



Cisco ONS 15216 Dispersion Compensation Unit User Guide

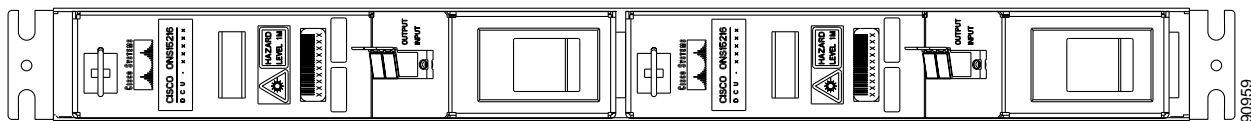
The Dispersion Compensation Unit (DCU) is a complementary part of the Cisco ONS 15216 product family. The DCU can interoperate with the ONS 15454, ONS 155xx, and ONS 15600 products.

This user guide contains functional and physical descriptions of the DCU shelf assembly (chassis) and its Dispersion Compensation Modules, instructions for installing the DCU chassis into the rack-mounted ONS 15216 shelf, and instructions for installing modules into the DCU chassis.

Functional Description

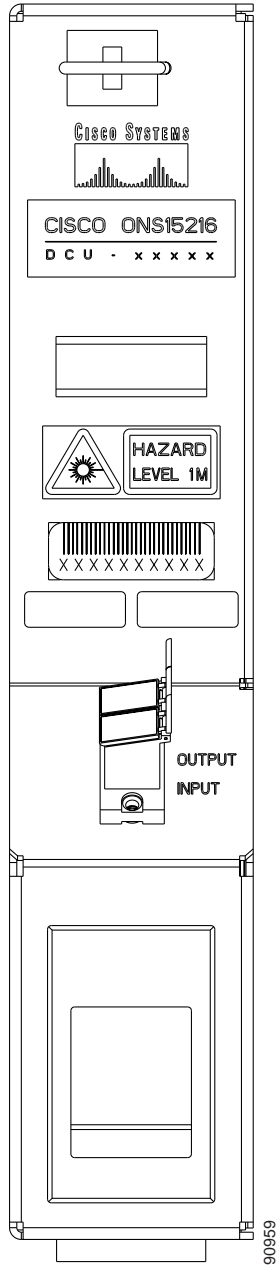
The DCU consists of the chassis and two modules. The modules function in both bidirectional and wavelength division multiplexing (WDM) directions. [Figure 1](#) shows the front view of the DCU chassis with two modules installed.

Figure 1 Cisco ONS 15216 DCU Shelf Assembly (Front View)



[Figure 2](#) shows the front panel of a DCU module.

Figure 2 Cisco ONS 15216 Dispersion Compensation Module (Front View)



Module capacity is determined by the level of chromatic dispersion compensation (CDC) granularity. [Table 1](#) describes the DCU module models available; they include seven C-band and six L-band models.

Table 1 *DCU Module Models and Compensation Levels*

Band	Module	Compensation Level
C-Band	DCU-100	100 ps/nm
	DCU-350	350 ps/nm
	DCU-450	450 ps/nm
	DCU-550	550 ps/nm
	DCU-750	750 ps/nm
	DCU-950	950 ps/nm
	DCU-1150	1150 ps/nm
L-Band	DCU-L-300	300 ps/nm
	DCU-L-600	600 ps/nm
	DCU-L-700	700 ps/nm
	DCU-L-800	800 ps/nm
	DCU-L-1000	1000 ps/nm
	DCU-L-1100	1100 ps/nm

Module Function

In optical networks, the DCU provides compensation for accumulated chromatic dispersion effect in line and terminal sites. It provides a flexible solution for accumulated chromatic dispersion without dropping and regenerating the wavelengths on the link, a process that would otherwise be necessary when accumulated chromatic dispersion exceeds the maximum allowed dispersion tolerance.

To provide effective compensation, the DCU is designed to operate over the entire band from 1525 to 1565 nm.

Two modules can be installed in the DCU chassis, one for east-to-west traffic and the other for west-to-east traffic. Each DCU chassis mounts into a 1-RU, 19-inch rack. A module consists of a fiber spool, connectors, and a connector adapter for input and output. The connector adapter has a cover that provides protection from laser radiation. The cover also protects against dirt and dust, which can cause equipment failure.

Connections

The DCU chassis has no connectors, but the DCU modules have one LC/UPC connector adapter. [Table 2](#) describes the input connection.

Table 2 *Dispersion Compensation Module Input Connection*

Input Connector	Connection From	Type
LC-UPC type connector	LC-UPC/LC-PC connector	LC-UPC/LC-PC connector

[Table 3](#) describes the output connection.

Table 3 *Dispersion Compensation Module Output Connections*

Output Connector	Connection To	Type
LC-UPC type connector	LC-UPC/LC-PC connector	LC-UPC/LC-PC connector

Technical Specifications

This section provides optical, environmental, and mechanical specifications for the DCU.

Optical Specifications

Table 4 lists the operating wavelengths.

Table 4 *Dispersion Compensation Module Operating Wavelengths*

Effect	Band	Range (nm)	Reference (nm)
Negative	C-band	1525—1565	1545.32

Environmental Specifications

Table 5 lists the environmental specifications for the DCU shelf assembly (chassis).

Table 5 *DCU Chassis Environmental Specifications*

Parameter	Specification
Temperature	-5° — 55°C (23° to 131°F)
Relative Humidity	95% maximum, non-condensing

Mechanical Specifications

Table 6 lists mechanical specifications for the DCU module.

Table 6 *Dispersion Compensation Module Mechanical Specifications*

Parameter	Specification
Dimensions	41.1 mm H x 208.2 mm W x 204.9 mm D (1.62 in. H x 8.20 in. W x 8.07 in. D)
Weight	Minimum: 2 kg (4.4 lb) Maximum: 3.5 kg (7.7 lb)

Remove and Install the Dispersion Compensation Modules

This section contains information for the removal and installation of the DCU modules, DCU chassis, and grounding.

Remove the Dispersion Compensation Modules

Use the following procedure to remove a DCU module:

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- Step 1** Place your right-hand thumb on the thumb-block located in the middle of the module.
 - Step 2** Use your right-index finger to push the connector spring lock located on the right-side of the module.
 - Step 3** Disconnect the connection.
 - Step 4** Use the rectangular pull handle provided on the left center of the front panel to pull the module until the connector spring lock releases.
 - Step 5** Use both hands to remove the module from the DCU chassis.
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Install the Dispersion Compensation Modules

Use the following procedure to install a DCU module:

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- Step 1** Use both hands to push the module all the way into the chassis until the connector spring lock on the right side of the module clicks into place.
 - Step 2** Open the cover on the connector adapter (the cover has a laser warning) and then connect the cable connector.
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Remove and Install the Dispersion Compensation Unit Chassis



This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024



When removing or installing the DCU chassis, you must connect the ground first and disconnect it last; see the [“Remove and Install the Chassis Ground Strap”](#) section on page 6 for more information.

Remove the DCU Chassis

Use the following procedure to remove the DCU shelf assembly:

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- Step 1 Remove all DCU modules from the chassis (“[Removal and Installation of the Dispersion Compensation Modules](#)” section on page 5).
 - Step 2 Disconnect the ground cables from the DCU chassis.
 - Step 3 Remove mounting screws from the mounting brackets and lift the DCU chassis out of the rack.
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Install the DCU Chassis

Use the following procedure to install a DCU shelf assembly:

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- Step 1 Position the DCU chassis in the rack to align the mounting brackets.
 - Step 2 Insert the mounting screws into the mounting brackets and tighten the screws.
 - Step 3 Connect the ground cables to the DCU chassis using the “[Install the Chassis Ground Strap](#)” procedure on page 6.
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Remove and Install the Chassis Ground Strap

When installing or removing the DCU chassis, you must connect the ground first and disconnect it last.

Remove the Chassis Grounding

Use the following procedure to remove the chassis ground:

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- Step 1 To disconnect the ground strap from the DCU chassis, remove the lug screw and grounding lug.
 - Step 2 Disconnect the chassis ground strap from the office ground point or the rack ground point.
 - Step 3 Disconnect the chassis ground strap from the DCU chassis.
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Install the Chassis Ground Strap

Use the following procedure to install the chassis ground strap:

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- Step 1 Connect the chassis ground strap to the DCU chassis.
 - Step 2 Terminate the chassis ground strap to either the office ground point or the rack ground point before applying power to the unit.

- Step 3** Use the grounding lug to attach the ground strap to the chassis according to local site practice.
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Fiber-Optic Connector Cleaning and Maintenance

Regular connector cleaning is required to maintain the performance of fiber-optic circuits. Before installing the fiber-optic cable, always perform the cleaning procedure for cable connectors described in the following section. Whenever possible, inspect each connector before making a connection.



Warning

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051



Warning

Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040

Customer Supplied Cleaning Materials

The following cleaning materials are recommended but are not supplied with the DCU:

- Reagent grade ethyl alcohol in an alcohol dispenser
- Lint free laboratory wipes
- Clean, dry, oil-free, compressed air

When cleaning a paired cable connector (bulkhead mating adapter), always clean the mating adapter first. If the mating adapter is properly maintained, meaning it is used with clean, defect-free fiber connectors and capped when not in use, it should not require cleaning. However, if you suspect the adapter is dirty, clean it by blowing the adapter with clean, dry, oil-free compressed air. Always keep unused adapter ports and fiber connectors capped with a clean dust cap.

Clean Fiber-Optic Cable Connectors

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- Step 1** Remove the dust cap from the fiber connector.
- Step 2** Wipe the connector tip with the pre-moistened alcohol wipe.
- The design of the LC connector makes it difficult to clean the entire perimeter of the ferrule, because only a small portion close to the ferrule tip is accessible. Clean the tip of the ferrule and the entire accessible perimeter. Keep the fiber connector capped at all times when not in use.
- Step 3** Blow dry using filtered air.
- Step 4** Use an inspection microscope to inspect each fiber connector for dirt, cracks, or scratches. If the connector is not clean, repeat [Step 1](#) through [Step 3](#). If the connector shows damage (for example, scratches or pits across the fiber core), replace the fiber patch cord with a new one equipped with a defect-free connector.
- Step 5** Insert the fiber connector into the applicable adapter or attach a dust cap to the fiber connector.

**Note**

If you must replace a dust cap on a connector, first verify that the dust cap is clean. To clean the dust cap, wipe the outside of the cap using a dry, lint-free wipe and swab the inside of the dust cap using a Cletop stick swab (14100400).

Clean the Internal Fiber-Optic Cable Connectors

The connectors on the DCU modules are inside adapters and need special cleaning treatment because they are difficult to access. Use the following procedure to clean internal fiber-optic cable adapters:

- Step 1 Remove the dust plug from the fiber adapter.
- Step 2 Insert a Cletop stick swab (14100400) into the adapter opening and rotate the swab.
- Step 3 Place dust plugs on the fiber adapters when not in use.

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

<http://www.cisco.com/techsupport>

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at this URL:

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

Product Documentation DVD

The Product Documentation DVD is a comprehensive library of technical product documentation on a portable medium. The DVD enables you to access multiple versions of installation, configuration, and command guides for Cisco hardware and software products. With the DVD, you have access to the same HTML documentation that is found on the Cisco website without being connected to the Internet. Certain products also have .PDF versions of the documentation available.

The Product Documentation DVD is available as a single unit or as a subscription. Registered Cisco.com users (Cisco direct customers) can order a Product Documentation DVD (product number DOC-DOCDVD= or DOC-DOCDVD=SUB) from Cisco Marketplace at this URL:

<http://www.cisco.com/go/marketplace/>

Cisco Optical Networking Product Documentation CD-ROM

Optical networking-related documentation, including Cisco ONS 15xxx product documentation, is available in a CD-ROM package that ships with your product. The Optical Networking Product Documentation CD-ROM is updated periodically and may be more current than printed documentation.

Ordering Documentation

Registered Cisco.com users may order Cisco documentation at the Product Documentation Store in the Cisco Marketplace at this URL:

<http://www.cisco.com/go/marketplace/>

Nonregistered Cisco.com users can order technical documentation from 8:00 a.m. to 5:00 p.m. (0800 to 1700) PDT by calling 1 866 463-3487 in the United States and Canada, or elsewhere by calling 011 408 519-5055. You can also order documentation by e-mail at tech-doc-store-mkpl@external.cisco.com or by fax at 1 408 519-5001 in the United States and Canada, or elsewhere at 011 408 519-5001.

Documentation Feedback

You can rate and provide feedback about Cisco technical documents by completing the online feedback form that appears with the technical documents on Cisco.com.

You can submit comments about Cisco documentation by using the response card (if present) behind the front cover of your document or by writing to the following address:

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

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you will find information about how to:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories, security notices, and security responses for Cisco products is available at this URL:

<http://www.cisco.com/go/psirt>

To see security advisories, security notices, and security responses as they are updated in real time, you can subscribe to the Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed. Information about how to subscribe to the PSIRT RSS feed is found at this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you have identified a vulnerability in a Cisco product, contact PSIRT:

- For Emergencies only—security-alert@cisco.com

An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- For Nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532



Tip

We encourage you to use Pretty Good Privacy (PGP) or a compatible product (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.x through 9.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

The link on this page has the current PGP key ID in use.

If you do not have or use PGP, contact PSIRT at the aforementioned e-mail addresses or phone numbers before sending any sensitive material to find other means of encrypting the data.

Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, at this URL:

<http://www.cisco.com/techsupport>

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>



Note

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests, or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—An existing network is down, or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of the network is impaired, while most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

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

- The *Cisco Product Quick Reference Guide* is a handy, compact reference tool that includes brief product overviews, key features, sample part numbers, and abbreviated technical specifications for many Cisco products that are sold through channel partners. It is updated twice a year and includes the latest Cisco offerings. To order and find out more about the Cisco Product Quick Reference Guide, go to this URL:

<http://www.cisco.com/go/guide>

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

<http://www.cisco.com/go/marketplace/>

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

<http://www.ciscopress.com>

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

<http://www.cisco.com/packet>

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

<http://www.cisco.com/go/iqmagazine>

or view the digital edition at this URL:

<http://ciscoiq.texterity.com/ciscoiq/sample/>

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:
<http://www.cisco.com/ipj>
- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:
<http://www.cisco.com/en/US/products/index.html>
- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:
<http://www.cisco.com/discuss/networking>
- World-class networking training is available from Cisco. You can view current offerings at this URL:
<http://www.cisco.com/en/US/learning/index.html>

