



Catalyst 4948-10GE Switch Installation Guide

March 2005

Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
<http://www.cisco.com>
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

Text Part Number: 78-16725-01
Customer Order Number: DOC-7816725=



THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The following information is for FCC compliance of Class A devices: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

The following information is for FCC compliance of Class B devices: The equipment described in this manual generates and may radiate radio-frequency energy. If it is not installed in accordance with Cisco's installation instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in part 15 of the FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

Modifying the equipment without Cisco's written authorization may result in the equipment no longer complying with FCC requirements for Class A or Class B digital devices. In that event, your right to use the equipment may be limited by FCC regulations, and you may be required to correct any interference to radio or television communications at your own expense.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the equipment to one side or the other of the television or radio.
- Move the equipment farther away from the television or radio.
- Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

Modifications to this product not authorized by Cisco Systems, Inc. could void the FCC approval and negate your authority to operate the product.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

CCVP, the Cisco logo, and Welcome to the Human Network are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn is a service mark of Cisco Systems, Inc.; and Access Registrar, Aironet, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, iQuick Study, LightStream, Linksys, MeetingPlace, MGX, Networkers, Networking Academy, Network Registrar, PIX, ProConnect, ScriptShare, SMARTnet, StackWise, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0711R)

Catalyst 4948-10GE Switch Installation Guide

Copyright © 2005 Cisco Systems, Inc. All rights reserved.



Preface ix

- Audience **ix**
- Organization **ix**
- Related Documentation **x**
- Conventions **x**
 - Statement 1071—Warning Definition **xii**
- Obtaining Documentation **xx**
 - Cisco.com **xx**
 - Documentation DVD **xx**
 - Ordering Documentation **xxi**
- Documentation Feedback **xxi**
- Cisco Product Security Overview **xxi**
 - Reporting Security Problems in Cisco Products **xxii**
- Obtaining Technical Assistance **xxiii**
 - Cisco Technical Support Website **xxiii**
 - Submitting a Service Request **xxiv**
 - Definitions of Service Request Severity **xxiv**
- Obtaining Additional Publications and Information **xxv**

CHAPTER 1

Product Overview 1-1

- Catalyst 4948-10GE Switch Applications **1-1**
- Catalyst 4948-10GE Switch Software Features **1-2**
- Hardware System Features **1-3**
- Switch Components **1-5**

- Traffic Ports 1-5
- Console Port 1-5
- Front Panel LEDs 1-6
- Chassis Cooling 1-7
- Power Supplies 1-8
- Environmental Monitoring of the Power Supplies 1-9
- Power Management for the Catalyst 4948-10GE Switch 1-10
 - Power Management Modes 1-10

CHAPTER 2

Site Planning 2-1

- Site Environmental Requirements 2-1
- Site Power Requirements 2-2
 - Preinstallation Requirements 2-3
 - Warnings and Cautions 2-3
 - EMI Recommendations 2-4
 - Power Requirements and Heat Dissipation 2-4
- DC Grounding Requirements 2-4
- Safety Overview 2-5
 - Ensuring Safety 2-5
 - Working Safely with Electricity 2-6
 - Preventing Electrostatic Discharge Damage 2-7
- Site Planning Checklist 2-7

CHAPTER 3

Installing the Switch 3-1

- Checking the Contents 3-1
- Rack-Mounting the Switch 3-2
 - Rack-Mounting Guidelines 3-3
 - Lifting the Chassis Safely 3-4
 - Required Installation Tools 3-5

Rack-Mounting the Catalyst 4948-10GE Switch 3-6

Connecting AC Power to the Catalyst 4948-10GE Switch 3-9

Connecting DC Power to the Catalyst 4948-10GE Switch 3-12

CHAPTER 4**X2 10-Gigabit Ethernet Module****Port Configuration 4-1**

X2 Modules Supported 4-2

X2 Module Handling Guidelines and Installation 4-2

Installing the 10-Gigabit Ethernet X2 Module 4-4

Removing the 10-Gigabit Ethernet X2 Module 4-8

Module Maintenance Guidelines 4-9

Cleaning the Fiber-Optic Connectors 4-10

CHAPTER 5**Troubleshooting the Installation 5-1**

Getting Started 5-2

Problem Solving to the System Component Level 5-2

Identifying Startup Problems 5-3

LED Readings 5-3

Troubleshooting the Power Supply 5-5

Contacting Customer Service 5-6

APPENDIX A**Specifications A-1**

Console Port A-1

10/100BASE-T Management Port A-2

Catalyst 4948-10GE Switch Specifications A-2

APPENDIX B**Translated Safety Warnings B-1**

Statement 1003—DC Power Disconnection B-1

Statement 1004—Installation Instructions **B-3**
Statement 1006—Chassis Warning for Rack-Mounting and Servicing **B-5**
Statement 1008—Class 1 Laser Product **B-13**
Statement 1011—Staring into Laser Beam **B-15**
Statement 1017—Restricted Area **B-17**
Statement 1019—Main Disconnecting Device **B-20**
Statement 1024—Ground Conductor **B-22**
Statement 1030—Equipment Installation **B-24**
Statement 1040—Product Disposal **B-26**
Statement 1045—Short-circuit Protection **B-29**
Statement 1051—Laser Radiation **B-32**
Statement 1074—Comply with Local and National Electrical Codes **B-35**
Statement 1075—Hazardous Voltage or Energy Present on DC Power
Terminals **B-36**

INDEX



Preface

This preface describes the audience, organization, and conventions of the *Catalyst 4948-10GE Switch Installation Guide* and provides information on how to obtain related documentation.

Audience

Only trained and qualified service personnel (as defined in IEC60950 and AZ/NZS 60950) should install, replace, or service the equipment.

Organization

This guide is organized as follows:

Chapter	Title	Description
Chapter 1	Product Overview	Describes the hardware features and functionality of the Catalyst 4948-10GE switch.
Chapter 2	Site Planning	Describes how to prepare your site for the installation of the switch.
Chapter 3	Installing the Switch	Details how to install the Catalyst 4948-10GE switch.
Chapter 4	X2 Port Configuration	Describes how to install, remove, and maintain X2 10-Gigabit Ethernet modules.

Chapter	Title	Description
Chapter 5	Troubleshooting the Installation	Provides troubleshooting guidelines for the initial hardware installation and suggests steps to help isolate and resolve problems.
Appendix A	Specifications	Lists the Catalyst 4948-10GE switch system specifications.
Appendix B	Translated Safety Warnings	Repeats in multiple languages the warnings in this guide.

Related Documentation

Refer to the following documents for additional information about configuring the Catalyst 4948-10GE switch:

- Software Configuration Guide—Catalyst 4500 Series.
- Command Reference—Catalyst 4500 Series.
- System Message Guide—Catalyst 4500 Series.

The Catalyst 4948-10GE switch uses software that also runs on the Catalyst 4500 series switches. Refer to the version of these documents appropriate for your software.

Conventions

This document uses the following conventions:

Convention	Description
boldface font	Commands and keywords are in boldface .
<i>italic</i> font	Arguments for which you supply values are in <i>italics</i> .
[]	Elements in square brackets are optional.
{ x y z }	Alternative keywords are grouped in braces and separated by vertical bars.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.

Convention	Description
string	A non-quoted set of characters. Do not use quotation marks around the string, because the string will include the quotation marks.
screen font	Terminal sessions and information that the system displays are in <i>screen font</i> .
boldface screen font	Information that you must enter is shown in boldface screen font .
<i>italic screen font</i>	Arguments for which you supply values are in <i>italic screen font</i> .
Ctrl-	Ctrl- represents the key labeled Control—for example, the key combination Ctrl-D means to hold down the Control key while you press the D key.
< >	Characters that do not print, such as passwords, are shown within angle brackets.

Notes use the following conventions:



Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the publication.

Cautions use the following conventions:



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 conventions:

Statement 1071—Warning Definition



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. Statement 1071

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**FONTOS BIZTONSÁGI ELOÍRÁSOK**

Ez a figyelmeztető jel veszélyre utal. Sérülésveszélyt rejtő helyzetben van. Mielőtt 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.

ORIZZE 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 重要 안전 지침

이 경고 기호는 위험을 나타냅니다. 작업자가 신체 부상을 일으킬 수 있는 위험한 환경에 있습니다. 장비에 작업을 수행하기 전에 전기 회로와 관련된 위험을 숙지하고 표준 작업 관례를 숙지하여 사고를 방지하십시오. 각 경고의 마지막 부분에 있는 경고문 번호를 참조하여 이 장치와 함께 제공되는 번역된 안전 경고문에서 해당 번역문을 찾으십시오.

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 لإصابات. 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

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at this URL:

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

Documentation DVD

Cisco documentation and additional literature are available in a Documentation DVD package, which may have shipped with your product. The Documentation DVD is updated regularly and may be more current than printed documentation. The Documentation DVD package is available as a single unit.

Registered Cisco.com users (Cisco direct customers) can order a Cisco Documentation DVD (product number DOC-DOCDVD=) from the Ordering tool or Cisco Marketplace.

Cisco Ordering tool:

<http://www.cisco.com/en/US/partner/ordering/>

Cisco Marketplace:

<http://www.cisco.com/go/marketplace/>

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Ordering tool:

<http://www.cisco.com/en/US/partner/ordering/>

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

Documentation Feedback

You can send comments about technical documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

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

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.

- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL:

<http://www.cisco.com/go/psirt>

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies—security-alert@cisco.com
- Nonemergencies—psirt@cisco.com



Tip

We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.x through 8.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one that has the most recent creation date in this public key server list:

<http://pgp.mit.edu:11371/pks/lookup?search=psirt%40cisco.com&op=index&exact=on>

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

Obtaining Technical Assistance

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, Cisco Technical Support provides 24-hour-a-day, award-winning technical assistance. The Cisco Technical Support Website on Cisco.com features extensive online support resources. In addition, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not hold a valid Cisco service contract, contact your reseller.

Cisco Technical Support Website

The Cisco Technical Support Website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, 365 days a year, at this URL:

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

Access to all tools on the Cisco Technical Support Website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>



Note

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support Website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

<http://www.cisco.com/go/marketplace/>

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

<http://www.ciscopress.com>

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

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

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

<http://www.cisco.com/go/iqmagazine>

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

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

- World-class networking training is available from Cisco. You can view current offerings at this URL:

<http://www.cisco.com/en/US/learning/index.html>



Product Overview

Revised: October 27, 2011

This chapter describes the Catalyst 4948-10GE switch, as well as system features and components.

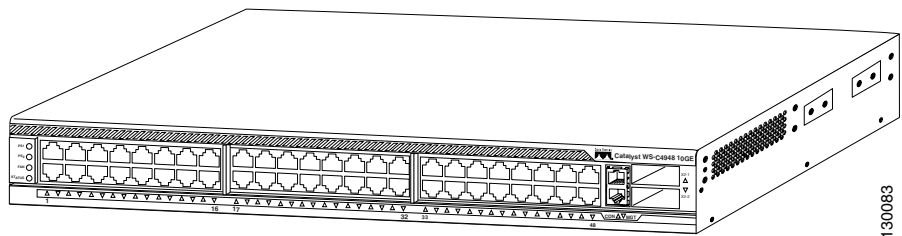
This chapter contains these sections:

- [Catalyst 4948-10GE Switch Applications, page 1-2](#)
- [Catalyst 4948-10GE Switch Software Features, page 1-2](#)
- [Hardware System Features, page 1-4](#)
- [Switch Components, page 1-5](#)

Catalyst 4948-10GE Switch Applications

The Catalyst 4948-10GE switch (see [Figure 1-1](#)) is designed for high-performance, high-density edge switching applications. It is a fixed configuration switching solution delivering 10/100/1000 connectivity on all ports, supporting hot swappable, redundant power supplies in a compact one rack-unit size for applications where space is at a premium.

Figure 1-1 Catalyst 4948-10GE Switch



The Catalyst 4948-10GE switch has a 136-Gbps, nonblocking, full-duplex switching fabric, providing 102 million packets-per-second of switching capacity for high-speed applications. The Catalyst 4948-10GE chassis has 48 10/100/1000BASE-T Ethernet ports and two 10-Gigabit Ethernet uplink ports.

A removable automatic variable speed fan tray for low noise operation at room temperature and removable and redundant 300 W AC or 300 W DC power supply provides fault-tolerance protection for the switch. See the [“Connecting AC Power to the Catalyst 4948-10GE Switch”](#) section on page 3-9.

Catalyst 4948-10GE Switch Software Features

The following is an overview of Catalyst 4948-10GE features:

- Layer 2, Layer 3, and Layer 4 switching services
- Support for 55,000 MAC addresses for Layer 2 switching

- Support for 4,096 VLANs and 4,096 VLAN IDs
 - IEEE 802.1Q VLAN tagging on all ports
 - Q-in-Q for EFM
 - Cisco Inter Switch Link (ISL) tagging on all ports
- 16,000 multicast forwarding entries and 16,000 unicast forwarding entries
- 1022 ingress policers and 1022 egress policers
- 32,000 ingress Security ACEs and 32,000 egress Security ACEs
- Support for port aggregation using Port Aggregation Protocol (PAgP) for Gigabit EtherChannel
- Catalyst 4500 series management software features include the following:
 - Command-line interface (CLI) and Simple Network Management Protocol (SNMP) interfaces consistent with the Catalyst 4500 series switches
 - Compatible development of new features with the Catalyst 4500 series switches
 - Support for out-of-band management over serial lines through a terminal attached to the console interface
 - Support for in-band management through any switch port through SNMP, Telnet client, and Trivial File Transfer Protocol (TFTP)
 - Remote Monitoring (RMON) with RMON-1
 - Support for standard Layer 2 features: 802.1D Spanning Tree, Cisco Discovery Protocol (CDP), VTP version 2 with pruning extensions, and Cisco Group Management Protocol (CGMP) client
- Embedded management features include the following:
 - Full SNMP instrumentation including entity-Management Information Base (MIB), all relevant standard MIBs, and all relevant Cisco MIBs
 - Support for the first four RMON groups (Ethernet Statistics, Alarms, Events, and History) on a per-port basis without the need for an optional RMON processing module
 - Performance management information
 - Embedded CiscoView support

Hardware System Features

The Catalyst 4948-10GE switch is a high-performance dedicated Ethernet switch that fully integrates into the Catalyst family of switches using Catalyst 4500 series system software.

The following is an overview of the Catalyst 4948-10GE hardware features:

- 48 10BASE-T/100BASE-TX/1000BASE-T Ethernet ports using RJ-45 interfaces. The following standards are supported:
 - IEEE 802.3 10BASE-T
 - IEEE 802.3u 100BASE-TX
 - IEEE 802.3z 1000BASE-X
 - IEEE 802.3x Pause and/or Full Duplex
 - IEEE 802.1Q
 - IEEE 802.3ab 1000BASE-T
 - IEEE 802.3ae
 - IEEE 802.1p
- Two 10-Gigabit Ethernet uplink ports using X2 interfaces
- Serial console management port using an RJ-45 interface
- A removable automatic variable speed fan tray for low noise operation at room temperature
- Redundant and removable 300 W AC power supplies (DC available)
- 256-MB SDRAM (fixed)
- 64-MB embedded Flash memory
- 136-Gbps switching capacity, 102 million packets-per-second actual forwarding rate
- EtherChannel at 10/100/1000 Mbps, as well as 10 Gbps
- Hardware-based access lists
- Storm control in hardware

Switch Components

This section describes the Catalyst 4948-10GE hardware components.

Traffic Ports

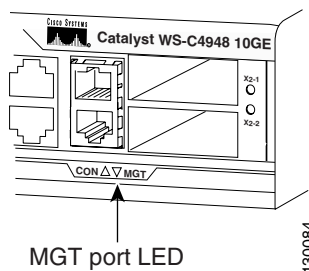
There are 48 10/100/1000BASE-T Ethernet ports using RJ-45 interfaces and two 10-Gigabit Ethernet uplink ports using X2 interfaces.

Console Port

A console serial port (RJ-45) provides for switch management using standard console equipment. (See [Figure 1-2](#).) A connector pinout table is provided in [Appendix A, “Specifications,”](#) for the console and management ports.

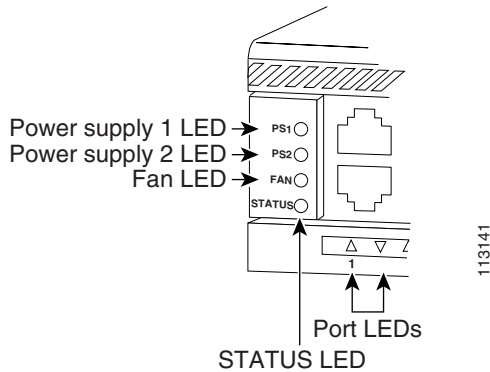
The Management port on the front panel is only operational when the switch is in rommon mode. When in use, it offers the same TCP/IP based management services available via inband access (telnet SNMP etc). IP address configuration via BOOTP is supported on the Management port; it also supports image download to the switch.

Figure 1-2 Detailed View of the LEDs for the Management Ports



Note

A console cable is not provided with the system. It is an option that can be ordered.

Figure 1-3 Detailed View of the STATUS LED

Front Panel LEDs

The LEDs on the front panel of the Catalyst 4948-10GE switch (see [Figure 1-2](#) and [Figure 1-3](#)) provide status information as follows:

- STATUS LED indicates the operating state of the Catalyst 4948-10GE switch.
- PS1 LED indicates the internal power supply status.
- PS2 LED indicates the internal power supply status.
- FAN LED indicates the fan tray status.
- A link status LED is below the 10/100 BASE-T management port.

A description of the LED functions is provided in [Table 1-1](#).

Table 1-1 LED Descriptions

LED	Color or State	Description
STATUS	Green	At startup, the Catalyst 4948 performs a series of diagnostic tests: All tests pass
	Red	A test other than an individual port test fails
	Flashing	System boot or diagnostic tests in progress
	Yellow	System is in rommon mode or a power supply has failed
	Off	Switch is disabled
CON	Green	10/100 BASE-T console port is in link-up state
	Off	10/100 BASE-T console port is in link-down state or not connected
		There are no blinking, red, or yellow states for this port
MGT	Green	10/100 BASE-T Management port is in link-up state
	Off	10/100 BASE-T Management port is in link-down state or not connected
		There are no blinking, red, or yellow states for this port
Port 1-48	Green	Port is operational
	Yellow	Port is disabled by user
	Flashing yellow	Power-on self-test indicates faulty port
	Off	No signal detected or link configuration failure

Table 1-1 LED Descriptions

LED	Color or State	Description
FAN	Off	No power to the switch or fans (the tray may not be plugged in especially if one or more of the power supplies status LED is green)
	Green	Fan tray operational
	Red	Fault detected
PS1 and PS2	Off	No power to the PS
	Green	Operational ¹
	Red	Fault detected or the on/off switch is set to off while the power supply is plugged in

1. If either LED is green and the other is OFF the power supply is probably not plugged in. If it is red, the supply is either plugged in and not switched on or it is faulty. It may be necessary to interrogate the system for further status using the CLI.

Chassis Cooling



Note

For environmental specifications, see [Chapter 2, “Site Planning.”](#)

The hot-swappable system fan tray provides cooling air for the internal chassis components. The fans exhaust air to the rear, and fresh air is drawn in from the sides of the chassis.

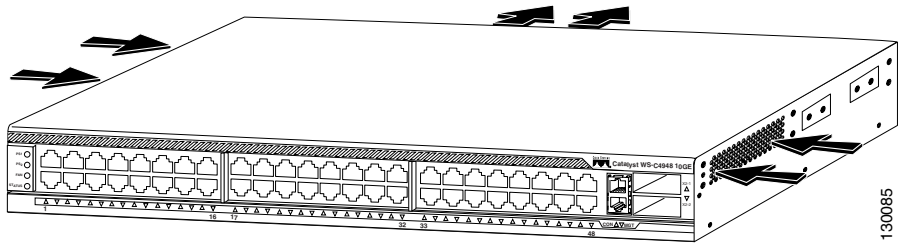


Caution

When the fan tray is removed, internal circuitry is exposed that should not be touched by tools or fingers. The system should not be left operating without a fan tray for longer than is necessary to replace a faulty fan tray with a new one.

[Figure 1-4](#) shows the direction of airflow going in and out of the switch.

Figure 1-4 Catalyst 4948-10GE Airflow



There are four fans in the fan tray. If an individual fan fails, the other fans continue to run. Sensors monitor the internal air temperatures. The number of fans in operation and their speed varies according to the internal temperature for the quietest operation possible. If the air temperature exceeds a desired threshold, the environmental monitor displays warning messages.

Power Supplies

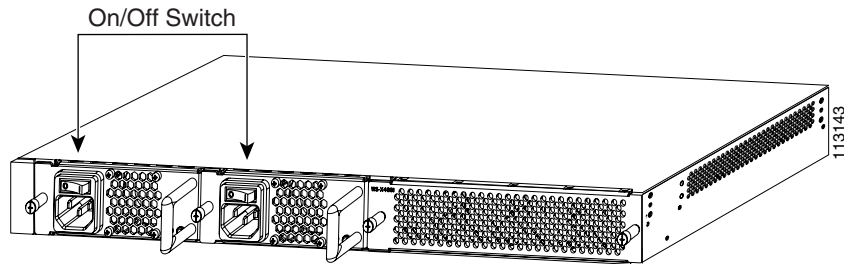


Note

For complete power specifications for the Catalyst 4948-10GE switch, see Appendix A, “[Specifications](#).”

The Catalyst 4948-10GE switch has two redundant internal 300 W AC or 300 W DC power supplies.

The internal power supplies have individual power cords and status LEDs (PS1 and PS2 on the front panel). There are also LEDs on the power supplies that show status for the input (Input OK) and output (Output OK) currents. A power cord is used to connect the power supplies to the site AC power source. There is a power switch on the AC Catalyst 4948-10GE switch power supplies; AC power is present when a power cord is plugged into a power supply and the switch is set to the On position. DC power supplies do not use a power supply cord or have an on/off switch.

Figure 1-5 On/Off Switch Locations

The switch will start with only one power supply plugged in, but redundant failover and load sharing will not be available in this configuration. We recommend that you always connect both power supplies to separate AC or DC circuits for optimal power reliability.

For safety reasons, the AC power supply needs to be switched off and unplugged before it is removed from a chassis or inserted into a chassis. DC supplies should have power shut off from the source before they are removed.

If only one power supply will be used, you must use the blank faceplate supplied to cover the empty power bay.

Environmental Monitoring of the Power Supplies

Using the environmental monitoring and reporting functions, you can maintain normal system operation by resolving adverse environmental conditions prior to loss of operation.

Each power supply monitors its own temperature and output voltages. If conditions reach critical thresholds, the power supply might shut down to avoid damage from excessive heat or electrical current. The Catalyst 4948-10GE switch senses the operating condition of the power supply and reports status through software.

Power Management for the Catalyst 4948-10GE Switch

You can select AC or DC power supplies for your switch. The Catalyst 4948-10GE switch supports the following power supplies:

- 300 W AC
- 300 W DC

A redundant power supply can be identified and diagnosed by a running system regardless of its input status. AC and DC supplies are interchangeable.

Power Management Modes

The Catalyst 4948-10GE switch supports the redundant power management mode. In this mode, if both power supplies are operating normally, each provides from 20/80 to 45/55 percent of the total system power requirements at all times. If one power supply fails, the other unit increases power to 100 percent of the total power requirement.



Site Planning

This chapter describes how to prepare your site for installation of the Catalyst 4948-10GE switch and contains these sections:

- [Site Environmental Requirements, page 2-1](#)
- [Site Power Requirements, page 2-2](#)
- [Grounding Requirements, page 2-4](#)
- [Safety Overview, page 2-5](#)
- [Site Planning Checklist, page 2-7](#)

For detailed information about cabling requirements, see [Chapter 4, “X2 10-Gigabit Ethernet Module Port Configuration.”](#)



Note

A site planning checklist is provided on page 3-5 to help ensure that you complete all site planning activities before you install the switch.

Site Environmental Requirements

Planning a proper location for the switch and layout for your equipment rack or wiring closet is essential for successful system operation. You should install the switch in an enclosed, secure area, ensuring that only qualified personnel have access to the switch and control of the environment. Equipment that is placed too closely together or that is inadequately ventilated can cause system overtemperature conditions. In addition, poor equipment placement can make chassis panels inaccessible and difficult to maintain.

The switch operates as a standalone system mounted in a rack in a secure wiring closet. It requires a dry, clean, well-ventilated, and air-conditioned environment. To ensure normal operation, maintain ambient airflow. If the airflow is blocked or restricted, or if the intake air is too warm, an overtemperature condition can occur. The switch environmental monitor can then shut down the system to protect the system components.

To ensure normal operation and avoid unnecessary maintenance, plan your site configuration and prepare your site *before* installation. After installation, make sure that the site maintains an ambient temperature of 0 to 40° C (32 to 104° F). It is essential to keep the area around the chassis as free from dust and foreign conductive material (such as metal flakes from nearby construction activity) as is possible.

Multiple switches can be rack-mounted with little or no clearance above and below the chassis. However, when mounting a switch in a rack with other equipment, or when placing it on the floor near other equipment, ensure that the exhaust from other equipment does not blow into the intake vents of the chassis.

Cooling air is drawn in through the front side and exhausted through the rear of the chassis. Keep the front and rear sides clear of obstructions, including dust and foreign conductive material, and away from the exhaust ports of other equipment.

[Appendix A, “Specifications,”](#) lists the operating and nonoperating environmental site requirements for the switches. To maintain normal operation and ensure high system availability, maintain an ambient temperature and EMI-free and continuous power at your site. The environmental ranges listed in Appendix A are those within which the switch will continue to operate; however, a measurement that approaches the minimum or maximum of a range indicates a potential problem. You can maintain normal operation by anticipating and correcting environmental anomalies before they exceed the maximum operating range.

Site Power Requirements

This section describes the installation site power requirements for the Catalyst 4948-10GE switch. Verify your site power before you install the switch.

This section consists of the following sections:

- [Preinstallation Requirements, page 2-3](#)
- [Warnings and Cautions, page 2-3](#)

- [EMI Recommendations, page 2-4](#)
- [Power Requirements and Heat Dissipation, page 2-4](#)

Preinstallation Requirements

Follow these requirements when preparing your site for the Catalyst 4948-10GE switch installation:

- Connect each switch to separate wiring on a dedicated circuit; provide each switch with its own branch circuit connection with sufficient overcurrent protection and direct grounding to the branch circuit.
- To prevent a loss of input power, be sure the total maximum load on each AC circuit is within the current ratings of the wiring and breakers.

Warnings and Cautions

Follow these precautions when preparing your site for the Catalyst 4948-10GE switch installation:



Caution

The total maximum load on each AC or DC -input power circuit must be within the rating of the wiring and breaker. An overload of input power can result if this requirement is not met.



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

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

EMI Recommendations

Follow these guidelines when setting up the site wiring. When planning the location of the new system, consider electromagnetic interface (EMI), the distance limitations for signaling, and connector compatibility.

When wires are run for any significant distance in an electromagnetic field, radio frequency interference (RFI) can occur between the field and the signals on the wires.

- Bad plant wiring can result in radio frequency interference.
- Strong EMI, especially when caused by lightning or radio transmitters, can destroy the signal drivers and receivers in the switch and can create an electrical hazard by conducting power surges through lines and into equipment.

**Note**

To predict and remedy strong EMI, you might need to consult RFI experts.

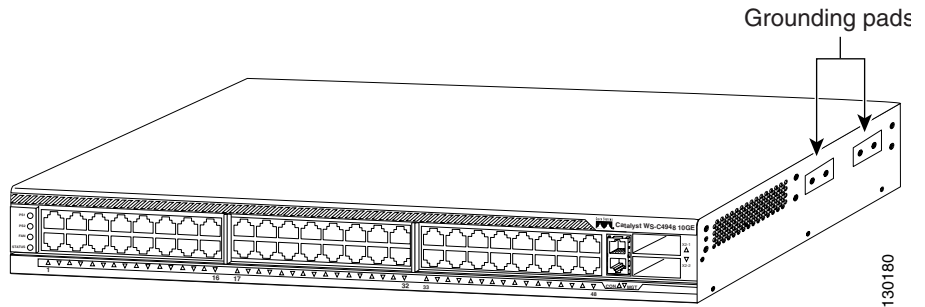
Power Requirements and Heat Dissipation

The power requirements might be useful for planning the power distribution system needed to support the switches. Heat dissipation is an important consideration for sizing the air-conditioning requirements for an installation. Refer to [Appendix A, “Specifications,”](#) for the power and heat ratings for a Catalyst 4948-10GE switch.

Grounding Requirements

Grounding is recommended on all AC or DC installations, using only approved copper connectors. Attach the provided two hole ground lug to the chassis using M4x 8mm bolts and then to the central office (CO) or other interior ground system with number 6 AWG wire. The grounding connectors are on the right side of the chassis, and either one may be used.

Figure 2-1 Grounding Pad Locations



Safety Overview

This section provides safety information that you should read and understand to ensure a safe switch installation.

Ensuring Safety

Follow these guidelines to ensure your safety and protect the equipment. This list is not inclusive of all potentially hazardous situations that you may be exposed to as you install the switch, so be alert.



Warning

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



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



Note

To completely de-energize the system, unplug the power cord.

- Always use caution when lifting heavy equipment. See the [“Lifting the Chassis Safely” section on page 3-4](#) before lifting the Catalyst 4948-10GE switch.
- Always turn all power supplies off by unplugging all power cords before installing or removing a chassis.
- Keep the chassis area clear and free of dust during and after installation.
- Keep tools and chassis components off of the floor and away from foot traffic.
- Avoid wearing jewelry (including rings and chains) or other items that could get caught in the chassis. Avoid wearing any loose clothing, or securely fasten items such as ties, scarves, or sleeves.
- Install the system in compliance with the following local and national electrical codes:
 - United States—National Fire Protection Association (NFPA 70); United States National Electrical Code
 - Canada—Canadian Electrical Code, Part I, CSA C22.1
 - Other countries—International Electrotechnical Commission (IEC) 60364, Part 1 through Part 7

Working Safely with Electricity

Follow these basic guidelines when working with any electrical equipment:

- Locate the emergency power-off switch for the room in which you are working before beginning installation.
- Disconnect all power and external cables before installing or removing a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Examine your work area carefully for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage occurs when electronic cards or components are improperly handled and can result in complete or intermittent failures. Follow these guidelines to prevent ESD damage:

- Always use an ESD-preventive wrist or ankle strap, and ensure that it makes maximum contact with the skin.
- When coming into contact with any internal components, always use a wrist strap connected to one of the following:
 - ESD wrist strap connector
 - Any unpainted grounded surface on the chassis or equipment rack

**Caution**

Periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms (Mohms).

- Handle cards by the edges only.
- Avoid contact between the modules and clothing. The wrist strap protects only the card from ESD voltages on the body; ESD voltages on clothing can still cause damage.

Site Planning Checklist

Table 2-1 lists the site planning activities that you should perform before you install the Catalyst 4948-10GE switch. Completing each activity helps to ensure a successful switch installation.

Table 2-1 Site Planning Checklist

Task No.	Planning Activity	Verified By	Time	Date
1	Space evaluation: Space and layout Floor covering Shock and vibration Lighting Maintenance access			
2	Environmental evaluation: Ambient temperature Humidity Altitude Atmospheric contamination Airflow			
3	Power evaluation: Input power type Receptacle proximity to the equipment Dedicated (separate) circuits for redundant power supplies UPS for power failures			
4	Grounding evaluation: Circuit breaker size			
5	Cable and interface equipment evaluation: Cable type Connector type Cable distance limitations Interface equipment (transceivers)			
6	EMI evaluation: Distance limitations for signaling Site wiring RFI levels			



Installing the Switch

Revised: January 4, 2012

This chapter describes how to install the Catalyst 4948-10GE switch. For first-time installations, perform the procedures in the following sections in the order listed.

- [Checking the Contents, page 3-1](#)
- [Rack-Mounting the Switch, page 3-2](#)
- [Connecting AC Power to the Catalyst 4948-10GE Switch, page 3-9](#)
- [Connecting DC Power to the Catalyst 4948-10GE Switch, page 3-11](#)



Note

Before starting the installation procedures in this chapter, complete the site planning checklist in [Chapter 2, “Site Planning,”](#) to verify that all planning activities were completed.

Checking the Contents



Note

Do not discard the shipping container when you unpack the switch. Flatten the shipping cartons and store them. You will need the container if you need to move or ship the switch in the future.

To check the contents of the shipping container follow these steps:

- Step 1** Check the contents of the accessories kit against the packing slip. Verify that you received all listed equipment, which should include the following:
- Switch hardware and software documentation, if ordered
 - Optional equipment that you ordered, such as network interface cables, transceivers, or special connectors



Note A console cable is not provided in the accessory kit. It can be ordered separately.

- Step 2** To begin installation, proceed to the [“Rack-Mounting the Switch” section on page 3-2](#).

Rack-Mounting the Switch

A standard rack-mount kit is included for mounting the switch in a standard 19-inch (48.3 cm) equipment rack. A standard equipment rack has two unobstructed outer posts, a minimum depth between the front and rear mounting posts of 19.25 inches (48.9 cm), and a maximum depth of 32 inches (81.3 cm). This kit is not suitable for racks with obstructions (such as a power strip) that could impair access to the switch.



Caution

Before installing the chassis in a rack, read the [“Site Environmental Requirements” section on page 2-1](#) to familiarize yourself with the proper site and environmental conditions. Failure to read and follow these guidelines could lead to an unsuccessful installation and possible damage to the system and components.



Caution

This unit is meant to be rack-mounted, and is not intended to bear more than its own weight. Do not stack more than two on a table top, the added weight may damage the bottom chassis.

**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.** Statement 1006

Rack-Mounting Guidelines

Before rack-mounting the switch, ensure the following:

- The equipment rack is the proper size.
 - The width of the rack, between the two front mounting strips or rails, must be 17.75 inches (45.09 cm).
 - The depth of the rack, between the front and rear mounting strips, must be at least 19.25 inches (48.9 cm) but not more than 32 inches (81.3 cm).
 - The rack must have sufficient vertical clearance to insert the chassis. The chassis height is 1.75 inches (4.45 cm).
- The equipment rack is stable and in no danger of falling over.
 - Ensure that the shelf is constructed to support the weight and dimensions of the chassis. For physical specifications, see [Appendix A, “Specifications.”](#)
 - We recommend that you bolt the rack to the floor.
 - Mount the unit at the bottom of the rack if it is the only unit in the rack.
 - Install heavier equipment in the lower half of the rack to maintain a low center of gravity and prevent the rack from becoming top-heavy and tipping over.
 - Install the stabilizers before mounting or servicing the switch in the rack (if the rack is provided with stabilizing devices).

- The equipment rack is properly ventilated.
 - Install the chassis in an enclosed rack only if it has adequate ventilation or an exhaust fan; use an open rack whenever possible.
 - Ensure that the ambient temperature of the rack environment does not exceed a maximum temperature of 104° F (40° C). Note that if the switch is installed in a closed or multiunit rack assembly, the ambient operating temperature of the rack environment might be higher than the ambient room temperature.
 - Note that a ventilation system in a closed rack that is too powerful might also prevent cooling by creating negative pressure around the chassis and redirecting the air away from the chassis intake vent. If necessary, operate the chassis with the rack open.
 - To prevent airflow restriction, allow at least 3 inches (7.6 cm) of clearance around the ventilation openings on the sides of the chassis.
 - Use baffles correctly to assist in cooling the chassis.
 - Note that equipment near the bottom of a rack may generate excessive heat that is drawn upward and into the intake ports of equipment above, leading to overtemperature conditions in the chassis at or near the top of the rack.
 - Consider the equipment and cabling that is already installed in the rack. Ensure that cables from other equipment will not obstruct the airflow through the chassis or impair access to the power supplies or switching modules. Route cables away from field-replaceable components to avoid disconnecting cables unnecessarily for equipment maintenance or upgrades.
 - Allow at least 3 to 4 feet (91.4 to 121.9 cm) of clearance behind the rack for maintenance and removal of switch assemblies. If the rack is mobile, you can push it back within 1 foot (30.45 cm) of a wall or cabinet for normal operation and pull it out when necessary for maintenance.

Lifting the Chassis Safely

The chassis is not intended to be moved frequently. Before you install the switch, ensure that your site is properly prepared so that you can avoid moving the chassis later to accommodate power sources and network connections.

Whenever you lift a chassis or any heavy object, follow these guidelines:

- Ensure that your footing is solid, and balance the weight of the chassis between your feet.
- Lift the chassis slowly; never move suddenly or twist your body as you lift.
- Keep your back straight and lift with your legs, not your back. If you must bend down to lift the chassis, bend at the knees, not at the waist, to reduce the strain on your lower back muscles. (See [Figure 3-1](#).)
- Always disconnect all external cables before lifting or moving the chassis.

Figure 3-1 *Unsafe Lifting Practices*



Required Installation Tools

The following tools and equipment are required to install the chassis:

- Number 1, number 2 Phillips, and 3/16-inch flat-blade screwdriver
- Antistatic mat or antistatic foam
- Your own ESD grounding strap or the disposable ESD strap included with the system

The following tools and equipment are required to install the chassis in a rack:

- Rack-mount kit
- Tape measure and level

Rack-Mounting the Catalyst 4948-10GE Switch

Follow these steps to install the Catalyst 4948-10GE switch in a rack.

Step 1 Prepare for installation:

- Place the chassis on the floor or on a sturdy table as close as possible to the rack. Leave enough clearance to allow you to move around the chassis.
- Use a tape measure to measure the depth of the rack. Measure from the outside of the front mounting posts to the outside of the rear mounting strip. The depth must be at least 19.25 inches (48.9 cm) but not greater than 32 inches (81.3 cm).
- Measure the space between the inner edges of the left front and right front mounting posts to ensure that it is 17.75 inches (45.09 cm) wide. (The chassis is 17.5 inches [44 cm] wide and must fit between the mounting posts.)
- Open the rack-mount kit, and refer to the component checklist to verify that all parts are included.

Table 3-1 Catalyst 4948-10GE Switch: Rack-Mount Kit Checklist

Quantity	Part Description	Received
2	L brackets	
8	M4 Phillips pan-head screws	
4	12-24 x 3/4-inch Phillips binder-head screws	
4	10-32 x 3/4-inch Phillips binder-head screws	



Note Figure 3-2 illustrates how to attach the front of the switch to the rack. You can also attach the rear of the switch to the rack, depending on the configuration of your rack.

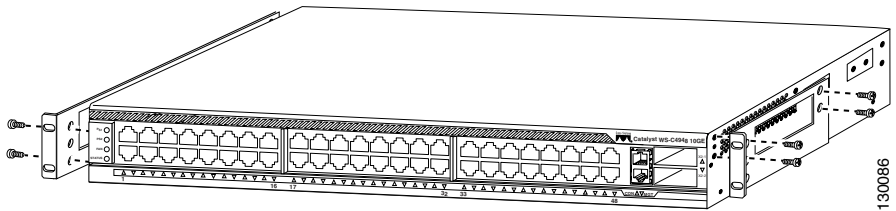
- Step 2** Note that the L brackets connect the chassis to the rack. You can mount the L brackets to the front or rear mounting holes of the chassis, depending on which end is in the front of the rack.



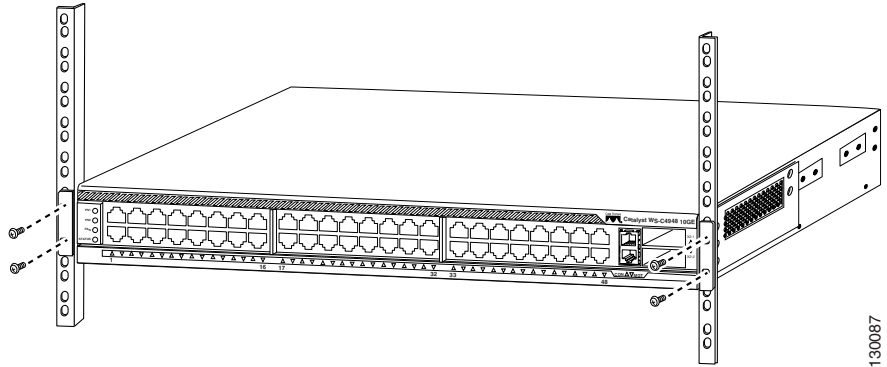
Note Some equipment racks provide a power strip along the length of one of the rear posts. If the rack has this feature, consider the position of the strip when planning fastener points. Before installing the L brackets on the chassis, determine whether to install the chassis from the front or the rear of the rack.

Attach the left and right L brackets using the four M4 Phillips pan-head screws provided in the rack-mount kit. (See [Figure 3-2](#).)

Figure 3-2 Attaching the L Brackets to the Switch

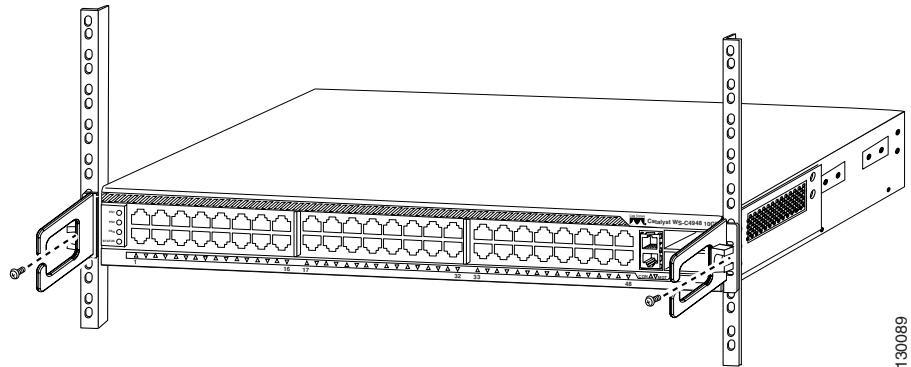


- Step 3** Install the chassis in the rack as:
- Position the chassis in the rack as follows (see [Figure 3-3](#)):
 - If the chassis front panel is in the front of the rack, insert the rear of the chassis between the mounting posts.
 - If the rear of the chassis is in the front of the rack, insert the front of the chassis between the mounting posts.
 - Align the mounting holes in the L bracket with the mounting holes in the equipment rack.
 - Secure the chassis using four (two on each side) 12-24 x 3/4-inch screws through the elongated holes in the L bracket and into the threaded holes in the mounting post.
 - Use a tape measure and level to ensure that the chassis is installed straight and level.

Figure 3-3 Installing the Switch in the Rack

130087

Step 4 Attach the cable guide to the right or left side of the chassis mount.

Figure 3-4 Installing the Cable Guide

130089

Step 5 Do not connect the power cord at this time. Proceed to [“Connecting AC Power to the Catalyst 4948-10GE Switch”](#) section on page 3-9.

Connecting AC Power to the Catalyst 4948-10GE Switch

Follow these steps and warnings when connecting power to the Catalyst 4948-10GE switch:

-
- Step 1** Prior to connecting the power supply to a power source, ensure that all of the site power and grounding requirements described in Chapter 2, “[Site Planning](#),” have been met and the chassis is properly grounded as described in the “[Grounding Requirements](#)” section on page 2-4.

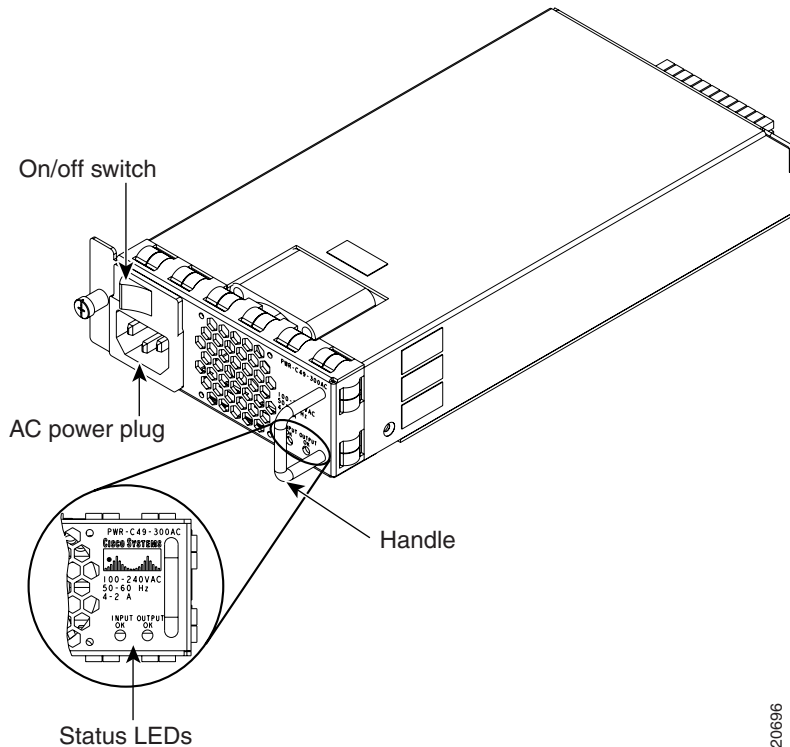


Warning

The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device. Statement 1019

- Step 2** Plug the power cords into the power supplies.

Figure 3-5 AC Power Supply



120696

- Step 3** Connect the other end of the power cords to an AC-power input source. If both power supplies will be used, make sure they are on different circuits.
- Step 4** Turn the power switches to the ON position.
- Step 5** Verify power supply operation by looking at the front panel power supply LEDs:
- The PS1 or PS2 LED is green when the power supply and fans are functioning normally.
 - The PS1 or PS2 LED is red when the power supply is not functioning normally. The on/off switch may be set to off while the power supply is plugged in, or the power supply may be defective and not providing DC power to the switch. There may also be a fan failure.
 - The PS1 or PS2 LED is off when there is no power supply installed.

From the system console, enter the **show power** command to display the power supply and system status. For more information on this command, see the command reference publication for your software release.

If the LEDs or **show power** command indicate a power or other system problem, see [Chapter 5, “Troubleshooting the Installation,”](#) for troubleshooting information.

Connecting DC Power to the Catalyst 4948-10GE Switch

Follow these steps and warnings when connecting DC power to the Catalyst 4948-10GE switch:



Warning

Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003



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

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. Statement 1045

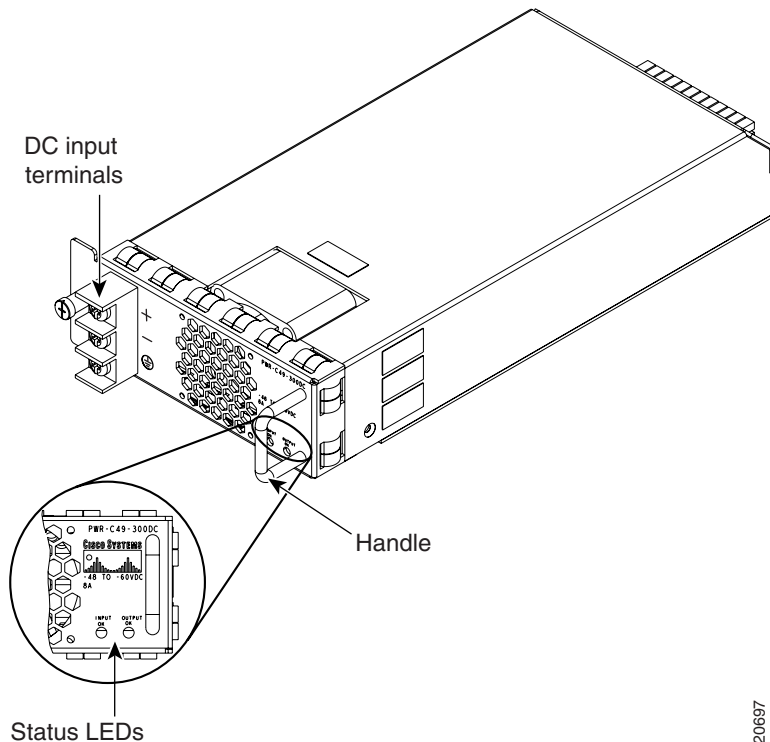


Warning

Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place. Statement 1075

- Step 1** Prior to connecting the power supply to a power source, ensure that all of the site power and grounding requirements described in Chapter 2, “[Site Planning](#),” have been met and the chassis is properly grounded as described in the “[Grounding Requirements](#)” section on page 2-4.
- Step 2** Remove the safety cover from the power terminal.
- Step 3** Connect the power supply ground terminal to earth ground.

Figure 3-6 DC Power Supply



- Step 4** Connect the positive and negative power cables into the power supplies using a number 2 Phillips screwdriver.



Note The DC power cables may use AWG #10 to AWG #12 wire.

1200697

- Step 5** Replace the safety cover over the power terminals.
- Step 6** Connect the other end of the power cables to an DC-power input source. If both power supplies will be used, make sure they are on different circuits.
- Step 7** Turn on the power from the power source. The DC supply does not have an on/off switch.
- Step 8** Verify power supply operation by looking at the front panel power supply LEDs:
- The PS1 or PS2 LED is green when the power supply is functioning normally.
 - The PS1 or PS2 LED is red when the power supply is not functioning normally.
 - The PS1 or PS2 LED is off when the power supply is not connected to a power source.

From the system console, enter the **show power** command to display the power supply and system status. For more information on this command, see the command reference publication for your software release.

If the LEDs or **show power** command indicate a power or other system problem, see [Chapter 5, “Troubleshooting the Installation,”](#) for troubleshooting information.



X2 10-Gigabit Ethernet Module Port Configuration

This chapter contains instructions for installing X2 modules, which are laser optical transceivers used for 10-Gigabit Ethernet connections. It contains these sections:

- [X2 Modules Supported, page 4-2](#)
- [Installing the 10-Gigabit Ethernet X2 Module, page 4-4](#)
- [Removing the 10-Gigabit Ethernet X2 Module, page 4-8](#)
- [Cleaning the Fiber-Optic Connectors, page 4-9](#)

The 10-Gigabit Ethernet ports on these modules are used primarily for backbone interconnection of other high-performance switches and routers. (See [Figure 4-1](#).) These 10-Gigabit Ethernet uplink ports operate in full-duplex mode only, and use the hot-swappable X2 module optical transceivers. X2 modules have SC connectors to connect to multimode fiber (MMF) and single-mode fiber (SMF) cable.

X2 Modules Supported

The Cisco 4948-10GE switch has two ports that can be configured with modules with SC connectors, as shown in [Figure 4-1](#). The following module types are supported:

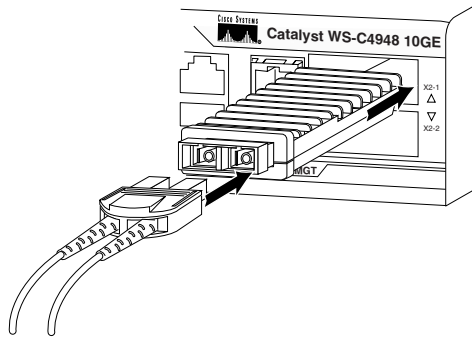
- LR
- Other types are to be announced soon



Caution

Protect your modules by inserting clean dust plugs into them after the cables are extracted from them. Be sure to clean the optic surfaces of the fiber optic cables before you plug them back into the optical bores of another module. Avoid getting dust and other contaminants into the optical bores of your modules: The optics do not work correctly when obstructed with dust.

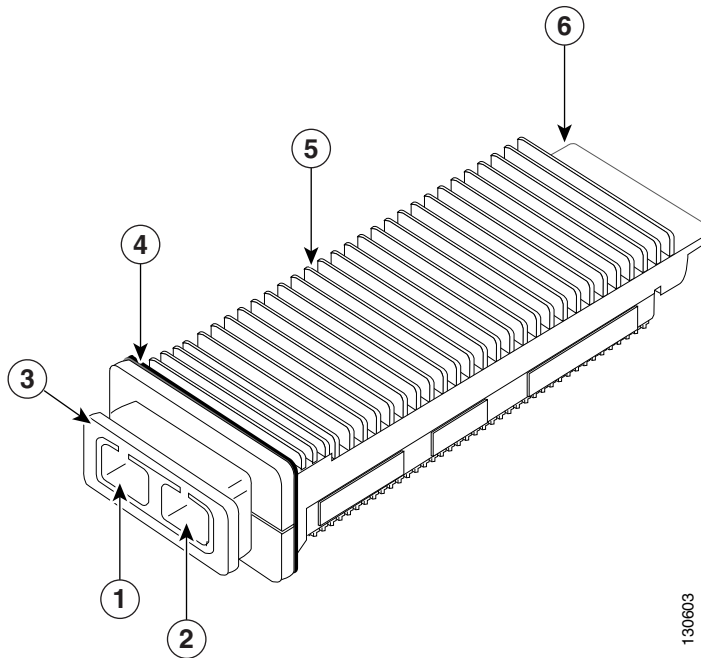
Figure 4-1 Connecting SC Connectors to the Module



X2 Module Handling Guidelines and Installation

An X2 module (see [Figure 4-2](#)) is a hot-swappable input/output device that plugs into the 10 Gigabit Ethernet port of the Catalyst 4948-10GE switch and links the switch with a fiber-optic network.

Figure 4-2 10-Gigabit Ethernet X2 Module



1	Transmit optical bore	4	EMI gasket
2	Receive optical bore	5	Module heat sink
3	Sleeve latching mechanism	6	Module connector

Table 4-1 lists the specifications for the 10-Gigabit Ethernet X2 module.

Table 4-1 Module Specifications

Specification	Description
Wavelength	1310 nm (1260 nm–1355 nm)
Speed	10-Gigabit Ethernet
Cabling distance	Up to 10 km (6.2 miles)
Connector	SC Duplex

Table 4-1 Module Specifications (continued)

Specification	Description
Mean launch power (maximum)	+0.5 dBm
Minimum sensitivity	-14.4 dBm
Dimensions	89.05 mm x 40.05 mm x 19.25 mm (3.5 in x 1.58 in x 0.76 in)

**Warning****Class 1 laser product.** Statement 1008**Warning****Do not stare into the beam or view it directly with optical instruments.** Statement 1011**Warning****Use of controls, adjustments, or performing procedures other than those specified may result in hazardous radiation exposure.** Statement 1057

If a module designed for operation on an SMF cable is directly coupled to an MMF cable, an effect known as Differential Mode Delay (DMD) might occur. See the *Catalyst 4500 Series Module Installation Guide* for more information.

Installing the 10-Gigabit Ethernet X2 Module

**Caution**

The 10-Gigabit Ethernet X2 module is a static-sensitive device. Always use an ESD wrist strap or similar individual grounding device when handling modules or coming into contact with modules.

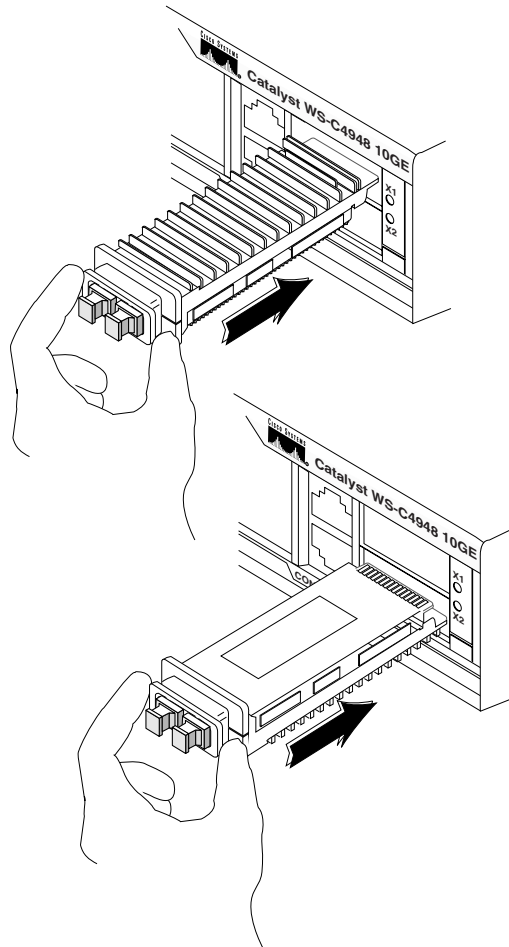
To install a 10-Gigabit Ethernet X2 module, follow these steps:

Step 1

Using a small flat-blade screwdriver, carefully pry the module port cover off of the module faceplate.

Use the two arrows on the port cover as guides for inserting the screwdriver blade. Save the port cover for future use.

- Step 2** Remove the module from its protective packaging.
- Step 3** Check the label on the module to verify that it is the correct model for your network.
- Step 4** Insert the top module with the cooling fins up, and the bottom module with the cooling fins pointing down. Be sure the orientation of the module is correct before inserting it into the switch. (See [Figure 4-3](#).)

Figure 4-3 *Installing the 10-Gigabit Ethernet X2 Module*

130091

- a. Grip the sides of the module sleeve with your thumb and forefinger, and insert the module into the socket on the module front panel. You will hear a click when the module is approximately 90 percent installed.
- b. Continue sliding the module into the socket until you hear a second click. The module connector is now mated to the socket connector.
- c. Verify that the module EMI gasket is in contact with the faceplate.

**Tip**

With some modules you might need to pull out the latching sleeve as you slide the module into the socket. When the EMI gasket makes contact with the module faceplate, slide the latching sleeve in to secure the module in the socket.

**Caution**

If you attempt to insert the bottom X2 module with the cooling fins pointing up, you will probably permanently damage the connector.

**Note**

Before removing the dust plugs and making any optical connections, observe the following guidelines:

- Always keep the protective dust plugs on the unplugged fiber-optic cable connectors and the module optical bores until you are ready to make a connection.
 - Always inspect and clean the SC connector end-faces just before making any connections. Refer to the Tip on this page for a pointer to a fiber-optic inspection and cleaning white paper.
 - Always grasp the SC connector housing to plug or unplug a fiber-optic cable.
-

Step 5 Remove the dust plugs from the network interface cable SC connectors.
Save the dust plugs for future use.

Step 6 Inspect and clean the SC connector's fiber-optic end-faces. Refer to the Tip below for a pointer to a fiber-optic inspection and cleaning white paper.

**Tip**

For complete information on inspecting and cleaning fiber-optic connections, refer to the white-paper document at this URL:

http://www.cisco.com/en/US/tech/tk482/tk607/technologies_white_paper09186a0080254eba.shtml

Step 7 Remove the dust plugs from the module optical bores.

- Step 8** Immediately attach the network interface cable SC connectors to the module.
-

Removing the 10-Gigabit Ethernet X2 Module



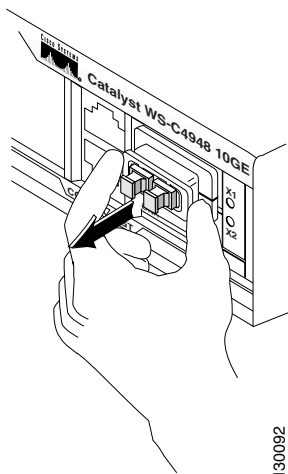
Caution

The 10-Gigabit Ethernet X2 module is a static-sensitive device. Always use an ESD wrist strap or similar individual grounding device when handling modules or coming into contact with modules.

If you are removing a 10-Gigabit Ethernet X2 module, follow these steps:

- Step 1** Disconnect the network fiber-optic cable from the module connectors. Immediately reinstall the dust plugs in the module optical bores and the fiber-optic cable SC connectors.
- Step 2** Grip the sides of the module sleeve with your thumb and forefinger, and pull the sleeve out to release the module from the socket connector. (See [Figure 4-4](#).)

Figure 4-4 Removing the 10-Gigabit Ethernet X2 Module



- Step 3** Slide the 10-Gigabit Ethernet X2 module out of the socket and immediately place it in an antistatic bag.
- Step 4** Reinstall the socket cover if you are not installing an X2 module in the empty socket.
- a. Position the socket cover in front of the socket opening.
 - b. Snap the socket cover in place.
-

Module Maintenance Guidelines

To properly maintain modules, follow these guidelines:

- To prevent ESD damage, follow normal handling procedures.
- When the module is stored or when a fiber-optic cable is not plugged in, always keep plugs in the optical bores.
- The most common source of contaminants in the optical bores is debris picked up on the ferrules of the optical connectors. Use an alcohol swab or Kim-Wipe to clean the ferrules of the optical connector.



Warning

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Statement 1051

Cleaning the Fiber-Optic Connectors

In a fiber-optic system, light is transmitted through an extremely small fiber core, often 62.5 microns or less in diameter. Because dust particles range from a tenth of a micron to several microns in diameter, dust and any contamination at the end of the fiber core can degrade the performance of the connector interface where the two cores meet. Therefore, the connector must be precisely aligned, and the connector interface must be absolutely free of trapped foreign material.

Connector loss, or insertion loss, is a critical performance characteristic of a fiber-optic connector. Return loss is also an important factor. Return loss specifies the amount of reflected light; the lower the reflection, the better the connection. The best physical contact connectors have return losses greater than -40 dB, although -20 to -30 dB is more common.

The connection quality depends on the type of connector and the proper cleaning and connection techniques. Dirty fiber connectors are a common source of light loss. Keep the connectors clean at all times, and keep the dust covers installed when the connectors are not in use.

Before installing any type of cable or connector, use a lint-free alcohol pad from a cleaning kit to clean the ferrule, the protective white tube around the fiber, and the end-face surface of the fiber.

As a general rule, whenever there is a significant, unexplained loss of light, clean the connectors.

**Caution**

Use extreme care when removing or installing connectors so that you do not damage the connector housing or scratch the end-face surface of the fiber. Always install protective covers on unused or disconnected components to prevent contamination. Always clean fiber connectors before installing them.

To clean the optical connectors, use a CLETOP cassette cleaner (type A for SC connectors or type B for MT-RJ connectors) and follow the product directions. If a CLETOP cassette cleaner is not available, follow these steps:

-
- Step 1** Use a lint-free tissue soaked in 99 percent pure isopropyl alcohol to gently wipe the faceplate. Wait five seconds for the surfaces to dry, and repeat.
 - Step 2** Remove any residual dust from the faceplate with clean, dry, oil-free compressed air.

**Warning**

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.
Statement 1051

- Step 3** Use a magnifying glass or inspection microscope to inspect the ferrule at an angle. Do not look directly into the aperture. Repeat the process if any contamination is detected.
-

The connectors used inside the system have been cleaned by the manufacturer and connected to the adapters in the proper manner. The operation of the system should be error free if the customer provides clean connectors on the application side, follows the previous directions, and follows these guidelines:

- Clean the connectors using either a CLETOP cassette cleaner (Type A for SC connectors and Type B for MT-RJ connectors) or lens tissues before connecting to the adapters. Use pure alcohol to remove contamination.
- Do not clean the inside of the connector adapters.
- Do not use force or quick movements when connecting the fiber-optic connectors in the adapters.
- Cover the connectors and adapters to keep the inside of the adapters or the surface of the connectors from getting dirty when you are not using the connectors or while you are cleaning the chassis.

■ **Cleaning the Fiber-Optic Connectors**



Troubleshooting the Installation

This chapter describes how to troubleshoot the Catalyst 4948-10GE switch hardware installation and contains these sections:

- [Getting Started, page 5-2](#)
- [Problem Solving to the System Component Level, page 5-2](#)
- [Identifying Startup Problems, page 5-3](#)
- [Troubleshooting the Power Supply, page 5-5](#)
- [Contacting Customer Service, page 5-6](#)

If your system has problems starting up, use the information in this chapter to help isolate the cause. Problems with the initial startup are often caused by poor or improper connections. Although temperature conditions above the maximum acceptable level rarely occur at initial startup, environmental monitoring functions are included because they also monitor DC-line voltages.



Note

For configuration questions or problems, refer to the software configuration guide or the command reference publication to configure or enable the interfaces.

Getting Started

When the initial system boot is complete, verify the following:

- Power supplies are supplying power to the system.
- The system fan assembly is operating.
- System software boots successfully.

If all of these conditions are met and the hardware installation is complete, refer to the Software Configuration Guide and the Command Reference publications to troubleshoot the software. However, if any of these conditions are not met, use the procedures in this chapter to isolate and, if possible, resolve the problem.

Problem Solving to the System Component Level

The key to success when troubleshooting the system is to isolate the problem to a specific system component. The first step is to compare what the system *is doing* to what it *should be doing*. Because a startup problem can usually be attributed to a single component, it is more efficient to isolate the problem to a subsystem rather than troubleshoot each separate component in the system.

The switch consists of the following subsystems:

- Power supply—Includes the power supply and power supply cooling. (See the [“Troubleshooting the Power Supply”](#) section on page 5-5.)
- Fan assembly system—The chassis fan assembly should operate whenever system power is on. Usually, it continues to operate even when the environmental monitor shuts down the system because of an overtemperature or overvoltage condition. (It will shut down for a power supply shutdown.) You should be able to hear the fan assembly to determine whether or not it is operating. If the FAN LED is orange and you determine that the fan assembly is not operating, you should immediately contact a customer service representative. There are no installation adjustments that you can make if the fan assembly does not function properly at the initial startup.

Identifying Startup Problems

When you connect the power cords to the Catalyst 4948-10GE switch, follow these steps:

-
- Step 1** Flip the power switches to the on position (AC powered systems only).
 - Step 2** Verify that power is available to the power supplied from the site AC or DC source. Flip breakers and fuses if necessary.
 - Step 3** Listen for the system fan assembly. If you do not immediately hear the system fan assembly begin to operate, see [“Troubleshooting the Power Supply” section on page 5-5](#).
 - Step 4** If you determine that the power supplies are functioning normally and that the fan assembly is faulty, contact a customer service representative. If the system fan assembly does not function properly at initial startup, there are no installation adjustments that you can make.
-

LED Readings

LEDs indicate all system states in the startup sequence. By checking the LEDs, you can determine when and where the system failed in the startup sequence. To check the LEDs, follow these steps:

-
- Step 1** Compare the LED states to [Table 5-1](#):

Table 5-1 Power Supply LED Meanings

LED and Color	Meaning
INPUT OK (AC)	This LED should turn green immediately when power is applied to the supply and the power switch is set to ON.
Green	AC input voltage is greater than 82 +/-3V.
Red	In a dual power supply configuration (alternate unit powered) the AC input is less than 73 +/-3V, or the power supply is turned off.
Off	AC input voltage is less than 73 +/-3V, or the power supply is turned off.
INPUT OK (DC)	This LED should turn green immediately when power is applied to the supply.
Green	DC input voltage is greater than -38.25 +/-2.25V.
Red	In a dual power supply configuration (alternate unit powered) the DC input is less than 33 +/-3V, or the power supply is turned off.
Off	In a single supply configuration, the LED shall be off to signal that DC input is less than 33 +/-3V, or the power supply is turned off.
OUTPUT OK	
Green	DC output voltages are within the normal operating range.
Red	Output voltage between the minimum and maximum limits will not create an output fail alarm. Output voltages below the minimum or above the maximum will create an output fail alarm and cause the LED to illuminate red.

Step 2 Verify that the LEDs on the front panel are lit:

- The STATUS LED flashes yellow during diagnostic boot tests. It is green when the switch is operational (online). If the system software is unable to start up, this LED stays orange.

- The port LEDs (1-48) are green when the module is operational (online). If no signal is detected, the LINK LED is off. The port LED remains yellow if the port is disabled. The port LED flashes yellow if the port tested faulty at startup.
- Step 3** If a STATUS LED is red, contact a customer service representative for instructions.
- Step 4** If the boot information and system banner are not displayed, verify that the terminal is set correctly and that it is connected properly to the console port.
-

Troubleshooting the Power Supply

Follow these steps to help isolate a power subsystem problem:

- Step 1** Verify that the power supply is plugged in and that the on/off switch is set to ON (if the power supply is an AC supply).
- Step 2** Look at the power supply LED (PS1 or PS2). If the LED is off or if the LED is red, unplug the power cord, and then plug the power cord in. Be sure the on/off switch is OFF before removing the power cord from the power supply.
- Step 3** If the LED remains off, there might be a problem with the AC or DC source or the power cable.
- Step 4** Connect the power cord to another power source if one is available.
- Step 5** If the LED then lights, the problem is the first power source.
- Step 6** If the LED fails to light after you connect the power supply to a new power source, replace the power cord.
- Step 7** If the LED still fails to light when the switch is connected to a different power source with a new power cord, the power supply is probably faulty.
- If you are unable to resolve the problem, contact a customer service representative for instructions.
-

Contacting Customer Service

If you are unable to solve a startup problem after using the troubleshooting suggestions in this chapter, contact a customer service representative for assistance and further instructions. Before you call, have the following information ready to help your service provider assist you as quickly as possible:

- Date you received the switch
- Chassis serial number (located on a label on the right of the rear of the chassis, see [Figure 5-1](#))
- Type of software and release number
- Maintenance agreement or warranty information
- Brief description of the problem
- Brief explanation of the steps you have already taken to isolate and resolve the problem

Figure 5-1 *Serial Number Location*





Specifications

Revised: January 4, 2012

This appendix provides cable and technical specifications for the Catalyst 4948-10GE switch.

Console Port

The console port is an RJ-45 receptacle. The Request to Send (RTS) signal tracks the state of the Clear to Send (CTS) input. [Table A-1](#) lists the console port pinouts.

Table A-1 Console Port Pinouts

Pin	Signal	Direction	Description
1	RTS	output	request to send
2	DTR	output	data terminal ready
3	TXD	output	transmit data
4	GND	—	—
5	GND	—	—
6	RXD	input	receive data
7	DSR	input	data set ready
8	CTS	input	clear to send

**Note**

A console cable is not provided in the accessory kit. It can be ordered as an option.

10/100BASE-T Management Port

The 10/100BASE-T management port is an RJ-45 receptacle with a Link Status LED. [Table A-2](#) lists the 10/100BASE-T port pinouts.

Table A-2 10/100BASE-T Port Pinouts

Pin	Signal	Direction	Description
1	RXDP	input	receive data
2	RXDN	input	receive data
3	TXDP	output	transmit data
4	unused	—	—
5	unused	—	—
6	TXDN	output	transmit data
7	unused	—	—
8	unused	—	—

Catalyst 4948-10GE Switch Specifications

Catalyst 4948-10GE switch specifications are provided in [Table A-3](#).

Table A-3 Catalyst 4948-10GE Switch Specifications

Item	Specification
Environmental	
Temperature ambient operating	32°F (0°C) to 104°F (40°C)
Temperature ambient nonoperating and storage	−40 to 167°F (−40 to 75°C)

Table A-3 Catalyst 4948-10GE Switch Specifications (continued)

Item	Specification
Humidity (RH), ambient (noncondensing) operating	10% to 90%
Humidity (RH), ambient (noncondensing) nonoperating and storage	5% to 95%
Altitude operating and nonoperating	-60 to 2000 m
Switch heat dissipation	1023 BTU/hour
Switching Components	
Memory	256-MB SDRAM, 64-MB Flash (onboard and fixed), 512-KB NVRAM, 256 bytes serial EEROM
Physical Characteristics	
Dimensions (H x W x D)	1.75 x 17.5 x 16 in. (4.5 x 44.5 x 40.6 cm)
Weight	17 lb (7.8 kg) for a system with two power supplies
Airflow	Sides in, rear out
AC Power	
Power supply output	300 W
System power dissipation	150 W
AC-input	4 A maximum @ 100 VAC 2 A maximum @ 240 VAC
AC frequency	50 to 60 Hz
Output current	25A max
Output voltage	12V
Input KVA rating	0.375 KVA
DC Power	
Power supply output	300 W
System power dissipation	150 W
DC-input	8A @ -48 to -60 VDC
Output current	25A max

Table A-3 Catalyst 4948-10GE Switch Specifications (continued)

Item	Specification
Output voltage	12V
Input KVA rating	0.4 KVA



Translated Safety Warnings

This appendix repeats in multiple languages the warnings in this guide. These translated warnings can be used with other documents related to this guide.

Statement 1003—DC Power Disconnection



Warning

Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003

Waarschuwing

Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom naar het gelijkstroom circuit uitgeschakeld is.

Varoitus

Varmista, että tasavirtapiirissä ei ole virtaa ennen seuraavien toimenpiteiden suorittamista.

Attention

Avant de pratiquer l'une quelconque des procédures ci-dessous, vérifier que le circuit en courant continu n'est plus sous tension.

Warnung

Vor Ausführung der folgenden Vorgänge ist sicherzustellen, daß die Gleichstromschaltung keinen Strom erhält.

Avvertenza

Prima di svolgere una qualsiasi delle procedure seguenti, verificare che il circuito CC non sia alimentato.

Advarsel	Før noen av disse prosedyrene utføres, kontroller at strømmen er frakoblet likestrømkretsen.
Aviso	Antes de executar um dos seguintes procedimentos, certifique-se que desligou a fonte de alimentação de energia do circuito de corrente contínua.
¡Advertencia!	Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) esté cortada (OFF).
Varning!	Innan du utför någon av följande procedurer måste du kontrollera att strömförsörjningen till likströmskretsen är bruten.
Aviso	Antes de executar qualquer um dos procedimentos a seguir, verifique se a energia foi removida do circuito DC.
Advarsel	Før du udfører nogen af følgende procedurer, skal du sikre dig, at der ikke er strøm til jævnstrømskredsløbet.
	Mielőtt a következő eljárások bármelyikét végrehajtaná, feltétlenül szakítsa meg az egyenáramú áramkör tápellátását.
Предупреждение	Перед выполнением любых описанных ниже действий убедитесь, что цепь питания постоянным током отключена.
警告	在进行下述任一操作过程之前，要确保将电源从直流电路上断开。
警告	次の手順を開始する前に、DC回路から電源が切断されていることを確認してください。
주의	다음 작업을 진행하기 전에, 직류 회로에서 전원이 차단되었는지 확인하십시오.
تحذير	قبل القيام بأي من الإجراءات التالية، تأكد من فصل التيار من دائرة التيار المباشر.

Statement 1004—Installation Instructions



Warning

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

Waarschuwing

Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.

Varoitus

Lue asennusohjeet ennen järjestelmän yhdistämistä virtalähteeseen.

Attention

Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

Warnung

Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

Avvertenza

Consultare le istruzioni di installazione prima di collegare il sistema all'alimentatore.

Advarsel

Les installasjonsinstruksjonene før systemet kobles til strømkilden.

Aviso

Leia as instruções de instalação antes de ligar o sistema à fonte de energia.

¡Advertencia!

Lea las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Varning!

Läs installationsanvisningarna innan du kopplar systemet till strömförsörjningsenheten.

Mielőtt áramforráshoz csatlakoztatná a rendszert, olvassa el az üzembe helyezési útmutatót!

Предупреждение

Перед подключением устройства к источнику электропитания ознакомьтесь с данной инструкцией по установке.

警告 在将系统与电源连接之前，请仔细阅读安装说明。

警告 必ず設置手順を読んでから、システムを電源に接続してください。

Upozorenje Prije obavljanja nekog od sljedećih postupaka, provjerite da u krugovima s istosmjernom strujom nema napajanja.

Upozornění Před provedením kterékoliv z následujících operací odpojte napájení od stejnosměrného obvodu.

Προειδοποίηση Πριν να ακολουθήσετε οποιαδήποτε από τις παρακάτω διαδικασίες, βεβαιωθείτε ότι έχει διακοπεί η τροφοδοσία από το κύκλωμα συνεχούς ρεύματος.

אזהרה לפני ביצוע אחד מהנהלים הבאים, ודא שאפסקת החשמל למעגל הזרם הישר (DC) מנותקת.

Opomena Пред вршење на која и да е од следните постапки, погрижете се да нема напојување на струјните кола со едновременна струја.

Ostrzeżenie Przed przystąpieniem do wykonywania poniższych procedur należy upewnić się, że odłączono zasilanie od obwodu prądu stałego.

Upozornenie Pred vykonaním ktorejkoľvek z nasledujúcich operácií odpojte napájanie od jednosmerného obvodu.

Statement 1006—Chassis Warning for Rack-Mounting and Servicing



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. Statement 1006

Waarschuwing

Om lichamelijk letsel te voorkomen wanneer u dit toestel in een rek monteert of het daar een servicebeurt geeft, moet u speciale voorzorgsmaatregelen nemen om ervoor te zorgen dat het toestel stabiel blijft. De onderstaande richtlijnen worden verstrekt om uw veiligheid te verzekeren:

- Dit toestel dient onderaan in het rek gemonteerd te worden als het toestel het enige in het rek is.
- Wanneer u dit toestel in een gedeeltelijk gevuld rek monteert, dient u het rek van onderen naar boven te laden met het zwaarste onderdeel onderaan in het rek.
- Als het rek voorzien is van stabiliseringshulpmiddelen, dient u de stabilisatoren te monteren voordat u het toestel in het rek monteert of het daar een servicebeurt geeft.

Varoitus

Kun laite asetetaan telineeseen tai huolletaan sen ollessa telineessä, on noudatettava erityisiä varotoimia järjestelmän vakavuuden säilyttämiseksi, jotta vältytään loukkaantumiselta. Noudata seuraavia turvallisuusohjeita:

- Jos telineessä ei ole muita laitteita, aseta laite telineen alaosaan.
- Jos laite asetetaan osaksi täytettyyn telineeseen, aloita kuormittaminen sen alaosaan kaikkein raskaimmalla esineellä ja siirry sitten sen yläosaan.
- Jos telinettä varten on vakaimet, asenna ne ennen laitteen asettamista telineeseen tai sen huoltamista siinä.

- Attention** Pour éviter toute blessure corporelle pendant les opérations de montage ou de réparation de cette unité en casier, il convient de prendre des précautions spéciales afin de maintenir la stabilité du système. Les directives ci-dessous sont destinées à assurer la protection du personnel:
- Si cette unité constitue la seule unité montée en casier, elle doit être placée dans le bas.
 - Si cette unité est montée dans un casier partiellement rempli, charger le casier de bas en haut en plaçant l'élément le plus lourd dans le bas.
 - Si le casier est équipé de dispositifs stabilisateurs, installer les stabilisateurs avant de monter ou de réparer l'unité en casier.
- Warnung** Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt. Die folgenden Richtlinien sollen zur Gewährleistung Ihrer Sicherheit dienen:
- Wenn diese Einheit die einzige im Gestell ist, sollte sie unten im Gestell angebracht werden.
 - Bei Anbringung dieser Einheit in einem zum Teil gefüllten Gestell ist das Gestell von unten nach oben zu laden, wobei das schwerste Bauteil unten im Gestell anzubringen ist.
 - Wird das Gestell mit Stabilisierungszubehör geliefert, sind zuerst die Stabilisatoren zu installieren, bevor Sie die Einheit im Gestell anbringen oder sie warten.
- Avvertenza** Per evitare infortuni fisici durante il montaggio o la manutenzione di questa unità in un supporto, occorre osservare speciali precauzioni per garantire che il sistema rimanga stabile. Le seguenti direttive vengono fornite per garantire la sicurezza personale:
- Questa unità deve venire montata sul fondo del supporto, se si tratta dell'unica unità da montare nel supporto.
 - Quando questa unità viene montata in un supporto parzialmente pieno, caricare il supporto dal basso all'alto, con il componente più pesante sistemato sul fondo del supporto.
 - Se il supporto è dotato di dispositivi stabilizzanti, installare tali dispositivi prima di montare o di procedere alla manutenzione dell'unità nel supporto.

- Advarsel** **Unngå fysiske skader under montering eller reparasjonsarbeid på denne enheten når den befinner seg i et kabinett. Vær nøye med at systemet er stabilt. Følgende retningslinjer er gitt for å verne om sikkerheten:**
- Denne enheten bør monteres nederst i kabinettet hvis dette er den eneste enheten i kabinettet.
 - Ved montering av denne enheten i et kabinett som er delvis fylt, skal kabinettet lastes fra bunnen og opp med den tyngste komponenten nederst i kabinettet.
 - Hvis kabinettet er utstyrt med stabiliseringsutstyr, skal stabilisatorene installeres før montering eller utføring av reparasjonsarbeid på enheten i kabinettet.
- Aviso** **Para se prevenir contra danos corporais ao montar ou reparar esta unidade numa estante, deverá tomar precauções especiais para se certificar de que o sistema possui um suporte estável. As seguintes directrizes ajudá-lo-ão a efectuar o seu trabalho com segurança:**
- Esta unidade deverá ser montada na parte inferior da estante, caso seja esta a única unidade a ser montada.
 - Ao montar esta unidade numa estante parcialmente ocupada, coloque os itens mais pesados na parte inferior da estante, arrumando-os de baixo para cima.
 - Se a estante possuir um dispositivo de estabilização, instale-o antes de montar ou reparar a unidade.
- ¡Advertencia!** **Para evitar lesiones durante el montaje de este equipo sobre un bastidor, o posteriormente durante su mantenimiento, se debe poner mucho cuidado en que el sistema quede bien estable. Para garantizar su seguridad, proceda según las siguientes instrucciones:**
- Colocar el equipo en la parte inferior del bastidor, cuando sea la única unidad en el mismo.
 - Cuando este equipo se vaya a instalar en un bastidor parcialmente ocupado, comenzar la instalación desde la parte inferior hacia la superior colocando el equipo más pesado en la parte inferior.
 - Si el bastidor dispone de dispositivos estabilizadores, instalar éstos antes de montar o proceder al mantenimiento del equipo instalado en el bastidor.

- Varning!** För att undvika kroppsskada när du installerar eller utför underhållsarbete på denna enhet på en ställning måste du vidta särskilda försiktighetsåtgärder för att försäkra dig om att systemet står stadigt. Följande riktlinjer ges för att trygga din säkerhet:
- Om denna enhet är den enda enheten på ställningen skall den installeras längst ned på ställningen.
 - Om denna enhet installeras på en delvis fylld ställning skall ställningen fyllas nedifrån och upp, med de tyngsta enheterna längst ned på ställningen.
 - Om ställningen är försedd med stabiliseringsdon skall dessa monteras fast innan enheten installeras eller underhålls på ställningen.
- Aviso** Para evitar lesões corporais ao montar ou dar manutenção a esta unidade em um rack, é necessário tomar todas as precauções para garantir a estabilidade do sistema. As seguintes orientações são fornecidas para garantir a sua segurança:
- Se esta for a única unidade, ela deverá ser montada na parte inferior do rack.
 - Ao montar esta unidade em um rack parcialmente preenchido, carregue-o de baixo para cima com o componente mais pesado em sua parte inferior.
 - Se o rack contiver dispositivos estabilizadores, instale-os antes de montar ou dar manutenção à unidade existente.
- Advarsel** For at forhindre legemesbeskadigelse ved montering eller service af denne enhed i et rack, skal du sikre at systemet står stabilt. Følgende retningslinjer er også for din sikkerheds skyld:
- Enheden skal monteres i bunden af dit rack, hvis det er den eneste enhed i racket.
 - Ved montering af denne enhed i et delvist fyldt rack, skal enhederne installeres fra bunden og opad med den tungeste enhed nederst.
 - Hvis racket leveres med stabiliseringsenheder, skal disse installeres for enheden monteres eller serviceres i racket.

A készülék rackbe történő beszerelése és karbantartása során bekövetkező sérülések elkerülése végett speciális óvintézkedésekkel meg kell őrizni a rendszer stabilitását. A személyes biztonsága érdekében tartsa be a következő szabályokat:

- **Ha a rackben csak ez az egy készülék található, a rack aljába kell beszerelni.**
- **Ha nincs teljesen tele az a rack, amelybe beszerelik a készüléket, alulról fölfelé haladva töltsse fel a racket úgy, hogy a legnehezebb készülék kerüljön a rack aljába.**
- **Ha stabilizáló eszközök is tartoznak a rackhez, szerelje fel a stabilizátorokat, mielőtt beszerelné az egységet a rackbe, vagy karbantartást végezne rajta.**

Предупреждение

Во избежание травм при монтаже и обслуживании устройства в стойке следует принять особые меры предосторожности, чтобы убедиться в устойчивости оборудования. Для обеспечения безопасности работ необходимо соблюдать следующие правила.

- Если в стойке находится одно устройство, оно должно быть установлено в нижней части.
- При монтаже устройств в частично заполненную стойку устанавливайте оборудование снизу вверх, размещая наиболее тяжелые устройства в нижней части.
- Если стойка снабжена приспособлениями для стабилизации, их необходимо установить до начала монтажа или обслуживания оборудования.

警告

为避免在机架中安装或维修该部件时使身体受伤，您必须采取特殊的预防措施确保系统固定。以下是确保安全的原则：

- 如果此部件是机架中唯一的部件，应将其安装在机架的底部。
- 如果在部分装满的机架中安装此部件，请按从下往上的顺序安装各个部件，并且最重的组件应安装在机架的底部。
- 如果机架配有固定装置，请先装好固定装置，然后再在机架中安装或维修部件。

警告 この装置をラックに設置したり保守作業を行ったりするときは、人身事故を防ぐため、システムが安定しているかどうかを十分に確認する必要があります。次の注意事項に従ってください。

- ラックにこの装置を単独で設置する場合は、ラックの一番下に設置します。
- ラックに別の装置がすでに設置されている場合は、最も重量のある装置を一番下にして、重い順に下から上へ設置します。
- ラックに安定器具が付属している場合は、その安定器具を取り付けてから、装置をラックに設置するか、またはラック内の装置の保守作業を行ってください。

주의 이 장치를 랙에 장착하거나 서비스할 때 신체 부상을 방지하려면, 시스템이 안정된 상태를 유지하도록 특별히 주의해야 합니다. 사용자의 안전을 위해 다음 지침 사항을 준수하십시오.

- 이 장치가 랙에 장착되는 유일한 것일 경우, 랙의 맨 아래 부분에 장착되어야 합니다.
- 부분적으로 차 있는 랙에 이 장치를 장착할 경우, 가장 무거운 장치를 랙의 맨 아래 부분부터 차례로 장착하십시오.
- 안정기가 랙과 함께 제공되는 경우, 이 안정기를 설치한 후 이 장치를 랙에 장착하거나 서비스하십시오

تحذير لتجنب حدوث أي إصابات عند تركيب هذه الوحدة، يجب اتباع بعض الاحتياطات لضمان عمل النظام بشكل سليم. يتم ذكر الإرشادات التالية لضمان الأمان.

يجب تركيب هذه الوحدة في الجزء السفلي من الدولاب المتضمن قضبان إذا كانت هذه الوحدة هي الوحدة الوحيدة في الدولاب الذي يحتوي على قضبان.

عند تركيب هذه الوحدة في دولاب شبه ممتلئ، قم برفع الدولاب من الجزء السفلي لأعلى بحيث يكون الجزء الأثقل وزناً أسفل الدولاب.

إذا كان الدولاب المتضمن قضباناً يحتوي على أجهزة حفظ التوازن، قم بتثبيت هذه الأجهزة قبل تركيب الوحدة في الدولاب.

- Upozorenje** Kako ne bi došlo do tjelesnih ozljeda kod postavljanja ili servisiranja uređaja na polici, potrebno je poduzeti mjere predostrožnosti kako bi sustav uvijek bio stabilan. Sigurnost se može osigurati poštivanjem sljedećih smjernica:
- Ovaj uređaj treba ugraditi na dno police, ukoliko je to jedini uređaj na polici.
 - Kod ugradnje uređaja u policu na kojoj se već nalaze drugi uređaji, policu treba opremiti počevši od dna, te tako da se na dno stave najteži dijelovi.
 - Ukoliko su na polici ugrađeni stabilizatori, njih montirajte prije ugradnje ili servisiranja uređaja na polici.
- Upozornění** Abyste předešli poranění osob při montáži nebo opravě zařízení v montážním rámu, musíte dodržovat zvláštní preventivní opatření pro zajištění udržení stability systému. Pro zajištění bezpečnosti obsluhy jsou určeny následující zásady:
- Pokud je toto zařízení jedinou jednotkou v montážním rámu, musí být namontováno na nejnižší místo rámu.
 - Pokud je toto zařízení montováno do částečně obsazeného montážního rámu, obsazujte montážní rám ve směru zdola nahoru tak, aby byla nejtěžší součást nejnižší.
 - Pokud je montážní rám vybaven stabilizačními zařízeními, nainstalujte stabilizátory ještě před montáží nebo opravou zařízení v montážním rámu.
- Προειδοποίηση** Για να αποφύγετε τον τραυματισμό κατά την τοποθέτηση ή τη συντήρηση αυτής της συσκευής σε αρθρωτό σύστημα, πρέπει να λάβετε ειδικές προφυλάξεις για να διασφαλίσετε τη σταθερότητα του συστήματος. Οι παρακάτω οδηγίες παρέχονται για να εξασφαλίσουν την ασφάλειά σας:
- Αυτή η συσκευή πρέπει να τοποθετείται στο κάτω μέρος του αρθρωτού συστήματος αν είναι η μοναδική συσκευή σε αυτό.
 - Όταν τοποθετείτε αυτήν τη συσκευή σε εν μέρει γεμάτο αρθρωτό σύστημα, τοποθετήστε συσκευές στο αρθρωτό σύστημα από κάτω προς τα επάνω, με τη βαρύτερη συσκευή στο κάτω μέρος του συστήματος.
 - Εάν το αρθρωτό σύστημα διαθέτει διατάξεις σταθεροποίησης, τοποθετήστε τους σταθεροποιητές πριν τοποθετήσετε ή συντηρήσετε τη συσκευή στο αρθρωτό σύστημα.

אזהרה

כדי למנוע פציעה בעת הרכבת יחידה זו במעמד או טיפול בה, עליך לנקוט אמצעי זהירות מיוחדים כדי להבטיח את יציבות המערכת. הקווים המנחים הבאים ניתנים על מנת להבטיח את ביטחונך:

- אם יחידה זו היא יחידה בודדת במעמד, יש להרכיב את היחידה בחלקו התחתון של המעמד.
- בעת הרכבת יחידה זו במעמד המלא בחלקו, טען את המעמד החל בחלק התחתון וכלפי מעלה כאשר הרכיב הכבד ביותר נמצא בחלקו התחתון של המעמד.
- אם המעמד מסופק עם התקני ייצוב, התקן את המייצבים לפני הרכבה היחידה במעמד או טיפול בה.

Opomena

За да се не повредите кога го монтирате или го сервисирате уредот на полица, мора да бидете особено претпазливи за да ја обезбедите стабилноста на системот. Следите напатствија се дадени за да ја осигураат Вашата безбедност:

- Уредот треба да се монтира најдолу на полицата ако е единствен уред на полицата.
- Кога го монтирате уредот на делумно пополнета полица, полнете ја полицата од дното кон врвот со најтешката компонента на дното на полицата.
- Ако полицата има стабилизаторски делови, наместете ги стабилизаторите пред да го монтирате или сервисирате уредот на полицата.

- Ostrzeżenie** Aby zapobiec urazom podczas montażu lub serwisowania tego urządzenia w stojaku, należy zastosować szczególne środki ostrożności w celu zapewnienia stabilności układu. Poniżej przedstawiono wskazówki, których przestrzeganie zapewni bezpieczeństwo:
- Jeśli urządzenie to jest jedynym urządzeniem w stojaku, powinno być zamontowane na dole.
 - W przypadku montażu urządzenia w częściowo zapełnionym stojaku należy instalować kolejne urządzenia od najniższego do najwyższego, przy czym element najcięższy powinien być zamontowany najniżej w stojaku.
 - Jeśli stojak jest wyposażony w elementy stabilizujące, należy zamontować stabilizatory przed przystąpieniem do montażu lub serwisowania urządzeń w stojaku.
- Upozornenie** Aby ste predišli poraneniu osôb pri montáži alebo oprave zariadenia v montážnom ráme, musíte dodržiavať zvláštne preventívne opatrenia na zaistenie udržania stability systému. Na zaistenie bezpečnosti obsluhy sú určené nasledujúce zásady:
- Pokiaľ je toto zariadenie jedinou jednotkou v montážnom ráme, musí byť namontované na najnižšie miesto v ráme.
 - Pokiaľ je toto zariadenie montované do čiastočne obsadeného montážneho rámu, obsadzujte montážny rám v smere zdola nahor tak, aby bola najťažšia súčasť najnižšie.
 - Pokiaľ je montážny rám vybavený stabilizačnými zariadeniami, nainštalujte stabilizátory ešte pred montážou alebo opravou zariadenia v montážnom ráme.

Statement 1008—Class 1 Laser Product



Warning

Class 1 laser product. Statement 1008

Waarschuwing

Klasse-1 laser produkt.

Varoitus Luokan 1 lasertuote.

Attention Produit laser de classe 1.

Warnung Laserprodukt der Klasse 1.

Avvertenza Prodotto laser di Classe 1.

Advarsel Laserprodukt av klasse 1.

Aviso Produto laser de classe 1.

¡Advertencia! Producto láser Clase I.

Varning! Laserprodukt av klass 1.

Aviso Produto a laser de classe 1.

Advarsel Klasse 1 laserprodukt.

Class 1 besorolású lézeres termék.

Предупреждение Лазерное устройство класса 1.

警告 这是 1 类激光产品。

警告 クラス1レーザー製品です。

주의 클래스 1 레이저 제품.

تخدير Class 1 Laser \ منتج

Upozorenje Laserski proizvod klase 1

Upozornění Laserový výrobek třídy 1.

Προειδοποίηση Προϊόν λέιζερ κατηγορίας 1.

אזהרה מוצר לייזר Class 1.

Opomena Ласерски производ од класа 1.

Ostrzeżenie Produkt laserowy klasy 1.

Upozornenie Laserový výrobok triedy 1.

Statement 1011—Staring into Laser Beam



Warning

Do not stare into the beam or view it directly with optical instruments.
Statement 1011

Waarschuwing

Niet in de straal staren of hem rechtstreeks bekijken met optische instrumenten.

Varoitus

Älä katso säteeseen äläkä tarkastele sitä suoraan optisen laitteen avulla.

Attention

Ne pas fixer le faisceau des yeux, ni l'observer directement à l'aide d'instruments optiques.

Warnung

Nicht direkt in den Strahl blicken und ihn nicht direkt mit optischen Geräten prüfen.

Avvertenza **Non fissare il raggio con gli occhi né usare strumenti ottici per osservarlo direttamente.**

Advarsel **Stirr eller se ikke direkte på strålen med optiske instrumenter.**

Aviso **Não olhe fixamente para o raio, nem olhe para ele directamente com instrumentos ópticos.**

¡Advertencia! **No mirar fijamente el haz ni observarlo directamente con instrumentos ópticos.**

Varning! **Rikta inte blicken in mot strålen och titta inte direkt på den genom optiska instrument.**

Ne nézzen bele a sugárba, és ne nézze közvetlenül optikai berendezések segítségével!

Предупреждение Не допускайте попадания лазерного луча в глаза и не смотрите на него через оптические приборы.

警告 请勿直视光束或直接用光学仪器观看光束。

警告 光線をのぞきこんだり、光学機器を使用して光線を直接見たりしないでください。

Statement 1017—Restricted Area



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

Waarschuwing

Deze eenheid is bestemd voor installatie in plaatsen met beperkte toegang. Toegang tot een dergelijke plaats kan alleen verkregen worden door middel van een speciaal instrument, een slot en sleutel of een ander veiligheidsmiddel.

Varoitus

Tämä laite on tarkoitettu asennettavaksi paikkaan, johon pääsy on rajoitettua. Tällaiseen paikkaan pääsee vain erikoistyökalua, lukkoon sopivaa avainta tai jotakin muuta turvalaitetta käyttämällä.

Attention

Cet appareil est à installer dans des zones d'accès réservé. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

Warnung

Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

Avvertenza

Questa unità è prevista per essere installata in un'area ad accesso limitato, vale a dire un'area accessibile solo mediante l'uso di un attrezzo speciale, come lucchetto e chiave, o altri dispositivi di sicurezza.

Advarsel

Denne enheten er beregnet på installasjon i områder med begrenset tilgang. Et begrenset tilgangsområde kan bare nås ved hjelp av et spesielt verktøy, lås og nøkkel, eller andre sikkerhetsanordninger.

Aviso

Esta unidade foi concebida para instalação em áreas de acesso restrito. Uma área de acesso restrito é uma área à qual apenas tem acesso o pessoal de serviço autorizado, que possua uma ferramenta, chave e fechadura especial, ou qualquer outra forma de segurança.

¡Advertencia! Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

Varning! Denna enhet är avsedd för installation i områden med begränsat tillträde. Ett område med begränsat tillträde kan endast tillträdas med hjälp av specialverktyg, lås och nyckel eller annan säkerhetsanordning.

Aviso Esta unidade deve ser instalada em áreas de acesso restrito. Uma área de acesso restrito só pode ser acessada com o uso de uma ferramenta especial, cadeado e chave ou outros meios de segurança.

Advarsel Denne enhed er beregnet til installation i områder med begrænset adgang. Der kan kun opnås adgang til et begrænset område ved at bruge et særligt stykke værktøj, lås og nøgle, eller en anden form for sikkerhed.

A készülék korlátozottan hozzáférhető területre történő beszerelésre készült. A korlátozottan hozzáférhető területekhez csak speciális szerszám, zár és kulcs vagy más biztonsági berendezés segítségével lehet hozzáférni.

Предупреждение Данное устройство предназначено для установки в помещениях с ограниченным доступом. В такие помещения можно попасть, только имея специальное устройство доступа, карту или ключ или пройдя проверку другими средствами обеспечения безопасности.

警告 此部件应安装在限制进出的场所。限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

警告 この装置は立ち入り制限区域内に設置することが前提になっています。立ち入り制限区域とは、鍵、錠、またはその他の保全手段を使用しないと立ち入ることができない区域です。

주의 이 장치는 접근이 제한된 영역에 설치하도록 제작되었습니다. 특수 도구, 잠금 장치 및 키, 또는 기타 보안 수단을 통해서만 이 접근 제한 영역에 액세스할 수 있습니다.

تحذير تم تخصيص هذه الوحدة ليتم تشبيتها في مناطق محظور الوصول إليها. يمكن الوصول إلى المنطقة المحظورة فقط من خلال استخدام أداة خاصة أو قفل أو مفتاح أو أي وسيلة أخرى من التأمين.

Upozorenje Uređaj je namijenjen ugradnji na teško dostupnim mjestima. Teško su dostupna mjesta takva mjesta koja su dostupna samo uz pomoć posebnih alata, lokota i ključa, ili nekog drugog načina osiguravanja sigurnosti.

Upozornění Toto zařízení je určeno pro instalaci v prostorech s omezeným přístupem. Do prostoru s omezeným přístupem lze získat přístup pouze pomocí zvláštního nástroje, zámku a klíče nebo jiných zabezpečovacích prostředků.

Προειδοποίηση Αυτή η συσκευή προορίζεται για να τοποθετηθεί σε χώρους στους οποίους η πρόσβαση είναι περιορισμένη. Η πρόσβαση σε ένα χώρο με περιορισμένη πρόσβαση είναι δυνατή μόνο με τη χρήση ενός ειδικού εργαλείου, κλειδαριάς και κλειδιού ή άλλου μέσου ασφαλείας.

אזהרה יחידה זו מיועד להתקנה באזורים עם גישה מוגבלת. גישה לאזורים המיועדים לגישה מוגבלת אפשרית רק באמצעות כלי מיוחד, מנעול ומפתח, או אמצעי בטיחות אחרים.

Opomena Уредот е наменет за местење во области со ограничен пристап. Во областите со ограничен пристап може да се влезе само со употреба на специјална алатка, брава и клуч или со други средства за обезбедување.

- Ostrzeżenie** To urządzenie jest przystosowane do instalacji w miejscach o ograniczonym dostępie. Przez miejsce o ograniczonym dostępie rozumie się miejsce, do którego dostęp uzyskać można wyłącznie za pomocą specjalnego narzędzia, zamka z kluczem lub innego zabezpieczenia.
- Upozornenie** Toto zariadenie je určené na inštaláciu v priestoroch s obmedzeným prístupom. Do priestoru s obmedzeným prístupom je možné získať prístup iba pomocou špeciálneho nástroja, zámku a kľúča, alebo iných zabezpečovacích prostriedkov.

Statement 1019—Main Disconnecting Device



Warning

The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device. Statement 1019

Waarschuwing

De combinatie van de stekker en het elektrisch contactpunt moet te allen tijde toegankelijk zijn omdat deze het hoofdmecanisme vormt voor verbreking van de aansluiting.

Varoitus

Pistoke/liitinkohta toimii pääkatkaisumekanismina. Pääsy siihen on pidettävä aina esteettömänä.

Attention

La combinaison de prise de courant doit être accessible à tout moment parce qu'elle fait office de système principal de déconnexion.

Warnung

Der Netzkabelanschluß am Gerät muß jederzeit zugänglich sein, weil er als primäre Ausschaltvorrichtung dient.

Avvertenza

Il gruppo spina-presa deve essere sempre accessibile, poiché viene utilizzato come dispositivo di scollegamento principale.

Advarsel **Kombinasjonen støpsel/uttak må alltid være tilgjengelig ettersom den fungerer som hovedfrakoplingsenhet.**

Aviso **A combinação ficha-tomada deverá ser sempre acessível, porque funciona como interruptor principal.**

¡Advertencia! **El conjunto de clavija y toma ha de encontrarse siempre accesible ya que hace las veces de dispositivo de desconexión principal.**

Varning! **Man måste alltid kunna komma åt stickproppen i uttaget, eftersom denna koppling utgör den huvudsakliga fråkopplingsanordningen.**

A dugaszolóaljzat és a dugasz együttesének mindig hozzáférhetőnek kell lennie, mivel ez szolgál főmegszakítóként.

Предупреждение Штепсельная розетка всегда должна быть доступна, поскольку она служит основным устройством отключения.

警告 插销和插座必须便于随时插拔，因为它是主要断电设备。

警告 主要な切断装置となるので、プラグとソケットは常に手が届く場所に置く必要があります。

Statement 1024—Ground Conductor



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

Waarschuwing

Deze apparatuur dient geaard te zijn. De aardingsleiding mag nooit buiten werking worden gesteld en de apparatuur mag nooit bediend worden zonder dat er een op de juiste wijze geïnstalleerde aardingsleiding aanwezig is. Neem contact op met de bevoegde instantie voor elektrische inspecties of met een elektricien als u er niet zeker van bent dat er voor passende aarding gezorgd is.

Varoitus

Laitteiden on oltava maadoitettuja. Älä koskaan ohita maajohdinta tai käytä laitteita ilman oikein asennettua maajohdinta. Ota yhteys sähkötarkastusviranomaiseen tai sähköasentajaan, jos olet epävarma maadoituksen sopivuudesta.

Attention

Cet équipement doit être mis à la masse. Ne jamais rendre inopérant le conducteur de masse ni utiliser l'équipement sans un conducteur de masse adéquatement installé. En cas de doute sur la mise à la masse appropriée disponible, s'adresser à l'organisme responsable de la sécurité électrique ou à un électricien.

Warnung

Dieses Gerät muss geerdet sein. Auf keinen Fall den Erdungsleiter unwirksam machen oder das Gerät ohne einen sachgerecht installierten Erdungsleiter verwenden. Wenn Sie sich nicht sicher sind, ob eine sachgerechte Erdung vorhanden ist, wenden Sie sich an die zuständige Inspektionsbehörde oder einen Elektriker.

Avvertenza

Questa apparecchiatura deve essere dotata di messa a terra. Non escludere mai il conduttore di protezione né usare l'apparecchiatura in assenza di un conduttore di protezione installato in modo corretto. Se non si è certi della disponibilità di un adeguato collegamento di messa a terra, richiedere un controllo elettrico presso le autorità competenti o rivolgersi a un elettricista.

Advarsel Dette utstyret må jordes. Omgå aldri jordingslederen og bruk aldri utstyret uten riktig montert jordingsleder. Ta kontakt med fagfolk innen elektrisk inspeksjon eller med en elektriker hvis du er usikker på om det finnes velegnet jordning.

Aviso Este equipamento deve ser aterrado. Nunca anule o fio terra nem opere o equipamento sem um aterramento adequadamente instalado. Em caso de dúvida com relação ao sistema de aterramento disponível, entre em contato com os serviços locais de inspeção elétrica ou um eletricista qualificado.

¡Advertencia! Este equipo debe estar conectado a tierra. No inhabilite el conductor de tierra ni haga funcionar el equipo si no hay un conductor de tierra instalado correctamente. Póngase en contacto con la autoridad correspondiente de inspección eléctrica o con un electricista si no está seguro de que haya una conexión a tierra adecuada.

Varning! Denna utrustning måste jordas. Koppla aldrig från jordledningen och använd aldrig utrustningen utan en på lämpligt sätt installerad jordledning. Om det föreligger osäkerhet huruvida lämplig jordning finns skall elektrisk besiktningsauktoritet eller elektriker kontaktas.

A berendezés csak megfelelő védőföldeléssel működtethető. Ne iktassa ki a földelés csatlakozóját, és ne üzemeltesse a berendezést szabályosan felszerelt földelő vezeték nélkül! Ha nem biztos benne, hogy megfelelő földelés áll rendelkezésbe, forduljon a helyi elektromos hatóságokhoz vagy egy villanyszerelőhöz.

Предупреждение Данное устройство должно быть заземлено. Никогда не отключайте провод заземления и не пользуйтесь оборудованием при отсутствии правильно подключенного провода заземления. За сведениями об имеющихся возможностях заземления обратитесь к соответствующим контролирующим организациям по энергоснабжению или к инженеру-электрику.

警告 此设备必须接地。切勿使接地导体失效，或者在没有正确安装接地导体的情况下操作该设备。如果您不能肯定接地导体是否正常发挥作用，请咨询有关电路检测方面的权威人士或电工。

警告 この装置はアース接続する必要があります。アース導体を破損しないよう注意し、アース導体を正しく取り付けないまま装置を稼働させないでください。アース接続が適正であるかどうか分からない場合には、電気検査機関または電気技術者に相談してください。

Statement 1030—Equipment Installation



Warning

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

Waarschuwing

Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door bevoegd geschoold personeel.

Varoitus

Tämän laitteen saa asentaa, vaihtaa tai huoltaa ainoastaan koulutettu ja laitteen tunteva henkilökunta.

Attention

Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.

Warnung

Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.

Avvertenza

Questo apparato può essere installato, sostituito o mantenuto unicamente da un personale competente.

Advarsel

Bare opplært og kvalifisert personell skal foreta installasjoner, utskiftninger eller service på dette utstyret.

Aviso	Apenas pessoal treinado e qualificado deve ser autorizado a instalar, substituir ou fazer a revisão deste equipamento.
¡Advertencia!	Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.
Varning!	Endast utbildad och kvalificerad personal bör få tillåtelse att installera, byta ut eller reparera denna utrustning.
Aviso	Somente uma equipe treinada e qualificada tem permissão para instalar, substituir ou dar manutenção a este equipamento.
Advarsel	Kun uddannede personer må installere, udskifte komponenter i eller servicere dette udstyr.
	A berendezést csak szakképzett személyek helyezhetik üzembe, cserélhetik és tarthatják karban.
Предупреждение	Установку, замену и обслуживание этого оборудования может осуществлять только специально обученный квалифицированный персонал.
警告	只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。
警告	この装置の設置、交換、保守は、訓練を受けた相応の資格のある人が行ってください。
주의	교육을 받고 자격을 갖춘 사람만 이 장비를 설치, 교체, 또는 서비스를 수행해야 합니다.
تحذير	يسمح للمُتخِصِّين فقط بتركيب المعدة أو استبدالها أو إجراء الصيانة عليها.
Upozorenje	Uređaj smije ugrađivati, mijenjati i servisirati samo za to obučeno i osposobljeno servisno osoblje.

Upozornění	Instalaci, výměnu nebo opravu tohoto zařízení směji provádět pouze proškolené a kvalifikované osoby.
Προειδοποίηση	Η τοποθέτηση, η αντικατάσταση και η συντήρηση του εξοπλισμού επιτρέπεται να γίνονται μόνο από καταρτισμένο προσωπικό με τα κατάλληλα προσόντα.
אזהרה	רק עובדים מיומנים ומוסמכים רשאים להתקין, להחליף, או לטפל בציד זה.
Орoмена	Местењето, заменувањето и сервисирањето на оваа опрема треба да му биде дозволено само на обучен и квалификуван персонал.
Ostrzeżenie	Do instalacji, wymiany i serwisowania tych urządzeń mogą być dopuszczone wyłącznie osoby wykwalifikowane i przeszkolone.
Upozornenie	Inštaláciu, výmenu alebo opravu tohto zariadenia smú vykonávať iba vyškolené a kvalifikované osoby.

Statement 1040—Product Disposal



Warning

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

Waarschuwing

Het uiteindelijke wegruimen van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

Varoitus

Tämä tuote on hävitettävä kansallisten lakien ja määräysten mukaisesti.

Attention	La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.
Warnung	Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.
Avvertenza	Lo smaltimento di questo prodotto deve essere eseguito secondo le leggi e regolazioni locali.
Advarsel	Endelig kassering av dette produktet skal være i henhold til alle relevante nasjonale lover og bestemmelser.
Aviso	Deitar fora este produto em conformidade com todas as leis e regulamentos nacionais.
¡Advertencia!	Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.
Varning!	Vid deponering hanteras produkten enligt gällande lagar och bestämmelser.
Aviso	O descarte definitivo deste produto deve estar de acordo com todas as leis e regulamentações nacionais.
Advarsel	Endelig bortskaffelse af dette produkt skal ske i henhold til gældende love og regler.
	A készülék végső elhelyezéséről az adott országban érvényes törvények és előírások szerint kell intézkedni.
Предупреждение	Окончательная установка данного изделия должна выполняться в соответствии со всеми региональными и местными правилами и нормами.
警告	本产品的废弃处理应根据所有国家的法律和规章进行。

警告 この製品を廃棄処分する際は、各国の法律および規制に従って取り扱ってください。

주의 해당 국가의 관련 법규 및 규정에 따라 이 장치를 폐기해야 합니다.

تحذير عند التخلص من المنتج يجب اتباع القوانين والتشريعات المحلية.

Upozorenje Zbrinjavanje ovoga proizvoda u otpad treba provesti u skladu s važećim zakonima i odredbama.

Upozornění **Upozornění:** Likvidace tohoto výrobku musí být provedena podle platných zákonů a předpisů.

Προειδοποίηση Η τελική απόρριψη αυτού του προϊόντος πρέπει να γίνεται σύμφωνα με όλους τους εθνικούς νόμους και κανονισμούς.

אזהרה סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות ולחוקי המדינה.

Opomena Крајното фрлање на овој производ треба да се изврши во согласност со сите национални закони и прописи.

Ostrzeżenie **Ostateczna likwidacja tego urządzenia po jego wycofaniu z eksploatacji powinna odbywać się zgodnie z przepisami krajowymi.**

Upozornenie **Upozornenie** Likvidácia tohto výrobku musí byť vykonaná podľa platných zákonov a predpisov.

Statement 1045—Short-circuit Protection



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. Statement 1045

Waarschuwing

Voor dit product moet kortsluitbeveiliging (overstroombeveiliging) deel uitmaken van de installatie in het gebouw. De installatie moet voldoen aan de nationale en lokale bedradingvoorschriften.

Varoitus

Tämä tuote vaatii suojauksen oikosulkuja (ylivirtaa) vastaan osana asennusta rakennukseen. Asenna ainoastaan kansallisten ja paikallisten johdotussäännösten mukaisesti.

Attention

La protection de ce produit contre les courts-circuits (surtensions) doit être assurée par la configuration électrique du bâtiment. Vérifiez que l'installation a lieu uniquement en conformité avec les normes de câblage en vigueur au niveau national et local.

Warnung

Für dieses Produkt ist eine Kurzschlußsicherung (Überstromsicherung) erforderlich, die als Teil der Gebäudeinstallation zur Verfügung gestellt wird. Die Installation sollte nur in Übereinstimmung mit den nationalen und regionalen Vorschriften zur Verkabelung erfolgen.

Avvertenza

Questo prodotto richiede una protezione contro i cortocircuiti, da fornirsi come parte integrante delle dotazioni presenti nell'edificio. Effettuare l'installazione rispettando le Norme CEI pertinenti.

Advarsel

Dette produktet krever beskyttelse mot kortslutninger (overspenninger) som en del av installasjonen. Bare installer utstyret i henhold til nasjonale og lokale krav til ledningsnett.

Aviso

Este produto requer proteção contra curto-circuitos (sobrecorrente de corrente), que deve estar instalada nos edifícios. Instale apenas de acordo com as normas de instalação elétrica nacionais e locais.

Advertencia Este producto necesita estar conectado a la protección frente a cortacircuitos (sobretensiones) que exista en el edificio. Instálelo únicamente en conformidad con las regulaciones sobre cableado, tanto locales como nacionales, a las que se tenga que atender.

Varning! Denna produkt kräver att kortslutningsskydd (överström) tillhandahålles som en del av byggnadsinstallationen. Installera bara i enlighet med nationella och lokala kabeldragningsbestämmelser.

Aviso Este produto requer uma proteção contra curto-circuito (sobrecorrente) que deve fazer parte da instalação do edifício. Faça a instalação somente de acordo com as regulamentações de cabeamento nacionais e locais.

Advarsel Dette produkt kræver beskyttelse mod kortslutning (overstrøm). Dette skal være en del elinstallationen i bygningen. Installation skal ske i overensstemmelse med nationale og lokale ledningsregler.

A termékhez kötelező rövidzárlat (túláram) elleni védelmet használni, amelyet az épület kábelezésének részeként kell biztosítani. Csak az országos és helyi kábelezési előírásoknak megfelelően helyezhető üzembe.

Предупреждение Для этого устройства необходима защита от короткого замыкания (перегрузки), являющаяся частью электропроводки здания. При установке устройства необходимо соблюдать региональные и местные требования к электрооборудованию.

警告 此产品需要短路（过载电流）保护，这种保护要由建筑物内的供电电路提供。安装时必须遵守国家 and 当地有关布线的规章。

警告 この製品は、設置する建物にショート（過電流）保護機構が備わっていることを前提に設計されています。電気配線に関する一般規定および地域の規定に従って設置してください。

주의 이 제품은 단락(과전류) 보호가 필요하며, 이는 건물 설치의 일부로 제공됩니다. 국가 및 해당 지역 배선 규정에 따라 설치하십시오.

تحذير يجب وجود حماية من الدوائر الكهربائية القصير كجزء من تركيب الجهاز. قم بالتركيب طبقاً للتشريعات السلكية المحلية.

Upozorenje Za ovaj je proizvod potrebna zaštita od prekomjerne količine struje (kratkoga spoja), koja mora biti ugrađena kao dio električnoga strujnog kruga. Zaštitu ugradite samo u skladu s važećim zakonima i propisima o ožičenju.

Upozornění **Upozornění:** Tento výrobek vyžaduje ochranu proti zkratu (nadproudu), která je součástí instalace budovy. Instalaci provádějte pouze v souladu s platnými předpisy pro elektroinstalaci.

Προειδοποίηση Αυτό το προϊόν απαιτεί στην κτιριακή εγκατάσταση να περιλαμβάνεται προστασία από βραχυκύκλωμα (υπέρ-ένταση). Η τοποθέτηση να γίνεται μόνο σύμφωνα με τους εθνικούς και τοπικούς κανονισμούς για την καλωδίωση.

אזהרה למוצר זה נדרשת הגנה מפני קצר (זרם-יתר), המסופקת כחלק ממערך ההתקנה. יש להתקין רק בהתאם להנחיות החיווט הנהוגות המדינה וההנחיות המקומיות.

Орoмeнa За производот треба да се обезбеди заштита од краток spoj (пpегoлeм нaпoн) штo e вгpaдeнa вo инстaлaциjатa нa згpaдaтa. Мeстeтe ja инстaлaциjатa сaмo вo сoглacнoст сo нaциoнaлнитe и пoмeснитe пpoписи зa eлeктричнo oжичувaњe.

- Ostrzeżenie** To urządzenie wymaga zastosowania zabezpieczenia przeciwzwarciowego (nadprądowego) jako elementu instalacji elektrycznej budynku. Należy je instalować zgodnie z krajowymi i lokalnymi przepisami dotyczącymi instalacji elektrycznych.
- Upozornenie** Upozornenie Tento výrobok vyžaduje ochranu proti krátkemu spojeniu (nadprúdu), ktorá je súčasťou inštalácie budovy. Inštaláciu uskutočňujte iba v súlade s platnými predpismi pre elektroinštaláciu.

Statement 1051—Laser Radiation



Warning

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.
Statement 1051

Waarschuwing

Losgekoppelde of losgeraakte glasvezels of aansluitingen kunnen onzichtbare laserstraling produceren. Kijk niet rechtstreeks in de straling en gebruik geen optische instrumenten rond deze glasvezels of aansluitingen.

Varoitus

Irrotetuista kuiduista tai liittimistä voi tulla näkymätöntä lasersäteilyä. Älä tuijota säteitä tai katso niitä suoraan optisilla välineillä.

Attention

Les fibres ou connecteurs débranchés risquent d'émettre des rayonnements laser invisibles à l'œil. Ne regardez jamais directement les faisceaux laser à l'œil nu, ni d'ailleurs avec des instruments optiques.

Warnung

Unterbrochene Fasern oder Steckverbindungen können unsichtbare Laserstrahlung abgeben. Blicken Sie weder mit bloßem Auge noch mit optischen Instrumenten direkt in Laserstrahlen.

- Avvertenza** **Le fibre ottiche ed i relativi connettori possono emettere radiazioni laser. I fasci di luce non devono mai essere osservati direttamente o attraverso strumenti ottici.**
- Advarsel** **Det kan forekomme usynlig laserstråling fra fiber eller kontakter som er frakoblet. Stirr ikke direkte inn i strålene eller se på dem direkte gjennom et optisk instrument.**
- Aviso** **Radiação laser invisível pode ser emitida de conectores ou fibras desconectadas. Não olhe diretamente para os feixes ou com instrumentos ópticos.**
- ¡Advertencia!** **Es posible que las fibras desconectadas emitan radiación láser invisible. No fije la vista en los rayos ni examine éstos con instrumentos ópticos.**
- Varning!** **Osynlig laserstrålning kan avges från frånkopplade fibrer eller kontaktdon. Rikta inte blicken in i strålar och titta aldrig direkt på dem med hjälp av optiska instrument.**
- Aviso** **Radiação laser invisível pode ser emitida a partir de fibras ou conectores desconectados. Não fixe o olhar nos feixes e nem olhe diretamente com instrumentos ópticos.**
- Advarsel** **Usynlig laserstråling kan forekomme fra brukte fibre eller stik. Stir ikke ind i stråler eller direkte med optiske instrumenter.**

A nem csatlakoztatott üvegszálak és csatlakozók láthatatlan lézersugárzást bocsáthatnak ki. Ne nézzen bele a sugárba, és ne nézze közvetlenül, optikai berendezések segítségével!

Предупреждение Отключенные световоды и разъемы могут испускать невидимое лазерное излучение. Не допускайте попадания лазерного луча в глаза и не смотрите на него через оптические приборы.

警告 断开的光纤或接头有可能发出不可见的激光辐射。请勿直视光束或直接用光学仪器观看光束。

警告 光ファイバ ケーブルまたはコネクタを取り外した状態では、目に見えないレーザー光が放射されていることがあります。光線をのぞきこんだり、光学機器を使用して光線を直接見たりしないでください。

주의 연결이 해제된 섬유나 커넥터에서 눈에 보이지 않는 레이저 방사열이 방출될 수 있습니다. 레이저 빔을 눈으로 쳐다 보거나 광학 기구를 사용하여 직접 보지 마십시오.

تحذير من المحتمل انبعاث أشعة الليزر من الألياف غير المتصلة أو التوصيلات. لا تتحدق النظر في الشعاع أو النظر مباشرة بدون أي أداة بصرية.

Upozorenje Postoji mogućnost laserskog zračenja iz iskopčanih vlakana ili priključaka. Nemojte gledati izravno u zrake niti ih promatrati optičkim instrumentima.

Upozornění Odpojená vlákna kabelů či konektory mohou vyzařovat neviditelné laserové záření. Nedívejte se do paprsků ani nepozorujte přímo pomocí optických přístrojů.

Προειδοποίηση Από αποσυνδεδεμένες ίνες ή υποδοχές μπορεί να εκπέμπεται αόρατη ακτινοβολία λέιζερ. Μην κοιτάτε απευθείας τις δέσμες φωτός και μην τις απεικονίζετε απευθείας με οπτικά όργανα.

אזהרה תתיכן פליטה של קרינת לייזר בלתי-נראית מסיבים או ממחברים מנותקים. אל תביט ישירות לתוך קרני אור ואל תביט באמצעות במכשירים אופטיים.

Opomena Невидливо ласерско зрачење може да зрачи од исклучените влакна или приклучоци. Не гледајте во зраци и не прегледувајте ги директно со оптички инструменти.

- Ostrzeżenie** Odłączone światłowody lub złącza mogą emitować niewidzialne promieniowanie laserowe. Nie należy patrzeć prosto w wiązkę lasera ani bezpośrednio obserwować jej przy użyciu przyrządów optycznych.
- Upozornenie** Odpojené vlákna káblov alebo konektory môžu vyžarovať neviditeľné laserové žiarenie. Nepozeraajte sa do lúčov ani ich nepozorujte priamo pomocou optických prístrojov.

Statement 1074—Comply with Local and National Electrical Codes



Warning

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

Waarschuwing

Bij installatie van de apparatuur moet worden voldaan aan de lokale en nationale elektriciteitsvoorschriften.

Varoitus

Laitteisto tulee asentaa paikallisten ja kansallisten sähkömääräysten mukaisesti.

Attention

L'équipement doit être installé conformément aux normes électriques nationales et locales.

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

Avvertenza

L'installazione dell'impianto deve essere conforme ai codici elettrici locali e nazionali.

Advarsel

Installasjon av utstyret må samsvare med lokale og nasjonale elektrisitetsforskrifter.

Aviso A instalação do equipamento tem de estar em conformidade com os códigos eléctricos locais e nacionais.

¡Advertencia! La instalación del equipo debe cumplir con las normativas de electricidad locales y nacionales.

Varning! Installation av utrustningen måste ske i enlighet med gällande elinstallationsföreskrifter.

A berendezés üzembe helyezését a helyi és a nemzeti elektromossági előírások figyelembevételével kell elvégezni.

Предупреждение Установка оборудования должна соответствовать местным и национальным электротехническим нормам.

警告 设备安装必须符合本地与本国电气法规。

警告 機器の取り付けは地域および国内の電気工事規定に遵守する必要があります。

Statement 1075—Hazardous Voltage or Energy Present on DC Power Terminals



Warning

Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place. Statement 1075

Waarschuwing

Op DC-aansluitingspunten kunnen zich gevaarlijke voltages of energieën voordoen. Plaats altijd de afsluiting wanneer de aansluitingspunten niet worden gebruikt. Zorg ervoor dat blootliggende contactpunten niet toegankelijk zijn wanneer de afsluiting is geplaatst.

Varoitus	Tasavirtaliittimissä saattaa olla huomattava jännite tai teho. Sulje suojus aina, kun liittimet eivät ole käytössä. Suojuksen ollessa suljettuna varmista, että kohde on suojattu eristämättömiltä johtimilta.
Attention	Le voltage ou l'énergie électrique des terminaux à courant continu peuvent être dangereux. Veuillez à toujours replacer le couvercle lors les terminaux ne sont pas en service. Assurez-vous que les conducteurs non isolés ne sont pas accessibles lorsque le couvercle est en place.
Warnung	In mit Gleichstrom betriebenen Terminals kann es zu gefährlicher Spannung kommen. Die Terminals müssen abgedeckt werden, wenn sie nicht in Betrieb sind. Stellen Sie bei Benutzung der Abdeckung sicher, dass alle nicht isolierten, stromführenden Kabel abgedeckt sind.
Avvertenza	I terminali di alimentazione DC potrebbero contenere voltaggio o energia pericolosi. Accertarsi di sostituire il coperchio ogni qualvolta i terminali non sono operativi. Accertarsi che i conduttori scoperti non siano accessibili quando il coperchio è inserito.
Advarsel	Det kan forekomme farlig spenning eller energi i likestrømsterminaler. Sett alltid dekselet på plass når terminalene ikke er i bruk. Kontroller at uisolerte ledere ikke er tilgjengelige når dekselet er på plass.
Aviso	Os terminais de corrente contínua podem fornecer tensão ou energia perigosa. Volte a colocar a tampa, sempre que os terminais não estiverem a ser utilizados. Certifique-se de que os condutores sem isolamento não estão acessíveis, quando a tampa estiver colocada.
¡Advertencia!	Puede haber energía o voltaje peligrosos en los terminales eléctricos de CC. Reemplace siempre la cubierta cuando no estén utilizándose los terminales. Asegúrese de que no haya acceso a conductores descubiertos cuando la cubierta esté colocada.
Varning!	Farlig spänning eller skadlig energi kan finnas i likströmsterminalerna. Sätt alltid tillbaka höljet när terminalerna inte används. Försäkra att inga oisolerade ledare kan nås när höljet sitter på plats.

Az egyenáramú csatlakozókon veszélyes feszültség vagy energia léphet fel. Ha a csatlakozók nincsenek bekötve, feltétlenül tegye vissza a fedelet. Ügyeljen rá, hogy a szigetetlen vezetőkeket ne lehessen megérinteni, ha a fedél fel van szerelve.

- Предупреждение** На контактах питания постоянного тока может присутствовать опасное напряжение или энергия. Всегда устанавливайте крышку на место после завершения обслуживания. Когда крышка установлена, все неизолированные проводники должны быть недоступны.
- 警告** 直流电源终端可能产生危险的电压或能量。终端不使用时，务必将机盖盖上。确认机盖盖上时，无法使用不绝缘导体。
- 警告** 直流電力端子に危険な電圧やエネルギーが発生している可能性があります。使用していない端子には常にカバーを付けてください。カバーが付いているときは非絶縁形コンダクタに接触できないことを確認してください。
-



A

- accessory kit contents [3-2](#)
- airflow
 - site environment [2-2](#)
 - within the chassis [1-8](#)

B

- blank faceplate [1-9](#)
- brackets
 - cable [3-8](#)
 - mounting [3-6](#)

C

- cable guide [3-8](#)
- chassis
 - dimensions [A-3](#)
 - weight [A-3](#)
- checklist, site planning [2-7](#)
- cleaning guidelines [4-11](#)
- connectors
 - fiber-optic [4-11](#)
- console port

- location [1-5](#)
- pinouts [A-1](#)
- customer service [5-6](#)

D

- dimensions, chassis [A-3](#)
- documentation
 - audience [ix](#)
 - conventions [x](#)
 - organization [ix](#)
 - related [x](#)

E

- electrostatic discharge (ESD) [2-7](#)
- EMI recommendations [2-4](#)
- environmental requirements [2-1](#)

F

- fan tray
 - cooling [1-7](#)
 - failure [1-8](#)
 - status LED [1-7](#)

G

grounding requirement, DC systems [2-4](#)

H

hardware description

power supply [1-8](#)

heat dissipation

determining [2-4](#)

I

installing the switch

guidelines [3-2](#)

lifting [3-4](#)

procedure [3-6](#)

safety overview [2-5](#)

tools required [3-5](#)

troubleshooting [5-1](#)

L

label, chassis serial number [5-6](#)

LEDs

locations [1-6](#)

meanings [1-7](#)

power supply [5-3](#)

M

management port pinout [A-2](#)

memory [A-3](#)

MT-RJ connectors

cleaning [4-11](#)

P

pinout

management port [A-2](#)

port status LED [1-7](#)

power

connecting [3-9, 3-12](#)

DC grounding requirements [2-4](#)

determining power requirements and heat
dissipation [2-4](#)

EMI recommendations [2-4](#)

general requirements [2-3](#)

management [1-10](#)

specifications [A-3](#)

troubleshooting [5-2](#)

warnings and cautions [2-3](#)

power supply

environmental monitoring [1-9](#)

LEDs [1-7, 5-3](#)

overview [1-8](#)

redundancy [1-9](#)

specifications [A-3](#)

troubleshooting [5-4, 5-5](#)

R

rack-mounting [3-2](#)

redundancy

power supply [1-9](#)

S

safety

ensuring safety [2-5](#)

overview [2-5](#)

translated safety warnings [B-1](#)

screws [3-6](#)

serial number, chassis [5-6](#)

site planning

checklist [2-7](#)

DC grounding requirement [2-4](#)

EMI recommendations [2-4](#)

environmental requirements [2-1](#)

general requirements [2-3](#)

overview [2-1](#)

warnings and cautions [2-3](#)

software documentation [x](#)

specifications

AC Power [A-3](#)

DC Power [A-3](#)

environmental [A-2](#)

switching components [A-3](#)

startup sequence [5-3](#)

status LED [1-7](#)

system specifications [A-1](#)

T

temperature thresholds [2-2](#)

traffic ports [1-5](#)

troubleshooting

contacting customer service [5-6](#)

initial boot [5-2](#)

methodology [5-2](#)

power supply [5-4, 5-5](#)

startup [5-3](#)

typographical conventions [x](#)

W

warnings

translated safety warnings [B-1](#)

warning definition [xii](#)

weight

chassis [A-3](#)

