



# Cisco ONS 15216 OSC-1510 User Guide

## Overview

The Cisco ONS 15216 Optical Supervisory Channel (OSC) 1510 allows communication to any site without the need for a functioning OADM, EDFA, or mux/demux at that site. This type of communication is established by removing the OSC signal from the composite DWDM channel before the composite channel passes through any other ONS 15216 equipment. The OSC signal is then added into the composite signal enabling Ethernet connectivity from the network operations center (NOC) to each device on the ring. This Ethernet connectivity survives any equipment or single-fiber failure and ensures that visibility to any device on the ring is maintained regardless of any failure.

This user guide contains functional and physical descriptions of and installation instructions for the Cisco ONS 15216 OSC-1510.

## Functional Description of the OSC-1510

The ONS 15216 OSC-1510 is a 1-RU 19-inch rack-mounted shelf assembly. The mounting ears are reversible so that the OSC-1510 can be mounted in either a 19- or 23-inch equipment rack. The connectors are SC bulkhead adapters. To help with port identification and cabling, there is a retractable tray located under the front panel that contains a port layout diagram. The front panel of the OSC-1510 is shown in [Figure 1](#).

*Figure 1 ONS 15216 OSC-1510 Front Panel View*



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The ONS 15216 OSC-1510 is a single-channel 100 GHz passive device that allows you to add or drop a protected OSC wavelength in each direction at any point of a DWDM link. The OSC channel uses the 33rd wavelength in the S-Band at 1510-nm. The OSC-1510 unit essentially functions as a passive filter. Monitor ports are provided so a user can check for the presence of the OSC channel in the composite DWDM signal.

## Network Relationship

The OSC-1510 can separate and drop the 1510-nm OSC channel from a composite signal of wavelengths. This dropped OSC channel is then sent to the receive gigabit interface converter (GBIC) port on a Catalyst 2950 switch (Figure 2) while the 32 wavelengths of C-band WDM is sent to the input express channel of an OADM filter (Figure 3).

Figure 2 Catalyst 2950 Front Panel View

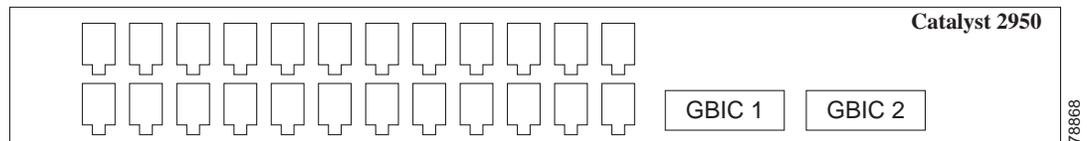
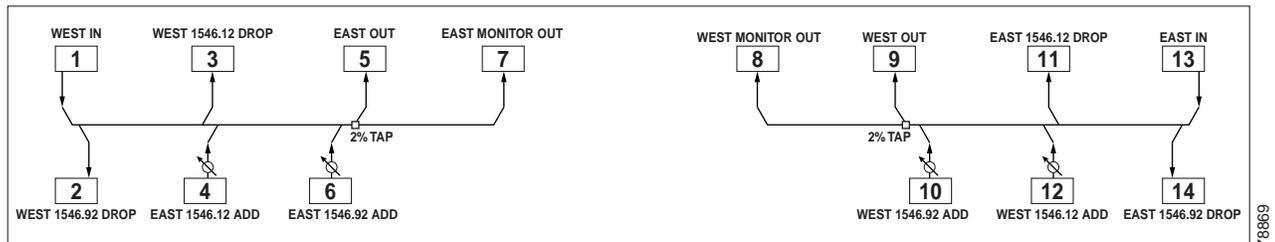
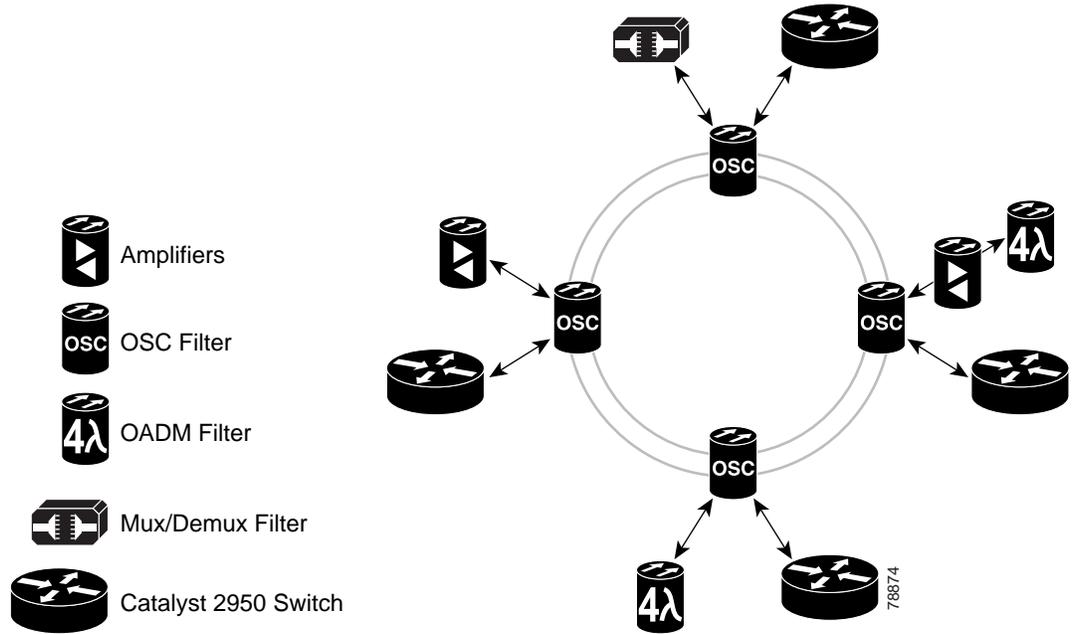


Figure 3 2-Channel OADM Front Panel View



The OSC-1510 adds back the transmitted 1510-nm wavelength from the Catalyst 2950 switch and the 32 separate wavelengths of the WDM via the output express channel of the OADM. An example of an OSC network with an OADM, amplifiers, Catalyst 2950 switch, and Mux/Demux is shown in Figure 4.

Figure 4 OSC Network Example



The initial phase of the OSC-1510 implementation into the overall ONS 15216 solution is to provide an out-of-band management solution for all DWDM platforms that have Ethernet communication ports to enable an exchange of management information. The OSC-1510 will provide remote fault management in the form of alarms, performance management, and configuration management of DWDM platforms. It also allows for remote access and software/file transfer to the DWDM platform using the OSC channel.



Note

The use of the OSC-1510 with any DWDM platform does not provide topology discovery of DWDM networks or time synchronization via SNTP.

## Network Limitations and Constraints of the Catalyst 2950 Switch and OSC-1510



Note

The maximum distance between OSC-1510 units is 25 dB.

All IP interfaces connected to a node equipped with the OSC-1510 must be on the same subnet.

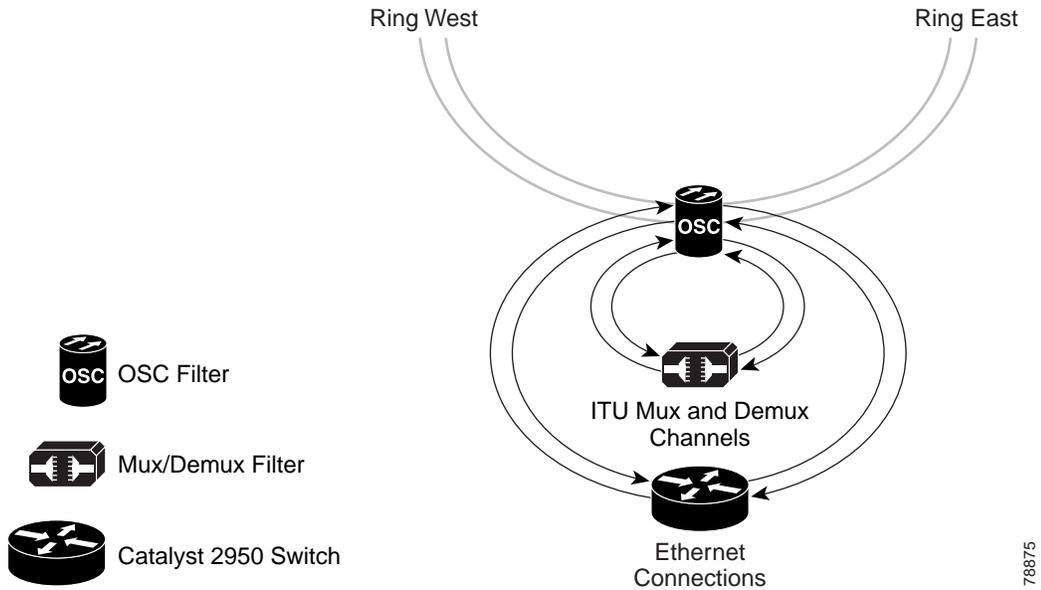
## OSC-1510 Node Types and Fiber Connection Information

This section describes the available node types for the OSC-1510. The available node types are terminal, terminal with amplifiers, OADM, and optical line amplifier (OLA). Fiber connection tables are also provided in this section to clarify the connections necessary for proper operation.

## Terminal Node

A terminal node is a DWDM node that terminates a linear system. [Figure 5](#) provides an example of a terminal node equipped with the OSC-1510, Mux/Demux filter, and the Catalyst 2950 switch. Cable the terminal node per the fiber connections listed in [Table 1](#).

*Figure 5 Terminal Node Example*



## Terminal Node with Amplifiers

A terminal node with amplifiers is the same as a terminal node but it requires amplifiers in order to communicate between sites. [Figure 6](#) provides an example of an amplified terminal node with the OSC-1510, Mux/Demux filter, and the Catalyst 2950 switch. Cable the amplified terminal node per the fiber connections listed in [Table 1](#).

Figure 6 Amplified Terminal Node Example

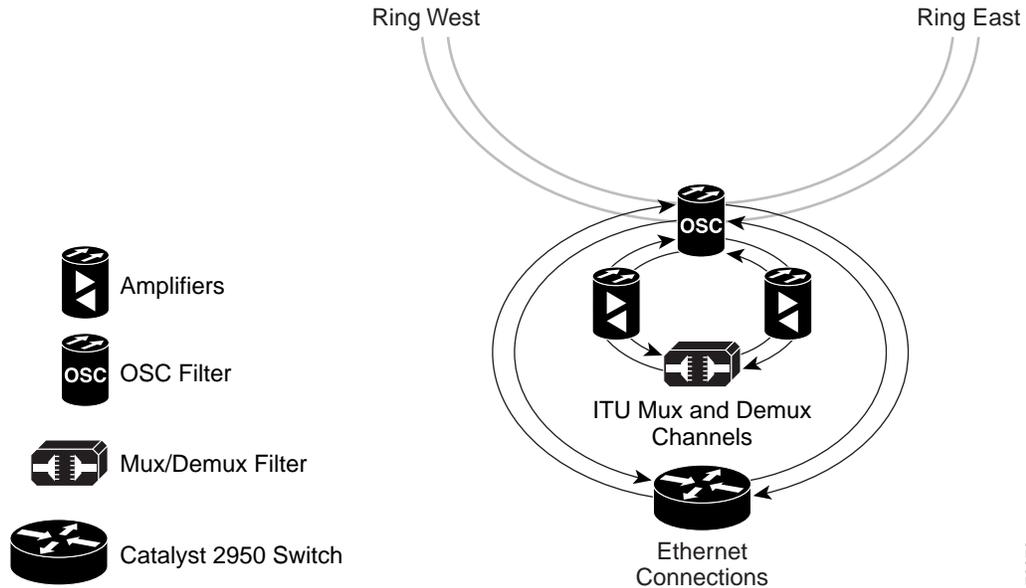


Table 1 Terminal Node Fiber Connection List

From	To	From	To
<b>OSC to Amplifier to WEST Mux/Demux</b>		<b>Mux/Demux to an ONS 15454 (1547.77 nm Sample)</b>	
OSC-1510 Port 6	AMP 1 IN	EAST DROP 1547.77	454 ELR EAST RX
AMP 1 OUT	Mux/Demux WEST IN	EAST ADD 1547.77	454 ELR EAST TX
OSC-1510 Port 9	AMP 2 OUT	WEST DROP 1547.77	454 ELR WEST RX
AMP 2 IN	Mux/Demux WEST OUT	WEST ADD 1547.77	454 ELR WEST TX
<b>OSC to EAST Mux/Demux</b>		<b>OSC to Fiber Outside Plant</b>	
OSC-1510 Port 8	AMP 3 IN	OSC-1510 Port 1	WEST Fiber Ring TX
AMP 3 OUT	Mux/Demux EAST IN	OSC-1510 Port 2	WEST Fiber Ring RX
OSC-1510 Port 7	AMP 4 OUT	OSC-1510 Port 13	EAST Fiber Ring RX
AMP 4 IN	Mux/Demux EAST OUT	OSC-1510 Port 14	EAST Fiber Ring TX
<b>OSC to Catalyst 2950 Switch</b>			
OSC-1510 Port 3	2950 GBIC 1 RX		
OSC-1510 Port 5	2950 GBIC 2 TX		
OSC-1510 Port 10	2950 GBIC 2 RX		
OSC-1510 Port 12	2950 GBIC 1 TX		

## OADM Node

An OADM node drops a subset of the DWDM channels at a given site. Figure 7 provides an example of a OADM node equipped with the OADM 2 unit, the OSC-1510, and the Catalyst 2950 switch. Cable the OADM node per the fiber connections listed in Table 2.

Figure 7 OADM Node Example

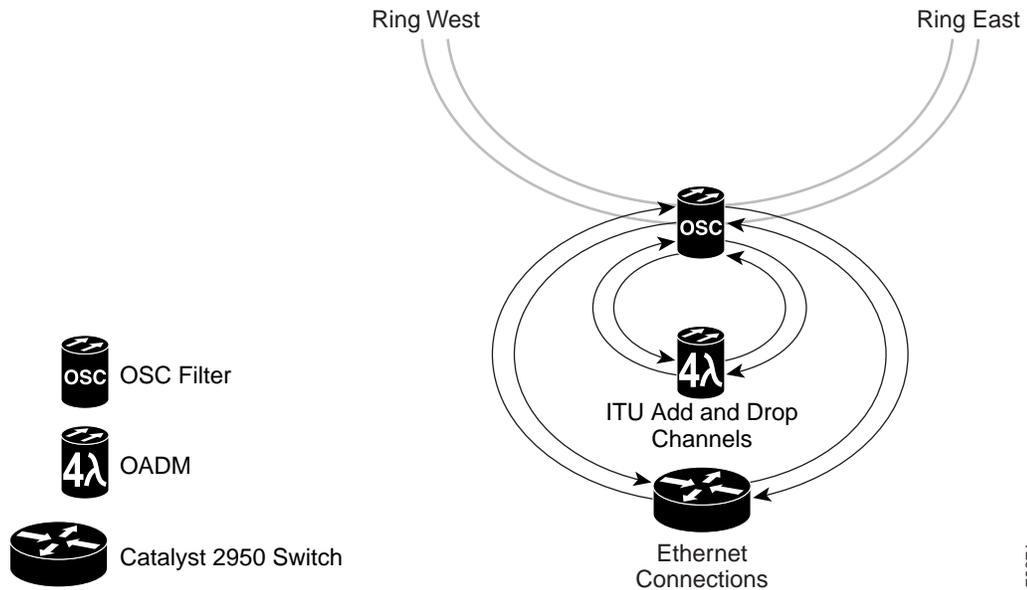


Table 2 OADM Node Fiber Connection List

From	To	From	To
<b>OSC to 2-Channel OADM</b>		<b>2-Channel OADM to an ONS 15454</b>	
OSC-1510 Port 6	OADM 2 Port 1	OADM 2 Port 11	454 ELR EAST RX
OSC-1510 Port 7	OADM 2 Port 5	OADM 2 Port 4	454 ELR EAST TX
OSC-1510 Port 8	OADM 2 Port 13	OADM 2 Port 3	454 ELR WEST RX
OSC-1510 Port 9	OADM 2 Port 9	OADM 2 Port 12	454 ELR WEST TX
<b>OSC to Catalyst 2950 Switch</b>		<b>OSC to Fiber Outside Plant</b>	
OSC-1510 Port 3	2950 GBIC 1 RX	OSC-1510 Port 1	WEST Fiber Ring TX
OSC-1510 Port 5	2950 GBIC 2 TX	OSC-1510 Port 2	WEST Fiber Ring RX
OSC-1510 Port 10	2950 GBIC 2 RX	OSC-1510 Port 13	EAST Fiber Ring RX
OSC-1510 Port 12	2950 GBIC 1 TX	OSC-1510 Port 14	EAST Fiber Ring TX

## Amplified OADM Node

An amplified OADM node is the same as an OADM node but it requires amplifiers in order to communicate between sites. Figure 8 provides an example of an Amplified OADM node, the OSC-1510, the 2-channel OADM, and the Catalyst 2950 switch. Cable the Amplified Terminal node per the fiber connections listed in Table 3.

Figure 8 Amplified OADM Node Example

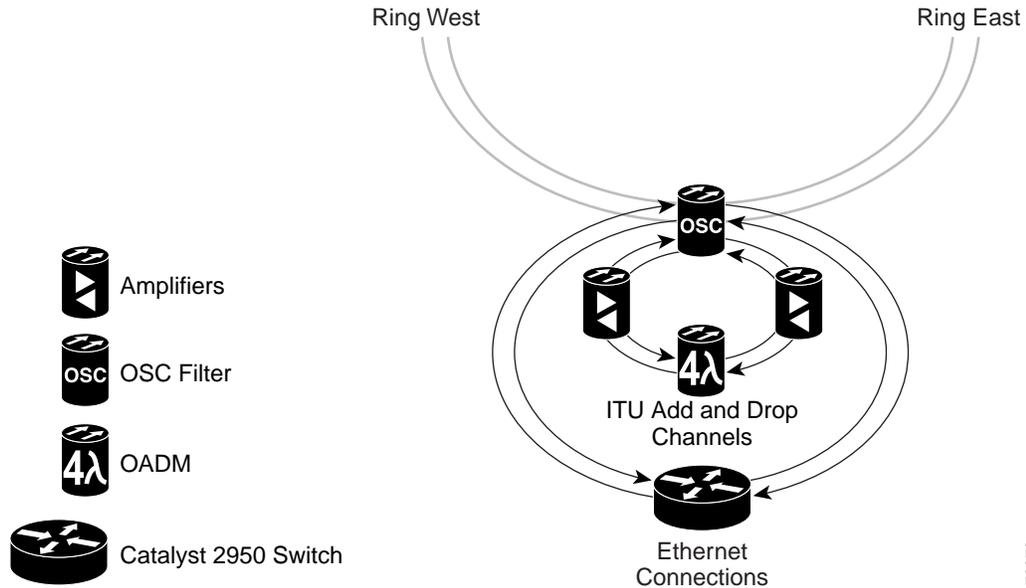


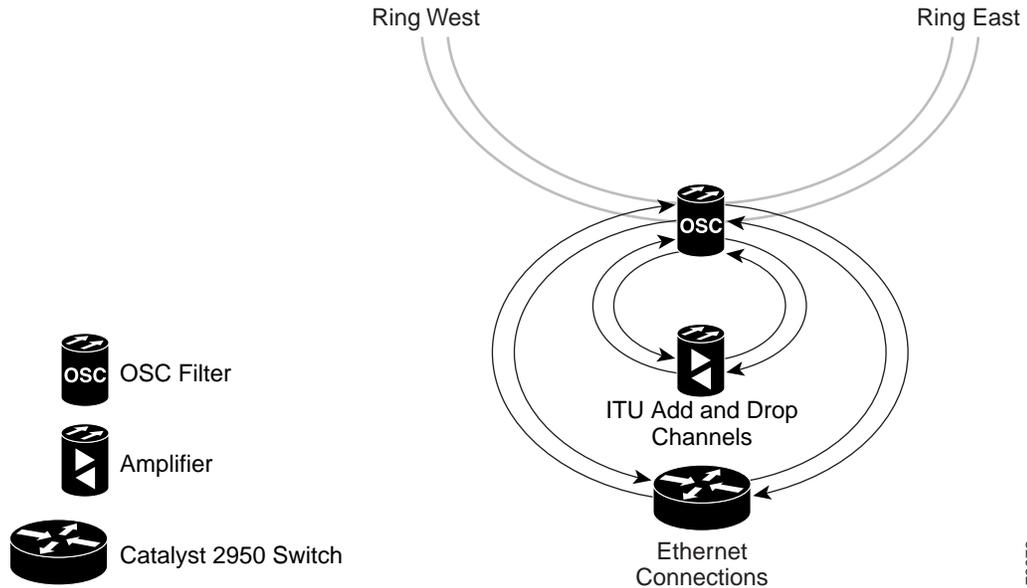
Table 3 Amplified OADM Node Fiber Connection List

From	To	From	To
<b>OSC to Amplifier to 2-Channel OADM</b>		<b>2-Channel OADM to an ONS 15454</b>	
OSC-1510 Port 6	AMP 1 IN	OADM 2 Port 11	454 ELR EAST RX
AMP 1 OUT	OADM 2 Port 1	OADM 2 Port 4	454 ELR EAST TX
OSC-1510 Port 7	AMP 2 OUT	OADM 2 Port 3	454 ELR WEST RX
AMP 2 IN	OADM 2 Port 5	OADM 2 Port 12	454 ELR WEST TX
OSC-1510 Port 8	AMP 3 IN	<b>OSC to Fiber Outside Plant</b>	
AMP 3 OUT	OADM 2 Port 13	OSC-1510 Port 1	WEST Fiber Ring TX
OSC-1510 Port 9	AMP 4 OUT	OSC-1510 Port 2	WEST Fiber Ring RX
AMP 4 IN	OADM 2 Port 9	OSC-1510 Port 13	EAST Fiber Ring RX
<b>OSC to Catalyst 2950 Switch</b>		OSC-1510 Port 14	EAST Fiber Ring TX
OSC-1510 Port 3	2950 GBIC 1 RX		
OSC-1510 Port 5	2950 GBIC 2 TX		
OSC-1510 Port 10	2950 GBIC 2 RX		
OSC-1510 Port 12	2950 GBIC 1 TX		

## OLA Node

An OLA node is where amplification is required but no channels are dropped. Figure 9 provides an example of a OLA node equipped with the amplifier, the OSC-1510, and the Catalyst 2950 switch. Cable the OLA node per the fiber connections listed in Table 4.

Figure 9 OLA Node Example



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Table 4 OLA Node Fiber Connection List

From	To	From	To
<b>OSC to West Mux/Demux</b>		<b>Mux/Demux to an ONS 15454 (1547.77 nm sample)</b>	
OSC-1510 Port 6	AMP 1 IN	EAST DROP 1547.77	454 ELR EAST RX
OSC-1510 Port 9	AMP 1 OUT	EAST ADD 1547.77	454 ELR EAST TX
<b>OSC to East Mux/Demux</b>		WEST DROP 1547.77	454 ELR WEST RX
OSC-1510 Port 8	AMP 2 IN	WEST ADD 1547.77	454 ELR WEST TX
OSC-1510 Port 7	AMP 2 OUT		
<b>OSC to Catalyst 2950 Switch</b>		<b>OSC to Fiber Outside Plant</b>	
OSC-1510 Port 3	2950 GBIC 1 RX	OSC-1510 Port 1	WEST Fiber Ring TX
OSC-1510 Port 5	2950 GBIC 2 TX	OSC-1510 Port 2	WEST Fiber Ring RX
OSC-1510 Port 10	2950 GBIC 2 RX	OSC-1510 Port 13	EAST Fiber Ring RX
OSC-1510 Port 12	2950 GBIC 1 TX	OSC-1510 Port 14	EAST Fiber Ring TX

## Catalyst 2950 to the OSC-1510 Setup

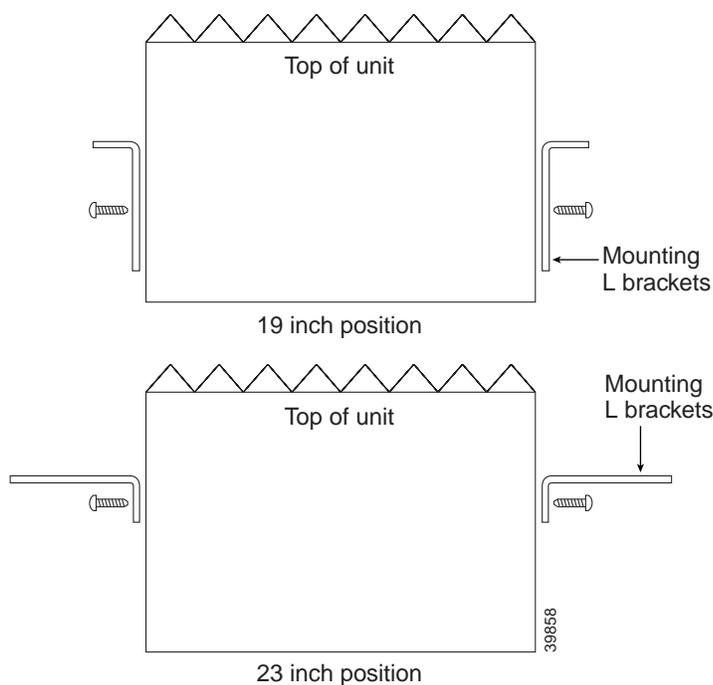
Connect the Catalyst 2950 to the OSC-1510 according to [Table 5](#). For information about installing and configuring the Catalyst 2950 switch, refer the most recent Catalyst 2950 documentation.

**Table 5** OSC-1510 to Catalyst 2950 Fiber Connection List

From	To
OSC-1510 Port 3	2950 GBIC 1 RX
OSC-1510 Port 5	2950 GBIC 2 TX
OSC-1510 Port 10	2950 GBIC 2 RX
OSC-1510 Port 12	2950 GBIC 1 TX

## Installation

The ONS 15216 OSC-1510 can be installed in a standard 19- or 23-inch equipment rack. Each assembly includes reversible mounting brackets that you can rotate to fit either rack size. The unit ships with the mounting brackets in the 19-inch position. [Figure 10](#) shows the top view of a unit with the mounting brackets in both positions.

**Figure 10** OSC-1510 Reversible Mounting Brackets

Four rack-mounting screws are included with each OSC-1510. Because the OSC-1510 is a passive device, no power cabling or connections are necessary. The unit can be installed anywhere in the rack (in other words, above or below the DWDM generating equipment) according to local site practice.

### Procedure to Install the OSC-1510

- Step 1** Set the mounting brackets to either the 19- or 23-inch position, depending on the rack you are using.

**Note**

Keep in mind that the units are shipped with the mounting brackets in the 19-inch position. See [Figure 10](#) for mounting bracket positioning information.

**Step 2** Secure the unit to the rack using the three mounting screws included.

**Step 3** Connect the fibers according to appropriate fiber connection table: for a terminal node ([Table 1](#)), an OADM node ([Table 2](#)), an Amplified OADM node ([Table 3](#)), or an OLA node ([Table 4](#)).

## Fiber Optic Connector Cleaning and Maintenance

Disciplined connector cleaning care is required to maintain the performance of fiber optic circuits. It is important that both the SC/UPC connector at the end of the fiber optic cable and the mating bulkhead adapter on the front panel of the OSC-1510 are clean before the connection is made.

**Warning**

**To prevent serious eye damage, never look directly into a fiber optic cable connector or mating adapter. Never assume laser power is turned off or the fiber is disconnected at the other end.**

**Warning**

**Always handle, use, and dispose of chemicals and other cleaning materials in accordance with manufacturer's instructions.**

**Note**

Before installing the fiber optic cable, always perform the cleaning procedure for cable connectors described in the following section. Whenever possible, inspect each connector before connecting it to the mating bulkhead adapter on the OSC-1510 front panel.

**Note**

The SC bulkhead adapters on the OSC-1510 front panel are less likely to get dirty if they are capped when not in use. Since the procedure for a thorough cleaning of these adapters is complicated and involves opening the OSC-1510 unit, Cisco recommends that you use a commercially available cleaning kit and closely follow the instructions included with the kit. Only a simple, routine cleaning procedure for these adapters that can be easily performed by the customer is described here.

## Customer Supplied Cleaning Materials

The following cleaning materials are recommended but are not supplied with the OSC-1510 unit:

- Reagent grade ethyl alcohol in an alcohol dispenser
- Lint free laboratory wipes
- Clean, dry, oil-free compressed air

When cleaning a paired cable connector (bulkhead mating adapter), always clean the mating adapter first. If properly maintained (only used with clean, defect-free fiber connectors and capped when not in use), the mating adapter should not require cleaning. However, if you suspect the adapter is dirty, clean it by blowing with clean, dry, oil-free compressed air.

## Procedure to Clean the Bulkhead Mating Adapters

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- Step 1** Read the manufacturer's instructions to properly use the compressed air can.  
Improper use of the compressed air may cause more contamination to the part being cleaned and defeat the purpose of cleaning the bulkhead mating adapters.
- Step 2** Before blowing the adapter clean, release a short blast of compressed air to remove any dust inside the nozzle of the compressed air can.
- Step 3** Blow three to four short blasts of air into the adapter housing to remove any dust.




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**Note** Always keep unused adapter ports and fiber connectors capped with a clean dust cap.

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## Procedure to Clean Fiber Optic Cable Connectors

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- Step 1** Fold a clean wipe several times to get a pad of 6 to 8 layers of material.
- Step 2** Remove the protective cap on the SC/UPC optical fiber cable connector.
- Step 3** Dampen (but do not soak) a corner of the pad with alcohol using the alcohol dispenser.
- Step 4** Firmly press the tip of the ferrule into the alcohol-moistened area of the wipe. Pinch the wipe firmly with your fingers against the ferrule and twist the ferrule to firmly wipe the ferrule. Repeat this step three times, using a clean alcohol-moistened area each time.




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**Note** The design of the SC connector makes it difficult to clean the entire perimeter of the ferrule, because only a small portion close to the ferrule tip is accessible. Clean the tip of the ferrule and the entire accessible perimeter. Keep the fiber connector capped at all times when not in use.

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- Step 5** Press the ferrule tip into a clean, dry spot on the wipe and perform the pinch-and-twist procedure described in [Step 4](#) once.
- Step 6** Discard the used wipe.
- Step 7** (Optional) A couple of short blasts of clean, dry oil-free compressed air should remove any tissue fragments that may have been deposited on the ferrule during cleaning.
- Step 8** Whenever possible, inspect the ferrule end-face to ensure the cleaning procedure effectively removed the dust/dirt from the ferrule and that no cleaning-induced damages are present.
- Step 9** If the ferrule end-face is still dirty, repeat Steps 1 through 8.
- Step 10** If the ferrule shows damages (for example, scratches or pits across the fiber core), replace the fiber patch cord with a new one equipped with a defect-free connector.  
Defects on the fiber cable connector are likely to damage the mating connector inside the OSC-1510, which results in more costly repairs.
- Step 11** If the ferrule end-face is clean and damage-free, place the connector into the corresponding clean mating adapter on the OSC-1510 front panel following the instructions in the next section.
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# Fiber Optic Cable Installation



Warning

Follow all directions and warning labels when working with optical fiber cables and adapters. To prevent serious eye damage, never look directly into an optical fiber cable connector or mating adapter.



Warning

When connecting an optical fiber patch cord between the OSC-1510 and the optical card ports in the ONS 15454, use the electrostatic discharge wristband supplied with the ONS 15454. Plug the wristband into the ESD jack on the lower right front side of the ONS 15454.



Note

Always clean all fiber connectors thoroughly before making the connection with the mating adapter. Very small particles can permanently damage the end of the mating fiber inside the OSC-1510 unit which makes regular cleaning imperative. See the [“Fiber Optic Connector Cleaning and Maintenance”](#) section on page 10 for cleaning instructions.



Note

The OSC-1510 front panel features SC/UPC bulkhead adapters. Always use fiber optic cables equipped with the corresponding (SC/UPC) connector type. Using any other type of connector results in damaging the connector and/or adapter.

## Procedure to install and route fiber optic cables to the OSC-1510

- Step 1 Place the SC/UPC cable connector in front of the corresponding bulkhead adapter on the front panel of the OSC-1510.
- Step 2 Align the keyed ridge of the cable connector with the slot in the receiving adapter.
- Step 3 Gently push the cable connector into the adapter until you hear a click, indicating the latching system is engaged.
- Step 4 Open the fiber guide by pulling the fiber guide locker on the appropriate side of the front panel. A spring-ball screw that allows the fiber guide locker to be easily opened or closed secures the top.
- Step 5 Route fiber cables through the fiber guide and lock them into place using the fiber guide locker.

# Obtaining Documentation

These sections explain how to obtain documentation from Cisco Systems.

## World Wide Web

You can access the most current Cisco documentation on the World Wide Web at this URL:

<http://www.cisco.com>

Translated documentation is available at this URL:

[http://www.cisco.com/public/countries\\_languages.shtml](http://www.cisco.com/public/countries_languages.shtml)

## Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

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Cisco TAC inquiries are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

The Cisco TAC resource that you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

## Cisco TAC Web Site

You can use the Cisco TAC Web Site to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to this URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

<http://www.cisco.com/register/>

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC Web Site, you can open a case online by using the TAC Case Open tool at this URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC Web Site.

## Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this URL:

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Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.

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