CHAPTER 6

Technical Specifications

Note The terms "Unidirectional Path Switched Ring" and "UPSR" may appear in Cisco literature. These terms do not refer to using Cisco ONS 15xxx products in a unidirectional path switched ring configuration. Rather, these terms, as well as "Path Protected Mesh Network" and "PPMN," refer generally to Cisco's path protection feature, which may be used in any topological network configuration. Cisco does not recommend using its path protection feature in any particular topological network configuration.

This chapter describes technical specifications of the ONS 15454 equipment. For additional information, refer to the *Cisco ONS 15454 Reference Manual*.

The following topics are covered in this chapter:

Note In this chapter, the terms ONS 15454, shelf, and node are used interchangeably.

ONS 15454 Specifications

The Cisco ONS provides flexible SONET add/drop multiplexer features and offers service aggregation and high-bandwidth transport for voice and data traffic on a single platform. It is Network Equipment Building System (NEBS) Level 3 compliant for Type 2, Type 4, and Class A devices and meets the applicable criteria set forth in the following requirements documents:

- GR-63-CORE, Issue 1, October, 1995
- GR-1089-CORE, Issue 2, with Revision 1, February, 1999
- UL Standard 60950 Ed3, December 1, 2000
- UL Standard 94, October 29, 1996

- Requirement 1.1.4-20 of AT&T NEDS MLID #9069, December 30, 1999
- SBC TP76200MP, May, 2001

ONS 15454 Configurations

Table 6-1 lists how the ONS 15454 can be configured.

Table 6-1 ONS 15454 Node Configurations

ONS 15454 MSPP	ONS 15454 MSTP	ONS 15454 Hybrid
Terminal	Hub	1+1 Protected Flexible Terminal
Point-to-Point	Terminal	Terminal
Linear	OADM	Scalable Terminal
Two-fiber path protection	ROADM	OADM
Two- fiber BLSR	Anti-ASE	Line Amplifier
Four-fiber BLSR	Line Amplifier	Amplified TDM
Dual Ring Interconnect (DRI)	OSC Regeneration	
Path protected mesh network (PPMN)		
Add-drop multiplexer (ADM)		
Regenerator		
Hubbed Rings		
Multi-hubbed Rings		

Physical Specifications

The ONS 15454 shelf assemblies with a fan tray and reversible mounting ears has the following dimensions:

Table 6-2 ONS 15454 Shelf Dimensions

Physical Dimension	15454-SA-ANSI Shelf	15454-SA-HD Shelf
Height	18.5 inches (40.7 cm)	18.5 inches (40.7 cm)
Width:		
• Minimum	19 inches (41.8 cm)	19 inches (41.8 cm)
• Maximum	23 inches (50.6 cm)	23 inches (50.6 cm)
Depth[1] BNC and SMB EIAs:		
• Without cabling and rear cover	12 inches (26.4 cm)	12 inches (26.4 cm)
• With cabling and rear cover	14 inches (35.6 cm)	14 inches (35.6 cm)
Depth[1] UBIC-H EIAs:		
• Without cabling and rear cover	NA	12 inches (26.4 cm)
• With cabling and rear cover	NA	15.0 inches (33 cm)

Table 6-2 ONS 15454 Shelf Dimensions (continued)

Physical Dimension	15454-SA-ANSI Shelf	15454-SA-HD Shelf
Depth[1] UBIC-V EIAs:		
• Without cabling and rear cover	NA	12 inches (26.4 cm)
• With cabling and rear cover	NA	16.75 inches (36.85 cm)
Weight:		
• Empty (without cards)	55 lb (24.947 kg)	55 lb (24.947 kg)
• Full (with cards)	98 lb (44.451 kg)	98 lb (44.451 kg)
Footprint	13 ft^2	13 ft^2
Minimum Aisle Clearance Requirement	24-inches	24-inches

1. The optional deep door adds approximately 2 inches (4.4 cm) to depth dimensions.

Environmental Specifications

Note The Cisco ONS 15454 is intended for use with telecommunications equipment only.

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

Warning **This equipment must be installed and maintained by service personnel as defined by AS/NZS 3260. Incorrectly connecting this equipment to a general purpose outlet could be hazardous. The telecommunications lines must be disconnected 1) before unplugging the main power connector and/or 2) while the front door is open.**

Warning **The ONS 15454 is intended for installation in restricted access areas. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock, key, or other means of security. A restricted access area is controlled by the authority responsible for the location.**

Warning **The ONS 15454 is suitable for mounting on concrete or other non-combustible surfaces only.**

Caution Unused card slots should be filled with a blank faceplate (Cisco P/N 15454-BLANK). The blank faceplate ensures proper airflow when operating the ONS 15454 without the front door attached, although Cisco recommends that the front door remain attached.

Note The ONS 15454 is designed to comply with Telcordia GR-1089-CORE Type 2 and Type 4. Install and operate the ONS 15454 only in environments that do not expose wiring or cabling to the outside plant. Acceptable applications include Central Office Environments (COEs), Electronic Equipment Enclosures (EEEs), Controlled Environment Vaults (CEVs), huts, and Customer Premises Environments (CPEs).

Note The ONS 15454 is not designed as a Type 3 EU and has not undergone NEBS tests and evaluation for equipment directly connected to outside plant (OSP) facilities.

Note The fan tray assembly is required for all ONS 15454 installations.

Warning **To prevent the equipment from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 131°F (55°C) unless configured for industrial temperature (I-temp). All I-temp rated components are -40°F to +149°F (-40°C to +65°C). To prevent airflow restriction, allow at least 1 inch (25.4 mm) of clearance around the ventilation openings.**

The ONS 15454 is environmentally hardened and will function at operating temperatures of -40°F to +149°F (-40°C to +65°C) and humidity of 5 to 95 percent (non-condensing) when configured with the following components:

- 15454-SA-HD Shelf
- 15454-SA-ANSI Shelf
- 15454-FTA2 Fan Tray
- 15454-FTA3-T Fan Tray
- 15454-TCC2
- 15454-TCC2P
- 15454-XC-T
- 15454-AIC-T
- 15454-AIC-I
- 15454-AEP
- 15454-DS3_EC1-48[1]
- 15454-DSXM-12

For all other configurations, the ONS 15454 functions at operating temperatures of 32 to 131 degrees Fahrenheit (0 to +55 degrees Celsius).

Note The I-Temp symbol is displayed on the faceplate of an I-Temp compliant card. A card without this symbol is C-Temp compliant.

When installed in an ONS 15454, all plug-in cards meet the following safety requirements:

- UL 1950

1. Not deployable as I-Temp because the exising XC-10G cross-connect card is not rated as I-Temp.

- CSA C22.2 No. 950
- EN 60950
- IEC 60950

Power Specifications

- Recommended Input Voltage: -48VDC
  - Two -48VDC power feeds (Breaker A and Breaker B)
- Acceptable Input Voltage Range: -40 to -56.7VDC
- Maximum Power Consumption: 1060W (System Release 3.1 or higher); 952W (System Release prior to 3.1)
- Recommended Amperage: 35A with SA-HD; 30A (System Release 3.1 or higher); 20A (System Release prior to 3.1)
- Power Terminals: #6 Lug

Bandwidth Capacity

- Total Capacity: 240 Gb/s
- Data Plane Bandwidth: 160 Gb/s
- SONET plane bandwidth: 80 Gb/s

Database Storage

- Nonvolatile Memory (Flash): 256 MB (with TCC2/TCC2P)
- Volatile memory (synchronous dynamic RAM): 256 MB (with TCC2/TCC2P)
- When dual TCC2/TCC2P cards are installed in the ONS 15454, each TCC2/TCC2P card hosts a separate database; therefore, the protect card database is available if the database on the working TCC2/TCC2P fails. You can also store a backup version of the database on the workstation running CTC. This operation should be part of a regular ONS 15454 maintenance program at approximately weekly intervals, and should also be completed when preparing an ONS 15454 for a pending natural disaster, such as a flood or fire.

Note The following parameters are not backed up and restored: node name, IP address, mask and gateway, and Internet Inter-ORB Protocol (IIOP) port. If you change the node name and then restore a backed up database with a different node name, the circuits map to the new node name. Cisco recommends keeping a record of the old and new node names.

Synchronization

- Stratum 3, per Telcordia GR-253-CORE
- Free-running Access: Accuracy +/– 4.6 ppm

- Holdover Stability: 3.7 * 10-7 per day including temperature (< 255 slips in first 24 hours)
- Modes: External, Line, Mixed
- References: BITS 1, BITS 2, Line, Internal
- SSM Message Set: Generation 1 or Generation 2

BITS Interface

- Two DS-1 or 64KHz+8KHz (TCC2P with R5.0 and higher only) BITS inputs
- Two derived DS-1 or 6MHz (TCC2P with R5.0 and higher only) outputs
- BITS 1 and BITS 2 pins provided on backplane
- BITS Coding: AMI or B8ZS
- BITS Framing: SF (D4) or ESF

Operations Interface

- Local Craft Access: An EIA/TIA-232 ASCII interface (9600 baud) or 10BaseT LAN interface on the TCC2/TCC2P faceplate.
- External Network/LAN Access: A 10BaseT LAN interface via the backplane. Set the LAN 10/100 Ethernet port for half-duplex.
- Modem Access: An EIA/TIA-232 DB-9 type connector on the TCC2/TCC2P faceplate. See Table 6-3, Computer Requirements, for modem settings.
- TL1 Access: An EIA/TIA-232 ASCII interface (9600 baud) on the TCC2/TCC2P faceplate or 10BaseT LAN interface on both the TCC2/TCC2P faceplate and backplane.
- Cisco Transport Controller (CTC) Access: A 10BaseT LAN interface on the TCC2/TCC2P faceplate and backplane.

Computer Requirements

Table 6-3 lists the requirements for PCs and UNIX workstations. In addition to the Java Runtime Environment (JRE), the Java plug-in and modified java.policy file are also included on the ONS 15454 software CD and the ONS 15454 documentation CD.

Table 6-3 Computer Requirements

Area	Requirements	Notes
Processor	Pentium III (or higher) 700 MHz, UltraSPARC, or equivalent	700 MHz is the recommended processor speed. You can use computers with a lower processor speed; however, you may experience longer response times and slower performance.
RAM	384 MB RAM recommended, 512 MB RAM optimum	Cisco recommends using 512 MB RAM for networks with 25 nodes or more to avoid longer response times and slower performance.

Table 6-3 Computer Requirements (continued)

Area	Requirements	Notes
Hard Drive	20 GB recommended with 50 MB vacant space available	—
Operating System	• PC: Windows 98, Windows NT 4.0 with Service Pack 6, Windows 2000, or Windows XP • Workstation: Solaris versions 8 or 9	—
JRE	JRE 1.4.2 or 1.3.1_02	JRE 1.4.2 is installed by the CTC Installation Wizard included on the Cisco ONS 15454 software and documentation CDs. JRE 1.4.2 provides enhancements to CTC performance, especially for large networks with numerous circuits. Cisco recommends that you use JRE 1.4.2 for networks with Software R4.6 nodes. If CTC must be launched directly from nodes running software earlier than R4.6, Cisco recommends JRE 1.3.1_02.
Web Browser	• PC: Netscape 4.76, Netscape 7.x, Internet Explorer 6.x • UNIX Workstation: Netscape 4.76, Netscape 7.x	For the PC, use JRE 1.4.2 or 1.3.1_02 with any supported web browser. For UNIX, use JRE 1.4.2 with Netscape 7.x or JRE 1.3.1_02 with Netscape 4.76. Netscape 4.76 or 7.x is available at the following site: http://browser.netscape.com Internet Explorer 6.x is available at the following site: http://www.microsoft.com
java.policy File	A java.policy file modified for CTC	The java.policy file is modified by the CTC Installation Wizard included on the Cisco ONS 15454 software and documentation CDs.

Table 6-3 Computer Requirements (continued)

Area	Requirements	Notes
Cable	User-supplied CAT-5 straight-through cable with RJ-45 connectors on each end to connect the computer to the ONS 15454 directly or through a LAN port on the TCC2/TCC2P faceplate	—
Modem	A compatible modem must meet the following minimum requirements: • 300, 1200, 2400, 4800, or 9600 baud • Full duplex • 8 data bits • No parity bits • 1 start bit • 1 stop bit • No flow control	—

Shelf Assemblies

The ONS 15454 shelf assembly is the physical steel enclosure that holds plug-in cards, EIAs, and connectors for power, grounding, and alarm contacts. Table 6-4 lists the shelf assemblies deployed to date, with the newest assembly available listed at the top of the table.

Table 6-4 Shelf Assembly Versions

Product Name	Part Number	Description
15454-SA-HD	800-23890-xx 800-24848-xx	Cisco ONS 15454 High Density Shelf Assembly, NEBS 3 ANSI, High Density Electrical Capacity, Industrial Temperature Rated
15454-SA-ANSI	800-19857-xx	Cisco ONS 15454 NEBS 3 ANSI 10Gb/s Shelf Assembly, NEBS 3 ANSI, Enhanced Fiber Management, Increased Power Rating (-48VDC, 30A)
15454-SA-NEBS3E	800-07149-xx	Cisco ONS 15454 NEBS 3 Compliant Shelf Assembly, Enhanced Fiber Management, Power Rating (-48VDC, 25A)

Table 6-4 Shelf Assembly Versions (continued)

Product Name	Part Number	Description
15454-SA-NEBS3	800-06741-xx	Cisco ONS 15454 NEBS 3 Compliant Shelf Assembly, Power Rating (-48VDC, 25A)
454-SA-NEBS3 (Cerent)	89-01-00018	Cerent 454 Shelf Assembly, NEBS 3 Compliant
454-SA-R1 (Cerent)	89-01-00013 89-01-00001	Cerent 454 Shelf Assembly

Shelf Assembly Overview

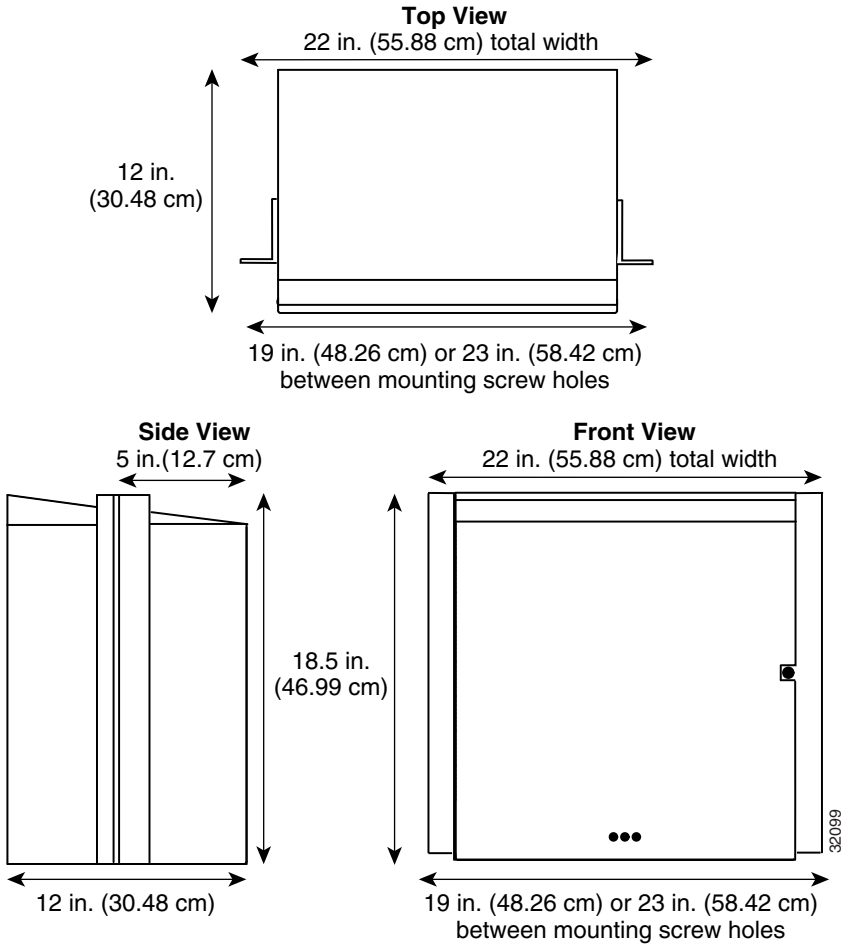
When installed in an equipment rack, the ONS 15454 assembly is typically connected to a fuse and alarm panel to provide centralized alarm connection points and distributed power for the ONS 15454. Fuse and alarm panels are third-party equipment and are not described in this documentation. The front door of the ONS 15454 allows access to the shelf assembly, fan-tray assembly, and cable-management area. The backplane provide access to alarm contacts, external interface contacts, power terminals, and BNC, SMB, and UBIC connectors.

You can mount the ONS 15454 in a 19- or 23-inch rack (482.6 or 584.2 mm). The shelf assembly ships preset for installation in a 23-inch (584.2 mm) rack, but you can reverse the mounting bracket to fit the smaller 19-inch (482.6 mm) rack. The shelf assembly weighs approximately 55 pounds (24.94 kg) with no cards installed. The shelf assembly includes a front door for added security, a fan tray module for cooling, and extensive cable-management space. An optional deep door kit (P/N 15454-SA-DRKIT) can be ordered to accommodate fiber jumpers requiring extended bending radius. The ONS 15454 must have one inch (25.4 mm) of airspace below the installed shelf assembly to allow air flow to the fan intake. If a second ONS 15454 is installed underneath the shelf assembly, the air ramp on top of the lower shelf assembly provides the air spacing needed and should not be modified in any way.

ONS 15454 optical cards have SC and LC connectors on the card faceplate. Fiber optic cables are routed into the front of the destination cards. Electrical cards (DS-1, DS-3, DS3XM, and EC-1) require electrical interface assemblies (EIAs) to provide the cable connection points for the shelf assembly. In most cases, EIAs are ordered with the ONS 15454 and come preinstalled on the backplane. See the Electrical Interface Assemblies section in this chapter for more information about the EIAs.

The ONS 15454 is powered using two -48 VDC power feeds (Breaker A and Breaker B) with a minimum of 30 Amp circuit breakers. Maximum power consumption is 1,060 Watts. Negative, return, and ground power terminals are accessible on the backplane. Figure 6-1 shows the dimensions of the ONS 15454 shelf assembly.

Figure 6-1 Shelf Assembly Dimensions



System Release 3.1 introduced the 15454-SA-ANSI shelf assembly. This shelf has enhanced fiber management capabilities and is designed to support the 10Gb/s hardware, which includes the XC-10G cross-connect, OC48 any slot, and OC192 cards.

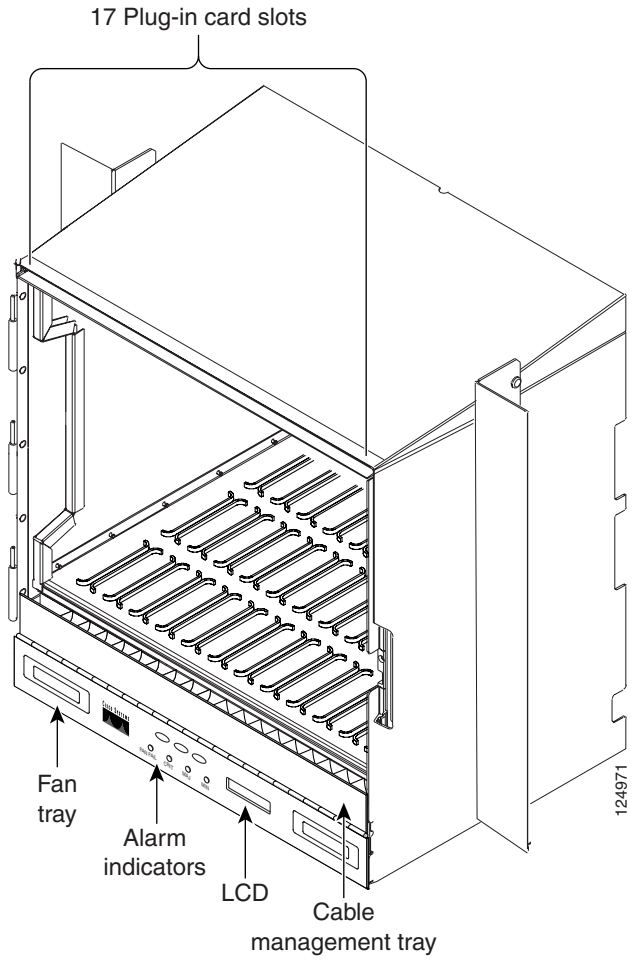
Release 4.6 introduced the new high density 15454-SA-HD shelf assembly and updated universal backplane interface connector (UBIC) EIAs. This new high-density shelf assembly and UBICs with an increased number of connectors enables a single shelf to support up to 224 DS1s, 192 DS3/EC-1s, and 1:N protection where N is less than or equal to five, leveraging higher-density electrical cards, as well as free-up valuable shelf slots to be used for other service interfaces. Except for these changes and new symbols identifying the high density card slots, this new shelf is identical to the 15454-SA-ANSI shelf assembly. The high density shelf is software independent and backwards compatible with early releases.

Slot Assignments

As shown in Figure 6-2, the ONS 15454 shelf assembly has 17 card slots numbered sequentially from left to right. Slots 1 to 4 and 14 to 17 are multispeed slots. They can host any ONS 15454 plug-in card, except the OC48 IR 1310, OC48 LR 1550, OC48 ELR 1550, and OC192 LR 1550 cards. Slots 5, 6, 12, and 13 are high-speed slots. They can host all ONS 15454 cards, except the OC12/STM4-4 and OC3-8 cards. You can install the OC48 IR/STM16 SH AS 1310 and the OC48 LR/STM16 LH AS 1550 cards in any multispeed or high-speed card slot.

Slots 7 and 11 are dedicated to TCC2/TCC2P cards. Slots 8 and 10 are dedicated to cross-connect (XC, XCVT, XC10G) cards. Slot 9 is reserved for the optional Alarm Interface Controller (AIC or AIC-I) card. Slots 3 and 15 can also host DS1N-14 and DS3XM-12 cards that are used in 1:N protection.

Figure 6-2 ONS 15454 Shelf Assembly



Shelf assembly slots have symbols indicating the type of cards that you can install in them. Each ONS 15454 card has a corresponding symbol. The symbol on the card must match the symbol on the slot. Table 6-5 lists the slot and card symbol definitions.

Table 6-5 Slot and Card Symbol Definitions

Symbol Color/Shape	Definition
Orange/Circle	Multi-speed slots 1 to 6 and 12 to 17. Only install ONS 15454 cards with a circle symbol on the faceplate in these slots.
Blue/Triangle	High-speed slots 5, 6, 12, and 13. Only install ONS 15454 cards with circle or a triangle symbol on the faceplate in these slots.
Purple/Square	TCC2/TCC2P slots 7 and 11. Only install ONS 15454 cards with a square symbol on the faceplate in these slots.

Table 6-5 Slot and Card Symbol Definitions (continued)

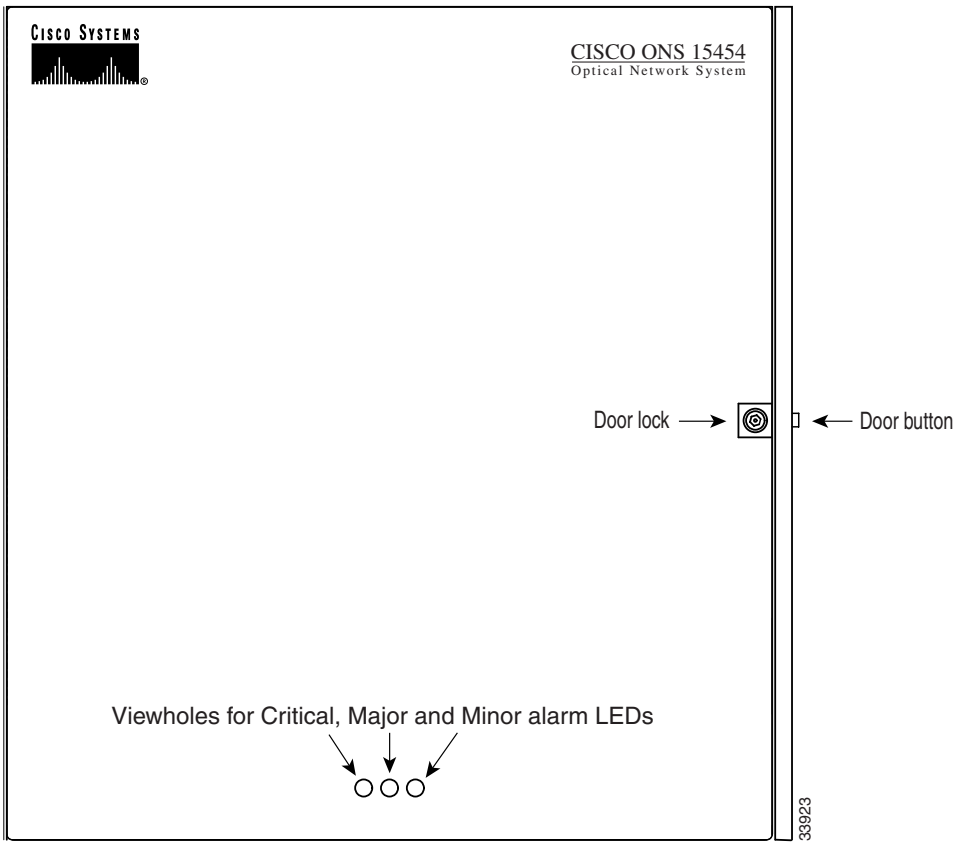
Symbol Color/Shape	Definition
Green/Cross	Cross-connect (XC/XCVT/XC10G) slots 8 and 10. Only install ONS 15454 cards with a cross symbol on the faceplate in these slots.
Red/P	Protection slots 5 and 15 for 1:N protection schemes. In these slots, install only ONS 15454 cards with a red P on the faceplate.
Red/Diamond	AIC slot 9. In this slot, install only ONS 15454 cards with a diamond symbol on the faceplate.
Gold/Star	Multi-speed slots 1 to 4 and 14 to 17. In these slots, install only ONS 15454 cards with a star symbol on the faceplate.
Blue/Hexagon	(Only used with the 15454-SA-HD shelf assembly) High density card slots 1 to 3 and 15 to 17. In these slots, install only high density ONS 15454 cards with a blue hexagon symbol on the faceplate.

Filler slot cards are available for any unpopulated card slot numbered 1 to 17, a blank filler slot card, model 15454-BLANK, must be installed to maintain proper airflow and compliance with NEBS EMI and ESD requirements.

Shelf Assembly Front Doors

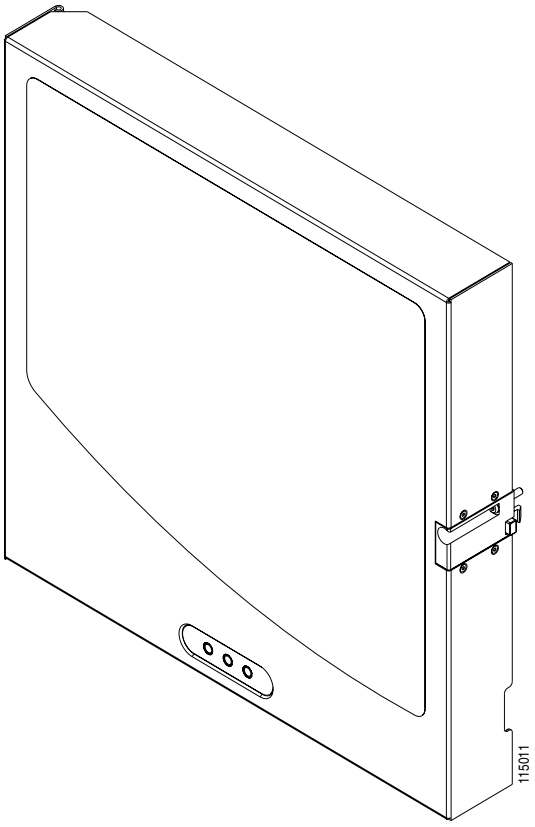
The ONS 15454 shelf assembly features a standard locked door to the front compartment. A pinned hex key that unlocks the front door ships with the ONS 15454. A button on the right side of the shelf assembly releases the door. The front door shown in Figure 6-3 provides access to the shelf assembly, cable-management tray, fan-tray assembly, and LCD screen.

Figure 6-3 Shelf Assembly Front Door



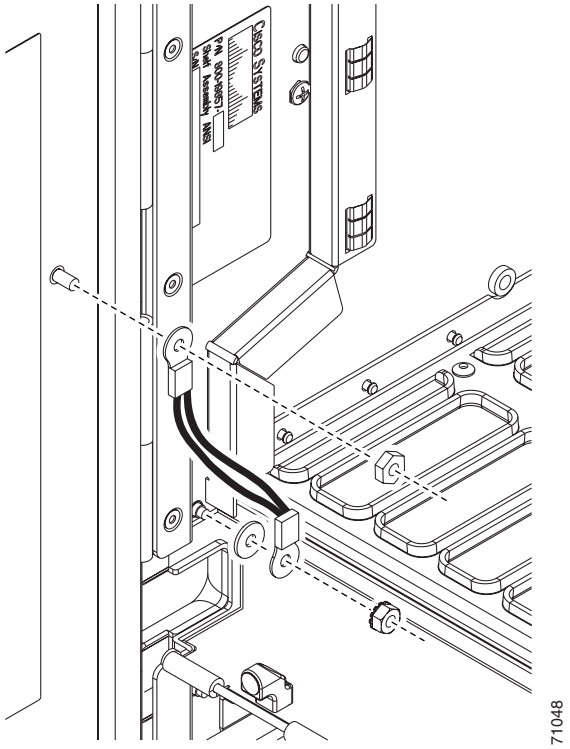
The ONS 15454 ships with a standard door, but an optional deep door kit (P/N 15454-SA-DRKIT) can be ordered to accommodate fiber jumpers requiring an extended bending radius (see Figure 6-4).

Figure 6-4 Cisco ONS 15454 Deep Door



A button on the right side of the shelf assembly releases the door. You can remove the front door of the shelf assembly to provide unrestricted access to the front of the card slots. Before you remove the front door, you have to remove the ground strap of the front door as shown in Figure 6-5.

Figure 6-5 Front Door Ground Strap



An erasable label shown in Figure 6-6 is pasted on the inside of the front door. You can use the label to record slot assignments, port assignments, card types, node ID, rack ID, and serial number for the ONS 15454. The label also includes the Class I and Class 1M laser warning shown in Figure 6-7.

Figure 6-6 Erasable Label Inside Front Door

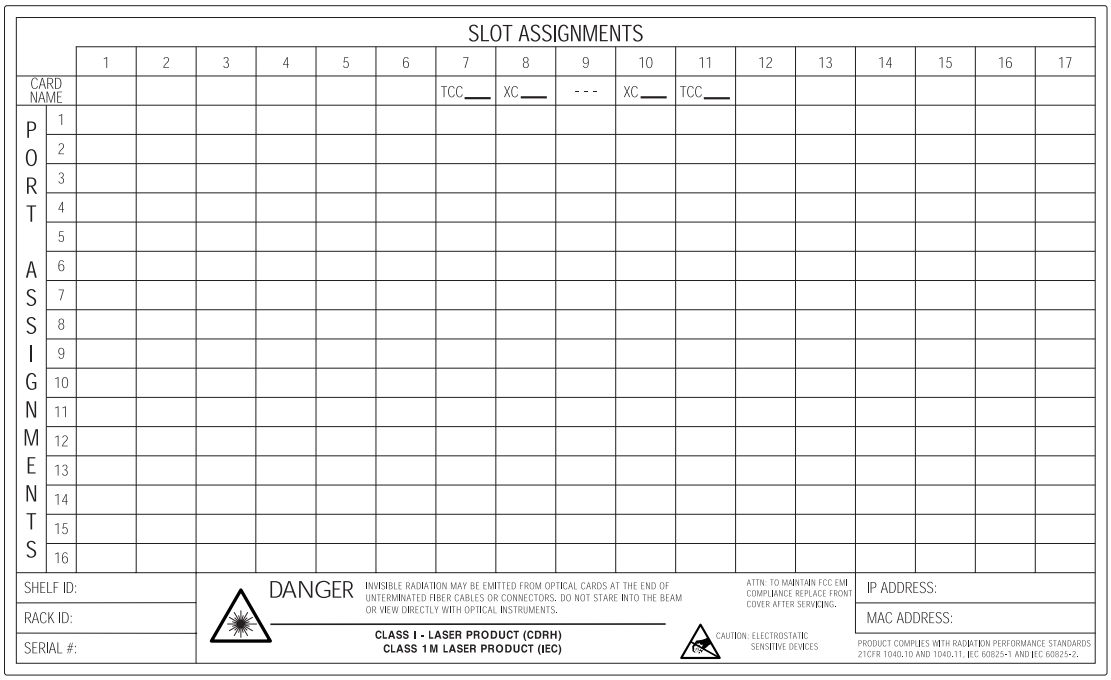
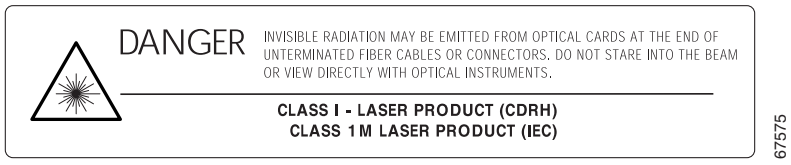


Figure 6-7 Laser Warning on the Front Door Label



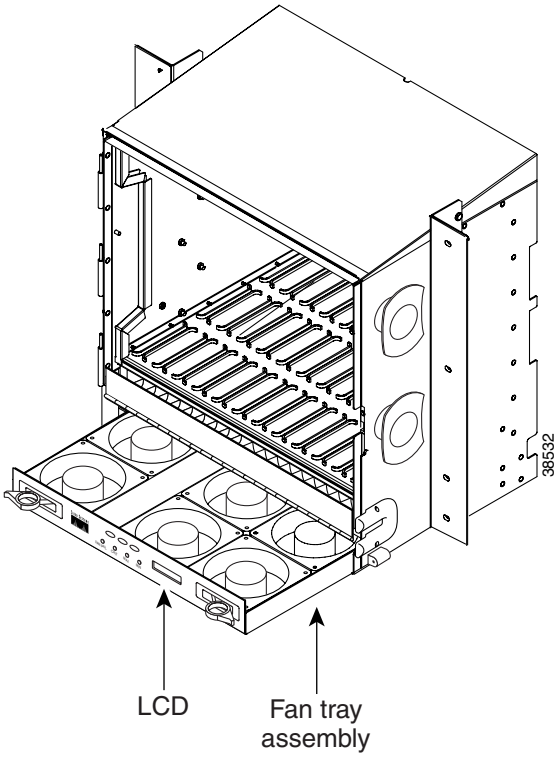
Fan Tray Assembly

The fan tray assembly is located at the bottom of the ONS 15454 shelf assembly (see Figure 6-8). The fan tray is a removable drawer that holds fans and fan-control circuitry for the ONS 15454. The front door can be left in place when removing or installing the fan tray but removal is recommended. After you install the fan tray, you should only need to access it if a fan failure occurs or you need to replace or clean the fan-tray air filter.

There are presently two series of fan tray assemblies available for the ONS 15454:

1. FTA3-T high airflow assembly
2. FTA2 standard airflow assembly

Figure 6-8 Fan Tray Assembly



The fan tray slides into the ONS 15454, under the main card-cage (see Figure 6-8). Fan power, control, and status signals are provided by a rear connector that engages when the tray is inserted. The fans provide large volume airflow exceeding 100 linear feet per minute (LFM) across each of the plug-in cards. In addition to containing six variable-speed fans, the fan tray assembly provides a front-panel Liquid-Crystal Display, Status and Alarm LED's, and push-buttons, allowing for the quick monitoring of system status. A replaceable filter element slides in under the fan tray. The filter will function properly no matter which side faces up. This filter can be installed and removed by hand. Inspect the air filter every 30 days, and clean the filter every three to six months. Replace the air filter every two to three years and keep spare filters in stock. Avoid cleaning the air filter with harsh cleaning agents or solvents.

Caution Do not operate an ONS 15454 without the mandatory fan-tray air filter.

Fan speed is controlled by TCC2/TCC2P card temperature sensors. The sensors measure the input air temperature at the fan-tray assembly. Fan speed options are low, medium, and high. If the TCC2/TCC2P card fails, the fans automatically shift to high speed. The temperature measured by the TCC2/TCC2P sensors is displayed on the LCD screen. Table 6-6 lists power requirements for the fan-tray assembly.

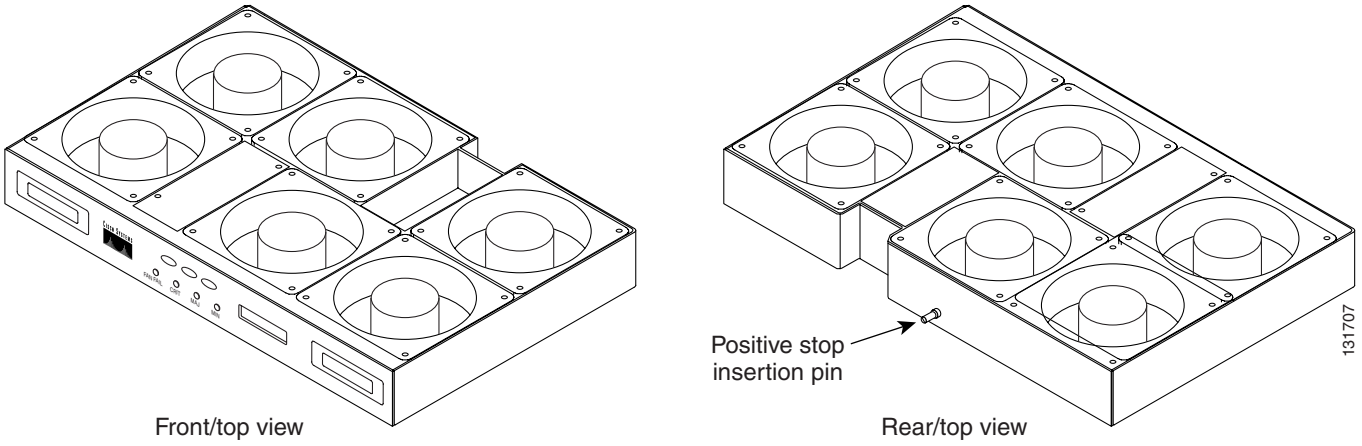
If one or more fans fail on the fan-tray assembly, replace the entire assembly. You cannot replace individual fans. The red Fan Fail LED on the front of the fan tray illuminates when one or more fans fail. For fan tray replacement instructions, refer to the *Cisco ONS 15454 Troubleshooting Guide*. The red Fan Fail LED clears after you install a working fan tray.

Table 6-6 Fan-tray Power Requirements

Fan Tray Assembly	Watts	Amps	BTU/Hr
FTA2	53	1.21	198
FTA3 -T	86.4	1.8	295

The FTA3-T shown in Figure 6-9 offers the higher airflow capabilities required to support ONS 15454 systems equipped with XC-10G cross-connect cards and is rated for industrial temperature installations (-40 to +65 Celsius). The FTA3-T employs a positive stop insertion pin (see Figure 6-9) to prevent the installation of the fan tray assembly into shelf assembly versions prior to the ANSI offering.

Figure 6-9 FTA3-T High Airflow Assembly



The FTA2 fan tray assembly is required for ONS 15454 System Release <3.1 and can be used in systems deployed for industrial temperature (I-temp) operation (-40o to +65o Celsius).

The compatibility between fan tray assemblies and shelf assemblies is outlined in Table 6-7.

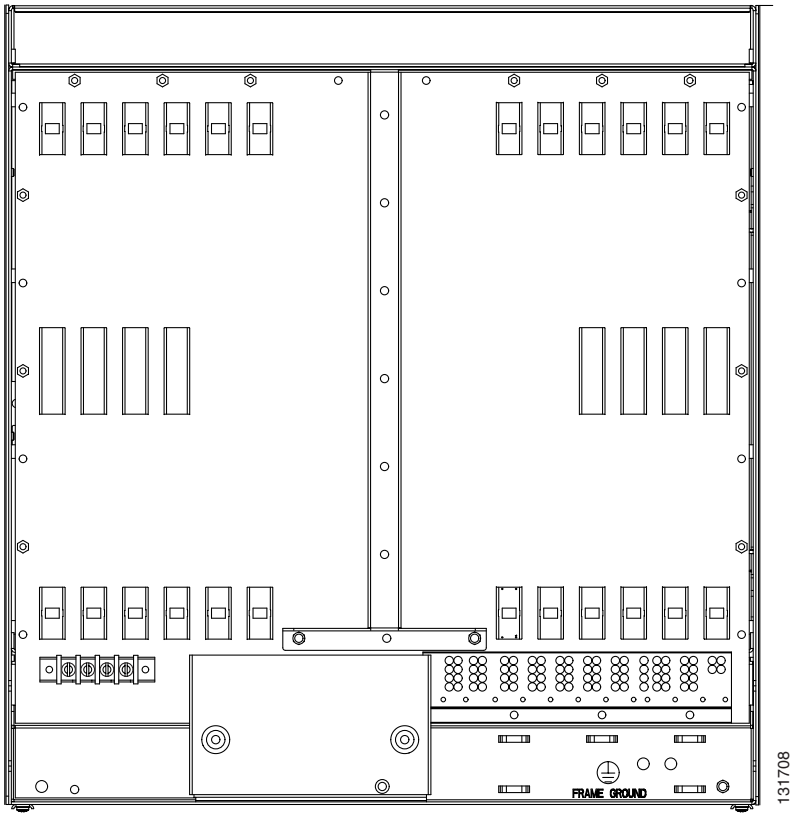
Table 6-7 Fan and Assembly Tray Compatibility Matrix

Fan Tray Assembly Product Name	Fan Tray Assembly Part Number	Shelf Assembly Product Name
15454-FTA3-T (Required for XC-10G equipped systems)	800-23907-xx 800-21448-xx 800-19858-xx (FTA-3)	15459-SA-HD 15454-SA-ANSI
15454-FTA2	800-07145-xx 800-07385-xx 800-19591-xx 800-19590-xx	15454-SA-ANSI 15454-SA-NEBS3E
15454-FTA	800-06782-xx	15454-SA-NEBS3 454-SA-NEBS3 454-SA-R1 (Cerent)
454-FTA	89-01-00004	454-SA-R1 (Cerent)

Backplane

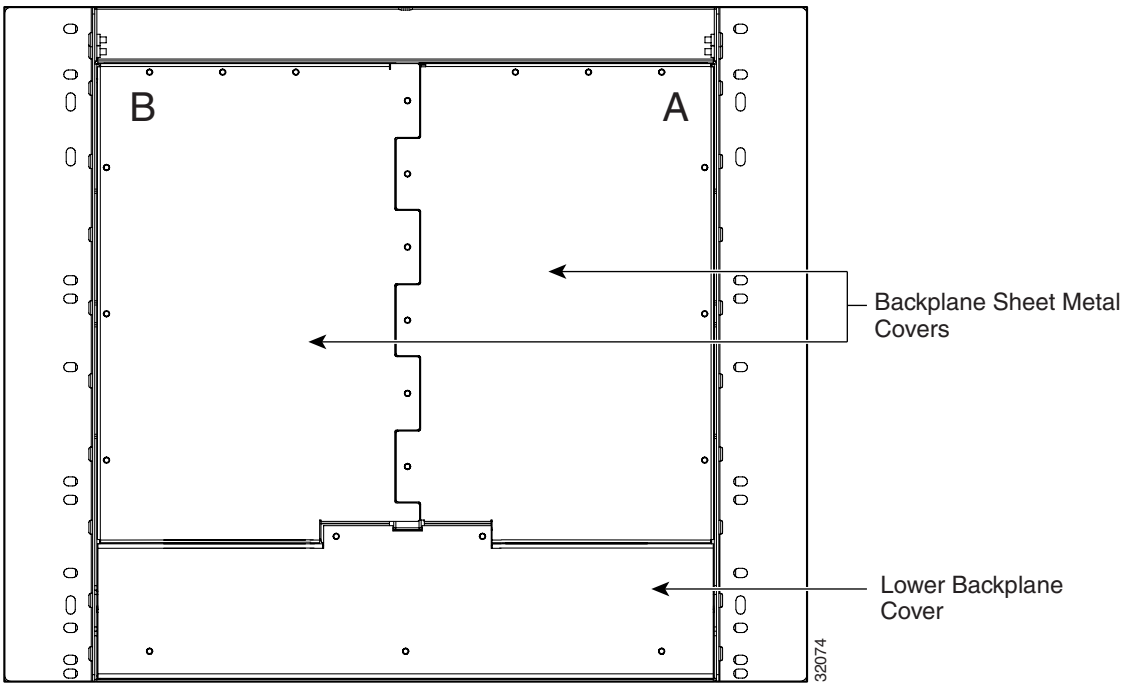
The backplane (Figure 6-10) provides access to alarm contacts, external interface contacts, power terminals, and Electrical Interface Assemblies (EIAs).

Figure 6-10 ONS 15454 Backplane



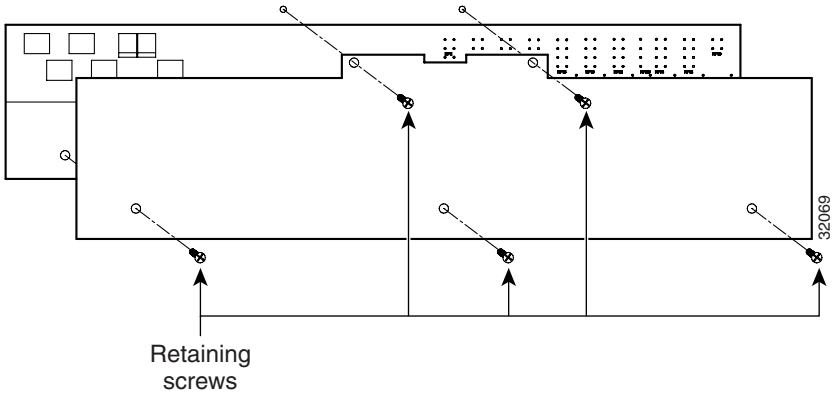
If a backplane does not have Electrical Interface Assembly (EIA) panels installed, it should have two sheet metal backplane covers (one on each side of the backplane) as illustrated in Figure 6-11. Each cover is held in place with nine 6-32 x 3/8 inch Phillips screws.

Figure 6-11 Sheet Metal Backplane Covers



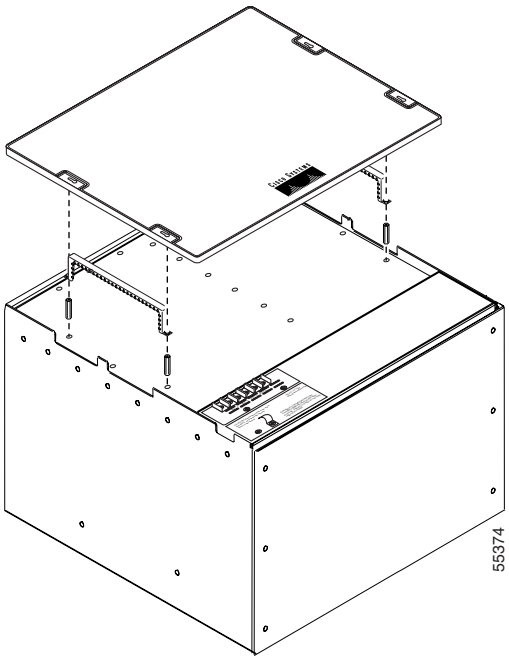
Prior to System R4.0, the lower section of the backplane was covered by a clear plastic protector. With System R4.0 and higher, this section of the backplane is covered by a metal protector to reduce electro-magnetic interference. Both protectors are held in place by five 6-32 x 1/2 inch screws. Remove the lower backplane cover to access the alarm interface panel (AIP), alarm pin fields, frame ground, and power terminals (Figure 6-12).

Figure 6-12 Removable Lower Backplane Cover



The ONS 15454 has an optional plastic Rear Cover Assembly (RCA) that provides additional protection for the cables and connectors on the backplane (see Figure 6-13).

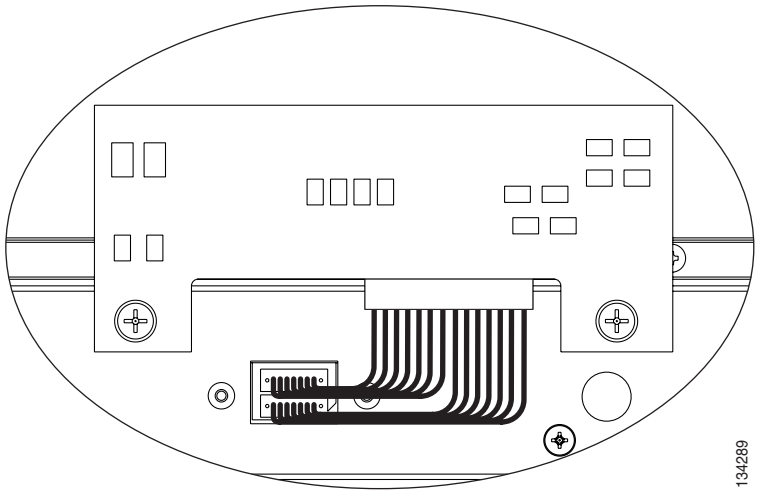
Figure 6-13 Plastic Rear Cover with Spacers



Alarm Interface Panel

The Alarm Interface Panel (AIP) is located next to the alarm contacts on the lower section of the backplane (see Figure 6-14). The AIP provides surge protection for the ONS 15454. It also provides an interface from the backplane to the fan tray assembly and LCD. The AIP plugs into the backplane using a 96-pin DIN connector and is held in place with two retaining screws. The panel has a non-volatile memory chip that stores the unique node address (MAC address).

Figure 6-14 Alarm Interface Panel



Alarm Interface Panel Replacement

Note Ensure that all nodes in the affected network are running the same software version before replacing the AIP and repairing circuits. If you need to upgrade nodes to the same software version, no hardware should be changed or circuit repair performed until after the software upgrade is complete.

If the AIP fails, a MAC Fail alarm displays on the CTC Alarms menu and/or the LCD display on the fan-tray assembly will go blank. To perform an in-service replacement of the AIP, you must contact Cisco Technical Assistance Center (TAC) at 877-323-7368.

You can replace the AIP on an in-service system without affecting traffic (except Ethernet traffic on nodes running a software release earlier than Release 4.0). The circuit repair feature allows you to repair circuits affected by MAC address changes on one node at a time. Circuit repair will work when all nodes are running the same software version. Each individual AIP upgrade requires an individual circuit repair; if AIPs are replaced on two nodes, the circuit repair must be performed twice.

Caution Do not use a 2-A AIP with a 5-A fan-tray assembly; doing so will cause a blown fuse on the AIP.

Note The 5-A AIP (73-7665-XX) is required when installing the new fan-tray assembly (15454-FTA3), which comes preinstalled on the shelf assembly (15454-SA-ANSI).

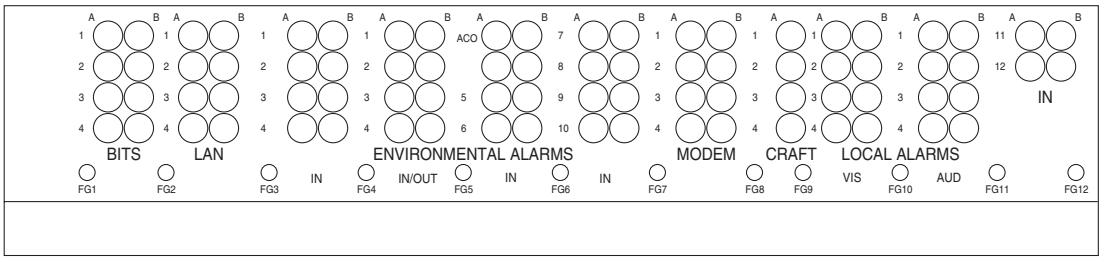
Note The MAC address identifies the nodes that support circuits. It allows CTC to determine circuit sources, destinations, and spans. The TCC2 or TCC2P cards in the ONS 15454 also use the MAC address to store the node's database.

Note A blown fuse on the AIP board can cause the LCD display to go blank.

Alarm Contacts

The ONS 15454 has a backplane pin field located at the bottom of the backplane (see Figure 6-15). The backplane pin field provides 0.045 square inch wire-wrap pins for enabling external alarms, timing input and output, and craft interface terminals.

Figure 6-15 ONS 15454 Backplane Pinouts (System Release 3.4 or Later)



Field	Pin	Function
BITS	A1	BITS Output 2 negative (–)
	B1	BITS Output 2 positive (+)
	A2	BITS Input 2 negative (–)
	B2	BITS Input 2 positive (+)
	A3	BITS Output 1 negative (–)
	B3	BITS Output 1 positive (+)
	A4	BITS Input 1 negative (–)
	B4	BITS Input 1 positive (+)
LAN	Connecting to a hub, or switch	
	A1	RJ-45 pin 6 RX–
	B1	RJ-45 pin 3 RX+
	A2	RJ-45 pin 2 TX–
	B2	RJ-45 pin 1 TX+
	Connecting to a PC/Workstation or router	
	A1	RJ-45 pin 2 RX–
	B1	RJ-45 pin 1 RX+
	A2	RJ-45 pin 6 TX–
	B2	RJ-45 pin 3 TX+
ENVIR ALARMS IN	A1	Alarm input pair number 1: Reports closure on connected wires.
	B1	
	A2	Alarm input pair number 2: Reports closure on connected wires.
	B2	
	A3	Alarm input pair number 3: Reports closure on connected wires.
	B3	
	A4	Alarm input pair number 4: Reports closure on connected wires.
	B4	
	A5	Alarm input pair number 5: Reports closure on connected wires.
	B5	
	A6	Alarm input pair number 6: Reports closure on connected wires.
	B6	
	A7	Alarm input pair number 7: Reports closure on connected wires.
	B7	
	A8	Alarm input pair number 8: Reports closure on connected wires.
	B8	
	A9	Alarm input pair number 9: Reports closure on connected wires.
	B9	
	A10	Alarm input pair number 10: Reports closure on connected wires.
	B10	
	A11	Alarm input pair number 11: Reports closure on connected wires.
	B11	
	A12	Alarm input pair number 12: Reports closure on connected wires.
	B12	

Field	Pin	Function
ENVIR ALARMS IN/OUT N/O	A1/A13	Normally open output pair number 1
	B1/B13	
	A2/A14	Normally open output pair number 2
	B2/B14	
	A3/A15	Normally open output pair number 3
	B3/B15	
	A4/A16	Normally open output pair number 4
	B4/B16	
ACO	A1	Normally open ACO pair
	B1	
CRAFT	A1	Receive (PC pin #2)
	A2	Transmit (PC pin #3)
	A3	Ground (PC pin #5)
	A4	DTR (PC pin #4)
LOCAL ALARMS AUD (Audible) N/O	A1	Alarm output pair number 1: Remote audible alarm.
	B1	
	A2	Alarm output pair number 2: Critical audible alarm.
	B2	
	A3	Alarm output pair number 3: Major audible alarm.
	B3	
	A4	Alarm output pair number 4: Minor audible alarm.
	B4	
LOCAL ALARMS VIS (Visual) N/O	A1	Alarm output pair number 1: Remote visual alarm.
	B1	
	A2	Alarm output pair number 2: Critical visual alarm.
	B2	
	A3	Alarm output pair number 3: Major visual alarm.
	B3	
	A4	Alarm output pair number 4: Minor visual alarm.
	B4	

If you are using an AIC-I card, contacts provisioned as OUT are 1-4. Contacts provisioned as IN are 13-16.

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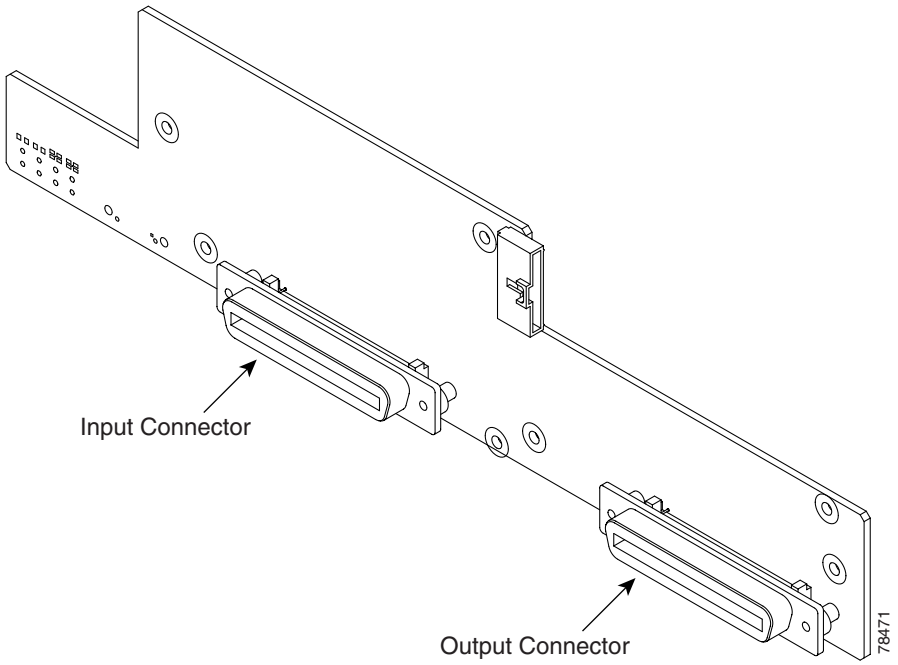
Visual and audible alarms are typically wired to trigger an alarm light or bell at a central alarm collection point when the corresponding contacts are closed. You can use the Alarm Cutoff pins to activate a remote ACO (Alarm Cut Off) for audible alarms. You can also activate the ACO function by pressing

the ACO button on the TCC2/TCC2P card faceplate. The ACO function clears all audible alarm indications. After clearing the audible alarm indication, the alarm is still present and viewable in the Alarms tab in CTC.

Alarm Expansion Panel

The optional alarm expansion panel (AEP) can be used with the enhanced Alarm Interface Controller card (AIC-I) card to provide an additional 48 dry alarm contacts, 32 of which are inputs and 16 are outputs. The AEP shown in Figure 6-16 is a printed circuit board assembly that is installed on the backplane. Here, the left connector is the input connector and the right connector is the output connector.

Figure 6-16 AEP Printed Circuit Board Assembly



The AIC-I without an AEP already contains direct alarm contacts. These direct AIC-I alarm contacts are routed through the backplane to wire-wrap pins accessible from the back of the shelf. If you install an AEP, you cannot use the alarm contacts on the wire-wrap pins.

See the *Cisco ONS 15454 Reference Manual* for AEP Specifications.

Electrical Interface Assemblies

Electrical Interface Assemblies (EIAs) are typically pre-installed when ordered with the ONS 15454. EIAs must be ordered when using DS-1, DS-3, DS3XM-6, DS3XM-12, EC-1, or DS3/EC1-48 cards.

Seven different EIA backplane covers are available for the ONS 15454:

1. BNC
2. High-Density BNC

3. Mini BNC
4. SMB
5. AMP Champ
6. UBIC-V
7. UBIC-H

EIAs are attached to the shelf assembly backplane to provide electrical interface cable connections. EIAs are available with SMB, BNC, and SCSI connectors for DS-3 or STS-1 electrical circuits. EIAs are available with AMP Champ and SCSI connectors for DS-1 circuits. You must use SMB or UBIC EIAs for DS-1 twisted-pair cable installations. UBIC-V, UBIC-H or Mini-BNC (DS3/EC-1) EIAs are required when using the high-density (48-port DS-3/EC-1 and 56-port DS-1) electrical cards. UBIC-V and UBIC-H EIAs use 50-pin SCSI connectors for DS3, EC-1 and DS-1 circuits.

You can install EIAs on one or both sides of the ONS 15454 backplane in any combination (in other words, AMP Champ on Side A and BNC on Side B or High-Density BNC on side A and SMB on side B, and so forth including the UBIC).

As you face the rear of the ONS 15454 shelf assembly, the right-hand side is the A side and the left-hand side is the B side. The top of the EIA connector columns are labeled with the corresponding slot number, and EIA connector pairs are marked transmit (Tx) and receive (Rx) to correspond to transmit and receive cables.

EIA Configurations

The matrix provided in Table 6-8 describes the EIA configurations available for the ONS 15454.

Table 6-8 Electrical Interface Assembly Configurations

EIA Type	Interface Cards Supported	A Side Connector Capacity	A Side Connectors Map To	A Side Product Number	B Side Connector Capacity	B Side Connectors Map To	B Side Product Number
Low-Density BNC	DS3-12 DS3XM-6 EC1-12	24 pairs of BNC connectors	Slot 2 and Slot 4	15454-EIA-BNC-A48	24 pairs of BNC connectors	Slot 14 and Slot 16	15454-EIA-BNC-B48
High-Density BNC	DS3-12 DS3XM-6 EC1-12	48 pairs of BNC connectors	Slot 1, Slot 2, Slot 4, and Slot 5	15454-EIA-BNC-A96	96 pairs of BNC connectors	Slot 12, Slot 13, Slot 14, Slot 15, Slot 16, and Slot 17	15454-EIA-BNC-B96
MiniBNC	DS3-12 DS3/EC1-48 DS3XM-6 DS3XM-12 EC1-12	96 pairs of BNC connectors	Slot 1[1], Slot 2[1], Slot 3[1], Slot 4, Slot 5, and Slot 6	15454-EIA-BNC-A96	96 pairs of BNC connectors	Slot 12, Slot 13, Slot 14, Slot 15[1], Slot 16[1], and Slot 17[1]	15454-EIA-BNC-B96

Table 6-8 Electrical Interface Assembly Configurations (continued)

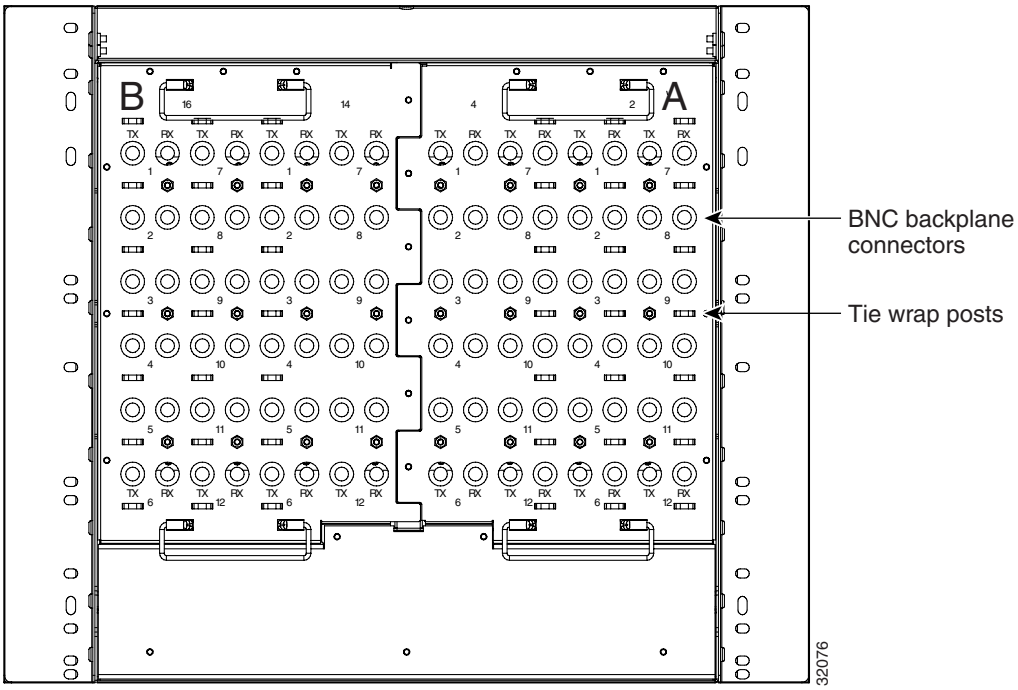
EIA Type	Interface Cards Supported	A Side Connector Capacity	A Side Connectors Map To	A Side Product Number	B Side Connector Capacity	B Side Connectors Map To	B Side Product Number
SMB	DS1-14 DS3-12 EC1-12 DS3XM-6 DS3XM-12	84 pairs of SMB connectors	Slot 1, Slot 2, Slot 3, Slot 4, Slot 5, and Slot 6	15454-EIA-SMB-A84	84 pairs of SMB connectors	Slot 12, Slot 13, Slot 14, Slot 15, Slot 16, and Slot 17	15454-EIA-SMB-B84
AMP Champ	DS1-14	6 AMP Champ connectors	Slot 1, Slot 2, Slot 3, Slot 4, Slot 5, and Slot 6	15454-EIA-AMP-A84	6 AMP Champ connectors	Slot 12, Slot 13, Slot 14, Slot 15, Slot 16, and Slot 17	15454-EIA-AMP-B84
UBIC	DS1-14 DS3-12 DS3/EC1-48 DS3XM-6 DS3XM-12 EC1-12	16 SCSI connectors	Slot 1[1], Slot 2[1], Slot 3[1], Slot 4, Slot 5, and Slot 6	15454-EIA-UBIC-V-A and 15454-EIA-UBIC-H-A	16 SCSI connectors: 112 DS1s, 96 DS3s, 96 EC-1s	Slot 12, Slot 13, Slot 14, Slot 15[1], Slot 16[1], and Slot 17[1]	15454-EIA-UBIC-V-B and 15454-EIA-UBIC-H-B

1. High-density card slots.

Low-Density BNC EIA

You can use BNC EIAs for DS-3 and STS-1 electrical circuits. The Low-Density BNC EIA supports 24 DS-3 or 24 STS-1 electrical circuits on each side of the ONS 15454 (24 transmit and 24 receive connectors). If you install Low-Density BNC EIAs on both sides of the shelf assembly, the ONS 15454 hosts up to 48 circuits. The BNC connectors on the EIA supports Trompeter UCBJ224 (75-ohm) 4-leg connectors (King or ITT are also compatible). Right-angle mating connectors for the connecting cable are AMP 413588-2 (75-ohm) connectors. If preferred, you can also use a straight connector of the same type. Use RG-59/U cable to connect to the ONS 15454 BNC EIA. These cables are recommended to connect to a patch panel and are designed for long runs. You can use Low-Density BNC EIAs with the DS3-12, DS3-12E, DS3XM-6, DS3XM-12, or EC1-12 cards. Figure 6-17 shows the ONS 15454 with pre-installed Low-Density BNC EIAs.

Figure 6-17 Low-Density BNC EIA for use in 1:1 Protection Schemes



The EIA side marked "A" has 24 pairs of BNC connectors. The first 12 pairs of BNC connectors correspond to Ports 1 to 12 for a 12-port card and map to Slot 2 on the shelf assembly. The BNC connector pairs are marked "Tx" and "Rx" to indicate transmit and receive cables for each port. You can install an additional card in Slot 1 as a protect card for the card in Slot 2. The second 12 BNC connector pairs correspond to Ports 1 to 12 for a 12-port card and map to Slot 4 on the shelf assembly. You can install an additional card in Slot 3 as a protect card for the card in Slot 4. Slots 5 and 6 do not support DS-3 cards when the standard BNC EIA panel connectors are used.

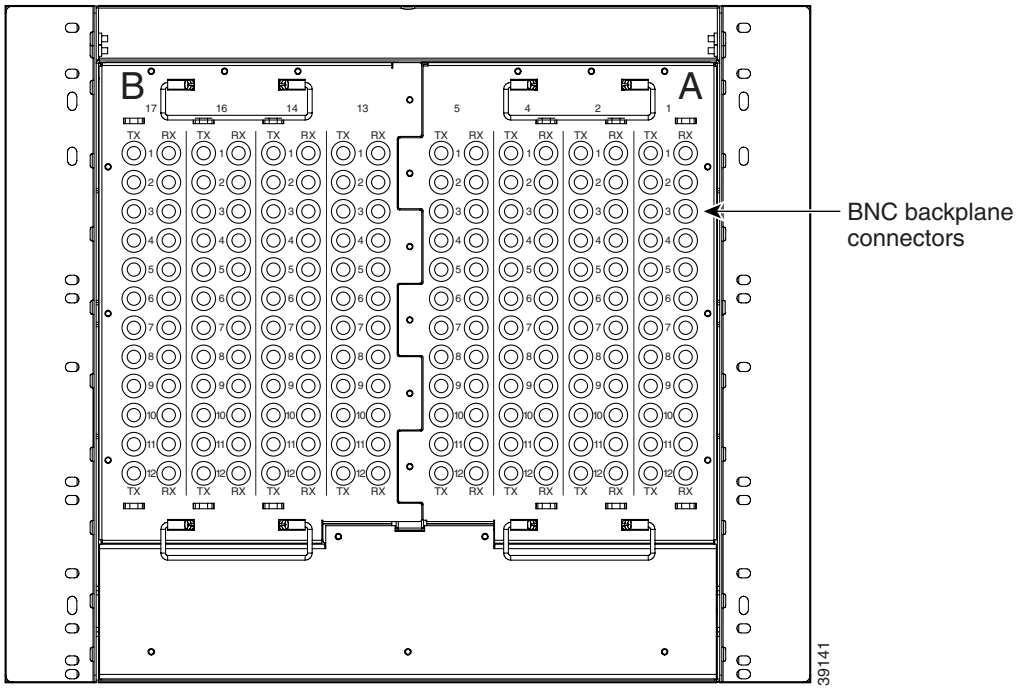
The EIA side marked "B" provides an additional 24 pairs of BNC connectors. The first 12 BNC connector pairs correspond to Ports 1 to 12 for a 12-port card and map to Slot 14 on the shelf assembly. The BNC connector pairs are marked "Tx" and "Rx" to indicate transmit and receive cables for each port. You can install an additional card in Slot 15 as a protect card for the card in Slot 14. The second 12 BNC connector pairs correspond to Ports 1 to 12 for a 12-port card and map to Slot 16 on the shelf assembly. You can install an additional card in Slot 17 as a protect card for the card in Slot 16. Slots 12 and 13 do not support DS-3 cards when the standard BNC EIA panel connectors are used.

When BNC connectors are used with a DS3N-12 card in Slot 3 or 15, the 1:N card protection extends only to the two slots adjacent to the 1:N card due to BNC wiring constraints.

High-Density BNC EIA

The ONS 15454 high-density BNC EIA supports 48 DS-3 or STS-1 circuits on each side of the ONS 15454 (48 transmit and 48 receive connectors). If you install BNC EIAs on both sides of the unit, the ONS 15454 hosts up to 96 circuits. The high-density BNC EIA supports Trompeter UCBJ224 (75 ohm) 4 leg connectors (King or ITT are also compatible). Use straight connectors on RG-59/U cable to connect to the high-density BNC EIA. Cisco recommends these cables for connection to a patch panel; they are designed for long runs. You can use high-density BNC EIAs with DS3-12, DS3-12E, DS3XM-6, DS3XM-12, or EC1-12 cards. Figure 6-18 shows the ONS 15454 with pre-installed high-density BNC EIAs.

Figure 6-18 High-Density BNC Backplane for use in 1:N Protection Schemes



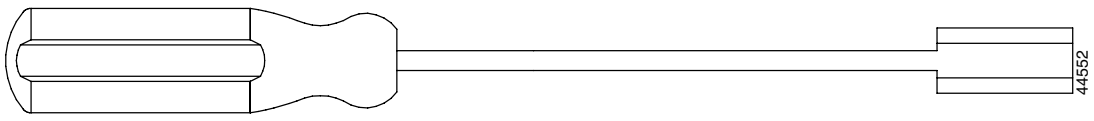
The EIA side marked "A" hosts 48 pairs of BNC connectors. Each column of connector pairs is numbered and corresponds to the slot of the same number. The first column (12 pairs) of BNC connectors corresponds to Slot 1 on the shelf assembly, the second column to Slot 2, the third column to Slot 4, and the fourth column to Slot 5. The rows of connectors correspond to Ports 1 to 12 of a 12-port card.

The EIA side marked "B" provides an additional 48 pairs of BNC connectors. The first column (12 pairs) of BNC connectors corresponds to Slot 13 on the shelf assembly, the second column to Slot 14, the third column to Slot 16, and the fourth column to Slot 17. The rows of connectors correspond to Ports 1 to 12 of a 12-port card. The BNC connector pairs are marked "Tx" and "Rx" to indicate transmit and receive cables for each port. The High-Density BNC EIA supports both 1:1 and 1:N protection across all slots except Slots 6 and 12.

BNC Insertion and Removal Tool

Due to the large number of BNC connectors on the High-Density BNC EIA, you might require a special tool for inserting and removing BNC EIAs (see Figure 6-19). This tool also helps with ONS 15454 patch panel connections.

Figure 6-19 BNC Insertion and Removal Tool



The BNC insertion and removal tool can be obtained from the following vendors:

- Trompeter Electronics Inc. (www.trompeter.com)

31186 La Baya Drive

Westlake Village, CA 91362-4047

Phone: (800) 982-2629 Fax: (818) 706-1040

Part Number: RT-1L

MiniBNC EIA

The ONS 15454 MiniBNC EIA supports a maximum of 192 transmit and receive DS-3 or STS-1 electrical connections, 96 per side (A and B) through 192 miniBNC connectors on each side. If you install BNC EIAs on both sides of the unit, the ONS 15454 hosts up to 192 circuits. The MiniBNC EIAs are designed to support DS-3 and EC-1 signals. The MiniBNC EIA supports the following cards:

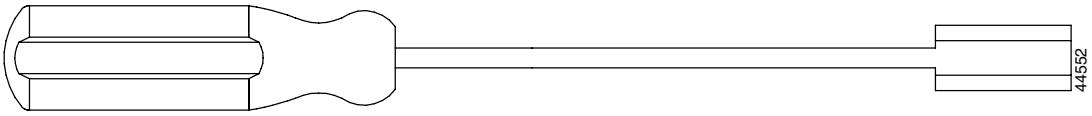
- DS3-12
- DS3-12E
- EC1-12
- DS3XM-6
- DS3XM-12
- DS3/EC1-48

Note EC-1 functionality will be available on the 48-port DS-3/EC-1 card in a future software release.

Mini BNC Insertion and Removal Tool

Due to the large number of BNC connectors on the High-Density BNC EIA, you might require a special tool for inserting and removing BNC EIAs (see Figure 6-19). This tool also helps with ONS 15454 patch panel connections.

Figure 6-20 Mini BNC Insertion and Removal Tool



The Mini BNC insertion and removal tool can be obtained from the following vendors:

- Trompeter Electronics Inc. (www.trompeter.com)

  31186 La Baya Drive

  Westlake Village, CA 91362-4047

  Phone: (800) 982-2629 Fax: (818) 706-1040

  Part Number: RT-4L

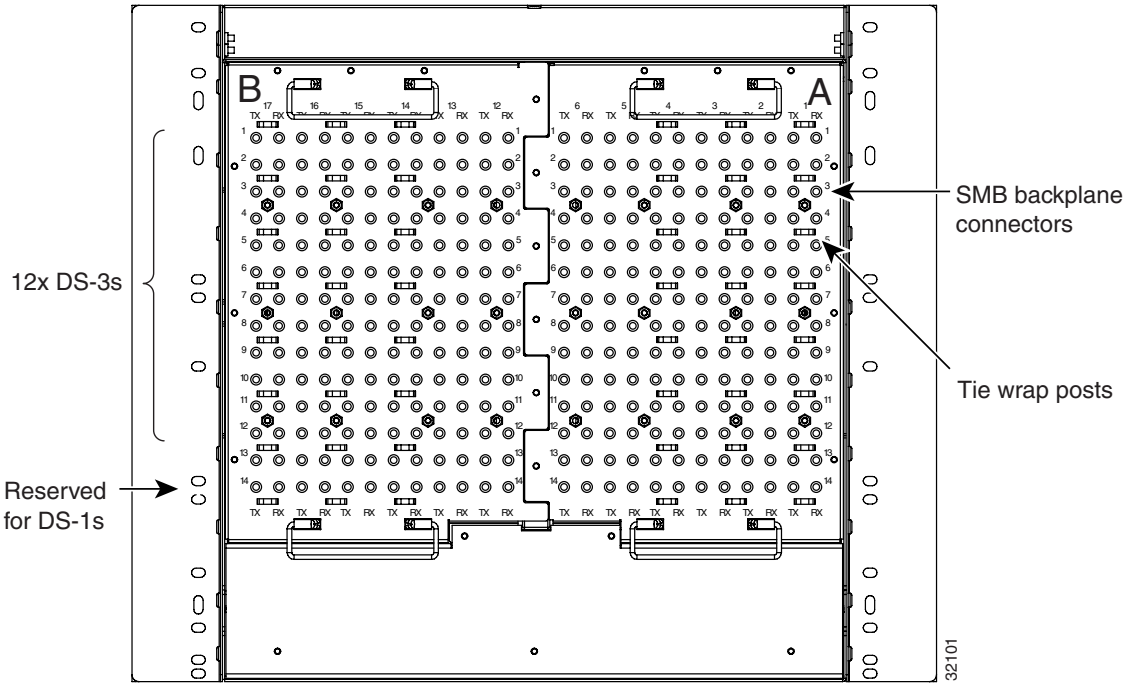
SMB EIA

The ONS 15454 SMB EIA supports AMP 415484-1 75 ohm 4 leg connectors. Right-angle mating connectors for the connecting cable are AMP 415484-2 (75 ohm) connectors. Use RG-179/U cable to connect to the ONS 15454 EIA. Cisco recommends these cables for connection to a patch panel; they are not designed for long runs. Range does not affect loopback testing.

You can use SMB EIAs with DS1-14, DS3-12, DS3-12E, DS3XM-6, DS3XM-12, and EC1-12 cards. If you use DS1-14 cards, use the DS-1 electrical interface adapter (balun) to terminate the twisted pair DS-1 cable to the SMB EIA. SMB EIAs support 14 ports per slot when used with a DS1-14 card, 12 ports per slot when used with a DS3-12, DS3XM-12, or EC1-12 card, and 6 ports per slot when used with a DS3XM-6 card.

Figure 6-21 shows the ONS 15454 with pre-installed SMB EIAs and the sheet metal cover and screw locations for the EIA. The SMB connectors on the EIA are AMP 415504-3 (75 ohm) 4 leg connectors.

Figure 6-21 SMB EIA



The SMB EIA has 84 transmit and 84 receive connectors on each side of the ONS 15454 for a total of 168 SMB connectors (84 circuits).

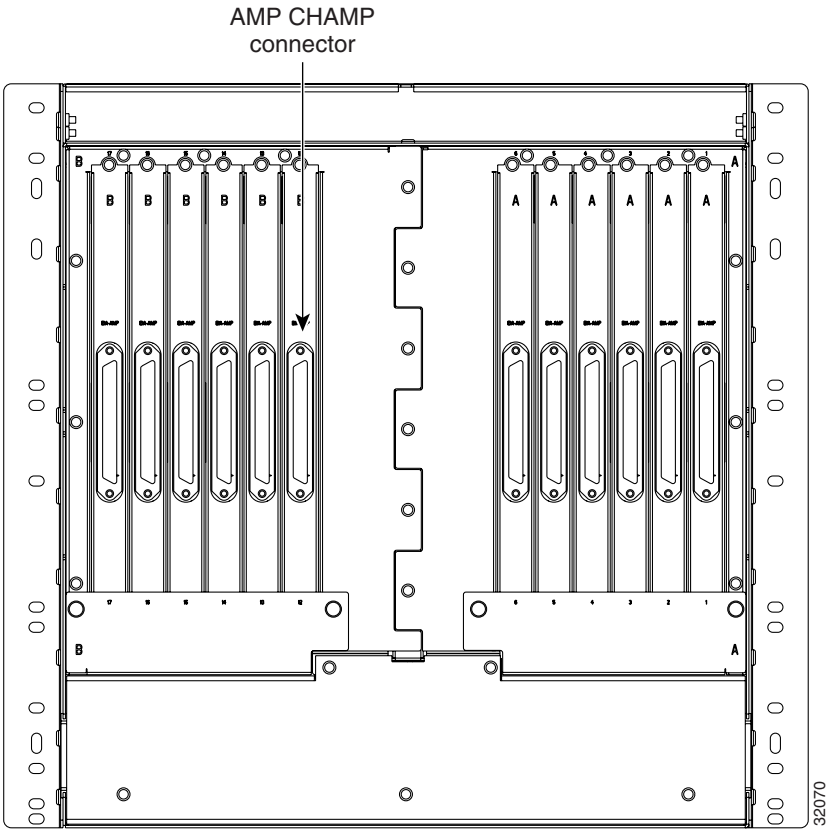
The SMB EIA side marked "A" hosts 84 SMB connectors in six columns of 14 connectors. The "A" side columns are numbered 1 to 6 and correspond to Slots 1 to 6 on the shelf assembly. The SMB EIA side marked "B" hosts an additional 84 SMB connectors in six columns of 14 connectors. The "B" side columns are numbered 12 to 17 and correspond to Slots 12 to 17 on the shelf assembly. The connector rows are numbered 1 to 14 and correspond to the 14 ports on a DS-1 card.

For DS-3 or EC-1, the SMB EIA supports 72 transmit and 72 receive connectors, for a total of 144 SMB connectors (72 circuits). If you use a DS-3 or EC-1 card, only ports 1 to 12 are active. If you use a DS3XM-6 card, only ports 1 to 6 are active. The SMB connector pairs are marked "Tx" and "Rx" to identify transmit and receive cables for each port. If you use SMB connectors, you can install DS-1, DS-3, or EC-1 cards in any multispeed slot (Slots 1 to 6 or 12 to 17).

AMP Champ EIA

The ONS 15454 AMP Champ EIA supports 64-pin (32 pair) AMP Champ connectors for each slot on both sides of the shelf assembly where the EIA is installed. Cisco AMP Champ connectors are female AMP # 552246-1 with AMP # 552562-2 bail locks. Each AMP Champ connector supports 14 DS-1 ports. You can use AMP Champ EIAs with DS-1 cards only. Figure 6-22 shows the ONS 15454 with pre-installed AMP Champ EIAs and the corresponding sheet metal cover and screw locations for the EIA.

Figure 6-22 AMP EIA Champ Backplane



The EIA side marked "A" hosts six AMP Champ connectors. The connectors are numbered 1 to 6 for the corresponding slots on the shelf assembly. Each AMP Champ connector on the backplane supports 14 DS-1 ports for a DS1-14 card, and each connector features 28 live pairs (one transmit pair and one receive pair) for each DS-1 port.

The EIA side marked "B" hosts six AMP Champ connectors. The connectors are labeled 12 to 17 for the corresponding slots on the shelf assembly. Each AMP Champ connector on the backplane supports 14 DS-1 ports for a DS1-14 card, and each connector features 28 live pairs (one transmit pair and one receive pair) for each DS-1 port.

UBIC-V EIA

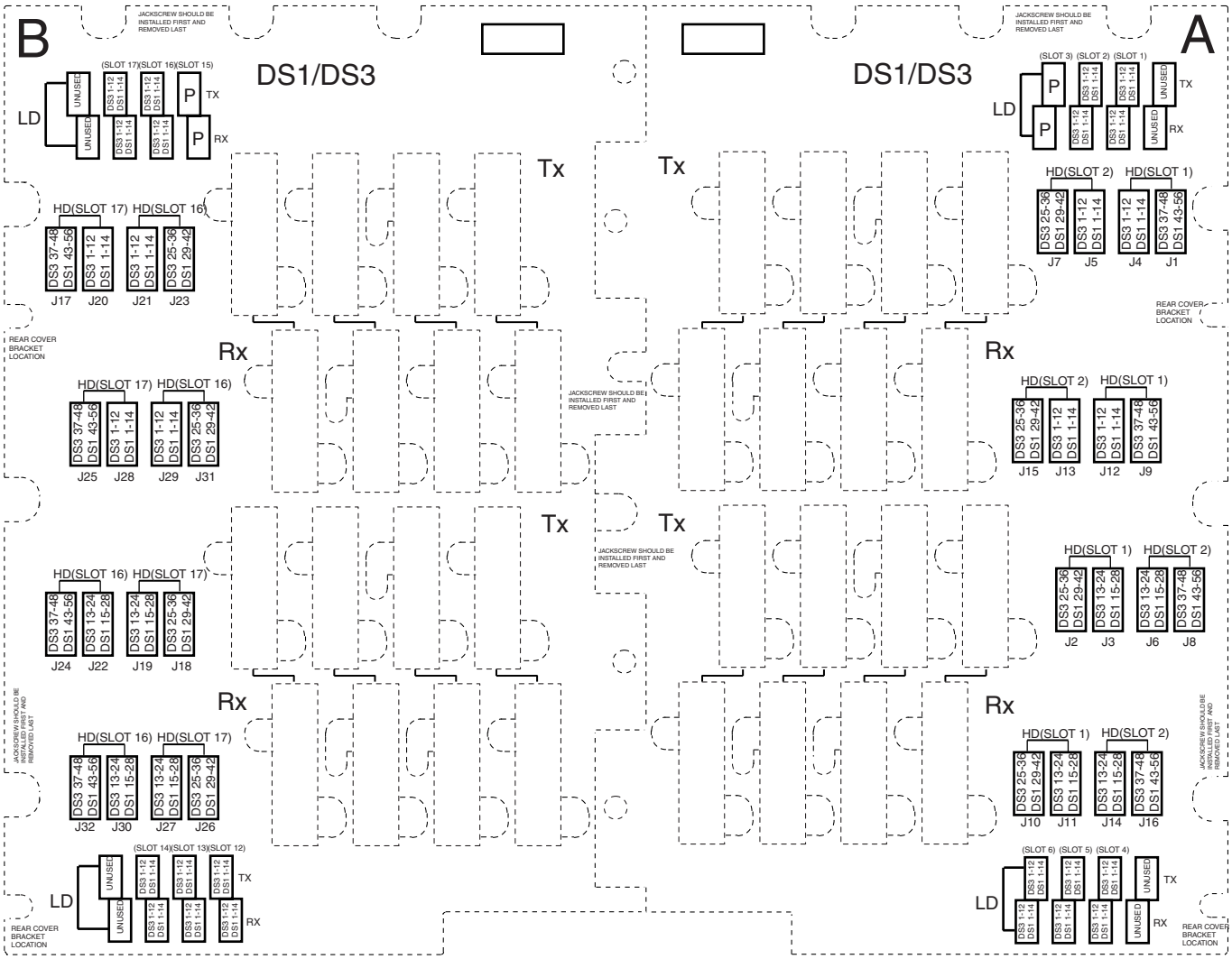
The universal backplane interface connector (UBIC-V) backplane covers are typically preinstalled when ordered with the ONS 15454 high density shelf (15454-SA-HD). UBIC-Vs are required when using the high-density (48-port DS-3/EC-1 and 56-port DS-1) electrical cards.

UBIC-V EIAs are attached to the shelf assembly backplane to provide up to 112 transmit and receive connections through 16 SCSI connectors per side (A and B). The UBIC-V EIAs are designed to support DS-1, DS-3, and EC-1 signals. The appropriate cable assembly is required depending on the type of signal.

You can install UBIC-Vs on one or both sides of the ONS 15454. As you face the rear of the ONS 15454 shelf assembly, the right side is the A side (15454-EIA-UBIC-V-A) and the left side is the B side (15454-EIA-UBIC-V-B). The diagrams adjacent to each row of SCSI connectors indicate the slots and ports that correspond with each SCSI connector in that row, depending on whether you are using a high-density (HD) or low-density (LD) configuration. UBIC-V EIAs will support the high-density DS3/EC1-48 and DS3XM-12 cards, as well as low-density electrical cards. Figure 6-23 shows the slot assignments for sides A and B.

Note The high-density DS1-56 electrical card will be available in a future release.

Figure 6-23 UBIC-V Slot Designations



The UBIC-V sheet metal covers use the same screw holes as the standard sheet metal covers, but they have 12 additional holes for pan-head screws and three holes for jack screws, so you can screw down the cover and the board using standoffs on the UBIC-V board.

When installed with the standard door and cabling on the backplane, the ONS 15454 shelf measures approximately 15.7 inches deep when partially populated with backplane cables, 16.1 inches deep when fully populated, and 16.75 inches deep with the rear cover installed.

When installed with the deep door and cabling on the backplane, the ONS 15454 shelf measures approximately 17.5 inches deep when partially populated with backplane cables, 17.9 inches deep when fully populated, and 18.55 inches deep with the rear cover installed.

The A and B sides each host 16 high-density, 50-pin SCSI connectors. The A-side maps to Slots 1 through 6 and the B-side maps to Slots 12 through 17.

In Software Releases 4.1.x and 4.6.x, UBIC-V EIAs support unprotected, 1:1, and 1:N (N < 5) protection groups. In Software R5.0 and higher, UBIC-V EIAs also support available high-density cards in unprotected and 1:N (N < 2) protection groups.

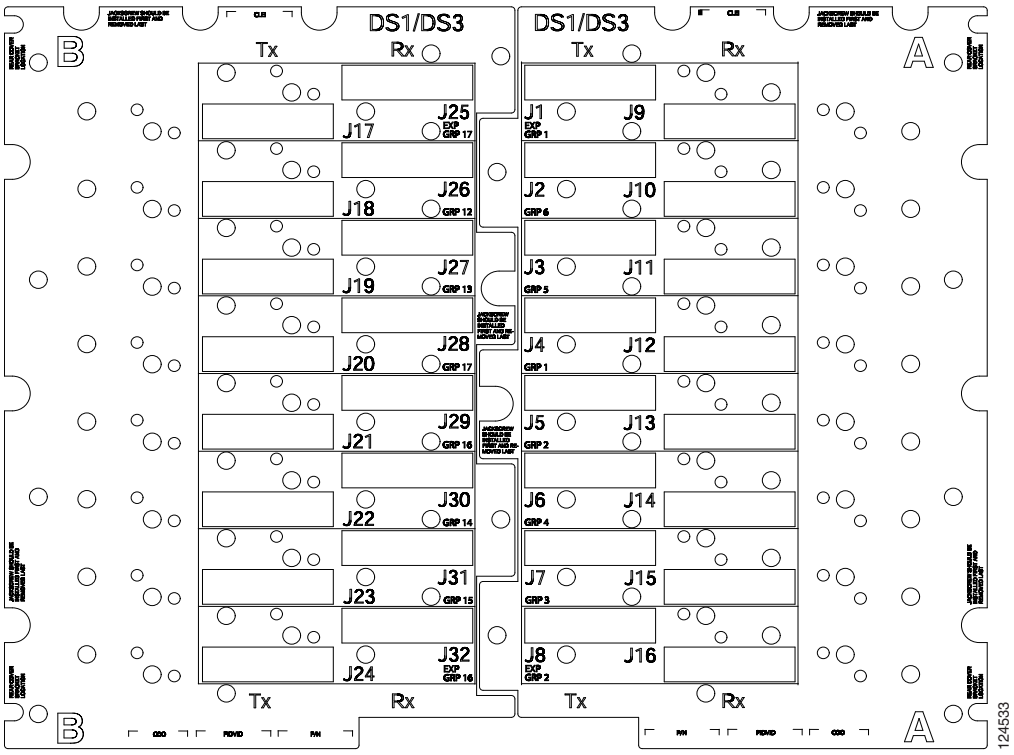
UBIC-H EIA

UBIC-H EIAs are attached to the shelf assembly backplane to provide up to 112 transmit and receive DS-1 connections through 16 SCSI connectors per side (A and B) or 96 transmit and receive DS-3 connections. The UBIC-H EIAs are designed to support DS-1, DS-3, and EC-1 signals. The appropriate cable assembly is required depending on the type of signal.

You can install UBIC-H EIAs on one or both sides of the ONS 15454. As you face the rear of the ONS 15454 shelf assembly, the right side is the A side (15454-EIA-UBICH-A) and the left side is the B side (15454-EIA-UBICH-B). The J-labels adjacent to each row of SCSI connectors indicate the slots and ports that correspond with each SCSI connector in that row, depending on whether you are using a high density (HD) or low density (LD) configuration. UBIC-H EIAs will support the high-density DS3/EC1-48 and DS3XM-12 cards, as well as low-density electrical cards. Figure 6-24 shows the A and B side connector labeling.

Note The high-density DS1-56 electrical card will be available in a future release.

Figure 6-24 UBIC-H EIA Connector Labeling



When installed with the standard door and cabling on the backplane, the ONS 15454 shelf measures approximately 14.5 inches deep when fully populated with backplane cables, and 15.0 inches deep with the rear cover installed.

When installed with the deep door and cabling on the backplane, the ONS 15454 shelf measures approximately 16.5 inches deep when fully populated with backplane cables, and 17.0 inches deep with the rear cover installed.

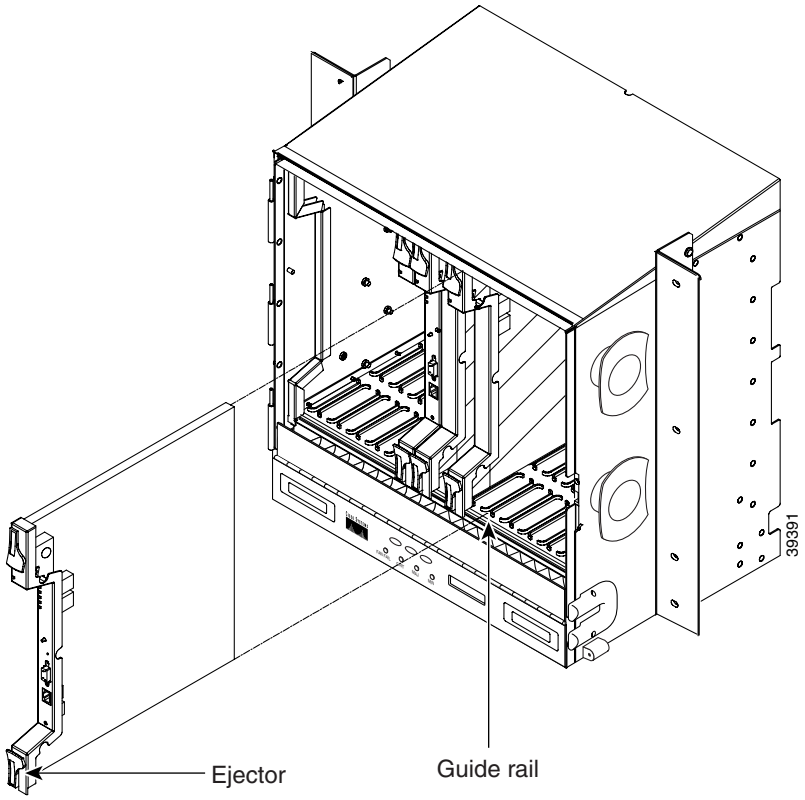
The A and B sides each host 16 high-density, 50-pin SCSI connectors. The A-side maps to Slots 1 through 6 and the B-side maps to Slots 12 through 17.

In Software Releases prior to Release 5.0, UBIC-H EIAs support unprotected, 1:1, and 1:N (where N < 5) protection groups. In Software R5.0 and greater, UBIC-Hs additionally support available high-density cards in unprotected and 1:N protection (where N < 2) protection groups.

Plug-in Cards

ONS 15454 plug-in cards have electrical plugs at the back that plug into electrical connectors on the shelf assembly backplane. When the ejectors are fully closed, the card plugs into the assembly backplane. Figure 6-25 shows card installation.

Figure 6-25 Installation of Plug-in Cards



Release 5.0 features background ASIC monitoring for all line cards and cross connect cards, standby assurance for DS-3 cards, and BLSR PCA Pseudo Random Bit Signal (PRBS) generation and detection. This inhibits switching to a failed line card, if such a card exists, by generating a diagnostic failure alarm. The feature also causes a switch-away on the cross connect cards via an equipment failure alarm. All diagnostic failures are logged in the alarm history. The feature accomplishes these goals by adding three new timers that ensure the correct state of the cards at key points in card communication. A verification guard timer is used when a Force is issued, to ensure that the far end has a chance to respond. A detection guard timer is used to ensure the presence of an SF/SD condition before switching away from a card. A recover guard timer ensures the absence of SF/SD prior to switching to a card.

Card Replacement

To replace an ONS 15454 card with another card of the same type, you do not need to make any changes to the database; remove the old card and replace it with a new card. To replace a card with a card of a different type, physically remove the card and replace it with the new card, then delete the original card from CTC. For specifics, refer to the *Cisco ONS 15454 Procedure Guide*.

Card Descriptions

The tables in this section describe the function and slot assignment for each ONS 15454 plug-in card. Each card is marked with a symbol that corresponds to a slot (or slots) on the ONS 15454 shelf assembly. The cards can only be installed into slots displaying the same symbols.

- Refer to Table 6-9 for Common Card Functions and Slot Assignment
- Refer to Table 6-10 for Electrical Card Functions and Slot Assignment
- Refer to Table 6-11 for Optical Card Functions and Slot Assignment
- Refer to Table 6-12 for Transponder and Muxponder Card Functions and Slot Assignments
- Refer to Table 6-15 for Ethernet Card Functions and Slot Assignment
- Refer to Table 6-17 for DWDM Card Functions and Slot Assignment
- Refer to Table 6-16 for Storage Area Network (SAN) Transport Card Function and Slot Assignment

See http://cisco.com/en/US/products/hw/optical/ps2006/prod_eol_notices_list.html for the latest list of End-Of-Life and End-Of-Sale notices.

Table 6-9 Common Card Functions and Slot Assignments

Card	Description	Slot Assignment
TCC+	The TCC+ is the main processing center for the ONS 15454 running Software Release 3.4 and earlier. It provides synchronization, 10 DCC terminations, system initialization, provisioning, alarm reporting, maintenance, and diagnostics.	7 and 11
TCC2	The TCC2 card requires Software Release 4.0 or later. The TCC2 performs the same functions as the TCC+, but has additional features such as A/B power supply monitoring, support for up to 84 DCC terminations, and on-card lamp test.	7 and 11
TCC2P	The TCC2P card performs the same functions as the TCC2, but also has Ethernet security features and 64K composite clock building integrated timing supply (BITS) timing. These additional features require Software Release 5.0 and later. The TCC2P is backwards compatible with Software Release 4.0.	7 and 11
XCVT	The XCVT card performs the same functions as the XC, but can manage both STS and VT circuits up to 48c.	8 and 10
XC10G	The XC10G card performs the same functions as the XC-VT, but can manage STS and VT circuits up to 192c. The XC-10G has the same VT bandwidth of the XC and VT cards, but supports up to four times the STS bandwidth of these cards.	8 and 10
AIC	The AIC card provides user-defined (environmental) alarms with its 4 input and 4 output alarm contact closures. It also provides orderwire.	9

Table 6-9 Common Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
AIC-I	The AIC-I card provides user-defined (environmental) alarms with its 12 input and 4 output alarm contact closures. It also provides orderwire, user-data channels, and A/B power supply monitoring.	9
AEP	The AEP board is used with the AIC-I card to provide 48 dry alarm contacts: 32 inputs and 16 outputs.	Bottom of backplane

Note Do not operate the ONS 15454 with only one TCC card and one XC/XCVT/XC10G card. Two TCC and cross-connect cards must always be installed for redundant operation.

Table 6-10 Electrical Card Functions and Slot Assignments

Card	Description	Slot Assignment
DS1-14	The ONS 15454 DS1-14 card provides 14 Telcordia-compliant, GR-499 DS-1 ports. Each port operates at 1.544 Mb/s over a 100 ohm twisted-pair copper cable. Each DS1-14 port has DSX-level (digital signal cross-connect frame) outputs supporting distances up to 655 feet. With the proper backplane EIA and wire-wrap or AMP Champ connectors. The DS1-14 card can function as a working or protect card in 1:1 protection schemes and as a working card in 1:N protection schemes.	1–6 and 12–17
DS1N-14	The DS1N-14 card supports the same features as the DS1-14 card in addition to enhanced protection schemes. The DS1N-14 is capable of 1:N (N<5) protection with the proper backplane EIA and wire-wrap or AMP Champ connectors. The DS1N-14 card can function as a working or protect card in 1:1 or 1:N protection schemes.	1:1 protection: 1–6 and 12–17 1:N protection: 3, 15
DS3-12	The DS3-12 card provides 12 Telcordia-compliant, GR-499 DS-3 ports per card. Each port operates at 44.736 Mb/s over a single 75 ohm 728A or equivalent coaxial span. Each port features DSX-level outputs supporting distances up to 450 feet (137 meters) depending on facility conditions. With the proper backplane EIA, the card supports BNC or SMB connectors. The DS3-12 card operates as a working or protect card in 1:1 protection schemes and as a working card in 1:N protection schemes.	1–6 and 12–17
DS3N-12	The DS3N-12 card supports the same features as the DS3-12 card in addition to enhanced protection schemes. The DS3N-12 is capable of 1:N (N<5) protection with the proper backplane EIA and SMB or BNC connectors. The DS3N-12 card can function as a working or protect card in 1:1 or 1:N protection schemes.	1:1 protection: 1-6 and 12-17 1:N protection: 3, 15
DS3-12E	The ONS 15454 DS3-12E card provides 12 Telcordia-compliant ports per card. Each port operates at 44.736 Mb/s over a single 75 ohm 728A or equivalent coaxial span. Each port features DSX-level outputs supporting distances up to 450 feet (137 meters). With the proper backplane EIA, the card supports SMB or BNC connectors. The DS3-12E card provides enhanced performance monitoring functions.	1–6 and 12–17

Table 6-10 Electrical Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
DS3N-12E	The DS3N-12E card supports the same features as the DS3N-12E card in addition to enhanced protection schemes. The DS3N-12 is capable of 1:N (N<5) protection with the proper backplane EIA and SMB or BNC connectors. The DS3N-12E card can function as a working or protect card in 1:1 or 1:N protection schemes.	1:1 protection: 1-6 and 12–17 1:N protection: 3, 15
DS3/EC1-48	The ONS 15454 DS3/EC1-48 card provides 48 Telcordia-compliant, GR-499 DS-3 ports per card. Each port operates at 44.736 Mb/s over a single 75-ohm 728A or equivalent coaxial span. The DS3/EC1-48 card operates as a working or protect card in 1:N protection schemes, where N<=2. Note: EC-1 functionality will be supported in a future software release.	1–3 and 15–17 1:N protection: 3, 15
DS3XM-6	The DS3XM-6 card, commonly referred to as a transmux card, provides six Telcordia-compliant, GR-499-CORE M13 multiplexing functions. The DS3XM-6 converts six framed DS-3 network connections to 28x6 or 168 VT1.5s. Each DS3XM-6 port features DSX-level outputs supporting distances up to 450 feet (137 meters) depending on facility conditions. You cannot create circuits from a DS3XM-6 card to a DS-3 card. DS3XM-6 cards operate at the VT1.5 level. The DS3XM-6 card supports 1:1 protection with the proper backplane EIA. EIAs are available with BNC or SMB connectors.	1–6 and 12–17
DS3XM-12	This card provides the same M13 multiplexing functions as the DS3XM-6 card, however the DS3XM-12 converts up to 12 framed DS-3 network connections to 12 x 28 VT1.5s. The DS3XM-12 card also provides a portless transmux interface to change DS-3s mapped in an OC-N signal into VT1.5s.	1–6 and 12–17 1:N protection: 3, 15
EC1-12	The EC1-12 card provides 12 Telcordia-compliant, GR-253 STS-1 electrical ports per card. Each port operates at 51.840 Mbps over a single 75 ohm 728A or equivalent coaxial span. Each EC1-12 interface features DSX-level (digital signal cross-connect frame) outputs supporting distances up to 450 feet (137 meters) depending on facility conditions. An EC1-12 card can be 1:1 protected with another EC1-12 card but cannot protect more than one EC1-12 card. You must install the EC1-12 in an even-numbered slot to serve as a working card and in an odd-numbered slot to serve as a protect card.	1–6 and 12–17

Table 6-11 Optical Card Functions and Slot Assignments

Card	Description	Slot Assignment
OC3-IR-4/STM1-SH-1310 nm	The OC3 IR 4/STM1 SH 1310 card provides four intermediate- or short-range SONET/SDH OC-3 ports compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. Each port operates at 155.52 Mb/s over a single-mode fiber span. The card supports VT and non-concatenated or concatenated payloads at the STS-1 or STS-3c signal levels. The OC3 IR 4/STM1 SH 1310 card supports 1+1 unidirectional or bidirectional protection switching. You can provision protection on a per port basis. The card uses SC connectors.	1–6 and 12–17
OC3-IR-8/STM1-SH-1310 nm	The OC3IR/STM1SH 1310-8 card provides eight intermediate- or short-range SONET/SDH OC-3 ports compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. Each port operates at 155.52 Mb/s over a single-mode fiber span. The card supports the same payloads and protection schemes as the four port OC3 card. (labeled) on the card faceplate. The card uses LC connectors on the faceplate, angled downward 12.5 degrees.	1–4 and 14–17
OC12-IR/STM4-SH-1310 nm	The OC12 IR/STM4 SH 1310 card provides one intermediate- or short-range SONET/SDH OC-12 port compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. The port operates at 622.08 Mb/s over a single-mode fiber span. The card supports VT and non-concatenated or concatenated payloads at STS-1, STS-3c, STS-6c or STS-12c signal levels. The OC12 IR/STM4 SH 1310 card supports 1+1 unidirectional or bidirectional protection switching. You can provision protection on a per port basis. The card uses SC connectors.	1–6 and 12–17
OC12-LR/STM4-LH-1310 nm	The OC12 LR/STM4 LH 1310 card provides one long-range SONET OC-12 port per card compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. The port operates at 622.08 Mb/s over a single-mode fiber span. The card supports the same payloads and protection schemes as the OC12 IR/STM4 SH 1310 card. The OC12 LR/STM4 LH 1310 uses SC connectors.	1–6 and 12–17
OC12-LR/STM4-LH-1550 nm	The OC12 LR/STM4 LH 1550 card provides one long-range SONET/SDH OC-12 port compliant with the ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. The port operates at 622.08 Mb/s over a single-mode fiber span. The card supports the same payloads and protection schemes as the OC12 IR/STM4 SH 1310 card. The OC12 LR/STM4 LH 1550 card uses SC connectors.	1–6 and 12–17
OC12-IR-4/STM4-SH-1310 nm	The OC12 IR/STM4 SH 1310-4 card provides four intermediate- or short-range SONET/SDH OC-12/STM-4 ports compliant with the ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. Each port operates at 622.08 Mb/s over a single-mode fiber span. The card supports VT and non-concatenated or concatenated payloads at the STS-1, STS-3c, STS-6c, or STS-12c signal levels. The OC12 IR/STM4 SH 1310-4 card supports 1+1 unidirectional or bidirectional protection switching. You can provision protection on a per port basis. The OC12 IR/STM4 SH 1310-4 card uses SC connectors.	1–4 and 14–17[1]

Table 6-11 Optical Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
OC48-IR-1310 nm	The OC48 IR 1310 card provides one intermediate-range, SONET OC-48 port per card, compliant with Telcordia GR-253-CORE. Each port operates at 2.49 Gb/s over a single-mode fiber span. The card supports VT and non-concatenated, or concatenated payloads at STS-1, STS-3c, STS-6c, STS-12c, or STS-48c signal levels. The OC48 IR 1310 card supports 1+1 unidirectional or bidirectional protection switching. The OC48 IR 1310 card uses SC connectors.	5, 6, 12, and 13
OC48-LR-1550 nm	The OC48 LR 1550 card provides one long-range, SONET OC-48 port per card, compliant with Telcordia GR-253-CORE. Each port operates at 2.49 Gb/s over a single-mode fiber span. The card supports VT, non-concatenated or concatenated payloads at STS-1, STS-3c, STS-6c STS-12c or STS-48c signal levels. The OC48 LR 1550 card supports 1+1 unidirectional or bidirectional protection switching. The OC48 LR 1550 card uses SC connectors.	5, 6, 12, and 13
OC48-IR/STM16-SH-AS-1310 nm	The OC48 IR/STM16 SH AS 1310 card provides one intermediate-range SONET/SDH OC-48 port compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. The port operates at 2.49 Gb/s over a single-mode fiber span. The card supports VT and non-concatenated or concatenated payloads at STS-1, STS-3c, STS-6c, STS-12c, or STS-48c signal levels. The card supports 1+1 unidirectional or bidirectional protection switching and uses SC connectors.	1–6 and 12–17
OC48-LR/STM16-LH -AS-1550 nm	The OC48 LR/STM16 LH AS 1550 card provides one long-range SONET/SDH OC-48 port compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. The OC48 LR/STM16 LH AS 1550 and OC48 IR/STM16 SH AS 1310 cards are functionally the same.	1–6 and 12–17
OC48-ELR/STM16-EH-ITU-100GHz	Thirty-seven distinct OC48 ELR/STM16 EH 100 GHz cards provide the ONS 15454 DWDM channel plan. Nineteen of the cards operate in the blue band with spacing of 100 GHz on the ITU grid (1528.77 nm, 1530.33 nm, 1531.12 nm, 1531.90 nm, 1532.68 nm, 1533.47 nm, 1534.25 nm, 1535.04 nm, 1535.82 nm, 1536.61 nm, 1538.19 nm, 1538.98 nm, 1539.77 nm, 1540.56 nm, 1541.35 nm, 1542.14 nm, 1542.94 nm, 1543.73 nm, 1544.53 nm). ITU spacing conforms to ITU-T G.692 and Telcordia GR-2918-CORE, issue 2. The other eighteen cards operate in the red band with spacing of 100 GHz on the ITU grid (1546.12 nm, 1546.92 nm, 1547.72 nm, 1548.51 nm,1549.32 nm, 1550.12 nm, 1550.92 nm, 1551.72 nm, 1552.52 nm, 1554.13 nm, 1554.94 nm, 1555.75 nm, 1556.55 nm, 1557.36 nm, 1558.17 nm, 1558.98 nm, 1559.79 nm, 1560.61 nm). These cards are also designed to interoperate with Cisco's ONS 15454) DWDM solution. Each OC48 ELR/STM16 EH 100 GHz card has one SONET OC-48/SDH STM-16 port that complies with Telcordia GR-253-CORE, ITU-T G.692, and ITU-T G.958. The port operates at 2.49 Gb/s over a single-mode fiber span. The card carries VT, concatenated, and non-concatenated payloads at STS-1, STS-3c, STS-6c, STS-12c, or STS-48c signal levels. Each card supports 1+1 unidirectional or bidirectional protection switching and uses SC connectors.	5, 6, 12, and 13

Table 6-11 Optical Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
OC192-SR/STM64-IO -1310 nm	The OC192 SR/STM64 IO 1310 card provides one intra-office (IO) short-range SONET/SDH OC-192 port in the 1310-nm wavelength range, compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. The port operates at 9.95328 Gb/s and supports VT and non-concatenated or concatenated payloads. The OC192 SR/STM64 IO 1310 card supports 1+1 unidirectional or bidirectional protection switching and uses SC connectors.	5, 6, 12, and 13
OC192-IR/STM64-SH -1550 nm	The OC192 IR/STM64 SH 1550 card provides one intermediate-range SONET/SDH OC-192 port in the 1550-nm wavelength range, compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. The port operates at 9.95328 Gb/s and supports VT and non-concatenated or concatenated payloads. The OC192 IR/STM64 SH 1550 card supports 1+1 unidirectional or bidirectional protection switching and uses SC connectors.	5, 6, 12, and 13
OC192-LR/STM64-LH-1550 nm	The OC192 LR/STM64 LH 1550 card provides one long-range SONET/SDH OC-192 port compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. The OC192 LR/STM64 LH 1550 and OC192 IR/STM64 SH 1550 cards are functionally the same.	5, 6, 12, and 13
OC192-LR/STM64-LH-ITU-100GHz	Sixteen distinct OC-192/STM-64 ITU 100 GHz DWDM cards comprise the ONS 15454 DWDM channel plan. [2] Eight of the cards operate in the blue band with a spacing of 100 GHz in the ITU grid (1534.25 nm, 1535.04 nm, 1535.82 nm, 1536.61 nm, 1538.19 nm, 1538.98 nm, 1539.77 nm, and 1540.56 nm). The other eight cards operate in the red band with a spacing of 100 GHz in the ITU grid (1550.12 nm, 1550.92 nm, 1551.72 nm, 1552.52 nm, 1554.13 nm, 1554.94 nm, 1555.75 nm, and 1556.55 nm). The OC192 LR/STM64 LH ITU card provides one long-reach STM-64/OC-192 port per card, compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE . The port operates at 9.95328 Gb/s and supports VT and non-concatenated or concatenated payloads. Each card supports 1+1 unidirectional or bidirectional protection switching and uses SC connectors.	5, 6, 12, and 13

1. If you ever expect to upgrade an OC-12/STM-4 ring to a higher bit rate, you should not put an OC12 IR/STM4 SH 1310-4 in that ring. The four-port card is not upgradable to a single-port card. The reason is that four different spans, possibly going to four different nodes, cannot be merged to a single span.
2. Of the sixteen OC-192/STM-64 ITU 100 GHz DWDM cards, the following eight cards are available with System Release 4.0: 1534.25 nm, 1535.04 nm, 1535.82 nm, 1536.61 nm, 1550.12 nm, 1550.92 nm, 1551.72 nm, and 1552.52 nm.

Table 6-12 Transponder and Muxponder Card Functions and Slot Assignments

Card	Description	Slot Assignment
TXP_MR_10G	The 10 Gb/s Transponder-100 GHz-Tunable xx.xx-xx.xx card (TXP_MR_10G) processes one 10 Gb/s signal (client side) into one 10-Gb/s, 100 GHz DWDM signal (trunk side). It provides one 10 Gb/s port per card that can be provisioned for an STM64/OC-192 short reach (1310nm) signal, compliant with ITU-T G.707, G.709, ITU-T G.691, Telcordia GR-253-CORE, or to 10 GE BASE-LR, compliant to IEEE 802.3. The TXP_MR_10G card is tunable over two neighboring wavelengths in the 1550nm, ITU 100 GHz range. It is available in sixteen different versions, covering thirty-two different wavelengths in the 1550nm range.	1–6 and 12–17
TXP_MR_10E	The 10 Gb/s Transponder-100 GHz-Tunable xx.xx-xx.xx (TXP_MR_10E) card is a multirate transponder for the ONS 15454 platform. It processes one 10 Gb/s signal (client side) into one 10 Gb/s, 100 GHz DWDM signal (trunk side) that is tunable on four wavelength channels (ITU-T 100 GHz grid). You can provision this card in a linear configuration, BLSR, path protection, or a regenerator. The card can be used in the middle of BLSR or 1+1 spans when the card is configured for transparent termination mode. The TXP_MR_10E port features a 1550nm laser for the trunk port and an ONS-XC-10G-S1 XFP module for the client port and contains two transmit and receive connector pairs (labeled) on the card faceplate. The TXP_MR_10E card is tunable over four wavelengths in the 1550nm ITU 100-GHz range. They are available in eight versions of the card, covering thirty-two different wavelengths in the 1550nm range.	11–6 and 12–17
TXP_MR_2.5G	The 2.5 Gb/s Multirate Transponder-100 GHz-Tunable xx.xx-xx.xx (TXP_MR_2.5G) card processes one 8 Mb/s to 2.488 Gb/s signal (client side) into one 8 Mb/s to 2.5 Gb/s, 100 GHz DWDM signal (trunk side). It provides one long-reach STM-16/OC-48 port per card, compliant with ITU-T G.707, ITU-T G.709, ITU-T G.957, and Telcordia GR-253-CORE. The TXP_MR_2.5G card is tunable over four wavelengths in the 1550nm ITU 100-GHz range. They are available in eight versions of the card, covering thirty-two different wavelengths in the 1550nm range. The TXP_MR_2.5G card support 2R and 3R modes of operation where the client signal is mapped into a ITU-T G.709 frame.	1–6 and 12–17
TXPP_MR_2.5G	The 2.5 Gb/s Multirate Transponder-Protected-100 GHz-Tunable xx.xx-xx.xx (TXPP_MR_2.5G) card processes one 8 Mb/s to 2.488 Gb/s signal (client side) into two 8 Mb/s to 2.5 Gb/s, 100 GHz DWDM signals (trunk side). It provides two long-reach STM-16/OC-48 ports per card, compliant with ITU-T G.707, ITU-T G.957, and Telcordia GR-253-CORE. The TXPP_MR_2.5G card is tunable over four wavelengths in the 1550nm ITU 100-GHz range. They are available in eight versions of the card, covering thirty-two different wavelengths in the 1550nm range. The TXPP_MR_2.5G card support 2R and 3R modes of operation where the client signal is mapped into a ITU-T G.709 frame.	1–6 and 12–17

Table 6-12 Transponder and Muxponder Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
MXP_2.5G_10G	The 2.5 Gb/s-10 Gb/s Muxponder-100 GHz-Tunable xx.xx-xx.xx (MXP_2.5G_10G) card multiplexes/demultiplexes four 2.5 Gb/s signals (client side) into one 10 Gb/s, 100 GHz DWDM signal (trunk side). It provides one extended long-range STM-64/OC-192 port per card on the trunk side (compliant with ITU-T G.707, ITU-T G.709, ITU-T G.957, and Telcordia GR-253-CORE) and four intermediate- or short-range OC-48/STM-16 ports per card on the client side. The port operates at 9.95328 Gb/s over unamplified distances up to 80 km (50 miles) with different types of fiber such as C-SMF or dispersion compensated fiber limited by loss and/or dispersion. The port can also operate at 10.70923 Gb/s in ITU-T G.709 Digital Wrapper/FEC mode. Client ports on the MXP_2.5G_10G card are also interoperable with OC-1 (STS-1) fiber optic signals defined in Telcordia GR-253-CORE. An OC-1 signal is the equivalent of one DS3 channel transmitted across optical fiber. OC-1 is primarily used for trunk interfaces to phone switches in the United States. The MXP_2.5G_10G card is tunable over two neighboring wavelengths in the 1550nm, ITU 100 GHz range. It is available in sixteen different versions, covering thirty-two different wavelengths in the 1550nm range.	11–6 and 12–17
MXP_2.5G_10E	The 2.5 Gb/s-10 Gb/s Muxponder-100 GHz-Tunable xx.xx-xx.xx (MXP_2.5G_10E) card is a DWDM muxponder for the ONS 15454 platform that supports full optical transparency on the client side. The card multiplexes four 2.5 Gb/s client signals (4 x OC48/STM-16 SFP) into a single 10 Gb/s DWDM optical signal on the trunk side. The MXP_2.5G_10E provides wavelength transmission service for the four incoming 2.5 Gbps client interfaces. The MXP_2.5G_10E muxponder passes all SONET overhead bytes transparently. The MXP_2.5G_10E works with Optical Transparent Network (OTN) devices defined in ITU-T G.709. The card supports Optical Data Channel Unit 1 (ODU1) to Optical Channel Transport Unit (OTU2) multiplexing, an industry standard method for asynchronously mapping a SONET/SDH payload into a digitally wrapped envelope. The MXP_2.5G_10E card is tunable over four neighboring wavelengths in the 1550nm, ITU 100 GHz range. It is available in eight different versions, covering thirty-two different wavelengths in the 1550nm range. The MXP_2.5G_10E card is not compatible with the MXP_2.5G_10G card, which does not supports full optical transparency. The faceplate designation of the card is "4x2.5G 10E MXP."	1–6 and 12–17

Table 6-12 Transponder and Muxponder Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
MXP_MR_2.5G	The 2.5 Gb/s Multirate Muxponder-100 GHz-Tunable 15xx.xx-15yy.yy (MXP_MR_2.5G) card aggregates a mix and match of client Storage Area Network (SAN) service client inputs (GE, FICON, and Fibre Channel) into one 2.5 Gb/s STM-16/OC-48 DWDM signal on the trunk side. It provides one long-reach STM-16/OC-48 port per card and is compliant with Telcordia GR-253-CORE. The client interface supports the following payload types: • GE • 1G FC • 2G FC • 1G FICON • 2G FICON Because the card is tunable to one of four adjacent grid channels on a 100 GHz spacing, this card is available in eight versions covering thirty-two different wavelengths in the 1550 nm range.	1–6 and 12–17
MXPP_MR_2.5G	The 2.5 Gb/s Multirate Muxponder-Protected-100 GHz-Tunable 15xx.xx-15yy.yy (MXPP_MR_2.5G) card aggregates various client SAN service client inputs (GE, FICON, and Fibre Channel) into one 2.5 Gb/s STM-16/OC-48 DWDM signal on the trunk side. It provides two long-reach STM-16/OC-48 ports per card and is compliant with ITU-T G.957 and Telcordia GR-253-CORE. The client interface supports the following payload types: • GE • 1G FC • 2G FC • 1G FICON • 2G FICON Because the card is tunable to one of four adjacent grid channels on a 100 GHz spacing, this card is available in eight versions covering thirty-two different wavelengths in the 1550 nm range.	1–6 and 12–17

The TXP_MR_2.5G and TXPP_MR_2.5G cards support 2R and 3R modes of operation where the client signal is mapped into a ITU-T G.709 frame. The mapping function is simply done by placing a digital wrapper around the client signal. Only OC-48/STM-16 client signals are fully ITU-T G.709 compliant and the output bit rate depends on the input client signal. Table 6-13 shows the possible combinations of client interfaces, input bit rates, 2R and 3R modes, and ITU-T G.709 monitoring.

Table 6-13 2R and 3R Mode and ITU-T G.709 Compliance by Client Interface

Client Interface	Input Bit Rate	3R vs. 2R	ITU-T G.709
OC-48/STM-16	2.488 Gb/s	3R	On or Off
DV-6000	2.38 Gb/s	2R	NA

Table 6-13 2R and 3R Mode and ITU-T G.709 Compliance by Client Interface (continued)

Client Interface	Input Bit Rate	3R vs. 2R	ITU-T G.709
2 Gigabit Fiber Channel (2G-FC)/FICON	2.125 Gb/s	3R[1]	On or Off
High definition television (HDTV)	1.48 Gb/s	2R	NA
Gigabit Ethernet (GE)	1.25 Gb/s	3R	On or Off
1 Gigabit Fiber Channel (1G-FC)/FICON	1.06 Gb/s	3R	On or Off
OC-12/STM-4	622 Mb/s	3R	On or Off
OC-3/STM-1	155 Mb/s	3R	On or Off
ESCON	200 Mb/s	2R	NA
SDI/D1 Video	270 Mb/s	2R	NA

1. No monitoring.

The output bit rate is calculated for the trunk bit rate by using the 255/238 ratio as specified in ITU-T G.709 for OTU1. Table 6-14 lists the calculated trunk bit rates for the client interfaces with ITU-T G.709 enabled.

Table 6-14 Trunk Bit Rates With ITU-T G.709 Enabled

Client Interface	ITU-T G.709 Disabled	ITU-T G.709 Enabled
OC-48/STM-16	2.488 Gb/s	2.66 Gb/s
2G-FC	2.125 Gb/s	2.27 Gb/s
GE	1.25 Gb/s	1.34 Gb/s
1G-FC	1.06 Gb/s	1.14 Gb/s
OC-12/STM-3	622 Mb/s	666.43 Mb/s
OC-3/STM-1	155 Mb/s	166.07 Mb/s

Table 6-15 Ethernet Card Functions and Slot Assignments

Card	Description	Slot Assignment
CE-100T-8	The CE-100T-8 card provides eight RJ-45 10/100 Mb/s Ethernet ports as well as an RJ-45 console port, all of which are accessible at the faceplate. The CE-100T-8 card provides mapping of 10/100 Mb/s Ethernet traffic into SONET STS-12 payloads, making use of low order (VT1.5) virtual concatenation, high order (STS-1) virtual concatenation, and generic framing procedure (GFP), point-to-point protocol/high-level data link control (PPP/HDLC) framing protocols. It also supports the link capacity adjustment scheme (LCAS), which allows hitless dynamic adjustment of SONET link bandwidth. The circuit types supported are: • HO-CCAT • LO-VCAT with no HW-LCAS • LO-VCAT with HW-LCAS • STS-1-2v SW-LCAS with ML only Each 10/100 Ethernet port can be mapped to a SONET channel in increments of VT1.5 or STS-1 granularity, allowing an efficient transport of Ethernet and IP over the SONET infrastructure.	1–6 and 12–17
E100T-12[1]	Use the E100T-12 with the XC or XCVT cards. The E100T-12 card provides 12 switched, IEEE 802.3-compliant, 10/100BaseT Ethernet ports that can independently detect the speed of an attached device (autosense) and automatically connect at the appropriate speed. The ports auto configure to operate at either half or full duplex and determine whether to enable or disable flow control. You can also configure Ethernet ports manually. Each E100T-12 card supports standards-based, wire-speed, Layer 2 Ethernet switching between its Ethernet interfaces. The IEEE 802.1Q tag logically isolates traffic (typically subscribers). IEEE 802.1Q also supports multiple classes of service. The E100T-12 ports use RJ-45 interfaces.	1–6 and 12–17
E1000-2[1]	Use the E1000-2 with the XC or XCVT cards. Do not use the E1000-2 when the XC10G card is in use. The E1000-2 card provides two IEEE 802.3 compliant 1000 Mb/s ports for high-capacity customer LAN interconnections. Each port supports full-duplex operation. Each E1000-2 card supports standards-based, Layer 2 Ethernet switching between its Ethernet interfaces and SONET interfaces on the ONS 15454. The IEEE 802.1Q VLAN tag logically isolates traffic (typically subscribers). The E1000-2 card uses GBIC modular receptacles for the optical interfaces.	11–6 and 12–17
E100T-G	The E100T-G is the functional equivalent of the E100T-12, but will interoperate with the XC10G cross-connect. The E100T-G ports use RJ-45 interfaces.	1–6 and 12–17
E1000-2-G	The E1000-2-G is the functional equivalent of the E1000-2, but will interoperate with the XC10G cross-connect.	1–6 and 12–17

Table 6-15 Ethernet Card Functions and Slot Assignments

Card	Description	Slot Assignment
G1000-4[1]	Use the G1000-4 card with the XC-10G card. The G1000-4 card provides four ports of IEEE 802.3 compliant 1000-Mb/s interfaces. Each port supports full-duplex operation for a maximum bandwidth of OC-48 on each card. The circuit sizes supported are STS-1, STS-3c, STS-6c, STS-9c, STS-24c, STS-48c. The G1000-4 card uses GBIC modular receptacles for the optical interfaces.	1–6 and 12–17
G1K-4	The G1K-4 card provides four ports of IEEE 802.3 compliant 1000-Mb/s interfaces. Each interface supports full-duplex operation for a maximum bandwidth of 1 Gb/s or 2 Gb/s bidirectional per port, and 2.5 Gb/s or 5 Gb/s bidirectional per card. Each port auto negotiates for full duplex and 802.3z flow control. The circuit sizes supported are STS-1, STS-3c, STS-6c, STS-9c, STS-24c, STS-48c. The G1K-4 card uses GBIC modular receptacles for the optical interfaces.	1–6 and 12–17

Table 6-15 Ethernet Card Functions and Slot Assignments

Card	Description	Slot Assignment
ML100T-12	The ML100T-12 card provides 12 ports of IEEE 802.3 compliant 10/100 interfaces. Each card supports standards-based, wire-speed, Layer 2 Ethernet switching between its Ethernet ports. The IEEE 802.1Q tag and port-based VLANs logically isolate traffic (typically subscribers). Priority queuing is also supported to provide multiple classes of service. Each interface supports full-duplex operation for a maximum bandwidth of 200 Mb/s per port and 2.488 Gb/s per card. Each port independently detects the speed of an attached device (autosenses) and automatically connects at the appropriate speed. The ports auto configure to operate at either half or full duplex and can determine whether to enable or disable flow control. The card features two virtual packet over SONET (POS) ports with a maximum combined bandwidth of STS-48. The ports function in a manner similar to OC-N card ports, and each port carries an STS circuit with a size of STS-1, STS-3c, STS-6c, STS-9c, STS-12c, or STS-24c. The ML-Series POS ports supports virtual concatenation (VCAT) of SONET circuits and a software link capacity adjustment scheme (SW-LCAS). The ML-Series card supports a maximum of two VCAT groups with each group corresponding to one of the POS ports. Each VCAT group must be provisioned with two circuit members. An ML-Series card supports STS-1c-2v, STS-3c-2v and STS-12c-2v.	1–6 and 12–17 with the XC10G or 5, 6, 12, and 13 with the XC or XCVT
ML1000-2	The ML1000-2 card provides two ports of IEEE 802.3 compliant 1000-Mb/s interfaces. Each interface supports full-duplex operation for a maximum bandwidth of 2 Gbps per port and 4 Gbps per card. Each port auto configures for full duplex and IEEE 802.3z flow control. Each ML1000-2 card supports standards-based, Layer 2 Ethernet switching between its Ethernet ports and any other Ethernet or SONET trunk interfaces on the ONS 15454. The IEEE 802.1Q tag and port-based VLANS logically isolate traffic (typically subscribers). Priority queuing is also supported to provide multiple classes of service. Two queues are provided on card. Queue level is provisionable from 0 to 7. 0 to 3 map, and 4 to 7 map. The card features two virtual packet over SONET (POS) ports with a maximum combined bandwidth of STS-48. The ports function in a manner similar to OC-N card ports, and each port carries an STS circuit with a size of STS-1, STS-3c, STS-6c, STS-9c, STS-12c, or STS-24c. The ML-Series POS ports supports VCAT of SONET circuits and a software link capacity adjustment scheme (SW-LCAS). The ML-Series card supports a maximum of two VCAT groups with each group corresponding to one of the POS ports. Each VCAT group must be provisioned with two circuit members. An ML-Series card supports STS-1c-2v, STS-3c-2v and STS-12c-2v. The ML1000-2 card interfaces to Small Form Factor Pluggable (SFP) slots supporting SX and LS GBICs.	1–6 and 12–17 with the XC10G or 5, 6, 12, and 13 with the XC or XCVT

1. See http://cisco.com/en/US/products/hw/optical/ps2006/prod_eol_notices_list.html for the latest End-Of-Life and End-Of-Sale notices.

Table 6-16 Storage Area Network (SAN) Transport Card Function and Slot Assignment

Card	Description	Slot Assignment
FC_MR-4	The FC_MR-4 card is compatible with Software R4.6 and greater. The FC_MR-4 card uses pluggable Gigabit Interface Converters (GBICs) to transport non-SONET/SDH-framed, block-coded protocols over SONET/SDH. The FC_MR-4 enables four client Fibre Channel (FC) ports to be transported over SONET/SDH, encapsulating the frames using the ITU-T Generic Framing Protocol (GFP) format and mapping them into either T1X1 G.707-based Virtual Concatenated (VCAT) payloads or standard contiguously concatenated SONET/SDH payloads. The FC_MR-4 card has the following features: • Four FICON ports operating at 1 Gb/s or 2 Gb/s – All four ports can be operational at any time due to subrate support – Advanced Distance Extension capability (buffer-to-buffer credit spoofing) • Pluggable GBIC optics: – Dual rate (1G/2G): MM (550 m) and SM (10 km) – Single rate (1G): SX (550 m) and LX (10 km) • SONET/SDH support – Four 1.0625 Gbps FC channels can be mapped into SONET/SDH containers as small as STS1/VC3 (subrate), with a minimum of STS-24c/VC4-8c for full rate, and as large as STS48c/VC4-24c. – Four 2.125 Gbps FC channels can be mapped into SONET/SDH containers as small as STS1/VC3 (subrate), with a minimum of STS48c/VC4-24c for full rate, and as large as STS48c/VC4-24c. • Frame encapsulation: ITU-T G.7041 Generic Framing Procedure-Transparent (GFP-T) • High-order SONET/SDH virtual concatenation support (STS1-xv/VC-3 and STS3c-xv/VC-4) The card can be provisioned as part of any valid ONS 15454 SONET/SDH network topology, such as a path protection, bidirectional line switched ring (BLSR), or linear network topologies. The FC_MR-4 card can operate in two different modes: • Line Rate mode - This mode is backward compatible with the Software Release 4.6 Line Rate mode. • Enhanced mode - This mode supports subrate, distance extension, and other enhancements. The FC_MR-4 card reboots when a card mode changes (a traffic hit results). The FPGA running on the card upgrades to the required image. However, the FPGA image in the card's flash is not modified.	5, 6, 12, and 13 when used with XCVT cards or 1–6 and 12–17 when used with XC10G cards

Table 6-17 DWDM Card Functions and Slot Assignments

Card	Description	Slot Assignment
OSCM	The OSCM has one set of optical ports and one Ethernet port located on the faceplate. An optical service channel (OSC) is a bidirectional channel connecting all the nodes in a ring. The channel transports OSC overhead that is used to manage ONS 15454 DWDM networks. The OSC uses the 1510 nm wavelength and does not affect client traffic. The primary purpose of this channel is to carry clock synchronization and orderwire channel communications for the DWDM network. It also provides transparent links between each node in the network. The OSC is an OC-3 formatted signal. The OSCM is used in amplified nodes that include the OPT-BST booster amplifier. The OPT-BST includes the required OSC wavelength combiner and separator component. The OSCM cannot be used in nodes where you use OC-N cards, electrical cards, or cross-connect cards. The OSCM supports the following features: • OC-3/STM-1 formatted OSC • Supervisory data channel (SDC) forwarded to the TCC2/TCC2P cards for processing • Distribution of the synchronous clock to all nodes in the ring • 100BaseT far-end (FE) user data channel (UDC) • Monitoring functions such as orderwire support and optical safety	8 and 10
OSC-CSM	The OSC-CSM has three sets of optical ports and one Ethernet port located on the faceplate. The OSC-CSM is identical to the OSCM, but also contains a combiner and separator module in addition to the OSC module. The OSC-CSM is used in unamplified nodes. This means that the booster amplifier with the OSC wavelength combiner and separator is not required for OSC-CSM operation. The OSC-CSM supports the following features: • Optical combiner and separator module for multiplexing and demultiplexing the optical service channel to or from the wavelength division multiplexing (WDM) signal • OC-3/STM-1 formatted OSC • SDC forwarded to the TCC2/TCC2P cards for processing • Distribution of the synchronous clock to all nodes in the ring • 100BaseT FE UDC • Monitoring functions such as orderwire support • Optical safety: Signal loss detection and alarming, fast transmitted power shut down by means of an optical 1x1 switch • Optical safety remote interlock (OSRI), a feature capable of shutting down the optical output power • Automatic laser shutdown (ALS), a safety mechanism used in the event of a fiber cut	1–6 and 12–17

Table 6-17 DWDM Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
OPT-PRE	The OPT-PRE amplifier has five optical ports (three sets) located on the faceplate. The OPT-PRE is designed to support 64 channels at 50-GHz channel spacing, but Software R4.6 and R5.0 only supports 32 channels at 100 GHz. The OPT-PRE is a C-band DWDM, two-stage erbium-doped fiber amplifier (EDFA) with mid-amplifier loss (MAL) for allocation to a dispersion compensation unit (DCU). To control the gain tilt, the OPT-PRE is equipped with a built-in VOA. The VOA can also be used to pad the DCU to a reference value. The OPT-PRE features: • Fixed gain mode with programmable tilt • True variable gain • Fast transient suppression • Nondistorting low-frequency transfer function • Settable maximum output power • Fixed output power mode (mode used during provisioning) • MAL for fiber-based DCU • Amplified spontaneous emissions (ASE) compensation in fixed gain mode • Full monitoring and alarm handling with settable thresholds • Optical safety features that include signal loss detection and alarming, fast power down control and reduced maximum output power in safe power mode • Four signal photodiodes to monitor the input and output optical power of the two amplifier stages through CTC • An optical output port for external monitoring	1–6 and 12–17

Table 6-17 DWDM Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
OPT-BST	The OPT-BST amplifier has four sets of optical ports located on the faceplate. The OPT-BST is designed to support 64 channels at 50-GHz channel spacing, but Software R4.6 supports 32 channels at 100 GHz. The OPT-BST is a C-band DWDM EDFA with OSC add-and-drop capability. When an ONS 15454 MSTP has an OPT-BST installed, it is only necessary to have the OSCM to process the OSC. To control the gain tilt, the OPT-BST is equipped with a built-in VOA. The OPT-BST features include: • Fixed gain mode (with programmable tilt) • True variable gain • Fast transient suppression • Nondistorting low-frequency transfer function • Settable maximum output power • Fixed output power mode (mode used during provisioning) • ASE compensation in fixed gain mode • Full monitoring and alarm handling with settable thresholds • Optical safety features, including signal loss detection and alarming, fast power down control, and reduced maximum output power in safe power mode • OSRI, which is a software feature capable (through CTC) of shutting down the optical output power or reducing the power to a safe level (automatic power reduction) • ALS, which is a safety mechanism used in the event of a fiber cut **Note** Note: The optical splitters each have a ratio of 1:99. The result is that the power at the MON TX and MON RX ports is about 20 dB lower than the power at the COM TX and COM RX ports.	1–6 and 12–17
32MUX-O	The 32MUX-O has five sets of ports located on the faceplate. The 32-channel multiplexer card (32 MUX-O) multiplexes 32 100 GHz-spaced channels identified in the channel plan. The 32MUX-O is typically used in hub nodes and provides the multiplexing of 32 channels, spaced at 100 GHz, into one fiber before their amplification and transmission along the line. The 32MUX-O features include: • Arrayed waveguide grating (AWG) device that enables full multiplexing functions for the channels. • Each single-channel port is equipped with VOAs for automatic optical power regulation prior to multiplexing. In the case of electrical power failure, the VOA is set to its maximum attenuation for safety purposes. A manual VOA setting is also available. • Each single-channel port is monitored using a photodiode to enable automatic power regulation. • An additional optical monitoring port with 1/99 splitting ratio is available.	Two slots between Slots 1–5 and 12–16

Table 6-17 DWDM Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
32DMX-O	The 32DMX-O has five sets of ports located on the faceplate. The 32-Channel Demultiplexer (32 DMX-O) card demultiplexes 32 100 GHz-spaced channels identified in the channel plan. The 32DMX-O features include: • AWG that enables channel demultiplexing functions. • Each single-channel port is equipped with VOAs for automatic optical power regulation after demultiplexing. In the case of electrical power failure, the VOA is set to its maximum attenuation for safety purposes. A manual VOA setting is also available. • Each single-channel port is monitored using a photodiode to enable automatic power regulation. **Note** Note: In contrast, the single-slot 32DMX card does not have VOAs on each drop port for optical power regulation. The 32DMX optical demultiplexer module is used in conjunction with the 32-Channel Wavelength Selective Switch (32WSS) card in ONS 15454 Multiservice Transport Platform (MSTP) nodes.	Two slots between Slots 1–5 and 12–16
32DMX	The 32DMX has five sets of ports located on the faceplate. The 32-Channel Demultiplexer card (32DMX) is a single-slot optical demultiplexer. The card receives an aggregate optical signal on its COM RX port and demultiplexes it into to 32 100-GHz-spaced channels. The 32DMX card works in conjunction with the 32WSS card to create a software-controlled network element with ROADM functionality. ROADM functionality requires two 32DMX single-slot cards and two 32WSS double-slot cards (six slots in the ONS 15454 chassis). Equipped with ROADM functionality, ONS 15454 MSTP nodes can be configured at the optical channel level using CTC, Cisco MetroPlanner, and Cisco Transport Manager (CTM). Both the 32DMX card and 32WSS card utilize planar lightwave circuit (PLC) technology to perform wavelength-level processing. The 32DMX includes these high-level features: • COM RX port: COM RX is the input port for the aggregate optical signal being demultiplexed. This port is supported by both a VOA for optical power regulation and a photodiode for optical power monitoring. • DROP ports (1-32): On its output, the 32DMX provides 32 drop ports that are typically used for dropping channels within the ROADM node. Each drop port has a photodiode for optical power monitoring. Unlike the two-slot 32DMX-O demultiplexer, the drop ports on the 32DMX do not have a VOA per channel for optical power regulation.	1–6 and 12–17

Table 6-17 DWDM Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
4MD-xx.x	The 4MD-xx.x card has five sets of ports located on the faceplate. The 4-Channel Multiplexer/Demultiplexer (4MD-xx.x) card multiplexes and demultiplexes four 100 GHz-spaced channels identified in the channel plan. The 4MD-xx.x card is designed to be used with band OADMs (both AD-1B-xx.x and AD-4B-xx.x). There are eight versions of this card that correspond with the eight sub-bands specified in Table 4-17. The 4MD-xx.x has the following features implemented inside a plug-in optical module: • Passive cascade of interferential filters perform the channel multiplex/demultiplex function. • Software controlled VOAs at every port of the multiplex section to regulate the optical power of each multiplexed channel. • Software monitored photodiodes at the input and output multiplexer and demultiplexer ports for power control and safety purposes. • Software-monitored "virtual photodiodes" at the common DWDM output and input ports. A "virtual photodiode" is a firmware calculation of the optical power at that port. This calculation is based on the single channel photodiode reading and insertion losses of the appropriated paths.	1–6 and 12–17
AD-1C-xx.x	The AD-1C-xx.x card has three sets of ports located on the faceplate. The 1-Channel OADM (AD-1C-xx.x) card passively adds or drops one of the 32 channels utilized within the 100 GHz-spacing of the DWDM card system. There are thirty-two versions of this card, each designed only for use with one wavelength. Each wavelength version of the card has a different part number. The AD-1C-xx.x has the following internal features: • Two cascaded passive optical interferential filters perform the channel add and drop functions. • One software-controlled VOA regulates the optical power of the inserted channel. • Software-controlled VOA regulates the insertion loss of the express optical path. • Internal control of the VOA settings and functions, photodiode detection, and alarm thresholds. • Software-monitored virtual photodiodes (firmware calculations of port optical power) at the common DWDM output and input ports.	1–6 and 12–17

Table 6-17 DWDM Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
AD-2C-xx.x	The AD-2C-xx.x card has four sets of ports located on the faceplate. The 2-Channel OADM (AD-2C-xx.x) card passively adds or drops two adjacent 100 GHz channels within the same band. There are sixteen versions of this card, each designed for use with one pair of wavelengths. The card bidirectionally adds and drops in two different sections on the same card to manage signal flow in both directions. Each version of the card has a different part number. The AD-2C-xx.x cards are provisioned for the channel pairs in Table 4-18. In this table, channel IDs are given rather than wavelengths. The AD-2C-xx.x has the following features: • Passive cascade of interferential filters perform the channel add and drop functions. • Two software-controlled VOAs in the add section, one for each add port, regulate the optical power of inserted channels. • Software-controlled VOAs regulate insertion loss on express channels. • Internal control of the VOA settings and functions, photodiode detection, and alarm thresholds. • Software-monitored virtual photodiodes (firmware calculation of port optical power) at the common DWDM output and input ports.	1–6 and 12–17
AD-4C-xx.x	The AD-4C-xx.x card has six sets of ports located on the faceplate. The 4-Channel OADM (AD-4C-xx.x) card passively adds or drops all four 100 GHz-spaced channels within the same band. There are eight versions of this card, each designed for use with one band of wavelengths. The card bidirectionally adds and drops in two different sections on the same card to manage signal flow in both directions. There are eight versions of this card with eight part numbers. The AD-4C-xx.x cards are provisioned for the channel pairs in Table 4-19. The AD-4C-xx.x has the following features: • Passive cascade of interferential filters perform the channel add and drop functions. • Four software-controlled VOAs in the add section, one for each add port, regulate the optical power of inserted channels. • Two software-controlled VOAs regulate insertion loss on express and drop path, respectively. • Internal control of the VOA settings and functions, photodiode detection, and alarm thresholds. • Software-monitored virtual photodiodes (firmware calculation of port optical power) at the common DWDM output and input ports.	1–6 and 12–17

Table 6-17 DWDM Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
AD-1B-xx.x	The AD-1B-xx.x card has three sets of ports located on the faceplate. The 1-Band OADM (AD-1B-xx.x) card passively adds or drops a single band of four adjacent 100 GHz-spaced channels. There are eight versions of this card with eight different part numbers, each version designed for use with one band of wavelengths. The card bidirectionally adds and drops in two different sections on the same card to manage signal flow in both directions. This card can be used when there is asymmetric adding and dropping on each side (east or west) of the node; a band can be added or dropped on one side but not on the other. The AD-1B-xx.x has the following features: • Passive cascaded interferential filters perform the channel add and drop functions. • Two software-controlled VOAs regulate the optical power flowing in the express and drop OADM paths (drop section). • Output power of the dropped band is set by changing the attenuation of the VOA drop. • The VOA express is used to regulate the insertion loss of the express path. • Internal controlled VOA settings and functions, photodiode detection, and alarm thresholds. • Software-monitored virtual photodiode (firmware calculation of port optical power) at the common DWDM output.	1–6 and 12–17
AD-4B-xx.x	The AD-4B-xx.x card has six sets of ports located on the faceplate. The 4-Band OADM (AD-4B-xx.x) card passively adds or drops four bands of four adjacent 100 GHz-spaced channels. There are two versions of this card with different part numbers, each version designed for use with one set of bands. The card bidirectionally adds and drops in two different sections on the same card to manage signal flow in both directions. This card can be used when there is asymmetric adding and dropping on each side (east or west) of the node; a band can be added or dropped on one side but not on the other. The AD-4B-xx.x cards are provisioned for the channel pairs in Table 4-20. The AD-4B-xx.x has the following features: • Five software-controlled VOAs regulate the optical power flowing in the OADM paths. • Output power of each dropped band is set by changing the attenuation of each VOA drop. • The VOA express is used to regulate the insertion loss of the express path. • Internal controlled VOA settings and functions, photodiode detection, and alarm thresholds. • Software-monitored virtual photodiode (firmware calculation of port optical power) at the common DWDM output port.	1–6 and 12–17

Table 6-17 DWDM Card Functions and Slot Assignments (continued)

Card	Description	Slot Assignment
32WSS	The 32WSS card has seven sets of ports located on the faceplate. The card takes up two slots and can operates in Slots 1-2, 3-4, 5-6, or in Slots 12-13, 14-15, or 16-17. The 32-Channel Wavelength Selective Switch (32WSS) card performs channel add/drop processing within the ONS 15454 DWDM node. The 32WSS works in conjunction with the 32DMX to implement ROADM functionality. Equipped with ROADM functionality, the ONS 15454 DWDM can be configured to add or drop individual optical channels using CTC, Cisco MetroPlanner, and CTM. A ROADM network element utilizes two 32WSS cards (two slots each) and two 32DMX cards (one slot each), for a total of six slots in the chassis. The 32WSS has six types of ports: • ADD RX ports (1-32): These ports are used for adding channels. Each add channel is associated with an individual switch element that selects whether an individual channel is added. Each add port has optical power regulation provided by a VOA. • EXP RX port: The EXP RX port receives an optical signal from another 32WSS module in the same network element. • EXP TX port: The EXP TX port sends an optical signal to the other 32WSS module within the network element. • COM TX port: The COM TX port sends an aggregate optical signal to a booster card (for example, OPT_BST) for transmission outside of the network element. • COM RX port: The COM RX port receives the optical signal from a pre-amplifier and sends it to the optical splitter. • DROP TX port: The DROP TX port sends the split off optical signal that contains drop channels to the 32DMX card where the channels are further processed and dropped.	1–2, 3–4, 5–6, and 12–13, 14–15, or 16–17

LED Indicators

TCC+, TCC2, and TCC2P Cards

The TCC+, TCC2, and TCC2P (TCC) cards have the following LED indicators on the faceplates.

Card-Level Indicators

- Red FAIL LED - This LED is lit during reset. The FAIL LED flashes during the boot and write process. Replace the card if the FAIL LED persists.
- ACT/STBY LED - The ACT/STBY (Active/Standby) LED indicates the TCC is in active mode when the LED is green, and in standby mode when it is yellow. The ACT/STBY LED also provides the timing reference and shelf control. When the active TCC is writing to its database to the standby TCC database, the card LEDs blink. To avoid memory corruption, do not remove the TCC when the active or standby LED is blinking.

Network-Level Indicators

- Red CRIT LED - Indicates critical alarms in the network at the local terminal.
- Red MAJ LED - Indicates major alarms in the network at the local terminal.
- Yellow MIN LED - Indicates a minor alarm in the network at the local terminal.
- Red REM LED - Provides first-level alarm isolation. The remote (REM) LED turns red when an alarm is present in one or several of the remote terminals.
- Green SYNC LED - Indicates that node timing is synchronized to an external reference.
- Green ACO LED - After pressing the alarm cutoff (ACO) button, the green ACO LED illuminates. The ACO button opens the audible alarm closure on the backplane. ACO state is stopped if a new alarm occurs. After the originating alarm is extinguished, the ACO LED and audible alarm control are reset.

XC, XCVT, and XC10G Cards

The XC, XCVT, and XC10G (cross-connect) cards have the following card-level LED indicators on the faceplates:

- Red FAIL LED - The red FAIL LED indicates that the card's processor is not ready. If the FAIL LED persists, replace the card.
- ACT/STBY LED - The ACT/STBY (Active/Standby) LED turns green when the XC card is active and carrying traffic and amber when it is in the standby mode as a protect card.

Electrical, Optical, and DWDM Cards

The electrical, optical, and DWDM cards have the following card-level LED indicators:

- Red FAIL LED - The red FAIL LED indicates that the card's processor is not ready. If the FAIL LED persists, replace the card.
- ACT/STBY LED - The ACT/STBY (Active/Standby) LED turns green when the card is active and carrying traffic and amber when it is in the standby mode as a protect card.
- Amber SF LED - The amber SF LED indicates a signal failure or condition such as port LOS, LOF, AIS, or high BERs. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

Port-level indicators include the following:

- Bicolor LEDs show the status per port. The LEDs shows green if the port is available to carry traffic, is provisioned as in-service, and is part of a protection group, in the active mode. You can also find the status of the ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to quickly view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot.
- The OSCM has three OC-3 optical ports located on the faceplate. One long-reach OSC transmits and receives the OSC to and from another DWDM node. Both data communications network (DCN) data and far-end (FE) payload are carried on this link. Two intermediate-reach OC-3 ports are used for DCN extension.
- The OSC-CSM has a UC port and three sets of ports located on the faceplate.
- The OPT-PRE amplifier has five optical ports located on the faceplate. MON is the output monitor port. COM Rx is the input signal port. COM Tx is the output signal port. DCC Rx is the MAL input signal port. DCC Tx is the MAL output signal port.

- The OPT-BST amplifier has eight optical ports located on the faceplate. MON Rx is the output monitor port (receive section). MON Tx is the output monitor port. COM Rx is the input signal port. LINE Tx is the output signal port. LINE Rx is the input signal port (receive section). COM Tx is the output signal port (receive section). OSC Rx is the OSC add input port. OSC Tx is the OSC drop output port.
- The 32MUX-O and 32DMX-O cards have five sets of ports located on the faceplate. COM Tx is the line output. MON is the optical monitoring port. The xx.x-yy.y Rx ports represent the four groups of 8 channels ranging from xx.x wavelength to yy.y wavelength according to the channel plan.
- The 32DMX card has five ports located on the faceplate. The port labeled COM RX is the line input (it typically receives DROP TX from the 32WSS module). The TX ports are 32 drop ports. The connectors provide four groups of eight channels ranging from xx.x wavelength to yy.y wavelength according to the channel plan.
- The 4MD-xx.x card has five sets of ports located on the faceplate. COM Rx is the line input. COM Tx is the line output. The 15xx.x Tx ports represent demultiplexed channel Outputs 1 to 4. The 15xx.x Rx ports represent multiplexed channel Inputs 1 to 4.
- The AD-1C-xx.x has six LC-PC-II optical ports: two for add/drop channel client input and output, two for express channel input and output, and two for communication.
- The AD-2C-xx.x card has eight LC-PC-II optical ports: four for add/drop channel client input and output, two for express channel input and output, and two for communication.
- The AD-4C-xx.x card has 12 LC-PC-II optical ports: eight for add/drop channel client input and output, two for express channel input and output, and two for communication.
- The AD-1B-xx.x has six LC-PC-II optical ports: two for add/drop channel client input and output, two for express channel input and output, and two for communication.
- The AD-4B-xx.x has 12 LC-PC-II optical ports: eight for add/drop band client input and output, two for express channel input and output, and two for communication.
- The 32WSS card has five sets of ports located on the faceplate. COM RX is the line input, COM TX is the line output, EXP RX is the port where a channel can be added or passed through, EXP TX is the port that passes through the channels that are not dropped, and DROP TX is the port for the dropped channels. The xx.x-yy.y TX ports represent the four groups of eight channels ranging from xx.x wavelength to yy.y wavelength according to the channel plan.
- Each FC_MR-4 port has a corresponding ACT/LNK LED. The ACT/LNK LED is solid green if the port is available to carry traffic, is provisioned as in-service, and in the active mode. The ACT/LNK LED is blinking green if the port is carrying traffic.

Ethernet Cards

The Ethernet cards have the following card-level LED indicators:

- Red FAIL LED - The red FAIL LED indicates the card's processor is not ready or a catastrophic software failure occurred on the Ethernet card. As part of the boot sequence, the FAIL LED is turned on, and it turns off when the software is deemed operational.
- ACT/STBY LED - ACT/STBY LED provides the operational status of the card. When the LED is green it indicates that the Ethernet card is active and the software is operational. The LED is amber when the card is in the standby mode.

Port-level Indicators include the following:

- LED Off - No link exists to the Ethernet port.

- Steady Amber LED - A link exists to the Ethernet port, but traffic flow is inhibited. For example, an unconfigured circuit, an error on line, or a non-enabled port may inhibit traffic flow.
- Solid Green LED - A link exists to the Ethernet port, but no traffic is carried on the port.
- Flashing Green LED - A link exists to the Ethernet port and traffic is being carried on the port. The LED flash rate reflects the traffic rate for the port.

Card Port and Connector Information

Table 6-18 Card Port and Connector Information

Plug-in Card	Number of Ports	Compliant Standard	Line Rate	Connector Type	Connector Location
DS1-14	14	GR-499-CORE	1.544 Mb/s	SMB with Balun adapter or AMP Champ	Backplane EIA
DS1N-14	14	GR-499-CORE	1.544 Mb/s	SMB with Balun or AMP Champ[1]	NA
DS3-12	12	GR-499-CORE	44.736 Mb/s	SMB or BNC[1]	Backplane EIA
DS3N-12	12	GR-499-CORE	44.736 Mb/s	SMB or BNC[1]	NA
DS3-12E	12	GR-499-CORE	44.736 Mb/s	SMB or BNC[1]	Backplane EIA
DS3N-12E	12	GR-499-CORE	44.736 Mb/s	SMB or BNC[1]	Backplane EIA
DS3/EC1-48	48	GR-499-CORE	44.736 Mb/s	SMB or BNC[1]	Backplane EIA
DS3XM-6	6	GR-499-CORE M13	44.736 Mb/s	SMB or BNC[1]	Backplane EIA
DS3XM-12	12	GR-499-CORE M13	44.736 Mb/s	SMB or BNC[1]	Backplane EIA
EC1-12	12	GR-253-CORE	51.84 Mb/s	SMB or BNC[1]	Backplane EIA
OC3-4/STM1 (All)	4	GR-253-CORE	155.52 Mb/s	SC	Faceplate
OC3-8/STM1	8	GR-253-CORE	155.52 Mb/s	LC	Faceplate
OC12/STM4	1	GR-253-CORE	622.08 Mb/s	SC	Faceplate
OC12-4/STM4	4	GR-253-CORE	622.08 Mb/s	SC	Faceplate
OC48/STM16 (All versions)	1	GR-253-CORE	2488.32 Mb/s	SC	Faceplate
OC48/STM16-AS	1	GR-253-CORE	2488.32 Mb/s	SC	Faceplate
OC48/STM16-ITU (100 GHz & 200 GHz)	1	GR-253-CORE ITU-T G.692 ITU-T G.958	2488.32 Mb/s	SC	Faceplate
OC-192/STM64[2] (All versions)	1	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	SC	Faceplate
OC-192/STM64-ITU[2] (100 GHz)	1	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	SC	Faceplate

Table 6-18 Card Port and Connector Information (continued)

Plug-in Card	Number of Ports	Compliant Standard	Line Rate	Connector Type	Connector Location
MXP-2.5-10G[2]	4-Client 1-Trunk	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	Client: SFP Trunk: LC	Faceplate
MXP_2.5G_10E[2]	4-Client 1-Trunk	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	Client: SFP Trunk: LC	Faceplate
TXP-MR-10G[2]	1-Client 1-Trunk	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC	Faceplate
TXP-MR-10E[2]	1-Client 1-Trunk	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC	Faceplate
TXP_MR_2.5G	1-Client 1-Trunk	GR-253-CORE ITU-T G.707 ITU-T G.957	2.488 Gb/s	Client: SFP Trunk: LC	Faceplate
TXPP_MR_2.5G	1-Client 2-Trunk	GR-253-CORE ITU-T G.707 ITU-T G.957	2.488 Gb/s	Client: SFP Trunk: LC	Faceplate
FC_MR-4	4	GR-253-CORE ITU-T G.957	1.0625- or 2.125-Gb/s	GBIC-SC	Faceplate
E100T-12	12	IEEE 802.3	100 Mb/s	RJ-45	Faceplate
E1000-2	2	IEEE 802.3	1000 Mb/s	GBIC-SC	Faceplate
E100T-G	12	IEEE 802.3	100 Mb/s	RJ-45	Faceplate
E1000-2-G	2	IEEE 802.3	1000 Mb/s	GBIC-SC	Faceplate
G1000-4	4	IEEE 802.3	1000 Mb/s	GBIC-SC	Faceplate
G1K-4	4	IEEE 802.3	1000 Mb/s	GBIC-SC	Faceplate
ML100T-12	12	IEEE 802.3	100 Mb/s	RJ-45	Faceplate
ML1000-2	2	IEEE 802.3	1000 Mb/s	LC-SFP	Faceplate
OSCM	2	GR-253-CORE ITU-T G.957	155.52 Mb/s	LC	Faceplate
OSC-CSM	4	GR-253-CORE ITU-T G.957	UDC: FE Optical: 155.52 Mb/s	UDC: RJ45 Optical: LC	Faceplate
OPT-PRE	5	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate

Table 6-18 Card Port and Connector Information (continued)

Plug-in Card	Number of Ports	Compliant Standard	Line Rate	Connector Type	Connector Location
OPT-BST	4	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate
32MUX-O	5	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate
32DMX-O	5	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate
32DMX	5	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate
4MD-xx.x	5	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate
AD-1C-xx.x	3	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate
AD-2C-xx.x	4	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate
AD-4C-xx.x	6	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate
AD-1B-xx.x	3	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate
AD-4B-xx.x	6	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate

Table 6-18 Card Port and Connector Information (continued)

Plug-in Card	Number of Ports	Compliant Standard	Line Rate	Connector Type	Connector Location
32WSS	7	GR-253-CORE ITU-T G.707 ITU-T G.957	9.95328 Gb/s	LC-UPC/2	Faceplate

1. When used as a protect card, the card does not have a physical external connection. The protect card connects to the working card(s) through the backplane and becomes active when the working card fails. The protect card then uses the physical connection of the failed card.
2. Warning: Class 1 (21 CFR 1040.10 and 1040.11) and Class 1M (IEC 60825-1 2001-01) laser products. Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not stare into the beam or 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. Use of controls or adjustments, or performance of procedures other than those specified may result in hazardous radiation exposure.

Card Compatibility

The following tables list the software release and common card compatibility for each plug-in card. Table cells with dashes (—) mean cards are not compatible with the listed software release or cross-connect card.

See http://cisco.com/en/US/products/hw/optical/ps2006/prod_eol_notices_list.html for the latest list of End-Of-Life and End-Of-Sale notices.

Table 6-19 Common Card Software and Hardware Compatibility

Card	R3.0.1	R3.1.x	R3.2.x	R3.3.x	R3.4.x	R4.0.x	R4.1.x	R4.6.x	R5.0.x	XC	XCVT	XC10G[1]
TCC+	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	Yes	Yes	Yes
TCC2	—	—	—	—	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TCC2P	—	—	—	—	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes
XC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	Yes	Yes	—
XCVT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	Yes	Yes	—
XC10G[1]	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	Yes
AIC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AIC-I	—	—	—	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AEP	—	—	—	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

1. The XC10G card requires a TCC+/TCC2/TCC2P card, Software R3.1 or later, and the 15454-SA-ANSI or 15454-SA-HD shelf assemblies to operate.

Table 6-20 Electrical Card Software and Cross-Connect Card Compatibility

Card	R3.1.x	R3.2.x	R3.3.x	R3.4.x	R4.0.x	R4.1.x	R4.6.x	R5.0.x	XC	XCVT	XC10G
EC1-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DS1-14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DS1N-14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DS3-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DS3N-12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DS3-12E	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 6-20 Electrical Card Software and Cross-Connect Card Compatibility

Card	R3.1.x	R3.2.x	R3.3.x	R3.4.x	R4.0.x	R4.1.x	R4.6.x	R5.0.x	XC	XCVT	XC10G
DS3N-12E	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DS3/EC1-48	—	—	—	—	—	—	—	Yes	Yes	Yes	Yes
DS3XM-6	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DS3XM-12	—	—	—	—	—	—	—	Yes	Yes	Yes	Yes

Table 6-21 Optical Card Software and Cross-Connect Card Compatibility

Card	R3.0.1	R3.1.x	R3.2.x	R3.3.x	R3.4.x	R4.0.x	R4.1.x	R4.6.x	R5.0.x	XC	XCVT	XC10G
OC3-IR-4/STM1-SH-1310	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OC-3-IR-8/STM 1-SH-1310	-	-	-	-	-	Yes	Yes	Yes	Yes	-	-	Yes in slots 1-4 and 14-17
OC12-IR/STM4-SH-1310	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OC12-LR/STM4-LH-1310	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OC12-LR/STM4-LH-1550	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OC12-IR-4/STM 4-SH-1310	—	—	—	Yes	Yes	Yes	Yes	Yes	Yes	—	—	Yes in slots 1-4 and 14-17
OC48-IR-1310	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OC48-LR-1550	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OC48-IR/STM1 6-SH-AS-1310	—	Yes[1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes, in slots 5, 6, 12, and 13	Yes, in slots 5, 6, 12, and 13	Yes[1]
OC48-LR/STM1 6-LH-AS-1550	—	Yes[1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes, in slots 5, 6, 12, and 13	Yes, in slots 5, 6, 12, and 13	Yes[1]
OC48-ELR/STM 16-EH-100GHz	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OC48-ELR-200 GHz	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OC192-SR/STM 64-IO-1310	—	—	—	—	—	Yes	Yes	Yes	Yes	—	—	Yes[1]
OC192-IR/STM 64-SH-1550	—	—	—	—	—	Yes	Yes	Yes	Yes	—	—	Yes[1]

Table 6-21 Optical Card Software and Cross-Connect Card Compatibility (continued)

Card	R3.0.1	R3.1.x	R3.2.x	R3.3.x	R3.4.x	R4.0.x	R4.1.x	R4.6.x	R5.0.x	XC	XCVT	XC10G
OC192-LR/STM 64-LH-1550	—	Yes[1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	Yes[1]
OC192-LR/STM 64-LH-ITU	—	—	—	—	—	Yes	Yes	Yes	Yes	—	—	Yes[1]

1. The XC10G card requires a TCC+/TCC2/TCC2P card, Software R3.1 or later, and the 15454-SA-ANSI or 15454-SA-HD shelf assemblies to operate.

Table 6-22 Ethernet Card Software and Cross-Connect Card Compatibility

Card	R3.0.1	R3.1.x	R3.2.x	R3.3.x	R3.4.x	R4.0.x	R4.1.x	R4.6.x	R5.0.x	XC	XC-VT	XC10G
CE-100T-8	—	—	—	—	—	—	—	—	Yes	—	—	Yes
E100T-12	Yes	Yes	Yes	yes	Yes	Yes	Yes	Yes	Yes	—	Yes	—
E1000-2	Yes	Yes	Yes	yes	Yes	Yes	Yes	Yes	Yes	—	Yes	—
E100T-G	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes[1]
E1000-2-G	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes[1]
G1000-4	—	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes[1]
G1K-4	—	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ML100T-12	—	—	—	—	—	Yes	Yes	Yes	Yes	Yes, in slots 5, 6, 12, and 13	Yes, in slots 5, 6, 12, and 13	Yes
ML1000-2	—	—	—	—	—	Yes	Yes	Yes	Yes	Yes, in slots 5, 6, 12, and 13	Yes, in slots 5, 6, 12, and 13	Yes

1. To use Ethernet cards with the XC10G card, select either the E100T-G, E1000-2-G, G1000-4, or G1K4 card. Do not use the E100T-12 card or E1000-2 card with the XC10G.

Table 6-23 SAN Card Software and Common Card Compatibility

Card	R4.6.x	R5.0.x	XC	XC-VT	XC10G
FC_MR-4	Yes	Yes	Yes, in slots 5, 6, 12, and 13	Yes, in slots 5, 6, 12, and 13	Yes

Table 6-24 Transponder/Muxponder Card Software and Common Card Compatibility

Card	R4.5.x	R4.6.x	R4.7.x	R5.0.x	TCC2	TCC2P	AIC/AIC-I	XC10G[1]
TXP_MR-10G	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TXP_MR_10E	-	-	Yes	Yes	Yes	Yes	Yes	Yes
TXP_MR_2.5G	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TXPP_MR_2.5G	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 6-24 Transponder/Muxponder Card Software and Common Card Compatibility

Card	R4.5.x	R4.6.x	R4.7.x	R5.0.x	TCC2	TCC2P	AIC/AIC-I	XC10G[1]
MXP_2.5_10G	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MXP_2.5_10E	-	-	Yes	Yes	Yes	Yes	Yes	Yes
MXP_MR_2.5G	-	-	Yes	Yes	Yes	Yes	Yes	Yes
MXPP_MR_2.5G	-	-	Yes	Yes	Yes	Yes	Yes	Yes

1. XC10G cannot be used with Release 4.5, but is supported in Release 4.6 and higher for hybrid MSTP/MSPP configurations.

Table 6-25 DWDM Card Software and Common Card Compatibility

Card	R4.5.x	R4.6.x	R4.7.x	R5.0.x	TCC2	TCC2P	AIC/AIC-I	XC10G[1]
OSCM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OSC-CSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OPT-PRE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OPT-BST	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32MUX-O	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32DMX-O	Yes	Yes	Yes	yes	Yes	Yes	Yes	Yes
32DMX	—	—	Yes	Yes	Yes	Yes	Yes	Yes
4MD-xx.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AD-1C-xx.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AD-2C-xx.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AD-4C-xx.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AD-1B-xx.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AD-4B-xx.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32WSS	—	—	Yes	Yes	Yes	Yes	Yes	Yes

1. XC10G cannot be used with Release 4.5, but is supported in Release 4.6 and higher for hybrid MSTP/MSPP configurations.

GBIC and SFP Connectors

The ONS 15454 Ethernet cards use industry standard small form-factor pluggable connectors (SFPs) and Gigabit Interface Converter (GBIC) modular receptacles. The ML-Series Gigabit Ethernet cards use standard Cisco SFPs. The Gigabit E-Series card and the G-Series card use standard Cisco GBICs. With Software Release 4.1 and higher, G-Series cards can also be equipped with dense wavelength division multiplexing (DWDM) and coarse wavelength division multiplexing (CWDM) GBICs to function as Gigabit Ethernet transponders.

For all Ethernet cards, the type of GBIC or SFP plugged into the card is displayed in CTC and TL1. Cisco offers SFPs and GBICs as separate orderable products.

GBIC and SFP Card Compatibility

Caution Only use GBICs and SFPs certified for use in Cisco Optical Networking Systems. The qualified Cisco GBIC and SFP pluggable module's top assembly numbers (TANs) are provided in Table 6-50.

The technical specifications for Cisco's GBICs and SFPs are listed in Table 6-26.

Table 6-26 GBIC and SFP Specifications

Specifications	1000BaseSX	1000BaseLX	1000BaseZX	1000BaseSX SFP	1000BaseLX SFP
General:					
Connector	SC	SC	SC	SFP	SFP
Wavelength	850 nm	1300 nm	1550 nm	850 nm	1300 nm
Minimum Cable Distance[1]	2 m	2 m	2 m	2 m	2 m
Maximum Cable Distance	1,804 ft (550 m)	32,810 ft. (10 km)	262,480 ft. (80 km)	1,804 ft (550 m)	32,810 ft. (10 km)
Port Cabling					
Wavelength	850 nm	1300 nm	1550 nm	850 nm	1300 nm
Fiber Type	MMF	SMF	SMF	MMF	SMF
Core Size (microns)	62.5	62.5	Not Conditional	62.5	62.5
Modal Bandwidth	160 MHz/km	500 MHz/km	NA	160 MHz/km	500 MHz/km
Maximum Distance	220 m	550 m	80 km	220 m	550 m
Fiber Loss Budgets:					
Transmit Minimum	-9.5 dBm	-11 dBm	0 dBm	-9.5 dBm	-11 dBm
Transmit Maximum	-4 dBm	-3 dBm	4.77 dBm	-4 dBm	-3 dBm
Receive Minimum	-17 dBm	-19 dBm	-24 dBm	-17 dBm	-19 dBm
Receive Maximum	0 dBm	-3 dBm	-1 dBm	0 dBm	-3 dBm
Operating Temperature	-5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)	-5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)	-5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)	• Commercial: -5° to 70°C • Extended: -5°C to +85°C • I-Temp: -40°C to +85°C	• Commercial: -5° to +70°C • Extended: -5°C to +85°C • I-Temp: -40°C to +85°C
Dimensions:					
Height	0.39 in.	0.39 in.	0.39 in.	0.03 in.	0.03 in.

Table 6-26 GBIC and SFP Specifications (continued)

Specifications	1000BaseSX	1000BaseLX	1000BaseZX	1000BaseSX SFP	1000BaseLX SFP
Width	1.18 in.	1.18 in.	1.18 in.	0.53 in.	0.53 in.
Depth	2.56 in.	2.56 in.	2.56 in.	2.22 in.	2.22 in.
IEEE Compliant	Yes	Yes	Yes	Yes	Yes

1. When using an LX SFP or LX GBIC with multimode fiber, you must install a mode-conditioning patch cord between the SFP/GBIC and the multimode fiber cable on both the transmit and receive ends of the link. The mode-conditioning patch cord is required for link distances less than 100 m (328 feet) or greater than 300 m (984 feet). The mode-conditioning patch cord prevents overdriving the receiver for short lengths of multimode fiber and reduces differential mode delay for long lengths of multimode fiber.

DWDM and CWDM GBICs

DWDM (15454-GBIC-xx.x, 15454E-GBIC-xx.x) and CWDM (15454-GBIC-xxxx, 15454E-GBIC-xxxx) GBICs operate in the ONS 15454 G-Series card when the card is configured in Gigabit Ethernet Transponding mode or in Ethernet over SONET mode. DWDM and CWDM GBICs are both wavelength division multiplexing (WDM) technologies and operate over single-mode fibers with SC connectors. Cisco CWDM GBIC technology uses a 20 nm wavelength grid and Cisco ONS 15454 DWDM GBIC technology uses a 1 nm wavelength grid. CTC displays the specific wavelengths of the installed CWDM or DWDM GBICs. DWDM wavelengths are spaced closer together and require more precise lasers than CWDM. The DWDM spectrum allows for optical signal amplification.

The DWDM and CWDM GBICs receive across the full 1300 nm and 1500 nm bands, which includes all CWDM, DWDM, LX/LH, ZX wavelengths, but transmit on one specified wavelength. This capability can be exploited in some of the G-Series transponding modes by receiving wavelengths that do not match the specific transmission wavelength.

G1000-4 cards support CWDM and DWDM GBICs. G1K-4 cards with the Common Language Equipment Identification (CLEI) code of WM5IRWPCAA (manufactured after August 2003) support CWDM and DWDM GBICs. G1K-4 cards manufactured prior to August 2003 do not support CWDM or DWDM GBICs.

The ONS 15454-supported CWDM GBICs reach support eight wavelengths as shown in Table 6-27.

Table 6-27 Supported Wavelengths for CWDM GBICs

CWDM GBIC Wavelengths	1470 nm	1490 nm	1510 nm	1530 nm	1550 nm	1570 nm	1590 nm	1610 nm
Corresponding GBIC Colors	Grey	Violet	Blue	Green	Yellow	Orange	Red	Brown
Band	47	49	51	53	55	57	59	61

The ONS 15454 supports 32 different DWDM GBICs in the red and blue bands and can be paired with optical amplifiers, such as the Erbium-Doped Fiber Amplifier (EDFA). Operating temperature range for DWDM GBICs is from -5 to +40 degrees Celsius.

Table 6-28 100 GHz DWDM GBIC Channel Plan

Blue Band	1530.33	1531.12	1531.90	1532.68	1534.25	1535.04	1535.82	1536.61
	1538.19	1538.98	1539.77	1540.56	1542.14	1542.94	1543.73	1544.53

Table 6-28 100 GHz DWDM GBIC Channel Plan

Red Band	1546.12	1546.92	1547.72	1548.51	1550.12	1550.92	1551.72	1552.52
	1554.13	1554.94	1555.75	1556.55	1558.17	1558.98	1559.79	1560.61

Network Element Defaults and Performance Monitoring Thresholds

The following tables lists the network element (NE) default settings for the ONS 15454 and threshold ranges for monitored parameters. These tables include card and node default settings from the factory. Cards not listed in these tables are not supported by NE defaults. The factory [default] settings are in brackets. For a description of defaults and performance monitoring (PM) parameters, see the *Cisco ONS 15454 Reference Manual*.

You can disable any monitored threshold by setting its value to zero. To change card settings individually (that is, without changing the NE defaults), refer to the Change Card Settings chapter of the *Cisco ONS 15454 Procedure Guide*. To change node settings, refer to the Change Node Settings chapter of the *Cisco ONS 15454 Procedure Guide*.

- Refer Table 6-29 for CTC defaults
- Refer Table 6-30 for Node defaults
- Refer Table 6-31 for DS1-14 defaults
- Refer Table 6-32 for DS3-12/DS3-12E defaults
- Refer Table 6-33 for DS3/EC1-48 defaults
- Refer Table 6-34 for DS3XM-6 defaults
- Refer Table 6-35 for DS3XM-12 defaults
- Refer Table 6-36 for EC1-12 defaults
- Refer Table 6-37 for OC3-4/OC3-8 defaults
- Refer Table 6-38 for OC12/OC12-4 defaults
- Refer Table 6-39 for OC48 defaults
- Refer Table 6-40 for OC-192 defaults
- Refer Table 6-41 for OSC-CSM defaults
- Refer Table 6-42 for OSCM defaults
- Refer Table 6-43 for MXP_2.5G_10G defaults
- Refer Table 6-44 for MXP_2.5G_10E defaults
- Refer Table 6-45 for MXP_MR_2.5G/MXPP_MR_2.5G defaults
- Refer Table 6-46 for TXP_MR_10G defaults
- Refer Table 6-47 for TXP_MR_10E defaults
- Refer Table 6-48 for TXP_MR_2.5G/TXPP_MR_2.5G defaults
- Refer Table 6-49 for FC_MR-4 defaults
- Refer Table 6-50 for CE-100T-8 defaults
- Refer Table 6-51 for G1000-4/G1K4 defaults

- Refer Table 6-52 for ML100T-12 defaults
- Refer Table 6-53 for ML1000-2 defaults

See http://cisco.com/en/US/products/hw/optical/ps2006/prod_eol_notices_list.html for the latest list of End-Of-Life and End-Of-Sale notices.

Table 6-29 CTC Defaults

Field	Parameter	Settable Range [Default]
CTC	Circuits Auto Route	TRUE - FALSE [TRUE]
	Circuits Create Like TL1	TRUE - FALSE [FALSE]
	Circuits State	IS; OOS,DSBLD; OOS,MT; IS,AINS [IS,AINS]
	Network Map	Germany, Japan, Netherlands, South Korea, United Kingdom, United States [United States]

Table 6-30 Node Defaults

Field	Parameter	Settable Range [Default]
Circuits	Send PDIP	TRUE - FALSE [TRUE]
	UPSR Reversion Time (minutes)	0.5 - 12.0 [5.0]
	UPSR Revertive	TRUE - FALSE [FALSE]
	UPSR STS-Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-6]
	UPSR STS-Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]
	UPSR Switch on PDIP	TRUE - FALSE [FALSE]
	UPSR VT-Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-5]
	UPSR VT-Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]
General	Defaults Description	HTML Text [Factory Defaults]
	IIOP Listener Port	0 - 65535 [57790]
	Insert AIS On SDP	TRUE - FALSE [FALSE]
	NTP SNTP Server	Variable [0.0.0.0]
	SDP BER	1E-5 - 1E-9 [1E-6]
	Time Zone	GMT-EST, CST, PST [GMT-PST]
	USE Daylight Savings Time (DST)	TRUE - FALSE [TRUE]
Network	Alarm Missing Backplane LAN	TRUE - FALSE [FALSE]
	CTC IP Display Suppression	TRUE - FALSE [FALSE]
	Gateway Settings	None, ENE, GNE [None]
	LCD IP Setting	Allow Configuration, Display Only, Suppress Display [Allow Configuration]

Table 6-30 Node Defaults (continued)

Field	Parameter	Settable Range [Default]
Power Monitor	Extremely High Input Voltage (EHIBATVG)	-40.5 to -56.5 V in 0.5 V steps [-56.5]
	Extremely Low Input Voltage (ELWBATVG)	-40.5 to -56.5 V in 0.5 V steps [-40.5]
	High Input Voltage (HIBATVG)	-40.5 to -56.5 V in 0.5 V steps [-54.0]
	Low Input Voltage (LWBATVG)	-40.5 to -56.5 V in 0.5 V steps [-44.0]
Protection	1+1 bidirectional Switching	TRUE - FALSE [FALSE]
	1+1 Detection Guard Timer (seconds)	0 - 5 [1]
	1+1 Recovery Guard Timer (seconds)	0 - 10 [1]
	1+1 Reversion Time (minutes)	0.5 - 12.0 [5.0]
	1+1 Revertive	TRUE - FALSE [FALSE]
	1+1 Verify Guard Timer	0.5 - 1 [0.5]
	BLSR Ring Reversion Time (minutes)	0.5 - 12.0 [5.0]
	BLSR Ring Revertive	TRUE - FALSE [TRUE]
	BLSR Span Reversion Time (minutes)	0.5 - 12.0 [5.0]
	BLSR Span Revertive	TRUE - FALSE [TRUE]
	Ycable Reversion Time (minutes)	0.5 - 12.0 [5.0]
	Ycable Revertive	TRUE - FALSE [FALSE]
	Splitter Reversion Time (minutes)	0.5 - 12.0 [5.0]
	Splitter Revertive	TRUE - FALSE [FALSE]

Table 6-30 Node Defaults (continued)

Field	Parameter	Settable Range [Default]
Security	Access LAN Access	No LAN Access, Backplane Only, Front & Backplane [Front & Backplane]
	Access Restore Time Out	0 -10 [5]
	Idle User Timeout Policy Maintenance	0 - 999 [60]
	Idle User Timeout Policy Provisioning (minutes)	0 - 999 [30]
	Idle User Timeout Policy Retrieve (minutes)	0 - 999 [0]
	Idle User Timeout Policy Superuser (minutes)	0 - 999 [15]
	Legal Disclaimer Login Warning Message	HTML Text [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.]
	Other Disable Inactive User	TRUE - FALSE [FALSE]
	Other Inactive Duration	40 - 90 Days [45]
	Other PM Clearing Privilege	SUPERUSER, PROVISIONING, MAINTENANCE, RETRIEVE [PROVISIONING]
	Other Single Session Per User	TRUE - FALSE [FALSE]
	Password Aging Enforce Password Aging	TRUE - FALSE [FALSE]
	Password Aging Maintenance Expiration Period	20 to 90 days [45]
	Password Aging Maintenance Warning Period	2 to 90 days [5]
	Password Aging Provisioning Expiration Period	20 to 90 days [45]
	Password Aging Provisioning Warning Period	2 to 90 days [5]
	Password Aging Retrieve Expiration Period	20 to 90 days [45]
	Password Aging Retrieve Warning Period	2 to 90 days [5]
	Password Aging Superuser Expiration Period	20 to 90 days [45]
	Password Aging Superuser Warning Period	2 to 90 days [5]
	Password Change Cannot Change New Password	TRUE - FALSE [FALSE]
	Password Change Cannot Change New Password For N Days	20 to 90 days [45]
	Password Change Prevent Reusing Last N Passwords	0 - 10 [1]
	Password Change Require Password Change On First Login To New Account	TRUE - FALSE [FALSE]
	Shell Access SSH	TRUE - FALSE [FALSE]
	Shell Access Telnet Port	23 - 9999 [23]
	User Lockout Failed Logins Before Lockout	0 - 10 [5]
	User Lockout Lockout Duration (min:sec)	00:00 - 10:00 [00:30]
	User Lockout Manual Unlock By Superuser	TRUE - FALSE [FALSE]

Table 6-30 Node Defaults (continued)

Field	Parameter	Settable Range [Default]
Timing	BITS-1 Alarm Indication Signal (AIS) Threshold	PRS - RES [SMC]
	BITS 1 Admin SSM In	PRS - RES [STU]
	BITS-1 Coding	B8ZS - AMI [B8ZS]
	BITS 1 Coding Out	B8ZS - AMI [B8ZS]
	BITS 1 Facility Type	DS1 - 64Khz+8Khz [DS1]
	BITS 1 Facility Type Out	DS1 - 64Khz+8Khz [DS1]
	BITS-1 Framing	ESF - SF(D4) [ESF]
	BITS 1 Framing Out	ESF - SF(D4) [ESF]
	BITS-1 Line Build Out (LBO) in feet	0 -655 [0-133]
	BITS-1 State	IS - OOS [IS]
	BITS-1 State Out	IS - OOS [IS]
	BITS-2 Alarm Indication Signal (AIS) Threshold	PRS - RES [SMC]
	BITS 2 Admin SSM In	PRS - RES [STU]
	BITS 2 Coding	B8ZS - AMI [B8ZS]
	BITS 2 Coding Out	B8ZS - AMI [B8ZS]
	BITS 2 Facility Type	DS1 - 64Khz+8Khz [DS1]
	BITS 2 Facility Type Out	DS1 - 64Khz+8Khz [DS1]
	BITS 2 Framing	ESF - SF(D4) [ESF]
	BITS 2 Framing Out	ESF - SF(D4) [ESF]
	BITS 2 Line Build Out (LBO) in feet	0 -655 [0-133]
	BITS 2 State	IS - OOS [IS]
	BITS 2 State Out	IS - OOS [IS]
	General Mode	Line, External, Mixed [External]
	General Quality of RES	PRS<RES - RES=DUS [RES=DUS]
	General Reversion Time (minutes)	0.5 - 12.0 [5.0]
	General Revertive	TRUE - FALSE [FALSE]
	General SSM Message Set	Generation 1 - Generation 2 [Generation 1]

Table 6-31 DS1-14 Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	Line Coding	AMI - B8ZS [AMI]	
	Line Length (feet)	0 - 655 [0-131]	
	Line Type	D4, ESF, Unframed [D4]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	State	IS; OOS,DSBLD; OOS,MT; IS,AINS [OOS,DSBLD]	
Line - Near End	Coding Violations (CV) [BPV count]	0-1388700 [13340]	0-133315200 [133400]
	Errored Seconds (ES)	0-900 [65]	0-86400 [648]
	Loss of Signal Seconds (LOSS)	0-900 [10]	0-86400 [10]
	Severely Errored Seconds (SES)	0-900 [10]	0-86400 [100]
Line - Far End	Errored Seconds (ES)	0-900 [65]	0-86400 [648]
Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [13296]	0-27561600 [132960]
	Errored Seconds (ES)	0-900 [65]	0-86400 [648]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [17]
	Severely Errored Seconds (SES)	0-900 [10]	0-86400 [100]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
Path - Far End	Controlled Slip Seconds (CSS)	0-900 [25]	0-86400 [25]
	Coding Violations (CV) [BIP count]	0-287100 [13296]	0-27561600 [132960]
	Errored Seconds (ES)	0-900 [65]	0-86400 [648]
	Errored Seconds-A (ESA) sent by the NE	0-900 [25]	0-86400 [25]
	Errored Seconds-B (ESB) sent by CPE	0-900 [25]	0-86400 [25]
	Severely Errored Framed Seconds (SEFS)	0-900 [25]	0-86400 [25]
	Severely Errored Seconds (SES)	0-900 [10]	0-86400 [100]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-31 DS1-14 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
VT - Near End	Coding Violations (CV) [BIP8 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [10]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
VT - Far End	Coding Violations (CV) [BIP8 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
STS - Near End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
STS - Far End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-32 DS3-12/DS3-12E Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	Far End Inhibit Loopback (DS-3E only)	TRUE - FALSE [FALSE]	
	Line Length (feet)	0 - 450 [0-225]	
	Line Type (DS-3E only)	M13, CBIT, Unframed, Auto Provision [Unframed]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	State	IS; OOS,DSBLD; OOS,MT; IS,AINS [OOS,DSBLD]	

Table 6-32 DS3-12/DS3-12E Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Line - Near End	Coding Violations (CV) [BPV count]	0-38700 [387]	0-3715200 [3865]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Loss of Signal Seconds (LOSS)	0-900 [10]	0-86400 [10]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
Pbit Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
Cbit Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
Cbit Path - Far End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
STS - Near End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-32 DS3-12/DS3-12E Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
STS - Far End	Coding Violations (CV) [G1 count]	0-72 [15]	0-6912 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-2160000 [10]	0-207360000 [10]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-33 DS3/EC1-48 Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	Far End Inhibit Loopback (DS-3E only)	TRUE - FALSE [FALSE]	
	Line Length (feet)	0 - 450 [0-225]	
	Line Type (DS-3E only)	M13, CBIT, Unframed, Auto Provision [Unframed]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	State	IS; OOS,DSBLD; OOS,MT; IS,AINS [IS,AINS]	
Line - Near End	Coding Violations (CV) [BPV count]	0-38700 [387]	0-3715200 [3865]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Loss of Signal Seconds (LOSS)	0-900 [10]	0-86400 [10]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
Pbit Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
Cbit Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-33 DS3/EC1-48 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Cbit Path - Far End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
STS - Near End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
STS - Far End	Coding Violations (CV) [G1 count]	0-72 [15]	0-6912 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-2160000 [10]	0-207360000 [10]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-34 DS3XM-6 Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	Far End Inhibit Loopback	TRUE - FALSE [FALSE]	
	Line Length (feet)	0 - 450 [0-225]	
	Line Type	M13, CBIT [M13]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	State	IS; OOS,DSBLD; OOS,MT; IS,AINS [OOS,DSBLD]	
Line - Near End	Coding Violations (CV) [BPV count]	0-38700 [387]	0-3715200 [3865]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Loss of Signal Seconds (LOSS)	0-900 [10]	0-86400 [10]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]

Table 6-34 DS3XM-6 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Pbit Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
Cbit Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
Cbit Path - Far End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
DS1 Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Errored Seconds (ES)	0-900 [65]	0-86400 [648]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [17]
	Severely Errored Seconds (SES)	0-900 [10]	0-86400 [100]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
STS - Near End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
STS - Far End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-34 DS3XM-6 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
VT - Near End	Coding Violations (CV) [BIP8 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
VT - Far End	Coding Violations (CV) [BIP8 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-35 DS3XM-12 Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration	Far End Inhibit Loopback	TRUE - FALSE [FALSE]	
	Line Length (feet)	0 - 450 [0-225]	
	Line Type	M13, CBIT [M13]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	State	IS; OOS,DSBLD; OOS,MT; IS,AINS [OOS,DSBLD]	
DS1 Configurations	Facility Datalink Mode	T1.403 [T1.403]	
	Line Type	ESF, D4, UNFRAMED, AUTO FRAMED [AUTO FRAMED]	
Line - Near End	Coding Violations (CV) [BPV count]	0-38700 [387]	0-3715200 [3865]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Loss of Signal Seconds (LOSS)	0-900 [10]	0-86400 [10]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
Pbit Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-35 DS3XM-12 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Cbit Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
Cbit Path - Far End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-287100 [382]	0-27561600 [3820]
	Errored Seconds (ES)	0-900 [25]	0-86400 [250]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [8]
	Severely Errored Seconds (SES)	0-900 [4]	0-86400 [40]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
Ds1 Network - Far End	Errored Seconds (ES) FE	0-900 [65]	0-86400 [648]
	Errored Seconds (ES) NE	0-900 [65]	0-86400 [648]
	Severely Errored Seconds (SES) FE	0-900 [10]	0-86400 [100]
	Severely Errored Seconds (SES) NE	0-900 [10]	0-86400 [100]
	Unavailable Seconds (UAS) FE	0-900 [10]	0-86400 [10]
	Unavailable Seconds (UAS) NE	0-900 [10]	0-86400 [10]
DS1 Path - Near End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Coding Violations (CV) [BIP count]	0-2160000 [13296]	0-13219200 [132960]
	Errored Seconds (ES)	0-900 [65]	0-86400 [648]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [17]
	Severely Errored Seconds (SES)	0-900 [10]	0-86400 [100]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
DS1 Path - Far End	AIS Seconds (AISS)	0-900 [10]	0-86400 [10]
	Controlled Slip Seconds (CSS)	0-900 [25]	1-86400 [25]
	Coding Violations (CV) [BIP count]	0-2160000 [13296]	0-13219200 [132960]
	Errored Seconds (ES)	0-900 [65]	0-86400 [648]
	Errored Seconds-A (ESA) sent by the NE	0-900 [25]	1-86400 [25]
	Errored Seconds-B (ESB) sent by the CPE	0-900 [25]	1-86400 [25]
	Severely Errored Seconds Alarm Signal (SAS)	0-900 [2]	0-86400 [17]
	Severely Errored Framed Seconds (SEFS)	0-900 [25]	1-86400 [25]
	Severely Errored Seconds (SES)	0-900 [10]	0-86400 [100]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-36 EC1-12 Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Line	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	Line Length (feet)	0 - 450 [0-225]	
	Pointer Justification (PJ) STS Monitor #	0, 1 [0]	
	Rx Equalization	TRUE - FALSE [TRUE]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	State	IS; OOS,DSBLD; OOS,MT; IS,AINS [OOS,DSBLD]	
Configuration - STS	Intermediate Path Performance Monitoring (IPPM) Enabled	TRUE - FALSE [FALSE]	
Line - Near End	STS-1 Coding Violations (CV) [B2 count]	0-137700 [1312]	0-8850600 [13120]
	STS-1 Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	STS-1 Failure Count (FC)	0-72 [10]	0-6912 [40]
	STS-1 Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	STS-1 Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
Line - Far End	Coding Violations (CV) [B2 count]	0-137700 [1312]	0-8850600 [13120]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
Section - Near End	Coding Violations (CV) [B1 count]	0-138600 [10000]	0-13219200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]

Table 6-36 EC1-12 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
STS-1 - Near End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Difference (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-37 OC3-4/ OC3-8 Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Line	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	Admin SSM In	PRD - RES [STU]	
	AIS Mode (OC-3 8 port card only)	Enable - Disabled [Disabled]	
	AlS Recovery Interval (OC-3-8 card only)	60-300 [100] seconds	
	AlS Recovery Pulse Duration (OC-3-8 card only)	2.0-100.0 [2.0] seconds	
	Enable Synch Messaging (SyncMsgIn)	TRUE - FALSE [TRUE]	
	Pointer Justification (PJ) STS Monitor #	0-3 [0]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	Send <FF> Do Not Use	TRUE - FALSE [FALSE]	
	Send Do Not Use (DUS)	TRUE - FALSE [FALSE]	
	State	IS; OOS,DSBLD; OOS,MT; IS,AINS [OOS,DSBLD]	

Table 6-37 OC3-4/ OC3-8 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - STS	Intermediate Path Performance Monitoring (IPPM) Enabled	TRUE - FALSE [FALSE]	
Line - Near End	Coding Violations (CV) [B2 count]	0-137700 [1312]	0-13219200 [13120]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Protection Switching Count (PSC)	0-600 [1]	0-57600 [5]
	Protection Switching Duration (PSD) seconds	0-900 [300]	0-86400 [600]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
Line - Far End	Coding Violations (CV) [B2 count]	0-137700 [1312]	0-13219200 [13120]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
Section - Near End	Coding Violations (CV) [B1 count]	0-138600 [10000]	0-13219200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
STS-1 - Near End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Difference (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-37 OC3-4/ OC3-8 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
STS-3c - Near End	Coding Violations (CV) [B3 count]	0-2160000 [25]	0-207360000 [250]
	Errored Seconds (ES)	0-900 [20]	0-86400 [200]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Diff. (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-600 [60]	0-57600 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-600 [60]	0-57600 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-38 OC12/ OC12-4 Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Line	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	Admin SSM In	PRD - RES [STU]	
	Enable Synch Messaging (SyncMsgIn)	TRUE - FALSE [TRUE]	
	Pointer Justification (PJ) STS Monitor #	0-12 [0]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	Send <FF> Do Not Use	TRUE - FALSE [FALSE]	
	Send Do Not Use (DUS)	TRUE - FALSE [FALSE]	
	State	IS; OOS,DSBLD; OOS,MT; IS,AINS [OOS,DSBLD]	
Configuration - STS	Intermediate Path Performance Monitoring (IPPM) Enabled	TRUE - FALSE [FALSE]	

Table 6-38 OC12/ OC12-4 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Line - Near End	Coding Violations (CV) [B2 count]	0-137700 [5315]	0-13219200 [53150]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Protection Switching Count (PSC)	0-600 [1]	0-57600 [5]
	Protection Switching Count (PSC) - Working	0-600 [1]	0-57600 [5]
	Protection Switching Duration (PSD) seconds	0-600 [300]	0-57600 [600]
	Protection Switching Duration (PSD) seconds - Working	0-600 [300]	0-57600 [600]
	Severely Errored Seconds (SES)	0-900 [1]	1-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	1-86400 [10]
Line - Far End	Coding Violations (CV) [B2 count]	0-137700 [5315]	1-13219200 [53150]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
Section - Near End	Coding Violations (CV) [B1 count]	0-138600 [10000]	0-13219200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
STS-1 - Near End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Difference (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-38 OC12/ OC12-4 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
STS-3c-9c - Near End	Coding Violations (CV) [B3 count]	0-2160000 [25]	0-207360000 [250]
	Errored Seconds (ES)	0-900 [20]	0-86400 [200]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Diff. (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
STS-12c - Near End	Coding Violations (CV) [B3 count]	0-2160000 [75]	0-207360000 [750]
	Errored Seconds (ES)	0-900 [60]	0-86400 [600]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Diff. (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-39 OC48 Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Line	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	Admin SSM In	PRD - RES [STU]	
	AIS Mode	Enable - Disabled [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Duration (seconds)	2.0-100.0 [2.0]	
	Enable Synch Messaging (SyncMsgIn)	TRUE - FALSE [TRUE]	
	Pointer Justification (PJ) STS Monitor #	0-48 [0]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Send <FF> Do Not Use	TRUE - FALSE [FALSE]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	Send Do Not Use (DUS)	TRUE - FALSE [FALSE]	
	State	IS; OOS,DSBLD; OOS,MT; IS,AINS [OOS,DSBLD]	
Configuration - STS	Intermediate Path Performance Monitoring (IPPM) Enabled	TRUE - FALSE [FALSE]	
Line - Near End	Coding Violations (CV) [B2 count]	0-2212200 [21260]	0-212371200 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Protection Switching Count (PSC)	0-600 [1]	0-57600 [5]
	Protection Switching Count (PSC) - Ring	0-600 [1]	0-57600 [5]
	Protection Switching Count (PSC) - Span	0-600 [1]	0-57600 [5]
	Protection Switching Count (PSC) - Working	0-600 [1]	0-57600 [5]
	Protection Switching Duration (PSD) seconds	0-600 [300]	0-86400 [600]
	Protection Switching Duration (PSD) seconds - Ring	0-900 [300]	0-86400 [600]
	Protection Switching Duration (PSD) seconds - Span	0-900 [300]	0-86400 [600]
	Protection Switching Duration (PSD) seconds - Working	0-900 [300]	0-86400 [600]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
Line - Far End	Coding Violations (CV) [B2 count]	0-2212200 [21260]	0-212371200 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]

Table 6-39 OC48 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Section - Near End	Coding Violations (CV) [B1 count]	0-2151900 [10000]	0-206582400 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
STS-1 - Near End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Difference (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
STS-3c-9c - Near End	Coding Violations (CV) [B3 count]	0-2160000 [25]	0-207360000 [250]
	Errored Seconds (ES)	0-900 [20]	0-86400 [200]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Diff. (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-39 OC48 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
STS-12c-48c - Near End	Coding Violations (CV) [B3 count]	0-2160000 [75]	0-207360000 [750]
	Errored Seconds (ES)	0-900 [60]	0-86400 [600]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Diff. (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-40 OC-192 Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Line	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	Admin SSM In	PRD - RES [STU]	
	AIS Mode	Enable - Disabled [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Duration (seconds)	2.0-100.0 [2.0]	
	Enable Synch Messaging (SyncMsgIn)	TRUE - FALSE [TRUE]	
	Pointer Justification (PJ) STS Monitor #	0-192 [0]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	Send <FF> Do Not Use	TRUE - FALSE [FALSE]	
	Send Do Not Use (DUS)	TRUE - FALSE [FALSE]	
	State	IS; OOS,DSBLD; OOS,MT; IS,AINS [OOS,DSBLD]	
Configuration - STS	Intermediate Path Performance Monitoring (IPPM) Enabled	TRUE - FALSE [FALSE]	

Table 6-40 OC-192 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Line - Near End	Coding Violations (CV) [B2 count]	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Protection Switching Count (PSC)	0-600 [1]	0-57600 [5]
	Protection Switching Count (PSC) - Ring	0-600 [1]	0-57600 [5]
	Protection Switching Count (PSC) - Span	0-600 [1]	0-57600 [5]
	Protection Switching Count (PSC) - Working	0-600 [1]	0-57600 [5]
	Protection Switching Duration (PSD) seconds	0-900 [300]	0-86400 [600]
	Protection Switching Duration (PSD) seconds - Ring	0-900 [300]	0-86400 [600]
	Protection Switching Duration (PSD) seconds - Span	0-900 [300]	0-86400 [600]
	Protection Switching Duration (PSD) seconds - Working	0-900 [300]	0-86400 [600]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
Line - Far End	Coding Violations (CV) [B2 count]	0-8850600 [85040]	0-849657600 [85040]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
Section - Near End	Coding Violations (CV) [B1 count]	0-7967700 [10000]	0-764899200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]

Table 6-40 OC-192 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
STS-1 - Near End	Coding Violations (CV) [B3 count]	0-2160000 [15]	0-207360000 [125]
	Errored Seconds (ES)	0-900 [12]	0-86400 [100]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Difference (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]
STS-3c-9c - Near End	Coding Violations (CV) [B3 count]	0-2160000 [25]	0-207360000 [250]
	Errored Seconds (ES)	0-900 [20]	0-86400 [200]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Diff. (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-40 OC-192 Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
STS-12c-192c - Near End	Coding Violations (CV) [B3 count]	0-2160000 [75]	0-207360000 [750]
	Errored Seconds (ES)	0-900 [60]	0-86400 [600]
	Failure Count (FC)	0-72 [10]	0-6912 [10]
	Negative Pointer Justification Count - Path Detected (NPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Negative Pointer Justification Count - Path Generated (NPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Pointer Justification Count Diff. (PJCDIFF)	0-1200 [0]	0-115200 [0]
	Pointer Justification Count Sum (PJCS-PDET)	0-3600000 [0]	0-345600000 [0]
	Pointer Justification Count Sum (PJCS-PGEN)	0-3600000 [0]	0-345600000 [0]
	Positive Pointer Justification Count - Path Detected (PPJC-Pdet)	0-3600000 [60]	0-345600000 [5760]
	Positive Pointer Justification Count - Path Generated (PPJC-Pgen)	0-3600000 [60]	0-345600000 [5760]
	Severely Errored Seconds (SES)	0-900 [3]	0-86400 [7]
	Unavailable Seconds (UAS)	0-900 [10]	0-86400 [10]

Table 6-41 OSC-CSM Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
PM Thresholds-Line - Near End	Coding Violations (CV) [B2 count]	0-137700 [1312]	0-13219200 [13120]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Protection Switching Count (PSC)	0-600 [1]	0-57600 [5]
	Protection Switching Duration (PSD) seconds	0-900 [300]	0-86400 [600]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Line - Far End	Coding Violations (CV) [B2 count]	0-137700 [1312]	0-13219200 [13120]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]

Table 6-41 OSC-CSM Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
PM Thresholds-Section - Near End	Coding Violations (CV) [B1 count]	0-138600 [10000]	0-13219200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]

Table 6-42 OSCM Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
PM Thresholds-Line - Near End	Coding Violations (CV) [B2 count]	0-137700 [1312]	0-13219200 [13120]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Protection Switching Count (PSC)	0-600 [1]	0-57600 [5]
	Protection Switching Duration (PSD) seconds	0-900 [300]	0-86400 [600]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Line - Far End	Coding Violations (CV) [B2 count]	0-137700 [1312]	0-13219200 [13120]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Section - Near End	Coding Violations (CV) [B1 count]	0-138600 [10000]	0-13219200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]

Table 6-43 MXP_2.5G_10G Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Client	Payload Data Type	SONET, SDH [SONET]	
	Termination Mode	TRANSPARENT, SECTION, LINE [TRANSPARENT]	

Table 6-43 MXP_2.5G_10G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Line	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Duration (seconds)	2.0-100.0 [2.0]	
	Enable Synch Messaging (SyncMsgIn)	TRUE - FALSE [TRUE]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	Send Do Not Use (DUS)	TRUE - FALSE [FALSE]	
	Termination Mode	TRANSPARENT, SECTION, LINE [TRANSPARENT]	
	Pluggable Port Module (PPM) Port Assignment	UNASSIGNED, OC48 [UNASSIGNED]	
	Pluggable Port Module (PPM) Slot Assignment	UNASSIGNED, PPM (1 port) [UNASSIGNED]	
Configuration - Trunk	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Duration (seconds)	2.0-100.0 [4.0]	
Optical Transport Network (OTN)	OTN Lines Forward Error Correction (FEC)	DISABLE, STANDARD, ENHANCED [STANDARD]	
	OTN Lines G709 OTN	TRUE - FALSE [TRUE]	
	OTN Lines Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
OTN G709 Thresholds-Section Monitoring (SM) - Near End	Background Block Errors (BBE)	0-8850600 [10000]	0-849657600 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
	Unavailable Seconds (UAS)	0-900 [500]	0-86400 [5000]
OTN G709 Thresholds-Section Monitoring (SM) - Far End	Background Block Errors (BBE)	0-8850600 [10000]	0-849657600 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
	Unavailable Seconds (UAS)	0-900 [500]	0-86400 [5000]

Table 6-43 MXP_2.5G_10G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
OTN G709 Thresholds-Path Monitoring (PM) - Near End	Background Block Errors (BBE)	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
OTN G709 Thresholds-Path Monitoring (PM) - Far End	Background Block Errors (BBE)	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
OTN FEC Thresholds - Standard	Bit Errors Corrected	0-9033621811200 [903330]	0-867227693875200 [8671968]
	Uncorrectable Words	0-4724697600 [5]	0-453570969600 [480]
Optical Thresholds-Client - Warning	High Laser Bias (percent)	0 - 100.0 [81.0]	31.5 - 100.0 [85.5]
	High Rx Power (dBm)	-40.0 - 30.0 [2.0]	-20.9 - 30.0 [2.5]
	High Tx Power (dBm)	-19.9 - 30.0 [2.0]	-10.5 - 30.0 [2.5]
	Low Rx Power (dBm)	-40.0 - 1.8 [-20.0]	-40.0 - 1.9 [-20.5]
	Low Tx Power (dBm)	-40.0 - 1.8 [-7.0]	-40.0 - 10.5 [-7.5]
Optical Thresholds-Client - Alarm	High Laser Bias (percent)	33.0 - 100.0 [90.0]	
	High Rx Power (dBm)	-19.9 - 30.0 [3.0]	
	High Tx Power (dBm)	-11.0 - 30.0 [3.0]	
	Low Rx Power (dBm)	-40.0 - 2.0 [-21.0]	
	Low Tx Power (dBm)	-40.0 - 2.0 [-8.0]	
Optical Thresholds-Trunk - Warning	High Laser Bias (percent)	33.0 - 100.0 [81.0]	31.5 - 100.0 [85.5]
	High Rx Power (dBm)	-25.2 - 30.0 [-7.5]	-26.6 - 30.0 [-7.3]
	High Tx Power (dBm)	-22.5 - 30.0 [3.5]	-23.8 - 30.0 [3.7]
	Low Rx Power (dBm)	-40.0 - -3.3 [-24.5]	-40.0 - -3.2 [-24.7]
	Low Tx Power (dBm)	-40.0 - 3.1 [2.5]	-40.0 - 23.8 [2.3]
Optical Thresholds-Trunk - Alarm	High Laser Bias (percent)	30.0 - 100.0 [90.0]	
	High Rx Power (dBm)	-28.0 - 30.0 [-7.0]	
	High Tx Power (dBm)	-25.0 - 30.0 [4.0]	
	Low Rx Power (dBm)	-40.0 - -3.0 [-25.0]	
	Low Tx Power (dBm)	-40.0 - 3.5 [2.0]	

Table 6-43 MXP_2.5G_10G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
PM Thresholds-Client-Line - Near End	Coding Violations (CV) [B2 count]	0-2212200 [21260]	0-212371200 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Client-Line - Far End	Coding Violations (CV) [B2 count]	0-2212200 [21260]	0-212371200 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Client-Section - Near End	Coding Violations (CV) [B1 count]	0-2151900 [10000]	0-206582400 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
PM Thresholds-Trunk-Line - Near End	Coding Violations (CV) [B2 count]	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Trunk-Section - Near End	Coding Violations (CV) [B1 count]	0-7967700 [10000]	0-764899200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]

Table 6-44 MXP_2.5G_10E Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Client	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Squelch Mode	AIS, Squelch [Squelch]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Duration (seconds)	2.0-100.0 [2.0]	
	Enable Synch Messaging (SyncMsgIn)	TRUE - FALSE [TRUE]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	Send Do Not Use (DUS)	TRUE - FALSE [FALSE]	
	Termination Mode	TRANSPARENT, SECTION, LINE [TRANSPARENT]	
	Pluggable Port Module (PPM) Port Assignment	UNASSIGNED, OC48 [UNASSIGNED]	
	Pluggable Port Module (PPM) Slot Assignment	UNASSIGNED, PPM (1 port) [UNASSIGNED]	
Configuration - Trunk	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [300]	
	AIS Recovery Pulse Duration (seconds)	60-200.0 [100]	
Optical Transport Network (OTN)	OTN Lines Asynchronous/Synchronous Mapping	ODU Multiplex [ODU Multiplex]	
	OTN Lines Forward Error Correction (FEC)	DISABLE, STANDARD, ENHANCED [STANDARD]	
	OTN Lines G709 OTN	TRUE - FALSE [TRUE]	
	OTN Lines Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
OTN G709 Thresholds-Section Monitoring (SM) - Near End	Background Block Errors (BBE)	0-8850600 [10000]	0-849657600 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
	Unavailable Seconds (UAS)	0-900 [500]	0-86400 [5000]
OTN G709 Thresholds-Section Monitoring (SM) - Far End	Background Block Errors (BBE)	0-8850600 [10000]	0-849657600 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
	Unavailable Seconds (UAS)	0-900 [500]	0-86400 [5000]

Table 6-44 MXP_2.5G_10E Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
OTN G709 Thresholds-Path Monitoring (PM) - Near End	Background Block Errors (BBE)	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
OTN G709 Thresholds-Path Monitoring (PM) - Far End	Background Block Errors (BBE)	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
OTN FEC Thresholds - Standard	Bit Errors Corrected	0-9033621811200 [903330]	0-867227693875200 [8671968]
	Uncorrectable Words	0-4724697600 [5]	0-453570969600 [480]
OTN FEC Thresholds - Enhanced	Bit Errors Corrected	0-9033621811200 [903330]	0-867227693875200 [8671968]
	Uncorrectable Words	0-4724697600 [5]	0-453570969600 [480]
Optical Thresholds-Client - Warning	High Laser Bias (percent)	0 - 100.0 [81.0]	31.5 - 100.0 [85.5]
	High Rx Power (dBm)	-40.0 - 30.0 [2.0]	-20.9 - 30.0 [2.5]
	High Tx Power (dBm)	-19.9 - 30.0 [2.0]	-10.5 - 30.0 [2.5]
	Low Rx Power (dBm)	-40.0 - 1.8 [-20.0]	-40.0 - 1.9 [-20.5]
	Low Tx Power (dBm)	-40.0 - 1.8 [-7.0]	-40.0 - 10.5 [-7.5]
Optical Thresholds-Client - Alarm	High Laser Bias (percent)	33.0 - 100.0 [90.0]	
	High Rx Power (dBm)	-19.9 - 30.0 [3.0]	
	High Tx Power (dBm)	-11.0 - 30.0 [3.0]	
	Low Rx Power (dBm)	-40.0 - 2.0 [-21.0]	
	Low Tx Power (dBm)	-40.0 - 2.0 [-8.0]	
Optical Thresholds-Trunk - Warning	High Laser Bias (percent)	33.0 - 100.0 [95.0]	31.5 - 100.0 [96.0]
	High Rx Power (dBm)	-25.2 - 30.0 [-7.5]	-26.6 - 30.0 [-7.3]
	High Tx Power (dBm)	-22.5 - 30.0 [7.0]	-23.8 - 30.0 [7.0]
	Low Rx Power (dBm)	-40.0 - -3.3 [-24.5]	-40.0 - -3.2 [-24.7]
	Low Tx Power (dBm)	-40.0 - 3.1 [2.0]	-40.0 - 23.8 [2.0]
Optical Thresholds-Trunk - Alarm	High Laser Bias (percent)	30.0 - 100.0 [98.0]	
	High Rx Power (dBm)	-28.0 - 30.0 [-7.0]	
	High Tx Power (dBm)	-25.0 - 30.0 [8.0]	
	Low Rx Power (dBm)	-40.0 - -3.0 [-25.0]	
	Low Tx Power (dBm)	-40.0 - 3.5 [1.0]	

Table 6-44 MXP_2.5G_10E Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
PM Thresholds-Client-Line - Near End	Coding Violations (CV) [B2 count]	0-2212200 [21260]	0-212371200 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Client-Line - Far End	Coding Violations (CV) [B2 count]	0-2212200 [21260]	0-212371200 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Client-Section - Near End	Coding Violations (CV) [B1 count]	0-2151900 [10000]	0-206582400 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
PM Thresholds-Trunk-Section - Near End	Coding Violations (CV) [B1 count]	0-7967700 [10000]	0-764899200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]

Table 6-45 MXP_MR_2.5G/MXPP_MR_2.5G Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Client	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Duration (seconds)	2.0-100.0 [4.0]	
	Pluggable Port Module (PPM) Port Assignment	UNASSIGNED, One_GE, FC1G ISL, FC2G ISL, FICON1G ISL, FICON2G ISL [UNASSIGNED]	
	Pluggable Port Module (PPM) Slot Assignment	UNASSIGNED, PPM (1 port) [UNASSIGNED)]	

Table 6-45 MXP_MR_2.5G/MXPP_MR_2.5G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Fibre Channel (FC)	Distance Extension Auto Detect	TRUE - FALSE [TRUE]	
	Distance Extension Auto Adjust GFP Buffer Threshold	TRUE - FALSE [FALSE]	
	Distance Extension Enabled	TRUE - FALSE [FALSE]	
	Distance Extension Number of Credits	2-256 [32]	
	Distance Extension Number of GFP Buffers	16-1200 [16]	
	Enhanced FC Maximum Frame Size	2148-2172 [2148]	
Configuration - Trunk	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Duration (seconds)	2.0-100.0 [4.0]	
	Enable Synch Messaging (SyncMsgIn for MXP_MR_2.5G card only)	TRUE - FALSE [TRUE]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	Send Do Not Use (DUS for MXP_MR_2.5G card only)	TRUE - FALSE [FALSE]	
Optical Thresholds-Client - Warning	High Laser Bias (percent)	0 - 100.0 [81.0]	31.5 - 100.0 [85.5]
	High Rx Power (dBm)	-40.0 - 30.0 [2.0]	-20.9 - 30.0 [2.5]
	High Tx Power (dBm)	-19.9 - 30.0 [2.0]	-10.5 - 30.0 [2.5]
	Low Rx Power (dBm)	-40.0 - 1.8 [-20.0]	-40.0 - 1.9 [-20.5]
	Low Tx Power (dBm)	-40.0 - 1.8 [-7.0]	-40.0 - 10.5 [-7.5]
Optical Thresholds-Client - Alarm	High Laser Bias (percent)	33.0 - 100.0 [90.0]	
	High Rx Power (dBm)	-19.9 - 30.0 [3.0]	
	High Tx Power (dBm)	-11.0 - 30.0 [3.0]	
	Low Rx Power (dBm)	-40.0 - 2.0 [-21.0]	
	Low Tx Power (dBm)	-40.0 - 2.0 [-8.0]	
Optical Thresholds-Trunk - Warning	High Laser Bias (percent)	33.0 - 100.0 [95.0]	31.5 - 100.0 [96.0]
	High Rx Power (dBm)	-25.2 - 30.0 [-7.5]	-26.6 - 30.0 [-7.3]
	High Tx Power (dBm)	-22.5 - 30.0 [30.0]	-23.8 - 30.0 [30.0]
	Low Rx Power (dBm)	-40.0 - -3.3 [-24.5]	-40.0 - -3.2 [-24.7]
	Low Tx Power (dBm)	-40.0 - 3.1 [-40.0]	-40.0 - 23.8 [-40]

Table 6-45 MXP_MR_2.5G/MXPP_MR_2.5G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Optical Thresholds-Trunk - Alarm	High Laser Bias (percent)	30.0 - 100.0 [98.0]	
	High Rx Power (dBm)	-28.0 - 30.0 [-7.0]	
	High Tx Power (dBm)	-25.0 - 30.0 [30.0]	
	Low Rx Power (dBm)	-40.0 - -3.0 [-25.0]	
	Low Tx Power (dBm)	-40.0 - 3.5 [-40.0]	
PM Thresholds-Trunk-Line - Near End	Coding Violations (CV) [B2 count]	0-8850600 [21260]	0-849657600 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Trunk-Line - Far End	Coding Violations (CV) [B2 count]	0-8850600 [21260]	0-849657600 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Trunk-Section - Near End	Coding Violations (CV) [B1 count]	0-7967700 [10000]	0-764899200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]

Table 6-46 TXP_MR_10G Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Client	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Duration (seconds)	2.0-100.0 [2.0]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	Termination Mode	TRANSPARENT, LINE [TRANSPARENT]	
	Multi-rate (MR) Port Assignment	UNASSIGNED, SONET (including 10G Thernet WAN Phy), 10G Ethernet LAN Phy [UNASSIGNED]	

Table 6-46 TXP_MR_10G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Trunk	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Duration (seconds)	2.0-100.0 [4.0]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
Optical Transport Network (OTN)	OTN Lines Forward Error Correction (FEC)	DISABLE, ENABLE [ENABLE]	
	OTN Lines G709 OTN	TRUE - FALSE [TRUE]	
	OTN Lines Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
OTN G709 Thresholds-Section Monitoring (SM) - Near End	Background Block Errors (BBE)	0-8850600 [10000]	0-849657600 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
	Unavailable Seconds (UAS)	0-900 [500]	0-86400 [5000]
OTN G709 Thresholds-Section Monitoring (SM) - Far End	Background Block Errors (BBE)	0-8850600 [10000]	0-849657600 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
	Unavailable Seconds (UAS)	0-900 [500]	0-86400 [5000]
OTN G709 Thresholds-Path Monitoring (PM) - Near End	Background Block Errors (BBE)	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
OTN G709 Thresholds-Path Monitoring (PM) - Far End	Background Block Errors (BBE)	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
OTN FEC Thresholds - Standard	Bit Errors Corrected	0-9033621811200 [903330]	0-867227693875200 [8671968]
	Uncorrectable Words	0-4724697600 [5]	0-453570969600 [480]

Table 6-46 TXP_MR_10G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Optical Thresholds-Client - Warning	High Laser Bias (percent)	0 - 100.0 [81.0]	31.5 - 100.0 [85.5]
	High Rx Power (dBm)	-40.0 - 30.0 [1.0]	-20.9 - 30.0 [1.5]
	High Tx Power (dBm)	-19.9 - 30.0 [1.0]	-10.5 - 30.0 [1.5]
	Low Rx Power (dBm)	-40.0 - 1.8 [-16.0]	-40.0 - 1.9 [-16.5]
	Low Tx Power (dBm)	-40.0 - 1.8 [-8.0]	-40.0 - 10.5 [-8.5]
Optical Thresholds-Client - Alarm	High Laser Bias (percent)	33.0 - 100.0 [90.0]	
	High Rx Power (dBm)	-19.9 - 30.0 [2.0]	
	High Tx Power (dBm)	-11.0 - 30.0 [2.0]	
	Low Rx Power (dBm)	-40.0 - 2.0 [-17.0]	
	Low Tx Power (dBm)	-40.0 - 2.0 [-9.0]	
Optical Thresholds-Trunk - Warning	High Laser Bias (percent)	33.0 - 100.0 [81.0]	31.5 - 100.0 [85.5]
	High Rx Power (dBm)	-25.2 - 30.0 [-7.5]	-26.6 - 30.0 [-7.3]
	High Tx Power (dBm)	-22.5 - 30.0 [3.5]	-23.8 - 30.0 [3.7]
	Low Rx Power (dBm)	-40.0 - -3.3 [-24.5]	-40.0 - -3.2 [-24.7]
	Low Tx Power (dBm)	-40.0 - 3.1 [2.5]	-40.0 - 23.8 [2.3]
Optical Thresholds-Trunk - Alarm	High Laser Bias (percent)	30.0 - 100.0 [90.0]	
	High Rx Power (dBm)	-28.0 - 30.0 [-7.0]	
	High Tx Power (dBm)	-25.0 - 30.0 [4.0]	
	Low Rx Power (dBm)	-40.0 - -3.0 [-25.0]	
	Low Tx Power (dBm)	-40.0 - 3.5 [2.0]	
PM Thresholds-Client-Line - Near End	Coding Violations (CV) [B2 count]	0-2212200 [85040]	0-212371200 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Client-Line - Far End	Coding Violations (CV) [B2 count]	0-2212200 [21260]	0-212371200 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Client-Section - Near End	Coding Violations (CV) [B1 count]	0-2151900 [10000]	0-206582400 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]

Table 6-46 TXP_MR_10G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
PM Thresholds-Trunk-Line - Near End	Coding Violations (CV) [B2 count]	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Trunk-Line - Far End	Coding Violations (CV) [B2 count]	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Trunk-Section - Near End	Coding Violations (CV) [B1 count]	0-7967700 [10000]	0-764899200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]

Table 6-47 TXP_MR_10E Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Client	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Squelch Mode	AIS, Squelch [Squelch]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Duration (seconds)	2.0-100.0 [2.0]	
	Enable Synch Messaging (SyncMsgIn)	TRUE - FALSE [TRUE]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	Send Do Not Use (DUS)	TRUE - FALSE [FALSE]	
	Termination Mode	TRANSPARENT, SECTION, LINE [TRANSPARENT]	
	Pluggable Port Module (PPM) Port Assignment	UNASSIGNED, SONET (including 10G Thernet WAN Phy), 10G Ethernet LAN Phy, 10G Fibre Channel [UNASSIGNED]	
	Pluggable Port Module (PPM) Slot Assignment	UNASSIGNED, PPM (1 port) [UNASSIGNED]	

Table 6-47 TXP_MR_10E Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Trunk	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [300]	
	AIS Recovery Pulse Duration (seconds)	60-200.0 [100]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
Optical Transport Network (OTN)	OTN Lines Asynchronous/Synchronous Mapping	Asynch Mapping, Synch Mapping [Synch Mapping]	
	OTN Lines Forward Error Correction (FEC)	DISABLE, STANDARD, ENHANCED [STANDARD]	
	OTN Lines G709 OTN	TRUE - FALSE [TRUE]	
	OTN Lines Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
OTN G709 Thresholds-Section Monitoring (SM) - Near End	Background Block Errors (BBE)	0-8850600 [10000]	0-849657600 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
	Unavailable Seconds (UAS)	0-900 [500]	0-86400 [5000]
OTN G709 Thresholds-Section Monitoring (SM) - Far End	Background Block Errors (BBE)	0-8850600 [10000]	0-849657600 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
	Unavailable Seconds (UAS)	0-900 [500]	0-86400 [5000]
OTN G709 Thresholds-Path Monitoring (PM) - Near End	Background Block Errors (BBE)	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
OTN G709 Thresholds-Path Monitoring (PM) - Far End	Background Block Errors (BBE)	0-8850600 [85040]	0-849657600 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
OTN FEC Thresholds - Standard	Bit Errors Corrected	0-9033621811200 [903330]	0-867227693875200 [8671968]
	Uncorrectable Words	0-4724697600 [5]	0-453570969600 [480]

Table 6-47 TXP_MR_10E Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
OTN FEC Thresholds - Enhanced	Bit Errors Corrected	0-9033621811200 [903330]	0-867227693875200 [8671968]
	Uncorrectable Words	0-4724697600 [5]	0-453570969600 [480]
Optical Thresholds-Client - Warning	High Laser Bias (percent)	0 - 100.0 [81.0]	31.5 - 100.0 [85.5]
	High Rx Power (dBm)	-40.0 - 30.0 [1.0]	-20.9 - 30.0 [1.5]
	High Tx Power (dBm)	-19.9 - 30.0 [1.0]	-10.5 - 30.0 [1.5]
	Low Rx Power (dBm)	-40.0 - 1.8 [-16.0]	-40.0 - 1.9 [-16.5]
	Low Tx Power (dBm)	-40.0 - 1.8 [-8.0]	-40.0 - 10.5 [-8.5]
Optical Thresholds-Client - Alarm	High Laser Bias (percent)	33.0 - 100.0 [90.0]	
	High Rx Power (dBm)	-19.9 - 30.0 [2.0]	
	High Tx Power (dBm)	-11.0 - 30.0 [2.0]	
	Low Rx Power (dBm)	-40.0 - 2.0 [-17.0]	
	Low Tx Power (dBm)	-40.0 - 2.0 [-9.0]	
Optical Thresholds-Trunk - Warning	High Laser Bias (percent)	33.0 - 100.0 [95.0]	31.5 - 100.0 [96.0]
	High Rx Power (dBm)	-25.2 - 30.0 [-7.5]	-26.6 - 30.0 [-7.3]
	High Tx Power (dBm)	-22.5 - 30.0 [7.0]	-23.8 - 30.0 [7.0]
	Low Rx Power (dBm)	-40.0 - -3.3 [-24.5]	-40.0 - -3.2 [-24.7]
	Low Tx Power (dBm)	-40.0 - 3.1 [2.0]	-40.0 - 23.8 [2.0]
Optical Thresholds-Trunk - Alarm	High Laser Bias (percent)	30.0 - 100.0 [98.0]	
	High Rx Power (dBm)	-28.0 - 30.0 [-7.0]	
	High Tx Power (dBm)	-25.0 - 30.0 [8.0]	
	Low Rx Power (dBm)	-40.0 - -3.0 [-25.0]	
	Low Tx Power (dBm)	-40.0 - 3.5 [1.0]	
PM Thresholds-Client-Line - Near End	Coding Violations (CV) [B2 count]	0-2212200 [85040]	0-212371200 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Client-Line - Far End	Coding Violations (CV) [B2 count]	0-2212200 [85040]	0-212371200 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]

Table 6-47 TXP_MR_10E Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
PM Thresholds-Client-Section - Near End	Coding Violations (CV) [B1 count]	0-2151900 [10000]	0-206582400 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
PM Thresholds-Trunk-Line - Near End	Coding Violations (CV) [B2 count]	0-2212200 [85040]	0-212371200 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Trunkt-Line - Far End	Coding Violations (CV) [B2 count]	0-2212200 [85040]	0-212371200 [850400]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-Trunk-Section - Near End	Coding Violations (CV) [B1 count]	0-7967700 [10000]	0-764899200 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]

Table 6-48 TXP_MR_2.5G / TXPP_MR_2.5G Defaults

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
Configuration - Client	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Width (seconds)	2.0-100.0 [4.0]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
	Termination Mode	TRANSPARENT, SECTION, LINE [TRANSPARENT]	
	Pluggable Port Module (PPM) Port Assignment	UNASSIGNED, OC3_PORT, OC12_PORT, ONE_GE_PORT, ESCON_PORT, DV6000_PORT, SDI_D1_VIDEO_PORT, HDTV_PORT [UNASSIGNED]	
	Pluggable Port Module (PPM) Slot Assignment	UNASSIGNED, PPM (1 port) [UNASSIGNED]	
Configuration - Trunk	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]	
	AIS Mode	Disabled, Automatic Restart, Manual Restart, Manual Restart for Test [Disabled]	
	AIS Recovery Interval (seconds)	60-300 [100]	
	AIS Recovery Pulse Width (seconds)	2.0-100.0 [4.0]	
	Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
	Signal Fail (SF) BER	1E-3 - 1E-5 [1E-4]	
Optical Transport Network (OTN)	OTN Lines Forward Error Correction (FEC)	DISABLE, ENABLE[ENABLE]	
	OTN Lines G709 OTN	TRUE - FALSE [TRUE]	
	OTN Lines Signal Degrade (SD) BER	1E-5 - 1E-9 [1E-7]	
OTN G709 Thresholds-Section Monitoring (SM) - Near End	Background Block Errors (BBE)	0-8850600 [10000]	0-849657600 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
	Unavailable Seconds (UAS)	0-900 [500]	0-86400 [5000]
OTN G709 Thresholds-Section Monitoring (SM) - Far End	Background Block Errors (BBE)	0-8850600 [10000]	0-849657600 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
	Unavailable Seconds (UAS)	0-900 [500]	0-86400 [5000]

Table 6-48 TXP_MR_2.5G / TXPP_MR_2.5G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
OTN G709 Thresholds-Path Monitoring (PM) - Near End	Background Block Errors (BBE)	0-8850600 [21260]	0-849657600 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
OTN G709 Thresholds-Path Monitoring (PM) - Far End	Background Block Errors (BBE)	0-8850600 [21260]	0-849657600 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
Optical Thresholds-Client - Warning	High Laser Bias (percent)	0 - 100.0 [81.0]	31.5 - 100.0 [85.5]
	High Rx Power (dBm)	-40.0 - 30.0 [2.0]	-20.9 - 30.0 [2.5]
	High Tx Power (dBm)	-19.9 - 30.0 [2.0]	-10.5 - 30.0 [2.5]
	Low Rx Power (dBm)	-40.0 - 1.8 [-20.0]	-40.0 - 1.9 [-20.5]
	Low Tx Power (dBm)	-40.0 - 1.8 [-7.0]	-40.0 - 10.5 [-7.5]
Optical Thresholds-Client - Alarm	High Laser Bias (percent)	33.0 - 100.0 [90.0]	
	High Rx Power (dBm)	-19.9 - 30.0 [3.0]	
	High tx Power (dBm)	-19.9 - 30.0 [3.0]	
	Low Rx Power (dBm)	-40.0 - 2.0 [-21.0]	
	Low tx Power (dBm)	-40.0 - 2.0 [-8.0]	
Optical Thresholds-Trunk - Warning	High Laser Bias (percent)	33.0 - 100.0 [81.0]	31.5 - 100.0 [85.5]
	High Rx Power (dBm)	-25.2 - 30.0 [-7.5]	-26.6 - 30.0 [-7.3]
	Low Rx Power (dBm)	-40.0 - -3.3 [-24.5]	-40.0 - -3.2 [-24.7]
Optical Thresholds-Trunk - Alarm	High Laser Bias (percent)	30.0 - 100.0 [90.0]	
	High Rx Power (dBm)	-28.0 - 30.0 [-7.0]	
	Low Rx Power (dBm)	-40.0 - -3.0 [-25.0]	
PM Thresholds-OC-3 Line - Near End	Coding Violations (CV) [B2 count]	0-137700 [1312]	0-13219200 [13120]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]

Table 6-48 TXP_MR_2.5G / TXPP_MR_2.5G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
PM Thresholds-OC-3 Line - Far End	Coding Violations (CV) [B2 count]	0-137700 [1312]	0-13219200 [13120]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-OC-3 Section - Near End	Coding Violations (CV) [B1 count]	0-2151900 [10000]	0-206582400 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
PM Thresholds-OC-12 Line - Near End	Coding Violations (CV) [B2 count]	0-137700 [5315]	0-13219200 [53150]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-OC-12 Line - Far End	Coding Violations (CV) [B2 count]	0-137700 [5315]	0-13219200 [53150]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-OC-12 Section - Near End	Coding Violations (CV) [B1 count]	0-2151900 [10000]	0-206582400 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
PM Thresholds-OC-48 Line - Near End	Coding Violations (CV) [B2 count]	0-2212200 [21260]	0-212371200 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]
PM Thresholds-OC-48 Line - Far End	Coding Violations (CV) [B2 count]	0-2212200 [21260]	0-212371200 [212600]
	Errored Seconds (ES)	0-900 [87]	0-86400 [864]
	Failure Count (FC)	0-72 [10]	0-6912 [40]
	Severely Errored Seconds (SES)	0-900 [1]	0-86400 [4]
	Unavailable Seconds (UAS)	0-900 [3]	0-86400 [10]

Table 6-48 TXP_MR_2.5G / TXPP_MR_2.5G Defaults (continued)

Field	Parameter	Threshold Range [Default]	
		15 Minutes	1 Day
PM Thresholds-OC-48 Section - Near End	Coding Violations (CV) [B1 count]	0-2151900 [10000]	0-206582400 [100000]
	Errored Seconds (ES)	0-900 [500]	0-86400 [5000]
	Severely Errored Framed Seconds (SEFS)	0-900 [500]	0-86400 [5000]
	Severely Errored Seconds (SES)	0-900 [500]	0-86400 [5000]
FEC Thresholds-OC-3	Bit Errors Corrected	0-9033621811200 [15012]	0-867227693875200 [1441152]
	Uncorrectable Words	0-4724697600 [1]	0-453570969600 [96]
FEC Thresholds-OC-12	Bit Errors Corrected	0-9033621811200 [56457]	0-867227693875200 [5419872]
	Uncorrectable Words	0-4724697600 [1]	0-453570969600 [96]
FEC Thresholds-OC-48	Bit Errors Corrected	0-9033621811200 [225837]	0-867227693875200 [21680352]
	Uncorrectable Words	0-4724697600 [1]	0-453570969600 [96]
FEC Thresholds-1 Gigabit Ethernet	Bit Errors Corrected	0-9033621811200 [112500]	0-867227693875200 [10800000]
	Uncorrectable Words	0-4724697600 [1]	0-453570969600 [96]
FEC Thresholds-1 Gigabit Fibre Channel/Ficon	Bit Errors Corrected	0-9033621811200 [90000]	0-867227693875200 [8640000]
	Uncorrectable Words	0-4724697600 [1]	0-453570969600 [96]
FEC Thresholds-1 Gigabit FICON	Bit Errors Corrected	0-9033621811200 [90000]	0-867227693875200 [8640000]
	Uncorrectable Words	0-4724697600 [1]	0-453570969600 [96]
FEC Thresholds-Trunk-2 Gigabit Fibre Channel	Bit Errors Corrected	0-9033621811200 [180900]	0-867227693875200 [17366400]
	Uncorrectable Words	0-4724697600 [1]	0-453570969600 [96]
FEC Thresholds-Trunk-2 Gigabit FICON	Bit Errors Corrected	0-9033621811200 [180900]	0-867227693875200 [17366400]
	Uncorrectable Words	0-4724697600 [1]	0-453570969600 [96]

Table 6-49 FC_MR-4 Defaults

Field	Parameter	Threshold Range [Default]
Configuration	Card Mode	
	Port Link Recovery	TRUE-FALSE [FALSE]
	Port Media Type	Fibre Channel-1Gbps ISL, Fibre Channel-2Gbps ISL, FICON-1Gbps ISL, FICON-2Gbps ISL, Undefined [Fibre Channel-1Gbps ISL]
	Port State	IS; OOS,DSLBD; OOS,MT [OOS,DSLBD]
	Port Distance Extension Auto Detect	TRUE-FALSE [TRUE]
	Port Distance Extension Auto Adjust GFP Buffer Threshold	TRUE-FALSE [FALSE]
	Port Distance Extension Enable	TRUE-FALSE [FALSE]
	Port Distance Extension Number of Credits	2-256 [256]
	Port Distance Extension Number of GFP Buffers	16-1200 [16]
	Port Enhanced Fibre Channel/FICON Ingress Idle Filtering	TRUE-FALSE [TRUE]
	Port Enhanced Fibre Channel/FICON Maximum Frame Size	2148-2174 [2148]

Table 6-50 CE-100T-8 Defaults

Field	Parameter	Threshold Range [Default]
Configuration	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]
	State	IS; OOS,DSLBD; OOS,MT [OOS,DSLBD]
	Ethernet Port Configuration for 802.1Q-VLAN CoS (count)	0-7 [7]
	Ethernet Port Configuration for IP ToS (count)	0-255 [255]

Table 6-51 G1000-4/G1K4 Defaults

Field	Parameter	Threshold Range [Default]
Configuration	AINS Soak Time (hrs:min)	00:00 - 48:00 [08:00]
	State	IS; OOS,DSLBD; OOS,MT [OOS,DSLBD]

Table 6-52 ML100T-12 Defaults

Field	Parameter	Threshold Range [Default]
Configuration	Card Mode	HDLC, GFP-F [HDLC]

Table 6-53 ML1000-2 Defaults

Field	Parameter	Threshold Range [Default]
Configuration	Card Mode	HDLC, GFP-F [HDLC]

Remote Monitoring Specification Alarm Thresholds

The ONS 15454 supports remote monitoring (RMON) Management Information Base (MIB) objects specified in RFC 2819 [1], RFC 2358, and RFC 2233. RMON MIBs are intended to interface with a network management system (NMS) to monitor the health of the ONS 15454 network.

One of the ONS 15454 RMON MIBs is the Alarm group, which consists of the alarmTable. An NMS uses the alarmTable to find the alarm-causing thresholds for network performance. The thresholds apply to the current 15-minute interval and the current 24-hour interval. RMON monitors several variables, such as Ethernet collisions, and triggers an event when the variable crosses a threshold during that time interval. For example, if a threshold is set at 1000 collisions and 1001 collisions occur during the 15-minute interval, an event triggers. CTC allows you to provision these thresholds for Ethernet statistics.

Release 5.0 adds enhancements to the SNMP agent on the ONS 15454 MSPP to supplement existing RMON support. This enhancement includes support for the High Capacity RMON (HC-RMON) MIB. HC-RMON-MIB is an extension of RMON. RMON counters are 32-bit while HC-RMON counters are 32-bit and 64-bit as defined in the MIB. Release 5.0 supports the following HC-RMON tables:

- mediaIndependentTable
- etherStatsHighCapacityTable
- etherHistoryHighCapacityTable

Table 6-54 defines the RMON MIB variables you can provision in CTC. For example, to set the collision threshold, choose etherStatsCollisions from the Variable menu.

Table 6-54 Ethernet Threshold Variables (MIBs)

Variable	Definition
iflnOctets	Total number of octets received on the interface, including framing octets
iflnUcastPkts	Total number of unicast packets delivered to an appropriate protocol
ifInMulticastPkts	Number of multicast frames received error free (not supported by E-Series)
ifInBroadcastPkts	Number of packets, delivered by this sublayer to a higher (sub)layer, which were addressed to a broadcast address at this sublayer (not supported by E-Series)

Table 6-54 Ethernet Threshold Variables (MIBs) (continued)

Variable	Definition
ifInDiscards	Number of inbound packets which were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol (not supported by E-Series)
iflnErrors	Number of inbound packets discarded because they contain errors
ifOutOctets	Total number of transmitted octets, including framing packets
ifOutUcastPkts	Total number of unicast packets requested to transmit to a single address
ifOutMulticastPkts	Number of multicast frames transmitted error free (not supported by E-Series)
ifOutBroadcastPkts	Total number of packets that higher-level protocols requested be transmitted, and which were addressed to a broadcast address at this sublayer, including those that were discarded or not sent (not supported by E-Series)
ifOutDiscards	Number of outbound packets which were chosen to be discarded even though no errors had been detected to prevent their being transmitted (not supported by E-Series)
dot3statsAlignmentErrors	Number of frames with an alignment error, that is, the length is not an integral number of octets and the frame cannot pass the Frame Check Sequence (FCS) test
dot3StatsFCSErrors	Number of frames with framecheck errors, that is, there is an integral number of octets, but an incorrect FCS
dot3StatsSingleCollisionFrames	Number of successfully transmitted frames that had exactly one collision
dot3StatsMutlipleCollisionFrame	Number of successfully transmitted frames that had multiple collisions
dot3StatsDeferredTransmissions	Number of times the first transmission was delayed because the medium was busy
dot3StatsExcessiveCollision	Number of frames where transmissions failed because of excessive collisions
dot3StatsFrameTooLong	Number of received frames that were larger than the maximum size permitted
dot3StatsCarrierSenseErrors	Number of transmission errors on a particular interface that are not otherwise counted (not supported by E-Series)
dot3StatsSQETestErrors	Number of times that the SQE TEST ERROR message is generated by the PLS sublayer for a particular interface (not supported by E-Series)
etherStatsJabbers	Total number of Octets of data (including bad packets) received on the network
etherStatsUndersizePkts	Number of packets received with a length less than 64 octets
etherStatsFragments	Total number of packets that are not an integral number of octets or have a bad FCS, and that are less than 64 octets long

Table 6-54 Ethernet Threshold Variables (MIBs) (continued)

Variable	Definition
etherStatsOversizePkts	Total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and were otherwise well formed
etherStatsOctets	Total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets)
etherStatsPkts64Octets	Total number of packets received (including error packets) that were 64 octets in length
etherStatsPkts65to127Octets	Total number of packets received (including error packets) that were 65-172 octets in length
etherStatsPkts128to255Octets	Total number of packets received (including error packets) that were 128-255 octets in length
etherStatsPkts256to511Octets	Total number of packets received (including error packets) that were 256-511 octets in length
etherStatsPkts512to1023Octets	Total number of packets received (including error packets) that were 512-1023 octets in length
etherStatsPkts1024to1518Octets	Total number of packets received (including error packets) that were 1024-1518 octets in length
etherStatsJabbers	Total number of packets longer than 1518 octets that were not an integral number of octets or had a bad FCS
etherStatsCollisions	Best estimate of the total number of collisions on this segment
etherStatsCollisionFrames	Best estimate of the total number of frame collisions on this segment
etherStatsCRCAlignErrors	Total number of packets with a length between 64 and 1518 octets, inclusive, that had a bad FCS or were not an integral number of octets in length
receivePauseFrames	Number of received 802.x pause frames (not supported by E-Series)
transmitPauseFrames	Number of transmitted 802.x pause frames (not supported by E-Series)
receivePktsDroppedInternalCongestion	Number of received frames dropped because of frame buffer overflow and other reasons (not supported by E-Series)
transmitPktsDroppedInternalCongestion	Number of frames dropped in the transmit direction because of frame buffer overflow and other reasons (not supported by E-Series)
txTotalPkts	Total number of transmit packets (not supported by E-Series)
rxTotalPkts	Total number of receive packets (not supported by E-Series)