



## Installing ONS 15454 SDH E3-12 Cards

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### Product Name: 15454E-E3-12=

This document contains a description of E3-12 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 E3-12 cards.

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### Note

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

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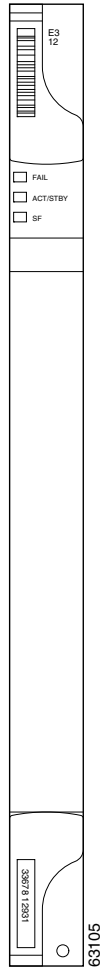
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# E3-12 Card

The twelve-port ONS 15454 SDH E3-12 card provides twelve ITU-compliant, G.703 E-3 ports per card. Each interface operates at 34.368 Mbits/s (Mbps) over a 75 ohms coaxial cable (with FMEC-E3/DS3). The E3-12 card operates as a working or protect card in 1:1 protection schemes and as a working card in 1:N protection schemes. [Figure 1](#) shows the E3-12 faceplates, and [Figure 2](#) shows a block diagram of the card.

**Figure 1** E3-12 faceplate



You can install the E3-12 card in any multispeed or high-speed card slot on the ONS 15454 SDH. Each E3-12 port features ITU-T G.703 compliant level outputs supporting cable losses of up to 12 dB @ 17184 kHz.

The E3-12 card supports 1:1 protection.



**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.

**Note**

When a protection switch moves traffic from the E3-12 working/active card to the E3-12 protect/standby card, ports on the now active/standby card cannot be taken out of service. Lost traffic can result if you take a port out of service even if the E3-12 active/standby card no longer carries traffic.

## E3-12 Card-Level Indicators

The E3-12 card faceplate has three LEDs.

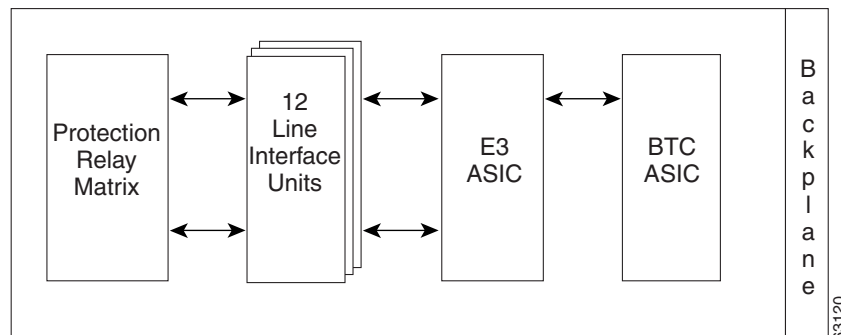
**Table 1** E3-12 Card-Level Indicators

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 FAIL LED persists.
ACTV/STBY LED Green (Active) Yellow (Standby)	When the ACTV/STBY LED is green, the E3-12 card is operational and ready to carry traffic. When the ACTV/STBY LED is yellow, the E3-12 card is operational and in standby (protect) mode.
Yellow SF LED	The yellow SF LED indicates a signal failure or condition such as port LOS.

## E3-12 Port-Level Indicators

You can find the status of the twelve E3-12 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** E3-12 block diagram



## E3-12 Specifications

- E3-12 Input
  - Bit Rate: 34.368 MBits/s (Mbps)  $\pm$  20 ppm
  - Line Code: HDB-3
  - Termination: Unbalanced coaxial cable
  - Input Impedance: 75 ohms  $\pm$  5%
  - Cable Loss: up to 12 dB @ 17184 kHz (for cable length see specification of the cable that you are using)
  - AIS: ITU-T G.704-compliant
- E3-12 Output
  - Bit Rate: 34.368 MBits/s (Mbps)  $\pm$  20 ppm
  - Line Code: HDB-3
  - Termination: Unbalanced coaxial cable
  - Output Impedance: 75 ohms  $\pm$  5%
  - AIS: ITU-T G.704-compliant
  - Power Level: -1.8 - +5.7 dBm
  - Pulse Shape: ITU-T G.703, Figure 17
  - Pulse Amplitude: 0.36 - 0.85 V peak-to-peak
  - Loopback Modes: Terminal and Facility
- E3-12 Electrical Interface
  - Connectors: 1.0/2.3 Miniature Coax connectors in FMEC-E3/DS3
- 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: 38.20 W, 0.80 A (AMPS) @ -48V, 130.4 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: 0.7 kg (1.7 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 E3-12 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.

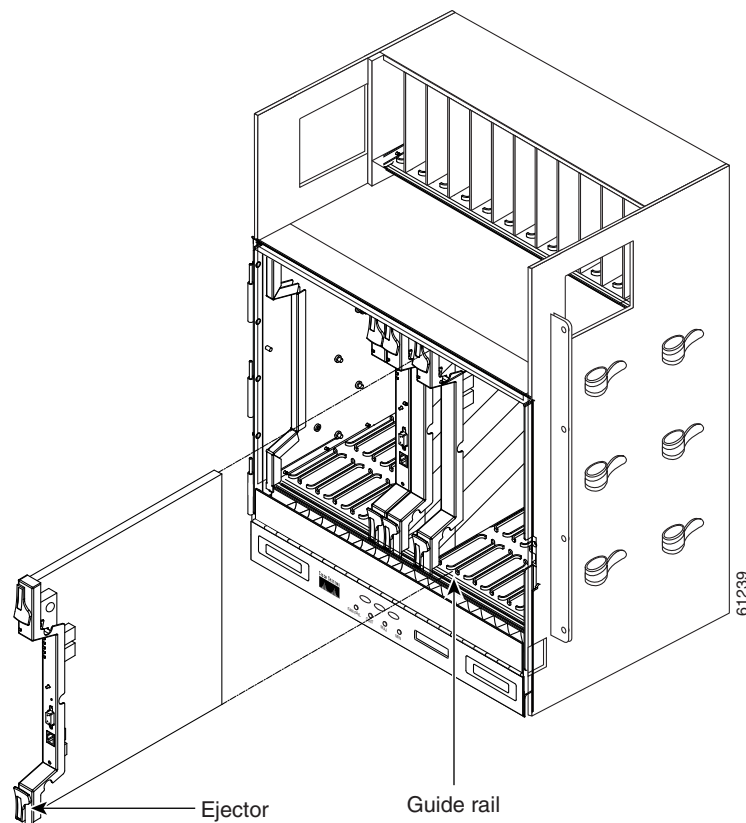


**Caution**

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 5](#)).
- 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 E3-12 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 E3-12 Card

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- Step 1** Verify that power is applied to the shelf assembly.
  - Step 2** Verify that the E3-12 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 E3-12 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:

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- 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.

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

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- 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.

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- Step 2** Switch the active card to standby:
- In the node view, select the **Maintenance > E1-N-14, DS3iN-12 and E3-12** tabs.
  - From the menu, choose **Switch**.
  - 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.

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- 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 and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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