



Cisco ONS 15216 EDFA2 Operations Guide

Release 2.1.0
September 2002

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Preface

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

Optical Networking Product Documentation CD-ROM

Optical networking-related documentation, including the *Cisco ONS 15216 EDFA2 Operations Guide*, is available in a CD-ROM package that ships with your product. The Optical Networking Product Documentation CD-ROM, a member of the Cisco Connection Family, is updated as required. Therefore, it might be more current than printed documentation. To order additional copies of the Optical Networking Product Documentation CD-ROM, contact your local sales representative or customer service. The CD-ROM package is available as a single unit or through an annual subscription.

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The Cisco Technical Assistance Center (TAC) is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two levels of support are available: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

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.

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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.



Applications

This manual describes how to install and operate the Cisco Optical Network System (ONS) 15216 Erbium-Doped Fiber Amplifier 2 (EDFA2). The ONS 15216 EDFA2 is an optical amplifier that enables the migration to next-generation all-optical networks. It features bandwidth-on-demand and wavelength protection switching that extend dense wavelength division multiplexing (DWDM) links by hundreds of kilometers.

With the ONS 15216 EDFA2, optical signals from a span in a DWDM network can be added or dropped without negatively affecting (degrading) other optical signals on the same span.

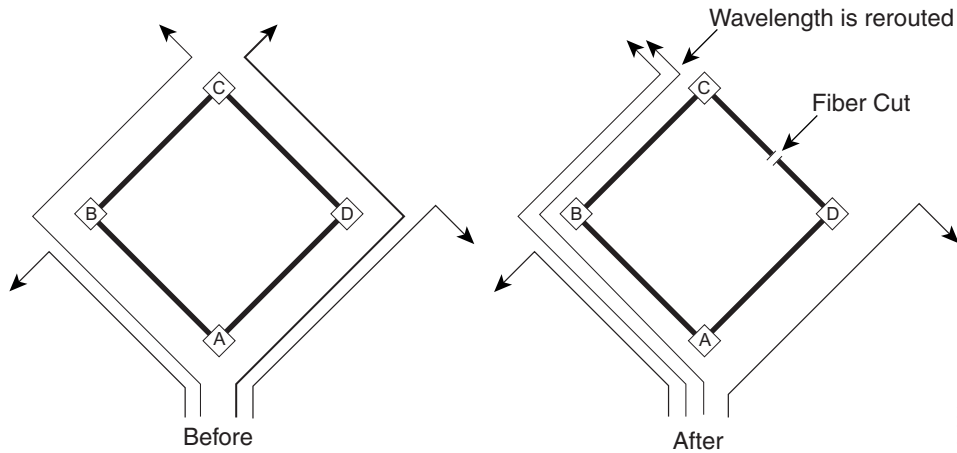
1.1 Bandwidth-On-Demand

The ONS 15216 EDFA2 is a technology for bandwidth-on-demand wavelength services. Depending on the settings and the input power, every wavelength in a ONS 15216 EDFA2 is guaranteed to be amplified by 13 to 22 dB. With the ONS 15216 EDFA2's gain control technology, amplification for each wavelength remains constant at all times as wavelengths are added or dropped from an optical fiber. As long as the total input power of all wavelengths is between 4 dBm and -27 dBm, any number of wavelengths can be amplified.

1.2 Wavelength Protection Switching

The ONS 15216 EDFA2 uses wavelength protection switching to restore wavelengths that are lost in the event of a fiber cut or other loss of signal. [Figure 1-1](#) shows an example of wavelength protection switching. In this example, two wavelengths are routed clockwise around a metro ring, and two wavelengths are routed counter-clockwise around the same ring. Of the two clockwise wavelengths, only one transits the span linking locations C and D. If a fiber cut occurred on this span, the affected wavelength could be restored by rerouting it (counter-clockwise) around the ring to location D. Wavelength protection switching minimizes the amount of bandwidth allocated for restoration because only the affected wavelength is restored, not the entire fiber.

Figure 1-1 Wavelength Protection Switching



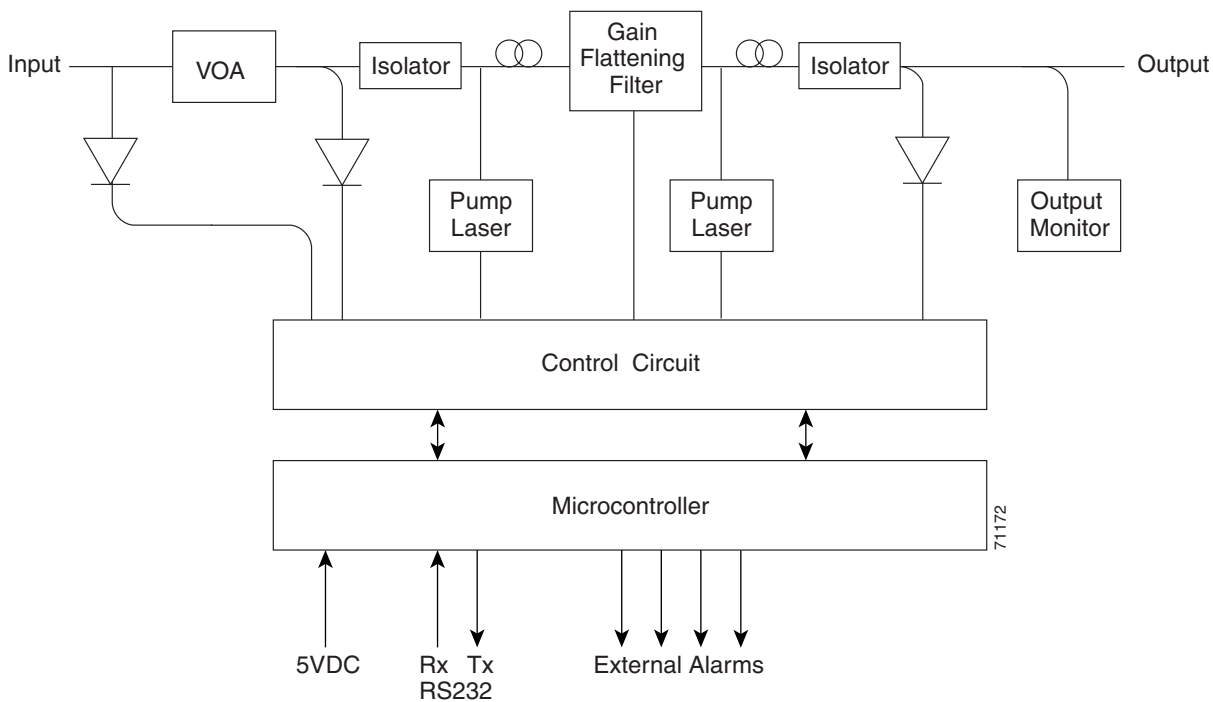
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After a protection switch occurs, the number of wavelengths on each fiber changes. In the example, the number of counter-clockwise wavelengths increases to three, while the number of clockwise wavelengths decreases to one.

1.3 Key Features

Figure 1-2 shows a block diagram of the ONS 15216 EDFA2.

Figure 1-2 ONS 15216 EDFA2 Block Diagram



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The ONS 15216 EDFA2 has the following key features:

- Adjustable constant gain of 13 to 22 dB
- Gain flattening < 2 dB (peak to valley)
- Transient suppression
- Low noise figure of < 7 dB at -5 dBm input
- Simple Network Management Protocol (SNMP) MIBs
- Transaction Language 1 (TL1)

1.3.1 Constant Gain

Constant amplification (gain) per wavelength is important for ensuring that variations in power between channels at the receivers is minimized. As wavelengths are added/dropped from an optical fiber, small variations in gain between channels in a span can cause large variations in the power difference between channels at the receivers. The ONS 15216 EDFA2 enables bandwidth-on-demand services by guaranteeing that every wavelength is amplified by a value that can be set between 13 and 22 dB, no matter how many wavelengths are being amplified.

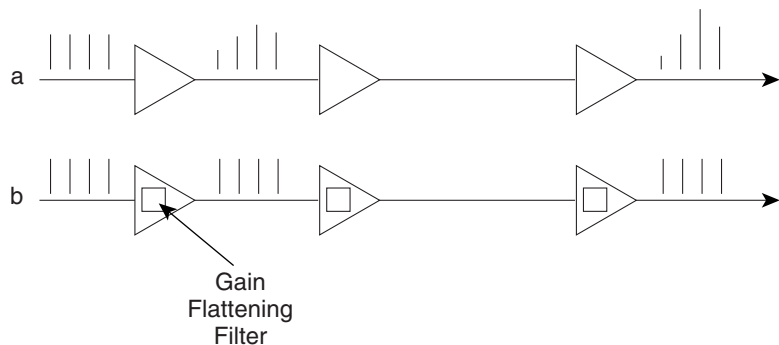
Constant gain is achieved using an automatic control circuit that adjusts pump power when changes in input power are detected. The ONS 15216 EDFA2 operates in Constant Gain Temperature Compensated mode by default, but since there may be applications where other operating modes may be required, the ONS 15216 EDFA2 can also be set to operate in any one the following pump control modes:

- Constant Pump Current mode
- Constant Pump Power mode
- Constant Output Power mode

1.3.2 Gain Flattening

Figure 1-3 illustrates the effect of the gain flattening filter in the ONS 15216 EDFA2. Fiber (a) in the figure shows a set of channels with equal powers being input to a cascaded network of amplifiers that produce vastly different power levels and optical signal-to-noise ratios (OSNR) at the output. In contrast, fiber (b) shows how the EDFAs effectively reduce this effect by introducing a gain flattening filter within each amplifier.

Figure 1-3 Gain Flattening Filter



1.3.3 Transient Suppression

Transients in the performance of optical amplifiers are inevitable whenever the number of signals, or the relative power of signals, changes. The ONS 15216 EDFA2 uses transient suppression to reduce the amount of time required by an amplifier to recover from a change. This indicates the suitability of the amplifier for add/drop applications like those described earlier.

1.3.4 Low Noise

Whenever there is gain in an optical system, noise also occurs. The predominant source of noise in EDFAs is amplified spontaneous emission (ASE). The ONS 15216 EDFA2 has a low noise figure of less than 7 dB at -5 dBm input.

1.3.5 SNMP MIBs

The ONS 15216 EDFA2 SNMP MIB contains definitions of management information that allows network systems to be remotely monitored, configured, and controlled.

1.3.6 TL1

The ONS 15216 EDFA2 has a TL1 interface available to the network operator and craftsperson.



Technical Specifications

This chapter discusses the technical specifications for the Cisco ONS 15216 EDFA2.

2.1 Optical Specifications

ONS 15216 EDFA2 optical specifications are listed and described in [Table 2-1](#).

Table 2-1 ONS 15216 EDFA2 Optical Specifications

Requirement	Specification
Input signal wavelength	1530 nm to 1563 nm
Input power (channel total)	-27 dBm to 4 dBm (total all channels) See the “Maximum Input Power” section on page 2-2 and “Channel Loading” section on page 2-2 for more information. Note In the event of a fiber cut or loss of connection, and there is no input power, the ONS 15216 EDFA2 has -3.5 dBm of output power. For additional safety information, see the “Safety Requirements” section on page 3-3.
Mode of operation	Unidirectional (two common fibers: one transmit, one receive)
Maximum output power	17 dBm
Signal gain per channel	13 dB to 22 dB
Channel gain deviation from setpoint	± 1.25 dB
Gain flattened	< 2 dB (peak to valley)
Maximum noise figure	< 7 dB at -5 dBm input power
Polarization mode dispersion (PMD)	< 0.6 ps
Input/output optical return loss	> 27 dB
Backward ASE power	-30 dBm maximum
Polarization sensitivity	< 0.5 dB
Automatic gain control (AGC)	The ONS 15216 EDFA2 contains an active gain block with an automatic gain control loop to minimize the effects of output power variations per wavelength upon adding or deleting wavelengths on the same DWDM ring.

2.1.1 Maximum Input Power

The ONS 15216 EDFA2 operates at a gain setting between 13 and 22 dB. Each gain setting has a maximum input power. The maximum input power is defined as the output power, 17 dBm, minus the gain setting. For example at a gain setting of 22 dB, the maximum input power is -5 dBm. Prolonged operation beyond the maximum input power can shorten the life of the ONS 15216 EDFA2.

Optical attenuators are required to bring total input power to less than the maximum input power when operating in constant gain mode.

2.1.2 Channel Loading

You can ensure a smooth upgrade path from a single channel to the maximum numbers of channels with a minimum disruption of service if the per-channel power of the single channel is properly set from the start. The per-channel power should be set so that at full channel loading, the total input power is less than the maximum power indicated in [Table 2-2](#). For example, if the maximum number of channels at full loading is 18 and the gain is set to 22 dB, the maximum per channel power is -17.6 dBm.

Use [Table 2-2](#) to calculate per-channel power as a function of the maximum total number of channels at full loading. Contact Cisco TAC with any questions or concerns regarding maximum input power or setting the upgrade path.

Table 2-2 Channel Power (Gain = 13 dB)

	4	3	2	1	0	-1	-2	-3	-4	-5
Number of Channels at Full Loading	Maximum Power per Channel at Gain Setting (units measured in dBm)									
1	4.0	3.0	2.0	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0
2	1.0	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	-7.0	-8.0
3	-0.8	-1.8	-2.8	-3.8	-4.8	-5.8	-6.8	-7.8	-8.8	-9.8
4	-2.0	-3.0	-4.0	-5.0	-6.0	-7.0	-8.0	-9.0	-10.0	-11.0
5	-3.0	-4.0	-5.0	-6.0	-7.0	-8.0	-9.0	-10.0	-11.0	-12.0
6	-3.8	-4.8	-5.8	-6.8	-7.8	-8.8	-9.8	-10.8	-11.8	-12.8
7	-4.5	-5.5	-6.5	-7.5	-8.5	-9.5	-10.5	-11.5	-12.5	-13.5
8	-5.0	-6.0	-7.0	-8.0	-9.0	-10.0	-11.0	-12.0	-13.0	-14.0
9	-5.5	-6.5	-7.5	-8.5	-9.5	-10.5	-11.5	-12.5	-13.5	-14.5
10	-6.0	-7.0	-8.0	-9.0	-10.0	-11.0	-12.0	-13.0	-14.0	-15.0
11	-6.4	-7.4	-8.4	-9.4	-10.4	-11.4	-12.4	-13.4	-14.4	-15.4
12	-6.8	-7.8	-8.8	-9.8	-10.8	-11.8	-12.8	-13.8	-14.8	-15.8
13	-7.1	-8.1	-9.1	-10.1	-11.1	-12.1	-13.1	-14.1	-15.1	-16.1
14	-7.5	-8.5	-9.5	-10.5	-11.5	-12.5	-13.5	-14.5	-15.5	-16.5
15	-7.8	-8.8	-9.8	-10.8	-11.8	-12.8	-13.8	-14.8	-15.8	-16.8
16	-8.0	-9.0	-10.0	-11.0	-12.0	-13.0	-14.0	-15.0	-16.0	-17.0
17	-8.3	-9.3	-10.3	-11.3	-12.3	-13.3	-14.3	-15.3	-16.3	-17.3

Table 2-2 Channel Power (Gain = 13 dB) (continued)

	4	3	2	1	0	-1	-2	-3	-4	-5
Number of Channels at Full Loading	Maximum Power per Channel at Gain Setting (units measured in dBm)									
18–	-8.6	-9.6	-10.6	-11.6	-12.6	-13.6	-14.6	-15.6	-16.6	-17.6
19	-8.8	-9.8	-10.8	-11.8	-12.8	-13.8	-14.8	-15.8	-16.8	-17.8
20	-9.0	-10.0	-11.0	-12.0	-13.0	-14.0	-15.0	-16.0	-17.0	-18.0
21	-9.2	-10.2	-11.2	-12.2	-13.2	-14.2	-15.2	-16.2	-17.2	-18.2
22	-9.4	-10.4	-11.4	-12.4	-13.4	-14.4	-15.4	-16.4	-17.4	-18.4
23	-9.6	-10.6	-11.6	-12.6	-13.6	-14.6	-15.6	-16.6	-17.6	-18.6
24	-9.8	-10.8	-11.8	-12.8	-13.8	-14.8	-15.8	-16.8	-17.8	-18.8
25	-10.0	-11.0	-12.0	-13.0	-14.0	-15.0	-16.0	-17.0	-18.0	-19.0
26	-10.1	-11.1	-12.1	-13.1	-14.1	-15.1	-16.1	-17.1	-18.1	-19.1
27	-10.3	-11.3	-12.3	-13.3	-14.3	-15.3	-16.3	-17.3	-18.3	-19.3
28	-10.5	-11.5	-12.5	-13.5	-14.5	-15.5	-16.5	-17.5	-18.5	-19.5
29	-10.6	-11.6	-12.6	-13.6	-14.6	-15.6	-16.6	-17.6	-18.6	-19.6
30	-10.8	-11.8	-12.8	-13.8	-14.8	-15.8	-16.8	-17.8	-18.8	-19.8
31	-10.9	-11.9	-12.9	-13.9	-14.9	-15.9	-16.9	-17.9	-18.9	-19.9
32	-11.1	-12.1	-13.1	-14.1	-15.1	-16.1	-17.1	-18.1	-19.1	-20.1

2.2 Electrical Specifications

The ONS 15216 EDFA2 uses a power supply that meets the electrical specifications listed in [Table 2-3](#).

Table 2-3 ONS 15216 EDFA2 Electrical Specifications

Requirement	Specification
Input voltage	-48 VDC
Maximum power consumption	< 25 W at 65°C end of life
Minimum supply voltage	-40 VDC
Maximum supply voltage	-57 VDC or under
Maximum current	0.52 A

2.3 Mechanical Specifications

Table 2-4 lists the ONS 15216 EDFA2 mechanical specifications.

Table 2-4 ONS 15216 EDFA2 Mechanical Specifications

Requirement	Specification
Dimensions (H x W x D)	1 3/4 in. x 17 3/16 in. x 11 in. (4.4 cm x 43.7 cm x 27.9 cm)
Weight	5.45 lb (2.47 kg)
Ambient operating temperature	32 to 122°F (0 to 50°C)
Storage temperature	−40 to 185°F (−40 to 85°C)
Humidity operation	Relative humidities of 5 to 95%, non-condensing. With ambient temperatures above 84° F (29°C), the relative humidity may be limited to that corresponding to a specific humidity of 0.024 pounds of water per pound of dry air.
Humidity storage	Relative humidities of 5 to 95%, non-condensing. With ambient temperatures above 84° F (29°C), the relative humidity may be limited to that corresponding to a specific humidity of 0.024 pounds of water per pound of dry air.
Connector types	SC/UPC Bulkhead connectors
Mean time between failures (MTBF)	12.7 years as per calculation procedure outlined in TR-NWT-000332, Issue 4, Method 1

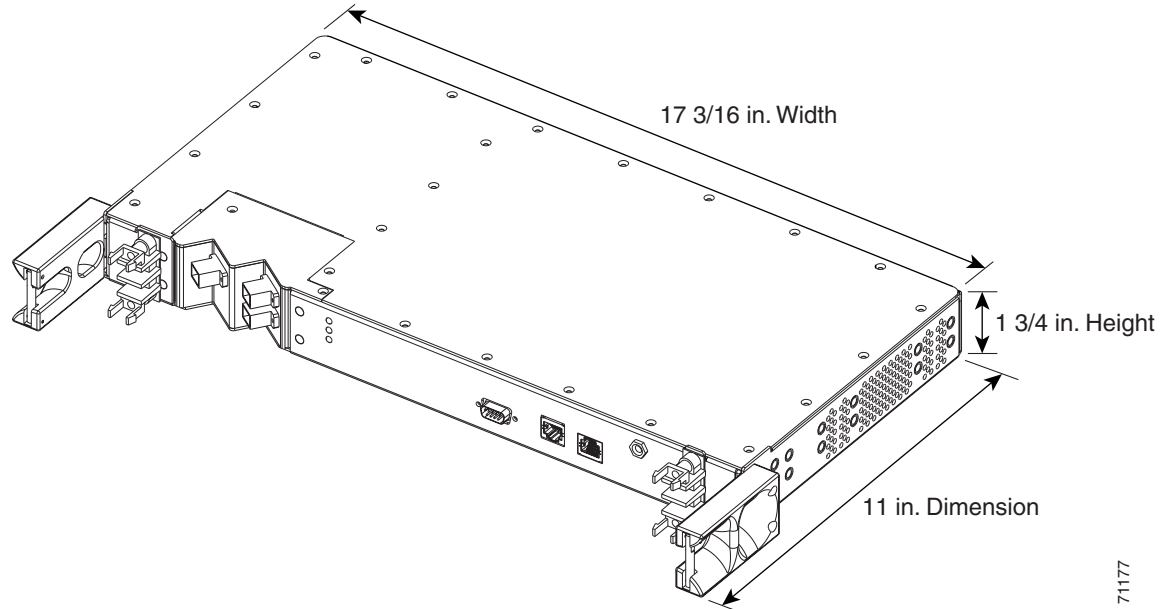
2.4 External Features

The ONS 15216 EDFA2 has the following external features:

- Front panel LEDs, graphics, and warning displays
- Brackets for rack mounting (including reversible ears that permit front, mid, and rear mounting)
- Rear and side cooling vents
- Access door for fiber cleaning
- Fiber routing and retaining feature
- Two threaded grounding studs on rear and two threaded grounding holes on side
- Screw lug terminal block for power connection
- RJ-45 connector for external alarm connection
- RJ-45 connector for LAN connection
- SC/UPC connectors for optical interface
- DB-9 female connector for craft EIA/TIA-232 serial interface connection

Figure 2-1 displays a mechanical outline of the external features and dimensions of the ONS 15216 EDFA2.

Figure 2-1 ONS 15216 EDFA2 Dimensions



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2.5 Front Panel

Figure 2-2 shows the ONS 15216 EDFA2 front panel in detail. The front panel provides an all-front access (fibers, power, alarm contact, and management interface) that complies with international standards.

Figure 2-2 ONS 15216 EDFA2 Front Panel

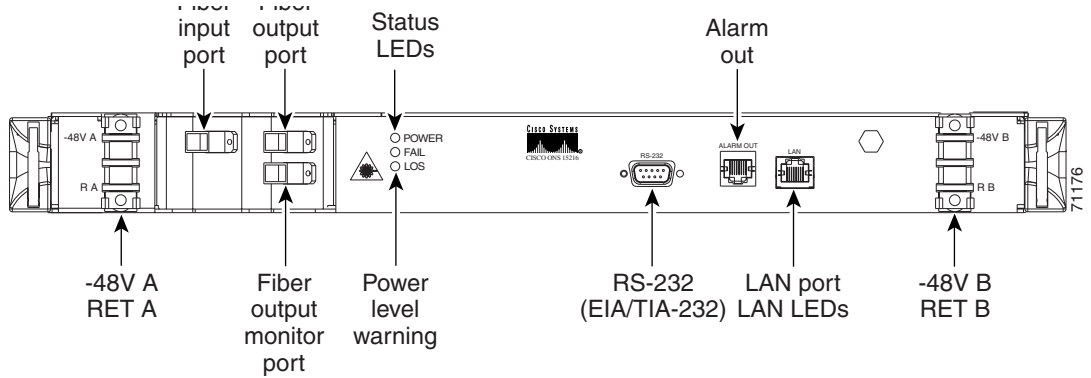


Table 2-5 describes the ONS 15216 EDFA2 front panel features.

Table 2-5 ONS 15216 EDFA2 Front Panel Features

Feature	Description
Terminal strip	Terminal strip for supplying power to the ONS 15216 EDFA2. Attach AWG 18 stranded power wires to appropriate terminals.
Threaded grounding holes	Threaded grounding holes (#10/32) to ground the ONS 15216 EDFA2.
Alarm Out	RJ-45 connector used for alarm system connection. (See the “Alarm Out Relay Interface (RJ-45)” section on page 3-5 for additional information.)
Serial port connection (EIA/TIA-232)	Serial port for local or remote (modem) data communication connection. (See Chapter 3, “Installation” for additional information.)
Label	Laser warnings, designation labels, and power level warning.
Status LEDs	LEDs indicating status of power, fail, loss of signal, Ethernet link availability and Ethernet link traffic. (See the “Alarm LEDs” section on page 3-6.)
Fiber input	SC/UPC fiber input port.
Fiber output	SC/UPC fiber output port.
Monitor output	SC/UPC port for fiber that taps off 1% of output signal for monitoring purposes.
Chassis ground lugs	Rear panel grounding post to attach chassis ground wire using #8/32 nut.
LAN	RJ-45 connector used for 10BASE-T Ethernet connection. For more information, see the “LAN Interface (Ethernet)” section on page 3-14.



Installation

3.1 Introduction

This chapter contains the installation procedures for the Cisco ONS 15216 EDFA2. The chapter is divided into the following sections:

- Power (–48V A, RET A, –48V B, RET B, and chassis ground)
- Optical (fiber input and output ports)
- Communications (Alarm Out, LEDs, EIA/TIA-232, and LAN)

3.2 Standard Precautions

The following standard precautions should be taken when installing the ONS 15216 EDFA2:

- Basic electrical precautions should be taken before powering up the ONS 15216 EDFA2.
- Using standard fiber handling and cleaning procedures is critical when installing optical networking equipment.
- Eye safety precautions should be employed when handling fiber optic patchcords.

3.3 Placement and Power Connection

3.3.1 General Rack Considerations

The following potential hazards should be considered when installing the ONS 15216 EDFA2 within a rack:

- **Elevated Operating Ambient Temperature**—If installed in a closed or multi-module rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Consideration should be given to installing the equipment in an environment compatible with the manufacturer’s maximum rated ambient temperature.
- **Reduced Air Flow**—Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical Loading**—Mounting of the equipment in the rack should be such that it avoids uneven mechanical loading.

- **Circuit Overloading**—Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used.
- **Reliable Earthing**—Reliable grounding of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (i.e., use of power strip, etc.).

**Warning**

The ONS 15216 EDFA2 is intended for installation in a restricted access area. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock, key, or other means of security. A restricted access area is controlled by the authority responsible for the location.

3.3.2 Rack Installation and Power Supply Procedures

**Warning**

Before performing any of the following procedures, ensure that the power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

Follow these steps to install the ONS 15216 EDFA2 into the rack and correctly set up the power supply:

-
- Step 1** Mount the ONS 15216 EDFA2 in the rack (19 inches or 23 inches reversible ears). Empty rack space is not required above or below the ONS 15216 EDFA2.
 - Step 2** Connect the –48 VDC power cable to the office fuse panel (user-provided).
 - a. 1.0A fusing is required (user-provided).
 - b. Use 18 AWG stranded wire (and wire and wire lugs as appropriate).
 - Step 3** Connect power from the fuse panel to the power bus A terminals on the front panel of the ONS 15216 EDFA2. See [Figure 2-2 on page 2-5](#).
 - Step 4** Repeat [Step 3](#) for power bus B.
 - Step 5** Connect the facility ground to the ONS 15216 EDFA2 side or rear panel ground using #10/32 star washer and 3/4-inch screws (provided on the module).
 - Step 6** Insert 1.0A fuses into the fuse panel (user-provided).

The Power LED on the front panel of the ONS 15216 EDFA2 should illuminate when the power is supplied.

3.4 SC/UPC Optical Ports

SC/UCP optical ports are as follows:

- Optical input signal to be amplified (INPUT)
 - Input must be between -27 dBm and $+4$ dBm
- Optically amplified output (OUTPUT)
- Optical monitored output signal (MONITOR OUT)
 - 1% tap of output or 20 dB below output signal

3.4.1 Safety Requirements



Warning

Procedures that require the fiber connections to be open must only be performed by service personnel trained in laser safety requirements. Use of controls or performing adjustments or procedures other than those specified herein may result in hazardous radiation exposure.



Warning

Anyone working with the ONS 15216 EDFA2 must not allow their eyes or body to be exposed to the laser beam or to a reflection from a mirror-like surface. Additionally, viewing the laser output with certain optical instruments (eye loupes, microscopes) within a distance of 100 mm may pose an eye hazard.



Warning

In the event of a fiber cut or loss of connection and there is no input power, the ONS 15216 EDFA2 still has -3.5 dBm of optical output power.

The TL1, SNMP, and command-line interface (CLI) commands can be used to increase the level of laser energy. Necessary precautions must be taken to avoid exposure to laser energy when using these commands.

3.4.2 Optical Connection Procedure



Warning

Follow all directions and warning labels when working with optical fibers. To prevent eye damage, never look directly into a fiber or connector.

Connect the customer-supplied fiber optic patchcords to the SC/UPC optical ports of the ONS 15216 EDFA2 using the following procedure. Refer to [Figure 3-1](#) while performing this procedure:

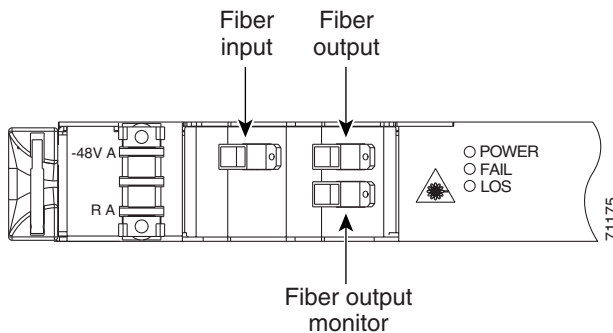
Step 1 Clean both ends of the two fiber optic patchcords. Refer to the Cisco document “Cleaning Procedure for Fiber Optic Connectors” for more information.

Step 2 Connect the first patchcord between the ONS 15216 EDFA2 OUTPUT connector and the FACILITY LINE connection.

The measured optical output power should be approximately -3.5 dBm.

- Step 3** Connect the second patchcord to TERMINAL OUTPUT. Measure and record the total optical power:
- DWDM/OADM output
 - Terminal transmitter output
- Step 4** If optical power at the end of the TERMINAL OUTPUT patchcord is less than or equal to +4 dBm, connect the end to the ONS 15216 EDFA2 input. If the optical power is greater than +4 dBm, additional optical attenuation is required to bring optical power below +4 dBm.

Figure 3-1 ONS 15216 EDFA2 Optical Connections



3.4.3 Optical Amplification Operation Verification Procedure

To verify ONS 15216 EDFA2 optical amplification, use the following procedure:

- Step 1** Connect an optical power meter to the MONITOR OUT port.
- Step 2** Measure and record the output power. The MONITOR OUT port level is -20 dB less than the signal.
- Step 3** Verify that the ONS 15216 EDFA2 input and output power are within the range shown in [Table 3-1](#).
- For example, if the total input power is between -27 dBm and -5 dBm, expect an output power between -5 dBm and 17 dBm.

Table 3-1 Gain Range

Gain (dB)	Total Input Power (dBm)		Total Output Power (dBm)	
	Min	Max	Min	Max
22	-27	-5	-5	17



Note

Unless overridden by the user, the gain per channel is by default set to 22 dB by the ONS 15216 EDFA2. Gain is fixed at 22 dB as long as total input power is less than or equal to -5 dBm. If your input power is higher than -5 dBm, see the “Set Gain” section on page 4-5.

3.5 Communications

The ONS 15216 EDFA2 can communicate in the following ways:

- Alarm Out relay contacts (RJ-45)
- Alarm LEDs
- Serial interface (EIA/TIA-232)
- Serial interface connected to a modem
- LAN interface (RJ-45)

3.5.1 Alarm Out Relay Interface (RJ-45)

The ONS 15216 EDFA2 Alarm Out (RJ-45) port reports alarm status for the following:

- Loss or degradation of electrical power
- Pump laser overheating or excessive pump current, output power, gain, and case temperature
- Loss or degradation of optical network

These alarms can be connected to a network operations center (NOC) network management system (NMS) using the following methods:

- Cisco ONS 15454 miscellaneous discrete input
- Central Office alarm panel/system

[Table 3-2](#) provides the ONS 15216 EDFA2 RJ-45 alarm out pinout and alarm definitions.

Table 3-2 Alarm Pinout and Definitions (RJ-45)

Relay	Pinout	Description
0	1 (0+)	Loss of electrical power
	2 (0-)	
1	3 (1+)	Pump laser temperature or bias is out of range; input power is out of tolerance for gain settings (Major)
	4 (1-)	
2	5 (2+)	Loss of optical input signal or input signal is below threshold (Minor)
	6 (2-)	
3	7 (3+)	Loss of electrical power or out of range for Bus A or Bus B while in duplex mode
	8 (3-)	

3.5.1.1 Alarm Relay Connection Procedure

To set up alarm contacts, follow these steps:

- Step 1** Connect the RJ-45 to the stub-end cable using a #22 AWG solid wire.



Note Cable and connector are not provided.

- Step 2** Connect the alarm cable to the alarm system contacts:
- a. Cisco ONS 15454 medium-dependent interface (MDI) wire wrap pins
 - b. Central office (CO) alarm panel

Refer to [Table 3-2 on page 3-5](#) for information concerning alarm contacts. Refer to [Alarm LEDs, page 3-6](#) for information on the ONS 15216 EDFA2 alarm LEDs.

3.5.2 Alarm LEDs

The ONS 15216 EDFA2 has five LEDs:

- POWER
- FAIL
- LOS
- Ethernet socket (2)

Three of these LEDs, POWER, FAIL, and LOS, are located at the left hand side of the ONS 15216 EDFA2 box. The two Ethernet LEDs are located at the top left and right hand sides of the Ethernet socket. When the module is powered on, an LED test is performed.

3.5.2.1 POWER LED (Green)

The POWER LED is green. This LED functions as follows:

- **On:** –48 VDC is within tolerance. (Power Bus A and B are powered normally.)
- **Off:** No power or power is out of tolerance from the internal power supply. (Power Bus A and B are not powered.)
- **Flashing:** Power Bus A or B (in duplex mode) has failed or is out of tolerance, or power BUS A (in simplex mode) is out of tolerance.

In the off condition, the first pair of alarm relay contacts in the RJ-45 connector changes from a normally open condition to a closed condition. The LED and alarm automatically reset when the condition clears. (For additional alarm contact closure information, see the [“Alarm Out Relay Interface \(RJ-45\)” section on page 3-5.](#))

3.5.2.2 FAIL LED (Red)

The FAIL LED is red. This LED functions as follows:

- **On:** The pump laser bias, pump laser temperature, output power, gain, or case temperature is out of tolerance. (A major internal failure has occurred.)
- **Off:** The pump laser bias or pump laser temperature is in a specified range.

In the on condition, the second pair of alarm relay contacts in the RJ-45 connector changes from a normally open to a closed condition. If an invalid input optical signal is applied to the ONS 15216 EDFA2, the Fail LED is illuminated. The LED and alarm automatically reset when the condition clears.

3.5.2.3 LOS LED (Yellow)

The loss of signal (LOS) LED is yellow. This LED functions as follows:

- **On:** The optical input power to the ONS 15216 EDFA2 is below the loss of input threshold. (A LOS threshold decision occurs.)
- **Off:** The optical input power is within the input threshold and/or no –48 VDC is present.

In the on condition, the third pair of alarm relay contacts in the RJ-45 connector changes from a normally open condition to a closed condition. The LED and alarm automatically reset when the condition clears.

3.5.2.4 Ethernet Socket LEDs

Two LEDs are located at the top left and right hand sides of the Ethernet socket. These LEDs are both green. These LEDs function as follows:

- If left Ethernet socket LED is on, the link is up.
- If right Ethernet socket LED is on or flashing, there is Ethernet traffic.

3.5.3 Serial Interface (EIA/TIA-232) Communication

This section describes communication with the ONS 15216 EDFA2 using a serial connection.

3.5.3.1 Required Equipment

Establishing a serial communications link with a ONS 15216 EDFA2 requires the equipment listed in [Table 3-3](#).

Table 3-3 *Equipment Checklist*

Hardware	Comments
Laptop, or VT100, running HyperTerminal.	User-provided. HyperTerminal can be found in the Microsoft Windows Accessories menu.
EIA/TIA-232 cable with DB-9F connectors wired as shown in Figure 3-8 .	Provides EIA/TIA-232 link to ONS 15216 EDFA2.

3.5.3.2 EIA/TIA-232 Connection Procedure

To set up an EIA/TIA-232 link to the ONS 15216 EDFA2, use the following procedure. (The procedure uses HyperTerminal and a connection via the COM1 port.)

-
- Step 1** Connect the DB-9F end of the EIA/TIA-232 data cable (straight cable, user provided) to the laptop COM port.
 - Step 2** Connect the other end of the EIA/TIA-232 data cable to the EIA/TIA-232 serial port connection on the front access panel of the ONS 15216 EDFA2.
 - Step 3** Open HyperTerminal. (HyperTerminal can be found in the Microsoft Windows Accessories menu.)
 - Step 4** Type **Optical Amplifier**, select an icon, and click **OK**.
 - Step 5** In the Connect To dialog box ([Figure 3-2](#)), click **Direct to Com1** in the Connect using field. Click **OK**.

Figure 3-2 HyperTerminal Connect To Dialog Box

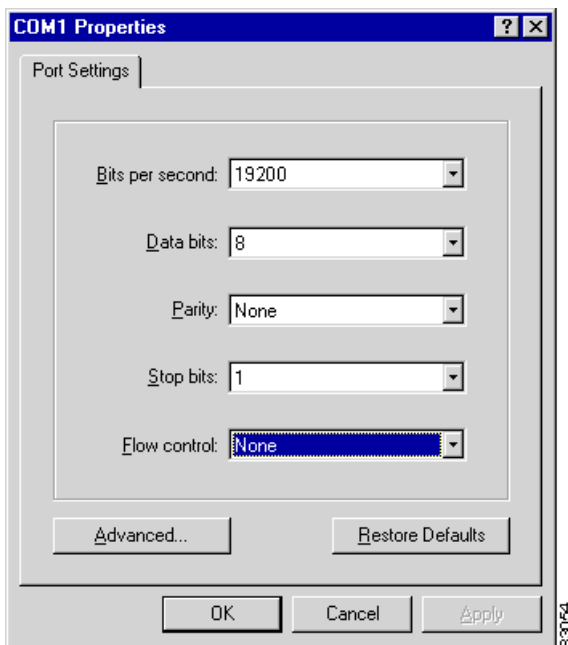


Step 6 Configure the Port Settings in the COM1 Properties dialog box as shown in [Figure 3-3](#). The Port Settings must be configured as follows:

- Bits per second—19200
- Data bits—8
- Parity—None
- Stop bits—1
- Flow control—None

Click **OK** when done.

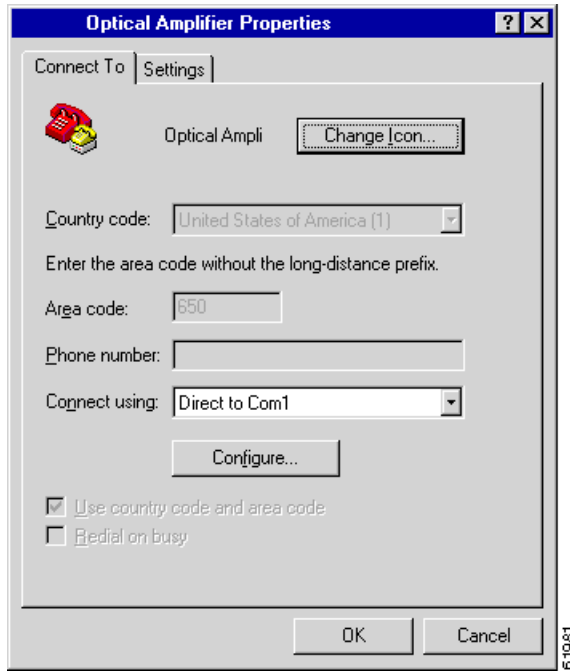
Figure 3-3 HyperTerminal COM1 Properties Dialog Box



Step 7 In the HyperTerminal main window, click **File > Properties**.

Step 8 Click **Connect To** tab in the Optical Amplifier Properties dialog box as shown in [Figure 3-4](#).

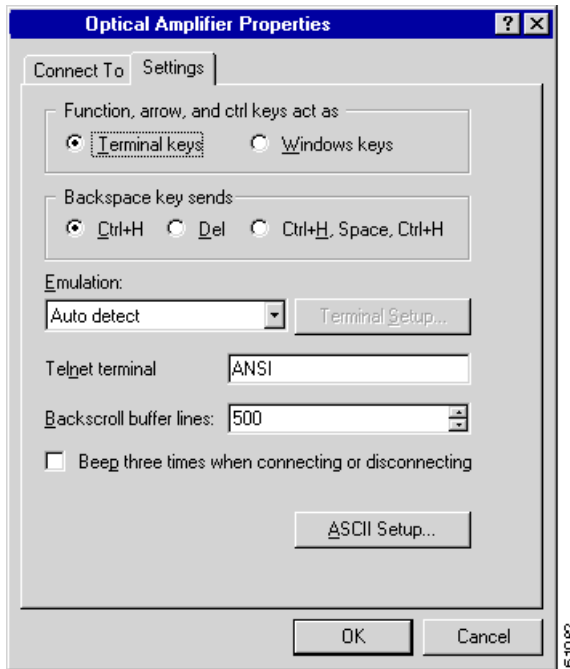
Figure 3-4 Optical Amplifier Properties Dialog Box (Connect To Tab)



Step 9 Ensure that Direct to Com1 is selected in the Connect using field.

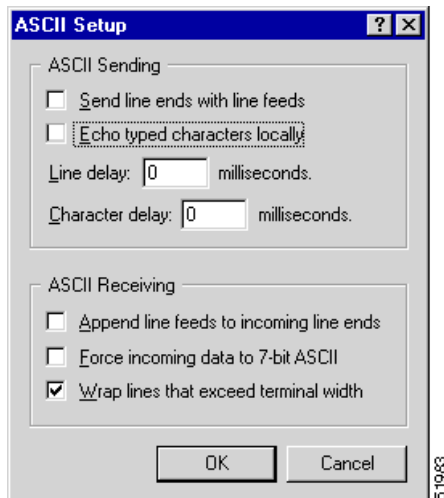
Step 10 Click **Settings** ([Figure 3-5](#)) and click **ASCII Setup**.

Figure 3-5 Optical Amplifier Properties Dialog Box (Settings Tab)



Step 11 Configure the ASCII Setup window as shown in [Figure 3-6](#). Click **OK** when done.

Figure 3-6 HyperTerminal ASCII Setup Dialog Box



Step 12 Click **OK** to return to the main HyperTerminal window.

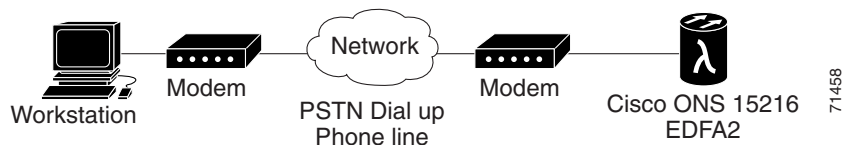
The ONS 15216 EDFA2 login screen appears. The appearance depends on the shell the ONS 15216 EDFA2 is set to (TL1 is the default shell). See [“Log In via EIA/TIA-232 Port Using HyperTerminal”](#) section on page 4-1 for the login procedure in ASH shell and [“Log In via EIA/TIA-232 Port Using HyperTerminal”](#) section on page 8-1 for the login procedure in TL1 shell.

3.5.4 Serial Interface Remote Communication via Modem

This section describes the procedure for establishing a remote dial-up connection to the ONS 15216 EDFA2. ONS 15216 EDFA2 remote communication requires two US Robotics 56K Fax modems set up to send data over a two-wire dial-up telephone line. (See [Figure 3-7](#).)

This section assumes the use of the US Robotics 56K Fax modem V.90. Other modem types may require different settings to establish a remote dial-up connection. The user should review their modem documentation to ensure compatibility between US Robotics and other vendor modem types.

Figure 3-7 Remote Communication



3.5.4.1 Remote Communication Component Requirements

Table 3-4 lists the components required to communicate remotely with a ONS 15216 EDFA2. Table 3-4 is divided into two sections: Remote Site and Local Site. The Remote Site section lists components needed at the site that contains the ONS 15216 EDFA2 and the Local Site section lists components needed at the site where the user is located.

Table 3-4 Communication Component List

Component	Notes
Remote Site	
1 ONS 15216 EDFA2	
1 US Robotics 56K Fax modem V.90	The modem to ONS 15216 EDFA2 connection must be set for 19200 baud. The modem to modem connection must be set for 14400 baud.
1 10-ft DB-25M to DB-9F cable	For connection between ONS 15216 EDFA2 and modem.
1 RJ-11 to RJ-11 telephone cable	For connection between the modem and PSTN dial-up telephone line
1 public switched telephone network (PSTN) dial-up telephone line	
Local Site	
1 PC running HyperTerminal	
US Robotics 56K Fax modem V.90	The modem to ONS 15216 EDFA2 connection must be set for 19200 baud. The modem to modem connection must be set for 14400 baud.
1 10-ft DB-25M to DB-9F	For connection between PC COM port and modem.
1 RJ-11 to RJ-11 telephone cable	For connection between the modem and PSTN dial-up telephone line.
1 PSTN dial-up telephone line	

3.5.4.2 Modem Signals

The only signals required for communication are TXD (transmit), RXD (receive), and SIGNAL GROUND. By adjusting the modem manufacturer settings, the other signals can be ignored.

3.5.4.3 Modem Power Up

The modem has a DIP switch that overrides certain NVRAM settings during a power up. For consistent operation throughout the power cycles, the DIP switches must be set as displayed in Table 3-5.

Table 3-5 Modem DIP Switch Setting

DIP Switch Setting	Up (U) or Down (D)	Description
1	D	Data terminal ready override
2	U	Verbal result codes
3	U	Suppress result codes
4	D	No echo, offline commands
5	U	Auto-answer on first ring, or higher if specified in NVRAM
6	U	Carrier detect normal
7	U	Load NVRAM defaults
8	D	Smart mode

3.5.4.4 Modem Configuration Settings

After configuring the DIP switch settings, each modem configuration must then be set using a terminal program such as Microsoft Windows HyperTerminal.

Connect the modem to the PC serial port using a DB-25M to DB-9F modem cable as per the manufacturer recommendations.

Set the terminal communication parameters as follows:

- 19,200 baud
- No parity
- 8 bits per character
- 1 stop bit, and no flow control

Table 3-6 gives a brief description of the modem settings that are stored in NVRAM. These settings survive power supply interruptions. Use these settings to configure each modem.

Table 3-6 Modem Settings

Modem Setting	Description
b0	ITU-T answer sequence
e0	Echo off
f1	Local echo off
m1	Speaker on until CONNECT
q1	Quiet mode; no results code
v1	Verbal codes
x1	Select result codes displayed
y0	Use profile 0 setting in NVRAM
&a3	Enable extra result codes
&b1	Fixed DTE speed
&c1	Normal CD operation

Table 3-6 Modem Settings (continued)

Modem Setting	Description
&d0	DTR override
&g0	No guard tone, U.S. and Canada
&h0	Flow control disabled
&i0	Software flow control disabled
&k0	Data compression disabled
&m5	ARQ mode
&n8	Fix highest connect speed to 14,400 bps
&p1	Pulse dialing option
&r1	Ignore Request to Send (RTS)
&s1	Modem controls Data Set Ready (DSR)
&t5	Prohibits remote digital loopback
&u8	Fix lowest connect speed to 14,400 bps
&y1	Break handling; destructive/expedited
&w0	Store configuration 0
s0=1	Auto-answer on first ring
s2=128	Disable escape to command mode

3.5.4.5 Setting and Saving Modem Settings

To set and save modem settings, enter the following command to the terminal program and to each modem:

```
atb0e0f1m1q1v1x1y0
at&a3&b1&c1&d0&g0&h0&i0&k0s0=1
at&m5&n8&7p1&r1&s1&t5&u8&y1s2=128
at&w0
```

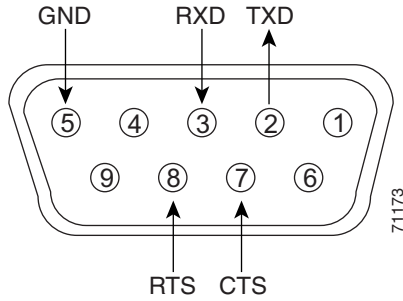

Note

Modem communication is not necessary unless dial-up remote communication is desired.

3.5.4.6 PC Connection via Modem

The ONS 15216 EDFA2 and modem are connected through an EIA/TIA-232 port using a DB-9 connector. The modem, PC, and ONS 15216 EDFA2 should be physically set up as displayed in [Figure 3-8](#). Use [Figure 3-8](#) to properly connect the ONS 15216 EDFA2 to the modem.

Figure 3-8 DB-9 Pinout (EIA/TIA-232)



Using the terminal program from the PC, enter the **ATDT** command with the appropriate telephone number to call the remote ONS 15216 EDFA2 modem. After the modems synchronize, log into the ONS 15216 EDFA2 using the correct user name and password. Refer to [Chapter 5, “SNMP MIB Installation and Configuration,”](#) [Chapter 6, “ASH Commands,”](#) and [Chapter 9, “TL1 Commands,”](#) for additional information on commands.

3.5.5 LAN Interface (Ethernet)

You can connect to the ONS 15216 EDFA2 to an Ethernet LAN for remote access.



Note

Before communicating and managing the ONS 15216 EDFA2 via the Ethernet port, the user must first enter an IP address. To set an IP address, see [Chapter 4, “Provisioning in the ASH Shell.”](#)

Telnet is an application that allows remote management using IP over the Ethernet LAN. The following types of commands can be issued through a Telnet session:

- SNMP MIB commands ([Chapter 5, “SNMP MIB Installation and Configuration”](#))
- CLI commands ([Chapter 6, “ASH Commands”](#))
- TL1 commands ([Chapter 9, “TL1 Commands”](#))

3.5.5.1 LAN Connection Procedure

Use the following procedure to configure the module to accept SNMP, CLI, and TL1 commands via its RJ-45 LAN port:

- Step 1** The ONS 15216 EDFA2 IP address is factory set at 0.0.0.0. The IP address must be set before the ONS 15216 EDFA2 can be accessed via the Ethernet port. See [“Set IP Address” section on page 4-3.](#)
- Step 2** Connect ONS 15216 EDFA2 to the network via the module LAN port.
Use a straight-through Cat5 Ethernet cable with RJ-45 connectors to connect to a LAN, or use a cross-over cable if connecting directly to a PC.
- Step 3** At a terminal or workstation, open the Telnet application.



Note

To send CLI and TL1 commands over IP, a Telnet client is required. For SNMP management over IP, a generic SNMP manager is required.

Step 4 Connect to the ONS 15216 EDFA2 using the module's IP address.

If you do not specify a port number, the ONS 15216 EDFA2 responds in the shell that the ONS 15216 EDFA2 is set to (TL1 is the default shell). Specify port number 8023 to access through the ASH shell or port number 3083 to access through the TL1 shell.

The ONS 15216 EDFA2 login screen appears. See [“Log In via EIA/TIA-232 Port Using HyperTerminal” section on page 4-1](#) for the login procedure in ASH shell and [“Log In via EIA/TIA-232 Port Using HyperTerminal” section on page 8-1](#) for the login procedure in TL1 shell.



Provisioning in the ASH Shell

This chapter discusses the provisioning procedures for the Cisco ONS 15216 EDFA2 using SNMP and a proprietary command line interface named the ASH shell. See [Chapter 8, “Provisioning in the TL1 Shell”](#) for provisioning information using TL1 commands in the TL1 shell.

The provisioning procedure for the ONS 15216 EDFA2 in the ASH shell is as follows:

1. [Log In via EIA/TIA-232 Port Using HyperTerminal, page 4-1](#)
2. [Set IP Address, page 4-3](#)
3. [Log In via LAN Port Using Telnet \(Optional\), page 4-3](#)
4. [Set Date and Time, page 4-4](#)
5. [Set Power Bus Mode \(Simplex or Duplex\), page 4-4](#)
6. [Verify Amplifier Operational Status, page 4-4](#)
7. [Set Gain, page 4-5](#)
8. [Set Alarm Thresholds, page 4-5](#)
9. [Set Password, page 4-10](#)
10. [Add Users, page 4-11](#)
11. [Save Changes, page 4-11](#)
12. [Log Off, page 4-12](#)
13. [Recover Default Password, page 4-12](#)

The following sections describe these steps in detail.

4.1 Log In via EIA/TIA-232 Port Using HyperTerminal

Logging in through the EIA/TIA-232 port is required to set the ONS 15216 EDFA2 IP address before there can be access via the LAN port. (See [“Log In via LAN Port Using Telnet \(Optional\)”](#) section on [page 4-3](#).)

-
- Step 1** Connect to the EIA/TIA-232 port on the front panel. See [“EIA/TIA-232 Connection Procedure”](#) section on [page 3-7](#) for line connection and HyperTerminal setup instructions.
- Step 2** Open HyperTerminal. (HyperTerminal can be found in the Microsoft Windows Accessories menu.)
- Step 3** If you see the login window shown in [Example 4-1](#), skip to [Step 4](#).

By default the ONS 15216 EDFA2 is in TL1 shell, so this step may be required to proceed in ASH shell. When in TL1 shell, the screen opens to a simple prompt (*sidtidname*:ONS15216 EDFA2>). To change to ASH shell, log in using the procedure in “[Log In via EIA/TIA-232 Port Using HyperTerminal](#)” section on page 8-1, and then enter the following command at the hostname prompt:

```
Welcome to ONS15216 EDFA2 Console (v2.1.0)
```

```
sidtidname:ONS15216 EDFA2> ED-NE-GEN:::123:::CLI=ASH;
```

Then enter the following command at the hostname prompt:

```
sidtidname:ONS15216 EDFA2> INIT-SYS::ALL:1234::1;
```

The ONS 15216 EDFA2 should log you off and then bring up the ASH shell login window.

Step 4 Check that the ONS 15216 EDFA2 login window appears as shown in [Example 4-1](#).

Example 4-1 ASH Shell Login Window

```
-- LOGIN ----- sysname

                ONS15216 EDFA2 Optical Amplifier
                -----

                Software Version 2.1.0

                Copyright (c) 2000-2001 Cisco Systems, Inc.

                Username: {           }
                Password: {           }

                [Login]
```

Step 5 Enter both a user name and password.

The default user name and password is CISCO15 with no password (press **Enter**).



Note

For security reasons, it is recommended to change the password from its default value. See [Set Password, page 4-10](#) or [Set Password, page 8-10](#).

Step 6 Press **Enter** when [Login] becomes highlighted. [Example 4-2](#) displays the login response.

Example 4-2 ASH Shell Login Response

```
Welcome to ONS15216 EDFA2 Console (v2.1.0)
```

```
ash:hostname:ONS15216 EDFA2>
```

An EIA/TIA-232 link to the ONS 15216 EDFA2 is established. The user can now provision the ONS 15216 EDFA2.

4.2 Set IP Address

Before connecting the ONS 15216 EDFA2 to a LAN, it is mandatory to set the ONS 15216 EDFA2 IP address through a local serial communication interface using the EIA/TIA-232 port on the front of the module.

-
- Step 1** If you do not know the ONS 15216 EDFA2's IP address, subnet mask, gateway address, or host name, contact your network administrator.
 - Step 2** At the command prompt, enter the **snmp row set local cerent15216EdfaSromIpMgmtGroup** command (displayed in [Example 4-3](#)) and press Enter.

Example 4-3 Setting IP Address, Subnet Mask, Gateway Address, and Host Name

```
ash:hostname:ONS15216 EDFA2> snmp row set local cerent15216EdfaSromIpMgmtGroup

cerent15216EdfaSromIpMgmtEnetAddress 0.0.0.0
cerent15216EdfaSromIpMgmtEnetSubNetMask 0.0.0.0
cerent15216EdfaSromIpMgmtDefaultRouterAddress 0.0.0.0
cerent15216EdfaSromIpMgmtHostName " "
```

Because row set is being used in this command, the user is prompted row by row to enter the IP address, the subnet mask, the gateway address, and the host name (community ID).

- Step 3** The changes must be saved prior to terminating the session. See [“Save Changes” section on page 4-11](#).
 - Step 4** The system must be rebooted to make the IP address active. Use the **processor reset** command. (See [“processor reset Command” section on page 6-11](#).)
-

4.3 Log In via LAN Port Using Telnet (Optional)

Provisioning of the ONS 15216 EDFA2 can be accomplished entirely through the EIA/TIA-232 port using CLI commands. After an IP address is assigned, it may be easier to provision the ONS 15216 EDFA2 using Telnet or an SNMP manager. A Telnet client is needed for CLI commands over IP. A generic SNMP manager is required for SNMP management over IP. After connecting the ONS 15216 EDFA2 to the network through its RJ-45 LAN port (see [“LAN Interface \(Ethernet\)” section on page 3-14](#)), the user can configure the module to accept SNMP and CLI commands via Telnet using the following procedure:

-
- Step 1** Connect to the LAN port on the front panel. See [“LAN Connection Procedure” section on page 3-14](#).
 - Step 2** Click the Microsoft Windows **Start** menu and select **Run**.
 - Step 3** In the text field, type the following:

```
telnet <ONS 15216 EDFA2 IP address> 8023
```

Specifying port 8023 ensures login through the ASH shell. If no port is specified, the ONS 15216 EDFA2 responds in the shell that the ONS 15216 EDFA2 is set to. (TL1 is the default shell.)

Step 4 Log in again using [Step 4](#) through [Step 6](#) in “Log In via EIA/TIA-232 Port Using HyperTerminal” section on page 4-1.

You are now connected to the ONS 15216 EDFA2 via Telnet.

4.4 Set Date and Time

Use the **snmp attribute set local cerent15216EdfaRtcDateAndTimeLocalString** command to set the date, time, and time zone. Entries must follow this format: “yyyy-m-d,h:m:s.s +h:m”. Following the space, the time zone is set as +/- hours from Greenwich Mean Time (GMT) (also designated as universal coordinated time (UTC)) followed by a colon and minutes ahead for daylight savings. For example, Pacific Daylight Time would be -8:60 and Greenwich Mean Time would be +0:0. See [Example 4-4](#).

Example 4-4 Setting the Date and Time

```
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaRtcDateAndTimeLocalString
"2002-6-30,14:8:30.0 -8:60"
```

4.5 Set Power Bus Mode (Simplex or Duplex)

The ONS 15216 EDFA2 allows users to set a simplex (one power source—Bus A) or duplex (redundant power source—Bus A and Bus B) Power Bus mode. Use the **snmp attribute set local cerent15216EdfaPowerBusMode** command to set the desired Power Bus mode. The default mode is duplex. See [Example 4-5](#).

Example 4-5 Setting the Power Bus Mode

```
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPowerBusMode simplex
```

4.6 Verify Amplifier Operational Status

To ensure that the amplifier is working correctly on the optical level, you must verify the amplifier operational status. Use the **snmp table display local cerent15216EdfaOverallStatusGroup** command to verify amplifier operational status. [Example 4-6](#) displays the output of this command.

Example 4-6 Verifying the Amplifier Operations Status

```
ash:hostname:ONS15216 EDFA2> snmp table display local cerent15216EdfaOverallStatusGroup

CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaOverallStatusGroup ::=
{
    cerent15216EdfaInPoweruW = 279;
    cerent15216EdfaInPowerdBm = -1555;
    cerent15216EdfaOutPowermW = 476;
    cerent15216EdfaOutPowerdBm = 678;
    cerent15216EdfaConstGainOverallGainMeasured = 219;
    cerent15216EdfaVariableGainPreAttenuationMeasured = 10;
};
```

The input power (signal) should be consistent with the input power measured during the optical connection procedure. See the “[Optical Connection Procedure](#)” section on page 3-3 for more information. The output power value should be 22 dB greater than the input, assuming that the default gain setting is 22 dB.

**Note**

An input power higher than -5 dBm will return a Gain Out of Range alarm that can be cleared by correctly setting the gain value. For more information, refer to [Table 2-2](#).

4.7 Set Gain

To ensure that the ONS 15216 EDFA2 output signal is received by the transceiver in the network element, it is important that the gain is set correctly.

The desired output power per channel is dependent on the number of channels traversed in the amplifier. The user sets the gain of the amplifier depending on the input power (signal) level, the network application, and the required receiver specifications necessary for error-free operation. Gain range is provided in [Table 3-1](#).

To set the amplifier gain, enter the **snmp attribute set local cerent15216EdfaConstGainOverallGain *gainvalue*** command, where *gainvalue* is the desired gain multiplied by ten. For example, if the desired gain is 20 dB, the *gainvalue* would be set to 200. [Example 4-7](#) shows the command used to set the gain.

Example 4-7 Setting the Gain

```
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaConstGainOverallGain 200
```

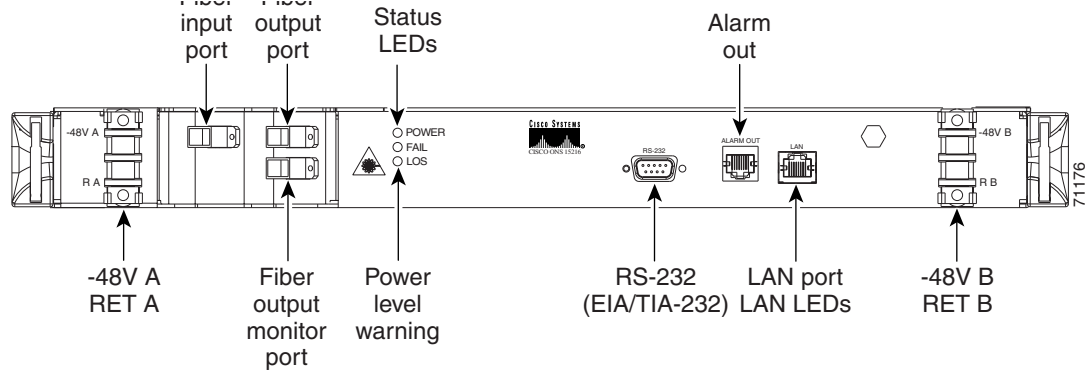
**Note**

Prior to changing or implementing gain changes, consult with the Cisco TAC to ensure proper network operation.

4.8 Set Alarm Thresholds

Alarm thresholds are set so that the network operator can be notified when valid alarms occur via the RJ-45 ALARM OUT and RJ-45 LAN ports on the front panel of the ONS 15216 EDFA2. (See [Figure 4-1](#).)

Figure 4-1 ONS 15216 EDFA2 Front Panel



Alarms are reported for the following conditions:

- Loss or degradation of electrical power
- Pump laser overheating, excessive pump current
- Loss or degradation of optical input

Alarms can be connected to a network operations center (NOC) network management system (NMS) via a network element miscellaneous discrete input and/or office alarm panel/system.

For a full description of alarm threshold command attributes, refer to [Chapter 5, “SNMP MIB Installation and Configuration”](#) or [Chapter 6, “ASH Commands.”](#)

To display the alarm thresholds, use the **snmp table display local cerent15216EdfaCfgGroup** command ([Example 4-8](#)). This command returns the current alarm threshold default values.

Example 4-8 Displaying the Alarm Thresholds

```
ash:hostname:ONS15216 EDFA2> snmp table display local cerent15216EdfaCfgGroup
```

```
CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaCfgGroup ::=
{
cerent15216EdfaCfgSaved = false;
cerent15216EdfaLpoutSetpoint = 0;
cerent15216EdfaLpoutDeviation = 200;
cerent15216EdfaLpoutHysteresis = 100;
cerent15216EdfaLOSThreshold = -2600;
cerent15216EdfaLOSHysteresis = 100;
cerent15216EdfaCtmpMin = -5;
cerent15216EdfaCtmpMinHysteresis = 1;
cerent15216EdfaCtmpMax = 65;
cerent15216EdfaCtmpMaxHysteresis = 1;
cerent15216EdfaCLEI = "";
cerent15216EdfaPowerBusMode = duplex;
cerent15216EdfaPowerBusDCVoltageMin = 410;
cerent15216EdfaPowerBusDCVoltageMax = 560;
};
```

To set the alarm thresholds, use the **snmp row set local cerent15216EdfaCfgGroup** command. After this command is entered, the user is prompted to modify each attribute, row by row, until all attributes are set. Alarm threshold attributes are described in [Table 4-1](#).

Table 4-1 Alarm Threshold Attribute Definitions

Attribute	Variable Definition	Syntax	Maximum Access	Description
cerent15216Edfa CfgSaved	Configuration saved status	True Value	Read-only	Indicates whether the current configuration has been saved. The value can be true or false. If false, the configuration is not saved.
cerent15216Edfa LpoutSetpoint	Loss of output power setpoint	Integer (0 to 1000)	Read-only	Can be disregarded when operating amplifier in Constant Gain Temperature Compensated mode (manufacturer default) and Constant Pump Current mode. Setpoint object is only valid when amplifier is used in Constant Output Power and Constant Pump Power modes.
cerent15216Edfa LpoutDeviation	Loss of output power deviation	Integer (0 to 1000)	Read-write	Can be disregarded when operating amplifier in manufacturer default Constant Gain Temperature Compensated mode. Deviation object is only valid when amplifier is used in Constant Output Power and Constant Pump Power modes.
cerent15216Edfa LpoutHysteresis	Loss of output power hysteresis	Integer (0 to 1000)	Read-write	Can be disregarded when operating amplifier in manufacturer default Constant Gain Temperature Compensated mode. Hysteresis object is only valid when amplifier is used in Constant Output Power and Constant Pump Power modes.
cerent15216Edfa LOSThreshold	Loss of signal (input power) threshold	Integer (-3100 to -1500)	Read-write	Notifies operations personnel if the optical input signal of the ONS 15216 EDFA2 drops below a level that impacts proper operation of optical network. Set this attribute at a value that is appropriate for the intended application so that the alarm condition is meaningful. Consult with the Cisco TAC to determine the threshold value for your application. As a guideline, Cisco recommends setting the threshold value at 3 dBm below the current input power level of the amplifier. Valid entries are between -3100 and -1500 in dBm times 100. For example, if the total input power of the amplifier is -24 dBm and the loss of input power threshold required is -27 dBm, the loss of input power alarm threshold is -2700.

Table 4-1 Alarm Threshold Attribute Definitions (continued)

Attribute	Variable Definition	Syntax	Maximum Access	Description
cerent15216Edfa LOSHysteresis	Loss of signal (input power) hysteresis	Integer (0 to 1000)	Read-write	Used to set the amount the input signal must increase above the LOS Threshold level before the alarm is cleared. This attribute, in conjunction with the loss of input signal alarm threshold, enables efficient clearing of alarms. Set this attribute at a value that is appropriate for the application so that the alarm condition will clear when input is stable. Consult with the Cisco TAC to determine the correct value for your application. As a guideline, Cisco recommends setting the value 1 dBm above the LOS Threshold value. With this setting, the module will clear the alarm if it detects a signal level of 1 dBm above the current LOS Threshold value. Valid entries are between 0 and 1000 and are in dBm times 100. For example, if the hysteresis required is 1 dBm, the power alarm hysteresis is 100.
cerent15216Edfa CtmpMin	Minimum case temperature	Integer (-10 to 10)	Read-write	Notifies operations personnel notification if the case temperature of the ONS 15216 EDFA2 drops below a level that impacts proper operation of the optical network. The minimum case temperature should be set at a value that is appropriate for the intended application and within product specifications. Users should consult with the Cisco TAC to determine the threshold value for their application. As a guideline, Cisco recommends that minimum case temperature be set at 1°C. Valid entries are between -10 and 10°C.

Table 4-1 Alarm Threshold Attribute Definitions (continued)

Attribute	Variable Definition	Syntax	Maximum Access	Description
cerent15216Edfa CtmpMinHysteresis	Minimum case temperature hysteresis	Integer (0 to 10)	Read-write	Used to set the amount the case temperature of the module must rise above the minimum case temperature alarm level before the alarm is cleared. This attribute, in conjunction with the case temperature minimum, enables efficient clearing of alarms. Set the hysteresis at a value that is appropriate for the application so that the alarm condition will clear when the input is stable. The user should consult with the Cisco TAC in order to determine the value for their application. As a guideline, Cisco recommends that the hysteresis value be set at 1°C. Valid entries are between 0 and 10°C.
cerent15216Edfa CtmpMax	Maximum case temperature	Integer (20 to 70)	Read-write	Notifies operations personnel if the case temperature of the ONS 15216 EDFA2 is at a level that may impact proper operation of the optical network. Set the maximum case temperature at a value that is appropriate for intended application and within product specifications. Consult with the Cisco TAC to determine the threshold value for your application. As a guideline, Cisco recommends that minimum case temperature value be set at 50°C. Valid entries are between 20 and 70°C.
cerent15216Edfa CtmpMaxHysteresis	Maximum case temperature hysteresis	Integer (0 to 10)	Read-write	Used to set the amount the case temperature of module must drop below the maximum case temperature alarm level before the alarm is cleared. This attribute, in conjunction with the case temperature minimum, enables efficient clearing of alarms. Set the hysteresis at a value that is appropriate for the application. If an alarm occurs, the case temperature must return to 1°C below the set value to clear the alarm. Consult with the Cisco TAC to determine the value for your application. As a guideline, Cisco recommends setting the value at 1°C. Valid entries are between 0 and 10°C. Setting this value to 0 disables this option.

Table 4-1 Alarm Threshold Attribute Definitions (continued)

Attribute	Variable Definition	Syntax	Maximum Access	Description
cerent15216Edfa PowerBusDCVoltageMin	Power bus minimum voltage	Integer (350 to 700)	Read-write	Minimum allowable power bus DC voltage. The default minimum power bus voltage is set at -40 VDC. Valid entries are between 350 and 700 and are in negative volts times 10. For example, if the voltage required is -40 VDC, the power bus setting is 400. The power bus measurement has a 1.0V tolerance. If the minimum threshold is configured at 400 (-40 VDC), the alarm may not raise until the voltage drops below -39 VDC.
cerent15216Edfa PowerBusDCVoltageMax	Power bus maximum voltage	Integer (350 to 700)	Read-write	Maximum allowable power bus DC voltage. The default maximum power bus voltage is set at -57 VDC. Valid entries are between 350 and 700 and are in negative volts times 10. For example, if the voltage required is -57 VDC, the power bus setting is 570. The power bus measurement has a 1.0V tolerance. If the maximum threshold is configured at 570 (-57 VDC), the alarm may not raise until the voltage goes above -58 VDC.

4.9 Set Password

To restrict access to the ONS 15216 EDFA2, use the **user passwd set** command to change the default user password. The password must be a string of up to 10 characters, where at least 2 are non-alphabetic characters and at least 1 is a special character. With the exception of the administrator access level (read_write_admin), users can only modify their own passwords. For additional information on user levels, refer to [Table 6-1](#). [Example 4-9](#) displays the command.

Example 4-9 Changing Current User's Password

```
ash:hostname:ONS15216 EDFA2> user passwd set
Password =
****
New Password =
*****
Confirm New Password =
*****
```



Note

The default user name for the administrator level is CISCO15 with no default password. To start a session for this user name, press Enter.

4.10 Add Users

Use the **user entry create** command to add new users to the ONS 15216 EDFA2. The syntax is to enter the command followed by the user name and then the access level (read, read_write, read_write_admin) as shown in [Example 4-10](#). The ONS 15216 EDFA2 responds with a request for the password.

Passwords must be an ASCII string of up to 10 characters, where at least 2 are non-alphabetic characters with at least one special character. Special characters are +, #, and % (defined in Telcordia GR-831-CORE).

Example 4-10 Adding a New User

```
ash:hostname:ONS15216 EDFA2> user entry create janedoe read_write
New Password =
*****
Confirm New Password =
*****
```

4.11 Save Changes

To ensure that the provisioning changes are set, you must save your changes prior to terminating the session. To save changes, use the **snmp attribute set local cerent15216EdfaOpSaveConfig perform** command ([Example 4-11](#)).

Example 4-11 Saving Changes

```
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaOpSaveConfig perform
```

Most SNMP configuration attributes require the above save command before terminating the session (does not apply to TL1 shell). The exceptions to this save requirement (the attributes that are automatically saved) are shown below:

- cerent15216EdfaPowerBusMode
- cerent15216EdfaPowerBusDCVoltageMin
- cerent15216EdfaPowerBusDCVoltageMax
- cerent15216EdfaConstGainOverallGain
- cerent15216EdfaVariableGainPreAttenuation
- SromIpMgmtGroup attributes:
 - cerent15216EdfaSromIpMgmtEnetAddress
 - cerent15216EdfaSromIpMgmtEnetSubNetMask
 - cerent15216EdfaSromIpMgmtDefaultRouterAddress
 - cerent15216EdfaSromIpMgmtHostName
- BootTable attributes:
 - cerent15216EdfaBootModuleIndex
 - cerent15216EdfaBootEntryIndex
 - cerent15216EdfaBootType
 - cerent15216EdfaBootIpAddress
 - cerent15216EdfaBootFileName

4.12 Log Off

At the end of a session, the user must log off of the ONS 15216 EDFA2. To log off, use the **logoff** command. This is shown in [Example 4-12](#).

Example 4-12 Logging Off

```
ash:hostname:ONS15216 EDFA2> logoff
```

4.13 Recover Default Password

If the root password for CISCO15 is lost, there is a procedure to reset it to regain full administrative control of the ONS 15216 EDFA2. The user must be connected to the ONS 15216 EDFA2 by serial communication, perform a hard power reset, and then performs a series of commands within 60 seconds of rebooting, according to the following procedure.



Warning

The ONS 15216 EDFA2 ceases its optical amplification function when power is off during this process. Traffic should be rerouted before this procedure begins.



Note

If the ONS 15216 EDFA2 firmware is not version 2.1.0 or greater, the CISCO15 user resets to read_write access level, not read_write_admin, which has full administrative control. Contact Cisco TAC for assistance.

-
- Step 1** Connect to the EIA/TIA-232 port.
- Step 2** Open HyperTerminal. (HyperTerminal can be found in the Microsoft Windows Accessories menu.)
- Step 3** Perform hard power reset of the ONS 15216 EDFA2 (disconnect and reconnect power).
- Step 4** While the dots are present in the HyperTerminal window during the reboot process, enter **Ctrl C** on the keyboard.
- The ONS 15216 EDFA2 should boot from the firmware image. The prompt is %.
- Step 5** At the hostname prompt, enter the following command (must be done within 60 seconds of rebooting):
- ```
hostname:edfaboot%user passwd set CISCO15 default
```
- Step 6** At the hostname prompt, enter the following command:
- ```
hostname:edfaboot%login CISCO15
```
- Step 7** At the hostname prompt, enter the following command:
- ```
hostname:edfaboot%processor reset
```
- After the processor reset, the default CISCO15 login password will be the default (the Enter key).
-



# SNMP MIB Installation and Configuration

This chapter explains how to read and understand SNMP MIB as it relates to the Cisco ONS 15216 EDFA2. This chapter is a reference of all ONS 15216 EDFA2 SNMP commands that are used in a network management system (NMS). For provisioning the ONS 15216 EDFA2, see [Chapter 4, “Provisioning in the ASH Shell”](#).

## 5.1 SNMP Overview

Simple Network Management Protocol (SNMP) is an application-layer communication protocol that allows network devices to retrieve and modify the value of management information, as well as provide event notification to a NMS.

The ONS 15216 EDFA2 SNMP implementation uses standard Internet Engineering Task Force (IETF) MIBs to convey inventory, fault, and performance management information.

SNMP allows limited management of the ONS 15216 EDFA2 by a generic, third-party SNMP manager (for example, HP OpenView Network Node manager [NNM] or Open Systems Interconnection [OSI] NetExpert).

The ONS 15216 EDFA2 supports SNMP Version 1 (SNMPv1) and SNMP Version 2c (SNMPv2c) protocols.

### 5.1.1 SNMP Components

An SNMP-managed network consists of three primary components:

- Managed devices
- Agents
- Management systems

A managed device is a network node that contains an SNMP agent and resides on an SNMP-managed network. Managed devices collect and store management information and use SNMP to make this information available to management systems that use SNMP. Managed devices include routers, access servers, switches, bridges, hubs, computer hosts, and network elements such as the ONS 15216 EDFA2.

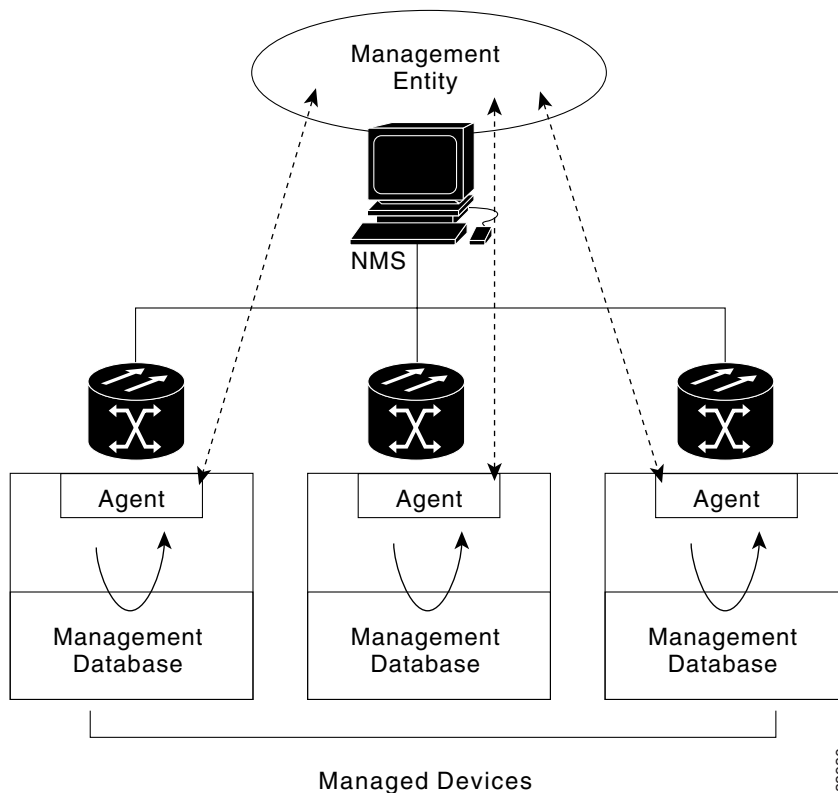
## 5.1.2 ONS 15216 EDFA2 SNMP Elements

The following three SNMP elements are used with the ONS 15216 EDFA2:

- SNMP agent
- SNMP MIB
- SNMP manager

The SNMP elements are shown in [Figure 5-1](#).

**Figure 5-1** SNMP Elements



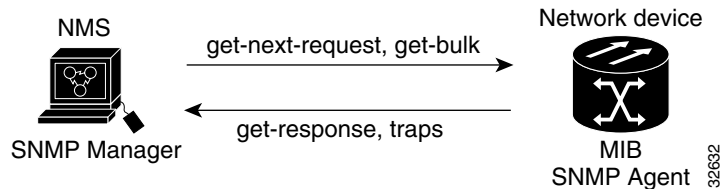
### 5.1.2.1 SNMP Agent

An agent is an entity that assumes an operation role to receive, process, and respond to requests, as well as generated event reports. The SNMP agent gathers data from the MIB, which is the repository for device parameter and network data. To respond to requests, the agent must have network management information access. To generate reports, an agent must be notified of internal events.

Cisco provides both an SNMP agent (installed on the ONS 15216 EDFA2) and SNMP MIB to monitor the ONS 15216 EDFA2. The SNMP agent software and MIB are pre-installed on each module.

[Figure 5-2](#) shows the relationship between the SNMP agent and the MIB.

Figure 5-2 SNMP Agent and MIB



## 5.1.2.2 SNMP MIB

The SNMP MIBs (CERENT-15216-EDFA-MIB.mib and CERENT-GLOBAL-REGISTRY.mib) are files written in ASN.1 syntax. The CERENT-15216-EDFA-MIB.mib specifies what ONS 15216 EDFA2 information needs to be monitored. This MIB is pre-installed on the SNMP agent and is accessible via the CLI.

The CERENT-15216-EDFA-MIB.mib and other MIBs can also be installed on a third-party SNMP manager located at a network management center. The SNMP manager at the network management center or the SNMP manager, accessible via the CLI, (see [SNMP Manager, page 5-3](#)) uses the SNMP MIBs to communicate with the SNMP agent.

## 5.1.2.3 SNMP Manager

The ONS 15216 EDFA2 comes with a pre-installed SNMP manager accessible via the CLI. This SNMP manager can be accessed and used to communicate with the SNMP agent that is also pre-installed on each ONS 15216 EDFA2. This manual displays examples of issuing SNMP commands to the amplifier using the built-in SNMP manager.

### 5.1.2.3.1 Third-party, Vendor-Specific SNMP Managers

SNMP managers from third-party vendors running on a separate computer located at a network management center are often used to manage network elements. If a third-party SNMP manager is used, it must be able to communicate with the SNMP agent pre-installed on the ONS 15216 EDFA2.

If a third-party SNMP manager is used, it is assumed that the SNMP manager is pre-installed prior to the SNMP MIB installation. Each vendor-specific SNMP manager has a unique set of instructions for SNMP MIB installation. For directions on loading the SNMP MIBs, refer to SNMP manager documentation.

Cisco does not provide or recommend a standard third-party SNMP manager.

## 5.1.3 SNMP MIBs and Message Types

SNMP operations can be quite powerful. A manager can retrieve or modify the value of management information accessible by an agent, an agent can report an event to a manager, and the manager can inform another manager of the value of management information on an agent. Using retrieval and modification operations, a manager can cause an agent to perform an action or execute a command. The manager can also create new and delete existing instances of management information.

A MIB is a hierarchically-organized collection of information. Network management protocols, such as SNMP, gain access to these MIBs. MIBs consist of managed objects and are identified by object identifiers (OID).

The ONS 15216 EDFA2 SNMP agent communicates with an SNMP management application (a third-party application or the built-in SNMP manager) using SNMP messages. [Table 5-1](#) describes SNMP operation types.

**Table 5-1** SNMP Operation Types

| Operation        | Description                                                                                                                                                                                                                                                                       |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| get-request      | Retrieves a value from a specific variable.                                                                                                                                                                                                                                       |
| get-next-request | Retrieves the value following the named variable; this operation is often used to retrieve variables in a Table. With this operation, an SNMP agent does not need to know the exact variable name. The SNMP manager searches sequentially to find the needed variable in the MIB. |
| get-response     | The reply to a get-request, get-next-request, get-bulk-request, or set-request sent by an NMS.                                                                                                                                                                                    |
| get-bulk-request | Similar to a get-next-request, but this operation fills the get-response with up to the max-repetition number of get-next interactions.                                                                                                                                           |
| trap             | An unsolicited message sent by an SNMP agent to an SNMP manager indicating that an event has occurred.                                                                                                                                                                            |
| set-request      | Sets a value of a specific variable.                                                                                                                                                                                                                                              |

## 5.1.4 Command Syntax Using the SNMP Agent

Although Cisco has its own separate SNMP manager (Cisco Transport Manager [CTM]), communication with the ONS 15216 EDFA2 is also possible using the built-in SNMP manager, its agent, and the MIB. (See [Figure 5-1](#).) The commands and command syntax displayed in this manual are the result of using the built-in ONS 15216 EDFA2 SNMP manager included with the CLI card.

Commands can be issued via Telnet over a LAN or directly through the EIA/TIA-232 port on the module. (See [Chapter 3, “Installation”](#).) After setting up a connection to the module and entering a password and user name, the following prompt appears:

```
ash:hostname:ONS15216 EDFA2>
```

To communicate with the module using SNMP, the command must begin with “snmp”.



### Note

To view a list of possible SNMP operations, enter “snmp” followed by a space and press the **Tab** key. (See [Example 5-1](#).)

### Example 5-1 snmp Command Followed by the Tab Key

```
ash:hostname:ONS15216 EDFA2> snmp
agent
attribute
host
mib
pdu
row
session
subtree
table
trap
tree
```



Continue to enter operations from the list until the complete command is created. (See [Example 5-2](#).)

**Example 5-2 *snmp table display Command***

```
ash:hostname:ONS15216 EDFA2> snmp table display local cerent
cerent15216EdfaCommunityEntry
cerent15216EdfaCommTrapEntry
cerent15216EdfaViewEntry
cerent15216EdfaAgentControlGroup
cerent15216EdfaActionOpGroup
cerent15216EdfaLogEventControl
cerent15216EdfaLogEventEntry
cerent15216EdfaBootEntry
cerent15216EdfaBootImageEntry
cerent15216EdfaRtcDateAndTime
cerent15216EdfaSromIpMgmtGroup
cerent15216EdfaSromRingGroup
cerent15216EdfaCfgGroup
cerent15216EdfaOverallControl
cerent15216EdfaPumpCfgEntry
cerent15216EdfaOverallStatusGroup
cerent15216EdfaPumpStatusEntry
cerent15216EdfaAlarmEntry
cerent15216EdfaVersionGroup
cerent15216EdfaOpGroup
ash:hostname:ONS15216 EDFA2> snmp Table display local cerent15216Edfa
```

Use these commands to set up community strings ([Enabling SNMP Remote Management Community Strings, page 5-5](#)) and traps ([VersionGroup Table, page 5-18](#)).

## 5.2 Enabling SNMP Remote Management Community Strings

SNMP communities are groupings of workstations and servers (or gateways) that can manage the ONS 15216 EDFA2. NMSs also use SNMP communities to enforce security. SNMP enforces security through password-like community strings. Access to the SNMP agent and the ONS 15216 EDFA2 can be limited by both IP address and community string.

The CLI SNMP manager (local SNMP manager) must be used to setup remote management (via a Telnet connection or terminal server). A third-party, vendor-specific SNMP manager cannot be used to setup remote management.

The process for setting up community entries consists of:

- [Creating a View, page 5-6](#)
- [Creating a Community Entry, page 5-7](#)

The ONS 15216 EDFA2 has the two default community strings listed in [Table 5-2](#).

**Table 5-2 *Default Community Strings***

| Community String | Default Privileges                     |
|------------------|----------------------------------------|
| public           | read operations for all MIBs           |
| private          | read and write operations for all MIBs |

The privileges assigned to the default strings can be modified or new communities with custom privileges can be created.

## 5.2.1 Creating a View

The following command describes how to set a view entry. A view defines and restricts the MIB attributes that a particular community can access. The view entry and the community entry are set to factory defaults. Users should consult with the Cisco TAC before modifying these settings.

### 5.2.1.1 Set View Entry

**Command:** `snmp row set local cerent15216EdfaViewEntry`

**Syntax:** `snmp row set local cerent15216EdfaViewEntry view index # subtree`

**Description:** To create a community entry, a view must first be created. A MIB view can restrict the MIBs that a particular community can access. To create a view, type the command. # is an integer (1 to 2048) assigned to this view entry and *subtree* is the MIB subtree to which this view applies. Multiple view entries can be used for each view index.

This command creates a new row in the ViewEntry Table. The SNMP manager prompts the user for each attribute.

To display a list of possible values, press the **Spacebar** followed by the **Tab** key. (See [Example 5-3](#).)

#### Example 5-3 *cerent15216EdfaViewEntry Set Command*

```
ash:hostname:ONS15216 EDFA2> snmp row set local cerent15216EdfaViewEntry cerent

cerent15216EdfaViewMask '0'H
cerent15216EdfaViewType included
cerent15216EdfaViewStatus
 active
 notInService
 notReady
 createAndGo
 createAndWait
 destroy
cerent15216EdfaViewStatus createAndGo
ash:hostname:ONS15216 EDFA2> snmp row display local cerent15216EdfaViewEntry 1 cerent
CLASS cerent15216Edfa-AGENT-MIB.cerent15216EdfaViewEntry ::=
{
 cerent15216EdfaViewIndex = 1;
 cerent15216EdfaViewSubtree = { cerent };
 cerent15216EdfaViewMask = '00'H;
 cerent15216EdfaViewType = included;
 cerent15216EdfaViewStatus = active;
```

Access to the ONS 15216 EDFA2 can be restricted by IP address or community string using this command.

[Table 5-3](#) describes the command and MIB view prompts.

**Table 5-3** Creating a View

| Data Prompt                | Command                                                         | Description                                                                                                                                                   |
|----------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cerent15216EdfaViewIndex   | snmp row set local<br>cerent15216EdfaViewEntry<br>1 zeroDotZero | View Index: A unique value for each MIB view.<br><br>This value is the number entered with the command.                                                       |
| cerent15216EdfaViewSubTree | Sub-Tree Object Identifier                                      | Sub-Tree Object Identifier: An object identifier that designates a sub-tree element in the MIB hierarchy. zeroDotZero specifies the entire CLI MIB hierarchy. |
| cerent15216EdfaViewMask    | 'O'H                                                            | A bit mask that identifies objects in the subtree.                                                                                                            |
| cerent15216EdfaViewType    | included                                                        | A flag that specifies the status of the view. Valid entries are included and excluded.                                                                        |
| cerent15216EdfaViewStatus  | createAndGo                                                     | If the entry currently exists, use active. (CreateAndGo cannot be used if any entry exists.)                                                                  |

## 5.2.2 Creating a Community Entry

SNMP communities are groupings of workstations and servers (or gateways) that can manage the ONS 15216 EDFA2. NMSs use SNMP communities to enforce security. Because access to the SNMP agent is controlled by a community entry, every SNMP agent must be configured to recognize one or more community names, and to provide the appropriate level of access to managers according to the community name. The following commands describe the commands for displaying or setting community entries. Users should consult with the Cisco TAC before modifying these settings.

### 5.2.2.1 Set CommunityEntry

**Command:** `snmp row set local cerent15216EdfaCommunityEntry`

**Syntax:** `snmp row set local cerent15216EdfaCommunityEntry community index`

**Description:** After creating a view, use the `snmp row set local cerent15216EdfaCommunityEntry` command to create a community entry for that view.

The SNMP manager prompts the user for each attribute. Press the **Spacebar** and then the **Tab** key after a prompt to view possible data inputs ([Example 5-4](#)). Refer to [Table 5-4](#) for information concerning data for each prompt.

**Example 5-4** *cerent15216EdfaCommunityEntry Set Command*

```
ash:hostname:ONS15216 EDFA2> snmp row set local cerent15216EdfaCommunityEntry 1
cerent15216EdfaCommName " "
cerent15216EdfaCommViewIndex 0
cerent15216EdfaCommPrivileges 35
cerent15216EdfaCommSrcIPAddr 0.0.0.0
```

```
cerent15216EdfaCommNetMask 0.0.0.0
cerent15216EdfaCommStatus 0
 cerent15216EdfaCommStatus OBJECT-TYPE
 SYNTAX INTEGER
 {
 active(1),
 notInService(2),
 notReady(3),
 createAndGo(4),
 createAndWait(5),
 destroy(6)
 }
 MAX-ACCESS read-create
 DESCRIPTION
 ::= { cerent15216EdfaCommunityEntry 7 }
```

Table 5-4 displays the definitions for the community entry values.

**Table 5-4** *Creating a Community Entry*

| Data Prompt                   | Description                                                                                                                                                                                                                                                                           |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cerent15216EdfaCommIndex      | Community Index: An index that uniquely identifies a particular SNMP community. This community index is part of the command. In Example 5-4, it is “1”.                                                                                                                               |
| cerent15216EdfaCommName       | Community Name: The community string.                                                                                                                                                                                                                                                 |
| cerent15216EdfaCommViewIndex  | View Index: The view index specifies which MIBs this particular community string can access.                                                                                                                                                                                          |
| cerent15216EdfaCommPrivileges | Privileges: A bitmap of access privileges that govern what management operations a particular community can perform. These privileges are expressed as a sum of values, where each value represents a particular operation. Refer to Table 5-5 for the SNMP Operation Decimal Values. |
| cerent15216EdfaCommSrcIPAddr  | Source IP Address: The IP address from which network management traffic for this community originates.                                                                                                                                                                                |
| cerent15216EdfaCommNetMask    | NetMask: The subnet mask for the source IP address.                                                                                                                                                                                                                                   |
| cerent15216EdfaCommStatus     | Status: The status of this conceptual row in the community table. Use createAndGo to create a new row. Use active to modify an existing row.                                                                                                                                          |

### 5.2.2.2 Display CommunityEntry

**Command:** `snmp row display local cerent15216EdfaCommunityEntry`

**Syntax:** `snmp row display local cerent15216EdfaCommunityEntry community index`

**Description:** After creating a community string, use this command to view its parameters. The number in the command refers to the community index number created in the previous section.

**Example 5-5** *cerent15216EdfaCommunityEntry Display Command*

```
ash:hostname:ONS15216 EDFA2> snmp row display local cerent15216EdfaCommunityEntry 1

CLASS cerent15216Edfa-AGENT-MIB.cerent15216EdfaCommunityEntry ::=
{
```

```

cerent15216EdfaCommIndex = 1;
cerent15216EdfaCommName = "private";
cerent15216EdfaCommViewIndex = 1;
cerent15216EdfaCommPrivileges = 255;
cerent15216EdfaCommSrcIPAddr = 0.0.0.0;
cerent15216EdfaCommNetMask = 255.255.255.255;
cerent15216EdfaCommStatus = active;
};

```

Table 5-5 displays the decimal values for the following SNMP operations.

**Table 5-5** *SNMP Operation Decimal Values*

| SNMP Operation                                 | Decimal Values |
|------------------------------------------------|----------------|
| Get                                            | 1              |
| GetNext                                        | 2              |
| Response (enable for all community strings)    | 4              |
| Set                                            | 8              |
| SNMPv1-Trap                                    | 16             |
| GetBulk                                        | 32             |
| Inform (enable for all community strings)      | 64             |
| SNMPv2-Trap (enable for all community strings) | 128            |

For example, 255 is the sum of all decimal values and specifies access to all SNMP operations. This sum is the default private community. 247 is the sum for all SNMP operations with the exception of the Set operation. This sum is the default public community.

## 5.3 Tables and Groups

The `cerent15216Edfa.mib` contains several key tables that are used to review and provision the ONS 15216 EDFA2. The following tables are listed and described in the following sections:

- [CfgGroup Table](#), page 5-9
- [PumpCfgEntry Table](#), page 5-11
- [OverallStatusGroup Table](#), page 5-14
- [OverallControl Table](#), page 5-15
- [PumpStatusEntry Table](#), page 5-15
- [AlarmEntry Table](#), page 5-16
- [OpGroup Table](#), page 5-17
- [VersionGroup Table](#), page 5-18

### 5.3.1 CfgGroup Table

The `cerent15216EdfaCfgGroup` Table is used to set or get alarm threshold configuration. The associated table command provides a summary of all alarm thresholds. See [Table 5-6](#) for variable definitions. For more information on alarm thresholds, see the [“Set Alarm Thresholds”](#) section on page 4-5.

**Table 5-6** *cerent15216EdfaCfgGroup Variable Descriptions*

| <b>Variable</b>                  | <b>Syntax</b>                       | <b>Maximum Access</b> | <b>Description</b>                                                                                                                                                                                         |
|----------------------------------|-------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cerent15216EdfaCfgSaved          | True Value                          | Read-only             | Indicates whether the current configuration has been saved.                                                                                                                                                |
| cerent15216EdfaLpoutSetpoint     | Integer (0 to 1000)                 | Read-only             | Loss of pump output power set point for the Lpout alarm (*10 mW).<br><br>This is set when the cerent15216EdfaPumpCfgConstOutput attribute is set for pump 2.                                               |
| cerent15216EdfaLpoutDeviation    | Integer (0 to 1000)                 | Read-write            | Amount that the output power must deviate from the set point to set the Lpout alarm (*100 dBm).                                                                                                            |
| cerent15216EdfaLpoutHysteresis   | Integer (0 to 1000)                 | Read-write            | Amount that the output power must move towards the set point before the Lpout alarm is cleared (*100 dBm).                                                                                                 |
| cerent15216EdfaLOSThreshold      | Integer (-3100 to -1500)            | Read-write            | Loss of signal threshold (*100 dBm).                                                                                                                                                                       |
| cerent15216EdfaLOSHysteresis     | Integer (0 to 1000)                 | Read-write            | Amount above cerent15216EdfaLOSThreshold that the input signal must rise before the Lpin alarm is cleared (*100 dBm).                                                                                      |
| cerent15216EdfaCtmpMin           | Integer (-10 to 10)                 | Read-write            | Minimum allowable case temperature in degrees Celsius.                                                                                                                                                     |
| cerent15216EdfaCtmpMinHysteresis | Integer (0 to 10)                   | Read-write            | Amount above cerent15216EdfaCtmpMin that the case temperature must rise before the Ctmp alarm is cleared in degrees Celsius.                                                                               |
| cerent15216EdfaCtmpMax           | Integer (20 to 70)                  | Read-write            | Maximum allowable case temperature in degrees Celsius.                                                                                                                                                     |
| cerent15216EdfaCtmpMaxHysteresis | Integer (0 to 10)                   | Read-write            | Amount below cerent15216EdfaCtmpMax that the case temperature must drop before the Ctmp alarm is cleared in degrees Celsius.                                                                               |
| cerent15216EdfaCLEI              | Display String (0 to 10 characters) | Read-only             | Indicates the factory setting of the Common Language Equipment Identifier (CLEI) code (established by Telcordia) of the Cisco ONS 15216 EDFA2. This attribute can be accessed but not changed by the user. |

**Table 5-6** *cerent15216EdfaCfgGroup Variable Descriptions (continued)*

| Variable                             | Syntax                       | Maximum Access | Description                                                                                                                                                                                                                                               |
|--------------------------------------|------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cerent15216EdfaPowerBus Mode         | cerent15216Edfa PowerBusMode | Read-write     | Simplex for one power source (Bus A) or duplex for redundant power source (Bus A and Bus B) Power Bus mode.                                                                                                                                               |
| cerent15216EdfaPowerBus DCVoltageMin | Integer (350 to 700)         | Read-write     | Minimum allowable power bus DC voltage. The default maximum power bus voltage is set at -40 VDC. Valid entries are between 350 and 700 and are in negative volts times 10. For example, if the voltage required is -40 VDC, the power bus setting is 400. |
| cerent15216EdfaPowerBus DCVoltageMax | Integer (350 to 700)         | Read-write     | Maximum allowable power bus DC voltage. The default maximum power bus voltage is set at -57 VDC. Valid entries are between 350 and 700 and are in negative volts times 10. For example, if the voltage required is -57 VDC, the power bus setting is 570. |

Use the `snmp attribute set local cerent15216EdfaOpSaveConfig perform` command to save changes.

## 5.3.2 PumpCfgEntry Table

The `cerent15216EdfaPumpCfgEntry` table is used to set or get pump laser control mode configuration. The associated table command displays a settings summary or allows you to set pumps. See [Table 5-7](#) for variable definitions. The factory default pump control mode for the ONS 15216 EDFA2 is Constant Gain Temperature Compensated. Cisco recommends that users contact the Cisco TAC prior to changing this mode of operation.

**Table 5-7** *cerent15216EdfaPumpCfgEntry Variable Descriptions*

| Variable                          | Syntax                      | Maximum Access | Description                                                                                                                                                                                                                                                                                                             |
|-----------------------------------|-----------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cerent15216EdfaPumpCfgPumpNum     | cerent15216Edfa PumpNumber  | Not Accessible | Pump laser number (1 or 2).                                                                                                                                                                                                                                                                                             |
| cerent15216EdfaPumpCfgControlMode | cerent15216Edfa ControlMode | Read-write     | Laser pump control mode. When the mode is set directly to <code>constCurrent</code> , <code>constPower</code> , or <code>constOutputPower</code> , the current value of <code>ConstPumpCurrent</code> , <code>ConstPumpPower</code> , or <code>ConstOutPower</code> is used as the constant parameter for the new mode. |

**Table 5-7** *cerent15216EdfaPumpCfgEntry Variable Descriptions (continued)*

| Variable                               | Syntax             | Maximum Access | Description                                                                                                    |
|----------------------------------------|--------------------|----------------|----------------------------------------------------------------------------------------------------------------|
| cerent15216EdfaPumpCfgConstPumpCurrent | Integer (0 to 300) | Read-write     | Constant pump current (mA).<br>The current that is used when the pump control mode is changed to constCurrent. |
| cerent15216EdfaPumpCfgConstPumpPower   | Integer (0 to 100) | Read-write     | Constant pump power (mW). The power that is used when the control mode is changed to constPumpPower.           |
| cerent15216EdfaPumpCfgConstOutPower    | Integer (0 to 650) | Read-write     | Constant output power (*10 mW). The power that is used when the control mode is changed to constOutputPower.   |

### 5.3.2.1 Set Mode to Constant Pump Current, Constant Pump Power, or Constant Output Power

If using either Constant Pump Current or Constant Pump Power mode, the user should set both pump modes to be the same.

Constant Output Power mode is only valid for pump 2. If pump 2 is set to Constant Output Power Mode, pump 1 is automatically set to Constant Pump Power mode with a value of 75 mW.

For Constant Gain Temperature Compensated mode, the system automatically sets the second pump to this mode when either pump is set.



#### Warning

**The pump control modes Constant Pump Current, Constant Pump Power, and Constant Output Power are to be used with very high precautions. They are service affecting and can reduce the life cycle of the lasers if used in extreme conditions. The factory default setting and recommended mode of operation is Constant Gain Temperature Compensated mode. Cisco recommends that users contact the Cisco TAC before changing from this mode of operation.**

To set the ONS 15216 EDFA2 to Constant Pump Current mode, use the following steps:

- Step 1** Set the pump value using `cerent15216EdfaPumpCfgConstPumpCurrent` attribute.
  - a. Select pump 1.
  - b. Set the value.
- Step 2** Repeat [Step 1](#) for pump 2.
- Step 3** Set the pump mode of operation using `cerent15216EdfaPumpCfgControlMode` attribute.
  - a. Select pump 1.
  - b. Set the mode.
- Step 4** Repeat [Step 3](#) for pump 2.

**Example 5-6** shows how to set the ONS 15216 EDFA2 to Constant Pump Current mode and then set it back to Constant Gain Temperature Compensated mode. (Setting pump 1 or 2 to Constant Gain Temperature Compensated mode sets both pumps to that mode.)



**Example 5-6 Setting Mode to Constant Pump Current and then Back to Constant Gain Temperature Compensated**

```

ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPumpCfgConstPumpCurrent 1
200
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPumpCfgConstPumpCurrent 2
200
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPumpCfgControlMode 1
constGainTempComp
constOutputPower
constCurrent
constPower
idle
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPumpCfgControlMode 1
constCurrent
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPumpCfgControlMode 2
constCurrent
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPumpCfgControlMode 1
constGainTempComp

```

---

**5.3.2.2 Change Value for Constant Pump Current, Constant Pump Power, or Constant Output Power Mode**

To change the values for Constant Pump Current and Constant Pump Power modes and the setting to take effect, the user must first set new values for both pumps and then set the pump control modes for both pumps again.

Constant Output Power Mode is only valid for pump 2. To change the value for pump 2 and the setting to take effect, the user must set the new value for pump 2 and then set pump to Constant Output Power mode again. Pump 1 is automatically set to Constant Pump Power mode with a value of 75 mW.

For Constant Gain Temperature Compensated mode, the system automatically sets both pumps to the gain set at the time it is set.

To change the value for Constant Pump Current mode, use the following steps:

- 
- Step 1** Set the pump value using **cerent15216EdfaPumpCfgConstPumpCurrent** attribute.
    - a. Select pump 1.
    - b. Set the value.
  - Step 2** Repeat [Step 1](#) for pump 2.
  - Step 3** Set the pump mode of operation using **cerent15216EdfaPumpCfgControlMode** attribute.
    - a. Select pump 1.
    - b. Set the mode.
  - Step 4** Repeat [Step 3](#) for pump 2.

[Example 5-6](#) shows how to set the value for Constant Pump Current mode to be 200 mA and then set the mode to Constant Pump Current mode again for the settings to take effect.

**Example 5-7 Changing Value for Constant Pump Current Mode**

```

ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPumpCfgConstPumpCurrent 1
200
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPumpCfgConstPumpCurrent 2
200
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPumpCfgControlMode 1
constCurrent
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaPumpCfgControlMode 2
constCurrent

```

## 5.3.3 OverallStatusGroup Table

The cerent15216EdfaOverallStatusGroup Table allows users to display the input and output of the ONS 15216 EDFA2 amplifier. [Table 5-8](#) describes cerent15216EdfaOverallStatusGroup Table variables.

**Table 5-8 cerent15216EdfaOverallStatusGroup Variable Descriptions**

| Variable                                          | Syntax                      | Maximum Access | Description                                                                                                                          |
|---------------------------------------------------|-----------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| cerent15216EdfaInPoweruW                          | Integer (0 to 99999)        | Read-only      | EDFA input power (*10 microW)                                                                                                        |
| cerent15216EdfaInPowerdBm                         | Integer (-999999 to 999999) | Read-only      | EDFA input power (*100 dBm)                                                                                                          |
| cerent15216EdfaOutPowermW                         | Integer (0 to 999999)       | Read-only      | EDFA output power (*100 mW)                                                                                                          |
| cerent15216EdfaOutPowerdBm                        | Integer (-99999 to 99999)   | Read-only      | EDFA output power (*100 dBm)                                                                                                         |
| cerent15216EdfaConstGainOverallGainMeasured       | Integer (0 to 230)          | Read-only      | The measured overall gain (*10 dB) that is used when the control mode in the PumpCfg table is set to constGainTempComp               |
| cerent15216EdfaVariableGainPreAttenuationMeasured | Integer (0 to 110)          | Read-only      | The measured pre-attenuation (*10 dB) that is used when the control mode in the PumpCfg table is <i>not</i> set to constGainTempComp |

**Note**

The values in mW and microW units are measured values. The dBm units are converted from mW or microW to dBm, so these values could be slightly different. If you take the cerent15216EdfaInPoweruW, convert it to dBm ( $10\log(\text{cerent15216EdfaInPoweruW})$ ) and compare the value to the attribute cerent15216EdfaInPowerdBm, you will see a small difference. The difference is because of rounding error. The value cerent15216EdfaInPoweruW that is displayed on the screen has been rounded, but the value used in the calculation has more significant digits.

## 5.3.4 OverallControl Table

The `cerent15216EdfaOverallControl` Table allows the user to display and configure overall gain and pre-attenuation. [Table 5-9](#) describes `cerent15216EdfaOverallControl` variables.

**Table 5-9** *cerent15216EdfaOverallControl Variable Descriptions*

| Variable                                               | Syntax               | Maximum Access | Description                                                                                                                                             |
|--------------------------------------------------------|----------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>cerent15216EdfaConstGainOverallGain</code>       | Integer (130 to 220) | Read-write     | The overall gain (*10 dB) that is used when the control mode in the <code>PumpCfg</code> Table is set to <code>constGainTempComp</code> .               |
| <code>cerent15216EdfaVariableGainPreAttenuation</code> | Integer (10 to 100)  | Read-write     | The pre-attenuation (*10 dB) that is used when the control mode in the <code>PumpCfg</code> Table is <i>not</i> set to <code>constGainTempComp</code> . |

## 5.3.5 PumpStatusEntry Table

The `cerent15216EdfaPumpStatusEntry` Table is used to display optical amplification module data. [Table 5-10](#) displays information regarding the `cerent15216EdfaPumpStatusEntry` Table variables.

**Table 5-10** *cerent15216EdfaPumpStatusEntry Variable Descriptions*

| Variable                                                    | Syntax                                 | Maximum Access | Description                             |
|-------------------------------------------------------------|----------------------------------------|----------------|-----------------------------------------|
| <code>cerent15216EdfaPumpStatusPumpNum</code>               | <code>cerent15216EdfaPumpNumber</code> | Read-only      | Pump laser number                       |
| <code>cerent15216EdfaPumpStatusLaserChipTemp</code>         | Integer (-9999 to 9999)                | Read-only      | Laser chip temperature (*10°C)          |
| <code>cerent15216EdfaPumpStatusLaserChipTempSetpoint</code> | Integer (0 to 999)                     | Read-only      | Laser chip temperature setpoint (*10°C) |
| <code>cerent15216EdfaPumpStatusLaserTECCurrent</code>       | Integer (0 to 99999)                   | Read-only      | Laser TEC current (mA)                  |
| <code>cerent15216EdfaPumpStatusLaserPower</code>            | Integer (0 to 99999)                   | Read-only      | Laser power (*100 mW)                   |
| <code>cerent15216EdfaPumpStatusLaserCurrent</code>          | Integer (0 to 999999)                  | Read-only      | Laser current (*100 mA)                 |
| <code>cerent15216EdfaPumpStatusAmbientTemp</code>           | Integer (-9999 to 9999)                | Read-only      | Ambient temperature (*100°C)            |
| <code>cerent15216EdfaPumpStatusDCVoltage</code>             | Integer (0 to 9999)                    | Read-only      | DC voltage (*10V)                       |

**Table 5-10** *cerent15216EdfaPumpStatusEntry Variable Descriptions (continued)*

| Variable                                   | Syntax                      | Maximum Access | Description              |
|--------------------------------------------|-----------------------------|----------------|--------------------------|
| cerent15216EdfaPumpStatusInPoweruW         | Integer (0 to 99999)        | Read-only      | Input power (*10 microW) |
| cerent15216EdfaPumpStatusInPowerdBm        | Integer (-999999 to 999999) | Read-only      | Input power (*100 dBm)   |
| cerent15216EdfaPumpStatusOutPowermW        | Integer (0 to 999999)       | Read-only      | Output power (*100 mW)   |
| cerent15216EdfaPumpStatusOutPowerdBm       | Integer (-99999 to 99999)   | Read-only      | Output power (*100 dBm)  |
| cerent15216EdfaPumpStatusGain <sup>1</sup> | Integer (-9999 to 9999)     | Read-only      | Gain (*10 dB)            |

- <sup>1</sup>. The value of the cerent15216EdfaPumpStatusGain variable should always be around 23 dB. This variable is the internal amplifier module gain. The cerent15216EdfaPumpStatusGain variable should not be confused with the cerent15216EdfaConstGainOverallGain variable that is used to set the gain of the ONS 15216 EDFA2. The cerent15216EdfaPumpStatusGain is the value of the gain of the amplification module only, it does not take into account the VOA (variable optical attenuator) attenuation. If you try to calculate the gain using the values of the PumpStatusOutPowerdBm – PumpStatusInPowerdBm you will not get the exact PumpStatusGain value. A more complex calculation is required to get the gain value. It needs to take ASE (amplified spontaneous emission) into account. This is often called the amplifier noise. This variable will be more dominant when the input power to the amplifier is low.

## 5.3.6 AlarmEntry Table

The cerent15216EdfaAlarmEntry Table is used to display alarm status. The associated table command provides a summary of all alarms. [Table 5-11](#) describes the cerent15216EdfaAlarmEntry Table variables.

**Table 5-11** *cerent15216EdfaAlarmEntry Variable Descriptions*

| Variable                          | Syntax                           | Maximum Access | Description                                                       |
|-----------------------------------|----------------------------------|----------------|-------------------------------------------------------------------|
| cerent15216EdfaAlarmIndex         | cerent15216EdfaIndex             | Not Accessible | A unique value to identify this entry.                            |
| cerent15216EdfaAlarmID            | AutonomousType                   | Read-only      | The alarm this entry refers to.                                   |
| cerent15216EdfaAlarmPriority      | cerent15216EdfaAlarmPriority     | Read-only      | The priority of this alarm.                                       |
| cerent15216EdfaAlarmState         | cerent15216EdfaAlarmState        | Read-only      | The reporting state of this alarm.                                |
| cerent15216EdfaAlarmEnable Status | cerent15216EdfaControl           | Read-write     | If the alarm is enabled/disabled.                                 |
| cerent15216EdfaAlarmDateAndTime   | cerent15216EdfaDateAndTimeString | Read-only      | The local date and time when the alarm entered its current state. |

## 5.3.7 OpGroup Table

The `cerent15216EdfaOpGroup` Table is used to display or set operation actions, such as saving configuration or loading new software. The individual variables in [Table 5-12](#) are generally used instead of the `Table` command. That is, when performing a cutover command, the user would use the **snmp attribute set local cerent15216EdfaOpCutover perform** command.

**Table 5-12** *cerent15216EdfaOpGroup Variable Descriptions*

| Variable                                  | Syntax                                   | Maximum Access | Description                                                                                                                                                                                                                                                  |
|-------------------------------------------|------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>cerent15216EdfaOpStatus</code>      | <code>cerent15216EdfaActionStatus</code> | Read-only      | The status of the current operation.                                                                                                                                                                                                                         |
| <code>cerent15216EdfaOpResult</code>      | Integer                                  | Read-only      | This value is used to save the error result (if any) of the last operation. Success is indicated by a value of 0.                                                                                                                                            |
| <code>cerent15216EdfaOpRequestId</code>   | Integer                                  | Read-write     | The request identifier for this operation. This is provided to allow managers to match actions and results.                                                                                                                                                  |
| <code>cerent15216EdfaOpCutover</code>     | <code>cerent15216EdfaAction</code>       | Read-write     | When “perform” is written to this object, firmware is executed from the current plane and the alternate plane status is changed to the default active plane.                                                                                                 |
| <code>cerent15216EdfaOpLoad</code>        | <code>cerent15216EdfaAction</code>       | Read-write     | When “perform” is written to this object, new firmware is downloaded. Before setting this attribute, the source of the new firmware should be specified by setting <code>cerent15216EdfaOpSrcFileName</code> and <code>cerent15216EdfaOpTftpSrvAddr</code> . |
| <code>cerent15216EdfaOpSrcFileName</code> | DisplayString (0 to 127 characters)      | Read-write     | Source file name for the Load operation.                                                                                                                                                                                                                     |
| <code>cerent15216EdfaOpTftpSrvAddr</code> | IpAddress                                | Read-write     | TFTP file server address for the Load operation.                                                                                                                                                                                                             |
| <code>cerent15216EdfaOpReset</code>       | <code>cerent15216EdfaAction</code>       | Read-write     | When “perform” is written to this object, a software reset is performed.                                                                                                                                                                                     |
| <code>cerent15216EdfaOpSaveConfig</code>  | <code>cerent15216EdfaAction</code>       | Read-write     | To save the configuration of the optical module, write “perform” to this object.                                                                                                                                                                             |

## 5.3.8 VersionGroup Table

The `cerent15216EdfaVersionGroup` Table allows users to display the currently loaded image and the image to be loaded after cutover. [Table 5-13](#) describes `cerent15216EdfaVersionGroup` Table variables.

**Table 5-13** *cerent15216EdfaVersionGroup Variable Descriptions*

| Variable                                     | Syntax                              | Maximum Access | Description                                                         |
|----------------------------------------------|-------------------------------------|----------------|---------------------------------------------------------------------|
| <code>cerent15216EdfaCurrentVersion</code>   | DisplayString (0 to 255 characters) | Read-only      | The version of the currently loaded image.                          |
| <code>cerent15216EdfaAlternateVersion</code> | DisplayString (0 to 255 characters) | Read-only      | The version of the image to be loaded after a cutover is performed. |

## 5.4 Setting Up Traps

Traps are asynchronous notifications sent from the ONS 15216 EDFA2 to a predetermined location (IP address, subnet mask, etc.). A community entry must be created prior to remotely setting up traps using either Telnet or a terminal server. [Table 5-14](#) displays the alarm notification types in the `cerent15216Edfa.mib` that initiate a trap.

**Table 5-14** *Notification Types that Initiate a Trap*

| Notification                               | MIB Items                                                                                                                                                      | Description                                                                                                                                              |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>cerent15216EdfaOpFinished</code>     | <code>cerent15216EdfaOpSaveConfig</code><br><code>cerent15216EdfaOpCutover</code><br><code>cerent15216EdfaOpLoad</code><br><code>cerent15216EdfaOpReset</code> | “Op Finished” indicates that an operation has completed or, in the case of <code>cerent15216EdfaOpReset</code> , the operation is about to be performed. |
| <code>cerent15216EdfaAlarmActivated</code> | <code>cerent15216EdfaAlarmID</code><br><code>cerent15216EdfaAlarmPriority</code><br><code>cerent15216EdfaAlarmDateAndTime</code>                               | “Alarm Activate” is a notification indicating an alarm has changed to an active state.                                                                   |
| <code>cerent15216EdfaAlarmCleared</code>   | <code>cerent15216EdfaAlarmID</code><br><code>cerent15216EdfaAlarmPriority</code><br><code>cerent15216EdfaAlarmDateAndTime</code>                               | “Alarm Cleared” is a notification indicating an alarm has changed to a cleared state.                                                                    |

### 5.4.1 Display Trap Command

**Command:** `snmp table display local cerent15216EdfaCommTrapEntry`

**Syntax:** `snmp table display local cerent15216EdfaCommTrapEntry #`

**Description:** Displays the communities for traps. See example 5-8.

**Example 5-8 cerent15216EdfaCommTrapEntry Display Command**

```

ash:hostname:ONS15216 EDFA2> snmp table display local cerent15216EdfaCommTrapEntry

CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaCommTrapEntry ::=
{
 cerent15216EdfaCommTrapIndex = 0;
 cerent15216EdfaCommTrapCommunity = "";
 cerent15216EdfaCommTrapDestIPAddress = 0.0.0.0;
 cerent15216EdfaCommTrapDestUDPPort = 0;
 cerent15216EdfaCommTrapViewIndex = 0;
 cerent15216EdfaCommTrapVersion = 0;
 cerent15216EdfaCommTrapStatus = notReady;
};
CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaCommTrapEntry ::=
{
 cerent15216EdfaCommTrapIndex = 1;
 cerent15216EdfaCommTrapCommunity = "private";
 cerent15216EdfaCommTrapDestIPAddress = 172.22.87.50;
 cerent15216EdfaCommTrapDestUDPPort = 162;
 cerent15216EdfaCommTrapViewIndex = 1;
 cerent15216EdfaCommTrapVersion = v2;
 cerent15216EdfaCommTrapStatus = active;
};

```

## 5.4.2 Set Trap Command

**Command:** `snmp row set local cerent15216EdfaCommTrapEntry`**Syntax:** `snmp row set local cerent15216EdfaCommTrapEntry #`**Description:** The command followed by a community number permits the user to set the parameters for the SNMP trap. [Example 5-9](#) displays the prompts that appear after entering the command.

Prompts appear for the following settings:

- `cerent15216EdfaCommTrapCommunity`: The trap destination community name.
- `cerent15216EdfaCommTrapDestIPAddress`: The trap destination IP address.
- `cerent15216EdfaCommTrapDestUDPPort`: The trap destination UDP port.
- `cerent15216EdfaCommTrapViewIndex`: The trap destination MIB view index. A trap may be sent to this destination if it is contained in this MIB view. A 0 implies no MIB view.
- `cerent15216EdfaCommTrapVersion`: The trap version number.
- `cerent15216EdfaCommTrapStatus`: The status of this conceptual row in the `cerent15216EdfaCommunityTrapTable`.

If the data needs to be changed, enter new data after the prompt.

**Example 5-9 cerent15216EdfaCommTrapEntry Set Command**

```

ash:hostname:ONS15216 EDFA2> snmp row set local cerent15216EdfaCommTrapEntry 1

cerent15216EdfaCommTrapCommunity "private"
cerent15216EdfaCommTrapDestIPAddress 172.22.87.50
cerent15216EdfaCommTrapDestUDPPort 162
cerent15216EdfaCommTrapViewIndex 1
cerent15216EdfaCommTrapVersion v2
cerent15216EdfaCommTrapStatus 4

```

```
ash:hostname:ONS15216 EDFA2>
```

### 5.4.3 Set Agent Trap Enable

**Command:** `snmp attribute set local cerent15216EdfaAgentTrapEnable`

**Syntax:** `snmp attribute set local cerent15216EdfaAgentTrapEnable control`

**Description:** Enables or disables SNMP traps depending on whether the parameter *control* is “enabled” or “disabled”.

### 5.4.4 Get Agent Trap Enable

**Command:** `snmp attribute get local cerent15216EdfaAgentTrapEnable`

**Syntax:** `snmp attribute get local cerent15216EdfaAgentTrapEnable`

**Description:** Ensures that the SNMP traps are enabled. The system responds with “enabled”.

## 5.5 Retrieving Information

The following SNMP commands access ONS 15216 EDFA2 information.

### 5.5.1 IP Address

**Command:** `snmp table display local cerent15216EdfaSromIpMgmtGroup`

**Syntax:** `snmp table display local cerent15216EdfaSromIpMgmtGroup`

**Description:** Displays the ONS 15216 EDFA2 IP address.

The following SNMP command displays the ONS 15216 EDFA2’s IP address and other networking information:

- `snmp row display local cerent15216EdfaSromIpMgmtGroup` command ([Example 5-10](#))

#### **Example 5-10** *cerent15216EdfaSromIpMgmtGroup Display Command*

```
ash:hostname:ONS15216 EDFA2> snmp row display local cerent15216EdfaSromIpMgmtGroup

CLASS cerent15216Edfa-SROM-IP-ADDRESS-MIB.cerent15216EdfaSromIpMgmtGroup ::=
{
 cerent15216EdfaSromIpMgmtEnetAddress = 172.22.82.19;
 cerent15216EdfaSromIpMgmtEnetSubNetMask = 255.255.0.0;
 cerent15216EdfaSromIpMgmtDefaultRouterAddress = 172.22.82.1;
 cerent15216EdfaSromIpMgmtHostName = "hostname";
};
```

[Table 5-15](#) describes the other attributes displayed by these commands.



**Table 5-15** *cerent15216EdfaSromIpMgmtGroup Command Attributes*

| Attribute                                     | Description                                                                                                                                                                                                                                        |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cerent15216EdfaSromIpMgmtEnetAddress          | The IP address used by the system Ethernet management port. If set to 0.0.0.0, IP traffic is not supported over the Ethernet interface. The system must have at least one IP address, either for the Ethernet management port, or for IP over ATM. |
| cerent15216EdfaSromIpMgmtDefaultRouterAddress | The default router (gateway) address for the network.                                                                                                                                                                                              |
| cerent15216EdfaSromIpMgmtEnetSubNetMask       | The IP subnetwork mask for the Ethernet management port.                                                                                                                                                                                           |
| cerent15216EdfaSromIpMgmtHostName             | The host name of the system.                                                                                                                                                                                                                       |

## 5.5.2 Date and Time

**Command:** `snmp attribute get local cerent15216EdfaRtcDateAndTime`

**Syntax:** `snmp attribute get local cerent15216EdfaRtcDateAndTime`

**Description:** Displays the date and time for the ONS 15216 EDFA2.

The following SNMP command displays the date and time for the ONS 15216 EDFA2 and other time data:

- `snmp row display local cerent15216EdfaRtcDateAndTime` command

The following SNMP command sets the date and time for the ONS 15216 EDFA2 and other time data:

- `snmp attribute set local cerent15216EdfaRtcDateAndTimeLocalString` command

When setting the local time of day, set the time zone first, set the DST offset second, and set the local time last. Entries must follow this format: “yyyy-m-d,h:m:s.s +h:m”. Following the space, the time zone is set as +/- hours from Greenwich Mean Time (GMT) (also designated as universal coordinated time (UTC)) followed by a colon and minutes ahead for daylight savings. For example, Pacific Daylight Time would be -8:60 and Greenwich Mean Time would be +0:0.

[Example 5-11](#) displays the ONS 15216 EDFA2 command for displaying the date and time.

### **Example 5-11** *cerent15216EdfaRtcDateAndTime Display Command*

```
ash:hostname:ONS15216 EDFA2> snmp row display local cerent15216EdfaRtcDateAndTime
```

```
CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaRtcDateAndTime ::=
{
 cerent15216EdfaRtcDateAndTimeLocal = '07d20716070a2a042d083c'H;
 cerent15216EdfaRtcDateAndTimeGMT = '07d207160e0a2a042b0000'H;
 cerent15216EdfaRtcDateAndTimeLocalString = "2002-7-22,7:10:42.4 -8:60";
 cerent15216EdfaRtcDateAndTimeGMTString = "2002-7-22,14:10:42.4 +0:0";
 cerent15216EdfaRtcDateAndTimeTimezone = -8;
 cerent15216EdfaRtcDateAndTimeSaving = 60;
 cerent15216EdfaRtcDateAndTimeFormsString = "07/22/2002 07:10:42";
};
```

[Table 5-16](#) describes the attributes displayed by these commands.

**Table 5-16** *cerent15216EdfaRtcDateAndTime Command Attributes*

| Attribute                                | Description                                                                                                                                                                                                                                  |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cerent15216EdfaRtcDateAndTimeLocal       | The current local time. Setting this value changes the time according to the cerent15216EdfaRtcDateAndTimeTimezone and cerent15216EdfaRtcDateAndTimeSaving values. The time zone and saving fields of this attribute are in the set command. |
| cerent15216EdfaRtcDateAndTimeGMT         | The current GMT time.                                                                                                                                                                                                                        |
| cerent15216EdfaRtcDateAndTimeLocalString | The current local time.                                                                                                                                                                                                                      |
| cerent15216EdfaRtcDateAndTimeGMTString   | The current GMT time.                                                                                                                                                                                                                        |
| cerent15216EdfaRtcDateAndTimeTimezone    | The time zone in hours from GMT.                                                                                                                                                                                                             |
| cerent15216EdfaRtcDateAndTimeSaving      | The current daylight saving offset in minutes.                                                                                                                                                                                               |
| cerent15216EdfaRtcDateAndTimeFormsString | The current local time.                                                                                                                                                                                                                      |

## 5.5.3 Power Gain

**Command:** `snmp attribute get local cerentEdfa15216EdfaConstGainOverallGain`

**Syntax:** `snmp attribute get local cerentEdfa15216EdfaConstGainOverallGain #`

**Description:** Displays the overall power gain when the ONS 15216 EDFA2 is in Constant Gain Temperature Compensated mode.

The following commands access overall power gain when in the Constant Gain Temperature Compensated mode:

- `snmp row display local cerent15216EdfaOverallControl` command
- `snmp row get local cerent15216EdfaOverallControl` command

The `cerent15216EdfaConstGainOverallGain` attribute in `cerent15216EdfaOverallControl` display command shows the ONS 15216 EDFA2 power gain ([Example 5-12](#)).

### **Example 5-12** *cerent15216EdfaOverallControl Display Command*

```
ash:hostname:ONS15216 EDFA2>snmp row display local cerent15216EdfaOverallControl

CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaOverallControl ::= {
 cerent15216EdfaConstGainOverallGain = 220;
 cerent15216EdfaVariableGainPreAttenuation = 0;
};
```

For information about all of the parameters in the `cerent15216EdfaOverallStatusGroup`, refer to [Table 5-8](#).

## 5.5.4 Case Temperature

### 5.5.4.1 Case Temperature Value

**Command:** `snmp attribute get local cerent15216EdfaPumpStatusAmbientTemp`

**Syntax:** `snmp attribute get local cerent15216EdfaPumpStatusAmbientTemp pump#`

**Description:** Displays case temperature value (where *pump#* is the pump number).

The following command displays the temperature value (where *pump#* is the pump number) and other pump status data:

- `snmp row display local cerent15216EdfaPumpStatusAmbientTemp pump#` command

The `cerent15216EdfaPumpStatusAmbientTemp` attribute of the `cerentEdfaPumpStatusEntry` display command shows the case temperature (Example 5-13).

#### Example 5-13 `cerent15216EdfaPumpStatusEntry` Display Command

```
ash:hostname:ONS15216 EDFA2> snmp row display local cerent15216EdfaPumpStatusEntry 1
```

```
CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaPumpStatusEntry ::=
{
 cerent15216EdfaPumpStatusPumpNum = 1;
 cerent15216EdfaPumpStatusLaserChipTemp = 260;
 cerent15216EdfaPumpStatusLaserChipTempSetpoint = 260;
 cerent15216EdfaPumpStatusLaserTECCurrent = 20;
 cerent15216EdfaPumpStatusLaserPower = 8503;
 cerent15216EdfaPumpStatusLaserCurrent = 17010;
 cerent15216EdfaPumpStatusAmbientTemp = 2272;
 cerent15216EdfaPumpStatusDCVoltage = 52;
 cerent15216EdfaPumpStatusInPoweruW = 1;
 cerent15216EdfaPumpStatusInPowerdBm = -4003;
 cerent15216EdfaPumpStatusOutPowermW = 3195;
 cerent15216EdfaPumpStatusOutPowerdBm = 1504;
 cerent15216EdfaPumpStatusGain = 550;
};
```

Refer to [Table 5-10](#) for information about all of the parameters in the `cerent15216EdfaPumpStatusEntry` Table.

### 5.5.4.2 Case Temperature Alarm Threshold

#### 5.5.4.2.1 CtmpMin

**Command:** `snmp attribute get local cerent15216EdfaCtmpMin`

**Syntax:** `snmp attribute get local cerent15216EdfaCtmpMin`

**Description:** This command displays minimum case temperature alarm threshold.

#### 5.5.4.2.2 CtmpMax

**Command:** `snmp attribute get local cerent15216EdfaCtmpMax`

**Syntax:** `snmp attribute get local cerent15216EdfaCtmpMax`

**Description:** This command displays maximum case temperature alarm threshold.

The following command displays case temperature alarm threshold and other temperature data:

- **snmp row display local cerent15216EdfaCfgGroup** command

This command is shown in [Example 5-14](#).

#### **Example 5-14 cerent15216EdfaCfgGroup Display Command**

```
ash:hostname:ONS15216 EDFA2> snmp row display local cerent15216EdfaCfgGroup

CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaCfgGroup ::=
{
 cerent15216EdfaCfgSaved = true;
 cerent15216EdfaLpoutSetpoint = 0;
 cerent15216EdfaLpoutDeviation = 200;
 cerent15216EdfaLpoutHysteresis = 100;
 cerent15216EdfaLOSThreshold = -3102;
 cerent15216EdfaLOSHysteresis = 100;
 cerent15216EdfaCtmpMin = -5;
 cerent15216EdfaCtmpMinHysteresis = 1;
 cerent15216EdfaCtmpMax = 65;
 cerent15216EdfaCtmpMaxHysteresis = 1;
 cerent15216EdfaCLEI = "WMM4180BRA";
 cerent15216EdfaPowerBusMode = duplex;
 cerent15216EdfaPowerBusDCVoltageMin = 420;
 cerent15216EdfaPowerBusDCVoltageMax = 700;
};
```

Refer to [Table 5-8](#) for information about all of the parameters in cerent15216EdfaOverallStatusGroup.

## 5.5.4.3 Case Temperature Alarm Hysteresis

### 5.5.4.3.1 CtmpMaxHysteresis

**Command:** `snmp attribute get local cerent15216EdfaCtmpMaxHysteresis`

**Syntax:** `snmp attribute get local cerent15216EdfaCtmpMaxHysteresis`

**Description:** Displays maximum case temperature alarm hysteresis.

The cerent15216EdfaCtmpMaxHysteresis attribute in the cerent15216EdfaCfgGroup display command shows the maximum case hysteresis temperature alarm threshold ([Example 5-14](#)). Refer to [Table 5-6](#) for information about all of the parameters in cerent15216EdfaCfgGroup.

### 5.5.4.3.2 CtmpMinHysteresis

**Command:** `snmp attribute get local cerent15216EdfaCtmpMinHysteresis`

**Syntax:** `snmp attribute get local cerent15216EdfaCtmpMinHysteresis`

**Description:** Displays the minimum case hysteresis temperature alarm threshold.

The following command displays case temperature alarm hysteresis and other data:

- **snmp row display local cerent15216EdfaCfgGroup** command

The cerent15216EdfaCfgGroup command is shown in [Example 5-14](#). For information about all of the parameters in the cerent15216EdfaCfgGroup table, see [Table 5-6](#).

## 5.5.5 Power Bus

### 5.5.5.1 Power Bus Mode

**Command:** `snmp attribute get local cerent15216EdfaPowerBusMode`

**Syntax:** `snmp attribute get local cerent15216EdfaPowerBusMode`

**Description:** Displays the power bus mode (simplex or duplex).

The following command displays power bus voltage and other data:

- `snmp row display local cerent15216EdfaCfgGroup` command

### 5.5.5.2 Power Bus Alarm Threshold

#### 5.5.5.2.1 PowerBusDCVoltageMax

**Command:** `snmp attribute get local cerent15216EdfaPowerBusDCVoltageMax`

**Syntax:** `snmp attribute get local cerent15216EdfaPowerBusDCVoltageMax`

**Description:** Displays the maximum allowable power bus DC voltage (multiplied by  $-10V$ ).

The following command displays power bus voltage and other data:

- `snmp row display local cerent15216EdfaCfgGroup` command

#### 5.5.5.2.2 PowerBusDCVoltageMin

**Command:** `snmp attribute get local cerent15216EdfaPowerBusDCVoltageMin`

**Syntax:** `snmp attribute get local cerent15216EdfaPowerBusDCVoltageMin`

**Description:** Displays the minimum allowable power bus DC voltage (multiplied by  $-10V$ ).

The following command displays power bus voltage and other data:

- `snmp row display local cerent15216EdfaCfgGroup` command

## 5.5.6 Input Power (Signal)

### 5.5.6.1 Input Power (Signal) Value

#### 5.5.6.1.1 InPowerduW

**Command:** `snmp attribute get local cerent15216EdfaInPoweruW`

**Syntax:** `snmp attribute get local cerent15216EdfaInPoweruW`

**Description:** Displays input power value in microwatts.

The following command displays the ONS 15216 EDFA2 input power value and other status information:

- `snmp row display local cerent15216EdfaOverallStatusGroup` command

For information about all of the parameters in the `cerent15216EdfaOverallStatusGroup` table, see [Table 5-8](#).

### 5.5.6.1.2 InPowerdBm

**Command:** `snmp attribute get local cerent15216EdfaInPowerdBm`

**Syntax:** `snmp attribute get local cerent15216EdfaInPowerdBm`

**Description:** Displays the input power value in dBm. The dBm units are converted from  $\mu$ W to dBm, so these values could be slightly different due to rounding error.

The following command displays input power value and other status information:

- `snmp row display local cerent15216EdfaOverallStatusGroup` command

For information about all of the parameters in the `cerent15216EdfaOverallStatusGroup` table, refer to [Table 5-8](#).

### 5.5.6.2 Loss of Signal (Input Power) Alarm Threshold

**Command:** `snmp attribute get local cerent15216EdfaLOSThreshold`

**Syntax:** `snmp attribute get local cerent15216EdfaLOSThreshold`

**Description:** Displays the loss of signal (input power) alarm threshold.

The following command displays the loss of input power alarm threshold and other laser power and temperature data:

- `snmp row display local cerent15216EdfaCfgGroup` command

The `cerent15216EdfaLOSThreshold` attribute in the `cerent15216EdfaCfgGroup` display command shows the loss of input power alarm threshold ([Example 5-14](#)).

For information about all of the parameters in the `cerent15216EdfaCfgGroup` table, refer to [Table 5-6](#).

### 5.5.6.3 Loss of Signal (Input Power) Alarm Hysteresis

**Command:** `snmp attribute get local cerent15216EdfaLOSHysteresis`

**Syntax:** `snmp attribute get local cerent15216EdfaLOSHysteresis`

**Description:** Displays the loss of signal (input power) alarm hysteresis value.

The following command displays the loss of input power hysteresis value and other laser power and temperature data:

- `snmp row display local cerent15216EdfaCfgGroup` command

The `cerent15216EdfaLOSHysteresis` attribute in the `cerent15216EdfaCfgGroup` display command shows the loss of input power alarm threshold ([Example 5-14](#)). For information about all of the parameters in the `cerent15216EdfaCfgGroup` table, refer to [Table 5-6](#).

## 5.5.7 Output Power

### 5.5.7.1 Output Power Value

#### 5.5.7.1.1 OutPowermW

**Command:** `snmp attribute get local cerent15216EdfaOutPowermW`

**Syntax:** `snmp attribute get local cerent15216EdfaOutPowermW`

**Description:** Displays output power value in milliwatts.

The **snmp row display local cerent15216EdfaOverallStatusGroup** command displays the ONS 15216 EDFA2 output power value and additional pump status. For information about all of the parameters in the `cerent15216EdfaOverallStatusGroup` table, refer to [Table 5-8](#).

### 5.5.7.1.2 OutPowerdBm

**Command:** **snmp attribute get local cerent15216EdfaOutPowerdBm**

**Syntax:** **snmp attribute get local cerent15216EdfaOutPowerdBm**

**Description:** Displays output power value in dBm. This command displays loss of output power value and additional pump status data. The dBm units are converted from mW to dBm, so these values could be slightly different due to rounding error.

For information about all of the parameters in the `cerent15216EdfaOverallStatusGroup` table, refer to [Table 5-8](#).

## 5.5.7.2 Loss of Output Power Alarm Setpoint

### 5.5.7.2.1 LpoutSetpoint

**Command:** **snmp attribute get local cerent15216EdfaLpoutSetpoint**

**Syntax:** **snmp attribute get local cerent15216EdfaLpoutSetpoint**

**Description:** This attribute notifies network operations personnel notification if the output power of the ONS 15216 EDFA2 drops below a level that impacts proper operation of the optical network.

Typically, network operations personnel should set the loss of output power alarm threshold at a value that is appropriate for the intended network application so that the alarm condition is meaningful. Consult with the Cisco TAC to determine threshold value for your application. As a guideline, Cisco recommends that loss of output power alarm threshold value be set at 1 dBm below the current output power level of the amplifier.

When the ONS 15216 EDFA2 is set to Constant Gain Temperature Compensated mode (factory default), the value for loss of output power alarm threshold cannot be changed. To display the loss of output power alarm threshold and other power and temperature alarm data, use the **snmp table display local cerent15216EdfaCfgGroup** command (shown in [Example 5-14](#)). This command returns the current alarm threshold default values.

### 5.5.7.2.2 LpoutDeviation

**Command:** **snmp attribute get local cerent15216EdfaLpoutDeviation**

**Syntax:** **snmp attribute get local cerent15216EdfaLpoutDeviation**

**Description:** This attribute is not required when operating in factory default Constant Gain Temperature Compensated mode. Setting of the loss of output power alarm deviation is only necessary when the amplifier is used in Constant Output Power mode.

This attribute is used to set the amount by which the output power must vary from the threshold set point before the alarm is activated. This attribute, in conjunction with the loss of output power alarm threshold and hysteresis, enables notification of network operations personnel if the output power of the ONS 15216 EDFA2 drops below a level that would impact proper operation of the optical network.

Typically, network operations personnel should set the loss of output power alarm deviation at a value that is appropriate for the intended network application so that the alarm condition is meaningful. Consult with the Cisco TAC to determine the deviation value for your application. As a guideline, Cisco recommends that the loss of output power alarm deviation value be set at 2 dBm. The module triggers an alarm if it detects a signal level of 2 dBm below the current output power alarm level threshold value set for the amplifier.

When the ONS 15216 EDFA2 is set to Constant Gain Temperature Compensated mode (factory default), the value for the loss of output power alarm threshold cannot be changed. To display the loss of output power alarm deviation and other power and temperature alarm data, use the **snmp table display local cerent15216EdfaCfgGroup** command as shown in [Example 5-14](#). This command returns the current alarm threshold default values.

To set the loss of output power alarm deviation when the ONS 15216 EDFA2 is configured for operation in Constant Output Power or Constant Pump Power mode, type **snmp attribute set local cerent15216EdfaLpoutDeviation** at the command prompt followed by a number (as shown in [Example 5-15](#)). Valid entries are between 0 and 1000 and are in dBm times 100. For example, if the loss of output power deviation required were 0.2 dBm, the number input as the loss of output power alarm deviation would be 20.

The user is prompted to modify the attribute. If no changes are required, press **Enter** to return to command prompt.

#### **Example 5-15 cerent15216EdfaLpoutDeviation Set Command**

```
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaLpoutDeviation 200

ash:hostname:ONS15216 EDFA2> snmp row display local cerent15216EdfaCfgGroup

CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaCfgGroup ::=
{
 cerent15216EdfaCfgSaved = false;
 cerent15216EdfaLpoutSetpoint = 0;
 cerent15216EdfaLpoutDeviation = 200;
 cerent15216EdfaLpoutHysteresis = 100;
 cerent15216EdfaLOSThreshold = -2694;
 cerent15216EdfaLOSHysteresis = 100;
 cerent15216EdfaCtmpMin = -5;
 cerent15216EdfaCtmpMinHysteresis = 1;
 cerent15216EdfaCtmpMax = 65;
 cerent15216EdfaCtmpMaxHysteresis = 1;
 cerent15216EdfaCLEI = "WMAW27VLAA";
 cerent15216EdfaPowerBusMode = duplex;
 cerent15216EdfaPowerBusDCVoltageMin = 420;
 cerent15216EdfaPowerBusDCVoltageMax = 700;
};
```

Changes must be saved before terminating the session. See the [“Save Changes”](#) section on page 4-11.

### 5.5.7.3 Loss of Output Power Alarm Hysteresis

**Command:** `snmp attribute get local cerent15216EdfaLpoutHysteresis`

**Syntax:** `snmp attribute get local cerent15216EdfaLpoutHysteresis`



**Description:** This attribute is not required when operating in factory default Constant Gain Temperature Compensated mode. Setting of the loss of output power alarm deviation is only necessary when the amplifier is used in Constant Output Power or Constant Pump Power modes of operation.

This attribute is used to set the amount by which the output power must increase from the threshold setpoint before the alarm is cleared. This attribute, in conjunction with the loss of output power alarm threshold and deviation, enables efficient processing and clearing of the alarm condition.

Typically, network operations personnel should set the loss of output power alarm hysteresis at a value that is appropriate for the intended network application so that the alarm condition is meaningful. Consult with the Cisco TAC to determine the hysteresis value for your application. As a guideline, Cisco recommends that loss of output power alarm hysteresis value be set at 0.2 dBm. The module clears the alarm if it detects a signal level of 0.2 dBm above the current output power alarm level threshold value set for the amplifier.

When ONS 15216 EDFA2 is set to Constant Gain Temperature Compensated mode (factory default), the value for loss of output power alarm threshold cannot be changed. To display the loss of output power alarm deviation and other power and temperature alarm data, use the **snmp table display local cerent15216EdfaCfgGroup** command as shown in [Example 5-14](#). This command returns the current alarm threshold default values.

To set the loss of output power alarm hysteresis when ONS 15216 EDFA2 is configured for operation in either Constant Output Power mode or Constant Pump Power mode, type **snmp attribute set local cerent15216EdfaLpoutHysteresis** at the command prompt followed by a number. Valid entries are between 0 and 1000 and are in dBm times 100. For example, if the loss of output power hysteresis required were 0.2 dBm, the number input as loss of output power alarm hysteresis would be 200.

The user is prompted to modify the attribute. If changes are not required, press **Enter** to return to command prompt.

Changes must be saved before terminating the session. See the [“Save Changes” section on page 4-11](#).

## 5.5.8 Alarm Entry

**Command:** **snmp table display local cerent15216EdfaAlarmEntry**

**Syntax:** **snmp table display local cerent15216EdfaAlarmEntry**

**Description:** Accesses the alarm status. [Example 5-16](#) shows the **cerent15216EdfaAlarmEntry display** command.

### **Example 5-16 cerent15216EdfaAlarmEntry Display Command**

```
ash:hostname:ONS15216 EDFA2> snmp table display local cerent15216EdfaAlarmEntry
```

```
CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaAlarmEntry ::=
{
cerent15216EdfaAlarmID.1 = lcrnt1;
cerent15216EdfaAlarmID.2 = lcrnt2;
cerent15216EdfaAlarmID.3 = ltmp1;
cerent15216EdfaAlarmID.4 = ltmp2;
cerent15216EdfaAlarmID.5 = lpout;
cerent15216EdfaAlarmID.6 = lpin;
cerent15216EdfaAlarmID.7 = gain;
```

```
cerent15216EdfaAlarmID.8 = ctmp;
cerent15216EdfaAlarmID.9 = powerBusA;
cerent15216EdfaAlarmID.10 = powerBusB;
```

For information about all of the parameters in the cerent15216EdfaAlarmEntry table, refer to [Table 5-11](#).

## 5.6 Summary of SNMP Alarms

[Table 5-17](#) summarizes the ONS 15216 EDFA2 SNMP alarms.

**Table 5-17 TL1 Autonomous Alarms**

| SNMP Alarm ID | Description                                                                                                                                             | Priority |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| lcrnt1        | Excessive pump current - pump 1. Drive current greater than 95% of end of life value. Current must drop to 90% of end of life value for alarm to clear. | Minor    |
| lcrnt2        | Excessive pump current - pump 2. Drive current greater than 95% of end of life value. Current must drop to 90% of end of life value for alarm to clear. | Minor    |
| ltmp1         | Pump 1 laser temp. out of range. Chip temperature deviating more than 10 degrees C from setpoint.                                                       | Minor    |
| ltmp1         | Pump 1 laser temp. out of range. Chip temperature deviating more than 10 degrees C from setpoint.                                                       | Minor    |
| lpout         | Loss of output power. EDFA output power is deviating more than the prescribed amount from the setpoint.                                                 | Major    |
| lpin          | Loss of input power (signal). EDFA input power is below the loss of signal threshold.                                                                   | Major    |
| gain          | Gain out of range. Gain has deviated more than 2dB from the setpoint.                                                                                   | Major    |
| ctmp          | Case temperature out of the prescribed range.                                                                                                           | Minor    |
| powerBusA     | The Power BUS A voltage is out of the prescribed range.                                                                                                 | Major    |
| powerBusB     | The Power BUS B voltage is out of the prescribed range.                                                                                                 | Major    |



# ASH Commands

ASH commands are available in the ASH shell command line interface. ASH commands consist of proprietary commands and command-line SNMP instructions. This chapter is a reference of ASH commands that are used in advanced setup and troubleshooting. For provisioning the Cisco ONS 15216 EDFA2 using ASH commands, see [Chapter 4, “Provisioning in the ASH Shell.”](#)

All commands discussed in this chapter are available to the default CISCO15 user and any other user with read\_write\_admin (RWA) access privileges. Users with read\_write (RW) and read (R) access levels have access to a subset of the commands, as shown in [Table 6-1](#).

## 6.1 Summary of Security Permissions for ASH Commands

**Table 6-1 ASH Commands Security Permissions (Access Levels)**

| Command              | Description                                                                                   | User Access Levels |     |     |
|----------------------|-----------------------------------------------------------------------------------------------|--------------------|-----|-----|
|                      |                                                                                               | R                  | RW  | RWA |
| clear                | Clears the shell screen.<br>See <a href="#">clear Command, page 6-10</a> .                    | Yes                | Yes | Yes |
| debug memory display | Displays memory.                                                                              | Yes                | Yes | Yes |
| error log display    | Displays current error log.                                                                   | No                 | Yes | Yes |
| exit                 | Exits the shell.<br>See <a href="#">exit Command, page 6-10</a> .                             | Yes                | Yes | Yes |
| ffs bams display     | Displays flash file system BAMS.                                                              | No                 | Yes | Yes |
| ffs block compress   | Compresses flash file system block into spare.                                                | No                 | Yes | Yes |
| ffs block display    | Displays flash file system blocks.                                                            | No                 | Yes | Yes |
| ffs file copy        | Copies flash file.                                                                            | No                 | Yes | Yes |
| ffs file delete      | Delete flash file.                                                                            | No                 | Yes | Yes |
| ffs file display     | Displays contents of flash file.                                                              | No                 | Yes | Yes |
| ffs file list        | Displays the files in flash memory.<br>See <a href="#">ffs file list Command, page 6-13</a> . | No                 | Yes | Yes |
| ffs file rename      | Renames flash file.                                                                           | No                 | Yes | Yes |
| ffs format           | Formats flash file system.                                                                    | No                 | Yes | Yes |
| ffs status display   | Displays current flash file system status.                                                    | No                 | Yes | Yes |

**Table 6-1 ASH Commands Security Permissions (Access Levels) (continued)**

| Command                                 | Description                                                                                                                   | User Access Levels |     |     |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------|-----|-----|
|                                         |                                                                                                                               | R                  | RW  | RWA |
| ffs tftp get                            | Copies TFTP file to flash file system.                                                                                        | No                 | Yes | Yes |
| ffs tftp put                            | Copies flash file to TFTP file system.                                                                                        | No                 | Yes | Yes |
| ffs tftp record get                     | Copies record-based TFTP file to flash file.                                                                                  | No                 | Yes | Yes |
| ffs tftp record put                     | Copies record-based flash file to TFTP file.                                                                                  | No                 | Yes | Yes |
| flash block display                     | Displays flash memory.                                                                                                        | No                 | No  | Yes |
| flash block erase                       | Erases specified flash block.                                                                                                 | No                 | No  | Yes |
| flash block modify                      | Modifies flash memory.                                                                                                        | No                 | No  | Yes |
| flash boot erase                        | Erases flash boot sector.                                                                                                     | No                 | No  | Yes |
| flash boot program tftp                 | Programs flash from TFTP file.                                                                                                | No                 | No  | Yes |
| flash chip block display                | Displays chip block flash memory.                                                                                             | No                 | No  | Yes |
| flash chip block erase                  | Erases specified flash chip block.                                                                                            | No                 | No  | Yes |
| flash chip block modify                 | Modifies chip block flash memory.                                                                                             | No                 | No  | Yes |
| flash chip display                      | Displays flash chip information.                                                                                              | No                 | No  | Yes |
| flash chip erase                        | Erases specified flash chip.                                                                                                  | No                 | No  | Yes |
| flash chip reset                        | Resets flash chip.                                                                                                            | No                 | No  | Yes |
| gain attenuation display                | Displays target attenuation.                                                                                                  | Yes                | Yes | Yes |
| gain attenuation modify                 | Modifies target attenuation.                                                                                                  | No                 | Yes | Yes |
| gain gain display                       | Displays gain setting.<br>See <a href="#">gain gain display Command, page 6-9</a> .                                           | Yes                | Yes | Yes |
| gain gain modify                        | Modifies gain setting.<br>See <a href="#">gain gain modify Command, page 6-9</a> .                                            | No                 | Yes | Yes |
| help                                    | Gives help about commands.<br>See <a href="#">help Command, page 6-10</a> .                                                   | Yes                | Yes | Yes |
| history                                 | Displays the history list.<br>See <a href="#">history Command, page 6-10</a> .                                                | Yes                | Yes | Yes |
| login                                   | Allows the user to log into shell.<br>See <a href="#">login and logoff Commands, page 6-11</a> .                              | Yes                | Yes | Yes |
| logoff                                  | Allows the user to log off of the shell.<br>See <a href="#">login and logoff Commands, page 6-11</a> .                        | Yes                | Yes | Yes |
| manufacturer clei display               | Displays CLEI code.                                                                                                           | Yes                | Yes | Yes |
| manufacturer mode enable                | Enables access to manufacturer commands.                                                                                      | No                 | No  | Yes |
| manufacturer restore defaults all       | Restores all settings to manufacturer defaults.<br>See <a href="#">manufacturer restore defaults all Command, page 6-28</a> . | No                 | No  | Yes |
| manufacturer restore defaults passwords | Restores manufacturer password defaults.<br>See <a href="#">manufacturer restore defaults passwords Command, page 6-28</a> .  | No                 | No  | Yes |

**Table 6-1 ASH Commands Security Permissions (Access Levels) (continued)**

| Command                       | Description                                                                                             | User Access Levels |     |     |
|-------------------------------|---------------------------------------------------------------------------------------------------------|--------------------|-----|-----|
|                               |                                                                                                         | R                  | RW  | RWA |
| network host ftp              | FTPs to remote host.                                                                                    | No                 | Yes | Yes |
| network host ping             | Pings remote host.                                                                                      | No                 | Yes | Yes |
| network host telnet           | Telnets to remote host                                                                                  | No                 | Yes | Yes |
| pdm busmode display           | Displays the bus mode (simplex or duplex).<br>See <a href="#">pdm busmode display Command, page 6-8</a> | Yes                | Yes | Yes |
| pdm busmode modify            | Modifies the bus mode (simplex or duplex).<br>See <a href="#">pdm busmode modify Command, page 6-8</a>  | No                 | Yes | Yes |
| pdm cfg threshold bus display | Displays bus threshold configuration.                                                                   | Yes                | Yes | Yes |
| pdm cfg threshold bus modify  | Modifies bus threshold configuration.                                                                   | No                 | Yes | Yes |
| pdm cfg threshold display     | Display threshold configuration.                                                                        | Yes                | Yes | Yes |
| processor reset               | Resets the CPU.<br>See <a href="#">processor reset Command, page 6-11</a> .                             | No                 | Yes | Yes |
| shell lines set               | Sets the number of shell lines.<br>See <a href="#">shell lines set Command, page 6-12</a> .             | Yes                | Yes | Yes |
| shell more disable            | Disables more.<br>See <a href="#">shell more enable and disable Commands, page 6-12</a> .               | Yes                | Yes | Yes |
| shell more enable             | Enables more.<br>See <a href="#">shell more enable and disable Commands, page 6-12</a> .                | Yes                | Yes | Yes |
| shell rows set                | Sets the number of shell rows.                                                                          | Yes                | Yes | Yes |
| shell status display          | Displays the shell status.<br>See <a href="#">shell status display Command, page 6-12</a> .             | Yes                | Yes | Yes |
| shell type display            | Displays the default shell type.                                                                        | Yes                | Yes | Yes |
| shell type modify             | Modifies the default shell type.<br>See <a href="#">shell type modify Command, page 6-12</a> .          | No                 | No  | Yes |
| snmp attribute get            | Gets an attribute.<br>See <a href="#">snmp attribute get Command, page 6-14</a> .                       | No                 | Yes | Yes |
| snmp attribute list           | Lists an attribute.<br>See <a href="#">snmp attribute list Command, page 6-15</a> .                     | No                 | Yes | Yes |
| snmp attribute oid get        | get an attribute                                                                                        | No                 | Yes | Yes |
| snmp attribute oid set        | set an attribute                                                                                        | No                 | Yes | Yes |
| snmp attribute set            | Sets an attribute.<br>See <a href="#">snmp attribute set Command, page 6-15</a> .                       | No                 | Yes | Yes |
| snmp host ip get              | Gets the IP address from host name.                                                                     | No                 | Yes | Yes |
| snmp host name get            | Gets the host name from IP address.                                                                     | No                 | Yes | Yes |

**Table 6-1 ASH Commands Security Permissions (Access Levels) (continued)**

| Command                  | Description                                                                                                                                                                                                                         | User Access Levels |     |     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----|-----|
|                          |                                                                                                                                                                                                                                     | R                  | RW  | RWA |
| snmp mib display         | Displays a MIB.<br>See <a href="#">snmp mib display Command, page 6-16</a> .                                                                                                                                                        | No                 | Yes | Yes |
| snmp mib get             | Gets a MIB.<br>See <a href="#">snmp mib get Command, page 6-16</a> .                                                                                                                                                                | No                 | Yes | Yes |
| snmp mib list            | Lists a MIB.<br>See <a href="#">snmp mib list Command, page 6-16</a> .                                                                                                                                                              | No                 | Yes | Yes |
| snmp pdu send            | Sends a SNMP protocol data unit (PDU).                                                                                                                                                                                              | No                 | Yes | Yes |
| snmp row display         | Displays a row.<br>See <a href="#">snmp row display Command, page 6-17</a> .                                                                                                                                                        | No                 | Yes | Yes |
| snmp row get             | Gets a row.<br>See <a href="#">snmp row get Command, page 6-18</a> .                                                                                                                                                                | No                 | Yes | Yes |
| snmp row line set        | Dumps a row.                                                                                                                                                                                                                        | No                 | Yes | Yes |
| snmp row oid display     | Displays a row.                                                                                                                                                                                                                     | No                 | Yes | Yes |
| snmp row oid get         | Gets a row.                                                                                                                                                                                                                         | No                 | Yes | Yes |
| snmp row oid set         | Dumps a row.                                                                                                                                                                                                                        | No                 | Yes | Yes |
| snmp row set             | Sets a row.<br>See <a href="#">snmp row set Command, page 6-18</a> .                                                                                                                                                                | No                 | Yes | Yes |
| snmp session version get | Displays the default SNMP session version.<br>See <a href="#">snmp session version get Command, page 6-18</a> .                                                                                                                     | No                 | Yes | Yes |
| snmp session version v1  | Sets default SNMP session version to v1.                                                                                                                                                                                            | No                 | Yes | Yes |
| snmp session version v2C | Sets default SNMP session version to v2C.                                                                                                                                                                                           | No                 | Yes | Yes |
| snmp subtree display     | Displays a subtree.<br>See <a href="#">snmp subtree display Command, page 6-18</a> .                                                                                                                                                | No                 | Yes | Yes |
| snmp subtree get         | Gets a subtree.<br>See <a href="#">snmp subtree get Command, page 6-19</a> .                                                                                                                                                        | No                 | Yes | Yes |
| snmp subtree list        | Lists a subtree.<br>See <a href="#">snmp subtree list Command, page 6-20</a> .                                                                                                                                                      | No                 | Yes | Yes |
| snmp table display       | Displays a table.<br>See <a href="#">snmp table display Command, page 6-20</a> .<br>See also <a href="#">Display Trap Command, page 5-18</a> , <a href="#">IP Address, page 5-20</a> , and <a href="#">Alarm Entry, page 5-29</a> . | No                 | Yes | Yes |
| snmp table get           | Gets a table.<br>See <a href="#">snmp table get Command, page 6-21</a> .                                                                                                                                                            | No                 | Yes | Yes |
| snmp table list          | Lists a table.<br>See <a href="#">snmp table list Command, page 6-22</a> .                                                                                                                                                          | No                 | Yes | Yes |
| snmp trap send           | Sends a SNMP trap.                                                                                                                                                                                                                  | No                 | Yes | Yes |

**Table 6-1 ASH Commands Security Permissions (Access Levels) (continued)**

| Command                       | Description                                                                                                                     | User Access Levels |     |     |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------|-----|-----|
|                               |                                                                                                                                 | R                  | RW  | RWA |
| snmp tree attribute list      | Lists the attributes in the MIB.<br>See <a href="#">snmp tree attribute list Command, page 6-22</a> .                           | No                 | Yes | Yes |
| snmp tree mib list            | Lists the MIBs in the MIB tree.                                                                                                 | No                 | Yes | Yes |
| snmp tree oid display         | Displays object identifier (OID) for a MIB tree object.                                                                         | No                 | Yes | Yes |
| snmp tree syntax display      | Displays the syntax of a MIB tree object.                                                                                       | No                 | Yes | Yes |
| snmp tree table provided list | Lists provided tables in the MIB tree.                                                                                          | No                 | Yes | Yes |
| srom cfg boot display         | Displays the serial ROM boot content.<br>See <a href="#">srom cfg boot display Command, page 6-6</a> .                          | No                 | Yes | Yes |
| srom cfg boot modify          | Modifies the serial ROM boot contents.<br>See <a href="#">srom cfg boot modify Command, page 6-7</a> .                          | No                 | Yes | Yes |
| srom cfg debug display        | Displays one config (CFG) ROM byte.                                                                                             | No                 | No  | Yes |
| srom cfg debug modify         | Modifies one CFG ROM byte.                                                                                                      | No                 | No  | Yes |
| srom cfg display              | Displays CFG ROM contents.                                                                                                      | No                 | Yes | Yes |
| srom cfg ip display           | Displays the serial ROM IP contents.<br>See <a href="#">srom cfg ip display Command, page 6-7</a> .                             | No                 | Yes | Yes |
| srom cfg ip modify            | Modifies the serial ROM IP contents.<br>See <a href="#">srom cfg ip modify Command, page 6-8</a> .                              | No                 | Yes | Yes |
| srom cfg modify               | Modifies CFG ROM contents.                                                                                                      | No                 | Yes | Yes |
| srom id display               | Displays serial ROM contents.                                                                                                   | No                 | Yes | Yes |
| tl1c                          | TL1s to host.                                                                                                                   | Yes                | Yes | Yes |
| user active list              | Lists the active users.<br>See <a href="#">user active list Command, page 6-26</a> .                                            | No                 | Yes | Yes |
| user active message send      | Sends the message to all active users.<br>See <a href="#">user active message send Command, page 6-26</a> .                     | No                 | Yes | Yes |
| user entry create             | Creates a new user.<br>See <a href="#">user entry create Command, page 6-23</a> .                                               | No                 | No  | Yes |
| user entry delete             | Deletes the user.<br>See <a href="#">user entry delete Command, page 6-24</a> .                                                 | No                 | No  | Yes |
| user entry edit               | Edits an existing user entry.<br>See <a href="#">user entry edit Command, page 6-23</a> .                                       | No                 | No  | Yes |
| user file display             | Displays the user names and information.<br>See <a href="#">user file display and user name display Commands, page 6-24</a> .   | No                 | Yes | Yes |
| user inactivity display       | Displays user inactivity times.<br>See <a href="#">user inactivity modify and user inactivity display Commands, page 6-25</a> . | Yes                | Yes | Yes |

**Table 6-1 ASH Commands Security Permissions (Access Levels) (continued)**

| Command                         | Description                                                                                                                    | User Access Levels |     |     |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------|-----|-----|
|                                 |                                                                                                                                | R                  | RW  | RWA |
| user inactivity modify          | Modifies user inactivity time.<br>See <a href="#">user inactivity modify and user inactivity display Commands</a> , page 6-25. | No                 | No  | Yes |
| user name display               | Displays the user name.<br>See <a href="#">user file display and user name display Commands</a> , page 6-24.                   | Yes                | Yes | Yes |
| user passwd set                 | Sets the user password.<br>See <a href="#">user passwd set Command</a> , page 6-25.                                            | Yes                | Yes | Yes |
| user passwd set <i>username</i> | Sets another user's password.<br>See <a href="#">user passwd set Command</a> , page 6-25.                                      | No                 | No  | Yes |
| voa power input display         | Displays VOA power input.<br>See <a href="#">voa power input display Command</a> , page 6-9.                                   | Yes                | Yes | Yes |

## 6.2 Configuration Commands

The following commands are useful in configuring the ONS 15216 EDFA2:

- [srom cfg boot display Command](#), page 6-6
- [srom cfg boot modify Command](#), page 6-7
- [srom cfg ip display Command](#), page 6-7
- [srom cfg ip modify Command](#), page 6-8
- [pdm busmode display Command](#), page 6-8
- [pdm busmode modify Command](#), page 6-8
- [pdm cfg threshold bus display Command](#), page 6-8
- [pdm cfg threshold bus modify Command](#), page 6-9
- [gain gain display Command](#), page 6-9
- [gain gain modify Command](#), page 6-9
- [voa power input display Command](#), page 6-9

### 6.2.1 srom cfg boot display Command

Command: **srom cfg boot display**

Syntax: **srom cfg boot display**

**Description:** Displays the serial ROM boot contents. Data displayed includes the IP address and file names. See [Example 6-1](#).

**Example 6-1 srom cfg boot display Command**

```
ash:hostname:ONS15216 EDFA2> srom cfg boot display
```



```

Boot Count 4
 Boot Record 0 type 2 Flash
 IP Address 0.0.0.0
 Filename 15216EdfaSw_x.x.x_bin
 Boot Record 1 type 2 Flash
 IP Address 0.0.0.0
 Filename 15216EdfaSw_y.y.y_bin
 Boot Record 2 type 2 Flash
 IP Address 0.0.0.0
 Filename
 Boot Record 3 type 2 Flash
 IP Address 0.0.0.0
 Filename
CRC-32 8bd3cb56

```

## 6.2.2 srom cfg boot modify Command

**Command:** `srom cfg boot modify`

**Syntax:** `srom cfg boot modify`

**Description:** Modifies the contents of the ROM boot. See [Example 6-2](#).

### Example 6-2 srom cfg boot modify Command

```

ash:hostname:ONS15216 EDFA2> srom cfg boot modify

Boot Count = 4

 Boot Record 0 type 1 TFTP
 2
 Filename = users/name/15216EdfaSw_x.x.x_bin
 15216EdfaSw_x.x.x_bin
 Boot Record 1 type 2 Flash
 2
 Filename = orion427
 15216EdfaSw_y.y.y_bin
 Boot Record 2 type 2 Flash

 Boot Record 3 type 2 Flash

```



**Note** Boot type 1 = TFTP and boot type 2 = Flash.

## 6.2.3 srom cfg ip display Command

**Command:** `srom cfg ip display`

**Syntax:** `srom cfg ip display`

**Description:** Displays the serial ROM IP contents. The ROM IP contents are shown, including IP address, subnet mask, default router address, and hostname. See [Example 6-3](#).

### Example 6-3 srom cfg ip display Command

```

ash:hostname:ONS15216 EDFA2> srom cfg ip display

```

```
Shelf ID = 1
IP Address = 192.168.60.168
Subnet Mask = 255.255.255.0
Default Router IP Address = 192.168.60.254
Hostname = hostname
SW Config = 0x00000000
CRC32 = 0x54f863a2
```

## 6.2.4 srom cfg ip modify Command

**Command:** `srom cfg ip modify`

**Syntax:** `srom cfg ip modify`

**Description:** Modifies the serial ROM IP contents. The user is prompted, row by row, to change the items listed in [Example 6-4](#).

### *Example 6-4 srom cfg ip modify Command*

```
ash:hostname:ONS15216 EDFA2> srom cfg ip modify

Shelf ID = 1

IP Address = 192.168.60.168

Subnet Mask = 255.255.255.0

Default Router IP Address = 192.168.60.254

Hostname = hostname

SW Config = 0x00000000
```

## 6.2.5 pdm busmode display Command

**Command:** `pdm busmode display`

**Syntax:** `pdm busmode display`

**Description:** Displays power bus mode (simplex or duplex).

## 6.2.6 pdm busmode modify Command

**Command:** `pdm busmode modify`

**Syntax:** `pdm busmode modify {simplex | duplex}`

**Description:** Modifies power bus mode to simplex (single power source–Bus A) or duplex (redundant power source–Bus A and B).

## 6.2.7 pdm cfg threshold bus display Command

**Command:** `pdm cfg threshold bus display`

**Syntax:** `pdm cfg threshold bus display`

**Description:** Displays the minimum and maximum allowable power bus DC voltage.

**Example 6-5** *pdm cfg threshold bus display Command*

```
ash:hostname:ONS15216 EDFA2> pdm cfg threshold bus display
BUS Threshold Low = 40000(mV)
BUS Threshold High = 57000(mV)
```

## 6.2.8 pdm cfg threshold bus modify Command

**Command:** `pdm cfg threshold bus modify`

**Syntax:** `pdm cfg threshold bus modify`

**Description:** Modifies minimum and maximum allowable power bus DC voltage.

**Example 6-6** *pdm cfg threshold bus modify Command*

```
ash:hostname:ONS15216 EDFA2> pdm cfg threshold bus modify
BUS Threshold Low = 40000(mV)
40500
BUS Threshold High = 57000(mV)
```

## 6.2.9 gain gain display Command

**Command:** `gain gain display`

**Syntax:** `gain gain display`

**Description:** Displays the gain setting for the ONS 15216 EDFA2.

**Example 6-7** *gain gain display Command*

```
ash:hostname:ONS15216 EDFA2> gain gain display
Target = 22000(mdB), Actual = 21985(mdB)
```

## 6.2.10 gain gain modify Command

**Command:** `gain gain modify`

**Syntax:** `gain gain modify value`

**Description:** Modifies the gain setting for the ONS 15216 EDFA2.

**Example 6-8** *gain gain modify Command*

```
ash:hostname:ONS15216 EDFA2> gain gain modify 22000
Target = 22000(mdB), Actual = 21996(mdB)
```

## 6.2.11 voa power input display Command

**Command:** `voa power input display`

**Syntax:** `voa power input display`

**Description:** Displays variable optical attenuator (VOA) power input.

## 6.3 Administrative Commands

The following commands are useful in administering the ONS 15216 EDFA2:

- [clear Command, page 6-10](#)
- [exit Command, page 6-10](#)
- [help Command, page 6-10](#)
- [history Command, page 6-10](#)
- [login and logoff Commands, page 6-11](#)
- [processor reset Command, page 6-11](#)

### 6.3.1 clear Command

**Command:** `clear`

**Syntax:** `clear`

**Description:** Clears content from the terminal window. An empty screen with a cursor appears.

### 6.3.2 exit Command

**Command:** `exit`

**Syntax:** `exit`

**Description:** Ends the session with the ONS 15216 EDFA2.

### 6.3.3 help Command

**Command:** `help`

**Syntax:** `help`

**Description:** Displays a list of all CLI commands for current user security level.

### 6.3.4 history Command

**Command:** `history`

**Syntax:** `history`

**Description:** Displays a list of commands issued by the user during that specific session. See [Example 6-9](#).

**Example 6-9 history Command**

```
ash:hostname:ONS15216 EDFA2> history

user active list
user active message send hi
user file display
user entry create
user entry delete albert
user file display
user name display
user passwd set
help
history
```

## 6.3.5 login and logoff Commands

**Command:** login or logoff**Syntax:** login or logoff

**Description:** Used to access and exit communication with the ONS 15216 EDFA2. Logging into the module requires both a user name and a password. Only use these commands if you have stopped the booting process or are displaying the format for logging into the module. Type the command, the first few letters of the attribute, and press the **Tab** key to view a list of attributes that can be set. See [Example 6-10](#).

**Example 6-10 login Command**

```
ash:hostname:ONS15216 EDFA2> login

Parameters
 user_name (string[0..16]) name of user
 password (string[0..16]) password of user
```

## 6.3.6 processor reset Command

**Command:** processor reset**Syntax:** processor reset

**Description:** Resets the processor on the CLI card. Although the performance of the amplifier is not affected, communication with the module is ended and the user must log in again.

## 6.4 Shell Commands

The following commands are useful in working with the shell within the ONS 15216 EDFA2 SNMP manager:

- [shell lines set Command, page 6-12](#)
- [shell more enable and disable Commands, page 6-12](#)
- [shell status display Command, page 6-12](#)
- [shell type modify Command, page 6-12](#)

## 6.4.1 shell lines set Command

**Command:** `shell lines set`

**Syntax:** `shell lines set #lines`

**Description:** Sets the number of lines that can be viewed on the screen without pressing Enter. 40 lines per screen is recommended (maximum is 999).

## 6.4.2 shell more enable and disable Commands

**Command:** `shell more enable` or `shell more disable`

**Syntax:** `shell more {enable | disable}`

**Description:** The `shell more enable` command enables the more function, limiting the output that appears on the screen. When the more function is enabled, press **Enter** to view additional information on the screen.

The `shell more disable` command disables the more function.

## 6.4.3 shell status display Command

**Command:** `shell status display`

**Syntax:** `shell status display`

**Description:** Displays the current shell settings, including the number of shell lines, the number of shell rows, and whether the more setting is enabled or disabled. See [Example 6-11](#).

### **Example 6-11 shell status display Command**

```
ash:hostname:ONS15216 EDFA2> shell status display
```

```
Shell Lines: 22
Shell Rows : 80
More : On
```

## 6.4.4 shell type modify Command

**Command:** `shell type modify`

**Syntax:** `shell type modify {tl1 | ash}`

**Description:** Sets the shell type to TL1 or ASH for the ONS 15216 EDFA2's EIA/TIA-232 port (accessed via HyperTerminal) and the default TCP/IP port on the ONS 15216 EDFA2's LAN port (accessed via Telnet). The default is TL1. This command requires a system reboot using the `processor reset` command for changes to take effect.

To return to the ASH shell from the TL1 shell, use the command **ED-NE-GEN**. (See Step 3. in [“Log In via LAN Port Using Telnet \(Optional\), page 4-3”](#) section on page 4-1.)

## 6.5 Flash File System Commands

The flash file system (FFS) file commands allow the user to manage the number of files that are on the ONS 15216 EDFA2 Flash memory. Never erase the following files:

- Two current versions of software (15216EdfaSw\_*x.x.x*)
- snmp.cfg

Because the snmp.cfg file contains important SNMP attributes, deleting this file would mean that the community and view tables would have to be reset before a remote user could access the ONS 15216 EDFA2 via SNMP.

EDFA software image files are named using a special naming convention. Do not to change the file name when image files are downloaded from an FTP server onto the box in the field when using the FTP command shell of the ONS 15216 EDFA2.

### 6.5.1 ffs file list Command

**Command:** ffs file list

**Syntax:** ffs file list

**Description:** List the files on the ONS 15216 EDFA2 Flash memory. See [Example 6-12](#).

#### Example 6-12 ffs file list Command

```
ash:hostname:ONS15216 EDFA2> ffs file list

-----name----- type status length rename_bam attributes
15216EdfaSw_2.1.0 1 fffc 1684899 ffffffff ffffffff
 snmp.bak 1 fffc 1709 00140001 ffffffff
 passwd 2 fffc -1 ffffffff ffffffff
 snmp.cfg 1 fffc 1709 ffffffff ffffffff
15216EdfaSw_2.0.1 1 fffc 1681923 ffffffff ffffffff
```

## 6.6 SNMP Commands

The SNMP commands are useful in working with the SNMP protocol to provision and configure the ONS 15216 EDFA2. When issuing these SNMP commands, the command syntax requires that the command must be followed by either the ONS 15216 EDFA2 IP address or the word “local”.

SNMP commands are listed as follows:

- [snmp attribute get Command, page 6-14](#)
- [snmp attribute list Command, page 6-15](#)
- [snmp attribute set Command, page 6-15](#)
- [snmp mib display Command, page 6-16](#)
- [snmp mib get Command, page 6-16](#)
- [snmp mib list Command, page 6-16](#)
- [snmp row display Command, page 6-17](#)
- [snmp row get Command, page 6-18](#)

- [snmp row set Command, page 6-18](#)
- [snmp session version get Command, page 6-18](#)
- [snmp subtree display Command, page 6-18](#)
- [snmp subtree get Command, page 6-19](#)
- [snmp subtree list Command, page 6-20](#)
- [snmp table display Command, page 6-20](#)
- [snmp table get Command, page 6-21](#)
- [snmp table list Command, page 6-22](#)
- [snmp tree attribute list Command, page 6-22](#)

## 6.6.1 snmp attribute get Command

**Command:** `snmp attribute get`

**Syntax:** `snmp attribute get {IP_address | local} attribute_name index`

**Description:** Accesses and displays a specific MIB attribute. See [Example 6-13](#).

### Example 6-13 snmp attribute get Command

```
ash:hostname:ONS15216 EDFA2> snmp attribute get local sysDescr

attributes
 sysDescr "ONS15216 vx.x.x ONS15216 vx.x.x, Serial No
00000000100520, MAC Addr 0010b4000b12"
```

Type the command, the first few letters of the attribute, and press **Tab** to view a list of attributes that can be set. See [Example 6-14](#).

### Example 6-14 snmp attribute get Command List

```
ash:hostname:ONS15216 EDFA2> snmp attribute get local cerent

cerent15216EdfaCommIndex
cerent15216EdfaCommName
cerent15216EdfaCommViewIndex
cerent15216EdfaCommPrivileges
cerent15216EdfaCommSrcIPAddr
cerent15216EdfaCommNetMask
cerent15216EdfaCommStatus
cerent15216EdfaCommTrapIndex
cerent15216EdfaCommTrapCommunity
cerent15216EdfaCommTrapDestIPAddress
cerent15216EdfaCommTrapDestUDPPort
cerent15216EdfaCommTrapViewIndex
cerent15216EdfaCommTrapVersion
cerent15216EdfaCommTrapStatus
cerent15216EdfaViewIndex
cerent15216EdfaViewSubtree
cerent15216EdfaViewMask
cerent15216EdfaViewType
cerent15216EdfaViewStatus
cerent15216EdfaAgentTrapEnable
...
```



## 6.6.2 snmp attribute list Command

**Command:** `snmp attribute list`

**Syntax:** `snmp attribute list {IP_address | local} attribute_name`

**Description:** Lists the value of an attribute for all table rows. See [Example 6-15](#).

### Example 6-15 snmp attribute list Command

```
ash:hostname:ONS15216 EDFA2> snmp attribute list local cerent15216EdfaAlarmID

cerent15216EdfaAlarmID.1 = lcrnt1;
cerent15216EdfaAlarmID.2 = lcrnt2;
cerent15216EdfaAlarmID.3 = ltmp1;
cerent15216EdfaAlarmID.4 = ltmp2;
cerent15216EdfaAlarmID.5 = lpout;
cerent15216EdfaAlarmID.6 = lpin;
cerent15216EdfaAlarmID.7 = gain;
cerent15216EdfaAlarmID.8 = ctmp;
cerent15216EdfaAlarmID.9 = powerBusA;
cerent15216EdfaAlarmID.10 = powerBusB;
```

## 6.6.3 snmp attribute set Command

**Command:** `snmp attribute set`

**Syntax:** `snmp attribute set {IP_address | local} attribute_name index new_value`

**Description:** Sets the attribute for a MIB item. Type the command, the first few letters of the attribute, and press **Tab** to view a list of attributes that can be set. See [Example 6-16](#).

### Example 6-16 snmp attribute set Command

```
ash:hostname:ONS15216 EDFA2> snmp attribute set local cerent15216EdfaAgentTrapEnable
enabled
 sysContact
 sysName
 sysLocation
 ifAdminStatus
 atIfIndex
 atPhysAddress
 atNetAddress
 ipForwarding
 ipDefaultTTL
 ipRouteDest
 ipRouteIfIndex
 ipRouteMetric1
 ipRouteMetric2
 ipRouteMetric3
 ipRouteMetric4
 ipRouteNextHop
 ipRouteType
 ipRouteAge
 ipRouteMask
 ipRouteMetric5
 ...
```

## 6.6.4 snmp mib display Command

**Command:** `snmp mib display`

**Syntax:** `snmp mib display {IP_address | local} -all`

**Description:** Displays all writable MIB attributes (or all accessible attributes if the -all option is used).

## 6.6.5 snmp mib get Command

**Command:** `snmp mib get`

**Syntax:** `snmp mib get {IP_address | local}`

**Description:** Displays all MIB attributes. The data is output in two columns. The first column lists the attributes and indices and the second column lists the data. See [Example 6-17](#).

### Example 6-17 snmp mib get Command

```
ash:hostname:ONS15216 EDFA2> snmp mib get local

attributes
 sysDescr"mntuboot v0.0.0 ONS15216 EDFA2 v1.3.0, MAC Addr 0010b4000525"
 sysObjectIDcerent15216EdfaNode
 sysUpTime24703705
 sysContact" "
 sysName"sysname"
 sysLocation" "
 sysServices0
 sysORLastChange90

index
 sysORIndex1
attributes
 sysORIDsnmpBasicCompliance
 sysORDescr" "
 sysORUpTime24704075
```

## 6.6.6 snmp mib list Command

**Command:** `snmp mib list`

**Syntax:** `snmp mib list {IP_address | local}`

**Description:** Displays the values of all attributes supported by the SNMP agent. [Example 6-18](#).

### Example 6-18 snmp mib list Command

```
ash:hostname:ONS15216 EDFA2> snmp mib list local

sysDescr.0 = "hostname v3.0.0 ONS15216 EDFA2 v2.1.1, Serial No DIT0533000P, MAC
Addr 00059a383d10";
sysObjectID.0 = { cerent15216EdfaNode };
sysUpTime.0 = 355920;
sysContact.0 = " ";
sysName.0 = "sysname";
sysLocation.0 = " ";
sysServices.0 = 0;
```

```

sysORLastChange.0 = 135;
sysORID.1 = { snmpBasicCompliance };
sysORID.2 = { rs232Compliance };
sysORDescr.1 = "";
sysORDescr.2 = "";
sysORUpTime.1 = 355925;
sysORUpTime.2 = 355925;
ifNumber.0 = 3;
ifIndex.300 = 300;
ifIndex.302 = 302;
ifIndex.350 = 350;
ifDescr.300 = "Intra-machine interface";
ifDescr.302 = "Ethernet Interface";
ifDescr.350 = "RS232 Interface";
ifType.300 = softwareLoopback;
ifType.302 = ethernetCsmacd;
ifType.350 = rs232;
ifMtu.300 = 0;
ifMtu.302 = 1500;
ifMtu.350 = 0;
ifSpeed.300 = 0;
ifSpeed.302 = 10000000;
ifSpeed.350 = 19171;
...

```

## 6.6.7 snmp row display Command

**Command:** `snmp row display`

**Syntax:** `snmp row display {IP_address | local} row_name index`

**Description:** Displays a row. Use this command to obtain information to use with other commands. Type the command, the first few letters of the attribute, and press **Tab** to view a list of attributes that can be set. Type an attribute from the list to view its row data. See [Example 6-19](#).

### Example 6-19 snmp row display Command

```

ash:hostname:ONS15216 EDFA2> snmp row display local cerent15216Edfa
cerent15216EdfaCfgGroup
cerent15216EdfaPumpCfgEntry
cerent15216EdfaAlarmControl
cerent15216EdfaStatusGroup
cerent15216EdfaPumpStatusEntry
cerent15216EdfaAlarmEntry
cerent15216EdfaOpGroup
ash:hostname:ONS15216 EDFA2> snmp row display local cerent15216EdfaCfgGroup

CLASS CERENT-MIB.cerent15216EdfaCfgGroup ::=
{
 cerent15216EdfaCfgSaved = true;
 cerent15216EdfaLpoutSetpoint = 1000;
 cerent15216EdfaLpoutDeviation = 200;
 cerent15216EdfaLpoutHysteresis = 100;
 cerent15216EdfaLOSThreshold = -2400;
 cerent15216EdfaLOSHysteresis = 100;
 cerent15216EdfaCtmpMin = 5;
 cerent15216EdfaCtmpMinHysteresis = 1;
 cerent15216EdfaCtmpMax = 65;
 cerent15216EdfaCtmpMaxHysteresis = 1;
}

```

## 6.6.8 snmp row get Command

**Command:** `snmp row get`

**Syntax:** `snmp row get {IP_address | local} row_name index`

**Description:** Accesses a row. Use this command to obtain information to use with other commands. See [Example 6-20](#).

### Example 6-20 snmp row get Command

```
ash:hostname:ONS15216 EDFA2> snmp row get local cerent15216EdfaCfgGroup

CfgSa Lpo Lpo Lpo LOST LOS C C Ct C
true 1000 200 100 -2400 100 5 1 65 1
```

## 6.6.9 snmp row set Command

**Command:** `snmp row set`

**Syntax:** `snmp row set {IP_address | local} row_name index`

**Description:** Sets data within a row. Use the `snmp row display` command first to view the contents of data within a row. See [Example 6-21](#).

### Example 6-21 snmp row set Command

```
ash:hostname:ONS15216 EDFA2> snmp row set local cerent15216EdfaAlarmEntry 1

cerent15216EdfaAlarmEnableStatus disabled
```

## 6.6.10 snmp session version get Command

**Command:** `snmp session version get`

**Syntax:** `snmp session version get {IP_address | local}`

**Description:** Displays the SNMP version for the session. See [Example 6-22](#).

### Example 6-22 snmp session version get Command

```
ash:hostname:ONS15216 EDFA2> snmp session version get local

host 172.22.82.19
version v1
```

## 6.6.11 snmp subtree display Command

**Command:** `snmp subtree display`

**Syntax:** `snmp subtree display {IP_address | local} subtree`

**Description:** Displays the attributes below a node in a SNMP tree. See [Example 6-23](#).

**Example 6-23 snmp subtree display Command**

```

ash:hostname:ONS15216 EDFA2> snmp subtree display local cerent

BEGIN-HOST "testhost" 0.0.0.0 "private"

CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaCommunityEntry ::=
{
 cerent15216EdfaCommIndex = 1;
 cerent15216EdfaCommName = "public";
 cerent15216EdfaCommViewIndex = 1;
 cerent15216EdfaCommPrivileges = 247;
 cerent15216EdfaCommSrcIPAddr = 0.0.0.0;
 cerent15216EdfaCommNetMask = 255.255.255.255;
 cerent15216EdfaCommStatus = active;
};
CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaCommunityEntry ::=
{
 cerent15216EdfaCommIndex = 2;
 cerent15216EdfaCommName = "private";
 cerent15216EdfaCommViewIndex = 1;
 cerent15216EdfaCommPrivileges = 255;
 cerent15216EdfaCommSrcIPAddr = 0.0.0.0;
 cerent15216EdfaCommNetMask = 255.255.255.255;
 cerent15216EdfaCommStatus = active;
...

```

## 6.6.12 snmp subtree get Command

**Command:** snmp subtree get**Syntax:** snmp subtree get {*IP\_address* | local} *subtree***Description:** Accesses a subtree. See [Example 6-24](#).**Example 6-24 snmp subtree get Command**

```

ash:hostname:ONS15216 EDFA2> snmp subtree get local sysDescr

index
 sysORIndex 1
attributes
 sysORID snmpBasicCompliance
 sysORDescr " "
 sysORUpTime 391985

index
 sysORIndex 2
attributes
 sysORID rs232Compliance
 sysORDescr " "
 sysORUpTime 391990

 3

index
 ifIndex 300
attributes
 ifDescr "Intra-machine interface"
 ifType softwareLoopback
...

```

## 6.6.13 snmp subtree list Command

**Command:** `snmp subtree list`

**Syntax:** `snmp subtree list {IP_address | local}`

**Description:** Lists the attributes below a node in a SNMP tree. See [Example 6-25](#).

### Example 6-25 snmp subtree list Command

```
ash:hostname:ONS15216 EDFA2> snmp subtree list local

Root
ccitt
zeroDotZero
iso
org
dod
internet
directory
mgmt
mib-2
system
sysDescr
sysObjectID
sysUpTime
sysContact
sysName
sysLocation
sysServices
sysORLastChange
sysORTable
...

ash:hostname:ONS15216 EDFA2> snmp subtree list local internet

sysDescr.0 = "hostname v3.0.0 ONS15216 EDFA2 v2.1.0, Serial No DIT0533000P, MAC
Addr 00059a383d10";
sysObjectID.0 = { cerent15216EdfaNode };
sysUpTime.0 = 35913255;
sysContact.0 = "";
sysName.0 = "sysname";
sysLocation.0 = "";
sysServices.0 = 0;
sysORLastChange.0 = 120;
sysORID.1 = { snmpBasicCompliance };
...
```

## 6.6.14 snmp table display Command

**Command:** `snmp table display`

**Syntax:** `snmp table display {IP_address | local}`

**Description:** Displays table data for the ONS 15216 EDFA2. [Example 6-26](#) displays the command entered without a table. After typing the command without a table and pressing the **Tab** key, a list of tables appears. Type the command with a table name to display the table and its data. Data displayed using this command are per rows. Attributes are grouped together in rows. See [Example 6-26](#).

**Example 6-26 snmp table display Command**

```
ash:hostname:ONS15216 EDFA2> snmp table display local
```

```

system
sysOREntry
interfaces
ifEntry
atEntry
ip
ipAddrEntry
ipRouteEntry
ipNetToMediaEntry
ipForward
ipForwardEntry
ipCidrRouteEntry
icmp
tcp
tcpConnEntry
udp
udpEntry
egp

```

```
...
```

```
ash:hostname:ONS15216 EDFA2> snmp table display local system
```

```

CLASS SNMPv2-MIB.system ::=
{
 sysDescr = "hostname v3.0.0 ONS15216 EDFA2 v2.1.0, Serial No DIT0533000P, MA
C Addr 00059a383d10";
 sysObjectID = { cerent15216EdfaNode };
 sysUpTime = 35942955;
 sysContact = "";
 sysName = "sysname";
 sysLocation = "";
 sysServices = 0;
 sysORLastChange = 120;
};

```

## 6.6.15 snmp table get Command

**Command:** `snmp table get`

**Syntax:** `snmp table get {IP_address | local} table`

**Description:** Accesses table data. See [Example 6-27](#).

**Example 6-27 snmp table get Command**

```
ash:hostname:ONS15216 EDFA2> snmp table get local system
```

```

attributes
sysDescr "hostname, Hardware Rev A1, ONS15216 EDFA2,
v2.1.0, Serial No DIT0533000P, MAC Addr 00059a383d10"
sysObjectID cerent15216EdfaNode
sysUpTime 1330310
sysContact "username"
sysName "sysname"
sysLocation "Lab"
sysServices 0
sysORLastChange 125

```

## 6.6.16 snmp table list Command

**Command:** `snmp table list`

**Syntax:** `snmp table list {IP_address | local} table`

**Description:** Lists all the data within a table. [Example 6-28](#) below displays the command for the UDP (User Datagram Protocol) table. This command displays data by attribute.

### *Example 6-28 snmp table list Command*

```
ash:hostname:ONS15216 EDFA2> snmp table list local udp

udpInDatagrams.0 = 11341;
udpNoPorts.0 = 135;
udpInErrors.0 = 1983;
udpOutDatagrams.0 = 9233;
udpLocalAddress.0.0.0.0.7 = 0.0.0.0;
udpLocalAddress.172.22.82.19.161 = 172.22.82.19;
udpLocalPort.0.0.0.0.7 = 7;
udpLocalPort.172.22.82.19.161 = 161;
```

## 6.6.17 snmp tree attribute list Command

**Command:** `snmp tree attribute list`

**Syntax:** `snmp tree attribute list`

**Description:** Lists all the attributes implemented by the SNMP agent. See [Example 6-29](#).

### *Example 6-29 snmp tree attribute list Command*

```
ash:hostname:ONS15216 EDFA2> snmp tree attribute list

sysDescr
sysObjectID
sysUpTime
sysContact
sysName
sysLocation
sysServices
sysORLastChange
sysORIndex
sysORID
sysORDescr
sysORUpTime
ifNumber
ifIndex
ifDescr
ifType
ifMtu
ifSpeed
ifPhysAddress
ifAdminStatus
ifOperStatus
...
```



## 6.7 User Commands

The following commands are useful in setting up and maintaining user accounts for the ONS 15216 EDFA2:

- [user entry create Command, page 6-23](#)
- [user entry edit Command, page 6-23](#)
- [user entry delete Command, page 6-24](#)
- [user file display and user name display Commands, page 6-24](#)
- [user inactivity modify and user inactivity display Commands, page 6-25](#)
- [user passwd set Command, page 6-25](#)
- [user active list Command, page 6-26](#)
- [user active message send Command, page 6-26](#)

### 6.7.1 user entry create Command

**Command:** `user entry create`

**Syntax:** `user entry create name user_mode`

**Description:** Creates a new user. The parameters required to create a new user are user name, access level, and password.

The `user_mode` (access privilege level) is set by entering either `read`, `read_write`, or `read_write_admin`. See [Table 6-1 on page 6-1](#) for the command privileges of each user level. The password must be an ASCII string of up to 10 characters, where at least 2 are non-alphabetic characters with at least one special character. Legal and special characters are as defined in Telcordia GR-831-CORE. See [Example 6-30](#).

**Example 6-30 user entry create Command**

```
ash:hostname:ONS15216 EDFA2> user entry create jdoe read_write
New Password =

Confirm New Password =

```

### 6.7.2 user entry edit Command

**Command:** `user entry edit`

**Syntax:** `user entry edit username`

**Description:** Edit a user's parameters (name, password, and access level). This command uses the optional parameters shown at the beginning of [Example 6-31](#). The `-user_mode` parameter changes the access level (`read`, `read_write`, or `read_write_admin`). If the password is not to be changed, hit the **Enter** key when the new password is requested and confirmed, as shown in [Example 6-32](#).

**Example 6-31 user entry edit Command (Change Password)**

```
ash:hostname:ONS15216 EDFA2> user entry edit
Options
 -new_user_name (string[0..10]) new name of user
 -user_mode (string[0..16]) mode of user
Parameters
 user_name (string[0..10]) name of user

ash:hostname:ONS15216 EDFA2> user entry edit jsmith
New Password =

Confirm New Password =

```

**Example 6-32 user entry edit Command (Change Access Level)**

```
ash:hostname:ONS15216 EDFA2> user entry edit jsmith -user_mode read_write
New Password =

Confirm New Password =
```

## 6.7.3 user entry delete Command

**Command:** user entry delete

**Syntax:** user entry delete *username*

**Description:** Delete users. See [Example 6-33](#).

**Example 6-33 user entry delete Command**

```
ash:hostname:ONS15216 EDFA2> user entry delete jdoe
```

## 6.7.4 user file display and user name display Commands

**Command:** user file display or user name display

**Syntax:** user file display or user name display

**Description:** Type the **user file display** command to display a list of all the users and user information. Type the **user name display** command to display the name of the current user.

The access privilege level is set by entering either read, read\_write, or read\_write\_admin. See [Table 6-1 on page 6-1](#) for the command privileges of each user level. Inactivity is the length of time of user inactivity before the user is automatically logged off. See [Example 6-34](#).

**Example 6-34 user file display Command**

```
ash:hostname:ONS15216 EDFA2> user file display

User Mode Inactivity
CISCO15 read_write_admin 15
janedoe read_write 30
jdoe read_write 30
johndoe read 60
```

## 6.7.5 user inactivity modify and user inactivity display Commands

**Command:** `user inactivity modify` or `user inactivity display`

**Syntax:** `user inactivity modify levelvalue` or `user inactivity display`

**Description:** Inactivity is the length of time of user inactivity before the user is automatically logged off. Type the `user inactivity modify` command to change the inactivity values. Type the `user inactivity display` command to display the current inactivity values.

The default inactivity values for the read, read\_write, and read\_write\_admin user access levels are 60, 30, and 15 minutes, respectively. Possible values are 0 to 99 (in minutes). A value of 0 means no timeout. See [Example 6-35](#) and [Example 6-36](#).

### Example 6-35 user inactivity modify Command

```
ash:hostname:ONS15216 EDFA2> user inactivity modify read 75
```

### Example 6-36 user inactivity display Command

```
ash:hostname:ONS15216 EDFA2> user inactivity display
```

| Mode             | Inactivity |
|------------------|------------|
| read_write_admin | 15         |
| read_write       | 30         |
| read             | 75         |

## 6.7.6 user passwd set Command

To restrict access to the ONS 15216 EDFA2, use the `user passwd set` command to change the default user password. [Example 6-37](#) displays the `user passwd set` syntax for a current user. [Example 6-38](#) displays the `user passwd set username` command for changing another user's password.

The password must be an ASCII string of up to 10 characters, where at least 2 are non-alphabetic characters with at least one special character. Legal and special characters are as defined in Telcordia GR-831-CORE. With the exception of the read\_write\_admin level user, the user can only modify their own password.

### Example 6-37 Changing Current User's Password

```
ash:hostname:ONS15216 EDFA2> user passwd set
Password =

New Password =

Confirm New Password =

```

### Example 6-38 Changing Another User's Password

```
ash:hostname:ONS15216 EDFA2> user passwd set jdoe
Password =

New Password =

Confirm New Password =

```

**Note**

The default user name for the administrator level is CISCO15 with no default password. To start a session for this user name, press **Enter**.

## 6.7.7 user active list Command

**Command:** user active list

**Syntax:** user active list

**Description:** Displays a list of the active users. See [Example 6-39](#).

### *Example 6-39 user active list Command*

```
ash:hostname:ONS15216 EDFA2> user active list
```

```
Users
CISCO15
```

## 6.7.8 user active message send Command

**Command:** user active message send

**Syntax:** user active message send ["message"]

**Description:** Sends a message to all current users on the system. See [Example 6-40](#).

### *Example 6-40 user active message send Command*

```
ash:hostname:ONS15216 EDFA2> user active message send
```

```
Parameters
message (string[0..32]) message to send
```

```
ash:hostname:ONS15216 EDFA2> user active message send "hello world"
```

```
*** Broadcast Message:
*** hello world
```

# 6.8 Manufacturing Information Access Commands

## 6.8.1 snmp table display local entPhysicalEntry Command

**Command:** snmp table display local entPhysicalEntry

**Syntax:** snmp table display local entPhysicalEntry

**Description:** Displays the trap destination database. See [Example 6-41](#).

### *Example 6-41 snmp table display local entPhysicalEntry Command*

```
ash:hostname:ONS15216 EDFA2> snmp table display local entPhysicalEntry
```

```

CLASS ENTITY-MIB.entPhysicalEntry ::=
{
 entPhysicalIndex = 1;
 entPhysicalDescr = "ONS15216 EDFA2";
 entPhysicalVendorType = { cerent15216EdfaChassis };
 entPhysicalContainedIn = 0;
 entPhysicalClass = chassis;
 entPhysicalParentRelPos = -1;
 entPhysicalName = "hostname";
 entPhysicalHardwareRev = "v3.0.0";
 entPhysicalFirmwareRev = "v1.2.0";
 entPhysicalSoftwareRev = "v1.3.0";
 entPhysicalSerialNum = "DIT0533000P";
 entPhysicalMfgName = "Cisco";
 entPhysicalModelName = "ONS216EDFA";
 entPhysicalAlias = "";
 entPhysicalAssetID = "";
 entPhysicalIsFRU = true;
};

```

## 6.8.2 snmp table display local cerent15216EdfaCommTrapEntry Command

**Command:** `snmp table display local cerent15216EdfaCommTrapEntry`

**Syntax:** `snmp table display local cerent15216EdfaCommTrapEntry`

**Description:** Displays information about autonomous messages (SNMP traps) going to destination manager's location (IP address).

### *Example 6-42 snmp table display local cerent15216EdfaCommTrapEntry Command*

```
ash:hostname:ONS15216 EDFA2> snmp table display local cerent15216EdfaCommTrapEntry
```

```

CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaCommTrapEntry ::=
{
 cerent15216EdfaCommTrapIndex = 1;
 cerent15216EdfaCommTrapCommunity = "private";
 cerent15216EdfaCommTrapDestIPAddress = 172.22.87.50;
 cerent15216EdfaCommTrapDestUDPPort = 162;
 cerent15216EdfaCommTrapViewIndex = 1;
 cerent15216EdfaCommTrapVersion = v2;
 cerent15216EdfaCommTrapStatus = active;
};

CLASS CERENT-15216-EDFA-MIB.cerent15216EdfaCommTrapEntry ::=
{
 cerent15216EdfaCommTrapIndex = 2;
 cerent15216EdfaCommTrapCommunity = "private";
 cerent15216EdfaCommTrapDestIPAddress = 172.22.87.254;
 cerent15216EdfaCommTrapDestUDPPort = 162;
 cerent15216EdfaCommTrapViewIndex = 1;
 cerent15216EdfaCommTrapVersion = v2;
 cerent15216EdfaCommTrapStatus = active;
};

```

## 6.9 Manufacturer Mode

A **manufacturer mode enable** command is available. It raises the root access level to the fifth and highest manufacturer level to allow undocumented commands that are used only for manufacturing purposes.



**Warning**

---

**Customers are strongly cautioned not to use this mode.**

---

## 6.10 Restore Commands

### 6.10.1 manufacturer restore defaults passwords Command

**Command:** `manufacturer restore defaults passwords`

**Syntax:** `manufacturer restore defaults passwords`

**Description:** Restores the manufacturing factory default passwords to the ONS 15216 EDFA2.



**Note**

---

If the password for the CISCO15 user is lost and there are not other users with read\_write\_admin access level in the system, the password for CISCO15 can be reset by following the procedure in [“Recover Default Password”](#) section on page 4-12.

---

### 6.10.2 manufacturer restore defaults all Command

**Command:** `manufacturer restore defaults all`

**Syntax:** `manufacturer restore defaults all`

**Description:** Restores the manufacturing factory settings to the ONS 15216 EDFA2.



## FTP Command Line

---

This chapter discusses the Cisco ONS 15216 EDFA2 FTP command line and explains how to get and send image and configuration files between an FTP server and the ONS 15216 EDFA2.

### 7.1 Logging into the FTP Command Line

To start an FTP session, use the following command:

```
ash:hostname:ONS15216 EDFA2>network host ftp server ip address
```

To log off, type **quit** at the FTP command line. This command disconnects the user from the remote server and exits the FTP shell.

### 7.2 FTP Commands

Typing the help command in FTP command line mode displays a list of all FTP commands. See [Example 7-1](#).

#### **Example 7-1 FTP Help Command**

```
ftp> help
```

```
Available commands (optional parameters are in []):
```

```
cd dirChange remote directory to dir.
cdupChange remote directory to parent.
closeClose ftp connection and quit ftp shell.
get remote_fileGet remote_file from remote server and save as local_file.
lls List local files.
login [username>Login to remote server as username (prompted for password).
ls [expr]Detailed listing of remote files matching expr.
nls [expr]Name only listing of remote files matching expr.
open ip_addressOpen a connection to server at ip_address and port.
put local_fileSend local_file to remote server and save as remote_file.
pwd Show current remote directory.
quitLose ftp connection and quit ftp shell.
type tSet type to t, either I image/binary or A ascii.
```







## Provisioning in the TL1 Shell

---

This chapter discusses the provisioning procedures for the Cisco ONS 15216 EDFA2 using TL1 commands in the TL1 shell. See [Chapter 4, “Provisioning in the ASH Shell”](#) for provisioning information using command-line SNMP and proprietary commands in the ASH shell.

The provisioning procedure for the ONS 15216 EDFA2 in the TL1 shell is as follows:

1. [Log In via EIA/TIA-232 Port Using HyperTerminal, page 8-1](#)
2. [Set IP Address, page 8-3](#)
3. [Log In via LAN Port Using Telnet \(Optional\), page 8-3](#)
4. [Set Date and Time, page 8-4](#)
5. [Set Power Bus Mode \(Simplex or Duplex\), page 8-4](#)
6. [Verify Amplifier Operational Status, page 8-4](#)
7. [Set Gain, page 8-5](#)
8. [Set Alarm Thresholds, page 8-5](#)
9. [Set Password, page 8-10](#)
10. [Add Users, page 8-10](#)
11. [Log Off, page 8-11](#)

The following sections describe these steps in detail.

### 8.1 Log In via EIA/TIA-232 Port Using HyperTerminal

Logging in through the EIA/TIA-232 port is required to set the ONS 15216 EDFA2 IP address before there can be access via the LAN port (see [“Log In via LAN Port Using Telnet \(Optional\)”](#) section on [page 8-3](#)).

- 
- Step 1** Connect to the EIA/TIA-232 port on the ONS 15216 EDFA2. See [“LAN Connection Procedure”](#) section on [page 3-14](#) for line connection and HyperTerminal setup instructions.
- Step 2** Open HyperTerminal. (HyperTerminal can be found in the Microsoft Windows Accessories menu.)
- Step 3** If you see the login window shown in [Example 8-1](#), skip to [Step 4](#).

If the ONS 15216 EDFA2 has been set to ASH shell, this step may be required to proceed in TL1 shell. When in ASH shell, the screen opens to a multi-line login screen beginning with -- LOGIN--- and with the cursor positioned in the Username line. To change to the TL1 shell, log in using the procedure in “[Log In via EIA/TIA-232 Port Using HyperTerminal](#)” section on page 4-1, and then enter the following command at the ASH hostname prompt:

```
ash:hostname:ONS15216 EDFA2> shell type modify t11
```

Then enter the following command at the ASH hostname prompt:

```
ash:hostname:ONS15216 EDFA2> processor reset
```

The ONS 15216 EDFA2 should log you off and then bring up the TL1 shell login prompt.

- Step 4** Check that the ONS 15216 EDFA2 login prompt appears as shown in [Example 8-1](#).

**Example 8-1 TL1 Shell Login Prompt**

```
Welcome to ONS15216 EDFA2 Console (v2.1.1.0)
```

```
sidtidname:ONS15216 EDFA2>
```

- Step 5** Log in using the **ACT-USER** command (see “[ACT-USER](#)” section on page 9-9) with the following syntax:

```
ACT-USER: [<tid>]:<uid>:<ctag>::<pid>;
```

The tid is the same as the *sidtidname* in the command line prompt (use is optional), uid is the user name, ctag is an arbitrary number to associate with the command, and pid is the user password. The default uid is CISCO15 with no pid (nothing between the last colon and semicolon).



**Note**

For security reasons, it is recommended to change the password from its default value. See [Set Password](#), page 8-10.

- Step 6** After the semicolon is entered, the ONS 15216 EDFA2 displays the login response, as shown in [Example 8-2](#).

**Example 8-2 TL1 Shell Login Response**

```
sidtidname:ONS15216 EDFA2> ACT-USER::CISCO15:100::;
```

```
sidtidname 2002-07-11 10:09:19
M 100 COMPLD
/* ACT-USER */
;
sidtidname:ONS15216 EDFA2>
```

An EIA/TIA-232 link to the ONS 15216 EDFA2 is established. The user can now provision the ONS 15216 EDFA2.

## 8.2 Set IP Address

Before connecting the ONS 15216 EDFA2 to a LAN, it is mandatory to set the ONS 15216 EDFA2 IP address through a local serial communication interface using the EIA/TIA-232 port on the front of the module.

- Step 1** If you do not know the ONS 15216 EDFA2's IP address, subnet mask, gateway address, or sid/tid name, contact your network administrator.
- Step 2** At the command prompt, enter the **ED-NE-GEN** command (see “[ED-NE-GEN](#)” section on page 9-18) according to the following syntax:

```
ED-NE-GEN: [<tid>]::<ctag>:: [NAME=<name>], [IPADDR=<ipaddr>], [IPMASK=<ipmask>], [DEFRTR=<def
rtr>];
```

The *name* is the sid/tid name in the command line prompt. See [Example 8-3](#).

### Example 8-3 Setting IP Address, Subnet Mask, Gateway Address, and sid/tid Name Using TL1

```
sidtidname:ONS15216 EDFA2> ED-NE-GEN:::101:::NAME=Amp01,IPADDR=192.167.3.4,IPMASK=255.255.
255.0,DEFRTR=192.167.3.20;
```

- Step 3** The system must be rebooted to make the IP address active. Use the **INIT-SYS** command (see “[INIT-SYS](#)” section on page 9-23), as follows:

```
sidtidname:ONS15216 EDFA2> INIT-SYS::ALL:102::1;
```

## 8.3 Log In via LAN Port Using Telnet (Optional)

Provisioning of the ONS 15216 EDFA2 can be accomplished entirely through the EIA/TIA-232 port, so this step is optional. After an IP address is assigned, it may be easier to provision the ONS 15216 EDFA2 using Telnet. A Telnet client is needed for TL1 commands over IP. After connecting the ONS 15216 EDFA2 to the network through its RJ-45 LAN port (see “[LAN Interface \(Ethernet\)](#)” section on page 3-14), the user can configure the module to accept TL1 commands via Telnet using the following procedure:

- Step 1** Connect to the LAN port on the ONS 15216 EDFA2. See “[LAN Connection Procedure](#)” section on page 3-14.
- Step 2** Click the Microsoft Windows **Start** menu and select **Run**.
- Step 3** In the text field, type the following:

```
telnet <ONS 15216 EDFA2 IP address> 3083
```

Specifying port 3083 ensures login through the TL1 shell. If no port is specified, the ONS 15216 EDFA2 responds in the shell that the ONS 15216 EDFA2 is set to. (TL1 is the default shell.)

- Step 4** Log in again using [Step 4](#) through [Step 6](#) in “[Log In via EIA/TIA-232 Port Using HyperTerminal](#)” section on page 8-1.

You are now connected to the ONS 15216 EDFA2 via Telnet.

## 8.4 Set Date and Time

Use the **ED-DAT** command (see “[ED-DAT](#)” section on page 9-16) to set the date and time. A time zone cannot be set using TL1. The time setting is restricted to universal coordinated time (UTC) according to the following syntax:

```
ED-DAT: [<tid>]::<ctag>::<utcdat>, <utctime>;
```

The utcdat and utctime entries must follow this format: yyyy-mm-dd,hh-mm-ss. See [Example 8-4](#).

### Example 8-4 Setting the Date and Time Using TL1

```
sidtidname:ONS15216 EDFA2> ED-DAT:::120::2002-04-18,02-24-55;
```

## 8.5 Set Power Bus Mode (Simplex or Duplex)

The ONS 15216 EDFA2 allows users to set a simplex (one power source–Bus A) or duplex (redundant power source–Bus A and Bus B) Power Bus mode. The default mode is duplex. Use the **ED-ENV** command (see “[ED-ENV](#)” section on page 9-17) to set the desired power bus mode according to the following syntax:

```
ED-ENV: [<tid>]:<aid>:<ctag>:::PWRBUSMODE=<pwrbusmode>;
```

The pwrbusmode value can be SIMPLEX or DUPLEX. See [Example 8-5](#).

### Example 8-5 Setting the Power Bus Mode Using TL1

```
sidtidname:ONS15216 EDFA2> ED-ENV:::ALL:121:::PWRBUSMODE=SIMPLEX;
```

## 8.6 Verify Amplifier Operational Status

To ensure that the amplifier is working correctly on the optical level, you must verify the amplifier operational status. Use the **RTRV-DWDM** command (see “[RTRV-DWDM](#)” section on page 9-45) to verify amplifier operational status according to the following syntax:

```
RTRV-DWDM: [<tid>]:<aid>:<ctag>;
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>:INPWRMICROW=<inputpoweruw>,INPWRDBM=<inputpowerdbm>,OUTPWRMILLIW=<outputpowermw>,
 OUTPWRDBM=<outputpowerdbm>,PUMP1CTRLMODE=<pump1ctrlmode>,PUMP1CTRLVALUE=<pump1ctrlvalue>,
 PUMP2CTRLMODE=<pump2ctrlmode>,PUMP2CTRLVALUE=<pump1ctrlvalue>,OVERALLGAIN=<gain>,PREATT=<preatt>"
```

[Example 8-6](#) displays sample output of this command.

### Example 8-6 Verifying the Amplifier Operations Status Using TL1

```
sidtidname:ONS15216 EDFA2> RTRV-DWDM:::ALL:122;

 sidtidname 2002-07-11 10:20:05
M 122 COMPLD
 "1:INPWRMICROW=264,INPWRDBM=-1578,OUTPWRMILLIW=172,OUTPWRDBM=237,PUMP1CTRLMODE=GAINTEMP,
 PUMP1CTRLVALUE=169,PUMP2CTRLMODE=GAINTEMP,PUMP2CTRLVALUE=169,OVERALLGAIN=169,PREATT=60"
;
```

The input power should be consistent with the input power measured during the optical connection procedure. See the “[Optical Connection Procedure](#)” section on page 3-3 for more information. The output power value should be 22 dB greater than the input, assuming that the default gain setting is 22 dB.

**Note**

An input power higher than -5 dBm will return a Gain Out of Range alarm that can be cleared by correctly setting the gain value. For more information, refer to [Table 2-2](#).

## 8.7 Set Gain

To ensure that the ONS 15216 EDFA2 output signal is received by the transceiver in the network element, it is important that the gain is set correctly.

The desired output power per channel is dependent on the number of channels traversed in the amplifier. The user sets the gain of the amplifier depending on the input power level, the network application, and the required receiver specifications necessary for error-free operation. Gain range is provided in [Table 3-1](#).

To set the amplifier gain, use the **ED-DWDM** command (see “[ED-DWDM](#)” section on page 9-16), according to the following syntax:

```
ED-DWDM: [<tid>]:<aid>:<ctag>:::[GAIN=<gain>];
```

The *gain* is the desired gain multiplied by ten. For example, if the desired gain is 20 dB, the *gain* value would be set to 200.

### Example 8-7 Setting the Gain Using TL1

```
sidtidname:ONS15216 EDFA2> ED-DWDM: :ALL: 123 : :GAIN=200;
```

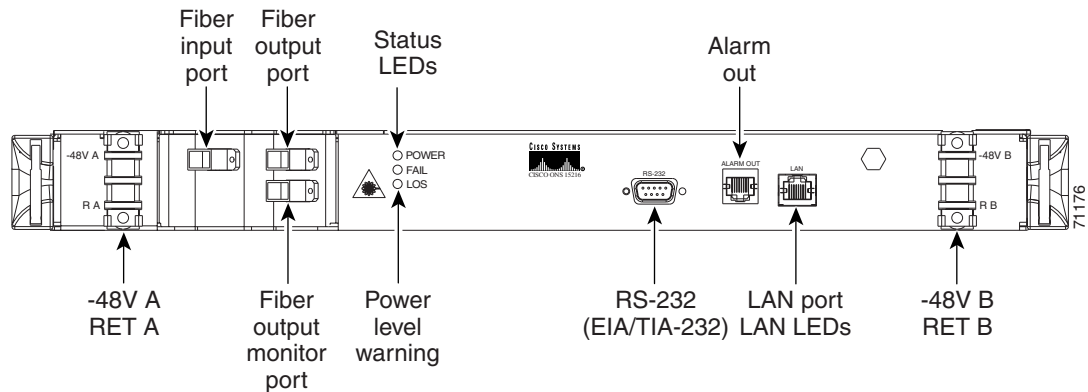
**Note**

Prior to changing or implementing gain changes, consult with the Cisco TAC to ensure proper network operation.

## 8.8 Set Alarm Thresholds

Alarm thresholds are set so that the network operator can be notified when valid alarms occur via the RJ-45 ALARM OUT and RJ-45 LAN ports on the front panel of the ONS 15216 EDFA2. (See [Figure 8-1](#).)

Figure 8-1 ONS 15216 EDFA2 Front Panel



Alarms are reported for the following conditions:

- Degradation of electrical power source
- Pump laser overheating or excessive pump current
- Loss or degradation of optical input (signal)
- Loss of output power or gain out of range
- Case temperature out of range

Alarms can be connected to a NOC NMS via a network element miscellaneous discrete input and/or office alarm panel/system.

For a full description of alarm threshold command attributes, refer to [Chapter 9, “TL1 Commands.”](#)

To display the alarm thresholds, use the **RTRV-TH-DWDM** and **RTRV-TH-EQPT** commands (see “[RTRV-TH-DWDM](#)” section on page 9-51 and “[RTRV-TH-EQPT](#)” section on page 9-53) according to the following syntax:

```
RTRV-TH-DWDM: [<tid>]:<aid>:<ctag>:: [<thresholdtype>] [,] [,];
<sid> <date> <time>
M <ctag> COMPLD
" <aid>, DWDM:<thresholdtype>, , , <thresholdvalue>"

RTRV-TH-EQPT: [<tid>]:<aid>:<ctag>:: [<thresholdtype>] [,] [,];
<sid> <date> <time>
M <ctag> COMPLD
" <aid>:<thresholdtype>, , , <thresholdvalue>"
```

[Example 8-8](#) shows sample command outputs.

#### Example 8-8 Displaying the Alarm Thresholds Using TL1

```
sidtidname:ONS15216 EDFA2> RTRV-TH-DWDM::ALL:124::;

sidtidname 2002-07-11 11:15:19
M 124 COMPLD
"1,DWDM:LOSTH,,, -3000"
"1,DWDM:LOSHYST,,, 5"
"1,DWDM:LPOUTDEV,,, 1000"
"1,DWDM:LPOUTHYST,,, 5"
"1,DWDM:LPOUTSETPT,,, 0"
;
sidtidname:ONS15216 EDFA2> RTRV-TH-EQPT::ALL:125::;
```

```

sidtidname 2002-07-11 11:16:10
M 125 COMPLD
"EQPT:MAXCTMP,,,65"
"EQPT:MAXCTMPHYST,,,5"
"EQPT:MINCTMP,,,10"
"EQPT:MINCTMPHYST,,,2"
;

```

To set the alarm thresholds, use the **SET-TH-DWDM** and **SET-TH-EQPT** commands (see “**SET-TH-DWDM**” section on page 9-57 and “**SET-TH-EQPT**” section on page 9-58). Alarm threshold attributes are described in Table 8-1.

**Table 8-1 Alarm Threshold Attribute Definitions**

| Attribute | Variable Definition                    | Syntax                   | Maximum Access | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|----------------------------------------|--------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LOSTH     | Loss of signal (input power) threshold | Integer (-3100 to -1500) | Read-write     | Notifies operations personnel if the optical input signal of the ONS 15216 EDFA2 drops below a level that impacts proper operation of optical network. Set this attribute at a value that is appropriate for the intended application so that the alarm condition is meaningful. Consult with the Cisco TAC to determine the threshold value for your application. As a guideline, Cisco recommends setting the threshold value at 3 dBm below the current input power level of the amplifier. Valid entries are between -3100 and -1500 dBm times 100. For example, if the total input power of the amplifier is -24 dBm and the loss of input power threshold required is -27 dBm, the loss of input power alarm threshold is -2700. |

Table 8-1 Alarm Threshold Attribute Definitions (continued)

| Attribute  | Variable Definition                     | Syntax              | Maximum Access | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------|-----------------------------------------|---------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LOSHYST    | Loss of signal (input power) hysteresis | Integer (0 to 1000) | Read-write     | Used to set the amount the input signal must increase above the LOS Threshold level before the alarm is cleared. This attribute, in conjunction with the loss of input signal alarm threshold, enables efficient clearing of alarms. Set this attribute at a value that is appropriate for the application so that the alarm condition will clear when input is stable. Consult with the Cisco TAC to determine the correct value for your application. As a guideline, Cisco recommends setting the value 1 dBm above the LOS Threshold value. With this setting, the module will clear the alarm if it detects a signal level of 1 dBm above the current LOS Threshold value. Valid entries are between 0 and 1000 and are in dBm times 100. For example, if the hysteresis required is 1 dBm, the power alarm hysteresis is 100. |
| LPOUTDEV   | Loss of output power deviation          | Integer (0 to 1000) | Read-write     | Can be disregarded when operating amplifier in factory default Constant Gain Temperature Compensated mode. Deviation object is only valid when amplifier is used in Constant Output Power and Constant Pump Power modes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| LPOUTHYST  | Loss of output power hysteresis         | Integer (0 to 1000) | Read-write     | Can be disregarded when operating amplifier in factory default Constant Gain Temperature Compensated mode. Hysteresis object is only valid when amplifier is used in Constant Output Power and Constant Pump Power modes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| LPOUTSETPT | Loss of output power setpoint           | Integer (0 to 1000) | Read-only      | Can be disregarded when operating amplifier in factory default Constant Gain Temperature Compensated mode. Setpoint object is only valid when amplifier is used in Constant Output Power and Constant Pump Power modes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |



Table 8-1 Alarm Threshold Attribute Definitions (continued)

| Attribute   | Variable Definition                 | Syntax                 | Maximum Access | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-------------------------------------|------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MAXCTMP     | Maximum case temperature            | Integer<br>(20 to 70)  | Read-write     | Notifies operations personnel if the case temperature of the ONS 15216 EDFA2 is at a level that may impact proper operation of the optical network. Set the maximum case temperature at a value that is appropriate for intended application and within product specifications. Consult with the Cisco TAC to determine the threshold value for your application. As a guideline, Cisco recommends that minimum case temperature value be set at 50°C. Valid entries are between 20 and 70°C.                                                                                                                                                         |
| MAXCTMPHYST | Maximum case temperature hysteresis | Integer<br>(0 to 10)   | Read-write     | Used to set the amount the case temperature of module must drop below the maximum case temperature alarm level before the alarm is cleared. This attribute, in conjunction with the case temperature minimum, enables efficient clearing of alarms. Set the hysteresis at a value that is appropriate for the application. If an alarm occurs, the case temperature must return to 1°C below the set value to clear the alarm. Consult with the Cisco TAC to determine the value for your application. As a guideline, Cisco recommends setting the value at 1°C. Valid entries are between 0 and 10°C. Setting this value to 0 disables this option. |
| MINCTMP     | Minimum case temperature            | Integer<br>(-10 to 10) | Read-write     | Notifies operations personnel if the case temperature of the ONS 15216 EDFA2 drops below a level that impacts proper operation of the optical network. The minimum case temperature should be set at a value that is appropriate for the intended application and within product specifications. Users should consult with the Cisco TAC to determine the threshold value for their application. As a guideline, Cisco recommends that minimum case temperature be set at 1°C. Valid entries are between -10 and 10°C.                                                                                                                                |

**Table 8-1 Alarm Threshold Attribute Definitions (continued)**

| Attribute   | Variable Definition                 | Syntax            | Maximum Access | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|-------------------------------------|-------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MINCTMPHYST | Minimum case temperature hysteresis | Integer (0 to 10) | Read-write     | Used to set the amount the case temperature of the module must rise above the minimum case temperature alarm level before the alarm is cleared. This attribute, in conjunction with the case temperature minimum, enables efficient clearing of alarms. Set the hysteresis at a value that is appropriate for the application so that the alarm condition will clear when the input is stable. The user should consult with the Cisco TAC in order to determine the value for their application. As a guideline, Cisco recommends that the hysteresis value be set at 1°C. Valid entries are between 0 and 10°C. |

## 8.9 Set Password

To restrict access to the ONS 15216 EDFA2, use the **ED-PID** command (see “[ED-PID](#)” section on [page 9-19](#)) to change the default user password according to the following syntax:

```
ED-PID:[<tid>]:<uid>:<ctag>::<oldpid>,<newpid>;
```

Note that the password must be a string of up to 10 characters, where at least 2 are non-alphabetic characters and at least 1 is a special character. See [Example 8-9](#).

### Example 8-9 Changing Current User's Password Using TL1

```
sidtidname:ONS15216 EDFA2> ED-PID::CISCO15:130::OLDPW,NEWPW;
```



#### Note

The default user name for the administrator level is CISCO15 with no default password.

## 8.10 Add Users

Use the **ENT-USER-SECU** command (see “[ED-USER-SECU](#)” section on [page 9-20](#)) to add new users to the ONS 15216 EDFA2 according to the following syntax:

```
ENT-USER-SECU:[<tid>]:<uid>:<ctag>::<pid>,,<al>[:];
```

The uid is the user name, pid is the password, and al is the access level (R, RW, RWA). Passwords must be an ASCII string of up to 10 characters, where at least 2 are non-alphabetic characters with at least one special character. Special characters are +, #, and % (defined in Telcordia GR-831-CORE). The access levels are presented in “[Summary of Security Permissions for TL1 Commands](#)” section on [page 9-6](#). See [Example 8-10](#).

**Example 8-10 Adding a New User Using TL1**

```
sidtidname:ONS15216 EDFA2> ENT-USER-SECU::jsmith:140::jpasswd,,RW;
```

## 8.11 Log Off

At the end of a session, the user must log off of the ONS 15216 EDFA2. To log off, use the **CANC-USER** command (see “[CANC-USER](#)” section on page 9-12) according to the following syntax:

```
CANC-USER:[<tid>]:<uid>:<ctag>;
```

See [Example 8-11](#).

**Example 8-11 Logging Off Using TL1**

```
sidtidname:ONS15216 EDFA2> CANC-USER::CISCO15:150;
```





# TL1 Commands

---

## 9.1 Introduction

This chapter provides the details of TL1 commands supported by the Cisco ONS 15216 EDFA2. This chapter also maps various TL1 command parameters to their SNMP counterpart attributes in the ONS 15216 EDFA2 MIB (CERENT-15216-EDFA-MIB.mib).

## 9.2 Connection to the ONS 15216 EDFA2

The ONS 15216 EDFA2 system supports up to ten simultaneous Telnet connections via the Ethernet LAN port. TL1 sessions are available on TCP/IP port 3082 for raw TL1 and/or port 3083 for TL1 over Telnet. When connected, the **ACT-USER** command activates a session. (See [“Log In via LAN Port Using Telnet \(Optional\)” section on page 8-3.](#))

## 9.3 Explanation of Command Parameters

TL1 messages are grouped into autonomous and non-autonomous types. Autonomous messages are generated as a result of activity on the network elements such as alarms, thresholds, alerts and status information. No request is required in order to receive autonomous messages. Non-autonomous messages consist of a request command and a response from the ONS 15216 EDFA2. Autonomous messages and non-autonomous commands use a common set of parameters. Some of the most common parameters are defined in the following sections.

### 9.3.1 Source Identifier (*sid*) and Target Identifier (*tid*)

The source identifier (*sid*) or target identifier (*tid*) parameters uniquely identify an ONS 15216 EDFA2. For the ONS 15216 EDFA2, *sid* and *tid* are the same. The *sid/tid* name is used only by the TL1 shell in the ONS 15216 EDFA2. While the TL1 shell uses the *sid/tid* name in its command line prompt, the ASH shell uses the host name.

### 9.3.2 Command Code Modifier (*ccm*)

The command code modifier (*ccm*) identifies the object of the action being applied by the verb of the TL1 command. Some command code modifiers for the ONS 15216 EDFA2 are described in [Table 9-1](#).

**Table 9-1 Command Code Modifiers**

| ccm    | Description                                |
|--------|--------------------------------------------|
| DWDM   | Optical parameters.                        |
| ENV    | Environmental (power bus) parameters.      |
| EQPT   | General parameters of the ONS 15216 EDFA2. |
| INV    | Inventory parameters.                      |
| NE-GEN | IP communications parameters.              |

### 9.3.3 Access Identifier (aid)

The access identifier (*aid*) parameter uniquely identifies an object within the ONS 15216 EDFA2. For the ONS 15216 EDFA2, there are four specific *aids* (1, PWR-A, PWR-B, EQPT) and the ALL *aid*, as described in [Table 9-2](#). All autonomous messages identify their specific *aid* in the message. For all command inputs that require an *aid* as a mandatory parameter, the ALL *aid* is accepted as well as any relevant specific *aids*. If the ALL *aid* is used in a command, the response contains the appropriate specific *aid*. For the commands **RTRV-ALM-ENV** and **RTRV-COND-ENV**, inputting a specific *aid* filters the response to information relevant to that *aid*.

**Table 9-2 Access Identifiers**

| aid   | Description                                                                                     |
|-------|-------------------------------------------------------------------------------------------------|
| 1     | Directly affecting the optical signal.                                                          |
| PWR-A | Affecting Power Bus A (or both A and B).                                                        |
| PWR-B | Affecting Power Bus B.                                                                          |
| EQPT  | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus). |
| ALL   | Any or all of the preceding (command input only).                                               |

### 9.3.4 Correlation Tag (ctag)

The correlation tag (*ctag*) is a unique tag associated with a command. If the user specifies a *ctag* while entering a command, the response of that command from the ONS 15216 EDFA2 TL1 agent carries the same *ctag* value. The *ctag* consists of no more than six alphanumeric characters.

## 9.4 Notation

The commands described in this document use the symbols shown in [Table 9-3](#) to describe the command format. These symbols are derived from the Telcordia Network Maintenance: Network Element and Transport Surveillance Messages Manual (Generic Requirements, GR-833-CORE).

**Table 9-3 TL1 Notation Symbols**

| Symbol | Meaning                | Description                                                                                                                                                                                                                                                                                                                                                |
|--------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [ ]    | Optional expression    | Square brackets indicate the parameters are optional. An optional parameter means that if a user inputs an empty field for an optional parameter, then a default value (or a default action) will be substituted automatically in the transmitted input field. The default value, or null value, is defined in the parameter descriptions of the messages. |
| < >    | Variable expression    | Angle brackets enclose one or more variable items in the command line, e.g., <date>, <time>, <aid>, etc.<br><br>Italics are used to note variables in paragraph text, e.g., <i>date</i> , <i>time</i> , <i>aid</i> , etc.                                                                                                                                  |
| +      | More than one time     | Plus signs indicate that preceding symbol or group of symbols (enclosed in parentheses) may occur one or more times.                                                                                                                                                                                                                                       |
| text   | Indent of three spaces | An indented line indicates an entry of three spaces in the command line.                                                                                                                                                                                                                                                                                   |

## 9.5 Summary of Autonomous Alarms and Messages

[Table 9-4](#) summarizes the ONS 15216 EDFA2 autonomous alarms. [Table 9-5](#) summarizes the ONS 15216 EDFA2 autonomous events. [Table 9-6](#) summarizes the ONS 15216 EDFA2 file transfer events. [Table 9-7](#) summarizes the ONS 15216 EDFA2 clear alarms.

**Table 9-4 TL1 Autonomous Alarms**

| TL1 Autonomous Message | Condition Type (condtype) | Condition Descriptor (conddescr) | Access Identifier (aid) | Notification Code (ntfncnde) | Service Effect (srveff) |
|------------------------|---------------------------|----------------------------------|-------------------------|------------------------------|-------------------------|
| REPT ALM DWDM          | LOS                       | Loss Of Signal (input power)     | 1                       | MJ                           | SA                      |
| REPT ALM DWDM          | GAIN                      | Gain Out Of Range                | 1                       | MJ                           | SA                      |
| REPT ALM DWDM          | LPOUT                     | Loss Of Output Power             | 1                       | MJ                           | SA                      |
| REPT ALM ENV           | PWRBUSA                   | Power Bus A (voltage) Alarm      | PWR-A                   | MJ                           | –                       |
| REPT ALM ENV           | PWRBUSB                   | Power Bus B (voltage) Alarm      | PWR-B                   | MJ                           | –                       |
| REPT ALM EQPT          | CTMP                      | Case Temperature Out Of Range    | EQPT                    | MN                           | NSA                     |
| REPT ALM EQPT          | LCRNT1                    | Excessive Pump1 Current          | EQPT                    | MN                           | NSA                     |
| REPT ALM EQPT          | LCRNT2                    | Excessive Pump2 Current          | EQPT                    | MN                           | NSA                     |
| REPT ALM EQPT          | LTMP1                     | Excessive Pump1 Temperature      | EQPT                    | MN                           | NSA                     |
| REPT ALM EQPT          | LTMP2                     | Excessive Pump2 Temperature      | EQPT                    | MN                           | NSA                     |

**Note**

The messages for Loss of Signal (LOS), Gain Out of Range (GAIN), and Loss of Output Power (LPOUT) are prioritized (in the order just listed) so that only one message can be delivered at one time. For example, if the ONS 15216 EDFA2 detects both a loss of input signal and a loss of output power at the same time, it will deliver only the Loss of Signal (LOS) message to the user. This prioritized filtering of alarms does not occur with the SNMP delivery of alarms of the ONS 15216 EDFA2.

**Table 9-5 TL1 Autonomous Events**

| TL1 Autonomous Message | Condition Type (condtype) | Condition Descriptor (conddescr)                | Access Identifier (aid) | Condition Effect (condeff) |
|------------------------|---------------------------|-------------------------------------------------|-------------------------|----------------------------|
| REPT EVT DWDM          | CTRLMODE1                 | Pump1 Control Mode Changed                      | 1                       | TC                         |
| REPT EVT DWDM          | CTRLMODE2                 | Pump2 Control Mode Changed                      | 1                       | TC                         |
| REPT EVT DWDM          | GAINCHGD                  | Overall Gain Changed                            | 1                       | TC                         |
| REPT EVT DWDM          | LOSHYSTCHGD               | LOS (loss of signal) Hysteresis Changed         | 1                       | TC                         |
| REPT EVT DWDM          | LOSTHCHGD                 | LOS (loss of signal) Threshold Changed          | 1                       | TC                         |
| REPT EVT DWDM          | LPOUTCHGD                 | Loss Of Output Power Setpoint Changed           | 1                       | TC                         |
| REPT EVT DWDM          | LPOUTDEVCHGD              | Lpout (loss of output power) Deviation Changed  | 1                       | TC                         |
| REPT EVT DWDM          | LPOUTHYSTCHGD             | Lpout (loss of output power) Hysteresis Changed | 1                       | TC                         |
| REPT EVT DWDM          | PREATTCHGD                | Pre-attenuation Changed                         | 1                       | TC                         |
| REPT EVT ENV           | PWRBUSMAXCHGD             | Power Bus Max (voltage) Changed                 | PWR-A                   | TC                         |
| REPT EVT ENV           | PWRBUSMINCHGD             | Power Bus Min (voltage) Changed                 | PWR-A                   | TC                         |
| REPT EVT ENV           | PWRBUSMODE                | Power Bus Mode Changed                          | PWR-B                   | TC                         |
| REPT EVT EQPT          | MAXCTMPCHGD               | Max Case Temperature Changed                    | EQPT                    | TC                         |
| REPT EVT EQPT          | MAXCTMPHYSTCHGD           | Max Ctmp (case temperature) Hysteresis Changed  | EQPT                    | TC                         |
| REPT EVT EQPT          | MINCTMPCHGD               | Min Case Temperature Changed                    | EQPT                    | TC                         |
| REPT EVT EQPT          | MINCTMPHYSTCHGD           | Min Ctmp (case temperature) Hysteresis Changed  | EQPT                    | TC                         |
| REPT EVT EQPT          | CUTOVERRESET              | (Software) Reset After Cutover                  | EQPT                    | TC                         |



**Table 9-5 TL1 Autonomous Events (continued)**

| TL1 Autonomous Message | Condition Type (condtype) | Condition Descriptor (conddescr) | Access Identifier (aid) | Condition Effect (condeff) |
|------------------------|---------------------------|----------------------------------|-------------------------|----------------------------|
| REPT EVT EQPT          | SOFTWARELOAD              | (New) Software Load              | EQPT                    | TC                         |
| REPT EVT EQPT          | SOFTWARERESET             | Software Reset                   | EQPT                    | TC                         |

**Table 9-6 TL1 Autonomous File Transfer Events**

| Autonomous TL1 Message | File Transfer Status (fxfr_status) | File Transfer Result (fxfr_rslt) | Access Identifier (aid) |
|------------------------|------------------------------------|----------------------------------|-------------------------|
| REPT EVT FXFR          | START                              |                                  | EQPT                    |
| REPT EVT FXFR          | COMPLD                             | SUCCESS                          | EQPT                    |
|                        |                                    | FAILURE                          | EQPT                    |

**Table 9-7 TL1 Autonomous Clear Alarms**

| TL1 Autonomous Message | Condition Type (condtype) | Condition Descriptor (conddescr) | Access Identifier (aid) | Notification Code (ntfcncde) | Service Effect (srveff) |
|------------------------|---------------------------|----------------------------------|-------------------------|------------------------------|-------------------------|
| REPT ALM DWDM          | LOS                       | Loss Of Signal (input power)     | 1                       | CL                           | SA                      |
| REPT ALM DWDM          | GAIN                      | Gain Out Of Range                | 1                       | CL                           | SA                      |
| REPT ALM DWDM          | LPOUT                     | Loss Of Output Power             | 1                       | CL                           | SA                      |
| REPT ALM ENV           | PWRBUSA                   | Power Bus A (voltage) Alarm      | PWR-A                   | CL                           | –                       |
| REPT ALM ENV           | PWRBUSB                   | Power Bus B (voltage) Alarm      | PWR-B                   | CL                           | –                       |
| REPT ALM EQPT          | CTMP                      | Case Temperature Out Of Range    | EQPT                    | CL                           | NSA                     |
| REPT ALM EQPT          | LCRNT1                    | Excessive Pump1 Current          | EQPT                    | CL                           | NSA                     |
| REPT ALM EQPT          | LCRNT2                    | Excessive Pump2 Current          | EQPT                    | CL                           | NSA                     |
| REPT ALM EQPT          | LTMP1                     | Excessive Pump1 Temperature      | EQPT                    | CL                           | NSA                     |
| REPT ALM EQPT          | LTMP2                     | Excessive Pump2 Temperature      | EQPT                    | CL                           | NSA                     |

## 9.6 Summary of Security Permissions for TL1 Commands

Table 9-8 summarizes the security permissions (access levels) for each available TL1 command and autonomous message.

**Table 9-8 TL1 Commands and Messages Security Permissions (Access Levels)**

| Command or Message | Description                                                                          | User Access Levels |                  |                   |
|--------------------|--------------------------------------------------------------------------------------|--------------------|------------------|-------------------|
|                    |                                                                                      | R                  | RW               | RWA               |
| ACT-USER           | Activates user session (login).<br>See <a href="#">ACT-USER</a> , page 9-9.          | Yes                | Yes              | Yes               |
| ALW-MSG-ALL        | Allows automatic (REPT) messages.<br>See <a href="#">ALW-MSG-ALL</a> , page 9-9.     | Yes                | Yes              | Yes               |
| APPLY              | Applies software cutover.<br>See <a href="#">APPLY</a> , page 9-11.                  | No                 | No               | Yes               |
| CANC-USER          | Cancels user session (logoff).<br>See <a href="#">CANC-USER</a> , page 9-12.         | Yes                | Yes              | Yes               |
| COPY-RFILE         | Copies remote or local file to FFS.<br>See <a href="#">COPY-RFILE</a> , page 9-12.   | No                 | Yes              | Yes               |
| CPY-MEM            | Copies log file from RAM to FFS.<br>See <a href="#">CPY-MEM</a> , page 9-13.         | No                 | Yes              | Yes               |
| DLT-RFILE          | Deletes file from FFS.<br>See <a href="#">DLT-RFILE</a> , page 9-15.                 | No                 | Yes              | Yes               |
| DLT-USER-SECU      | Deletes a user.<br>See <a href="#">DLT-USER-SECU</a> , page 9-15.                    | No                 | No               | Yes               |
| ED-DAT             | Edits date and time.<br>See <a href="#">ED-DAT</a> , page 9-16.                      | No                 | Yes              | Yes               |
| ED-DWDM            | Edits optical parameters.<br>See <a href="#">ED-DWDM</a> , page 9-16.                | No                 | Yes              | Yes               |
| ED-ENV             | Edits power bus mode.<br>See <a href="#">ED-ENV</a> , page 9-17.                     | No                 | Yes              | Yes               |
| ED-NE-GEN          | Edits general IP-related parameters.<br>See <a href="#">ED-NE-GEN</a> , page 9-18.   | No                 | Yes              | Yes               |
| ED-PID             | Edits user password.<br>See <a href="#">ED-PID</a> , page 9-19.                      | Yes<br>(own UID)   | Yes<br>(own UID) | Yes<br>(all UIDs) |
| ED-USER-SECU       | Edits a user's name and parameters.<br>See <a href="#">ED-USER-SECU</a> , page 9-20. | No                 | No               | Yes               |
| ENT-USER-SECU      | Enters new user.<br>See <a href="#">ENT-USER-SECU</a> , page 9-20.                   | No                 | No               | Yes               |
| INH-MSG-ALL        | Inhibits some automatic messages.<br>See <a href="#">INH-MSG-ALL</a> , page 9-21.    | Yes                | Yes              | Yes               |
| INIT-SYS           | Initializes (reboots) system.<br>See <a href="#">INIT-SYS</a> , page 9-23.           | No                 | Yes              | Yes               |

**Table 9-8 TL1 Commands and Messages Security Permissions (Access Levels) (continued)**

| Command or Message                             | Description                                                                                                          | User Access Levels |     |     |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------|-----|-----|
|                                                |                                                                                                                      | R                  | RW  | RWA |
| REPT ALM DWDM                                  | Message that reports optical alarm activation/clearing.<br>See <a href="#">REPT ALM DWDM</a> , page 9-24.            | Yes                | Yes | Yes |
| REPT ALM ENV                                   | Message that reports power-bus alarm activation/clearing.<br>See <a href="#">REPT ALM ENV</a> , page 9-25.           | Yes                | Yes | Yes |
| REPT ALM EQPT                                  | Message that reports general alarm activation/clearing.<br>See <a href="#">REPT ALM EQPT</a> , page 9-27.            | Yes                | Yes | Yes |
| REPT EVT DWDM<br>REPT EVT ENV<br>REPT EVT EQPT | Message that reports event logging.<br>See <a href="#">REPT EVT DWDM / REPT EVT ENV / REPT EVT EQPT</a> , page 9-28. | Yes                | Yes | Yes |
| REPT EVT FXFR                                  | Message that reports FTP file transfer.<br>See <a href="#">REPT EVT FXFR</a> , page 9-30.                            | Yes                | Yes | Yes |
| RTRV-ALM-ALL                                   | Retrieves all current alarms.<br>See <a href="#">RTRV-ALM-ALL</a> , page 9-31.                                       | Yes                | Yes | Yes |
| RTRV-ALM-DWDM                                  | Retrieves current optical alarms.<br>See <a href="#">RTRV-ALM-DWDM</a> , page 9-33.                                  | Yes                | Yes | Yes |
| RTRV-ALM-ENV                                   | Retrieves current power-bus alarms.<br>See <a href="#">RTRV-ALM-ENV</a> , page 9-34.                                 | Yes                | Yes | Yes |
| RTRV-ALM-EQPT                                  | Retrieves current general alarms.<br>See <a href="#">RTRV-ALM-EQPT</a> , page 9-36.                                  | Yes                | Yes | Yes |
| RTRV-AO                                        | Retrieves most-recent autonomous output (REPT) messages.<br>See <a href="#">RTRV-AO</a> , page 9-37.                 | Yes                | Yes | Yes |
| RTRV-COND-ALL                                  | Retrieves condition (state) of all current alarms.<br>See <a href="#">RTRV-COND-ALL</a> , page 9-38.                 | Yes                | Yes | Yes |
| RTRV-COND-DWDM                                 | Retrieves condition (state) of current optical alarms.<br>See <a href="#">RTRV-COND-DWDM</a> , page 9-40.            | Yes                | Yes | Yes |
| RTRV-COND-ENV                                  | Retrieves condition (state) of current power-bus alarms.<br>See <a href="#">RTRV-COND-ENV</a> , page 9-41.           | Yes                | Yes | Yes |
| RTRV-COND-EQPT                                 | Retrieves condition (state) of current general alarms.<br>See <a href="#">RTRV-COND-EQPT</a> , page 9-42.            | Yes                | Yes | Yes |
| RTRV-DFLT-SECU                                 | Retrieves timeouts for access levels.<br>See <a href="#">RTRV-DFLT-SECU</a> , page 9-44.                             | No                 | No  | Yes |
| RTRV-DWDM                                      | Retrieves optical parameters.<br>See <a href="#">RTRV-DWDM</a> , page 9-45.                                          | Yes                | Yes | Yes |

**Table 9-8 TL1 Commands and Messages Security Permissions (Access Levels) (continued)**

| Command or Message | Description                                                                                              | User Access Levels |                  |                   |
|--------------------|----------------------------------------------------------------------------------------------------------|--------------------|------------------|-------------------|
|                    |                                                                                                          | R                  | RW               | RWA               |
| RTRV-ENV           | Retrieves power bus mode.<br>See <a href="#">RTRV-ENV</a> , page 9-46.                                   | Yes                | Yes              | Yes               |
| RTRV-HDR           | Retrieves header (pings NE).<br>See <a href="#">RTRV-HDR</a> , page 9-47.                                | Yes                | Yes              | Yes               |
| RTRV-INV           | Retrieves inventory parameters.<br>See <a href="#">RTRV-INV</a> , page 9-48.                             | Yes                | Yes              | Yes               |
| RTRV-NE-GEN        | Retrieves general IP-related parameters.<br>See <a href="#">RTRV-NE-GEN</a> , page 9-49.                 | Yes                | Yes              | Yes               |
| RTRV-RFILE         | Retrieves files on FFS.<br>See <a href="#">RTRV-RFILE</a> , page 9-50.                                   | Yes                | Yes              | Yes               |
| RTRV-TH-DWDM       | Retrieves optical thresholds.<br>See <a href="#">RTRV-TH-DWDM</a> , page 9-51.                           | Yes                | Yes              | Yes               |
| RTRV-TH-ENV        | Retrieves power-bus thresholds.<br>See <a href="#">RTRV-TH-ENV</a> , page 9-52.                          | Yes                | Yes              | Yes               |
| RTRV-TH-EQPT       | Retrieves general thresholds.<br>See <a href="#">RTRV-TH-EQPT</a> , page 9-53.                           | Yes                | Yes              | Yes               |
| RTRV-TOD           | Retrieves date and time.<br>See <a href="#">RTRV-TOD</a> , page 9-54.                                    | Yes                | Yes              | Yes               |
| RTRV-USER-SECU     | Retrieves access level of user(s).<br>See <a href="#">RTRV-USER-SECU</a> , page 9-55.                    | Yes<br>(own UID)   | Yes<br>(own UID) | Yes<br>(all UIDs) |
| SET-ATTR-SECUDFLT  | Sets timeout values for access levels.<br>See <a href="#">SET-ATTR-SECUDFLT</a> , page 9-56.             | No                 | No               | Yes               |
| SET-TH-DWDM        | Sets optical thresholds.<br>See <a href="#">SET-TH-DWDM</a> , page 9-57.                                 | No                 | Yes              | Yes               |
| SET-TH-ENV         | Sets power-bus thresholds.<br>See <a href="#">SET-TH-ENV</a> , page 9-57.                                | No                 | Yes              | Yes               |
| SET-TH-EQPT        | Sets general thresholds.<br>See <a href="#">SET-TH-EQPT</a> , page 9-58.                                 | No                 | Yes              | Yes               |
| STA-LOCL-RST       | Resets all parameters to manufacturer's default values.<br>See <a href="#">STA-LOCL-RST</a> , page 9-59. | No                 | No               | Yes               |

## 9.7 TL1 Commands and Autonomous Messages

### 9.7.1 ACT-USER

**Command:** ACT-USER

**Description:** Activates user session (login).

**Syntax:**

```
ACT-USER: [<tid>]:<uid>:<ctag>::<pid>;
```

**Example 9-1 ACT-USER Command**

```
Amp01:ONS15216 EDFA2> ACT-USER:Amp01:JOE:123::***;
```

**Table 9-9 ACT-USER Syntax Description**

| Parameter | Syntax | Description                                                                                                                                                                                                                                                    |
|-----------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uid       | string | The user's identifier (user name). Can be any combination of up to 10 alphanumeric characters.                                                                                                                                                                 |
| pid       | string | The user's private identifier (password). The password must be a string of up to 10 characters, where at least 2 are non-alphabetic characters and at least 1 is a special character. Special characters are +, #, %, etc. (defined in Telcordia GR-831-CORE). |

### 9.7.2 ALW-MSG-ALL

**Command:** ALW-MSG-ALL

**Description:** Permits or resumes the dispatch of automatic messages from the ONS 15216 EDFA2 that were inhibited by an **INH-MSG** call. All alarms in existence at the time that this command restores them are transmitted via REPT ALM and REPT EVT messages.

**Syntax:**

```
ALW-MSG-ALL: [<tid>]:<ctag>:: [<ntfcncde>], [<condtype>][,];
```

**Example 9-2 ALW-MSG-ALL Command**

```
Amp01:ONS15216 EDFA2> ALW-MSG-ALL:Amp01::123::MJ,LOS;
```

Table 9-10 ALW-MSG-ALL Syntax Description

| Parameter | Syntax    | Description                                                                                                                                                                                                                                                                                                                          |
|-----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ntfncode  |           | Notification code of the alarm or event that is to be allowed (maps to <code>cerent15216EdfaAlarmPriority</code> for active alarms). A null maps to none of the codes, i.e., with a null, all existing <i>ntfncode</i> inhibitions are kept unchanged. Possible values are:                                                          |
|           | MJ        | Major alarm.                                                                                                                                                                                                                                                                                                                         |
|           | MN        | Minor alarm.                                                                                                                                                                                                                                                                                                                         |
|           | NA        | No alarm.                                                                                                                                                                                                                                                                                                                            |
|           | CL        | Cleared alarm.                                                                                                                                                                                                                                                                                                                       |
| condtype  |           | Condition type of the alarm or event that is to be allowed. (Maps to <code>cerent15216EdfaLogEventID</code> .) ALL maps to all types. A null maps to none of the types, i.e., with a null, all existing <i>condtype</i> inhibitions are kept unchanged. Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | LOS       | “Loss of Signal” (input power) alarm ( <code>cerent15216EdfaAlarmLpin</code> ).                                                                                                                                                                                                                                                      |
|           | GAIN      | “Gain Out of Range” alarm ( <code>cerent15216EdfaAlarmGain</code> ).                                                                                                                                                                                                                                                                 |
|           | LPOUT     | “Loss of Output Power” alarm ( <code>cerent15216EdfaAlarmLpout</code> ).                                                                                                                                                                                                                                                             |
|           | CTMP      | “Case Temperature Out of Range” alarm ( <code>cerent15216EdfaAlarmCtmp</code> ).                                                                                                                                                                                                                                                     |
|           | LCRNT1    | “Excessive Pump1 Current” alarm ( <code>cerent15216EdfaAlarmLcrnt1</code> ).                                                                                                                                                                                                                                                         |
|           | LCRNT2    | “Excessive Pump2 Current” alarm ( <code>cerent15216EdfaAlarmLcrnt2</code> ).                                                                                                                                                                                                                                                         |
|           | LTMP1     | “Excessive Pump1 Temperature” alarm ( <code>cerent15216EdfaAlarmLtmp1</code> ).                                                                                                                                                                                                                                                      |
|           | LTMP2     | “Excessive Pump2 Temperature” alarm ( <code>cerent15216EdfaAlarmLtmp2</code> ).                                                                                                                                                                                                                                                      |
|           | POWERBUSA | “Power Bus A (voltage) Alarm” ( <code>cerent15216EdfaAlarmPowerBusA</code> ).                                                                                                                                                                                                                                                        |
|           | POWERBUSB | “Power Bus B (voltage) Alarm” ( <code>cerent15216EdfaAlarmPowerBusB</code> ).                                                                                                                                                                                                                                                        |
|           | CTRLMODE1 | “Pump1 Control Mode Changed” ( <code>cerent15216EdfaControlMode</code> for <code>cerent15216EdfaPumpCfgPumpNumber=1</code> ).                                                                                                                                                                                                        |
|           | CTRLMODE2 | “Pump2 Control Mode Changed” ( <code>cerent15216EdfaControlMode</code> for <code>cerent15216EdfaPumpCfgPumpNumber=2</code> ).                                                                                                                                                                                                        |

Table 9-10 ALW-MSG-ALL Syntax Description (continued)

| Parameter | Syntax          | Description                                                                             |
|-----------|-----------------|-----------------------------------------------------------------------------------------|
|           | GAINCHGD        | “Overall Gain Changed”<br>(cerent15216EdfaConstGainOverallGain).                        |
|           | LOSHYSTCHGD     | “LOS (loss of signal) Hysteresis Changed”<br>(cerent15216EdfaLOSHysteresis).            |
|           | LOSTHCHGD       | “LOS (loss of signal) Threshold Changed”<br>(cerent15216EdfaLOSThreshold).              |
|           | LPOUTCHGD       | “Loss of Output Power Setpoint Changed”<br>(cerent15216EdfaLpoutSetpoint).              |
|           | LPOUTDEVCHGD    | “Lpout (loss of output power) Deviation Changed”<br>(cerent15216EdfaLpoutDeviation).    |
|           | LPOUTHYSTCHGD   | “Lpout (loss of output power) Hysteresis Changed”<br>(cerent15216EdfaLpoutHysteresis).  |
|           | PREATTCHGD      | “Pre-attenuation Changed”<br>(cerent15216EdfaVariableGainPreAttenuation).               |
|           | PWRBUSMAXCHGD   | “Power Bus Max (voltage) Changed”<br>(cerent15216EdfaPowerBusDCVoltageMax).             |
|           | PWRBUSMINCHGD   | “Power Bus Min (voltage) Changed”<br>(cerent15216EdfaPowerBusDCVoltageMin).             |
|           | PWRBUSMODE      | “Power Bus Mode Changed”<br>(cerent15216EdfaPowerBusMode).                              |
|           | MAXCTMPCHGD     | “Max Case Temperature Changed”<br>(cerent15216EdfaCtmpMax).                             |
|           | MAXCTMPHYSTCHGD | “Max Ctmp (case temperature) Hysteresis Changed”<br>(cerent15216EdfaCtmpMaxHysteresis). |
|           | MINCTMPCHGD     | “Min Case Temperature Changed”<br>(cerent15216EdfaCtmpMin).                             |
|           | MINCTMPHYSTCHGD | “Min Ctmp (case temperature) Hysteresis Changed”<br>(cerent15216EdfaCtmpMinHysteresis). |
|           | CUTOVERRESET    | (Software) “Reset after Cutover”<br>(cerent15216EdfaOpCutover).                         |
|           | SOFTWARELOAD    | (New) “Software Load” (cerent15216EdfaOpLoad).                                          |
|           | SOFTWARERESET   | “Software Reset” (cerent15216EdfaOpReset).                                              |
|           | ALL             | All <i>condtype</i> preceding.                                                          |

## 9.7.3 APPLY

**Command:** APPLY

**Description:** Applies a software cutover in the memory. There are two boot file entries. This command exchanges boot file entries 1 and 2 so that when the system is restarted (by the **INIT-SYS** command), it boots with the image that was (before the execution of this command) at the second entry.

**Syntax:**

```
APPLY: [<tid>]::<ctag>;
```

**Example 9-3 APPLY Command**

```
Amp01:ONS15216 EDFA2> APPLY:Amp01::1234;
```

## 9.7.4 CANC-USER

**Command:** CANC-USER

**Description:** Cancels user session (logoff).

**Syntax:**

```
CANC-USER: [<tid>]:<uid>:<ctag>;
```

**Example 9-4 CANC-USER Command**

```
Amp01:ONS15216 EDFA2> CANC-USER:Amp01:JOE:100;
```

**Table 9-11 CANC-USER Syntax Description**

| Parameter | Syntax | Description                        |
|-----------|--------|------------------------------------|
| uid       | string | The user's identifier (user name). |

## 9.7.5 COPY-RFILE

**Command:** COPY-RFILE

**Description:** Copies a local or remote file to the persistent memory (flash file system) on the ONS 15216 EDFA2. Depending on the value specified for the TYPE parameter, this command can be used to download a remote software image file to the ONS 15216 EDFA2 as its second boot entry (to cutover-upgrade later using the **APPLY** command), to copy a remote or local file to the ONS 15216 EDFA2 flash file system, or to copy a file on the ONS 15216 EDFA2 flash file system to a remote or local file. There may be a delay while this command executes. See [REPT EVT FXFR, page 9-30](#) for information on the autonomous response messages.

**Syntax:**

```
COPY-RFILE: [<tid>]::<ctag>::TYPE=<type>, SRC=<src>, [DEST=<dest>], [OVERWRITE=<overwrite>;
```

**Example 9-5 COPY-RFILE Command and Response**

```
Amp01:ONS15216 EDFA2> COPY-RFILE:Amp01::1234::TYPE=SWDL, SRC="ftp://user1:passwd@192.168.85
.10:21/bin/15216EdfaSw_2.1.0", DEST="file://localhost/15216EdfaSw_2.1.0", OVERWRITE=YES;
Amp01 2002-04-30 11:34:05
M 100 COMPLD
/* COPY-RFILE */
;
Amp01 2002-04-30 11:34:05
A 7 REPT EVT FXFR
EQPT:15216EdfaSw_2.1.0, START, ,
;
```



```

Amp01 2002-04-30 11:35:24
A 8 REPT EVT FXFR
 EQPT:15216EdfaSw_2.1.0,COMPLD,SUCCESS,2013987
;

```

Table 9-12 COPY-FILE Syntax Description

| Parameter    | Syntax | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| type         |        | Specifies the type and direction of transfer. Possible values are:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|              | RFR    | Restore a file from remote server to the ONS 15216 EDFA2's flash file system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|              | RFBU   | Backup a file from the ONS 15216 EDFA2's flash file system to the remote server ( <i>overwrite</i> is always YES for this type).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              | SWDL   | Download a software image file to the ONS 15216 EDFA2's flash file system and update the second boot entry to point to this file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| src,<br>dest | string | <p><i>src</i> and <i>dest</i> must both be URLs. Both FTP and file URLs are supported.</p> <p>An FTP URL has the following format:</p> <p><b>ftp://[&lt;userid&gt;[:&lt;password&gt;]@]&lt;ftphost&gt;[:&lt;port&gt;]]/&lt;urlpath&gt;</b></p> <p>A file URL (referring to the local system) has the following format:</p> <p><b>file://localhost/&lt;urlpath&gt;</b></p> <p>where</p> <p>&lt;userid&gt; is the FTP user identifier</p> <p>&lt;password&gt; is the FTP password for the user</p> <p>&lt;ftphost&gt; is the IP address of the FTP server</p> <p>&lt;port&gt; is the port number to connect to</p> <p>&lt;urlpath&gt; is the path in the following format:</p> <p><b>&lt;cwd1&gt;/&lt;cwd2&gt;/.../&lt;cwdn&gt;/&lt;filename&gt;</b></p> <p>where &lt;cwd1&gt;...&lt;cwdn&gt; are directory levels and &lt;filename&gt; is the file name</p> |
| overwrite    |        | Possible values are:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|              | YES    | Overwrite existing file of the same name at the destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|              | NO     | Do not overwrite if file with same name exists at the destination. This is the default if <i>overwrite</i> is null.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## 9.7.6 CPY-MEM

**Command:** CPY-MEM

**Description:** Copies the log file in the non-persistent memory (RAM) or a specified file on the persistent memory (flash file system) to a file with a specified name on the persistent memory.

**Syntax:**

```
CPY-MEM:[<tid>]::<ctag>:: [<fromfile>], [<fromdev>], [<tofile>];
```

**Example 9-6 CPY-MEM Command and Response (Copy LOG File from RAM as aolog.txt on FFS)**

```
Amp01:ONS15216 EDFA2> CPY-MEM:Amp01::123::LOG, MEM, ;
Amp01 2002-07-16 09:49:01
M 123 COMPLD
/* CPY-MEM */
;
```

**Example 9-7 CPY-MEM Command and Response (Copy LOG File from RAM as aolog.txt on FFS using Null)**

```
Amp01:ONS15216 EDFA2> CPY-MEM:Amp01::123::, , , ;
Amp01 2002-07-16 09:46:01
M 123 COMPLD
/* CPY-MEM */
;
```

**Example 9-8 CPY-MEM Command and Response (Copy aolog.txt on FFS as logfile20020716.txt on FFS)**

```
Amp01:ONS15216 EDFA2> CPY-MEM:Amp01::123::aolog.txt, FFS, logfile20020716;
Amp01 2002-07-16 09:50:38
M 123 COMPLD
/* CPY-MEM */
;
```

**Table 9-13 CPY-MEM Syntax Description**

| Parameter | Syntax           | Description                                                                                                                                                                                           |
|-----------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| fromfile  |                  | Name of the source file. A null means LOG. Can be null only when <i>fromdev</i> is also null.                                                                                                         |
|           | LOG              | ONS 15216 EDFA2 system log file, only when <i>fromdev</i> is specified to be MEM or null.                                                                                                             |
|           | any other string | The name of the source file when <i>fromdev</i> is specified to be FFS. If <i>fromdev</i> is specified to be MEM or null, any string other than LOG is invalid.<br><br>File names are case sensitive. |

**Table 9-13 CPY-MEM Syntax Description (continued)**

| Parameter | Syntax | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| fromdev   |        | Device on which the source file exists. A null means MEM. Possible values are:                                                                                                                                                                                                                                                                                                                                                                                   |
|           | MEM    | ONS 15216 EDFA2 non-persistent memory (RAM).                                                                                                                                                                                                                                                                                                                                                                                                                     |
|           | FFS    | ONS 15216 EDFA2 persistent memory (flash file system).                                                                                                                                                                                                                                                                                                                                                                                                           |
| tofile    | string | The name string of the destination file. A null value is valid only when <i>fromfile</i> is LOG or null and <i>fromdev</i> is MEM or null. When null is valid, the system log file (LOG) is saved as aolog.txt.<br><br>File names are case sensitive.<br><br>If copying from RAM (MEM) and the destination file name already exists, the destination file is overwritten. If copying from FFS and the destination file name already exists, the execution fails. |

## 9.7.7 DLT-RFILE

**Command:** DLT-RFILE

**Description:** Deletes a file from the flash file system (FFS) of the ONS 15216 EDFA2.

**Syntax:**

```
DLT-RFILE: [<tid>] :: <ctag> :: FILE=<localfilename>;
```

**Example 9-9 DLT-RFILE Command**

```
Amp01:ONS15216 EDFA2> DLT-RFILE:Amp01::1234::FILE=snmp.cfg;
```

**Table 9-14 DLT-RFILE Syntax Description**

| Parameter     | Syntax | Description                                                                                                            |
|---------------|--------|------------------------------------------------------------------------------------------------------------------------|
| localfilename | string | Name of the file on the flash file system of the ONS 15216 EDFA2 that is to be deleted. File names are case sensitive. |

## 9.7.8 DLT-USER-SECU

**Command:** DLT-USER-SECU

**Description:** Deletes (removes) an existing user from the system.

**Syntax:**

```
DLT-USER-SECU: [<tid>] : <uid> : <ctag>;
```

**Example 9-10 DLT-USER-SECU Command**

```
Amp01:ONS15216 EDFA2> DLT-USER-SECU:Amp01:jsmith:123;
```

**Table 9-15 DLT-USER-SECU Syntax Description**

| Parameter | Syntax | Description                                                         |
|-----------|--------|---------------------------------------------------------------------|
| uid       | string | The user identifier (user name) of the existing user to be removed. |

## 9.7.9 ED-DAT

**Command:** ED-DAT

**Description:** Edits the date and/or time of the ONS 15216 EDFA2.

**Syntax:**

```
ED-DAT: [<tid>]::<ctag>::<utcdatetime>, <utctime>;
```

**Example 9-11 ED-DAT Command**

```
Amp01:ONS15216 EDFA2> ED-DAT:Amp01::123::2001-12-18,02-24-55;
```

**Table 9-16 ED-DAT Syntax Description**

| Parameter   | Syntax     | Description                                                                                                                                                                                                                                                 |
|-------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| utcdatetime | yyyy-mm-dd | Change date to this value in universal coordinated time (UTC), which is the same as Greenwich Mean Time (GMT) Modifies cerent15216EdfaRtcDateAndTimeGMTString. Can not be null if <i>utctime</i> is also null.                                              |
| utctime     | hh-mm-ss   | Change time to this value in universal coordinated time (UTC), which is the same as Greenwich Mean Time (GMT). (A time zone can not be set using TL1.) Modifies cerent15216EdfaRtcDateAndTimeGMTString. Can not be null if <i>utcdatetime</i> is also null. |

## 9.7.10 ED-DWDM

**Command:** ED-DWDM

**Description:** Configures the ONS 15216 EDFA2 optical control parameters.

**Syntax:**

```
ED-DWDM: [<tid>]:<aid>:<ctag>:::[PUMP1CTRLMODE=<pump1ctrlmode>], [PUMP1CTRLVALUE=<pump1ctrlvalue>], [PUMP2CTRLMODE=<pump2ctrlmode>], [PUMP2CTRLVALUE=<pump2ctrlvalue>], [OVERALLGAIN=<gain>], [PREATT=<preatt>];
```

**Example 9-12 ED-DWDM Command**

```
Amp01:ONS15216 EDFA2> ED-DWDM:Amp01:ALL:123::PUMP1CTRLMODE=GAINTEMP;
```

Table 9-17 ED-DWDM Syntax Description

| Parameter                         | Syntax    | Description                                                                                                                                                                                                                                                                                                              |
|-----------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| aid                               | 1<br>ALL  | 1 and ALL have same input effect.                                                                                                                                                                                                                                                                                        |
| pump1ctrlmode,<br>pump2ctrlmode   |           | Pump 1 or pump 2 control mode (maps to <code>cerent15216EdfaPumpCfgControlMode</code> for the corresponding pump). Generally, <code>pump1ctrlmode</code> and <code>pump2ctrlmode</code> must be the same value. One exception is OPWR which is not valid for pump 1 and can only be set for pump 2. Possible values are: |
|                                   | CRNT      | Constant Pump Current mode ( <code>cerent15216EdfaPumpCfgControlMode</code> set to <code>constCurrent</code> ). Must set pump 1 and pump 2 to this mode at the same time.                                                                                                                                                |
|                                   | PWR       | Constant Pump Power mode ( <code>cerent15216EdfaPumpCfgControlMode</code> set to <code>constPower</code> ). Must set Pump 1 and Pump 2 to this mode at the same time.                                                                                                                                                    |
|                                   | OPWR      | Constant Output Power mode ( <code>cerent15216EdfaPumpCfgControlMode</code> set to <code>constOutputPower</code> ). This is not a valid mode for pump 1. If pump 2 is set to OPWR, pump 1 gets automatically set to PWR with a value of 75 mW.                                                                           |
|                                   | GAINTEMP  | Constant Gain Temperature Compensated mode (manufacturer default) ( <code>cerent15216EdfaPumpCfgControlMode</code> set to <code>constGainTempComp</code> ). If one pump is set to GAINTEMP, the other pump automatically gets set to GAINTEMP also.                                                                      |
| pump1ctrlvalue,<br>pump2ctrlvalue |           | Pump 1 or pump 2 control value. This value's interpretation depends on the control mode of the corresponding pump. Command fails if control mode is GAINTEMP. Possible values are:                                                                                                                                       |
|                                   | 0 - 300   | Current value in mA when mode is CRNT (sets <code>cerent15216EdfaPumpCfgConstPumpCurrent</code> ). The default value is 0. Must set pump 1 and pump 2 at the same time.                                                                                                                                                  |
|                                   | 0 - 100   | Pump power in mW when mode is PWR (sets <code>cerent15216EdfaPumpCfgConstPumpPower</code> ). The default value is 0. Must set pump 1 and pump 2 at the same time.                                                                                                                                                        |
|                                   | 0 - 650   | Output power in units of 10 mW when mode is OPWR (sets <code>cerent15216EdfaPumpCfgConstOutPower</code> ). The default value is 0.                                                                                                                                                                                       |
| gain                              | 130 - 220 | Value of gain in units of 10 dB when mode is GAINTEMP (sets <code>cerent15216EdfaConstGainOverallGain</code> ).                                                                                                                                                                                                          |
| preatt                            | 10 - 100  | Gain pre-attenuation value in units of 10 dB when mode is other than GAINTEMP (sets <code>cerent15216EdfaVariableGainPreAttenuation</code> ).                                                                                                                                                                            |

## 9.7.11 ED-ENV

**Command:** ED-ENV

**Description:** Configures the ONS 15216 EDFA2 environmental (power bus) parameters.

**Syntax:**

```
ED-ENV: [<tid>]:<aid>:<ctag>:::PWRBUSMODE=<pwrbusmode>;
```

**Example 9-13 ED-ENV Command**

```
Amp01:ONS15216 EDFA2> ED-ENV:Amp01:ALL:123:::PWRBUSMODE=SIMPLEX;
```

**Table 9-18 ED-ENV Syntax Description**

| Parameter  | Syntax                | Description                                                                                                |
|------------|-----------------------|------------------------------------------------------------------------------------------------------------|
| aid        | PWR-A<br>PWR-B<br>ALL | PWR-A, PWR-B, and ALL have same input effect.                                                              |
| pwrbusmode |                       | Power bus mode. Possible values are:                                                                       |
|            | SIMPLEX               | Simplex mode. Requires power only to bus A. Sets cerent15216EdfaPowerBusMode to simplex.                   |
|            | DUPLEX                | Duplex mode (default). Requires power to both bus A and bus B. Sets cerent15216EdfaPowerBusMode to duplex. |

## 9.7.12 ED-NE-GEN

**Command:** ED-NE-GEN

**Description:** Edit general parameters of the ONS 15216 EDFA2. Edits ONS 15216 EDFA2's sid (source identifier)/tid (target identifier), IP address, IP mask, and IP address of the default router. The ONS 15216 EDFA2 needs to be manually rebooted for the changes to take effect. (Use the **INI-SYS** command to manually reboot after changing parameters.) Also edits the boot table content: to return to the TL1 shell from the ASH shell, use the ASH command **shell type modify tl1** (step 3. in “[Log In via EIA/TIA-232 Port Using HyperTerminal](#)” section on page 8-1).

**Syntax:**

```
ED-NE-GEN: [<tid>]:<ctag>:::[NAME=<name>], [IPADDR=<ipaddr>], [IPMASK=<ipmask>], [DEFRTR=<def
rtr>], [BOOTRECORDTYPE1=<bootrectype1>], [BOOTFILENAME1=<bootfilename1>], [BOOTIPADDR1=<booti
paddr1>], [BOOTRECORDTYPE2=<bootrectype2>], [BOOTFILENAME2=<bootfilename2>], [BOOTIPADDR2=<bo
otipaddr2>], [CLI=<cli>];
```

**Example 9-14 ED-NE-GEN Command**

```
Amp01:ONS15216 EDFA2> ED-NE-GEN:Amp01::123:::NAME=Amp01, IPADDR=192.167.3.4, IPMASK=255.255.
255.0, DEFRTR=192.167.3.20, BOOTRECORDTYPE2=TFTP, BOOTFILENAME2=15216EdfaSw_1.4.0, BOOTIPADDR2
=192.168.3.4, CLI=ASH;
```

**Table 9-19 ED-NE-GEN Syntax Description**

| Parameter | Syntax | Description                                                      |
|-----------|--------|------------------------------------------------------------------|
| name      | string | System's sid/tid name.                                           |
| ipaddr    | string | IP address of the system (cerent15216EdfaSromIpMgmtEnetAddress). |

**Table 9-19 ED-NE-GEN Syntax Description (continued)**

| Parameter     | Syntax | Description                                                                                                                                     |
|---------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| ipmask        | string | Subnet mask of the system (cerent15216EdfaSromIpMgmtEnetSubNetMask).                                                                            |
| defrtr        | string | IP address of the default router (cerent15216EdfaSromIpMgmtDefaultRouterAddress).                                                               |
| bootrectype1  |        | Boot record type (cerent15216EdfaBootType for first entry). Possible values are:                                                                |
|               | FLASH  | Boot from flash.                                                                                                                                |
|               | TFTP   | Boot through TFTP.                                                                                                                              |
| bootfilename1 | string | Boot file name (cerent15216EdfaBootFileName for first entry). File names are case sensitive.                                                    |
| bootipaddr1   | string | IP address to boot from if <i>bootrectype1</i> is set to TFTP (cerent15216EdfaBootIpAddress for first entry).                                   |
| bootrectype2  |        | Boot record type (cerent15216EdfaBootType for second entry). Possible values are:                                                               |
|               | FLASH  | Boot from flash.                                                                                                                                |
|               | TFTP   | Boot through TFTP.                                                                                                                              |
| bootfilename2 | string | Boot file name (cerent15216EdfaBootFileName for second entry). File names are case sensitive.                                                   |
| bootipaddr2   | string | IP address to boot from if <i>bootrectype2</i> is set to TFTP (cerent15216EdfaBootIpAddress for second entry).                                  |
| cli           |        | Default type of command line interface for all EIA/TIA-232 and default telnet port user sessions with the ONS 15216 EDFA2. Possible values are: |
|               | TL1    | TL1 shell interface (manufacturer default).                                                                                                     |
|               | ASH    | ASH shell interface – ONS 15216 EDFA2's native interface.                                                                                       |

## 9.7.13 ED-PID

**Command:** ED-PID

**Description:** Edits password.

**Syntax:**

```
ED-PID: [<tid>]:<uid>:<ctag>::<oldpid>, <newpid>;
```

**Example 9-15 ED-PID Command**

```
Amp01:ONS15216 EDFA2> ED-PID:Amp01:JOE:123::OLDPW, NEWPW;
```

**Table 9-20 ED-PID Syntax Description**

| Parameter | Syntax | Description                                                                                                                                                                                                                                           |
|-----------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uid       | string | The user's identifier (user name).                                                                                                                                                                                                                    |
| oldpid    | string | The user's old password.                                                                                                                                                                                                                              |
| newpid    | string | The user's new private identifier (password). Must be a string of up to 10 characters, where at least 2 are non-alphabetic characters and at least 1 is a special character. Special characters are +, #, %, etc. (defined in Telcordia GR-831-CORE). |

## 9.7.14 ED-USER-SECU

**Command:** ED-USER-SECU

**Description:** Edits the user identifier, password and access level of an existing user. Per TR-835, only those data parameters that are to be edited are entered while those that are unaffected are omitted. If any position-defined parameter is omitted, a comma is to be used as the delimiter.

**Syntax:**

```
ED-USER-SECU: [<tid>]:<uid>:<ctag>::<newuid>,<pid>,,<al>[:];
```

### Example 9-16 ED-USER-SECU Command

```
Amp01:ONS15216 EDFA2> ED-USER-SECU:Amp01:jsmith:123::johnsmith,****,,RW;
```

**Table 9-21 ED-USER-SECU Syntax Description**

| Parameter | Syntax | Description                                                                                                                                                                                                                                           |
|-----------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uid       | string | The user identifier (user name) of the existing user whose parameters are being modified.                                                                                                                                                             |
| newuid    | string | New user identifier (user name) for the existing user. Can be any combination of up to 10 alphanumeric characters.                                                                                                                                    |
| pid       | string | The user's new private identifier (password). Must be a string of up to 10 characters, where at least 2 are non-alphabetic characters and at least 1 is a special character. Special characters are +, #, %, etc. (defined in Telcordia GR-831-CORE). |
| al        |        | New access level of the user. See <a href="#">“Summary of Security Permissions for TL1 Commands”</a> section on page 9-6 for access level permissions.                                                                                                |
|           | R      | Read only privileges.                                                                                                                                                                                                                                 |
|           | RW     | Read and write privileges.                                                                                                                                                                                                                            |
|           | RWA    | Read, write, and administrative privileges.                                                                                                                                                                                                           |

## 9.7.15 ENT-USER-SECU

**Command:** ENT-USER-SECU



**Description:** Creates a new user in the system; specifies the user identifier, password and access level of the new user.

**Syntax:**

```
ENT-USER-SECU: [<tid>]:<uid>:<ctag>::<pid>, ,<al>[:];
```

**Example 9-17 ENT-USER-SECU Command**

```
Amp01:ONS15216 EDFA2> ENT-USER-SECU:Amp01:jsmith:123::****,,RW;
```

**Table 9-22 ENT-USER-SECU Syntax Description**

| Parameter | Syntax | Description                                                                                                                                                                                                                                       |
|-----------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uid       | string | The user identifier (user name) of the new user being created. Can be any combination of up to 10 alphanumeric characters.                                                                                                                        |
| pid       | string | The user's private identifier (password). Must be a string of up to 10 characters, where at least 2 are non-alphabetic characters and at least 1 is a special character. Special characters are +, #, %, etc. (defined in Telcordia GR-831-CORE). |
| al        |        | Access level of the user. See <a href="#">“Summary of Security Permissions for TL1 Commands”</a> section on page 9-6 for access level permissions.                                                                                                |
|           | R      | Read only privileges.                                                                                                                                                                                                                             |
|           | RW     | Read and write privileges.                                                                                                                                                                                                                        |
|           | RWA    | Read, write, and administrative privileges.                                                                                                                                                                                                       |

## 9.7.16 INH-MSG-ALL

**Command:** INH-MSG-ALL

**Description:** Prohibits the dispatch of some automatic messages from the ONS 15216 EDFA2 as specified in the parameters. Does not affect response from RTRV commands.

**Syntax:**

```
INH-MSG-ALL: [<tid>]:<ctag>:: [<ntfcncde>], [<condtype>][,];
```

**Example 9-18 INH-MSG-ALL Command**

```
Amp01:ONS15216 EDFA2> INH-MSG-ALL:Amp01::123::MJ,LOS;
```

Table 9-23 INH-MSG-ALL Syntax Description

| Parameter | Syntax    | Description                                                                                                                                                                                                                                                                                                                          |
|-----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ntfncode  |           | Notification code of the alarm or event that is to be inhibited (maps to <code>cerent15216EdfaAlarmPriority</code> for active alarms). A null maps to none of the codes, i.e., with a null, all existing <i>ntfncode</i> allowances are kept unchanged. Possible values are:                                                         |
|           | MJ        | Major alarm.                                                                                                                                                                                                                                                                                                                         |
|           | MN        | Minor alarm.                                                                                                                                                                                                                                                                                                                         |
|           | NA        | No alarm.                                                                                                                                                                                                                                                                                                                            |
|           | CL        | Cleared alarm.                                                                                                                                                                                                                                                                                                                       |
| condtype  |           | Condition type of the alarm or event that is to be inhibited (maps to <code>cerent15216EdfaLogEventID</code> ). ALL maps to all types. A null maps to none of the types, i.e., with a null, all existing <i>condtype</i> allowances are kept unchanged. Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | LOS       | “Loss of Signal” (input power) alarm ( <code>cerent15216EdfaAlarmLpin</code> ).                                                                                                                                                                                                                                                      |
|           | GAIN      | “Gain Out of Range” alarm ( <code>cerent15216EdfaAlarmGain</code> ).                                                                                                                                                                                                                                                                 |
|           | LPOUT     | “Loss of Output Power” alarm ( <code>cerent15216EdfaAlarmLpout</code> ).                                                                                                                                                                                                                                                             |
|           | CTMP      | “Case Temperature Out of Range” alarm ( <code>cerent15216EdfaAlarmCtmp</code> ).                                                                                                                                                                                                                                                     |
|           | LCRNT1    | “Excessive Pump1 Current” alarm ( <code>cerent15216EdfaAlarmLcrnt1</code> ).                                                                                                                                                                                                                                                         |
|           | LCRNT2    | “Excessive Pump2 Current” alarm ( <code>cerent15216EdfaAlarmLcrnt2</code> ).                                                                                                                                                                                                                                                         |
|           | LTMP1     | “Excessive Pump1 Temperature” alarm ( <code>cerent15216EdfaAlarmLtmp1</code> ).                                                                                                                                                                                                                                                      |
|           | LTMP2     | “Excessive Pump2 Temperature” alarm ( <code>cerent15216EdfaAlarmLtmp2</code> ).                                                                                                                                                                                                                                                      |
|           | POWERBUSA | “Power Bus A (voltage) Alarm” ( <code>cerent15216EdfaAlarmPowerBusA</code> ).                                                                                                                                                                                                                                                        |
|           | POWERBUSB | “Power Bus B (voltage) Alarm” ( <code>cerent15216EdfaAlarmPowerBusB</code> ).                                                                                                                                                                                                                                                        |
|           | CTRLMODE1 | “Pump1 Control Mode Changed” ( <code>cerent15216EdfaControlMode</code> for <code>cerent15216EdfaPumpCfgPumpNumber=1</code> ).                                                                                                                                                                                                        |
|           | CTRLMODE2 | “Pump2 Control Mode Changed” ( <code>cerent15216EdfaControlMode</code> for <code>cerent15216EdfaPumpCfgPumpNumber=2</code> ).                                                                                                                                                                                                        |

Table 9-23 INH-MSG-ALL Syntax Description (continued)

| Parameter | Syntax          | Description                                                                             |
|-----------|-----------------|-----------------------------------------------------------------------------------------|
|           | GAINCHGD        | “Overall Gain Changed”<br>(cerent15216EdfaConstGainOverallGain).                        |
|           | LOSHYSTCHGD     | “LOS (loss of signal) Hysteresis Changed”<br>(cerent15216EdfaLOSHysteresis).            |
|           | LOSTHCHGD       | “LOS (loss of signal) Threshold Changed”<br>(cerent15216EdfaLOSThreshold).              |
|           | LPOUTCHGD       | “Loss of Output Power Setpoint Changed”<br>(cerent15216EdfaLpoutSetpoint).              |
|           | LPOUTDEVCHGD    | “Lpout (loss of output power) Deviation Changed”<br>(cerent15216EdfaLpoutDeviation).    |
|           | LPOUTHYSTCHGD   | “Lpout (loss of output power) Hysteresis Changed”<br>(cerent15216EdfaLpoutHysteresis).  |
|           | PREATTCHGD      | “Pre-attenuation Changed”<br>(cerent15216EdfaVariableGainPreAttenuation).               |
|           | PWRBUSMAXCHGD   | “Power Bus Max (voltage) Changed”<br>(cerent15216EdfaPowerBusDCVoltageMax).             |
|           | PWRBUSMINCHGD   | “Power Bus Min (voltage) Changed”<br>(cerent15216EdfaPowerBusDCVoltageMin).             |
|           | PWRBUSMODE      | “Power Bus Mode Changed”<br>(cerent15216EdfaPowerBusMode).                              |
|           | MAXCTMPCHGD     | “Max Case Temperature Changed”<br>(cerent15216EdfaCtmpMax).                             |
|           | MAXCTMPHYSTCHGD | “Max Ctmp (case temperature) Hysteresis Changed”<br>(cerent15216EdfaCtmpMaxHysteresis). |
|           | MINCTMPCHGD     | “Min Case Temperature Changed”<br>(cerent15216EdfaCtmpMin).                             |
|           | MINCTMPHYSTCHGD | “Min Ctmp (case temperature) Hysteresis Changed”<br>(cerent15216EdfaCtmpMinHysteresis). |
|           | CUTOVERRESET    | (Software) “Reset after Cutover”<br>(cerent15216EdfaOpCutover).                         |
|           | SOFTWARELOAD    | (New) “Software Load” (cerent15216EdfaOpLoad).                                          |
|           | SOFTWARERESET   | “Software Reset” (cerent15216EdfaOpReset).                                              |
|           | ALL             | All <i>condtype</i> preceding.                                                          |

## 9.7.17 INIT-SYS

**Command:** INIT-SYS

**Description:** Reboots the system.

**Syntax:**

```
INIT-SYS: [<tid>]:<aid>:<ctag>::<ph>;
```

**Example 9-19 INIT-SYS Command**

```
Amp01:ONS15216 EDFA2> INIT-SYS:Amp01:ALL:1234::1;
```

**Table 9-24 INIT-SYS Syntax Description**

| Parameter | Syntax                | Description                          |
|-----------|-----------------------|--------------------------------------|
| aid       | string<br>EQPT<br>ALL | EQPT and ALL have same input effect. |
| ph        | integer<br>1          | Level of initialization. Always 1.   |

## 9.7.18 REPT ALM DWDM

**Command:** REPT ALM DWDM**Description:** Reports when a DWDM alarm is logged or cleared (derived from `cerent15216EdfaAlarmState`).**Note**

The REPT ALM DWDM messages for Loss of Signal, Gain Out of Range, and Loss of Output Power are prioritized (in the order just listed) so that only one message can be delivered at one time. For example, if the ONS 15216 EDFA2 detects both a loss of input signal and a loss of output power at the same time, it will deliver only the Loss of Signal message to the user. This prioritized filtering of alarms does not occur with the SNMP delivery of alarms of the ONS 15216 EDFA2.

**Syntax:**

```
<sid> <date> <time>
<almcde> <atag> REPT ALM DWDM
 "<aid>:<ntfncde>,<condtype>,<srveff>,<ocrdat>,<ocrtm>,,:<conddescr>"
;
```

**Example 9-20 REPT ALM DWDM Message**

```
Amp01 2001-06-18 14:50:44
** 142 REPT ALM DWDM
 "1:MJ,LOS,SA,6-18,14-50-44,,:\\"Loss Of Signal\\""
;
```

**Table 9-25 REPT ALM DWDM Syntax Description**

| Parameter | Syntax   | Description                                                       |
|-----------|----------|-------------------------------------------------------------------|
| time      | hh:mm:ss | Time of origination of TL1 message.                               |
| almcde    |          | The alarm severity code for the TL1 message. Possible values are: |
|           | **       | Major alarm.                                                      |
|           | *        | Minor alarm.                                                      |
|           | A        | No alarm. Occurs only when <i>ntfncde</i> is NA.                  |

Table 9-25 REPT ALM DWDM Syntax Description (continued)

| Parameter | Syntax     | Description                                                                                                                                                           |
|-----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| atag      | 0 - 999    | An integer between 0 and 999 used as a sequence number in autonomous messages.                                                                                        |
| aid       |            | Always 1.                                                                                                                                                             |
|           | 1          | Directly affecting the optical signal.                                                                                                                                |
| conddescr |            | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below.                                          |
| condtype  |            | Condition type identifies the type of alarm (maps to <i>cerent15216EdfaLogEventID</i> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | LOS        | "Loss of Signal" (input power) alarm ( <i>cerent15216EdfaAlarmLpin</i> ).                                                                                             |
|           | GAIN       | "Gain Out of Range" alarm ( <i>cerent15216EdfaAlarmGain</i> ).                                                                                                        |
|           | LPOUT      | "Loss of Output Power" alarm ( <i>cerent15216EdfaAlarmLpout</i> ).                                                                                                    |
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                                   |
| ntfncde   |            | Notification code (maps to <i>cerent15216EdfaAlarmPriority</i> ). Possible values are:                                                                                |
|           | MJ         | Major alarm.                                                                                                                                                          |
|           | MN         | Minor alarm.                                                                                                                                                          |
|           | CL         | Cleared alarm.                                                                                                                                                        |
|           | NA         | No alarm.                                                                                                                                                             |
| ocrdat    | m-d        | Date (month-day) of the event occurrence (derived from <i>cerent15216EdfaDateAndTimeString</i> ).                                                                     |
| ocrtm     | h-m-s      | Time (hour-minute-second) of the event occurrence (derived from <i>cerent15216EdfaDateAndTimeString</i> ).                                                            |
| sid       | string     | Source identifier uniquely identifies the source of a TL1 autonomous command.                                                                                         |
| srveff    |            | Effect on service. Possible values are:                                                                                                                               |
|           | SA         | Service affecting.                                                                                                                                                    |
|           | NSA        | Non-service affecting.                                                                                                                                                |

## 9.7.19 REPT ALM ENV

**Command:** REPT ALM ENV

**Description:** Reports when a power bus alarm is logged or cleared (derived from *cerent15216EdfaAlarmState*).

**Syntax:**

```
<sid> <date> <time>
<almcde> <atag> REPT ALM ENV
 "<aid>:<ntfncde>,<condtype>,<ocrdat>,<ocrtm>,<conddescr>"
;
```

**Example 9-21 REPT ALM ENV Message**

```

Amp01 2001-06-18 14:48:44
** 141 REPT ALM ENV
 "PWR-A:MJ,PWRBUSA,6-18,14-48-44,\"Power Bus A Alarm\""
;

```

**Table 9-26 REPT ALM ENV Syntax Description**

| Parameter | Syntax     | Description                                                                                                                                                           |
|-----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| almcde    |            | The alarm severity code for the TL1 message. Possible values are:                                                                                                     |
|           | **         | Major alarm.                                                                                                                                                          |
|           | *          | Minor alarm.                                                                                                                                                          |
|           | A          | No alarm. Occurs only when <i>ntfncde</i> is NA.                                                                                                                      |
| atag      | 0 - 999    | An integer between 0 and 999 used as a sequence number in autonomous messages .                                                                                       |
| aid       |            | Possible values are:                                                                                                                                                  |
|           | PWR-A      | Affecting Power Bus A (or both A and B).                                                                                                                              |
|           | PWR-B      | Affecting Power Bus B.                                                                                                                                                |
| conddescr |            | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below.                                          |
| condtype  |            | Condition type identifies the type of alarm (maps to <i>cerent15216EdfaLogEventID</i> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | PWRBUSA    | "Power Bus A (voltage) Alarm"<br>( <i>cerent15216EdfaAlarmPowerBusA</i> ).                                                                                            |
|           | PWRBUSB    | "Power Bus B (voltage) Alarm"<br>( <i>cerent15216EdfaAlarmPowerBusB</i> ).                                                                                            |
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                                   |
| ntfncde   |            | Notification code (maps to <i>cerent15216EdfaAlarmPriority</i> ). Possible values are:                                                                                |
|           | MJ         | Major alarm.                                                                                                                                                          |
|           | MN         | Minor alarm.                                                                                                                                                          |
|           | CL         | Cleared alarm.                                                                                                                                                        |
|           | NA         | No alarm.                                                                                                                                                             |
| ocrdat    | m-d        | Date (month-day) of the event occurrence (derived from <i>cerent15216EdfaDateAndTimeString</i> ).                                                                     |
| ocrtm     | h-m-s      | Time (hour-minute-second) of the event occurrence (derived from <i>cerent15216EdfaDateAndTimeString</i> ).                                                            |
| sid       | string     | Source identifier uniquely identifies the source of a TL1 autonomous command.                                                                                         |
| time      | hh:mm:ss   | Time of origination of TL1 message.                                                                                                                                   |

## 9.7.20 REPT ALM EQPT

**Command:** REPT ALM EQPT

**Description:** Reports when a general alarm (not directly affecting optical signal or power bus) is logged or cleared (derived from `cerent15216EdfaAlarmState`).

**Syntax:**

```
<sid> <date> <time>
<almcde> <atag> REPT ALM EQPT
 "<aid>:<ntfncde>,<condtype>,<srveff>,<ocrdat>,<ocrtm>,,:<conddescr>"
;
```

### Example 9-22 REPT ALM EQPT Message

```
Amp01 2001-06-18 14:48:44
* 141 REPT ALM EQPT
 "EQPT:MN,LCRNT1,NSA,6-18,14-48-44,,:\\"Excessive Pump1 Current\\""
;
```

**Table 9-27 REPT ALM EQPT Syntax Description**

| Parameter | Syntax  | Description                                                                                                                                                                 |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| almcde    |         | The alarm severity code for the TL1 message. Possible values are:                                                                                                           |
|           | **      | Major alarm.                                                                                                                                                                |
|           | *       | Minor alarm.                                                                                                                                                                |
|           | A       | No alarm. Occurs only when <i>ntfncde</i> is NA.                                                                                                                            |
| atag      | 0 - 999 | An integer between 0 and 999 used as a sequence number in autonomous messages .                                                                                             |
| aid       |         | Always EQPT.                                                                                                                                                                |
|           | EQPT    | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus).                                                                             |
| conddescr |         | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below.                                                |
| condtype  |         | Condition type identifies the type of alarm (maps to <code>cerent15216EdfaLogEventID</code> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | CTMP    | “Case Temperature Out of Range” alarm ( <code>cerent15216EdfaAlarmCtmp</code> ).                                                                                            |
|           | LCRNT1  | “Excessive Pump1 Current” alarm ( <code>cerent15216EdfaAlarmLcrnt1</code> ).                                                                                                |
|           | LCRNT2  | “Excessive Pump2 Current” alarm ( <code>cerent15216EdfaAlarmLcrnt2</code> ).                                                                                                |
|           | LTMP1   | “Excessive Pump1 Temperature” alarm ( <code>cerent15216EdfaAlarmLtmp1</code> ).                                                                                             |
|           | LTMP2   | “Excessive Pump2 Temperature” alarm ( <code>cerent15216EdfaAlarmLtmp2</code> ).                                                                                             |

**Table 9-27 REPT ALM EQPT Syntax Description (continued)**

| Parameter | Syntax     | Description                                                                                        |
|-----------|------------|----------------------------------------------------------------------------------------------------|
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                                |
| ntfncde   |            | Notification code (maps to cerent15216EdfaAlarmPriority). Possible values are:                     |
|           | MJ         | Major alarm.                                                                                       |
|           | MN         | Minor alarm.                                                                                       |
|           | CL         | Cleared alarm.                                                                                     |
|           | NA         | No alarm.                                                                                          |
| ocrdat    | m-d        | Date (month-day) of the event occurrence (derived from cerent15216EdfaDateAndTimeString).          |
| ocrtm     | h-m-s      | Time (hour-minute-second) of the event occurrence (derived from cerent15216EdfaDateAndTimeString). |
| sid       | string     | Source identifier uniquely identifies the source of a TL1 autonomous command.                      |
| srveff    |            | Effect on service. Possible values are:                                                            |
|           | SA         | Service affecting.                                                                                 |
|           | NSA        | Non-service affecting.                                                                             |
| time      | hh:mm:ss   | Time of origination of TL1 message.                                                                |

## 9.7.21 REPT EVT DWDM / REPT EVT ENV / REPT EVT EQPT

**Command:** REPT EVT DWDM or REPT EVT ENV or REPT EVT EQPT

**Description:** Reports autonomous events. Reports when an event is logged.

**Syntax:**

```
<sid> <date> <time>
A <atag> REPT EVT <ccm>
 "<aid>:<condtype>,<condeff>,<ocrdat>,<ocrtm>,,,,:<conddescr>"
;
```

### Example 9-23 REPT EVT DWDM Message

```
Amp01 2001-06-18 14:48:44
A 141 REPT EVT DWDM
 "1:CTRLMODE1,TC,6-18,14-48-44,,,,:\\"Pump1 Control Mode Changed\\""
;
```



Table 9-28 REPT EVT DWDM / REPT EVT ENV / REPT EVT EQPT Syntax Description

| Parameter         | Syntax                  | Description                                                                                                                                                           |
|-------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| atag              | 0 - 999                 | An integer between 0 and 999 used as a sequence number in autonomous messages .                                                                                       |
| aid               |                         | Possible values are:                                                                                                                                                  |
|                   | 1                       | Directly affecting the optical signal.                                                                                                                                |
|                   | PWR-A                   | Affecting Power Bus A (or both A and B).                                                                                                                              |
|                   | PWR-B                   | Affecting Power Bus B.                                                                                                                                                |
|                   | EQPT                    | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus).                                                                       |
| conddescr         |                         | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below.                                          |
| condtype<br>(ccm) |                         | Condition type identifies the type of event (maps to <i>cerent15216EdfaLogEventID</i> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|                   | CTRLMODE1<br>(DWDM)     | “Pump1 Control Mode Changed”<br>( <i>cerent15216EdfaControlMode</i> for <i>cerent15216EdfaPumpCfgPumpNumber=1</i> ).                                                  |
|                   | CTRLMODE2<br>(DWDM)     | “Pump2 Control Mode Changed”<br>( <i>cerent15216EdfaControlMode</i> for <i>cerent15216EdfaPumpCfgPumpNumber=2</i> ).                                                  |
|                   | GAINCHGD<br>(DWDM)      | “Overall Gain Changed”<br>( <i>cerent15216EdfaConstGainOverallGain</i> ).                                                                                             |
|                   | LOSHYSTCHGD<br>(DWDM)   | “LOS (loss of signal) Hysteresis Changed”<br>( <i>cerent15216EdfaLOSHysteresis</i> ).                                                                                 |
|                   | LOSTHCHGD<br>(DWDM)     | “LOS (loss of signal) Threshold Changed”<br>( <i>cerent15216EdfaLOSThreshold</i> ).                                                                                   |
|                   | LPOUTCHGD<br>(DWDM)     | “Loss of Output Power Setpoint Changed”<br>( <i>cerent15216EdfaLpoutSetpoint</i> ).                                                                                   |
|                   | LPOUTDEVCHGD<br>(DWDM)  | “Lpout (loss of output power) Deviation Changed”<br>( <i>cerent15216EdfaLpoutDeviation</i> ).                                                                         |
|                   | LPOUTHYSTCHGD<br>(DWDM) | “Lpout (loss of output power) Hysteresis Changed”<br>( <i>cerent15216EdfaLpoutHysteresis</i> ).                                                                       |
|                   | PREATTCHGD<br>(DWDM)    | “Pre-attenuation Changed”<br>( <i>cerent15216EdfaVariableGainPreAttenuation</i> ).                                                                                    |
|                   | PWRBUSMAXCHGD<br>(EVN)  | “Power Bus Max (voltage) Changed”<br>( <i>cerent15216EdfaPowerBusDCVoltageMax</i> ).                                                                                  |
|                   | PWRBUSMINCHGD<br>(EVN)  | “Power Bus Min (voltage) Changed”<br>( <i>cerent15216EdfaPowerBusDCVoltageMin</i> ).                                                                                  |
|                   | PWRBUSMODE<br>(EVN)     | “Power Bus Mode Changed”<br>( <i>cerent15216EdfaPowerBusMode</i> ).                                                                                                   |
|                   | MAXCTMPCHGD<br>(EQPT)   | “Max Case Temperature Changed”<br>( <i>cerent15216EdfaCtmpMax</i> ).                                                                                                  |

**Table 9-28 REPT EVT DWDM / REPT EVT ENV / REPT EVT EQPT Syntax Description (continued)**

| Parameter         | Syntax                    | Description                                                                                        |
|-------------------|---------------------------|----------------------------------------------------------------------------------------------------|
| condtype<br>(ccm) | MAXCTMPHYSTCHGD<br>(EQPT) | “Max Ctmp (case temperature) Hysteresis Changed”<br>(cerent15216EdfaCtmpMaxHysteresis).            |
|                   | MINCTMPCHGD<br>(EQPT)     | “Min Case Temperature Changed”<br>(cerent15216EdfaCtmpMin).                                        |
|                   | MINCTMPHYSTCHGD<br>(EQPT) | “Min Ctmp (case temperature) Hysteresis Changed”<br>(cerent15216EdfaCtmpMinHysteresis).            |
|                   | CUTOVERRESET<br>(EQPT)    | (Software) “Reset after Cutover”<br>(cerent15216EdfaOpCutover).                                    |
|                   | SOFTWARELOAD<br>(EQPT)    | (New) “Software Load” (cerent15216EdfaOpLoad).                                                     |
|                   | SOFTWARERESET<br>(EQPT)   | “Software Reset” (cerent15216EdfaOpReset).                                                         |
| condeff           | string<br>TC              | Effect of the condition. Always TC (transient condition).                                          |
| date              | yyyy-mm-dd                | Date of origination of TL1 message.                                                                |
| ocrdat            | m-d                       | Date (month-day) of the event occurrence (derived from cerent15216EdfaDateAndTimeString).          |
| ocrtm             | h-m-s                     | Time (hour-minute-second) of the event occurrence (derived from cerent15216EdfaDateAndTimeString). |
| sid               | string                    | Source identifier uniquely identifies the source of a TL1 autonomous command.                      |
| srveff            |                           | Effect on service. Possible values are:                                                            |
|                   | SA                        | Service affecting.                                                                                 |
|                   | NSA                       | Non-service affecting.                                                                             |
| time              | hh:mm:ss                  | Time of origination of TL1 message.                                                                |

## 9.7.22 REPT EVT FXFR

**Command:** REPT EVT FXFR

**Description:** Reports autonomous events related to the FTP file transfer (see “COPY-RFILE” section on page 9-12). Reports when an event related to the file transfer is logged.

**Syntax:**

```
<sid> <date> <time>
A <atag> REPT EVT FXFR
 "<aid>:<filename>,<fxfr_status>[,<fxfr_rslt>][,<bytes_xfrd>]"
;
```

**Example 9-24 REPT EVT FXFR Message**

```
Amp01 2001-06-18 14:48:44
A 141 REPT EVT FXFR
 "EQPT:VMRLS20.EXE,COMPLD,SUCCESS,8051"
;
```

**Table 9-29 REPT EVT FXFR Syntax Description**

| Parameter   | Syntax     | Description                                                                                                                                                                                    |
|-------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| atag        | 0 - 999    | An integer between 0 and 999 used as a sequence number in autonomous messages.                                                                                                                 |
| aid         |            | Always EQPT.                                                                                                                                                                                   |
|             | EQPT       | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus).                                                                                                |
| bytes_xfrd  |            | Total number of bytes transferred when <i>fxfr_status</i> is COMPLD. See <i>fxfr_status</i> below.                                                                                             |
| filename    |            | Identifies the name of the file that is being transferred.                                                                                                                                     |
| fxfr_rslt   |            | File transfer result indicates success or failure of the file transfer. This is displayed only when the file transfer has completed (i.e., <i>fxfr_status</i> is COMPLD). Possible values are: |
|             | SUCCESS    | File transfer was successful.                                                                                                                                                                  |
|             | FAILURE    | File transfer failed.                                                                                                                                                                          |
| fxfr_status |            | File transfer status of ONS 15216 EDFA2's file transfer at the current time. (The option IP (in progress) has not been implemented.) Possible values are:                                      |
|             | START      | File transfer has started.                                                                                                                                                                     |
|             | COMPLD     | File transfer has completed.                                                                                                                                                                   |
| date        | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                                                            |
| sid         | string     | Source identifier uniquely identifies the source of a TL1 autonomous command.                                                                                                                  |
| time        | hh:mm:ss   | Time of origination of TL1 message.                                                                                                                                                            |

## 9.7.23 RTRV-ALM-ALL

**Command:** RTRV-ALM-ALL

**Description:** Generates a report on all active alarms (except environmental (ENV) alarms as per Telcordia GR-833-CORE). Note that the ccm does not appear in the response for EQPT alarms.



**Note**

The messages for Loss of Signal (LOS), Gain Out of Range (GAIN), and Loss of Output Power (LPOUT) are prioritized (in the order just listed) so that only one message can be delivered at one time. For example, if the ONS 15216 EDFA2 detects both a loss of input signal and a loss of output power at the same time, it will deliver only the Loss of Signal (LOS) message to the user. This prioritized filtering of alarms does not occur with the SNMP delivery of alarms of the ONS 15216 EDFA2.

**Syntax:**

```
RTRV-ALM-ALL: [<tid>]::<ctag>:: [<ntfcncode>], [<condtype>], [<srveff>][, ,];
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>, <ccm>: <ntfcncode>, <condtype>, <srveff>, <ocrdat>, <ocrtm>, , : <conddescr>"
```

;

**Example 9-25 RTRV-ALM-ALL Command and Response**

```
Amp01:ONS15216 EDFA2> RTRV-ALM-ALL:Amp01::229::MN,LCRNT1,NSA,,;
Amp01 2002-06-20 14:30:00
M 229 COMPLD
"1,DWDM:MJ,LOS,SA,6-20,14-25-30,,:\\"Loss Of Signal\\" "
"EQPT,EQPT:MN,LCRNT1,NSA,6-20,14-25-30,,:\\"Excessive Pump1 Current\\" "
;
```

**Table 9-30 RTRV-ALM-ALL Syntax Description**

| Parameter         | Syntax           | Description                                                                                                                                                           |
|-------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| aid               |                  | Possible values are:                                                                                                                                                  |
|                   | 1                | Directly affecting the optical signal                                                                                                                                 |
|                   | EQPT             | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus)                                                                        |
| conddescr         |                  | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below                                           |
| condtype<br>(ccm) |                  | Condition type identifies the type of alarm (maps to <i>cerent15216EdfaLogEventID</i> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|                   | LOS<br>(DWDM)    | “Loss of Signal” (input power) alarm ( <i>cerent15216EdfaAlarmLpin</i> ).                                                                                             |
|                   | GAIN<br>(DWDM)   | “Gain Out of Range” alarm ( <i>cerent15216EdfaAlarmGain</i> ).                                                                                                        |
|                   | LPOUT<br>(DWDM)  | “Loss of Output Power” alarm ( <i>cerent15216EdfaAlarmLpout</i> ).                                                                                                    |
|                   | CTMP<br>(EQPT)   | “Case Temperature Out of Range” alarm ( <i>cerent15216EdfaAlarmCtmp</i> ).                                                                                            |
|                   | LCRNT1<br>(EQPT) | “Excessive Pump1 Current” alarm ( <i>cerent15216EdfaAlarmLcrnt1</i> ).                                                                                                |
|                   | LCRNT2<br>(EQPT) | “Excessive Pump2 Current” alarm ( <i>cerent15216EdfaAlarmLcrnt2</i> ).                                                                                                |
|                   | LTMP1<br>(EQPT)  | “Excessive Pump1 Temperature” alarm ( <i>cerent15216EdfaAlarmLtmp1</i> ).                                                                                             |
|                   | LTMP2<br>(EQPT)  | “Excessive Pump2 Temperature” alarm ( <i>cerent15216EdfaAlarmLtmp2</i> ).                                                                                             |
| date              | yyyy-mm-dd       | Date of origination of TL1 message.                                                                                                                                   |
| ntfncode          |                  | Notification code (maps to <i>cerent15216EdfaAlarmPriority</i> ). Possible values are:                                                                                |
|                   | MJ               | Major alarm.                                                                                                                                                          |
|                   | MN               | Minor alarm.                                                                                                                                                          |
|                   | CL               | Cleared alarm.                                                                                                                                                        |
|                   | NA               | No alarm.                                                                                                                                                             |

**Table 9-30 RTRV-ALM-ALL Syntax Description (continued)**

| Parameter | Syntax   | Description                                                                                        |
|-----------|----------|----------------------------------------------------------------------------------------------------|
| ocrdat    | m-d      | Date (month-day) of the event occurrence (derived from cerent15216EdfaDateAndTimeString).          |
| ocrtm     | h-m-s    | Time (hour-minute-second) of the event occurrence (derived from cerent15216EdfaDateAndTimeString). |
| sid       | string   | Source identifier uniquely identifies the source of a TL1 autonomous command.                      |
| srveff    |          | Effect on service. Possible values are:                                                            |
|           | SA       | Service affecting.                                                                                 |
|           | NSA      | Non-service affecting.                                                                             |
| time      | hh:mm:ss | Time of origination of TL1 message.                                                                |

## 9.7.24 RTRV-ALM-DWDM

**Command:** RTRV-ALM-DWDM

**Description:** Generates a report on active DWDM alarms.



**Note**

The messages for Loss of Signal (LOS), Gain Out of Range (GAIN), and Loss of Output Power (LPOUT) are prioritized (in the order just listed) so that only one message can be delivered at one time. For example, if the ONS 15216 EDFA2 detects both a loss of input signal and a loss of output power at the same time, it will deliver only the Loss of Signal (LOS) message to the user. This prioritized filtering of alarms does not occur with the SNMP delivery of alarms of the ONS 15216 EDFA2.

**Syntax:**

```
RTRV-ALM-DWDM: [<tid>]:<aid>:<ctag>:: [<ntfncde>], [<condtype>], [<srveff>] [, ,];
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>, <ccm>:<ntfncde>, <condtype>, <srveff>, <ocrdat>, <ocrtm>, , :<conddescr>"
;
```

**Example 9-26 RTRV-ALM-DWDM Command and Response**

```
Amp01:ONS15216 EDFA2> RTRV-ALM-DWDM: Amp01: ALL: 229: , , ;
 Amp01 2002-06-20 14:30:00
M 229 COMPLD
 "1, DWDM: MJ, LOS, SA, 6-20, 14-25-30, , : \"Loss Of Signal\""
;
```

**Table 9-31 RTRV-ALM-DWDM Syntax Description**

| Parameter | Syntax | Description                                       |
|-----------|--------|---------------------------------------------------|
| aid       |        | 1 and ALL have same input effect.                 |
|           | 1      | Directly affecting the optical signal.            |
|           | ALL    | Any or all of the preceding (command input only). |

Table 9-31 RTRV-ALM-DWDM Syntax Description (continued)

| Parameter | Syntax     | Description                                                                                                                                                           |
|-----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| conddescr |            | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below.                                          |
| condtype  |            | Condition type identifies the type of alarm (maps to <i>cerent15216EdfaLogEventID</i> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | LOS        | “Loss of Signal” (input power) alarm ( <i>cerent15216EdfaAlarmLpin</i> ).                                                                                             |
|           | GAIN       | “Gain Out of Range” alarm ( <i>cerent15216EdfaAlarmGain</i> ).                                                                                                        |
|           | LPOUT      | “Loss of Output Power” alarm ( <i>cerent15216EdfaAlarmLpout</i> ).                                                                                                    |
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                                   |
| ntfncde   |            | Notification code (maps to <i>cerent15216EdfaAlarmPriority</i> ). Possible values are:                                                                                |
|           | MJ         | Major alarm.                                                                                                                                                          |
|           | MN         | Minor alarm.                                                                                                                                                          |
|           | CL         | Cleared alarm.                                                                                                                                                        |
|           | NA         | No alarm.                                                                                                                                                             |
| ocrdat    | m-d        | Date (month-day) of the event occurrence (derived from <i>cerent15216EdfaDateAndTimeString</i> ).                                                                     |
| ocrtm     | h-m-s      | Time (hour-minute-second) of the event occurrence (derived from <i>cerent15216EdfaDateAndTimeString</i> ).                                                            |
| sid       | string     | Source identifier uniquely identifies the source of a TL1 autonomous command.                                                                                         |
| srveff    |            | Effect on service. Possible values are:                                                                                                                               |
|           | SA         | Service affecting.                                                                                                                                                    |
|           | NSA        | Non-service affecting.                                                                                                                                                |
| time      | hh:mm:ss   | Time of origination of TL1 message.                                                                                                                                   |

## 9.7.25 RTRV-ALM-ENV

**Command:** RTRV-ALM-ENV

**Description:** Generates a report on specific or all active environmental (power bus) alarms.

**Syntax:**

```
RTRV-ALM-ENV: [<tid>]:<aid>:<ctag>:: [<ntfncde>], [<condtype>];
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>,<ccm>:<ntfncde>,<condtype>,<ocrdat>,<ocrtm>,<conddescr>"
;
```

**Example 9-27 RTRV-ALM-ENV Command and Response**

```
Amp01:ONS15216 EDFA2> RTRV-ALM-ENV:Amp01:ALL:229::MJ,PWRBUSA;
```

```

Amp01 2002-06-20 14:30:00
M 229 COMPLD
 "PWR-A, ENV:MJ, PWRBUSA, 6-20, 14-25-30, \"Power Bus A Alarm\" "
;

```

**Table 9-32 RTRV-ALM-ENV Syntax Description**

| Parameter | Syntax     | Description                                                                                                                                                                 |
|-----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| aid       |            | Specifying PWR-A or PWR-B in input has a filter effect on the response.                                                                                                     |
|           | PWR-A      | Affecting Power Bus A (or both A and B).                                                                                                                                    |
|           | PWR-B      | Affecting Power Bus B.                                                                                                                                                      |
|           | ALL        | Any or all of the preceding (command input only).                                                                                                                           |
| conddescr |            | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below.                                                |
| condtype  |            | Condition type identifies the type of alarm (maps to <code>cerent15216EdfaLogEventID</code> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | PWRBUSA    | “Power Bus A (voltage) Alarm”<br>( <code>cerent15216EdfaAlarmPowerBusA</code> ).                                                                                            |
|           | PWRBUSB    | “Power Bus B (voltage) Alarm”<br>( <code>cerent15216EdfaAlarmPowerBusB</code> ).                                                                                            |
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                                         |
| ntfncde   |            | Notification code (maps to <code>cerent15216EdfaAlarmPriority</code> ). Possible values are:                                                                                |
|           | MJ         | Major alarm.                                                                                                                                                                |
|           | MN         | Minor alarm.                                                                                                                                                                |
|           | CL         | Cleared alarm.                                                                                                                                                              |
|           | NA         | No alarm.                                                                                                                                                                   |
| ocrdat    | m-d        | Date (month-day) of the event occurrence (derived from <code>cerent15216EdfaDateAndTimeString</code> ).                                                                     |
| ocrtm     | h-m-s      | Time (hour-minute-second) of the event occurrence (derived from <code>cerent15216EdfaDateAndTimeString</code> ).                                                            |
| sid       | string     | Source identifier uniquely identifies the source of a TL1 autonomous command.                                                                                               |
| time      | hh:mm:ss   | Time of origination of TL1 message.                                                                                                                                         |

## 9.7.26 RTRV-ALM-EQPT

**Command:** RTRV-ALM-EQPT

**Description:** Generates a report on all active alarms (except environmental alarms as per Telcordia GR-833-CORE).

**Syntax:**

```
RTRV-ALM-EQPT:[<tid>]:<aid>:<ctag>:: [<ntfncdc>], [<condtype>], [<srveff>][, ,];
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>:<ntfncdc>,<condtype>,<srveff>,<ocrdat>,<ocrtm>,, :<conddescr>"
;
```

### Example 9-28 RTRV-ALM-EQPT Command and Response

```
Amp01:ONS15216 EDFA2> RTRV-ALM-EQPT:Amp01:ALL:229:MN,LCRNT1,NSA,,;
 Amp01 2002-06-20 14:30:00
M 229 COMPLD
 "EQPT:MN,LCRNT1,NSA,6-20,14-25-30,, :\"Excessive Pump1 Current\""
```

**Table 9-33 RTRV-ALM-EQPT Syntax Description**

| Parameter | Syntax     | Description                                                                                                                                                           |
|-----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| aid       |            | EQPT and ALL have same input effect.                                                                                                                                  |
|           | EQPT       | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus).                                                                       |
|           | ALL        | Any or all of the preceding (command input only).                                                                                                                     |
| conddescr |            | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below.                                          |
| condtype  |            | Condition type identifies the type of alarm (maps to <i>cerent15216EdfaLogEventID</i> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | CTMP       | “Case Temperature Out of Range” alarm ( <i>cerent15216EdfaAlarmCtmp</i> ).                                                                                            |
|           | LCRNT1     | “Excessive Pump1 Current” alarm ( <i>cerent15216EdfaAlarmLcrnt1</i> ).                                                                                                |
|           | LCRNT2     | “Excessive Pump2 Current” alarm ( <i>cerent15216EdfaAlarmLcrnt2</i> ).                                                                                                |
|           | LTMP1      | “Excessive Pump1 Temperature” alarm ( <i>cerent15216EdfaAlarmLtmp1</i> ).                                                                                             |
|           | LTMP2      | “Excessive Pump2 Temperature” alarm ( <i>cerent15216EdfaAlarmLtmp2</i> ).                                                                                             |
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                                   |



**Table 9-33 RTRV-ALM-EQPT Syntax Description (continued)**

| Parameter | Syntax   | Description                                                                                        |
|-----------|----------|----------------------------------------------------------------------------------------------------|
| ntfncode  |          | Notification code (maps to cerent15216EdfaAlarmPriority). Possible values are:                     |
|           | MJ       | Major alarm.                                                                                       |
|           | MN       | Minor alarm.                                                                                       |
|           | CL       | Cleared alarm.                                                                                     |
|           | NA       | No alarm.                                                                                          |
| ocrdat    | m-d      | Date (month-day) of the event occurrence (derived from cerent15216EdfaDateAndTimeString).          |
| ocrtm     | h-m-s    | Time (hour-minute-second) of the event occurrence (derived from cerent15216EdfaDateAndTimeString). |
| sid       | string   | Source identifier uniquely identifies the source of a TL1 autonomous command.                      |
| srveff    |          | Effect on service. Possible values are:                                                            |
|           | SA       | Service affecting.                                                                                 |
|           | NSA      | Non-service affecting.                                                                             |
| time      | hh:mm:ss | Time of origination of TL1 message.                                                                |

## 9.7.27 RTRV-AO

**Command:** RTRV-AO

**Description:** Retrieves autonomous output.

Allows the operating system to retrieve a copy of queued autonomous messages or missing autonomous messages. Examples of autonomous messages are REPT ALM and REPT EVT.

Users can retrieve up to the latest 1000 autonomous messages (alarms and events). Normally, users should limit the retrieval to less than 200 messages to prevent alarm reporting and other active users from being impacted. To retrieve more than 200 messages, it is recommended that the user saves the autonomous message log to a file using the **CPY-MEM** command and then get the file through FTP using the **COPY-RFILE** command.

If none of the stored automatic messages satisfy the selection criteria, then a complete normal response is sent. If one or more stored autonomous messages satisfy the criteria, then the messages should be reported in the normal response in ATAG order.

**Syntax:**

```
RTRV-AO:[<tid>]::<ctag>:::[ATAGSEQ=<atagseq>][,MSGTYPE=<msgtype>];
```

**Example 9-29 RTRV-AO Command**

```
Amp01:ONS15216 EDFA2> RTRV-AO:Amp01::123:::ATAGSEQ=20&&30,MSGTYPE=EVT;
```

**Table 9-34 RTRV-AO Syntax Description**

| Parameter | Syntax | Description                                                                                                                                                                                                                                                                                                                       |
|-----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| atagseq   |        | <i>atag</i> is an integer between 0 and 999 used by the ONS 15216 EDFA2 to sequentially number in autonomous messages. <i>atagseq</i> can be a single <i>atag</i> number or a range of numbers in the form <i>AA&amp;&amp;BB</i> , where <i>AA</i> and <i>BB</i> are integers. If null, the 20 latest messages will be retrieved. |
| msgtype   |        | Type of message. A null value means both ALM and EVT.                                                                                                                                                                                                                                                                             |
|           | ALM    | Alarm message.                                                                                                                                                                                                                                                                                                                    |
|           | EVT    | Event message.                                                                                                                                                                                                                                                                                                                    |

## 9.7.28 RTRV-COND-ALL

### Command: RTRV-COND-ALL

**Description:** Generates a report on the condition (state) of all alarms (except environmental alarms). Note that the *ccm* does not appear in the response for EQPT alarms.



#### Note

The messages for Loss of Signal (LOS), Gain Out of Range (GAIN), and Loss of Output Power (LPOUT) are prioritized (in the order just listed) so that only one message can be delivered at one time. For example, if the ONS 15216 EDFA2 detects both a loss of input signal and a loss of output power at the same time, it will deliver only the Loss of Signal (LOS) message to the user. This prioritized filtering of alarms does not occur with the SNMP delivery of alarms of the ONS 15216 EDFA2.

#### Syntax:

```
RTRV-COND-ALL:[<tid>]::<ctag>::[<condtype>][, ,];
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>,<ccm>:<ntfncde>,<condtype>,<srveff>,<ocrdat>,<ocrtm>,,,<conddescr>"
;
```

#### Example 9-30 RTRV-COND-ALL Command and Response

```
Amp01:ONS15216 EDFA2> RTRV-COND-ALL:Amp01::229::LCRNT1;
Amp01 2002-06-20 14:30:00
M 229 COMPLD
 "1,DWDM:MJ,LOS,SA,6-20,14-25-30,,,\"Loss Of Signal\""
 "EQPT,EQPT:MN,LCRNT1,NSA,6-20,14-25-30,,,\"Excessive Pump1 Current\""
;
```

**Table 9-35 RTRV-COND-ALL Syntax Description**

| Parameter | Syntax | Description                                                                                     |
|-----------|--------|-------------------------------------------------------------------------------------------------|
| aid       |        | Possible values are:                                                                            |
|           | 1      | Directly affecting the optical signal.                                                          |
|           | EQPT   | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus). |

Table 9-35 RTRV-COND-ALL Syntax Description (continued)

| Parameter         | Syntax           | Description                                                                                                                                                           |
|-------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| conddescr         |                  | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below.                                          |
| condtype<br>(ccm) |                  | Condition type identifies the type of alarm (maps to <i>cerent15216EdfaLogEventID</i> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|                   | LOS<br>(DWDM)    | “Loss of Signal” (input power) alarm ( <i>cerent15216EdfaAlarmLpin</i> ).                                                                                             |
|                   | GAIN<br>(DWDM)   | “Gain Out of Range” alarm ( <i>cerent15216EdfaAlarmGain</i> ).                                                                                                        |
|                   | LPOUT<br>(DWDM)  | “Loss of Output Power” alarm ( <i>cerent15216EdfaAlarmLpout</i> ).                                                                                                    |
|                   | CTMP<br>(EQPT)   | “Case Temperature Out of Range” alarm ( <i>cerent15216EdfaAlarmCtmp</i> ).                                                                                            |
|                   | LCRNT1<br>(EQPT) | “Excessive Pump1 Current” alarm ( <i>cerent15216EdfaAlarmLcrnt1</i> ).                                                                                                |
|                   | LCRNT2<br>(EQPT) | “Excessive Pump2 Current” alarm ( <i>cerent15216EdfaAlarmLcrnt2</i> ).                                                                                                |
|                   | LTMP1<br>(EQPT)  | “Excessive Pump1 Temperature” alarm ( <i>cerent15216EdfaAlarmLtmp1</i> ).                                                                                             |
|                   | LTMP2<br>(EQPT)  | “Excessive Pump2 Temperature” alarm ( <i>cerent15216EdfaAlarmLtmp2</i> ).                                                                                             |
| date              | yyyy-mm-dd       | Date of origination of TL1 message.                                                                                                                                   |
| ntfncde           |                  | Notification code (maps to <i>cerent15216EdfaAlarmPriority</i> ). Possible values are:                                                                                |
|                   | MJ               | Major alarm.                                                                                                                                                          |
|                   | MN               | Minor alarm.                                                                                                                                                          |
|                   | NA               | No alarm.                                                                                                                                                             |
| ocrdat            | m-d              | Date (month-day) of the event occurrence (derived from <i>cerent15216EdfaDateAndTimeString</i> ).                                                                     |
| ocrtm             | h-m-s            | Time (hour-minute-second) of the event occurrence (derived from <i>cerent15216EdfaDateAndTimeString</i> ).                                                            |
| sid               | string           | Source identifier uniquely identifies the source of a TL1 autonomous command.                                                                                         |
| srveff            |                  | Effect on service. Possible values are:                                                                                                                               |
|                   | SA               | Service affecting.                                                                                                                                                    |
|                   | NSA              | Non-service affecting.                                                                                                                                                |
| time              | hh:mm:ss         | Time of origination of TL1 message.                                                                                                                                   |

## 9.7.29 RTRV-COND-DWDM

**Command:** RTRV-COND-DWDM

**Description:** Generates a report on the condition (state) of DWDM alarms.



**Note**

The messages for Loss of Signal (LOS), Gain Out of Range (GAIN), and Loss of Output Power (LPOUT) are prioritized (in the order just listed) so that only one message can be delivered at one time. For example, if the ONS 15216 EDFA2 detects both a loss of input signal and a loss of output power at the same time, it will deliver only the Loss of Signal (LOS) message to the user. This prioritized filtering of alarms does not occur with the SNMP delivery of alarms of the ONS 15216 EDFA2.

**Syntax:**

```
RTRV-COND-DWDM: [<tid>]:<aid>:<ctag>:: [<condtype>][, ,];
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>, <ccm>: <ntfncde>, <condtype>, <srveff>, <ocrdat>, <ocrtm>, , , <conddescr>"
;
```

**Example 9-31 RTRV-COND-DWDM Command and Response**

```
Amp01:ONS15216 EDFA2> RTRV-COND-DWDM: Amp01: ALL: 229: : LOS;
 Amp01 2002-06-20 14:30:00
M 229 COMPLD
 "1,DWDM:MJ,LOS,SA,6-20,14-25-30,,, \"Loss Of Signal\""
;
```

**Table 9-36 RTRV-COND-DWDM Syntax Description**

| Parameter | Syntax     | Description                                                                                                                                                           |
|-----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| aid       |            | 1 and ALL have same input effect.                                                                                                                                     |
|           | 1          | Directly affecting the optical signal.                                                                                                                                |
|           | ALL        | Any or all of the preceding (command input only).                                                                                                                     |
| conddescr |            | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below.                                          |
| condtype  |            | Condition type identifies the type of alarm (maps to <i>cerent15216EdfaLogEventID</i> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | LOS        | “Loss of Signal” (input power) alarm ( <i>cerent15216EdfaAlarmLpin</i> ).                                                                                             |
|           | GAIN       | “Gain Out of Range” alarm ( <i>cerent15216EdfaAlarmGain</i> ).                                                                                                        |
|           | LPOUT      | “Loss of Output Power” alarm ( <i>cerent15216EdfaAlarmLpout</i> ).                                                                                                    |
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                                   |
| ntfncde   |            | Notification code (maps to <i>cerent15216EdfaAlarmPriority</i> ). Possible values are:                                                                                |
|           | MJ         | Major alarm.                                                                                                                                                          |
|           | MN         | Minor alarm.                                                                                                                                                          |
|           | NA         | No alarm.                                                                                                                                                             |

**Table 9-36 RTRV-COND-DWDM Syntax Description (continued)**

| Parameter | Syntax   | Description                                                                                                      |
|-----------|----------|------------------------------------------------------------------------------------------------------------------|
| ocrdat    | m-d      | Date (month-day) of the event occurrence (derived from <code>cerent15216EdfaDateAndTimeString</code> ).          |
| ocrtm     | h-m-s    | Time (hour-minute-second) of the event occurrence (derived from <code>cerent15216EdfaDateAndTimeString</code> ). |
| sid       | string   | Source identifier uniquely identifies the source of a TL1 autonomous command.                                    |
| srveff    |          | Effect on service. Possible values are:                                                                          |
|           | SA       | Service affecting.                                                                                               |
|           | NSA      | Non-service affecting.                                                                                           |
| time      | hh:mm:ss | Time of origination of TL1 message.                                                                              |

## 9.7.30 RTRV-COND-ENV

**Command:** RTRV-COND-ENV

**Description:** Generates a report on the condition (state) of environmental (power bus) alarms.

**Syntax:**

```
RTRV-COND-ENV: [<tid>]:<aid>:<ctag>:: [<condtype>] [, ,] ;
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>, <ccm>:<ntfcncode>, <condtype>, <srveff>, <ocrdat>, <ocrtm>, , , <conddescr>"
;
```

### Example 9-32 RTRV-COND-ENV Command and Response

```
Amp01:ONS15216 EDFA2> RTRV-COND-ENV:Amp01:ALL:229::PWRBUSA;
 Amp01 2002-06-20 14:30:00
M 229 COMPLD
 "PWR-A, ENV:MJ, PWRBUSA, NSA, 6-20, 14-25-30, , , \"Power Bus A Alarm\" "
;
```

**Table 9-37 RTRV-COND-ENV Syntax Description**

| Parameter | Syntax | Description                                                                                                                  |
|-----------|--------|------------------------------------------------------------------------------------------------------------------------------|
| aid       |        | Specifying PWR-A or PWR-B in input has a filter effect on the response.                                                      |
|           | PWR-A  | Affecting Power Bus A (or both A and B).                                                                                     |
|           | PWR-B  | Affecting Power Bus B.                                                                                                       |
|           | ALL    | Any or all of the preceding (command input only).                                                                            |
| conddescr |        | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below. |

**Table 9-37 RTRV-COND-ENV Syntax Description (continued)**

| Parameter | Syntax     | Description                                                                                                                                                   |
|-----------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| condtype  |            | Condition type identifies the type of alarm (maps to cerent15216EdfaLogEventID). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | PWRBUSA    | “Power Bus A (voltage) Alarm” (cerent15216EdfaAlarmPowerBusA).                                                                                                |
|           | PWRBUSB    | “Power Bus B (voltage) Alarm” (cerent15216EdfaAlarmPowerBusB).                                                                                                |
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                           |
| ntfncde   |            | Notification code (maps to cerent15216EdfaAlarmPriority). Possible values are:                                                                                |
|           | MJ         | Major alarm.                                                                                                                                                  |
|           | MN         | Minor alarm.                                                                                                                                                  |
|           | NA         | No alarm.                                                                                                                                                     |
| ocrdat    | m-d        | Date (month-day) of the event occurrence (derived from cerent15216EdfaDateAndTimeString).                                                                     |
| ocrtm     | h-m-s      | Time (hour-minute-second) of the event occurrence (derived from cerent15216EdfaDateAndTimeString).                                                            |
| sid       | string     | Source identifier uniquely identifies the source of a TL1 autonomous command.                                                                                 |
| srveff    |            | Effect on service. Possible values are:                                                                                                                       |
|           | SA         | Service affecting.                                                                                                                                            |
|           | NSA        | Non-service affecting.                                                                                                                                        |
| time      | hh:mm:ss   | Time of origination of TL1 message.                                                                                                                           |

## 9.7.31 RTRV-COND-EQPT

### Command: RTRV-COND-EQPT

**Description:** Generates a report on the condition (state) of general alarms.

### Syntax:

```
RTRV-COND-EQPT: [<tid>]:<aid>:<ctag>:: [<condtype>] [, ,];
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>:<ntfncde>,<condtype>,<srveff>,<ocrdat>,<ocrtm>,,,<conddescr>"
;
```

### Example 9-33 RTRV-COND-EQPT Command and Response

```
Amp01:ONS15216 EDFA2> RTRV-COND-EQPT:Amp01:ALL:229::LCRNT1;
 Amp01 2002-06-20 14:30:00
M 229 COMPLD
 "EQPT:MN,LCRNT1,NSA,6-20,14-25-30,,,\"Excessive Pump1 Current\""
```

Table 9-38 RTRV-COND-EQPT Syntax Description

| Parameter | Syntax     | Description                                                                                                                                                           |
|-----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| aid       |            | EQPT and ALL have same input effect.                                                                                                                                  |
|           | EQPT       | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus).                                                                       |
|           | ALL        | Any or all of the preceding (command input only).                                                                                                                     |
| conddescr |            | Detailed text description of the event. The <i>conddescr</i> is 1 to 64 characters of ASCII text. See <i>condtype</i> below.                                          |
| condtype  |            | Condition type identifies the type of alarm (maps to <i>cerent15216EdfaLogEventID</i> ). Possible <i>condtype</i> and corresponding <i>conddescr</i> (in quotes) are: |
|           | CTMP       | “Case Temperature Out of Range” alarm ( <i>cerent15216EdfaAlarmCtmp</i> ).                                                                                            |
|           | LCRNT1     | “Excessive Pump1 Current” alarm ( <i>cerent15216EdfaAlarmLcrnt1</i> ).                                                                                                |
|           | LCRNT2     | “Excessive Pump2 Current” alarm ( <i>cerent15216EdfaAlarmLcrnt2</i> ).                                                                                                |
|           | LTMP1      | “Excessive Pump1 Temperature” alarm ( <i>cerent15216EdfaAlarmLtmp1</i> ).                                                                                             |
|           | LTMP2      | “Excessive Pump2 Temperature” alarm ( <i>cerent15216EdfaAlarmLtmp2</i> ).                                                                                             |
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                                   |
| ntfncde   |            | Notification code (maps to <i>cerent15216EdfaAlarmPriority</i> ). Possible values are:                                                                                |
|           | MJ         | Major alarm.                                                                                                                                                          |
|           | MN         | Minor alarm.                                                                                                                                                          |
|           | NA         | No alarm.                                                                                                                                                             |
| ocrdat    | m-d        | Date (month-day) of the event occurrence (derived from <i>cerent15216EdfaDateAndTimeString</i> ).                                                                     |
| ocrtm     | h-m-s      | Time (hour-minute-second) of the event occurrence (derived from <i>cerent15216EdfaDateAndTimeString</i> ).                                                            |
| sid       | string     | Source identifier uniquely identifies the source of a TL1 autonomous command.                                                                                         |
| srveff    |            | Effect on service. Possible values are:                                                                                                                               |
|           | SA         | Service affecting.                                                                                                                                                    |
|           | NSA        | Non-service affecting.                                                                                                                                                |
| time      | hh:mm:ss   | Time of origination of TL1 message.                                                                                                                                   |

## 9.7.32 RTRV-DFLT-SECU

**Command:** RTRV-DFLT-SECU

**Description:** Retrieves the timeout value(s) for user access level(s).

**Syntax:**

```
RTRV-DFLT-SECU: [<tid>]:<aid>:<ctag>;
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>:AL=<al>,TMOUT=<timeout>"
;
```

### Example 9-34 RTRV-DFLT-SECU Command and Response

```
Amp01:ONS15216 EDFA2> RTRV-DFLT-SECU:Amp01:ALL:123;
Amp01 2002-01-12 08:01:05
M 123 COMPLD
"EQPT:AL=R, TMOUT=60"
"EQPT:AL=RW, TMOUT=30"
"EQPT:AL=RWA, TMOUT=15"
;
```

**Table 9-39 RTRV-DFLT-SECU Syntax Description**

| Parameter | Syntax     | Description                                                                                                                                        |
|-----------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                |
| time      | hh:mm:ss   | Time of origination of TL1 message.                                                                                                                |
| aid       |            | EQPT and ALL have same input effect.                                                                                                               |
|           | EQPT       | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus).                                                    |
|           | ALL        | Any or all of the preceding (command input only).                                                                                                  |
| al        |            | Access level of the user. See <a href="#">“Summary of Security Permissions for TL1 Commands”</a> section on page 9-6 for access level permissions. |
|           | R          | Read only privileges.                                                                                                                              |
|           | RW         | Read and write privileges.                                                                                                                         |
|           | RWA        | Read, write, and administrative privileges.                                                                                                        |
| timeout   | integer    | Timeout in minutes.                                                                                                                                |



## 9.7.33 RTRV-DWDM

### Command: RTRV-DWDM

**Description:** Retrieves the ONS 15216 EDFA2 optical control configuration.

### Syntax:

```
RTRV-DWDM: [<tid>]:<aid>:<ctag>;
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>:INPWRMICROW=<inputpoweruw>,INPWRDBM=<inputpowerdbm>,OUTPWRMILLIW=<outputpowermw>
,OUTPWRDBM=<outputpowerdbm>,PUMP1CTRLMODE=<pump1ctrlmode>,PUMP1CTRLVALUE=<pump1ctrlvalue>,
PUMP2CTRLMODE=<pump2ctrlmode>,PUMP2CTRLVALUE=<pump2ctrlvalue>,OVERALLGAINMEASURED=<gainmea
sured>,PREATTMEASURED=<preattmeasured>"
;
```

### Example 9-35 RTRV-DWDM Command and Response

```
Amp01:ONS15216 EDFA2> RTRV-DWDM: Amp01: ALL: 123 ;
 Amp01 2002-06-20 14:30:00
M 124 COMPLD
 "1:INPWRMICROW=264,INPWRDBM=-1578,OUTPWRMILLIW=172,OUTPWRDBM=237,PUMP1CTRLMODE=GAINTEMP
,PUMP1CTRLVALUE=169,PUMP2CTRLMODE=GAINTEMP,PUMP2CTRLVALUE=169,OVERALLGAINMEASURED=169,PREA
TTMEASURED=60"
;
```

**Table 9-40 RTRV-DWDM Syntax Description**

| Parameter      | Syntax           | Description                                                            |
|----------------|------------------|------------------------------------------------------------------------|
| date           | yyyy-mm-dd       | Date of origination of TL1 message.                                    |
| time           | hh:mm:ss         | Time of origination of TL1 message.                                    |
| aid            |                  | 1 and ALL have same input effect.                                      |
|                | 1                | Directly affecting the optical signal.                                 |
|                | ALL              | Any or all of the preceding (command input only).                      |
| inputpoweruw   | 0 - 99999        | Input power (signal) in units of 10 microW (cerent15216EdfaInPoweruW). |
| inputpowerdbm  | -999999 - 999999 | Input power (signal) in units of 100 dBm (cerent15216EdfaInPowerdBm).  |
| outputpowermw  | 0 - 999999       | Output power in units of 100 mW (cerent15216EdfaOutPowermW).           |
| outputpowerdbm | -99999 - 99999   | Output power in units of 100 dBm (cerent15216EdfaOutPowerdBm).         |

Table 9-40 RTRV-DWDM Syntax Description (continued)

| Parameter                         | Syntax   | Description                                                                                                                             |
|-----------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------|
| pump1ctrlmode,<br>pump2ctrlmode   |          | Pump 1 or pump 2 control mode (maps to cerent15216EdfaPumpCfgControlMode for the corresponding pump). Possible values are:              |
|                                   | CRNT     | Constant Pump Current mode (cerent15216EdfaPumpCfgControlMode set to constCurrent).                                                     |
|                                   | PWR      | Constant Pump Power mode (cerent15216EdfaPumpCfgControlMode set to constPower).                                                         |
|                                   | OPWR     | Constant Output Power mode (cerent15216EdfaPumpCfgControlMode set to constOutputPower). A valid mode only for pump 2.                   |
|                                   | GAINTEMP | Constant Gain Temperature Compensated mode (manufacturer default) (cerent15216EdfaPumpCfgControlMode set to constGainTempComp).         |
|                                   | IDLE     | Pump is shut down (cerent15216EdfaPumpCfgControlMode set to idle).                                                                      |
| pump1ctrlvalue,<br>pump2ctrlvalue |          | Pump 1 or pump 2 control value. This value's interpretation depends on the control mode of the corresponding pump. Possible values are: |
|                                   | 0 - 300  | Current value in mA when mode is CRNT (gets cerent15216EdfaPumpCfgConstPumpCurrent).                                                    |
|                                   | 0 - 100  | Pump power in mW when mode is PWR (gets cerent15216EdfaPumpCfgConstPumpPower).                                                          |
|                                   | 0 - 650  | Output power in units of 10 mW when mode is OPWR (gets cerent15216EdfaPumpCfgConstOutPower).                                            |
| gainmeasured                      | 0 - 230  | Value of gain in units of 10 dB when mode is GAINTEMP (gets cerent15216EdfaConstGainOverallGainMeasured).                               |
| preattmeasured                    | 0 - 110  | Gain pre-attenuation value in units of 10 dB (gets cerent15216EdfaVariableGainPreAttenuationMeasured).                                  |

## 9.7.34 RTRV-ENV

**Command:** RTRV-ENV

**Description:** Retrieves the ONS 15216 EDFA2 environmental parameter configuration.

**Syntax:**

```
RTRV-ENV: [<tid>]:<aid>:<ctag>;
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>:PWRBUSMODE=<pwrbusmode>"
;
```

**Example 9-36 RTRV-ENV Command and Response**

```
Amp01:ONS15216 EDFA2> RTRV-ENV:Amp01:ALL:123;
 Amp01 2002-06-20 14:30:00
M 123 COMPLD
 "PWR-B:PWRBUSMODE=DUPLEX"
;
```

**Table 9-41 RTRV-ENV Syntax Description**

| Parameter  | Syntax     | Description                                                                                                          |
|------------|------------|----------------------------------------------------------------------------------------------------------------------|
| date       | yyyy-mm-dd | Date of origination of TL1 message.                                                                                  |
| time       | hh:mm:ss   | Time of origination of TL1 message.                                                                                  |
| aid        |            | PWR-A, PWR-B, and ALL have same input effect.                                                                        |
|            | PWR-A      | Affecting Power Bus A (or both A and B).                                                                             |
|            | PWR-B      | Affecting Power Bus B.                                                                                               |
|            | ALL        | Any or all of the preceding (command input only).                                                                    |
| pwrbusmode |            | Power bus mode setting (cerent15216EdfaPowerBusMode). Possible values are:                                           |
|            | SIMPLEX    | Simplex mode. Requires power only to bus A (cerent15216EdfaPowerBusMode set to simplex).                             |
|            | DUPLEX     | Duplex mode (manufacturer default). Requires power to both bus A and B. (cerent15216EdfaPowerBusMode set to duplex). |

## 9.7.35 RTRV-HDR

**Command: RTRV-HDR**

**Description:** Retrieves header. Sends standard keep-alive message used to ping the ONS 15216 EDFA2. It also returns the current date, time, and sid/tid name of the ONS 15216 EDFA2 in the reply.

**Syntax:**

```
RTRV-HDR:[<tid>]::<ctag>;
 <sid> <date> <time>
M <ctag> COMPLD
;
```

**Example 9-37 RTRV-HDR Command and Response**

```
Amp01:ONS15216 EDFA2> RTRV-HDR:Amp01::100;
 Amp01 2001-06-08 08:10:50
M 100 COMPLD
;
```

**Table 9-42 RTRV-HDR Syntax Description**

| Parameter | Syntax     | Description                         |
|-----------|------------|-------------------------------------|
| date      | yyyy-mm-dd | Date of origination of TL1 message. |
| time      | hh:mm:ss   | Time of origination of TL1 message. |

## 9.7.36 RTRV-INV

**Command:** RTRV-INV

**Description:** Retrieves the inventory information of the ONS 15216 EDFA2.

**Syntax:**

```
RTRV-INV:[<tid>]:<aid>:<ctag>;
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>:CLEI=<cleicode>,DESCR=<descr>,NAME=<name>,HARDWAREREV=<hwrev>,
FIRMWAREREV=<fwrev>,SOFTWAREREV=<swrev>,SERIALNUM=<serialnum>,MFGNAME=<mfg>,MODELNAME=<model>"
;
```

### Example 9-38 RTRV-INV Command and Response

```
Amp01:ONS15216 EDFA2> RTRV-INV:Amp01:ALL:123;
Amp01 2002-01-12 08:01:05
M 123 COMPLD
 "EQPT:CLEI=IPT01AA0AAA,DESCR=ONS15216EDFA2,NAME=Amp01,HARDWAREREV=v3.0.0,
FIRMWAREREV=v1.3.1,SOFTWAREREV=v2.1.7,SERIALNUM=DIT0533000P,MFGNAME=Cisco
Systems,MODELNAME=511112"
;
```

**Table 9-43 RTRV-INV Syntax Description**

| Parameter | Syntax     | Description                                                                                     |
|-----------|------------|-------------------------------------------------------------------------------------------------|
| date      | yyyy-mm-dd | Date of origination of TL1 message.                                                             |
| time      | hh:mm:ss   | Time of origination of TL1 message.                                                             |
| aid       |            | EQPT and ALL have same input effect.                                                            |
|           | EQPT       | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus). |
|           | ALL        | Any or all of the preceding (command input only).                                               |
| cleicode  | string     | CLEI code (cerent15216EdfaCLEI).                                                                |
| descr     | string     | System description (cerent15216EdfaPhysicalDescr).                                              |
| fwrev     | string     | Firmware revision number (cerent15216EdfaPhysicalFirmwareRev).                                  |
| hwrev     | string     | Hardware revision number (cerent15216EdfaPhysicalHardwareRev).                                  |
| mfg       | string     | Manufacturer name (cerent15216EdfaPhysicalMfgName).                                             |
| model     | string     | Model name (cerent15216EdfaPhysicalModelName).                                                  |
| name      | string     | System's sid/tid name (does not map to an SNMP attribute).                                      |
| serialnum | string     | System serial number (cerent15216EdfaPhysicalSerialNum).                                        |
| swrev     | string     | Software revision number (cerent15216EdfaPhysicalSoftwareRev).                                  |

## 9.7.37 RTRV-NE-GEN

**Command:** RTRV-NE-GEN

**Description:** Retrieves general parameters of the ONS 15216 EDFA2. Retrieves sid/tid name, IP address and mask, and default router information. Also retrieves the boot table content.

**Syntax:**

```
RTRV-NE-GEN:[<tid>]::<ctag>;
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>:NAME=<name>, IPADDR=<ipaddr>, IPMASK=<ipmask>, DEFRTTR=<defrtr>,
BOOTRECORDTYPE1=<bootrectype1>, BOOTFILENAME1=<bootfilename1>, BOOTIPADDR1=<bootipaddr1>,
BOOTRECORDTYPE2=<bootrectype2>, BOOTFILENAME2=<bootfilename2>,
BOOTIPADDR2=<bootipaddr2>, CLI=<cli>"
;
```

### Example 9-39 RTRV-NE-GEN Command and Response

```
Amp01:ONS15216 EDFA2> RTRV-NE-GEN:Amp01::123;
 Amp01 2002-01-12 08:01:05
M 123 COMPLD
 "EQPT:NAME=Amp01, IPADDR=172.22.87.100, IPMASK=255.255.255.0, DEFRTTR=172.22
.87.2, BOOTRECORDTYPE1=FLASH, BOOTFILENAME1=15216EdfaSw_2.1.0, BOOTIPADDR1=0.0.0.0,
BOOTRECORDTYPE2=TFTP, BOOTFILENAME2=bin/15216EdfaSw_2.0.1, BOOTIPADDR2=1
72.22.128.249, CLI=TL1"
;
```

**Table 9-44 RTRV-NE-GEN Syntax Description**

| Parameter     | Syntax | Description                                                                                                       |
|---------------|--------|-------------------------------------------------------------------------------------------------------------------|
| aid           |        | Always EQPT.                                                                                                      |
|               | EQPT   | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus).                   |
| name          | string | System's sid/tid name.                                                                                            |
| ipaddr        | string | IP address of the system (cerent15216EdfaSromIpMgmtEnetAddress).                                                  |
| ipmask        | string | Subnet mask of the system (cerent15216EdfaSromIpMgmtEnetSubNetMask).                                              |
| defrtr        | string | IP address of the default router (cerent15216EdfaSromIpMgmtDefaultRouterAddress).                                 |
| bootrectype1  |        | Boot record type (cerent15216EdfaBootTest for first entry). Possible values are:                                  |
|               | FLASH  | Boot from flash.                                                                                                  |
|               | TFTP   | Boot through TFTP.                                                                                                |
| bootfilename1 | string | Boot file name (cerent15216EdfaBootTestFileName for first entry). File names are case sensitive.                  |
| bootipaddr1   | string | IP address to boot from if <i>bootrectype1</i> is set to TFTP (cerent15216EdfaBootTestIpAddress for first entry). |

**Table 9-44 RTRV-NE-GEN Syntax Description (continued)**

| Parameter     | Syntax | Description                                                                                                                                     |
|---------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| bootrectype2  |        | Boot record type (cerent15216EdfaBootTest for second entry). Possible values are:                                                               |
|               | FLASH  | Boot from flash.                                                                                                                                |
|               | TFTP   | Boot through TFTP.                                                                                                                              |
| bootfilename2 | string | Boot file name (cerent15216EdfaBootTestFileName for second entry). File names are case sensitive.                                               |
| bootipaddr2   | string | IP address to boot from if <i>bootrectype2</i> is set to TFTP (cerent15216EdfaBootTestIpAddress for second entry).                              |
| cli           |        | Default type of command line interface for all EIA/TIA-232 and default telnet port user sessions with the ONS 15216 EDFA2. Possible values are: |
|               | TL1    | TL1shell interface (manufacturer default).                                                                                                      |
|               | ASH    | ASH shell interface – ONS 15216 EDFA2's native interface.                                                                                       |

## 9.7.38 RTRV-RFILE

**Command:** RTRV-RFILE

**Description:** Lists a specific file or all files on the flash file system of the ONS 15216 EDFA2.

**Syntax:**

```
RTRV-RFILE: [<tid>]::<ctag>:: [<localfilename>+];
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>:<localfilename>"
;
```

### Example 9-40 RTRV-RFILE Command and Response (List all Files)

```
Amp01:ONS15216 EDFA2> RTRV-RFILE:Amp01::123::;
 Amp01 2002-01-12 08:01:05
M 123 COMPLD
 "EQPT:snmp.cfg,15216EdfaSw_2.1.0,passwd"
;
```

### Example 9-41 RTRV-RFILE Command and Response (List a Specific File)

```
Amp01:ONS15216 EDFA2> RTRV-RFILE:Amp01::123::snmp.cfg;
 Amp01 2002-01-12 08:01:05
M 123 COMPLD
 "EQPT:snmp.cfg"
;
```

**Table 9-45 RTRV-RFILE Syntax Description**

| Parameter     | Syntax | Description                                                                                                                                                                                                                                               |
|---------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| aid           |        | Always EQPT.                                                                                                                                                                                                                                              |
|               | EQPT   | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus).                                                                                                                                                           |
| localfilename | string | Name of the file on the flash file system of the ONS 15216 EDFA2 that is to be listed. A null value in the request means all files are to be listed. A null value in the response means the file specified does not exist. File names are case sensitive. |

## 9.7.39 RTRV-TH-DWDM

**Command:** RTRV-TH-DWDM

**Description:** Retrieves optical threshold and set point values for the ONS 15216 EDFA2.

**Syntax:**

```
RTRV-TH->][,][,];
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>,DWDM:<thresholdtype>,,,<thresholdvalue>"
;
```

### Example 9-42 RTRV-TH-DWDM Command and Response

```
Amp01:ONS15216 EDFA2> RTRV-TH-DWDM:Amp01:ALL:123::LPOUTDEV;
 Amp01 2001-06-08 09:00:05
M 123 COMPLD
 "1,DWDM:LPOUTDEV,, ,1000"
;
```

**Table 9-46 RTRV-TH-DWDM Syntax Description**

| Parameter | Syntax     | Description                                       |
|-----------|------------|---------------------------------------------------|
| date      | yyyy-mm-dd | Date of origination of TL1 message.               |
| time      | hh:mm:ss   | Time of origination of TL1 message.               |
| aid       |            | 1 and ALL have same input effect.                 |
|           | 1          | Directly affecting the optical signal.            |
|           | ALL        | Any or all of the preceding (command input only). |

Table 9-46 RTRV-TH-DWDM Syntax Description (continued)

| Parameter                                       | Syntax     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| thresholdtype<br>and<br>thresholdvalue<br>pairs |            | Type of threshold or set point that is to be retrieved. A null value is equivalent to ALL. Possible to specify values for one or more of the following:                                                                                                                                                                                                                                                                                                                |
|                                                 | LOSHYST    | Loss of signal (input power) hysteresis (cerent15216EdfaLOSHysteresis).<br><br><i>thresholdvalue</i> can be between 0 and 1000, with default of 100, in units of 100 dBm.                                                                                                                                                                                                                                                                                              |
|                                                 | LOSTH      | Loss of signal (input power) threshold (cerent15216EdfaLOSThreshold).<br><br><i>thresholdvalue</i> can be between -3100 and -1500, with default of -3000, in units of 100 dBm.                                                                                                                                                                                                                                                                                         |
|                                                 | LPOUTDEV   | Loss of output power deviation (cerent15216EdfaLpoutDeviation).<br><br><i>thresholdvalue</i> can be between 0 and 1000, with default of 200, in units of 100 dBm.                                                                                                                                                                                                                                                                                                      |
|                                                 | LPOUTHYST  | Loss of output power hysteresis (cerent15216EdfaLpoutHysteresis).<br><br><i>thresholdvalue</i> can be between 0 and 1000, with default of 100, in units of 100 dBm.                                                                                                                                                                                                                                                                                                    |
|                                                 | LPOUTSETPT | Loss of output power set point (cerent15216EdfaLpoutSetpoint). This read-only value is only valid when amplifier is in Constant Output Power (OPWR) and Constant Pump Power (PWR) modes. Can be disregarded when in Constant Gain Temperature Compensated (GAINTEMP) or Constant Pump Current (CRNT) mode.<br><br><i>thresholdvalue</i> is read-only and automatically determined by the pump control mode with a possible value between 0 and 1000 in units of 10 mW. |

## 9.7.40 RTRV-TH-ENV

**Command:** RTRV-TH-ENV

**Description:** Retrieves threshold values of the environmental (power bus) parameters of the ONS 15216 EDFA2.

**Syntax:**

```
RTRV-TH-ENV: [<tid>]:<aid>:<ctag>:: [<thresholdtype>] [,] ;
 <sid> <date> <time>
M <ctag> COMPLD
 "<aid>, ENV:<thresholdtype>, , , <thresholdvalue>"
;
```



**Example 9-43 RTRV-TH-ENV Command and Response**

```
Amp01:ONS15216 EDFA2> RTRV-TH-ENV:Amp01:ALL:123::PWRBUSMIN;
Amp01 2002-07-16 14:24:29
M 123 COMPLD
"PWR-A, ENV:PWRBUSMIN, , , 420"
;
```

**Table 9-47 RTRV-TH-ENV Syntax Description**

| Parameter                              | Syntax     | Description                                                                                                                                                     |
|----------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| date                                   | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                             |
| time                                   | hh:mm:ss   | Time of origination of TL1 message.                                                                                                                             |
| aid                                    |            | PWR-A, PWR-B, and ALL have same input effect.                                                                                                                   |
|                                        | PWR-A      | Affecting Power Bus A (or both A and B).                                                                                                                        |
|                                        | PWR-B      | Affecting Power Bus B.                                                                                                                                          |
|                                        | ALL        | Any or all of the preceding (command input only).                                                                                                               |
| thresholdtype and thresholdvalue pairs |            | Type of threshold that is to be retrieved. A null value is equivalent to ALL. Possible to specify values for one or more of the following:                      |
|                                        | PWRBUSMIN  | Power bus minimum voltage (cerent15216EdfaPowerBusDCVoltageMin).<br><i>thresholdvalue</i> can be between 350 and 700, with default of 400, in units of -10 VDC. |
|                                        | PWRBUSMAX  | Power bus maximum voltage (cerent15216EdfaPowerBusDCVoltageMax).<br><i>thresholdvalue</i> can be between 350 and 700, with default of 570, in units of -10 VDC. |

## 9.7.41 RTRV-TH-EQPT

**Command:** RTRV-TH-EQPT**Description:** Retrieves general threshold values for the ONS 15216 EDFA2.**Syntax:**

```
RTRV-TH-EQPT:[<tid>]:<aid>:<ctag>:: [<thresholdtype>] [,] [,] ;
<sid> <date> <time>
M <ctag> COMPLD
"<aid>:<thresholdtype>, , , <thresholdvalue>"
;
```

**Example 9-44 RTRV-TH-EQPT Command and Response**

```
Amp01:ONS15216 EDFA2> RTRV-TH-EQPT:Amp01:ALL:123::MAXCTMP;
Amp01 2001-06-08 09:00:05
M 123 COMPLD
"EQPT:MAXCTMP, , , 60"
;
```

**Table 9-48 RTRV-TH-EQPT Syntax Description**

| Parameter                              | Syntax      | Description                                                                                                                                                  |
|----------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| date                                   | yyyy-mm-dd  | Date of origination of TL1 message.                                                                                                                          |
| time                                   | hh:mm:ss    | Time of origination of TL1 message.                                                                                                                          |
| aid                                    |             | EQPT and ALL have same input effect.                                                                                                                         |
|                                        | EQPT        | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus).                                                              |
|                                        | ALL         | Any or all of the preceding (command input only).                                                                                                            |
| thresholdtype and thresholdvalue pairs |             | Type of threshold or set point that is to be retrieved. A null value is equivalent to ALL. Possible to specify values for one or more of the following:      |
|                                        | MAXCTMP     | Maximum case temperature (cerent15216EdfaCtmpMax).<br><i>thresholdvalue</i> can be between 20 and 70, with default of 65 in units of °C.                     |
|                                        | MAXCTMPHYST | Maximum case temperature hysteresis (cerent15216EdfaCtmpMaxHysteresis).<br><i>thresholdvalue</i> can be between 0 and 10, with default of 1, in units of °C. |
|                                        | MINCTMP     | Minimum case temperature (cerent15216EdfaCtmpMin).<br><i>thresholdvalue</i> can be between -10 and 10, with default of -5, in units of °C.                   |
|                                        | MINCTMPHYST | Minimum case temperature hysteresis (cerent15216EdfaCtmpMinHysteresis).<br><i>thresholdvalue</i> can be between 0 and 10, with default of 1, in units of °C. |

## 9.7.42 RTRV-TOD

**Command:** RTRV-TOD

**Description:** Retrieves the date and time of the ONS 15216 EDFA2.

**Syntax:**

```
RTRV-TOD: [<tid>]::<ctag>[::];
 <sid> <date> <time>
M <ctag> COMPLD
 "<tmody>,<tmtime>,<tmsrcdv>,<tmsrcst>"
;
```

**Example 9-45 RTRV-TOD Command and Response**

```
Amp01:ONS15216 EDFA2> RTRV-TOD:Amp01::123;
 Amp01 2002-06-20 14:30:00
M 123 COMPLD
 "2002,06,20,14,30,00,000,UTC,GPS,IS-ACT"
;
```

**Table 9-49 RTRV-TOD Syntax Description**

| Parameter                                                     | Syntax     | Description                                                                                                                                                           |
|---------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| date                                                          | yyyy-mm-dd | Date of origination of TL1 message.                                                                                                                                   |
| time                                                          | hh:mm:ss   | Time of origination of TL1 message.                                                                                                                                   |
| tmode<br>format:<br>YYYY<br>MM<br>DD<br>HH<br>MM<br>SS<br>sss |            | Time of day of the format: YYYY,MM,DD,HH,MM,SS,sss<br><br>Current calendar year<br>Month<br>Day<br>Hour<br>Minutes<br>Seconds<br>Sub-seconds, currently fixed at 000. |
| tmtime                                                        | UTC        | Type of time, currently fixed at universal coordinated time (UTC), which is the same as Greenwich Mean Time (GMT).                                                    |
| tmsrcdv                                                       | GPS        | Time source deviation, currently fixed at GPS.                                                                                                                        |
| tmsrcst                                                       | IS-ACT     | State of the time source, of the format <primaryState>-<secondaryState> (per Telcordia GR-1093-CORE), currently fixed at IS-ACT (In_Service, Active).                 |

## 9.7.43 RTRV-USER-SECU

**Command:** RTRV-USER-SECU

**Description:** Retrieves the access level of an existing user from the system. Does not return the password.

**Syntax:**

```
RTRV-USER-SECU: [<tid>]:<uid>:<ctag>;
 <sid> <date> <time>
M <ctag> COMPLD
 "<uid>,<al>"
;
```

**Example 9-46 RTRV-USER-SECU Command and Response**

```
Amp01:ONS15216 EDFA2> RTRV-USER-SECU:Amp01:jsmith:123;
 Amp01 2002-05-13 17:23:16
M 123 COMPLD
 "jsmith,RW"
;
```

**Table 9-50 RTRV-USER-SECU Syntax Description**

| Parameter | Syntax | Description                                                                                                                                                                                |
|-----------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| sid       | string | Source identifier uniquely identifies the source of a TL1 autonomous command.                                                                                                              |
| al        |        | Access level of the user. See <a href="#">“Summary of Security Permissions for TL1 Commands”</a> section on page 9-6 for access level permissions.                                         |
|           | R      | Read only privileges.                                                                                                                                                                      |
|           | RW     | Read and write privileges.                                                                                                                                                                 |
|           | RWA    | Read, write, and administrative privileges.                                                                                                                                                |
| uid       | string | User identifier (user name) of the existing user. If no user identifier is specified and the current user has RWA access level, it will list all existing users and their security levels. |

## 9.7.44 SET-ATTR-SECUDFLT

**Command:** SET-ATTR-SECUDFLT

**Description:** Sets the timeout value of user sessions for users with a specific access level. If no communication occurs for this time, the user session is closed by the ONS 15216 EDFA2 TL1 agent. Users affected by changes to the timeout must log out and log in again for the change to take effect.

**Syntax:**

```
SET-ATTR-SECUDFLT: [<tid>]::<ctag>::AL=<al>, TMOUT=<timeout>[,,][,,][,,];
```

### Example 9-47 SET-ATTR-SECUDFLT Command

```
Amp01:ONS15216 EDFA2> SET-ATTR-SECUDFLT:Amp01::123::AL=RW, TMOUT=45;
```

**Table 9-51 SET-ATTR-SECUDFLT Syntax Description**

| Parameter | Syntax | Description                                                                                                                                                               |
|-----------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| al        |        | Access level for which the timeout is being set. See <a href="#">“Summary of Security Permissions for TL1 Commands”</a> section on page 9-6 for access level permissions. |
|           | R      | Read only privileges.                                                                                                                                                     |
|           | RW     | Read and write privileges.                                                                                                                                                |
|           | RWA    | Read, write, and administrative privileges.                                                                                                                               |
| timeout   | 0 - 99 | Value of the timeout in minutes for the corresponding access level. Defaults are:<br>R = 60 min.<br>RW = 30 min.<br>RWA = 15 min.<br>0 means no timeout.                  |

## 9.7.45 SET-TH-DWDM

**Command:** SET-TH-DWDM

**Description:** Sets optical threshold values for the ONS 15216 EDFA2.

**Syntax:**

```
SET-TH-DWDM: [<tid>]:<aid>:<ctag>::<thresholdtype>,<thresholdvalue>[, ,];
```

**Example 9-48 SET-TH-DWDM Command**

```
Amp01:ONS15216 EDFA2> SET-TH-DWDM:Amp01:ALL:123::LOSTH,-1500;
```

**Table 9-52 SET-TH-DWDM Syntax Description**

| Parameter                              | Syntax    | Description                                                                                                                                                                 |
|----------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| aid                                    |           | 1 and ALL have same input effect.                                                                                                                                           |
|                                        | 1         | Directly affecting the optical signal.                                                                                                                                      |
|                                        | ALL       | Any or all of the preceding (command input only).                                                                                                                           |
| thresholdtype and thresholdvalue pairs | string    | Type of threshold that is to be set. The threshold is set to the <i>thresholdvalue</i> that follows the comma. Possible to specify values for one or more of the following: |
|                                        | LOSHYST   | Loss of signal (input power) hysteresis (cerent15216EdfaLOSHysteresis).<br><i>thresholdvalue</i> can be between 0 and 1000, with default of 100, in units of 100 dBm.       |
|                                        | LOSTH     | Loss of signal (input power) threshold (cerent15216EdfaLOSThreshold).<br><i>thresholdvalue</i> can be between -3100 and -1500, with default of -3000, in units of 100 dBm.  |
|                                        | LPOUTDEV  | Loss of output power deviation (cerent15216EdfaLpoutDeviation).<br><i>thresholdvalue</i> can be between 0 and 1000, with default of 200, in units of 100 dBm.               |
|                                        | LPOUTHYST | Loss of output power hysteresis (cerent15216EdfaLpoutHysteresis).<br><i>thresholdvalue</i> can be between 0 and 1000, with default of 100, in units of 100 dBm.             |

## 9.7.46 SET-TH-ENV

**Command:** SET-TH-ENV

**Description:** Sets threshold values of the environmental (power bus) parameters of the ONS 15216 EDFA2.

**Syntax:**

```
SET-TH-ENV: [<tid>]:<aid>:<ctag>::<thresholdtype>,<thresholdvalue>[, ,];
```

**Example 9-49 SET-TH-ENV Command**

```
Amp01:ONS15216 EDFA2> SET-TH-ENV:Amp01:PWR-A:100::PWRBUSMIN,450;
```

**Table 9-53 SET-TH-ENV Syntax Description**

| Parameter                              | Syntax    | Description                                                                                                                                                                 |
|----------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| aid                                    |           | PWR-A, PWR-B, and ALL have same input effect.                                                                                                                               |
|                                        | PWR-A     | Affecting Power Bus A (or both A and B).                                                                                                                                    |
|                                        | PWR-B     | Affecting Power Bus B.                                                                                                                                                      |
|                                        | ALL       | Any or all of the preceding (command input only).                                                                                                                           |
| thresholdtype and thresholdvalue pairs |           | Type of threshold that is to be set. The threshold is set to the <i>thresholdvalue</i> that follows the comma. Possible to specify values for one or more of the following: |
|                                        | PWRBUSMIN | Power bus minimum voltage (cerent15216EdfaPowerBusDCVoltageMin).<br><i>thresholdvalue</i> can be between 350 and 700, with default of 400, in units of -10 VDC.             |
|                                        | PWRBUSMAX | Power bus maximum voltage (cerent15216EdfaPowerBusDCVoltageMax).<br><i>thresholdvalue</i> can be between 350 and 700, with default of 570, in units of -10 VDC.             |

## 9.7.47 SET-TH-EQPT

**Command:** SET-TH-EQPT**Description:** Sets general threshold values for the ONS 15216 EDFA2.**Syntax:**

```
SET-TH-EQPT:[<tid>]:<aid>:<ctag>::<thresholdtype>,<thresholdvalue>[, ,];
```

**Example 9-50 SET-TH-EQPT Command**

```
Amp01:ONS15216 EDFA2> SET-TH-EQPT:Amp01:ALL:123::MAXCTMP,60;
```

**Table 9-54 SET-TH-EQPT Syntax Description**

| Parameter | Syntax | Description                                                                                     |
|-----------|--------|-------------------------------------------------------------------------------------------------|
| aid       |        | EQPT and ALL have same input effect.                                                            |
|           | EQPT   | General parameters of the ONS 15216 EDFA2 (not directly affecting optical signal or power bus). |
|           | ALL    | Any or all of the preceding (command input only).                                               |

Table 9-54 SET-TH-EQPT Syntax Description (continued)

| Parameter                              | Syntax      | Description                                                                                                                                                                 |
|----------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| thresholdtype and thresholdvalue pairs | string      | Type of threshold that is to be set. The threshold is set to the <i>thresholdvalue</i> that follows the comma. Possible to specify values for one or more of the following: |
|                                        | MAXCTMP     | Maximum case temperature (cerent15216EdfaCtmpMax). <i>thresholdvalue</i> can be between 20 and 70, with default of 65 in units of °C.                                       |
|                                        | MAXCTMPHYST | Maximum case temperature hysteresis (cerent15216EdfaCtmpMaxHysteresis). <i>thresholdvalue</i> can be between 0 and 10, with default of 1, in units of °C.                   |
|                                        | MINCTMP     | Minimum case temperature (cerent15216EdfaCtmpMin). <i>thresholdvalue</i> can be between -10 and 10, with default of -5, in units of °C.                                     |
|                                        | MINCTMPHYST | Minimum case temperature hysteresis (cerent15216EdfaCtmpMinHysteresis). <i>thresholdvalue</i> can be between 0 and 10, with default of 1, in units of °C.                   |

## 9.7.48 STA-LOCL-RST

**Command:** STA-LOCL-RST

**Description:** Instructs the ONS 15216 EDFA2 to restore all the manufacturing default settings. The files on the flash file system (FFS), the date and time, the sid/tid name (*name*), and the values of manufacturing calibration are not affected. This command must be followed by the INIT-SYS command to take effect.



### Warning

**This command resets the IP address, deletes the user directory, reverts CISC015 to the default password, and resets other parameters to restore the unit to its state as shipped from manufacturing.**

**Syntax:**

```
STA-LOCL-RST: [<tid>] :: <ctag>;
```

### Example 9-51 STA-LOCL-RST Command

```
Amp01:ONS15216 EDFA2> STA-LOCL-RST:Amp01::10;
```







# Regulatory Compliance and Safety Information

## Regulatory Compliance

**Table A-1 Regulatory Standards Compliance**

| Discipline                                                                                | Standard                                                                        | Description                                                                                                  |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| EMC                                                                                       | ETS 300 132-2: 1996                                                             | Power supply interface at the input to telecommunications equipment; Part 2: Operated by direct current (DC) |
|                                                                                           | ACA AS/NZS3548                                                                  | Conducted Emissions - Class B<br>Radiated Emissions - Class B                                                |
|                                                                                           | EN 300 386-2:1997                                                               |                                                                                                              |
|                                                                                           | EN 55022: 1995 Amendments A1 and A2                                             |                                                                                                              |
|                                                                                           | EN 50082-2:1997                                                                 |                                                                                                              |
|                                                                                           | EN 61000-4-2:1995                                                               |                                                                                                              |
|                                                                                           | EN 61000-4-3: 1997                                                              |                                                                                                              |
|                                                                                           | ENV 50204: 1996                                                                 |                                                                                                              |
|                                                                                           | EN 61000-4-4: 1995                                                              |                                                                                                              |
| EN 61000-4-5: 1995                                                                        |                                                                                 |                                                                                                              |
| EN 61000-4-6: 1996                                                                        |                                                                                 |                                                                                                              |
| FCC Title 47 of the CFR, Part 15, Subpart B for a Class B Digital Device                  | Electromagnetic Compatibility - Radiated Emissions for a Class B Digital Device |                                                                                                              |
| NEBS GR-1089-CORE Issue 2, December 1997, with Revision 1, February 1999 Sections 2 and 3 | Conducted Emissions Requirement<br>Radiated Emissions Requirement               |                                                                                                              |
| VCCI V-1/93. 11, V-2/97. 04, V-4/97, R-1225 and C-1287                                    | VCCI Class B ITE, Radiated Emissions                                            |                                                                                                              |

**Table A-1 Regulatory Standards Compliance (continued)**

| Discipline    | Standard                                                                                           | Description                                                                                                                       |
|---------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Safety        | IEC 60950                                                                                          |                                                                                                                                   |
|               | EN 60950                                                                                           |                                                                                                                                   |
|               | UL 60950                                                                                           |                                                                                                                                   |
|               | CSA-C22.2 No. 60950                                                                                |                                                                                                                                   |
|               | TS 001                                                                                             |                                                                                                                                   |
|               | AS/NZS 3260                                                                                        |                                                                                                                                   |
| Environmental | ETS 300 019-2-1                                                                                    | Storage Temperature Test                                                                                                          |
|               | ETS 300 019-2-2                                                                                    | Transportation Test                                                                                                               |
|               | ETS 300 019-2-3                                                                                    | Operation Test                                                                                                                    |
|               | ETS 300 019-2-4 pr A1                                                                              | Waveform Test - Zone 4 Profile                                                                                                    |
|               | GR-63-Core, Issue 1, October 1995<br>Section 5.1, 5.4 and 5.5                                      |                                                                                                                                   |
| Telecom       | NEBS GR-1089-CORE Issue 2,<br>December 1997 with Revision 1,<br>February 1999 Type 2 Equipment     | Sections 4.2, 4.5, 4.6, 5.2, 5.3, 5.4, 6.0,<br>7.2, 7.3, 7.4, 7.5, 7.6, 8.1, 8.2, 9.1, 9.2,<br>9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.10 |
|               | Network Equipment Development<br>Standards (NEDS) MLID #9069,<br>September 28, 2001, Version 3.1.1 |                                                                                                                                   |

## Translated Safety Warnings

This appendix contains the translated warnings that are required for this publication. These warnings are required to comply with the regulatory agency requirements of several countries.

The translated safety warnings are listed in the following order:

1. English
2. Dutch
3. Finnish
4. French
5. German
6. Italian
7. Norwegian
8. Portuguese
9. Spanish
10. Swedish
11. Chinese (not all warnings translated)
12. Japanese (not all warnings translated)
13. Korean (not all warnings translated)

The safety warnings contained in this document are:

- Warning Definition
- DC Power Supply Warning
- Installation Warning
- Power Cord Warning
- No On/Off Switch Warning
- SELV Circuit Warning
- Laser Radiation Warning
- Laser Beam Warning
- Power Cabling Warning
- Grounded Equipment Warning
- Ground Connection Warning
- Jewelry Removal Warning
- Qualified Personnel Warning
- Supply Circuit Warning
- Invisible Laser Radiation Warning
- Incorrect Connection Warning
- Ground Conductor Warning
- Voltages on DC-input Power Supply Terminals
- More Than One Power Supply
- Cisco ONS 15216 EDFA2 Rack Installation
- Exposed DC Power Wire Warning
- 48 VDC Power System
- Chassis Power Connection
- Cisco ONS 15216 EDFA2 Temperature Requirement
- VCCI Compliance for Class B Equipment
- SELV-IEC 60950 DC Power Supply Warning
- Cisco ONS 15216 EDFA2 Power Circuit Overload Warning
- Product Disposal Warning
- Energy Hazard
- Unit Grounding Protection Warning
- DC Power Disconnection Warning
- Ground Wire Warning
- Declaration of Conformity with Regard to the Directives 73/23/EEC and 89/336/EEC as amended by Directive 93/68/EEC
- Declaration of Conformity to R&TTE Directive 1999/5/EEC for the European Community, Switzerland, Norway, Iceland and Liechtenstein
- Class B EMC Warning

- Safety Requirements Warning
- Laser Radiation Warning
- Fiber Disconnect Sequence Warning
- Optical Connector Warning
- Optical Connector Disconnect Warning
- Eye Damage Warning
- Static Electricity Warning
- Connector Cleaning Warning
- Cable Connection Sequence Warning
- Module Removal Warning
- DC Power SELV Requirement Warning
- Reinforced Insulation Warning
- Power Supply Voltage Warning
- DC Power Supply Connection Warning

## Warning Definition



### Warning

This warning symbol means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.

### Waarschuwing

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.

### Varoitus

Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Attention</b>     | <b>Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document <i>Regulatory Compliance and Safety Information</i> (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.</b> |
| <b>Warnung</b>       | <b>Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument <i>Regulatory Compliance and Safety Information</i> (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.</b>                    |
| <b>Avvertenza</b>    | <b>Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento <i>Regulatory Compliance and Safety Information</i> (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.</b>                                                          |
| <b>Advarsel</b>      | <b>Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet <i>Regulatory Compliance and Safety Information</i> (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.</b>                                                           |
| <b>Aviso</b>         | <b>Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento <i>Regulatory Compliance and Safety Information</i> (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.</b>                                                              |
| <b>¡Advertencia!</b> | <b>Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado <i>Regulatory Compliance and Safety Information</i> (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.</b>                                           |
| <b>Varning!</b>      | <b>Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förekommer i denna publikation i dokumentet <i>Regulatory Compliance and Safety Information</i> (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.</b>                                                                                                         |

## DC Power Supply Warning



### Warning

When stranded wiring is required, use approved wiring terminations, such as closed-loop or spade-type with upturned lugs. These terminations should be the appropriate size for the wires and should clamp both the insulation and conductor.

### Waarschuwing

Wanneer geslagen bedrading vereist is, dient u bedrading te gebruiken die voorzien is van goedgekeurde aansluitpunten, zoals het gesloten-lus type of het grijperschop type waarbij de aansluitpunten omhoog wijzen. Deze aansluitpunten dienen de juiste maat voor de draden te hebben en dienen zowel de isolatie als de geleider vast te klemmen.

### Varoitus

Jos säikeellinen johdin on tarpeen, käytä hyväksyttyä johdinliitäntää, esimerkiksi suljettua silmukkaa tai kourumaista liitäntää, jossa on ylöspäin käännetyt kiinnityskorvat. Tällaisten liitäntöjen tulee olla kooltaan johtimiin sopivia ja niiden tulee puristaa yhteen sekä eristeen että johdinosan.

### Attention

Quand des fils torsadés sont nécessaires, utiliser des douilles terminales homologuées telles que celles à circuit fermé ou du type à plage ouverte avec cosses rebroussées. Ces douilles terminales doivent être de la taille qui convient aux fils et doivent être refermées sur la gaine isolante et sur le conducteur.

### Warnung

Wenn Litzenverdrahtung erforderlich ist, sind zugelassene Verdrahtungsabschlüsse, z.B. für einen geschlossenen Regelkreis oder gabelförmig, mit nach oben gerichteten Kabelschuhen zu verwenden. Diese Abschlüsse sollten die angemessene Größe für die Drähte haben und sowohl die Isolierung als auch den Leiter festklemmen.

### Avvertenza

Quando occorre usare trecce, usare connettori omologati, come quelli a occhio o a forcilla con linguette rivolte verso l'alto. I connettori devono avere la misura adatta per il cablaggio e devono serrare sia l'isolante che il conduttore.

### Advarsel

Hvis det er nødvendig med flertrådede ledninger, brukes godkjente ledningsavslutninger, som for eksempel lukket sløyfe eller spadetype med oppoverbøyde kabelsko. Disse avslutningene skal ha riktig størrelse i forhold til ledningene, og skal klemme sammen både isolasjonen og lederen.

### Aviso

Quando forem requeridas montagens de instalação elétrica de cabo torcido, use terminações de cabo aprovadas, tais como, terminações de cabo em circuito fechado e planas com terminais de orelha voltados para cima. Estas terminações de cabo deverão ser do tamanho apropriado para os respectivos cabos, e deverão prender simultaneamente o isolamento e o fio condutor.

### ¡Advertencia!

Cuando se necesite hilo trenzado, utilizar terminales para cables homologados, tales como las de tipo "bucle cerrado" o "espada", con las lengüetas de conexión vueltas hacia arriba. Estos terminales deberán ser del tamaño apropiado para los cables que se utilicen, y tendrán que sujetar tanto el aislante como el conductor.

### Varning!

När flertrådiga ledningar krävs måste godkända ledningskontakter användas, t.ex. kabelsko av sluten eller öppen typ med uppåtvänd tapp. Storleken på dessa kontakter måste vara avpassad till ledningarna och måste kunna hålla både isoleringen och ledaren fastklämda.

## Installation Warning


**Warning**

Read the installation instructions before you connect the system to its power source.

**Waarschuwing**

Raadpleeg de installatie-aanwijzingen voordat u het systeem met de voeding verbindt.

**Varoitus**

Lue asennusohjeet ennen järjestelmän yhdistämistä virtalähteeseen.

**Attention**

Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

**Warnung**

Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen.

**Avvertenza**

Consultare le istruzioni di installazione prima di collegare il sistema all'alimentatore.

**Advarsel**

Les installasjonsinstruksjonene før systemet kobles til strømkilden.

**Aviso**

Leia as instruções de instalação antes de ligar o sistema à sua fonte de energia.

**¡Advertencia!**

Ver las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

**Varning!**

Läs installationsanvisningarna innan du kopplar systemet till dess strömförsörjningsenhet.

**警告**

システムを電源に接続する前に、インストラクションについての説明書を必ずお読みください。

## Power Cord Warning


**Warning**

This unit might have more than one power cord. To reduce the risk of electric shock, disconnect the two power supply cords before servicing the unit.

**Waarschuwing**

Dit toestel kan meer dan één netsnoer hebben. Om het risico van een elektrische schok te verminderen, dient u de stekkers van de twee netsnoeren uit het stopcontact te halen voordat u het toestel een servicebeurt geeft.

**Varoitus**

Tässä laitteessa saattaa olla useampi kuin yksi virtajohto. Irrota molemmat virtalähteestä tulevat johtimet ennen laitteen huoltamista, jotta vältät sähköiskun vaaran.

**Attention**

Il est possible que cette unité soit munie de plusieurs cordons d'alimentation. Pour éviter les risques d'électrocution, débrancher les deux cordons d'alimentation avant de réparer l'unité.

**Warnung**

Diese Einheit hat möglicherweise mehr als ein Netzkabel. Zur Verringerung der Stromschlaggefahr trennen Sie beide Netzgerätekabel ab, bevor Sie die Einheit warten.

|                      |                                                                                                                                                                                                                    |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Avvertenza</b>    | <b>Questa unità potrebbe essere dotata di più di un cavo di alimentazione. Per ridurre il rischio di scossa elettrica, scollegare i due cavi di alimentazione prima di procedere alla manutenzione dell'unità.</b> |
| <b>Advarsel</b>      | <b>Denne enheten kan være utstyrt med mer enn én strømledning. Koble fra de to strømledningene før det utføres reparasjonsarbeid på enheten for å redusere faren for elektriske støt.</b>                          |
| <b>Aviso</b>         | <b>Esta unidade poderá ter mais do que um cabo de alimentação. Para reduzir o risco de choque eléctrico, desligue os dois cabos de alimentação antes de efectuar reparações na unidade.</b>                        |
| <b>¡Advertencia!</b> | <b>Puede ser que este equipo posea más de un cable de alimentación. Para reducir el riesgo de descarga eléctrica, desenchufar los dos cables antes de proceder al mantenimiento de la unidad.</b>                  |
| <b>Varning!</b>      | <b>Denna enhet kan vara försedd med mer än en nätsladd. För att minska risken för elektriska stötar skall båda nätsladdarna dras ur innan du utför underhållsarbete på enheten.</b>                                |
| <b>警告使用者</b>         | 這台裝置可能有一條以上的電源線。為了減少觸電的危險，修理該裝置之前，請斷開兩條電                                                                                                                                                                           |
| <b>警告</b>            | この装置には2本以上の電源コードが付いていることがあります。感電などの事故防止のため、装置を扱う前に2本の電源コードを切り離してください。                                                                                                                                              |
| <b>주의</b>            | 이 장치는 한 개 이상의 전력코드를 가진 것도 있습니다. 이 장치를 수리나 점검할 때는, 감전을 방지하기 위해 사전에 두 개의 전원코드를 절연시키십시오.                                                                                                                              |

## No On/Off Switch Warning



### Warning

**Unplug the power cord before you work on a system that does not have an on/off switch.**

### Waarschuwing

**Voordat u aan een systeem werkt dat geen aan/uit schakelaar heeft, dient u de stekker van het netsnoer uit het stopcontact te halen.**

### Varoitus

**Ennen kuin teet mitään sellaiselle järjestelmälle, jossa ei ole kaksiasentokytkintä, kytke irti virtajohto.**

### Attention

**Avant de travailler sur un système non équipé d'un commutateur marche-arrêt, débrancher le cordon d'alimentation.**

### Warnung

**Bevor Sie an einem System ohne Ein/Aus-Schalter arbeiten, ziehen Sie das Netzkabel heraus.**

### Avvertenza

**Prima di lavorare su un sistema che non è dotato di un interruttore on/off, scollegare il cavo di alimentazione.**

### Advarsel

**Før det skal utføres arbeid på et system som ikke har en av/på-bryter, skal strømledningen trekkes ut.**



|                      |                                                                                                                                                  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Aviso</b>         | <b>Antes de começar a trabalhar num sistema que não possua um interruptor ON/OFF, desligue o cabo de alimentação.</b>                            |
| <b>¡Advertencia!</b> | <b>Antes de trabajar sobre cualquier sistema que carezca de interruptor de Encendido/Apagado (ON/OFF), desenchufar el cable de alimentación.</b> |
| <b>Varning!</b>      | <b>Dra ur nätsladden innan du utför arbete på ett system utan strömbrytare.</b>                                                                  |
| <b>警告</b>            | <b>オン/オフスイッチのない装置を扱う前には、必ず電源コードを抜いてください。</b>                                                                                                     |

## SELV Circuit Warning



### Warning

The port labeled "Ethernet," "10BaseT," "Token Ring," "Console," and "AUX" are safety extra-low voltage (SELV) circuits. SELV circuits should only be connected to other SELV circuits. Because the BRI circuits are treated like telephone-network voltage, avoid connecting the SELV circuit to the telephone network voltage (TNV) circuits.

### Waarschuwing

De poorten die "Ethernet", "10BaseT", "Token Ring", "Console" en "AUX" zijn gelabeld, zijn veiligheidscircuits met extra lage spanning (genaamd SELV = Safety Extra-Low Voltage). SELV-circuits mogen alleen met andere SELV-circuits verbonden worden. Omdat de BRI-circuits op dezelfde manier als telefoonnetwerkspanning behandeld worden, mag u het SELV-circuit niet verbinden met de telefoonnetwerkspanning (TNV) circuits.

### Varoitus

Portit, joissa on nimet "Ethernet", "10BaseT", "Token Ring", "Console" ja "AUX", ovat erityisen pienen jännityksen omaavia turvallisuuspirejä (SELV-piirejä). Tällaiset SELV-piirit tulee yhdistää ainoastaan muihin SELV-piireihin. Koska perusluokan liitäntöjen (Basic Rate Interface- eli BRI-liitännät) jännite vastaa puhelinverkoston jännitettä, vältä SELV-piirin yhdistämistä puhelinverkoston jännitepiireihin (TNV-piireihin).

### Attention

Les ports étiquetés « Ethernet », « 10BaseT », « Token Ring », « Console » et « AUX » sont des circuits de sécurité basse tension (Safety Extra-Low Voltage ou SELV). Les circuits SELV ne doivent être interconnectés qu'avec d'autres circuits SELV. Comme les circuits BRI sont considérés comme des sources de tension de réseau téléphonique, éviter de connecter un circuit SELV à un circuit de tension de réseau téléphonique (telephone network voltage ou TNV).

### Warnung

Die mit "Ethernet", "10BaseT", "Token Ring", "Console" und "AUX" beschrifteten Buchsen sind Sicherheitskreise mit Sicherheitskleinspannung (Safety Extra-Low Voltage, SELV). SELV-Kreise sollten ausschließlich an andere SELV-Kreise angeschlossen werden. Da die BRI-Kreise wie Telefonnetzspannungen behandelt werden, ist der SELV-Kreis nicht an Telefonnetzspannungskreise (TNV) anzuschließen.

### Avvertenza

Le porte contrassegnate da "Ethernet", "10BaseT", "TokenRing", "Console" e "AUX" sono circuiti di sicurezza con tensione molto bassa (SELV). I circuiti SELV devono essere collegati solo ad altri circuiti SELV. Dato che i circuiti BRI vengono trattati come tensioni di rete telefonica, evitare di collegare il circuito SELV ai circuiti in cui è presente le tensione di rete telefonica (TNV).

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Advarsel</b>      | Utgangene merket "Ethernet", "10BaseT", "Token Ring", "Console" og "AUX" er lavspenning (SELV) for ekstra sikkerhet. SELV-kretser skal kun kobles til andre SELV-kretser. Fordi BRI-kretsene håndteres som telenettspenning, unngå å koble SELV-kretsen til kretser for telenettspenning (TNV).                                                                                                                                                        |
| <b>Aviso</b>         | As portas "Ethernet", "10BaseT", "Token Ring", "Console", and "AUX" são circuitos de segurança de baixa tensão (SELV). Estes circuitos deverão ser apenas ligados a outros circuitos SELV. Devido ao facto de os circuitos BRI (Interface de Ritmo Básico) serem tratados como sendo de tensão equivalente à da rede telefónica, evite ligar o circuito SELV aos circuitos TNV (tensão de rede telefónica).                                            |
| <b>¡Advertencia!</b> | Los puertos "Ethernet", "10BaseT", "Token Ring", "Console" y "AUX" son circuitos de muy baja señal que garantizan ausencia de peligro (Safety Extra-Low Voltage = SELV). Estos circuitos SELV deben ser conectados exclusivamente con otros también de tipo SELV. Puesto que los circuitos tipo BRI se comportan como aquéllos con voltajes de red telefónica, debe evitarse conectar circuitos SELV con circuitos de voltaje de red telefónica (TNV). |
| <b>Varning!</b>      | De portar som är märkta "Ethernet", "10BaseT", "Token Ring", "Console" och "AUX" är SELV-kretsar, d.v.s. skyddskretsar med extra låg spänning (SELV: Safety Extra-Low Voltage = skyddsklenspänning). SELV-kretsar får endast anslutas till andra SELV-kretsar. Eftersom BRI-kretsar behandlas liksom telefontätsspänning bör SELV-kretsen inte anslutas till telefontätsspänningskretsar (TNV-kretsar).                                                |

## Laser Radiation Warning



|                      |                                                           |
|----------------------|-----------------------------------------------------------|
| <b>Warning</b>       | Laser radiation is present when the system is open.       |
| <b>Waarschuwing</b>  | Laserstraling is aanwezig wanneer het systeem open is.    |
| <b>Varoitus</b>      | Lasersäteitä järjestelmän ollessa avoinna.                |
| <b>Attention</b>     | Production d'un rayonnement laser en position ouverte.    |
| <b>Warnung</b>       | Laserstrahlung in geöffnetem Zustand.                     |
| <b>Avvertenza</b>    | Emissione di radiazioni laser quando il sistema è aperto. |
| <b>Advarsel</b>      | Laserstråling er til stede når enheten er åpen.           |
| <b>Aviso</b>         | Radiação laser presente quando aberto.                    |
| <b>¡Advertencia!</b> | Radiación láser presente cuando el sistema está abierto.  |
| <b>Varning!</b>      | Laserstrålning pågår när enheten är öppen.                |

## Laser Beam Warning



|                      |                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------|
| <b>Warning</b>       | <b>Do not stare into the beam or view it directly with optical instruments.</b>                      |
| <b>Waarschuwing</b>  | <b>Niet in de straal staren of hem rechtstreeks bekijken met optische instrumenten.</b>              |
| <b>Varoitus</b>      | <b>Älä katso säteeseen äläkä tarkastele sitä suoraan optisen laitteen avulla.</b>                    |
| <b>Attention</b>     | <b>Ne pas fixer le faisceau des yeux, ni l'observer directement à l'aide d'instruments optiques.</b> |
| <b>Warnung</b>       | <b>Nicht direkt in den Strahl blicken und ihn nicht direkt mit optischen Geräten prüfen.</b>         |
| <b>Avvertenza</b>    | <b>Non fissare il raggio con gli occhi né usare strumenti ottici per osservarlo direttamente.</b>    |
| <b>Advarsel</b>      | <b>Stirr eller se ikke direkte på strålen med optiske instrumenter.</b>                              |
| <b>Aviso</b>         | <b>Não olhe fixamente para o raio, nem olhe para ele directamente com instrumentos ópticos.</b>      |
| <b>¡Advertencia!</b> | <b>No mirar fijamente el haz ni observarlo directamente con instrumentos ópticos.</b>                |
| <b>Varning!</b>      | <b>Rikta inte blicken in mot strålen och titta inte direkt på den genom optiska instrument.</b>      |
| <b>警告</b>            | <b>ビームを直視したり、レンズを通して覗き込むことは避けてください。</b>                                                              |

## Power Cabling Warning



|                     |                                                                                                                                                                                |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Warning</b>      | <b>Secure all power cabling when installing this unit to avoid disturbing field-wiring connections.</b>                                                                        |
| <b>Waarschuwing</b> | <b>Zet alle stroomkabels vast wanneer dit toestel wordt geïnstalleerd om te voorkomen dat de verbindingen van de veldbedrading worden verstoord.</b>                           |
| <b>Varoitus</b>     | <b>Kiinnitä kaikki voimakaapelit tiukkaan tätä laitetta asentaessasi, jotta vältät kentän johdinkytkentöjen vioittumista.</b>                                                  |
| <b>Attention</b>    | <b>Lors de l'installation de cet appareil, fixer tous les câbles d'alimentation pour éviter de provoquer des perturbations aux raccordements des câblages propres au site.</b> |
| <b>Warnung</b>      | <b>Bei der Installation dieser Einheit die Netzverkabelung befestigen, um die Störung von Feldkabelanschlüssen zu vermeiden.</b>                                               |
| <b>Avvertenza</b>   | <b>In fase di installazione dell'unità, assicurare tutti i cablaggi di alimentazione per evitare di alterare i collegamenti degli avvolgimenti di campo.</b>                   |

|                      |                                                                                                                                                    |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Advarsel</b>      | <b>Når denne enheten installeres, må alle kraftledninger sikres for å unngå at feltkabelkoblingene forstyrres.</b>                                 |
| <b>Aviso</b>         | <b>Para evitar problemas com as ligações de rede de campanha, prenda todos os cabos de corrente quando instalar esta unidade.</b>                  |
| <b>¡Advertencia!</b> | <b>Sujetar todo el cableado de alimentación cuando se instale este equipo para evitar que se mezcle con las conexiones del cableado "in situ".</b> |
| <b>Varning!</b>      | <b>Fäst allt starkströmskablage vid installation av denna enhet så att fältkopplingen inte rubbas.</b>                                             |

## Grounded Equipment Warning



|                      |                                                                                                                                                                |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Warning</b>       | <b>This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use.</b>                                         |
| <b>Waarschuwing</b>  | <b>Deze apparatuur hoort geaard te worden. Zorg dat de host-computer tijdens normaal gebruik met aarde is verbonden.</b>                                       |
| <b>Varoitus</b>      | <b>Tämä laitteisto on tarkoitettu maadoitettavaksi. Varmista, että isäntälaitte on yhdistetty maahan normaalikäytön aikana.</b>                                |
| <b>Attention</b>     | <b>Cet équipement doit être relié à la terre. S'assurer que l'appareil hôte est relié à la terre lors de l'utilisation normale.</b>                            |
| <b>Warnung</b>       | <b>Dieses Gerät muß geerdet werden. Stellen Sie sicher, daß das Host-Gerät während des normalen Betriebs an Erde gelegt ist.</b>                               |
| <b>Avvertenza</b>    | <b>Questa apparecchiatura deve essere collegata a massa. Accertarsi che il dispositivo host sia collegato alla massa di terra durante il normale utilizzo.</b> |
| <b>Advarsel</b>      | <b>Dette utstyret skal jordes. Forviss deg om vertsterminalen er jordet ved normalt bruk.</b>                                                                  |
| <b>Aviso</b>         | <b>Este equipamento deverá estar ligado à terra. Certifique-se que o host se encontra ligado à terra durante a sua utilização normal.</b>                      |
| <b>¡Advertencia!</b> | <b>Este equipo debe conectarse a tierra. Asegurarse de que el equipo principal esté conectado a tierra durante el uso normal.</b>                              |
| <b>Varning!</b>      | <b>Denna utrustning är avsedd att jordas. Se till att värdenheten är jordad vid normal användning.</b>                                                         |
| <b>警告</b>            | <b>この装置はアースを必要とするものです。通常動作時は、ホストがアースされていることを確認してください。</b>                                                                                                      |

## Ground Connection Warning



|                      |                                                                                                                                     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Warning</b>       | <b>When installing the unit, always make the ground connection first and disconnect it last.</b>                                    |
| <b>Waarschuwing</b>  | <b>Bij de installatie van het toestel moet de aardverbinding altijd het eerste worden gemaakt en het laatste worden losgemaakt.</b> |
| <b>Varoitus</b>      | <b>Laitetta asennettaessa on maahan yhdistäminen aina tehtävä ensiksi ja maadoituksen irti kytkeminen viimeiseksi.</b>              |
| <b>Attention</b>     | <b>Lors de l'installation de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée en dernier.</b>  |
| <b>Warnung</b>       | <b>Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden.</b>                 |
| <b>Avvertenza</b>    | <b>In fase di installazione dell'unità, eseguire sempre per primo il collegamento a massa e disconnetterlo per ultimo.</b>          |
| <b>Advarsel</b>      | <b>Når enheten installeres, må jordledningen alltid tilkobles først og frakobles sist.</b>                                          |
| <b>Aviso</b>         | <b>Ao instalar a unidade, a ligação à terra deverá ser sempre a primeira a ser ligada, e a última a ser desligada.</b>              |
| <b>¡Advertencia!</b> | <b>Al instalar el equipo, conectar la tierra la primera y desconectarla la última.</b>                                              |
| <b>Varning!</b>      | <b>Vid installation av enheten måste jordledningen alltid anslutas först och kopplas bort sist.</b>                                 |

## Jewelry Removal Warning



|                     |                                                                                                                                                                                                                                                                                                                                        |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Warning</b>      | <b>Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.</b>                                                                    |
| <b>Waarschuwing</b> | <b>Alvorens aan apparatuur te werken die met elektrische leidingen is verbonden, sieraden (inclusief ringen, kettingen en horloges) verwijderen. Metalen voorwerpen worden warm wanneer ze met stroom en aarde zijn verbonden, en kunnen ernstige brandwonden veroorzaken of het metalen voorwerp aan de aansluitklemmen lassen.</b>   |
| <b>Varoitus</b>     | <b>Ennen kuin työskentelet voimavirtajohtoihin kytkettyjen laitteiden parissa, ota pois kaikki korut (sormukset, kaulakorut ja kellot mukaan lukien). Metalliesineet kuumenevat, kun ne ovat yhteydessä sähkövirran ja maan kanssa, ja ne voivat aiheuttaa vakavia palovammoja tai hitsata metalliesineet kiinni liitännänapoihin.</b> |

|                      |                                                                                                                                                                                                                                                                                                                                               |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Attention</b>     | <b>Avant d'accéder à cet équipement connecté aux lignes électriques, ôter tout bijou (anneaux, colliers et montres compris). Lorsqu'ils sont branchés à l'alimentation et reliés à la terre, les objets métalliques chauffent, ce qui peut provoquer des blessures graves ou souder l'objet métallique aux bornes.</b>                        |
| <b>Warnung</b>       | <b>Vor der Arbeit an Geräten, die an das Netz angeschlossen sind, jeglichen Schmuck (einschließlich Ringe, Ketten und Uhren) abnehmen. Metallgegenstände erhitzen sich, wenn sie an das Netz und die Erde angeschlossen werden, und können schwere Verbrennungen verursachen oder an die Anschlußklemmen angeschweißt werden.</b>             |
| <b>Avvertenza</b>    | <b>Prima di intervenire su apparecchiature collegate alle linee di alimentazione, togliersi qualsiasi monile (inclusi anelli, collane, braccialetti ed orologi). Gli oggetti metallici si riscaldano quando sono collegati tra punti di alimentazione e massa: possono causare ustioni gravi oppure il metallo può saldarsi ai terminali.</b> |
| <b>Advarsel</b>      | <b>Fjern alle smykker (inkludert ringer, halskjeder og klokker) før du skal arbeide på utstyr som er koblet til kraftledninger. Metallgjenstander som er koblet til kraftledninger og jord blir svært varme og kan forårsake alvorlige brannskader eller smelte fast til polene.</b>                                                          |
| <b>Aviso</b>         | <b>Antes de trabalhar em equipamento que esteja ligado a linhas de corrente, retire todas as jóias que estiver a usar (incluindo anéis, fios e relógios). Os objectos metálicos aquecerão em contacto com a corrente e em contacto com a ligação à terra, podendo causar queimaduras graves ou ficarem soldados aos terminais.</b>            |
| <b>¡Advertencia!</b> | <b>Antes de operar sobre equipos conectados a líneas de alimentación, quitarse las joyas (incluidos anillos, collares y relojes). Los objetos de metal se calientan cuando se conectan a la alimentación y a tierra, lo que puede ocasionar quemaduras graves o que los objetos metálicos queden soldados a los bornes.</b>                   |
| <b>Varning!</b>      | <b>Tag av alla smycken (inklusive ringar, halsband och armbandsur) innan du arbetar på utrustning som är kopplad till kraftledningar. Metallobjekt hettas upp när de kopplas ihop med ström och jord och kan förorsaka allvarliga brännskador; metallobjekt kan också sammansvetsas med kontakterna.</b>                                      |

## Qualified Personnel Warning



### Warning

Only trained and qualified personnel should be allowed to install or replace this equipment.

### Waarschuwing

Installatie en reparaties mogen uitsluitend door getraind en bevoegd personeel uitgevoerd worden.

### Varoitus

Ainoastaan koulutettu ja pätevä henkilökunta saa asentaa tai vaihtaa tämän laitteen.

### Avertissement

Tout installation ou remplacement de l'appareil doit être réalisé par du personnel qualifié et compétent.

### Achtung

Gerät nur von geschultem, qualifiziertem Personal installieren oder auswechseln lassen.

|                   |                                                                                                                                    |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Avvertenza</b> | <b>Solo personale addestrato e qualificato deve essere autorizzato ad installare o sostituire questo apparecchio.</b>              |
| <b>Advarsel</b>   | <b>Kun kvalifisert personell med riktig oppl ring b r montere eller bytte ut dette utstyret.</b>                                   |
| <b>Aviso</b>      | <b>Este equipamento dever  ser instalado ou substituído apenas por pessoal devidamente treinado e qualificado.</b>                 |
| <b>¡Atención!</b> | <b>Estos equipos deben ser instalados y reemplazados exclusivamente por personal t cnico adecuadamente preparado y capacitado.</b> |
| <b>Varning</b>    | <b>Denna utrustning ska endast installeras och bytas ut av utbildad och kvalificerad personal.</b>                                 |

## Supply Circuit Warning



|                      |                                                                                                                                 |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Warning</b>       | <b>Care must be given to connecting units to the supply circuit so that wiring is not overloaded.</b>                           |
| <b>Waarschuwing</b>  | <b>Let erop dat de toestellen op voedingscircuits worden aangesloten zonder het vermogen van de bedrading te overschrijden.</b> |
| <b>Varoitus</b>      | <b>Laiteyksik t on yhdistettävä huolellisesti sy tt piiriin niin, ett  johdot eiv t ole ylikuormitettuja.</b>                   |
| <b>Avertissement</b> | <b>Veillez   bien connecter les unit s au circuit d'alimentation afin de ne pas surcharger les connections.</b>                 |
| <b>Achtung</b>       | <b>Beim Anschlie en der Ger te an das Stromnetz ist darauf zu achten, da  die Schaltverbindungen nicht  berlastet werden.</b>   |
| <b>Avvertenza</b>    | <b>Fare attenzione quando si collegano le unit  al circuito di alimentazione, per non sovraccaricare i cablaggi.</b>            |
| <b>Advarsel</b>      | <b>V r n ye med   koble enheter til str mforsyningskretsen slik at ledningene ikke overbelastes.</b>                            |
| <b>Aviso</b>         | <b>Dever  ter precau  o ao ligar unidades ao circuito de fornecimento de energia, para n o sobrecarregar a instala  o.</b>      |
| <b>¡Atenci n!</b>    | <b>Poner mucho cuidado al conectar los equipos al circuito de alimentaci n a fin de no sobrecargar el cableado.</b>             |
| <b>Varning</b>       | <b>Var noga vid anslutning av enheter till matarstr mkretsen s  att ledningarna inte  verbelastas.</b>                          |

## Power Supply Wiring Warning



### Warning

The illustration shows the DC power supply terminal block. Wire the DC power supply using the appropriate wire terminations at the wiring end, as illustrated. The proper wiring sequence is ground to ground, positive to positive (line to L), and negative to negative (neutral to N). Note that the ground wire should always be connected first and disconnected last

### Waarschuwing

De figuur toont de aansluitstrip van de gelijkstroomvoeding. Breng de bedrading aan voor de gelijkstroomvoeding met behulp van de juiste draadaansluitingen aan het draadeinde zoals aangegeven. De juiste bedradingsvolgorde is aarde naar aarde, positief naar positief (lijn naar L) en negatief naar negatief (neutraal naar N). Let op dat de aarddraad altijd het eerst verbonden en het laatst losgemaakt wordt.

### Varoitus

Kuva esittää tasavirran pääterasiasa. Liitä tasavirtalähde johdon avulla käyttäen sopivia johdinliitäntöjä johdon päässä kuvan esittämällä tavalla. Oikea kytkentäjärjestys on maajohto maajohtoon, positiivinen positiiviseen (johto L:ään) ja negatiivinen negatiiviseen (nollajohto N:ään). Ota huomioon, että maajohto on aina yhdistettävä ensin ja irrotettava viimeisenä.

### Attention

La figure illustre le bloc de connexion de l'alimentation en courant continu. Câbler l'alimentation en courant continu en fixant les extrémités de fil qui conviennent aux extrémités câblées conformément au schéma. La séquence de câblage à suivre est terre-terre, positif-positif (ligne sur L), et négatif-négatif (neutre sur N). Noter que le fil de masse doit toujours être connecté en premier et déconnecté en dernier.

### Warnung

Die Abbildung zeigt den Terminalblock des Gleichstrom-Netzgeräts. Verdrahten Sie das Gleichstrom-Netzgerät unter Verwendung von geeigneten Kabelschuhen am Verdrahtungsende (siehe Abbildung). Die richtige Verdrahtungsfolge ist Erde an Erde, positiv an positiv (Leitung an L) und negativ an negativ (neutral an N). Beachten Sie bitte, daß der Erdungsdraht immer als erster verbunden und als letzter abgetrennt werden sollte.

### Avvertenza

L'illustrazione mostra la morsettiera dell'alimentatore CC. Cablare l'alimentatore CC usando i connettori adatti all'estremità del cablaggio, come illustrato. La corretta sequenza di cablaggio è da massa a massa, da positivo a positivo (da linea ad L) e da negativo a negativo (da neutro a N). Tenere presente che il filo di massa deve sempre venire collegato per primo e scollegato per ultimo.

### Advarsel

Figuren viser likestrømforsyningsenhetens tilkoplingsterminal. Likestrømforsyningsenheten tilkoples ved hjelp av ledningsavslutningene, slik som vist i figuren. Riktig tilkopplingssekvens er jord til jord, positiv til positiv (linje til L), og negativ til negativ (nøytral til N). Husk at jordingsledningen alltid bør tilkoples først og frakoples sist.

### Aviso

A figura mostra o bloco do terminal de fornecimento de corrente contínua. Ligue o fornecimento de corrente contínua recorrendo aos terminadores localizados na extremidade do cabo, conforme ilustrado. A sequência correcta de instalação é terra-a-terra, positivo-positivo (linha para L), e negativo-negativo (neutro para N). Note que o fio de terra deverá ser sempre o primeiro a ser ligado, e o último a ser desligado.



|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ¡Atención! | La figura muestra la caja de bornes de la fuente de alimentación de corriente continua. Cablear la fuente de alimentación de corriente continua, usando los terminales apropiados, en el extremo del cable tal como se muestra. Las conexiones deben realizarse en el siguiente orden: tierra con tierra, positivo con positivo (la línea con la L) y negativo con negativo (el neutro con la N). Tenga en cuenta que el conductor de tierra siempre tiene que conectarse el primero y desconectarse el último. |
| Warning!   | Illustrationen visar anslutningsplinten för likströmförsörjningsenheten. Koppla ledningarna till strömförsörjningsenheten med lämpliga ledningsavslutningar som bilden visar. Korrekt kopplingssekvens är jord till jord, positiv till positiv (linje till L) och negativ till negativ (neutral till N). Observera att jordledningen alltid skall anslutas först och kopplas bort sist.                                                                                                                         |

## Invisible Laser Radiation Warning



### Warning

Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures.

### Waarschuwing

Omdat er onzichtbare laserstraling uit de opening van de poort geëmitteerd kan worden wanneer er geen kabel aangesloten is, dient men om blootstelling aan laserstraling te vermijden niet in de open openingen te kijken.

### Varoitus

Kun porttiin ei ole kytketty kaapelia, portin aukosta voi vuotaa näkymätöntä lasersäteilyä. Älä katso avoimiin aukkoihin, jotta et altistu säteilylle.

### Attention

Etant donné qu'un rayonnement laser invisible peut être émis par l'ouverture du port quand aucun câble n'est connecté, ne pas regarder dans les ouvertures béantes afin d'éviter tout risque d'exposition au rayonnement laser.

### Warnung

Aus der Öffnung des Ports kann unsichtbare Laserstrahlung austreten, wenn kein Kabel angeschlossen ist. Kontakt mit Laserstrahlung vermeiden und nicht in offene Öffnungen blicken.

### Avvertenza

Poiché quando nessun cavo è collegato alla porta, da quest'ultima potrebbe essere emessa radiazione laser invisibile, evitare l'esposizione a tale radiazione e non fissare con gli occhi porte a cui non siano collegati cavi.

### Advarsel

Usynlige laserstråler kan sendes ut fra åpningen på utgangen når ingen kabel er tilkoblet. Unngå utsettelse for laserstråling og se ikke inn i åpninger som ikke er tildekket.

### Aviso

Evite uma exposição à radiação laser e não olhe através de aberturas expostas, porque poderá ocorrer emissão de radiação laser invisível a partir da abertura da porta, quando não estiver qualquer cabo conectado.

- ¡Advertencia!** Cuando no esté conectado ningún cable, pueden emitirse radiaciones láser invisibles por el orificio del puerto. Evitar la exposición a radiaciones láser y no mirar fijamente los orificios abiertos.
- Varning!** Osynliga laserstrålar kan sändas ut från öppningen i porten när ingen kabel är ansluten. Undvik exponering för laserstrålning och titta inte in i ej täckta öppningar.
- 

## Incorrect Connection Warning



- Warning** Incorrect connection of this or connected equipment to a general purpose outlet could result in a hazardous situation.
- Waarschuwing** Incorrecte aansluiting van deze of aangesloten apparatuur op een stopcontact voor algemene doeleinden kan een gevaarlijke situatie tot gevolg hebben.
- Varoitus** Tämän laitteen tai siihen liitettyjen laitteiden virheellinen kytkentä yleispistorasiaan voi aiheuttaa vaaratilanteen.
- Attention** Un branchement incorrect de cet équipement ou de l'équipement branché à une prise d'usage général peut créer une situation dangereuse.
- Warnung** Inkorrektes Anschließen von diesem oder damit verbundenen Geräten an einer Allzwecksteckdose kann eine Gefahrensituation verursachen.
- Avvertenza** Un collegamento errato di questo apparecchio, o dell'apparecchiatura a esso collegato, a una presa di uso generale può causare una situazione pericolosa.
- Advarsel** Feil kobling av dette utstyret eller tilhørende utstyr til et vanlig uttak kan føre til farlige situasjoner.
- Aviso** Uma conexão incorrecta a uma ficha de alimentação eléctrica normal, deste ou de qualquer equipamento a este conectado, poderá resultar numa situação potencialmente perigosa.
- ¡Advertencia!** La conexión incorrecta de este equipo, o del equipo conectado, a una toma o receptáculo de tipo general podría resultar en una situación peligrosa.
- Varning!** Felaktig koppling av denna eller ansluten utrustning till ett universaluttag kan orsaka riskfylld situation.
-

## Ground Conductor Warning



### Warning

Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

### Waarschuwing

De aardingsleiding mag nooit buiten werking gesteld worden en de apparatuur mag nooit bediend worden zonder dat er een op de juiste wijze geïnstalleerde aardingsleiding aanwezig is. Neem contact op met de bevoegde instantie voor elektrische inspecties of met een elektricien als u niet zeker weet of voor passende aarding gezorgd is.

### Varoitus

Älä koskaan ohita maajohdinta tai käytä laitteita ilman oikein asennettua maajohdinta. Ota yhteyttä asianmukaiseen sähkötarkastusviranomaiseen tai sähköasentajaan, jos olet epävarma maadoituksen sopivuudesta.

### Attention

Ne jamais rendre inopérant le conducteur de masse ni utiliser l'équipement sans un conducteur de masse adéquatement installé. En cas de doute sur la mise à la masse appropriée disponible, s'adresser à l'organisme responsable de la sécurité électrique ou à un électricien.

### Warnung

Umgehen Sie auf keinen Fall den Erdungsleiter und nehmen Sie die Geräte nicht in Betrieb, wenn der Erdungsleiter nicht sachgemäß installiert ist. Wenden Sie sich an die entsprechende Behörde, die für die Inspektion elektrischer Anlagen zuständig ist, oder an einen Elektriker, wenn Sie nicht sicher sind, ob der Anschluß ordnungsgemäß geerdet ist.

### Avvertenza

Non escludere mai il conduttore di protezione né usare l'apparecchiatura in assenza di un conduttore di protezione installato in modo corretto. Se non si sa con certezza che è disponibile un collegamento di messa a terra adeguato, esaminare le Norme CEI pertinenti o rivolgersi a un elettricista qualificato.

### Advarsel

Jordingslederen må aldri hindres, og utstyret må aldri brukes uten at en forsvarlig jordingsleder er installert. Kontakt elektrisitetstilsynet eller en elektriker dersom du er usikker på om riktig jording er tilgjengelig.

### Aviso

Nunca anule o condutor à terra nem opere o equipamento sem ter um condutor à terra adequadamente instalado. Em caso de dúvida em relação ao sistema de ligação à terra, contacte os serviços locais de inspeção eléctrica ou um electricista qualificado.

### ¡Advertencia!

No desactive nunca el conductor de tierra ni opere el equipo sin un conductor de tierra instalado correctamente. Póngase en contacto con las autoridades de inspección eléctrica pertinentes o con un electricista, si no está seguro de contar con una toma de tierra adecuada.

### Varning!

Koppla aldrig från jordledningen och använd aldrig utrustningen utan en på lämpligt sätt installerad jordledning. Om det föreligger osäkerhet huruvida lämplig jordning finns skall elektrisk besiktningsauktoritet eller elektriker kontaktas.

## Voltages on DC-input Power Supply Terminals



### Warning

Voltages might be present on the DC-input power supply terminals. Turn off the power source circuit breaker and remove the power supply before accessing the terminals.

### Waarschuwing

Er kan stroom aanwezig zijn op de voedingspolen van de gelijkstroomingang. Schakel de stroomonderbreker van de stroombron uit en verwijder de voedingsbron voordat u toegang tot de polen zoekt.

### Varoitus

Tasavirran lähteen jakorasiassa voi olla jännitettä. Katkaise virta virtalähteen kytkimestä ja irrota virtalähde ennen jakorasiaan koskemista.

### Attention

Il est possible que des courants électriques subsistent dans les terminaux à bloc d'alimentation CC. Mettez le disjoncteur de l'alimentation principale hors tension et retirez le bloc d'alimentation avant d'accéder aux terminaux.

### Warnung

Auf den Gleichstrom-Eingangs-Stromversorgungs-Terminals können Spannungen auftreten. Schalten Sie den Leistungsschutzschalter der Stromversorgung ab, und entfernen Sie die Stromversorgung, bevor Sie auf die Terminals zugreifen.

### Avvertenza

I voltaggi possono essere presenti sui terminali degli alimentatori elettrici DC di immissione. Spegnete l'interruttore per l'interruzione del circuito dell'alimentatore e togliete l'alimentatore elettrico prima di accedere i terminali.

### Advarsel

Spenning kan forekomme på likestrømsforsyningsenhetens inngangsterminaler. Slå av strømbryteren til strømkilden, og fjern strømtilførselsenheten før aksessering av terminalene.

### Aviso

Os terminais de alimentação de energia de CC de entrada podem conter voltajem. Desconecte o disjuntor da fonte de alimentação e remova a fonte de alimentação de energia antes de aceder aos respectivos terminais.

### ¡Advertencia!

Los terminales de suministro de alimentación CC de entrada pueden contener voltaje. Desconecte el cortacircuito de la fuente de alimentación y extraiga el suministro de alimentación antes de acceder a los terminales.

### Varning!

Spänningar kan förekomma på likströmsförsörjningsenhetens ingångspoler. Innan du skaffar dig tillträde till polerna, stäng av strömbrytaren till strömkällan och avlägsna strömförsörjningsenheten.

## More Than One Power Supply



### Warning

This unit has more than one power supply connection; all connections must be removed completely to completely remove power from the unit.

### Waarschuwing

Deze eenheid heeft meer dan één stroomtoevoerverbinding; alle verbindingen moeten volledig worden verwijderd om de stroom van deze eenheid volledig te verwijderen.

### Varoitus

Tässä laitteessa on useampia virtalähdekytkentöjä. Kaikki kytkennät on irrotettava kokonaan, jotta virta poistettaisiin täysin laitteesta.

### Attention

Cette unité est équipée de plusieurs raccordements d'alimentation. Pour supprimer tout courant électrique de l'unité, tous les cordons d'alimentation doivent être débranchés.

### Warnung

Diese Einheit verfügt über mehr als einen Stromanschluß; um Strom gänzlich von der Einheit fernzuhalten, müssen alle Stromzufuhren abgetrennt sein.

### Avvertenza

Questa unità ha più di una connessione per alimentatore elettrico; tutte le connessioni devono essere completamente rimosse per togliere l'elettricità dall'unità.

### Advarsel

Denne enheten har mer enn én strømtilkobling. Alle tilkoblinger må kobles helt fra for å eliminere strøm fra enheten.

### Aviso

Este dispositivo possui mais do que uma conexão de fonte de alimentação de energia; para poder remover a fonte de alimentação de energia, deverão ser desconectadas todas as conexões existentes.

### ¡Advertencia!

Esta unidad tiene más de una conexión de suministros de alimentación; para eliminar la alimentación por completo, deben desconectarse completamente todas las conexiones.

### Warning!

Denna enhet har mer än en strömförsörjningsanslutning; alla anslutningar måste vara helt avlägsnade innan strömtillförseln till enheten är fullständigt bruten.

## Cisco ONS 15216 EDFA2 Rack Installation



### Warning

The Cisco ONS 15216 EDFA2 must be installed in a rack that is secured to the building structure.

### Waarschuwing

De Cisco ONS 15216 EDFA2 moet in een stellage worden geïnstalleerd die aan een bouwsel is verankerd.

### Varoitus

Cisco ONS 15216 EDFA2 on asennettava telineeseen, joka on kiinnitetty rakennukseen.

### Attention

Le rack sur lequel est monté le Cisco ONS 15216 EDFA2 doit être fixé à la structure du bâtiment.

|                      |                                                                                                                                 |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Warnung</b>       | <b>Der Cisco ONS 15216 EDFA2 muß in einem Gestell installiert werden, das in der Gebäudestruktur verankert ist.</b>             |
| <b>Avvertenza</b>    | <b>Il Cisco ONS 15216 EDFA2 deve essere installato in un telaio, il quale deve essere fissato alla struttura dell'edificio.</b> |
| <b>Advarsel</b>      | <b>Cisco ONS 15216 EDFA2 må installeres i et stativ som er forankret til bygningsstrukturen.</b>                                |
| <b>Aviso</b>         | <b>O Cisco ONS 15216 EDFA2 deverá ser instalado numa prateleira fixa à estrutura do edifício.</b>                               |
| <b>¡Advertencia!</b> | <b>El Cisco ONS 15216 EDFA2 debe instalarse en un bastidor fijado a la estructura del edificio.</b>                             |
| <b>Varning!</b>      | <b>Cisco ONS 15216 EDFA2 måste installeras i en ställning som är förankrad i byggnadens struktur.</b>                           |

## Exposed DC Power Wire Warning



### Warning

An exposed wire lead from a DC-input power source can conduct harmful levels of electricity. Be sure that no exposed portion of the DC-input power source wire extends from the terminal block plug.

### Waarschuwing

Een blootgestelde verbindingsdraad van een ingangsgelijkstroombron kan gevaarlijke elektriciteitsniveaus geleiden. Zorg ervoor dat geen blootgesteld deel van het draad van de ingangsgelijkstroombron zich uitstrekt vanuit het aansluitblok van de terminal.

### Varoitus

Tasavirtalähteestä tuleva avoin johto voi johtaa vaarallisen määrän sähköä. Varmista, ettei kaapelikengän pistokkeesta tule esille lainkaan tasavirtajohdon avointa osaa.

### Attention

Pour éviter tout risque de choc électrique, vérifiez que les câbles d'alimentation secteur sont protégés par une gaine. Aucun fil dénudé ne doit apparaître hors du bloc d'alimentation du terminal.

### Warnung

Eine ungeschützte Kabelleitung von einer Gleichstrom-Eingangsspannungsquelle kann schädliche Elektrizitätslevel führen. Achten Sie darauf, daß von dem Klemmleistenstecker aus kein ungeschütztes Eingangsgleichstromkabel freiliegt.

### Avvertenza

Un cavo elettrico scoperto proveniente da un alimentatore DC-INPUT può trasmettere scariche elettriche ad elevata tensione. Assicuratevi che i cavi in uscita dall'alimentatore DC-input non presentino punti scoperti.

### Advarsel

En avdekket ledning fra en likestrømskilde kan lede farlig elektrisitet. Kontroller at ingen avdekkede deler av ledningen til likestrømskilden stikker ut av terminalens koblingsblokk.

### Aviso

Um fio condutor exposto de uma unidade de entrada de DC (corrente contínua) pode transportar níveis perigosos de electricidade. Certifique-se de que nenhuma secção exposta de um fio condutor da fonte de energia de entrada de DC se estende a partir da ficha da placa de terminais.

- ¡Advertencia!** Un cable desnudo de una fuente de entrada de alimentación de corriente directa (DC) puede conducir niveles de electricidad peligrosos. Asegúrese de que ninguna parte del cable de la fuente de alimentación de DC de entrada sale del enchufe del bloque de terminal.
- Varning!** En blottad trådleddning från en likströmsförsörjningsenhet kan utgöra en ledare för skadliga elektricitetsnivåer. Se till att inte någon blottad ledningsdel från likströmsförsörjningsenheten sticker ut från stiftplinten.

## 48 VDC Power System



- Warning** The customer 48 volt power system must provide reinforced insulation between the primary AC power and the 48 VDC output.
- Waarschuwing** Het 48 volt stroomsysteem van de klant dient versterkte isolatie tussen de primaire wisselstroom en de 48 VDC-uitgang te verschaffen.
- Varoitus** Asiakkaan 48 voltin virtajärjestelmän on tarjottava vahvistettu eriste ensisijaisen vaihtovirtalähteen ja 48 voltin tasavirtaliitännän välille.
- Attention** Le bloc d'alimentation 48 volts du client doit assurer une isolation renforcée entre l'alimentation CA principale et la sortie 48 V CC.
- Warnung** Das 48-Volt-Stromsystem des Kunden muß eine verstärkte Isolierung zwischen dem primären Wechselstrom und dem 48 VDC-Output aufweisen.
- Avvertenza** Il sistema elettrico di 48 volt del cliente deve avere un isolamento fra l'alimentatore elettrico AC e il VDC 48 di output.
- Advarsel** Kundens eget 48 volts strømopplegg må ha forsterket isolasjon mellom den primære vekselstrømskilden og den 48 volts likestrømsutgangen.
- Aviso** O sistema habitual de corrente de 48 volts deverá fornecer isolamento reforçado entre a corrente alternada (AC) principal e a saída de 48 VDC (tensão em corrente contínua).
- ¡Advertencia!** Aviso: El sistema del cliente de 48 voltios debe proporcionar aislamiento reforzado entre la energía principal AC y la potencia de salida de 48 VDC.
- Varning!** Kundens 48-volt strömsystem måste vara försett med förstärkt isolering mellan den primära växelströmmen och utmatningen av 48 V likström.

## Chassis Power Connection



### Warning

Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

### Waarschuwing

Voordat u aarddraden of elektriciteitsdraden op het frame aansluit of van het frame neemt, dient u te controleren of de stroom naar het gelijkstroomcircuit uitgeschakeld is. Om u ervan te verzekeren dat alle stroom UIT is geschakeld, kiest u op het schakelbord de stroomverbreker die het gelijkstroomcircuit bedient, draait de stroomverbreker naar de UIT positie en plakt de schakelaarhendel van de stroomverbreker met plakband in de UIT positie vast.

### Varoitus

Varmista, että tasavirtapiirissä ei ole virtaa ennen maadoitus- tai virtajohtojen kytkemistä asennuspohjaan tai ennen niiden irrottamista. Varmistaaksesi, että virta on KATKAISTU täysin, paikanna tasavirrasta huolehtivassa kojetaulussa sijaitseva suojakytkin, käännä suojakytkin KATKAISTU-asentoon ja teippaa suojakytkimen varsi niin, että se pysyy KATKAISTU-asennossa.

### Attention

Avant de connecter ou de déconnecter les câbles d'alimentation (pôles et terre) du châssis, vérifiez que le circuit de courant continu est hors tension : localisez le disjoncteur sur le panneau de commande du circuit de courant continu, poussez-le sur la position fermée (OFF) et, à l'aide d'un ruban adhésif, bloquez sa poignée sur cette position.

### Warnung

Gleichstrom-Unterbrechung Bevor Sie Erdungs- oder Stromkabel an das Chassis anschließen oder von ihm abtrennen, ist sicherzustellen, daß der Gleichstrom-Stromkreis unterbrochen ist. Um sicherzustellen, daß sämtlicher Strom AUS ist, machen Sie auf der Schalttafel den Unterbrecher für die Gleichstromschaltung ausfindig, stellen Sie den Unterbrecher auf OFF, und kleben Sie den Schaltergriff des Unterbrechers mit Klebeband in der AUS-Stellung fest.

### Avvertenza

Prima di collegare o distaccare i cavi elettrici o di messa a terra dallo chassis, assicuratevi che il circuito DC non sia alimentato. Per verificare che tutta l'alimentazione sia scollegata (OFF), individuare l'interruttore automatico sul quadro strumenti che alimenta il circuito CC, mettere l'interruttore in posizione OFF e fissarlo con nastro adesivo in tale posizione.

### Advarsel

Før til- eller frakobling av jord- og strømledninger til kabinettet, kontroller at strømmen er frakoblet likestrømkretsen. Sørg for at all strøm er slått AV. Dette gjøres ved å lokalisere strømbryteren på brytertavlen som betjener likestrømkretsen, slå strømbryteren AV og teipe bryterhåndtaket på strømbryteren i AV-stilling.

### Aviso

Antes de conectar ou desconectar a ligação à terra ou a alimentação do chassis, certifique-se de que desligou a fonte de alimentação de energia do circuito de corrente contínua. Para se assegurar que toda a corrente foi DESLIGADA, localize o disjuntor no painel que serve o circuito de corrente contínua e coloque-o na posição OFF (Desligado), segurando nessa posição a manivela do interruptor do disjuntor com fita isoladora.



- ¡Advertencia!** Antes de conectar o desconectar el circuito de tierra o de alimentación del chasis, asegúrese que la alimentación del circuito CC esté cortada (OFF). Para asegurarse de que toda la alimentación esté cortada (OFF), localice el interruptor automático en el panel que alimenta el circuito de corriente continua, cambie el interruptor automático a la posición de apagado (OFF) y sujete con cinta la palanca del interruptor automático en posición de apagado (OFF).
- Varning!** Innan du kopplar jord- eller elledningar till eller från chassit måste du kontrollera att strömförsörjningen till likströmskretsen är bruten. Kontrollera att all strömförsörjning är **BRUTEN** genom att slå AV det överspänningsskydd som skyddar likströmskretsen och tejpa fast överspänningsskyddets omkopplare i FRÅN-läget.

## Cisco ONS 15216 EDFA2 Temperature Requirement



### Warning

To prevent a Cisco ONS 15216 EDFA2 system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 122°F (50°C).

### Waarschuwing

Om te voorkomen dat een Cisco ONS 15216 EDFA2 systeem oververhit raakt, dient u het niet te bedienen op een plaats waar de maximale aanbevolen omgevingstemperatuur van 50°C wordt overschreden.

### Varoitus

Ettei Cisco ONS 15216 EDFA2 -järjestelmä ylikuumentuisi, sitä ei saa käyttää tilassa, jonka lämpötila ylittää korkeimman suositellun ympäristölämpötilan 50°C.

### Attention

Pour éviter toute surchauffe du système Cisco ONS 15216 EDFA2, ne l'utilisez pas dans une zone où la température ambiante est supérieure à 50°C.

### Warnung

Um ein Cisco ONS 15216 EDFA2-System vor Überhitzung zu schützen, darf dieser nicht in einer Gegend betrieben werden, in der die Umgebungstemperatur das empfohlene Maximum von 50°C überschreitet.

### Avvertenza

Per evitare il surriscaldamento dei sistemi Cisco ONS 15216 EDFA2, non adoperateli contain in un locale che ecceda la temperatura ambientale massima di 122°F (50°C).

### Advarsel

Unngå overoppheting av et Cisco ONS 15216 EDFA2-system. Skal ikke brukes på steder der den anbefalte maksimale omgivelsestemperaturen overstiger 50°C (122°F).

### Aviso

Para evitar o sobreaquecimento do sistema Cisco ONS 15216 EDFA2, não utilize este equipamento numa área que exceda a temperatura máxima recomendada de 50°C.

### ¡Advertencia!

Para impedir que un encaminador de la serie Cisco ONS 15216 EDFA2 se recaliente, no lo haga funcionar en un área en la que se supere la temperatura ambiente máxima recomendada de 122°F (50°C).

### Varning!

Förhindra att ett Cisco ONS 15216 EDFA2-system överhettas genom att inte använda det i ett område där den maximalt rekommenderade omgivningstemperaturen på 50°C överskrids.

## VCCI Compliance for Class B Equipment



### Warning

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

### 警告

VCCI準拠クラスB機器（日本）  
この機器は、Information Technology EquipmentのVoluntary Control Council for Interference (VCCI)の規格に準拠したクラスB製品です。この機器をラジオやテレビ受信機の近くで使用した場合、混信を発生する恐れがあります。本機器の設置および使用に際しては、取扱い説明書に従ってください。

## SELV-IEC 60950 DC Power Supply Warning



### Warning

Connect the unit only to DC power source that complies with the Safety Extra-Low Voltage (SELV) requirements in IEC 60950 based safety standards.

### Waarschuwing

Sluit de eenheid alleen maar aan op een gelijkstroombron die voldoet aan de veiligheidsvereisten voor extra-laag voltage (SELV) in de op IEC 60950 gebaseerde veiligheidsnormen.

### Varoitus

Liitä laite ainoastaan tasavirtalähteeseen, joka on yhdenmukainen IEC 60950:n suojattujen erittäisen alhaisen jännitteen (SELV) turvavaatimusten kanssa.

### Attention

Connectez l'unité uniquement à une alimentation CC compatible avec les recommandations SELV (Safety Extra-Low Voltage) des normes de sécurité IEC 60950.

### Warnung

Schließen Sie die Einheit nur an eine Gleichstrom-Stromquelle an, die mit den Safety Extra-Low Voltage (SELV)-Anforderungen in den auf IEC 60950 basierenden Sicherheitsstandards übereinstimmen.

### Avvertenza

Collegare l'unità esclusivamente a una presa di corrente continua rispondente ai requisiti SELV (Safety Extra-Low Voltage) in base alle norme di sicurezza IEC 60950.

### Advarsel

Koble bare enheten til en likestrømsforsyning som er i henhold til kravene for lavspenning (SELV) i IEC 60950-baserte sikkerhetsstandarder.

### Aviso

Conecte a unidade apenas à fonte da energia de CC que se encontra em conformidade com os requisitos dos circuitos de segurança de baixa tensão (SELV) constantes dos padrões de segurança baseados no IEC 60950.

- ¡Advertencia! **Conecte la unidad sólo en una fuente de energía DC que cumpla con los requisitos de voltaje extra bajo (SELV - Extra-Low Voltage) en los estándares de seguridad IEC 60950.**
- Varning! **Anslut enheten endast till en likströmsförsörjningsenhet som uppfyller kraven för SELV (skyddskretsar för mycket låg spänning) i IEC 60950-baserade säkerhetsstandarder.**

## Cisco ONS 15216 EDFA2 Power Circuit Overload Warning



### Warning

To prevent dangerous overloading of the power circuit, read the label on the rear of the Cisco ONS 15216 EDFA2 that indicates maximum power load ratings. Failure to follow these rating guidelines could result in a dangerous situation.

### Waarschuwing

Om gevaarlijke overbelasting van het stroomcircuit te vermijden, dient u het label op de achterkant van de Cisco ONS 15216 EDFA2 te lezen waarop de maximale stroombelasting wordt aangegeven. Het niet nakomen van deze richtlijnen kan leiden tot een gevaarlijke situatie.

### Varoitus

Päävirtapiirin vaarallisen ylikuormittumisen estämiseksi on tarkistettava suurin sallittu tehokuormitus Cisco ONS 15216 EDFA2:n takaosassa olevasta kyltistä. Ohjearvojen huomiotta jättämisestä voi aiheutua vaaratilanne.

### Attention

Pour éviter tout risque d'accident dangereux provoqué par une surcharge du circuit d'alimentation, il est vivement recommandé de tenir compte des mesures maximales de charge mentionnées sur l'étiquette à l'arrière du Cisco ONS 15216 EDFA2.

### Warnung

Um eine gefährliche Überlastung des Stromkreislaufs zu verhindern, muß das Label auf der Rückseite des Cisco ONS 15216 EDFA2 gelesen werden, auf dem die maximale Strombelastung angegeben wird. Nichtbefolgen der dort befindlichen Angaben kann zu Sicherheitsrisiken führen.

### Avvertenza

Per evitare sovraccarichi del circuito elettrico, leggete le indicazioni sul retro del Cisco ONS 15216 EDFA2 per le cariche massime di alimentazione elettrica. Rispettando queste indicazioni eviterete situazioni pericolose.

### Advarsel

Kontroller verdienene for maksimal strømbelastning på merket bak på Cisco ONS 15216 EDFA2-apparatet for å unngå faren for overbelastning av strømkretsen. Hvis retningslinjene for maksimal belastning ikke blir fulgt, kan det oppstå farlige situasjoner.

### Aviso

A fim de evitar sobrecarga perigosa do circuito de fornecimento de energia, é favor ler a etiqueta na parte de trás do Cisco ONS 15216 EDFA2, onde se encontram indicados os níveis máximos de carga de energia. O não cumprimento dessas indicações pode dar origem a uma situação de perigo.

|                      |                                                                                                                                                                                                                                                              |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>¡Advertencia!</b> | <b>Para prevenir una sobrecarga eléctrica , lea las instrucciones de la etiqueta que aparece en la parte posterior del Cisco ONS 15216 EDFA2 que indica la carga máxima de potencia. Si no sigue estas indicaciones podría correr riesgos de sobrecarga.</b> |
| <b>Varning!</b>      | <b>För att förhindra att elkretsen överbelastas genomläses etiketten bakpå Cisco ONS 15216 EDFA2 där märkdata om högsta tillåtna elbelastning anges. Följs ej märkdatans rekommendationer kan fara uppstå.</b>                                               |

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## Product Disposal Warning



|                      |                                                                                                                                                                                            |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Warning</b>       | <b>Ultimate disposal of this product should be handled according to all national laws and regulations.</b>                                                                                 |
| <b>Waarschuwing</b>  | <b>Het uiteindelijke wegruimen van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.</b>                                                        |
| <b>Varoitus</b>      | <b>Tämä tuote on hävitettävä kansallisten lakien ja määräysten mukaisesti.</b>                                                                                                             |
| <b>Attention</b>     | <b>La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.</b> |
| <b>Warnung</b>       | <b>Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.</b>                                                                                    |
| <b>Avvertenza</b>    | <b>Lo smaltimento di questo prodotto deve essere eseguito secondo le leggi e regolazioni locali.</b>                                                                                       |
| <b>Advarsel</b>      | <b>Endelig kassering av dette produktet skal være i henhold til alle relevante nasjonale lover og bestemmelser.</b>                                                                        |
| <b>Aviso</b>         | <b>Deitar fora este produto em conformidade com todas as leis e regulamentos nacionais.</b>                                                                                                |
| <b>¡Advertencia!</b> | <b>Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.</b>                                                                                   |
| <b>Varning!</b>      | <b>Vid deponering hanteras produkten enligt gällande lagar och bestämmelser.</b>                                                                                                           |

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## Energy Hazard



### Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment. This equipment contains an energy hazard. Disconnect the system before servicing.

### Waarschuwing

Alleen getraind en gekwalificeerd personeel mag deze uitrusting installeren, vervangen of onderhouden. Deze uitrusting bevat energierisico's. Ontkoppel het systeem voordat u het onderhoudt.

### Varoitus

Tämän laitteen asennuksen, vaihdon tai huollon saa suorittaa ainoastaan koulutettu ja pätevä henkilökunta. Laitteessa on sähköiskuvaara. Irrota järjestelmä ennen huoltoa.

### Attention

Cet équipement ne doit être installé, remplacé ou entretenu que par du personnel d'entretien qualifié et formé. Cet équipement contient de l'énergie électrique potentiellement dangereuse. Débrancher le système avant tout entretien/révision.

### Warnung

Gerät nur von geschultem, qualifiziertem Personal installieren, auswechseln oder warten lassen. Im Gerät liegt gefährliche Spannung an. Vor allen Wartungsarbeiten Gerät vom Netz trennen.

### Avvertenza

Questo apparato può essere installato, sostituito o revisionato solo da personale qualificato e competente. Questo apparecchio presenta pericolo di scosse elettriche. Scollegare il sistema prima di procedere alla revisione.

### Advarsel

Dette utstyret skal bare monteres, skiftes ut eller vedlikeholdes av kvalifisert personell som har gjennomgått opplæring. Det kan være fare for elektrisk støt forbundet med dette utstyret. Kople fra systemet før igangsetting av vedlikeholdsarbeid.

### Aviso

Apenas pessoal treinado e qualificado deve ser autorizado a instalar, substituir ou fazer a revisão deste equipamento. Este equipamento constitui risco de choque eléctrico. Desligar o sistema antes de efectuar qualquer serviço de revisão.

### ¡Advertencia!

Solamente el personal calificado debe instalar, reemplazar o reparar este equipo, ya que existe riesgo de descarga eléctrica. Desenchufe el sistema antes de proceder al mantenimiento del mismo.

### Varning!

Endast utbildad och behörig personal får utföra installation, utbyte eller service av denna utrustning. Denna utrustning kan medföra fara för elstöt. Koppla ifrån systemet innan service utförs.

## Unit Grounding Protection Warning



### Warning

Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

### Waarschuwing

De aardingsleiding mag nooit buiten werking gesteld worden en de apparatuur mag nooit bediend worden zonder dat er een op de juiste wijze geïnstalleerde aardingsleiding aanwezig is. Neem contact op met de bevoegde instantie voor elektrische inspecties of met een elektricien als u niet zeker weet of voor passende aarding gezorgd is.

### Varoitus

Älä koskaan ohita maajohdinta tai käytä laitteita ilman oikein asennettua maajohdinta. Ota yhteyttä asianmukaiseen sähkötarkastusviranomaiseen tai sähköasentajaan, jos olet epävarma maadoituksen sopivuudesta.

### Attention

Ne jamais rendre inopérant le conducteur de masse ni utiliser l'équipement sans un conducteur de masse adéquatement installé. En cas de doute sur la mise à la masse appropriée disponible, s'adresser à l'organisme responsable de la sécurité électrique ou à un électricien.

### Warnung

Umgehen Sie auf keinen Fall den Erdungsleiter und nehmen Sie die Geräte nicht in Betrieb, wenn der Erdungsleiter nicht sachgemäß installiert ist. Wenden Sie sich an die entsprechende Behörde, die für die Inspektion elektrischer Anlagen zuständig ist, oder an einen Elektriker, wenn Sie nicht sicher sind, ob der Anschluß ordnungsgemäß geerdet ist.

### Avvertenza

Non escludere mai il conduttore di protezione né usare l'apparecchiatura in assenza di un conduttore di protezione installato in modo corretto. Se non si sa con certezza che è disponibile un collegamento di messa a terra adeguato, esaminare le Norme CEI pertinenti o rivolgersi a un elettricista qualificato.

### Advarsel

Jordingslederen må aldri hindres, og utstyret må aldri brukes uten at en forsvarlig jordingsleder er installert. Kontakt elektrisitetstilsynet eller en elektriker dersom du er usikker på om riktig jording er tilgjengelig.

### Aviso

Nunca anule o condutor à terra nem opere o equipamento sem ter um condutor à terra adequadamente instalado. Em caso de dúvida em relação ao sistema de ligação à terra, contacte os serviços locais de inspeção eléctrica ou um electricista qualificado.

### ¡Advertencia!

No desactive nunca el conductor de tierra ni opere el equipo sin un conductor de tierra instalado correctamente. Póngase en contacto con las autoridades de inspección eléctrica pertinentes o con un electricista, si no está seguro de contar con una toma de tierra adecuada.

### Varning!

Koppla aldrig från jordledningen och använd aldrig utrustningen utan en på lämpligt sätt installerad jordledning. Om det föreligger osäkerhet huruvida lämplig jordning finns skall elektrisk besiktningsauktoritet eller elektriker kontaktas.

## DC Power Disconnection Warning



### Warning

Before performing any of the following procedures, ensure that DC power to the transverter you will be working on is turned OFF. To ensure that the power to the specific transverter is OFF, locate the power/breaker switch on the front of power feed panel that services that transverter, push the switch into the OFF position, then tape the switch in the OFF position.

### Waarschuwing

Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom op het gelijkstroomcircuit is uitgeschakeld. Om u ervan te verzekeren dat alle stroom is UITgeschakeld, kiest u op het schakelbord de stroomverbreker die het gelijkstroom circuit bedient, draait u de stroomverbreker naar de UIT positie en plakt u de schakelaarhendel van de stroomverbreker met plakband in de UIT positie vast.

### Varoitus

Varmista ennen seuraavien toimenpiteiden suorittamista, että tasavirtapiirin virta on KATKAISTU. Varmistaaksesi, että virta on KATKAISTU täysin, paikanna tasavirrasta huolehtivassa kojetaulussa sijaitseva suojakytkin. Käännä suojakytkin KATKAISTU-asentoon. Teippaa suojakytkimen varsi niin, että kytkin pysyy KATKAISTU-asennossa.

### Attention

Avant d'effectuer l'une des procédures décrites ci-dessous, vérifiez que le circuit alimenté en courant continu n'est plus sous tension. Pour vous en assurer, localisez le disjoncteur situé sur le panneau de service du circuit en courant continu, désactivez-le (OFF) et, à l'aide d'un ruban adhésif, bloquez la poignée du disjoncteur en position OFF.

### Warnung

Vor Ausführung der folgenden Vorgänge ist sicherzustellen, daß der Transverter, mit dem Sie arbeiten, nicht mit Strom versorgt wird. Um sicherzustellen, daß der Strom abgestellt ist, machen Sie auf der Vorderseite der Schalttafel den Stromschalter für den Transverter ausfindig, stellen Sie den Schalter auf AUS, und kleben Sie den Schaltergriff mit Klebeband in der AUS-Stellung fest.

### Avvertenza

Prima di svolgere una qualsiasi delle procedure seguenti, verificare che il circuito in corrente continua non sia alimentato. Per verificare che tutta l'alimentazione sia scollegata (OFF), individuare l'interruttore automatico sul quadro strumenti che alimenta il circuito CC, mettere l'interruttore in posizione OFF e fissarlo con nastro adesivo in tale posizione.

### Advarsel

Før du utfører noen av disse prosedyrene, må du kontrollere at strømtilførselen til transformatoren du skal bruke, er slått AV. Dette gjøres ved å lokalisere strømbryteren foran på brytertavlen som betjener transformatoren, deretter trykker du bryteren inn i AV-stilling og fester bryteren med teip i AV-stilling.

### Aviso

Antes de executar qualquer um dos seguintes procedimentos, certifique-se de que a fonte de alimentação de corrente contínua para o transversor em que irá trabalhar está DESLIGADA. Para se certificar de que toda a alimentação para esse transversor foi DESLIGADA, localize o disjuntor no painel que alimenta esse transversor e coloque-o na posição OFF (Desligado) e, em seguida, segure o disjuntor nessa posição com fita isoladora.

- ¡Advertencia!** Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) con el que se va a trabajar esté cortada (OFF). Para ello, localizar el interruptor de corriente en la parte frontal del panel que alimenta al circuito, cambiar el interruptor automático a la posición de Apagado (OFF) y sujetar con cinta adhesiva la palanca del interruptor automático en posición de Apagado (OFF).
- Varning!** Innan du utför någon av följande procedurer måste du kontrollera att strömförsörjningen till likströmskretsen är bruten. Kontrollera att all strömförsörjning är BRUTEN genom att slå AV det överspänningsskydd som skyddar likströmskretsen och tejpa fast överspänningsskyddets omkopplare i FRÅN-läget.

## Ground Wire Warning



### Warning

A ground wire must always be a single piece of wire. Never splice two wires together for a ground. Corrosion and weathering can lead to a poor connection at the splice, making the ground ineffective and dangerous.

### Waarschuwing

Een aardedraad moet altijd over de hele lengte uit een enkel stuk draad bestaan. Voor een aardedraad mogen nooit twee aparte draden aan elkaar verbonden worden. Invloed van het weer en roest kunnen de verbinding tussen de twee draden belemmeren waardoor de aardeverbinding minder goed werkt en zelfs gevaarlijk kan worden.

### Varoitus

Maajohtimen on oltava aina yksittäinen johdin. Maajohdinta ei saa koskaan tehdä liittämällä kahta johdinta yhteen. Syöpyminen ja sään vaikutus voivat heikentää liitoksen kytkentää, mikä tekee maadoituksesta tehottoman ja vaarallisen.

### Attention

Le fil de mise à la terre doit toujours être d'une seule pièce. Ne raccordez jamais deux fils ensemble pour fabriquer un fil de mise à la terre. La corrosion et les dommages provoqués par les intempéries risquent d'entraîner une connexion médiocre à l'endroit du raccord, diminuant ainsi l'efficacité de la mise à la terre et la rendant dangereuse.

### Warnung

Ein Erdungsdraht darf nur aus einem einzigen Draht bestehen. Verbinden Sie nie zwei Drähte zum Erden. Korrosion und Verwitterung können zu einer schlechten Übertragung an der Verbindungsstelle führen, wodurch die Erdung ineffizient und gefährlich wird.

### Avvertenza

I cavi di terra devono sempre essere costituiti da conduttori ininterrotti: non congiungere mai due cavi per realizzare un collegamento di terra. La corrosione e l'usura possono ridurre la conduttività della giunzione, rendendo così inefficace e pericoloso il collegamento a terra.

### Advarsel

En jordingsledning må alltid bestå av en enkel ledning. Skjøt aldri to ledninger sammen for jording. Korrosjon og værslitasje kan føre til dårlig kobling i skjøtet, slik at jordingen blir ueffektiv og farlig.

### Aviso

Um fio terra deve ser composto de um fio único. Nunca emende dois fios para fazer um fio terra. A corrosão e a ferrugem podem afetar a emenda e tornar o aterramento inefetivo ou perigoso.



- ¡Advertencia!** El cable que se utilice para la conexión a tierra siempre deberá ser de una sola pieza. Nunca empalme dos cables para hacer vconexión a tierra. La corrosión y el deterioro debido a los agentes atmosféricos pueden debilitar la conexión del empalme, lo cual puede hacer que la conexión a tierra no funcione adecuadamente y sea peligrosa.
- Varning!** En jordad tråd måste alltid bestå av en enda tråd. Splitsa aldrig ihop två trådar för jord. Korrosion och exponering för väder och vind kan leda till dålig anslutning vid splitsningen, med det resultatet att jordningen blir ineffektiv och farlig.

## Declaration of Conformity with Regard to the Directives 73/23/EEC and 89/336/EEC as amended by Directive 93/68/EEC

The Declaration of Conformity related to this product can be found at the following URL:  
<http://www.ciscofax.com/>

- Deutsch:** Dieses Gerät entspricht den wesentlichen Anforderungen und weiteren Bestimmungen der Richtlinien 73/23/EWG und 89/336/EWG mit der Ergänzung durch Richtlinie 93/68/EWG.
- Dansk:** Dette udstyr er i overensstemmelse med de ufravigelige hensyn og andre bestemmelser i direktiv 73/23/EEC og 89/336/EEC som ændret i direktiv 93/68/EEC.
- English:** This equipment is in compliance with the essential requirements and other provisions of Directives 73/23/EEC and 89/336/EEC as amended by Directive 93/68/EEC.
- Español:** Este equipo cumple con los requisitos esenciales y otras disposiciones de las Directrices 73/23/EEC y 89/336/EEC de acuerdo a las modificaciones de la Directriz 93/68/EEC.
- Français:** Cet appareil remplit les principales conditions requises et autres dispositions des Directives 73/23/EEC et 89/336/EEC, modifiées par la Directive 93/68/EEC.
- Íslenska:** Þessi búnaður samrýmist lögboðnum kröfum og öðrum ákvæðum tilskipana 73/23/EBE og 89/336/EBE, með breytingum skv. tilskipun 93/68/EBE.
- Italiano:** Questa apparecchiatura è conforme ai requisiti essenziali e altre disposizioni delle Direttive 73/23/EEC e 89/336/EEC modificate con la Direttiva 93/68/EEC.
- Nederlands:** Deze apparatuur voldoet aan de belangrijkste eisen en andere voorzieningen van richtlijnen 73/23/EEC en 89/336/EEC zoals gewijzigd door richtlijn 93/68/EEC.
- Norsk:** Dette utstyret samsvarer med de vesentligste kravene og andre regler i direktivene 73/23/EEC og 89/336/EEC samt i tilleggsdirektiv 93/68/EEC.
- Português:** Este equipamento satisfaz os requisitos essenciais e outras provisões das Directivas 73/23/EEC e 89/336/EEC, conforme amendados pela Directiva 93/68/EEC.

**Suomalainen:** Tämä laite on direktiivien 73/23/ETY ja 89/336/ETY (kuten muutettu direktiivissä 93/68/ETY) keskeisten vaatimusten ja määräysten mukainen.

**Svenska:** Denna utrustning uppfyller de väsentliga kraven och andra villkor i direktiven 73/23/EEC och 89/336/EEC enligt ändringarna i direktiv 93/68/EEC.

## Declaration of Conformity to R&TTE Directive 1999/5/EEC for the European Community, Switzerland, Norway, Iceland and Liechtenstein

**English** This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

**Nederlands:** Deze apparatuur voldoet aan de essentiële vereisten en andere relevante voorzieningen van EU-richtlijn 1999/5/EC.

**Suomalainen:** Tämä laite noudattaa direktiivin 1999/5/EC keskeisiä vaatimuksia ja sen muita olennaisia määräyksiä.

**Français:** Cet équipement répond aux exigences et provisions de la Directive 1999/5/EC.

**Deutsch:** Diese Geräte entsprechen den Anforderungen und anderen relevanten Bestimmungen der Richtlinie 1999/5/EC.

**Italiano:** Questa apparecchiatura rispetta i requisiti essenziali e le altre clausole rilevanti della Direttiva 1999/5/CE.

**Dansk:** Dette udstyret er i samsvar med de grundleggende kravene og andre relevante forskrifter i 1999/5/EC-direktivet.

**Português:** Este equipamento está de acordo com os requisitos essenciais e outras provisões relevantes da Diretiva 1999/5/EC.

**Español:** Este equipo cumple con los requisitos esenciales y otras provisiones relevantes de la Directiva 1999/5/EC.

**Svenska:** Denna utrustning uppfyller de väsentliga kraven och andra relevanta förordningar i Direktiv 1999/5/EC.

## Class B EMC Warning



### Warning

This is a Class B Device and is registered for EMC requirements for residential use. This device can be used not only in residential areas but in all other areas.

주의 B급 기기 이 기기는 가정용으로 전자파 적합 등록을 한 기기로서 주거지역 내에서는 물론 모든 지역에서 사용할 수 있습니다.

## Safety Requirements Warning



### Warning

All safety requirements and recommendations must be read by all personnel prior to working on the system. Failure to follow the safety requirements and recommendations could result in injury.

### Waarschuwing

Alle veiligheidsvereisten en -aanbevelingen dienen door het personeel gelezen te worden voordat er aan het systeem wordt gewerkt. Het niet nakomen van de veiligheidsvereisten en aanbevelingen kan leiden tot letsel.

### Varoitus

Kaikkien henkilökuntaan kuuluvien on luettava kaikki turvallisuusvaatimukset ja -suositukset ennen järjestelmän parissa työskentelyä. Näiden turvallisuusvaatimusten ja -suositusten laiminlyönti voi aiheuttaa tapaturman.

### Attention

Il est essentiel que chaque membre du personnel lise toutes les consignes et conditions d'utilisation avant d'exploiter le système. Le moindre manquement aux consignes et mesures de sécurité risque de provoquer des blessures.

### Warnung

Alle Sicherheitshinweise und Empfehlungen müssen vom gesamten Personal gelesen werden, bevor mit der Arbeit am System begonnen wird. Das Nichtbefolgen der Sicherheitshinweise und der Empfehlungen kann Verletzungen zur Folge haben.

### Avvertenza

Prima di intervenire sul sistema è necessario leggere tutti i requisiti e i suggerimenti relativi alla sicurezza. Se si ignorano i requisiti e i suggerimenti relativi alla sicurezza esiste il rischio di lesioni.

### Advarsel

Alle sikkerhetskrav og -anbefalinger skal leses av alt personell før arbeidet på systemet begynner. Hvis sikkerhetskrav og -anbefalinger ikke følges, er det fare for at skade kan oppstå.

### Aviso

Todos os requisitos e recomendações de segurança devem ser lidos por todo o pessoal antes de trabalhar no sistema. Podem ocorrer ferimentos se os requisitos e recomendações de segurança não forem seguidos.

|                      |                                                                                                                                                                                                                     |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>¡Advertencia!</b> | <b>El personal debe leer todos los requerimientos y recomendaciones de seguridad antes de trabajar en el sistema. El incumplimiento de tales requerimientos y recomendaciones podría provocar lesiones o daños.</b> |
| <b>Varning!</b>      | <b>Alla säkerhetskrav och rekommendationer måste läsas av all personal innan arbete på systemet påbörjas. Om säkerhetskraven och rekommendationerna inte följs kan detta leda till skador.</b>                      |

## Laser Radiation Warning



### Warning

Laser radiation presents an invisible hazard, so personnel should avoid exposure to the laser beam. Personnel must be qualified in laser safety procedures and must use proper eye protection before working on this equipment.

### Waarschuwing

Laserstraling levert een onzichtbaar gevaar op, zodat personeel blootstelling aan de laserstraal dient te vermijden. Het personeel dient gekwalificeerd te zijn in veiligheidsprocedures m.b.t. lasers en dient de juiste oogbescherming te dragen voordat er aan deze apparatuur wordt gewerkt.

### Varoitus

Lasersäteily muodostaa näkymättömän vaaran, joten henkilökunnan tulisi välttää altistumista lasersäteelle. Henkilökunnan on tunnettava laserin turvalliset käyttötoimet ja käytettävä asianmukaisia silmiensuojaimia ennen tämän laitteiston parissa työskentelyä.

### Attention

Les rayonnements laser constituent un risque grave invisible ; il est donc essentiel que le personnel évite toute exposition au rayon laser. Tout membre personnel doit avoir reçu une formation qualifiée en matière de procédures de sécurité laser et doit revêtir un équipement de protection optique adéquat avant d'exploiter l'équipement.

### Warnung

Da Laserstrahlung eine unsichtbare Gefahr darstellt, sollte das Personal nicht mit dem Laserstrahl in Berührung kommen. Das Personal muss mit den Laser-Sicherheitsvorkehrungen vertraut sein und zulässige Schutzbrillen tragen, bevor die Arbeit an diesen Geräten aufgenommen wird.

### Avvertenza

Evitare l'esposizione ai raggi laser, in quanto rappresentano un rischio invisibile. Prima di intervenire su questa apparecchiatura, occorre essere a conoscenza delle procedure di sicurezza relative ai laser e indossare protezioni adeguate per gli occhi.

### Advarsel


Laserstråling representerer en usynlig fare. Personellet må derfor unngå eksponering til laserstrålen. Personellet må være vel kjent med lasersikkerhetsprosedyrer og må bruke passende øyenvern før de begynner å jobbe med dette utstyret.

### Aviso

A radiação de laser representa um risco invisível, portanto deve-se evitar exposição pessoal ao feixe do laser. O pessoal deve estar qualificado em procedimentos de segurança de laser e deve usar proteção adequada para os olhos antes de trabalhar neste equipamento.

|               |                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ¡Advertencia! | <b>La radiación láser constituye un peligro invisible; por consiguiente, el personal debe evitar exponerse al haz láser. Los miembros del personal deben estar debidamente capacitados respecto de los procedimientos de seguridad cuando se trabaja con equipos láser y deben utilizar dispositivos adecuados de protección ocular antes de trabajar en este equipo.</b> |
| Varning!      | <b>Laserstrålning är en osynlig fara, så personal bör undvika att exponeras för laserstrålen. Personalen måste vara kvalificerad inom säkerhetsåtgärder för laser och måste använda korrekt ögonskydd innan arbete på denna utrustning påbörjas.</b>                                                                                                                      |

## Fiber Disconnect Sequence Warning

|                                                                                   |                                                                                                                                                                              |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                                                                                                              |
| Warning                                                                           | <b>To ensure personal safety when disconnecting fiber cable, always disconnect the input connector first and then the output connector.</b>                                  |
| Waarschuwing                                                                      | <b>De ingangsconnector dient altijd vóór de uitgangsconnector ontkoppeld te worden om de veiligheid van het personeel te garanderen bij het ontkoppelen van vezelkabels.</b> |
| Varoitus                                                                          | <b>Kuitukaapelia irrotettaessa on henkilökunnan turvallisuuden vuoksi tuloliitin irrotettava aina ensin ja sitten vasta lähtöliitin.</b>                                     |
| Attention                                                                         | <b>Pour assurer la sécurité de votre personne lors de la déconnexion d'un câble à fibres, commencez toujours par débrancher le connecteur d'entrée puis celui de sortie.</b> |
| Warnung                                                                           | <b>Lösen Sie bei Glasfaserkabeln immer zuerst die Eingangssteckverbinder und danach die Ausgangssteckverbinder, um die persönliche Sicherheit zu gewährleisten.</b>          |
| Avvertenza                                                                        | <b>Per tutelare la sicurezza personale, quando si scollega un cavo a fibre ottiche rimuovere per primo il connettore di ingresso e quindi quello di uscita.</b>              |
| Advarsel                                                                          | <b>For å sikre personvern under frakopling av fiberkabler, skal inngangskoplingen frakoples først, deretter frakoples utgangskoplingen.</b>                                  |
| Aviso                                                                             | <b>Para garantir a segurança pessoal ao desconectar o cabo de fibra, sempre desconecte o conector de entrada primeiro e depois o conector de saída.</b>                      |
| ¡Advertencia!                                                                     | <b>A los efectos de garantizar la seguridad personal durante la desconexión de cables de fibra, desconecte primero el conector de entrada y luego el de salida.</b>          |
| Varning!                                                                          | <b>För att garantera personlig säkerhet vid frånkoppling av fiberkabler ska alltid in-anlutningen kopplas ifrån först och sedan utanslutningen.</b>                          |

## Optical Connector Warning


**Warning**

Do not look directly at the optical connector output beams during connector removal and replacement. The beams can cause permanent eye damage.

**Waarschuwing**

Kijk niet rechtstreeks in de uitgangsstralen van de optische connector tijdens het verwijderen en vervangen van de connector. De stralen kunnen permanente oogschade veroorzaken.

**Varoitus**

Älä katso suoraan optisesta liittimestä tuleviin säteisiin liittimen irrotuksen ja vaihdon aikana. Säteet voivat aiheuttaa pysyviä silmävaurioita.

**Attention**

Ne regardez jamais directement les faisceaux de sortie d'un connecteur optique lors du retrait et du remplacement de ce dernier. Les rayonnements risquent d'endommager irrémédiablement votre vue.

**Warnung**

Sehen Sie nicht direkt in die Strahlen am Ausgang des optischen Steckverbinders, während Sie den Steckverbinder entfernen oder ersetzen. Die Strahlen können bleibende Augenschäden hervorrufen.

**Avvertenza**

Durante la rimozione e la sostituzione dei connettori ottici, evitare di guardare direttamente i raggi laser in uscita dal connettore stesso. I raggi laser possono provocare lesioni permanenti agli occhi.

**Advarsel**

Ikke se direkte på utgangsstrålene i den optiske koplingen ved fjerning og utskifting av koplinger. Strålene kan forårsake varige øyenskader.

**Aviso**

Não olhe diretamente para os feixes de saída do conector óptico durante a remoção e a substituição do conector. Os feixes podem causar danos permanentes aos olhos.

**¡Advertencia!**

No mire directamente hacia los haces de salida del conector óptico durante la remoción y reemplazo del conector. Los haces pueden causar daños oculares irreversibles.

**Varning!**

Titta aldrig rakt in i den optiska kontaktens strålar vid borttagning och byte av kontakt. Strålarna kan orsaka permanenta ögonskador.

## Optical Connector Disconnect Warning


**Warning**

Cap the end of a disconnected output connector immediately to disable the live laser signal to avoid possible eye damage and protect the connector from contamination.

**Waarschuwing**

Dek het uiteinde van de ontkoppelde uitgangsconnector onmiddellijk af om het onder spanning staande lasersignaal te inactiveren om mogelijke schade aan de ogen te vermijden en om de connector te beschermen tegen contaminatie.

|                      |                                                                                                                                                                                                                                                |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Varoitus</b>      | <b>Estä lasersignaalin kulku sulkemalla irrotetun tuloliittimen pää välittömästi silmävaurioiden estämiseksi ja liittimen suojaamiseksi lialta.</b>                                                                                            |
| <b>Attention</b>     | <b>Couvrez immédiatement l'extrémité d'un connecteur de sortie débranché pour désactiver le signal laser actif, afin d'éviter tout risque d'endommagement de la vue et de protéger le connecteur de toute contamination.</b>                   |
| <b>Warnung</b>       | <b>Verschließen Sie das Ende eines gelösten Ausgangssteckverbinders sofort mit einer Kappe, um das vorhandene Lasersignal zu deaktivieren und möglichen Augenschäden vorzubeugen und um den Steckverbinder vor Verunreinigung zu schützen.</b> |
| <b>Avvertenza</b>    | <b>Per evitare lesioni agli occhi e proteggere il connettore da contaminazione, coprire immediatamente i connettori di uscita scollegati in modo da bloccare il segnale laser attivo.</b>                                                      |
| <b>Advarsel</b>      | <b>En frakoplet utgangskopling skal øyeblikkelig forsynes med hette for å deaktivere det aktive lasersignalet for derved å unngå eventuell øyenskade og beskytte koplingen mot kontaminering.</b>                                              |
| <b>Aviso</b>         | <b>Tampe imediatamente a extremidade de um conector de saída desconectado para desativar o sinal de laser ativo e evitar possíveis danos aos olhos e proteger o conector contra contaminação.</b>                                              |
| <b>¡Advertencia!</b> | <b>Cubra inmediatamente el extremo de los conectores de salida que estén desconectados para así desactivar la señal activa de láser, evitar la posibilidad de daños oculares y proteger el conector contra la contaminación.</b>               |
| <b>Varning!</b>      | <b>Täck änden på en frånkopplad kontakt omedelbart för att sätta lasersignalen ur stånd så att eventuella ögonskador förhindras, och för att skydda kontakten så att den inte blir smutsig.</b>                                                |

## Eye Damage Warning



### Warning

Protective glasses such as the Laser-Gard Green C02 (LGE Spectacle, LGS Goggle, LGW Wraparound or LGF Full-View) or an equivalent type of covering equipment with optical density greater than 2 should be used. See your laser safety officer.

### Waarschuwing

Beschermingsbrillen zoals de Laser-Gard Green C02 (LGE Spectacle, LGS Goggle, LGW wraparound of LGF Full-View) of soortgelijke oogbescherming met een optische dichtheid van meer dan 2 dient te worden gebruikt. Neem contact op met uw veiligheidsexpert.

### Varoitus

Suojalaseja, kuten Laser-Gard Green C02 (LGE Spectacle, LGS Goggle, LGW Wraparound tai LGF Full-View) tai vastaavatyypistä peittävää välinettä, jonka optinen tiheys yli 2, on käytettävä. Ota yhteyttä laserturvallisuudesta vastaavaan henkilöön.

### Attention

Il convient de porter des lunettes de protection des modèles suivants : Laser-Gard Green C02 (LGE Spectacle, LGS Goggle, LGW Wraparound ou LGF Full-View) ou un équipement de protection équivalent caractérisé par une densité optique supérieure à 2. Consultez le spécialiste en sécurité laser de votre site.

|                      |                                                                                                                                                                                                                                                                            |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Warnung</b>       | Verwenden Sie Schutzbrillen wie die Laser-Gard Green CO2 (LGE Spectacle, LGS Goggle, LGW Wraparound oder LGF Full-View) oder einen entsprechenden Augenschutz mit einer optischen Dichte größer als 2. Wenden Sie sich an den Beauftragten für Lasersicherheit.            |
| <b>Avvertenza</b>    | È necessario utilizzare occhiali protettivi quali Laser-Gard Green CO2 (LGE Spectacle, LGS Goggle, LGW Wraparound o LGF Full-View) o un dispositivo di protezione di tipo equivalente con densità ottica superiore a 2. Consultare il responsabile per la sicurezza laser. |
| <b>Advarsel</b>      | Det bør brukes vernebriller av typen Laser-Gard Green CO2 (LGE-briller, LGS vernebriller, LGW buede briller eller LGF full synsvinkel) eller tilsvarende type verneutstyr med optisk tetthet høyere enn 2. Ta kontakt med representanten for lasersikkerhet.               |
| <b>Aviso</b>         | Deve-se usar óculos protetores como o Laser-Gard Green CO2 (LGE Spectacle, LGS Goggle, LGW Wraparound ou LGF Full-View) ou um tipo equivalente de equipamento de cobertura com densidade óptica maior que 2. Consulte seu agente de segurança de laser.                    |
| <b>¡Advertencia!</b> | Se deben utilizar anteojos de protección ocular tales como el Laser-Gard Green CO2 (LGE Spectacle, LGS Goggle, LGW Wraparound o LGF Full-View) o un tipo equivalente de equipo de cobertura con una densidad óptica mayor que 2. Consulte al encargado de seguridad.       |
| <b>Varning!</b>      | Skyddsglasögon av typen Laser-Gard Green CO2 (LGE Spectacle, LGS Goggle, LGW Wraparound eller LGF Full-View) eller motsvarande typ av täckande utrustning med en optisk densitet högre än 2 bör användas. Kontakta ansvarig för lasersäkerheten.                           |

## Static Electricity Warning



### Warning

Static electricity can damage electro-optical modules. While handling electro-optical module, wear a grounding wrist strap to discharge the static buildup. Wrist straps are designed to prevent static electricity damage to equipment.

### Waarschuwing

Statische elektriciteit kan elektro-optische modules beschadigen. Bij het hanteren van een electro-optische module dient u een geaarde polsband te dragen om de statische opeenhoping te ontladen. Polsbanden zijn ontworpen om schade van statische elektriciteit aan de apparatuur te voorkomen.

### Varoitus

Staattinen sähkö voi vahingoittaa sähköoptisia moduuleja. Sähköoptista moduulia käsiteltäessä on käytettävä maadoitusranneketta, joka purkaa kertyneen staattisen sähköön. Rannekkeet on tehty estämään staattisen sähköön aiheuttama laitteiden vahingoittuminen.

### Attention

Les décharges électrostatiques risquent d'endommager les modules électro-optiques. Lors de toute manipulation d'un module électro-optique, portez toujours un bracelet de protection antistatique pour décharger l'énergie statique accumulée. Ces bracelets antistatiques sont conçus pour empêcher tout dommage matériel dû aux décharges électrostatiques.



|                      |                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Warnung</b>       | <b>Statische Elektrizität kann zu Schäden an elektro-optischen Modulen führen. Tragen Sie ein Erdungsarmband, wenn Sie statische Energie entladen, während Sie mit elektro-optischen Modulen hantieren. Erdungsarmbänder schützen das Gerät vor Schäden durch statische Elektrizität.</b>                                                                         |
| <b>Avvertenza</b>    | <b>L'elettricità statica può danneggiare i moduli elettro-ottici. Per evitare l'accumulo di elettricità statica durante la manipolazione di un modulo elettro-ottico, indossare una fascia da polso per il collegamento a massa. Le fasce da polso sono progettate appositamente per prevenire i danni alle apparecchiature causati dall'elettricità statica.</b> |
| <b>Advarsel</b>      | <b>Statisk elektrisitet kan skade elektro-optiske moduler. Bruk jordet håndleddstropp ved håndtering av elektro-optiske moduler for å lade ut statisk opplading. Håndleddsstroppe er framstilt for å forhindre skader på utstyret forårsaket av statisk elektrisitet.</b>                                                                                         |
| <b>Aviso</b>         | <b>A eletricidade estática pode danificar módulos eletro-ópticos. Ao manusear um módulo eletro-óptico, use uma pulseira de aterramento para descarregar o acúmulo de estática. As pulseiras são projetadas para evitar danos ao equipamento por eletricidade estática.</b>                                                                                        |
| <b>¡Advertencia!</b> | <b>La electricidad estática puede dañar los módulos electro-ópticos. Al manipular módulos electro-ópticos, lleve puesta una pulsera de conexión a tierra para descargar la acumulación de electricidad estática. Las pulseras de descarga a tierra están diseñadas para prevenir daños a los equipos a causa de la electricidad estática.</b>                     |
| <b>Varning!</b>      | <b>Statisk elektricitet kan skada elektro-optiska moduler. Vid hantering av elektro-optiska moduler, använd ett jordande armband för att ladda ur statisk elektricitet som byggs upp. Armbanden är utformade för att förhindra skador på utrustning orsakade av statisk elektricitet.</b>                                                                         |

## Connector Cleaning Warning



### Warning

Be sure that the module is off and the laser is powered down before attempting to clean a connector. If you do not turn off and protect the module, you create a permanent health risk for yourself and others, and a risk of permanent connector damage.

### Waarschuwing

Zorg dat de module uit is en de laser uitgeschakeld is voordat u een connector probeert schoon te maken. Als u de module niet uitschakelt en beschermt, kan dit leiden tot een permanent gezondheidsrisico voor uzelf en anderen en kans op permanente schade aan de connector.

### Varoitus

Varmista, että moduuli on pois päältä ja ettei laseriin tule virtaa, ennen kuin yrität puhdistaa liitintä. Jos et kytke moduulia pois päältä ja suojaa sitä, voit altistaa itsesi ja muut pysyville terveyteen kohdistuville haittavaikutuksille sekä aiheuttaa pysyviä vaurioita liittimelle.

### Attention

Assurez-vous que le module est désactivé et que le laser est mis hors tension avant d'essayer de nettoyer un connecteur. Si vous omettez de protéger le module en le mettant hors tension, vous créez un risque de sécurité physique permanent pour vos collègues et vous-même, tout en risquant d'endommager irrémédiablement le connecteur.

|                      |                                                                                                                                                                                                                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Warnung</b>       | <b>Vergewissern Sie sich, dass das Modul ausgeschaltet und der Laser deaktiviert ist, bevor Sie versuchen, einen Steckverbinder zu reinigen. Wenn Sie das Modul nicht ausschalten und abschirmen, erzeugen Sie ein dauerhaftes Gesundheitsrisiko für sich und andere und riskieren eine permanente Schädigung des Steckverbinders.</b> |
| <b>Avvertenza</b>    | <b>Prima di pulire un connettore assicurarsi che il modulo sia spento e che il laser non sia alimentato. Se non si spegne e non si protegge il modulo esistono rischi relativi all'incolumità personale e di altri, nonché il pericolo di danni permanenti al connettore.</b>                                                          |
| <b>Advarsel</b>      | <b>Påse at modulen er slått av og at laseren også er slått av før rengjøring av en kopling. Hvis du ikke slår av og beskytter modulen, utgjør du en permanent helserisiko for deg selv og andre, i tillegg til permanent skade på koplingen.</b>                                                                                       |
| <b>Aviso</b>         | <b>Verifique se o módulo e o laser estão desligados antes de tentar limpar um conector. Se você não desligar e proteger o módulo, irá criar um risco permanente à saúde para você e para outros, e um risco de dano permanente no conector.</b>                                                                                        |
| <b>¡Advertencia!</b> | <b>Asegúrese de que el módulo y el láser estén apagados antes de intentar limpiar los conectores. Si no apaga y protege el módulo, corre el riesgo de dañar irreversiblemente no sólo los conectores, sino también su salud y la de los demás.</b>                                                                                     |
| <b>Varning!</b>      | <b>Se till att modulen är avstängd och att lasern har en lägre effekt före rengöring av kontakter. Om man inte stänger av och skyddar modulen skapar man en permanent hälsorisk för sig själv och andra, samt en risk för permanenta skador på kontakten.</b>                                                                          |

## Cable Connection Sequence Warning



### Warning

To ensure personal safety when reconnecting fiber cables, always reconnect the output connectors first before the input connectors.

### Waarschuwing

De uitgangconnectors dienen altijd vóór de ingangconnectors opnieuw aangesloten te worden, om de veiligheid van het personeel te garanderen bij het opnieuw aansluiten van vezelkabels.

### Varoitus

Kuitukaapeleita kytkettäessä on henkilökunnan turvallisuuden vuoksi lähtöliittimet kytkettävä aina ensin ennen tuloliittimiä.

### Attention

Pour assurer la sécurité de votre personne lors de la reconnexion de câbles à fibres, commencez toujours par reconnecter les connecteurs de sortie avant ceux d'entrée.

### Warnung


Verbinden Sie immer zuerst die Ausgangssteckverbinder und erst danach die Eingangssteckverbinder, um die persönliche Sicherheit beim erneuten Verbinden von Glasfaserkabeln zu gewährleisten.

### Avvertenza

Per tutelare la sicurezza personale quando si collega un cavo a fibre ottiche, collegare per primo il connettore di uscita e quindi quello di ingresso.

|                      |                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Advarsel</b>      | <b>For å sikre personvernet under gjeninnkopling av fiberkabler, må du alltid gjeninnkople utgangskoplingene før inngangskoplingene.</b>                          |
| <b>Aviso</b>         | <b>Para garantir a segurança pessoal ao reconectar cabos de fibra, sempre reconecte os conectores de saída primeiro, antes dos conectores de entrada.</b>         |
| <b>¡Advertencia!</b> | <b>A los efectos de garantizar la seguridad personal al volver a conectar cables de fibra, reconecte primero los conectores de salida y luego los de entrada.</b> |
| <b>Varning!</b>      | <b>För att garantera personlig säkerhet vid återanslutning av fiberkablar ska man alltid koppla tillbaka ut-anlutningen först och sedan in-anlutningen.</b>       |

## Module Removal Warning

|                                                                                   |                      |                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>Warning</b>       | <b>Removal of common modules causes traffic failure. Obtain proper authorization prior to any maintenance work.</b>                                                                      |
|                                                                                   | <b>Waarschuwing</b>  | <b>Het verwijderen van gemeenschappelijke modules leidt tot verkeersstoring. Zorg dat u de juiste autorisatie hebt alvorens onderhoud te verrichten.</b>                                 |
|                                                                                   | <b>Varoitus</b>      | <b>Yhteismoduulien poistaminen aiheuttaa liikennehäiriöitä. Hanki asianmukainen lupa ennen kunnossapitoa.</b>                                                                            |
|                                                                                   | <b>Attention</b>     | <b>Le retrait de modules communs risque de provoquer un arrêt accidentel du trafic. Veillez à obtenir les autorisations appropriées avant de procéder à tout travail de maintenance.</b> |
|                                                                                   | <b>Warnung</b>       | <b>Durch das Entfernen von gemeinsamen Modulen wird der Verkehr unterbrochen. Holen Sie eine offizielle Genehmigung ein, bevor Sie irgendwelche Wartungsarbeiten durchführen.</b>        |
|                                                                                   | <b>Avvertenza</b>    | <b>La rimozione dei moduli comuni provoca l'interruzione del traffico. Prima di qualsiasi intervento di manutenzione, è necessario disporre della relativa autorizzazione.</b>           |
|                                                                                   | <b>Advarsel</b>      | <b>Fjerning av fellesmoduler forårsaker trafikksvikt. Du må innhente autorisasjon før du foretar vedlikeholdsarbeider.</b>                                                               |
|                                                                                   | <b>Aviso</b>         | <b>A remoção dos módulos comuns causa falha de tráfego. Obtenha a autorização adequada antes de qualquer trabalho de manutenção.</b>                                                     |
|                                                                                   | <b>¡Advertencia!</b> | <b>La remoción de módulos comunes conlleva a fallas de tráfico. Obtenga la debida autorización antes de realizar tareas de mantenimiento.</b>                                            |
|                                                                                   | <b>Varning!</b>      | <b>Borttagning av gemensamma moduler orsakar trafikstopp. Skaffa korrekt behörighet före eventuellt underhållsarbete.</b>                                                                |

## DC Power SELV Requirement Warning



### Warning

The DC power supply systems (main, redundant, and service battery power supply systems) must be compliant with safety extra low voltage (SELV) requirements in accordance with IEC 60950 and UL 60950.

### Waarschuwing

De toevoersystemen van de gelijkstroom (hoofdtoevoersystemen, redundante en toevoersystemen voor de servicebatterij) dienen te voldoen aan de SELV (safety extra low voltage) vereisten in overeenstemming met IEC 60950 en UL 60950.

### Varoitus

Tasavirtavoimaverkkojen (pää-, varmennus- ja käyttöakkuvirtajärjestelmät) on noudatettava suojattuja erittäin alhaisia jännitteitä (SELV) koskevia vaatimuksia standardien IEC 60950 ja UL 60950 mukaisesti.

### Attention

Les systèmes d'alimentation en courant continu (systèmes principal, de secours et d'alimentation électrique d'entretien sur piles) doivent être conformes aux critères SELV (Safety Extra Low Voltage) tels qu'ils sont définis dans les normes IEC 60950 et UL 60950.

### Warnung

Die Systeme für die Gleichstromversorgung (Haupt-, redundante und Wartungsbatterie-Stromversorgungssysteme) müssen den Anforderungen für besonders niedrige Spannungen (SELV) nach den Richtlinien IEC 60950 und UL 60950 entsprechen.

### Avvertenza

I sistemi di alimentazione CC (sistema principale, di riserva e di alimentazione della batteria di servizio) devono essere conformi ai requisiti delle tensioni di sicurezza a basso voltaggio (SELV, Safety Extra Low Voltage) in conformità alle norme IEC 60950 e UL 60950.

### Advarsel

Likestrømsystemet (hovedledning, redundant og strøm fra servicebatterisystemet) må samsvare med sikkerhets-lavspenning (SELV)-kravene i henhold til IEC 60950 og UL 60950.

### Aviso

Os sistemas de fonte de alimentação CC (sistemas de fontes de alimentação principal, redundante e de bateria de serviço) devem ser compatíveis com os requisitos SELV (safety extra low voltage, tensão de segurança extra baixa) de acordo com as normas IEC 60950 e UL 60950.

### ¡Advertencia!

Los sistemas de suministro de alimentación de CC (sistemas de alimentación principal, redundante y de batería de servicio) deben cumplir los requerimientos de voltaje de seguridad extra bajo (SELV) de conformidad con IEC 60950 y UL 60950.

### Varning!

Matarsystemen för likström (huvud-, tilläggs- och servicebatterisystem) måste följa kraven för SELV (safety extra low voltage) i enlighet med IEC 60950 och UL 60950.

## Reinforced Insulation Warning



### Warning

The customer site 48 VDC power supply systems (main, redundant, and service battery power supply systems) must provide reinforced insulation (RI) between the primary AC power supply and the 48 VDC output in accordance with IEC 60950 and UL 60950.

### Waarschuwing

De toevoersystemen van 48 VDC op de locatie van de klant (hoofdtoevoersystemen, redundante en toevoersystemen voor de servicebatterij) dienen versterkte isolatie (RI) te verschaffen tussen de primaire wisselstroomtoevoer en de 48 VDC uitgang in overeenstemming met IEC 60950 en UL 60950.

### Varoitus

Asiakkaan puolen 48 V:n tasavirtavoimaverkoissa (pää-, varmennus- ja käyttöakkuvirtajärjestelmät) on oltava vahvistettu eristys (RI) ensisijaisen vaihtovirtalähteen ja 48 V:n tasavirta-ulos-tulon välillä standardien IEC 60950 ja UL 60950 mukaisesti.

### Attention

Les systèmes d'alimentation en courant continu de 48 V cc du site client (systèmes principal, de secours et d'alimentation électrique d'entretien sur piles) doivent fournir une isolation renforcée (RI, de l'anglais Reinforced Insulation) entre la principale source d'alimentation en ca et la sortie de 48 V cc, conformément aux normes IEC 60950 et UL 60950.

### Warnung

Die 48-Volt-Gleichstromsysteme am Kundenstandort (Haupt-, redundante und Wartungsbatterie-Stromversorgungssysteme) müssen über eine verstärkte Isolierung (Reinforced Insulation, RI) zwischen der Haupt-Wechselstromquelle und dem 48-Volt-Ausgang entsprechend den Richtlinien IEC 60950 und UL 60950 verfügen.

### Avvertenza

I sistemi di alimentazione a 48 V CC nella sede del cliente devono disporre di dispositivi di isolamento supplementare (RI, Reinforced Insulation) tra l'alimentazione CA principale e l'uscita a 48 V CC, in conformità a quanto previsto dalle norme IEC 60950 e UL 60950.

### Advarsel

Kundestedets 48 V likestrøms forsyningssystem (hovedledning, redundant og strøm fra servicebatterisystemet) må gi forsterket isolasjon mellom den primære vekselstrømforsyningen og 48 V likestrøm utgangseffekt i henhold til IEC 60950 og UL 60950.

### Aviso

Os sistemas de fonte de alimentação de 48 VCC das instalações do cliente (sistemas de fontes de alimentação principal, redundante e de bateria de serviço) devem oferecer isolamento reforçado (RI) entre a fonte de alimentação CA primária e a saída de 48 VCC de acordo com as normas IEC 60950 e UL 60950.

### ¡Advertencia!

Los sistemas de suministro de alimentación de 48 VCC del sitio del cliente (sistemas de alimentación principal, redundante y de batería de servicio) deben contar con aislamiento reforzado (RI) entre la fuente principal de alimentación de CA y la salida de 48 VCC, de conformidad con IEC 60950 y UL 60950.

### Varning!

Kundens 48 VDC matarsystem (huvud-, tillägs- och servicebatterisystem) måste ha förstärkt isolering (RI) mellan huvudväxelströmskällan och 48 VDC-uteffekten i enlighet med IEC 60950 och UL 60950.

## Power Supply Voltage Warning



|                      |                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Warning</b>       | <b>Abnormal power supply voltage must not exceed -60.0 VDC.</b>                                                   |
| <b>Waarschuwing</b>  | <b>Abnormale stroomtoevoerspanning mag -60,0 VDC niet overschrijden.</b>                                          |
| <b>Varoitus</b>      | <b>Poikkeava syöttöjännite ei saa olla yli -60,0 VDC.</b>                                                         |
| <b>Attention</b>     | <b>La tension d'alimentation électrique anormale ne peut dépasser -60 V cc.</b>                                   |
| <b>Warnung</b>       | <b>Spannungsabweichungen bei der Stromversorgung dürfen maximal 60,0 Volt Gleichspannung nicht überschreiten.</b> |
| <b>Avvertenza</b>    | <b>L'ampiezza delle anomalie nella tensione di alimentazione non deve superare -60 V CC.</b>                      |
| <b>Advarsel</b>      | <b>Abnormal strømforsyningsspenning må ikke overstige -60,0 V likestrøm.</b>                                      |
| <b>Aviso</b>         | <b>A tensão anormal da fonte de alimentação não deve exceder -60.0 VCC.</b>                                       |
| <b>¡Advertencia!</b> | <b>El voltaje anormal de la fuente de alimentación no debe ser mayor que -60 VCC.</b>                             |
| <b>Varning!</b>      | <b>Avvikande matarspänning får inte överstiga -60,0 VDC.</b>                                                      |

## DC Power Supply Connection Warning



|                     |                                                                                                                                                                                                                                                                              |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Warning</b>      | <b>Wire the DC power supply using the appropriate lugs at the wiring end, or with no lugs, as indicated in the Power Distribution Panel Cabling section.</b>                                                                                                                 |
| <b>Waarschuwing</b> | <b>Bedraad de wisselstroomtoevoer met de juiste aansluitingen aan het draaduiteinde of zonder aansluitingen, zoals aangegeven in de sectie Power Distribution Panel Cabling (Bekabeling van het stroomdistributiepaneel).</b>                                                |
| <b>Varoitus</b>     | <b>Kytke johdot tasavirtalähteeseen käyttämällä sopivia korvakkeita johtojen päässä tai ilman korvakkeita voimavirtapaneelin kaapelointia käsittelevän osan ohjeiden mukaisesti.</b>                                                                                         |
| <b>Attention</b>    | <b>Câblez l'alimentation en courant continu (cc) à l'aide des écrous de câblage appropriés à l'extrémité de câblage, voire sans écrous, comme l'indique la section consacrée au câblage du panneau de distribution de l'alimentation (Power Distribution Panel Cabling).</b> |
| <b>Warnung</b>      | <b>Verkabeln Sie die Gleichstromversorgung mit den erforderlichen Kabelschuhen an den Drahtenden bzw. ohne Kabelschuhe, wie im Abschnitt zur Stromverteilerverkabelung beschrieben.</b>                                                                                      |

|                      |                                                                                                                                                                                                                                                  |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Avvertenza</b>    | <b>Collegare l'alimentatore CC utilizzando i capicorda appropriati all'estremità o senza capicorda, secondo quanto indicato nella sezione relativa al cablaggio del pannello di distribuzione dell'alimentazione (Power Distribution Panel).</b> |
| <b>Advarsel</b>      | <b>Legg opp kablene for likestrømforsyningen med egnede kabelsko på kabelenden, eller uten kabelsko, som angitt i seksjonen Strømdistribusjon - Tavlekabling.</b>                                                                                |
| <b>Aviso</b>         | <b>Ligue a fonte de alimentação CC utilizando os terminais apropriados na extremidade de fiação ou sem terminais, conforme indicado na seção de Cabeamento do painel de distribuição de energia.</b>                                             |
| <b>¡Advertencia!</b> | <b>Conecte la fuente de alimentación de CC utilizando los conectores adecuados en el extremo del cableado, o sin utilizar conector alguno como se indica en la sección Cableado del panel de distribución de alimentación.</b>                   |
| <b>Varning!</b>      | <b>Koppla likströmförsörjningen med lämpliga kabelskor i kopplingsänden, eller utan kabelskor, så som visas i sektionen Power Distribution Panel Cabling strömkablar för panelen.</b>                                                            |

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