit packs in the shelf according to your network configuration and protection scheme.

In this procedure, you insert the circuit packs in the shelf but you do not engage them in the backplane and lock them in position.



CAUTION

Risk of equipment damage

Follow the ESD safety precautions listed under [“Handling circuit packs”](#) on page 7-2 in this chapter.

—continued—

Inserting circuit packs

Expected results

When you complete this procedure

- the circuit packs are inserted but are not seated in the Optical Metro 5200 shelf
- follow [Procedure 7-5](#) to install filler cards in all the empty slots in the shelf

Action

Step	Action
------	--------

- 1 Put on an antistatic wrist strap and connect it to a grounded point.
- 2 Remove the shelf cover by releasing the lock latches on the sides and lifting the door off its pivots, as shown in [Figure 7-1](#) on [page 7-5](#).

	<p>DANGER Risk of personal injury or equipment damage Do not let go of the shelf cover when you open it. The shelf cover is not permanently attached to the shelf. You must remove the door completely. If you let go of the door when you open it, you can cause personal injury, damage to the equipment, or both.</p>
---	--

- 3 Visually inspect the backplane to make sure that connector pins are straight and that the backplane is free of any packaging materials or other debris.
- 4 Make sure that the indicator lamps (LEDs) are at the top of the circuit pack before you attempt to position it in the shelf.
- 5 Carefully line up the top and bottom of the circuit pack with the plastic guides in the slot opening.

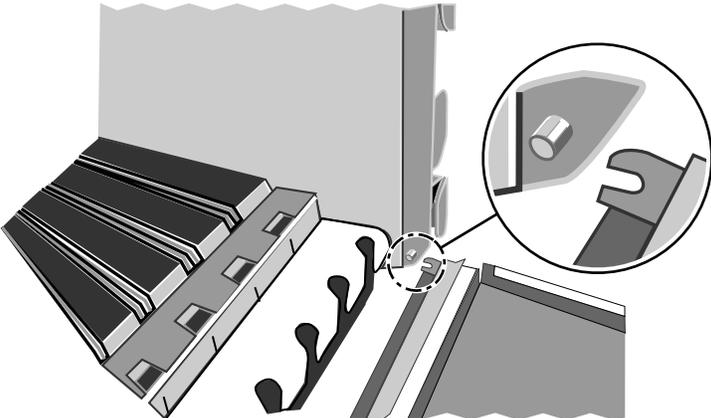
<p>ATTENTION During an installation, you insert the circuit packs in the shelf but you do not seat them in the backplane and lock them into position.</p>
--

- 6 Keep the lock latches flat against the faceplate so the circuit pack does not seat into the backplane connector. Carefully slide the circuit pack toward the back of the shelf until it stops.
- 7 Repeat [step 4](#) through [step 6](#) until all the circuit packs are in their correct positions in the circuit pack cage.

—end—

Figure 7-1
Removing the shelf cover

OM0138t



Procedure 7-2

Installing an ETS Comms module in an ETS shelf

Use this procedure to install the Enhanced Trunk Switch communications (ETS Comms) module into the ETS shelf if an ETS shelf is already installed in the rack.

The ETS consists of three components: the shelf, the comms module, and the switch module. Each item is shipped in individual boxes.

For more information on the Enhanced Trunk Switch, see “[Enhanced Trunk Switch](#)” in *Hardware Description*, 323-1701-102.

Requirements

Before you start this procedure, bear the following rules in mind:

- install the the three components of the ETS in following order:
 - first install the ETS shelf ([Procedure 4-13](#))
 - second install the ETS Comms module by using this procedure ([Procedure 7-2](#))
 - third, install the ETS Switch module ([Procedure 7-3](#))
- in this release, you must always install the ETS Switch module in the right-most slot of the ETS shelf. For correct operation, the ETS Comms module must be installed in the left-most slot of the ETS shelf (see [Figure 7-2](#)).

Figure 7-2
Enhanced Trunk Switch Comms module



—continued—

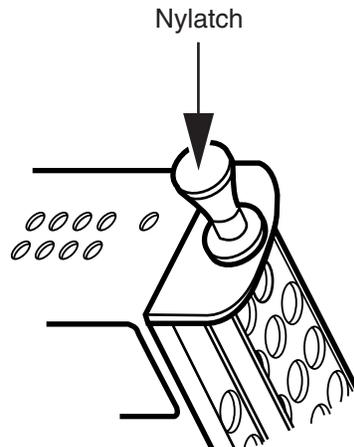
Procedure 7-2 (continued)

Installing an ETS Comms module in an ETS shelf

Figure 7-3 shows the Nylatch fastener of the ETS Switch module.

Figure 7-3
Nylatch fastener in the out position

OM2706p



Action

Step	Action
------	--------

- 1 Remove the Enhanced Trunk Switch comms module (see [Figure 7-2](#)) from its protective packaging.
- 2 Pull the Nylatch fasteners into the “out” position (see [Figure 7-3](#)).
- 3 Line the ETS Comms module up with the left-most slot of the ETS shelf.
- 4 With your fingers on the front panel of the ETS Comms module, push the module into the slot. Do not push on the Nylatch fasteners. It is normal to feel some resistance as the connector on the module engages the backplane connector.
Note: The module is seated correctly when the front flange of the module is flush against the front flange of the ETS shelf.
- 5 When the ETS Comms module is seated, push forward on the Nylatch fasteners until they snap into the “in” position.
- 6 If the ETS shelf is powered and the ETS Comms module is seated correctly, the CARD LED lights (yellow). The CARD LED turns green after the module is initialized.
- 7 Press the INIT button on the ETS Comms module. Wait at least one minute for the ETS Comms module to reinitialize before continuing with another procedure.

—end—

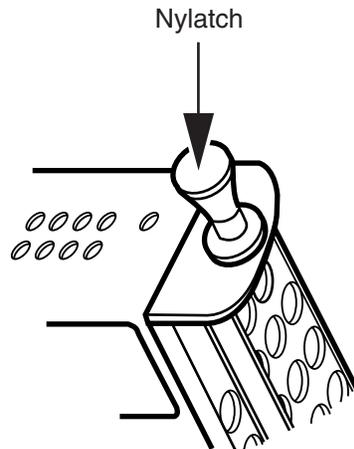
 Procedure 7-3 (continued)

Installing an ETS Switch module in an ETS shelf

Figure 7-5 shows the Nylatch fastener of the ETS Switch module.

Figure 7-5
Nylatch fastener of the ETS Switch module in the out position

OM2706p


Action

Step Action

- 1 Remove the ETS Switch module from its protective packaging (see [Figure 7-4](#)).
- 2 Pull the Nylatch fasteners into the “out” position (see [Figure 7-5](#)).
- 3 Line the ETS Switch module up with the right-most slot of the ETS shelf.
- 4 With your fingers on the front panel of the ETS Switch module, gently push the module into the slot. Do not push on the Nylatch fasteners. It is normal to feel some resistance as the connector on the module engages the backplane connector.

Note: The ETS Switch module is seated correctly when the front flange of the module is flush against the front flange of the ETS shelf.

—continued—

7-10 Installing circuit packs

Procedure 7-3 (continued)

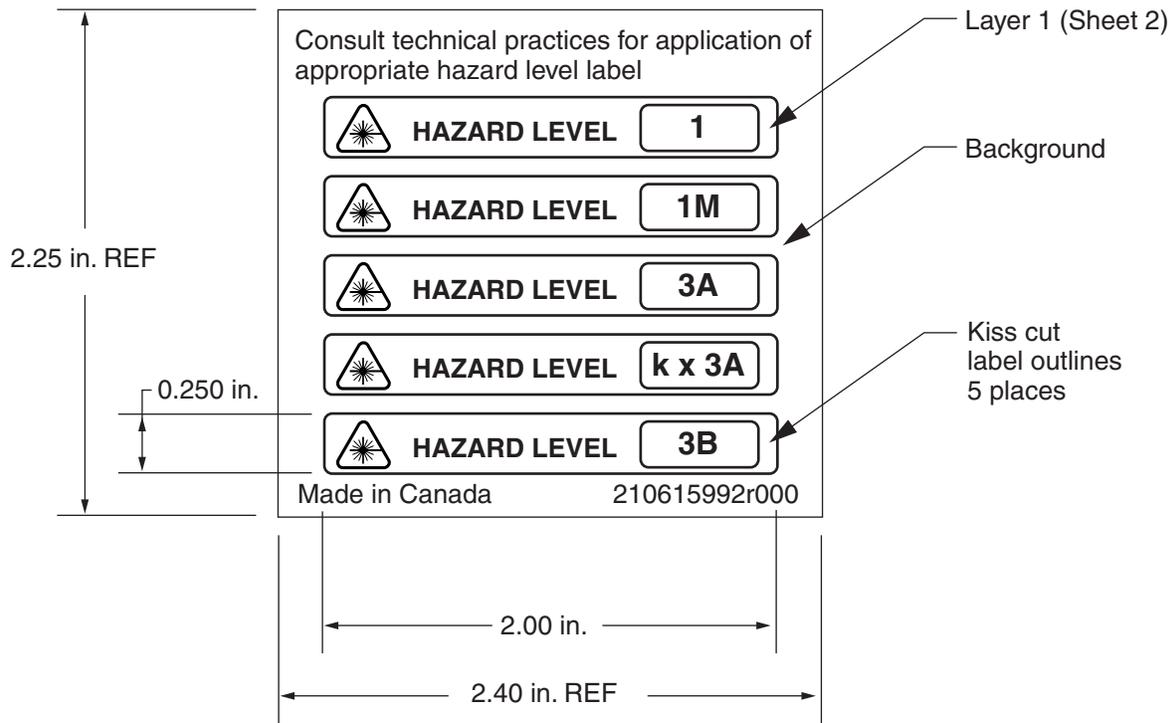
Installing an ETS Switch module in an ETS shelf

Step	Action								
5	When the ETS Switch module is seated, push forward on the Nylatch fasteners until they snap into the “in” position.								
6	Select the required hazard laser safety label as follows. <table><thead><tr><th>If the ETS Switch module is used on</th><th>Then</th></tr></thead><tbody><tr><td>an unamplified network</td><td>apply a hazard 3A laser safety label above the ETS Switch module</td></tr><tr><td>a preamplified network and the ETS Switch module is located before the preamplifier</td><td>apply a 3A safety label above the ETS Switch module</td></tr><tr><td>a preamplified network and the ETS Switch module is located after the preamplifier</td><td>apply a hazard laser safety label above the ETS Switch module</td></tr></tbody></table>	If the ETS Switch module is used on	Then	an unamplified network	apply a hazard 3A laser safety label above the ETS Switch module	a preamplified network and the ETS Switch module is located before the preamplifier	apply a 3A safety label above the ETS Switch module	a preamplified network and the ETS Switch module is located after the preamplifier	apply a hazard laser safety label above the ETS Switch module
If the ETS Switch module is used on	Then								
an unamplified network	apply a hazard 3A laser safety label above the ETS Switch module								
a preamplified network and the ETS Switch module is located before the preamplifier	apply a 3A safety label above the ETS Switch module								
a preamplified network and the ETS Switch module is located after the preamplifier	apply a hazard laser safety label above the ETS Switch module								
7	Apply the required hazard laser safety label on the ETS shelf, just above the ETS Switch module. The hazard safety labels are part of the ETS installation kit (see Figure 7-6). Align the bottom of the label to the top of the ETS Switch module. Align the left end of the label with the left end of the ETS Switch module.								
8	If the ETS shelf is powered and the ETS Switch module is seated correctly, you can observe the following: <ul style="list-style-type: none">• CARD and AUTO LEDs are lit (green).• MAJ LED is lit (red). This LED turn off after the fibers are connected and a signal is present.• MIN and PRI LEDs are lit (yellow). These LEDs turn off after the fibers are connected and a signal is present.								

—end—

Figure 7-6
Hazard laser safety label

OM2648p



Procedure 7-4 Installing small form factor pluggable modules

Use this procedure to install small form factor pluggable (SFP) modules into an optical interface circuit pack. If you are installing a SFP module into the Muxponder circuit pack, you can perform this procedure when the Muxponder circuit pack is carrying traffic on other SFP ports (client side) and on the line side ports.

Note: Two Muxponder circuit packs are available: the Muxponder 10 Gbit/s GbE/FC and Muxponder 10 Gbit/s GbE/FC VCAT circuit pack.

When you complete this procedure, the SFP module is installed in the circuit pack. For a view of an SFP module for a Muxponder circuit pack see [Figure 7-7](#).

Note: The Muxponder 10 Gbit/s GbE/FC circuit pack does not support traffic or SFP modules in ports 9 and 10. The Muxponder 10 Gbit/s GbE/FC VCAT circuit pack does support traffic or SFP modules in ports 9 and 10.

ATTENTION

Nortel Networks has conducted failure mode analysis regarding the repeated insertion and removal of an SFP. Under normal operating conditions, once inserted and carrying live traffic, SFP modules operate as fixed transceivers on current Optical Metro 5100/5200 circuit packs. However, if an SFP module is inserted and removed repeatedly, it is possible for the electrical contacts on the SFP module or the SFP receptacle on the Muxponder circuit pack to wear out prematurely. Unnecessary or repeated insertions and removals are not considered normal and accepted operating practice, and as such Nortel Networks recommends that this be avoided. Nortel Networks recommends that SFP removal and insertion be performed only as normal operating practice (for example, during maintenance, card replacement and trouble clearing operations).

—continued—

Procedure 7-4 (continued)

Installing small form factor pluggable modules

Requirements

Before you begin this procedure, you

- must wear an antistatic wrist strap
- make sure that you have the correct type of SFP module and the required number of SPF modules. You require one SPF module for each client-side port. For more details, refer to [Chapter 13](#) of the *Network Planning and Link Engineering*, 323-1701-110.
- make sure that you have the dust caps that are provided with the Muxponder circuit pack to cover empty SFP cages. Dust caps are recommended to prevent damage to empty SFP cages.

Precautions



CAUTION

Traffic will be lost

When you replace an SFP module, traffic will be lost during the entire duration of the procedure.



CAUTION

Risk of equipment damage

Follow the ESD safety precautions listed under “[Handling circuit packs](#)” on page 7-2 in this chapter.



CAUTION

Risk of affecting traffic on adjacent SFP modules

Because of the close proximity of adjacent in-service SFP modules, there is a significant risk of mechanical interference when you add or remove SFP modules, which causes traffic errors. Do not disturb the fibers connected to the traffic-carrying SFP ports. Use the universal fiber tool, which is provided with Muxponder circuit packs, to connect and disconnect the client optical fiber patchcords to reduce the risk.

Expected results

When you complete this procedure, the new SPF modules are installed in the Muxponder circuit pack.

—continued—

Procedure 7-4 (continued)

Installing small form factor pluggable modules

Action

Step	Action
1	Wear an antistatic wrist strap and foot straps to protect the equipment from static damage. Connect the wrist strap to an available earth point.
2	Remove the dust cap from the SFP receptacle on the optical interface circuit pack. Store the dust cap in an appropriate location.
3	Remove the SFP module (Figure 7-7) from its box.
4	Make sure that you orient the SFP module as follows before sliding the SFP module into the SFP receptacle of the appropriate circuit pack. <ul style="list-style-type: none">• For an Optical Metro 5200 system<ul style="list-style-type: none">— orient the SFP module such that the SFP latch opens towards the right when the SFP module needs to be inserted into an odd numbered SFP receptacle— orient the SFP module such that the SFP latch opens towards the left when the SFP module needs to be inserted into an even numbered SFP receptacle• For an Optical Metro 5100 system<ul style="list-style-type: none">— orient the SFP module such that the SFP latch opens towards the top when the SFP module needs to be inserted into an odd numbered SFP receptacle— orient the SFP module such that the SFP latch opens towards the left when the SFP module needs to be inserted into an even numbered SFP receptacle
5	Close the SFP latch (fold it back into the SFP module). Note: If the SFP latch is not folded back before you slide the SFP module into SFP receptable of the circuit pack, the SFP module can get stuck.
6	Slide the SFP module into the circuit pack SFP receptacle until the SFP module locks into place. Note: Figure 7-8 shows how to slide the SFP module into the SFP receptacle of a Muxponder 10 Gbit/s GbE/FC circuit pack.
7	Clean the fiber connector and the SFP adapter housings. See Procedure 9-1 , “ Cleaning SC, LC, or FC-type connectors (simplex or duplex) ” in <i>Installing OPTera Metro 5200 Shelves and Components</i> , 323-1701-201 and Procedure 9-5 , “ Cleaning the SFP adapter housing ” in <i>Installing Optical Metro 5200 Shelves and Components</i> , 323-1701-201.
8	Connect the fibers to the SFP module (see <i>Connection Procedures</i> , 323-1701-221).

—end—

Figure 7-7
SFP module for Muxponder circuit packs

OM2659p.jpg

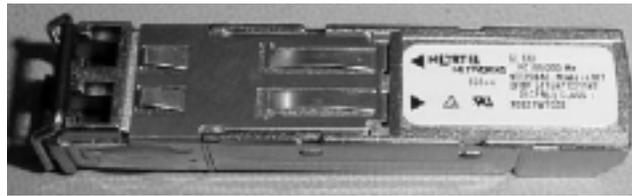


Figure 7-8
Installing an SFP module into a Muxponder 10 Gbit/s GbE/FC circuit pack

OM2620p.jpg



Procedure 7-5 Inserting filler cards

Follow this procedure to insert and seat filler cards in an Optical Metro 5200 shelf.

OCLD filler cards

OCLD filler cards (NT0H52BA) have FC connectors on the faceplate.

The OCLD filler card is mandatory if you are using the OMX (Standard) tray to hold unused pigtails. Install OCLD filler cards in any empty slots 1-4 and 15-18. Connect the pigtails from the OMX (Standard) tray to the FC connectors on the corresponding OCLD filler card to protect the fibers and the connectors. This also ensures that the pigtails are routed to the correct location in the event that you need to install a new OCLD circuit pack quickly.

The OCLD filler card may also be used in any shelf if you want to pre-fiber any OMX variant other than the OMX (Standard) tray. Install OCLD filler cards in any empty slots 1-8 and 11-18.

Note: Pre-fibering is an optional exercise. It is not mandatory.

LC filler cards

LC filler cards (NT0H52DA) have LC connectors on the faceplate. Install LC filler cards in any empty slots 1-8 and 11-18. The LC filler card is used if you want to pre-fiber any OMX variant other than the OMX (Standard) tray.

Note: Pre-fibering is an optional exercise. It is not mandatory.

Connect the patchcords from the OMX tray to the LC connectors on the corresponding LC filler card to protect the fibers and the connectors. This also ensures that the patchcords are routed to the correct location in the event that you need to install a new circuit pack quickly.

—continued—

Procedure 7-5 (continued)

Inserting filler cards

OFA filler cards

OFA filler cards (NT0H52CA) have SC connectors on the faceplate that are used to connect unused patchcords from the ECT. OFA circuit packs are four slots wide, but OFA filler cards are only one slot wide. If you have an ECT installed with an OFA shelf, install one OFA filler card, and three blank filler cards, for every group of four unused slots in the OFA shelf. This protects the fibers and connectors, and also ensures that the fibers are routed to the correct location in the event that you need to install a new OFA circuit pack quickly.

If you are not using an ECT with an OFA shelf, you can use blank filler cards for any empty slots in the shelf.

Valid slot assignments for OFA filler cards are 1, 5, 11, and 15.

Blank filler cards

Blank filler cards (NT0H52AA) have no connectors, and are installed in all other unused slots in DWDM or OFA shelves.

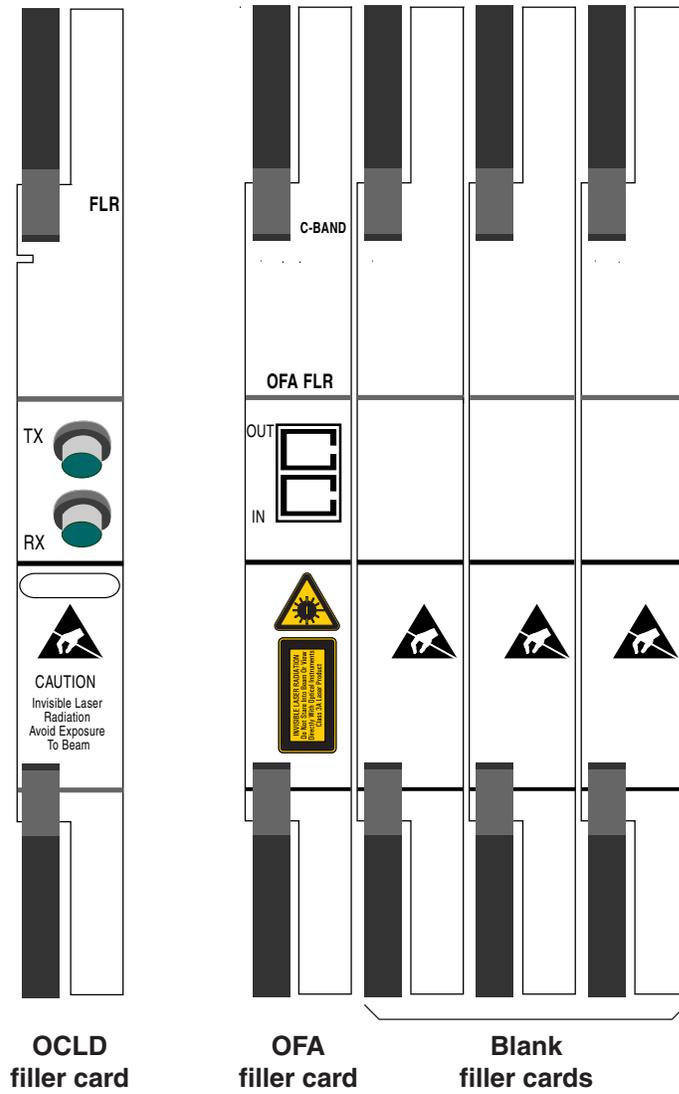
[Figure 7-9](#) shows an OCLD filler card, an OFA filler card, and three blank filler cards.

—continued—

Procedure 7-5 (continued)
Inserting filler cards

Figure 7-9
OCLD, OFA, and blank filler cards

OM0308p



—continued—

Procedure 7-5 (continued)
Inserting filler cards

Requirements

Before you begin this procedure, the Optical Metro 5200 shelf must be mounted in a rack or cabinet. Refer to the “[Installing Optical Metro 5200 shelves and equipment](#)” on page 4-1 chapter of this book for the required procedures.

<p>ATTENTION</p> <p>You must use filler cards in slots that do not have active circuit packs. Filler cards protect the connectors on the backplane from dust and debris, and improve the efficiency of cooling the shelf.</p>
--

For DWDM shelves with OMX (Standard) trays, you must identify the unused pigtailed and make sure you have enough OCLD filler cards to hold the pigtailed.

For an OFA shelf, you must identify the empty slots, and make sure that you have enough OFA filler cards, and blank filler cards, for the empty OFA slots.

You must wear an antistatic wrist strap throughout this procedure.

Precautions

	<p>DANGER Invisible laser radiation</p> <p>The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.</p>
---	---

Action

Step	Action
1	Put on an antistatic wrist strap and connect it to a grounded point.

—continued—

Procedure 7-5 (continued)

Inserting filler cards

- | Step | Action |
|------|---|
| 2 | Remove the shelf cover by releasing the lock latches on the sides and lifting the door off its pivots, as shown in Figure 7-1 on page 7-5 . |



DANGER

Risk of personal injury or equipment damage

Do not let go of the shelf cover when you open it. The shelf cover is not permanently attached to the shelf. You must remove the door completely. If you let go of the door when you open it, you can cause personal injury, damage to the equipment, or both.

- | | |
|---|---|
| 3 | Visually inspect the backplane to make sure that connector pins are straight and that the backplane is free of any packaging materials or other debris. |
| 4 | For OCLD and OFA filler cards, make sure that the Tx connector is at the top of the card before you attempt to position it in the shelf. |
| 5 | Carefully line up the top and bottom of the filler card with the plastic guides in the slot opening. |
| 6 | Carefully slide the filler card toward the back of the shelf but do not engage the card into the backplane connector. |
| 7 | Repeat step 4 through step 6 until all the filler cards are in place. |

—end—

Fiber management

Use the procedures in this chapter to manage the fiber from Optical Metro 5200 components and equipment.

Before you begin

It is important to clean all the fibers and optical connectors before you install them and make connections. All cleaning procedures are in [Chapter 9 “Cleaning connectors”](#).

It is also important that you accurately label all the fibers as you install them and make the connections to your equipment. Troubleshooting, maintenance, and upgrade tasks will be simplified if all connections are clearly understood before undertaking any of these activities. For labeling information, see [Procedure 8-1](#)

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer’s responsibility to provide fiber management. When the customer’s fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers for the Optical Metro 5200 shelves and equipment.

Before you begin the procedures in this chapter, make sure that you have completed the necessary procedures in the [“Installing Optical Metro 5200 shelves and equipment”](#) chapter of this book.

Requirements

All tools and materials tables include a check box for you to ensure that you have all the required materials for an installation. [Table 8-1](#) lists the tools and materials that you need to complete all the procedures in this chapter.

Table 8-1
Tools and materials required to manage fiber

Item	Quantity	Supplied	√
Fiber termination labels	as needed	no	
Curly locks or Velcro cable ties	as needed	no for most equipment yes with the OMX 16CH DWDM installation kit	

Precautions



CAUTION

Risk of equipment damage

Make sure you know how to handle electronic components correctly before you begin installation procedures. Incorrect handling can cause damage to static-sensitive components.



CAUTION

Risk of shelf malfunction

Nortel Networks recommends that you do not use cellular phones at any Optical Metro 5200 site. The use of cellular phones in proximity to Optical Metro equipment can cause shelf malfunction.

Handling optical fibers

When you work with optical fibers, you must take these precautions:

- Wear safety glasses when you install optical fibers.
- Never look into an active optical fiber or the optical fiber connector opening of an active or powered-up unit.

- Prevent direct exposure to optical fiber ends or optical connector ends where you can directly access the laser signal.

**DANGER****Risk of eye injury**

If you have a piece of a glass in your eye, get medical assistance immediately.

- Wear rubber gloves when you clean optical connectors. The gloves prevent direct contact with the isopropyl alcohol and prevent contamination of the ferrules with skin oils.
- Place all optical fiber clippings in a plastic container provided for that purpose.
- Handle optical fibers with caution. Place the optical fibers in a safe location during installation.
- Protect all optical fiber connectors with clean dust caps at all times.
- Follow the manufacturer instructions when you use an optical test set. Incorrect calibration or control settings can create hazardous levels of radiation.

Procedure list

All procedure lists include a check box for you to keep track of where you are in an installation. Place a check mark in this column when you are performing the procedure. [Table 8-2](#) lists the procedures in this chapter.

Table 8-2
Fiber management procedures

Procedure	Page	√
8-1 Labeling cables and optical fibers	8-5	
8-2 Guidelines for labeling the fibers and cables in an OFA installation kit	8-12	
8-3 Guidelines for routing fiber in the Fiber Manager	8-17	
8-4 Guidelines for routing fiber in a equipment drawer equipped with tray assemblies	8-22	
8-5 Routing fibers for optical circuit packs	8-27	
8-6 Routing fibers for the Muxponder circuit pack	8-30	
8-7 Routing fibers from the OMX (Standard) tray	8-39	
8-8 Routing fibers for the OMX 4CH + Fiber Manager or OMX 4CH Enhanced tray	8-44	

8-4 Fiber management

Table 8-2 (continued)
Fiber management procedures

Procedure	Page	√
8-9 Routing fibers for the OMX 16CH DWDM	8-49	
8-10 Routing fibers for the ECT tray	8-55	
8-11 Routing fibers for the OSC tray	8-58	
8-12 Routing fibers for the OSC tray with dual taps	8-62	
8-13 Routing fibers for the Transponder Protection Tray	8-66	
8-14 Routing fibers for the patch panel	8-71	
8-15 Routing fibers for the OMX 4CH CWDM or the OMX 4CH CWDM with dual taps	8-80	
8-16 Routing fibers for the OMX 4CH ITU CWDM or OMX 8CH ITU CWDM	8-89	
8-17 Routing fibers for the OMX 1CH OADM ITU CWDM or the OMX 4CH OADM ITU CWDM	8-95	
8-18 Routing fiber for the Optical Trunk Switch	8-101	
8-19 Routing fibers for the Enhanced Trunk Switch	8-103	
8-20 Routing fibers for the PBE	8-105	
8-21 Routing fibers for the 1310 nm Splitter/Coupler	8-109	
8-22 Routing fibers for the C&L Splitter/Coupler	8-113	
8-23 Routing fibers for the Discrete VOA	8-117	
8-24 Routing fibers for a DSCM drawer	8-121	

Procedure 8-1

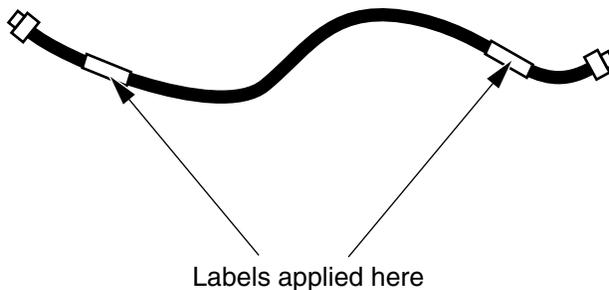
Labeling cables and optical fibers

Use this procedure to apply labels to both ends of all cables and optical fibers as shown in [Figure 8-1](#). To label cables and fibers, use Panduit labels printed through Microsoft Excel or the fiber tags provided with the HIP OFAs.

Panduit labels are provided on a standard 8.5x11 letter size sheet. Each sheet contains 49 labels. The label template use printing information pre-configured for the Panduit label sheet and should not need adjustment. If required, minor cell formatting can be conducted for proper alignment.

The fiber tags provided with the HIP OFAs describe various Hazard Levels present at different connectors in the system during operation of the HIP amplifier. For more information about the fiber tags, refer to the chapter [“Observing safety guidelines”](#) of this book. You may need to apply fiber tags. To apply these fiber tags, peel, roll and stick the appropriate Hazard Level on to the fiber plugging into the passive products.

Figure 8-1
Label application diagram



DX0428.eps=

Precautions

- Apply labels approximately 3” to 6” (or 75 mm to 150 mm) from the fiber boot.
- Labels should be applied to the patch cord in a fashion that does not create micro bends.

Requirements

- Make sure you have installed all fibers.

—continued—

8-6 Fiber management

Procedure 8-1 (continued)

Labeling cables and optical fibers

Table 8-3 lists the tools and materials that you need to complete this procedure.

Table 8-3
Tools and materials required to label cables and optical fibers

Item	Quantity	Supplied	√
If using the Panduit label method, a PC (or laptop) with Microsoft Excel running the installation fiber labeling template	1	no	
If using the Panduit label method, InkJet quality printer (or better)	1	no	
Fiber termination labels	as required	no	

Expected results

You have marked with labels all the fibers that connect to the Optical Metro 5200 network element.

—continued—

Procedure 8-1 (continued)
Labeling cables and optical fibers

Action

Step	Action
1	<p>If you are labeling cables and optical fibers Then complete using</p> <p>Panduit labels step 2 through step 7</p> <p>HIP OFA fiber tags step 8 through step 11</p> <p>Note: These fibers tags are necessary if HIP OFA modules are used.</p>
2	<p>Enter the appropriate information into the Microsoft Excel spreadsheet. Information is inserted into the appropriate cells, and will be printed in the corresponding label (see Figure 8-2 and Figure 8-3).</p> <p>Note: Only labels 1 through 14 are shown in the following illustration. There are 49 labels per sheet.</p>

Figure 8-2
Identification areas on a label

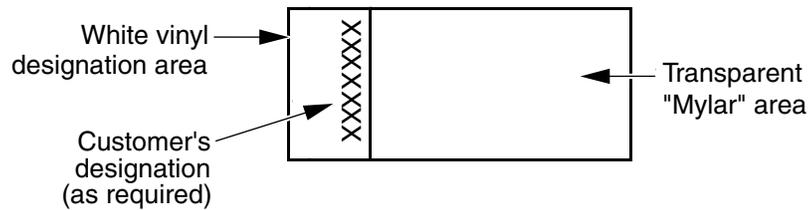


Figure 8-3
Panduit label spreadsheet

Label	Origination			Termination		
	Rack	Shelf	Slot / Port	Rack	Shelf	Slot / Port
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						

3 Print the Panduit labels. See [Figure 8-4](#) for examples of Panduit labels.

—continued—

8-8 Fiber management

Procedure 8-1 (continued)

Labeling cables and optical fibers

Step Action

Figure 8-4
Panduit fiber labels (example)

To: 100.01 Sh 1 1000.01 (TX) Fr: 200.01 Sh 1 2000.01 (RX)	To: 100.02 Sh 2 1000.02 (TX) Fr: 200.02 Sh 2 2000.02 (RX)	To: 100.03 Sh 3 1000.03 (TX) Fr: 200.03 Sh 3 2000.03 (RX)

- 4 Place the adhesive side of the label underneath the cable at a right angle. Apply labels approximately 3" to 6" (75mm to 150mm) from the fiber boot. The cable should lie along the boundary between the white portion and the clear portion of the label, ensuring the "To" and "From" information is oriented toward the end of the fiber boot.
- 5 Fold the transparent portion of the label over the patch cord and press firmly against the white side of the label. Ensure the label is completely sealed (see [Figure 8-5](#)).
- 6 Repeat [step 4](#) and [step 5](#) for the opposite end of the cable.

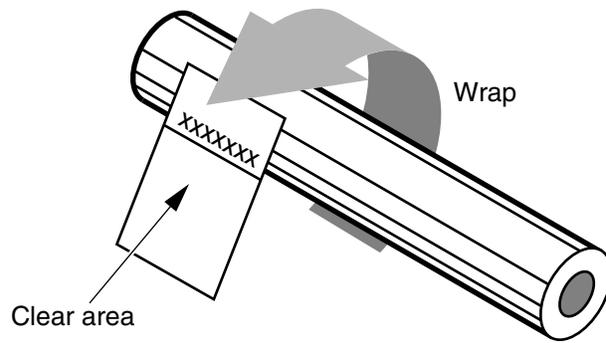
—continued—

Procedure 8-1 (continued)
Labeling cables and optical fibers

Step Action

Figure 8-5
Wrap the label around the cable of optical fiber

DX0430.eps



- 7 Repeat this procedure for all other cables and optical fibers.

Note: Nortel Networks recommends using duplicate labels with similar information at the patch panels (when applicable) to effectively trace fibers from the Optical Metro shelves to the patch panels.

You have completed this procedure if you are not labeling cables with HIP OFA fiber tags. These tags are required if HIP OFA modules are used.

—continued—

8-10 Fiber management

Procedure 8-1 (continued)

Labeling cables and optical fibers

Step	Action
8	Peel the backing tape of the HIP OFA fiber tag to the second bar. Place the starting point of the fiber tag on the fiber cable. Apply labels approximately 3" to 6" (75 mm to 150 mm) from the fiber boot. See Figure 8-6 and Figure 8-7 .

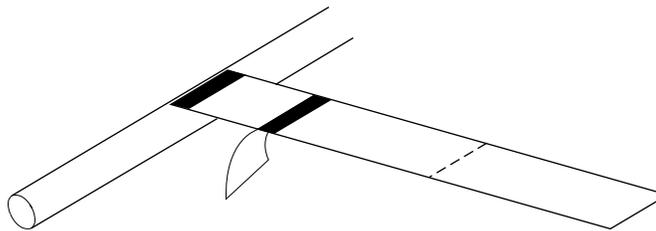
Figure 8-6
HIP OFA fiber tag starting point

OM1768t



Figure 8-7
Peel backing tape away until the second bar

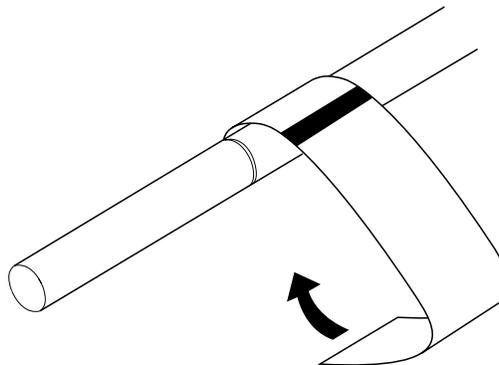
OM1769t



9 Wrap the fiber three times. See [Figure 8-8](#).

Figure 8-8
Wrap the fiber three times and then stop

OM1770t



10 Stop wrapping when the second black bar is reached. See [Figure 8-8](#).

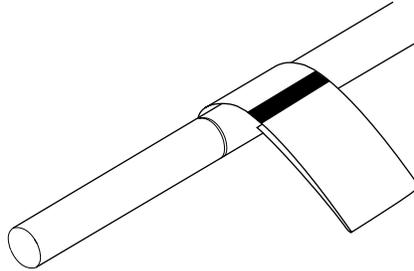
—continued—

Procedure 8-1 (continued)
Labeling cables and optical fibers

Step	Action
------	--------

Figure 8-9	Fold the text sections back to back
-------------------	--

OM1771t



11 After the label is wrapped around the fiber, pull off the remaining backing tape and fold the label caution text sections back to back. See [Figure 8-9](#) and [Figure 8-10](#).

Figure 8-10
Fold along the dotted line

OM1772t



—end—

Procedure 8-2

Guidelines for labeling the fibers and cables in an OFA installation kit

The OFA installation kit includes patch cords for connecting OFA circuit packs to ECTs, and data communications cables for connecting ECTs to the maintenance panel.

Because ECT configurations are flexible, loose labels are included in the OFA installation kit to allow you to identify the patch cords and cables for your configuration. Follow these guidelines to attach the loose labels to the patch cords and cables, according to your configuration.

Labeling the patch cords

To label the patch cords, you need to know whether you intend you deploy the ECT in a straddled or bookended configuration. For information about straddled and bookended ECTs, see the procedure in *Connection Procedures*, 323-1701-221.

Note: These guidelines apply only to patch cords for connecting OFA circuit packs to ECTs—not for connecting ECTs to other optical components such as OMXs, OSC trays, Optical Trunk Switches, or Enhanced Trunk Switches.

—continued—

Procedure 8-2 (continued)

Guidelines for labeling the fibers and cables in an OFA installation kit

Action

Step	Action
1	Identify the labels that you will attach to the end of the patch cords. Table 8-4 lists the features and uses of the SC/SC patch cords:

Table 8-4
SC/SC patch cord features

Patch cord pair	Used to	Affixed labels (see Note1)
Pair 1	connect OFA circuit pack in slot 4 to either upper or lower ECT tray (see Note2).	<ul style="list-style-type: none"> • OFA slot 4 IN • OFA slot 4 OUT
Pair 2	connect OFA circuit pack in slot 8 to either upper or lower ECT tray (see Note2).	<ul style="list-style-type: none"> • OFA slot 8 IN • OFA slot 8 OUT
Pair 3	connect OFA circuit pack in slot 14 to either upper or lower ECT tray (see Note2).	<ul style="list-style-type: none"> • OFA slot 14 IN • OFA slot 14 OUT
Pair 4	connect OFA circuit pack in slot 18 to either upper or lower ECT tray (see Note2).	<ul style="list-style-type: none"> • OFA slot 18 IN • OFA slot 18 OUT
<p>Note 1: Labels are affixed to the end of the patch cord that connects to the OFA circuit pack. Attach the label at least four inches from the tip of the connector on the end of the patch cord.</p> <p>Note 2: The upper and lower ECT trays refer to the placement of the ECT tray in the rack.</p>		

The loose labels that you will attach to the end of the patch cord that connects to the ECT are:

- WEST ECT C IN
- WEST ECT C OUT
- WEST ECT L IN
- WEST ECT L OUT
- EAST ECT C IN
- EAST ECT C OUT
- EAST ECT L IN
- EAST ECT L OUT

—continued—

8-14 Fiber management

Procedure 8-2 (continued)

Guidelines for labeling the fibers and cables in an OFA installation kit

Step	Action
2	Attach the loose labels to the ends of the SC-SC patch cords that connect to the ECT. If you intend to deploy the ECT in a straddled configuration bookended configuration
	Then refer to Table 8-5 . refer to Table 8-6 on page 8-15 .

Table 8-5
Label placement for straddled configurations

If this label is affixed to the end that connects to the OFA	Then attach this label to the end that connects to the ECT
OFA SLOT 4 IN	WEST ECT C OUT
OFA SLOT 4 OUT	WEST ECT C IN
OFA SLOT 8 IN	WEST ECT L OUT
OFA SLOT 8 OUT	WEST ECT L IN
OFA SLOT 14 IN	EAST ECT L OUT
OFA SLOT 14 OUT	EAST ECT L IN
OFA SLOT 18 IN	EAST ECT C OUT
OFA SLOT 18 OUT	EAST ECT C IN
Note: Attach the label at least 4 inches from the tip of the connector on the end of the patch cord.	

—continued—

Procedure 8-2 (continued)

Guidelines for labeling the fibers and cables in an OFA installation kit

Step Action

Table 8-6
Label placement for bookended configurations

If this label is affixed to the end that connects to the OFA	Then attach this label to the end that connects to the ECT
OFA SLOT 4 IN	EAST ECT C OUT
OFA SLOT 4 OUT	WEST ECT C IN
OFA SLOT 8 IN	EAST ECT L OUT
OFA SLOT 8 OUT	WEST ECT L IN
OFA SLOT 14 IN	WEST ECT L OUT
OFA SLOT 14 OUT	EAST ECT L IN
OFA SLOT 18 IN	WEST ECT C OUT
OFA SLOT 18 OUT	EAST ECT C IN
Note: Attach the label at least 4 inches from the tip of the connector on the end of the patch cord.	

- 3 Attach the label to the data communications cables. [Table 8-7](#) lists the feature and uses of the data communications cables.

Table 8-7
Data communications cable features

Cable	Used to
Long cable	connect the lower ECT tray to either the right or left OMXI card in the maintenance panel (see Note).
Short cable	connect the upper ECT tray to either the right or left OMXI card in the maintenance panel (see Note).
Note: The upper and lower ECT trays refer to the placement of the ECT tray in the rack.	

—continued—

Procedure 8-2 (continued)

Guidelines for labeling the fibers and cables in an OFA installation kit

Step	Action
	<p>The loose labels that you will attach to the ends of the data communications cables are:</p> <ul style="list-style-type: none"> • WEST ECT MONITOR • EAST ECT MONITOR • OMXI EAST 1 • OMXI WEST 1
4	<p>If the east ECT is uppermost in the rack west ECT is uppermost in the rack</p> <p>Then attach the labels to the data communications cables according to Table 8-8. Table 8-9.</p>

**Table 8-8
Label placement for east over west ECTs**

Cable	Attach this label to one end	Attach this label to the other end
long cable	WEST ECT MONITOR	OMXI WEST 1
short cable	EAST ECT MONITOR	OMXI EAST 1

**Table 8-9
Label placement for west over east ECTs**

Cable	Attach this label to one end	Attach this label to the other end
long cable	EAST ECT MONITOR	OMXI EAST 1
short cable	WEST ECT MONITOR	OMXI WEST 1

—end—

Procedure 8-3

Guidelines for routing fiber in the Fiber Manager

Follow these guidelines when you are routing slack fiber through the Fiber Manager.

Precautions

**CAUTION****Risk of insufficient fiber slack**

Be sure the Fiber Manager, and the equipment drawer from which the fiber is being routed, are fully open before you begin to route the fiber around the Fiber Manager spools. You must leave sufficient slack in the fiber so that you can open the equipment drawers without stretching the fiber.

**CAUTION****Risk of fiber damage**

Each Fiber Manager can manage a maximum of 16 fibers. Each fiber spool in the equipment drawer can manage 1.6 meters of fiber (maximum 3-mm diameter). Do not stretch the fiber, or wrap the fiber on the spools too tightly, or you risk damaging the fiber. Always use Curly locks or Velcro cable ties to bundle the fibers entering and exiting the Fiber Manager.

**CAUTION****Risk of affecting network reliability**

Fiber connectors should always be cleaned prior to making connections to ensure network reliability.

ATTENTION

The Fiber Manager has two sliding fiber management components located on the left and right sides of the equipment drawer. Each of these components has two tabs that lock into position across the top of the dish, to hold the routed fibers in position.

To open the tab to route fiber through the dish, press the tab toward the back of the latch while you lift the tab. Press down on the tab to close it.

—continued—

Procedure 8-3 (continued)

Guidelines for routing fiber in the Fiber Manager

	<p>CAUTION Possible risk of damage to equipment and fiber Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the equipment drawer to route the fiber.</p> <p>Allow for sufficient slack in the fibers entering and exiting the equipment drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the equipment drawer is opened.</p>
---	--

Guidelines for routing fiber

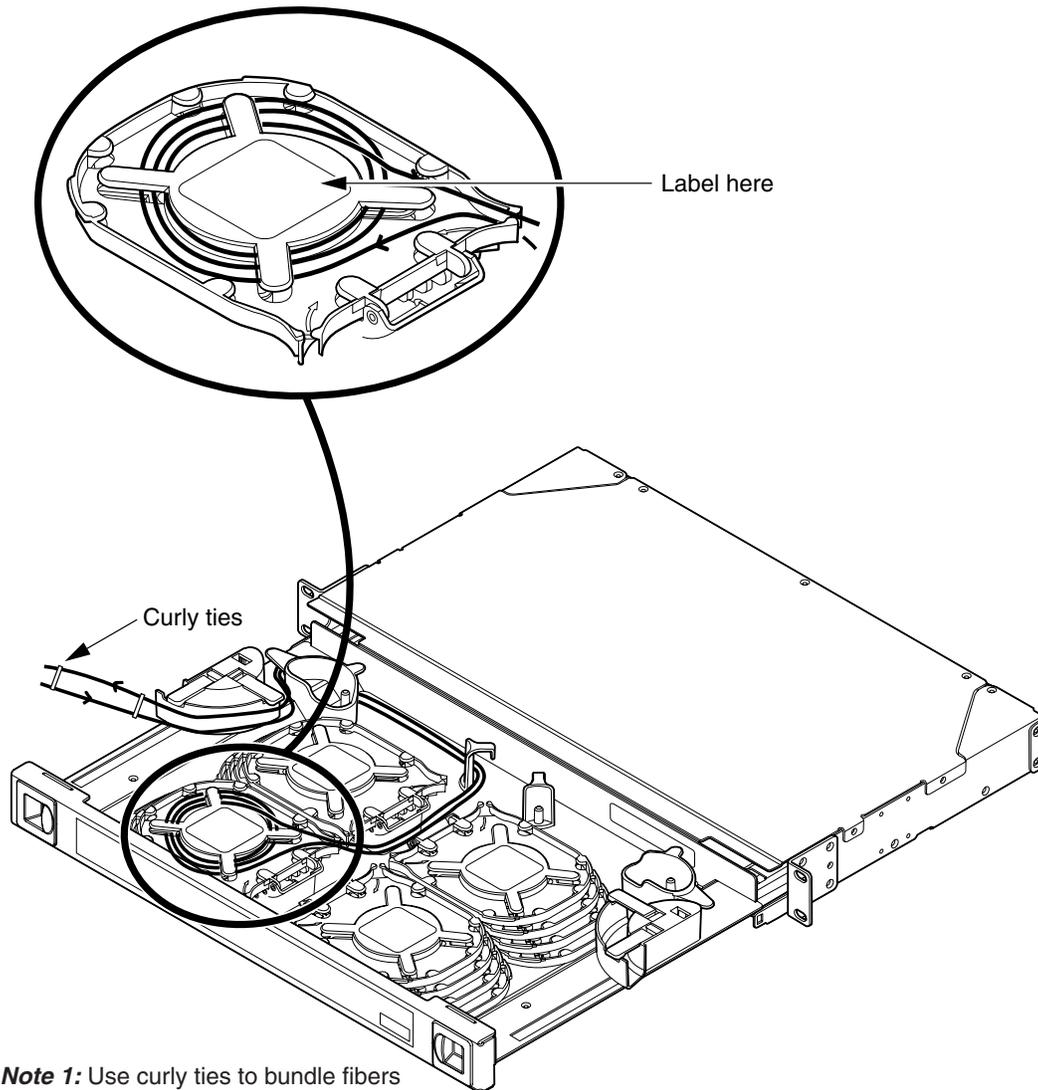
Guideline	Detail
1	Make sure every fiber is labeled.
2	Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you coil or bend fiber.
3	Fibers coming into the Fiber Manager from the left side should be routed around the spools on the left side of the equipment drawer. Fibers coming into the Fiber Manager from the right side should be routed around the spools on the right side of the equipment drawer. Note: Nortel Networks recommends that fibers enter and exit the Fiber Manager on the same side.
4	Route the fiber on the spools in the following order: <ol style="list-style-type: none"> 1 front spools ->bottom to top 2 rear spools ->bottom to top
5	Label each flip-up spool in the Fiber Manager.
6	Use curly locks or Velcro cable ties to bundle the fibers entering and exiting the Fiber Manager.

Figure 8-11 on page 8-19 illustrates how to route slack fiber around the spools in the Fiber Manager. Figure 8-12 on page 8-20 illustrates how to bundle the fibers using Curly Locks. Figure 8-13 on page 8-21 illustrates how to bundle the fibers using Velcro cables ties.

—end—

Figure 8-11
Routing slack fiber on spools in the Fiber Manager (NT0H57BB)

OM1803p



Note 1: Use curly ties to bundle fibers entering and exiting the tray.

Note 2: Do not stretch fibers when wrapping them around the fiber spools.

Note 3: Route fiber onto the spools in this order:

- front spools first - bottom spool to top spool
- rear spools after the front spools are full - bottom spool to top spool

Note 4: Attach a label to each spool to identify the fiber on the spool.

Figure 8-12
Bundling fibers entering and exiting the Fiber Manager (NT0H57BB) using Curly Locks

OM2356p

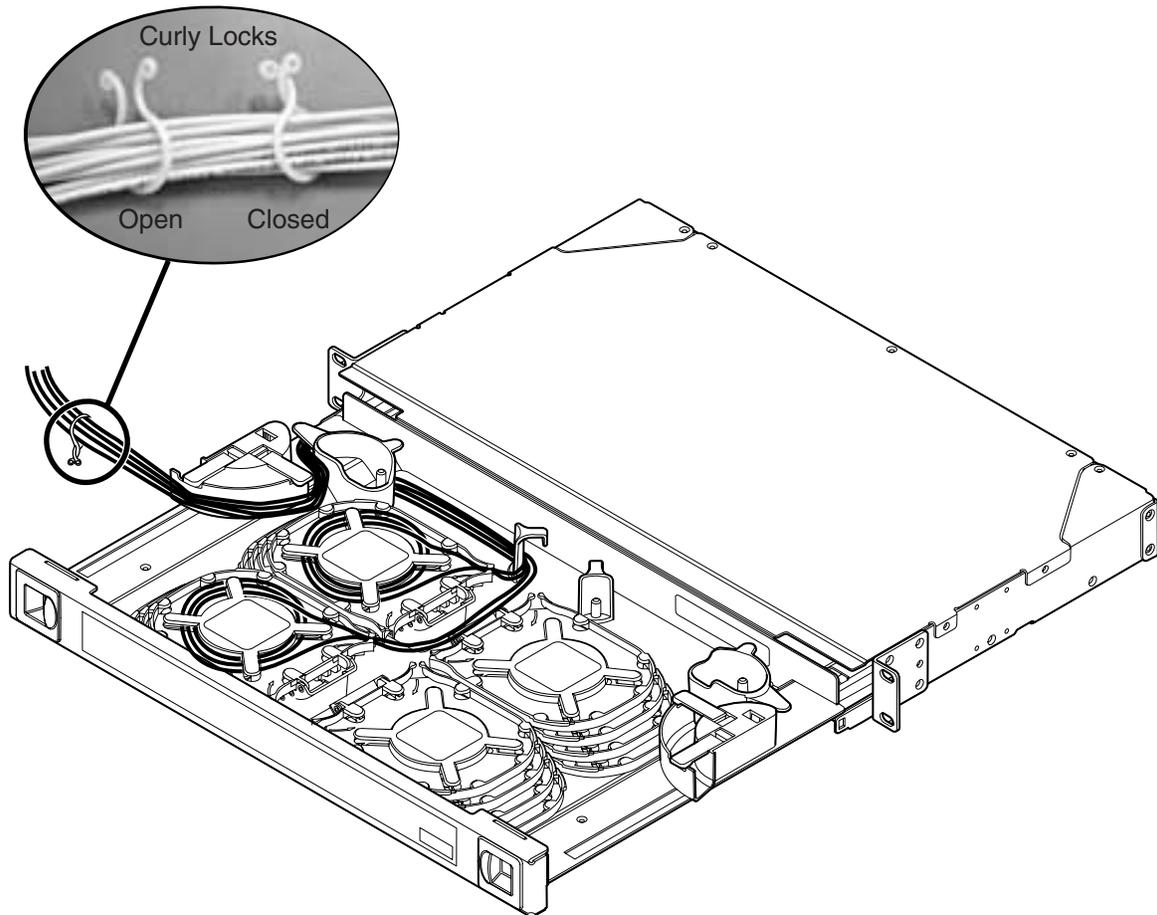
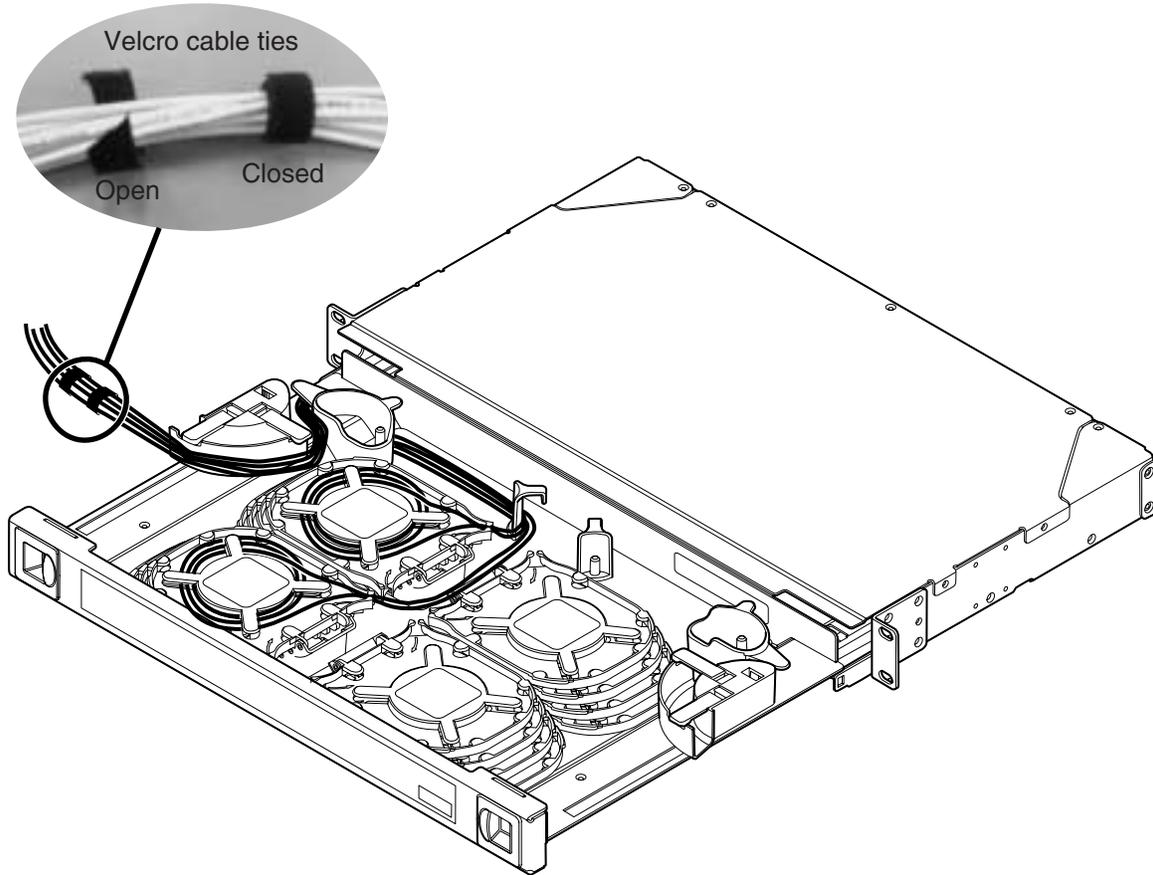


Figure 8-13
Bundling fibers entering and exiting the Fiber Manager (NT0H57BB) using Velcro cable ties

OM2357p



Procedure 8-4 Guidelines for routing fiber in a equipment drawer equipped with tray assemblies

Follow these guidelines when you are routing fibers in and out of a equipment drawer equipped with tray assemblies (such as OMX, OSC tray, OSC splitter/coupler with dual taps, C&L splitter/coupler, ECT, PBE, Transponder Protection Tray, Patch Panel, 1310 nm splitter/coupler and Discrete VOA). This procedure also provides guidelines to bundle fiber around bend radius limiters inside a equipment drawer equipped with these tray assemblies.

Precautions



CAUTION

Risk of insufficient fiber slack

Make sure that the equipment drawer from which the fiber is being routed is fully open before you begin to route the fiber around the fiber bend radius limiters. You must leave sufficient slack in the fiber so that you can open the equipment drawers without stretching the fiber.



CAUTION

Risk of fiber damage

Do not stretch the fiber, or wrap the fiber on the fiber bend radius limiters too tightly, or you risk damaging the fiber. Always use curly locks or Velcro cable ties to bundle fibers entering and exiting a equipment drawer. Always use curly locks or Velcro cable ties to bundle the fibers around the bend radius limiters inside a equipment drawer equipped with tray assemblies.



CAUTION

Risk of affecting network reliability

Fiber connectors should always be cleaned prior to making connections to ensure network reliability.

—continued—

Procedure 8-4 (continued)

Guidelines for routing fiber in a equipment drawer equipped with tray assemblies



CAUTION

Risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any equipment drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both. Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the equipment drawer to route the fiber. Allow for sufficient slack in the fibers entering and exiting the equipment drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the equipment drawer is opened.

—continued—

Procedure 8-4 (continued)

Guidelines for routing fiber in a equipment drawer equipped with tray assemblies**Guidelines for routing fiber**

Guideline	Detail
1	Verify whether the equipment drawer has a locking clip. If the equipment drawer has either a beige non-spring-loaded locking clip or a red spring-loaded locking clip, follow the instructions on page 8-48 . Then continue with the guidelines on this page (page 8-24).
2	Make sure that every fiber is labeled.
3	Route the fibers entering or exiting the tray through the opening on the right side or the left side of the equipment drawer. To determine on which side you need to route the fibers entering or exiting the tray, refer to the appropriate routing procedure in this chapter. Consult your system diagram for site-specific details.
4	<p>Fibers coming into the equipment drawer from the left side should be routed around the bend radius limiters on the left side of the equipment drawer. Fibers coming into the equipment drawer from the right side should be routed around the bend radius limiters on the right side of the equipment drawer.</p> <p>Route the fiber inside the equipment drawer according to the appropriate procedure in this chapter. Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Store excess fiber slack within the tray. Always use the fiber bend radius limiters to coil excess fiber slack.</p>
5	<p>Use Curly locks or Velcro cable ties to bundle the fibers routed around the fiber bend radius limiters to avoid loose fibers inside a equipment drawer.</p> <p>Figure 8-14 on page 8-25 illustrates how to bundle the fibers around bend radius limiters in a equipment drawer equipped with tray assemblies using Curly Locks. Figure 8-15 on page 8-26 illustrates how to bundle the fibers around bend radius limiters in a equipment drawer equipped with tray assemblies using Velcro cables ties.</p>
6	<p>Use Curly locks or Velcro cable ties to bundle the fibers entering and exiting the equipment drawer. See Figure 8-12 on page 8-20 and Figure 8-13 on page 8-21.</p> <p>Figure 8-12 on page 8-20 illustrates how to bundle the fibers exiting and entering a equipment drawer using Curly Locks. Figure 8-13 on page 8-21 illustrates how to bundle the fibers exiting and entering a equipment drawer using Velcro cable ties.</p>

—end—

Figure 8-14
Bundling fibers in a equipment drawer (equipped with tray assemblies) using Curly Locks

OM2358p

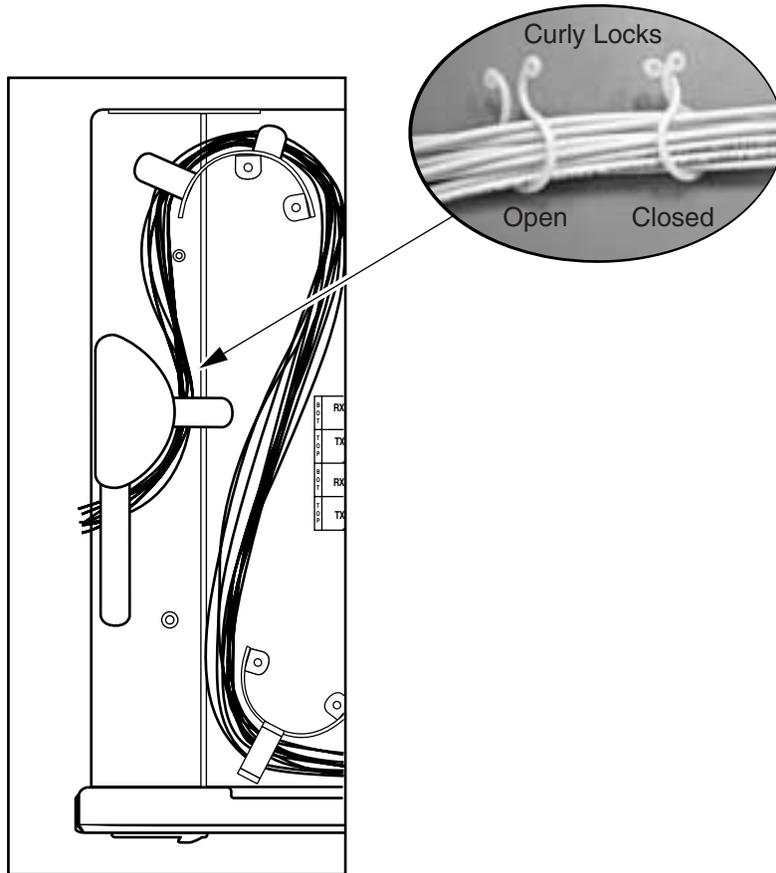
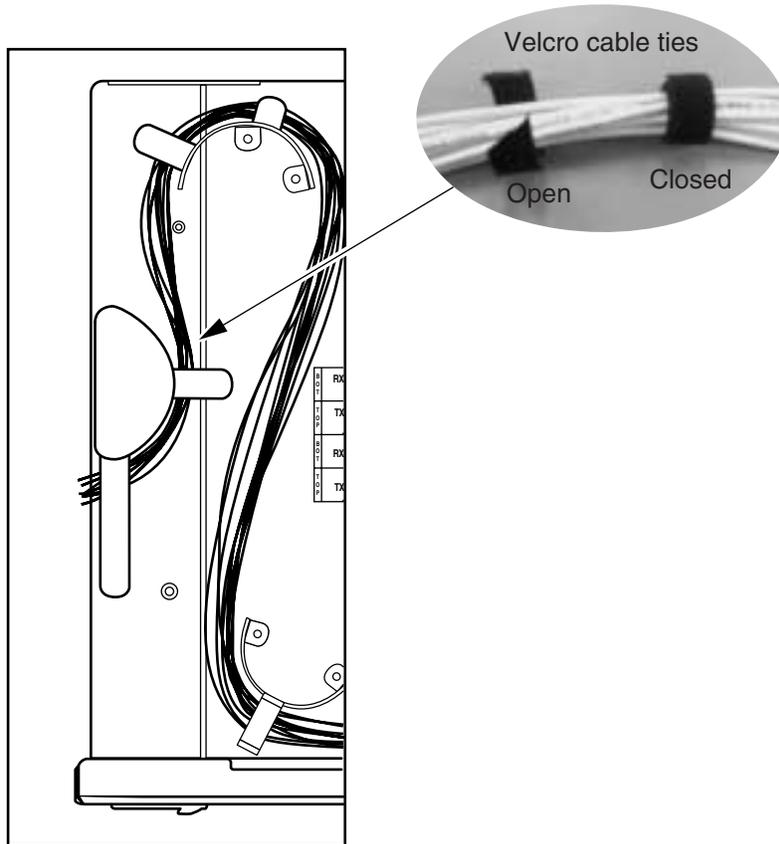


Figure 8-15
Bundling fibers in a equipment drawer (equipped with tray assemblies) using Velcro cables ties

OM2359p



Procedure 8-5

Routing fibers for optical circuit packs

Follow this procedure to route fiber-optic cables for optical circuit packs. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER

Risk of personal injury

When inserted in a shelf slot, the optical interface circuit pack emits laser light that can blind. Keep all optical connectors on the optical interface circuit packs capped when they are not connected to fiber-optic cables. Never look directly into the end of a fiber-optic cable.

Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.

Requirements

- Make sure all fibers and connectors are clean (see [Chapter 9 “Cleaning connectors”](#))
- Make sure all fibers are labeled (see [Procedure 8-1](#))

Expected results

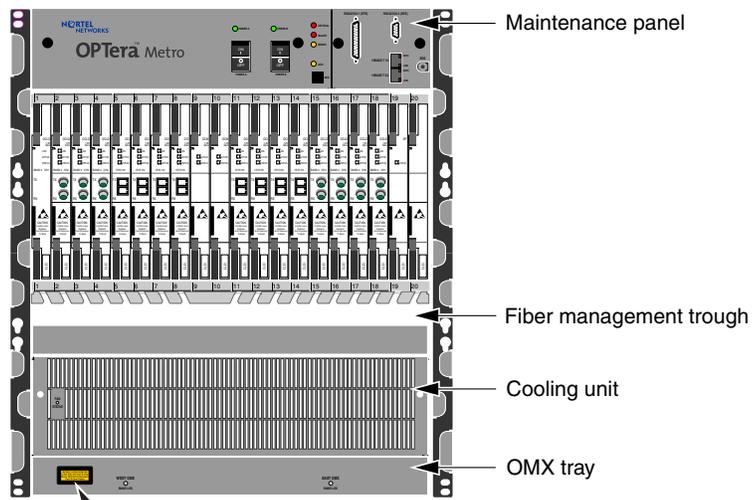
All optical fibers are routed to the fiber trough and are ready for connection. For connection procedures, see the Connecting components chapter of *Connection Procedures*, 323-1701-221.

—continued—

Action

Step	Action
1	Locate the fiber raceways on the shelf, including the vertical fiber brackets, the fiber management trough located just below the circuit packs (Figure 8-16) and the flexible fiber guide.

Figure 8-16
Fiber management trough on a shelf



OM0154p

—continued—

 Procedure 8-5 (continued)

Routing fibers for optical circuit packs

Step	Action
	<p>Note: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p>
2	<p>Fiber from the left side of the shelf should be routed through the vertical fiber brackets on the left-side of the shelf, then into the fiber management trough and up to the appropriate circuit pack.</p> <p>Note: All fibers entering the shelf on the left side should be connected to the circuit packs in slots 1 through 10. Consult your system diagram for site-specific details.</p>
3	<p>Fiber from the right side of the shelf should be routed through the vertical fiber brackets on the right-side of the shelf, then into the fiber management trough and up to the appropriate circuit pack.</p> <p>Note: All fibers entering the shelf on the right side should be connected to the circuit packs in slots 11 to 20, with the exception of the OSC circuit pack in slot 20. Instructions follow. Also, consult your system diagram for site-specific details.</p> <p>When routing fibers for the OSC circuit pack in slot 20, do not route the fibers upward from slot 20 to the associated OSC splitter/coupler tray using the fiber guide on the right side of the shelf because you risk of violating the minimum fiber bend radius. Instead, use one of the following alternative methods:</p> <ul style="list-style-type: none"> — route the fibers into a vertical fiber manager located at a distance of over 2.4 inches from the center of the OSC circuit pack — route the fibers to the left of the shelf (instead of to the right), then into the fiber guide on the left side of the shelf, across the front of another shelf, and finally up to the right side of the associated OSC splitter/coupler tray drawer.
4	<p>Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.</p>
5	<p>To route fibers from an OMX (Standard) tray, see Procedure 8-7.</p>

—end—

Procedure 8-6 Routing fibers for the Muxponder circuit pack

Follow this procedure to route fiber-optic cables for the Muxponder circuit pack. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment in a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER

Risk of personal injury

When inserted in a shelf slot, the optical interface circuit pack emits laser light that can blind. Keep all optical connectors on the optical interface circuit packs capped when they are not connected to fiber-optic cables. Never look directly into the end of a fiber-optic cable.



DANGER

Risk of laser radiation exposure

Do not stare into the beam or view directly with optical instruments. The invisible laser radiation can cause personal injury. Optical Metro 5100 is a Class 3A laser product.

—continued—

Procedure 8-6 (continued)

Routing fibers for the Muxponder circuit pack



CAUTION

Risk of damage to equipment

Observe the minimum bend radius of patch cords when routing optical fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.



CAUTION

Risk of damage to equipment

Label all fiber-optic patch cords with the correct wavelength band and function (Add or Drop) information. Otherwise, you can cause damage to equipment during and after maintenance.

Requirements

Before you start this procedure, you must make sure that

- all fibers and connectors are clean (see [Chapter 9, “Cleaning connectors”](#))
- all fibers are labeled (see [Procedure 8-1](#))

—continued—

Procedure 8-6 (continued)

Routing fibers for the Muxponder circuit pack

[Table 8-10](#) lists the tools and materials required to route fibers for the Muxponder circuit pack.

Table 8-10**Tools and materials required to route fibers for the Muxponder circuit pack**

Item	Quantity	Supplied
Line side: Single-mode fiber (SMF) duplex SC/PC-LC/PC cable with a straight boot on the SC connector and a 45-degree boot for the LC connector (see Note).	1 for each circuit pack	no (order from Nortel Networks)
Client side: LC to SC duplex fiber patch cords to connect the circuit pack (LC) to the patch panel or subtending equipment (SC) and a 45-degree boot for the LC connector. Multimode fiber (MMF) needed for 850 nm client interfaces (NT0H4319). Single-mode fiber (SMF) needed for 1310 nm client interfaces (NT0H4320). The pigtails of these 3 mm patch cords have a fiber jacket diameter of 1.6 mm.	1 duplex patch cord for each SFP port used	no (order from Nortel Networks)
Short pieces of Velcro (for fiber routing)	at least 2	no
Note: Refer to “Fiber-optic patch cords” in <i>Network Planning and Link Engineering</i> , 323-1701-110.		

Expected results

All optical fibers (line side and client side) are routed to the fiber trough and are ready for connection to the Muxponder circuit pack. For connection procedures, see [“Connecting components”](#) in *Connection Procedures*, 323-1701-221.

—continued—

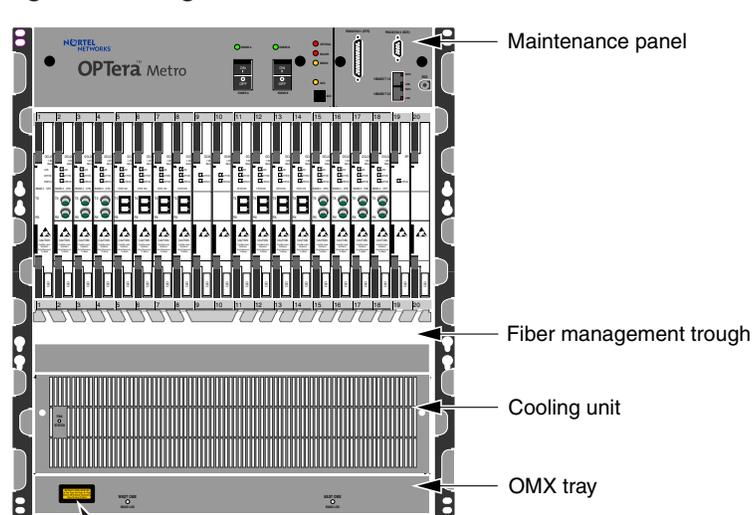
Procedure 8-6 (continued)

Routing fibers for the Muxponder circuit pack

Action

Step	Action
1	<p>Bear the following guidelines in mind when you route fiber.</p> <ul style="list-style-type: none"> Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers. Route all fibers entering the shelf on the left side to the circuit packs in slots 1 through 7. Consult your system diagram for site-specific details. Route all fibers entering the shelf on the right side to the circuit packs in slots 11 through 17. Consult your system diagram for site-specific details.
2	<p>Locate the fiber raceways on the shelf, including the vertical fiber brackets, the fiber management trough located just below the circuit packs (see Figure 8-17).</p>

Figure 8-17
Fiber management trough on a shelf



OM0154p

—continued—

Procedure 8-6 (continued)

Routing fibers for the Muxponder circuit pack

Step	Action
3	<p>Route the duplex LC-SC optical patch cords (for line side and client side) through the vertical fiber brackets of the shelf, and through the fiber management trough of the Optical Metro 5200 shelf.</p> <ul style="list-style-type: none">• Route the fiber from the left side of the shelf through the vertical fiber brackets on the left side of the shelf, then into the fiber management trough.• Route the fiber from the right side of the shelf through the vertical fiber brackets on the right side of the shelf, then into the fiber management trough.
4	<p>Use curly locks or Velcro cable ties to bundle the fiber exiting or entering the shelf to the side of the shelf.</p>

Routing client-side fibers between the shelf fiber management trough and the SFP ports on the circuit pack

5	<p>Manage fibers correctly, particularly when all the SFP ports of the Muxponder circuit pack are used.</p> <p>Bear the following guidelines in mind when you route fiber:</p> <ul style="list-style-type: none">• Leave some fiber slack in the vertical fiber brackets of the Optical Metro 5200 shelf to facilitate future installation and maintenance procedures. Fiber slack can facilitate future disconnection of fiber from a single SFP port. Without fiber slack, the user may have to disconnect the fibers of neighboring SFP ports on the Muxponder circuit pack to access a single SFP port (thereby possibly affecting traffic).• Use only thin, short pieces of Velcro to organize the fiber bundles that enter the exit aperture. This fiber bundling method prevents fiber pinching by the shelf cover. Thin, short pieces of Velcro do not interfere with the shelf front cover.• Achieve the correct bend radius when you are routing fibers for SFP ports 9 or 10 (at the bottom). Make sure that the fibers in the fiber bundle are as close as possible to the shelf front cover.
----------	---

Note: The Muxponder 10 Gbit/s GbE/FC circuit pack does not support traffic or SFP modules in ports 9 and 10. The Muxponder 10 Gbit/s GbE/FC VCAT circuit pack does support traffic or SFP modules in ports 9 and 10.

—continued—

Procedure 8-6 (continued)

Routing fibers for the Muxponder circuit pack

Step	Action				
6	<p>Route the fibers from the fiber management trough of the shelf to the SFP port on the Muxponder circuit pack (see Figure 8-18 and Figure 8-19).</p> <p>If the SFP port where the duplex LC connectors are to be connected is on the</p> <table border="0"> <tr> <td>right side of the faceplate (even-numbered port)</td> <td>Then make sure that you route the duplex fiber through the right exit aperture of the fiber through, under the Muxponder circuit pack</td> </tr> <tr> <td>left side of the faceplate (odd-numbered port)</td> <td>left exit aperture of the fiber trough, under the Muxponder circuit pack</td> </tr> </table> <p>Note: Figure 8-18 and Figure 8-19 show 10 SFP ports of a Muxponder 10 Gbit/s GbE/FC circuit pack. Bear in mind that the Muxponder 10 Gbit/s GbE/FC circuit pack does not support traffic or SFP modules in ports 9 and 10.)The Muxponder 10 Gbit/s GbE/FC VCAT circuit pack does support traffic or SFP modules in ports 9 and 10.)</p>	right side of the faceplate (even-numbered port)	Then make sure that you route the duplex fiber through the right exit aperture of the fiber through, under the Muxponder circuit pack	left side of the faceplate (odd-numbered port)	left exit aperture of the fiber trough, under the Muxponder circuit pack
right side of the faceplate (even-numbered port)	Then make sure that you route the duplex fiber through the right exit aperture of the fiber through, under the Muxponder circuit pack				
left side of the faceplate (odd-numbered port)	left exit aperture of the fiber trough, under the Muxponder circuit pack				

[Figure 8-18](#) and [Figure 8-19](#) also show the Muxponder 10 Gbit/s GbE/FC inserted in the shelf and the fibers connected to the SFP modules and to the line ports. Do not seat the Muxponder circuit pack into the shelf or connect the fiber patch cord now. For connection procedures, see “[Connecting components](#)” in *Connection Procedures*, 323-1701-221.

Routing line-side fibers between the shelf fiber management trough and the circuit pack

- | | |
|---|--|
| 7 | <p>Manage fibers correctly, particularly when all the SFP ports of the Muxponder circuit pack are used.</p> <p>Bear the following guidelines in mind when you route fiber:</p> <ul style="list-style-type: none"> Rotate slightly the 45-degree boot on the line-side fiber LC connector so that the duplex LC fibers are oriented on the left of the circuit pack faceplate. This positioning will facilitate the line-side fiber segregation from the client-side fibers. |
|---|--|

—continued—

Procedure 8-6 (continued)

Routing fibers for the Muxponder circuit pack

Step	Action
	<ul style="list-style-type: none">• Segregate the line-side fiber on the uppermost position of the faceplate as much as possible from the client-side fibers. Route the line-side fiber from the left-most position on the faceplate and down through the right aperture.• Leave some fiber slack in the vertical fiber brackets of the Optical Metro 5200 shelf to facilitate future installation and maintenance procedures. Fiber slack can facilitate future disconnection of fiber from a single SFP port. Without fiber slack, the user may have to disconnect the fibers of neighboring SFP ports on the Muxponder circuit pack to access a single SFP port (thereby possibly affecting traffic).• Use only thin, short pieces of Velcro to organize the fiber bundles that enter the exit aperture. This fiber bundling method prevents fiber pinching by the shelf cover. Thin, short pieces of Velcro do not interfere with the shelf front cover.
8	<p>Route the fibers from the fiber management trough of the shelf to the line port of the Muxponder circuit pack (see Figure 8-18 and Figure 8-19).</p> <p>Note 1: In Figure 8-18 and Figure 8-19 the Muxponder 10 Gbit/s GbE/FC circuit pack is inserted into the shelf and the fibers are connected to the SFP and to the line ports. Do not seat the Muxponder circuit pack into the shelf or connect the fiber patch cord now. For connection procedures, see “Connecting components” in <i>Connection Procedures</i>, 323-1701-221.</p> <p>Note 2: Figure 8-18 and Figure 8-19 show 10 SFP ports of the Muxponder 10 Gbit/s GbE/FC circuit pack. Bear in mind that the Muxponder 10 Gbit/s GbE/FC circuit pack does not support traffic or SFP modules in ports 9 and 10. The Muxponder 10 Gbit/s GbE/FC VCAT circuit pack does support traffic or SFP modules in ports 9 and 10.</p>

—end—

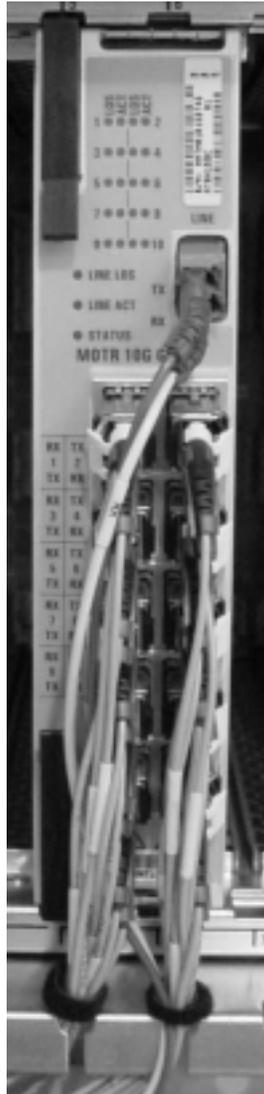
Figure 8-18
Routing fibers through the shelf through exit aperture (side view)

OM2617p.jpg



Figure 8-19
Routing fibers through the shelf through exit aperture (front view)

OM2615p.jpg



Procedure 8-7

Routing fibers from the OMX (Standard) tray

Follow this procedure to route the fiber-optic pigtails from the OMX (Standard) tray through the fiber management trough below the card cage. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.

	<p>DANGER Invisible laser radiation</p> <p>The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.</p>
--	--

Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.

Requirements

[Table 8-11](#) lists the tools and materials that you need to complete this procedure.

Table 8-11
Tools and materials required

Item	Quantity	Supplied	√
#2 Phillips screwdriver	1	no	

- Make sure all fibers and connectors are clean (see [Chapter 9, “Cleaning connectors”](#))
- Make sure all fibers are labeled (see [Procedure 8-1](#))

—continued—

Procedure 8-7 (continued)

Routing fibers from the OMX (Standard) tray

When you complete this procedure the fiber-optic pigtailed are routed from the OMX (Standard) tray to the circuit pack cage. For connection procedures, see the Connecting components chapter of *Connection Procedures*, 323-1701-221.

Action

Step	Action
1	Remove the cover of the fan.
2	Disconnect the OMX maintenance cable.
3	Open the OMX (Standard) tray by pressing and holding the two locking latches on the drawer and pull the drawer toward you until it is fully open. See Figure 8-24 on page 8-43 .
4	Remove the cover of the west OMX by removing the four screws that keep the cover in position and lifting the cover to the side. See Figure 8-20 on page 8-41 .
5	Remove the caps from the top of the flexible fiber guide attached to the west OMX and move the tabs out of the way. Extend the fiber guide.
6	Verify that the laser radiation tag is attached to the OMX pigtailed. The laser radiation tag is included with the Optical Metro 5200 installation kit. Note: If the laser radiation tags are not attached to the OMX pigtailed, refer to Procedure 4-14 "Installing an OMX (Standard) tray" on page 4-68 (step 5) .
<div style="border: 1px solid black; padding: 5px;"><p>CAUTION Risk of equipment damage Make sure that you do not disturb the optical fibers in the OMX when you route the pigtailed. Incorrect handling can result in damage to the optical fibers.</p></div>	
7	Route the OMX pigtailed from the west OMX through the opening on the left side of the tray and through the flexible fiber guide. See Figure 8-21 on page 8-42 . Note: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.
8	Replace the caps on the flexible fiber guides at each end and on every third link.
9	Insert the end of the flexible fiber guide attached to the west OMX into place on the left side of the shelf. See Figure 8-22 on page 8-42 .
10	Route the pigtailed from the flexible fiber guide up through the vertical fiber brackets and into the fiber management trough below the card cage area.

—continued—

Procedure 8-7 (continued)

Routing fibers from the OMX (Standard) tray

- | Step | Action |
|---|--|
| 11 | Replace the west OMX cover, making sure that the pigtailed come out of the opening in the cover that is closest to the rack rail. (The cover only fits one way. If necessary, turn the cover 180°.) Make sure that the back edge of the cover fits into the slot at the back of the tray. See Figure 8-23 on page 8-43 . |
| <div style="border: 1px solid black; padding: 5px;">  <p>CAUTION
 Risk of equipment damage
 To avoid damaging the optical fibers, make sure that the optical fibers inside the OMX are clear of the cover when you replace the cover.</p> </div> | |
| 12 | Repeat steps step 3 through step 11 for the east OMX and the opening on the right side of the tray. |
| 13 | Slide in the drawer while pressing the locking tabs in the middle of the sides of the drawer (see Figure 8-24 on page 8-43).
<i>The front locking tabs click when the tray is in the correct position.</i> |
| 14 | Reconnect the OMX maintenance cable. |
| 15 | Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf. |
| 16 | Replace the fan cover. |

—end—

Figure 8-20
Removing the cover of an OMX (Standard) tray

OM0121p

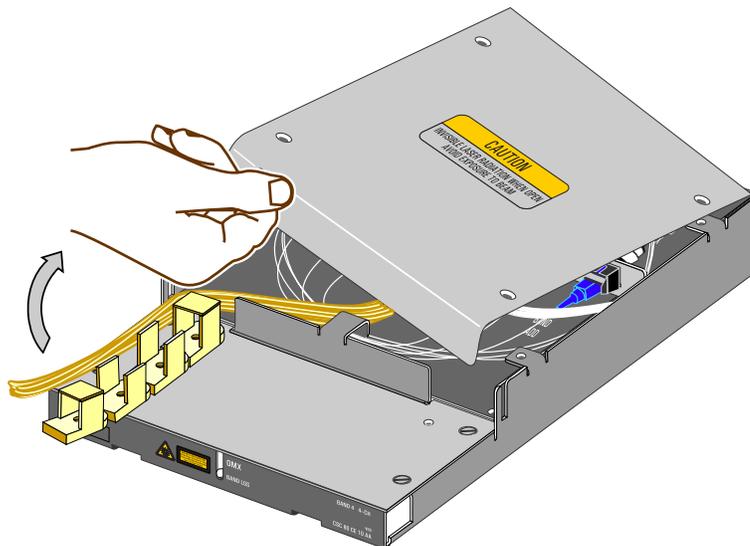


Figure 8-21
Flexible fiber guide position

OM0128p

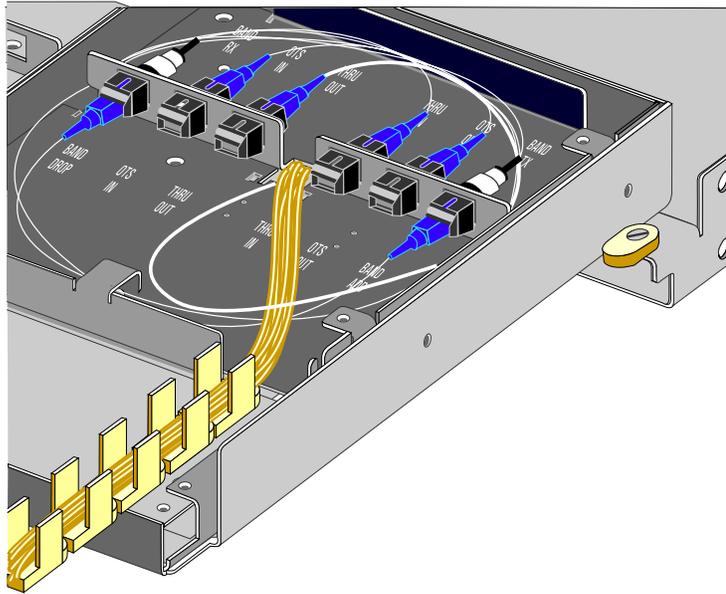


Figure 8-22
Routing the OMX (Standard) fiber-optic pigtails

OM0123p

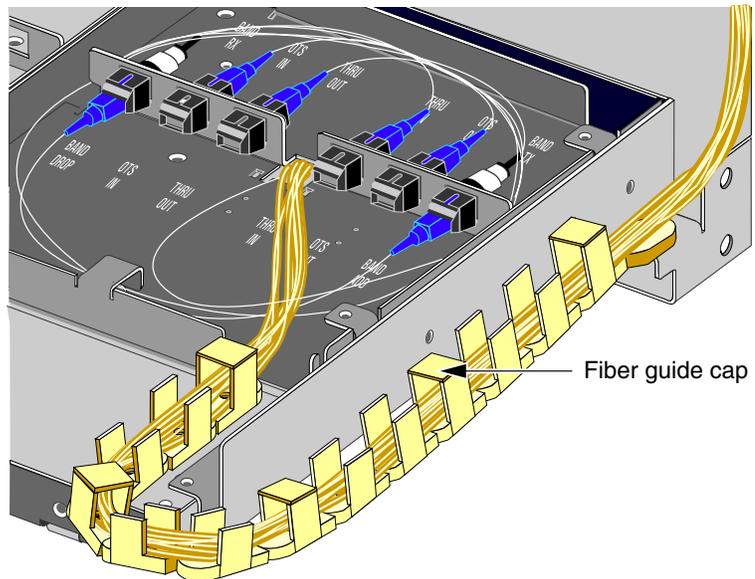


Figure 8-23
Replacing the cover of an OMX (Standard) tray

OM0122p

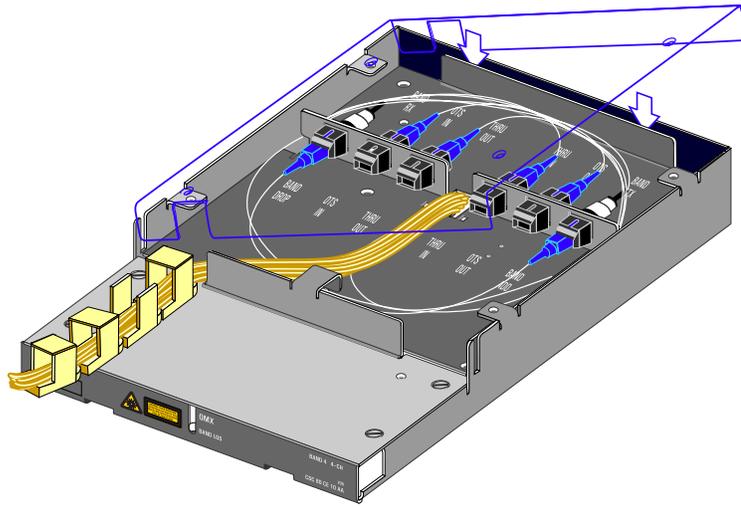
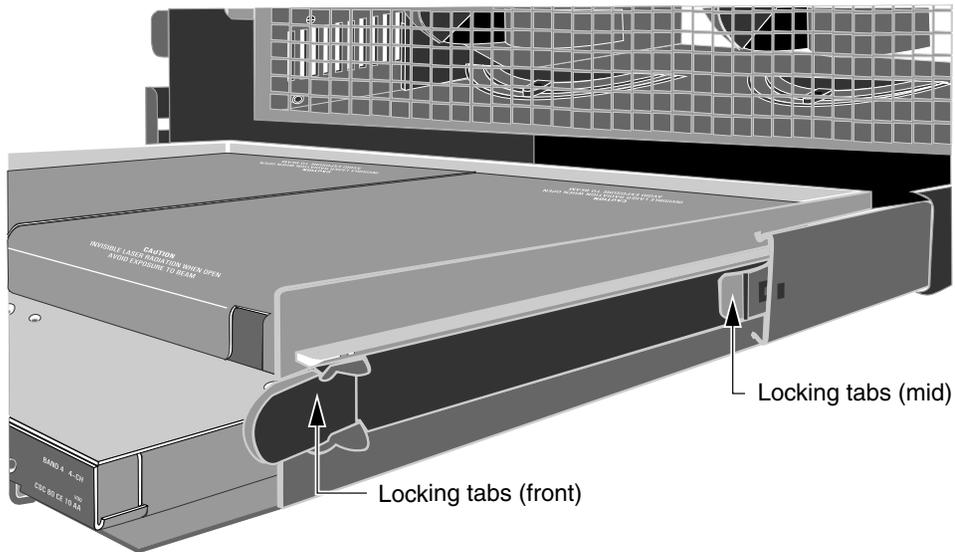


Figure 8-24
Locking tabs on the OMX (Standard) drawer

OM0129p



Procedure 8-8

Routing fibers for the OMX 4CH + Fiber Manager or OMX 4CH Enhanced tray

Follow this procedure to route the optical fibers from the OMX 4CH + Fiber Manager or OMX 4CH Enhanced tray through the fiber management trough below the card cage. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER

Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or $1M$ (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.



CAUTION

Possible risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any equipment drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the equipment drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the equipment drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the equipment drawer is opened.

—continued—

Procedure 8-8 (continued)

Routing fibers for the OMX 4CH + Fiber Manager or OMX 4CH Enhanced tray

Requirements

- The OMX cable (Ethernet cable) has been installed
- Make sure all fibers and connectors are clean (see [Chapter 9 “Cleaning connectors”](#))
- Make sure all fibers are labeled (see [Procedure 8-1](#))

When you complete this procedure the optical fibers are routed from the OMX 4CH + Fiber Manager or OMX 4CH Enhanced tray to the circuit pack cage. For connection procedures, see the Connecting components chapter of *Connection Procedures*, 323-1701-221.

Action

Step	Action
------	--------

- | | |
|---|--|
| 1 | Open the tray by pressing and holding the two locking latches on the equipment drawer and pull the equipment drawer toward you until it is fully open. |
|---|--|



CAUTION

Risk of equipment damage

Incorrect handling can result in damage to the optical fibers.

- | | |
|---|--|
| 2 | Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the equipment drawer. |
|---|--|

If the equipment drawer has a **Then**

beige non-spring-loaded locking clip

lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise ([Figure 8-27 on page 8-48](#)) until it rests on the edge of the equipment drawer. Then go to [step 3](#).

red spring-loaded locking clip or no locking clip

no action is required.

Note: The red spring-loaded locking clip ([Figure 8-28 on page 8-48](#)) automatically clicks the equipment drawer open into place.

Go to [step 3](#).

—continued—

Procedure 8-8 (continued)

Routing fibers for the OMX 4CH + Fiber Manager or OMX 4CH Enhanced tray

- | Step | Action | | | | | | |
|--------------------------------------|--|-------------------------------|------|--------------------------------------|--|--------------------------------|--|
| 3 | <p>If this OMX connects to circuit packs in slots 1-8, route the fibers entering or exiting the tray through the opening on the left side (see Figure 8-25 on page 8-47). If this OMX connects to circuit packs in slots 11-18, route the fibers entering or exiting the tray through the opening on the right side (see Figure 8-26 on page 8-47). Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <p>CAUTION
 Risk of equipment damage
 To avoid damaging the optical fibers, make sure that the optical fibers inside the OMX are clear of the cover when you replace the cover.</p> </div> | | | | | | |
| 4 | Repeat step 1 and step 3 for the other OMX (if applicable). | | | | | | |
| 5 | Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf. | | | | | | |
| 6 | <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">If the equipment drawer has a</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td style="border-top: 1px solid black;">beige non-spring-loaded locking clip</td> <td style="border-top: 1px solid black;">return the beige non-spring-loaded locking clip to the original upright position</td> </tr> <tr> <td>red spring-loaded locking clip</td> <td>push the red spring-loaded locking clip down</td> </tr> </tbody> </table> | If the equipment drawer has a | Then | beige non-spring-loaded locking clip | return the beige non-spring-loaded locking clip to the original upright position | red spring-loaded locking clip | push the red spring-loaded locking clip down |
| If the equipment drawer has a | Then | | | | | | |
| beige non-spring-loaded locking clip | return the beige non-spring-loaded locking clip to the original upright position | | | | | | |
| red spring-loaded locking clip | push the red spring-loaded locking clip down | | | | | | |
| 7 | <p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p> | | | | | | |

—end—

Figure 8-25
OMX 4CH + Fiber Manager or OMX 4CH Enhanced tray optical fiber routing (left side)

OM0515p

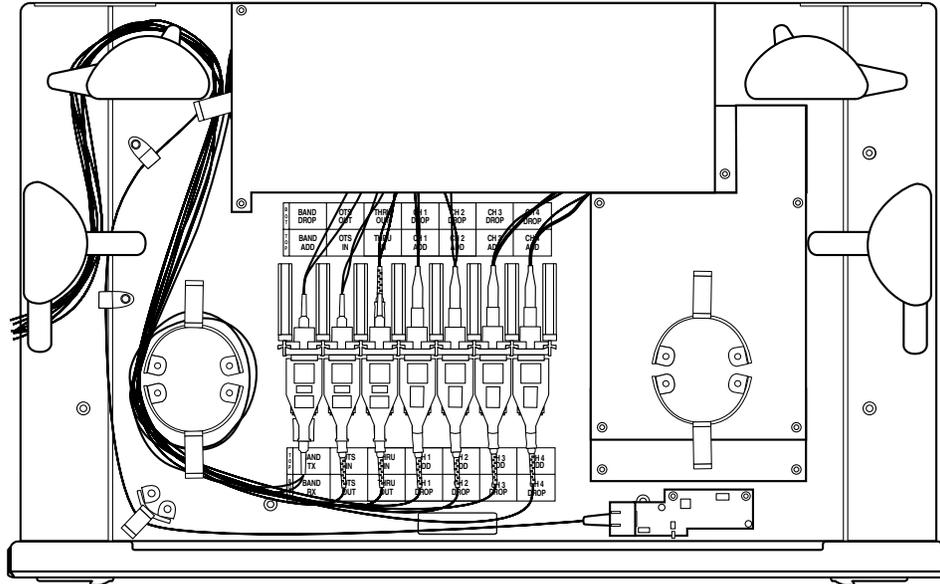


Figure 8-26
OMX 4CH + Fiber Manager or OMX 4CH Enhanced tray optical fiber routing (right side)

OM1984p

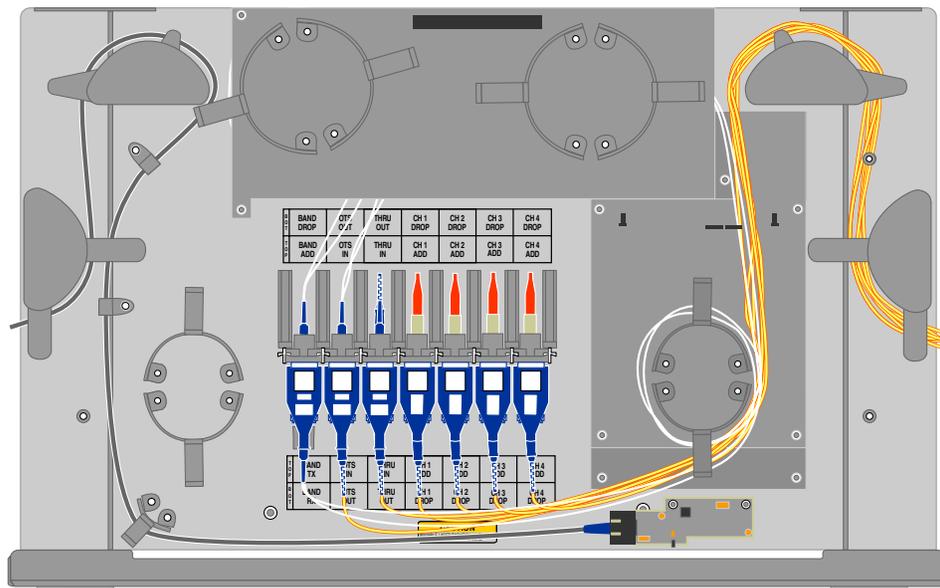


Figure 8-27
Locking a non-spring-loaded locking clip on an equipment drawer (sample)

OM2883t.jpg



Note 1: For an equipment drawer with a beige non-spring-loaded locking clip, you must lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise until it rests on the edge of the equipment drawer.

Note 2: Before you close the equipment drawer, you must return the beige non-spring-loaded locking clip to the original upright position.

Figure 8-28
Unlocking a spring-loaded locking clip on an equipment drawer (sample)

OM2825t



Note 1: For an equipment drawer with a red spring-loaded locking clip, no action is required when you open the equipment drawer. The red spring-loaded locking clip ([Figure 8-28 on page 8-48](#)) automatically clicks the equipment drawer open into place.

Note 2: Before you close the equipment drawer, you must push the red spring-loaded locking clip down.

Procedure 8-9

Routing fibers for the OMX 16CH DWDM

Follow this procedure to route the optical fibers within the OMX 16CH DWDM (NT0H32JA or NT0H32KA). Consult your system diagram for site-specific details.

Use this procedure only for fiber routing, not for connecting modules. For more information on connection procedures, refer to *Connection Procedures*, 323-1701-221.

Note: No fiber slack storage devices are provided inside the OMX 16CH DWDM. You must manage fiber slack outside the OMX 16CH DWDM. The steps in this procedure provide guidelines on fiber management. Make sure that you confirm the preferred method of fiber slack management for the system with the person responsible for installation.

Precautions

When installing the Optical Metro 5200 shelves and equipment in a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If you are using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12 inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.

**DANGER****Invisible laser radiation**

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

—continued—

Procedure 8-9 (continued)

Routing fibers for the OMX 16CH DWDM



CAUTION

Possible risk of damage to equipment and fiber

Make sure that the slider adapters (holding the fiber connectors) are completely inserted back into place before closing the OMX 16CH DWDM front panel. Failure to do so can cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always follow the fiber routing guidelines within this procedure.

Requirements

Before you start this procedure, make sure that

- the OMX 16CH DWDM (NT0H32JA or NT0H32KA) is installed. For installation information, see [Procedure 4-15 on page 4-77](#).
- all fibers and connectors are clean
- all fibers are labeled
- you find out the strategy for fiber slack management for the system from your next level of support (for installation)

[Table 8-12](#) lists the tools and materials required to route the OMX 16CH DWDM fibers.

Table 8-12

Tools and materials for routing fibers in the OMX 16CH DWDM

Item	Quantity	Supplied	√
#2 Phillips screwdriver	1	no	

—continued—

 Procedure 8-9 (continued)

Routing fibers for the OMX 16CH DWDM

Action

Step	Action
1	<p>Use a Phillips screwdriver to unscrew the two lock-screws on the top side (left and right) of the front panel of the OMX 16CH DWDM drawer. Then pull down the OMX 16CH DWDM front panel. See Figure 8-29 for an view of the top right lock screw (front panel closed)</p> <p>Note: The internal fibers are already routed inside the OMX 16CH DWDM drawer.</p>
2	<p>For the routing of external fibers, follow the inter-shelf routing fiber diagram inside the OMX 16CH DWDM front panel (see Figure 8-30). For external and internal fiber routing in the OMX 16CH DWDM, see Figure 8-31. For external fibers, follow the guidelines shown on the inter-shelf routing fiber label, which are described as follows:</p> <ul style="list-style-type: none"> • Slider adapters on the left side: Route to the left side of the drawer the duplex LC fibers going to the slider adapters for <ul style="list-style-type: none"> — Band 1 and Band 2 on the C-band OMX 16CH DWDM (NT0H32JA), and — Band 5 and Band 6 on the L-band OMX 16CH DWDM (NT0H32KA) • Slider adapters in the center: Route to the right side of the drawer <ul style="list-style-type: none"> — the SC fibers going to the OTS slider adapters for both the C-band and the L-band OMX 16CH DWDM, and — the L-band slider adapters on the C-band OMX 16CH DWDM. (These ports are the L-band upgrade ports only available on the NT0H32JA.) • Slider adapters on the right side: Route to the left side of the drawer the duplex LC fibers going to the slider adapters for <ul style="list-style-type: none"> — Band 3 and Band 4 on the C-band OMX 16CH DWDM (NT0H32JA), and — Band 7 and Band 8 on the L-band OMX 16CH DWDM (NT0H32KA) <p>Note: Figure 8-31 shows the external fibers connected in the OMX 16CH DWDM. For more information on connection procedures, refer to <i>Connection Procedures</i>, 323-1701-221.</p>

—continued—

Procedure 8-9 (continued)

Routing fibers for the OMX 16CH DWDM

Step	Action
3	<p>Make sure that the fibers enter and exit the OMX 16CH DWDM through the apertures on the side of the drawer. See Figure 8-29 for a view of the fibers entering and exiting the OMX 16CH DWDM (front panel closed).</p> <p>Note 1: Store fiber slack outside the OMX 16CH DWDM, using alternative methods. For example, tie fiber bundles (fastened with curly locks or Velcro cable ties) on the side of the rack. Make sure that you confirm the preferred method of fiber slack management with the person responsible for installation.</p> <p>Note 2: Follow the bend radius rule when you store the excess fiber slack outside the drawer. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p>
4	<p>Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the OMX 16CH DWDM. See Figure 8-29 and Figure 8-31.</p>
5	<p>Pull up the front panel and secure the two external lock-screws to close the OMX 16CH DWDM.</p>

—end—

Figure 8-29
Lock screw on the OMX 16CH DWDM front panel (front panel closed)

OM2613p.jpg



Figure 8-30
Inter-shelf fiber routing label inside the OMX 16CH DWDM front cover

OM2626p.jpg

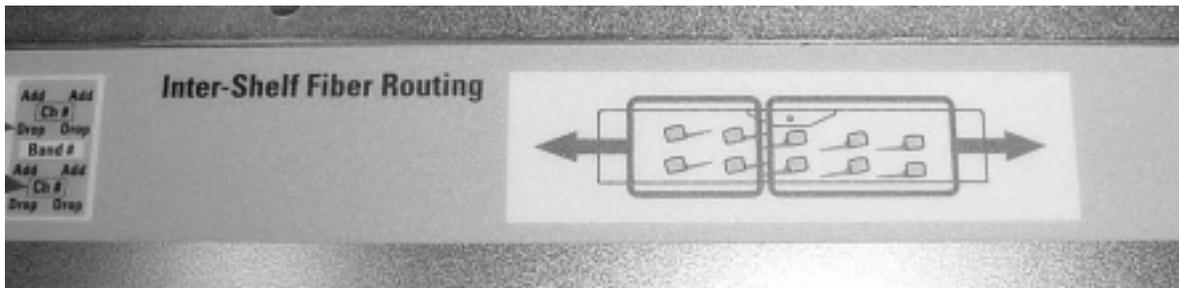
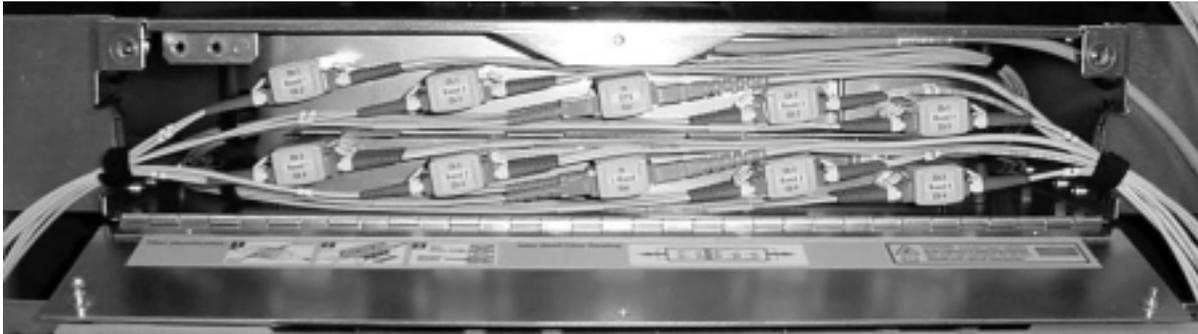


Figure 8-31
Routing of fibers inside the OMX 16CH DWDM

OM2627p.jpg



Procedure 8-10

Routing fibers for the ECT tray

Follow this procedure to route the optical fibers from the ECT tray through the fiber management trough below the card cage. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER

Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.



CAUTION

Possible risk of damage to equipment and fiber

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

Requirements

- Make sure all fibers and connectors are clean (see [Chapter 9 "Cleaning connectors"](#))
- Make sure all fibers are labeled (see [Procedure 8-1](#))

When you complete this procedure the optical fibers are routed from the ECT tray to the circuit pack cage. For connection procedures, see the Connecting components chapter of *Connection Procedures*, 323-1701-221.

—continued—

Procedure 8-10 (continued)
Routing fibers for the ECT tray

Action

Step	Action
1	Remove the cover of the fan.
2	Disconnect the ECT maintenance cable.
3	Open the ECT tray by pressing and holding the two locking latches on the drawer and pull the drawer toward you until it is fully open.
4	Loosen the captive screws that secure the access door on the top left side of the ECT and open the door.

	CAUTION Risk of equipment damage Incorrect handling can result in damage to the optical fibers.
---	---

- | | |
|---|--|
| 5 | Remove the caps from the top of the flexible fiber guide attached to the ECT tray and move the tabs out of the way. Extend the fiber guide. |
| 6 | Route the fibers through the flexible fiber guide into the ECT tray through the opening on the left hand side of the tray (see Figure 8-32). Consult your system diagram for site-specific details.

Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.

Note 2: Store excess fiber slack within the tray.

Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties. |
| 7 | Replace the caps on the flexible fiber guides at each end and on every third link. |
| 8 | To route fibers to the circuit packs, follow Procedure 8-5 . |
| 9 | Close the ECT cover and tighten the captive screws. |

	CAUTION Risk of equipment damage To avoid damaging the optical fibers, make sure that the optical fibers inside the ECT tray are clear of the cover when you replace the cover.
---	---

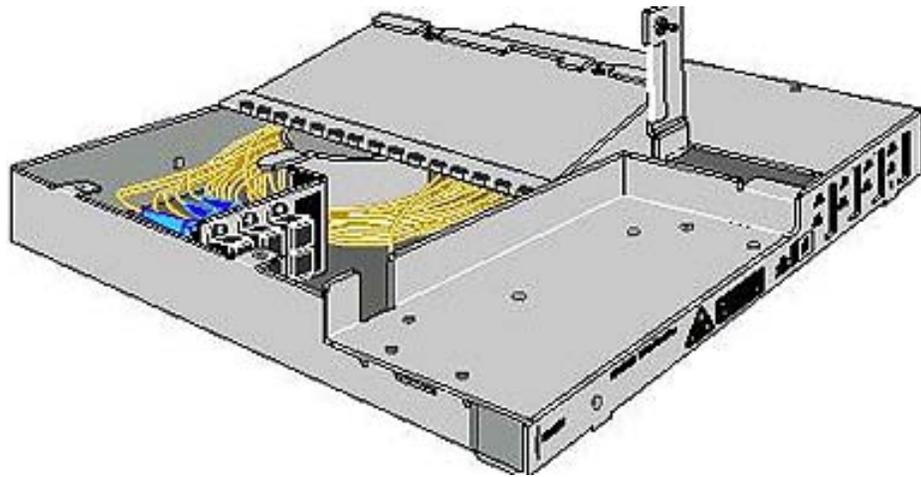
—continued—

Procedure 8-10 (continued)
Routing fibers for the ECT tray

Step	Action
10	Repeat step 3 through step 7 for the other ECT tray (if applicable).
11	Slide the ECT tray into the shelf while pressing the locking tabs in the middle of the sides of the drawer.
12	Reconnect the ECT maintenance cable.
13	Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.
14	Replace the fan cover.

Figure 8-32
ECT routing

OM0121p



—end—

Procedure 8-11

Routing fibers for the OSC tray

Follow this procedure to route the optical fibers from the OSC tray through the fiber management trough below the card cage. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER

Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.



CAUTION

Possible risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any equipment drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the equipment drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the equipment drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the equipment drawer is opened.

—continued—

 Procedure 8-11 (continued)
Routing fibers for the OSC tray

Requirements

- Make sure the OSC tray (NT0H57FA, or NT0H57DA) is installed. For installation information, see [Procedure 4-15 on page 4-77](#).
- Make sure the OSC module(s) is installed. For installation information, see [Procedure 4-21 on page 4-123](#).
- The OSC cable (Ethernet cable) has been installed
- Make sure all fibers and connectors are clean (see [Chapter 9 “Cleaning connectors”](#))
- Make sure all fibers are labeled (see [Procedure 8-1](#))

When you complete this procedure the optical fibers are routed from the OSC tray to the circuit pack cage. For connection procedures, see the Connecting components chapter of *Connection Procedures*, 323-1701-221.

Action

Step	Action		
1	Open the OSC tray by pressing and holding the two locking latches on the equipment drawer and pull the equipment drawer toward you until it is fully open.		
2	Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the equipment drawer.		
	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> If the equipment drawer has a beige non-spring-loaded locking clip red spring-loaded locking clip or no locking clip </td> <td style="width: 50%; vertical-align: top;"> Then lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3. no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3. </td> </tr> </table>	If the equipment drawer has a beige non-spring-loaded locking clip red spring-loaded locking clip or no locking clip	Then lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 . no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .
If the equipment drawer has a beige non-spring-loaded locking clip red spring-loaded locking clip or no locking clip	Then lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 . no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .		

—continued—

Procedure 8-11 (continued)

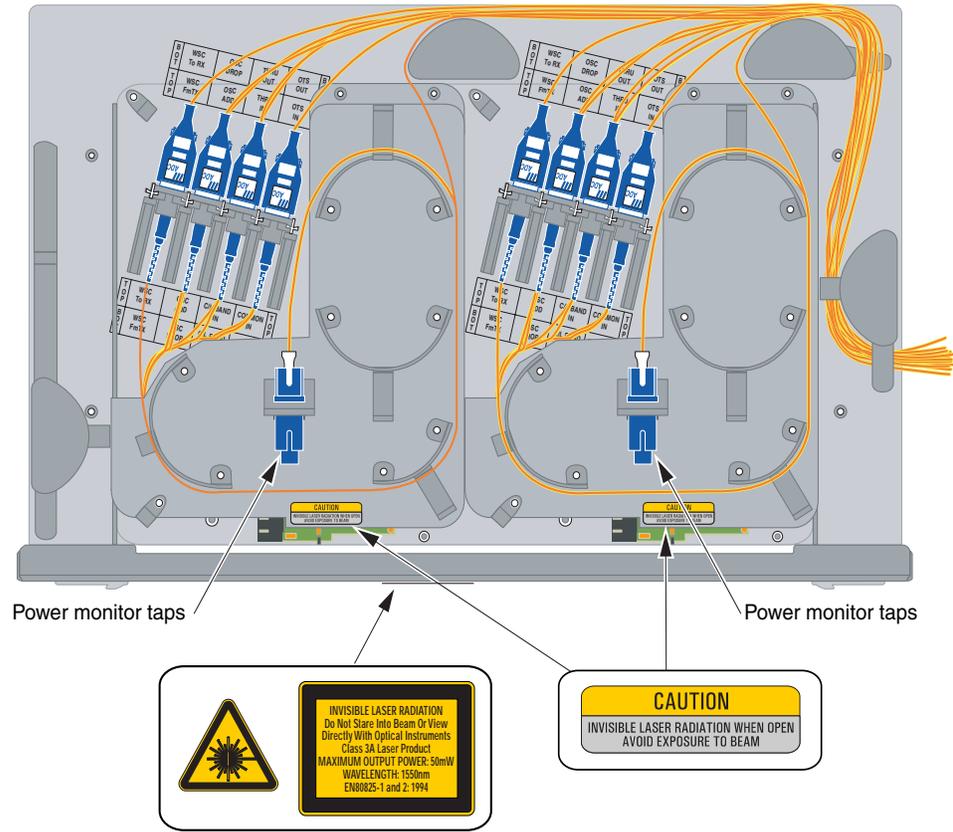
Routing fibers for the OSC tray

Step	Action						
3	<p>Route the fibers entering or exiting the tray through the opening on the right side according to Figure 8-33. Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						
4	<p>To route fibers to the circuit packs, follow Procedure 8-5.</p>						
5	<p>Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.</p>						
6	<table><thead><tr><th>If</th><th>Then</th></tr></thead><tbody><tr><td>the equipment drawer has a beige non-spring-loaded locking clip</td><td>return the beige non-spring-loaded locking clip to the original upright position</td></tr><tr><td>red spring-loaded locking clip</td><td>push the red spring-loaded locking clip down</td></tr></tbody></table>	If	Then	the equipment drawer has a beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position	red spring-loaded locking clip	push the red spring-loaded locking clip down
If	Then						
the equipment drawer has a beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position						
red spring-loaded locking clip	push the red spring-loaded locking clip down						
7	<p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p>						

—end—

Figure 8-33
OSC tray

OM0726p



Procedure 8-12

Routing fibers for the OSC tray with dual taps

Follow this procedure to route the optical fibers from the OSC splitter/coupler tray with dual taps through the fiber management trough below the card cage. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment into a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If you are using split flex tubing to route and secure optical fiber cables, secure the split flex tubing approximately every 12 inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER

Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of k x 3A (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.



CAUTION

Risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any equipment drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the equipment drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the equipment drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the equipment drawer is opened.

—continued—

Procedure 8-12 (continued)

Routing fibers for the OSC tray with dual taps

Requirements

Before you start this procedure, make sure that

- the equipment drawer for the OSC splitter/coupler tray assembly with dual taps (NT0H57GB, NT0H57GC) is installed. For installation information, see [Procedure 4-21 on page 4-123](#).
- the OSC splitter/coupler module(s) with dual taps are installed in the equipment drawer (NT0H57GA). For installation information, see [Procedure 4-21 on page 4-123](#).
- the data communication cable (Ethernet cable) has been installed
- all fibers and connectors are clean (see Chapter 9 “[Cleaning connectors](#)”)
- all fibers are labeled (see [Procedure 8-1](#))

When you complete this procedure, the optical fibers are routed from the OSC splitter/coupler tray with dual taps to the circuit pack cage. For connection procedures, see “[Connecting components](#)” chapter of *Connection Procedures*, 323-1701-221.

Action

Step	Action						
1	Open the equipment drawer of the OSC with dual taps by pressing and holding the two locking latches on the equipment drawer and pull the equipment drawer toward you until it is fully open.						
2	Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the equipment drawer.						
	<table border="0"> <tr> <td style="vertical-align: top;">If the equipment drawer has a</td> <td style="vertical-align: top;">Then</td> </tr> <tr> <td style="vertical-align: top;">beige non-spring-loaded locking clip</td> <td style="vertical-align: top;">lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</td> </tr> <tr> <td style="vertical-align: top;">red spring-loaded locking clip or no locking clip</td> <td style="vertical-align: top;">no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3.</td> </tr> </table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 .	red spring-loaded locking clip or no locking clip	no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 .						
red spring-loaded locking clip or no locking clip	no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .						

—continued—

Procedure 8-12 (continued)

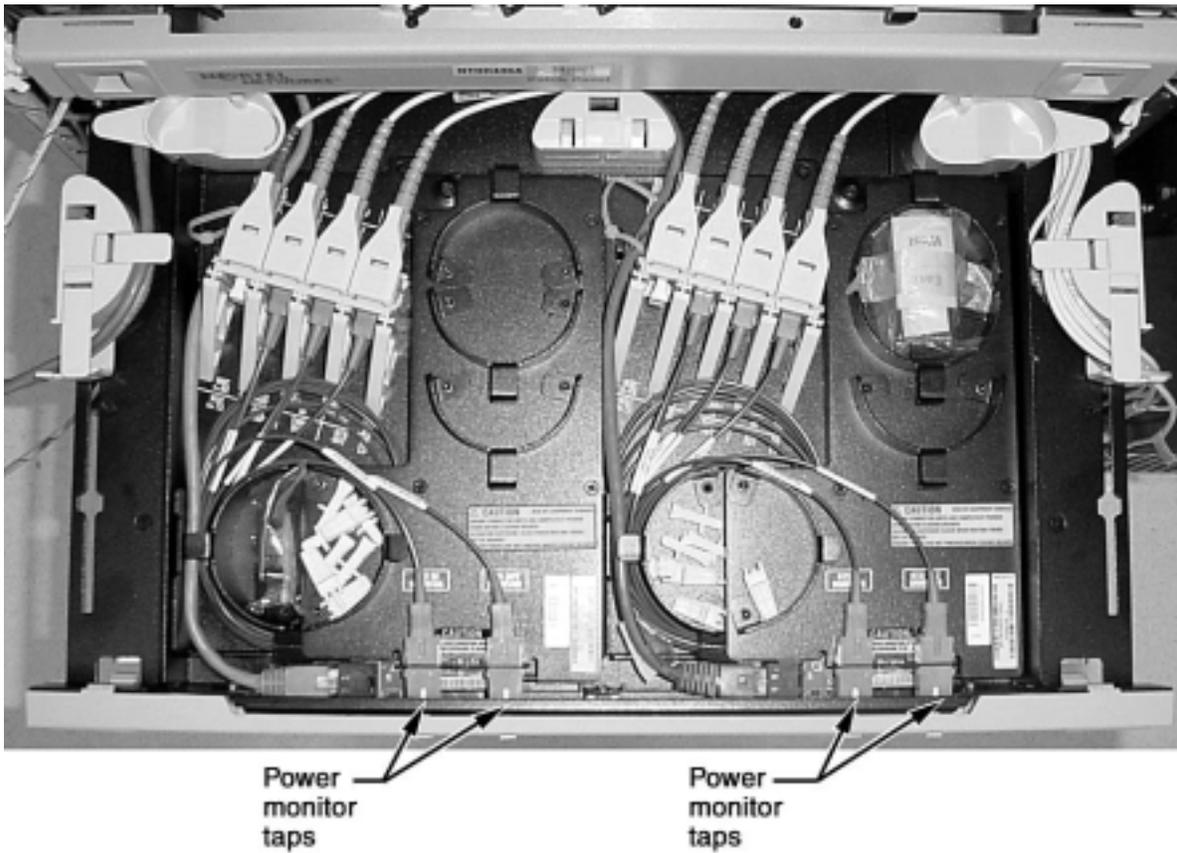
Routing fibers for the OSC tray with dual taps

Step	Action						
3	<p>Route the fibers entering or exiting the tray through the opening on the right side (see Figure 8-34). Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray. If the bend radius limiters in the front left of the tray are used to route the excess fiber, make sure that the monitoring fibers going to the taps on the faceplate are not buried under the external fibers that are connected to the tray. Quick and easy access is required for back-side fiber cleaning. To ensure adequate access, you must disconnect the monitoring fibers, cap them with dust caps, route the excess fiber coming from and outside the tray. Then you must uncap the monitoring fibers, clean them, and reconnect them to the internal monitoring ports of the faceplate.</p> <p>Note 3: If you view the equipment drawer from the top, you can see that the fibers exit the right side and route internally. In Figure 8-34, although not shown, the fibers are routed inside the equipment drawer at the rear.</p> <p>Note 4: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p> <p>Note 5: To route fibers to the circuit packs, follow Procedure 8-5.</p>						
4	Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.						
5	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If the equipment drawer has a</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">beige non-spring-loaded locking clip</td> <td style="padding: 5px;">return the beige non-spring-loaded locking clip to the original upright position</td> </tr> <tr> <td style="padding: 5px;">red spring-loaded locking clip</td> <td style="padding: 5px;">push the red spring-loaded locking clip down</td> </tr> </tbody> </table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position	red spring-loaded locking clip	push the red spring-loaded locking clip down
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position						
red spring-loaded locking clip	push the red spring-loaded locking clip down						
6	<p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p>						

—end—

Figure 8-34
Equipment drawer with two OSC splitter/coupler trays with dual taps

OM2671p.jpg



Procedure 8-13

Routing fibers for the Transponder Protection Tray

Follow this procedure to route the optical fibers from the Transponder Protection Tray (NT0H59AA, NT0H59AB, NT0H59BA, or NT0H59BB) through the fiber management trough below the card cage. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER
Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.



CAUTION
Possible risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any equipment drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the equipment drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the equipment drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the equipment drawer is opened.

—continued—

 Procedure 8-13 (continued)

Routing fibers for the Transponder Protection Tray

Requirements

- Make sure the Transponder Protection Tray (NT0H59AA, NT0H59AB, NT0H59BA, or NT0H59BB) is installed. For installation information, see [Procedure 4-15 on page 4-77](#).
- The Transponder Protection Tray cable (Ethernet cable) has been installed
- Make sure all fibers and connectors are clean (see [Chapter 9 “Cleaning connectors”](#))
- Make sure all fibers are labeled (see [Procedure 8-1](#))

When you complete this procedure the optical fibers are routed from the Transponder Protection Tray to the circuit pack cage. For connection procedures, see the Connecting components chapter of *Connection Procedures*, 323-1701-221.

Action

Step	Action				
1	Open the Transponder Protection Tray by pressing and holding the two locking latches on the equipment drawer and pull the equipment drawer toward you until it is fully open.				
2	Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the equipment drawer. If the equipment drawer has a Then <table border="0"> <tr> <td style="padding-right: 20px;">beige non-spring-loaded locking clip</td> <td>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</td> </tr> <tr> <td>red spring-loaded locking clip or no locking clip</td> <td>no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3.</td> </tr> </table>	beige non-spring-loaded locking clip	lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 .	red spring-loaded locking clip or no locking clip	no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .
beige non-spring-loaded locking clip	lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 .				
red spring-loaded locking clip or no locking clip	no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .				

—continued—

Procedure 8-13 (continued)

Routing fibers for the Transponder Protection Tray

Step	Action						
3	<p>Route the fibers entering or exiting the tray through the opening on the left side according to Figure 8-35 (four-filter Transponder Protection Tray) or Figure 8-36 (two-filter Transponder Protection Tray). Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						
4	<p>To route fibers to the circuit packs, follow Procedure 8-5.</p>						
5	<p>Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.</p>						
6	<table border="1"><thead><tr><th>If the equipment drawer has a</th><th>Then</th></tr></thead><tbody><tr><td>beige non-spring-loaded locking clip</td><td>return the beige non-spring-loaded locking clip to the original upright position</td></tr><tr><td>red spring-loaded locking clip</td><td>push the red spring-loaded locking clip down</td></tr></tbody></table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position	red spring-loaded locking clip	push the red spring-loaded locking clip down
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position						
red spring-loaded locking clip	push the red spring-loaded locking clip down						
7	<p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p>						

—end—

Figure 8-35
Transponder Protection Tray (four-filter)

OM0807p

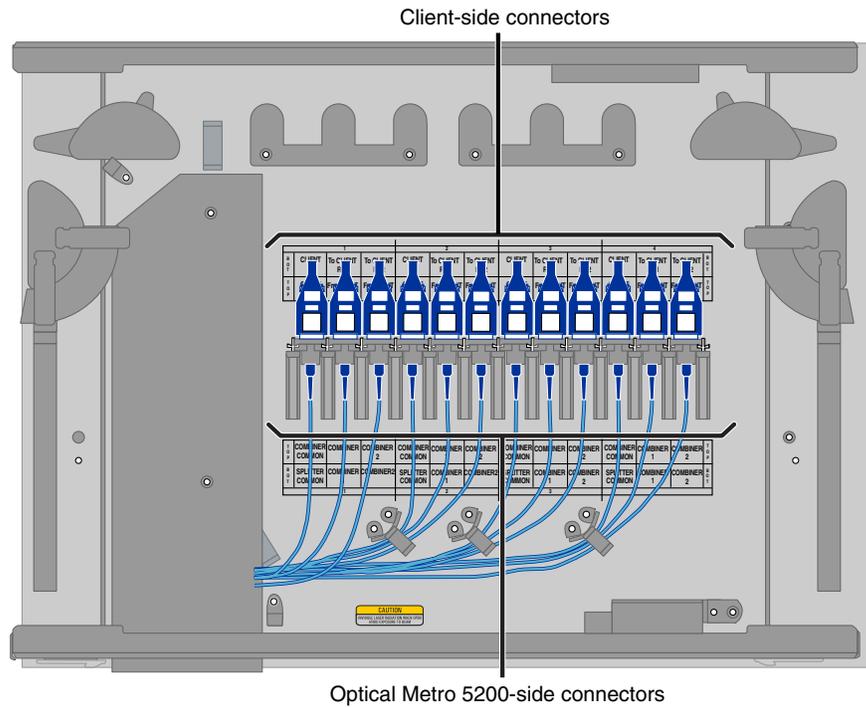
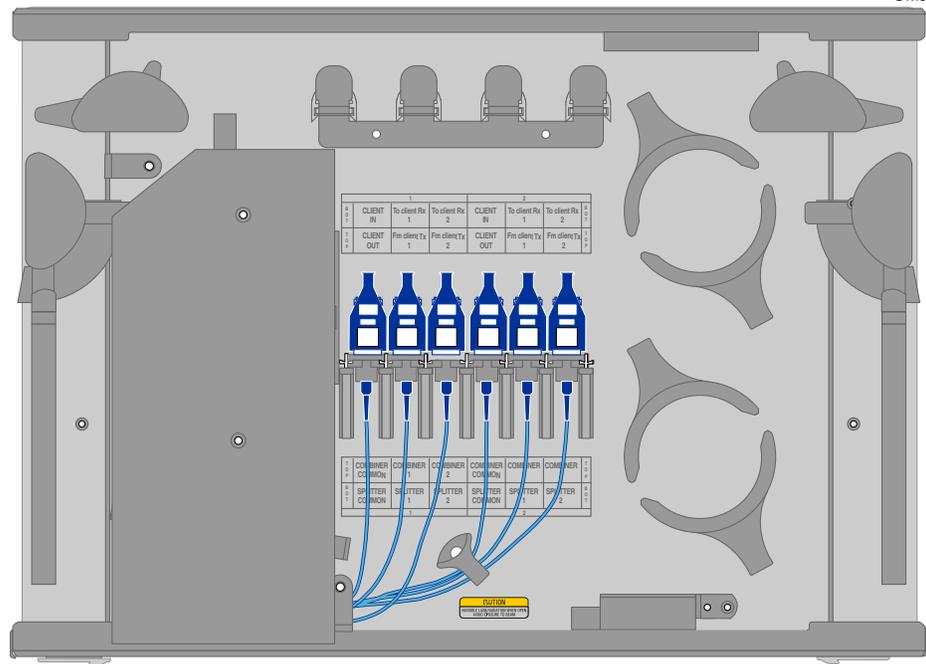


Figure 8-36
Transponder Protection Tray (two-filter)

OM0909p



Procedure 8-14

Routing fibers for the patch panel

Follow this procedure to route optical fibers within the 16-port patch panel (NT0H43CA) or 20-port patch panel (NT0H43CB) for fibers that connect to OCI SRM, OCI SRM SONET SDH, OCI SRM ESCON, or Muxponder 10 Gbit/s GbE/FC circuit packs, or for fibers that come from the subtending equipment. Consult your system diagram for site-specific details.

Note 1: You must use the 20-port patch panel for Muxponder 10 Gbit/s GbE/FC VCAT client-side applications. The Muxponder 10 Gbit/s GbE/FC VCAT circuit pack supports 20 client signals (10 ports each of Tx and Rx).

Note 2: You can use the 20-port patch panel or the 16-port patch panel for the OCI SRM, OCI SRM SONET SDH, OCI SRM ESCON, or Muxponder 10 Gbit/s GbE/FC circuit packs.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the equipment rack rails with lacing cord or wax string.

—continued—



DANGER

Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.



CAUTION

Possible risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any equipment drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the equipment drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the equipment drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the equipment drawer is opened.

Requirements

- Make sure the 16-port patch panel (NT0H343CA) or 20-port patch panel (NT0H43CB) is installed. For installation information, see [Procedure 4-15 on page 4-77](#).
- Make sure all fibers and connectors are clean.
- Make sure all fibers are labeled.

—continued—

 Procedure 8-14 (continued)
 Routing fibers for the patch panel

Action

Step	Action						
1	Open the patch panel by pressing and holding the two locking latches on the equipment drawer and pull the equipment drawer toward you until it is fully open.						
2	<p>Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the equipment drawer.</p> <p>If the equipment drawer has a</p> <table border="1"> <thead> <tr> <th></th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>beige non-spring-loaded locking clip</td> <td>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</td> </tr> <tr> <td>red spring-loaded locking clip or no locking clip</td> <td>no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3.</td> </tr> </tbody> </table>		Then	beige non-spring-loaded locking clip	lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 .	red spring-loaded locking clip or no locking clip	no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .
	Then						
beige non-spring-loaded locking clip	lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 .						
red spring-loaded locking clip or no locking clip	no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .						
3	<p>Route the patch cords (MT-RJ to SC or MTP to SC) that connect to the circuit packs seated in the east plane through the right side of the equipment drawer (see Figure 8-37 on page 8-75 and Figure 8-40 on page 8-78).</p> <p>Note 1: For a list of circuit packs that use the 16-port patch panel, see Table 8-13 on page 8-75. For a list of circuit packs that use the 20-port patch panel, see Table 8-14 on page 8-77. Consult your system diagram for site-specific details.</p> <p>Note 2: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 3: Store excess fiber slack within the tray.</p> <p>Note 4: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						

—continued—

Procedure 8-14 (continued)

Routing fibers for the patch panel

Step	Action						
4	<p>Route the patch cords that connect to the circuit packs seated in the west plane through the left side of the equipment drawer (see Figure 8-38 on page 8-76 and Figure 8-41 on page 8-78). Consult your system diagram for site-specific details.</p> <p>Note 1: For a list of circuit packs that use the 16-port patch panel, see Table 8-13 on page 8-75. For a list of circuit packs that use the 20-port patch panel, see Table 8-14 on page 8-77. Consult your system diagram for site-specific details.</p> <p>Note 2: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 3: Store excess fiber slack within the tray.</p> <p>Note 4: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						
5	<p>Route the subtending optical fibers through the left side of the equipment drawer (see Figure 8-39 on page 8-76 and Figure 8-42 on page 8-79).</p> <p>Note: For a list of circuit packs that use the 16-port patch panel, see Table 8-13 on page 8-75. For a list of circuit packs that use the 20-port patch panel, see Table 8-14 on page 8-77. Consult your system diagram for site-specific details.</p>						
6	<p>Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.</p>						
7	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">If the equipment drawer has a</td> <td style="width: 50%;">Then</td> </tr> <tr> <td style="padding-left: 20px;">beige non-spring-loaded locking clip</td> <td style="padding-left: 20px;">return the beige non-spring-loaded locking clip to the original upright position</td> </tr> <tr> <td style="padding-left: 20px;">red spring-loaded locking clip</td> <td style="padding-left: 20px;">push the red spring-loaded locking clip down</td> </tr> </table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position	red spring-loaded locking clip	push the red spring-loaded locking clip down
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position						
red spring-loaded locking clip	push the red spring-loaded locking clip down						
8	<p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p>						

—end—

Note: [Figure 8-37 on page 8-75](#), [Figure 8-38 on page 8-76](#), and [Figure 8-39 on page 8-76](#) show a fully fibered 16-port patch panel for the OCR SRM ESCON or the Muxponder 10 Gbit/s GbE/FC circuit packs. For a list of other circuit packs that use the 16-port patch panel and which specific ports they use, see [Table 8-13](#).

Table 8-13
Circuit packs that use the 16-port patch panel

Circuit pack	Ports 1-4 or 5-8	Ports 1-8
OCI SRM	Yes	
OCI SRM SONET/SDH	Yes	
OCI SRM ESCON	–	Yes
Muxponder 10 Gbit/s GbE/FC	–	Yes

Note: You can use either the 16-port patch panel or the 20-port patch panel with the circuit packs listed in this table.

Figure 8-37
Routing patch cords from east circuit packs (in the 16-port patch panel)

OM1936p

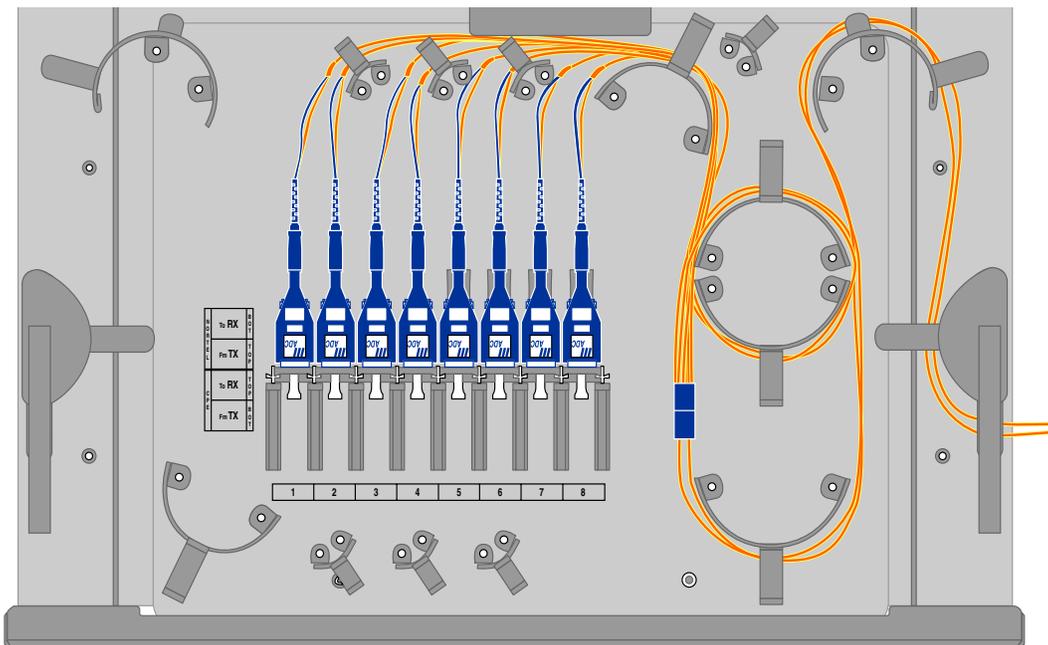


Figure 8-38
Routing patch cords from west circuit packs (in the 16-port patch panel)

OM1937p

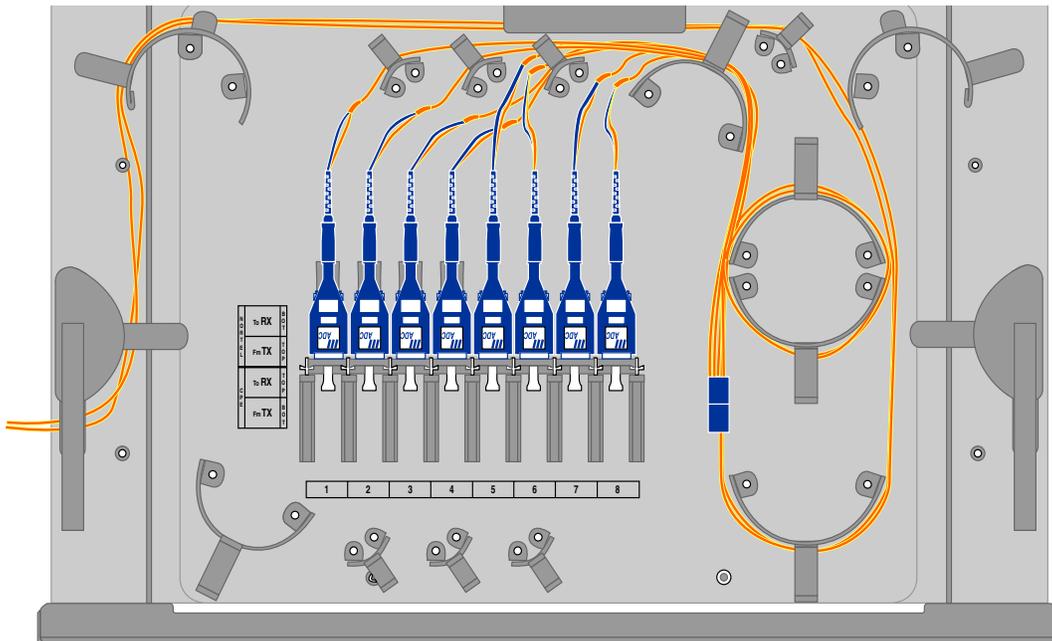
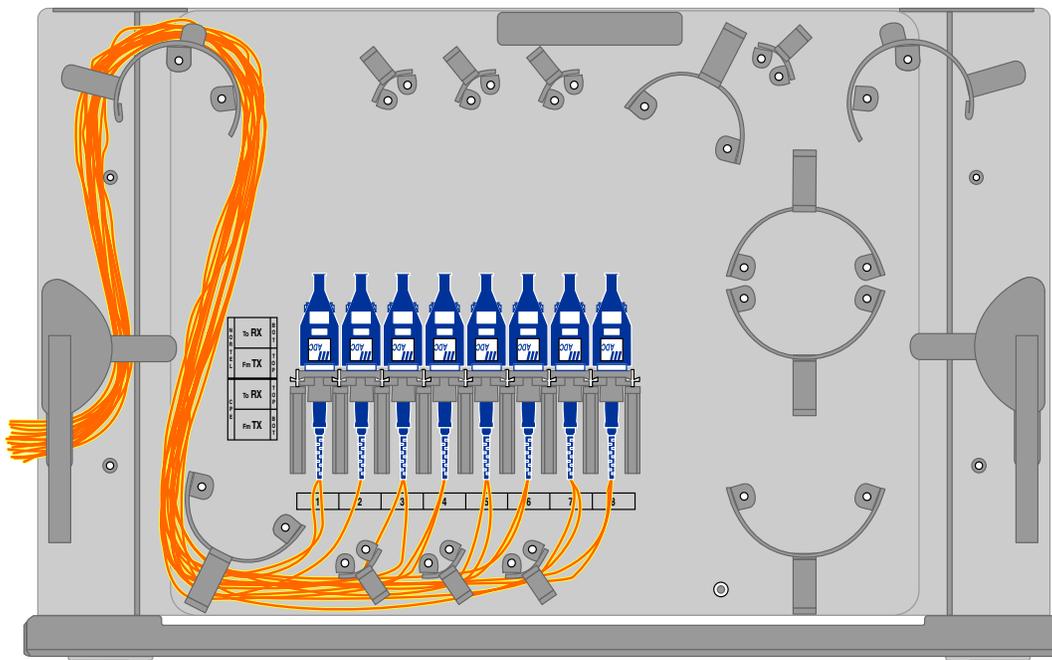


Figure 8-39
Routing subtending optical fibers (in the 16-port patch panel)

OM0250p



Note: Figure 8-40 on page 8-78, Figure 8-41 on page 8-78, and Figure 8-42 on page 8-79 show a fully fibered 20-port patch panel for the Muxponder 10 Gbit/s GbE/FC VCAT circuit pack. For a list of other circuit packs that can use the 20-port patch panel and which specific ports they use, see Table 8-14.

Table 8-14
Circuit packs that use the 20-port patch panel

Circuit pack	Ports 1-4 or 5-8	Ports 1-8	Ports 1-10
OCI SRM	Yes	–	–
OCI SRM SONET/SDH	Yes	–	–
OCI SRM ESCON	–	Yes	–
Muxponder 10 Gbit/s GbE/FC	–	Yes	–
Muxponder 10 Gbit/s GbE/FC VCAT	–	–	Yes
Note: You must use the 20-port patch panel with the Muxponder 10 Gbit/s GbE/FC VCAT circuit pack. For the rest of the circuit packs listed in this table you can use either the 16-port patch panel or the 20-port patch panel.			

Figure 8-40
Routing patch cords from east circuit pack (in a 20-port patch panel)

OM2833p

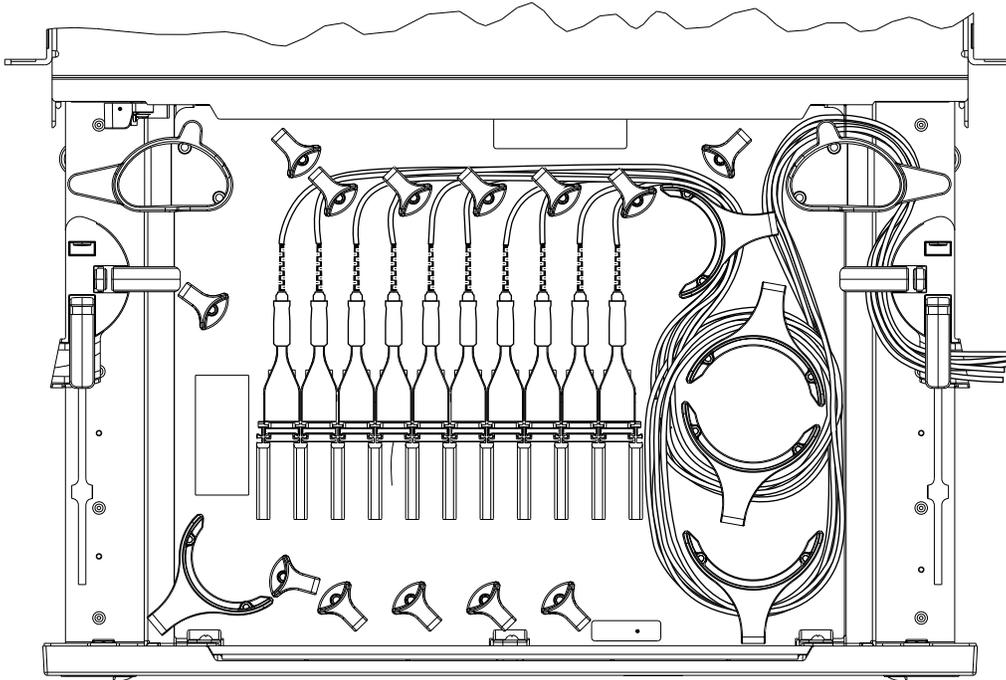


Figure 8-41
Routing patch cords from west circuit packs (in a 20-port patch panel)

OM2834p

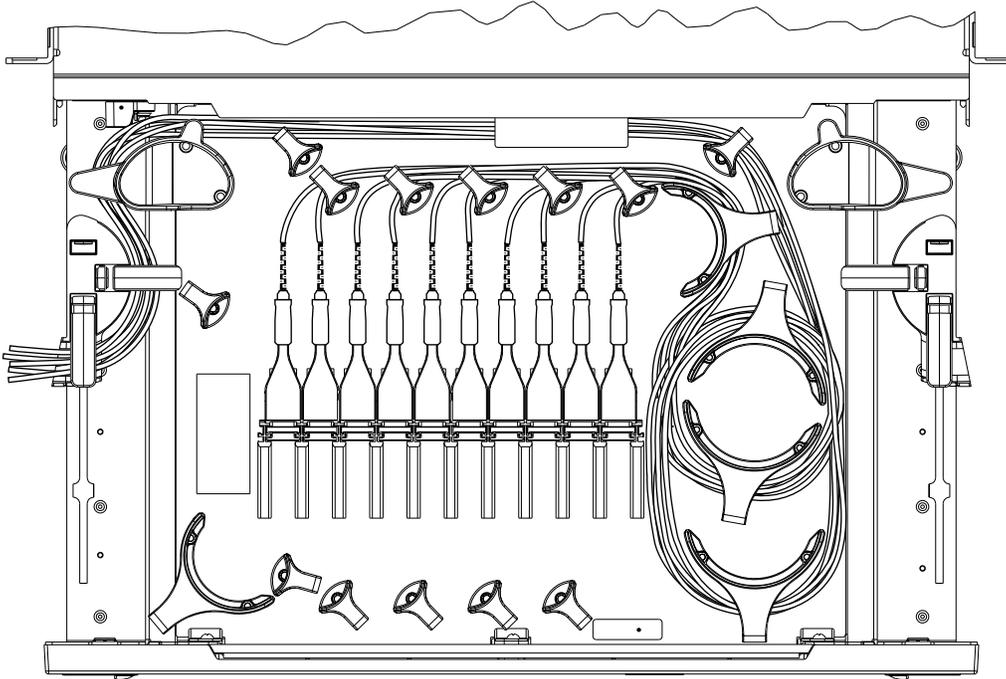
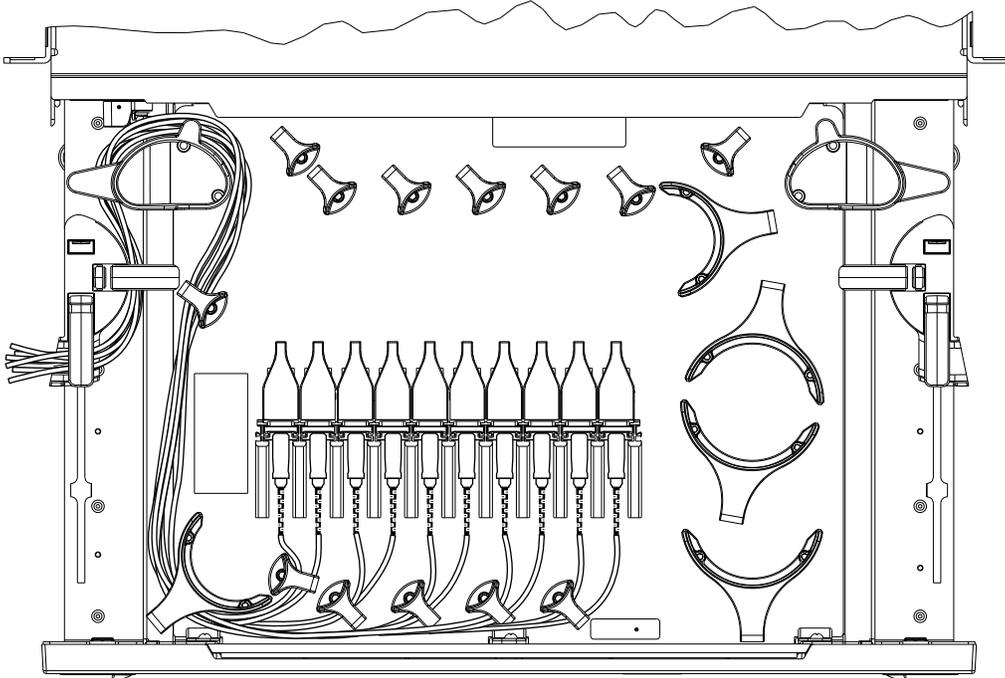


Figure 8-42
Routing subtending optical fibers (in a 20-port patch panel)

OM2882p



Procedure 8-15

Routing fibers for the OMX 4CH CWDM or the OMX 4CH CWDM with dual taps

Follow this procedure to route the optical fibers within the OMX 4CH CWDM (NT0H33JA/KA) or OMX 4CH CWDM with dual taps (NT0H33JB/KB). Consult your system diagram for site-specific details.

Note: The term “OMX 4CH CWDM” may not be used as a label on the front of the tray. The tray may be shipped with the label “OMX 4 CH 800 GHz <Band/Direction>”, where <Band/Direction> is “C-Band East”, “C-Band West”, “L-Band East”, or “L-Band West”.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer’s responsibility to provide fiber management. When the customer’s fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER

Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

—continued—

 Procedure 8-15 (continued)

Routing fibers for the OMX 4CH CWDM or the OMX 4CH CWDM with dual taps


CAUTION
Possible risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any equipment drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the equipment drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the equipment drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the equipment drawer is opened.

Requirements

- Make sure the OMX 4CH CWDM (NT0H33JA or NT0H33KA) is installed. For installation information, see [Procedure 4-15 on page 4-77](#).
- Make sure all fibers and connectors are clean.
- Make sure all fibers are labeled.

Action

Step	Action
------	--------

- | | |
|---|--|
| 1 | Open the OMX drawer by pressing and holding the two locking latches on the drawer and pull the drawer toward you until it is fully open. |
|---|--|

—continued—

Procedure 8-15 (continued)

Routing fibers for the OMX 4CH CWDM or the OMX 4CH CWDM with dual taps

Step	Action
2	<p>Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the drawer.</p> <p>If the equipment drawer has a beige non-spring-loaded locking clip Then lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</p> <p>red spring-loaded locking clip or no locking clip no action is required.</p> <p>Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3.</p>
3	<p>Route SC/FC patch cords that connect to OCLD circuit packs seated in the west plane from the left side of the west OMX drawer. See Figure 8-47 on page 8-88. Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>
4	<p>Route SC/FC patch cords that connect to OCLD circuit packs seated in the east plane from right side of the east OMX drawer. See Figure 8-48 on page 8-88. Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>

—continued—

 Procedure 8-15 (continued)

Routing fibers for the OMX 4CH CWDM or the OMX 4CH CWDM with dual taps

- 5** Route optical fibers intended for backbone or cross-over connections through the left or right side of the OMX drawer. See [Figure 8-47 on page 8-88](#) and [Figure 8-48 on page 8-88](#). Consult your system diagram for site-specific details.

Note: Optical fiber routing for these connections is more accessible from the left, because the required connectors are on the left. See [Figure 8-43 on page 8-84](#) or [Figure 8-45 on page 8-86](#), and [Figure 8-44 on page 8-85](#) or [Figure 8-46 on page 8-87](#).

- 6** Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.

- | | | |
|----------|--------------------------------------|--|
| 7 | If the equipment drawer has a | Then |
| | beige non-spring-loaded locking clip | return the beige non-spring-loaded locking clip to the original upright position |
| | red spring-loaded locking clip | push the red spring-loaded locking clip down |

- 8** Slide the equipment drawer into the shelf.
The locking latches click when the equipment drawer is in the correct position.

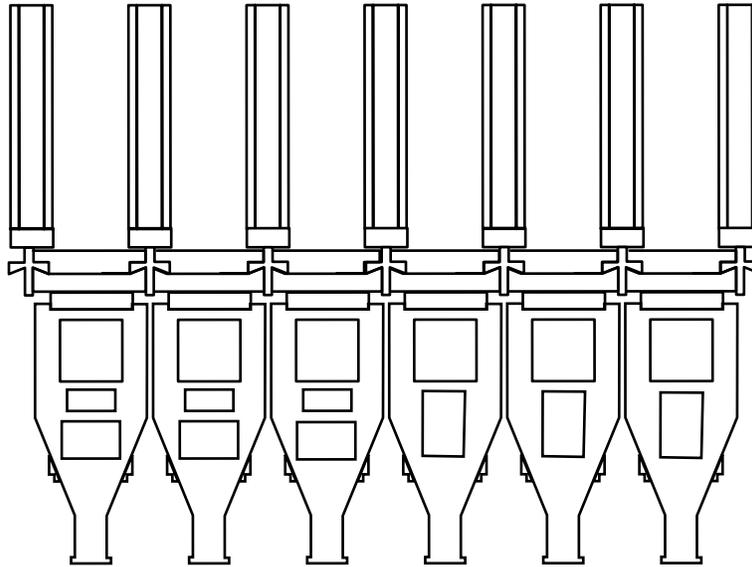
—end—

Figure 8-43
Connector labeling for the OMX 4CH CWDM (C-band)

OM0899t

Rear (Filter connections)

B O T	OTS O U T	THRU O U T	BAND 1 D R O P	BAND 2 D R O P	BAND 3 D R O P	BAND 4 D R O P	B O T
T O P	OTS I N	THRU I N	BAND 1 A D D	BAND 2 A D D	BAND 3 A D D	BAND 4 A D D	T O P



T O P	OTS I N	THRU I N	BAND 1 A D D	BAND 2 A D D	BAND 3 A D D	BAND 4 A D D	T O P
B O T	OTS O U T	THRU O U T	BAND 1 D R O P	BAND 2 D R O P	BAND 3 D R O P	BAND 4 D R O P	B O T

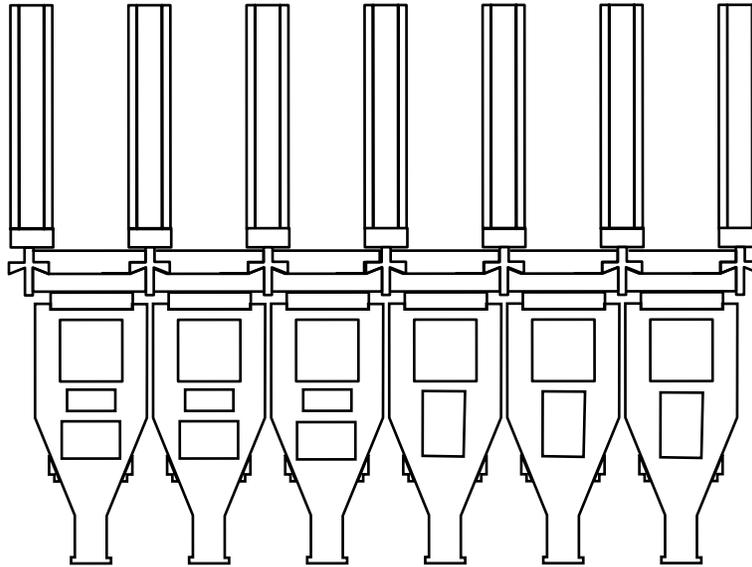
Front (External connections)

Figure 8-44
Connector labeling for the OMX 4CH CWDM (L-band)

OM0900t

Rear (Filter connections)

B O T	OTS O U T	THRU O U T	BAND 5 D R O P	BAND 6 D R O P	BAND 7 D R O P	BAND 8 D R O P	B O T
T O P	OTS I N	THRU I N	BAND 5 A D D	BAND 6 A D D	BAND 7 A D D	BAND 8 A D D	T O P



T O P	OTS I N	THRU I N	BAND 5 A D D	BAND 6 A D D	BAND 7 A D D	BAND 8 A D D	T O P
B O T	OTS O U T	THRU O U T	BAND 5 D R O P	BAND 6 D R O P	BAND 7 D R O P	BAND 8 D R O P	B O T

Front (External connections)

Figure 8-45
Connector labeling for the OMX 4CH CWDM with dual taps (C-band)

OM2819t

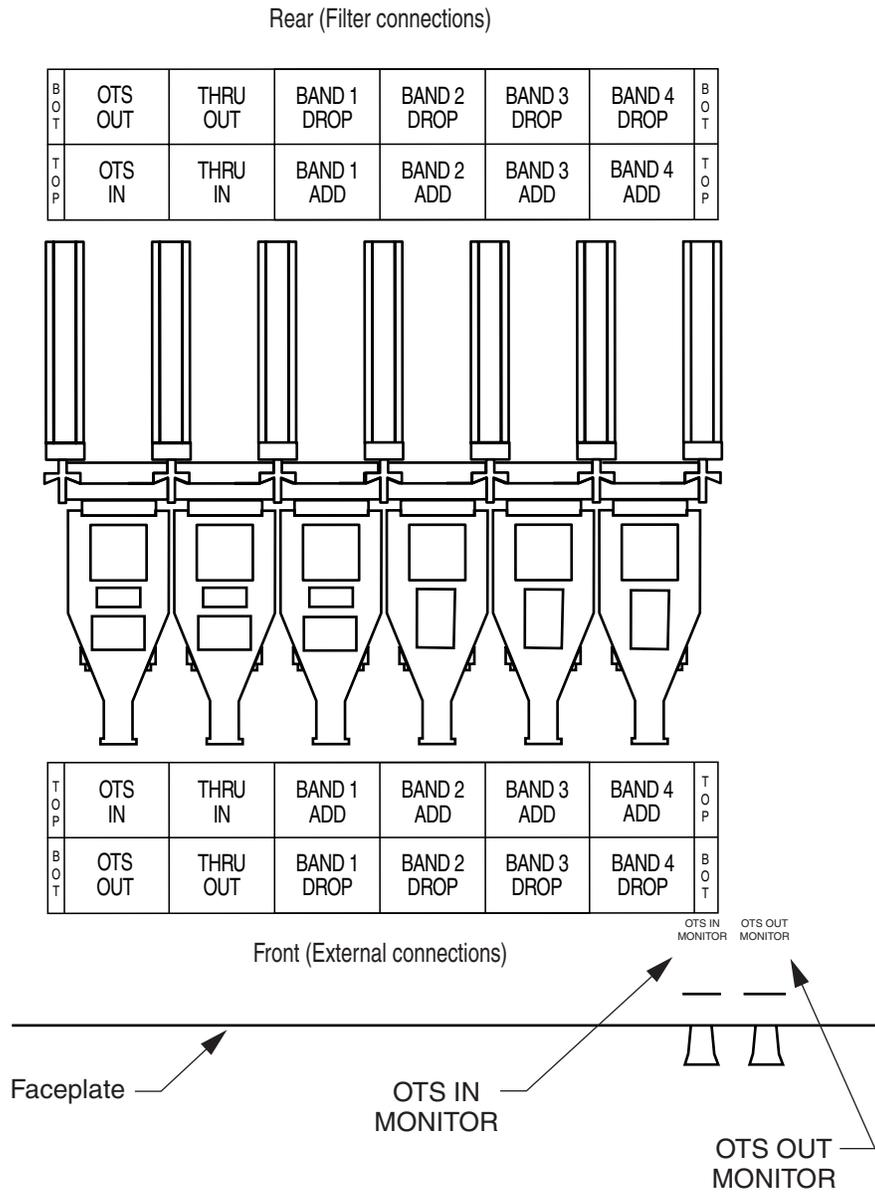


Figure 8-46
Connector labeling for the OMX 4CH CWDM with dual taps (L-band)

OM2818t

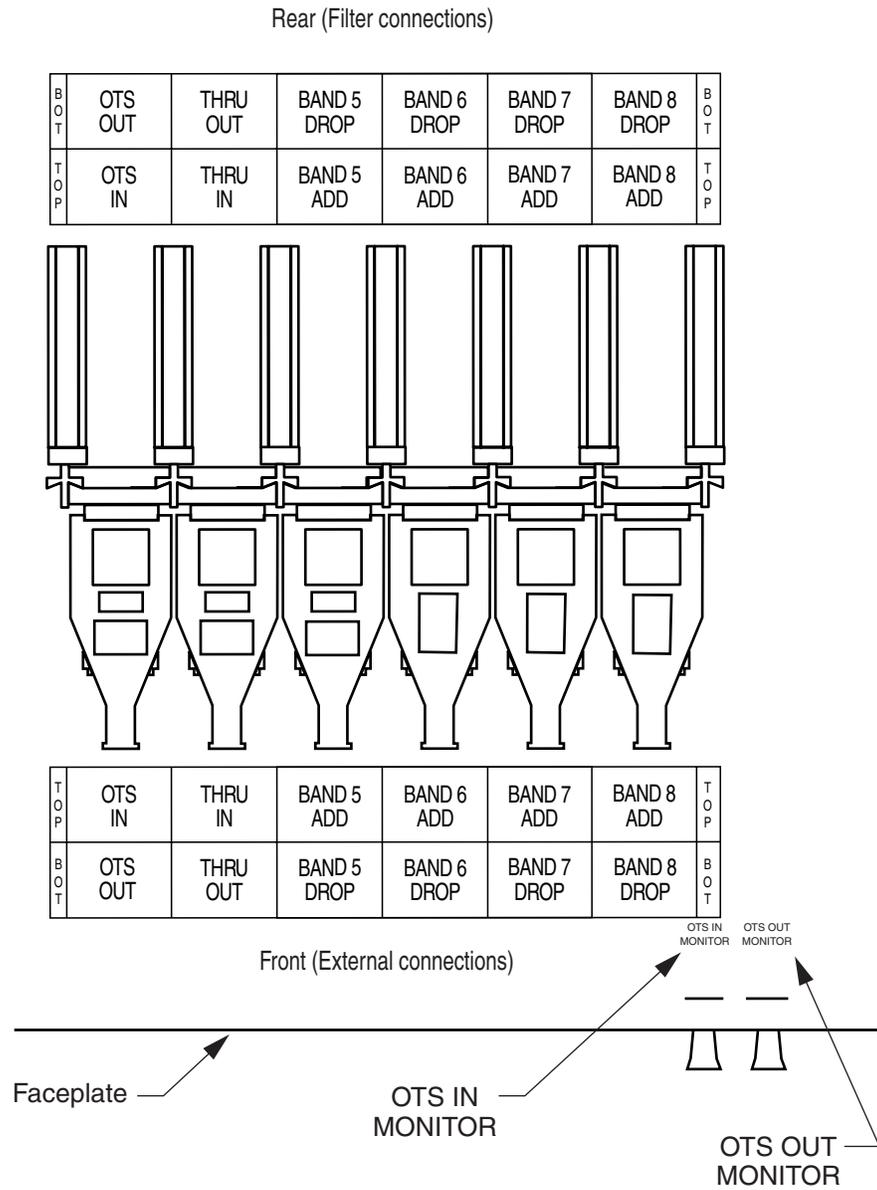
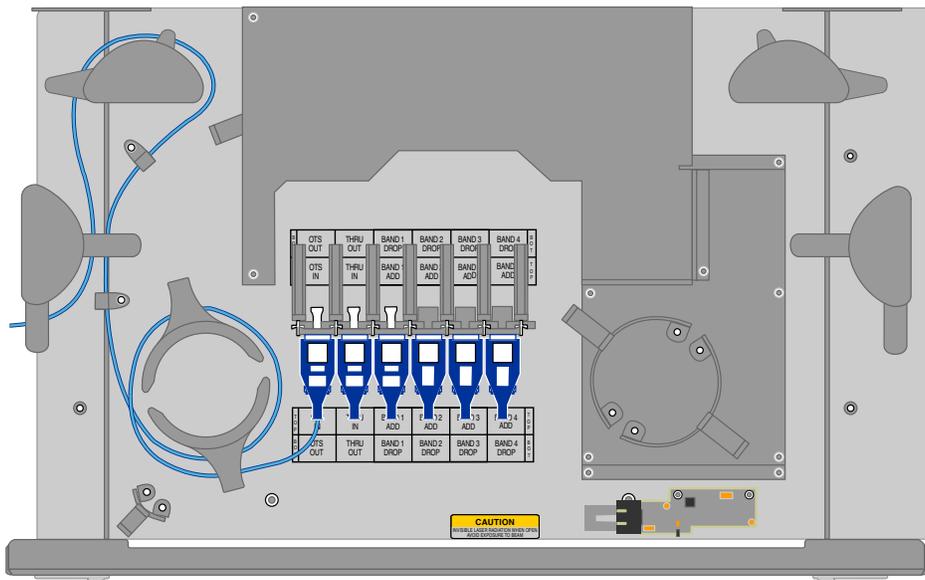


Figure 8-47
Patch cord routing from the left (OMX 4CH CWDM)

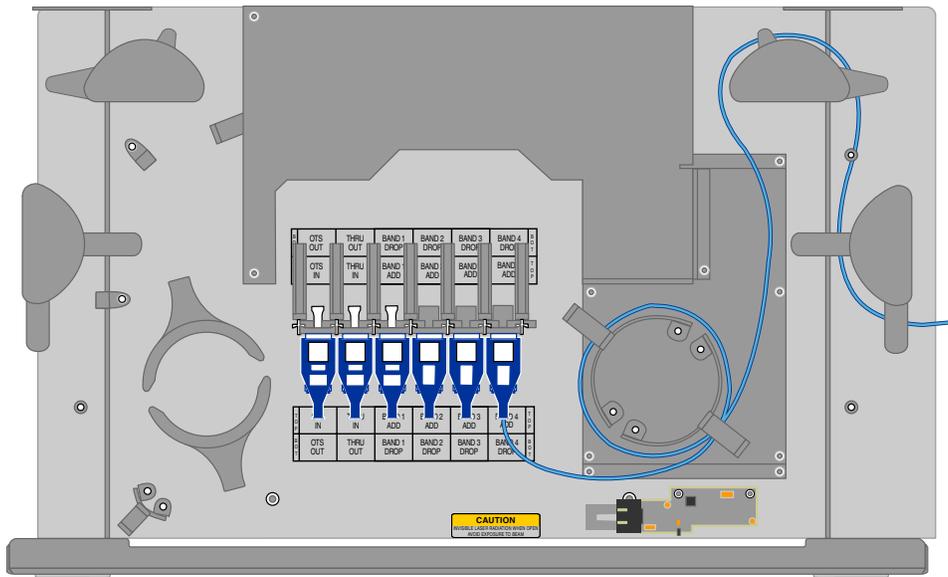
OM0995p



Note: The patch cord routing for the OMX 4CH CWDM with dual taps is the same as shown in [Figure 8-47](#).

Figure 8-48
Patch cord routing from the right (OMX 4CH CWDM)

OM0996p



Note: The patch cord routing for the OMX 4CH CWDM with dual taps is the same as shown in [Figure 8-48](#).

Procedure 8-16

Routing fibers for the OMX 4CH ITU CWDM or OMX 8CH ITU CWDM

Follow this procedure to route the optical fibers within the OMX 4CH ITU CWDM (NT0H33AA) or OMX 8CH ITU CWDM (NT0H33BA). Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER

Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$. Use only viewing instruments with proper optical attenuation.



CAUTION

Possible risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 8-16 (continued)

Routing fibers for the OMX 4CH ITU CWDM or OMX 8CH ITU CWDM

Requirements

- Make sure the OMX 4CH ITU CWDM (NT0H33AA) or OMX 8CH ITU CWDM (NT0H33BA) is installed. For installation information, see [Procedure 4-15 on page 4-77](#).
- Make sure all fibers and connectors are clean.
- Make sure all fibers are labeled.

Action

Step	Action
1	Open the OMX drawer by pressing and holding the two locking latches on the drawer and pull the drawer toward you until it is fully open.
2	Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the drawer. If the equipment drawer has a Then beige non-spring-loaded locking clip lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 . red spring-loaded locking clip or no locking clip no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .

—continued—

Procedure 8-16 (continued)

Routing fibers for the OMX 4CH ITU CWDM or OMX 8CH ITU CWDM

Step	Action						
3	<p>Route SC/FC patch cords that connect to OCLD circuit packs seated in the west plane from the left side of the west OMX drawer. See Figure 8-51 on page 8-94 (OMX 4CH ITU CWDM) or Figure 8-52 on page 8-94 (OMX 8CH ITU CWDM). Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						
4	<p>Route SC/FC patch cords that connect to OCLD circuit packs seated in the east plane from right side of the east OMX drawer. See Figure 8-51 on page 8-94 (OMX 4CH ITU CWDM) or Figure 8-52 on page 8-94 (OMX 8CH ITU CWDM). Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						
5	<p>Route optical fibers intended for backbone or cross-over connections through the left or right side of the OMX drawer. See Figure 8-51 on page 8-94 (OMX 4CH ITU CWDM) or Figure 8-52 on page 8-94 (OMX 8CH ITU CWDM). Consult your system diagram for site-specific details.</p> <p>Note: Optical fiber routing for these connections is more accessible from the left, because the required connectors are on the left. See Figure 8-49 on page 8-92, and Figure 8-50 on page 8-93.</p>						
6	Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.						
7	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If the equipment drawer has a</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>beige non-spring-loaded locking clip</td> <td>return the beige non-spring-loaded locking clip to the original upright position</td> </tr> <tr> <td>red spring-loaded locking clip</td> <td>push the red spring-loaded locking clip down</td> </tr> </tbody> </table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position	red spring-loaded locking clip	push the red spring-loaded locking clip down
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position						
red spring-loaded locking clip	push the red spring-loaded locking clip down						
8	<p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p>						

—end—

Figure 8-49
Connector labeling for the OMX 4CH ITU CWDM

OM1956t

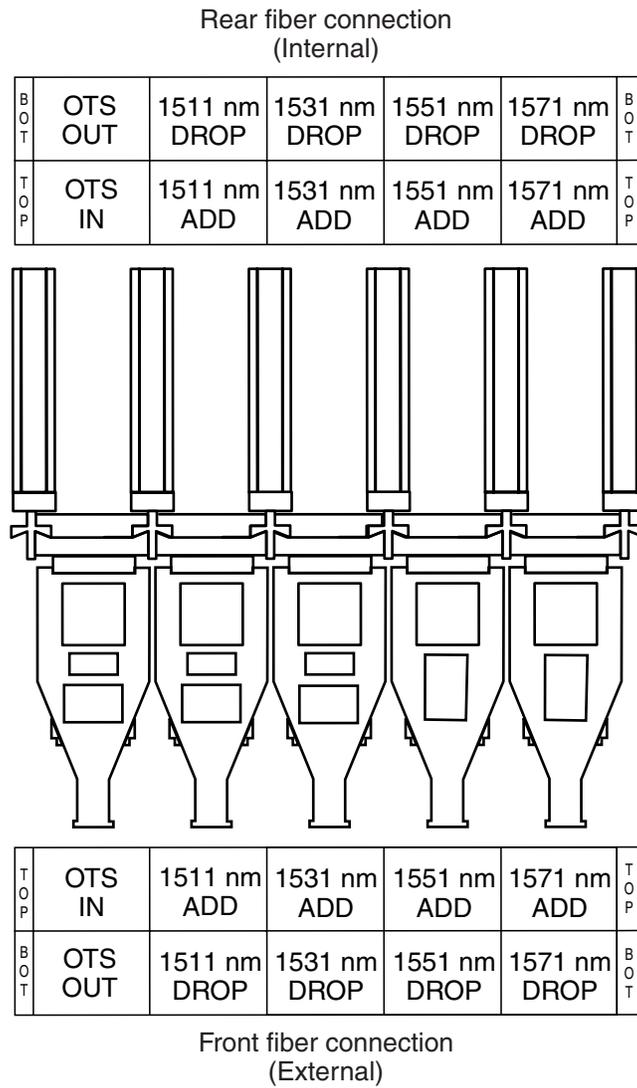


Figure 8-50
Connector labeling for the OMX 8CH ITU CWDW (L-band)

OM1957p

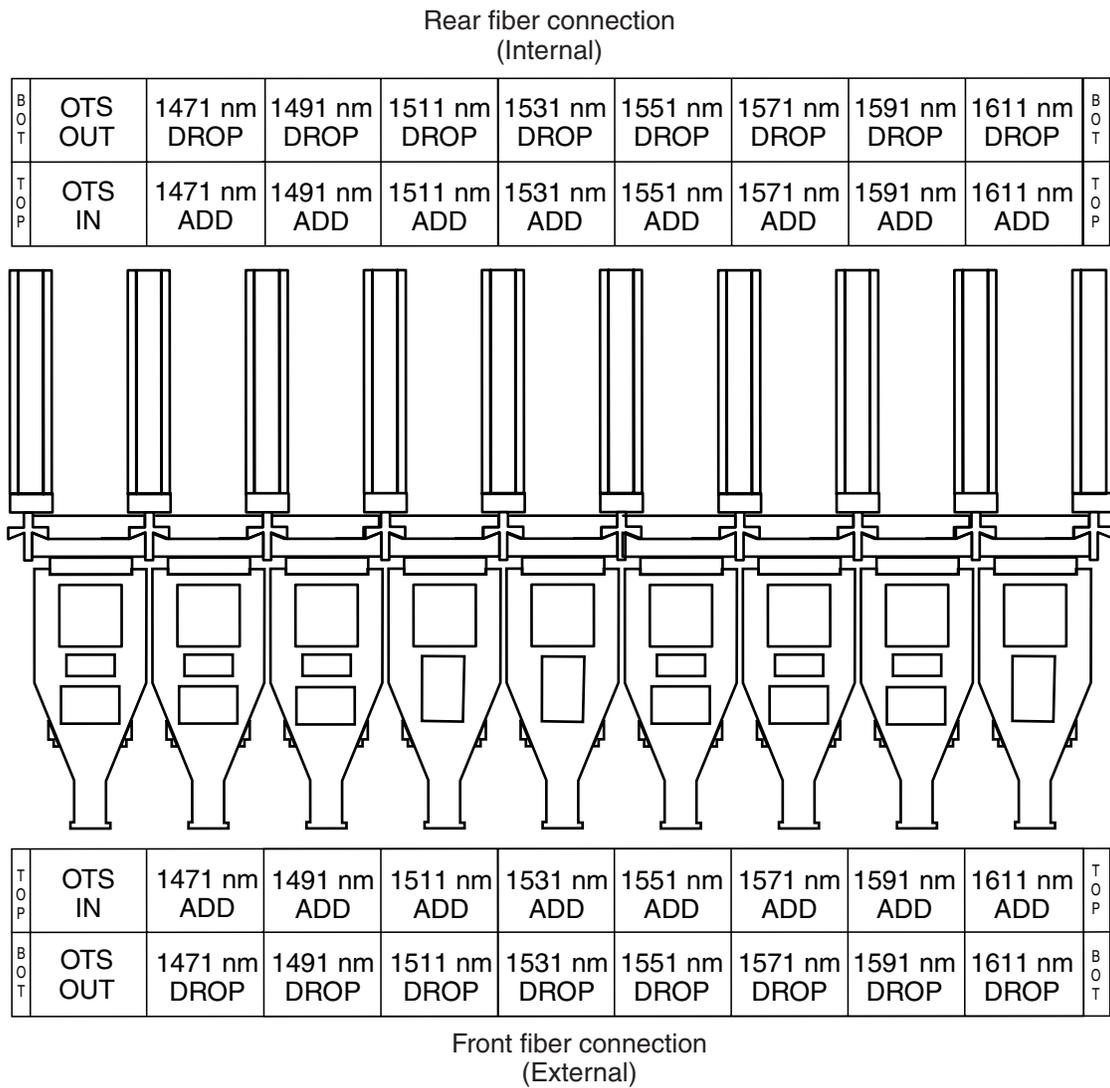


Figure 8-51
Patch cord routing - OMX 4CH ITU CWDM (left and right side)

OM2138t

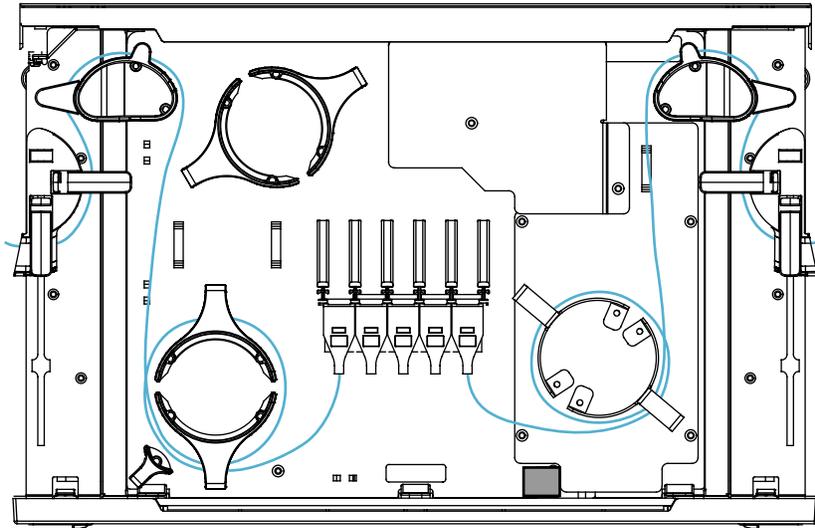
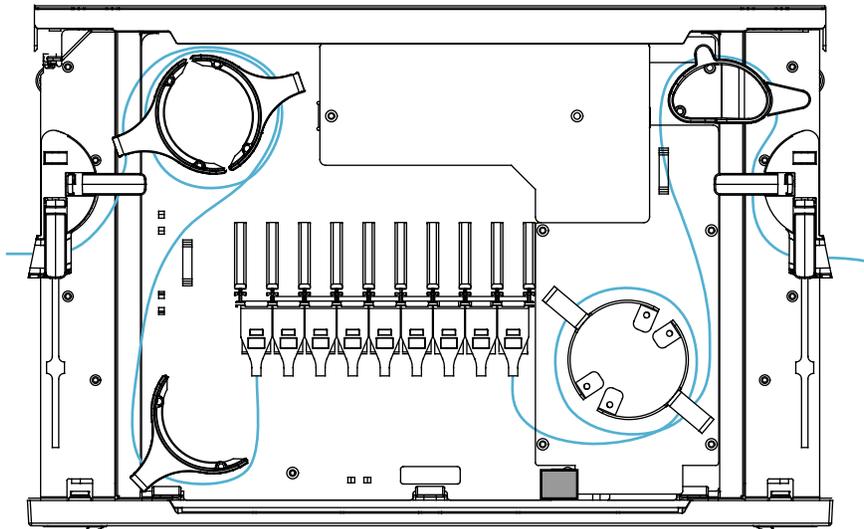


Figure 8-52
Patch cord routing - OMX 8CH ITU CWDM (left and right side)

OM2139t



Procedure 8-17

Routing fibers for the OMX 1CH OADM ITU CWDM or the OMX 4CH OADM ITU CWDM

Follow this procedure to route the optical fibers within the OMX 1CH OADM ITU CWDM (NTPM34AA-HA in single tray or dual tray drawer assemblies) or OMX 4CH OADM ITU CWDM (NTPM34JA/KA). Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12 inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER

Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$. Use only viewing instruments with proper optical attenuation.



CAUTION

Possible risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 8-17 (continued)

Routing fibers for the OMX 1CH OADM ITU CWDM or the OMX 4CH OADM ITU CWDM

Requirements

- Make sure that the OMX 1CH OADM ITU CWDM (NTPM34AA-HA in single tray or dual tray assembly) or OMX 4CH OADM ITU CWDM (NTPM34JA/KA) is installed. For installation information, see [Procedure 4-15 on page 4-77](#).
- Make sure that all fibers and connectors are clean.
- Make sure that all fibers are labeled.

Action

Step	Action		
1	Open the OMX drawer by pressing and holding the two locking latches on the drawer and pulling the drawer toward you until it is fully open.		
2	<p>Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the drawer.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>If the equipment drawer has a</p> <hr/> <p>beige non-spring-loaded locking clip</p> <p>red spring-loaded locking clip or no locking clip</p> </td> <td style="width: 50%; vertical-align: top;"> <p>Then</p> <hr/> <p>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</p> <p>no action is required.</p> <p>Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open.</p> <p>Go to step 3.</p> </td> </tr> </table>	<p>If the equipment drawer has a</p> <hr/> <p>beige non-spring-loaded locking clip</p> <p>red spring-loaded locking clip or no locking clip</p>	<p>Then</p> <hr/> <p>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</p> <p>no action is required.</p> <p>Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open.</p> <p>Go to step 3.</p>
<p>If the equipment drawer has a</p> <hr/> <p>beige non-spring-loaded locking clip</p> <p>red spring-loaded locking clip or no locking clip</p>	<p>Then</p> <hr/> <p>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</p> <p>no action is required.</p> <p>Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open.</p> <p>Go to step 3.</p>		
3	<p>Select the appropriate step :</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>If you are routing fibers for the</p> <hr/> <p>OMX 1CH OADM ITU CWDM</p> <p>OMX 4CH OADM ITU CWDM</p> </td> <td style="width: 50%; vertical-align: top;"> <p>Then go to</p> <hr/> <p>step 4</p> <p>step 5</p> </td> </tr> </table>	<p>If you are routing fibers for the</p> <hr/> <p>OMX 1CH OADM ITU CWDM</p> <p>OMX 4CH OADM ITU CWDM</p>	<p>Then go to</p> <hr/> <p>step 4</p> <p>step 5</p>
<p>If you are routing fibers for the</p> <hr/> <p>OMX 1CH OADM ITU CWDM</p> <p>OMX 4CH OADM ITU CWDM</p>	<p>Then go to</p> <hr/> <p>step 4</p> <p>step 5</p>		

—continued—

 Procedure 8-17 (continued)

Routing fibers for the OMX 1CH OADM ITU CWDM or the OMX 4CH OADM ITU CWDM

Step	Action
4	<p>Route SC/FC patch cords that connect to circuit packs located either in the west or east plane from the right side of the OMX drawer as illustrated in Figure 8-53 on page 8-99. Route optical SC/FC patch cords intended for backbone or cross-over connections the same way. Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p> <p>Go to step 8.</p>
5	<p>Route SC/FC patch cords that connect to circuit packs located in the west plane from the left side of the OMX drawer as illustrated in Figure 8-54 on page 8-99. Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>
6	<p>Route SC/FC patch cords that connect to circuit packs located in the east plane from the right side of the OMX drawer as illustrated in Figure 8-54 on page 8-99. Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>

—continued—

Procedure 8-17 (continued)

Routing fibers for the OMX 1CH OADM ITU CWDM or the OMX 4CH OADM ITU CWDM

Step	Action						
7	<p>Route optical fibers intended for backbone or cross-over connections through the left or right side of the OMX drawer as illustrated in Figure 8-54 on page 8-99. Consult your system diagram for site-specific details.</p> <p>Note 1: Optical fiber routing for these connections is more accessible from the left, because the required connectors are on the left. See Figure 8-55 on page 8-100 for the front fiber connector locations and names.</p> <p>Note 2: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 3: Store excess fiber slack within the tray.</p> <p>Note 4: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						
8	Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.						
9	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If the equipment drawer has a</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">beige non-spring-loaded locking clip</td> <td style="padding: 5px;">return the beige non-spring-loaded locking clip to the original upright position</td> </tr> <tr> <td style="padding: 5px;">red spring-loaded locking clip</td> <td style="padding: 5px;">push the red spring-loaded locking clip down</td> </tr> </tbody> </table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position	red spring-loaded locking clip	push the red spring-loaded locking clip down
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position						
red spring-loaded locking clip	push the red spring-loaded locking clip down						
10	<p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p>						

—end—

Figure 8-53
Routing fiber for the OMX 1CH OADM ITU CWDM

OM2701t.jpg

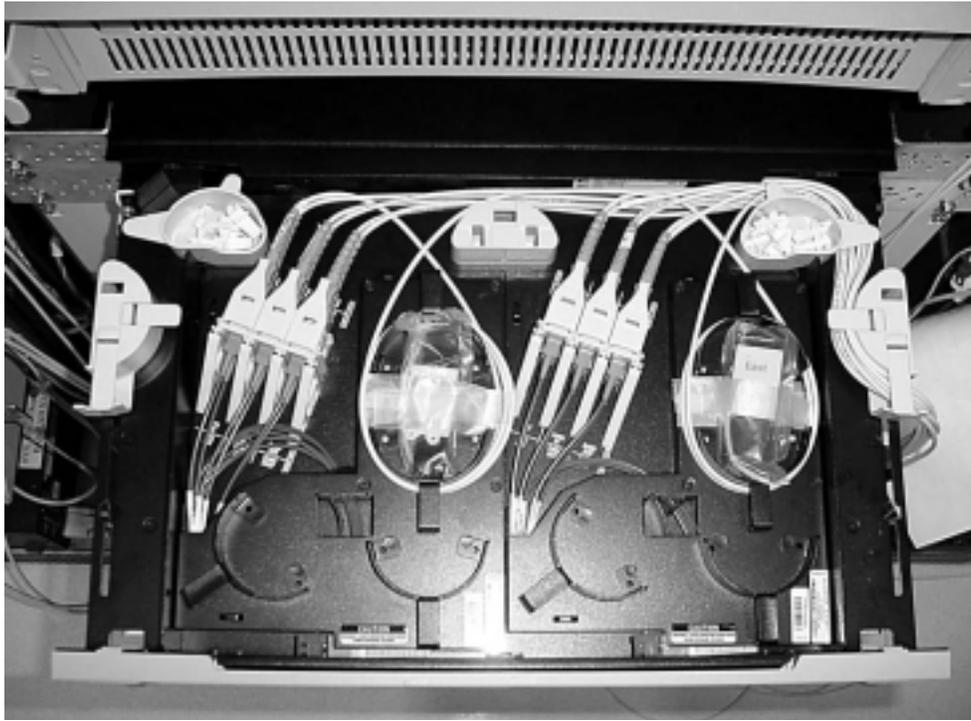


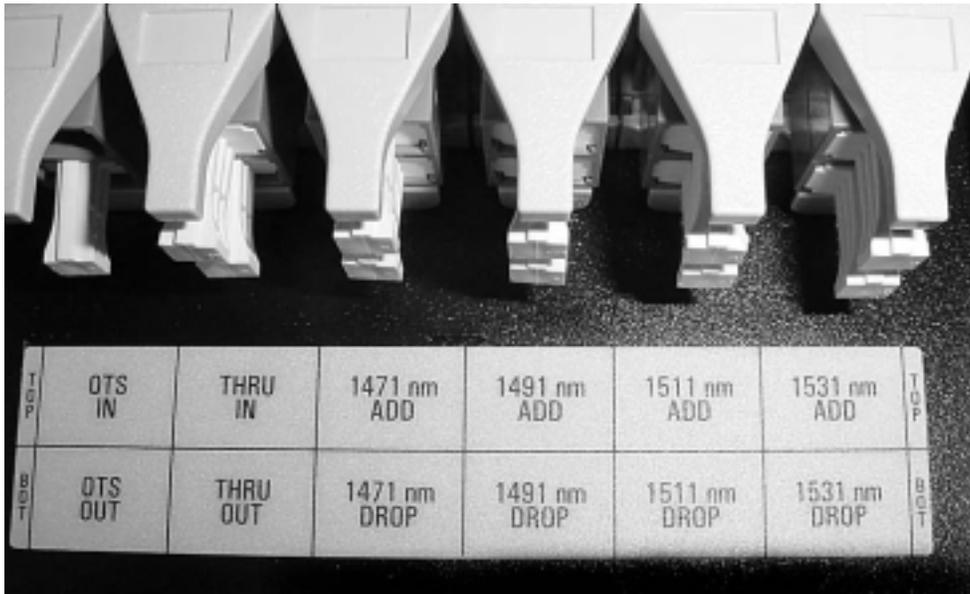
Figure 8-54
Routing fiber for the OMX 4CH OADM ITU CWDM (left and right side)

OM2702.jpg



Figure 8-55
Front fiber connectors in the OMX 4CH OADM ITU CWDM (NTPM34JA)

OM2700t.jpg



Procedure 8-18

Routing fiber for the Optical Trunk Switch

Follow this procedure to route optical fibers for the Optical Trunk Switch (OTS).

No fiber management devices are provided on the OTS. However, some fibering guidelines are provided in this procedure to accommodate the optical connector orientation on the OTS.

When installing the Optical Metro 5200 shelves and equipment into a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fiber.

Precautions

**DANGER****Invisible laser radiation**

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

**CAUTION****Risk of equipment damage**

Make sure that all connectors are adequately cleaned before you make any fiber connection.

—continued—

Procedure 8-18 (continued)

Routing fiber for the Optical Trunk Switch



CAUTION

Observe minimum bend radius

Observe the minimum bend radius of patch cords when routing optical fiber.



CAUTION

Label all patch cords clearly

Label all fiber-optic patch cords with the correct information.

Fiber routing guidelines for the OTS

Guideline	Detail
1	Route optical fibers to the left of the OTS, since the optical connectors are oriented on the left.
2	Use curly locks or Velcro cable ties to bundle the fibers exiting the OTS.
3	Use the vertical fiber management brackets on the side of the Optical Metro 5200 shelf to route the fibers to their destination, or use the fiber management devices provided by the customer (split flex tubing recommended).

—end—

Procedure 8-19

Routing fibers for the Enhanced Trunk Switch

Follow this procedure to route optical fibers for the Enhanced Trunk Switch (ETS).

No fiber management devices are provided on the ETS. However, some fibering guidelines are provided in this procedure to accommodate the optical connector orientation on the ETS.

When installing the Optical Metro 5200 shelves and equipment into a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

Precautions

**DANGER****Invisible laser radiation**

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.

**CAUTION****Risk of equipment damage**

Make sure that all connectors are adequately cleaned before you make any fiber connection.

—continued—

Procedure 8-19 (continued)

Routing fibers for the Enhanced Trunk Switch



CAUTION

Observe minimum bend radius

Observe the minimum bend radius of patch cords when routing optical fiber.



CAUTION

Label all patch cords clearly

Label all fiber-optic patch cords with the correct information.

Fiber routing guidelines for the ETS

Guideline	Detail
1	Route optical fibers to the right of the ETS, since the optical connectors are oriented on the right.
2	Use curly locks or Velcro cable ties to bundle the fibers exiting the ETS shelf area.
3	Use the vertical fiber management brackets on the side of the Optical Metro 5200 shelf to route the fibers to their destination, or use the fiber management devices provided by the customer (split flex tubing recommended).

—end—

Procedure 8-20

Routing fibers for the PBE

Follow this procedure to route the optical fibers within the PBE, and through the PBE to the fiber management trough below the card cage. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER

Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.



CAUTION

Possible risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

 Procedure 8-20 (continued)
Routing fibers for the PBE

Requirements

- Make sure all fibers and connectors are clean (see [Chapter 9 “Cleaning connectors”](#))
- Make sure all fibers are labeled (see [Procedure 8-1](#))

When you complete this procedure the optical fibers are routed within the PBE tray, and from the PBE tray to the circuit pack cage. For connection procedures, see the Connecting components chapter of *Connection Procedures*, 323-1701-221.

Action

Step	Action						
1	Open the PBE drawer by pressing and holding the two locking latches on the equipment drawer and pull the equipment drawer toward you until it is fully open.						
2	<p>Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the drawer.</p> <table border="0"> <tr> <td style="vertical-align: top;">If the equipment drawer has a</td> <td style="vertical-align: top;">Then</td> </tr> <tr> <td style="vertical-align: top;">beige non-spring-loaded locking clip</td> <td style="vertical-align: top;">lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</td> </tr> <tr> <td style="vertical-align: top;">red spring-loaded locking clip or no locking clip</td> <td style="vertical-align: top;">no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3.</td> </tr> </table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 .	red spring-loaded locking clip or no locking clip	no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 .						
red spring-loaded locking clip or no locking clip	no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .						

—continued—

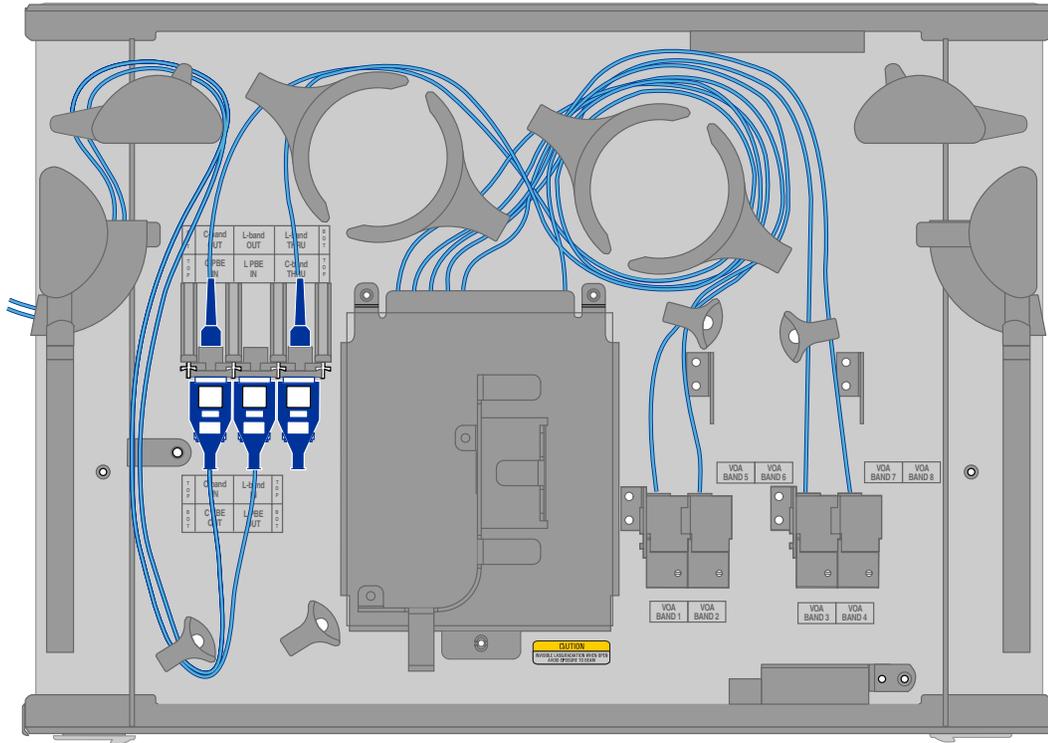
Procedure 8-20 (continued)
Routing fibers for the PBE

Step	Action						
3	<p>Route the fibers entering or exiting the tray through the opening on the left side according to Figure 8-56. Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						
4	To route fibers to the circuit packs, follow Procedure 8-5 .						
5	<p>Route the fibers within the drawer according to Figure 8-56. Consult your system diagram for site-specific details.</p> <p>Note: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p>						
6	Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.						
7	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If the equipment drawer has a</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">beige non-spring-loaded locking clip</td> <td style="padding: 5px;">return the beige non-spring-loaded locking clip to the original upright position</td> </tr> <tr> <td style="padding: 5px;">red spring-loaded locking clip</td> <td style="padding: 5px;">push the red spring-loaded locking clip down</td> </tr> </tbody> </table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position	red spring-loaded locking clip	push the red spring-loaded locking clip down
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position						
red spring-loaded locking clip	push the red spring-loaded locking clip down						
8	<p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p>						

—end—

Figure 8-56
PBE drawer

OM0908p



Procedure 8-21

Routing fibers for the 1310 nm Splitter/Coupler

Follow this procedure to route the optical fibers within the 1310 nm Splitter/Coupler (NT0H57JB), and through the 1310 nm Splitter/Coupler to the fiber management trough below the card cage. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER **Invisible laser radiation**

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.



CAUTION **Possible risk of damage to equipment and fiber**

Make sure that the bulkhead connectors are lowered and snapped into place before closing any drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 8-21 (continued)

Routing fibers for the 1310 nm Splitter/Coupler

Requirements

- Make sure all fibers and connectors are clean (see [Chapter 9 “Cleaning connectors”](#))
- Make sure all fibers are labeled (see [Procedure 8-1](#))

When you complete this procedure the optical fibers are routed within the 1310 nm Splitter/Coupler tray, and from the 1310 nm Splitter/Coupler tray to the circuit pack cage. For connection procedures, see the Connecting components chapter of *Connection Procedures*, 323-1701-221.

Action

Step	Action		
1	Open the 1310 nm Splitter/Coupler drawer by pressing and holding the two locking latches on the drawer and pull the drawer toward you until it is fully open.		
2	<p>Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the drawer.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>If the equipment drawer has a</p> <p>beige non-spring-loaded locking clip</p> <p>red spring-loaded locking clip or no locking clip</p> </td> <td style="width: 50%; vertical-align: top;"> <p>Then</p> <hr/> <p>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</p> <p>no action is required.</p> <p>Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open.</p> <p>Go to step 3.</p> </td> </tr> </table>	<p>If the equipment drawer has a</p> <p>beige non-spring-loaded locking clip</p> <p>red spring-loaded locking clip or no locking clip</p>	<p>Then</p> <hr/> <p>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</p> <p>no action is required.</p> <p>Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open.</p> <p>Go to step 3.</p>
<p>If the equipment drawer has a</p> <p>beige non-spring-loaded locking clip</p> <p>red spring-loaded locking clip or no locking clip</p>	<p>Then</p> <hr/> <p>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</p> <p>no action is required.</p> <p>Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open.</p> <p>Go to step 3.</p>		

—continued—

 Procedure 8-21 (continued)

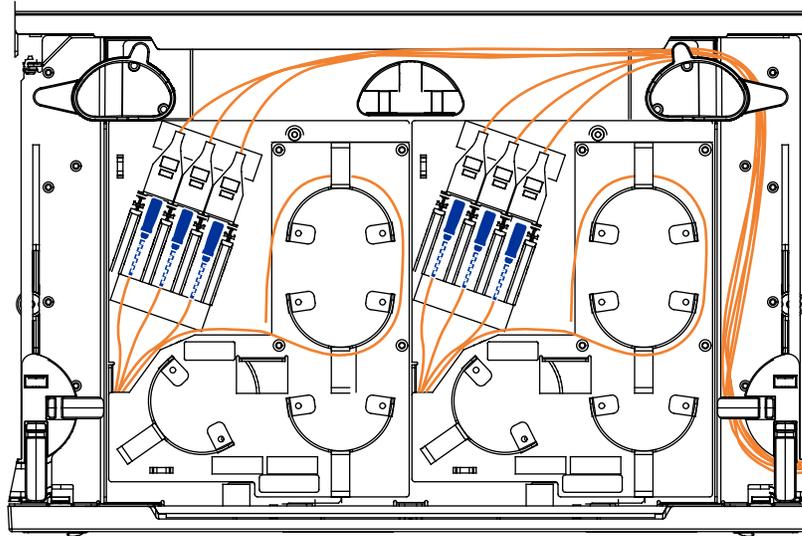
Routing fibers for the 1310 nm Splitter/Coupler

Step	Action						
3	<p>Route the fibers entering or exiting the tray through the opening on the left side according to Figure 8-57 on page 8-112. Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						
4	<p>Route the fibers within the drawer according to Figure 8-57 on page 8-112. Consult your system diagram for site-specific details.</p> <p>Note: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p>						
5	Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.						
6	<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">If the equipment drawer has a</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td style="border-top: 1px solid black;">beige non-spring-loaded locking clip</td> <td style="border-top: 1px solid black;">return the beige non-spring-loaded locking clip to the original upright position</td> </tr> <tr> <td>red spring-loaded locking clip</td> <td>push the red spring-loaded locking clip down</td> </tr> </tbody> </table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position	red spring-loaded locking clip	push the red spring-loaded locking clip down
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position						
red spring-loaded locking clip	push the red spring-loaded locking clip down						
7	<p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p>						

—end—

Figure 8-57
1310 nm Splitter/Coupler drawer

OM2127t



Procedure 8-22

Routing fibers for the C&L Splitter/Coupler

Follow this procedure to route the optical fibers within the C&L Splitter/Coupler (NT0H31AF), and through the C&L Splitter/Coupler to the fiber management trough below the card cage. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER
Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.



CAUTION
Possible risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 8-22 (continued)

Routing fibers for the C&L Splitter/Coupler

Requirements

- Make sure all fibers and connectors are clean (see [Chapter 9 “Cleaning connectors”](#))
- Make sure all fibers are labeled (see [Procedure 8-1](#))

When you complete this procedure the optical fibers are routed within the C&L Splitter/Coupler tray, and from the C&L Splitter/Coupler tray to the circuit pack cage. For connection procedures, see the Connecting components chapter of *Connection Procedures*, 323-1701-221.

Action

Step	Action		
1	Open the C&L Splitter/Coupler drawer by pressing and holding the two locking latches on the drawer and pull the drawer toward you until it is fully open.		
2	<p>Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the drawer.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>If the equipment drawer has a</p> <p>beige non-spring-loaded locking clip</p> <p>red spring-loaded locking clip or no locking clip</p> </td> <td style="width: 50%; vertical-align: top;"> <p>Then</p> <hr/> <p>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</p> <p>no action is required.</p> <p>Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open.</p> <p>Go to step 3.</p> </td> </tr> </table>	<p>If the equipment drawer has a</p> <p>beige non-spring-loaded locking clip</p> <p>red spring-loaded locking clip or no locking clip</p>	<p>Then</p> <hr/> <p>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</p> <p>no action is required.</p> <p>Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open.</p> <p>Go to step 3.</p>
<p>If the equipment drawer has a</p> <p>beige non-spring-loaded locking clip</p> <p>red spring-loaded locking clip or no locking clip</p>	<p>Then</p> <hr/> <p>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</p> <p>no action is required.</p> <p>Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open.</p> <p>Go to step 3.</p>		

—continued—

 Procedure 8-22 (continued)

Routing fibers for the C&L Splitter/Coupler

Step	Action						
3	<p>Route the fibers entering or exiting the tray through the opening on the left side according to Figure 8-58 on page 8-116. Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						
4	<p>Route the fibers within the drawer according to Figure 8-58 on page 8-116. Consult your system diagram for site-specific details.</p> <p>Note: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p>						
5	Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.						
6	<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">If the equipment drawer has a</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td style="border-top: 1px solid black;">beige non-spring-loaded locking clip</td> <td style="border-top: 1px solid black;">return the beige non-spring-loaded locking clip to the original upright position</td> </tr> <tr> <td>red spring-loaded locking clip</td> <td>push the red spring-loaded locking clip down</td> </tr> </tbody> </table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position	red spring-loaded locking clip	push the red spring-loaded locking clip down
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position						
red spring-loaded locking clip	push the red spring-loaded locking clip down						
7	<p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p>						

—end—

Procedure 8-23

Routing fibers for the Discrete VOA

Follow this procedure to route the optical fibers within the Discrete VOA tray assembly (NT0H31AG), and through the tray assembly to the fiber management trough below the card cage. Consult your system diagram for site-specific details.

Precautions

When installing the Optical Metro 5200 shelves and equipment within a new or existing rack, it is the customer's responsibility to provide fiber management. When the customer's fiber management requirements are not specified, Nortel Networks recommends that split flex tubing be used to route and secure fibers.

If using split flex tubing to route and secure fiber-optic cables, secure the split flex tubing approximately every 12-inches (30.5 cm) to the transverse arms of the equipment rack using lacing cord or wax string.



DANGER
Invisible laser radiation

The Optical Metro 5100/5200 operates up to a Hazard Level of $k \times 3A$ (IEC 60825-2:2000) or 1M (IEC 60825-2:2004). Use only viewing instruments with proper optical attenuation.



CAUTION
Possible risk of damage to equipment and fiber

Make sure that the bulkhead connectors are lowered and snapped into place before closing any drawers. Failure to do so could cause damage to the connector unit, the fibers attached to the connector unit, or both.

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

Allow for sufficient slack in the fibers entering and exiting the drawers. If sufficient slack is not left, the fibers can become stretched and damaged when the drawer is opened.

—continued—

Procedure 8-23 (continued)

Routing fibers for the Discrete VOA

Requirements

- Make sure all fibers and connectors are clean (see [Chapter 9 “Cleaning connectors”](#))
- Make sure all fibers are labeled (see [Procedure 8-1](#))

When you complete this procedure the optical fibers are routed within the Discrete VOA tray, and from the Discrete VOA tray to the circuit pack cage. For connection procedures, see the Connecting components chapter of *Connection Procedures*, 323-1701-221.

Action

Step	Action				
1	Open the Discrete VOA drawer by pressing and holding the two locking latches on the drawer and pull the drawer toward you until it is fully open.				
2	Verify whether the equipment drawer has a locking clip. The locking clip is located in the back left corner of the drawer. If the equipment drawer Then has a <hr/> <table><tbody><tr><td>beige non-spring-loaded locking clip</td><td>lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3.</td></tr><tr><td>red spring-loaded locking clip or no locking clip</td><td>no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3.</td></tr></tbody></table>	beige non-spring-loaded locking clip	lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 .	red spring-loaded locking clip or no locking clip	no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .
beige non-spring-loaded locking clip	lock the equipment drawer open by rotating the beige non-spring-loaded locking clip counter-clockwise (Figure 8-27 on page 8-48) until it rests on the edge of the equipment drawer. Then go to step 3 .				
red spring-loaded locking clip or no locking clip	no action is required. Note: The red spring-loaded locking clip (Figure 8-28 on page 8-48) automatically clicks into place to keep the equipment drawer open. Go to step 3 .				

—continued—

 Procedure 8-23 (continued)

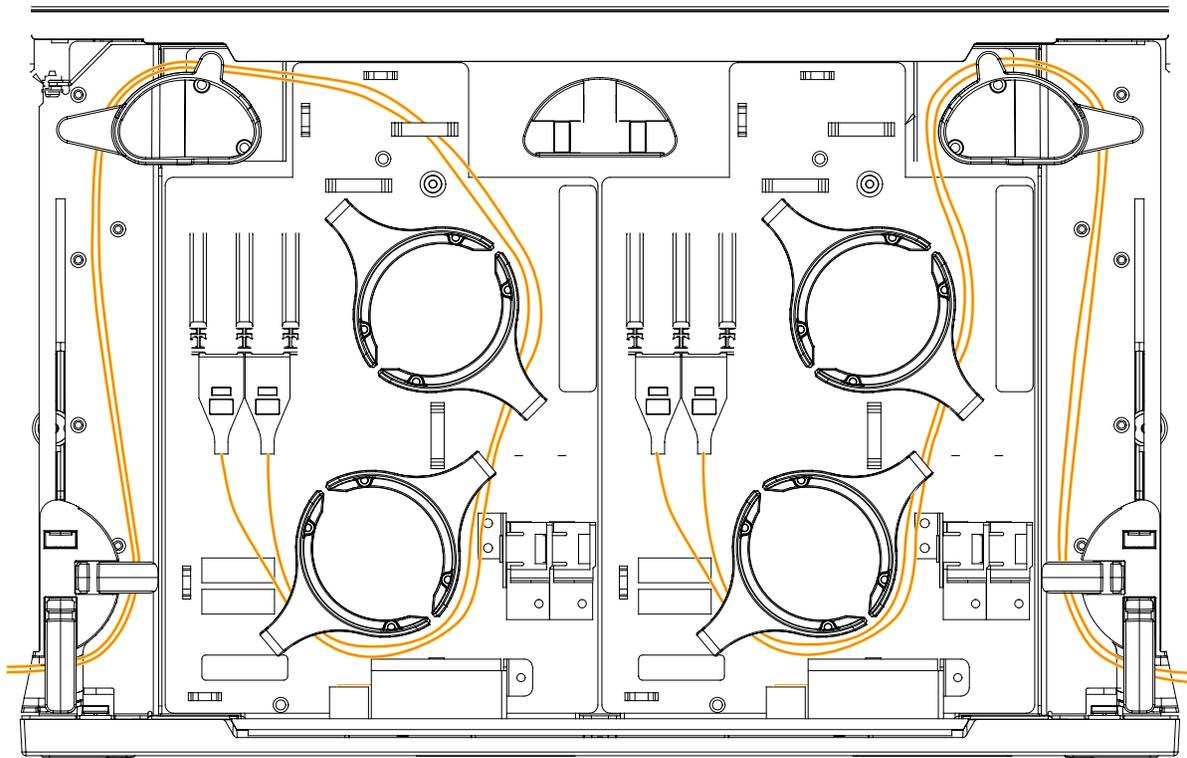
Routing fibers for the Discrete VOA

Step	Action						
3	<p>Route the fibers entering or exiting the tray through the opening on the left side or the right side, according to Figure 8-59 on page 8-120. Consult your system diagram for site-specific details.</p> <p>Note 1: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Note 2: Store excess fiber slack within the tray.</p> <p>Note 3: The fibers entering the tray can be bundled together using curly locks or Velcro cable ties.</p>						
4	<p>Route the fibers within the drawer according to Figure 8-59 on page 8-120. Consult your system diagram for site-specific details.</p> <p>Note: Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p>						
5	Use curly locks or Velcro cable ties to bundle fiber-optic cables entering and exiting the shelf.						
6	<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">If the equipment drawer has a</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td style="border-top: 1px solid black;">beige non-spring-loaded locking clip</td> <td style="border-top: 1px solid black;">return the beige non-spring-loaded locking clip to the original upright position</td> </tr> <tr> <td>red spring-loaded locking clip</td> <td>push the red spring-loaded locking clip down</td> </tr> </tbody> </table>	If the equipment drawer has a	Then	beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position	red spring-loaded locking clip	push the red spring-loaded locking clip down
If the equipment drawer has a	Then						
beige non-spring-loaded locking clip	return the beige non-spring-loaded locking clip to the original upright position						
red spring-loaded locking clip	push the red spring-loaded locking clip down						
7	<p>Slide the equipment drawer into the shelf.</p> <p><i>The locking latches click when the equipment drawer is in the correct position.</i></p>						

—end—

Figure 8-59
Discrete VOA drawer

OM2286p



Procedure 8-24

Routing fibers for a DSCM drawer

Follow these guidelines when you are routing fibers in and out of a DSCM drawer equipped with a DSCM tray. This procedure also provides guidelines on how to bundle fiber around bend radius limiters inside the DSCM drawer equipped with a DSCM tray assembly.

The fiber management guidelines for the DSCM drawer are very similar to the fiber management guidelines for the other Optical Metro 5100/5200 drawer assemblies.

Precautions

**CAUTION****Risk of insufficient fiber slack**

Make sure that the drawer from which the fiber is being routed is fully open before you begin to route the fiber around the fiber bend radius limiters. Allow sufficient slack in the fibers entering and exiting the drawers. If sufficient slack is not left, you risk stretching the fibers when the drawer is opened.

**CAUTION****Risk of fiber damage**

Do not stretch the fiber, or wrap the fiber on the fiber bend radius limiters too tightly. Otherwise you risk damaging the fiber. Always use curly locks or Velcro cable ties to bundle fibers entering and exiting a drawer. Always use curly locks or Velcro cable ties to bundle the fibers around the bend radius limiters inside a drawer equipped with tray assemblies.

**CAUTION****Risk of affecting network reliability**

Before you make connections, make sure that fiber connectors are clean. Otherwise, you risk affecting network reliability.

**CAUTION****Risk of damage to equipment and fiber**

Observe the minimum bend radius of 1.18 inches (30 mm) for the patch cords. Always use the fiber management components in the drawer to route the fiber.

—continued—

Requirements

Before you start this procedure, make sure that

- the DSCM drawer (NT0H57LA) is installed. For installation information, see [Procedure 4-15 “Installing and grounding equipment drawers”](#).
- the DSCM tray is installed in the DSCM drawer. For installation information, see [Procedure 4-20 “Installing a DSCM tray in a DSCM drawer”](#).
- all fibers and connectors are clean (see [Chapter 9 “Cleaning connectors”](#))
- all fibers are labeled (see [Procedure 8-1](#))

When you complete this procedure the optical fibers are routed from the DSCM tray inside the DSCM drawer to the side of the Optical Metro 5200 shelf. For connection procedures, see the [“Connecting components”](#) chapter of *Connection Procedures*, 323-1701-221.

—continued—

Procedure 8-24 (continued)
Routing fibers for a DSCM drawer

Guidelines for routing fiber

Guideline	Detail
1	Make sure that every fiber is labeled.
2	Route the fibers entering or exiting the tray through the opening on the right or on the left side of the drawer.
3	<p>Route the fibers coming into the drawer from the left side around the bend radius limiters on the left side of the drawer (see Figure 8-60 on page 8-124). Route the fibers coming into the drawer from the right side around the bend radius limiters on both the right and left sides of the drawer (see Figure 8-61 on page 8-125).</p> <p>Follow the bend radius rule when you route fiber. Do not exceed a 1.18-inch (30-mm) bend radius when you route fiber. Do not exceed a 3-inch (76.2-mm) bend radius when you coil or bend fibers.</p> <p>Store excess fiber slack within the tray. Always use the fiber bend radius limiters to coil excess fiber slack.</p>
4	<p>Use Curly locks or Velcro cable ties to bundle the fibers routed around the fiber bend radius limiters to avoid loose fibers inside a drawer.</p> <p>Figure 8-60 on page 8-124 illustrates how to route fibers in the DSCM drawer coming from/going to the left side opening of the drawer. Figure 8-60 shows how to bundle the fibers around bend radius limiters on the left side of a DSCM drawer using Velcro cables ties.</p> <p>Figure 8-61 on page 8-125 illustrates how to route fibers in the DSCM drawer coming from/going to the right side opening of the drawer. Figure 8-61 shows how to bundle the fibers around bend radius limiters on both the left and right sides of a DSCM drawer using Velcro cables ties.</p> <p>Note: For clarity, the photos for Figure 8-60 and Figure 8-61 were taken with the DSCM drawer on a table rather than in the rack. When you route fiber, the DSCM drawer is installed in the rack.</p>
5	Use Curly locks or Velcro cable ties to bundle the fibers entering and exiting the drawer. See Figure 8-62 on page 8-126 for an illustration of how to bundle the fibers exiting and entering a drawer using Curly Locks. See Figure 8-63 on page 8-126 for an illustration of how to bundle the fibers exiting and entering a drawer using Velcro cable ties.

—end—

Figure 8-60
Routing fibers in a DSCM drawer, entering and exiting left side of drawer (with Velcro cable ties)

OM2422p.jpg

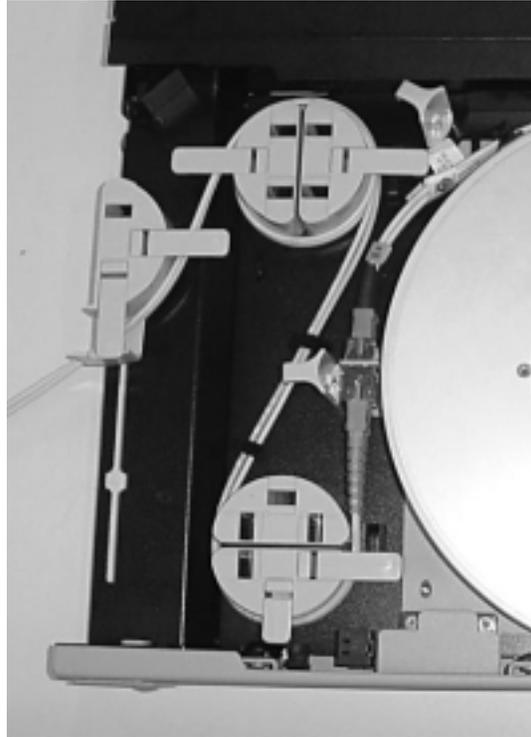


Figure 8-61
Routing fibers in a DSCM drawer, entering and exiting right side of drawer (with Velcro cable ties)

OM2423p.jpg

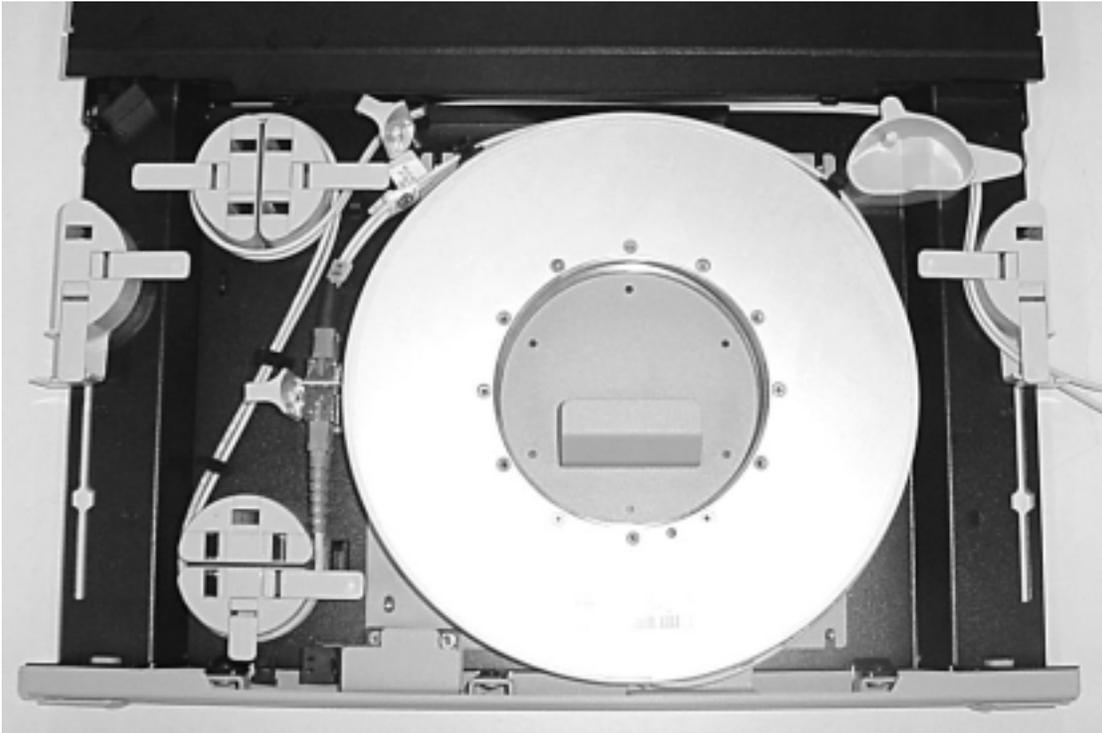


Figure 8-62
Bundling fibers entering and exiting DSCM drawer (with Curly locks)

OM2420p

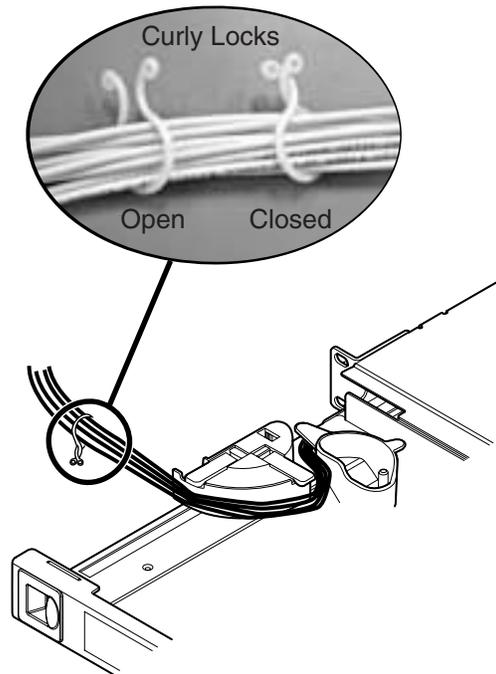
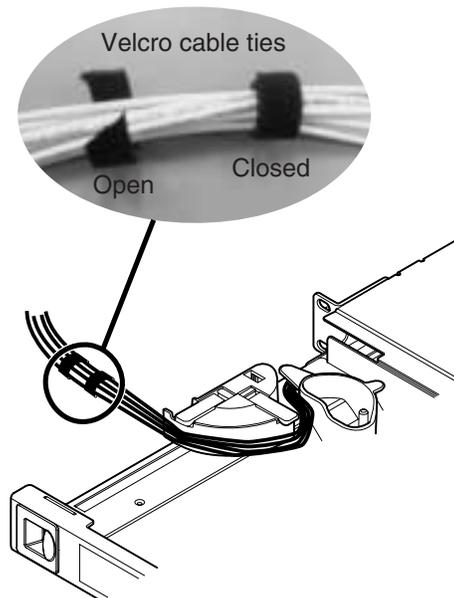


Figure 8-63
Bundling fibers entering and exiting a DSCM drawer (with Velcro cable ties)

OM2421p



Cleaning connectors

Use the procedures in this chapter to clean connectors. The performance of an optical fiber connector depends on how clean the connector and coupling are at the time of connection.

Cleaning zones

Optical connector cleaning zones for routine maintenance procedures include the ferrule cylinder and end face surfaces.

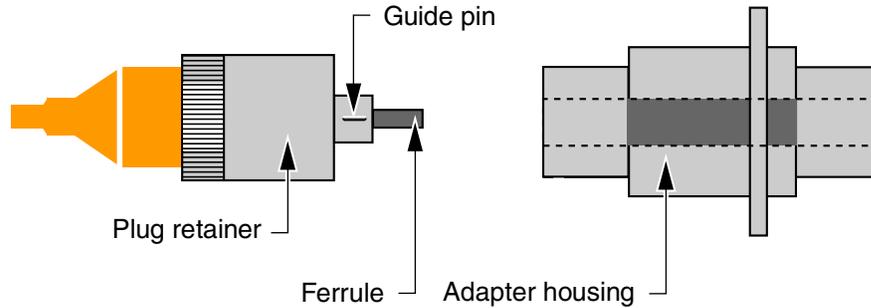
You only need to clean the circuit pack or coupler adapter housings during the initial installation, or when you suspect performance is reduced because of contamination.

Dust and dirt particles can bind to the end-face of the ferrule, especially when the optical power going through the fiber is high. If you remate dirty connectors you can damage the end-face. To correct this type of damage you require special polishing equipment and techniques beyond the scope of routine maintenance. If you discover a damaged ferrule end-face, contact Nortel Networks [Technical assistance service telephone numbers](#).

[Figure 9-1 on page 9-2](#) shows an example of a typical optical fiber connector and adapter housing. The ferrule provides the physical support for the optical fiber. The adapter housing is used to connect the two optical fibers together by aligning the two ferrules.

Figure 9-1
Typical optical fiber connector and adapter housing

OM0088t



Requirements

Nortel Networks recommends that you always clean fiber-optic connectors before connecting to transmission equipment, test equipment, patch panels, or other connectors.

Connector cleaning:

- ensures that fiber-optic assemblies work at their correct power level, by removing any dust or particles that could lead to optical power attenuation
- prevents damage to alignment sleeves and adapter housings

Precautions

Make sure that you review these caution and danger warning notices before you follow any cleaning procedure in this chapter.

	<p>DANGER Risk of personal injury Do not look into the end of fiber-optic connectors or into faceplate connectors of installed circuit packs. The light source used in fiber-optic devices can damage your eyes.</p>
--	--

**DANGER****Risk of personal injury**

Wear safety glasses when you work with the canned compressed gas to avoid getting dust in your eyes.

Wear safety glasses when working with isopropyl alcohol. Isopropyl alcohol can cause eye irritation on contact.

To avoid extended inhalation of alcohol vapors, use only small amounts of alcohol and work in a clean and ventilated area.

To avoid direct skin contact with the isopropyl alcohol and to avoid contaminating the ferrules with skin oils, it is preferable to wear vinyl gloves.

**CAUTION****Risk of shelf malfunction**

Nortel Networks recommends that you do not use cellular phones at any Optical Metro 5100/5200 site. The use of cellular phones in proximity to Optical Metro 5100/5200 equipment can cause shelf malfunction.

**CAUTION****Risk of connectors contamination**

To reduce the risk of oil contamination on connectors, do not use commercial compressed air or hose air when cleaning connectors and receptacles. Always use canned compressed gas to remove excess dust and dirt.

Do the appropriate cleaning process before remating connectors with their receptacles.

To prevent contamination, make sure you cover the optical faceplate connectors of all installed circuit packs and all the unconnected fiber connector ferrules with dust caps.

To avoid applying any oil from your fingers or other contaminants to the end face of the ferrule, handle connectors carefully.

**CAUTION****Risk of signal degradation**

Do not allow the solvent to dry on the ferrule. Dried solvent leaves a residual film on ferrule surfaces that prevents the fiber-optic assembly from working correctly.

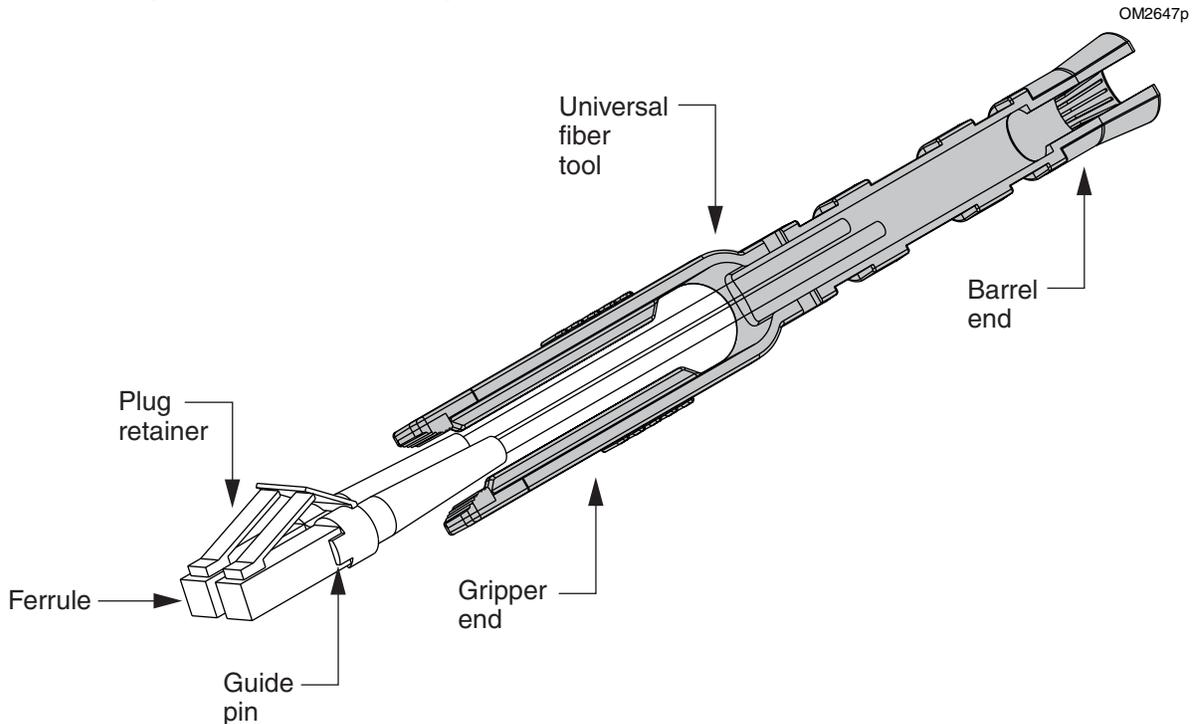
Handling optical fibers

When you work with optical fibers, you must take these precautions:

- Handle optical fibers with caution. Place the optical fibers in a safe location during installation, in order to avoid any fiber bending or anything else that could damage the fiber.
- Follow the manufacturer instructions when you use an optical test set. Incorrect calibration or control settings can create hazardous levels of radiation.

You can use the Universal fiber tool to facilitate the insertion and extraction of fiber connectors to prepare for the fiber cleaning procedures in this chapter. The Universal fiber tool is provided with the Optical Metro NT0H50BB shelf and the Muxponder 10 Gbit/s GbE/FC circuit pack. [Figure 9-2](#) shows the Universal fiber tool being used to access dual LC fiber connectors.

Figure 9-2
Disconnecting an LC connector using the Universal fiber tool (NTN458TC)



Requirements

Table 9-1 lists the tools and materials recommended to complete the procedures in this chapter.

Table 9-1
Tools and materials required to complete cleaning procedures

Vendor	Item	Description
TEXWIPE	TX404 Absorbond	Lint free, fiber free, 100% polyester cloth, clean-room certified
TEXWIPE	TX806 Wipe	Pre-moistened alcohol wipes
Chemical Supply House (Chemtronics)	Isopropyl Alcohol, reagent grade	Certified particle grade, filtered through 0.2 (store in a plastic squeeze bottle, available from Chemtronics)
Coventry (Chemtronics)	48040 Mini Foam swab	Mini foam swab in static-free package
Coventry (Chemtronics)	1.25 mm Sleeve Cleaning swab	Used to clean 1.25 mm female optical adaptors
ARIA Technologies Inc.	CLETOP stick-type (1.25 mm diameter)	Dry cloth on a stick
NOYES	200X (or higher) Fiberscope	Fiber-optic inspection microscope kit, 200X or higher magnification
AlcoaFL	FCC-02 PREP	Self-contained optical fiber connector cleaner, miracreation polyester tape
AlcoaFL	ACT-1	Adapter cleaning tips
(multiple vendors)	Vinyl gloves	
NTT international	CLETOP reel type A	Optical fiber connector cleaner (on a wiping roll)
NTT-AT	Optical reel cleaner (part number 6226)	Used to clean male MPO type multifiber connectors
NTT-AT	Optical reel cleaner (part number 6227)	Used to clean female MPO type multifiber connectors
multiple vendors	Optical fiber connector cleaning kit	Each cleaning kit case typically contains Cletop Reel cleaner, swabs, optic-preparation units, alcohol pump dispenser, space for compressed air can
multiple vendors	Canned compressed air	used to clean female optical adaptor housing

Table 9-1 (continued)
Tools and materials required to complete cleaning procedures

Vendor	Item	Description
multiple vendors	Safety glasses	Used to protect eyes when canned compressed air is used
multiple vendors	Antistatic strap	For ESD protection when manipulating electronic components
multiple vendors	Fiber patch cord labels	To identify optical patch cords
Nortel Networks	Optical connectors dust covers	Provided with the circuit packs
Nortel Networks	Universal fiber tool (NTN458TC)	Required only for Procedure 9-5, "Cleaning the SFP adapter housing" . Provided with the Muxponder 10 Gbit/s GbE/FC circuit pack. Can be used to disconnect or connect the duplex LC fiber on the SFP.

Procedure list

[Table 9-2](#) lists the procedures in this chapter.

Table 9-2
Connector cleaning procedures

Procedure	Page	Comments
9-1 Cleaning SC, LC, or FC-type connectors (simplex or duplex)	9-7	Recommended.
9-2 Cleaning MT-RJ connectors	9-11	Recommended
9-3 Cleaning MPO connectors	9-13	Recommended
9-4 Cleaning adapter housings and (when applicable) optical connectors on circuit packs	9-15	Recommended.
9-5 Cleaning the SFP adapter housing	9-19	Recommended.
9-6 Assessing cleanliness of the optical fiber end	9-24	Recommended to assess cleanliness of optical fiber end after any of the above cleaning procedures are performed.

Procedure 9-1 Cleaning SC, LC, or FC-type connectors (simplex or duplex)

Follow this procedure if you want to use a connector cleaning kit to clean SC, LC or FC-type connectors (simplex or duplex).

Requirements

Nortel Networks recommends that you use the tools and materials listed in [Table 9-1 on page 9-5](#) to clean the connectors.

Precautions

Do not clean the adapter housing when the connector is attached to it.

If an optical fiber connector is inside a circuit pack, you must remove the circuit pack and disconnect the connector from the sleeve before performing this procedure. Ensure that there is no traffic running on the circuit pack when the fibers are disconnected.

**CAUTION****Risk of damage and personal injury**

Make sure that you review the caution and danger warning notices listed in the introduction in this chapter. See [“Precautions” on page 9-2](#).

—continued—

9-8 Cleaning connectors

Procedure 9-1 (continued)

Cleaning SC, LC, or FC-type connectors (simplex or duplex)

Action

Step	Action				
1	<table border="0"><tr><td style="vertical-align: top;">If the optical fiber connectors are inserted in a circuit pack</td><td style="vertical-align: top;">Then make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 Switching traffic off a span in a path-protected network in <i>Provisioning and Operating Procedures</i>, 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the circuit pack, then go to step 2.</td></tr><tr><td style="vertical-align: top;">are not inserted in a circuit pack</td><td style="vertical-align: top;">If the connectors have protection caps, remove the caps, then go to step 2.</td></tr></table>	If the optical fiber connectors are inserted in a circuit pack	Then make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 Switching traffic off a span in a path-protected network in <i>Provisioning and Operating Procedures</i> , 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the circuit pack, then go to step 2 .	are not inserted in a circuit pack	If the connectors have protection caps, remove the caps, then go to step 2 .
If the optical fiber connectors are inserted in a circuit pack	Then make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 Switching traffic off a span in a path-protected network in <i>Provisioning and Operating Procedures</i> , 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the circuit pack, then go to step 2 .				
are not inserted in a circuit pack	If the connectors have protection caps, remove the caps, then go to step 2 .				
2	If there is a compressed gas can available in the cleaning tools, use it to remove loose dust and dirt particles from the cylindrical and end-face surfaces of the connector ferrule.				
3	Decide which of the following cleaning methods to use: <ul style="list-style-type: none">a. If there are pre-moistened pads or alcohol bottle with lint-free cloth available in the cleaning tools, go to step 4.b. If there is a Cletop Reel available in the cleaning tools, go to step 10. <p>Note: In some situation of incrustated dust-particles, only the alcohol cleaning method will work properly</p>				
4	Select one of the following steps: <ul style="list-style-type: none">a. Take a new lint-free cloth (TX-404) and fold it twice (long edge to long edge); then go to step 5.b. Open a pre-moistened wipe (TX-806) and go to step 6.				
5	Use the plastic squeeze bottle to put one drop of alcohol on the center of the lint free cloth.				
6	Put the end face surface of the connector in the center of the lint-free cloth (or wipe). Clean the rectangular face using a figure eight movement with the cloth.				
7	While the ferrule surfaces are still wet with solvent, fold a new, dry, lint free cloth (TX-404) in half and use it to remove the remaining solvent.				

—continued—

Procedure 9-1 (continued)

Cleaning SC, LC, or FC-type connectors (simplex or duplex)

Step	Action
8	See Procedure 9-6 “Assessing cleanliness of the optical fiber end” on page 9-24 to check the cleanliness of the ferrule end face with a fiberscope. If the ferrule is not clean, repeat step 4 through step 7 until no indication of contamination remains.
9	To prevent new contamination: If in step 1 of this procedure Then the optical fibers were inserted in a circuit pack and a protection switch was performed reconnect the fibers into their original location. make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4) Then reroute the traffic back to the original span using Procedure 3-46 Removing a manual, force, or lockout switch from a protection path in <i>Provisioning and Operating Procedures</i> , 323-1701-310. the optical fibers were inserted in a circuit pack but no protection switch was performed reconnect the fibers into the original location. Make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4). the optical fibers were not inserted in a circuit pack cover the connector with a clean dust cap if you are not going to use the connector immediately.
	<i>This is the end of the cleaning procedure if you are using pre-moistened pads of lint-free cloth with an alcohol bottle.</i>
10	Gently wipe the end face of the ferrules with a clean segment of the Cletop Reel cleaner, in the direction indicated on the cleaner. In the case of a simplex connector, while wiping in this direction, slowly rotate the fiber connector. Repeat this motion on the second wiping slot on the Cletop Reel.
11	See Procedure 9-6 “Assessing cleanliness of the optical fiber end” on page 9-24 to check the cleanliness of the ferrule end face with a fiberscope. If the ferrule is not clean, repeat step 10 until no indication of contamination remains.

—continued—

9-10 Cleaning connectors

Procedure 9-1 (continued)

Cleaning SC, LC, or FC-type connectors (simplex or duplex)

Step	Action
12	To prevent new contamination: If in step 1 of this procedure Then the optical fibers were inserted in a circuit pack and a protection switch was performed reconnect the fibers into their original location. make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4) Then reroute the traffic back to the original span using Procedure 3-46 Removing a manual, force, or lockout switch from a protection path in <i>Provisioning and Operating Procedures</i> , 323-1701-310. the optical fibers were inserted in a circuit pack but no protection switch was performed reconnect the fibers into the original location. Make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4). the optical fibers were not inserted in a circuit pack cover the connector with a clean dust cap if you are not going to use the connector immediately.

—end—

Procedure 9-2

Cleaning MT-RJ connectors

Follow this procedure to clean MT-RJ connectors.

Requirements

Nortel Networks recommends that you use the tools and materials listed in [Table 9-1 on page 9-5](#) to clean the connectors.

Precautions

Do not clean the adapter housing when the connector is attached to it.

If an optical fiber connector is inside a circuit pack, you must remove the circuit pack and disconnect the connector from the sleeve before performing this procedure. Ensure that there is no traffic running on the circuit pack when the fibers are disconnected.



CAUTION

Risk of damage and personal injury

Make sure that you review the caution and danger warning notices listed in the introduction in this chapter. See [“Precautions” on page 9-2](#).

Action

Step	Action				
1	<table border="0"> <tr> <td style="vertical-align: top;"> <p>If the optical fiber connectors are inserted in a circuit pack</p> </td> <td style="vertical-align: top;"> <p>Then</p> <p>make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 “Switching traffic off a span in a path-protected network” in <i>Provisioning and Operating Procedures</i>, 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the circuit pack, then go to step 2.</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p>are not inserted in a circuit pack</p> </td> <td style="vertical-align: top;"> <p>If the connectors have protection caps, remove the caps, then go to step 2.</p> </td> </tr> </table>	<p>If the optical fiber connectors are inserted in a circuit pack</p>	<p>Then</p> <p>make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 “Switching traffic off a span in a path-protected network” in <i>Provisioning and Operating Procedures</i>, 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the circuit pack, then go to step 2.</p>	<p>are not inserted in a circuit pack</p>	<p>If the connectors have protection caps, remove the caps, then go to step 2.</p>
<p>If the optical fiber connectors are inserted in a circuit pack</p>	<p>Then</p> <p>make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 “Switching traffic off a span in a path-protected network” in <i>Provisioning and Operating Procedures</i>, 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the circuit pack, then go to step 2.</p>				
<p>are not inserted in a circuit pack</p>	<p>If the connectors have protection caps, remove the caps, then go to step 2.</p>				

—continued—

9-12 Cleaning connectors

Procedure 9-2 (continued)

Cleaning MT-RJ connectors

Step	Action										
2	Use canned compressed gas to remove loose dust and dirt particles from the rectangular and end-face surfaces of the connector ferrule.										
3	Select one of the following steps: <ol style="list-style-type: none">Take a new lint-free cloth (TX-404) and fold it twice (long edge to long edge); then go to step 4.Open a pre-moistened wipe (TX-806) and go to step 5.										
4	Use the plastic squeeze bottle to put one drop of alcohol on the center of the lint free cloth.										
5	Put the end face surface of the connector in the center of the lint-free cloth (or wipe). Clean the rectangular face using a figure eight movement with the cloth.										
6	While the connector surface is still wet with alcohol, fold a new lint-free cloth (TX-404) in half and place it on a clean, flat, smooth surface.										
7	Hold the connector vertically and remove any remaining particles from the connector by wiping the end face on the cloth in a figure eight movement.										
8	See Procedure 9-6 “Assessing cleanliness of the optical fiber end” on page 9-24 to check the cleanliness of the ferrule end face with a fiberscope. If the ferrule is not clean, repeat step 3 through step 7 until no indication of contamination remains.										
9	To prevent new contamination: <table><thead><tr><th>If</th><th>Then</th></tr></thead><tbody><tr><td>in step 1 of this procedure</td><td></td></tr><tr><td>the optical fibers were inserted in a circuit pack and a protection switch was performed</td><td>reconnect the fibers into their original location. make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4) Then reroute the traffic back to the original span using Procedure 3-46 “Removing a manual, force, or lockout switch from a protection path” in <i>Provisioning and Operating Procedures</i>, 323-1701-310.</td></tr><tr><td>the optical fibers were inserted in a circuit pack but no protection switch was performed</td><td>reconnect the fibers into the original location. Make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4).</td></tr><tr><td>the optical fibers were not inserted in a circuit pack</td><td>cover the connector with a clean dust cap if you are not going to use the connector immediately.</td></tr></tbody></table>	If	Then	in step 1 of this procedure		the optical fibers were inserted in a circuit pack and a protection switch was performed	reconnect the fibers into their original location. make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4) Then reroute the traffic back to the original span using Procedure 3-46 “Removing a manual, force, or lockout switch from a protection path” in <i>Provisioning and Operating Procedures</i> , 323-1701-310.	the optical fibers were inserted in a circuit pack but no protection switch was performed	reconnect the fibers into the original location. Make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4).	the optical fibers were not inserted in a circuit pack	cover the connector with a clean dust cap if you are not going to use the connector immediately.
If	Then										
in step 1 of this procedure											
the optical fibers were inserted in a circuit pack and a protection switch was performed	reconnect the fibers into their original location. make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4) Then reroute the traffic back to the original span using Procedure 3-46 “Removing a manual, force, or lockout switch from a protection path” in <i>Provisioning and Operating Procedures</i> , 323-1701-310.										
the optical fibers were inserted in a circuit pack but no protection switch was performed	reconnect the fibers into the original location. Make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4).										
the optical fibers were not inserted in a circuit pack	cover the connector with a clean dust cap if you are not going to use the connector immediately.										

—end—

Procedure 9-3 Cleaning MPO connectors

Follow this procedure to clean MPO connectors.

Requirements

Nortel Networks recommends that you use the tools and materials listed in [Table 9-1 on page 9-5](#) to clean the connectors.

Precautions

Do not clean the adapter housing when the connector is attached to it.

If an optical fiber connector is inside a circuit pack, you must remove the circuit pack and disconnect the connector from the sleeve before performing this procedure. Ensure that there is no traffic running on the circuit pack when the fibers are disconnected.



CAUTION

Risk of damage and personal injury

Make sure that you review the caution and danger warning notices listed in the introduction in this chapter. See [“Precautions” on page 9-2](#).

Action

Step	Action				
1	<table border="0"> <tr> <td style="vertical-align: top;"> <p>If the optical fiber connectors are inserted in a circuit pack</p> </td> <td style="vertical-align: top;"> <p>Then</p> <p>make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 “Switching traffic off a span in a path-protected network” in <i>Provisioning and Operating Procedures</i>, 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the circuit pack, then go to step 2.</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p>are not inserted in a circuit pack</p> </td> <td style="vertical-align: top;"> <p>If the connectors have protection caps, remove the caps, then go to step 2.</p> </td> </tr> </table>	<p>If the optical fiber connectors are inserted in a circuit pack</p>	<p>Then</p> <p>make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 “Switching traffic off a span in a path-protected network” in <i>Provisioning and Operating Procedures</i>, 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the circuit pack, then go to step 2.</p>	<p>are not inserted in a circuit pack</p>	<p>If the connectors have protection caps, remove the caps, then go to step 2.</p>
<p>If the optical fiber connectors are inserted in a circuit pack</p>	<p>Then</p> <p>make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 “Switching traffic off a span in a path-protected network” in <i>Provisioning and Operating Procedures</i>, 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the circuit pack, then go to step 2.</p>				
<p>are not inserted in a circuit pack</p>	<p>If the connectors have protection caps, remove the caps, then go to step 2.</p>				

—continued—

9-14 Cleaning connectors

Procedure 9-3 (continued)
Cleaning MPO connectors

Step	Action								
2	Use canned compressed gas to remove loose dust and dirt particles from the rectangular and end-face surfaces of the connector ferrule.								
3	Select one of the following steps: <ol style="list-style-type: none"> a. If you are cleaning a male MPO multifiber connector, get the NTT-AT optical reel cleaner (part number 6226), then go to step 4. b. If you are cleaning a female MPO multifiber connector, get the NTT-AT optical reel cleaner (part number 6227), then go to step 4. 								
4	Press the green lever on the optical reel cleaner. The metal shutter on the top of the cleaner will open, exposing the cleaning surface. Note: Fresh cleaning material is exposed each time the green lever is pressed.								
5	Position the ferrule endface so that the fiber tips are in contact with the cleaning surface on the reel cleaner.								
6	Wipe the ferrule endface along the cleaning material in the direction shown on the cleaner.								
7	Release the green lever on the optical reel cleaner.								
8	See Procedure 9-6 “Assessing cleanliness of the optical fiber end” on page 9-24 to check the cleanliness of the ferrule end face with a fiberscope. If the ferrule is not clean, repeat step 3 through step 7 until no indication of contamination remains.								
9	To prevent new contamination:								
	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">If in step 1 of this procedure</td> <td style="width: 50%;">Then</td> </tr> <tr> <td style="border-top: 1px solid black;">the optical fibers were inserted in a circuit pack and a protection switch was performed</td> <td style="border-top: 1px solid black;">reconnect the fibers into their original location. make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4) Then reroute the traffic back to the original span using Procedure 3-46 “Removing a manual, force, or lockout switch from a protection path” in <i>Provisioning and Operating Procedures</i>, 323-1701-310.</td> </tr> <tr> <td style="border-top: 1px solid black;">the optical fibers were inserted in a circuit pack but no protection switch was performed</td> <td style="border-top: 1px solid black;">reconnect the fibers into the original location. Make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4).</td> </tr> <tr> <td style="border-top: 1px solid black;">the optical fibers were not inserted in a circuit pack</td> <td style="border-top: 1px solid black;">cover the connector with a clean dust cap if you are not going to use the connector immediately.</td> </tr> </table>	If in step 1 of this procedure	Then	the optical fibers were inserted in a circuit pack and a protection switch was performed	reconnect the fibers into their original location. make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4) Then reroute the traffic back to the original span using Procedure 3-46 “Removing a manual, force, or lockout switch from a protection path” in <i>Provisioning and Operating Procedures</i> , 323-1701-310.	the optical fibers were inserted in a circuit pack but no protection switch was performed	reconnect the fibers into the original location. Make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4).	the optical fibers were not inserted in a circuit pack	cover the connector with a clean dust cap if you are not going to use the connector immediately.
If in step 1 of this procedure	Then								
the optical fibers were inserted in a circuit pack and a protection switch was performed	reconnect the fibers into their original location. make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4) Then reroute the traffic back to the original span using Procedure 3-46 “Removing a manual, force, or lockout switch from a protection path” in <i>Provisioning and Operating Procedures</i> , 323-1701-310.								
the optical fibers were inserted in a circuit pack but no protection switch was performed	reconnect the fibers into the original location. Make sure the adapter housing is clean before reconnecting the fibers (refer to Procedure 9-4).								
the optical fibers were not inserted in a circuit pack	cover the connector with a clean dust cap if you are not going to use the connector immediately.								

—end—

Procedure 9-4

Cleaning adapter housings and (when applicable) optical connectors on circuit packs

Follow this procedure to clean adapter housings and connectors on circuit pack or modules with optical connections.

Nortel Networks recommends that you clean adapter housings and connectors on circuit packs or modules with optical connections only

- during initial installation
- when you suspect performance is reduced because of contamination

Requirements

Nortel Networks recommends that you use the tools and materials listed in [Table 9-1 on page 9-5](#) to clean the adapter housings and connectors on circuit pack or modules with optical connections.

Precautions

Do not clean the adapter housing when the connector is attached to it.

If an optical fiber connector is inside a circuit pack, you must remove the circuit pack and disconnect the connector from the sleeve before performing this procedure. Ensure that there is no traffic running on the circuit pack when the fibers are disconnected.



CAUTION

Risk of damage and personal injury

Make sure that you review the caution and danger warning notices listed in the introduction in this chapter. See [“Precautions” on page 9-2](#).

—continued—

Procedure 9-4 (continued)

Cleaning adapter housings and (when applicable) optical connectors on circuit packs

Action

Step	Action						
1	<table border="0"> <tr> <td style="vertical-align: top;"> <p>If the circuit pack is inserted in the shelf and there are optical fibers connected to the faceplate</p> </td> <td style="vertical-align: top;"> <p>Then make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 “Switching traffic off a span in a path-protected network” in <i>Provisioning and Operating Procedures</i>, 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the faceplate, then go to step 2.</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p>not inserted in the shelf</p> </td> <td style="vertical-align: top;"> <p>If the faceplate connectors have protection caps, remove the caps, then go to step 3.</p> </td> </tr> </table>	<p>If the circuit pack is inserted in the shelf and there are optical fibers connected to the faceplate</p>	<p>Then make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 “Switching traffic off a span in a path-protected network” in <i>Provisioning and Operating Procedures</i>, 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the faceplate, then go to step 2.</p>	<p>not inserted in the shelf</p>	<p>If the faceplate connectors have protection caps, remove the caps, then go to step 3.</p>		
<p>If the circuit pack is inserted in the shelf and there are optical fibers connected to the faceplate</p>	<p>Then make sure the circuit pack is not carrying traffic. If there is traffic running on the circuit pack, and if there is a protection path available, switch the traffic off the span using Procedure 4-7 “Switching traffic off a span in a path-protected network” in <i>Provisioning and Operating Procedures</i>, 323-1701-310. If there is no protection path available, advise your network administrator before continuing the procedure. Disconnect the fiber connectors from the adapter housing on the faceplate, then go to step 2.</p>						
<p>not inserted in the shelf</p>	<p>If the faceplate connectors have protection caps, remove the caps, then go to step 3.</p>						
2	<p>Unseat the circuit pack from the shelf. Release the lock latches at the top and bottom of the circuit pack and slide it slightly out of the shelf.</p>						
3	<table border="0"> <tr> <td style="vertical-align: top;"> <p>If the adapter housing is for SC, LC or FC connectors</p> </td> <td style="vertical-align: top;"> <p>Then go to step 4.</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p>MT-RJ (receptacle MT-RJ device) connectors</p> </td> <td style="vertical-align: top;"> <p>go to step 11.</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p>MPO connectors</p> </td> <td style="vertical-align: top;"> <p>this type of adapter housing does not need cleaning. You have completed this procedure.</p> </td> </tr> </table>	<p>If the adapter housing is for SC, LC or FC connectors</p>	<p>Then go to step 4.</p>	<p>MT-RJ (receptacle MT-RJ device) connectors</p>	<p>go to step 11.</p>	<p>MPO connectors</p>	<p>this type of adapter housing does not need cleaning. You have completed this procedure.</p>
<p>If the adapter housing is for SC, LC or FC connectors</p>	<p>Then go to step 4.</p>						
<p>MT-RJ (receptacle MT-RJ device) connectors</p>	<p>go to step 11.</p>						
<p>MPO connectors</p>	<p>this type of adapter housing does not need cleaning. You have completed this procedure.</p>						
4	<p>Disconnect the patch cords inside the circuit pack that are going into the adapter housing to be cleaned.</p>						
5	<p>Use “Cleaning SC, LC, or FC-type connectors (simplex or duplex)” on page 9-7 to clean the fiber connectors inside the circuit pack. See Procedure 9-6 “Assessing cleanliness of the optical fiber end” on page 9-24 to check the cleanliness of the ferrule end face with a fiberscope. If the ferrule is not clean, repeat the cleaning until no indication of contamination remains. After completing the appropriate procedure, go to the next step of this procedure.</p>						

—continued—

Procedure 9-4 (continued)

Cleaning adapter housings and (when applicable) optical connectors on circuit packs

Step	Action
6	<p>While the internal patch cords are still unconnected, carefully insert the tip of a new, dry cleaning swab into the adapter housing.</p> <p>Note 1: The cleaning swab size is smaller for LC adapter housing compared to SC and FC adapter housing.</p> <p>Note 2: Solvent/alcohol should not be used for adapter housing cleaning as there is no way to determine if residue is still present after cleaning, and the solvent could get trapped in the many crevices of the adapter housing.</p>
7	Gently rotate the tip of the swab to wipe the inside of the adapter housing.
8	Gently remove the tip of the swab and throw away the swab.
9	Repeat step 6 through step 8 for each connector adapter housing on the circuit pack/module.
10	Reconnect the internal fiber patch cords inside the circuit pack (that were disconnected and cleaned in step 4 and step 5). When completed, go to step 20 .
11	To clean MT-RJ connectors, use “Cleaning MT-RJ connectors” on page 9-11 , then go to the next step of this procedure.
12	Clean the MT-RJ adapter housing. Attach the extension tube supplied with the canned compressed gas to the can nozzle.
13	Carefully insert the extension tube into the optical port of the receptacle device.
14	Blow canned compressed gas into the optical port of the receptacle device to remove loose dust or dirt particles.
15	Carefully remove the extension tube from the optical port of the receptacle device.
16	<p>Carefully insert the tip of a new, dry cleaning swab into the MT-RJ adapter housing.</p> <p>Note: Solvent/alcohol should not be used for adapter housing cleaning as there is no way to determine if residue is still present after cleaning, and the solvent could get trapped in the many crevices of the adapter housing.</p>
17	Gently rotate the tip of the swab to wipe as much as possible the inside of the adapter housing.
18	Gently remove the tip of the swab and throw away the swab.
19	<p>Repeat step 12 to step 18 if required.</p> <p>Note: There is no better way to assess the cleanliness of a receptacle MT-RJ device than reconnecting the fibers and verifying that the traffic is no longer affected by dust particles in the receptacle. To do that, continue with the next step in this procedure.</p>

—continued—

9-18 Cleaning connectors

Procedure 9-4 (continued)

Cleaning adapter housings and (when applicable) optical connectors on circuit packs

Step	Action
20	To prevent new contamination: If in step 1 of this procedure Then the optical fibers were inserted in a circuit pack and a protection switch was performed reconnect the fibers into their original location. Then reroute the traffic back to the original span pack using Procedure 3-46 "Removing a manual, force, or lockout switch from a protection path" in <i>Provisioning and Operating Procedures</i> , 323-1701-310. the optical fibers were inserted in a circuit pack but no protection switch was performed reconnect the fibers into the original location. the optical fibers were not inserted in a circuit pack cover the faceplate connector with a clean dust cap if you are not going to use the connector immediately.

—end—

Procedure 9-5

Cleaning the SFP adapter housing

Use this procedure to clean the small form factor pluggable (SFP) adaptor housing. The following circuit packs include SFPs:

- Muxponder 10 Gbit/s GbE/FC circuit pack
- Muxponder 10 Gbit/s Gbe/FC VCAT circuit pack

Nortel Networks recommends that you clean SFP adapter housing only

- during initial installation
- when you suspect performance is reduced because of contamination

For an illustration of an SFP module of a Muxponder 10 Gbit/s GbE/FC circuit pack, see [Figure 9-3 on page 9-23](#) .

Requirements

Nortel Networks recommends that you use the tools and materials listed in [Table 9-1 on page 9-5](#) to clean the adaptor housings and connectors on circuit pack or modules with optical connections.

Precautions

If an optical fiber is connected to the SFP module, you must disconnect the fibers from the SFP before performing this procedure. If client protection is not available on the subtending equipment, traffic will be lost on the SFP module whose adapter housing you are cleaning.



CAUTION

Risk of damage and personal injury

Make sure that you review the caution and danger warning notices listed in the introduction of this chapter. See [“Precautions” on page 9-2](#).

—continued—

Procedure 9-5 (continued)

Cleaning the SFP adaptor housing

Step	Action
1	<p>Determine the required task:</p> <p>If the SFP module whose fiber adaptor housing requires cleaning is inserted in the circuit pack and has optical fibers connected to it</p> <p>Then make sure that the SFP module is not carrying traffic.</p> <ul style="list-style-type: none"> • If the circuit pack is carrying traffic and client signal protection is available (on the subtending equipment), contact your network administrator to switch the traffic off the span. • If there is no protection path available, inform your network administrator before continuing the procedure. <p>Label the fiber connectors. Disconnect the fiber connectors from the SFP module. To disconnect the duplex LC fiber on the Muxponder 10 Gbit/s GbE/FC circuit pack, use the black plastic tongue provided with the circuit pack. Then go to step 2.</p> <p>inserted in the circuit pack and has no optical fibers connected to it go to step 2</p> <p>not inserted in the circuit pack go to step 3</p>

Removing the SFP module

- 2 Remove the SFP module by pulling the latch on the SFP module sideward (left or right depending on the SFP port number) to disengage the SFP module from the SFP port. Carefully pull the SFP module out of its receptacle without affecting fibers connected to other SFP ports on the circuit pack.
For a SFP module on a Muxponder 10 Gbit/s GbE/FC circuit pack, follow [Procedure 7-4 "Installing small form factor pluggable modules"](#). Then go [step 3](#).

Cleaning the SFP adaptor housing

- 3 Attach the extension tube supplied with the canned compressed gas to the can nozzle.
- 4 Remove LC male dust caps from the SFP adaptor housing, if applicable. Carefully insert the extension tube into the optical port of the SFP receptacle.

—continued—

Procedure 9-5 (continued)

Cleaning the SFP adapter housing

Step	Action
5	Blow canned compressed gas into the optical port of the SFP receptacle to remove loose dust or dirt particles.
6	Carefully remove the extension tube from the optical port of the receptacle device.
7	Carefully insert the tip of a new, dry cleaning swab into the female adapter housing on the SFP module. The SFP module for the Muxponder 10 Gbit/s GbE/FC includes two LC female adaptor housings. Note: Do not use solvent or alcohol to clean adapter housings. It is not possible to determine if the solvent or alcohol has left a residue after cleaning. The solvent or alcohol can get trapped in the crevices of the adapter housing.
8	Gently rotate the tip of the swab to wipe as much as possible of the inside of the adapter housing.
9	Gently remove the tip of the swab. Discard the swab.
10	Repeat step 7 to step 9 for the remaining adaptor housing on the SFP module, if applicable.
11	Repeat step 3 to step 10 if required. Note: To assess the cleanliness of the SFP receptacle device, reconnect the fibers and verify that the traffic is no longer affected by dust particles in the receptacle. Continue with step 12 .

—continued—

9-22 Cleaning connectors

Procedure 9-5 (continued)
Cleaning the SFP adapter housing

Preventing contamination

12 Select your next step.

If in [step 1](#) of this procedure

Then

the optical fibers were connected to the SFP module and a protection switch was performed on the client subtending equipment

reinstall the SFP module into the circuit pack. For the Muxponder 10 Gbit/s GbE/FE, follow [Procedure 7-4, "Installing small form factor pluggable modules"](#).

Make sure that the fiber connectors are clean. Then reconnect the fibers into their original location on the SFP module (refer to the labels). For the Muxponder 10 Gbit/s GbE/FC circuit pack, you can use the black plastic tongue to reconnect the duplex LC fiber.

Contact your network administrator to reroute the traffic back to the original span. If the traffic is restored, the SFP receptacle device (female adaptor housing) is now clean.

no optical fibers were inserted into the SFP module and the SFP module was installed into the circuit pack

reinstall the SFP module into the circuit pack. For the Muxponder 10 Gbit/s GbE/FC, follow the [Procedure 7-4, "Installing small form factor pluggable modules"](#).

If you are not going to use the SFP module connector immediately, cover it with a clean male dust cap.

the SFP module was not installed into the circuit pack

cover the SFP module connector with a clean male dust cap, if you are not going to use the SFP module connector immediately.

—end—

Procedure 9-6 Assessing cleanliness of the optical fiber end

Follow this procedure to assess the cleanliness of the optical fiber end.

Requirements

Nortel Networks recommends that you use the NOYES 200X Fiberscope listed in [Table 9-1 on page 9-5](#) for this procedure.

Precautions

If an optical fiber connector is inside a circuit pack, you must remove the circuit pack and disconnect the connector from the sleeve before performing this procedure. Ensure that there is no traffic running on the circuit pack when the fibers are disconnected.



CAUTION

Risk of damage and personal injury

Make sure that you review the caution and danger warning notices listed in the introduction in this chapter. See [“Precautions” on page 9-2](#).



DANGER

Risk of personal injury

Make sure that the optical fiber is disconnected from any light source. The light source used in fiber-optic devices can damage your eyes.

Action

Step	Action
------	--------

- | | |
|---|---|
| 1 | <p>Before assessing the cleanliness of the optical fiber end, make sure the following conditions are met:</p> <ul style="list-style-type: none">• the fiber being inspecting doesn't carry traffic• the fiber is not connected to any light source <p>If either of these conditions are not met, or if you are unsure, contact your next level of support before going to the next step.</p> |
|---|---|

—continued—

Procedure 9-6 (continued)

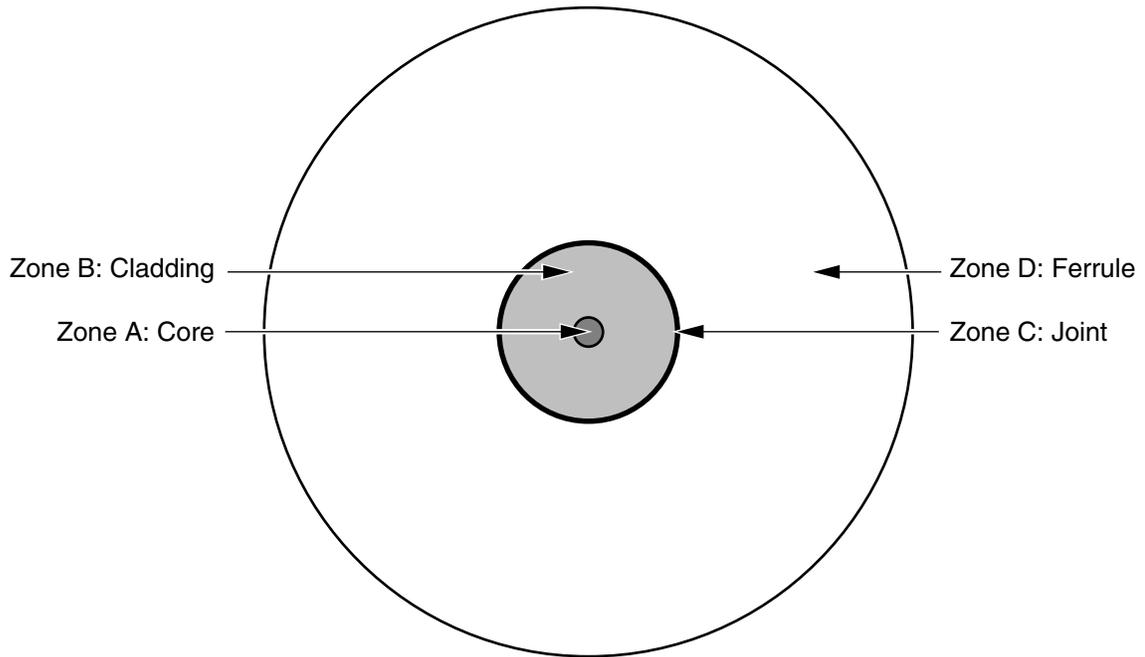
Assessing cleanliness of the optical fiber end

Step	Action
2	<p>Make sure the fiber is not connected to a circuit pack or an adapter housing.</p> <p>Note: Step 1 confirmed that the fiber, even if connected in a circuit pack or adapter housing, is not carrying traffic or light, so you can safely disconnect the fiber from the circuit pack in order to proceed with the inspection.</p>
3	Select the appropriate fiberscope adapter for the type of optical fiber connector you are inspecting (LC, SC, FC, MT-RJ or MPO).
4	Install the selected adapter on the fiberscope.
5	Insert the optical fiber connector into the fiberscope adapter.
6	Turn the fiberscope light to the ON position.
7	Look into the fiberscope and see Figure 9-4 on page 9-26 to adjust the focus of the fiberscope so that you can identify the four inspection zones of the optical fiber end. If you are inspecting MT-RJ or MPO connectors, select one core and cladding in the connector for your focus. See Figure 9-5 on page 9-27 for MPO connectors, or Figure 9-6 on page 9-27 for MT-RJ connectors.
8	Compare the image of the optical fiber end with Figure 9-7 on page 9-28 and Figure 9-8 on page 9-28 .
9	<p>If the image is similar to Figure 9-7 on page 9-28, the optical fiber connector is dirty. Repeat the appropriate cleaning procedure, and then repeat this procedure to assess cleanliness.</p> <p>Note: If the image remains dirty after repeated cleaning, replace the assembly. Send the contaminated assembly to the next level of technical support.</p>
10	<p>If the image is similar to Figure 9-8 on page 9-28, the optical fiber connector is clean. If required, reconnect the fiber immediately on the circuit pack connector where it is supposed to go (the adapter housing should already have been cleaned using the appropriate procedure). If this fiber is not to be connected immediately to a circuit pack, put a dust cap on the fiber to protect it from contamination and damage.</p> <p>Note: When the dust cap is removed from the fiber, the fiber end needs to be cleaned again.</p>
11	<p>If you are inspecting MT-RJ or MPO connectors, select the next core and cladding for your fiberscope focus and go back to step 8.</p> <p><i>If you have inspected all the cores and claddings of the MT-RJ or MPO connector, you have completed this procedure.</i></p>

—end—

Figure 9-4
Inspection zones of the optical fiber end (SC or LC connector types)

EX0352



Legend:

Zone A = Diameter of 25 microns - bigger than physical "core"

Zone B = Diameter of 115 microns - "cladding"

Zone C = Dark zone around the cladding - epoxy

Zone D = White band - ferrule

Figure 9-5
Inspection zones of the optical fiber end (MPO connector types)

OM1946t

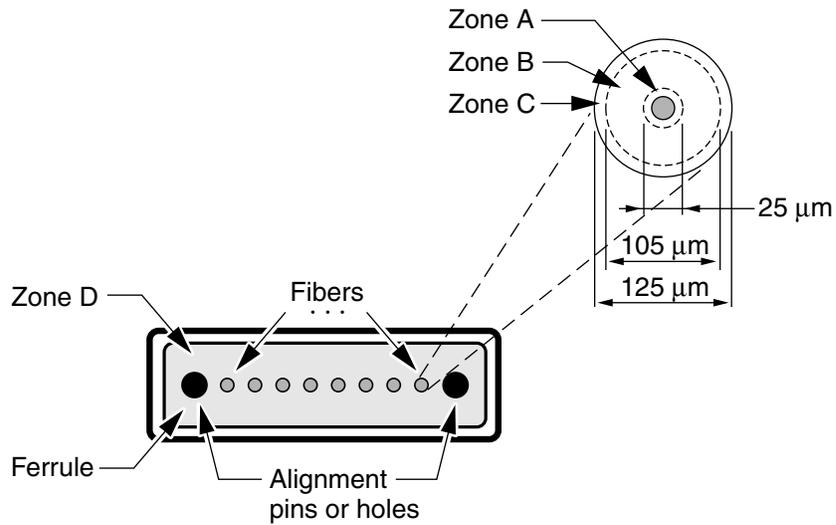


Figure 9-6
Inspection zones of the optical fiber end (MT-RJ connector types)

OM1947t

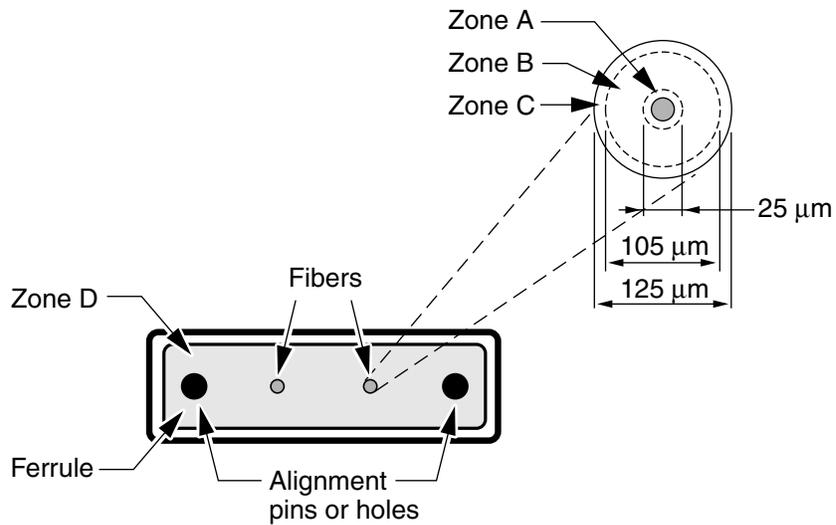


Figure 9-7
Dirty optical fiber end

EX0353

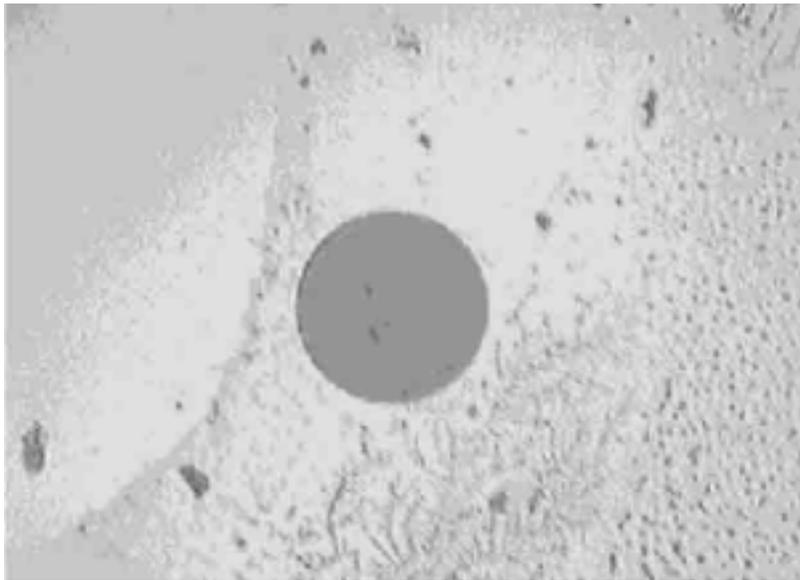
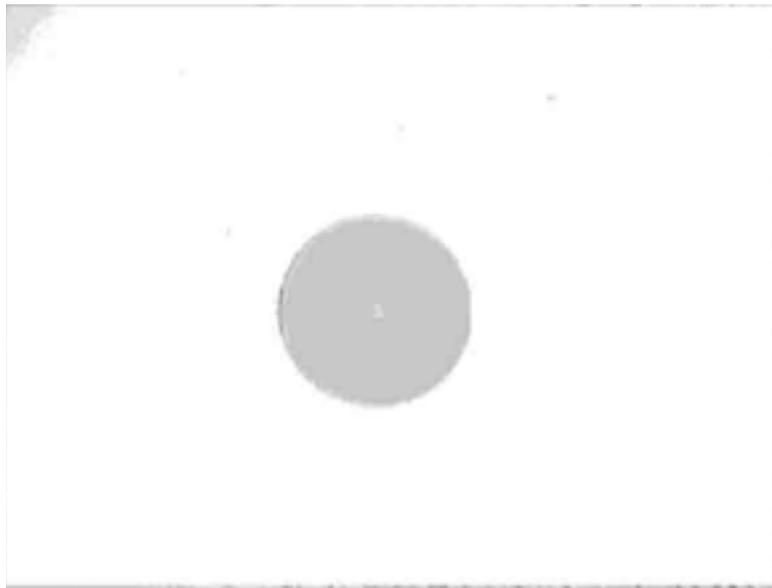


Figure 9-8
Clean optical fiber end

EX0354



Nortel

Optical Metro 5100/5200

Installing Optical Metro 5200 Shelves and Components, Part 2 of 2

Copyright © 2000–2005 Nortel Networks, All Rights Reserved

The information contained herein is the property of Nortel Networks and is strictly confidential. Except as expressly authorized in writing by Nortel Networks, the holder shall keep all information contained herein confidential, shall disclose the information only to its employees with a need to know, and shall protect the information, in whole or in part, from disclosure and dissemination to third parties with the same degree of care it uses to protect its own confidential information, but with no less than reasonable care. Except as expressly authorized in writing by Nortel Networks, the holder is granted no rights to use the information contained herein.

This information is provided “as is”, and Nortel Networks does not make or provide any warranty of any kind, expressed or implied, including any implied warranties of merchantability, non-infringement of third party intellectual property rights, and fitness for a particular purpose.

Nortel , the Nortel logo, the Globemark, and OPTera are trademarks of Nortel Networks.

HP and HP-UX are trademarks of Hewlett-Packard, Inc. Pentium is a trademark of Intel Corporation. Internet Explorer, Windows, and Windows NT are trademarks of Microsoft Corporation. Netscape Communicator is a trademark of Netscape Communications Corporation. Common Desktop Environment, Java, Solaris, and Ultra are trademarks of Sun Microsystems, Inc. UNIX is a trademark of X/Open Company Limited.

323-1701-201
Standard Release 8.0 Issue 1
April 2005
Printed in Canada and the United Kingdom

