



# Connecting Cisco T3 and E3 Service Modules to the Network

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**Last Updated: August 14, 2013**  
**OL-27149-01**

This guide describes how to install a Cisco SM-X-1T3/E3 service module and how to connect the service module to your network.

## Contents

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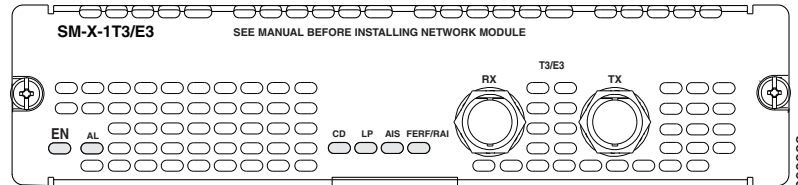
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# About the Cisco SM-X-1T3/E3 Enhanced Service Module

The Cisco SM-X-1T3/E3 is a single-port universal T3/E3 enhanced service module with integrated CSU/DSU, clear channel, and subrate support. Channels on the service module can be configured as either T3 or E3 using Cisco IOS software.

**Figure 1** Cisco SM-X-1T3/E3 Enhanced Service Module Faceplate



## Conventions



### Note

Means *reader take note*. Notes contain helpful suggestions or references to additional information and material.



### Caution

This symbol means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



### Tip

Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.



### Warning

#### IMPORTANT SAFETY INSTRUCTIONS

**This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning statement to locate its translation in the translated safety warnings that accompanied this device.** Statement 1071

#### SAVE THESE INSTRUCTIONS

## Safety Warnings



### Warning

**Read the installation instructions before connecting the system to the power source.** Statement 1004

**Warning**

**Only trained and qualified personnel should be allowed to install, replace, or service this equipment.**  
Statement 1030

**Warning**

**This equipment must be installed and maintained by service personnel as defined by AS/NZS 3260. Incorrectly connecting this equipment to a general-purpose outlet could be hazardous. The telecommunications lines must be disconnected 1) before unplugging the main power connector or 2) while the housing is open, or both.** Statement 1043

**Warning**

**Before working on a system that has an on/off switch, turn OFF the power and unplug the power cord.**  
Statement 1

**Warning**

**This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.** Statement 1028

**Warning**

**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

**Warning**

**Hazardous network voltages are present in WAN ports regardless of whether power to the unit is OFF or ON. To avoid electric shock, use caution when working near WAN ports. When detaching cables, detach the end away from the unit first.** Statement 1026

**Warning**

**Before opening the unit, disconnect the telephone-network cables to avoid contact with telephone-network voltages.** Statement 1041

**Warning**

**Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.** Statement 43

**Warning**

**Do not use this product near water; for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool.** Statement 1035

**Warning**

**Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.** Statement 1036

**Warning**

**Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.** Statement 1037

**Warning**

**Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.** Statement 1038

**Warning**

**To report a gas leak, do not use a telephone in the vicinity of the leak.** Statement 1039

**Warning**

**There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.** Statement 1015

**Warning**

**Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

**Warning**

**No user-serviceable parts inside. Do not open.** Statement 1073

**Warning**

**For connections outside the building where the equipment is installed, the following ports must be connected through an approved network termination unit with integral circuit protection.**

T3, E3 Statement 1044

## Installing and Removing the Cisco SM-X-1T3/E3 on Second Generation Integrated Services Routers

For information on installing Cisco SM-X-1T3/E3 Enhanced Service Modules on Second Generation Integrated Services Routers (ISR G2), see [Installing Cisco Network Modules and Service Modules in Cisco Access Routers](#).

To operate the Cisco SM-X-1T3/E3 module on Cisco ISR G2 routers, use one of the following Cisco IOS releases:

- 15.2(4)M4 or later
- 15.3(1)T2 or later
- 15.3(2)T1 later

# Installing and Removing the Cisco SM-X-1T3/E3 on Cisco 4451-X Integrated Services Routers

This section describes the following tasks for the Cisco SM-X-1T3/E3 enhanced service module:

- [Software Requirements for the Cisco SM-X-1T3/E3](#), page 5
- [Removing the Cisco SM-X-1T3/E3 from a Cisco ISR 4451-X Router](#), page 6
- [Installing the Cisco SM-X-1T3/E3 in a Cisco ISR 4451-X Router](#), page 6
- [Verifying Cisco SM-X-1T3/E3 Installation in a Cisco ISR 4451-X Router](#), page 6

**Caution**

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Always wear an electrostatic discharge (ESD)-preventive wrist strap and ensure that it makes good contact with your skin when you remove or install a service module (SM). Connect the equipment end of the wrist strap to the metal part of the chassis.

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**Caution**

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Handle service modules (SMs) by the edges only. SMs are ESD-sensitive components and can be damaged by mishandling.

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## Software Requirements for the Cisco SM-X-1T3/E3

Cisco IOS XE Release 3.9.1 or later release is required to operate the Cisco SM-X-1T3/E3 enhanced service module on Cisco ISR 4451-X routers.

To determine the version of Cisco IOS software that is running on your router, log in to the router and enter the **show version** command:

```
Router> show version
```

```
Cisco IOS Software, IOS-XE Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Experimental  
Version 15.3 (20130513:160617)  
[v153_2_s_xe39_throttle-BLD-BLD_V153_2_S_XE39_THROTTLE_LATEST_20130513_144824-ios 170]  
Copyright (c) 1986-2013 by Cisco Systems, Inc.  
Compiled Mon 13-May-13 14:05 by mcpre
```

```
IOS XE Version: BLD_V153_2_S
```

## Removing the Cisco SM-X-1T3/E3 from a Cisco ISR 4451-X Router

Use the following procedure to remove the Cisco SM-X-1T3/E3 from a Cisco ISR 4451-X Router:

- 
- Step 1** Read the “[Safety Warnings](#)” section on page -2 before you perform any module replacement.
  - Step 2** Locate the service module (SM) to be removed.
  - Step 3** Using a number 1 Phillips or flat-blade screwdriver, unscrew the captive mounting screws on the module faceplate. See [Figure 1](#).
  - Step 4** Pull the Cisco SM-X-1T3/E3 out of the chassis.
  - Step 5** Place the SM in an antistatic bag to protect it from electrostatic discharge (ESD) damage.
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## Installing the Cisco SM-X-1T3/E3 in a Cisco ISR 4451-X Router

Use the following procedure to install the Cisco SM-X-1T3/E3 on a Cisco ISR 4451-X Router:

- 
- Step 1** Read the “[Safety Warnings](#)” section on page -2 before you perform any module replacement.
  - Step 2** Remove the blank faceplates installed over the slot you intend to use.
  - Step 3** Push the Cisco SM-X-1T3/E3 into place until you feel the edge connector seat securely into the connector on the router backplane. The module faceplate should contact the chassis rear panel.
  - Step 4** Using a number 1 Phillips or flat-blade screwdriver, tighten the captive mounting screws on the module faceplate. See [Figure 1](#).
- 

## Verifying Cisco SM-X-1T3/E3 Installation in a Cisco ISR 4451-X Router

Use the **show diag** command to verify that the Cisco SM-X-1T3/E3 has been installed correctly. In the following example, one service module is recognized by the system.

```
router#show diag ?
  all          All related information
  chassis     Chassis related information
  slot        Slot location information for this command
  subslot     Subslot location information for this command
```

```
Router#show diag subslot 2/0 eeprom detail
```

SPA EEPROM data for subslot 2/0:

```

EEPROM version           : 4
Compatible Type          : 0xFF
Controller Type          : 1909
Hardware Revision        : 1.0
PCB Part Number          : 73-14154-02
Top Assy. Part Number    : 800-36532-01
Board Revision           : 06
Deviation Number         : 123598
Fab Version              : 02
PCB Serial Number        : FOC15495HU1
Asset ID                 : REV 2F
Product Identifier (PID) : SM-X-1T3/E3
Version Identifier (VID) : V01
CLEI Code                : TBD
Base MAC Address         : C4 0A CB 56 00 99
MAC Address block size   : 3
Manufacturing Test Data  : 00 00 00 00 00 00 00 00
Environment Monitor Data : 40 0B E3 43 00 0A
Platform features        : 02 01 01 0A 00 00 00 00
                          01 01 00

```

## Connecting Cisco SM-X-1T3/E3 Service Modules to the Network

To connect a Cisco SM-X-1T3/E3 enhanced service module to the network, use a 75-ohm 728-A coaxial cable to connect the BNC connector on the service module to a networking device (see [Figure 2](#)).



**Warning**

**Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 1030



**Warning**

**No user-serviceable parts inside. Do not open.** Statement 1073



**Warning**

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



**Warning**

**Read the installation instructions before connecting the system to the power source.** Statement 1004



**Warning**

**Installation of the equipment must comply with local and national electrical codes.** Statement 1074



**Warning**

**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

**Warning**

**Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

**Warning**

**For connections outside the building where the equipment is installed, the following ports must be connected through an approved network termination unit with integral circuit protection. T3/E3** Statement 1044

**Warning**

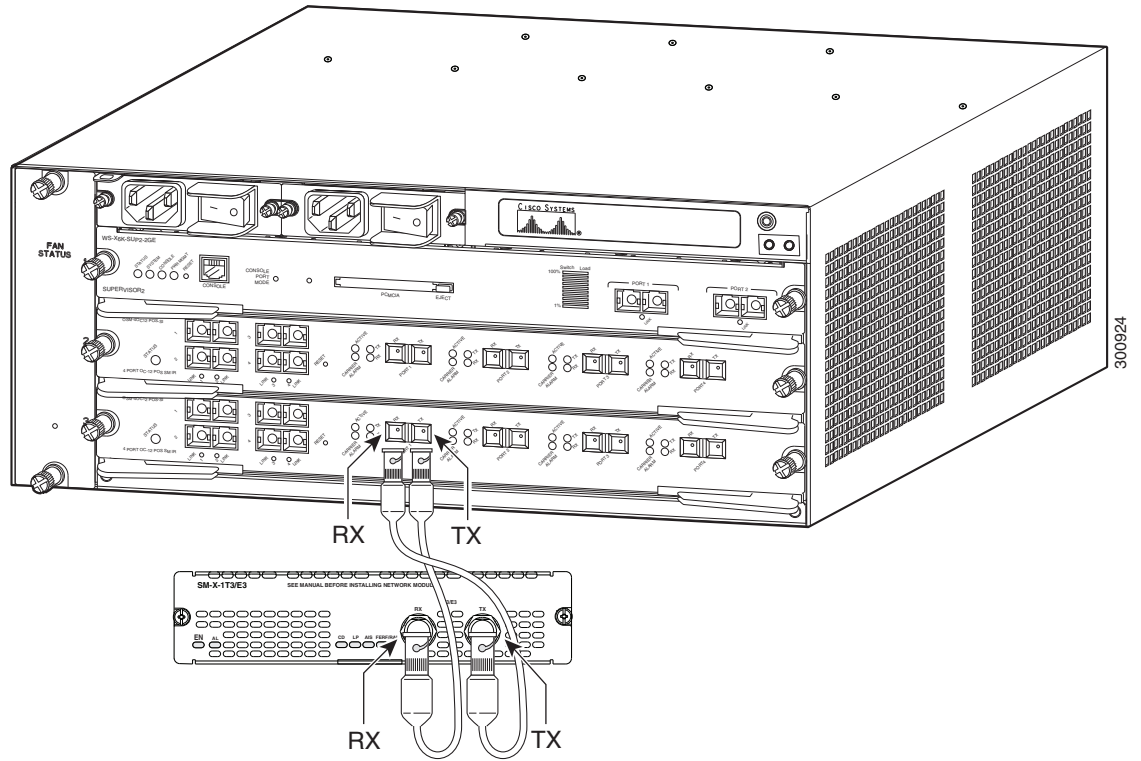
**To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the SM-X-1T3/E3 interface ports only to intra-building or unexposed wiring or cable. The intrabuilding cable must be shielded and the shield must be grounded at both ends. The intra-building port(s) of the equipment or subassembly must not be metallicly connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallicly to OSP wiring.** Statement 7003

**Caution**

To minimize transient surges, the internal wiring should not be routed in the same conduit with power lines or external telephone lines.



**Figure 2** Connecting a T3/E3 Service Module to a Networking Device



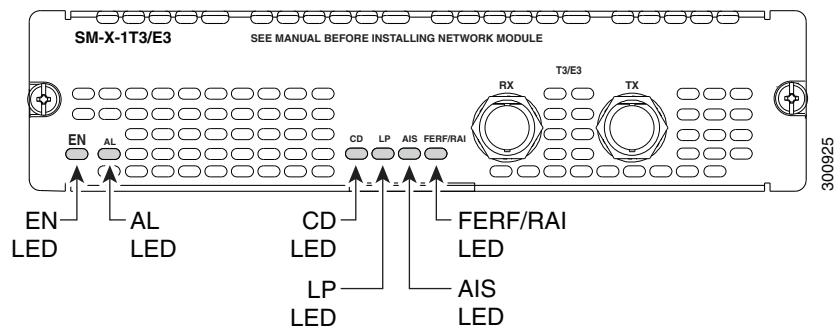
**Tip**

When connecting the Cisco SM-X-1T3/E3 service module to a port adapter used in another router series, verify that you are connecting the TX port on the service module with the RX port on the port adapter, and the TX port on the port adapter to the RX port on the service module.

## Cisco SM-X-1T3/E3 Service Module LEDs

The Cisco SM-X-1T3/E3 enhanced service module includes several indicator LEDs. [Figure 3](#) and [Table 1](#) describe the LEDs on the T3/E3 enhanced service module.

**Figure 3** Cisco SM-X-1T3/E3 LEDs



**Table 1**      **Cisco SM-X-1T3/E3Service Module LEDs**

<b>LED</b>	<b>Meaning</b>
EN	Green indicates that the service module has passed its self-test and is available to the router.
AL	Yellow indicates that the port is out of frame.
CD	Green indicates that the signal is present on the port.
LP	Yellow indicates that a loopback condition is present on the port.
AIS	Yellow indicates an alarm on the DS3 transmission.
FERF/RAI	Yellow indicates a remote failure at the far end of the connection.

## Additional References

- [Related Documents, page 11](#)
- [Technical Assistance, page 11](#)

## Related Documents

Related Topic	Document Title
Configuring Cisco SM-X-1T3/E3 software	<a href="#">Cisco SM-X-1T3/E3 Enhanced Service Module Configuration Guide</a>
Regulatory compliance and safety information	<a href="#">Cisco Service Module Regulatory Compliance and Safety Information</a>

## Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

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