Cisco 819 Integrated Services Router Hardware Installation Guide

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Preface

This preface describes the objectives, audience, organization, and conventions of this guide and describes related documents that have additional information. It contains the following sections:

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Objective

This guide provides an overview and explains how to install, connect, and perform initial configuration for the Cisco 819 ISR. Some information may not apply to your particular router model.

For warranty, service, and support information, see the "Cisco One-Year Limited Hardware Warranty Terms" section in *Readme First for the Cisco 800 Series Integrated Services Routers* that was shipped with your router.

Audience

This guide is intended for Cisco equipment providers who are technically knowledgeable and familiar with Cisco routers and Cisco IOS software and features.

Organization

This guide is organized into the following chapters and appendix.

Chapter	Name	Description
Chapter 1	Chapter 1, "Product Overview"	Describes the router models and the hardware features available.
Chapter 2	Chapter 2, "Installing the Router"	Lists the items shipped with the router, the equipment and tools necessary for installing the router, the safety warnings and guidelines, and the procedures for installing the router.
Chapter 3	Chapter 3, "Connecting the Router"	Describes typical connections for the router, procedures for connecting the router to various devices, and how to verify the connections.
Chapter 4	Chapter 4, "Initial Configuration"	Provides the procedures for initially configuring the router settings.
Appendix A	Appendix A, "Technical Specifications"	Provides the router, port, and cabling specifications.

Conventions

This section describes the conventions used in this guide.

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

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

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

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

■

Figyelem

FONTOS BIZTONSÁGI ELOÍRÁSOK

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

중요 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.

Cisco 819 Integrated Services Router Hardware Installation Guide

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

предупредување

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 ОВИЕ НАПАТСТВИЈА

Ostrzeżenie

WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA

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

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ

Upozornenie

DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY

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

USCHOVAJTE SI TENTO NÁVOD

Opozorilo **POMEMBNI VARNOSTNI NAPOTKI**

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

SHRANITE TE NAPOTKE!

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

Warning **When installing the product, please use the provided or designated connection cables/power cables/AC adaptors. Using any other cables/adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL-certified cables (that have the "UL" shown on the code) for any other electrical devices than products designated by CISCO. The use of cables that are certified by Electrical Appliance and Material Safety Law (that have "PSE" shown on the code) is not limited to CISCO-designated products.** Statement 371

Warning **Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system.** Statement 378

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

Warning **To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables.** Statement 1021

Warning This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

Warning **If the symbol of suitability with an overlaid cross appears above a port, you must not connect the port to a public network that follows the European Union standards. Connecting the port to this type of public network can cause severe personal injury or can damage the unit.** Statement 1031

Warning **Connect the unit only to DC power source that complies with the safety extra-low voltage (SELV) requirements in IEC 60950 based safety standards.** Statement 1033

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

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

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

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

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Warning **Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, because they may cause serious injury or death. For proper installation and grounding of the antenna, please refer to national and local codes (for example, U.S.:NFPA 70, National Electrical Code, Article 810, Canada: Canadian Electrical Code, Section 54).** Statement 1052

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

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

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

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

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

Warning   **The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed.** Statement 1077

Warning   **Hot surface.** Statement 1079

Related Documentation

- *Regulatory Compliance and Safety Information for Cisco 800 Series and SOHO Series Routers*
- *Cisco IOS Release Notes*
- *Cisco IOS Quality of Service Solutions Command Reference, Release 12.4T*
- *Cisco IOS Security Configuration Guide, Release 12.4T*
- *Cisco IOS Security Command Reference, Release 12.4T*
- *Cisco CP Express User's Guide*

Searching Cisco Documents

To search an HTML document using a web browser, press **Ctrl-F** (Windows) or **Cmd-F** (Apple). In most browsers, the option to search whole words only, invoke case sensitivity, or search forward and backward is also available.

To search a PDF document in Adobe Reader, use the basic Find toolbar (**Ctrl-F**) or the Full Reader Search window (**Shift-Ctrl-F**). Use the Find toolbar to find words or phrases within a specific document. Use the Full Reader Search window to search multiple PDF files simultaneously and to change case sensitivity and other options. Adobe Reader's online help has more information about how to search PDF documents.

Obtaining Documentation and Submitting a Service Request

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

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

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS Version 2.0.

Product Overview

This chapter provides an overview of the features available for the Cisco 819 and Cisco 819H Integrated Services Routers (ISRs) and contains the following sections:

Note For compliance and safety information, see *Regulatory Compliance and Safety Information Roadmap* that ships with the router and *Regulatory Compliance and Safety Information for Cisco 800 Series and SOHO Series Routers.*

General Description

The Cisco 819 Integrated Services Router, part of the Cisco Integrated Services Routers Generation 2 (ISR G2) Family designed in compact hardened and non-hardened form factors, is the smallest Cisco IOS Software router with support for integrated fourth-generation (4G LTE) and third-generation (3G) wireless WAN (mobile broadband backhaul). The 3G Cisco 819 now supports Dual 802.11 a/b/g/n radios WiFi. The Cisco 819 ISR machine-to-machine gateway provides a rapidly deployable, highly available, reliable, and secure solution into machine-to-machine applications for financial, telemetry, utility, retail, industrial automation, and transportation with comprehensive management capability. Transparently integrated into Cisco IOS Software as an enterprise-class feature, the Cisco 819 Hardened ISR provides highly secure data, voice, and video communications to stationary and mobile network nodes across wired and wireless links.

Available in both non-hardened (Cisco 819G) and hardened (Cisco 819HG) versions, the Cisco 819 supporting 4G LTE and 3G wireless WAN (WWAN) speeds offers a cost-effective, rapidly deployable, reliable, and secure primary or backup solution. With support for industrial-grade components, the hardened Cisco 819HG extends the ISR machine-to-machine gateway footprint and provides the flexibility for deployment in many different stationary and mobile environments where space, heat dissipation, exposure to extreme temperatures, harsher environments, and low power consumption are critical factors. For mobile applications, Mobile IP delivers transparent roaming across multiple wireless networks capable of covering wide geographic areas.

The Cisco 819 ISR is a standard form factor with a commercial operating range. The 3G Cisco 819 ISRs support the 3G speeds (High-Speed PacketAccess Plus [HSPA+] enabling up to 4G speeds and Evolution Data Optimized [EVDO Rev A]). They are backward-compatible with High-Speed Packet Access (HSPA), Universal Mobile Telecommunications Service (UMTS), Enhanced Data Rates for Global Evolution (EDGE), General Packet Radio Service (GPRS), and EVDO Rev 0/1xRTT.

The 4G LTE C819 supports the latest Third-Generation Partnership Project (3GPP) Release 8 LTE standards. The Cisco 4G multimode LTE WWAN C819 provides persistent and reliable LTE connectivity with fallback and transparent handoff to earlier technologies. The Cisco 819HG-4G and Cisco 819G-4G support multimode 4G LTE and have embedded Sierra Wireless multimode modem.

The Cisco 819 ISR is a desktop form factor with built-in wall-mount features, floor mount, and DIN rail mount features in selected SKUs. These routers are powered by an external AC power or optional DC adapter. Figure 1-1 shows the Cisco 819HG ISR.

Beginning with IOS release 15.2(4)M1, the new 3G Cisco 819HGW and Cisco 819HWD ISRs support WiFi radios with a higher memory density and a new barrel-type power connector. A Wireless Local Area Network (WLAN) implements a flexible data communication system frequently augmenting rather than replacing a wired LAN within a building or campus. WLANs use radio frequency to transmit and receive data over the air, minimizing the need for wired connections. Figure 1-2 shows the Cisco 819HGW ISR.

The WLAN for 3G Cisco 819HGW and Cisco 819HWD ISRs have the following additional features:

- Dual 802.11 a/b/g/n radios
- External WiFi antenna
- WLAN LED

![Note icon] **Note**   Cisco 819 is used to refer to Cisco 819HG, Cisco 819G, Cisco 819H, Cisco 819HGW, Cisco 819HWD, Cisco 819HG-4G, and Cisco 819G-4G ISRs unless specifically called out otherwise.

Figure 1-1   ***Cisco 819HG Integrated Services Router***
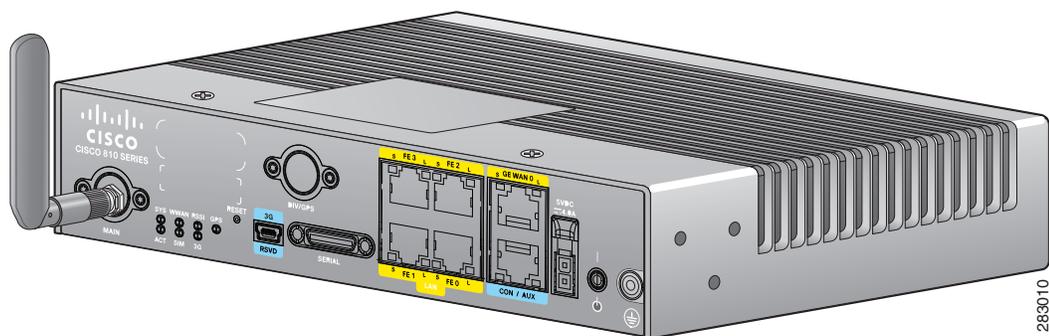
Figure 1-2   *Cisco 819HGW Integrated Services Router*
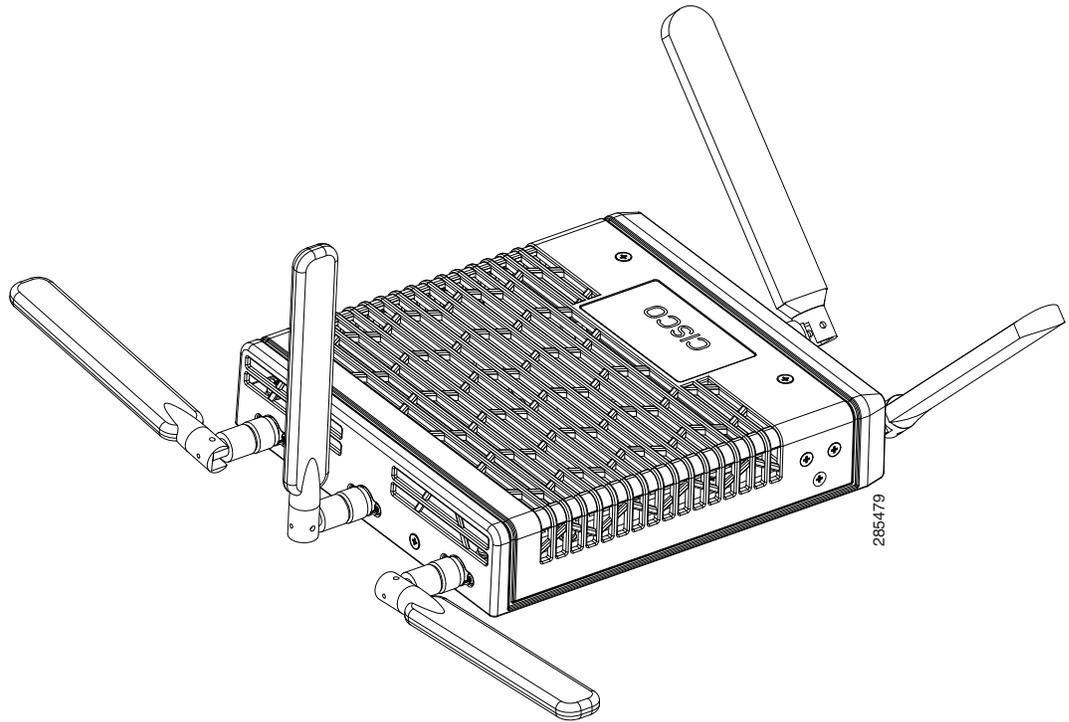
Figure 1-3 shows the front panel details of the Cisco 819HG ISR.

Figure 1-3   *Cisco 819HG ISR Front Panel*

1	3G main antenna	7	FE ports
2	LEDs	8	GE WAN port
3	Reset button	9	Console/Aux port

4	3G mini-USB diagnostic port	10	5 VDC molex power input
5	Diversity/GPS antenna	11	Power switch
6	12-in-1 serial port	12	Ground

Figure 1-4 shows the front panel details of the Cisco 819HGW ISR.

Figure 1-4   ***Cisco 819HGW ISR Front Panel***
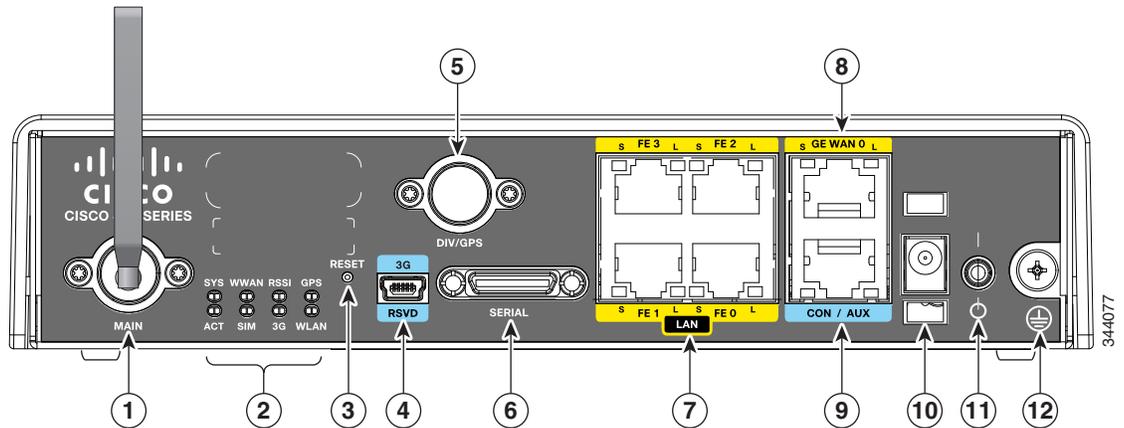
1	3G main antenna	7	FE ports
2	LEDs	8	GE WAN port
3	Reset button	9	Console/Aux port
4	3G mini-USB diagnostic port	10	5 VDC barrel-type power input
5	Diversity/GPS antenna	11	Power switch
6	12-in-1 serial port	12	Ground

Figure 1-5 shows the front panel details of the Cisco 819 4G LTE ISR.

Figure 1-5   Cisco 819 4G LTE ISR Front Panel
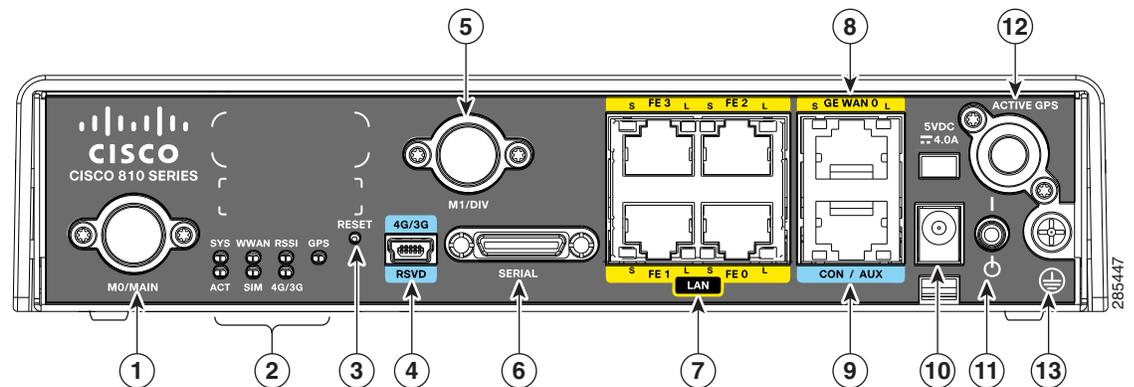
1	Antenna connector—M0/MAIN	**8**	GE WAN port
2	LEDs	**9**	Console/Aux port
3	Reset button	**10**	Power input
4	4G/3G port	**11**	Power switch
5	Antenna connector—M1/DIV	**12**	Active GPS antenna connector
6	Serial port	**13**	Ground
7	FE ports		

SKU Information

Table 1-1 lists the different 3G SKUs available for the Cisco 819HG and Cisco 819G ISRs. All SKUs support external antenna.

Note   WLAN is not supported.

Table 1-1   Supported 3G SKUs for Cisco 819HG and Cisco 819G ISRs

SKU ID	Description
C819HG+7-K9	Compact Hardened 3G IOS Router with Global HSPA + Release 7 based on MC8705
C819HG-U-K9	Compact Hardened 3G IOS Router with GLOBAL HSPA Release 6 based on MC8795V
C819HG-V-K9	Compact Hardened 3G IOS Router with Verizon EVDO Rev A based on MC5728V
C819HG-S-K9	Compact Hardened 3G IOS Router with Sprint EVDO Rev A based on MC5728V

Table 1-1   ***Supported 3G SKUs for Cisco 819HG and Cisco 819G ISRs(continued)***

SKU ID	Description
C819HG-B-K9	Compact Hardened 3G IOS Router with Bharat generic EVDO Rev A based on MC5728V
C819G+7-K9	C ompact Non-hardened 3G IOS Router with Global HSPA + Release 7 based on MC8705
C819G-U-K9	Compact Non-hardened 3G IOS Router with GLOBAL HSPA Release 6 based on MC8795V
C819G-V-K9	Compact Non-hardened 3G IOS Router with Verizon EVDO Rev A based on MC5728V
C819G-S-K9	Compact Non-hardened 3G IOS Router with Sprint EVDO Rev A based on MC5728V
C819G-B-K9	Compact Non-hardened 3G IOS Router with Bharat generic EVDO Rev A based on MC5728V

Table 1-2 lists the different SKUs available for the Cisco 819HGW, Cisco 819H, and Cisco 819HWD ISRs.

Table 1-2   Supported SKUs for Cisco 819HGW, Cisco 819H, and Cisco 819HWD ISRs

SKU ID	WLAN ID	WiFi External Antenna Support	Description
C819HGW+7-E-K9	AP802H-AGN-E-K9	Yes	Cisco 819 Secure Hardened M2M GW (non-US) 3.7G HSPA + Release 7 with SMS/GPS and Dual WiFi Radio with ETSI
C819HGW+7-N-K9	AP802H-AGN-N-K9	Yes	Cisco 819 Secure Hardened M2M GW (non-US) 3.7G HSPA + Release 7 with SMS/GPS and Dual WiFi Radio with ANZ
C819HGW+7-A-A-K9	AP802H-AGN-A-K9	Yes	Cisco 819 Secure Hardened M2M GW (North America) 3.7G HSPA + Release 7 with SMS/GPS and Dual WiFi Radio with FCC for ATT
C819HGW-V-A-K9	AP802H-AGN-A-K9	Yes	Cisco 819 Secure Hardened Router for Verizon EV-DO Rev A with SMS/GPS and Dual WiFi Radio with FCC
C819HGW-S-A-K9	AP802H-AGN-A-K9	Yes	Cisco 819 Secure Hardened Router for Sprint EV-DO Rev A with SMS/GPS and Dual WiFi Radio with FCC
C819H-K9	—	—	Cisco 819 Secure Hardened Router with Serial WLAN and 3G are not supported
C819HWD-E-K9	AP802H-AGN-E-K9	Yes	Cisco 819 Secure Hardened Router and Dual WiFi Radio with ETSI 3G is not supported
C819HWD-A-K9	AP802H-AGN-A-K9	Yes	Cisco 819 Secure Hardened Router and Dual WiFi Radio with FCC 3G is not supported

Table 1-3 lists the different 4G LTE SKUs available for the Cisco 819HG and Cisco 819G ISRs.

Table 1-3   *Supported 4G LTE SKUs for the Cisco 819HG-4G and Cisco 819G-4G ISRs*

SKU ID	Mode	Operating Regions	Frequency Band	Description
C819HG-4G-V-K9	LTE—DOrA	North America	700 MHz (band 13) for LTE 800/1900 MHz for CDMA 1xRTT, 1xEVDO Rev A	Compact Hardened Cisco 819 router with multimode LTE feature dedicated to Verizon Wireless networks. This comes with a Sierra Wireless MC7750 modem.
C819G-4G-V-K9	LTE—DOrA	North America	700 MHz (band 13) for LTE 800/1900 MHz for CDMA 1xRTT, 1xEVDO Rev A	Compact Non-hardened Cisco 819 router with multimode LTE feature dedicated to Verizon Wireless networks. This comes with a Sierra Wireless MC7750 modem.
C819HG-4G-A-K9	LTE—HSPA+/ HSPA/UMTS/ EDGE/GPRS	North America	700 MHz(band 17)/AWS(band 4)/2100MHz(band 1) for LTE 800/850/1900/2100 MHz for UMTS/ HSPA+/HSPA 850/900/1800/1900 MHz for GSM/EDGE/GPRS	Compact Hardened Cisco 819 router with multimode LTE feature dedicated to AT&T Wireless networks. This comes with a Sierra Wireless MC7700 modem.
C819G-4G-A-K9	LTE—HSPA+/ HSPA/UMTS/ EDGE/GPRS	North America	700 MHz(band 17)/AWS(band 4)/2100MHz(band 1) for LTE 800/850/1900/2100 MHz for UMTS/ HSPA+/HSPA 850/900/1800/1900 MHz for GSM/EDGE/GPRS	Compact Non-hardened Cisco 819 router with multimode LTE feature dedicated to AT&T Wireless networks. This comes with a Sierra Wireless MC7700 modem.

Table 1-3   *Supported 4G LTE SKUs for the Cisco 819HG-4G and Cisco 819G-4G ISRs (continued)*

SKU ID	Mode	Operating Regions	Frequency Band	Description
C819HG-4G-G-K9	LTE—HSPA+/ HSPA/UMTS/ EDGE/GPRS	Global	800 MHz (band 20)/900 MHz (band 8)/1800 MHz (band 3)/2100 MHz (band 1)/2600 MHz (band 7) for LTE 900/2100 MHz for UMTS/ HSPA+/HSPA 900/1800/1900 MHz for GSM/EDGE/GPRS	Hardened Cisco 819 router with multimode LTE feature for global wireless networks. This comes with a Sierra Wireless MC7710 modem.
C819G-4G-G-K9	LTE—HSPA+/ HSPA/UMTS/ EDGE/GPRS	Global	800 MHz (band 20)/900 MHz (band 8)/1800 MHz (band 3)/2100 MHz (band 1)/2600 MHz (band 7) for LTE 900/2100 MHz for UMTS/ HSPA+/HSPA 900/1800/1900 MHz for GSM/EDGE/GPRS	Non-hardened Cisco 819 router with multimode LTE feature for global wireless networks. This comes with a Sierra Wireless MC7710 modem.

Rebranding of C8xx-B and EHWIC-3G-EVDO-B

The C881G-B-K9, C819G-B-K9, and EHWIC-EVDO-B (Bharat) SKUs are introduced as an umbrella SKU to cover BSNL, Tata, and Reliance service providers in India.

Software based mechanism is introduced to identify specific carrier.

Carrier ID and name are displayed under "*show cellular <unit> hardware*".

The software mechanism is backward compatible with other existing CDMA SKUs such as HWIC-3G-CDMA(-S,-V) and PCEX-3G-CDMA(-S,-V).

Cisco IOS Requirement

15.3(2)T, 15.3(3)M or later. New MIB objects for carrier ID and name will be introduced in later release.

Sample CLI Output

```
Router#show cellular 0/0/0 hardware
Modem Firmware Version = p2813301
Modem Firmware built = 06-24-10
Hardware Version = MC5728V Rev 1.0
Electronic Serial Number (ESN) = 0x60E62C87 [09615084679] Preferred Roaming List (PRL)
Version = 10 PRI SKU ID = 535479 Carrier ID = 19 Carrier Name = Reliance Current Modem
Temperature = 30 degrees Celsius Endpoint Port Map = 75
Router#


Router#show cellular 0/1/0 hardware
Modem Firmware Version = p2813301
Modem Firmware built = 06-24-10
Hardware Version = MC5728V Rev 1.0
Electronic Serial Number (ESN) = 0x60E62431 [09615082545] Preferred Roaming List (PRL)
Version = 10 PRI SKU ID = 535479 Carrier ID = 29 Carrier Name = Tata Current Modem
Temperature = 30 degrees Celsius Endpoint Port Map = 75
Router#
```

Hardware Features

This section provides an overview of the following hardware features for the Cisco 819 ISR.

- Accessories, page 1-25

> **Note** The WAAS Express feature is not supported. This feature will be supported for 3G and 4G interfaces with later IOS releases.

Platform Features for Cisco 819 ISRs

Table 1-4 lists the platform features comparison for the Cisco 819 ISRs.

Table 1-4   Cisco 819 ISRs Platform Features

Platform Features	Cisco 819HG Cisco 819G (with 3G)	Cisco 819HGW Cisco 819HWD (with WiFi)	Cisco 819HG-4G Cisco 819G-4G (with 4G LTE)
512 MB DRAM	Yes	—	—
1 GB DRAM	—	Yes	Yes
1 Gigabit Ehernet WAN port	Yes	Yes	Yes
12-in-1 serial interface	Yes	Yes	Yes
256 KB of NVRAM storage	Yes	Yes	Yes
256 Compact Flash support in IDE mode (internal)	Yes	—	—
1 GB Compact Flash support in IDE mode (internal)	—	Yes	Yes
Cisco EnergyWise	Yes	Yes	—
Dual 802.11 a/b/g/n Radios with Cisco DFS, CleanAir, and Client Link support	—	Yes	—
Embedded 3G modem	Yes	Yes	—
Embedded 4G LTE modem	—	—	Yes
Environmental monitoring and temperature logging	Yes	Yes	—
Four ports FE interconnect switch support	Yes	Yes	Yes

Table 1-4   *Cisco 819 ISRs Platform Features (continued)*

Platform Features	Cisco 819HG Cisco 819G (with 3G)	Cisco 819HGW Cisco 819HWD (with WiFi)	Cisco 819HG-4G Cisco 819G-4G (with 4G LTE)
LED indicators for the platform	Yes	Yes	Yes
Onboard crypto acceleration	Yes	Yes	—
Power cord retention lock	—	Yes	Yes
Power switch lock	—	Yes	Cisco 819HG-4G ISRs only
Reset button	Yes	Yes	Yes
Real Time Clock (RTC)[1]	Yes	Yes	Yes
ScanSafe	Yes	Yes	—
Single console/AUX port	Yes	Yes	Yes
SNMP	Yes	Yes	—
TFTP support with Ethernet WAN interface	—	Yes	—
Warm reload	Yes	Yes	—

1. A real-time clock (RTC) with battery backup provides date and time when the system is powered on. The RTC is used to verify the validity of the Certification Authority stored on the router.

Antennas

The Cisco 819 3G routers provide two standard panel-mount TNC connectors to support the 3G antenna and the diversity and GPS external antenna. The main antenna is used for the primary 3G antenna. The second can be used as a diversity receive only 3G antenna or GPS antenna that does not require power supply from the router.

The Cisco 819 4G routers provide two standard panel-mount TNC connectors on the router front panel for the main and diversity antennas. The main antenna connector is used for the primary 4G antenna. The second antenna connector can be used as a diversity receive only 4G antenna. An SMA connector for active GPS antenna is also available on the front panel of the router.

The Cisco 819HGW and Cisco 819HWD ISRs also support Cisco WiFi external antennas. See the "Supported Cisco Antennas and Cables"section on page 1-19 for more information.

WiFi External Antenna

The external WiFi antenna is used to support better WiFi coverage. All external antenna supports the following:

•   Dual 802.11 a/b/g/n radios

•   2x3 MIMO

- Omnidirectional

Power Switch

The power switch shuts down the router. A power switch lock is available to prevent accidental turning off of the router in the hardened SKUs.

Reset Button

The Reset button resets the router configuration to the default configuration set by the factory. To restore the router configuration to the default configuration set by the factory, use a standard size #1 paper clip with wire gauge 0.033 inch or smaller and simultaneously press the reset button while applying power to the router.

LEDs

The LEDs are located on the front panel of the router. Table 1-5 describes the 3G LEDs for the Cisco 819 ISR.

Table 1-5   3G LED Descriptions

LED	Color	Description
SYS	Yellow	FPGA download is complete.
	Green (blinking)	ROMMON is operational.
	Green (solid)	IOS is operational.
	Green (four blinks during bootup)	Reset button has been pushed during the bootup.
	Off	After powering up, when FPGA is being downloaded (in ROMMON).
ACT	Green	Network activity on FE Switch ports, GE WAN port, 3G cellular interface, and serial interfaces.
	Off	No network activity.
WWAN	Green	Module is powered on and connected but not transmitting or receiving.
	Green (slow blinking)	Module is powered on and searching for connection.
	Green (fast blinking)	Module is transmitting or receiving.
	Off	Module is not powered.
GPS	Green (solid)	Standalone GPS.
	Green (slow blinking)	GPS is acquiring.
	Yellow (solid)	Assisted GPS.
	Yellow (slow blinking)	Assisted GPS is acquiring.
	Off	GPS is not configured.

Table 1-5   3G LED Descriptions (continued)

LED	Color	Description
RSSI	Green (solid)	Signal > –60 dBm Very strong signal
	Green (three blinks and then a long pause)	Signal <= –60 to 74 dBm Strong signal
	Green (two blinks and then a long pause)	Signal <= –75 to –89 dBm Fair signal
	Green (one blink and then a long pause)	Signal <= –90 to –109 dBm Marginal signal
	Off	Signal <= –110 dBm Unusable signal
SIM[1,2]	Green / Yellow (one green blink followed by two yellow blinks)	SIM in slot 0 active, SIM in slot 1 is not.
	Yellow / Green (one yellow blink followed by two green blinks)	SIM in slot 1 active, SIM in slot 0 is not.
	Off / Green (two green blinks and then a pause)	No SIM in slot 0, SIM present in slot 1.
	Green / Off (Slow single green blink and then a pause	SIM present in slot0, no SIM in slot 1.
	Off / Off	No SIM present in either slots.
3G	Green (one blink and then a pause)	For 1xRTT, EGPRS, or GPRS service.
	Green (two blinks and then a pause)	For EVDO, EVDO/1xRTT, or UMTS.
	Green (three blinks and then a pause)	For EVDO/1xRTT RevA, HSPA, or HSUPA/HSDPA.
	Green (solid)	For HSPA PLUS.
	Off	No Service.

1. Not applicable to Verizon and Sprint EVDO modems.

2. There is only one LED to indicate the status of two SIMs. A one-blink pattern represents the status of the SIM in slot 0, followed by a two-blink pattern for the SIM in slot 1.

Table 1-6 describes the WLAN LEDs for the Cisco 819HGW and Cisco 819HWD ISRs.

Table 1-6   WLAN LED Descriptions

WLAN LED	Color	Description
Boot loader status sequence	Blinking Green	Board initialization in progress.
		Initializing FLASH file system.
		Initializing Ethernet.
		Ethernet is OK.
		Starting Cisco IOS.
		Initialization is successful.
Association status	Green	Normal operating condition with no wireless client associated.
	Blue	Normal operating condition with at least one wireless client associated.
Operating status	Blinking Blue	Software upgrade in progress.
	Rapidly cycling through Blue, Green, Red, and White	Access point location command invoked.
	Blinking Red	Ethernet link is not operational.
Boot loader errors	Blinking Red and Blue	FLASH file system failure.
	Blinking Red and Off	Environment variable failure.
		Bad MAC address.
		Ethernet failure during the image recovery.
		Boot environment failure.
		No Cisco image file.
		Boot failure.
Cisco IOS errors	Red	Software failure. Try to disconnect and reconnect the unit power.

Table 1-7 describes the 4G LTE LEDs for the Cisco 819 ISR.

Table 1-7   4G LTE LED Descriptions

LED	Color	Description
SYS	Yellow	FPGA download is complete.
	Green (blinking)	ROMMON is operational.
	Green (solid)	IOS is operational.
	Green (four blinks during bootup)	Reset button has been pushed during the bootup.
	Off	After powering up, when FPGA is being downloaded (in ROMMON).
ACT	Green	Network activity on FE Switch ports, GE WAN port, 3G cellular interface, and serial interfaces.
	Off	No network connectivity.
WWAN	Green	Module is powered on and connected but not transmitting or receiving.
	Green (slow blinking)	Module is powered on and searching for connection.
	Green (fast blinking)	Module is transmitting or receiving.
	Off	Module is not powered.
GPS	Green (solid)	Standalone GPS.
	Green (slow blinking)	GPS is acquiring.
	Yellow (solid	Assisted GPS.
	Yellow (slow blinking)	Assisted GPS is acquiring.
	Off	GPS is not configured.
RSSI	Green (solid)	Signal > –60 dBm Very strong signal
	Green (three blinks and then a long pause)	Signal <= –60 to 74 dBm Strong signal
	Green (two blinks and then a long pause)	Signal <= –75 to –89 dBm Fair signal
	Green (one blink and then a long pause)	Signal <= –90 to –109 dBm Marginal signal
	Off	Signal <= –110 dBm Unusable signal

Table 1-7   4G LTE LED Descriptions (continued)

LED	Color	Description
SIM	Green / Yellow (one green blink followed by two yellow blinks)	SIM in slot 0 is active, SIM in slot 1 is not.
	Yellow / Green (one yellow blink followed by two green blinks)	SIM in slot 1 is active, SIM in slot 0 is not.
	Off / Green (two green blinks and then a pause)	No SIM in slot 0, SIM present in slot 1.
	Green / Off (Slow single green blink and then a pause)	SIM present in slot 0, no SIM in slot 1.
	Off / Off	No SIM present in either slots.
3G/4G	Green (one blink and then a pause)	For 1xRTT, EGPRS, or GPRS service.
	Green (two blinks and then a pause)	For EVDO, EVDO/1xRTT, or UMTS service.
	Green (three blinks and then a pause)	For EVDO/1xRTT RevA, HSPA, or HSUPA/HSDPA service.
	Green (four blinks and then a pause)	For HSPA+ service.
	Green (Solid)	For 4G/LTE service.
	Off	No Service.

Memory

The Cisco 819HG and Cisco 819G ISRs uses non-upgradable flash memory and main memory. The onboard flash memory contains the Cisco IOS software image and the boot flash contains the ROMMON boot code. Table 1-8 lists the memory requirements for Cisco 819 ISRs.

Table 1-8   Memory Requirements for Cisco 819 ISRs

Memory Requirements	Cisco 819HG Cisco 819G (with 3G)	Cisco 819HGW Cisco 819HWD (with WiFi)	Cisco 819HG-4G Cisco 819G-4G (with 4G LTE)
256 Compact Flash support in IDE mode (internal)	Yes	—	—
1 GB Compact Flash support in IDE mode (internal)	—	Yes	Yes
512 MB DRAM	Yes	—	—
1 GB DRAM	—	Yes	Yes

Embedded 3G Modem

The 3G cellular interface is the primary WAN data link, but it can also be used as a backup data link. The 3G technology is third-generation wide-area cellular technology that is used in broadband wireless data in a mobile environment.

Embedded 4G LTE Modem

The Cisco 819HG-4G and Cisco 819G-4G routers have an embedded 4G LTE modem provided by Sierra Wireless. The Verizon SKUs come with an MC7750 modem, the AT&T SKUs come with an MC7700 modem, and the Global SKUs come with an MC7710 modem.

SIM Card

Table 1-9 lists the SIM Card slots available for Cisco the 819 ISRs.

Table 1-9   SIM Card Slot

Two Internal SIM Card Slots	One Internal SIM Card Slot	No SIM Card Slot
C819G-U-K9	C819HG-4G-V-K9	C819HG-V-K9
C819G+7-K9	C819G-4G-V-K9	C819HG-S-K9
C819HG-U-K9	C819HG-4G-A-K9	C819G-V-K9
C819HG+7-K9	C819G-4G-A-K9	C819G-S-K9
C819HGW+7-A-A-K9		C819HGW-V-A-K9
C819HGW+7-E-K9		C819HGW-S-A-K9
C819HGW+7-N-K9		C819HG-B-K9
C819HG-4G-G-K9		C819G-B-K9
C819G-4G-G-K9		

Supported Cisco Antennas and Cables

The Cisco 819 ISR provides two standard panel-mount TNC connectors to support the 3G antenna and the diversity and GPS external antenna. The main antenna is used for the primary 3G antenna. The second can be used as a diversity receive only 3G antenna or GPS antenna that does not require power supply from the router.

Table 1-10 lists the Cisco 3G antennas that are supported for use on Cisco 819 ISRs.

Table 1-10   Supported Cisco 3G Antennas

Cisco Part Number	Antenna Type	Maximum Gain and Frequency Range	Description
3G-ANTM1919D	Dipole omnidirectional	0 dBi (806–960 MHz) 0 dBi (1710–2170 MHz)	This is the default antenna with dual faceplate mount. Multiband faceplate-mounted dipole antenna. For more information, see *Cisco Multiband Swivel Mount Dipole Antenna (3G-ANTM1919D)*.
3G-ANTM1916-CM	High-gain ceiling-mount omnidirectional	1.5 dBi (806–960 MHz) 2.5 dBi (1710–2170 MHz)	Multiband ceiling-mounted omnidirectional antenna. For more information, see *Cisco Multiband Omnidirectional Ceiling Mount Antenna (3G-ANTM1916-CM)*.
3G-AE015-R (Antenna Extension)	Extension base	0.8–6.0 GHz	This antenna extension is a base with a 15-foot cable included for use with a dipole omnidirectional antenna. For more information, see *Cisco Single-Port Antenna Stand for Multiband TNC Male-Terminated Portable Antenna (3G-AE015-R)*.
3G-ANTM-OUT-OM	Outdoor Omnidirectional	+2 dBi 800/900 MHz +4 dBi 1800/1900/2100 MHz	This is an outdoor low-profile omindirectional mast antenna. For more information, see *Cisco 3G Omnidirectional Outdoor Antenna (3G-ANTM-OUT-OM)*.
3G-ANTM-OUT-LP	Low Profile Stick Antenna	–1.5 dBi 850, 900 MHz –2.5 dBi 1800, 1900, 2100 MHz	This is an omindirectional stick antenna. For more information, see *Cisco 3G Low Profile Outdoor Antenna (3G-ANTM-OUT-LP)*.
3G-ACC-OUT-LA (Lightning Arrestor)	Lightning Arrestor	800–2200 MHz	This is a quarter-wave lightning protector with integrated high-pass filter. For more information, see *Cisco 3G Lightning Arrestor (3G-ACC-OUT-LA)*.

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Table 1-11 lists the supported Cisco WiFi antenna for Cisco 819HGW and Cisco 819HWD ISRs.

Table 1-11   Supported Cisco WiFi Antenna

Antenna	Frequency band(s)	Mounting Mechanical	IP Rating	Peak Gain 2.4 GHz (dBi)	Peak Gain 5 GHz (dBi)	Description
AIR-ANTM2050D-R	2.4–2.5 GHz 4.9–5.9 GHz	Faceplate Dipole	IP 41	1.4	4.5	This is the default antenna. For more information, see *Cisco Multiband Swivel-Mount Dipole Antenna (AIR-ANTM2050D-R)*.
AIR-ANT2430V-R	2.4 GHz	Ceiling	IP 41	3	—	For more information, see *Cisco Aironet 3-dBi Omnidirectional Antenna (AIR-ANT2430V-R)*.
AIR-ANT5140V-R	5 GHz	Ceiling	IP 41	—	4	For more information, see *Cisco Aironet 4-dBi Omnidirectional Antenna (AIR-ANT5140V-R)*.
AIR-ANT2440NV-R	2.4 GHz	Multi-mount (Wall/Ceiling /Mast)	IP 54	4	—	For more information, see *Cisco Aironet 2.4-GHz MIMO Wall-Mounted Omnidirectional Antenna (AIR-ANT2440NV-R)*.
AIR-ANT5140NV-R	5 GHz	Multi-mount (Wall/Ceiling /Mast)	IP 54	—	4	For more information, see *Cisco Aironet 5-GHz MIMO Wall Mount Omnidirectional Antenna (AIR-ANT5140NV-R)*.

Table 1-12 lists the Cisco 4G LTE antennas that are supported for use on Cisco 819 ISRs.

Table 1-12   *Supported 4G LTE Antennas*

Cisco Part Number	Description	Maximum Gain and Frequency Ranges	Description
4G-LTE-ANTM-D	Indoor 4G dipole omnidirectional antenna	• 2 dBi – 698 to 806 MHz – 824 to 894 MHz – 925 to 960 MHz – 1710 to 1885 MHz – 1920 to 1980 MHz – 2110 to 2170 MHz – 2500 to 2690 MHz	Multiband dipole antenna. For more information, see *Cisco 4G/3G Omnidirectional Dipole Antenna (4G-LTE-ANTM-D)*.
4G-ANTM-OM-CM	Indoor ceiling-mount omnidirectional antenna	698 to 2690 MHz	Multiband omnidirectional ceiling-mount antenna. For more information, see *Cisco 4G Indoor Ceiling-Mount Omnidirectional Antenna (4G-ANTM-OM-CM)*.
ANT-4G-OMNI-OUT-N	Multiband outdoor omnidirectional stick antenna	• 1.5 dBi – 698 to 960 MHz • 3.5 dBi – 1710 to 2710 MHz – 2300 to 2700 MHz	Multiband outdoor omnidirectional stick antenna. For more information, see *Cisco Outdoor Omnidirectional Antenna for 2G/3G/4G Cellular (ANT-4G-OMNI-OUT-N)*.
ANT-4G-SR-OUT-TNC	Multiband outdoor omnidirectional saucer antenna	• 1.5 dBi (peak gain with 10-foot cable) or 0.8 dBi (peak gain with 15-foot cable) – 698 to 960 MHz • 3.7 dBi (peak gain with 10-foot cable) or 0.2 dBi (peak gain with 15-foot cable) – 1710 to 2700 MHz	Low-profile outdoor saucer antenna. For more information, see *Cisco Integrated 4G Low-Profile Outdoor Saucer Antenna (ANT-4G-SR-OUT-TNC)*.
CGR-LA-NF-NF	Lighning Arrestor	800 to 2200 MHz	4G lightning arrestor kit for use on Cisco 4G wireless devices. For more information, see *Lightning Arrestor for the Cisco 1240 Connected Grid Router*.
4G-ACC-OUT-LA	Lightning Arrestor	800 to 2200 MHz	4G lightning arrestor kit for use on Cisco 4G wireless devices. For more information, see *Cisco 4G Lightning Arrestor (4G-ACC-OUT-LA)*.

Table 1-13 to Table 1-15 list the extension cables for use with 3G, WiFi, and 4G LTE antennas. The tables include the insertion loss information for the ultra-low-loss (ULL) LMR 400 extension cables.

Table 1-13   Cisco Extension Cables for Use with 3G Antennas

Cisco Product Number	Cable Length	Insertion Loss	Frequency (MHz)
3G-CAB-ULL-20	20 ft (6 m)	1.50 dB max	2100
3G-CAB-ULL-50	50 ft (15 m)	3.50 dB max	2100
3G-CAB-LMR240-25	25 ft (7.5 m)	3.50 dB max	2200
3G-CAB-LMR240-50	50 ft (15 m)	6.90 dB max	2200
3G-CAB-LMR240-75	75 ft (23 m)	10.5 dB max	2200

Table 1-14   Cisco Extension Cables for Use with WiFi Antennas

Cisco Product Number	Cable Length	Insertion Loss	Frequency (MHz)
AIR-CAB005LL-R	5 ft (1.524 m) (one RP-TNC plug, one RP-TNC jack)	0.5 dB 0.8 dB	2400 5800
AIR-CAB020LL-R	20 ft (6 m) (one RP-TNC plug, one RP-TNC jack)	1.3 dB 2.5 dB	2400 5800
AIR-CAB050LL-R	50 ft (15.24 m) (one RP-TNC plug, one RP-TNC jack)	3.4 dB 5.75 dB	2400 5800

Table 1-15   Cisco Extension Cables for Use with 4G LTE Antennas

Cisco Product Number	Cable Length	Maximum Insertion Loss	Frequency (MHz)	Color	Plenum Rated?[1]
4G-AE010-R	10 ft (3 m)	1.4 dB at 700 MHz 2.0 dB at 1.9 GHz 2.1 dB at 2.1 GHz 2.3 dB at 2.5 GHz	700 to 2600 MHz	Black	No
4G-AE015-R	15 ft (4.6 m)	2.3 dB at 700 MHz 3.3 dB at 1.9 GHz 3.7 dB at 2.1 GHz 4.0 dB at 2.5 GHz	700 to 2600 MHz	Black	No
4G-CAB-LMR240-25	25 ft (7.6 m)	2.1 dB at 700 MHz 4.0 dB at 2.6 GHz	700 to 1000 MHz 1700 to 2600 MHz	Black	Yes

Table 1-15   Cisco Extension Cables for Use with 4G LTE Antennas (continued)

Cisco Product Number	Cable Length	Maximum Insertion Loss	Frequency (MHz)	Color	Plenum Rated?[1]
4G-CAB-LMR240-50	50 ft (15 m)	4.1 dB at 700 MHz 7.4 dB at 2.6 GHz	700 to 1000 MHz 1700 to 2600 MHz	Black	Yes
4G-CAB-LMR240-75	75 ft (23 m)	6.1 dB at 700 MHz 11.0 dB at 2.6 GHz	700 to 1000 MHz 1700 to 2600 MHz	Black	Yes
4G-CAB-LMR240-25N	25 ft (7.6 m)	2.1 dB at 700 MHz 4.0 dB at 2600 MHz	700 to 1000 MHz 1700 to 2600 MHz	Black	No
4G-CAB-ULL-20	20 ft (6 m)	1.8 dB	700 to 2600 MHz	Black	Yes
4G-CAB-ULL-50	50 ft (15 m)	4.2 dB	700 to 2600 MHz	Black	Yes
CAB-L400-20-TNC-N	20 ft (6 m)	1.75 dB	700 to 2600 MHz	Black	No
CAB-L400-50-TNC-N	50 ft (15 m)	4.0 dB	700 to 2600 MHz	Black	No
CAB-L400-20-N-N	20 ft (6 m)	2.75 dB	700 to 2600 MHz	Black	No

1.   Cable can be routed within building plenum spaces.

Serial Port

The Cisco standard High Speed Smart Serial 12-in-1 connector allows the highest flexibility of connections to various DTE/DCE devices. The 12-in-1 serial interface pins connect to the FPGA. The FPGA configures the pin directions based on the cable type used. Figure 1-6 shows the magnified view of the 12-in-1 serial port. For more information, see *About Serial Connections*.

Figure 1-6   *12-in-1 Serial Port*

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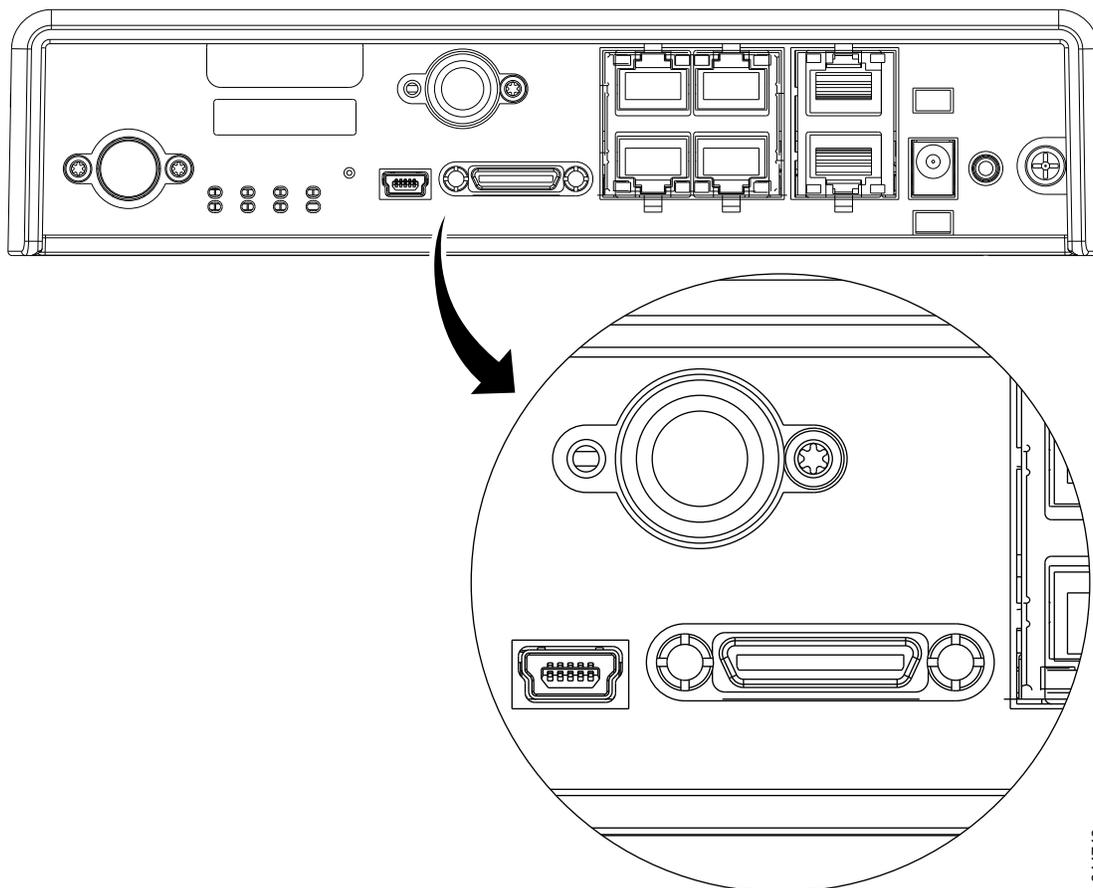
Power Supply

All SKUs require a 5 VDC power source. Cisco 819HG and Cisco 819G ISRs have a self-locking Molex mini-fit connector. Cisco 819HGW and Cisco 819HWD ISRs use a 5.5 mm barrel-type connector with separate locking clip. An external AC power adapter is supported by default. The optional external power adapters are available to support a variety of DC power sources, suitable for fixed, vehicle, or railway installations. The 5 VDC power input of the router is protected from over-voltage up to 20 VDC. The router will not power up if excessive voltage (for example, a 12 VDC adapter) is connected.

AC Power Adapter

The default configuration includes an external AC adapter that supplies up to 20 W of power. The AC power connection is a two-pin IEC 320 C8 receptacle. A mating AC power cord is supplied. The AC adapter does not provide chassis grounding to the router. A 1.3-meter long output cable connects to the router.

DC Power Adapters

The optional external DC power adapters are available for 12 VDC and 24 VDC nominal vehicle power.

- 12 VDC vehicle adapter has a 10 VDC to 36 VDC operating range
- 24 VDC vehicle adapter has an 18 VDC to 75 VDC operating range

The vehicle power adapters may be used for fixed or mobile installations. They do not provide electrical isolation; the input negative is connected to the output negative (chassis ground). Input cable is 1-meter long with stripped and tinned bare wire connections. The input positive connection is a white wire and the input negative is a black wire.

Note   The 24 VDC vehicle adapters will be available on Q1CY13.

Railway Power Adapters

The optional external power adapters meeting Railway Standards are available from a third-party supplier, Martek Power. Contact Martek Power directly to order and for detailed specifications. The use of Martek Power adapters listed in the "Supported Power Adapters"section on page A-6 will maintain Cisco warranty and support of the router; the power adapter itself is covered by Martek warranty. Input connection to the railway adapters is by a 1-meter long wire with stripped and tinned bare wire connection. A 1.3-meter long output cable connects to the router.

Accessories

Table 1-16 lists the accessories available for the Cisco 819 ISRs. For a complete list of SKUs that support these accessories, see the "Platform Features for Cisco 819 ISRs"section on page 1-11.

Table 1-16   Cisco 819 ISR Accessories

Cisco Part Number	Accessory
69-2453-01	Power cord retention lock
69-2454-01	Power switch lock cover

Installing the Router

This chapter describes the equipment and the procedures for successfully installing the Cisco 819 ISR and contains the following sections:

Note For compliance and safety information, see the *Regulatory Compliance and Safety Information Roadmap* that ships with the router and the *Regulatory Compliance and Safety Information for Cisco 800 Series and SOHO Series Routers*.

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

Warning **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.** Statement 1024

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

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

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

Warning **Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system.** Statement 378

Warning   **The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed.** Statement 1077

Warning   **Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, because they may cause serious injury or death. For proper installation and grounding of the antenna, please refer to national and local codes (for example, U.S.:NFPA 70, National Electrical Code, Article 810, Canada: Canadian Electrical Code, Section 54).** Statement 1052

Warning   **This product is not intended to be directly connected to the Cable Distribution System. Additional regulatory compliance and legal requirements may apply for direct connection to the Cable Distribution System. This product may connect to the Cable Distribution System ONLY through a device that is approved for direct connection.** Statement 1078

Equipment, Tools, and Connections

This section describes the equipment, tools, and connections necessary for installing your Cisco 819 ISR. It contains the following topics:

Items Shipped with your Router

Unpack the box and verify that all items listed on the invoice were shipped with the Cisco 819 ISR.

The following items are shipped with your router:

- AC power supply (default)
- AC power supply cable (default)
- Cisco Configuration Professional (Cisco CP) CD
- DC power supply (optional)
- Power cord retention lock (available in Cisco 819HGW, Cisco 819HWD, Cisco 819HG-4G, and Cisco 819G-4G ISRs only)
- Power switch lock (available in Cisco 819HGW, Cisco 819HWD, and Cisco 819HG-4G ISRs only)
- RJ-45-to-DB-9 console cable.
- Straight-through RJ-45 Ethernet cable
- Two cellular multiband swivel mount dipole antennas
- Three WiFi antennas for Cisco 819HGW and Cisco 819HWD ISRs

Note   AC or DC Power supply is included based on what is ordered.

Additional Items

The following items are not shipped with the router but are required for installation:

- ESD-preventive cord and wrist strap.
- Screws for mounting the router on a wall.
- Two number-10 wood screws (round- or pan-head) with number-10 washers or two number-10 washer-head screws, for mounting on a wall stud. The screws must be long enough to penetrate at least 3/4 inch (20 mm) into the supporting wood or metal wall stud.
- Two number-10 wall anchors with washers, for mounting the router on a hollow wall.
- Wire crimper for chassis grounding.
- Wire for connecting the chassis to an earth ground.
- AWG 14 (2 mm2) or larger wire for NEC-compliant chassis grounding.
- AWG 18 (1 mm2) or larger wire for EN/IEC 60950–compliant chassis grounding.
- Ring terminal with an inner diameter of 1/4 inch. (5 to 7 mm) for NEC-compliant chassis grounding.
- Ethernet cables for connecting to the Fast Ethernet (FE) WAN and LAN ports.

Connections

Obtain a broadband or Ethernet connection from your service provider.

Ethernet Devices

Identify the Ethernet devices that you will connect to the router: hub, servers, and workstations or PCs. Ensure that each device has a network interface card (NIC) for connecting to Ethernet ports.

If you plan to configure the software using Cisco IOS commands through the console port, provide an ASCII terminal or a PC that is running terminal emulation software to connect to the console port.

If you plan to connect a modem, provide the modem and modem cable.

Installing the Router

This section describes how to install the Cisco 819 ISR. These routers can be installed on a table top or other flat horizontal surface mounted on a wall or DIN rail.

The recommended clearance when horizontally mounted is 1.5 inches on both sides for floor mount bracket clearance and 2 inches on top. Top clearance is not required but stacking heat-dissipating objects on top of the router is not allowed. I/O side clearance is needed as it is required to access the cable connections. Clearance is not required on the backside (opposite side from I/O face) unless DIN rail mounting is required. Clearance is required to attach and mount the DIN rail bracket. The same clearances apply when mounted vertically.

This section also describes how to attach external antennas to the routers and contains the following topics:

Warnings

> ⚠
> **Warning** **This equipment needs to be grounded. Use a green and yellow 12 to 14 AWG ground wire to connect the host to earth ground during normal use.** Statement 242

> ⚠
> **Warning** **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.** Statement 1024

Warning   **Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system.** Statement 378

Warning   **Do not cover or obstruct the router vents located on both sides of the router; otherwise, overheating could occur and cause damage to the router.**

Warning   **Do not place anything on top of the router that weighs more than 10 pounds (4.5 kilograms), and do not stack routers on a desktop. Excessive weight on top of the router could damage the chassis.**

Warning   **Do not install the router or power supplies next to a heat source of any kind, including heating vents.**

Accessing the SIM Card

This section describes how to install and replace the SIM card. Ensure that the router is not mounted to a wall, floor, or DIN rail.

Caution   Do not touch any part of the exposed PCB circuit area when the SIM cover is removed.

Warning   **Hot surface.** Statement 1079

To access the SIM card in the Cisco 819 ISR, follow these steps:

Step 1   Power off the router and disconnect the power cable from the power source.

Step 2   Place the router on its side and ensure that any installed antennas are carefully oriented.

Step 3   Remove the SIM access panel using four flat head #6 screws. (See Figure 2-1.)

Step 4   Remove the SIM card and install the new cards.

Figure 2-1   *Accessing the SIM Cards*
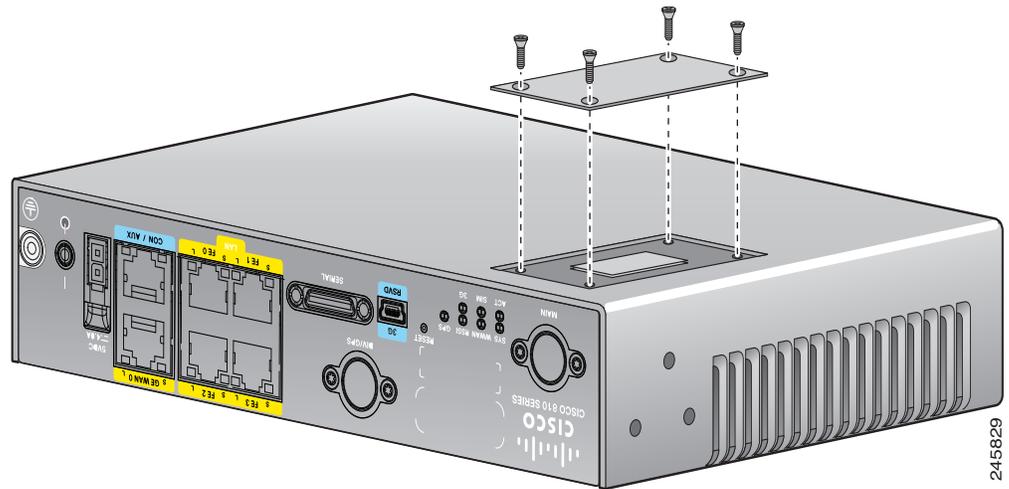
Step 5   Replace the panel and the screws.

Installing Antennas

Note   Before you install the Cisco 819 ISR on a table, wall, or DIN rail, install the antennas on the front panel. It is difficult to install the antennas after the router is installed.

Orient the antennas. For optimum wireless performance, the antennas should be perpendicular with respect to the floor.

If the router is being mounted on a desk, orient the antennas straight up.

To attach the radio antennas to your wireless router, follow these steps:

Step 1   Manually screw the antenna tight to the TNC connectors on the back of the router. (See Figure 2-2.)

Figure 2-2   Installing the Antenna

Step 2   Orient the antennas. For optimum wireless performance, antennas should be generally perpendicular to each other.

Installing a WiFi External Antenna

This section describes how to install a WiFi external antenna.

Step 1   Install the lightning arrestor. For details in installing lightning arrestor, see *Cisco Aironet Lightning Arrestor (AIR-ACC245LA-R)*.

Step 2   Rotate the knurled portion of the WiFi external antenna clockwise to screw the antenna to the RP-TNC. (See Figure 2-3.)

Note   WiFi antennas should be generally perpendicular to each other to achieve best coverage.

Figure 2-3   Cisco WiFi Antenna Assembly
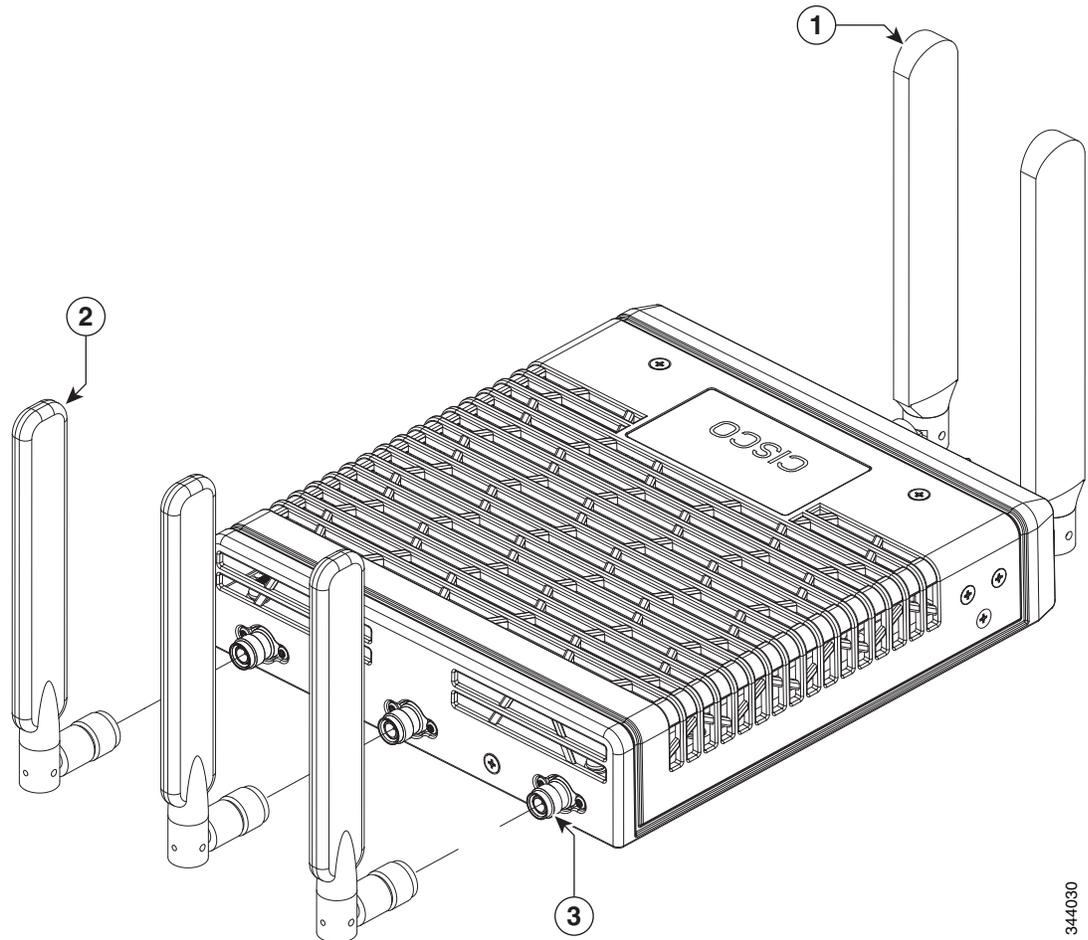
1	3G Dipole External Antenna	3	RP-TNC Connector
2	WiFi 2.4/5 Ghz Dipole External Antenna		

Installing on a Table

To install the router on a table or other flat horizontal surface, firmly place the router on a table or other horizontal surface. Keep at least 1 inch (2.5 centimeters) of clear space for heat dissipation.

Connect the chassis to a reliable earth ground. For the chassis ground connection procedures, see the .

Mounting on a Wall

The Cisco 819 ISR has mounting holes on the bottom of the chassis for mounting the unit on a wall or other vertical surface. The attachment hardware is provided.

Tip   When choosing a location for wall-mounting the router, consider cable limitations and wall structure.

To mount the router on a wall, follow these steps:

Step 1   Remove the screws on the sides of the routers.

Step 2   Attach the standard brackets to the chassis using the three screws provided for each bracket. (See Figure 2-4.)

Figure 2-4   *Attaching the Standard Brackets*
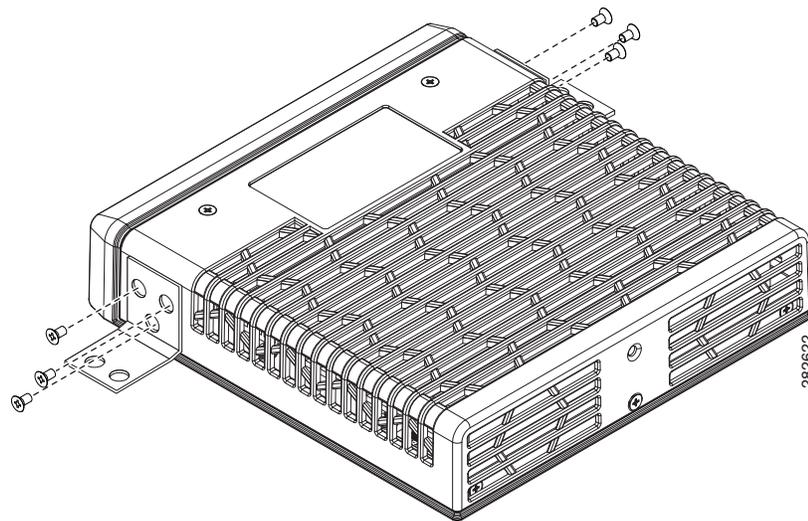
Step 3   Install the router to a wall stud using two number-10 wood screws, round- or pan-head, with number-10 washers or two number-10 washer-head screws. The screws must be long enough to penetrate at least 1.0 inch (25.4 mm) into the supporting wood or metal wall stud. (See Figure 2-5.)

Note   The orientation of the Cisco 819 ISR products is critical when wall-mounting. The router must be oriented as shown in Figure 2-5 with the left side of the router rotated up (as viewed from the IO side) to comply with IP41 and safety criteria. No other wall mounting orientation is supported.

Figure 2-5   *Installing the Router to the Wall*

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✎
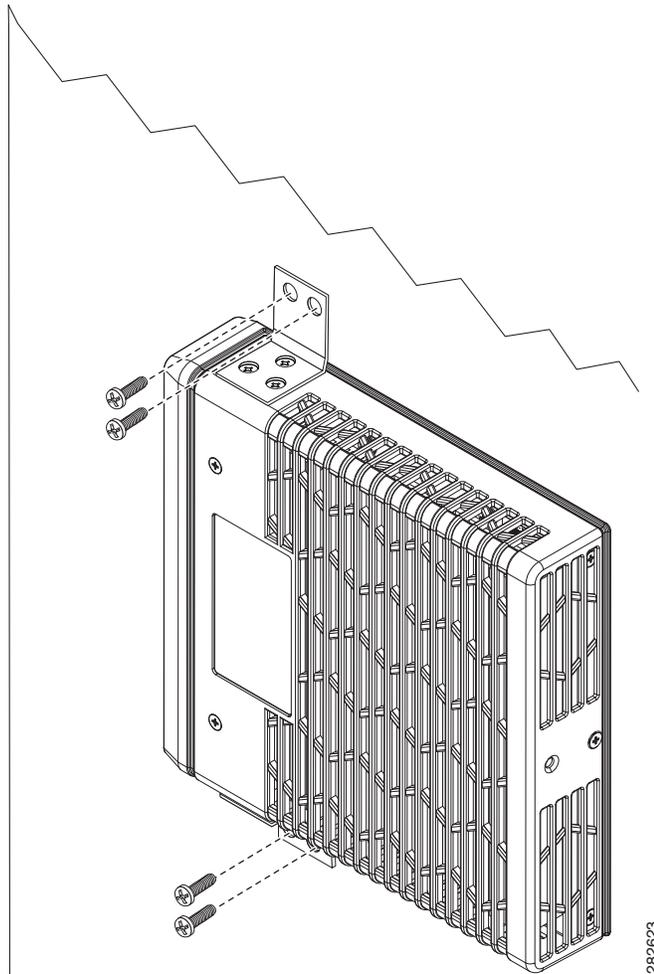
Note   For hollow-wall mounting, each bracket requires two wall anchors with washers. Wall anchors and washers must be size number 10.

Step 4   Route the cables so that they do not put a strain on the connectors or mounting hardware. To comply with IP 41, cables should be routed down relative to the router to prevent water from travelling on the cables.

Installing a DIN Rail

You can use either the 7.5-mm or the 15-mm thick DIN rail for the Cisco 819 ISR. Secure the DIN rail to the mounting surface approximately every 7.8 inches (200 mm) and use end-anchors appropriately.

✎

Note   DIN rail mounting is not supported on Cisco 819HGW and Cisco 819HWD ISRs.

To attach the Cisco 819 ISR to a 35-mm wide DIN rail, follow these steps.

Step 1   Attach the DIN rail to the back of the router using the three screws provided. (See Figure 2-6.)

Figure 2-6   Attaching the DIN Rail to the Cisco 819 ISR
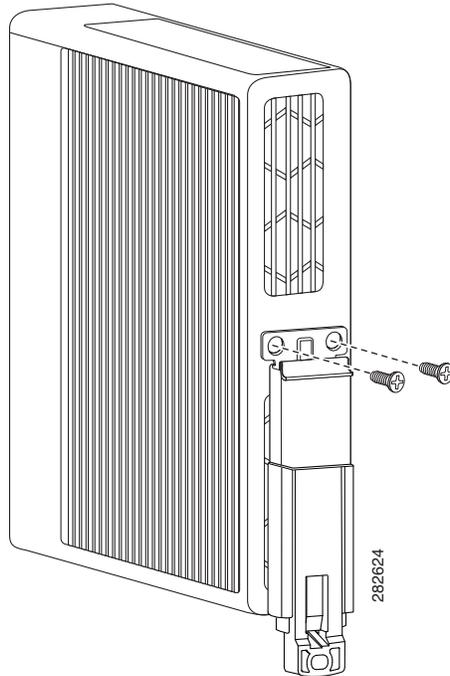
Step 2   Find the tab on the end of the DIN rail that extends past the router. (See Figure 2-7.) Press the tab in and slide the DIN rail out while the tab is pressed down.

Figure 2-7   DIN Rail Tab
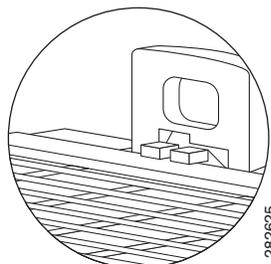
Step 3   Turn the router sideways so that the antenna is at the top.

Step 4   Position the rear edge of the router directly in front of the DIN rail, making sure that the DIN rail fits in the space between the latch and hook.

Step 5   Position the router so that the hook on the DIN rail bracket hooks onto the top edge of the DIN rail. The weight of the product can rest on the hook temporarily while the DIN rail bracket latches are secured.

Step 6   Push the DIN rail bracket latch up after the router is over the DIN rail to secure it. The router is now installed in the DIN rail. (See Figure 2-8.)

Figure 2-8   *Cisco 819 ISR Installed with the DIN Rail*
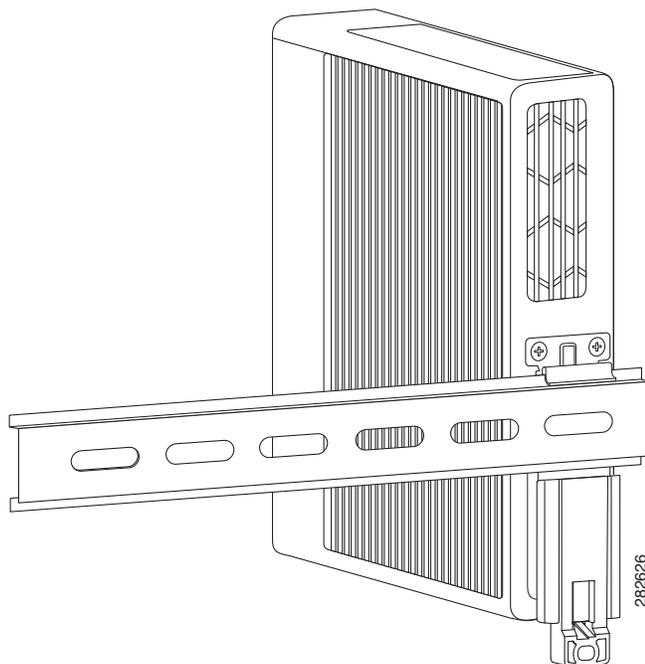
Installing the Router Ground Connection

The router must be connected to a reliable earth ground. Install the ground wire in accordance with local electrical safety standards.

- For NEC-compliant grounding, use size 14 AWG (2 mm2) or larger copper wire and a ring terminal with an inner diameter of 1/4 in. (5 to 7 mm).

- For EN/IEC 60950-compliant grounding, use size 18 AWG (1 mm2) or larger copper wire.

Warning   **This equipment needs to be grounded. Use a green and yellow 12 to 14 AWG ground wire to connect the host to earth ground during normal use.** Statement 242

To install the ground connection, follow these steps:

Step 1   Strip one end of the ground wire to the length required for the terminal.

Step 2   Crimp the ground wire to the ring terminal using the wire crimper.

Step 3   If you choose to install the power switch lock, perform Step 5 to Step 7.

If you choose not to install power switch lock, perform Step 4 and Step 6 to Step 7.

Step 4   Attach the ring terminal to the chassis. Use the single screw provided. Tighten the screws to a torque of 8 to 10 inch-pound (0.9 to 1.1 newton meter). (See Figure 2-9.)

Figure 2-9   Chassis Ground Connection Using Ring Terminal
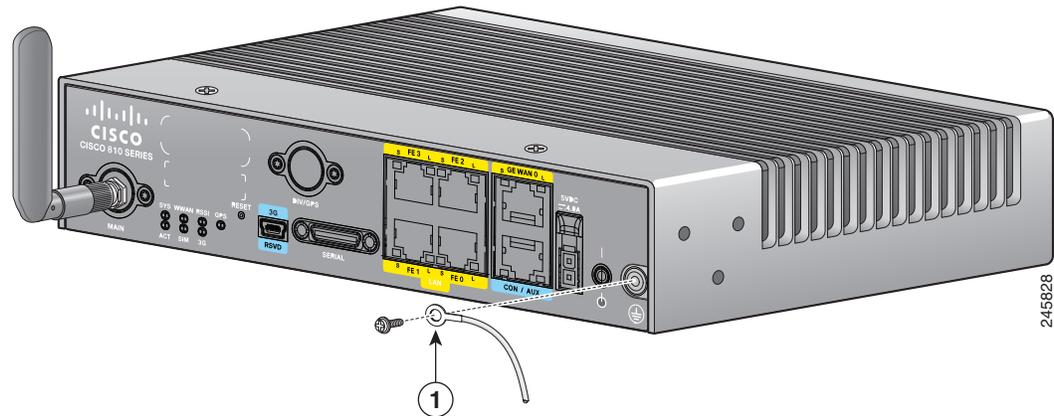
1	Ring terminal		

Step 5   Install the power switch lock, see the "Installing the Power Switch Lock" section on page 2-15. Tighten the screws to a torque of 8 to 10 in-lb (0.9 to 1.1 N-m). Torque the hex standoff to the same torque.

Step 6   Connect the other end of the ground wire to a known reliable earth ground point at your site.

Step 7   If you are using this router in a vehicle, attach the ring terminal to the chassis using one of the screws provided and the green or green and yellow striped wire. Connect the other end of the wire to the vehicle ground.

After you install and properly ground the router, you can connect the power wiring, the LAN cables, and the cables for administrative access as required for your installation.

Installing the Power Cord Retention Lock

The Cisco 819 ISRs have a power cord retention mechanism as an accessory. It locks the power cord to the router so when a user accidentally pulls out the power cord, the power cord will not come out from the router. For the complete list of Cisco 819 ISRs that support power cord retention lock, see Table 1-4.

This section describes how to install the power cord retention lock.

Step 1   Pre-assemble the o-ring onto the barrel of the power cord as shown in Figure 2-10.

Figure 2-10   *Pre-assemble the O-Ring onto the Barrel*
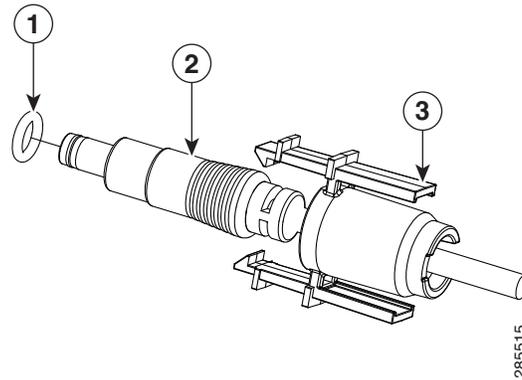
1	O-ring	3	Power cord lock
2	Power cord connector		

Step 2   Place the power cord lock onto the power cord behind the connector overmold as shown in Figure 2-11. Slide the power cord lock forward so that it captures the overmold and is fully seated.

Figure 2-11   *Place the Power Cord Lock onto the Power Cord*
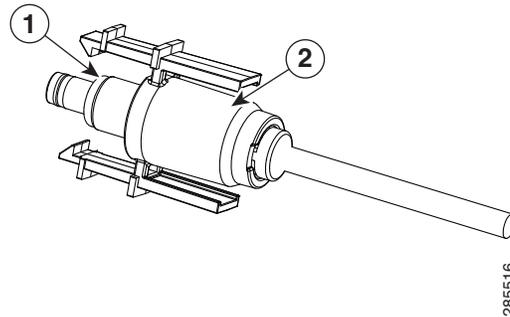
1	O-ring	2	Power cord lock

Step 3   Install the power cord with power cord lock and the pre-installed o-ring to mate with the power jack on the router while making sure that the two arms of the power cord lock slide into the corresponding slots on the router and are fully seated with both arms locking into the slots as shown in Figure 2-12.

Figure 2-12   Installing Power Cord Lock onto the Router
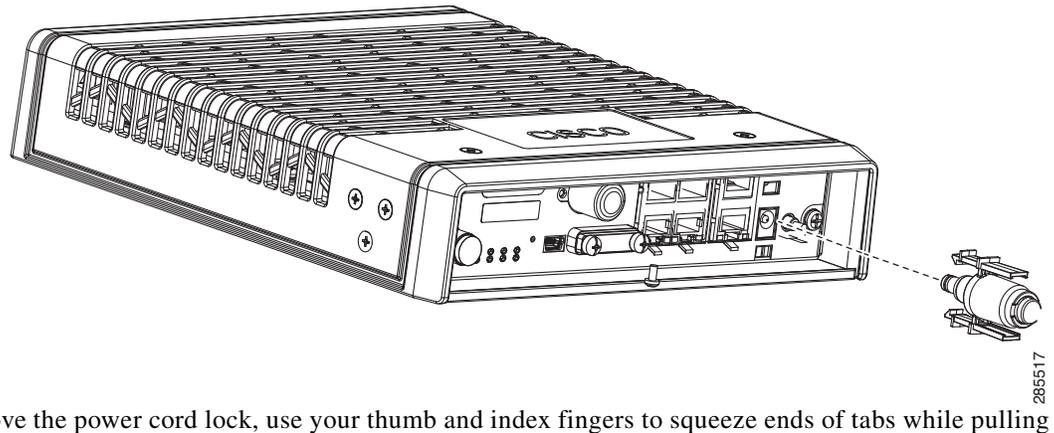
Step 4   To remove the power cord lock, use your thumb and index fingers to squeeze ends of tabs while pulling away from the router. (See Figure 2-13.)

Figure 2-13   End of Tabs
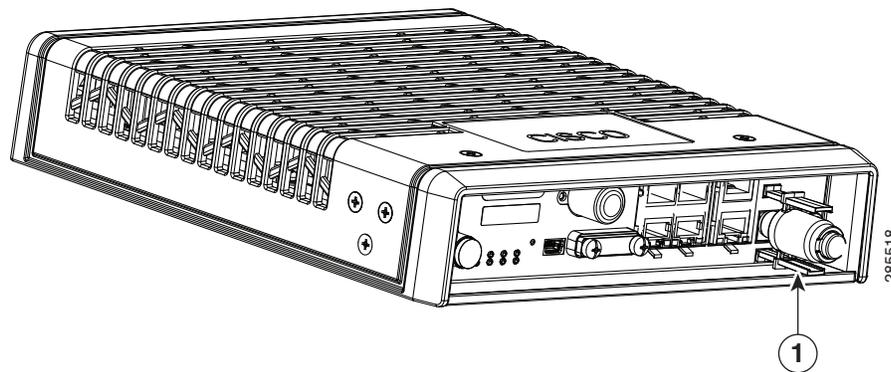
1	End of tabs

Installing the Power Switch Lock

The Cisco 819 ISRs have a power switch lock as an accessory. The power switch lock prevents unauthorized access to a tampered proof router (for example, router in a bus). For the complete list of Cisco 819 ISRs that support power switch lock, see Table 1-4.

This section describes how to install the power switch lock.

Step 1   Install the power switch lock by following the parts listed in Figure 2-14. All these parts are in the accessory kit in their own bag. The ring terminal does not have to be installed. Figure 2-15 shows the power switch lock installed.

Figure 2-14   *Installing Power Switch Lock*
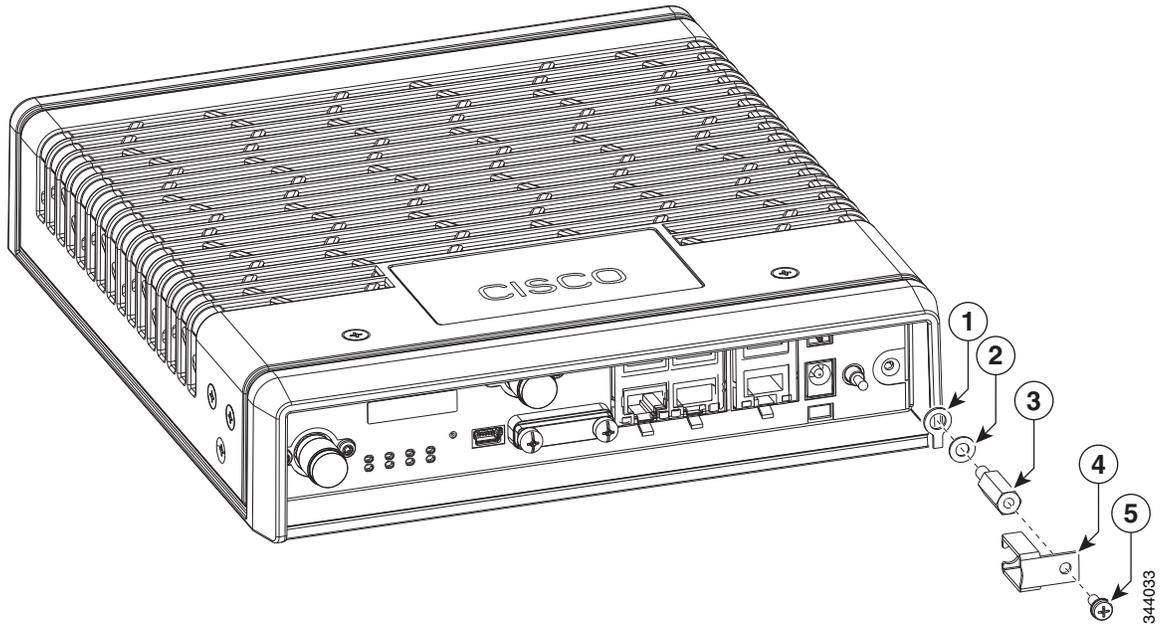
1	Ring terminal	**4**	Power switch lock
2	Power switch lock washer	**5**	Pan-head screw
3	Power switch lock standoff		

Figure 2-15   *Power Switch Lock Installed*
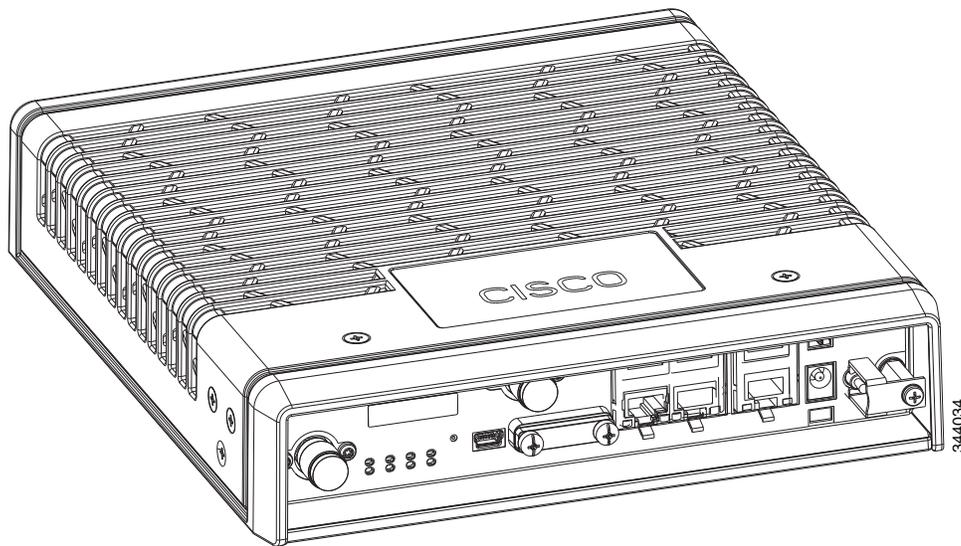
Mounting the DC Power Supply

Warning   **Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system.** Statement 378

The Cisco 800 ISR DC power supply may be mounted to a wall using four #6 pan- or round-head wood screws for the mounting holes on the supply.

Caution   Each mounting screw must go into a wall stud (wood) or a wall anchor of the appropriate type for the wall. Screws into drywall is not sufficient to support the DC power supply.

For attaching to a wall stud, the power supply requires #6 wood screws (round- or pan-head). The screws must be long enough to penetrate and tap at least 0.75 inches (19.1 mm) into the supporting wood or metal wall stud.

For hollow-wall mounting, the power supply requires the use of appropriate-sized wall anchors that work with the drywall thickness the unit is to be installed in. Use hollow-wall anchors that support using #6 screws and use #6 pan- or round-head screws to secure the power supply to the wall. Each wall anchor should be rated for at least 30 lbs.

Caution   If the screws are not properly anchored, the strain of the DC supply cables could pull the router from the wall.

Figure 2-16   DC Power Supply Wall-Mounting Features
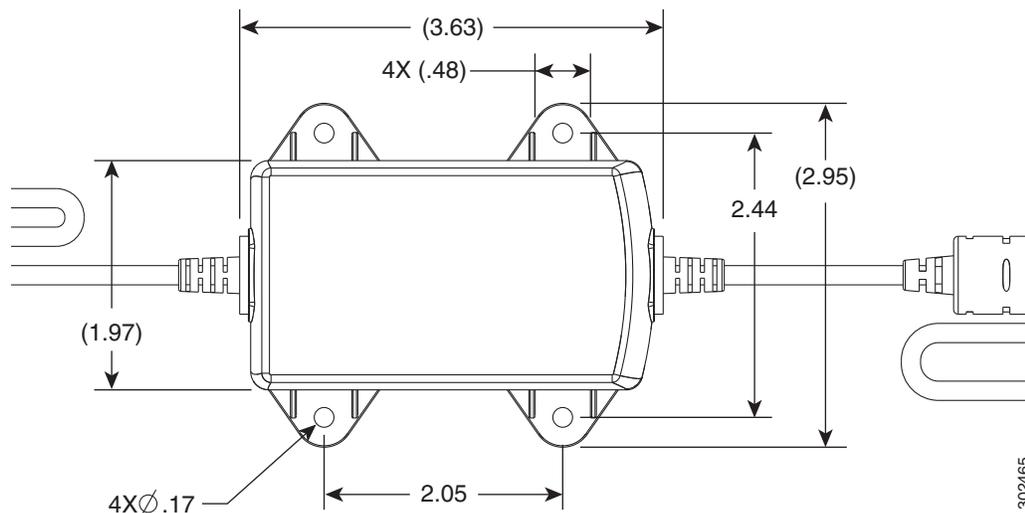
To mount the DC power supply to the wall, follow these instructions:

Step 1   Install the four screws into the mounting holes on the DC power supply (see Figure 2-16) before being secured to the wall studs or wall anchors.

Step 2   Hang the DC power supply by securing the screws to the wall stud or into the wall anchors.

Note   The DC supply is IP 41 compliant in all six orthogonal directions. The mounting orientation will not affect IP 41 compliance.

C H A P T E R **3**

Connecting the Router

This chapter describes how to connect Cisco 819 Integrated Services Router (ISRs) to Ethernet devices and a network. The chapter contains the following sections:

- Preparing to Connect the Router, page 3-1
- Connecting a PC, Server, or Workstation, page 3-2
- Connecting an External Ethernet Switch, page 3-2
- Connecting a Terminal or PC to the Console Port, page 3-4
- Connecting a Modem to the Console Port, page 3-5
- Connecting the AC Adapter, page 3-6
- Connecting the DC Adapter, page 3-6
- Verifying Connections, page 3-8

Note For compliance and safety information, see the Regulatory Compliance and Safety Information Roadmap that ships with the router and *Regulatory Compliance and Safety Information for Cisco 800 Series and SOHO Series Routers.*

Preparing to Connect the Router

Before you connect the router to the devices, install the router according to the instructions in the "Installing the Router" section on page 2-4.

Preventing Damage to the Router

To prevent damage to your router, follow these guidelines when connecting devices to your router:

- Turn off power to the devices and to the router until all connections are completed.

Caution Do not turn on the devices until after you have completed all connections to the router.

- If you must supply your own cable, see the "Technical Specifications" section on page A-1 for cabling specifications. If this appendix does not provide specifications for a particular cable, we strongly recommend ordering the cable from Cisco.

Connecting a PC, Server, or Workstation

To connect a PC (or other Ethernet devices) to an Ethernet switch port, follow these steps:

Step 1   Connect one end of the yellow Ethernet cable to an Ethernet switch port on the router. See Figure 3-1.

Figure 3-1   Connecting a Server, PC, or Workstation
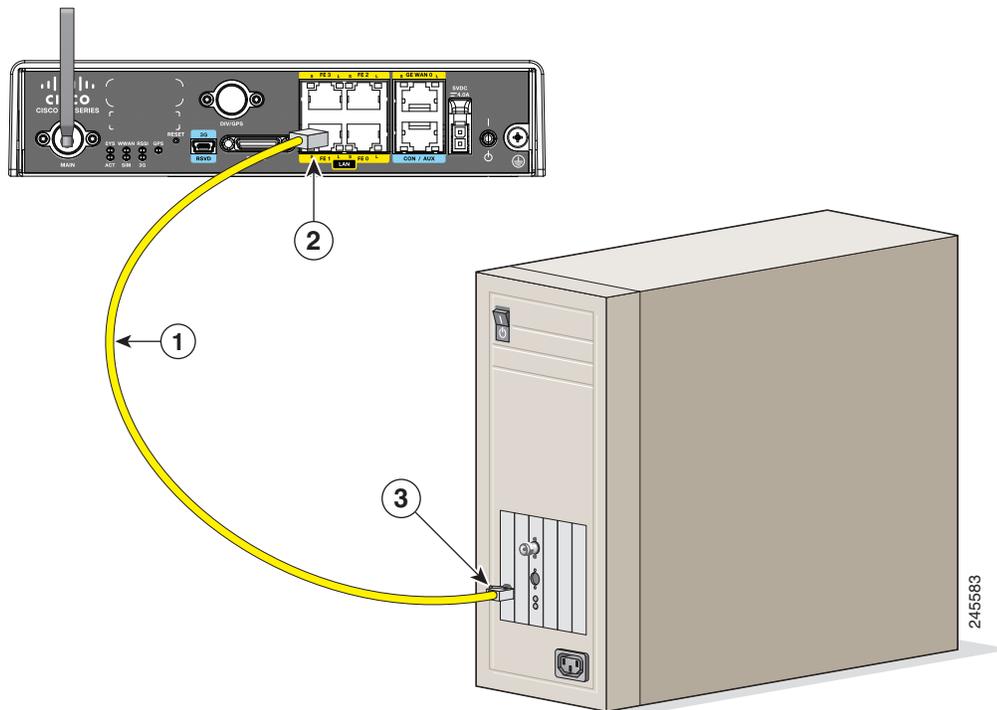
1	Yellow Ethernet cable	**3**	RJ-45 port on the network interface card
2	Ethernet switch port on the router		

Step 2   Connect the other end of the cable to the RJ-45 port on the network interface card (NIC) that is installed in the PC, server, or workstation.

Step 3   (Optional) Connect additional servers, PCs, or workstations to the other Ethernet switch ports.

Note   Use the Cisco Configuration Express to configure the Internet connection settings. See *Cisco Configuration Professional Quick Start Guide* for more information.

Connecting an External Ethernet Switch

If more than four PCs in an office must be connected to each other, you can add Ethernet connections to the router by connecting an external Ethernet switch to the Ethernet switch on the router.

To connect an external Ethernet switch to an Ethernet switch port on the router, complete the following steps:

Step 1   Connect one end of the yellow Ethernet cable to an Ethernet switch port on the router. (See Figure 3-2.)

Figure 3-2   *Connecting to an Ethernet Switch*
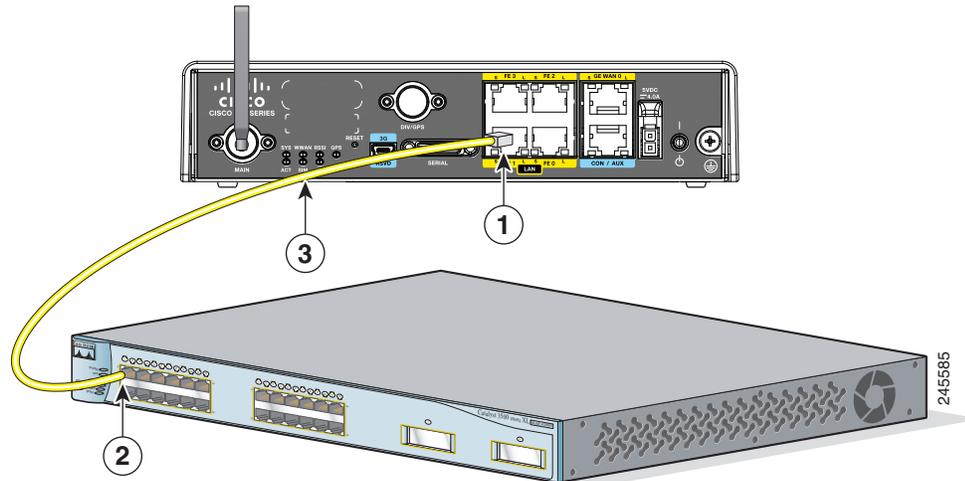
1	Ethernet switch port on the router	3	Yellow CAT5 Ethernet cable, RJ-45–to–RJ-45, connecting to an external Ethernet switch port
2	Available port on the external Ethernet switch		

Step 2   Connect the other end of the cable to the available port on the Ethernet switch to add additional Ethernet connections.

Step 3   Turn on the Ethernet switch.

Connecting a Terminal or PC to the Console Port

Connect a terminal or PC to the Console port either to configure the software by using the CLI or to troubleshoot problems with the router.

To connect a terminal or PC to the console port on the router and access the CLI, follow these steps:

Step 1   Connect the RJ-45 end of a DB-9-to-RJ-45 serial cable to the RJ-45 Console port on the router. Figure 3-3 shows the RJ-45 end of the serial cable connected to the Console port on the router.

Figure 3-3   *Connecting a Terminal or PC to the Console Port*
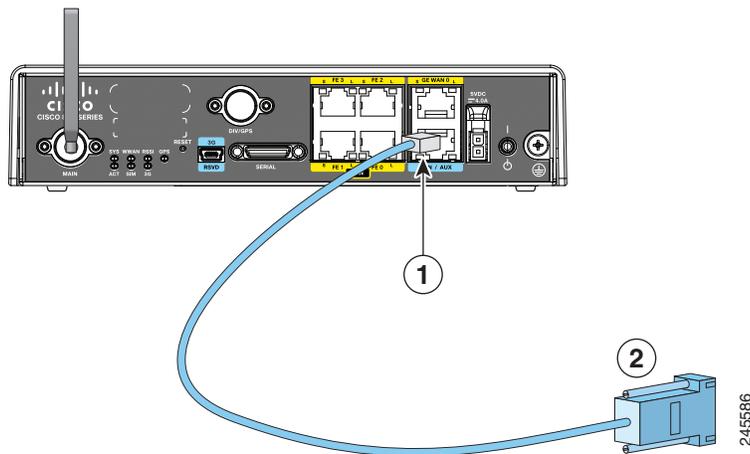
1	RJ-45 connector to the Console Aux port on the router	**2**	DB-9 connector

Step 2   Connect the DB-9 end of the DB-9-to-RJ-45 serial cable to the COM port on your laptop or PC.

Note   Some laptops and PCs do not come with DB-9 serial port connectors and may require a USB-to-serial port adapter.

Step 3   To communicate with the router, start a terminal emulator application.

Terminal Emulator Settings

Use the following settings for the terminal emulator connection:

- 9600 baud
- 8 data bits, no parity
- 1 stop bit
- No flow control

When the terminal emulator establishes communications, the router prompt is displayed.

For more information on terminal emulation settings, see *Applying Correct Terminal Emulator Settings for Console Connections.*

Connecting a Modem to the Console Port

To connect a modem to the router, follow these steps:

Step 1   Connect the RJ-45 end of the adapter cable to the Console port on the router as shown in Figure 3-4.

Figure 3-4   Connecting a Modem to the Console Port
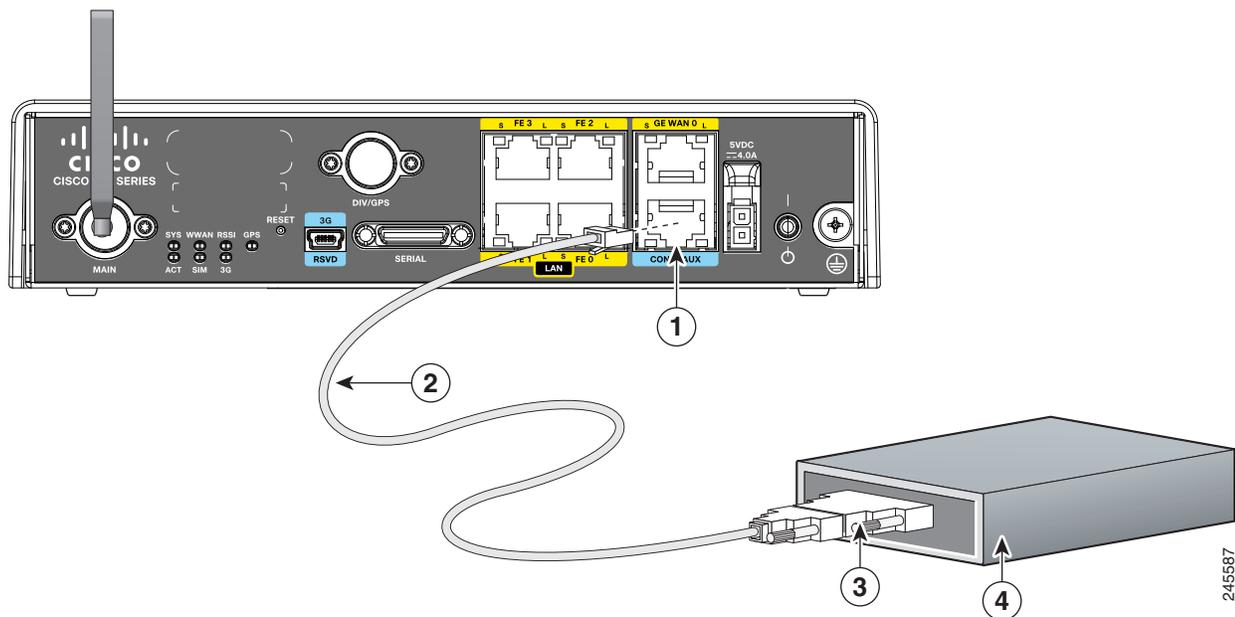
Step 2   Connect the DB-9 end of the console cable to the DB-9 end of the modem adapter.

Step 3   Connect the DB-25 end of the modem adapter to the modem.

Step 4   Make sure that your modem and the router console port are configured for the same transmission speed (up to 115200 b/s is supported) and support mode control with data carrier detect (DCD) and data terminal ready (DTR).

Connecting the AC Adapter

Warning   **The device is designed to work with TN power systems.** Statement 19

Warning   **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 120VAC, 20A U.S (240VAC, 16 to 20A international).** Statement 1005

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

To connect your Cisco 819 ISR to an AC power outlet, follow these steps:

Step 1   Connect the AC adapter to an AC power outlet.

Step 2   Plug the adapter cord into the router.

Connecting the DC Adapter

Warning   **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than 36 VDC, 5A** Statement 1005

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   **The device is designed to work with TN power systems.** Statement 19

To connect the DC power on your Cisco 819 ISR, follow these steps:

Step 1   Connect the black and white lead wires to a 12 VDC source. The black lead is negative or ground and the white lead is positive. The output cable is 1.3 meters while the input cable is 1 meter in length. (See Figure 3-5 and Figure 3-6.). For the complete list of supported power adapters, see the "Supported Power Adapters" section on page A-6.

Figure 3-5   DC Power Supply PWR1-20W-12VDC and PWR1-20W-24VDC
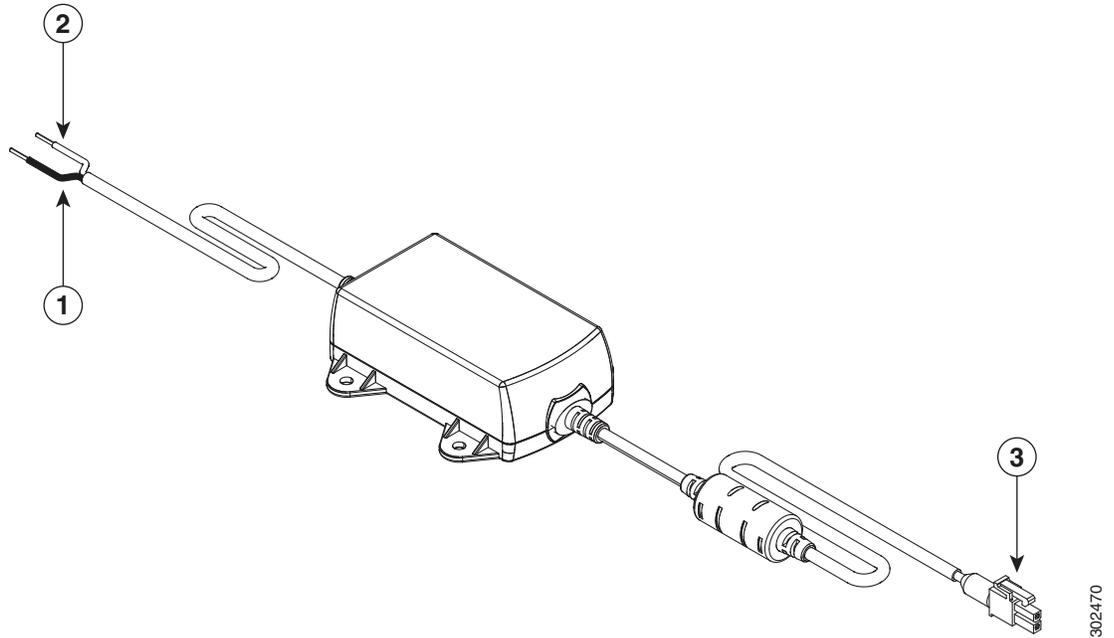
Figure 3-6   DC Power Supply PWR2-20W-12VDC and PWR2-20W-24VDC
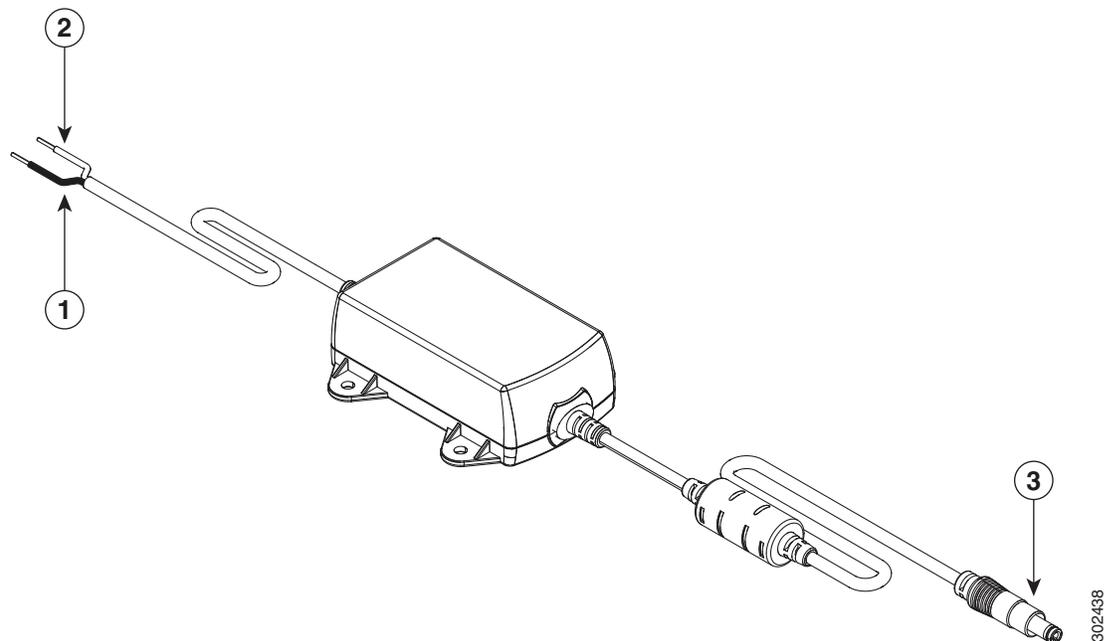
1	Black wire (negative)	**3**	Adapter
2	White wire (positive)		

Step 2   Plug the adapter cord into the router.

Verifying Connections

To verify that all devices are properly connected to the router, first turn on all the connected devices, then check the LEDs. To verify router operation, refer to Table 3-1.

For full LED description, see Table 1-5.

Table 3-1   *Verifying the Router Operation*

Power and Link	LEDs to Check	Normal Patterns
SYS	Yellow	FPGA download is complete.
	Green (blinking)	ROMMON is operational.
	Off	After powering up, when FPGA is being downloaded (in ROMMON).
ACT	Green	Network activity on FE Switch ports, GE WAN port, 3G cellular interface, and serial interfaces.
	Off	No network activity.

C H A P T E R 4

Initial Configuration

This chapter provides instructions for initial configuration of the Cisco 819 Integrated Services Routers (ISRs). For the initial configuration, we recommend using Cisco Configuration Professional (CP) Express. Cisco CP Express is a web-based GUI that guides you through initial configuration.

You may also initially configure your router by using the Cisco IOS command-line interface (CLI) or by using the setup command facility. To create the initial configuration, the setup command facility prompts you for basic information about your router and network.

This chapter contains the following sections:

Cisco Configuration Professional Express

After you connect the cables and power up the router, we recommend that you use the Cisco CP Express web-based application to configure the initial router settings.

For instructions on how to use Cisco CP Express to configure the router, see *Cisco CP Express User's Guide*.

Cisco IOS CLI

To configure the initial router settings by using the Cisco IOS CLI, you must set up a console connection. For instructions on how to set up a console connection, see the "Connecting a Terminal or PC to the Console Port" section on page 3-4.

To configure the initial router settings using the Cisco IOS CLI, follow these steps:

Step 1 Set up a console connection to your router. The following message is displayed:

```
...
router con0 is now available
```

Step 2   Press **Return**. The following message is displayed:

```
Cisco Configuration Professional Express (Cisco CP Express) is installed on this device.
This feature requires the one-time use of the username "username1"
with the password "password1." The default username and password have a privilege level of
15.

Please change these publicly known initial credentials using Cisco CP Express or the Cisco
IOS CLI.

Here are the Cisco IOS commands.

username <myuser>  privilege 15 secret 0 <mypassword>
no username username1

Replace <myuser> and <mypassword> with the username and password you want to use.

For more information about Cisco CP please follow the instructions in the QUICK START
GUIDE for your router...
...
User Access Verification
Username:
```

Step 3   Enter the username **username1** and press **Return** or **Enter**. The following prompt is displayed:

```
Password:
```

Step 4   Enter the password **password1** and press **Return** or **Enter**. The following prompt is displayed:

```
Router#
```

A message is displayed that is similar to the first warning message. The message directs you to change the username and password.

You are now in privileged EXEC mode.

✎
Note   You must change the username and password before you log off the router. You cannot use the username **username1** or password **password1** after you log off from this session.

Step 5   To change the username and password, enter the following at the prompt:

username *username* **privilege 15 secret 0** *password*

The *username* and *password* are the username and password that you determine.

To continue using the Cisco IOS CLI for initial configuration, see the applicable configuration procedures in *Cisco 819 Integrated Services Routers Software Configuration Guide*.

✎
Note   Save your configuration changes regularly to avoid losing them during resets, power cycles, or power outages. Use the **copy running-config startup-config** command at the privileged EXEC mode prompt (Router#) to save the configuration to NVRAM.

Step 6   Verify the initial configuration. See the .

Setup Command Facility

The setup command facility guides you through the configuration process by prompting you for the specific information that is needed to configure your system. Use the setup command facility to configure a hostname for the router, to set passwords, and to configure an interface for communication with the management network.

To use the setup command facility, you must set up a console connection with the router and enter the privileged EXEC mode.

To configure the initial router settings by using the setup command facility, follow these steps:

Step 1   Set up a console connection to your router, and enter privileged EXEC mode. For instructions on how to enter privileged EXEC mode, see Step 1 through Step 4 in the "Cisco IOS CLI" section on page 4-1.

Step 2   In privileged EXEC mode, at the prompt, enter **setup**.

```
yourname# setup
```

The following message is displayed:

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

Continue with configuration dialog? [yes/no]:
```

You are now in the setup command facility.

The prompts in the setup command facility vary, depending on your router model, on the installed interface modules, and on the software image. The following steps and the user entries (in **bold**) are shown as examples only.

> **Note**   If you make a mistake while using the setup command facility, you can exit and run the setup command facility again. Press **Ctrl-C** and enter the **setup** command at the privileged EXEC mode prompt (Router#). For more information on using the setup command facility, see "The Setup Command" chapter in *Cisco IOS Configuration Fundamentals Command Reference, Release 12.2T*.

Step 3   To proceed using the setup command facility, enter **yes.**

```
Continue with configuration dialog? [yes/no]: yes
```

Step 4   When the following messages appear, enter **yes** to enter basic management setup.

```
At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.

Default settings are in square brackets '[]'.

Basic management setup configures only enough connectivity
for management of the system, extended setup will ask you
to configure each interface on the system

Would you like to enter basic management setup? [yes/no]: yes
```

Step 5   Enter a hostname for the router (this example uses Router).

```
Configuring global parameters:
Enter host name [Router]: Router
```

Step 6   Enter an enable secret password. This password is encrypted (more secure) and cannot be seen when viewing the configuration.

```
The enable secret is a password used to protect access to
privileged EXEC and configuration modes. This password, after
entered, becomes encrypted in the configuration.
Enter enable secret: xxxxxx
```

Step 7   Enter an enable password that is different from the enable secret password. This password is *not* encrypted (less secure) and can be seen when viewing the configuration.

```
The enable password is used when you do not specify an
enable secret password, with some older software versions, and
some boot images.
Enter enable password: xxxxxx
```

Step 8   Enter the virtual terminal password, which prevents unauthenticated access to the router through ports other than the console port.

```
The virtual terminal password is used to protect
access to the router over a network interface.
Enter virtual terminal password: xxxxxx
```

Step 9   Respond to the following prompts as appropriate for your network:

```
Configure SNMP Network Management? [yes]:
    Community string [public]:
```

A summary of the available interfaces is displayed.

Step 10   Choose one of the available interfaces for connecting the router to the management network.

```
Enter interface name used to connect to the
management network from the above interface summary: fastethernet4
```

Step 11   Respond to the following prompts as appropriate for your network:

```
Configuring interface FastEthernet0:
Use the 100 Base-TX (RJ-45) connector? [yes]: yes
Operate in full-duplex mode? [no]: yes
Configure IP on this interface? [yes]: yes
    IP address for this interface: 172.1.2.3
    Subnet mask for this interface [255.255.0.0] : 255.255.0.0
    Class B network is 172.1.0.0, 26 subnet bits; mask is /16
```

The configuration is displayed:

```
The following configuration command script was created:

hostname Router
enable secret 5 $1$D5P6$PYx41/lQIASK.HcSbfO5q1
enable password xxxxxx
line vty 0 4
password xxxxxx
snmp-server community public
!
no ip routing
!
interface FastEthernet0
no shutdown
speed 100
duplex auto
ip address 172.16.2.3 255.255.0.0
!
```

Step 12   Respond to the following prompts. Enter **2** to save the initial configuration.

```
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]: 2
Building configuration...
Use the enabled mode 'configure' command to modify this configuration.

Press RETURN to get started! RETURN

The user prompt is displayed.
Router>
```

Step 13   Verify the initial configuration. See the "Verifying the Initial Configuration" section on page 4-5 for verification procedures.

After the initial configuration file is created, you can use the Cisco IOS CLI to perform additional configuration.

Verifying the Initial Configuration

To verify that the new interfaces are operating correctly, perform the following tests:

- To verify that the interfaces and line protocol are in the correct state—up or down—enter the **show interfaces** command.
- To display a summary status of the interfaces configured for IP, enter the **show ip interface brief** command.
- To verify that you configured the correct hostname and password, enter the **show configuration** command.

After you complete and verify the initial configuration, you can configure your Cisco router for specific functions.

APPENDIX A

Technical Specifications

This appendix provides router, port, cabling specifications, and power adapters for the Cisco 819 Integrated Services Router (ISRs) and contains the following sections:

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

Note For compliance and safety information, see the Regulatory Compliance and Safety Information Roadmap that was shipped with the router and *Regulatory Compliance and Safety Information for Cisco 800 Series and SOHO Series Routers.*

Router Specifications

Table A-1 lists the operational limits of the Cisco 819 ISR. Operating the router outside of the limits specified is not supported. For the complete list of SKUs available for each Cisco 819 ISRs, see the "SKU Information" section on page 1-5.

Table A-1   Cisco 819 ISR Specifications

Description	Hardened Design Specification (Cisco 819HG and Cisco 819HG-4G ISRs)	Non-Hardened Design Specifications (Cisco 819G and Cisco 819G-4G ISRs)	Hardened Design Specifications (C819HGW and C819HWD ISRs)
Physical Characteristics			
Dimensions (H x W x D)	1.73 x 7.7 x 8.1 in (44 x 196 x 206 mm)	1.67 x 7.7 x 7.2 in (42 x 196 x 183 mm)	1.73 x 7.7 x 9.0 in (44 x 196 x 229 mm)
Weight	3.2 lb (1.5 kg)	2.3 lb (1.0 kg)	3.4 lb (1.54 kg)

Table A-1   Cisco 819 ISR Specifications (continued)

Description	Hardened Design Specification (Cisco 819HG and Cisco 819HG-4G ISRs)	Non-Hardened Design Specifications (Cisco 819G and Cisco 819G-4G ISRs)	Hardened Design Specifications (C819HGW and C819HWD ISRs)
Maximum Power Consumption	11 W		20 W
Environmental Operating Ranges			
Operating Temperature and Altitude	–13 to 140°F (–25 to 60°C)	32 to 104°F (0 to 40°C)	–13 to 140°F (–25 to 60°C)
	Derate max operating temperature 1.5°C per 1000 feet above 5000 ft		
	10,000 ft maximum		
Humidity	Maximum 95% non-condensing RH	Maximum 85% non-condensing RH	Maximum 95% non-condensing RH
Environmental Tests			
Ingress Protection Rating	IP 41 per IEC 60529 for Vertical Falling Water, Pollution Degree 3	IP 20 per IEC 60529	IP 41 per IEC 60529 for Vertical Falling Water, Pollution Degree 3
Humidity	Non-condensing Relative Humidity: 5% to 95%		
Pollution	Pollution 3 for Dust		
Military Standard	MIL-STD-810G Method 514.6: Procedure 1 Category 4, Secured Cargo - Common Carrier		
	MIL-STD-810G Method 514.6: Procedure 1 Category 20, Ground Vehicles		
	MIL-STD-810G Method 516.6. Procedure 1, Functional Shock		
	MIL-STD-810G Method 516.6. Procedure 5, Crash Hazard		
	MIL-STD-810G Method 516.6. Procedure 6, Bench Handling		
Vibration and Shock (Railway Vehicles)	EN61373 Functional Random Vibe - Category 1, Class B		
	EN61373 Simulated Non-op Long-life Vibe - Category 1, Class B		
	EN61373 Non-op Shock, Class B		
Heavy-Duty Vehicle Applications	SAE J1455 Operating Random Vibe, Cab Mounted Truck		
	SAE J1455 Operating Sinusoidal Vibe, Category 3		
	SAE J1455 Non-operating Sinusoidal Vibe, Category 3		
	SAE J1455 Handling Drop Test		
Certifications			
Standard Safety Certifications	UL 60950-1, 2nd edition; CAN/CSA C22.2 No. 60950-1, 2nd edition, EN 60950-1, 2nd edition; CB to IEC 60950-1, 2nd edition with all group differences and national deviations		UL 60950-1, 2nd edition; CAN/CSA C22.2 No. 60950-1, 2nd edition, EN 60950-1, 2nd edition; CB to IEC 60950-1, 2nd edition with all group differences and national deviations; S/NZS 60950-1, first edition (Australia/New Zealand)

Table A-1   Cisco 819 ISR Specifications (continued)

Description	Hardened Design Specification (Cisco 819HG and Cisco 819HG-4G ISRs)	Non-Hardened Design Specifications (Cisco 819G and Cisco 819G-4G ISRs)	Hardened Design Specifications (C819HGW and C819HWD ISRs)
EMC Emissions	EN55022/CISPR22, CFR 47 Part 15, ICES003, VCCI-V-3, AS/NZS CISPR22, CNS13438, CISPR22, CNS13438, EN300-386, EN61000-3-2, EN61000-3-3, and EN61000-6-1		
EMC Immunity	EN55024/CISPR24, (EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11), and EN300-386		
Radio Immunity	EN301 489-1, EN 301 489-7, and EN301 489-24		
Transportation/Storage Conditions			
Temperature	–40 to158°F (–40 to 70°C)		–40 to185°F (–40 to 85°C)
Humidity	5–95%		
Altitude	4570 m (15,000 ft)		
Router AC Power Adapter[1]			
Input Voltage	85–264 VAC 100–240 VAC nominal		
Maximum Power Consumption	25 W		
Maximum Output Power Rating	20 W (5 VDC, 4 Amps)		
Router DC Power Adapter			
Input Voltage	12 VDC nominal PWRx-20W-12VDC (10 VDC to 36 VDC operating range) 24 VDC nominal PWRx-20W-24VDC (18 VDC to 75 VDC operating range)		
Maximum Power Consumption	25 W		
Maximum Output Power Rating	20 W (5 VDC, 4 Amps)		
Altitude	Operating: –500 to 10,000 ft, de-rating operating temperature 1°C per 1,000 feet Non-operating: –1,000 to 30,000 ft		
Cable Length	Input cable: 1 m Output cable: 1.3 m		
Inrush Current	50 A @ 25°C		
Temperature	Operating: –30 to 60°C, still air condition Non-operating: –40 to 85°C		
Humidity	Operating: 10% to 95%, non-condensing Non-operating: 10% to 95%, non-condensing		

Table A-1   Cisco 819 ISR Specifications (continued)

Description	Hardened Design Specification (Cisco 819HG and Cisco 819HG-4G ISRs)	Non-Hardened Design Specifications (Cisco 819G and Cisco 819G-4G ISRs)	Hardened Design Specifications (C819HGW and C819HWD ISRs)
Thermal Shock	Operating: –20 to 60°C at 0.5°C per minute		
	Non-operating: –40 to 85°C with change over time between 2 and 3 minutes.		
Vibration	Operating: 0.41 grms from 3 to 500 Hz with spectral break points of 0.0005 g2/Hz at 10 Hz and 200 Hz and 5 dB/octave roll off at each end; 2 hours per axis.		
	Non-Operating: 1.12 grms from 3 to 500 Hz with spectral break points of 0.0065 g2/Hz at 10 Hz and 100 Hz and 5 dB/octave roll off at each end; 30 minutes per axis.		
Shock	Half sine (operating): Duration = <2ms Velocity = 2.11m/s Number of shocks: a series of 6 shocks one on each side		
	Trapezoidal shock (non-operating): Duration = 12 to 25 ms Number of shocks: a series of 6 shocks one on each side		
Martek Railway Power Adapters[2]			
Nominal Input Voltages	—	—	24 V 52 V 72 V
In-ceiling Plenum	—	—	No
IP 65	—	—	Yes
Extended Shock-vibe	—	—	Yes EN50155 (EN61373) and RIA20
Maximum Power Consumption	—	—	25 W
Maximum Output Power Rating	—	—	20 W
Operating Temperature	—	—	–13 to 140°F (–25 to 60°C)
Antenna (Diversity and Antenna 3G-ANTM1919D)			
Antenna Dimensions	7.63 x 0.94 x 0.63 in (19.38 x 2.39 x 1.60 cm)		
Frequency Range	806 to 960 MHz and 1710 to 2170 MHz		
Gain	0 decibels relative to isotropic (dBi) (806 to 960 MHz) and 0 dBi (1710 to 2170 MHz)		
Maximum Power	25 W		
Connector	TNC male		
Voltage Standing Wave Ratio	< 2.5:1		
Nominal Impedance	50 ohms		

1. AC Power Adapter is not IP 41 rated. Installation must include protection of the adapter and power plug from water.
2. Contact Martek Power directly for details.

Mean Time Between Failure Ground Benign Environment

Table A-2 lists the Mean Time Between Failire (MTBF) values for Cisco 819 ISRs. The MTBF is calculated based on the Ground Benign condition. The values may be adjusted based on the different router usage.

Table A-2   MTBF Values

SKUs	MTBF (hours)
Cisco 819HG and Cisco 819G ISRs	
C819HG-U-K9 C819G-U-K9	380,000
C819HG+7-A-K9 C819HG+7-K9 C819G+7-A-K9 C819G+7-K9	420, 000
C819HG-S-K9 C819HG-V-K9 C819HG-B-K9 C819G-S-K9 C819G-V-K9 C819G-B-K9	280, 000
Cisco 819HGW, Cisco 819HWD, and Cisco 819H ISRs	
C819HGW-S-A-K9 C819HGW-V-A-K9	220,000
C819HGW+7-E-K9 C819HGW+7-N-K9 C819HGW+7-A-A-K9	293,000
C819HWD-E-K9 C819HWD-A-K9	630,000
C819H-K9	1,000,000
Cisco 819HG-4G and Cisco 819G-4G ISRs	
C819HG-4G-V-K9 C819G-4G-V-K9	214,000

Table A-2   MTBF Values (continued)

SKUs	MTBF (hours)
C819HG-4G-A-K9 C819G-4G-A-K9	226,000
C819HG-4G-G-K9 C819G-4G-G-K9	293,000

Supported Power Adapters

Table A-3 and Table A-4 list the supported power adapters for Cisco 819 ISRs. The PWR1 AC and DC adapters uses molex connector while PWR2 uses barrel-type connector.

Note The 24 VDC and Martek power adapters will be available on Q1CY13[1].

Table A-3   Cisco 819G ISR Power Adapters

Power Adapter	Nominal Input Range	C819G-4G-A-K9 C819G-4G-V-K9 C819G-4G-G-K9 (4G LTE SKUs)	C819G+7-K9 C819G-B-K9 C819G-S-K9 C819G-U-K9 C819G-V-K9 (3GSKUs)
PWR1-20W-AC	100–240 VAC	—	Yes
PWR2-20W-AC	100–240 VAC	Yes	—
PWR1-20W-12VDC	12 VDC	—	Yes
PWR2-20W-12VDC	12 VDC	Yes	—
PWR1-20W-24VDC	24 VDC	—	Yes
PWR2-20W-24VDC	24 VDC	Yes	—
Martek MBRH 0500-B/V1	24 VDC	—	Yes
Martek MBRH 0500-C/V1	52 VDC	—	Yes
Martek MBRH 0500-D/V1	72 VDC	—	Yes
Martek MBRH 0500-B/V2	24 VDC	Yes	—
Martek MBRH 0500-C/V2	52 VDC	Yes	—
Martek MBRH 0500-D/V2	72 VDC	Yes	—

1. Quarter 1 Calendar Year 2013.

Table A-4   *Cisco 819H ISR Power Adapters*

Power Adapter	Nominal Input Range	C819HG-4G-A-K9 C819HG-4G-V-K9 C819HG-4G-G-K9 (4G LTE SKUs)	C819HG+7-K9 C819HG-B-K9 C819HG-S-K9 C819HG-U-K9 C819HG-V-K9 (3G SKUs)	C819HGW-S-A-K9 C819HGW-V-A-K9 C819HGW+7-E-K9 C819HGW+7-N-K9 C819HGW+7-A-A-K9 (3G + WiFi SKUs)	C819HWD-E-K9 C819HWD-A-K9 (WiFi SKUs)	C819H-K9 (Serial SKU)
PWR1-20W-AC	100–240 VAC	—	Yes	—	—	—
PWR2-20W-AC	100–240 VAC	Yes	—	Yes	Yes	Yes
PWR1-20W-12VDC	12 VDC	—	Yes	—	—	—
PWR2-20W-12VDC	12 VDC	Yes	—	Yes	Yes	Yes
PWR1-20W-24VDC	24 VDC	—	Yes	—	—	—
PWR2-20W-24VDC	24 VDC	Yes	—	Yes	Yes	Yes
Martek MBRH 0500-B/V1	24 VDC	—	Yes	—	—	—
Martek MBRH 0500-C/V1	52 VDC	—	Yes	—	—	—
Martek MBRH 0500-D/V1	72 VDC	—	Yes	—	—	—
Martek MBRH 0500-B/V2	24 VDC	Yes	—	Yes	Yes	Yes
Martek MBRH 0500-C/V2	52 VDC	Yes	—	Yes	Yes	Yes
Martek MBRH 0500-D/V2	72 VDC	Yes	—	Yes	Yes	Yes