



TL1 Turn Up

This chapter describes how to provision the ONS 15216 EDFA3 using TL1 commands. Sections in this chapter include:

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You must use TL1 to set some of the initial configuration parameters for the ONS 15216 EDFA3. After the initial parameters are set, you can issue Simple Network Management Protocol (SNMP) commands through an SNMP management interface or continue to work in TL1. See [Chapter 10, “SNMP and the Management Information Base”](#) for information about Cisco’s SNMP management interface.



Note

You must create a community in order to apply security. Without a community string, some TL1 commands such as ACT-USER cannot be successfully completed. See the [“7.1 Start the TL1 Interface”](#) section for information about adding users to the ONS 15216 EDFA3.

7.1 Start the TL1 Interface

The TL1 interface starts up when HyperTerminal is started. See the “[5.3 Communicating with the EDFA3 Through a Serial EIA/TIA-232 \(RS-232\) Interface](#)” section on page 5-4 for information about starting HyperTerminal.

The TL1 login prompt reports messages similar to the following:

```
WARNING
This system is restricted to authorized users for business purposes. Unauthorized access
is a violation of the law. This service may be monitored for administrative and security
reasons. By proceeding, you consent to this monitoring.
>
```

The > prompt appears when TL1 has successfully connected.

7.2 Use TL1 to Log In with the Default Password

Log in using the ACT-USER command (see the “[8.4.1 ACT-USER](#)” section on page 8-6) with the following syntax:

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

For example, you would type:

```
> ACT-USER::CISCO15:123::*****;
```

where ACT-USER is the command, the tid is null by default so none is entered, CISCO15 is the default user id, 123 is the ctag used to identify this command, and ***** represents the password.



Note

For security reasons, it is recommended that you change the password from its default value. (Use TL1 to set the password for the amplifier using the “[7.15 Use TL1 to Set the Password for the Amplifier](#)” section on page 7-9.)

The ONS 15216 EDFA3 displays the login response, as shown in [Example 7-1](#).

Example 7-1 TL1 Shell Login Response

```
> ACT-USER::CISCO15:123;

EDFA3 2002-07-11 10:09:19
M 123 COMPLD
/* ACT-USER */
;
>
```

An EIA/TIA-232 (RS-232) link to the ONS 15216 EDFA3 is established. The user can now provision the ONS 15216 EDFA3.

7.3 Use TL1 to Set the Date and Time

Use the ED-DAT command (see the “8.4.10 ED-DAT” section on page 8-14) to set the date and time. A time zone cannot be set using TL1. The time setting is restricted to universal coordinated time (UTC) according to the following syntax:

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

The utcdat and utctime entries must follow the format yyyy-mm-dd, hh-mm-ss, as shown in [Example 7-2](#).

Example 7-2 Setting the Date and Time Using TL1

```
> ED-DAT:::123:::2003-09-18, 02-24-55;
```

7.4 Use TL1 to Set the Power Bus Mode (Simplex or Duplex)

The ONS 15216 EDFA3 allows users to set a simplex (one power source-Bus A) or duplex (redundant power source-Bus A and Bus B) Power Bus mode. The default mode is duplex. Use the ED-EQPT command to set the desired power bus mode according to the following syntax:

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

The pwrbusmode value can be SIMPLEX or DUPLEX as shown in [Example 7-3](#).

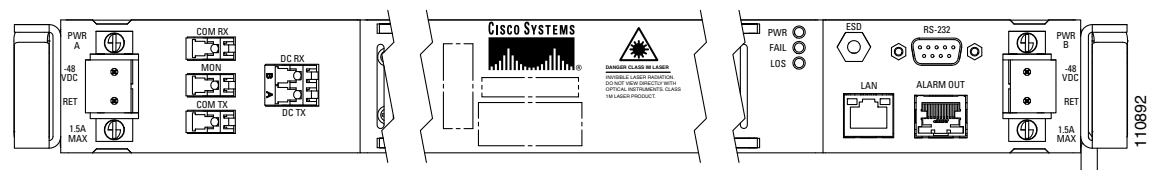
Example 7-3 Setting the Power Bus Mode Using TL1

```
> ED-EQPT:::ALL:123:::PWRBUSMODE=SIMPLEX;
```

7.5 Use TL1 to Set the Amplifier Alarm Thresholds

Alarm thresholds are set so that the network operator can be notified when valid alarms occur through the RJ-45 ALARM OUT and RJ-45 LAN ports on the ONS 15216 EDFA3 front panel ([Figure 7-1](#)).

Figure 7-1 ONS 15216 EDFA3 Front Panel



Alarms are reported for the following conditions:

- Degradation of electrical power source
- Laser pump overheating or excessive pump current
- Loss or degradation of optical input (signal)
- Loss of output power or gain out of range

- Case temperature out of range

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

By default, the LINE1RXPwrTHFailLow is set to 10 dBm to maintain the amplifier and the laser status in an OFF state. For a full description of alarm threshold command attributes, refer to [Chapter 8, “TL1 Commands and Autonomous Messages.”](#)

To display the alarm thresholds, use the RTRV-TH-DWDM and RTRV-TH-EQPT commands. Use the RTRV-TH-DWDM command according to the following syntax:

```
RTRV-TH-DWDM: [<tid>]:<aid>:<ctag>:: [<thresholdtype>] [,] [,];
```

The response to the RTRV-TH-DWDM command is in the following format:

```
<sid> <date> <time> M <ctag> COMPLD "<aid>,DWDM:<thresholdtype>,,,<thresholdvalue>"
```

Use the RTRV-TH-EQPT command according to the following syntax:

```
RTRV-TH-EQPT: [<tid>]:<aid>:<ctag>:: [<thresholdtype>] [,] [,];
```

The response to the RTRV-TH-EQPT command is in the following format:

```
<sid> <date> <time> M <ctag> COMPLD "<aid>:<thresholdtype>,,,<thresholdvalue>"
```

[Example 7-4](#) shows sample command outputs.

Example 7-4 Displaying the Alarm Thresholds Using TL1

```
> RTRV-TH-DWDM::ALL:124;

edfa3 2003-11-27 11:55:48
M 124 COMPLD
"1,DWDM:GAINTHDH,,,23.0dB"
"1,DWDM:GAINTHDL,,,19.0dB"
"1,DWDM:LINE1RXPWRTHFL,,, -25.0dBm"
"1,DWDM:LINE1TXPWRTHDH,,,12.0dBm"
"1,DWDM:LINE1TXPWRTHDL,,, 8.0dBm"
"1,DWDM:LINE1TXPWRTHFL,,, -6.0dBm"
"1,DWDM:LINE2RXPWRTHFL,,, -33.0dBm"
;

> RTRV-TH-EQPT::ALL:124;

edfa3 2003-11-27 11:56:40
M 124 COMPLD
"EQPT,EQPT:MAXCTMP,,,65.0C"
"EQPT,EQPT:MINCTMP,,, -5.0C"
"EQPT,PWR-B:PWRBUSMAX,,,57.0V"
"EQPT,PWR-B:PWRBUSMIN,,,40.0V"
;
```

To set the alarm thresholds, use the SET-TH-DWDM (see [“8.4.47 SET-TH-DWDM”](#) section on [page 8-52](#)) and SET-TH-EQPT (see the [“8.4.48 SET-TH-EQPT”](#) section on [page 8-53](#)) commands.

7.6 Use TL1 to Verify the Operational Status of the Amplifier

To ensure that the amplifier is working correctly on the optical level, you must verify the amplifier operational status. Use the RTRV-DWDM command (see “[8.4.32 RTRV-DWDM](#)” section on page 8-36) to verify amplifier operational status according to the following syntax:

```
RTRV-DWDM: [<tid>] :<aid>:<ctag>[::::];
```

The response to the RTRV-DWDM command is in the following format:

```
<sid> <date> <time> M <ctag>
" [<aid>] : [CTRLMODE=<ctrlmode>], [LINE1TXPWR=<line1txpwr>], [LINE1TXPWRSP=<line1txpwrsp>],
[LINE1RXPWR=<line1rxpwr>], [LINE2RXPWR=<line2rxpwr>], [LINE2TXPWR=<line2txpwr>], [PWROFFSET=<
pwoffset>], [GAIN=<gain>], [GAINSP=<gainsp>], [TILT=<tilt>], [TILTSP=<tiltsp>], [TILTOFFSET=<t
iltoffset>], [DCULOSS=<dculoss>], [OSRI=<on/off>], [LASTATUS=<on/off>], [VOA=<VOAvalue>] "
```

[Example 7-5](#) displays a command example and the sample output for this command.

Example 7-5 Verifying the Amplifier Operations Status Using TL1

```
> RTRV-DWDM::ALL:123;

EDFA3 2003-11-01 10:20:28
M 123 COMPLD

"1:CTRLMODE=CGAIN,LINE1TXPWR=-60.0dBm,LINE1TXPWRSP=10.0dBm,LINE1RXPWR=-5.1dBm,LINE2RXPWR=-
39.1dBm,LINE2TXPWR=-60.0dBm,PWROFFSET=0.0dB,GAIN=0.0dB,GAINSP=21.0dB,TILT=15.0dB,TILTSP=0.
0dB,TILTOFFSET=0.0dB,DCULOSS=14.8dB,OSRI=ON,LASSTATUS=OFF,VOA=0.0dB"
;
>
```

The input power should be consistent with the input power measured during the optical connection procedure. The output power value should be equal to the input power plus the gain value.

7.7 Use TL1 to Set the Amplifier Gain Level

To ensure that the ONS 15216 EDFA3 output signal is received by the transceiver in the network element, it is important that the amplifier gain is set correctly.

The desired output power per channel is dependent on the number of channels traversed in the amplifier. The user sets the gain of the amplifier depending on the input power level, the network application, and the required receiver specifications necessary for error-free operation.

To set the amplifier gain, use the ED-DWDM command (see “[8.4.11 ED-DWDM](#)” section on page 8-15), according to the following syntax:

```
ED-DWDM: [<tid>] :<aid>:<ctag>:::[GAINSP=<gain>];
```

Specify the GAINSP parameter, and a value that is appropriate for the level of optical power gain desired. [Example 7-6](#) shows an example of using the ED-DWDM command to set the gain.

Example 7-6 Setting the Gain Using TL1

```
> ED-DWDM::1:123:::GAINSP=20;
```

**Note**

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

If the amplifier is in COPWR mode, when issuing the ED-DWDM command it is necessary to set the CTRLMODE value to CGAIN. If the amplifier is already in CGAIN mode, then no modifications to the CTRLMODE parameter are necessary.

7.8 Use TL1 to Set the Optical Input Power Threshold

The ONS 15216 EDFA3 has a default value of 10 dBm for the input fail low threshold. This high default value is set to prevent the EDFA3 from turning on accidentally during the installation phase.

Use the following steps to set the optical input power threshold on the ONS 15216 EDFA3:

-
- Step 1** Determine the current optical input power threshold by issuing the RTRV-TH-DWDM TL1 command.
 - Step 2** The optical input power threshold is the parameter named LINE1RXPWRTHFL in the response to the RTRV-TH-DWDM command.
 - Step 3** Issue the SET-TH-DWDM TL1 command to change the optical input power threshold for the first stage amplifier:
 - Step 4** Specify the LINE1RXPWRTHFL parameter, and a value for that parameter that is appropriate for the location in which the EDFA3 is installed.
 - Step 5** Once again issue the SET-TH-DWDM TL1 command in order to change the optical input power threshold for the second stage amplifier.
 - Step 6** Specify the LINE2RXPWRTHFL parameter and a value for that parameter that is appropriate for the location in which the EDFA3 is installed.
-

7.9 Optical Amplification Test and Verification Procedure

**Note**

This procedure cannot be performed until the EDFA3 is configured so that it is operational. The necessary configuration includes providing an optical input signal, connecting the DC TX to the DC RX port through an optical attenuator or a dispersion compensation unit, and setting the optical power thresholds through the user interface.

When the EDFA3 is operational, an optical spectrum analyzer (OSA) can be connected to the MONITOR OUT port on the front of the EDFA3. Because the MONITOR OUT port represents a one percent tap off the second amplifier stage, any wavelengths displayed on the OSA are being amplified.

-
- Step 1** Verify that the gain flatness is within range for the amplification range (standard or extended) in which the amplifier is being used.
 - Step 2** Verify that the gain tilt is within range for the amplification range (standard or extended) in which the amplifier is being used.

Table 7-1 Optical Amplifier Test Gain Range

Gain (dB)	Total Input Power (dBm)		Total Output Power (dBm)		
	Min	Max	Min	Max	Typ
22	-27	-5	-23	-19	-20

**Note**

Unless overridden by the user, the gain per channel is by default set to 22 dB by the ONS 15216 EDFA3. Gain is fixed at 22 dB as long as total input power is less than or equal to -5 dBm. If your input power is higher than -5 dBm, reset the gain to a lower level.

7.10 Set the IP Address

Before connecting the ONS 15216 EDFA3 to a LAN, it is mandatory to set the ONS 15216 EDFA3 IP address through a local serial communication interface using the EIA/TIA-232 (RS-232) port on the front of the module. Setting the IP address consists of:

- Logging in as a TL1 user.
- Entering an ED-NE-GEN command with the IP address, subnet mask, and gateway address (see [Example 7-7](#)).
- The ONS 15216 EDFA3 reboots to make the IP address active.

**Note**

If you do not know the IP address, subnet mask or gateway address for the ONS 15216 EDFA3, contact your network administrator.

Example 7-7 Setting IP Address, Subnet Mask, and Gateway Address

```
> ED-NE-GEN:::123:::IPADDR=129.9.0.6, IPMASK=255.255.255.0, DEFRT=0.0.0.0;
```

7.11 Use the LAN Interface (Ethernet) to Open a Telnet Session

You can connect to the ONS 15216 EDFA3 to an Ethernet LAN for remote access.

**Note**

Before communicating with and managing the ONS 15216 EDFA3 through the Ethernet port, the user must first enter an IP address. Your system administrator can provide you with an unused IP address. To set an IP address, see the [“7.10 Set the IP Address”](#) section on page 7-7. The IP address factory default is 0.0.0.0.

Telnet is an application that allows remote management using IP over the Ethernet LAN. TL1 commands can be issued through a Telnet session. Use the following procedure to configure the ONS 15216 EDFA3 module to accept SNMP and TL1 commands through its RJ-45 LAN port:

Step 1 Connect the ONS 15216 EDFA3 to the network using the LAN port.

Use a Category 5 Ethernet cable with RJ-45 connectors to connect to a LAN or a PC. EDFA3 accepts both cross-over and straight-through Ethernet cables by auto-detection.

Step 2 At a terminal or workstation, open the Telnet application.



Note To send TL1 commands over IP, a Telnet client is required. For SNMP management over IP, a third-party SNMP manager is required.

Step 3 The EDFA3 can then be managed over Telnet by the user typing the following:

```
telnet IP-address
```

For example:

```
telnet 12.34.56.78 3083
```

Replace the IP address used in the example with the IP address entered in the previously issued ED-NE-GEN command. Port 3083 must be specified for Telnet character echo of the TL1 commands that are typed.

7.12 Use TL1 to Connect to the ONS 15216 EDFA3

The ONS 15216 EDFA3 system supports twenty total user accounts with up to ten simultaneous Telnet connections over the Ethernet LAN port. Ethernet TL1 sessions are available from TCP/IP port 3082 for raw use with TL1 commands (in accordance with NSIF-033-1999) and/or 3083 for TL1 over Telnet (in accordance with NSIF-033-1999). One FTP connection is allowed. When connected, the ACT-USER command activates a session.

If the number of connections exceeds the limit, the Telnet session is closed.



Note

Every user with a defined user name and password can open only one connection at a time. There should never be any open ports other than those required for TL1, SNMP, the Debug interface and FTP.



Note

The TL1 session on port 3082 has no character echo. This means that you will not be able to see the commands as you enter them.

7.13 Use TL1 to Add Users

Administrator level users can use the ENT-USER-SECU command to add new users to the ONS 15216 EDFA3 according to the following syntax:

```
ENT-USER-SECU: [<tid>]:<uid>:<ctag>::<pid>, , <al>[:];
```


The uid is the user name, pid is the password, and al is the access level (R, RW, RWA). Passwords must be an ASCII string of 6 to 10 characters, where at least 2 are nonalphanumeric characters with at least one special character. Special characters are +, #, and % (defined in Telcordia GR-831-CORE). See [Example 7-8](#).

Example 7-8 Adding a New User Using TL1

```
> ENT-USER-SECU::jsmith:140::jspaswds#1,,RW;
```

7.14 Use TL1 to Modify User Information

Administrator level users can use the ED-USER-SECU command to modify user information for the ONS 15216 EDFA3 according to the following syntax:

```
ED-USER-SECU: [<tid>]:<uid>:<ctag>::<newuid>,<pid>,,<al>[:];
```

The uid is the user name, pid is the password, and al is the access level (R, RW, RWA). Passwords must be an ASCII string of up to 10 characters, where at least 2 are nonalphanumeric characters with at least one special character. Special characters are +, #, and % (defined in Telcordia GR-831-CORE). See [Example 7-9](#).

Example 7-9 Modifying a User Using TL1

```
> ED-USER-SECU::jsmith:140::,anypaswd#2,,RWA;
```

7.15 Use TL1 to Set the Password for the Amplifier

To restrict access to the ONS 15216 EDFA3, use the ED-PID command (see the [“8.4.14 ED-PID” section on page 8-18](#)) to change the default user password according to the following syntax:

```
ED-PID: [<tid>]:<uid>:<ctag>::<oldpid>,<newpid>;
```

Note that the password must be a string of up to 10 characters, where at least 2 are nonalphanumeric characters and at least 1 is a special character. See [Example 7-10](#).

Example 7-10 Changing Current User's Password Using TL1

```
> ED-PID::CISCO15:130::OLDPW2#,NEWPW3#;
```



Note

The default user name for the administrator level is CISCO15 with no default password.

7.16 Set the Community Name and Trap Destination

Use the TL1 ENT-TRAPTABLE (Enter TRAPTABLE) command to add an entry in the SNMP Trap Destination Table. Each IP address entry represents a new community string. The user defines the following fields:

- Trap Receiver IP Address
- UDP Port Number

- Community String
- Version

The command is sent in the following format:

```
ENT-TRAPTABLE: [<TID>] :<aid>:<ctag>:: [TRAPCOM=<trapcom>], [TRAPPORT=<trapport>], [TRAPVER=<trapver>];
```

The <aid> consists of the IP address and is used by the command to identify a specific row in the SNMP Trap Destination Table (see [Table 8-9](#)). For this reason, each IP address must be unique inside the table.

The AID in the ENT-TRAPTABLE command is used not only for the trap receiver, but also for the SNMP manager. The user will not be able to browse the MIB unless the MIB browser workstation IP address is entered into the trap destination table.

Example 7-11 Using the ENT-TRAPTABLE Command to Set a Community String

```
ENT-TRAPTABLE::192.168.1.1:123::TRAPCOM=EDFA3_USER,TRAPPORT=162,TRAPVER=V1;

EDFA3 2003-11-01 10:08:15
M 123 COMPLD
/* ENT-TRAPTABLE */
;
>
```

The SNMP Trap destination Table can contain up to 10 rows.

7.17 Use TL1 to Log Off

At the end of a session, the user must log off of the ONS 15216 EDFA3. To log off, use the CANC-USER command (see the [“8.4.4 CANC-USER” section on page 8-8](#)) according to the following syntax:

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

See [Example 7-12](#) for an example of using this command.

Example 7-12 Logging Off Using TL1

```
> CANC-USER::CISCO15:123;
```

7.18 Automatic Log Off (Timeout)

The default timeout settings are:

- 15 minutes for the RWA user
- 30 minutes for the RW user
- 60 minutes for the R user

Use the RTRV-DFLT-SECU TL1 command to retrieve the timeout values.

When a timeout occurs, the corresponding port must drop, so the next session initiation at that port requires the regular login procedure. The following message is visible.

```
>
[10.92.27.66: remote disconnect]
```

In the above example, 10.92.27.66 indicates the node IP address.

The CANC message is only used to indicate that a session has been terminated because of a timeout.

