



Cisco ONS 15501 User Guide

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Preface

This preface describes the audience, organization, and conventions for the *Cisco ONS 15501 User Guide*. It also provides information about how to obtain related documentation and technical assistance.

Audience

Only trained and qualified personnel should be allowed to install, maintain, or troubleshoot the Cisco ONS 15501. Such individuals must be familiar with general optical transmission technology to properly utilize the unit.

Organization

This guide includes the following chapters:

Chapter	Title	Description
Chapter 1	Product Overview	Describes the Cisco ONS 15501 and its key features and applications.
Chapter 2	Installing the Cisco ONS 15501	Describes how to install the Cisco ONS 15501.
Chapter 3	Configuring the Cisco ONS 15501	Describes how to configure the Cisco ONS 15501 for onsite or remote monitoring.
Chapter 4	Command Reference	Lists the CLI commands used in the Cisco ONS 15501 environment.
Chapter 5	Troubleshooting	Describes the basic fault investigation and diagnostic (troubleshooting) procedures for the Cisco ONS 15501.
Appendix A	Cisco ONS 15501 Alarms	Lists the alarms defined for the Cisco ONS 15501.
Appendix B	Technical Specifications	Lists the technical specifications for the Cisco ONS 15501.
Appendix C	Connector Pinouts	Illustrates the pin configuration of the RS-232 DB-9 type connector and the Alarm Out RJ-45 connector.

Chapter	Title	Description
Appendix D	Time Zone Codes	Lists time zones and their correlating abbreviations, which are used when setting the time of the system.
Appendix E	Translated Safety Warnings	Lists the warnings in this guide and translates them into different languages.

Conventions

Notes use the following conventions:



Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the publication.

Cautions use the following conventions:



Caution

Means *caution should be taken*. Cautions contain information that is important to follow so as not to cause harm to the equipment.

Warnings use the following conventions:



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).

Attention	<p>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.</p>
Warnung	<p>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.</p>
Avvertenza	<p>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.</p>
Advarsel	<p>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.</p>
Aviso	<p>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.</p>
¡Advertencia!	<p>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.</p>
Varning!	<p>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.</p>

Related Documentation

Refer to the following documents for additional information about the Cisco ONS 15501:

- *Regulatory Compliance and Safety Information for the Cisco ONS 15500 Series*
- *Introduction to DWDM Technology*
- *Cisco ONS 15540 ESP Planning and Design Guide*
- *Cisco ONS 15540 ESP Configuration Guide and Command Reference*
- *Cisco ONS 15540 ESP Troubleshooting Guide*
- *Cisco ONS 15540 ESP MIB Quick Reference*
- *Glossary of Optical Networking Terms*

Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

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

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

International Cisco web sites can be accessed from this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

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

Registered Cisco.com users can order the Documentation CD-ROM (product number DOC-CONDOCCD=) through the online Subscription Store:

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You can order Cisco documentation in these ways:

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<http://www.cisco.com/en/US/partner/ordering/index.shtml>
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<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

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You can email your comments to bug-doc@cisco.com.

You can submit your comments by mail by using the response card behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com, which includes the Cisco Technical Assistance Center (TAC) Website, as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from the Cisco TAC website. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC website, including TAC tools and utilities.

Cisco.com

Cisco.com offers a suite of interactive, networked services that let you access Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com provides a broad range of features and services to help you with these tasks:

- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

To obtain customized information and service, you can self-register on Cisco.com at this URL:
<http://www.cisco.com>

Technical Assistance Center

The Cisco 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 website and the Cisco TAC Escalation Center. The avenue of support that you choose depends on the priority of the problem and the conditions stated in service contracts, when applicable.

We categorize Cisco TAC inquiries according to urgency:

- 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.

Cisco TAC Website

You can use the Cisco TAC website 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 website, 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 website. Some services on the Cisco TAC website require 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://tools.cisco.com/RPF/register/register.do>

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

<http://www.cisco.com/en/US/support/index.html>

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC website so that you can describe the situation in your own words and attach any necessary files.

Cisco TAC Escalation Center

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

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

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

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.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:
http://www.cisco.com/en/US/products/products_catalog_links_launch.html
- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary*, *Internetworking Technology Handbook*, *Internetworking Troubleshooting Guide*, and the *Internetworking Design Guide*. For current Cisco Press titles and other information, go to Cisco Press online at this URL:
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http://www.cisco.com/en/US/about/ac123/ac114/about_cisco_packet_magazine.html
- *iQ Magazine* is the Cisco monthly periodical that provides business leaders and decision makers with the latest information about the networking industry. You can access *iQ Magazine* at this URL:
http://business.cisco.com/prod/tree.taf%3fasset_id=44699&public_view=true&kbns=1.html
- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in the design, development, and operation of public and private internets and intranets. You can access the *Internet Protocol Journal* at this URL:
http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html
- Training—Cisco offers world-class networking training, with current offerings in network training listed at this URL:
http://www.cisco.com/en/US/learning/le31/learning_recommended_training_list.html



Product Overview

The Cisco ONS 15501 is a low-noise, gain-flattened C-band optical EDFA (erbium-doped fiber amplifier). This guide describes how to install and operate the Cisco ONS 15501 15501-EDFA and 15501-EDFA-AC.

The Cisco ONS 15501 complements high-performance digital transmitters in topologies requiring amplification of 1550-nm optical signals.

This chapter includes the following sections:

- Product Description, page 1-1
- Optical Specifications, page 1-2
- Key Features, page 1-3
- Cisco ONS 15501 Applications, page 1-5
- Cisco ONS 15501 AC Front Panel, page 1-8
- Cisco ONS 15501 DC Front Panel, page 1-10
- Cisco ONS 15501 LED Alarm Definitions, page 1-11

Product Description

The Cisco ONS 15501 contains erbium-doped optical fiber, optical couplers, and one or more pump lasers and isolators. An optical signal (within a range of 1530 to 1563 nm) arrives at the input connector. The 1550-nm signal travels through a length of erbium-doped fiber cable. Inside the amplifier, light from a laser at a wavelength of 980 nm (called the pump laser) is used to amplify the signal at 1550 nm. The amplified signal is coupled to the output cable for transmission to a node. In longer cable runs, up to six Cisco ONS 15501 EDFAs can be connected in tandem.

The Cisco ONS 15501 uses 980-nm pump lasers that are built to meet Bellcore TR-NWT-000468 and MIL-883D standards. With a noise figure approaching the theoretical minimum, the amplifier achieves results superior to that obtained from a 1480-nm pump laser. The 980-nm pump laser has a long lifetime, exceeding one million hours. Use of a small number of high-quality components makes the Cisco ONS 15501 a highly reliable product.

The Cisco ONS 15501 is polarization, modulation, and frequency independent, and operates in gain-controlled mode. It is optimized for different input and output powers, and it can be used as a preamplifier, inline amplifier, or booster. The unit provides excellent gain flatness for the cascading of amplifiers in DWDM applications.

The Cisco ONS 15501 is physically designed to fit into a 19-inch, 23-inch, or ETSI equipment rack, with front, middle, or rear mounting capability. It is equipped with connectors for optional monitoring either locally or remotely.

Optical Specifications

Table 1-1 lists the Cisco ONS 15501 optical specifications and Table 1-2 lists the alarms thresholds. For other technical specifications, see Appendix B, “Technical Specifications.”

Table 1-1 Cisco ONS 15501 Optical Specifications

Description	Specification
Wavelength range	1530 to 1563 nm
Input power range	-29 to 0 dBm
Saturated output power	17.3 ± 0.3 dBm
Noise figure	< 6.0 dB
Nominal gain	+17 dB
Gain flatness	< 1.5 dB
Settable variable gain	7 to 17 dB ¹
Automatic gain control accuracy	± 1.0 dB
Transient suppression response time	50 microseconds
Backward ASE ² power	< -25 dBm
PMD ³	< 0.6 ps
Mode of operation	Unidirectional
Optical return loss	> 27 dB
Input and output isolation	> 30 dB
Polarization sensitivity	< 0.5 dB
Tap ratio for output monitoring port	1 percent or -20 dB

1. Gain flatness is <1.5 dB for 13 to 17 dB; <2.0 dB for 7 to 13 dB.

2. ASE = amplified spontaneous emission

3. PMD = polarization mode dispersion

Table 1-2 Alarm Thresholds

Threshold	Minimum Value Programmable	Factory Default	Maximum Value Programmable
Optical input mean	-10	-10	0
Optical input trigger	0	20	20
Signal mean	-6	0	0
Signal trigger	0	17.5	18
Gain mean ¹	7	17.5	17.5

Table 1-2 Alarm Thresholds (continued)

Threshold	Minimum Value Programmable	Factory Default	Maximum Value Programmable
Gain trigger	0	1	2
Temp mean	20	30	40
Temp trigger	20	25	30

1. Gain mean is the only settable parameter that affects system performance.

Some attributes (optical input, optical output, temperature, and gain) allow alarm trigger points to be set on them. The alarms are triggered, or asserted, when the measured value crosses the value of *Mean ± Trigger*. Once triggered the alarm is cleared only when the measured value is at *Mean ± 90% of Trigger*. This approach builds a hysteresis window of 10% of trigger value. If chattering is noted for one of the alarms, increase the trigger value (so that the hysteresis is bigger) to eliminate the alarm chatter.

Key Features

The Cisco ONS 15501 has the following key features:

- Constant flat gain of 17 dB over the 1530 to 1563 nm band
- Optimized automatic gain control for the MAN
- Variable gain for flexibility in network design
- Typical transient suppression within 50 microseconds
- Low noise figure of <6.0 dB
- Input power range of -29 to 0 dBm
- Network management

Constant Gain Flatness

The Cisco ONS 15501 is a constant gain amplifier. It does not deliver a constant output, but rather ensures that the output energy spectrum is gain-flattened irrespective of input power (up to the maximum allowed). If a channel is removed, the output level drops at the wavelength that is removed, but the remaining energy spectrum remains nearly flat over its wavelength band. The gain flatness is also only minimally affected if the input signal is not flat by several decibels.

Optimized Automatic Gain Control

The Cisco ONS 15501 has a wide input power range of -29 to 0 dBm, over which it maintains gain flatness as well as a low noise figure across the entire C band. The Cisco ONS 15501 maintains a high level of precision, as well as speed, which allows it to be used as a booster, inline or preamplifier, thus reducing sparing expenses. The constant gain and noise figure capabilities of the Cisco ONS 15501 make network designs simpler and more predictable.

The lower gain available in the Cisco ONS 15501, combined with its ability to handle input signal powers of up to 0 dBm, also enables the network designer to achieve much higher OSNR (optical signal-to-noise ratio) after cascading several EDFAs. In addition, it allows the network to expand beyond

32 wavelengths to a maximum of 128 wavelengths if necessary. The OSNR improvements of 6 dB is equivalent to a four-fold increase in the number of EDFAs that can be cascaded. Alternatively, the unit can accommodate signals with four times the data rate (for instance, OC-192 as opposed to OC-48). Thus, the limitations of higher gain EDFAs that have input powers limited to -6 dBm can be easily overcome by using the Cisco ONS 15501. Some representative figures are included in Table 1-3, assuming a flat input to the first Cisco ONS 15501.

Table 1-3 Relative OSNR in Cascading EDFAs

Number of Cascaded EDFAs	Number of Wavelengths	Worst Case OSNR ¹ at 17 dB Gain ² at Gain Minimum	OSNR, 23 dB Gain ³
1	32	37.00 dB	31.00 dB
2	32	33.25 dB	27.25 dB
3	32	30.70 dB	24.70 dB
4	32	28.75 dB	22.70 dB
5	32	27.00 dB	21.00 dB
6	32	25.50 dB	19.50 dB

1. OSNR = optical signal-to-noise ratio
2. 0 dBm total input power.
3. -6 dBm total; -21 dBm per channel.

Variable Gain

When the gain of an EDFA is fixed, the assumption is that all networks can be laid out with equally spaced EDFAs. In reality, this is rarely the case. For designs in which the spacing must be flexible, variable gain allows the network designer to tailor network requirements much more accurately. For instance, when a Cisco ONS 15501 is used as a preamplifier for receivers having an overload point of -8 dBm per wavelength, the output VOA (variable optical attenuator) can prevent overload by reducing the signal going to the receiver. Alternately, when EDFA spacing is only 10 dB, the output VOA can be enabled to avoid saturation of the next stage EDFA, ensuring that the entire network has good gain flatness and virtually consistent OSNR across all wavelengths.

The variable gain capabilities of the Cisco ONS 15501 greatly enhance the flexibility of an optical network. System operators can add or drop optical elements, such as OADM (optical add/drop multiplexer), without drastic network redesigns or costly equipment changes. When a change occurs in span loss, the adjustable gain can be used to reset the network to a better operating point.

Transient Suppression

Transients in the performance of EDFAs are inevitable whenever the number of signals or the relative power of signals change. For example, when channel rerouting or system failure (caused by a fiber cut or equipment malfunction) transfers all incoming power to a single “surviving channel,” that channel momentarily experiences a higher gain, which can cause BER (bit error rate) problems due to eye-pattern closure. The amount of time required by an amplifier to recover from such a change indicates its suitability for add/drop applications.

The most important parameters in transient suppression are the recovery time and the overshoot and undershoot amplitude. The recovery time for the signal amplitude to get within 10% of the “steady state” amplitude after the switching event is referred to as the *transient suppression time*. Smaller values are desirable. From a 10 dB change in power (simulating the adding or dropping of 29 out of 32 channels present), the Cisco ONS 15501 never exceeds 100 microseconds and is typically below 50 microseconds. The Cisco ONS 15501 can respond to the most drastic power changes with overshoots or undershoots of less than 1 dB.

Low Noise Figure

The low noise characteristics of the Cisco ONS 15501 allow over six amplifiers to be cascaded and still achieve an excellent OSNR at input powers as low as -21 dBm per channel. This enables seamless migration to higher speeds beyond OC-48 and to a larger number of channels.

High Maximum Input Power

The high maximum optical power of the Cisco ONS 15501 increases the number of wavelengths that can potentially be routed to it. The higher input power range available can be used to increase the number of wavelengths to 128 from 32, without having any spectral gain tilt effects.

Network Management

The Cisco ONS 15501 supports SNMP, and it has a console port to facilitate setup and monitoring. With a customer-supplied network monitor and the provided MIB file, all monitorable and settable parameters are available remotely.

Cisco ONS 15501 Applications

The Cisco ONS 15501 supports the following applications:

- Point-to-point topologies
- Ring topologies
- Adding or dropping wavelengths
- Adjusting to span loss changes

Point-to-Point Topologies

In a metropolitan point-to-point DWDM network, the Cisco ONS 15501 can function as a pre-, post-, and/or inline amplifier. Most metropolitan point-to-point DWDM networks require post-amplifiers, but if a given span length exceeds the unit gain (>17 dB), a preamplifier may also be required to handle the optical link loss budget. When the span length greatly exceeds 17 dB, an inline amplifier might also be required.

Because of the wide input power range (–29 to 0 dBm) of the Cisco ONS 15501, trunk attenuation is typically also necessary, especially when the unit is used as a post-amplifier. For instance, when the per channel output power from the node is –5 dBm in a 32-channel system, the total output power from the node is +10 dBm. Thus, at least 10 dB of trunk attenuation is required directly preceding the amplifier.

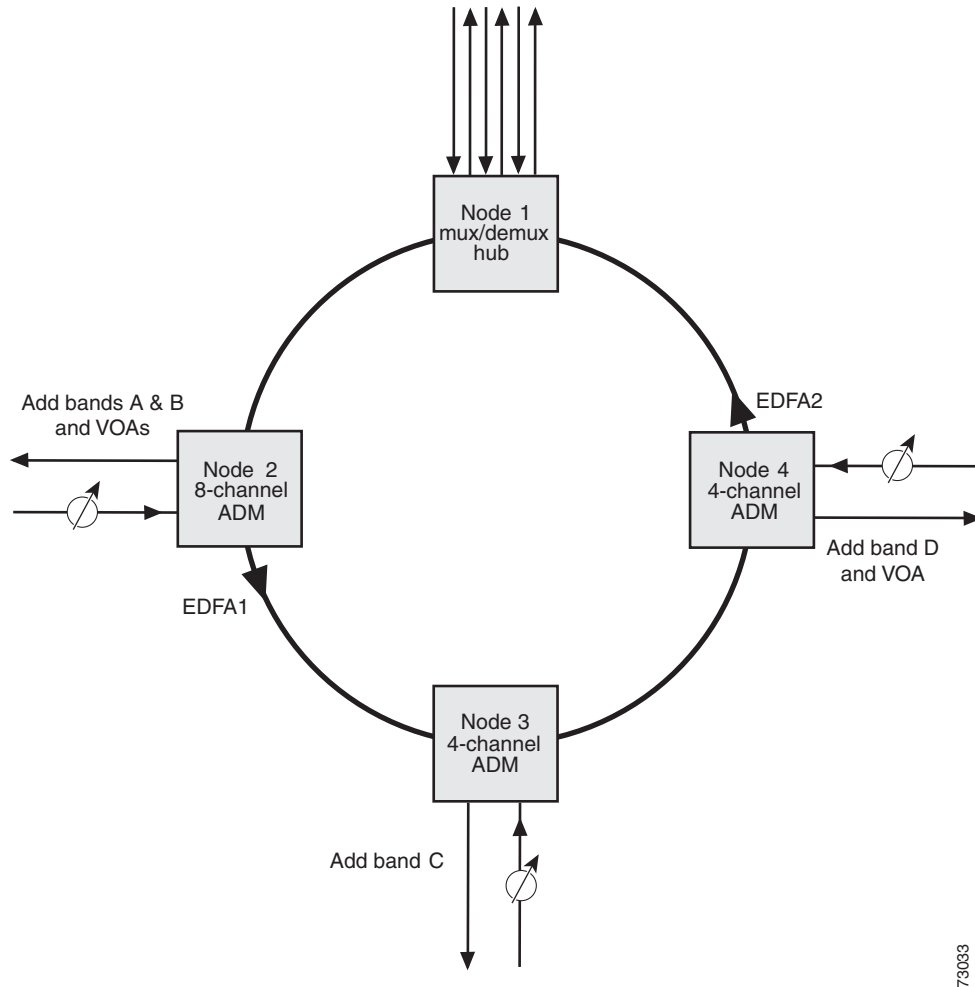
The Cisco ONS 15501 can also be tuned to meet post- or inline amplification input power requirements.

Assuming that the typical per channel power levels in a point-to-point network are identical at the source node, and that there are fewer than four amplifiers between source and destination nodes, it is not necessary to maintain per channel power equalization to satisfy each amplifier's total input power requirement and maintain acceptable OSNR for each channel.

Ring Topologies

An amplified ring topology requires more fine-tuning of power for each channel or band. Figure 1-1 illustrates a hubbed ring network utilizing counter-clockwise signal transmission. All bands (A, B, C and D) are transmitted from node 1. Node 2 terminates and transmits bands A and B; node 3 terminates and transmits band C; and node 4 terminates and transmits band D.

Figure 1-1 Power Equalization in an Amplified Ring Network



In general, EDFAs in a ring topology should be placed so they maintain the power level at the receiver, as well as the OSNR, of each channel. In this case, EDFAs serving as postamplifiers are located at nodes 2 and 4.

At node 2, the input power level of the EDFA is much higher than the input power level of the pass-through band (bands C and D), due to the added power from bands A and B. If trunk attenuation is employed directly before the EDFA at node 2 to keep the unit's total input power within the required range, the power levels of both the add bands (bands A and B) and the pass-through bands (bands C and D) are attenuated equally. As a result, the power level of the pass-through bands is much lower than that of the add bands. This significantly degrades the OSNR of the pass-through bands, and in cases where there are more than two EDFAs in the ring, some of the channels in the ring will not meet OSNR requirements.

To solve this problem, optical power attenuation should be applied on a per channel or per band basis. More attenuation is typically required for the add bands than for the pass-through bands. At the EDFA input, the individual channel or band power levels should be equalized as close as possible to the maximum per channel input power level (for example, -15 dBm in a 32-channel system). This process of optical power equalization is necessary to obtain better OSNR.

Inserting attenuation devices such as VOAs (variable optical attenuators) between the OADM (optical add/drop multiplexer) and the transmitter allows optical power management of individual channels. Per band power management at the trunk line, between the OADM and the EDFA, is also an effective method. The Cisco ONS 15501 is capable of supporting either approach, and its wide input range (–29 to 0 dBm) makes it an ideal amplifier for a broad array of ring network designs.

Adding or Dropping Wavelengths

Automatic gain control reacts to the adding or dropping of wavelengths in a network, without requiring power equalization tuning. The fast response of the Cisco ONS 15501 reduces the impact of adding or dropping channels, and prevents BER hits.

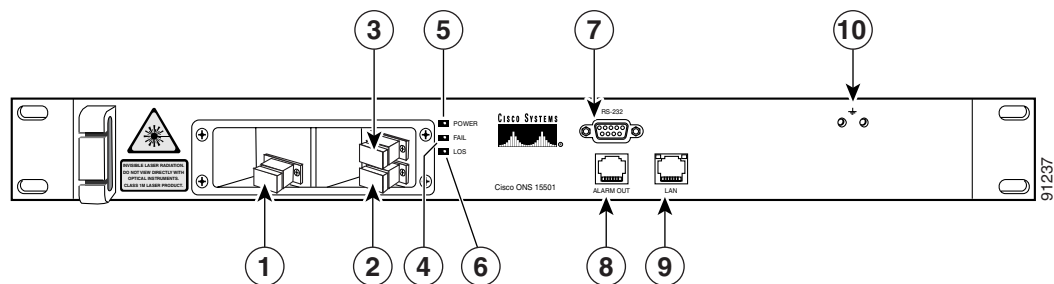
Adjusting to Span Loss Changes

It is typically necessary to adjust gain and attenuation values both for trunk attenuation and channel or band power equalization.

Cisco ONS 15501 AC Front Panel

Figure 1-2 shows the Cisco ONS 15501 front panel. The front panel provides an all-front access interface (fibers, power, alarm contact, and management) that complies with international standards. Table 1-4 explains the front panel features.

Figure 1-2 Cisco ONS 15501 AC Front Panel



1	Output monitor (connector)	6	LOS (loss of signal) (yellow LED)
2	Output (connector)	7	RS-232 (connector)
3	Input (connector)	8	Alarm out (connector)
4	Fail (red LED)	9	LAN (connector)
5	Power (green LED)	10	ESD (connector)

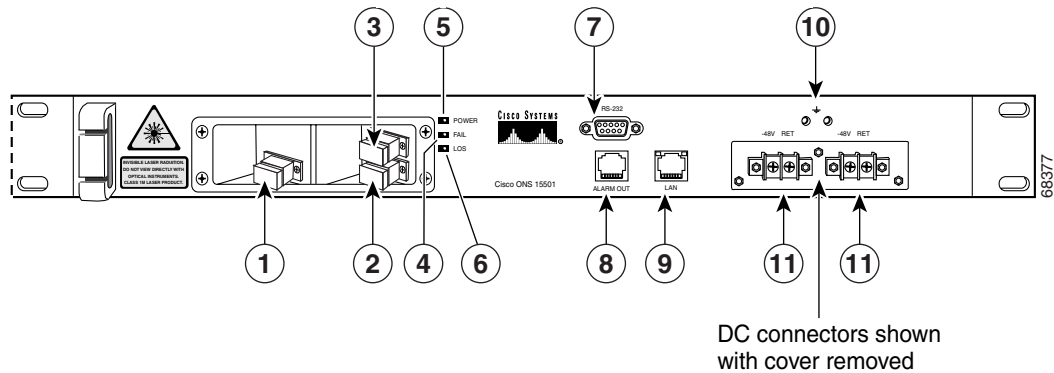
Table 1-4 Cisco ONS 15501 AC Front Panel Features

Feature	Description
Output monitor (connector)	Provides spectrum monitoring of the Cisco ONS 15501 output and uses an SC/UPC type bulkhead connector. (A shutter automatically closes when the cable is removed.)
Output (connector)	Provides output to an optical fiber cable and uses an SC/UPC type standard connector. (A shutter automatically closes when the cable is removed.)
Input (connector)	Provides optical fiber cable access to the input of the Cisco ONS 15501 and uses an SC/UPC type standard connector. (This is a nonshuttered connector.)
Fail (red LED)	Indicates a major failure, such as the pump laser, power supply, or the temperature level.
Power (green LED)	Indicates the unit is receiving normal operating power.
LOS (loss of signal) (yellow LED)	Indicates a loss of input signal when the input signal falls below the LOS threshold.
RS-232 (connector)	Provides a console port for local monitoring of the Cisco ONS 15501 and uses a straight serial, DB-9 type female connector that ships with the product. (See Appendix C, “Connector Pinouts.”) This port should only be used for the evaluation of the unit by a trained technician. It is not designed for permanent connection.
Alarm out (connector)	Provides four pairs of dry contacts for an optional external alarm-monitoring system. Normally has closed contacts and uses an RJ-45 type connector. (See Appendix C, “Connector Pinouts.”)
LAN (connector)	Provides Ethernet access for connecting to a remote SNMP monitoring location, and contains two LEDs. The left LED (green) indicates that an Ethernet connection is established. The right LED (yellow) indicates that a signal is being transmitted to the Ethernet. It uses an RJ-45 type connector.
ESD (connector)	Provides a socket for an anti-ESD wrist strap.

Cisco ONS 15501 DC Front Panel

Figure 1-3 shows the Cisco ONS 15501 DC front panel. The front panel provides an all-front access interface (fibers, power, alarm contact, and management) that complies with international standards. Table 1-5 explains the front panel features.

Figure 1-3 Cisco ONS 15501 DC Front Panel



1	Output monitor (connector)	7	RS-232 (connector)
2	Output (connector)	8	Alarm out (connector)
3	Input (connector)	9	LAN (connector)
4	Fail (red LED)	10	Frame ground attachment
5	Power (green LED)	11	Dual-circuit DC power input
6	LOS (loss of signal) (yellow LED)		

Table 1-5 Cisco ONS 15501 DC Front Panel Features

Feature	Description
Output monitor (connector)	Provides spectrum monitoring of the Cisco ONS 15501 output and uses an SC/UPC type bulkhead connector. (A shutter automatically closes when the cable is removed.)
Output (connector)	Provides output to an optical fiber cable and uses an SC/UPC type standard connector. (A shutter automatically closes when the cable is removed.)
Input (connector)	Provides optical fiber cable access to the input of the Cisco ONS 15501 and uses an SC/UPC type standard connector. (This is a nonshuttered connector.)
Fail (red LED)	Indicates a major failure, such as the pump laser, power supply, or the temperature level.
Power (green LED)	Indicates the unit is receiving normal operating power.
LOS (loss of signal) (yellow LED)	Indicates a loss of input signal when the input signal falls below the LOS threshold.

Table 1-5 Cisco ONS 15501 DC Front Panel Features (continued)

Feature	Description
RS-232 (connector)	Provides a console port for local monitoring of the Cisco ONS 15501 and uses a DB-9 type female connector that ships with the product. (See Appendix C, “Connector Pinouts.”) This port should only be used for the evaluation of the unit by a trained technician. It is not designed for permanent connection.
Alarm out (connector)	Provides four pairs of dry contacts for an optional external alarm-monitoring system. Normally has closed contacts and uses an RJ-45 type connector. (See Appendix C, “Connector Pinouts.”)
LAN (connector)	Provides Ethernet access for connecting to a remote SNMP monitoring location, and contains two LEDs. The left LED (green) indicates that an Ethernet connection is established. The right LED (yellow) indicates that a signal is being transmitted to the Ethernet. It uses an RJ-45 type connector.
Frame ground attachment	Provides tapped-screw mounting holes for attaching a frame ground lug and wiring.
Dual-circuit DC power input	Provides two sets of DC input barrier strip terminals. The right-hand strip terminal is for the primary DC power wiring; the left-hand strip terminal is for an optional backup DC power source. The left screw terminal of each strip is for –48 VDC; the right screw terminal is for the return path.

Cisco ONS 15501 LED Alarm Definitions

The Cisco ONS 15501 front panel has three LEDs:

- The green POWER LED turns on or off to reflect the following conditions:
 - On: Both power supply voltages are within tolerance (the Cisco ONS 15501 is powered normally).
 - Off: Both power supply voltages are outside of tolerance or unit is not powered up.
 - Blinking: One of the power supply voltages is outside of tolerance.
- The red FAIL LED turns on or off to reflect the following conditions:
 - On: The pump laser bias, pump laser temperature, or power supply is out of tolerance. This LED indicates a major internal failure, such as an overtemperature condition or a failure in the pump laser or power supply. To determine whether the LED is on because of the temperature or an actual failure, use the **status** command and check whether the temperature is NORMAL or OUT-OF-RANGE.
 - Off: The pump laser bias, pump laser temperature, and power supply are in the specified range.
- The yellow LOS LED turns on or off to reflect the following conditions:
 - On: Input signal level is below the loss-of-input threshold.
 - Off: Input signal level is above the minimum input power threshold.



Installing the Cisco ONS 15501

This chapter describes the installation procedures for the Cisco ONS 15501 chassis and its components.

This chapter includes the following sections:

- Creating a Site Log, page 2-1
- Required Tools and Parts, page 2-2
- Preventing ESD Damage, page 2-2
- Installation Checklist, page 2-3
- Rack-Mounting the Chassis, page 2-3
- Optical Connection, page 2-4
- AC Power Connection, page 2-5
- DC Power Connection, page 2-7
- Communication Connections, page 2-9
- Installation Commands, page 2-10

Before beginning any of the procedures in this document:

- Review the *Regulatory Compliance and Safety Information for the Cisco ONS 15501 AC* document to avoid injury to yourself or damage to the equipment.
- Ensure that your equipment configuration meets the minimum requirements for the installation you will perform, and that you have all the parts and tools you need.



Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

Creating a Site Log

We recommend keeping a site log (or a section of a larger site log) to record all actions related to the Cisco ONS 15501. The log should be kept near the chassis where anyone who works on the equipment can access it. Site log entries might include the following:

- Background information.
- Installation progress.

Make a copy of the “Installation Checklist” section on page 2-3 and insert it into the site log. Make entries on the checklist as you complete each procedure.

- Maintenance procedures.

Use the site log as a record of ongoing system maintenance. Each time a procedure is performed on the Cisco ONS 15501, update the site log to reflect situations such as maintenance schedules and requirements, intermittent problems, changes and updates, configuration changes, and related comments and notes.

Required Tools and Parts

You need the following tools and parts to install the Cisco ONS 15501:

- Phillips screwdriver
- Crimp tool (for grounding wire)
- Digital voltmeter (with ohmmeter function)
- Grounding wire (8 AWG)
- AC power supply connection cord for the Cisco ONS 15501 AC or power supply connection (18 AWG) for the Cisco ONS 15501 DC
- Listed two-hole copper grounding lug (0.25 in. [0.635 cm] diameter bolt hole size, 0.625 in. [1.5875 cm] center-to-center hole spacing)

Preventing ESD Damage

Electrostatic discharge (ESD) damage occurs when electronic cards or components are mishandled and can result in complete or intermittent failures. Note the following guidelines before you install or service the system:

- Always wear an ESD-preventive wrist or ankle strap when handling electronic components. Connect one end of the strap to an ESD jack or an unpainted metal component on the system (such as a captive installation screw).
- Handle cards by the faceplates and edges only; avoid touching the printed circuit board and connector pins.
- Place any removed component on an antistatic surface or in a static shielding bag.
- Avoid contact between cards and clothing. The wrist strap only protects the card from ESD voltages on the body; ESD voltages on clothing can still cause damage.
- For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms (Mohms).

Installation Checklist

The installation checklist includes the procedures for initial hardware installation of the Cisco ONS 15501. Mark the entries as you complete each procedure. Make a copy of this checklist, as needed, for the site log.

Installation checklist for site:

Product name:

Task	Verified By	Date
Background information placed in site log		
Cisco printed documentation received		
Cisco ONS 15501 received		
Accessories received		
Required tools available		
Additional equipment available		
Site power voltages verified		
Initial electrical connections established		
Cisco ONS 15501 fully installed		
Operation verified		

Rack-Mounting the Chassis

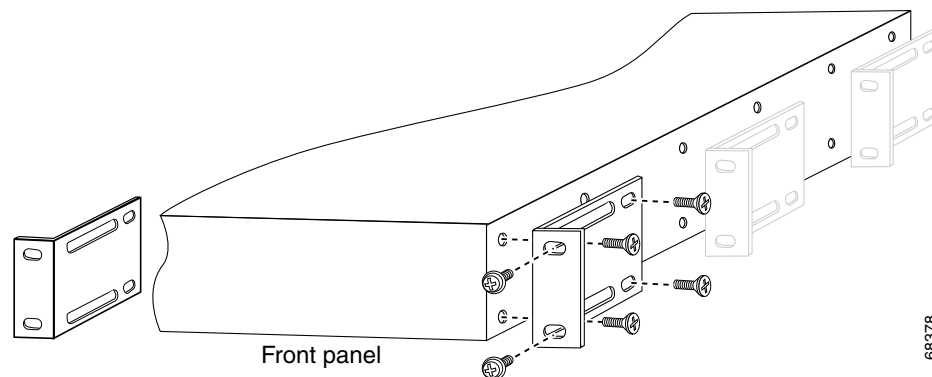
The Cisco ONS 15501 mounts in a standard 19-inch, 23-inch, or ETSI equipment rack and occupies 1RU (one rack unit is 1.75 inches) of vertical space. The unit is designed for front, middle, or rear mounting. It is attached to the rack as shown in Figure 2-1.



Note

The DC return is to remain isolated from the system frame and chassis(DC-I).

Figure 2-1 Rack-Mounting the Cisco ONS 15501



Caution

Use only the hardware provided with the Cisco ONS 15501. Failure to use the provided hardware may result in unintended damage. If hardware is lost, contact Cisco Systems, Inc. for a replacement.

To install the Cisco ONS 15501 in a rack, follow these steps:

-
- Step 1** Turn the Cisco ONS 15501 chassis so that the front panel is facing you.
 - Step 2** Determine the desired point of mounting and position the two mounting brackets accordingly.
 - Step 3** Attach the mounting brackets to the unit with the supplied screws using a Phillips screwdriver.
 - Step 4** Attach the unit to the rack with the supplied rack mounting screws using a Phillips screwdriver.
-

Optical Connection



Warning

Infra-red laser energy may be present on the cable connected to the receiving (input) connector. The transmitting (output) optical fiber connector and the monitoring (output monitor) connector are equipped with shutters that automatically close when a cable is removed. To avoid potential damage to the eyes, do not look directly into an optical fiber cable or a connector (whether shuttered or not). When an optical cable is not attached, place the supplied protective cap over the cable's connector. The output monitor output connector should be capped when not in use.



Warning

Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.



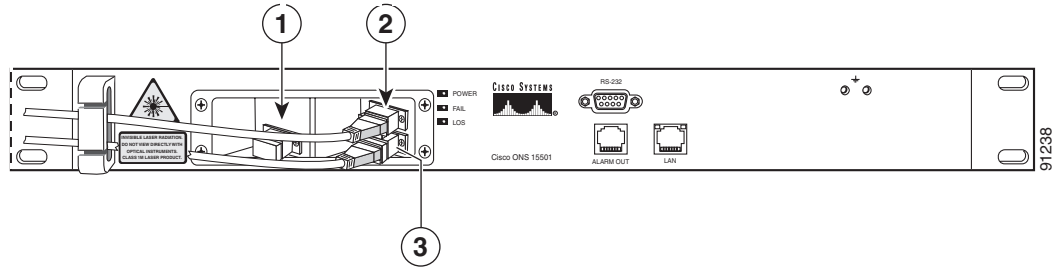
Warning

Use of controls, adjustments, or performing procedures other than those specified may result in hazardous radiation exposure.

To connect the customer-supplied optical fiber cable to the SC/UPC optical ports, follow these steps:

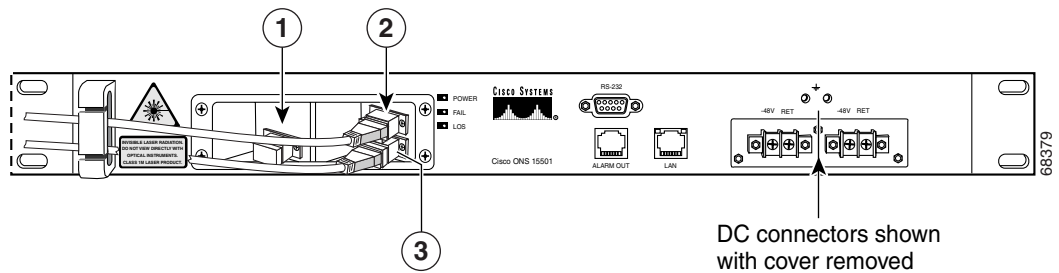
-
- Step 1** Connect the input optical fiber cable to the input connector (see Figure 2-2 and Figure 2-3). Avoid making sharp bends in the cable.
 - Step 2** Connect the output optical fiber cable to the output connector (see Figure 2-2 and Figure 2-3). Avoid making sharp bends in the cable.
-

Figure 2-2 Cisco ONS 15501 AC Optical Connections



1	Output monitor	3	Output connector
2	Input connector		

Figure 2-3 Cisco ONS 15501 DC Optical Connections



1	Output monitor	3	Output connector
2	Input connector		

AC Power Connection

The Cisco ONS 15501 AC power connector is located on the rear panel of the unit and can be powered directly from the facility VAC input through the Cisco ONS 15501 120-240 VAC power supply. This section describes how to connect AC power to the chassis.


Caution

Check the power at your site to ensure that you are receiving clean power (free of spikes and noise). Install a power conditioner, if necessary, to ensure proper voltages and power levels in the source voltage.


Caution

Use only the hardware provided with the Cisco ONS 15501. Failure to use the provided hardware may result in unintended damage. If hardware is lost, contact Cisco Systems for a replacement.

**Note**

The AC power cord that connects to the Cisco ONS 15501 120-240 VAC power supply power cord and then to the building VAC is not shipped with the Cisco ONS 15501. You must order this power cord separately.

There are six styles of AC-input power supply power cords available (differing in plug type); make sure you have the correct style for your site (see Figure 2-4). All AC-input power supply power cords measure 8 feet (2.5 m). We recommend that you do the following:

- Install an uninterruptable power source where possible.
- Install proper grounding to avoid damage from lightning and power surges.

Figure 2-4 AC Power Cords

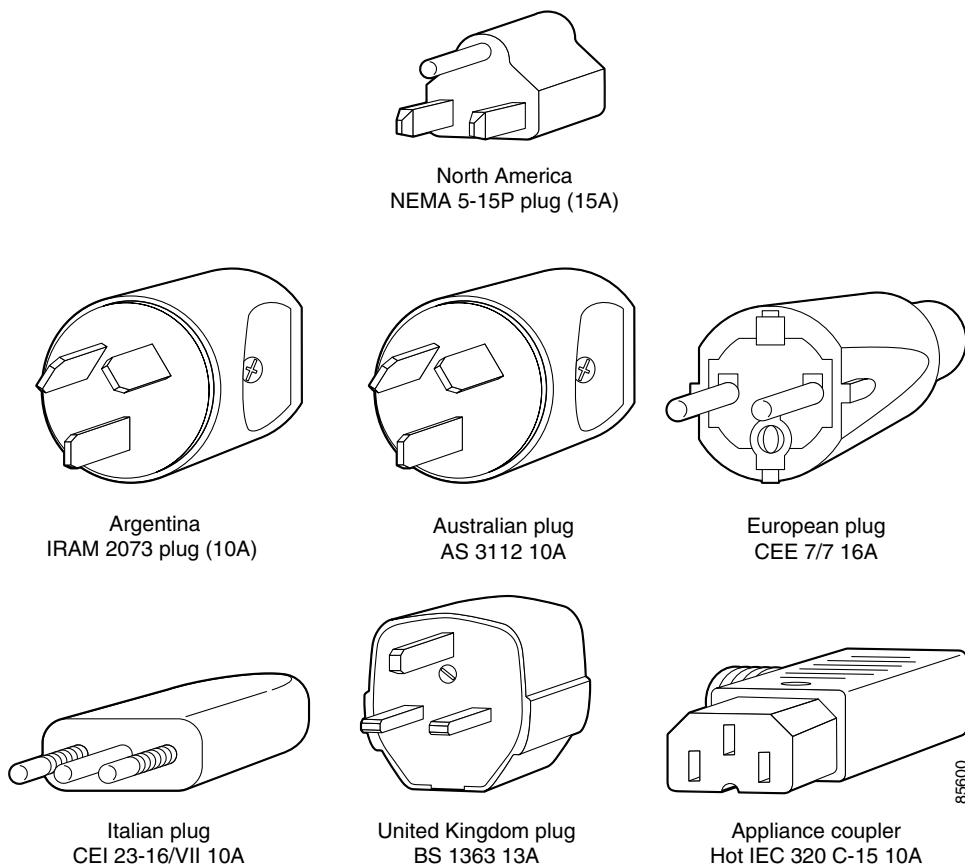


Table 2-1 lists the AC power cord options.

Table 2-1 AC Power Cord Options

Label	Description	Product Number
North America	120 VAC, 60 Hz AC power cord	15500-CAB-AC
Argentina	250 VAC, 50 Hz AC power cord	15500-CAB-ACR
Australia	240 VAC, 50 Hz AC power cord	15500-CAB-ACA

Table 2-1 AC Power Cord Options (continued)

Label	Description	Product Number
Europe	230 VAC, 50 Hz AC power cord	15500-CAB-ACE
Italy	220 VAC, 50 Hz AC power cord	15500-CAB-ACI
United Kingdom	240 VAC, 50 Hz AC power cord	15500-CAB-ACU

Table 2-2 lists the nominal and acceptable value ranges for source AC power.

Table 2-2 Source AC Power Specifications

Specifications	Nominal Value	Acceptable Range
AC input voltage	100 to 240 VAC, single phase	90 to 255 VAC
AC input line frequency	50/60 Hz	47 to 63 Hz
AC input current	8 A @100 VAC 3.5 A @240 VAC	—

Grounding the AC Chassis

To connect the provided grounding lug to the tapped frame grounding holes, follow these steps:

-
- Step 1** Verify that the primary and user-optional redundant external AC power circuits are disconnected.
 - Step 2** Identify the two tapped frame grounding holes at the upper right side of the Cisco ONS 15501 AC front panel. (See Figure 2-2.)
 - Step 3** Remove the two screws provided for securing the ground lug to the Cisco ONS 15501 AC.
 - Step 4** Connect the 8 AWG grounding wire to the grounding lug. The other end of the wire should be suitably grounded.
 - Step 5** Install the grounding lug on the Cisco ONS 15501 AC, using the two provided screws and washers.
 - Step 6** Test for proper frame ground using the ohmmeter section of a digital voltmeter. Place one prod on the Cisco ONS 15501 AC and the other on the frame grounding bus to which the grounding lug and grounding wire is connected. Observe for a zero-resistance ground.
-

DC Power Connection

The section describe how to ground the Cisco ONS 15501 DC and connect DC power to it.



Caution

Check the power at your site to ensure that you are receiving clean power (free of spikes and noise). Install a power conditioner, if necessary, to ensure proper voltages and power levels in the source voltage.

**Caution**

Use only the hardware provided with the Cisco ONS 15501 DC. Failure to use the provided hardware may result in unintended damage. If hardware is lost, contact Cisco Systems for a replacement.

**Caution**

The protective cover for the DC power terminals should be installed at all times when the equipment is energized, except for any necessary maintenance or troubleshooting.

**Warning**

When installing or replacing the unit, the ground connection must always be made first and disconnected last.

Grounding the DC Chassis

To connect the provided grounding lug to the tapped frame grounding holes, follow these steps:

- Step 1** Verify that the primary and user-optional redundant external DC power circuits are disconnected at the source.
- Step 2** Remove the cover from the DC power terminal connectors. Identify the two tapped frame grounding holes at the upper right side of the Cisco ONS 15501 DC front panel. (See Figure 2-3.)
- Step 3** Remove the two screws provided for securing the ground lug to the Cisco ONS 15501 DC.
- Step 4** Connect the 8 AWG grounding wire to the grounding lug. The other end of the wire should be suitably grounded.
- Step 5** Install the grounding lug on the Cisco ONS 15501 DC, using the two provided screws and washers.
- Step 6** Test for proper frame ground using the ohmmeter section of a digital voltmeter. Place one prod on the Cisco ONS 15501 DC and the other on the frame grounding bus to which the grounding lug and grounding wire is connected. Observe for a zero-resistance ground.

**Note**

There is an alternate grounding point on the chassis, located on the left side of the rear panel.

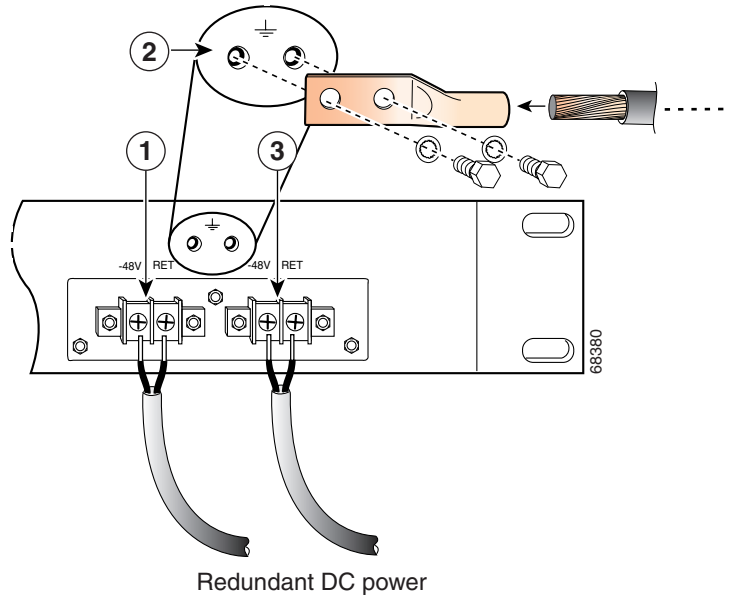
Connecting the Power

To connect the power wiring to the DC power terminal connectors, follow these steps:

- Step 1** Cut and strip the customer-supplied 8 AWG primary and redundant power supply wires, if necessary. Identify the –48 VDC wire and power return wire for the primary and redundant circuit.
- Step 2** Install the primary DC power wiring to the right-hand barrier strip. (See Figure 2-5.) The left-hand screw is the –48 V connection. The right-hand screw, marked “RET,” is the ground connection.
- Step 3** Install the redundant DC power wiring to the left-hand barrier strip. (See Figure 2-5.) The left-hand screw is the –48 V connection. The right-hand screw, marked “RET,” is the ground connection.

- Step 4** Replace the power connector cover.
- Step 5** Apply power to the primary and redundant DC circuits.

Figure 2-5 Connecting the Cisco ONS 15501 to a DC Power Source



1	Primary DC power connections	3	Redundant DC power connections
2	Tapped frame grounding holes		

Communication Connections

The Cisco ONS 15501 communicates in three ways:

- SNMP (through Ethernet)
- Alarm contacts (through RJ-45 connector)
- Console port (through RS-232)

See Appendix C, “Connector Pinouts,” for the wiring layouts of the RJ-45 and RS-232 connectors.

See the “Configuring Local Serial Communication” section on page 3-1 for detailed information about the RS-232 console port.

Setting Up Alarm Contacts

To set up alarm contacts, follow these steps:

- Step 1** Obtain an 8-conductor, 8 AWG solid-wire cable and terminate one end with an RJ-45 connector.

- Step 2** Connect the stub end of the alarm cable to the alarm system contacts, either to miscellaneous discrete inputs on terminal equipment or to a central office alarm panel.
- Step 3** Connect the RJ-45 connector to the Cisco ONS 15501.
-

See the “Alarm Contact Closures” section on page 3-4 and the “Cisco ONS 15501 LED Alarm Definitions” section on page 1-11.

Installation Commands

You can connect to a Cisco ONS 15501 locally using a serial connection or remotely through SNMP. See the “Configuring Local Serial Communication” section on page 3-1 for instructions on setting up either of these options. After you establish a connection, use the following commands to complete the hardware installation. See Chapter 4, “Command Reference,” for a complete list of available commands.

Introductory Commands

You can use the following commands to establish communication with the Cisco ONS 15501 and to access additional information about the amplifier.

- **help** — Displays a list of all available commands
- **sys-info** — Displays the basic information on the system, including CLEI (Common Language Equipment Identifier) code, model number, serial number, MAC address, firmware version, firmware build date, and software version

Review and Operational Commands

You can use the following commands to review the overall status of the Cisco ONS 15501.

- **alarm** — Displays a list of alarms in the system
- **status** — Displays the measured, alarm mean, and alarm trigger values for input power, internal case temperature, optical gain, and output signal power, as well as the measured values for optical output power



Configuring the Cisco ONS 15501

The Cisco ONS 15501 supports monitoring using CLI commands from the console port. It also supports remote monitoring using SNMP or Telnet (using TCP/IP over the Ethernet).

This chapter describes how to set up communications with a Cisco ONS 15501 and includes the following sections:

- Configuring Local Serial Communication, page 3-1
- Monitoring Alarms and Traps, page 3-2
- Upgrading the Flash Image, page 3-3
- Configuring Remote Communication, page 3-3
- Alarm Contact Closures, page 3-4

Configuring Local Serial Communication

To establish a serial communication link with a Cisco ONS 15501, the unit must first be properly installed and powered up. Table 3-1 lists the equipment required for setup.

Table 3-1 *Equipment for Local Serial Communication Setup*

Hardware	Comments
PC or Laptop	Customer-supplied
RS-232 cable with DB-9 connectors (see Appendix C, “Connector Pinouts”)	Customer-supplied

Setting Up the Software

To set up the software on the Cisco ONS 15501 for local serial communication, follow these steps:

- Step 1** Launch the serial port communication utility on the PC or laptop and configure it to communicate at 9600 baud, no parity, 8 bit data, 1 stop bit, and no flow control.
Connect the DB-9 end of the RS-232 data cable to the COM port on the PC or laptop.
- Step 2** Connect the other end of the RS-232 data cable to the RS-232 serial port on the Cisco ONS 15501 front panel. (See Figure 1-2 on page 1-8.)

**Note**

When connecting the serial port to a Cisco terminal server, configure the line for “no exec”. When connecting to a modem, configure the modem for no echo.

**Note**


Unexpected characters sent to the Cisco ONS 15501 during the bootup sequence may cause undesirable results.

Step 3 Press Enter to get the login prompt.

The Cisco ONS 15501 is now ready for basic system configuration.

Configuring a Basic System

To configure a basic system, follow these steps:

-
- Step 1** Log in to the system using the default master password **edfa1**.
- Step 2** Enter **host-config** *hostname* to set the host name. The maximum allowed length for *hostname* is 15 characters. The default host name is edfa.
- Step 3** Enter **ip-config** *ip-addr ip-subnet-mask def-gateway-ip* to set the IP address, subnet mask, and gateway address. In the absence of any arguments for subnetmask and gateway address, default values are inserted.
- Step 4** Enter **ntp** *status* to enable the NTP, if appropriate, and enter **ntp-ip** *ip-addr1 ip-addr2* to set the IP address of the NTP server.
- Step 5** Enter **set-time** *time* to set the time of the system if no NTP server is available. The time needs to be in the same format as this example, where PST is the time zone.
- ```
Fri Aug 24 10:50:31 2001 PST.
```
- 
-  **Note** See Appendix D, “Time Zone Codes,” for a list of time zones and correlating abbreviations.
- 
- Step 6** Enter **set-user-pwd** to set the user login password. The CLI then prompts the user for the default master password and the new user password. The default user password is **edfa**.
- Step 7** Enter **set-master-pwd** to set a new master password if you logged in using the master password. The CLI prompts the user for the default master password and the new master password. The default master password is **edfa1**.
- 

## Monitoring Alarms and Traps

To configure the software on the Cisco ONS 15501 for console port-based monitoring, follow these steps:

**Step 1** Enter **show-trap** to display the traps of the system.



- Step 2** Enter **alarm** to display the alarms in the system.
- Step 3** Enter **status** to check the optical and environmental status of the system.
- 

## Upgrading the Flash Image

To perform a field upgrade of a Flash image, follow these steps:

- Step 1** Ensure that the IP addresses and the FTP servers, user accounts, path names, and filenames of the Flash image are correctly set up.
- Step 2** Enter **show-trap** to verify that the trap display is turned on.
- Step 3** Enter **sw-download ftp** *server-IP username password path filename flashbank* or **sw-download tftp** *server-IP filename flashbank* to transfer the image from the FTP or TFTP server and burn it to the specified Flash bank. Make sure that the FTP or TFTP server is accessible using the same username, password, path name, and filename.



**Note** Two traps are generated to indicate the beginning and ending of the FTP burn process. The image cannot be downloaded to a currently active bank.

---

- Step 4** Once the **sw-download ftp** process is complete, enter **boot-bank** *flashbank* to set the boot bank from which the system next boots up.
- Step 5** Enter **reboot** to reboot the system.
- 

## Configuring Remote Communication

To establish a remote communication link with a Cisco ONS 15501 through Telnet or SNMP, the unit must first be properly installed and powered up.

### Configuring for Telnet

When the Ethernet port on the Cisco ONS 15501 is connected to other Ethernet switches for network management purposes, we recommend that either end of the Ethernet port NOT be configured in autonegotiation mode, and that both ends of the Ethernet connection be configured in either 10 Mbps or 100 Mbps, half or full duplex mode.



**Note** The Cisco ONS 15501 default Ethernet boot mode is half-duplex at 10 Mbps.

---

For additional information, see the **ethmode** command in Chapter 4, “Command Reference.”

To configure the Cisco ONS 15501 for Telnet, follow these steps:

---

- Step 1** Connect the Cisco ONS 15501 to an Ethernet LAN using a standard RJ-45 cable.

- Step 2** Make sure that the system network is properly set up by using the **ping** command to the IP address of the system.
- Step 3** Enter **telnet target-ip-address** to log in remotely to the Cisco ONS 15501.



**Note** All commands supported by the Cisco ONS 15501 through the console port are also supported in a Telnet session.

## Configuring for SNMP

When the Ethernet port on the Cisco ONS 15501 is connected to other Ethernet switches for network management purposes, we recommend that either end of the Ethernet port NOT be configured in autonegotiation mode, and that both ends of the Ethernet connection be configured in either 10 Mbps or 100 Mbps half or full duplex mode.



**Note** The Cisco ONS 15501 default Ethernet boot mode is half-duplex at 10 Mbps.

For additional information, see the **ethmode** command in Chapter 4, “Command Reference.”

To configure the Cisco ONS 15501 for SNMP, follow these steps:

- Step 1** Connect the Cisco ONS 15501 to an Ethernet LAN using a standard RJ-45 cable.
- Step 2** Enter **add-snmp-mgr manager-ip [version | community]** to set the SNMP manager IP addresses. For additional information, please refer to **add-snmp-mgr** in Chapter 4, “Command Reference.” The maximum number of SNMP manager IP addresses is 16.
- Step 3** Enter **get-snmp-mgr** to display the list of SNMP managers.
- Step 4** Enter **del-snmp-mgr manager-ip** to delete an SNMP manager entry.
- Step 5** Enter **add-snmp-com community-string [ro | rw]** to set the SNMP community string for remote monitoring. The maximum number of SNMP community strings allowed is 16.
- Step 6** Enter **get-snmp-com** to display the list of SNMP community strings.
- Step 7** Enter **del-snmp-com community-string** to delete an SNMP community string entry.

## Alarm Contact Closures

The Cisco ONS 15501 provides a front panel, single form C, discrete external alarm output. (See the “Cisco ONS 15501 AC Front Panel” section on page 1-8.) The external alarm output is through the eight wires of an RJ-45 connector.

The following events are reported by the discrete external alarms through individual alarm contacts:

- Alarm 1—Loss of input signal or input signal power below threshold
- Alarm 2—Failure in the pump laser or pump laser temperature or internal temperature out-of-range

- Alarm 3—Loss of input power supply or power supply out-of-range
- Alarm 4—Undefined (always on; may be used for power indication)

**Note**

The default state of the alarm contacts is Normally Closed. Depending on which fault condition occurs, specific alarm contacts open. The corresponding Cisco ONS 15501 LEDs turn on or off. (See the “Cisco ONS 15501 LED Alarm Definitions” section on page 1-11.)

Table 3-2 lists the RJ-45 pinouts for the alarms.

**Table 3-2 Alarm Pinouts**

| Pinout | Alarm                    |
|--------|--------------------------|
| 1      | Alarm 1+ (power)         |
| 2      | Alarm 1-                 |
| 3      | Alarm 2+ (major)         |
| 4      | Alarm 2-                 |
| 5      | Alarm 3+ (minor)         |
| 6      | Alarm 3-                 |
| 7      | Alarm 4+ (no connection) |
| 8      | Alarm 4-                 |





## Command Reference

---

This chapter describes the commands used in the Cisco ONS 15501 environment. The commands are listed alphabetically.



**Note**

---

To display a list of available commands, enter **help**. To obtain the syntax for any individual command, enter **help** *[command]*.

---



**Note**

---

All commands are case insensitive.

---



**Note**

---

Commands that change the configuration of the control module are protected by the master password. Commands that allow access to information but do not change the configuration are protected by the user password.

---

# add-snmp-com

To add an SNMP community string to the system, use the **add-snmp-com** command.

**add-snmp-com** *community-string* [**ro** | **rw**]

|                           |                           |                                                                                                                                                                             |
|---------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>community-string</i>   | Specifies the SNMP community string to be added to the system. The string can be comprised of any alphanumeric combination. The maximum number of characters allowed is 21. |
|                           | [ <b>ro</b>   <b>rw</b> ] | (Optional) Specifies read only or both read and write access associated with the community string.                                                                          |

**Defaults** The default access mode is **ro**.

**Command Types** Changes configuration

**Command Modes** Master password protected

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

**Usage Guidelines** The Cisco ONS 15501 supports up to 16 SNMP community strings.

**Examples** The following example shows how to add an SNMP community string to the system.

```
edfa > add-snmp-com abcd
```

| <b>Related Commands</b> | <b>Command</b>      | <b>Description</b>                               |
|-------------------------|---------------------|--------------------------------------------------|
|                         |                     | <b>del-snmp-com</b>                              |
|                         | <b>get-snmp-com</b> | Displays an SNMP community string in the system. |

# add-snmp-mgr

To add or modify an SNMP manager entry to the system, use the **add-snmp-mgr** command.

**add-snmp-mgr** *manager-ip* [*version*]

| Syntax Description |  |                                                                                   |
|--------------------|--|-----------------------------------------------------------------------------------|
| <i>manager-ip</i>  |  | Specifies the IP address of the host running the SNMP manager.                    |
| <i>version</i>     |  | (Optional) Specifies the SNMP version. Valid values are <b>v1</b> or <b>v2c</b> . |

**Defaults** The default version is **v2c**.

**Command Types** Changes configuration

**Command Modes** Master password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |
|                 | EDFA 4.0 | Added version option.        |

**Usage Guidelines** The Cisco ONS 15501 uses the SNMP manager address to direct SNMP trap and inform notifications. No notifications are sent unless at least one SNMP manager address is configured. The Cisco ONS 15501 accepts a maximum of 16 IP managers.

**Examples** The following example shows how to add an SNMP manager entry to the system.

```
edfa > add-snmp-mgr 10.1.2.71
```

| Related Commands | Command             | Description                                    |
|------------------|---------------------|------------------------------------------------|
|                  | <b>del-snmp-mgr</b> | Deletes an SNMP manager entry from the system. |
|                  | <b>get-snmp-mgr</b> | Displays an SNMP manager entry in the system.  |

# alarm

To display a list of alarms in the system, use the **alarm** command.

**alarm**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |
| EDFA 4.0 | Added time index to output.  |

## Examples

The following example shows how to display a list of alarms in the system.

```
edfa > alarm
Power Supply voltage level out of range (PS1) - @ 9
```



# boot-bank

To display the active and planned boot bank or to modify the active boot bank, use the **boot-bank** command.

**boot-bank** [*flash-bank*]

|                           |                   |                                                                                                                         |
|---------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>flash-bank</i> | (Optional) Specifies the Flash bank from which the system is booted. This should be <b>1</b> , <b>2</b> , or <b>3</b> . |
|---------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------|

**Defaults** Displays the active boot bank

**Command Types** Changes configuration

**Command Modes** Master password protected

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

**Usage Guidelines** The active boot bank is the Flash bank from which the system was booted. The planned boot bank is the Flash bank from which the system will next be booted.

**Examples** The following example shows how to modify the active boot bank.

```
edfa > boot-bank 2
```

The following example shows how to display the active boot bank.

```
edfa > boot-bank
Active flash bank number: 1
Planned flash bank number: 1
```

# copyright

To display the copyright information, use the **copyright** command.

## copyright

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 2.0 | This command was introduced. |

**Examples** The following example shows the copyright information.

```
edfa > copyright

*
* Copyright © 2002, Cisco Systems, Inc.
* Cisco Systems, Inc.
* 170 West Tasman Drive
* San Jose, CA 95134
*
* Based on software developed by, licensed under or Copyright
* by one or more of
* - GNU GENERAL PUBLIC LICENSE Version 2, June 1991
* - Carnegie Mellon University
* - Regents of the University of California
* - University of California, Berkeley and its contributors.
*

```

# del-snmp-com

To delete an SNMP community string from the system, use the **del-snmp-com** command.

**del-snmp-com** *community-string*

|                           |                         |                                                                    |
|---------------------------|-------------------------|--------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>community-string</i> | Specifies the SNMP community string to be deleted from the system. |
|---------------------------|-------------------------|--------------------------------------------------------------------|

|                 |      |
|-----------------|------|
| <b>Defaults</b> | None |
|-----------------|------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

|                        |                |                              |
|------------------------|----------------|------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|                        | EDFA 1.0       | This command was introduced. |

|                 |                                                                                                                 |
|-----------------|-----------------------------------------------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to delete an SNMP community string from the system.<br>edfa > del-snmp-com abcd |
|-----------------|-----------------------------------------------------------------------------------------------------------------|

|                         |                |                                                  |
|-------------------------|----------------|--------------------------------------------------|
| <b>Related Commands</b> | <b>Command</b> | <b>Description</b>                               |
|                         | add-snmp-com   | Adds an SNMP community string to the system.     |
|                         | get-snmp-com   | Displays an SNMP community string in the system. |

# del-snmp-mgr

To delete an SNMP manager entry from the system, use the **del-snmp-mgr** command.

**del-snmp-mgr** *manager-ip*

|                           |                   |                                                                |
|---------------------------|-------------------|----------------------------------------------------------------|
| <b>Syntax Description</b> | <i>manager-ip</i> | Specifies the IP address of the host running the SNMP manager. |
|---------------------------|-------------------|----------------------------------------------------------------|

|                 |      |
|-----------------|------|
| <b>Defaults</b> | None |
|-----------------|------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                   |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | The Cisco ONS 15501 uses the SNMP manager address to direct SNMP trap and inform notifications. No notifications are sent unless at least one SNMP manager address is configured. |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                                  |
|-----------------|----------------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to delete an SNMP manager entry from the system. |
|-----------------|----------------------------------------------------------------------------------|

```
edfa > del-snmp-mgr 10.1.2.71
```

| <b>Related Commands</b> | <b>Command</b>                                   | <b>Description</b>                      |
|-------------------------|--------------------------------------------------|-----------------------------------------|
|                         | <b>add-snmp-mgr</b>                              | Adds or modifies an SNMP manager entry. |
| <b>get-snmp-mgr</b>     | Displays the SNMP manager entries on the system. |                                         |

# ethmode

To display or modify the Ethernet boot mode, use the **ethmode** command.

**ethmode** *[mode]*

|                           |             |                                                                                                                                                                                                                                                   |
|---------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>mode</i> | Specifies the Ethernet boot mode. The boot mode is specified as <b>0</b> for auto-sense; <b>1</b> for full-duplex at 100 Mbps; <b>2</b> for half-duplex at 100 Mbps; <b>3</b> for full-duplex at 10 Mbps; or <b>4</b> for half-duplex at 10 Mbps. |
|---------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                                  |
|-----------------|----------------------------------------------------------------------------------|
| <b>Defaults</b> | Displays the current Ethernet boot mode.<br>The default mode value is <b>4</b> . |
|-----------------|----------------------------------------------------------------------------------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

|                        |                |                              |
|------------------------|----------------|------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                                                                                                                |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | To display the current Ethernet boot mode, enter the command without the mode argument.<br>The system default Ethernet boot mode is <b>4</b> for half-duplex at 10 Mbps.<br>After setting a new Ethernet boot mode, the system must be rebooted for the change to take affect. |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                    |
|-----------------|--------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to display the Ethernet boot mode. |
|-----------------|--------------------------------------------------------------------|

```
edfa > ethmode
ethernet init-mode 4
```

The following example shows how to modify the Ethernet boot mode.

```
edfa > ethmode 3
ethernet init-mode updated to 3
```

# gain

To display the measured optical signal gain, use the **gain** command.

**gain**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

## Usage Guidelines

The value for measured optical signal gain is displayed in decibels (dB).

## Examples

The following example shows how to display the measured optical signal gain.

```
edfa > gain
17.50 (dB)
```

## Related Commands

| Command              | Description                                                                                                                                                                                                                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>gainmean</b>      | Displays the configured signal gain and alarm mean level.                                                                                                                                                                                                                                                                                          |
| <b>gaintrig</b>      | Displays the gain alarm trigger level.                                                                                                                                                                                                                                                                                                             |
| <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
| <b>setgainmean</b>   | Sets the signal gain and alarm mean level.                                                                                                                                                                                                                                                                                                         |
| <b>setgaintrig</b>   | Sets the gain alarm trigger level.                                                                                                                                                                                                                                                                                                                 |
| <b>sgain</b>         | Displays the state of the gain error monitor.                                                                                                                                                                                                                                                                                                      |

# gainmean

To display the configured signal gain and alarm mean level, use the **gainmean** command.

**gainmean**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

## Usage Guidelines

The value for configured Cisco ONS 15501 signal gain and alarm mean level is displayed in decibels (dB).

## Examples

The following example shows how to display the configured signal gain and alarm mean level.

```
edfa > gainmean
17.50 (dB)
```

## Related Commands

| Command              | Description                                                                                                                                                                                                                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>gain</b>          | Displays the measured optical signal gain.                                                                                                                                                                                                                                                                                                         |
| <b>gaintrig</b>      | Displays the gain alarm trigger level.                                                                                                                                                                                                                                                                                                             |
| <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
| <b>setgainmean</b>   | Sets the signal gain and alarm mean level.                                                                                                                                                                                                                                                                                                         |
| <b>setgaintrig</b>   | Sets the gain alarm trigger level.                                                                                                                                                                                                                                                                                                                 |

# gaintrig

To display the gain alarm trigger level, use the **gaintrig** command.

**gaintrig**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

## Usage Guidelines

The value for Cisco ONS 15501 gain alarm trigger level is displayed in decibels (dB).

## Examples

The following example shows how to display the gain alarm trigger level.

```
edfa > gaintrig
1.00 (dB)
```

## Related Commands

| Command              | Description                                                                                                                                                                                                                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>gain</b>          | Displays the measured optical signal gain.                                                                                                                                                                                                                                                                                                         |
| <b>gainmean</b>      | Displays the configured signal gain and alarm mean level.                                                                                                                                                                                                                                                                                          |
| <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
| <b>setgainmean</b>   | Sets the signal gain and alarm mean level.                                                                                                                                                                                                                                                                                                         |
| <b>setgaintrig</b>   | Sets the gain alarm trigger level.                                                                                                                                                                                                                                                                                                                 |



# get-snmp-com

To display the SNMP community strings in the system, use the **get-snmp-com** command.

**get-snmp-com** *community-string*

|                           |                         |                                                      |
|---------------------------|-------------------------|------------------------------------------------------|
| <b>Syntax Description</b> | <i>community-string</i> | Specifies the SNMP community string to be displayed. |
|---------------------------|-------------------------|------------------------------------------------------|

|                 |                                                   |  |
|-----------------|---------------------------------------------------|--|
| <b>Defaults</b> | Displays all SNMP community strings in the system |  |
|-----------------|---------------------------------------------------|--|

|                      |                               |  |
|----------------------|-------------------------------|--|
| <b>Command Types</b> | Does not change configuration |  |
|----------------------|-------------------------------|--|

|                      |                           |  |
|----------------------|---------------------------|--|
| <b>Command Modes</b> | Master password protected |  |
|----------------------|---------------------------|--|

|                        |                |                              |
|------------------------|----------------|------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|                        | EDFA 1.0       | This command was introduced. |

|                 |                                                                                    |
|-----------------|------------------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to display an SNMP community string in the system. |
|-----------------|------------------------------------------------------------------------------------|

```
edfa > get-snmp-com abcd
 A list of the SNMP community string
=====
private
abcd
```

|                         |                     |                                                   |
|-------------------------|---------------------|---------------------------------------------------|
| <b>Related Commands</b> | <b>Command</b>      | <b>Description</b>                                |
|                         | <b>add-snmp-com</b> | Adds an SNMP community string to the system.      |
|                         | <b>del-snmp-com</b> | Deletes an SNMP community string from the system. |

# get-snmp-mgr

To display the SNMP manager entries on the system, use the **get-snmp-mgr** command.

**get-snmp-mgr**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Displays all IP values of the SNMP manager

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

## Usage Guidelines

This command displays SNMP manager configuration information for all entries on the system.

## Examples

The following example shows how to display the values of SNMP managers.

```
edfa > get-snmp-mgr
 A list of the SNMP manager IP addresses
 =====
209.128.68.147
10.1.2.71
```

## Related Commands

| Command             | Description                                           |
|---------------------|-------------------------------------------------------|
| <b>add-snmp-mgr</b> | Adds or modifies an SNMP manager entry to the system. |
| <b>del-snmp-mgr</b> | Deletes an SNMP manager entry from the system.        |

# help

To display the syntax for an individual command or to display a list of available user commands, use the **help** command.

**help** [*command*]

|                           |                                                  |
|---------------------------|--------------------------------------------------|
| <b>Syntax Description</b> | <i>command</i> (Optional) Specifies the command. |
|---------------------------|--------------------------------------------------|

|                 |                                         |
|-----------------|-----------------------------------------|
| <b>Defaults</b> | Displays the list of available commands |
|-----------------|-----------------------------------------|

|                      |                               |
|----------------------|-------------------------------|
| <b>Command Types</b> | Does not change configuration |
|----------------------|-------------------------------|

|                      |                         |
|----------------------|-------------------------|
| <b>Command Modes</b> | User password protected |
|----------------------|-------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | If there is a command specified, the corresponding help for that command is printed. Without any command specified, a list of all commands is shown. |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                                                   |
|-----------------|---------------------------------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows the list of available commands when logged on with the user password. |
|-----------------|---------------------------------------------------------------------------------------------------|

```
edfa > help
STATUS: Alarm, Gain, GainMean, GainTrig, InPwr, InPwrMean, InPwrTrig,
OptOutPwr, OutSigPwr, OutSigPwrMean, OutSigPwrTrig, SGain,
SInPwr, SOutSigPwr, SPs1, SPs2, SPump, Status, STemp, Temp,
TempMean, TempTrig

SYSTEM: copyright, ethmode, get-snmp-mgr, help, host-config, ip-config,
logout, neighbor-in, neighbor-out, ntp, ntp-ip, sys-info, time,
timeout, timezone

MAINTENANCE: hide-trap, show-trap
```

The following example shows the list of available commands when logged on with the master password.

```
edfa > help
STATUS: Alarm, Gain, GainMean, GainTrig, InPwr, InPwrMean, InPwrTrig,
OptOutPwr, OutSigPwr, OutSigPwrMean, OutSigPwrTrig, SGain,
SInPwr, SOutSigPwr, SPs1 SPs2, SPump, Status, STemp, Temp,
TempMean, TempTrig

SETUP: ResetMeanTrig, SetGainMean, SetGainTrig, SetInPwrMean,
SetInPwrTrig, SetOutSigPwrMean, SetOutSigPwrTrig, SetTempMean,
SetTempTrig

SYSTEM: add-snmp-com, add-snmp-mgr, copyright, del-snmp-com, del-snmp-mgr,
ethmode, get-snmp-com, get-snmp-mgr, help, host-config, ip-config,
logout, neighbor-in, neighbor-out, ntp, ntp-ip, ping,
set-master-pwd, set-time, set-user-pwd, sys-info, time, timeout,
timezone

MAINTENANCE: boot-bank, hide-trap, reboot, show-trap, sw-download
```

# hide-trap

To hide the trap message, use the **hide-trap** command.

**hide-trap**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** None

---

**Command Types** Changes configuration

---

**Command Modes** User password protected

---

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

---

---

**Examples** The following example shows how to hide the trap message.

```
edfa > hide-trap
```

---

| <b>Related Commands</b> | <b>Command</b> | <b>Description</b>         |
|-------------------------|----------------|----------------------------|
|                         | show-trap      | Displays the trap message. |

---

# host-config

To display or modify the current host name, use the **host-config** command.

**host-config** [*hostname*]

|                           |                 |                                                                                                                                                                            |
|---------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>hostname</i> | (Optional) Specifies the host name. The <i>hostname</i> argument can have a maximum of 15 characters. Use only alphanumeric characters, hyphens, periods, and underscores. |
|---------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                |
|-----------------|--------------------------------|
| <b>Defaults</b> | Displays the current host name |
|-----------------|--------------------------------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                                                                                                                    |
|----------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Command Modes</b> | Master password protected. User password allows access to the current host name, but does not allow modifications. |
|----------------------|--------------------------------------------------------------------------------------------------------------------|

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

|                 |                                                                  |
|-----------------|------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to modify the current host name. |
|-----------------|------------------------------------------------------------------|

```
edfa > host-config ADM-EAST
ADM-EAST >
```

# inpwr

To display the measured optical input power, use the **inpwr** command.

**inpwr**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Usage Guidelines** The value for optical input power is displayed in decibels per milliwatt (dBm).

**Examples** The following example shows how to display the optical input power.

```
edfa > inpwr
-46.03 (dBm)
```

| Related Commands | Command              | Description                                                                                                                                                                                                                                                                                                                                        |
|------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <b>inpwrmean</b>     | Displays the optical input alarm mean level.                                                                                                                                                                                                                                                                                                       |
|                  | <b>inpwrtrig</b>     | Displays the optical input alarm trigger level.                                                                                                                                                                                                                                                                                                    |
|                  | <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                  | <b>setinpwrmean</b>  | Sets the optical input alarm mean level.                                                                                                                                                                                                                                                                                                           |
|                  | <b>setinpwrtrig</b>  | Sets the optical input alarm trigger level.                                                                                                                                                                                                                                                                                                        |
|                  | <b>sinpwr</b>        | Displays the state of the optical input level alarm monitor.                                                                                                                                                                                                                                                                                       |

# inpwmean

To display the optical input alarm mean level, use the **inpwmean** command.

## inpwmean

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

### Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

### Usage Guidelines

The value for optical input alarm mean level is displayed in decibels per milliwatt (dBm).

### Examples

The following example shows how to display the optical input alarm mean level.

```
edfa > inpwmean
-38.00 (dBm)
```

### Related Commands

| Command              | Description                                                                                                                                                                                                                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>inpwr</b>         | Displays the measured optical input power.                                                                                                                                                                                                                                                                                                         |
| <b>inpwrtrig</b>     | Displays the optical input alarm trigger level.                                                                                                                                                                                                                                                                                                    |
| <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
| <b>setinpwrmean</b>  | Sets the optical input alarm mean level.                                                                                                                                                                                                                                                                                                           |
| <b>setinpwrtrig</b>  | Sets the optical input alarm trigger level.                                                                                                                                                                                                                                                                                                        |



# inpwrtrig

To display the optical input alarm trigger level, use the **inpwrtrig** command.

**inpwrtrig**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Usage Guidelines** The value for optical input alarm trigger level is displayed in decibels (dB).

**Examples** The following example shows how to display the optical input alarm trigger level.

```
edfa > inpwrtrig
1.00 (dB)
```

| Related Commands | Command              | Description                                                                                                                                                                                                                                                                                                                                        |
|------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <b>inpwr</b>         | Displays the measured optical input power.                                                                                                                                                                                                                                                                                                         |
|                  | <b>inpwrmean</b>     | Displays the optical input alarm mean level.                                                                                                                                                                                                                                                                                                       |
|                  | <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                  | <b>setinpwrmean</b>  | Sets the optical input alarm mean level.                                                                                                                                                                                                                                                                                                           |
|                  | <b>setinpwrtrig</b>  | Sets the optical input alarm trigger level.                                                                                                                                                                                                                                                                                                        |

# ip-config

To display or modify the IP address, IP subnet mask and IP default gateway, use the **ip-config** command.

```
ip-config [ip-addr [ip-subnet-mask [def-gateway-ip]]]
```

| Syntax Description    |                                                             |
|-----------------------|-------------------------------------------------------------|
| <i>ip-addr</i>        | (Optional) Specifies the IP address.                        |
| <i>ip-subnet-mask</i> | (Optional) Specifies the IP subnet mask.                    |
| <i>def-gateway-ip</i> | (Optional) Specifies the IP address of the default gateway. |

## Defaults

If no values are entered, the command displays the current IP address, IP subnet mask, and default IP gateway.

If a value is entered for *ip-addr*, but not for *ip-subnet-mask*, the default IP subnet mask is 255.255.255.0.

If a value is entered for *ip-addr*, but not for *def-gateway-ip*, the default IP gateway is xx.yy.zz.1, where xx.yy.zz is obtained by binary AND of first three bytes of *ip-addr* and *ip-subnet-mask*.

## Command Types

Changes configuration

## Command Modes

User password protected for display; master password protected for modification.

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

## Examples

The following example shows how to display the IP address, IP subnet mask, and default IP gateway.

```
edfa > ip-config
10.1.2.221 255.255.255.0 10.1.2.1
```

The following example shows how to modify the IP address, IP subnet mask, and default IP gateway.

```
edfa > ip-config 192.168.0.10 255.255.255.240 192.168.0.1
```

# logout

To log out of the system, use the **logout** command.

## logout

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** None

---

**Command Types** Does not change configuration

---

**Command Modes** User password protected

---

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

---

# neighbor-in

To display or modify the neighboring equipment details for optical input, use the **neighbor-in** command.

```
neighbor-in [[host link-host] [ip link-ip] [port link-port]] | [disable]
```

| Syntax Description           |                                                                                                                                        |  |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>host</b> <i>link-host</i> | (Optional) Specifies the host name for input neighbor. The maximum length is 32 characters.                                            |  |
| <b>ip</b> <i>link-ip</i>     | (Optional) Specifies the IP address for input neighbor.                                                                                |  |
| <b>port</b> <i>link-port</i> | (Optional) Specifies the name for the port on the remote host providing the input optical signal. The maximum length is 32 characters. |  |
|                              | <b>Note</b> If the <b>host</b> or <b>ip</b> keywords are not present, the <b>port</b> keyword is not allowed.                          |  |
| <b>disable</b>               | (Optional) Deletes the input neighbor information.                                                                                     |  |
|                              | <b>Note</b> The <b>disable</b> option is not allowed with any other options.                                                           |  |

**Defaults** If no values are entered, the command displays the current input neighbor details.

**Command Types** Changes configuration

**Command Modes** User password protected for read; master password protected for write.

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 2.0 | This command was introduced. |

**Usage Guidelines** In the absence of all arguments, the configured input neighbor network element (NE) information is shown.

To include space characters in the **host** or **port**, use double quotes (for example, **neighbor-in host "DWDM phoenix 10"**). Excluding the **disable** keyword, whenever a keyword is present, the keyword value must be given. Either **host** or **ip** are required, while **port** is optional. The **disable** keyword deletes the neighbor NE information.

**Examples**

The following example shows how to modify and display the input neighbor equipment information.

```
edfa > neighbor-in host box1 ip 192.168.0.4 port box1-port
edfa > neighbor-in host box1
edfa > neighbor-in ip 192.168.0.4
edfa > neighbor-in host box1 port box1-port
edfa > neighbor-in host box1 ip 192.168.0.4
edfa > neighbor-in ip 192.168.0.4 port box1-port
edfa > neighbor-in disable
edfa > neighbor-in
 HOST: source1
 PORT: out-2
 IP ADDRESS: 10.1.5.41
```

The following example shows how to issue the **neighbor-in** command with all the parameters.

```
edfa > neighbor-in source1 ip 10.1.5.41 port out-2
edfa > neighbor-in
 HOST: source1
 PORT: out-2
 IP ADDRESS: 10.1.5.41
```

**Related Commands**

| Command             | Description                                                                     |
|---------------------|---------------------------------------------------------------------------------|
| <b>neighbor-out</b> | Displays and modifies the neighboring equipment information for optical output. |

# neighbor-out

To display or modify the neighboring equipment details for optical output, use the **neighbor-out** command.

```
neighbor-out [[host link-host] [ip link-ip] [port link-port]] | [disable]
```

| Syntax Description           |                                                                                                                                         |  |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>host</b> <i>link-host</i> | (Optional) Specifies the host name for the output neighbor. The maximum length is 32 characters.                                        |  |
| <b>ip</b> <i>link-ip</i>     | (Optional) Specifies the IP address for the output neighbor.                                                                            |  |
| <b>port</b> <i>link-port</i> | (Optional) Specifies the name for the port on the remote host receiving the output optical signal. The maximum length is 32 characters. |  |
|                              | <b>Note</b> If the <b>host</b> or <b>ip</b> keywords are not present, the <b>port</b> keyword is not allowed.                           |  |
| <b>disable</b>               | (Optional) Deletes the output neighbor information.                                                                                     |  |
|                              | <b>Note</b> The <b>disable</b> option is not allowed with any other options.                                                            |  |

**Defaults** If no values are entered, the command displays the current output neighbor details.

**Command Types** Changes configuration

**Command Modes** User password protected for read. Master password protected for write.

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 2.0 | This command was introduced. |

**Usage Guidelines** In the absence of all arguments, the configured output neighbor network element (NE) information is shown.

To include space characters in the **host** or **port**, use double quotes (for example, **neighbor-out host "DWDM phoenix 10"**). Excluding the **disable** keyword, whenever a keyword is present, the keyword value must be given. Either **host** or **ip** are required, while **port** is optional. The **disable** keyword deletes the neighbor NE information.

**Examples**

The following example shows how to modify and display the output neighboring equipment information.

```
edfa > neighbor-out host box1 ip 192.168.0.4 port box1-port
edfa > neighbor-out host box1
edfa > neighbor-out ip 192.168.0.4
edfa > neighbor-out host box1 port box1-port
edfa > neighbor-out host box1 ip 192.168.0.4
edfa > neighbor-out ip 192.168.0.4 port box1-port
edfa > neighbor-out disable
edfa > neighbor-out
 HOST: dest1
 PORT: in-2
 IP ADDRESS: 10.1.71.41
```

The following example shows how to issue the **neighbor-out** command with all the parameters.

```
edfa > neighbor-out dest1 ip 10.1.7.31 port in-1
edfa > neighbor-out
 HOST: dest1
 PORT: in-1
 IP ADDRESS: 10.1.5.41
```

**Related Commands**

| Command            | Description                                                                    |
|--------------------|--------------------------------------------------------------------------------|
| <b>neighbor-in</b> | Displays and modifies the neighboring equipment information for optical input. |

# ntp

To modify or display the NTP (Network Time Protocol) status for the system, use the **ntp** command.

```
ntp [status]
```

| <b>Syntax Description</b> | <i>status</i> (Optional) Specifies <b>on</b> to enable the NTP or <b>off</b> to disable the NTP.                                                                                                                                                                 |         |              |               |                                                          |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------|---------------|----------------------------------------------------------|
| <b>Defaults</b>           | Displays the current configuration of the NTP (that is, <b>on</b> or <b>off</b> ), as well as the current IP addresses of the primary and secondary NTP servers                                                                                                  |         |              |               |                                                          |
| <b>Command Types</b>      | Changes configuration                                                                                                                                                                                                                                            |         |              |               |                                                          |
| <b>Command Modes</b>      | User password protected for display; master password protected for modification.                                                                                                                                                                                 |         |              |               |                                                          |
| <b>Command History</b>    | <table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>EDFA 1.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>                                                                               | Release | Modification | EDFA 1.0      | This command was introduced.                             |
| Release                   | Modification                                                                                                                                                                                                                                                     |         |              |               |                                                          |
| EDFA 1.0                  | This command was introduced.                                                                                                                                                                                                                                     |         |              |               |                                                          |
| <b>Usage Guidelines</b>   | When the NTP is on, the status (up or down) of the NTP servers is displayed if no argument is provided for the command.                                                                                                                                          |         |              |               |                                                          |
| <b>Examples</b>           | <p>The following example shows how to enable the NTP for the system.</p> <pre>edfa &gt; ntp on</pre> <p>The following example shows how to display the current configuration of the NTP.</p> <pre>edfa &gt; ntp ON, 209.128.68.149:UP, 209.128.68.147:DOWN</pre> |         |              |               |                                                          |
| <b>Related Commands</b>   | <table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>ntp-ip</b></td> <td>Modifies or displays the IP addresses of the NTP server.</td> </tr> </tbody> </table>                                               | Command | Description  | <b>ntp-ip</b> | Modifies or displays the IP addresses of the NTP server. |
| Command                   | Description                                                                                                                                                                                                                                                      |         |              |               |                                                          |
| <b>ntp-ip</b>             | Modifies or displays the IP addresses of the NTP server.                                                                                                                                                                                                         |         |              |               |                                                          |



# ntp-ip

To modify or display the IP addresses of the NTP (Network Time Protocol) server, use the **ntp-ip** command.

```
ntp-ip [ip-addr1 [ip-addr2]]
```

| Syntax Description |                                                                  |
|--------------------|------------------------------------------------------------------|
| <i>ip-addr1</i>    | (Optional) Specifies the IP address of the primary NTP server.   |
| <i>ip-addr2</i>    | (Optional) Specifies the IP address of the secondary NTP server. |

**Defaults** Displays the current IP addresses of the primary and secondary NTP servers.  
If only one value is entered, that value is applied to the IP address of the primary NTP server.

**Command Types** Changes configuration

**Command Modes** User password protected for display; master password protected for modification.

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Examples** The following example shows how to modify the IP address of the primary and secondary NTP servers.

```
edfa > ntp-ip 209.128.68.149 209.128.68.147
```

The following example shows how to display the current IP addresses of the primary and secondary NTP servers.

```
edfa > ntp-ip
209.128.68.149, 209.128.68.147
```

| Related Commands | Command    | Description                                 |
|------------------|------------|---------------------------------------------|
|                  | <b>ntp</b> | Enables or disables the NTP for the system. |

# optoutpwr

To display the optical output power, use the **optoutpwr** command.

**optoutpwr**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** None

---

**Command Types** Does not change configuration

---

**Command Modes** User password protected

---

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

---



---

**Usage Guidelines** The value for optical output power is displayed in decibels per milliwatt (dBm).

---

**Examples** The following example shows how to display the optical output power.

```
edfa > optoutpwr
-28.53 (dBm)
```

# outsigpwr

To display the calculated output signal power, use the **outsigpwr** command.

**outsigpwr**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Usage Guidelines** The value for calculated output signal power is displayed in decibels per milliwatt (dBm).

**Examples** The following example shows how to display the calculated output signal power.

```
edfa > outsigpwr
-28.53 (dBm)
```

| Related Commands | Command                 | Description                                                                                                                                                                                                                                                                                                                                        |
|------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <b>outsigpwrmean</b>    | Displays the output signal alarm mean level.                                                                                                                                                                                                                                                                                                       |
|                  | <b>outsigpwrtrig</b>    | Displays the output signal alarm trigger level.                                                                                                                                                                                                                                                                                                    |
|                  | <b>resetmeantrig</b>    | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                  | <b>setoutsigpwrmean</b> | Sets the output signal alarm mean level.                                                                                                                                                                                                                                                                                                           |
|                  | <b>setoutsigpwrtrig</b> | Sets the output signal alarm trigger level.                                                                                                                                                                                                                                                                                                        |
|                  | <b>soutsigpwr</b>       | Displays the state of the signal output power monitor.                                                                                                                                                                                                                                                                                             |

# outsigpwrmean

To display the output signal alarm mean level, use the **outsigpwrmean** command.

## outsigpwrmean

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

### Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

### Usage Guidelines

The value for output signal alarm mean level is displayed in decibels per milliwatt (dBm).

### Examples

The following example shows how to display the output signal alarm mean level.

```
edfa > outsigpwrmean
2.00 (dBm)
```

### Related Commands

| Command                 | Description                                                                                                                                                                                                                                                                                                                                        |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>outsigpwr</b>        | Displays the calculated output signal power.                                                                                                                                                                                                                                                                                                       |
| <b>outsigpwrtrig</b>    | Displays the output signal alarm trigger level.                                                                                                                                                                                                                                                                                                    |
| <b>resetmeantrig</b>    | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
| <b>setoutsigpwrmean</b> | Sets the output signal alarm mean level.                                                                                                                                                                                                                                                                                                           |
| <b>setoutsigpwrtrig</b> | Sets the output signal alarm trigger level.                                                                                                                                                                                                                                                                                                        |

# outsigpwrtrig

To display the output signal alarm trigger level, use the **outsigpwrtrig** command.

**outsigpwrtrig**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Usage Guidelines** The value for output signal alarm trigger level is displayed in decibels (dB).

**Examples** The following example shows how to display the output signal alarm trigger level.

```
edfa > outsigpwrtrig
20.00 (dB)
```

| Related Commands | Command                 | Description                                                                                                                                                                                                                                                                                                                                        |
|------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <b>outsigpwr</b>        | Displays the calculated output signal power.                                                                                                                                                                                                                                                                                                       |
|                  | <b>outsigpwrmean</b>    | Displays the output signal alarm mean level.                                                                                                                                                                                                                                                                                                       |
|                  | <b>resetmeantrig</b>    | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                  | <b>setoutsigpwrmean</b> | Sets the output signal alarm mean level.                                                                                                                                                                                                                                                                                                           |
|                  | <b>setoutsigpwrtrig</b> | Sets the output signal alarm trigger level.                                                                                                                                                                                                                                                                                                        |

# ping

To ping an IP address, use the **ping** command.

```
ping ip-address [count]
```

|                            |                   |                                                                                   |
|----------------------------|-------------------|-----------------------------------------------------------------------------------|
| <b>Syntax Description.</b> | <i>ip-address</i> | Specifies the IP address of the host to ping.                                     |
|                            | <i>count</i>      | (Optional) Specifies the number of ping packets to be sent. The range is 1 to 20. |

|                 |                         |
|-----------------|-------------------------|
| <b>Defaults</b> | The default count is 5. |
|-----------------|-------------------------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

|                        |                |                              |
|------------------------|----------------|------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | <p>If no value is entered for the count, the system defaults to <b>5</b>. The system accepts a maximum count of <b>20</b>.</p> <p>If the <b>ping</b> command is issued from a Telnet session, pressing <b>Ctrl-c</b> stops the ping. If the <b>ping</b> command is issued from a serial port, pressing <b>Ctrl-c</b> does not stop the ping.</p> |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                                                                                                                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Examples</b> | <p>The following example shows how to ping an IP address.</p> <pre>edfa &gt; ping 192.168.0.1 PING 192.168.0.1 (192.168.0.1): 56 data bytes  --- 192.168.0.1 ping statistics --- 5 packets transmitted, 0 packets received, 100% packet loss</pre> |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

# ps1

To display the voltage of DC power supply 1, use the **ps1** command.

**ps1**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

## Examples

The following example shows how to display the voltage of power supply 1.

```
edfa > ps1
-49.51 (vDC)
```

## Related Commands

| Command     | Description                                              |
|-------------|----------------------------------------------------------|
| <b>ps2</b>  | Displays the voltage of DC power supply 2.               |
| <b>sps1</b> | Displays the status of the power supply 1 alarm monitor. |
| <b>sps2</b> | Displays the status of the power supply 2 alarm monitor. |

# ps2

To display the voltage of DC power supply 2, use the **ps2** command.

**ps2**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

## Examples

The following example shows how to display the voltage of power supply 2.

```
edfa > ps2
-49.43 (vDC)
```

## Related Commands

| Command     | Description                                              |
|-------------|----------------------------------------------------------|
| <b>ps1</b>  | Displays the voltage of DC power supply 1.               |
| <b>sps1</b> | Displays the status of the power supply 1 alarm monitor. |
| <b>sps2</b> | Displays the status of the power supply 2 alarm monitor. |



# reboot

To reboot the software on the Cisco ONS 15501, use the **reboot** command.

**reboot**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** The system reboots using the image for planned boot bank.

---

**Command Types** Does not change configuration

---

**Command Modes** Master password protected

---

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

---

# resetmeantrig

To reset the alarm mean and trigger levels for signal gain, optical input power, output signal power, and internal case temperature to the manufacturer's default settings, use the **resetmeantrig** command.

**resetmeantrig**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Changes configuration

**Command Modes** Master password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Usage Guidelines** The manufacturer's default setting can be found in Table 1-2 on page 1-2.

| Related Commands | Command                 | Description                                                 |
|------------------|-------------------------|-------------------------------------------------------------|
|                  | <b>gainmean</b>         | Displays the configured signal gain and alarm mean level.   |
|                  | <b>gaintrig</b>         | Displays the gain alarm trigger level.                      |
|                  | <b>inpwrmean</b>        | Displays the optical input alarm mean level.                |
|                  | <b>inpwrtrig</b>        | Displays the optical input alarm trigger level.             |
|                  | <b>outsigpwrmean</b>    | Displays the output signal alarm mean level.                |
|                  | <b>outsigpwrtrig</b>    | Displays the output signal alarm trigger level.             |
|                  | <b>setgainmean</b>      | Sets the signal gain and alarm mean level.                  |
|                  | <b>setgaintrig</b>      | Sets the gain alarm trigger level.                          |
|                  | <b>setoutsigpwrmean</b> | Sets the output signal alarm mean level.                    |
|                  | <b>setoutsigpwrtrig</b> | Sets the output signal alarm trigger level.                 |
|                  | <b>setinpwrtrig</b>     | Sets the optical input alarm trigger level.                 |
|                  | <b>settempmean</b>      | Sets the internal case temperature alarm mean level.        |
|                  | <b>settemptrig</b>      | Sets the internal case temperature alarm trigger level.     |
|                  | <b>tempmean</b>         | Displays the internal case temperature alarm mean level.    |
|                  | <b>temptrig</b>         | Displays the internal case temperature alarm trigger level. |

# restore

To restore the system and network settings of the control module, including all passwords, to the manufacturer's default settings, use the **restore** command.

**restore**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Changes configuration

**Command Modes** No password is required.

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Usage Guidelines**

This command can be used only from a serial port, not in a Telnet session.

Once connected to the serial port, you must press the **Enter** key within 15 seconds after the password prompt appears following a system reboot.

The command resets the user password to **edfa**.

The command does not reset any of the module settings; use the **resetmeantrig** command for that purpose.

We recommend rebooting the system after using this command; the default settings are not activated until the system reboots.

The **restore** command does not appear in the **help** command output, because the **restore** command is only a valid command during the first 15 seconds after a reboot.

| Related Commands | Command              | Description                                                                                                                                                                                                                                                                                                                                        |
|------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |

# setgainmean

To modify the signal gain and alarm mean, use the **setgainmean** command.

**setgainmean** *mean*

|                           |             |                                                   |
|---------------------------|-------------|---------------------------------------------------|
| <b>Syntax Description</b> | <i>mean</i> | Specifies the desired signal gain and alarm mean. |
|---------------------------|-------------|---------------------------------------------------|

|                 |         |
|-----------------|---------|
| <b>Defaults</b> | 17.5 dB |
|-----------------|---------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | The signal gain and alarm mean are measured in decibels (dB). The system accepts a minimum value of 7 dB and a maximum value of 17.5 dB. If a value entered falls outside of this acceptable range, the command is ignored and has no effect. |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                                                                     |
|-----------------|---------------------------------------------------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to modify the signal gain and alarm mean.<br><pre>edfa &gt; setgainmean 17.00</pre> |
|-----------------|---------------------------------------------------------------------------------------------------------------------|

| <b>Related Commands</b> | <b>Command</b>                                                                                                                                                                                                                                                                                                                                     | <b>Description</b>                         |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
|                         | <b>gain</b>                                                                                                                                                                                                                                                                                                                                        | Displays the measured optical signal gain. |
| <b>gainmean</b>         | Displays the configured signal gain and alarm mean level.                                                                                                                                                                                                                                                                                          |                                            |
| <b>gaintrig</b>         | Displays the gain alarm trigger level.                                                                                                                                                                                                                                                                                                             |                                            |
| <b>resetmeantrig</b>    | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |                                            |
| <b>setgaintrig</b>      | Sets the gain alarm trigger level.                                                                                                                                                                                                                                                                                                                 |                                            |

# setgaintrig

To modify the signal gain alarm trigger level, use the **setgaintrig** command.

```
setgaintrig trigger
```

|                           |                |                                                      |
|---------------------------|----------------|------------------------------------------------------|
| <b>Syntax Description</b> | <i>trigger</i> | Specifies the desired signal gain and alarm trigger. |
|---------------------------|----------------|------------------------------------------------------|

|                 |         |
|-----------------|---------|
| <b>Defaults</b> | 1.00 dB |
|-----------------|---------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                                                                      |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | The signal gain alarm trigger level is measured in decibels (dB). See Table 1-2 on page 1-2 for the minimum and maximum values. If a value entered falls outside of this acceptable range, the command is ignored and has no effect. |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                         |
|-----------------|-------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to modify the gain alarm trigger level. |
|-----------------|-------------------------------------------------------------------------|

```
edfa > setgaintrig 2.00
```

| <b>Related Commands</b> | <b>Command</b>                                                                                                                                                                                                                                                                                                                                     | <b>Description</b>                         |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
|                         | <b>gain</b>                                                                                                                                                                                                                                                                                                                                        | Displays the measured optical signal gain. |
| <b>gainmean</b>         | Displays the configured signal gain and alarm mean level.                                                                                                                                                                                                                                                                                          |                                            |
| <b>gaintrig</b>         | Displays the gain alarm trigger level.                                                                                                                                                                                                                                                                                                             |                                            |
| <b>resetmeantrig</b>    | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |                                            |
| <b>setgainmean</b>      | Sets the signal gain and alarm mean level.                                                                                                                                                                                                                                                                                                         |                                            |

# setinpwrmean

To set the optical input alarm mean level, use the **setinpwrmean** command.

**setinpwrmean** *mean*

|                           |             |                                                       |
|---------------------------|-------------|-------------------------------------------------------|
| <b>Syntax Description</b> | <i>mean</i> | Specifies the desired optical input alarm mean level. |
|---------------------------|-------------|-------------------------------------------------------|

|                 |           |
|-----------------|-----------|
| <b>Defaults</b> | -20.00 dB |
|-----------------|-----------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                                                                             |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | The optical input alarm mean is measured in decibels per milliwatt (dB). See Table 1-2 on page 1-2 for the minimum and maximum values. If a value entered falls outside of this acceptable range, the command is ignored and has no effect. |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                            |
|-----------------|----------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to set the optical input alarm mean level. |
|-----------------|----------------------------------------------------------------------------|

```
edfa > setinpwrmean -28.00
```

| <b>Related Commands</b> | <b>Command</b>       | <b>Description</b>                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                      | <b>inpwr</b>                                                                                                                                                                                                                                                                                                                                       |
|                         | <b>inpwrmean</b>     | Displays the optical input alarm mean level.                                                                                                                                                                                                                                                                                                       |
|                         | <b>inpwrtrig</b>     | Displays the optical input alarm trigger level.                                                                                                                                                                                                                                                                                                    |
|                         | <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                         | <b>setinpwrtrig</b>  | Sets the optical input alarm trigger level.                                                                                                                                                                                                                                                                                                        |

# setinpwrttrig

To set the optical input alarm trigger level, use the **setinpwrttrig** command.

**setinpwrttrig** *trigger*

|                           |                |                                                          |
|---------------------------|----------------|----------------------------------------------------------|
| <b>Syntax Description</b> | <i>trigger</i> | Specifies the desired optical input alarm trigger level. |
|---------------------------|----------------|----------------------------------------------------------|

|                 |          |
|-----------------|----------|
| <b>Defaults</b> | 10.00 dB |
|-----------------|----------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                                                                  |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | The optical input alarm trigger is measured in decibels (dB). See Table 1-2 on page 1-2 for the minimum and maximum values. If a value entered falls outside of this acceptable range, the command is ignored and has no effect. |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                               |
|-----------------|-------------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to set the optical input alarm trigger level. |
|-----------------|-------------------------------------------------------------------------------|

```
edfa > setinpwrttrig 2.00
```

| <b>Related Commands</b> | <b>Command</b>       | <b>Description</b>                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                      | <b>inpwr</b>                                                                                                                                                                                                                                                                                                                                       |
|                         | <b>inpwrmean</b>     | Displays the optical input alarm mean level.                                                                                                                                                                                                                                                                                                       |
|                         | <b>inpwrtrig</b>     | Displays the optical input alarm trigger level.                                                                                                                                                                                                                                                                                                    |
|                         | <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                         | <b>setinpwrttrig</b> | Sets the optical input alarm mean level.                                                                                                                                                                                                                                                                                                           |

# set-master-pwd

To modify the master password for the system, use the **set-master-pwd** command.

**set-master-pwd**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** None

---

**Command Types** Changes configuration

---

**Command Modes** Master password protected

---

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

---



---

**Usage Guidelines** This command prompts the user for the old password, and then prompts twice for the new password. The new password entered for both prompts must match. The default master password is **edfa1**.

---

**Examples** The following example shows how to modify the master password for the system.

```
edfa > set-master-pwd
Old Master Password:
New Password:
New Password:
```

---

| Related Commands | Command      | Description                              |
|------------------|--------------|------------------------------------------|
|                  | set-user-pwd | Sets a new user password for the system. |

---



# setoutsigpwrmean

To set the output signal alarm mean level, use the **setoutsigpwrmean** command.

**setoutsigpwrmean** *mean*

|                           |                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>mean</i>                                                                                                                                                                                                                                  | Specifies the desired output signal alarm mean level.                                                                                                                                                                                                                                                                                              |
| <b>Defaults</b>           | 2.00 dBm                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                    |
| <b>Command Types</b>      | Changes configuration                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                    |
| <b>Command Modes</b>      | Master password protected                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                    |
| <b>Command History</b>    | <b>Release</b>                                                                                                                                                                                                                               | <b>Modification</b>                                                                                                                                                                                                                                                                                                                                |
|                           | EDFA 1.0                                                                                                                                                                                                                                     | This command was introduced.                                                                                                                                                                                                                                                                                                                       |
| <b>Usage Guidelines</b>   | The output signal alarm mean is measured in decibels per milliwatt (dBm). See Table 1-2 on page 1-2 for the minimum and maximum values. If a value entered falls outside of this acceptable range, the command is ignored and has no effect. |                                                                                                                                                                                                                                                                                                                                                    |
| <b>Examples</b>           | The following example shows how to set the output signal alarm mean level.<br>edfa > <b>setoutsigpwrmean 1.00</b>                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                    |
| <b>Related Commands</b>   | <b>Command</b>                                                                                                                                                                                                                               | <b>Description</b>                                                                                                                                                                                                                                                                                                                                 |
|                           | <b>outsigpwr</b>                                                                                                                                                                                                                             | Displays the calculated output signal power.                                                                                                                                                                                                                                                                                                       |
|                           | <b>outsigpwrmean</b>                                                                                                                                                                                                                         | Displays the output signal alarm mean level.                                                                                                                                                                                                                                                                                                       |
|                           | <b>outsigpwrtrig</b>                                                                                                                                                                                                                         | Displays the output signal alarm trigger level.                                                                                                                                                                                                                                                                                                    |
|                           | <b>resetmeantrig</b>                                                                                                                                                                                                                         | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                           | <b>setoutsigpwrtrig</b>                                                                                                                                                                                                                      | Sets the output signal alarm trigger level.                                                                                                                                                                                                                                                                                                        |

# setoutsigpwrtrig

To set the output signal alarm trigger level, use the **setoutsigpwrtrig** command.

**setoutsigpwrtrig** *trigger*

|                           |                |                                                          |
|---------------------------|----------------|----------------------------------------------------------|
| <b>Syntax Description</b> | <i>trigger</i> | Specifies the desired output signal alarm trigger level. |
|---------------------------|----------------|----------------------------------------------------------|

|                 |          |
|-----------------|----------|
| <b>Defaults</b> | 20.00 dB |
|-----------------|----------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                                                                  |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | The output signal alarm trigger is measured in decibels (dB). See Table 1-2 on page 1-2 for the minimum and maximum values. If a value entered falls outside of this acceptable range, the command is ignored and has no effect. |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                               |
|-----------------|-------------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to set the output signal alarm trigger level. |
|-----------------|-------------------------------------------------------------------------------|

```
edfa > setoutsigpwrtrig 18.00
```

| <b>Related Commands</b> | <b>Command</b>          | <b>Description</b>                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                         | <b>outsigpwr</b>                                                                                                                                                                                                                                                                                                                                   |
|                         | <b>outsigpwrmean</b>    | Displays the output signal alarm mean level.                                                                                                                                                                                                                                                                                                       |
|                         | <b>outsigpwrtrig</b>    | Displays the output signal alarm trigger level.                                                                                                                                                                                                                                                                                                    |
|                         | <b>resetmeantrig</b>    | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                         | <b>setoutsigpwrmean</b> | Sets the output signal alarm mean level.                                                                                                                                                                                                                                                                                                           |

# settempmean

To modify the internal case temperature alarm mean level, use the **settempmean** command.

**settempmean** *mean*

|                           |             |                                                                   |
|---------------------------|-------------|-------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>mean</i> | Specifies the desired internal case temperature alarm mean level. |
|---------------------------|-------------|-------------------------------------------------------------------|

|                 |      |
|-----------------|------|
| <b>Defaults</b> | 30°C |
|-----------------|------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

|                        |                |                              |
|------------------------|----------------|------------------------------|
| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                                                                  |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | The internal case temperature mean is measured in degrees Celsius. See Table 1-2 on page 1-2 for the minimum and maximum values. If the value falls outside the acceptable range, the command is ignored and has no side effect. |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                                           |
|-----------------|-------------------------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to modify the internal case temperature alarm mean level. |
|-----------------|-------------------------------------------------------------------------------------------|

```
edfa > settempmean 29.00
```

|                         |                      |                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Related Commands</b> | <b>Command</b>       | <b>Description</b>                                                                                                                                                                                                                                                                                                                                 |
|                         | <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                         | <b>settemptrig</b>   | Sets the internal case temperature alarm trigger level.                                                                                                                                                                                                                                                                                            |
|                         | <b>temp</b>          | Displays the internal case temperature level.                                                                                                                                                                                                                                                                                                      |
|                         | <b>tempmean</b>      | Displays the internal case temperature alarm mean level.                                                                                                                                                                                                                                                                                           |
|                         | <b>temptrig</b>      | Displays the internal case temperature alarm trigger level.                                                                                                                                                                                                                                                                                        |

# settemptrig

To set the internal case temperature alarm trigger level, use the **settemptrig** command.

**settemptrig** *trigger*

|                           |                |                                                                      |
|---------------------------|----------------|----------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>trigger</i> | Specifies the desired internal case temperature alarm trigger level. |
|---------------------------|----------------|----------------------------------------------------------------------|

|                 |      |
|-----------------|------|
| <b>Defaults</b> | 30°C |
|-----------------|------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                                                                          |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | The internal case temperature trigger is measured in degrees Celsius. See Table 1-2 on page 1-2 for the minimum and maximum values. If a value entered falls outside of this acceptable range, the command is ignored and has no effect. |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                                           |
|-----------------|-------------------------------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to set the internal case temperature alarm trigger level. |
|-----------------|-------------------------------------------------------------------------------------------|

```
edfa > settemptrig 29.00
```

| <b>Related Commands</b> | <b>Command</b>       | <b>Description</b>                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                         | <b>settempmean</b>   | Sets the internal case temperature alarm mean level.                                                                                                                                                                                                                                                                                               |
|                         | <b>temp</b>          | Displays the internal case temperature level.                                                                                                                                                                                                                                                                                                      |
|                         | <b>tempmean</b>      | Displays the internal case temperature alarm mean level.                                                                                                                                                                                                                                                                                           |
|                         | <b>temptrig</b>      | Displays the internal case temperature alarm trigger level.                                                                                                                                                                                                                                                                                        |

# set-time

To display or modify the time of the system, use the **set-time** command.

**set-time** *time*

|                           |                                                                                                                                                                                                                                                                                                  |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <p><i>time</i></p> <p>Specifies the desired time of the system. The time must be entered in the same format as this example:</p> <pre>Fri Aug 24 20:50:31 2001 PST</pre> <p>PST is the time zone. See Appendix D, “Time Zone Codes,” for a list of time zones and correlating abbreviations.</p> |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                    |
|-----------------|----------------------------------------------------|
| <b>Defaults</b> | The default time zone is GMT, Greenwich Mean Time. |
|-----------------|----------------------------------------------------|

|                      |                       |
|----------------------|-----------------------|
| <b>Command Types</b> | Changes configuration |
|----------------------|-----------------------|

|                      |                           |
|----------------------|---------------------------|
| <b>Command Modes</b> | Master password protected |
|----------------------|---------------------------|

| <b>Command History</b> | <table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>EDFA 1.0</td> <td>This command was introduced.</td> </tr> </tbody> </table> | Release | Modification | EDFA 1.0 | This command was introduced. |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------|----------|------------------------------|
| Release                | Modification                                                                                                                                                                       |         |              |          |                              |
| EDFA 1.0               | This command was introduced.                                                                                                                                                       |         |              |          |                              |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | <p>The day of the week must be specified as <b>mon</b>, <b>tue</b>, <b>wed</b>, <b>thu</b>, <b>fri</b>, <b>sat</b>, or <b>sun</b>. The system accepts entries with a capitalized first character, such as <b>Mon</b>, or entries entirely in lowercase, such as <b>mon</b>.</p> <p>The month must be specified as <b>jan</b>, <b>feb</b>, <b>mar</b>, <b>apr</b>, <b>may</b>, <b>jun</b>, <b>jul</b>, <b>aug</b>, <b>sep</b>, <b>oct</b>, <b>nov</b>, or <b>dec</b>. The system accepts entries with a capitalized first character, such as <b>Jan</b>, or entries entirely in lowercase, such as <b>jan</b>.</p> <p>The day, hour, minute and second can all be specified by a one- or two-digit number. For example, the system accepts <b>1</b> and <b>01</b> as the same value.</p> <p>The year must be a four-digit number, such as <b>2002</b>.</p> <p>See Appendix D, “Time Zone Codes,” for a list of time zones and correlating abbreviations. The system accepts entries entirely in uppercase, such as <b>PST</b>, or entirely in lowercase, such as <b>pst</b>.</p> |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Examples**

The following example shows how to display the time of the system.

```
edfa > time
Time zone is set to PST
Thu Jan 01 00:00:00 1970 PST
```

The following example shows how to modify the time of the system.

```
edfa > set-time fri feb 8 1:2:30 2002 pst
Time zone is set to PST
Fri Feb 08 01:02:30 2002 PST
```

**Related Commands**

| Command         | Description                                       |
|-----------------|---------------------------------------------------|
| <b>time</b>     | Displays the time of the system.                  |
| <b>timezone</b> | Displays or modifies the time zone of the system. |

# set-user-pwd

To modify the user password for the system, use the **set-user-pwd** command.

**set-user-pwd**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Changes configuration

**Command Modes** Master password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Usage Guidelines** This command prompts the user for the old password, and then prompts twice for the new password. The new password entered for both prompts must match. The default user password is **edfa**.

**Examples** The following example shows how to set the time of the system.

```
edfa > set-user-pwd
Old Master Password:
New Password:
New Password:
```

| Related Commands | Command        | Description                                |
|------------------|----------------|--------------------------------------------|
|                  | set-master-pwd | Sets a new master password for the system. |

# sgain

To display the state of the gain error monitor, use the **sgain** command.

**sgain**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 4.0 | This command was introduced. |

## Usage Guidelines

Display values for this command are NORMAL and OUT-OF-RANGE.

## Examples

The following example shows how to display the state of the gain error monitor.

```
edfa > sgain
NORMAL
```

## Related Commands

| Command     | Description                                |
|-------------|--------------------------------------------|
| <b>gain</b> | Displays the measured optical signal gain. |



# show-trap

To display the trap message, use the **show-trap** command.

**show-trap**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** None

---

**Command Types** Does not change configuration

---

**Command Modes** User password protected

---

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

---

---

**Examples** The following example shows how to display the trap message.

```
edfa > show-trap
```

---

| <b>Related Commands</b> | <b>Command</b>   | <b>Description</b>      |
|-------------------------|------------------|-------------------------|
|                         | <b>hide-trap</b> | Hides the trap message. |

---

# sinpwr

To display the state of the optical input level alarm monitor, use the **sinpwr** command.

**sinpwr**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 4.0 | This command was introduced. |

**Usage Guidelines** Display values for this command are NORMAL and OUT-OF-RANGE.

**Examples** The following example shows how to display the state of the optical input level alarm monitor.

```
edfa > sinpwr
NORMAL
```

| Related Commands | Command      | Description                                |
|------------------|--------------|--------------------------------------------|
|                  | <b>inpwr</b> | Displays the measured optical input power. |

# soutsigpwr

To display the state of the signal output power monitor, use the **soutsigpwr** command.

**soutsigpwr**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 4.0 | This command was introduced. |

**Usage Guidelines** Display values for this command are NORMAL and OUT-OF-RANGE.

**Examples** The following example shows how to display the state of the signal output power monitor.

```
edfa > soutsigpwr
NORMAL
```

| Related Commands | Command          | Description                                  |
|------------------|------------------|----------------------------------------------|
|                  | <b>outsigpwr</b> | Displays the calculated output signal power. |

# sps1

To display the status of the power supply 1 alarm monitor, use the **sps1** command.

**sps1**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 4.0 | This command was introduced. |

## Usage Guidelines

Display values for this command are NORMAL and OUT-OF-RANGE.

## Examples

The following example shows how to display the status of the power supply 1 alarm monitor.

```
edfa > sps1
NORMAL
```

## Related Commands

| Command     | Description                                              |
|-------------|----------------------------------------------------------|
| <b>ps1</b>  | Displays the voltage of DC power supply 1.               |
| <b>sps2</b> | Displays the status of the power supply 2 alarm monitor. |

# sps2

To display the status of the power supply 2 alarm monitor, use the **sps2** command.

**sps2**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 4.0 | This command was introduced. |

**Usage Guidelines** Display values for this command are NORMAL and OUT-OF-RANGE.

**Examples** The following example shows how to display the status of the power supply 2 alarm monitor.

```
edfa > sps2
NORMAL
```

| Related Commands | Command | Description                                              |
|------------------|---------|----------------------------------------------------------|
|                  | ps2     | Displays the voltage of DC power supply 2.               |
|                  | sps2    | Displays the status of the power supply 2 alarm monitor. |

# spump

To display the state of the laser pump, use the **spump** command.

**spump**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** None

---

**Command Types** Does not change configuration

---

**Command Modes** User password protected

---

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 4.0 | This command was introduced. |

---



---

**Usage Guidelines** Display values for this command are GOOD and BAD.

---

**Examples** The following example shows how to display the state of the laser pump.

```
edfa > spump
GOOD
```

# status

To display the measured, alarm mean and alarm trigger values for input power, internal case temperature, optical gain and output signal power, as well as the measured values for optical output power, use the **status** command.

**status**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Examples** The following example shows how to display the status of the system.

```
edfa > status
=====
 Status Measured Mean Trigger
Input Optical Power NORMAL -15.84 (dB) -10.00 (dB) 15.00 (dB)
 Optical Gain NORMAL 6.99 (dB) 7.00 (dB) 0.50 (dB)
Optical Output Power -8.72 (dBm)
 Output Signal Power NORMAL -8.77 (dB) -6.00 (dB) 18.00 (dB)
 Pump Laser GOOD
 Temperature NORMAL 29.53 (C) 25.10 (C) 29.90 (C)
=====
```

# stemp

To display the state of the case temperature monitor, use the **stemp** command.

**stemp**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 4.0 | This command was introduced. |

**Usage Guidelines** Display values for this command are NORMAL and OUT-OF-RANGE.

**Examples** The following example shows how to display the state of the case temperature monitor.

```
edfa > stemp
NORMAL
```

| Related Commands | Command | Description                             |
|------------------|---------|-----------------------------------------|
|                  | temp    | Displays the internal case temperature. |



# sw-download

To download a software image using FTP or TFTP and to burn the image to a specified Flash bank, use the **sw-download** command.

```
sw-download ftp server-ip username password path filename flashbank [passive]
```

```
sw-download tftp server-ip filepath flashbank
```

```
sw-download terminate
```

```
sw-download
```

| Syntax Description |  |                                                                                                                               |
|--------------------|--|-------------------------------------------------------------------------------------------------------------------------------|
| <b>ftp</b>         |  | Specifies an FTP download.                                                                                                    |
| <i>server-ip</i>   |  | Specifies the IP address of the FTP or TFTP server that contains the image.                                                   |
| <i>username</i>    |  | Specifies the username to log in to the FTP server.                                                                           |
| <i>password</i>    |  | Specifies the password of the user on the FTP server.                                                                         |
| <i>path</i>        |  | Specifies the path of the directory that contains the image on the FTP server.                                                |
| <i>filename</i>    |  | Specifies the name of the image file.                                                                                         |
| <i>flashbank</i>   |  | Specifies the Flash bank where the image is to be transferred. It should be designated as <b>1</b> , <b>2</b> , or <b>3</b> . |
| <b>passive</b>     |  | (Optional) Specifies the string for FTP across a firewall. This is not required for FTP.                                      |
| <b>tftp</b>        |  | Specifies a TFTP download.                                                                                                    |
| <i>filepath</i>    |  | Specifies the fully qualified filename for the TFTP transfer.                                                                 |
| <b>terminate</b>   |  | Ends the software transfer in progress.                                                                                       |

**Defaults** None

**Command Types** Changes configuration

**Command Modes** Master password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Usage Guidelines** Use the **terminate** keyword to end the current download. For FTP failures across firewalls, try using the **passive** option. When burning a new image, the Flash bank specified cannot be the current Flash bank.

---

**Examples**

The following example shows how to download an image using FTP and burn the image to a specified Flash bank.

```
edfa > sw-download ftp 209.128.68.145 opruser oprpassword /home/load/bin EdfaImg.0.2 2
```

The following example shows how to download an image using TFTP and to burn the image to a specified Flash bank.

```
edfa > sw-download tftp 209.128.68.145 EdfaImg.0.2 2
```

# sys-info

To display basic information about the system, including CLEI (Common Language Equipment Identifier) code, model number, serial number, MAC address, firmware version, and firmware build date, use the **sys-info** command.

## sys-info

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Usage Guidelines** This command retrieves the information about the system. This include the manufacturer's name, firmware version, amplifier model number, serial number, Ethernet MAC address, and firmware update date.

**Examples** The following example shows how to display basic system information.

```
edfa > sys-info
CLEI: WMM8T00BRA
Amplifier model number: ONS15501
Serial number: MOR0643001G
MAC Address: 00044DFCC75
Firmware version: 4.0
Hardware Revision: 414141
Software build date: Thu Jan 2 17:15:07 PST 2003
System Up Time: 89839 seconds
Software in various Banks: 1)ons15501-sw.4.1
 2)ons15501-sw.4.1
 3)ons15501-sw.4.1
Active bank: 1 Planned bank: 1
```

# temp

To display the internal case temperature, use the **temp** command.

**temp**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

## Examples

The following example shows how to display the internal case temperature.

```
edfa > temp
33 (C)
```

## Related Commands

| Command              | Description                                                                                                                                                                                                                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
| <b>settempmean</b>   | Sets the internal case temperature alarm mean level.                                                                                                                                                                                                                                                                                               |
| <b>settemptrig</b>   | Sets the internal case temperature alarm trigger level.                                                                                                                                                                                                                                                                                            |
| <b>stemp</b>         | Displays the state of the case temperature monitor.                                                                                                                                                                                                                                                                                                |
| <b>tempmean</b>      | Displays the internal case temperature alarm mean level.                                                                                                                                                                                                                                                                                           |
| <b>temptrig</b>      | Displays the internal case temperature alarm trigger level.                                                                                                                                                                                                                                                                                        |

# tempmean

To display the internal case temperature alarm mean level, use the **tempmean** command.

**tempmean**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Examples** The following example shows how to display the internal case temperature alarm mean level.

```
edfa > tempmean
29.00 (C)
```

| Related Commands | Command              | Description                                                                                                                                                                                                                                                                                                                                        |
|------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
|                  | <b>settempmean</b>   | Sets the internal case temperature alarm mean level.                                                                                                                                                                                                                                                                                               |
|                  | <b>settemptrig</b>   | Sets the internal case temperature alarm trigger level.                                                                                                                                                                                                                                                                                            |
|                  | <b>temp</b>          | Displays the internal case temperature level.                                                                                                                                                                                                                                                                                                      |
|                  | <b>temptrig</b>      | Displays the internal case temperature alarm trigger level.                                                                                                                                                                                                                                                                                        |

# temptrig

To display the internal case temperature alarm trigger level, use the **temptrig** command.

**temptrig**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

## Command History

| Release  | Modification                 |
|----------|------------------------------|
| EDFA 1.0 | This command was introduced. |

## Examples

The following example shows how to display the internal case temperature alarm trigger level.

```
edfa > temptrig
29.00 (C)
```

## Related Commands

| Command              | Description                                                                                                                                                                                                                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>resetmeantrig</b> | Resets the signal gain and alarm mean level, gain alarm trigger level, optical input alarm mean level, optical input alarm trigger level, output signal alarm mean level, output signal alarm trigger level, internal case temperature alarm mean level, and internal case temperature alarm trigger level to the manufacturer's default settings. |
| <b>settempmean</b>   | Sets the internal case temperature alarm mean level.                                                                                                                                                                                                                                                                                               |
| <b>settemptrig</b>   | Sets the internal case temperature alarm trigger level.                                                                                                                                                                                                                                                                                            |
| <b>temp</b>          | Displays the internal case temperature level.                                                                                                                                                                                                                                                                                                      |
| <b>tempmean</b>      | Displays the internal case temperature alarm mean level.                                                                                                                                                                                                                                                                                           |

# time

To display the time of the system, use the **time** command.

**time**

**Syntax Description** This command has no arguments or keywords.

**Defaults** None

**Command Types** Does not change configuration

**Command Modes** User password protected

| Command History | Release  | Modification                 |
|-----------------|----------|------------------------------|
|                 | EDFA 1.0 | This command was introduced. |

**Usage Guidelines** The time is displayed in the same format as this example.

```
Fri Aug 24 10:50:31 2001 PST
```

PST is the time zone. See Appendix D, “Time Zone Codes,” for a list of time zones and correlating abbreviations.

**Examples** The following example shows how to display the time of the system.

```
edfa > time
Wed Jan 29 14:20:07 2003 GMT
```

| Related Commands | Command  | Description                                       |
|------------------|----------|---------------------------------------------------|
|                  | set-time | Sets the time of the system.                      |
|                  | timezone | Displays or modifies the time zone of the system. |

# timeout

To display or modify the timeout interval, use the **timeout** command.

**timeout** [*seconds*]

|                           |                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------|
| <b>Syntax Description</b> | <i>seconds</i> (Optional) Specifies the number of seconds for the timeout interval. |
|---------------------------|-------------------------------------------------------------------------------------|

|                 |          |
|-----------------|----------|
| <b>Defaults</b> | 600 secs |
|-----------------|----------|

|                      |                               |
|----------------------|-------------------------------|
| <b>Command Types</b> | Does not change configuration |
|----------------------|-------------------------------|

|                      |                         |
|----------------------|-------------------------|
| <b>Command Modes</b> | User password protected |
|----------------------|-------------------------|

| <b>Command History</b> | <b>Release</b> | <b>Modification</b>          |
|------------------------|----------------|------------------------------|
|                        | EDFA 1.0       | This command was introduced. |

|                         |                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage Guidelines</b> | If there is no activity from the user for a given amount of time (the timeout period), the system automatically logs the user off. The value for the timeout period is displayed in seconds. The default setting is 600 sec. Any modification to this setting applies only to the user session in progress; once the user logs off, the setting automatically resets to the default value. |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                 |                                                                       |
|-----------------|-----------------------------------------------------------------------|
| <b>Examples</b> | The following example shows how to modify the timeout period setting. |
|-----------------|-----------------------------------------------------------------------|

```
edfa > timeout 500
```

The following example shows how to view the timeout period setting.

```
edfa > timeout
Timeout period is 500 seconds
```



# timezone

To display or modify the time zone of the system, use the **timezone** command.

**timezone** [*zone*]

| <b>Syntax Description</b> | <i>zone</i> (Optional) Specifies the time zone at which to set the system.                                                                                                                                                                                         |         |              |                 |                              |             |                                  |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------|-----------------|------------------------------|-------------|----------------------------------|
| <b>Defaults</b>           | None                                                                                                                                                                                                                                                               |         |              |                 |                              |             |                                  |
| <b>Command Types</b>      | Does not change configuration                                                                                                                                                                                                                                      |         |              |                 |                              |             |                                  |
| <b>Command Modes</b>      | User password protected                                                                                                                                                                                                                                            |         |              |                 |                              |             |                                  |
| <b>Command History</b>    | <table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>EDFA 1.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>                                                                                 | Release | Modification | EDFA 1.0        | This command was introduced. |             |                                  |
| Release                   | Modification                                                                                                                                                                                                                                                       |         |              |                 |                              |             |                                  |
| EDFA 1.0                  | This command was introduced.                                                                                                                                                                                                                                       |         |              |                 |                              |             |                                  |
| <b>Usage Guidelines</b>   | See Appendix D, “Time Zone Codes,” for a list of time zones and correlating abbreviations.                                                                                                                                                                         |         |              |                 |                              |             |                                  |
| <b>Examples</b>           | <p>The following example shows how to display the time zone of the system.</p> <pre>edfa &gt; timezone GMT</pre> <p>The following example shows how to modify the time zone of the system.</p> <pre>edfa &gt; timezone PST</pre>                                   |         |              |                 |                              |             |                                  |
| <b>Related Commands</b>   | <table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>set-time</b></td> <td>Sets the time of the system.</td> </tr> <tr> <td><b>time</b></td> <td>Displays the time of the system.</td> </tr> </tbody> </table> | Command | Description  | <b>set-time</b> | Sets the time of the system. | <b>time</b> | Displays the time of the system. |
| Command                   | Description                                                                                                                                                                                                                                                        |         |              |                 |                              |             |                                  |
| <b>set-time</b>           | Sets the time of the system.                                                                                                                                                                                                                                       |         |              |                 |                              |             |                                  |
| <b>time</b>               | Displays the time of the system.                                                                                                                                                                                                                                   |         |              |                 |                              |             |                                  |





## Troubleshooting

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This chapter discusses basic fault investigation and diagnostic (troubleshooting) procedures for the Cisco ONS 15501.

This chapter includes the following sections:

- Basic Diagnostic Procedures, page 5-1
- Isolating the Problem, page 5-2
- Password Recovery, page 5-3
- Technical Support, page 5-4

## Basic Diagnostic Procedures

When a problem occurs over the network, use the following basic diagnostic procedures to determine if the Cisco ONS 15501 is the source of the problem:

- Verify the power connection.
- Verify the Ethernet connection.
- Verify the alarm connection.

## Verifying the Power Connection

To verify the power connection, follow these steps:

- 
- Step 1** Make sure that power is securely connected to the unit and that external AC power is being applied.
  - Step 2** Check for LED lamp activity on the front panel. Disregard the color or number of LEDs illuminated at this time. Verify only that one or more is on, indicating that the chassis is receiving power.
  - Step 3** Check the following areas for possible problems if no LEDs are on:
    - Verify that the power connection to the chassis is firmly made.
    - Verify that the circuit power switch(es) are in the ON position.
    - Verify that the external source AC power circuit breaker(s) are on.
    - Verify that the external power wires are delivering power correctly.
-

## Verifying the Ethernet Connection

To verify the Ethernet connection, follow these steps:

- 
- Step 1** Make sure that the RJ-45 connector is in good working condition and plug it into the LAN port.
- Step 2** Check for LED activity on the LAN port. The left LED is green when an Ethernet connection is established. The right LED flickers yellow when a signal is being transmitted to the Ethernet.
- Step 3** Check the following areas for possible problems if no LEDs are on:
- Verify that the RJ-45 connection to the chassis is firmly made.
  - Verify that the RJ-45 connector is in good working condition.
  - Verify that the external Ethernet source is on and delivering a signal.
- 

## Verifying the Alarm Connection

To verify the alarm connection, connect an ohmmeter to the ALARM OUT port, through an RJ-45 connector.

If the ohmmeter shows a reading of any kind, a connection is present. A very high resistance reading indicates that there are no alarm conditions; a low resistance reading indicates that alarm conditions do exist. See Appendix C, “Connector Pinouts.”

## Isolating the Problem

The key to troubleshooting the Cisco ONS 15501 is to isolate the problem to a specific component.

When troubleshooting, consider the following components of the Cisco ONS 15501:

- Power supply—Includes the power input wiring and associated switches and fuses.
- Front panel indicators—Includes the LEDs on the front panel, which help to identify a failure.
- Connecting cables—Includes all of the interface cables that connect the equipment to any transmission circuit or external device.

## Reading the Front Panel LEDs

The front panel LEDs provide the activity or alarm status of the interfaces or internal circuitry to which they correspond. If an LED is connected to an active circuit and registers an alarm condition or is not on, a problem may exist. Table 5-1 lists the front panel LEDs and what the conditions indicate.

**Table 5-1 Cisco ONS 15501 Front Panel LEDs**

| LED                  | Status | Description                                                                                                                                                                                                                                                       |
|----------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power                | Green  | Power is on.                                                                                                                                                                                                                                                      |
| Fail                 | Red    | The temperature is out-of-range or there is a failure in the pump laser or power supply. To determine if the red LED is on because of the temperature or an actual failure, use the <b>status</b> command and check if the temperature is NORMAL or OUT-OF-RANGE. |
| LOS (loss of signal) | Yellow | No signal is detected.                                                                                                                                                                                                                                            |

**Warning**

**Infra-red laser energy may be present on the cable connected to the receiving (Input) connector, at the transmitting (Output) optical fiber connector, or the monitoring (Optical Monitor) connector. To avoid potential damage to the eyes, do not look directly into this connector or cable. When an optical cable is not attached, place the supplied protective cap over the connector and the optical fiber cable.**

If the LOS (loss of signal) LED is yellow, then the input optical signal has disappeared or has fallen below the detection level.

- Check to see that the input optical cable is securely seated in its connector.
- Connect an optical power meter on an optical spectrum analyzer to the Output Monitor optical connector and check for proper level of the outgoing signal.
- Check with the distant transmitting end to determine if the signal is leaving that site at the proper level.
- Check that the input power mean and trigger values are configured correctly for the actual desired input signal.

## Password Recovery

If you have forgotten your passwords, you must power cycle the system and use the **restore** command to reset the passwords to the defaults. The **restore** command can only be entered from a session on the serial RJ-232 port, not from a Telnet session.

**Caution**

Be sure not to lose the passwords. Powercycling the system disrupts data flow.

To recover the system passwords, follow these steps

- 
- Step 1** Power cycle the system.
  - Step 2** Press the **Enter** key within 15 seconds after the password prompt appears on a HyperTerminal session on the serial console port.
  - Step 3** Type the **restore** command and press the **Enter** key at the “edfa >” prompt.
  - Step 4** Answer **yes** to command prompts and press the **Enter** key.
-

The default user password is *edfa* and the default master password is *edfa1*. For security reasons, you should change both passwords as soon as possible. Log in with master privileges and use the **set-user-pwd** and **set-master-pwd** commands to change the passwords.

## Technical Support

If the problem exists after you review the Cisco ONS 15501 status and attempt to reprovision the amplifier, contact the Cisco Technical Assistance Center (TAC). (See the preface for contact information.)



## Cisco ONS 15501 Alarms

---

This appendix describes the alarms defined for the Cisco ONS 15501:

- Ambient Temperature

[Temperature out of range]

**Explanation** The temperature measured by the thermal sensor shows a value outside the operational limits.

**Recommended Action** Change environment so that the chassis cools down.

- Electrical Power

[Power Supply voltage level out of range]

**Explanation** The measured power supply levels are not within range.

**Recommended Action** Ensure proper voltage levels for both the electrical inputs.

- Input Signal Power

[Input Signal level out of range]

**Explanation** The measured input signal power is not within range.

**Recommended Action** The device might be operating outside the configured input optical limits. Change the mean and trigger values appropriately, or check the equipment and link providing optical input to the unit.

- Output Signal Power

[Output Signal level out of range]

**Explanation** The measured output signal power is not within range.

**Recommended Action** The device may be operating outside of specified limits or the mean and trigger are not properly defined. Change the mean and trigger values appropriately, vary the optical input, or change the configured gain so that the output signal power is in the operational range.

- Controller Communication Failure

[Communication with embedded controller failed]

**Explanation** The communication with the embedded controller has failed.

**Recommended Action** This denotes internal monitoring failure. The unit needs servicing if this alarm appears frequently.

- Software Upgrade Initiated  
[Software download started]  
**Explanation** A TFTP or FTP request has been launched.  
**Recommended Action** None.
- Software Upgrade Failed  
[Software download failed]  
**Explanation** A TFTP or FTP request that was launched has failed.  
**Recommended Action** Fix the reported problem (network issues, bad user ID or password, remote server not configured or incorrect, filename or file path incorrect) and relaunch the software download with correct parameters.
- Software Upgrade Completed  
[Software download completed]  
**Explanation** A TFTP or FTP request that was launched has completed.  
**Recommended Action** None.
- Software Reboot Initiated  
[Software Reboot issued]  
**Explanation** Reboot has been requested on the unit  
**Recommended Action** None
- Software Rolled Back  
[Active and planned Software images are different]  
**Explanation** The unit has booted from a bank that is not the programmed bank. This is possibly because the image from programmed bank was bad or because the boot loader was explicitly asked to boot from another bank (using the console during bootup) or unit was frequently power-cycled.  
**Recommended Action** If the image is bad, reprogram a good image on corrupted bank.
- Configuration Changed  
[Configurable value modified]  
**Explanation** A writeable attribute has been modified through one of the management interfaces exposed by the system (for example, CLI or SNMP).  
**Recommended Action** None
- Unacceptable Gain  
[Measure signal gain is out of acceptable range]  
**Explanation** The equipment is unable to achieve the planned level for gain.  
**Recommended Action** Ensure that the optical input and environmental factors are within operational range. If the alarm is still present, the unit might need servicing.
- Laser Pump Bad  
[One or more of the laser pump(s) bad]



**Explanation** The measured parameters for the laser show that a laser pump has gone bad.

**Recommended Action** Ensure that the optical input and environmental factors are within operational range. If the alarm is still present, the unit needs servicing.

- EEPROM bad

[EEPROM access showed up errors]

**Explanation** The writes and reads from EEPROM have problems.

**Recommended Action** If this problem recurs, it denotes a fault with the monitoring interface and may require servicing.





## Technical Specifications

---

This appendix describes the technical specifications for the Cisco ONS 15501. This appendix includes the following sections:

- Cisco ONS 15501 Optical Specifications, page B-1
- Cisco ONS 15501 AC Electrical Specifications, page B-1
- Cisco ONS 15501 DC Electrical Specifications, page B-2
- Cisco ONS 15501 Mechanical Specifications, page B-2
- Cisco ONS 15501 AC Input Power Requirements, page B-2
- Cisco ONS 15501 DC Input Power Requirements, page B-3

### Cisco ONS 15501 Optical Specifications

Table 1-1 on page 1-2 lists the optical specifications of the Cisco ONS 15501.

### Cisco ONS 15501 AC Electrical Specifications

The Cisco ONS 15501 AC power supply meets the electrical specifications listed in Table B-1.

**Table B-1** Cisco ONS 15501 AC Electrical Specifications

| Description       | Specification                                                         |
|-------------------|-----------------------------------------------------------------------|
| Input voltage     | 100 to 240 VAC, single phase (nominal);<br>90 to 255 VAC (full range) |
| Power consumption | 15W maximum; 8W typical                                               |

## Cisco ONS 15501 DC Electrical Specifications

The Cisco ONS 15501 DC power supply meets the electrical specifications listed in Table B-2.

**Table B-2** Cisco ONS 15501 DC Electrical Specifications

| Description                  | Specification           |
|------------------------------|-------------------------|
| Input voltage                | −48 VDC                 |
| Power consumption            | 15W maximum; 8W typical |
| Minimum power supply voltage | −40.5 VDC               |
| Maximum power supply voltage | −57 VDC                 |

## Cisco ONS 15501 Mechanical Specifications

Table B-3 lists the mechanical specifications of the Cisco ONS 15501.

**Table B-3** Cisco ONS 15501 Mechanical Specifications

| Description                   | Specification                                                                                                                                            |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions (H x W x D)        | AC Version: 1.7 in. x 19.0 in. x 10.4in.<br>(44.45 mm x 482.6 mm x 265 mm)<br>DC Version: 1.7 in. x 19.0 in. x 10.1in.<br>(44.45 mm x 482.6 mm x 259 mm) |
| Weight                        | 6.8 lbs (3.09 kg)                                                                                                                                        |
| Ambient operating temperature | 0 to 50°C (32 to 122°F)                                                                                                                                  |
| Storage temperature           | −40 to 85°C (−40 to 185°F)                                                                                                                               |
| Humidity operation            | Up to 95 percent, noncondensing                                                                                                                          |
| Humidity storage              | Up to 95 percent, noncondensing                                                                                                                          |
| Connector type                | SC/UPC                                                                                                                                                   |

## Cisco ONS 15501 AC Input Power Requirements

Table B-4 lists the AC input power requirements of the Cisco ONS 15501.

**Table B-4** AC Input Power Specifications

| Description                | Specification                                                         |
|----------------------------|-----------------------------------------------------------------------|
| Power consumption          | 15W maximum; 8W typical                                               |
| Input power cable          | AC power input cables                                                 |
| Power source voltage range | 100 to 240 VAC, single phase (nominal);<br>90 to 255 VAC (full range) |

# Cisco ONS 15501 DC Input Power Requirements

Table B-5 lists the DC input power requirements of the Cisco ONS 15501.

**Table B-5** DC Input Power Supply Specifications

| Description                | Specification           |
|----------------------------|-------------------------|
| Power consumption          | 15W maximum; 8W typical |
| Input power cable          | 18 AWG wire             |
| Power source voltage range | -40.5 VDC to -57.0 VDC  |

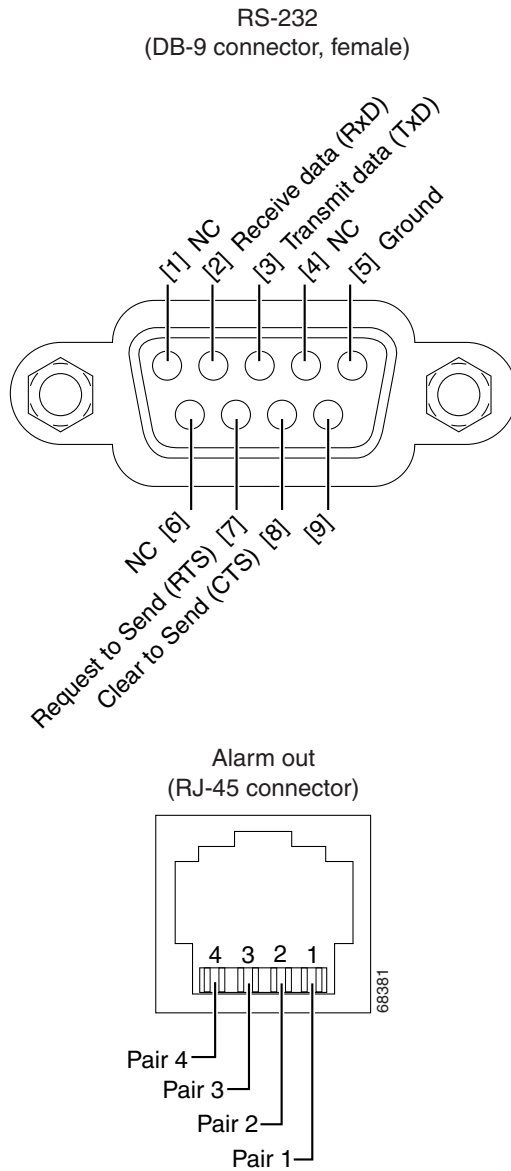




## Connector Pinouts

---

Figure C-1 shows the pin configuration of the RS-232 DB-9 type and alarm out RJ-45 connectors.

**Figure C-1 RS-232 and RJ-45 Connector Pinouts**

Pair 1 (pins 1—2): Shorted if LOS exists

Pair 2 (pins 3—4): Shorted if fault exists

Pair 3 (pins 5—6): Shorted if either power supply fails

Pair 4 (pins 7—8): Uncommitted (always shorted)





## Time Zone Codes

Table D-1 lists time zones and their correlating abbreviations. Use the abbreviations when setting the time of your system. (See the **set-time** command for more information.)

**Table D-1** Time Zone Codes

| Code | Time Zone                    |
|------|------------------------------|
| GMT  | Greenwich Mean               |
| UT   | Universal (Coordinated)      |
| WET  | Western European             |
| BST  | British Summer               |
| WAT  | West Africa                  |
| AT   | Azores                       |
| AST  | Atlantic Standard            |
| ADT  | Atlantic Daylight            |
| EST  | Eastern Standard             |
| EDT  | Eastern Daylight             |
| CST  | Central Standard             |
| CDT  | Central Daylight             |
| MST  | Mountain Standard            |
| MDT  | Mountain Daylight            |
| PST  | Pacific Standard             |
| PDT  | Pacific Daylight             |
| YST  | Yukon Standard               |
| TDT  | Yukon Daylight               |
| HST  | Hawaii Standard              |
| HDT  | Hawaii Daylight              |
| CAT  | Central Alaska               |
| AHST | Alaska-Hawaii Standard       |
| NT   | Nome                         |
| IDLW | International Date Line West |

**Table D-1 Time Zone Codes (continued)**

| <b>Code</b> | <b>Time Zone</b>             |
|-------------|------------------------------|
| CET         | Central European             |
| MET         | Middle European              |
| MEWT        | Middle European Winter       |
| MEST        | Middle European Summer       |
| MESZ        | Middle European Summer       |
| SWT         | Swedish Winter               |
| SST         | Swedish Summer               |
| FWT         | French winter                |
| FST         | French Summer                |
| EET         | Eastern Europe, USSR Zone 1  |
| BT          | Baghdad, USSR Zone 2         |
| ZP4         | USSR Zone 3                  |
| ZP5         | USSR Zone 4                  |
| ZP6         | USSR Zone 5                  |
| WAST        | West Australian Standard     |
| WADT        | West Australian Daylight     |
| CCT         | China Coast, USSR Zone 7     |
| JST         | Japan Standard, USSR Zone 8  |
| EAST        | Eastern Australian Standard  |
| EADT        | Eastern Australian Daylight  |
| GST         | Guam Standard, USSR Zone 9   |
| NZT         | New Zealand                  |
| NZST        | New Zealand Standard         |
| NZDT        | New Zealand Daylight         |
| IDLE        | International Date Line East |



## Translated Safety Warnings

---

This appendix contains the translations of the following safety warnings, which are included in this guide:

- Wrist Strap Warning, page E-1
- Restricted Area Warning, page E-3
- Qualified Personnel Warning, page E-4
- Unterminated Fiber Warning, page E-5
- Hazardous Radiation Exposure, page E-7

### Wrist Strap Warning



**Warning**

**During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.**

**Waarschuwing**

**Drag tijdens deze procedure aardingspolsbanden om te vermijden dat de kaart beschadigd wordt door elektrostatische ontlading. Raak het achterbord niet rechtstreeks aan met uw hand of met een metalen werktuig, omdat u anders een elektrische schok zou kunnen oplopen.**

**Varoitus**

**Käytä tämän toimenpiteen aikana maadoitettuja rannesuojia estääksesi kortin vaurioitumisen sähköstaattisen purkauksen vuoksi. Älä kosketa taustalevyä suoraan kädelläsi tai metallisella työkalulla sähköiskuvaaran takia.**

**Attention**

**Lors de cette procédure, toujours porter des bracelets antistatiques pour éviter que des décharges électriques n'endommagent la carte. Pour éviter l'électrocution, ne pas toucher le fond de panier directement avec la main ni avec un outil métallique.**

**Warnung**

**Zur Vermeidung einer Beschädigung der Karte durch elektrostatische Entladung während dieses Verfahrens ein Erdungsband am Handgelenk tragen. Bei Berührung der Rückwand mit der Hand oder einem metallenen Werkzeug besteht Elektroschockgefahr.**

**Figyelem!**

**Az elektromos kisülés okozta meghibásodás elkerülése érdekében az eljárás során viseljen földelő csuklópántot. Se kézzel, se fém eszközzel ne érjen hozzá a kártya hátlapjához, mert különben áramütést szenvedhet.**

|                       |                                                                                                                                                                                                                                                                                                          |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Avvertenza</b>     | <b>Durante questa procedura, indossare bracciali antistatici per evitare danni alla scheda causati da un'eventuale scarica elettrostatica. Non toccare direttamente il pannello delle connessioni, né con le mani né con un qualsiasi utensile metallico, perché esiste il pericolo di folgorazione.</b> |
| <b>Advarsel</b>       | <b>Bruk jordingsarmbånd under prosedyren for å unngå ESD-skader på kortet. Unngå direkte berøring av bakplanet med hånden eller metallverktøy, slik at di ikke får elektrisk støt.</b>                                                                                                                   |
| <b>Aviso</b>          | <b>Durante este procedimento e para evitar danos ESD causados à placa, use fitas de ligação à terra para os pulsos. Para evitar o risco de choque eléctrico, não toque directamente na parte posterior com a mão ou com qualquer ferramenta metálica.</b>                                                |
| <b>¡Advertencia!</b>  | <b>Usartiras conectadas a tierra en las muñecas durante este procedimiento para evitar daños en la tarjeta causados por descargas electrostáticas. No tocar el plano posterior con las manos ni con ninguna herramienta metálica, ya que podría producir un choque eléctrico.</b>                        |
| <b>Varning!</b>       | <b>Använd jordade armbandsremmar under denna procedur för att förhindra elektrostatisk skada på kortet. Rör inte vid baksidan med handen eller metallverktyg då detta kan orsaka elektrisk stöt.</b>                                                                                                     |
| <b>Предупреждение</b> | При выполнении данной процедуры наденьте заземленные браслеты, чтобы избежать повреждения платы электростатическим разрядом. Не дотрагивайтесь до задней панели рукой или металлическим предметом, поскольку это может привести к поражению электрическим током.                                         |
| <b>警告</b>             | 在此过程中，请佩戴接地腕带以避免ESD损坏插卡。请勿用手或任何金属工具直接接触后面板，否则您可能受到电击。                                                                                                                                                                                                                                                    |
| <b>警告</b>             | この手順を行う際には、ESDによるカードの損傷を防ぐため、静電気防止用リストストラップを着用してください。電気ショックを防ぐために、装置の背面を直接手や金属で触らないようにします。                                                                                                                                                                                                               |
| <hr/>                 |                                                                                                                                                                                                                                                                                                          |
| <b>Предупреждение</b> | При выполнении данной процедуры наденьте заземленные браслеты, чтобы избежать повреждения платы электростатическим разрядом. Не дотрагивайтесь до задней панели рукой или металлическим предметом, поскольку это может привести к поражению электрическим током.                                         |
| <b>警告</b>             | 在此过程中，请佩戴接地腕带以避免ESD损坏插卡。请勿用手或任何金属工具直接接触后面板，否则您可能受到电击。                                                                                                                                                                                                                                                    |
| <b>警告</b>             | この手順を行う際には、ESDによるカードの損傷を防ぐため、静電気防止用リストストラップを着用してください。電気ショックを防ぐために、装置の背面を直接手や金属で触らないようにします。                                                                                                                                                                                                               |
| <hr/>                 |                                                                                                                                                                                                                                                                                                          |

## Restricted Area Warning



### Warning

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

### Waarschuwing

Deze eenheid is bestemd voor installatie in plaatsen met beperkte toegang. Toegang tot een dergelijke plaats kan alleen verkregen worden door middel van een speciaal instrument, een slot en sleutel of een ander veiligheidsmiddel.

### Varoitus

Tämä laite on tarkoitettu asennettavaksi paikkaan, johon pääsy on rajoitettua. Tällaiseen paikkaan pääsee vain erikoistyökäluä, lukkoon sopivaa avainta tai jotakin muuta turvalaitetta käyttämällä.

### Attention

Cet appareil est à installer dans des zones d'accès réservé. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

### Warnung

Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

### Figyelem!

A készülék korlátozottan hozzáférhető területre történő beszerelésre készült. A korlátozottan hozzáférhető területekhez csak speciális szerszám, zár és kulcs vagy más biztonsági berendezés segítségével lehet hozzáférni.

### Avvertenza

Questa unità è prevista per essere installata in un'area ad accesso limitato, vale a dire un'area accessibile solo mediante l'uso di un attrezzo speciale, come lucchetto e chiave, o altri dispositivi di sicurezza.

### Advarsel

Denne enheten er beregnet på installasjon i områder med begrenset tilgang. Et begrenset tilgangsområde kan bare nås ved hjelp av et spesielt verktøy, lås og nøkkel, eller andre sikkerhetsanordninger.

### Aviso

Esta unidade foi concebida para instalação em áreas de acesso restrito. Uma área de acesso restrito é uma área à qual apenas tem acesso o pessoal de serviço autorizado, que possua uma ferramenta, chave e fechadura especial, ou qualquer outra forma de segurança.

### ¡Advertencia!

Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

### Varning!

Denna enhet är avsedd för installation i områden med begränsat tillträde. Ett område med begränsat tillträde kan endast tillträdas med hjälp av specialverktyg, lås och nyckel eller annan säkerhetsanordning.

### Предупреждение

Данное устройство предназначено для установки в помещениях с ограниченным доступом. В такие помещения можно попасть, только имея специальное устройство доступа, карту или ключ или пройдя проверку другими средствами обеспечения безопасности.

**警告** 此部件应安装在限制进出的场所。限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

**警告** この装置は立ち入り制限区域内に設置することが前提になっています。立ち入り制限区域とは、鍵、錠、またはその他の保全手段を使用しないと立ち入ることができない区域です。

**Предупреждение** Данное устройство предназначено для установки в помещениях с ограниченным доступом. В такие помещения можно попасть, только имея специальное устройство доступа, карту или ключ или пройдя проверку другими средствами обеспечения безопасности.

**警告** 此部件应安装在限制进出的场所。限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

**警告** この装置は立ち入り制限区域内に設置することが前提になっています。立ち入り制限区域とは、鍵、錠、またはその他の保全手段を使用しないと立ち入ることができない区域です。

## 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.**

### Avvertenza

**Solo personale addestrato e qualificato deve essere autorizzato ad installare o sostituire questo apparecchio.**

### Advarsel

**Kun kvalifisert personell med riktig opplæring bør montere eller bytte ut dette utstyret.**

### Aviso

**Este equipamento deverá ser instalado ou substituído apenas por pessoal devidamente treinado e qualificado.**

|            |                                                                                                                             |
|------------|-----------------------------------------------------------------------------------------------------------------------------|
| ¡Atención! | Estos equipos deben ser instalados y reemplazados exclusivamente por personal técnico adecuadamente preparado y capacitado. |
| Varning    | Denna utrustning ska endast installeras och bytas ut av utbildad och kvalificerad personal.                                 |

## Unterminated Fiber Warning



### Warning

Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.

### Waarschuwing

Er kunnen onzichtbare laserstralen worden uitgezonden vanuit het uiteinde van de onafgebroken vezelkabel of connector. Niet in de straal kijken of deze rechtstreeks bekijken met optische instrumenten. Als u de laseruitvoer met bepaalde optische instrumenten bekijkt (zoals bijv. een oogloep, vergrootglas of microscoop) binnen een afstand van 100 mm kan dit gevaar voor uw ogen opleveren.

### Varoitus

Päättämättömän kuitukaapelin tai -liittimen päästä voi tulla näkymätöntä lasersäteilyä. Älä tuijota sädettä tai katso sitä suoraan optisilla välineillä. Lasersäteen katsominen tietyillä optisilla välineillä (esim. suurennuslasilla tai mikroskoopilla) 10 cm:n päästä tai sitä lähempää voi olla vaarallista silmille.

### Attention

Des émissions de radiations laser invisibles peuvent se produire à l'extrémité d'un câble en fibre ou d'un raccord sans terminaison. Ne pas fixer du regard le rayon ou l'observer directement avec des instruments optiques. L'observation du laser à l'aide certains instruments optiques (loupes et microscopes) à une distance inférieure à 100 mm peut poser des risques pour les yeux.

### Warnung

Eine unsichtbare Laserstrahlung kann vom Ende des nicht angeschlossenen Glasfaserkabels oder Steckers ausgestrahlt werden. Nicht in den Laserstrahl schauen oder diesen mit einem optischen Instrument direkt ansehen. Ein Betrachten des Laserstrahls mit bestimmten optischen Instrumenten, wie z.B. Augenlupen, Vergrößerungsgläsern und Mikroskopen innerhalb eines Abstands von 100 mm kann für das Auge gefährlich sein.

### Figyelem!

A lezáratlan optikai kábelek és a csatlakozók láthatatlan lézerefényt bocsáthatnak ki. Ne nézzen bele a sugárba, és ne nézze közvetlenül, optikai berendezések segítségével! Ha a kibocsátott lézert 100 mm-esnél kisebb távolságból nézi bizonyos optikai eszközökkel (például nagyítóval vagy mikroszkóppal), látáskárosodást szenvedhet.

### Avvertenza

L'estremità del connettore o del cavo ottico senza terminazione può emettere radiazioni laser invisibili. Non fissare il raggio od osservarlo in modo diretto con strumenti ottici. L'osservazione del fascio laser con determinati strumenti ottici (come lupette, lenti di ingrandimento o microscopi) entro una distanza di 100 mm può provocare danni agli occhi.

**Advarsel** Usynlig laserstråling kan emittere fra enden av den ikke-terminerte fiberkabelen eller koblingen. Ikke se inn i strålen og se heller ikke direkte på strålen med optiske instrumenter. Observering av laserutgang med visse optiske instrumenter (for eksempel øyelupe, forstørrelsesglass eller mikroskoper) innenfor en avstand på 100 mm kan være farlig for øynene.

**Aviso** Radiação laser invisível pode ser emitida pela ponta de um conector ou cabo de fibra não terminado. Não olhe fixa ou diretamente para o feixe ou com instrumentos ópticos. Visualizar a emissão do laser com certos instrumentos ópticos (por exemplo, lupas, lentes de aumento ou microscópios) a uma distância de 100 mm pode causar riscos à visão.

**¡Advertencia!** El extremo de un cable o conector de fibra sin terminación puede emitir radiación láser invisible. No se acerque al radio de acción ni lo mire directamente con instrumentos ópticos. La exposición del ojo a una salida de láser con determinados instrumentos ópticos (por ejemplo, lupas y microscopios) a una distancia de 100 mm puede comportar lesiones oculares.

**Varning!** Osynlig laserstrålning kan komma från änden på en oavslutad fiberkabel eller -anslutning. Titta inte rakt in i strålen eller direkt på den med optiska instrument. Att titta på laserstrålen med vissa optiska instrument (t.ex. lupper, förstoringsglas och mikroskop) från ett avstånd på 100 mm kan skada ögonen.

**Предупреждение** Световоды и разъемы без заглушек могут испускать невидимое лазерное излучение. Не допускайте попадания лазерного луча в глаза и не смотрите на него через оптические приборы. Нельзя смотреть на источник лазерного излучения через некоторые оптические приборы (например увеличительное стекло, лупу или микроскоп) с расстояния ближе 100 мм: это может привести к травме органов зрения.

**警告** 无终端接头的光纤的末端或接头有可能发出不可见的激光辐射。请勿直视光束或直接用光学仪器观看。在 100 毫米的距离内用某些光学仪器（例如小型放大镜、放大镜和显微镜）观看激光输出有可能伤害眼睛。

**警告** 終端されていない光ファイバ ケーブルまたはコネクタの開口部からは、目に見えないレーザー光線が放射されていることがあります。光線をのぞきこんだり、光学機器を使用して直接見たりしないでください。ある種の光学機器（ルーペ、拡大鏡、顕微鏡など）を使用して 100 mm 以内の距離からレーザー光線を見ると、目を痛めることがあります。

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## Hazardous Radiation Exposure



### Warning

**Use of controls, adjustments, or performing procedures other than those specified may result in hazardous radiation exposure.**

### Waarschuwing

**Het gebruik van regelaars of bijstellingen of het uitvoeren van procedures anders dan opgegeven kan leiden tot blootstelling aan gevaarlijke straling.**

### Varoitus

**Säätimien tai säätöjen käyttö ja toimenpiteiden suorittaminen ohjeista poikkeavalla tavalla voi altistaa vaaralliselle säteilylle.**

### Attention

**L'utilisation de commandes, de réglages ou de procédures autres que ceux spécifiés peut entraîner une exposition dangereuse à des radiations.**

### Warnung

**Die Verwendung von nicht spezifizierten Steuerelementen, Einstellungen oder Verfahrensweisen kann eine gefährliche Strahlenexposition zur Folge haben.**

### Figyelem!

**Az előírtaktól különböző kezelőszervek és módosítások használata, vagy ilyen eljárások végrehajtása azt eredményezheti sugárzásveszélyt rejt magában.**

### Avvertenza

**L'adozione di controlli, regolazioni o procedure diverse da quelle specificate può comportare il pericolo di esposizione a radiazioni.**

### Advarsel

**Bruk av kontroller eller justeringer eller utførelse av prosedyrer som ikke er spesifiserte, kan resultere i farlig strålingseksponering.**

### Aviso

**O uso de controles, ajustes ou desempenho de procedimentos diferentes dos especificados pode resultar em exposição prejudicial de radiação.**

### ¡Advertencia!

**La aplicación de controles, ajustes y procedimientos distintos a los especificados puede comportar una exposición peligrosa a la radiación.**

### Varning!

**Om andra kontroller eller justeringar än de angivna används, eller om andra processer än de angivna genomförs, kan skadlig strålning avges.**

**Предупреждение** Использование других элементов управления и регулировки, а также не указанные здесь действия могут привести к воздействию опасного излучения.

**警告** 不按照规定的步骤控制、调整或操作有可能造成危险的辐射外泄。

**警告** 記載されている手順以外の方法で性能を調節しようとする、レーザー光線の放射に曝される危険性があります。

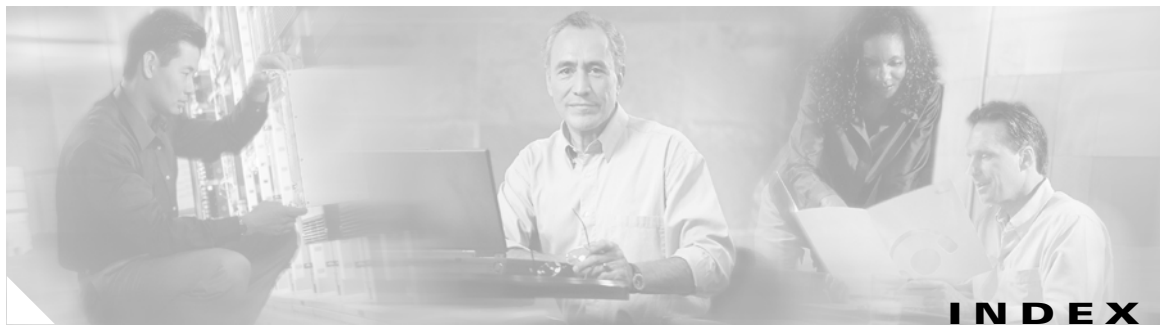
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**警告** 記載されている手順以外の方法で性能を調節しようとする、レーザー光線の放射に曝される危険性があります。

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