



Installing ONS 15454 SDH DS3iN-12 Cards

Product Name: 15454E-DS3IN-12=

This document contains a description of DS3iN-12 card features, installation procedures, removal instructions, and technical specifications. Use this document in conjunction with the *Cisco ONS 15454 SDH Installation and Operations Guide* and the *Cisco ONS 15454 SDH Troubleshooting and Reference Guide* when working with DS3iN-12 cards.

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Note

For information about circuits and card capacities, see the *Cisco ONS 15454 SDH Installation and Operations Guide*.

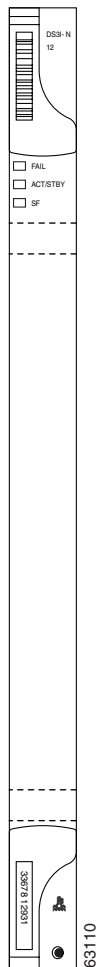


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DS3iN-12 Card

The twelve-port ONS 15454 SDH DS3iN-12 card provides twelve ITU-T G.703, GR-499, ITU-T G.704 compliant DS-3 ports per card. Each port operates at 44.736 Mbits/s (Mbps) over a 75 ohms coaxial cable (with FMEC-E3/DS3). The DS3iN-12 can detect several different errored logic bits within a DS-3 frame. This function lets the ONS 15454 SDH identify a degrading DS-3 facility caused by upstream electronics (DS-3 Framer). In addition, DS3 frame format auto detection and J1 path trace are supported. By monitoring additional overhead in the DS-3 frame, subtle network degradations can be detected. [Figure 1](#) shows the DS3iN-12 faceplate and [Figure 2](#) shows a block diagram of the card.

Figure 1 DS3iN-12 faceplate



The following list summarizes the DS3iN-12 card features:

- Provisionable framing format M23, C-bit or unframed
- Auto recognition and provisioning of incoming framing
- VC-3 payload mapping as per ITU-T G.707
- Idle signal ("1100") monitoring as per GR-499
- P-bit monitoring

- C-bit parity monitoring
- X-bit monitoring
- M-bit monitoring
- F-bit monitoring
- Far-end block errors (FEBE) monitoring
- Far-end alarm and control (FEAC) status and loop code detection
- Path trace byte support with TIM-P alarm generation

You can install the DS3iN-12 card in any multispeed or high-speed card slot. Each DS3iN-12 port features DSX-level outputs supporting distances up to 450 feet. With FMEC-E3/DS3 the card supports 1.0/2.3 Miniature Coax nonbalanced connectors.

The DS3iN-12 can operate as the protect card in a 1:N ($N \leq 5$) DS-3 protection group. It has circuitry that allows it to protect up to five working DS3iN-12 cards.

**Note**

The lowest level cross-connect is STM-1. Lower level signals, such as E-1, DS-3, or E-3, can be dropped. This may leave part of the bandwidth unused.

DS3iN-12 Card-Level Indicators

The DS3iN-12 card faceplate has three LEDs.

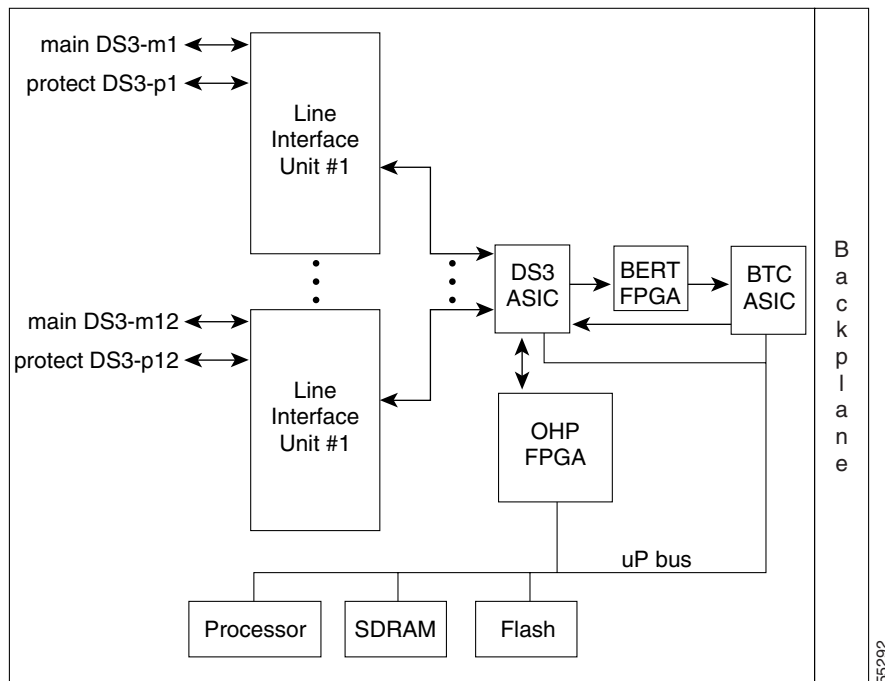
Table 1 DS3iN-12 Card-Level Indicators

Card-Level LEDs	Description
Red FAIL LED	The red FAIL LED indicates the card's processor is not ready. This LED is lit during Reset. The FAIL LED flashes during the boot process. Replace the card if the red FAIL LED persists.
ACT/STBY LED Green (Active) Yellow (Standby)	When the ACTV/STBY LED is green, the DS3iN-12 card is operational and ready to carry traffic. When the ACTV/STBY LED is yellow, the DS3iN-12 card is operational and in standby (protect) mode.
Yellow SF LED	The yellow SF LED indicates a signal failure or condition such as LOS or LOF on one or more of the card's ports.

DS3iN-12 Port-Level Indicators

You can find the status of the DS3iN-12 card ports using the LCD screen on the ONS 15454 SDH 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. Refer to [Chapter 1, "Alarm Troubleshooting,"](#) of the *"Cisco ONS 15454 SDH Troubleshooting and Maintenance Guide, R3.3"* for a complete description of the alarm messages.

Figure 2 DS3iN-12 block diagram



DS3iN-12 Card Specifications

- DS3iN-12 Input
 - Bit Rate: 44.736 MBits/s (Mbps) \pm 20 ppm
 - Frame Format: ITU-T G.704, ITU-T G.752 / DS-3 ANSI T1.107-1988
 - Line Code: B3ZS
 - Termination: Unbalanced coaxial cable
 - Input Impedance: 75 ohms \pm 5%
 - Cable Loss: Max 137 m (450 ft.) 734A, RG59, 728A / Max 24 m (79 ft.) RG179
 - AIS: ITU-T G.704-compliant
- DS3iN-12 Output
 - Bit Rate: 44.736 MBits/s (Mbps) \pm 20 ppm
 - Frame Format: ITU-T G.704 , ITU-T G.752 / DS-3 ANSI T1.107-1988
 - Line Code: B3ZS
 - Termination: Unbalanced coaxial cable
 - Output Impedance: 75 ohms \pm 5%
 - AIS: ITU-T G.704-compliant
 - Power Level: -1.8 - +5.7 dBm (The power level is for a signal of all ones and is measured at a center frequency of 22.368 MHz (3 ± 1 -kHz) bandwidth.)

- Pulse Shape: ITU-T G.703, Figure 14 / ANSI T1.102-1988 Figure 8
- Pulse Amplitude: 0.36 - 0.85 V peak-to-peak
- Loopback Modes: Terminal and Facility
- Line Build Out: 0-69 m (0-225 ft.); 69-137 m (226-450 ft.)
- DS3iN-12 Electrical Interface
 - Connectors: 1.0/2.3 Miniature Coax connectors via FMEC-E3/DS3 card
- Environmental
 - Overvoltage Protection: as in ITU-T G.703 Annex B
 - Operating Temperature: -5 to +45 degrees Celsius
 - Operating Humidity: 5 - 95%, non-condensing
 - Power Consumption: 26.80 W, 0.56 A (AMPS) @ -48V, 91.5 BTU/Hr.
- Dimensions
 - Height: 321.3 mm, (12.650 in.)
 - Width: 18.2 mm, (0.716 in.)
 - Depth: 228.6 mm, (9.000 in.)
 - Depth with backplane connector: 235 mm, (9.250 in.)
 - Weight not including clam shell: 0.8 kg (1.9 lbs.)
- Compliance
 - ONS15454 SDH cards, when installed in a system, comply with these standards:
 - Safety: IEC 60950, EN 60950, UL 60950, CSA C22.2 No. 60950, TS 001, AS/NZS 3260

Installation Procedures

Use this section if you are installing or removing the DS3iN-12 card for the first time. After you become familiar with ONS 15454 SDH card installation and boot up, use this section as a reference.



Caution

Always use the supplied electrostatic discharge (ESD) wristband when working with an ONS 15454 SDH. Plug the wristband cable into the ESD jack located on the lower right outside edge of the shelf assembly and ensure the shelf assembly is properly grounded.

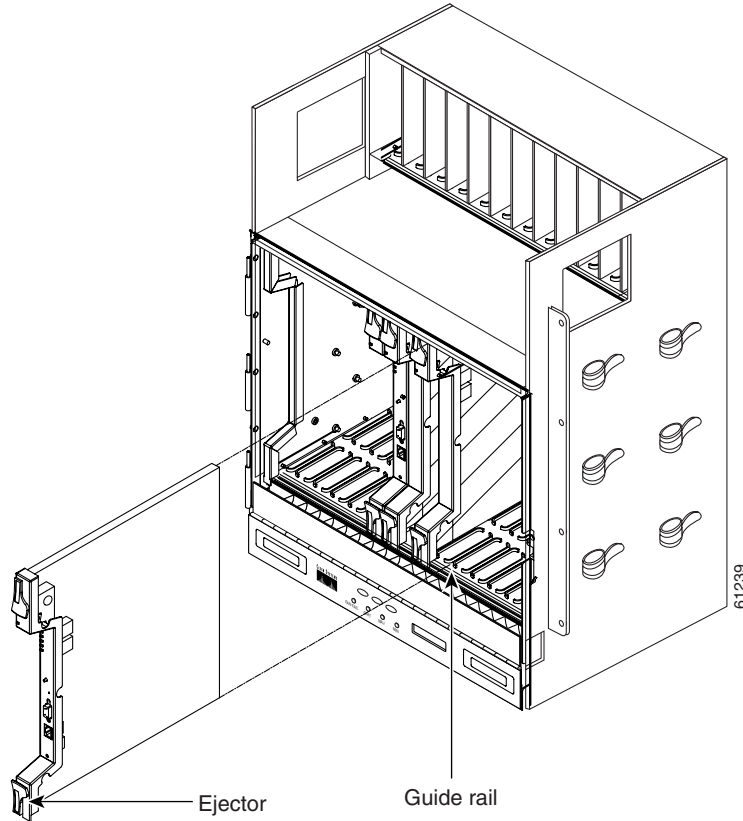


Caution

Hazardous voltage or energy may be present on the backplane when the system is operating. Use caution when servicing.

- Step 1** Open the card ejectors.
- Step 2** Carefully insert the card into the guide rails of the desired slot ([Figure 3 on page 6](#)).
- Step 3** Push the card into the connector on the back plane by closing the ejectors.

Figure 3 *Installing cards in an ONS 15454 SDH*



Card Turn Up

Follow the steps in this section to verify card turn up. If one or more of the Cisco Transport Controller (CTC) software screen conditions according to [“Verify Successful Turn Up of the DS3iN-12 Card” section on page 6](#) are not met, re-install the card. Replace the unit if the faulty state persists.

Verify Successful Turn Up of the DS3iN-12 Card

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- Step 1** Verify that power is applied to the shelf assembly.
 - Step 2** Verify that the DS3iN-12 card has been installed in the correct slot.
 - Step 3** Verify that the card appears in the correct slot on the CTC software screen.
 - Step 4** Verify that the card is white on the CTC software screen.
 - Step 5** Verify that the card is shown in Inventory on the CTC software screen.
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Removal Procedures

Use this section if you are installing or removing the DS3iN-12 card for the first time. After you become familiar with ONS 15454 SDH card installation and boot up, use this section as a reference.


Caution

Always use the supplied electrostatic discharge (ESD) wristband when working with an ONS 15454 SDH. Plug the wristband cable into the ESD jack located on the lower right outside edge of the shelf assembly and ensure the shelf assembly is properly grounded.


Caution

Hazardous voltage or energy may be present on the backplane when the system is operating. Use caution when servicing.


Note

Traffic can be interrupted if you pull an active card from the ONS 15454 SDH. Use caution when replacing cards and verify that only inactive or standby cards are being replaced. If an active card needs to be replaced, follow the procedure to switch the electrical card to standby mode before you pull the card from the node.

Reset an Electrical Card (E1-N-14, DS3iN-12, or E3-12)


Note

An electrical card reset can cause a linear 1:1 or 1:N protection switch or an MSSPRing protection switch.

The cards should be replaced when the red FAIL LED appears.

Take these precautions before performing an electrical card reset to avoid causing a linear 1:1, 1:N or MSSPRing protection switch:

-
- Step 1** Ensure that the working span is active on the local and remote nodes.
- Step 2** Ensure that the working span is carrying error-free traffic without SF alarms.
- Step 3** Place a lockout on the protection span before initiating an electrical card reset. In an MSSPRing, place a lockout on the East and West cards of the nodes adjacent to the electrical card switch node; for example, to switch the electrical card on Node B, place the lockout on the West card of Node A and on the East card of Node C. No lockout is necessary on Node B. Before the lockout is set, verify that the MSSPRing is not switched. Traffic can be lost if a lockout is set when the MSSPRing is switched, .
- <-----East [Node A] West-----East [Node B] West-----East [Node C] West----->
- In a 1:1 protection scheme, place a lockout on the protect card and verify that traffic is traveling over the working span before setting the lockout.
-

Replace an In-Service Electrical Card (E1-N-14, DS3iN-12, or E3-12)

Step 1 Determine which electrical card is active. The active card ACT/STBY LED is green. The standby card ACT/STBY LED is yellow.

**Note**

You can determine whether the card is in active mode or standby mode by viewing it in the CTC software and positioning the cursor over the card graphic to display the status.

Step 2 Switch the active card to standby:

- a. In the node view, select the **Maintenance > E1-N-14, DS3iN-12 and E3-12** tabs.
- b. From the menu, choose **Switch**.
- c. Click **Yes** on the Confirm Switch dialog box.

**Note**

A minor alarm appears on the manually-switched slot. After the active electrical card goes into standby, the original standby slot becomes active. This causes the former standby card ACT/STBY LED to become green.

Step 3 Pull the new standby card from the ONS 15454 SDH.

Step 4 Insert the replacement card into the empty slot. The replacement card boots up and becomes ready for service after approximately one minute. Release the protection lockout.

Related Documentation

- DOC-7813038= *Cisco ONS 15454 SDH Installation and Operations Guide*
- DOC-7813037= *Cisco ONS 15454 SDH Troubleshooting and Reference Guide*

Obtaining Documentation

The following sections explain how to obtain documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following URL:

<http://www.cisco.com>

Translated documentation is available at the following URL:

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

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:
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<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

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Obtaining Technical Assistance

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<http://www.cisco.com>

Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

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

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

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

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number.

This document is to be used in conjunction with the documents listed in the “[Related Documentation](#)” section.

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