CHAPTER 7

Setup Tunable Dispersion Compensating Units

This chapter explains the Tunable Dispersion Compensating Units (T-DCU) used in Cisco ONS 15454 dense wavelength division multiplexing (DWDM) networks. For card safety and compliance information, refer to the *Regulatory Compliance and Safety Information for Cisco CPT and Cisco ONS Platforms* document.

Note Unless otherwise specified, "ONS 15454" refers to both ANSI and ETSI shelf assemblies.

The T-DCU unit compensates for chromatic dispersion (CD) of the transmission fiber. The T-DCU provides two line cards with varied set of tunable wavelengths to compensate for CD.

This chapter includes:

7.1 Card Overview

The T-DCU card provides a selectable set of discrete negative chromatic dispersion values to compensate for chromatic dispersion of the transmission line. The card operates over the entire C-band (in the range of 1529.0 nm to 1562.5 nm) and monitors the optical power at the input and the output ports. The two types of T-DCU line cards are:

- TDC-CC (Coarse T-DCU)
- TDC-FC (Fine T-DCU)

Note Each T-DCU card is marked with a symbol that corresponds to a slot (or slots) on the ONS 15454 shelf assembly. Cards should be installed in slots that have the same symbols. See the "Card Slot Requirements" section in the *Cisco ONS 15454 Hardware Installation Guide*.

7.1.1 Card Summary

Table 7-1 lists and summarizes the information about the TDC-CC and TDC-FC cards.

Table 7-1 T-DCU Cards

Card	Port Description	For Additional Information
TDC-CC	The TDC-CC has one set of optical ports located on the faceplate. It operates in slots 1 to 6 and slots 12 to 17.	See the 7.3 TDC-CC and TDC-FC Cards section.
TDC-FC	The TDC-FC has one set of optical ports located on the faceplate. It operates in slots 1 to 6 and slots 12 to 17.	

7.2 Safety Labels

For information about safety labels, see the "G.1.2 Class 1M Laser Product Cards" section on page G-4.

7.3 TDC-CC and TDC-FC Cards

The TDC-CC card provides 16 values of CD ranging from 0 to -1650 ps/nm with a granularity of 110 ps/nm in the C-band spectrum.

The TDC-FC card provides 16 values of CD ranging from 0 to -675 ps/nm with a granularity of 45 ps/nm in the C-band spectrum.

You can configure the TDC-CC and TDC-FC cards for the CD value listed in Table 7-2.

Table 7-2 TDC-CC and TDC-FC Tunable CD Value

Unit Configuration	TDC-CC [ps/nm]	TDC-FC [ps/nm]
0	0 [1]	0[2]
1	-110	-45
2	-220	-90
3	-330	-135
4	-440	-180
5	-550	-225
6	-660	-270
7	-770	-315
8	-880	-360
9	-990	-405
10	-1100	-450
11	-1210	-495
12	-1320	-540

Table 7-2 TDC-CC and TDC-FC Tunable CD Value

Unit Configuration	TDC-CC [ps/nm]	TDC-FC [ps/nm]
13	-1430	-585
14	-1540	-630
15	-1650	-675

1. The default value of the TDC-CC CD value for Coarse Unit is 0.
2. The default value of the TDC-FC value for Fine Unit is 0.

7.3.1 Key Features

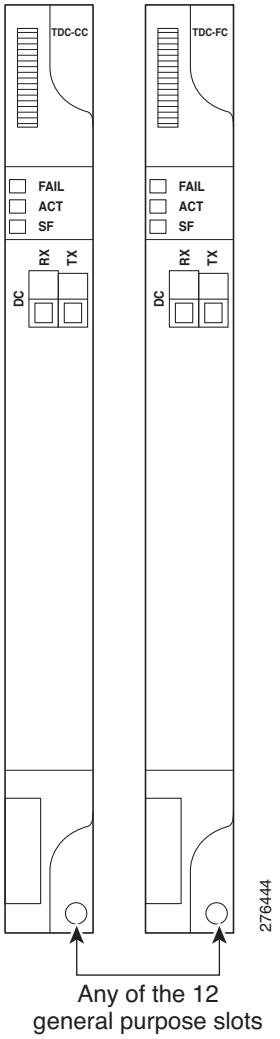
The TDC-CC and TDC-FC cards provide the following features:

- Single slot card with three LEDs on the front panel.
- Two LC-PC-II optical connectors on the front panel.
- Operates in slots from slot 1 to 6 and 12 to 17.
- Operates over the C-band (wavelengths from 1529 nm to 1562.5 nm) of the optical spectrum.
- Allows upto 16 provisionable CD values for chromatic dispersion compensation.
- Connects to OPT-PRE, OPT-AMP-C, OPT-RAMP-C, and OPT-RAMP-CE amplifiers and 40-SMR-1 and 40-SMR-2 cards.
- Supports performance monitoring and alarm handling for selectable thresholds.
- Allows monitoring and provisioning using CTC, SNMP, or TL1.

7.3.2 TDC-CC and TDC-FC Faceplate Diagram

Figure 7-1 shows the TDC-CC and TDC-FC faceplate diagram. The TDC-CC and TDC-FC cards can be installed or pulled out of operation from any user interface slot, without impacting other service cards operating within that shelf.

Figure 7-1 TDC-CC and TDC-FC Faceplates



Note The coarse T-DCU is identified with the card label as TDC-CC and the fine T-DCU with TDC-FC in the faceplate of the T-DCU card.

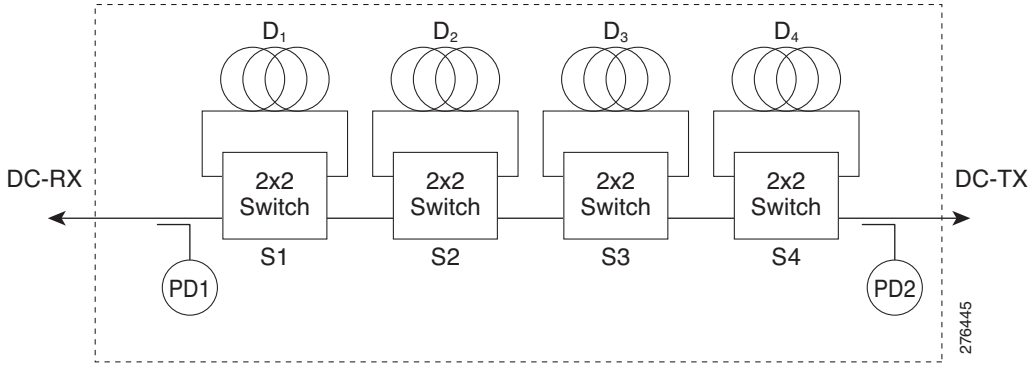
7.3.3 Functioning of Optical Ports

The T-DCU unit contains the DC-RX (input) and DC-TX (output) ports. The optical signal enters the DC-RX port, compensates the chromatic dispersion and then exits from the DC-TX port.

7.3.4 TDC-CC and TDC-FC Block Diagram

The TDC-CC and TDC-FC cards embed an optical module with four spools (D1, D2, D3, and D4) of dispersion compensating fiber that connects through the 2x2 bypass switches (Figure 7-2). Each bypass switch allows the corresponding dispersion compensation fiber spools to connect to the optical path from the DC-RX (input port) to the DC-TX (output port). The switch configuration selects the requested CD value and combines the four spools based on the 16 chromatic dispersion compensation values fetched. The photo diodes PD1 and PD2 are used to monitor the input and output ports respectively.

Figure 7-2 Block Diagram of TDC-CC and TDC-FC



7.3.5 TDC-CC and TDC-FC Cards Functions

The functions of the TDC-CC and TDC-FC cards are:

- G.16 Lamp Test, page G-19
- Card level indicators—Table G-1 on page G-7

7.4 Monitoring Optical Performance

The TDC-CC and TDC-FC cards monitor the optical input power and optical output power of the fiber. It monitors the insertion loss from the input (DC-RX) to the output (DC-TX) port, with the help of the two photodiodes PD1 and PD2. The TDC-CC and TDC-FC cards report the minimum, average, and maximum power statistics of each of the monitored ports or channels in the specific card. To view the optical power statistics of the TDC-CC and TDC-FC cards, refer to the Monitor Performance document. The performance data is recorded at 15 minutes and 24 hours intervals.

Note You can view the performance monitoring (PM) data of the card using CTC, SNMP, and TL1 interfaces.

Note The PM data is stored on a wrap-around basis at 32 x 15 min. and 2 x 24 hour intervals.

7.4.1 Related Procedures for TDC-CC and TDC-FC Cards

The following section lists procedures and tasks related to the configuration of the TDC-CC and TDC-FC cards:

- NTP-G30 Install the DWDM Cards, page 14-64
- DLP-G525 View Optical Power Statistics for TDC-CC and TDC-FC cards
- NTP-G240 Modify TDC-CC and TDC-FC Line Settings and PM Thresholds, page 20-76
- NTP-G242 Modify the CD setting of TDC-CC and TDC-FC Cards
- NTP-G119 Power Down the Node, page 24-27