



Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter Hardware Installation Guide

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Preface

Audience

This guide is for the networking or computer technician responsible for installing a Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter (referred to as the switch module). We assume that you are familiar with the concepts and terminology of Ethernet and local area networking.

Purpose

This guide documents the hardware features of the switch module. It describes the physical and performance characteristics of each switch module, and explains how to install a switch module.

Conventions

This document uses the following conventions and symbols for notes, cautions, and warnings. Translations of the warning statements in this document appear in the *Regulatory Compliance and Safety Information for the Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter* that ships with the switch module.



Note

Means *reader take note*. Notes contain helpful suggestions or references to materials not contained in this manual.



Caution

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

Warnings use the following convention:



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 to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Waarschuwing

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

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 de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

BEWAAR DEZE INSTRUCTIES

Varoitus

TÄRKEITÄ TURVALLISUUSOHJEITA

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

SÄILYTÄ NÄMÄ OHJEET

Attention

IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS

Warnung

WICHTIGE SICHERHEITSHINWEISE

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

Avvertenza IMPORTANTI ISTRUZIONI SULLA SICUREZZA

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

CONSERVARE QUESTE ISTRUZIONI**Advarsel VIKTIGE SIKKERHETSINSTRUKSJONER**

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

TA VARE PÅ DISSE INSTRUKSJONENE**Aviso INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

GUARDE ESTAS INSTRUÇÕES**¡Advertencia! INSTRUCCIONES IMPORTANTES DE SEGURIDAD**

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES**Varning! VIKTIGA SÄKERHETSANVISNINGAR**

Denna varningssignal 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 vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

SPARA DESSA ANVISNINGAR

Figyelem FONTOS BIZTONSÁGI ELOÍRÁSOK

Ez a figyelmeztető jel veszélyre utal. Sérülésveszélyt rejtő helyzetben van. Mielott bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplő figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján kereshető meg.

ORIZZÉ MEG EZEKET AZ UTASÍTÁSOKAT!

Предупреждение ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ

警告 重要的安全性说明

此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。

请保存这些安全性说明

警告 安全上の重要な注意事項

「危険」の意味です。人身事故を予防するための注意事項が記述されています。装置の取り扱い作業を行うときは、電気回路の危険性に注意し、一般的な事故防止策に留意してください。警告の各国語版は、各注意事項の番号を基に、装置に付属の「Translated Safety Warnings」を参照してください。

これらの注意事項を保管しておいてください。

주의 중요 안전 지침

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이 지시 사항을 보관하십시오.

Aviso INSTRUÇÕES IMPORTANTES DE SEGURANÇA

Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.

GUARDE ESTAS INSTRUÇÕES**Advarsel VIGTIGE SIKKERHEDSANVISNINGER**

Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemesbeskadigelse. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.

GEM DISSE ANVISNINGER**تحذير****إرشادات الأمان الهامة**

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض للإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في آخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز. قم بحفظ هذه الإرشادات

Upozorenje VAŽNE SIGURNOSNE NAPOMENE

Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopove, te biti upoznati sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.

SAČUVAJTE OVE UPUTE**Upozornění DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY**

Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoliv vybavení si uvědomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

USCHOVEJTE TYTO POKYNY

Προειδοποίηση ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κινδύνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοικειωθεί με τις συνήθεις πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφρασή της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ

אזהרה

הוראות בטיחות חשובות

סימן אזהרה זה מסמל סכנה. אתה נמצא במצב העלול לגרום לפציעה. לפני שתעבוד עם ציוד כלשהו, עליך להיות מודע לסכנות הכרוכות במעגלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כדי לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

שמור הוראות אלה

Opomena

ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА

Симболот за предупредување значи опасност. Се наоѓате во ситуација што може да предизвика телесни повреди. Пред да работите со опремата, бидете свесни за ризикот што постои кај електричните кола и треба да ги познавате стандардните постапки за спречување на несреќни случаи. Искористете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.

ЧУВАЈТЕ ГИ ОБИЕ НАПАТСТВИЈА

Ostrzeżenie

WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA

Ten symbol ostrzeżenia oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzeżenia podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ

Upozornenie

DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY

Tento varovný symbol označuje nebezpečenstvo. Nachádzate sa v situácii s nebezpečenstvom úrazu. Pred prácou na akomkoľvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

USCHOVAJTE SI TENTO NÁVOD

Opozorilo POMEMBNI VARNOSTNI NAPOTKI

Ta opozorilni simbol pomeni nevarnost. Nahajate se v situaciji, kjer lahko pride do telesnih poškodb. Preden pričnete z delom na napravi, se morate zavedati nevarnosti udara električnega toka, ter tudi poznati preventivne ukrepe za preprečevanje takšnih nevarnosti. Uporabite obrazložitevno številko na koncu posameznega opozorila, da najdete opis nevarnosti v priloženem varnostnem priročniku.

SHRANITE TE NAPOTKE!**警告****重要安全性指示**

此警告符號代表危險，表示可能造成人身傷害。使用任何設備前，請留心電路相關危險，並熟悉避免意外的標準作法。您可以使用每項警告後的聲明編號，查詢本裝置隨附之安全性警告譯文中的翻譯。請妥善保留此指示

Related Publications

For more information about the switch module, see the following documents on <http://www.cisco.com>:

- *Regulatory Compliance and Safety Information for the Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter*
- *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter Getting Started Guide*
- *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter NX-OS Configuration Guide*
- *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter NX-OS Command Reference*
- *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter NX-OS Release Notes*
- *Cisco NX-OS System Messages Reference*

For more information about the IBM BladeCenter enclosure, see the IBM documentation at:

<http://www.ibm.com>

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:

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CHAPTER 1

Product Overview

This chapter describes the Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter and includes the following sections:

- [Introduction, page 1-1](#)
- [Hardware Features, page 1-1](#)
- [Management Options, page 1-7](#)

Introduction

The Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter Hardware is a 10-Gb Ethernet switch module that you install in an IBM BladeCenter enclosure—referred to as the *blade enclosure*. The switch module offers a solution in high-end data centers where server virtualization and IO consolidation are required.

This section lists the switch module hardware characteristics:

- Six external 10-Gb Ethernet ports for uplink
- 14 internal XAUI ports for connection to the server blades in the chassis
- One 10/100/1000BASE-T RJ-45 copper management port for out-of-band management link
This port is available on the front panel next to the console port.
- One external RS-232 serial console port
This port is available on the front panel and uses an RJ-45 connector.

Hardware Features

This section describes the physical features of the switch module and includes the following topics:

- [External Interfaces, page 1-2](#)
- [Internal Interfaces, page 1-3](#)
- [Switch Module LEDs, page 1-4](#)
- [Supported SFP Transceivers, page 1-6](#)

Location of Interfaces

- [Location of Interfaces](#), page 1-2
- [Out-of-Band Management Port](#), page 1-2
- [External 10-Gigabit Ethernet Module Ports](#), page 1-2
- [Serial Console Port](#), page 1-3

Location of Interfaces

Figure 1-1 **Switch Module 4001I/4005I**



1-6	10-Gb Ethernet Small Form Factor Pluggable (SFP+) ports	7, 10	Release latches
8	Out-of-band management port (labeled Management)	9	Serial console port has RJ-45 connector for management console (labeled Console)

The out-of-band management RJ-45 port supports 10/100/1000BASE-T Ethernet. It can autonegotiate to operate at any line speed (10, 100, 1000 Mbps); full and half duplex modes for 10 and 100 Mbps line speed, and only full duplex at 1000 Mbps.

The switch module contains a switching ASIC that is capable of forwarding Ethernet and FCoE packets at wire rate speed.

Six SFP+ ports are wired for external uplink access and are located on the front panel of the switch module. These external uplinks support 10GBASE-SR SFP+, 10GBASE-LR SFP+, 10GBASE-CU SFP+, and GE-SFP.

The port speed for the internal Ethernet ports can be set to 1 Gb or 10 Gb (only the internal Ethernet ports can be set to auto-negotiate. See “[Internal 10-Gigabit Ethernet Module Server Ports](#)”). The duplex setting must be full duplex.

For information on configuring the port settings, refer to the *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter NX-OS Configuration Guide* and the *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter NX-OS Command Reference*.

Serial Console Port

The switch module can be accessed through a serial console port located on the front panel. This is the standard Cisco RS-232 console using an RJ-45 connector for the switch module.

You can use the console port to connect the switch module to a host such as a PC, workstation, or a terminal server. Use the supplied console cable to connect the switch to a host.

For more information about the console port, see the *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter Getting Started Guide* and the *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter NX-OS Configuration Guide* on Cisco.com.

Internal Interfaces

This section describes the internal interfaces of the switch module and includes the following topics:

- [Internal 10-Gigabit Ethernet Module Server Ports](#), page 1-3
- [Internal 100BASE-T Ethernet Management Port](#), page 1-3

Internal 10-Gigabit Ethernet Module Server Ports

The switch module contains a switching ASIC capable of forwarding Layer-2 packets at wire rate speed.

14 of the 10-Gb Ethernet ports are wired for internal access to the server blades. These downlink ports connect to the server blades through the IBM BladeCenter chassis backplane, using the KX/KX4 interface.

The port speed for the internal Ethernet ports can be set to 1 Gb, 10 Gb, or auto-negotiate. However, the duplex setting must be full duplex.

Internal 100BASE-T Ethernet Management Port

The internal Ethernet management port (mgmt0) is used only for switch module management traffic, not for data traffic. It is connected to the IBM Advanced Management Module (AMM) through the blade enclosure backplane connector. Traffic to and from this port is isolated from the switch ports. This port only supports autonegotiation with 100 Mb/s and full-duplex mode.

The switch module supports two 100BASE-T Ethernet ports connected to the management modules through the backplane. The two management module Ethernet interfaces are combined into a single Ethernet interface on the switch module management circuits. Which of the two management module interfaces is active is determined by the chassis.

Switch Module LEDs

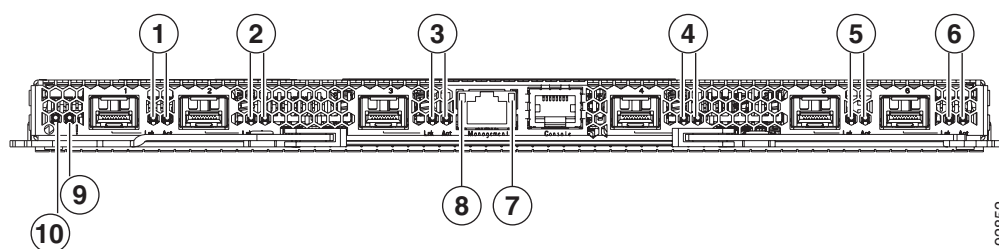
This section describes the LEDs on the switch module and includes the following topics:

- [Location of LEDs, page 1-4](#)
- [Uplink 10-Gb Ethernet Port LEDs, page 1-4](#)
- [System Status LED, page 1-5](#)
- [Management Port LEDs, page 1-5](#)

Location of LEDs

You can use the switch module LEDs to monitor switch module activity. [Figure 1-2](#) displays the LEDs that are described in [Table 1-1](#), [Table 1-2](#), and [Table 1-3](#).

Figure 1-2 Switch Module LEDs and System Activity LEDs



1	10-Gb Ethernet port 15 Link and Activity LED	2	10-Gb Ethernet port 16 Link and Activity LED
3	10-Gb Ethernet port 17 Link and Activity LED	4	10-Gb Ethernet port 18 Link and Activity LED
5	10-Gb Ethernet port 19 Link and Activity LED	6	10-Gb Ethernet port 20 Link and Activity LED
7	Out-of-band management port Activity LED	8	Out-of-band management port Link LED
9	System Status Fault LED	10	System Status OK LED

Uplink 10-Gb Ethernet Port LEDs

The switch module port LEDs are described in [Table 1-1](#). Each of the six uplink ports has two LEDs. The Activity LED blinks green or is off to indicate link activity. The Link Status LED is either solid green or off.

Table 1-1 Port LED Indications During Normal Operation

Port LED Indications		Port Status
Activity LED Indication	Link Status LED Indication	LED Description
Off	Off	No link established
Off	Solid green	No activity but link established

Table 1-1 Port LED Indications During Normal Operation

Port LED Indications		Port Status
Activity LED Indication	Link Status LED Indication	LED Description
Blinking green	Solid green	Activity (traffic) on an established link
Blinking green	Off	Activity (traffic) on an established link and port disabled (error disabled, STP blocked)

System Status LED

The system status is indicated by two LEDs. The OK LED is off when there is no power to the device, and displays as blinking or solid green when the system is active. The Fault LED is either off or displays as amber to indicate a malfunction. [Table 1-2](#) describes the System Status LED conditions.

Table 1-2 System LED Indications

System LED Indication	Description
OK LED	
Dark (off)	Power off
Solid green	System normal
Blinking green	power-on self-test (POST) in progress
Fault LED	
Dark (off)	No malfunction
Solid amber	System fault or malfunction

Management Port LEDs

The out-of-band management port has two 10/100/1000 BASE-T Ethernet LEDs. The indications of the Link LED and Activity LED are described in [Table 1-3](#).

Table 1-3 Out-of-Band Management Port LED Indications

LED Indication	Description
Link LED	
Solid green	Ethernet connection is established at the particular port with its link partner
Off	The port is not linked
Activity LED	
Blinking Green	Port is operating
Off	No activity

Supported SFP Transceivers

The switch module supports both copper and fiber SFP+ Ethernet transceivers. This section includes the following topics:

- [SFP+ Ethernet Transceivers, page 1-6](#)
- [SFP+ Copper Cables, page 1-6](#)

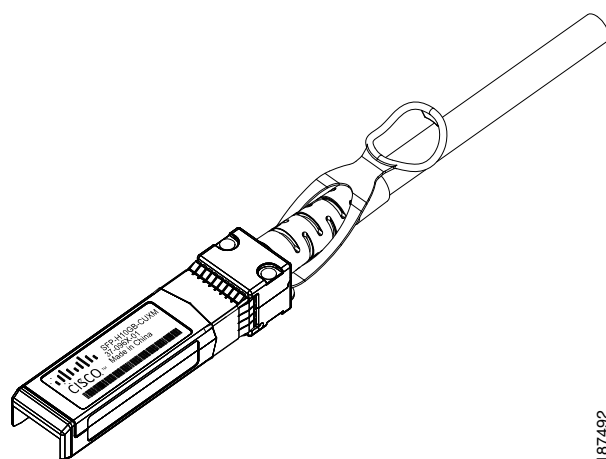
SFP+ Ethernet Transceivers

The enhanced Small-Form-Factor Pluggable (SFP+) 10-Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package. It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface. The switch module supports the following three transceivers:

Model	Description
SFP-10G-LR	10-Gigabit Ethernet—long range SFP+ module
SFP-10G-SR	10-Gigabit Ethernet—short range SFP+ module
SFP-10G-USR	10-Gigabit Ethernet—ultra-short range SFP+ module

Figure 1-3 shows the SFP-10G-SR transceiver.

Figure 1-3 SFP+ 10-Gigabit Ethernet Transceiver Module



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SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module. The cables come in the following lengths:

- 1m, 30 AWG
- 3m, 28-30 AWG
- 5m, 26-28 AWG

- 7m, 24-26 AWG

Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable 5 Meter
SFP-H10GB-CU7M	10GBASE-CU SFP+ Cable 7 Meter

Management Options

The switch module offers the following management options:

- **BladeCenter Advanced Management Module.** The switch module supports the chassis management interface to the AMM in a BladeCenter chassis. For a standalone switch modules, you can use the AMM to configure the Switch Module. See the *IBM BladeCenter Advanced Management Module User's Guide* for more information.
- **SNMP network management.** You can manage Switch Modules from an SNMP-compatible management station. The Switch Module supports a comprehensive set of Management Information Base (MIB) extensions. See the *Cisco Nexus Switch Module 4001I and 4005I for IBM BladeCenter NX-OS Configuration Guide* on Cisco.com and the documentation that came with your SNMP application for more information.



CHAPTER 2

Installing the Switch Module

This chapter describes how to install and configure the Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter and includes the following sections:

- [Safety Warnings, page 2-1](#)
- [Preparing to Install, page 2-3](#)
- [Installing and Removing the switch module, page 2-3](#)
- [Configuring the Switch Module with Initial Configurations, page 2-6](#)
- [Connecting the Switch Module Ports, page 2-8](#)

Safety Warnings

This section includes the basic installation warning statements. Translations of these warning statements appear in the *Regulatory Compliance and Safety Information for the Cisco Nexus Switch Module 4001I and 4005I for IBM BladeCenter*. Read this section before starting the installation procedure.

The switch module is for use only in listed IBM BladeCenter products. See the *Release Notes for the Cisco Nexus Switch Module 4001I and 4005I for IBM BladeCenter* on Cisco.com for listed IBM BladeCenter products.



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 reach into a vacant slot or chassis while you install or remove a module or a fan. Exposed circuitry could constitute an energy hazard. Statement 206



Warning

Do not work on the system or connect or disconnect cables during periods of lightning activity. Statement 1001

**Warning****Read the installation instructions before connecting the system to the power source.** Statement 1004**Warning****Class 1 laser product.** Statement 1008**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****This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.** Statement 1017**Warning****Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034**Warning****Ultimate disposal of this product should be handled according to all national laws and regulations.** Statement 1040**Warning****To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of:
104° F (40° C)** Statement 1047**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 to locate its translation in the translated safety warnings that accompanied this device.****SAVE THESE INSTRUCTIONS** Statement 1071**Warning****Installation of the equipment must comply with local and national electrical codes.** Statement 1074

Preparing to Install

This section describes the installation guidelines for the switch module. For information on the shipping box contents, see the *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter Getting Started Guide*.

To prepare for your installation, consider the following guidelines:

- Fill any unoccupied interconnect bays or any unoccupied power module bays in the blade enclosure with filler modules.
See the IBM BladeCenter documentation for more information about the specific enclosure model, the interconnect bay options, and the port mapping between the blade enclosure and the switch module.
- The orange release latch on the switch module means that it is hot-swappable. To maintain proper system cooling, you must replace a hot-swap switch module within one minute of removal.
- Verify that clearance to the switch module front panel is such that
 - Front-panel indicators can be easily read.
 - Access to ports is sufficient for unrestricted cabling.
 - The minimum bend radius and connector length of the cable for the SFP+ transceiver module is met. See the SFP+ transceiver module documentation for more information.
- Confirm that cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures. Make sure that the cabling is safely away from other devices that might damage the cables.
- For copper connections on Ethernet ports, cable lengths from the switch module to connected devices can be up to 328 feet (100 meters).
- Operating environment is within the ranges listed in [Appendix A, “Technical Specifications.”](#)
- For cable requirements for SFP+ transceiver connections, see [Appendix B, “Connector and Cable Specifications.”](#)
- Review and become familiar with the safety guidelines in the *Regulatory Compliance and Safety Information for the Cisco Nexus Switch Module 4001I and 4005I for IBM BladeCenter* on the documentation CD.
- Review and become familiar with the safety guidelines, and the temperature, power, and grounding requirements specified in the IBM blade enclosure installation and user’s guide.

Installing and Removing the switch module

This section describes the procedures for installing and removing the switch module. The section includes the following topics:

- [Installing the switch module, page 2-3](#)
- [Removing or Replacing the switch module, page 2-5](#)

Installing the switch module

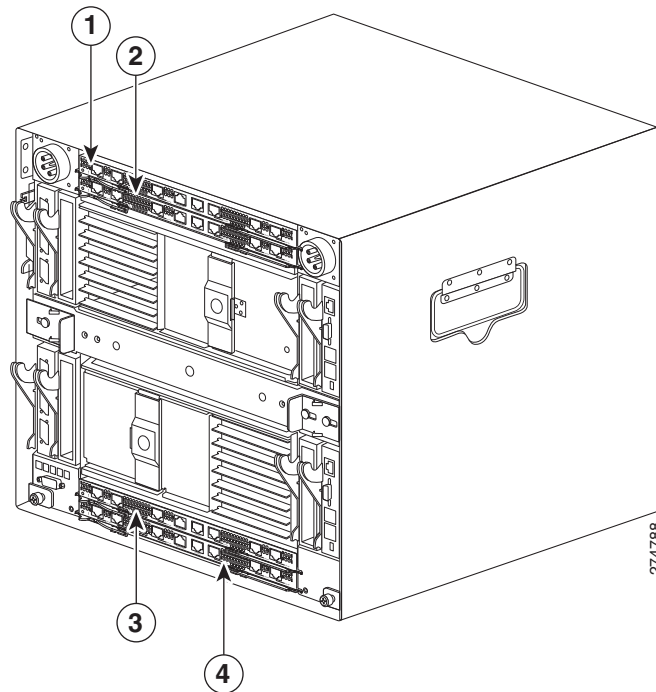
To install the switch module in the IBM BladeCenter, perform the following steps:

Step 1 Select the blade enclosure bay in which to install the switch module (Figure 2-1).



Note Figure 2-1 shows the IBM BC-H blade enclosure as an example. Your blade enclosure might be different. For additional information, see the documentation that comes with your blade server or BladeCenter unit.

Figure 2-1 Blade Enclosure Rear-Panel View



1	I/O module bay 7 ¹	3	I/O module bay 9 ¹
2	I/O module bay 8 ¹	4	I/O module bay 10 ¹

1. The bay numbers could be different depending upon your enclosure.

Step 2 Remove the filler module from the selected bay. Store the filler module for future use.

Each I/O-module bay must contain either a switch module or a filler module. Therefore, if the removed filler module occupied two bays and is a double-height filler, you must install a single-high filler module in the unused bay.

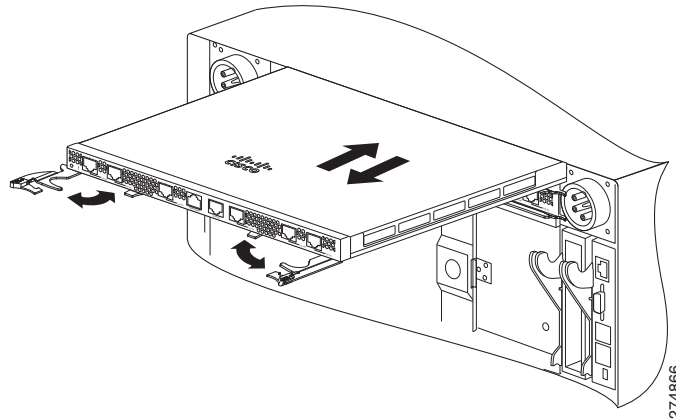


Note If you are preparing to install the switch module in a BladeCenter -HT, make sure the interposer card is installed in the interposer tray. For removal and installation details about the interposer card and tray, see your IBM documentation.

Step 3 If you have not already done so, touch the static-protective package that contains the switch module to any unpainted metal surface of the blade enclosure or any unpainted metal surface on any other grounded rack component for at least two seconds.

- Step 4** Remove the switch module from its static-protective package.
- Step 5** Move the two release latches to the open position (perpendicular to the switch module).
- Step 6** Slide the switch module into the selected bay until it stops ([Figure 2-2](#)).

Figure 2-2 *Installing the Switch Module*



- Step 7** Push the release latches to the closed position.
After you insert and lock the switch module, it turns on, and a power-on self-test (POST) occurs to verify that the unit is operating correctly.
The system power LED blinks green while the POST is running and then turns solid green when the POST is complete.
- Step 8** Confirm that the system power LED is green. See the “[Switch Module LEDs](#)” section on page 1-4 for more information about the switch module LEDs.
- Step 9** If you have a second switch to install, repeat [Step 1](#) to [Step 8](#).
- Step 10** To install the SFP+ transceiver module, see “[Installing an SFP+ Transceiver Module](#)” section on [page 2-9](#).

Removing or Replacing the switch module

To remove or replace the switch module, perform the following procedure:

- Step 1** Disconnect any cables from the switch module that you are removing.
- Step 2** Pull the release latches out from the switch module.
The switch module moves out of the bay slightly.
- Step 3** Slide the switch module out of the bay and set it aside.
- Step 4** Place either another switch module or a filler module in the bay.



Note Complete this step within 1 minute.

- Step 5** If you placed a switch module in the bay, reconnect the cables that you disconnected. Attach any additional cables that are required by the switch module. If you placed a filler module in the bay, then the replacement is complete.

Configuring the Switch Module with Initial Configurations

After the switch module boots up and displays the initial configuration dialog on the serial console connection, you can configure the switch.

To enter the basic configuration parameters, perform the following steps:

- Step 1** Telnet to the IP address that you configured in the AMM for mgmt1 of the switch module.
You can now configure the switch module.



Note

Register the switch module immediately with your supplier. Failure to register may affect response times for the initial service call. The device must be registered to receive entitled support services.

- Step 2** Enter the basic configuration information.

The following example shows how to start the basic configuration setup:

```
n3k-8# setup
```

```
---- Basic System Configuration Dialog ----
```

```
This setup utility will guide you through the basic configuration of
the system. Setup configures only enough connectivity for management
of the system.
```

```
*Note: setup is mainly used for configuring the system initially,
when no configuration is present. So setup always assumes system
defaults and not the current system configuration values.
```

```
Press Enter at anytime to skip a dialog. Use ctrl-c at anytime
to skip the remaining dialogs.
```

- Step 3** Enter the setup mode by entering **yes**.

The following example shows how to enter the setup mode:

```
Would you like to enter the basic configuration dialog (yes/no): yes
```

- Step 4** Create additional accounts by entering **yes** (no is the default).

The following example shows how to create additional accounts:

```
Create another login account (yes/no) [n]: y
```

- a.** Enter the user login ID:

```
Enter the User login Id: login
```

- b.** Enter the user password:

```
Enter the password for "gatest":
Please enter a valid password.
```

Confirm the password for "gatest":
Please enter a valid password.

c. Enter the default user role:

Enter the user role [network-operator]:

Step 5 Configure an SNMP community string by entering **yes**.

The following example shows how to configure an SNMP community string:

Configure read-only SNMP community string (yes/no) [n]: **y**

SNMP community string: **string**

Step 6 Enter a name for the switch.

The following example shows how to enter the switch name:

Enter the switch name: **ibm-switch-1**

Step 7 Configure out-of-band management by entering **yes**.

The following example shows how to configure out-of-band management:

Continue with Out-of-band (mgmt0) management configuration? (yes/no) [y]:

Mgmt0 IPv4 address: **10.10.10.1**

Mgmt0 IPv4 netmask: **255.255.255.0**



Note

The switch module has two out-of-band management interfaces. The AMM configuration is mgmt1. The mgmt0 must be placed on a different subnet than mgmt 1.

Step 8 Configure the IPv4 default gateway (recommended) by entering **yes**. You can then enter its IP address.

The following example shows how to configure the default gateway:

Configure the default gateway? (yes/no) [y]:

IPv4 address of the default gateway: **10.10.10.100**

Step 9 Enable the Telnet service by entering **yes**.

The following example shows how to enable the Telnet service:

Enable the telnet service? (yes/no) [y]:

Step 10 Enable the SSH service by entering **yes**.

The following example shows how to enable the SSH service:

Enable the ssh service? (yes/no) [n]:

Step 11 Configure the NTP server by entering **yes**.

The following example shows how to configure the NTP server:

Configure the ntp server? (yes/no) [n]:

The following configuration will be applied:

```
username gatest password <user-password> role network-operator
snmp-server community tospin ro
switchname ibm-switch-1
interface mgmt0
```

```
ip address 10.10.10.1 255.255.255.0
no shutdown
ip route 0.0.0.0/0 10.10.10.100
telnet server enable
no ssh server enable
```

Step 12 Continue to the next step by entering **no**. If you enter yes, the setup utility returns to the beginning of the setup, and repeats each step.

The following example shows how to continue to the following step without editing:

```
Would you like to edit the configuration? (yes/no) [n]: n
```

Step 13 Use and save this configuration by entering **yes**.

The following example shows how to save your configuration:

```
Use this configuration and save it? (yes/no) [y]: y
```

```
ibm-switch-1 #
```

If you do not save the configuration at this point, none of your changes are part of the configuration the next time the device reboots. Saving the configuration ensures that the boot variables for the kickstart and system images are also automatically configured.

Connecting the Switch Module Ports

This section describes how to connect the switch module ports and includes the following topics:

- [Installing Devices in the 10-Gb Ethernet Slots, page 2-8](#)
- [Connecting Devices to the Ethernet Port, page 2-10](#)

Installing Devices in the 10-Gb Ethernet Slots

This section describes how to install and remove the Small Form Factor Pluggable (SFP+) transceiver modules and includes the following topics:

- [Installing an SFP+ Transceiver Module, page 2-9](#)
- [Removing an SFP+ Transceiver Module, page 2-10](#)



Note

The procedures for installing and removing an SFP+ module can be used for the SFP module.

The following 10 G SFP+ modules are supported:

- SFP-10G-SR (short range, MMF)
- SFP-10G-LR (long range, SMF)
- SFP-H10GB-CU1M= 10GBASE-CU SFP+ Cable 1 Meter
- SFP-H10GB-CU3M= 10GBASE-CU SFP+ Cable 3 Meter
- SFP-H10GB-CU5M= 10GBASE-CU SFP+ Cable 5 Meter

The following 1 G SFP modules are supported:

- GLC-LH-SM= GE SFP,LC connector LX/LH transceiver D
- GLC-SX-MM= GE SFP, LC connector SX transceiver D
- GLC-T= 1000BASE-T SFP D

Installing an SFP+ Transceiver Module

When installing an SFP+ transceiver module, observe the following precautions:

- Do not remove the dust plugs from the fiber-optic SFP+ transceiver modules or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the module ports and cables from contamination and ambient light.
- Removing and installing an SFP+ module can shorten its useful life. Do not remove and insert any SFP+ module more often than is absolutely necessary.
- To prevent ESD damage, follow your normal board and component handling procedures when connecting cables to the switch module and other devices.

To install an SFP+ transceiver module, perform the following steps:

Step 1 Attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector or a bare metal surface on your chassis.

Step 2 Remove the SFP+ transceiver module from its protective packaging.



Note Do not remove the optical bore dust plugs until directed to do so later in the procedure.

Step 3 Remove the 10-Gb Ethernet module slot cover and save.

Step 4 Position the SFP+ transceiver in front of the socket opening.



Caution Verify the correct orientation of your transceiver module before inserting it into the slot. Incorrect insertion can damage the module.

If your transceiver module has a bale clasp, position the transceiver with the clasp on the bottom, close the clasp by pushing it up over the transceiver, and then gently insert the transceiver into the port until it clicks into place.

Step 5 Insert the SFP+ module into the SFP+ port until you feel the connector latch into place.

Step 6 Press the SFP+ module into the slot firmly with your thumb.

If your transceiver module has a bale clasp, move the clasp to the locked (upright) position.

Step 7 To verify that the SFP+ module is seated and latched properly:

- Grasp the SFP+ and try to remove it without releasing the latch.
- If the SFP+ cannot be removed, it is installed and seated properly. If the SFP+ module can be removed, reinsert it and press harder with your thumb, repeating if necessary until it is latched securely into the socket.

Step 8 Remove the dust plugs from the network interface cable LC connectors. Save the dust plugs for future use.



Note Do not remove the SFP+ module plugs until you are ready to install the cables.

- Step 9** Remove the dust plugs from the SFP+ transceiver optical bores.
- Step 10** Immediately attach the network interface cable LC connector to the SFP+ transceiver.

Removing an SFP+ Transceiver Module



Note The SFP+ transceiver modules are static sensitive devices. Always use an ESD wrist strap or similar individual grounding device when handling SFP+ transceivers or coming in contact with modules.

To remove an SFP+ transceiver module, perform the following steps:

- Step 1** Attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector or a bare metal surface on your chassis.
- Step 2** If a cable is installed in the transceiver:
- Record the cable and port connections for later reference.
 - Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.
 - Insert a dust plug into the cable end of the transceiver.



Caution If the transceiver does not remove easily in the next step, push the transceiver completely in, and then ensure that the latch is in the correct position before continuing.

- Step 3** Release and remove the SFP+ transceiver module from the socket connector.
- If your transceiver module has a bale clasp latch, open the clasp to the unlocked position before pulling the transceiver out of the port.
- Step 4** Insert a dust cover into the port end of the transceiver, and place the transceiver on an antistatic mat or into a static shielding bag or other protective environment.
- Step 5** If another transceiver is not being installed, protect the optical cage by inserting a clean cover.

Connecting Devices to the Ethernet Port

The External Management Port on the Switch Module is a 10/100/1000 Ethernet port that uses standard RJ-45 connectors with Ethernet pinouts. The maximum cable length is 328 feet (100 meters). The 100BASE-TX and 1000BASE-T traffic requires a Category 5, Category 5e, or Category 6 UTP cable. The 10BASE-T traffic can use Category 3 or Category 4 cable.

**Caution**

Category 5e and Category 6 cables can store high levels of static electricity. Always ground the cables to a suitable and safe earth ground before connecting them to the switch module or other devices.

The autonegotiation feature is enabled by default on the External Management Port. At this setting, the port configures itself to operate at the speed of attached devices. If the attached device does not support autonegotiation, you can explicitly set the External Management Port speed and the duplex parameters. To maximize performance, either allow the port to autonegotiate both speed and duplex, or set the port speed and duplex parameters on both ends of the connection.

For simplified cabling, the automatic medium-dependent interface crossover (auto-MDIX) feature is enabled by default on the External Management Port. With auto-MDIX enabled, the port detects the required cable type for copper Ethernet connections and configures the interface accordingly. Therefore, you can use either a crossover or a straight-through cable for connections to the External Management Port, regardless of the type of device on the other end of the connection.

See the *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter NX-OS Configuration Guide* and the *Cisco Nexus 4001I and 4005I Switch Module for IBM BladeCenter NX-OS Command Reference* for more information about enabling or disabling autonegotiation, and auto-MDIX.

If auto-MDIX is disabled, use the guidelines in [Table 2-1](#) to select the correct cable for connecting the switch-module 10/100/1000 Ethernet ports to other devices. See the “[Cable Specifications](#)” section on [page B-2](#) for cable-pinout descriptions.

Table 2-1 Recommended Ethernet Cables (When Auto-MDIX is Disabled)

Device	Crossover Cable ¹	Straight-Through Cable ¹
Switch module to switch module	Yes	No
Switch module to hub	Yes	No
Switch module to computer or server	No	Yes
Switch module to router	No	Yes
Switch module to IP phone	No	Yes

1. 100BASE-TX and 1000BASE-T traffic requires twisted four-pair, Category 5, Category 5e, or Category 6 cable. 10BASE-T traffic can use Category 3 or Category 4 cable.



APPENDIX **A**

Technical Specifications

This appendix lists the technical specifications for the Switch Module in [Table A-1](#) and [Table A-2](#).

Table A-1 *Switch Module Environmental and Physical Specifications*

Environmental Ranges	
Operating temperature	32 to 104°F (0 to 40°C)
Storage temperature	–13 to 158°F (–25 to 70°C)
Relative humidity	10 to 85% (noncondensing)
Operating altitude	Up to 10,000 ft (3049 m)
Storage altitude	Up to 15,000 ft (4573 m)
Physical Specifications	
Weight	3 lbs 15 oz (1.79 kg)
Physical Specifications	
Dimensions (H x D x W)	0.79 x 10.27 x 11.57 in. (20 x 260.93 x 293.9 cm)

Table A-2 *Power Specifications*

Power Specifications	
Maximum power	69 W
Input voltage range and frequency	12 VDC +/- 10%
Input current maximum	5.75 A (= 69 W/12 V)
Total input BTU	235 BTUs per hour, 69 W



APPENDIX **B**

Connector and Cable Specifications

This appendix describes the cables and adapters that you use to connect the Switch Module to other devices and includes the following sections:

- [Connector Specifications, page B-1](#)
- [Cable Specifications, page B-2](#)

Connector Specifications

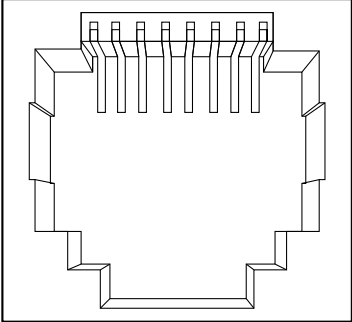
This section describes the connector specifications and includes the following topics:

- [10/100/1000 Management Ports, page B-1](#)
- [Serial Console Port, page B-2](#)

10/100/1000 Management Ports

The 10/100/1000 Management Ethernet ports on the Switch Module use standard RJ-45 connectors and Ethernet pinouts ([Figure B-1](#)).

Figure B-1 **10/100/1000 Port Pinouts**

Pin	Label	1 2 3 4 5 6 7 8
1	TP0+	
2	TP0-	
3	TP1+	
4	TP2+	
5	TP2-	
6	TP1-	
7	TP3+	
8	TP3-	

Serial Console Port

The console port is an asynchronous RS-232 serial port with an RJ-45 connector. [Table B-1](#) lists the pinouts for the console port on the Switch Module.

Table B-1 Console Port Pinouts

Pin	Signal
1 ¹	RTS
2	DTR
3	TxD
4	GND
5	GND
6	RxD
7	DSR
8	CTS

1. Pin 1 is connected internally to pin 8.

Cable Specifications

This section describes cable specifications for SFP and SFP+ modules.

[Table B-2](#) provides cabling specifications for the Cisco SFP modules.

Table B-2 SFP 1 GB Module Port Cabling Specifications

Cisco SFP+	Wavelength (nm)	Fibre Type	Core Size (microns)	Modal Bandwidth (MHz*km)	Cable Distance
Cisco GLC-LH-SM	1310	MMF	62.5	500	1804 feet (550 m)
			50.0	400	1804 feet (550 m)
			50.0	500	1804 feet (550 m)
		SMF	G.652	-	32,810 feet (10 km)
					6.2 miles (10 km)
Cisco GLC-SX-MM	850	MMF	62.5	160	722 feet (220 m)
			62.5	200	902 feet (275 m)
			50.0	400	1640 feet (500 m)
			50.0	500	1804 feet (550 m)
Cisco GLC-T=	N/A				

Table B-3 provides cabling specifications for the Cisco SFP+ modules.

Table B-3 SFP+ 10 GB Modules Port Cabling Specifications

Cisco SFP+	Wavelength (nm)	Cable Type	Core Size (microns)	Modal Bandwidth (MHz*km)	Cable Distance ¹
Cisco SFP-10G-SR	850	MMF	62.5	160	26 m
			62.5	200	33 m
			50.0	400	66 m
			50.0	500	82 m
			50.0	2000	300 m
Cisco SFP-10G-LR	1310	SMF	G.652		10 km
Cisco SFP-H10GB-CU1M	-	Twinax cable, 30 AWG cable assembly	-	-	1 m
Cisco SFP-H10GB-CU3M	-	Twinax cable, 30 AWG cable assembly	-	-	3 m
Cisco SFP-H10GB-CU5M	-	Twinax cable, 24 AWG cable assembly	-	-	5 m

1. Minimum cabling distance for -SR and -LR modules is 2 m, according to the IEEE 802.3ae.



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