Cisco 6015 I/O Module FRU Installation and Replacement Notes

Product Number for DS3+T1 I/O Module: 6015-DS3/T1-IO=

Product Number for E1 I/O Module: 6015-E1-IO=

This document provides an overview of and installation and replacement procedures for the Cisco 6015 Input/Output (I/O) module. The I/O module is a field-replaceable unit (FRU) and can be used in both a commercial and outside-plant environment.

Note The I/O module does not function when you use an OC-3c/OC-3c NI-2 card in the Cisco 6015; however, an I/O module must be installed in the chassis for the system to operate correctly. The OC-3c/OC-3c NI-2 card does not support the DS3, E1, or T1 interfaces found on the front of the I/O modules. Therefore, the trunk and subtending interfaces are provided on the front of the OC-3c/OC-3c NI-2 card.

The OC-3c/OC-3c NI-2 card can be used only in a commercial environment and does not work in an outside-plant environment. Either I/O module can be used in conjunction with the OC-3c/OC-3c NI-2 card.

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

Contents

This document includes the following sections:

CISCO SYSTEMS

Introduction

The I/O module performs the following system tasks:

• Provides the network WAN trunk physical interface

• Provides the subtending physical interfaces to subtended node chassis

Figure 1 shows the location of the I/O module in the Cisco 6015 chassis.

Figure 1   I/O Module Location in the Cisco 6015 Chassis
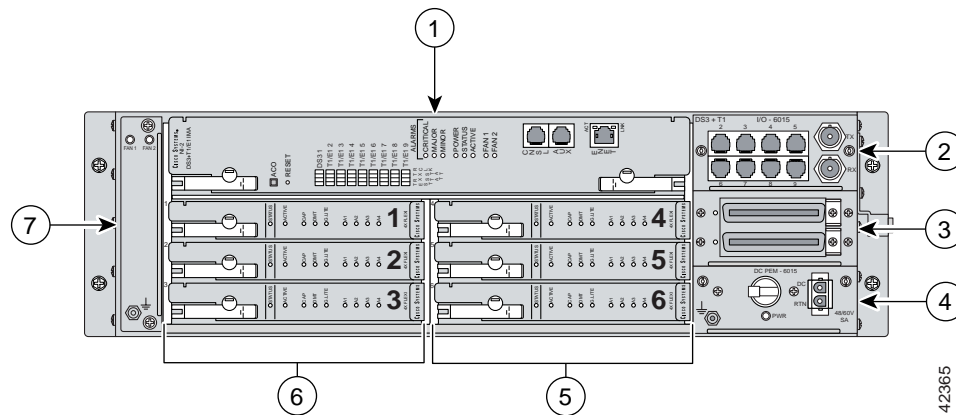
1	NI-2 card	5	xDSL line cards (slots 4 to 6)
2	I/O[1] module	6	xDSL line cards (slots 1 to 3)
3	DSL[2] interface module	7	Fan module
4	DC PEM[3]		

1. I/O = input/output

2. DSL = digital subscriber line

3. PEM = power entry module

Table 1 lists the specifications for the I/O module.

Table 1   I/O Module Specifications

Specification	Description	
Dimensions	Height: 1.688 in. (4.29 cm)	
	Depth: 9.375 in. (23.813 cm)	
	Width: 3.375 in. (8.573 cm)	
Weight	0.64 lb (0.29 kg)	
External interfaces	One DS3 (44.736 Mbps) coaxial port	
	Eight T1 (1.544 Mbps)/E1 (2.048 Mbps) RJ-48 ports	
Connector type	DS3—BNC[1]	
	E1/T1—RJ-48	
Power consumption	3W	
Minimum software and network management requirement	Use with a DS3+T1/E1 IMA NI-2 card in a commercial environment	Cisco IOS—Release 12.1(4)DA CDM[2]—Release 3.2
	Use with an ITEMP DS3+T1/E1 IMA NI-2 card in an outside-plant environment	Cisco IOS—Release 12.2(5)DA CDM—Release 3.4
	Use with an OC-3c/OC-3c NI-2 card in a commercial environment	Cisco IOS—Release 12.2(5)DA CDM—Release 3.2

1. BNC = Bayonet-Neill Concelman.
2. CDM = Cisco DSL Manager
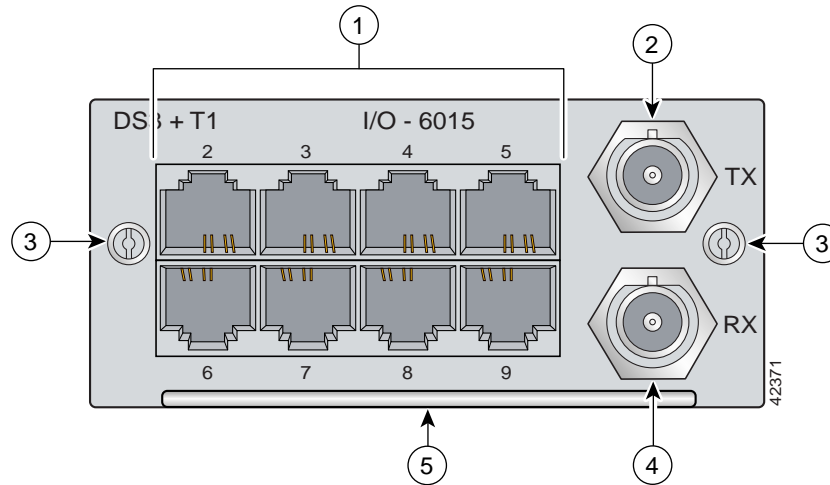
Currently, there are two versions of the I/O module:

- DS3+T1
- E1

The two versions are detailed in the following sections.

DS3+T1 I/O Module

The DS3+T1 I/O module is used in North America. Figure 2 shows a close-up of the DS3+T1 I/O module faceplate.

Figure 2   DS3+T1 I/O Module Faceplate

1	Eight RJ-48[1] receptacle connectors for eight T1 trunk or subtending interfaces	**4**	RX[2] BNC connector for the DS3 trunk interface
2	TX[3] BNC connector for the DS3 trunk interface	**5**	Extraction handle
3	Screws to secure the I/O module in the chassis		

1. An RJ-48 is a receptacle for an RJ-45 connection.

2. RX = receive.

3. TX = transmit.

E1 I/O Module

The E1 I/O module is used world wide, except for North America. Figure 3 shows a close-up of the E1 I/O module faceplate.

Figure 3   E1 I/O Module Faceplate
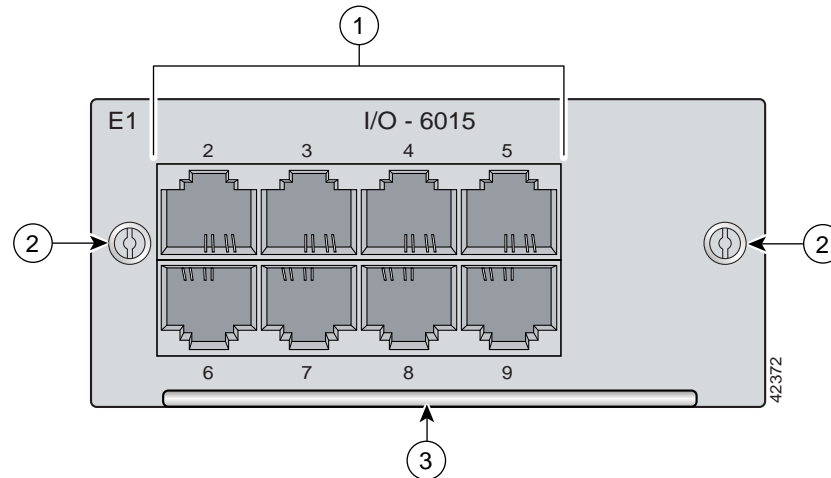
1	Eight RJ-48[1] receptacle connectors for eight E1 trunk or subtending interfaces	3	Extraction handle
2	Screws to secure the I/O module in the chassis		

1. An RJ-48 is a receptacle for an RJ-45 connection.

Part and Tool Requirements

Table 2 lists the tools and equipment that you need to install and remove an I/O module.

Table 2   Tool and Equipment Requirements Checklist

Check	Tools and Equipment
	Hardware Components and Cables
	DS3+T1 I/O module or E1 I/O module.
	Wire for the following T1/E1 connections, as necessary: • T1 trunk—Industry standard T1 twisted-pair wire (use two-pair stock only). • T1 subtend—RJ-48 to RJ-48 industry standard T1 twisted-pair wire (use two-pair stock only). • E1 trunk—Industry standard E1 twisted-pair wire (use two-pair stock only). • E1 subtend—RJ-48 to RJ-48 industry standard E1 twisted-pair wire (use two-pair stock only).

Table 2   Tool and Equipment Requirements Checklist (continued)

Check	Tools and Equipment
	Coaxial cable for a DS3 connection, as necessary — Type 734A or equivalent (75 ohm double-shielded, minimum coverage 80 percent braid and 100 percent foil). Use AIM Electronics BNC Co-Axial Type 3 Piece Connector, part number 27-9023, or equivalent only.
	Ferrites that yield an impedance of 53 ohms at 25 MHz and 177 ohms at 100 MHz are to be used for the T1/E1 trunk or subtended connections if unshielded cable is used for FCC Class B or EN55022 Class B compliance.
	Equipment necessary for ESD protection—You need this equipment whenever you handle Cisco chassis, modules, and cards.
	Tools
	No. 1 Phillips-head or flat-head screwdriver
	Software Components
	Cisco IOS or CDM
	Note See Table 1 for minimum software and network management release requirements.

General Safety Precautions and Maintenance Guidelines

This section describes the following areas:

General Safety Precautions

Before working on the equipment, be aware of standard safety guidelines and the hazards involved in working with electrical circuitry to prevent accidents. Adhere to the following cautions and warnings and those throughout the guide for safe and hazard-free installation.

Note   To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information for the Cisco 6015 System* document that accompanies this product.

Caution   Before you start the installation procedures, read the entire document for important information and safety warnings.

Caution   Proper ESD protection is required whenever you handle Cisco equipment. Installation and maintenance personnel should be properly grounded by means of grounding straps to eliminate the risk of ESD damage to the equipment. Equipment is subject to ESD damage whenever it is removed from the chassis.

⚠
Caution If fuses are already installed in the fuse and alarm panel, remove them. You can replace the fuses after the system is installed. Do not power up the system while you install and connect the system.

⚠
Caution It is important that the chassis cooling fans run continuously while the system is powered.

⚠
Caution Any card that is only partially connected to the backplane can disrupt system operation.

⚡
Warning **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. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.**

Waarschuwing **Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.**

Varoitus **Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).**

Attention **Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document *Regulatory Compliance and Safety Information* (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.**

Warnung **Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument *Regulatory Compliance and Safety Information* (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.**

Avvertenza Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento *Regulatory Compliance and Safety Information* (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.

Advarsel Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet *Regulatory Compliance and Safety Information* (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.

Aviso Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento *Regulatory Compliance and Safety Information* (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.

¡Advertencia! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado *Regulatory Compliance and Safety Information* (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.

Varning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förkommer i denna publikation i dokumentet *Regulatory Compliance and Safety Information* (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

Warning This unit is intended for installation in restricted access areas. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.

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

Warning High performance devices on this card can get hot during operation. To remove the card, hold it by the faceplate and bottom edge. Allow the card to cool before touching any other part of it or before placing it in an antistatic bag.

Warning To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on the port adapters; these types of handles are not designed to support the weight of the unit. Lift the unit only by grasping the chassis underneath its lower edge.

Warning *Never* attempt to lift the chassis with the handles on the power supplies or the switching modules. These handles are not designed to support the weight of the chassis. Using them to lift or support the chassis can result in severe damage to the equipment and serious bodily injury.

Warning Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages.

Warning To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

—This unit should be mounted at the bottom of the rack if it is the only unit in the rack.

—When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

—If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Warning Removing I/O cards, CPU cards, fans, and power supplies can expose you to high-energy (high-amperage) circuits and possible ejection of molten metal or to the shock hazard of telephony circuit voltages. Be sure to remove all rings, watches, and other jewelry from fingers, wrists, and arms before removing panels and devices.

Warning Use extreme care when removing or installing connectors so that you do not damage them.

Warning Use copper conductors only.

Warning A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.

Warning 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.

Warning   Never install telephone wiring during an electrical storm.

Warning   Do not reach into a vacant slot or chassis while you install or remove a card, a module, or a fan. Exposed circuitry could constitute an energy hazard.

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.

Warning   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.

Warning   When installing the unit, the ground connection must always be made first and disconnected last.

Warning   For personal safety, the ground wire must connect to safety (earth) ground at both the equipment and supply side of the DC wiring (unless the local electrical code requirements are different).

Warning   This equipment needs to be grounded. Use a green and yellow 12 to 14 AWG ground wire to connect the host to earth ground during normal use.

Warning   Incorrect connection of this or connected equipment to a general purpose outlet could result in a hazardous situation.

Warning   Read the installation instructions before you connect the system to its power source.

Warning   Do not work on the system or connect or disconnect cables during periods of lightning activity.

Warning   Use caution when installing or modifying telephone lines.

Warning   To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

Warning Secure all power cabling when installing this unit to avoid disturbing field-wiring connections.

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

Warning This equipment will be inoperable when main power fails.

Warning The power supply circuitry for the equipment can constitute an energy hazard. Before you install or replace the equipment, remove all jewelry (including rings, necklaces, and watches). Metal objects can come into contact with exposed power supply wiring or circuitry inside the equipment. This could cause the metal objects to heat up and cause serious burns or weld the metal object to the equipment.

Warning Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units.

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

Warning This chassis must be installed in a rack that is secured to the building structure.

Warning Make sure that your equipment rack is properly ventilated.

Warning The ports labeled "CNSL," "AUX," "ENET," "Tx," and "Rx (DS3)" are safety extra-low voltage (SELV) circuits. SELV circuits should only be connected to other SELV circuits. Because the Basic Rate Interface (BRI) circuits are treated like telephone-network voltage (TNV), avoid connecting the SELV circuit to the TNV circuits.

Warning This equipment is to be installed and maintained by service personnel only as defined by AS/NZS 3260 Clause 1.2.14.3 Service Personnel.

Warning This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.

Warning The T1/E1 connection is regarded as a source of voltage that should be inaccessible to user contact. Do not attempt to tamper with or open any public telephone operator (PTO)-provided equipment or connection hardware. Any hard-wired connection (other than by a nonremovable, connect-one-time-only plug) must be made only by PTO staff or suitably trained engineers.

Warning Network hazardous voltages are present in the T1 PRI cable. If you detach the cable, detach the end away from the router first to avoid possible electric shock. Network hazardous voltages are also present in the area of the T1 PRI (RJ-48C) ports, regardless of whether power is off or on.

Warning The telecommunications lines must be disconnected 1) before unplugging the main power connector or 2) while the housing is open.

Warning Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

Warning Do not use a telephone to report a gas leak in the vicinity of the leak.

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.

Warning VCCI Compliance for Class B Equipment (Japan).

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

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

Warning To reduce the risk of electric shock when servicing any individual unit, disconnect the power cord or cords that connect the unit to the AC powerstrip or DC busbar. When working with a DC system, remove the busbar connector before working on a device. Exposed live voltages are present at the device end; exposure to these may cause injury.

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.

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

Warning   During line card installation, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.

Warning   Ethernet cables must be shielded when used in a central office environment.

Warning   An exposed wire lead from a DC-input power source can conduct harmful levels of electricity. Be sure that no exposed portion of the DC-input power source wire extends from the terminal block plug.

Warning   This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use.

Warning   Metal objects heat up when connected to power and ground, and can cause serious burns.

General Maintenance Guidelines

This section covers the following topics:

- Installation and Replacement Suggestions, page 13
- Hot Swapping Modules, page 14

Installation and Replacement Suggestions

The following examples list the recommended installation and replacement practices for the Cisco 6015 system modules.

Caution   Any module that is only partially connected to the backplane can disrupt system operation.

- Do not force the module into its slot. This action can damage the pins on the backplane if they are improperly aligned with the module.
- Ensure that the module is straight and not at an angle when you install the module in the slot. Installing the module at an angle can damage the module. Use the guide rails to install the module correctly.

Hot Swapping Modules

The I/O module is a FRU; however, it is not hot swappable. If you remove the I/O module, service is interrupted for the entire system until you replace the I/O module.

⚠
Caution   Only a trained technician should install and remove the I/O module.

Preventing Electrostatic Discharge Damage

Proper ESD protection is required whenever you handle Cisco equipment. ESD damage, which can occur when electronic cards or components are improperly handled, results in complete or intermittent failures. Use an antistatic strap when you handle any card or component.

🔍
Tip   Use the ESD grounding jack on the fan module for all maintenance except when you remove the fan module. Use the ESD grounding jack on the DC PEM when you remove the fan module.

Follow these guidelines to prevent ESD damage:

- Always use an ESD ankle or wrist strap and ensure that the wrist strap makes good skin contact.
- Connect the equipment end of the strap to the ESD grounding jack. There are two ESD grounding jacks that are located on the following Cisco 6015 chassis modules:
  - Fan module
  - DC PEM
- When you install a component, use available ejector levers or captive installation screws to properly seat the bus connectors in the backplane or midplane. These devices prevent accidental removal, provide proper grounding for the system, and help ensure that bus connectors are properly seated.
- When you remove a component, use available ejector levers or captive installation screws to release the bus connectors from the backplane or midplane.
- Handle the modules by the extraction handles only; avoid touching the printed circuit boards or connectors.
- Place a removed component board-side-up on an antistatic surface or in a static-shielding container. If you plan to return the component to the factory, immediately place it in a static-shielding container.
- Avoid contact between the printed circuit boards and clothing. The wrist strap protects components from ESD voltages on the body only; ESD voltages on clothing can still cause damage.

⚠
Caution   Periodically check the resistance value of the antistatic strap. Ensure that the measurement is between 1 and 10 megohms.

Removing and Installing the I/O Module

The following sections describe how to remove or install an I/O module.

⚠

Caution   Proper ESD protection is required whenever you handle Cisco equipment. Installation and maintenance personnel should be properly grounded by means of grounding straps to eliminate the risk of ESD damage to the equipment. Equipment is subject to ESD damage whenever it is removed from the chassis.

Removing the I/O Module

Note   If you use AC power and the power cord is plugged into the wall outlet, unplug it.

If you use DC power and the fuses are already installed in the fuse and alarm panel, remove them. You can replace the fuses after you install and connect the system.

Cisco does not provide the fuse and alarm panel.

Timesaver   We recommend that you label each data cable at both ends to identify its destination.

Complete the following steps to remove the I/O module from the Cisco 6015 chassis:

Step 1   Connect a grounding strap to the ESD grounding jack that is located on the fan module.

Step 2   Set the circuit breaker on the DC PEM to the OFF (0) position.

Step 3   Disconnect the two DS3 BNC connectors from the front of the I/O module, as necessary.

Step 4   Disconnect the T1 or E1 RJ-45 cables from the RJ-48 receptacle connectors on the front of the I/O module, as necessary.

Step 5   Use a flat-head or Phillips-head screwdriver to unscrew the two screws that hold the I/O module to the chassis.

Step 6   Hold the extraction handle on the front of the module and carefully slide the module out of the slot.

Step 7   Replace the I/O module that you remove. See the "Installing the I/O Module" section on page 16 for I/O module installation procedures.

Installing the I/O Module

Complete the following steps to install the I/O module in the Cisco 6015 chassis:

Tip The term *subtending* refers to the host chassis (parent), and *subtended* refers to the downstream chassis (child) in a subtended network. The terms *parent* and *child* are used in the CDM software.

Timesaver We recommend that you label each data cable at both ends to identify its destination.

Step 1 Connect a grounding strap to the ESD grounding jack that is located on the fan module.

Step 2 Power off the Cisco 6015.

   a. If you use AC power and the power cord is plugged into the wall outlet, unplug it.

   b. If you use DC power and the fuses are already installed in the fuse and alarm panel, remove them. You can replace the fuses after you install and connect the system.
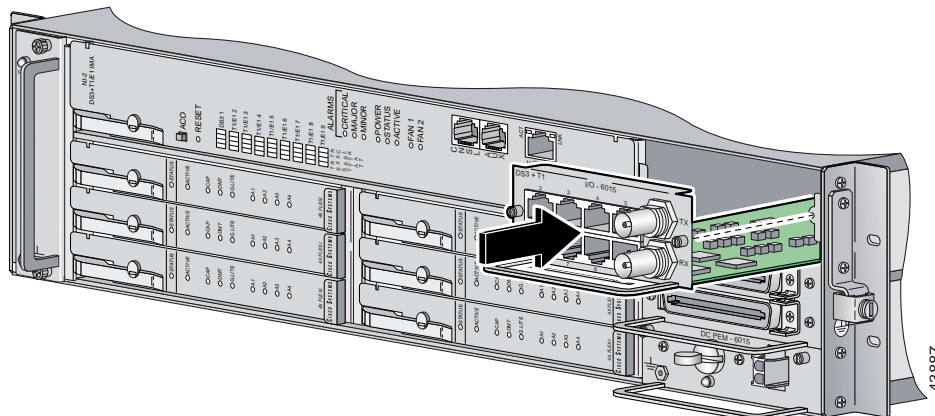
       Note Cisco does not provide the fuse and alarm panel.

   c. Set the circuit breaker on the DC PEM to the OFF (0) position.

Step 3 Horizontally align the module edges with the module guides at the right and left of the slot in the chassis.

Figure 4 shows the I/O module installation.

Figure 4   *I/O Module Installation*

Step 4 Hold the handle on the front of the module and gently apply pressure while you push the module into the slot.

Step 5 Push on the faceplate of the module to fully seat the module.

Step 6 Use a flat-head or Phillips-head screwdriver to attach the two screws to the chassis.

Step 7 If you are using a DS3+T1/E1 IMA NI-2 card and are installing a subtended network with subtended node chassis to a subtending host chassis, complete the following steps. If you are using an OC-3c/OC-3c NI-2 card and are installing a subtended network, proceed to Step 11 and refer to the *Cisco 6015 Hardware Installation Guide* for installation procedures. If you are not installing a subtended network, proceed to Step 8.

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>
> **Note** For more information on a subtended network configuration, refer to the *Cisco 6015 Hardware Installation Guide*.
>
> If unshielded cable is used for FCC Class B or EN55022 Class B compliance, the cables must be looped through ferrites.

   a. Connect one end of an RJ-45 crossover cable to one of the RJ-48 receptacle connectors on the I/O module in the subtending host chassis.

   b. Connect the other end of the cable that you used in Step 7a to one of the RJ-48 receptacle connectors on the I/O module in a subtended node chassis.

Figure 5 shows an example of a subtended network configuration.

Figure 5   Subtended Network Configuration
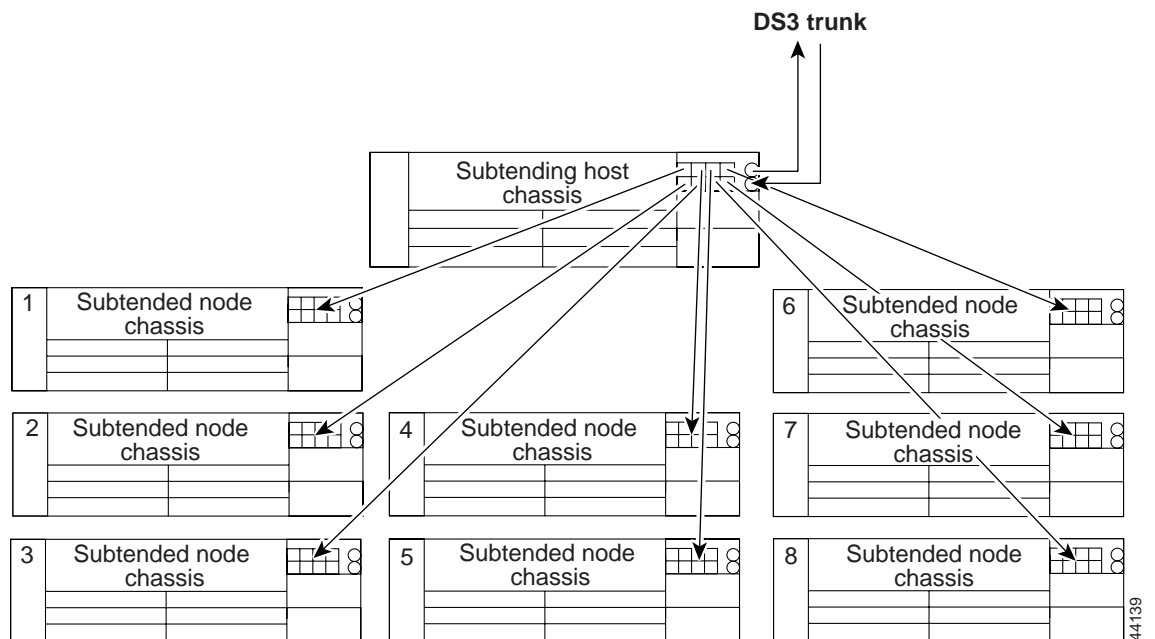
   c. Repeat Step 7a through Step 7b to connect the subtending host chassis to each subtended node chassis.

> ✎
>
> **Note** If you use a T1 or E1 trunk to the network, the trunk connection will originate at one of the RJ-48 receptacle connectors on the I/O module. Therefore, you can subtend only seven subtended node chassis.

Step 8 Connect the DS3+T1 I/O module to the network using a DS3 connection, as necessary.

   a. Verify that a DS3+T1 I/O module is installed in the chassis. The I/O module DS3 connections attach to the ATM switch. Two 75-ohm DS3 BNC connectors are provided for DS3 TX and RX. See Figure 2 for the location of the DS3 BNC connectors.

   b. Attach one end of a coaxial cable (type 734A or equivalent) to the TX DS3 BNC connector on the I/O module.

   c. Attach the end of the cable that you used in Step 8b, which originates at the TX DS3 BNC connector, to the RX BNC connector on the ATM switch.

   d. Attach one end of a coaxial cable (type 734A or equivalent) to the RX DS3 BNC connector on the I/O module.

   e. Attach the end of the cable that you used in Step 8d, which originates at the RX DS3 BNC connector, to the TX BNC connector on the ATM switch.

Step 9 Connect the DS3+T1 I/O module to the network using a T1 connection, as necessary.

   a. Verify that a DS3+T1 I/O module is installed in the chassis. See Figure 2 for the location of the T1 interfaces.

   b. Connect one end of an RJ-45 cable to one of the RJ-48 receptacle connectors on the I/O module. If a subtended network configuration is installed, you must make this connection to the I/O module in the subtending host chassis.

   > **Note** If unshielded cable is used for FCC Class B or EN55022 Class B compliance, the cables must be looped through ferrites.

   c. Connect the other end of the cable that you used in Step 9b to the ATM switch.

   > **Note** Verify that the pinouts of the RJ-45 cable connect TX to RX and RX to TX.

Step 10 Complete the following steps to connect the E1 I/O module to the network using an E1 connection, as necessary.

   a. Verify that an E1 I/O module is installed in the chassis. See Figure 3 for the location of the E1 interfaces.

   b. Connect one end of an RJ-45 cable to one of the RJ-48 receptacle connectors on the I/O module. If a subtended network configuration is installed, you must make this connection to the I/O module in the subtending host chassis.

   > **Note** If unshielded cable is used for FCC Class B or EN55022 Class B compliance, the cables must be looped through ferrites.

   c. Connect the other end of the cable that you used in Step 10b to the ATM switch.

   > **Note** Verify that the pinouts of the RJ-45 cable connect TX to RX and RX to TX.

Step 11 Plug the AC power cord into the wall outlet or reinsert the fuses in the fuse and alarm panel.

Step 12 Set the circuit breaker on the DC PEM to the ON (1) position.

Standards and Certifications

The I/O module has the same standards as the Cisco 6015 system, as detailed in Table 3.

Table 3   Regulatory Compliance for Cisco 6015 Hardware

Area of Compliance	Compliance Standard
Product Safety	UL 1950, 3rd Edition, EN 60950, AS/NZS 3260, IEC 950,
Emissions	CISPR22, EN55022, AS/ANS 3548, ICES-003, VCCI, BSMI (CNS 13438), FCC Part 15, Class B
Immunity	EN61000-4-2, 3, 4, 5 and 6/IEC-61000-4-2, 3, 4, 5 and 6; EN61000-4-11/IEC-61000-4-11
NEBS	Bellcore GR-63-CORE, GR-1089-CORE, SR-3590 Level 3
Telecom	CS-03, ACA TS 016: 1997, CTR 12 97/520/EC Amendment 1 1997 (TBR 12), JATE GREEN BOOK 1997
ETSI	300-386-1, 300-386-2

Related Documentation

A complete list of all DSL product related documentation is available on the World Wide Web at http://www.cisco.com/univercd/cc/td/doc/product/dsl_prod/index.htm

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. Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:

http://www.cisco.com/go/subscription

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

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com is a highly integrated Internet application and a powerful, easy-to-use tool that provides a broad range of features and services to help you to

- Streamline business processes and improve productivity
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You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

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.