



# Installing the 32DMX-L Card in the Cisco ONS 15454 SONET/SDH

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**Product Name:** 15454-32-DMX-L

This document provides a card description, specifications, and installation procedure for the dense wavelength division multiplexer (DWDM) 32DMX-L card. The 32DMX-L card is compatible with the ONS 15454 SONET (ANSI) and the Cisco ONS 15454 SDH (ETSI) shelf assemblies. Use this document in conjunction with the *Cisco ONS 15454 DWDM Procedure Guide*.

This document contains the following sections:

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## 32DMX-L Card Description

The 32-Channel Demultiplexer L-Band card (32DMX-L) is a single-slot optical demultiplexer. The card receives an aggregate optical signal on its COM RX port and demultiplexes it into 32 100-GHz-spaced channels. The 32DMX-L card is well suited for use in networks that employ DS fiber or SMF-28 single-mode fiber. The 32DMX-L card can be installed in Slots 1 to 6 and Slots 12 to 17.



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## Key Features

The 32DMX-L 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 a VOA for optical power regulation and a photodiode for optical power monitoring.
- **DROP ports (1 to 32):** On its output, the 32DMX-L card provides 32 drop ports that are typically used for dropping channels within the reconfigurable optical add/drop multiplexer (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-L card do not have a VOA per channel for optical power regulation.
- **A terminal site can be configured using only a 32WSS-L card and a 32DMX-L card plugged into the east or west side of the shelf.**
- **Fiber connection:** The 32DMX-L front panel has connectors for 32 DROP TX ports. These ports are connected using four 8-fiber MPO ribbon connectors. The COM RX port receives the incoming optical signal and is connected using a single LC duplex optical connector.

[Figure 1](#) shows the 32DMX-L card front panel and the basic traffic flow through the ports.

**Figure 1 32DMX-L Faceplate**

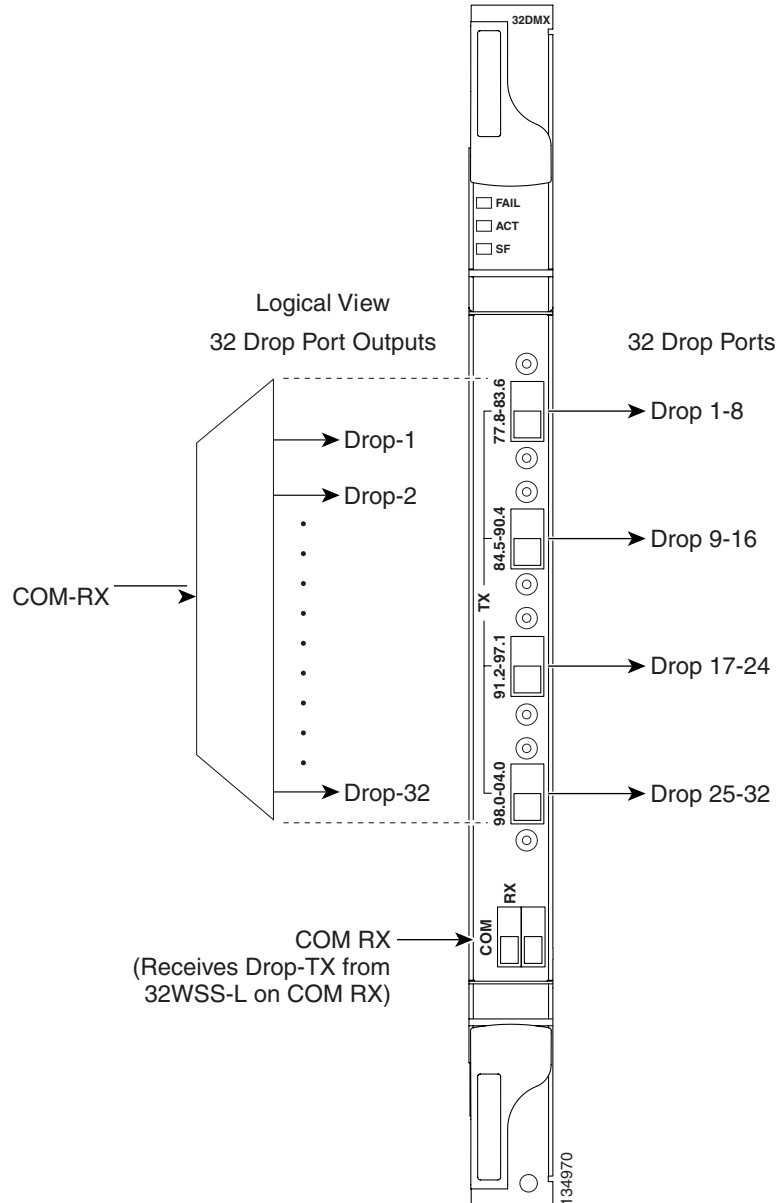


Figure 2 provides a block diagram of the 32DMX-L card.

**Figure 2** 32DMX-L Block Diagram

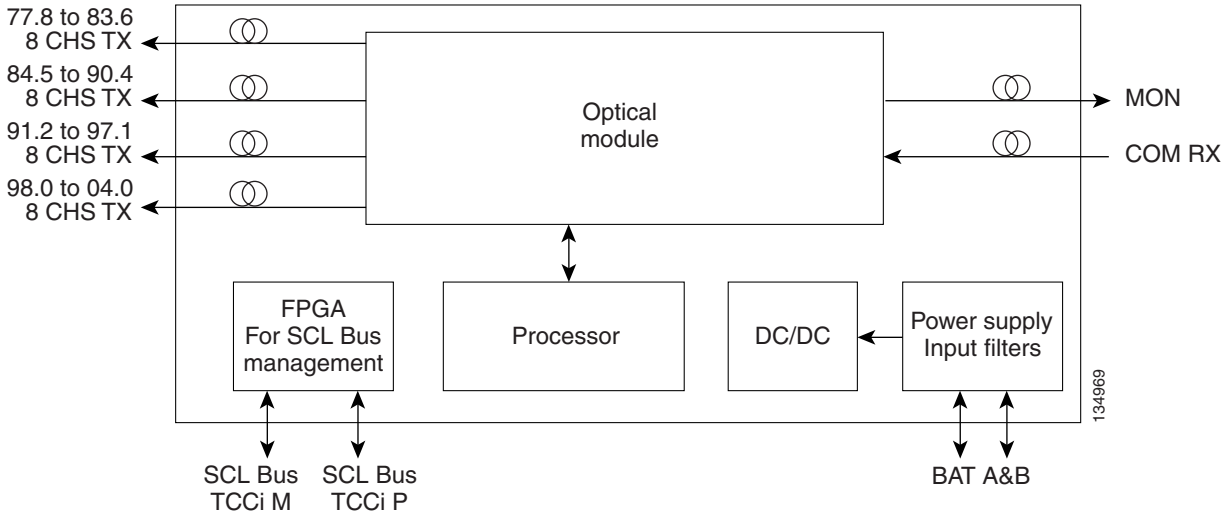
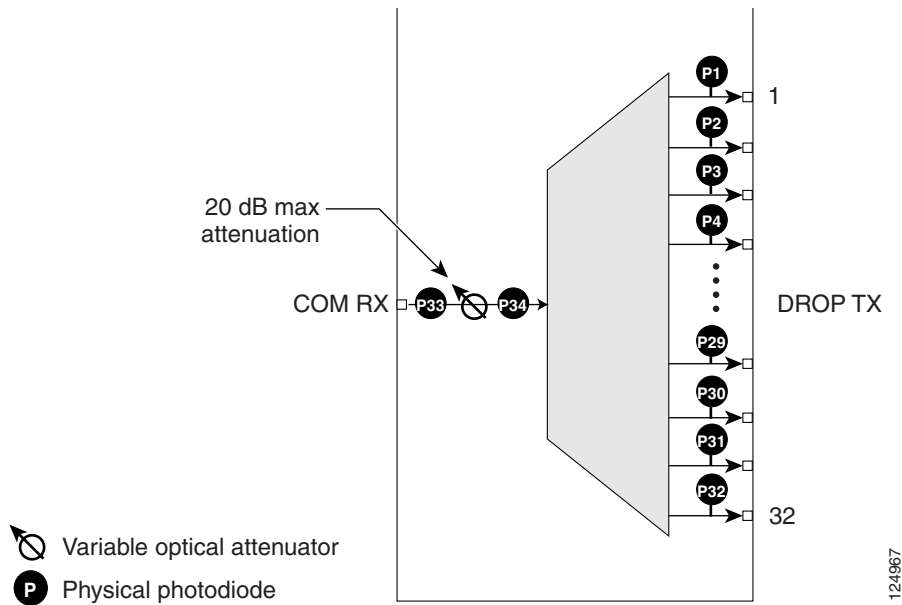


Figure 3 shows the 32DMX-L optical module functional block diagram.

**Figure 3** 32DMX-L Optical Module Functional Block Diagram



## ROADM

The 32DMX-L card works in conjunction with the 32WSS-L card to create a software-controlled NE with ROADM functionality. ROADM functionality requires two 32DMX-L single-slot cards and two 32WSS-L double-slot cards (six slots total in the ONS 15454 chassis).

Equipped with ROADM functionality, ONS 15454 DWDM nodes can be configured at the optical channel level using Cisco Transport Controller (CTC), Cisco MetroPlanner, and Cisco Transport Manager (CTM). Both the 32DMX-L card and 32WSS-L cards use PLC technology to perform wavelength-level processing.

## Power Monitoring

Physical photodiodes P1 through P3 monitor the power for the 32DMX-L card. The returned power level values are calibrated to the ports as shown in [Table 1](#).

**Table 1** 32DMX-L Port Calibration

Photodiode	CTC "Type" Name	Calibrated to Port
P1 - P32	DROP	DROP TX Channel
P33	INPUT COM	COM RX

## 32DMX-L Card Level Indicators

[Table 2](#) describes the three card-level LED indicators on the 32DMX-L card.

**Table 2** 32DMX-L Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the 32DMX-L card is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure on one or more of the card's ports. The amber SF LED also turns on when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

## 32DMX-L Port-Level Indicators

You can find the status of the 32DMX-L ports using the LCD screen on the ONS 15454 SONET fan-tray assembly. Use the LCD to 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 32DMX-L 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-L module). The TX ports are 32 drop ports. The connectors provide four groups of eight channels ranging from the xx.x wavelength to the yy.y wavelength according to the channel plan.

# 32DMX-L Card Specifications

The 32DMX-L card optical specifications are listed in [Table 3](#).



**Note**

For power specifications, see the *Cisco ONS 15454 DWDM Reference Manual*.

**Table 3** 32 DMX-L Optical Specifications

Parameter	Condition	Note	Min	Typical	Max	Units
-1 dB bandwidth	All SOP and within whole operating temperature range, connectors included, and for maximum VOA operating attenuation.	COM RX => TX 1, 32 (OUT)	+/-100	—	—	pm
-3 dB bandwidth			+/-199	—	—	pm
Insertion loss	All SOP, and within whole operating temperature range, connectors included.	COM RX => TX 1, 32	—	—	5.8	dB
VOA dynamic range	—	COM RX => TX 1, 32	25	—	—	dB
Maximum optical input power	—	—	300	—	—	mW

The 32DMX-L channel plan is shown in [Table 4](#). All 32DMX-L client interfaces must comply with this plan.

**Table 4** 32DMX-L Channel Plan

Band ID	Channel Label	Frequency (THz)	Wavelength (nm)
B77.8	77.8	190	1577.86
	78.6	189.9	1578.69
	79.5	189.8	1579.52
	80.3	189.7	1580.35
B81.1	81.1	189.6	1581.18
	82.0	189.5	1582.02
	82.8	189.4	1582.85
	83.6	189.3	1583.69
B84.5	84.5	189.2	1584.53
	85.3	189.1	1585.36
	86.2	189	1586.20
	87.0	188.9	1587.04

**Table 4** 32DMX-L Channel Plan (Continued)

Band ID	Channel Label	Frequency (THz)	Wavelength (nm)
B87.8	87.8	188.8	1587.88
	88.7	188.7	1588.73
	89.5	188.6	1589.57
	90.4	188.5	1590.41
B91.2	91.2	188.4	1591.26
	92.1	188.3	1592.10
	92.9	188.2	1592.95
	93.7	188.1	1593.79
B94.6	94.6	188	1594.64
	95.4	187.9	1595.49
	96.3	187.8	1596.34
	97.1	187.7	1597.19
B98.0	98.0	187.6	1598.04
	98.8	187.5	1598.89
	99.7	187.4	1599.75
	00.6	187.3	1600.60
B01.4	01.4	187.2	1601.46
	02.3	187.1	1602.31
	03.1	187	1603.17
	04.0	186.9	1604.03

The 32 DMX-L card has the following additional specifications:

- Environmental
  - Operating temperature:
    - C-Temp: –5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 95% RH
- Dimensions
  - Height: 12.65 in. (321.3 mm)
  - Width: 0.92 in. (23.4 mm)
  - Depth: 9.00 in. (228.6 mm)

## Install the 32DMX-L Card



**Warning**

**During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94



**Warning**

**Class 1M laser radiation when open. Do not view directly with optical instruments.** Statement 1053



**Warning**

**Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.** Statement 1056



**Caution**

Always use the supplied ESD wristband when working with a powered ONS 15454. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.



**Note**

If protective clips are installed on the back connectors of the cards, remove the clips before installing the cards.

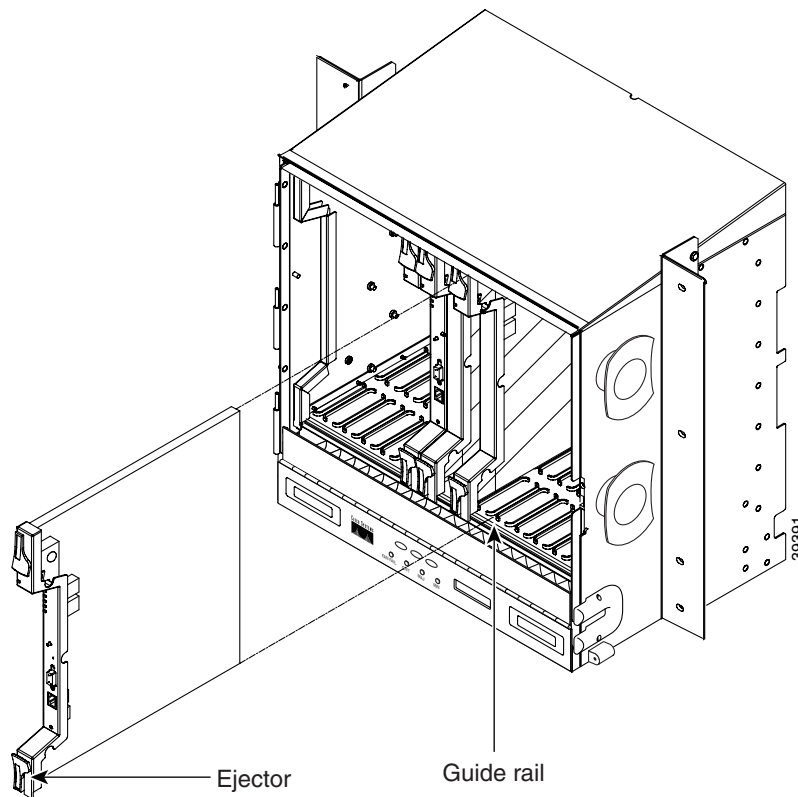


**Note**

If you install a card incorrectly, the FAIL LED flashes continuously.

Figure 4 shows general card installation.

**Figure 4** *Installing a Card in an ONS 15454 (ANSI) Shelf Assembly*



- Step 1** Display the card installation plan for the node using one of the following sources:
- The Cisco MetroPlanner Site Dialog window for the node you are provisioning.
  - CTC node view with slots preprovisioned based on the Cisco MetroPlanner Site Dialog window.
  - Written slot plan. The plan must be based on the Cisco MetroPlanner Site Dialog window for your installation.
- Step 2** Remove the 32DMX-L card from its packaging, then remove the protective caps from the card's rear connectors.
- Step 3** Open the card latches/ejectors.
- Step 4** Use the latches/ejectors to firmly slide the card along the slot guide rails until the card plugs into the receptacle at the back of the slot.
- Step 5** Verify that the card is inserted correctly and close the latches/ejectors on the card.



**Note** It is possible to close the latches/ejectors when the card is not completely plugged into the backplane. Ensure that you cannot insert the card any further.

- Step 6** Verify the LED activity:
- The FAIL LED turns on for approximately 35 seconds.
  - The FAIL LED blinks for approximately 40 seconds.
  - All LEDs turn on and then turn off within 5 seconds.
  - If new software is being downloaded to the card, the ACT and SF LEDs blink for 20 seconds to 3.5 minutes, depending on the card type.
  - The ACT LED turns on.
  - The SF LED stays on until all card ports connect to their far-end counterparts and a signal is present.
- Step 7** If the card does not boot up properly, or the LED activity does not mimic [Step 6](#), check the following:
- When a physical card type does not match the type of card provisioned for that slot in CTC, the card might not boot. If a 32DMX-L card does not boot, open CTC and ensure that the slot is not provisioned for a different card type before assuming that the card is faulty.
  - If the red FAIL LED does not turn on, check the power.
  - If you insert a card into a slot provisioned for a different card, all LEDs turn off.
  - If the red FAIL LED is on continuously or the LEDs behave erratically, the card is not installed. Remove the card and repeat Steps 3 to 6. If the card does not boot up properly the second time, it may be defective. Contact your next level of support.



**Note** The DWDM node type is determined by the cards that are installed. For example, if two 32DMX-O and two 32MUX-O cards are installed, but no AD-xC or AD-xB cards are installed, CTC considers the node a hub node. However, if one 32DMX-O and one 32MUX-O card are installed with no AD-xC or AD-xB cards, CTC considers the node a terminal node. For more information, refer to the *Cisco ONS 15454 DWDM Reference Manual*.

## Related Documentation

- *Cisco ONS 15454 DWDM Reference Manual*
- *Cisco ONS 15454 DWDM Procedure Guide*
- *Cisco ONS 15454 DWDM Troubleshooting Guide*
- *Cisco MetroPlanner DWDM Operations Guide*

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- Nonemergencies—[psirt@cisco.com](mailto:psirt@cisco.com)

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[http://www.cisco.com/en/US/products/products\\_security\\_vulnerability\\_policy.html](http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html)

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