



Cisco 809 Industrial Integrated Services Router Hardware Installation Guide

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- Increase the separation between the equipment and receiver.
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- Consult the dealer or an experienced radio/TV technician for help.

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Preface

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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.

Objective

This guide provides an overview and explains how to install, connect, and perform initial configuration for the Cisco 809 ISR. Previous versions of this guide contained additional configuration information which has now been relocated to the [Cisco IR800 Integrated Services Router Software Configuration Guide](#).

Audience

This guide is intended for people who have a high level of technical ability, although they may not have experience with Cisco software.

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.

Safety Warnings

Warning	<p>IMPORTANT SAFETY INSTRUCTIONS</p> <p>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</p> <p>SAVE THESE INSTRUCTIONS</p>
Waarschuwing	<p>BELANGRIJKE VEILIGHEIDSinSTRUCTIES</p> <p>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.</p> <p>BEWAAR DEZE INSTRUCTIES</p>
Varoitus	<p>TÄRKEITÄ TURVALLISUUSOHJEITA</p> <p>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.</p> <p>SÄILYTÄ NÄMÄ OHJEET</p>
Attention	<p>IMPORTANTES INFORMATIONS DE SÉCURITÉ</p> <p>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.</p> <p>CONSERVEZ CES INFORMATIONS</p>

Warnung	<p>WICHTIGE SICHERHEITSHINWEISE</p> <p>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.</p> <p>BEWAHREN SIE DIESE HINWEISE GUT AUF.</p>
Avvertenza	<p>IMPORTANTI ISTRUZIONI SULLA SICUREZZA</p> <p>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.</p> <p>CONSERVARE QUESTE ISTRUZIONI</p>
Advarsel	<p>VIKTIGE SIKKERHETSINSTRUKSJONER</p> <p>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.</p> <p>TA VARE PÅ DISSE INSTRUKSJONENE</p>
Aviso	<p>INSTRUÇÕES IMPORTANTES DE SEGURANÇA</p> <p>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.</p> <p>GUARDE ESTAS INSTRUÇÕES</p>

¡Advertencia!	<p>INSTRUCCIONES IMPORTANTES DE SEGURIDAD</p> <p>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.</p> <p>GUARDE ESTAS INSTRUCCIONES</p>
Varning!	<p>VIKTIGA SÄKERHETSANVISNINGAR</p> <p>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.</p> <p>SPARA DESSA ANVISNINGAR</p>
Figyelem	<p>FONTOS BIZTONSÁGI ELOÍRÁSOK</p> <p>Ez a figyelmeztető jel veszélyre utal. Sérülésveszélyt rejtő helyzetben van. Mielőtt bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplő figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján kereshető meg.</p> <p>ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!</p>
Предупреждение	<p>ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ</p> <p>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.</p> <p>СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ</p>
警告	<p>重要的安全性说明</p> <p>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。</p> <p>请保存这些安全性说明</p>
警告	<p>安全上の重要な注意事項</p> <p>「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。</p> <p>これらの注意事項を保管しておいてください。</p>

주의	<p>중요 안전 지침</p> <p>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.</p> <p>이 지시 사항을 보관하십시오.</p>
Aviso	<p>INSTRUÇÕES IMPORTANTES DE SEGURANÇA</p> <p>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.</p> <p>GUARDE ESTAS INSTRUÇÕES</p>
Advarsel	<p>VIGTIGE SIKKERHEDSANVISNINGER</p> <p>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.</p> <p>GEM DISSE ANVISNINGER</p>
تحذير	<p>إرشادات الأمان العامة</p> <p>يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات قبل بدء العمل، احذر مخاطر التعرض للخدمات الكهربائية وكن على علم بالإجراءات القياسية للحيولة 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</p>
Upozorenje	<p>VAŽNE SIGURNOSNE NAPOMENE</p> <p>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 upoznat i sa standardnim načinima izbjegavanja nesreća. U preveđenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.</p> <p>SAČUVAJTE OVE UPUTE</p>
Upozornění	<p>DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY</p> <p>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 seznámte 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.</p> <p>USCHOVEJTE TYTO POKYNY</p>

Προειδοποίηση	<p>ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ</p> <p>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 συνηθισμένες 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.</p> <p>ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ</p>
אזהרה	<p>הוראות בטיחות חשובות</p> <p>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.</p> <p>שמור הוראות אלה</p>
предупредување	<p>ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА</p> <p>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 секоје предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.</p> <p>ЧУВАЈТЕ ГИ ОВИЕ НАПАТСТВИЈА</p>
Ostrzeżenie	<p>WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA</p> <p>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.</p> <p>NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ</p>
Upozornenie	<p>DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY</p> <p>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.</p> <p>USCHOVAJTE SI TENTO NÁVOD</p>
Opozorilo	<p>Ta naprava mora biti ozemljena. Nikoli ne odklapljajte ozemljitve oz. upravljajte naprave, ki ni primerno ozemljena. V primeru, da niste sigurni, ali imate primerno ozemljitev, nemudoma pokličite pooblaščen električni servis ali električarja.</p>
警告	<p>重要安全性指示</p> <p>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</p>

**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**

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**

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

**Warning**

The intra-building ports of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly **MUST NOT** be metalically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to OSP wiring.

**Note**

This equipment is suitable for installation in Network Telecommunications Facilities and locations where NEC applies. This equipment is suitable for installation as part of the Common Bonding Network (CBN).

Related Documentation

- [Cisco IOS Release Notes](#)
- [Cisco IR800 Integrated Services Router Software Configuration Guide](#).
- [Getting Started and Product Document of Compliance for the Cisco IR809 Integrated Services Router](#)
 - Contains Product Compliance and Safety information as well as Declaration of Conformity
 - Hazardous Locations Standards and Marking Strings
 - EMC Information

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.



CHAPTER

1

Product Overview

This chapter provides an overview of the features available for the Cisco 809 Integrated Services Routers (ISRs).



Note

For compliance and safety information, see [Regulatory Compliance and Safety Information for Cisco 800 Series](#)

- [General Description, page 1](#)
- [SKU Information, page 7](#)
- [Hardware Features, page 8](#)
- [Supported Cisco Antennas and Cables, page 9](#)
- [Power Supply, page 16](#)
- [RJ45 Ports, page 17](#)
- [Accessories, page 18](#)

General Description

The Cisco 809 Integrated Services Router (IR809), part of the Cisco Integrated Services Routers Generation 2 (ISR G2) Family, is designed as a next generation ruggedized fixed form factor router. It is a small-form router with 4G, for use in ATM, POS, Telemetry, Billboards, Enterprise Fleet markets, Utilities and other SCADA (Supervisory Control and Data Acquisition) environments.

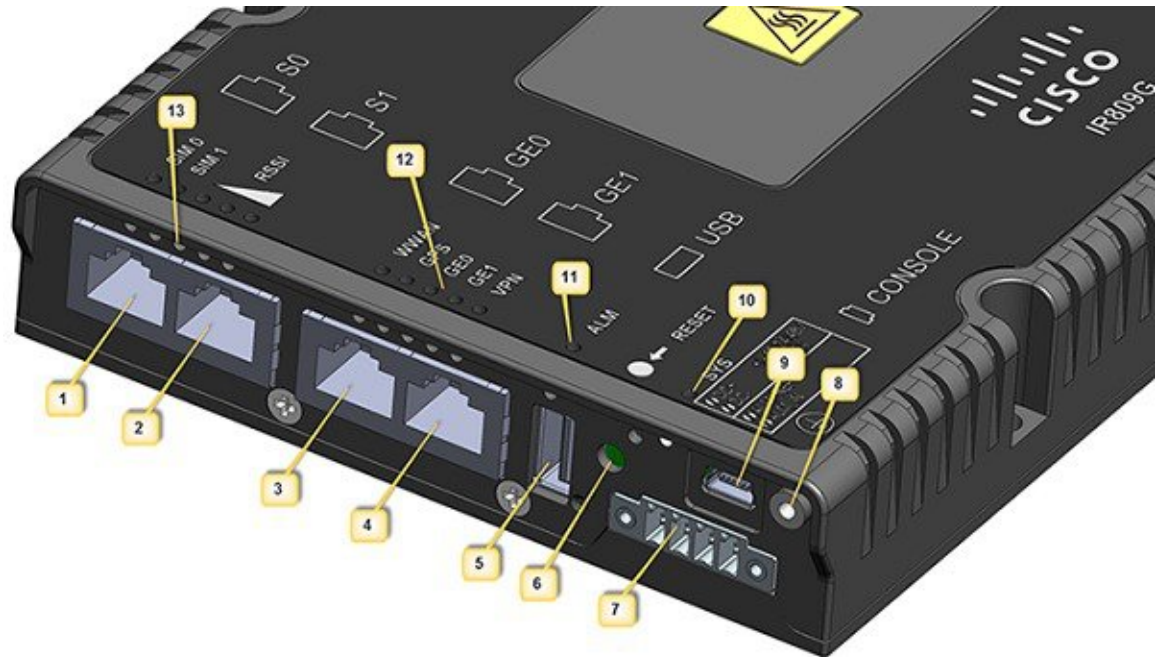
The following figure shows the IR809.

Figure 1: Cisco IR809 Integrated Services Router



The following figure shows the front panel details of the Cisco IR809.

Figure 2: Cisco IR809 Front Panel



1	S0 RS232 DCE/RS485 Combo Port	8	Grounding Point
2	S1 RS232 DTE only	9	Mini type-B USB console/debug port
3	GE0 (10/100/1000)	10	SYS LED
4	GE1 (10/100/1000)	11	Alarm LED
5	USB 2.0 (Type-A Host Port)	12	WAN/WWAN LEDs
6	RESET Button	13	SIM Card LEDs
7	DC Power/Alarm Connector		

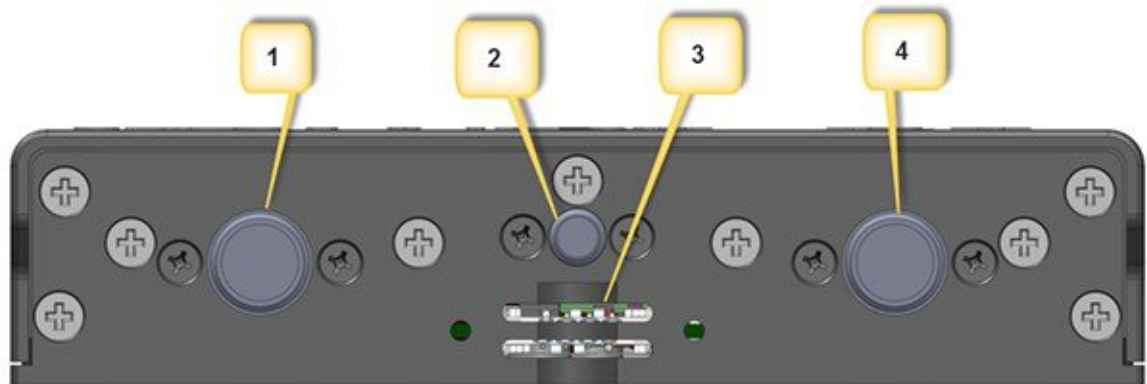


Note

LEDs are viewable from the top and from the front of the IR809.

The following figure shows the back panel details of the Cisco IR809.

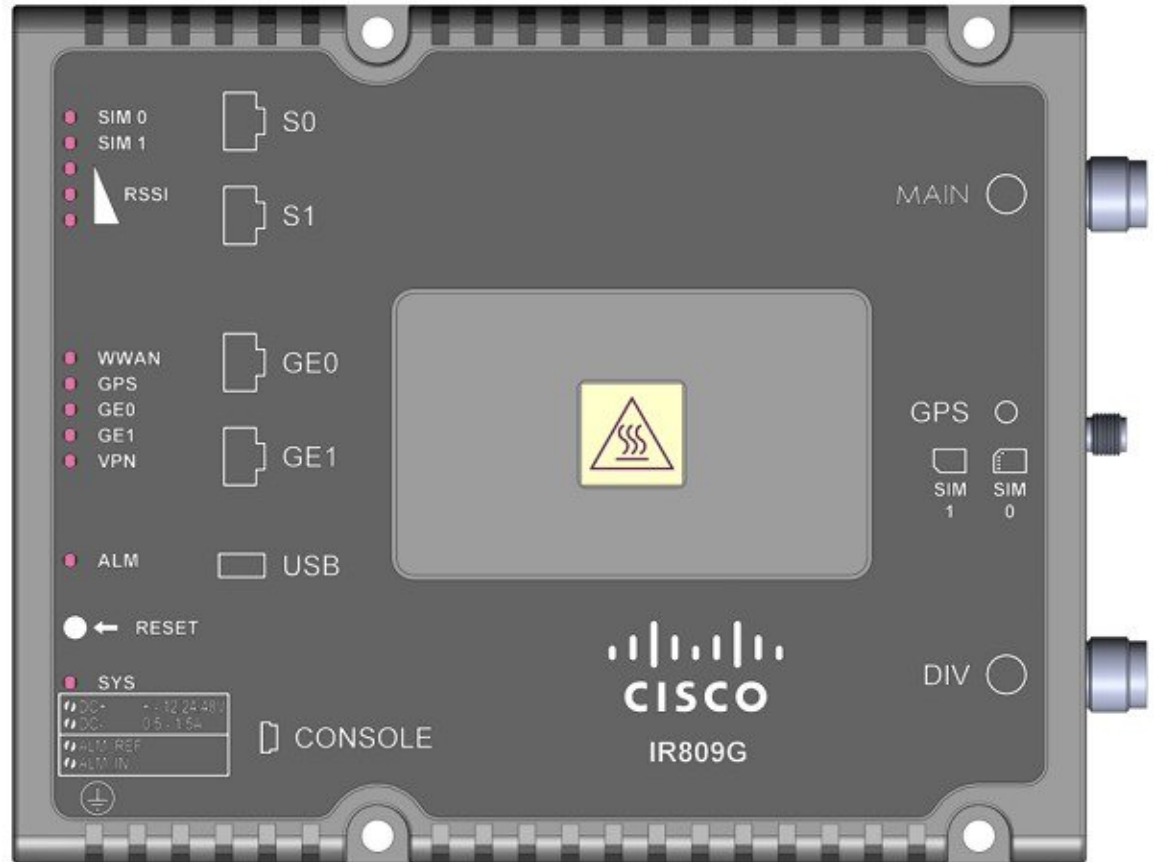
Figure 3: Cisco IR809 Back Panel



1	DIV TNC connector for 4G Modem
2	SMA connector for GPS
3	SIM0 and SIM1 Card Slots
4	MAIN TNC connector for 4G Modem

The following figure shows the top cover details of the Cisco IR809.

Figure 4: Cisco IR809 Top Cover



LEDs

The following table describes the LEDs for the Cisco 809 ISR.

Table 1: LED Descriptions

LED	Activity	Description
SYS	Power and System Status	<p>Off — No power</p> <p>Green Steady on — Normal operation</p> <p>Green Flashing — Boot up phase or in ROM Monitor mode</p> <p>Amber Steady on — Power is OK but possible internal FPGA program failure</p>

LED	Activity	Description
ALM	Alarm Input Status	Off — Normal operation Red - Alarm State on the Alarm Input
VPN_OK	VPN	Off — No VPN tunnel Steady Green — At least one VPN tunnel is up
GE0 (10/100/1000)WAN 0 GE0 (10/100/1000)WAN 1	Link Status	Off — No link Steady Green — Link is up Flashing — Transmitting and Receiving data
GPS	GPS Status	Off — GPS not configured On — GPS configured Slow Flash — GPS Acquiring in Standalone GPS Fast Flash — GPS Acquiring in Assisted GPS Note Slow Flash is defined as the LED will be on for 0.25 seconds and off for 0.75 seconds. Fast Flash is defined as the LED will be on for 0.25 seconds and off for 0.25 seconds.
WWAN	Wireless WAN Activity	Off — Modem not powered on On — Modem is powered on and connected but not transmitting or receiving Slow Blink — Modem is powered on and searching for connection Fast Blink — Modem is transmitting or receiving.
RSSI	Received Signal Strength Indication	The RSSI LEDs are a 3 LED bar graph to indicate signal strength. Their functionality is described in the RSSI LEDs table below.
SIM0/SIM1	SIM cards	Off — No USIM Green — USIM installed and active

Table 2: RSSI LEDs

RSSI	RSSI (2)	RSSI (1)	RSSI (0)
	Green	Green	Green/Amber
< -110dBm	Off	Off	Off
-110 to -90dBm	Off	Off	On - Amber
-90 to -75dBm	Off	Off	On - Green
-75 to -60dBm	Off	On - Green	On - Green
> -60dBm	On - Green	On - Green	On - Green

SKU Information

The following table lists the different SKUs available for the Cisco 809 Integrated Services Router. All SKUs support external antenna.

Table 3: Supported SKUs for Cisco IR809s

SKU ID	Description
IR809G-LTE-NA-K9	Multimode 4G/3G/2G connectivity to cellular networks operating in LTE 1900 MHz (band 2 PCS), 1700/2100 MHz (band 4 AWS), 850 MHz (band 5), 700 MHz (band 17) and 1900 MHz (band 25 extended PCS) frequencies; backward-compatible with UMTS and HSPA+: 850 MHz (band 5), 900 MHz (band 8), 1900 MHz (band 2 PCS), and 1700/2100 MHz (band 4 AWS).
IR809G-LTE-VZ-K9	Multimode 4G/3G/2G connectivity to cellular networks operating in LTE 700 MHz (band 13), 1700/2100 MHz (band 4 AWS), or 1900 MHz (band 25 extended PCS) frequencies; backward-compatible with EVDO Rev A/CDMA 1x BC0, BC1, BC10.
IR809G-LTE-GA-K9	Multimode 4G/3G/2G connectivity to cellular networks operating in LTE 800 MHz (band 20), 900 MHz (band 8), 1800 MHz (band 3), 2100 MHz (band 1), or 2600 MHz (band 7) frequencies; backward-compatible with UMTS and HSPA+: 850 MHz (band 5), 900 MHz (band 8), 1900 MHz (band 2), and 2100 MHz (band 1).

SKU ID	Description
IR809G-LTE-LA-K9	Multimode 4G/3G connectivity to cellular networks operating in FDD LTE 2100 MHz (band 1), 1800 MHz (band 3), 850 MHz (band 5), 2600 (band 7), 900 (band 8), 850 (band18, band19), 1500 (band 21), 700 (band 28) and TDD LTE 2600 (band 38), 1900 (band 39), 2300 (band 40) and 2500 (band 41); backward-compatible with WCDMA 2100 MHz (band 1), 850 MHz (band 5), 800 MHz (band 6, band 19), 900 MHz (band 8), 1700 MHz (band 9) and TD-SCDMA 1900 MHz (band 39).

Memory

The Cisco IR809 uses flash memory and main memory. The flash memory contains the Cisco IOS software image and the boot flash contains the ROMMON boot code. All memory components are factory default and not upgradeable by the end user.

The following table shows the memory allocation.

Table 4: Cisco IR809 Memory

Memory	Specification
Default and maximum DRAM	2GB
Default and maximum flash memory	8 GB eMMC (4GB usable)

Hardware Features

This section provides an overview of hardware features for the Cisco 809 ISR.

Platform Features for Cisco IR809

The following lists the hardware platform features for the Cisco IR809.

- Mechanical/Environmental
 - Form-factor, Width X Length X Height: 5.05" x 6.27" x 1.15" (12.8 x 15.9 x 2.9 cm)
 - Mounting Options: Wall, floor, cabinet, shelf, and DIN Rail mounting
 - -40C to +60C operating temperature (outside ambient)
 - 5Kft altitude
- External Power Entry
 - 9.6V to 60VDC; Nominal: 12 to 48VDC
 - 4-pin 3.8 mm EURO power connector

- External Reset/Recovery Push Button
- WWAN Modem
 - 1x Mini PCIe slot for Single multi-band 2G/3G/4G/LTE cellular modem
 - Dual internal USIM Cards (2 SIM cards). Provides reliability and multi-homing capabilities over LTE and HSPA-based networks.
- WAN Ports
 - 2x RJ45 10/100/1000 Gigabit Ethernet
- Serial Ports
 - 1 x RJ45 RS232 DTE Port
 - 1 x RJ45 RS232/RS485 DCE Port (SW-configurable)
- USB Ports
 - 1x USB2.0 Type A External Host Port
 - 1x USB2.0 Type Mini-B External Debug/Console Device Port
- Compliance
 - Telcordia GR-3108 Class 2 deployment
 - Class A EMC or better
 - RoHS6
 - IP30 compliant when vertical, IP40 compliant when mounted flat on a horizontal surface

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. The reset button works in two different manners:

- With the reset button pressed for less than 10 seconds, the IR809 will load with saved start-up configuration at that time.
- With the reset button pressed longer than 10 seconds, the NVRAM file system is erased and the IR809 boots up with Initial Configuration.

Supported Cisco Antennas and Cables

The Cisco IR809 ships without antennas. All antennas are options that can be ordered separately.

There are two TNC connectors on the backside of the device. The TNC connectors are used to connect to the 4G modem. The SMA connector is for the GPS antenna.

**Note**

Before choosing your antenna type and installation scenario, read through the following information.

This section lists the supported Antennas and Cables for the Cisco IR809. For detailed information about Cisco Antennas, please refer to the following guides:

- Connected Grid Antennas Installation Guide:
http://www.cisco.com/c/en/us/td/docs/routers/connectedgrid/antennas/installing/cg_antenna_install_guide.html
- Antennas for the Cisco 800 Series Routers:
<http://www.cisco.com/c/en/us/support/routers/800-series-routers/products-installation-guides-list.html>

**Note**

An antenna lightning arrestor must be used when an antenna is installed outdoors. Install per the country's national electrical code requirements for lightning protection. The Lightning Arrestor for LTE antenna's is CGR-LA-NF-NF or CGR-LA-NM-NF.

The following antennas and cables are available:

ANT-3-4G2G1-0

Description: Cisco Quinta 3 element 3-in-1 transportation antenna

- 2x 4G cellular, 1xGPS
- Color: Black radome
- RoHS compliant
- Environment: Outdoor

ANT-4G-OMNI-OUT-N

Description: Cisco outdoor omnidirectional antenna for 2G, 3G, and 4G LTE cellular

- UV-stable radome
- Mast-mounting bracket
- Applicable for both 2G and 3G solutions
- Domestic LTE 700 band and global LTE 2600 band
- Domestic cellular and global GSM
- WiMAX 2300 and 2500

Electrical Specifications:

- Frequency ranges: 698 to 960 MHz, 1710 to 2170 MHz, and 2300 to 2700 MHz

- Nominal gain (dBi): 698 to 960 MHz = 1.5 dBi, and 1710 to 2700 MHz = 3.5 dBi
- 3 dB beam width (E plane): 698 to 960 MHz = 81 degrees, 1710 to 2170 MHz = 75 degrees, and 2300 to 2700 MHz = 100 degrees
- 3 dB beam width (H plane): 360 degrees, omnidirectional
- Polarization: vertical and linear
- Nominal impedance: 50 ohms
- VSWR: < 2.5:1 (698 to 960 MHz) and < 2.0:1 (1710 to 2690 MHz)
- Radiation pattern: omnidirectional

Mechanical Specifications:

- Mount style: mast mount, upright position only
- Environment: outdoor
- Connector: N-type socket
- Antenna length (height): 9.8 x 1 in. (24.9 x 2.45 cm)
- Weight: 1.5 lb. (0.68 kg)
- Dimensions (H x Outside dimensions): 9.8 x 1 in. (24.8 x 24.5 mm)
- Operating temperature range: -22° to 158°F (-30° to 70°C)
- Storage temperature: -40° to 185°F (-40° to 85°C)
- Maximum power: 20W
- Radome: polycarbonate, UV, white
- Material substance compliance: ROHS compliant

ANT-4G-PNL-OUT-N

Description: Cisco multiband panel outdoor 4G LTE antenna:

- Supports 3G and 4G LTE solutions
- Multiband
- Wall mount and mast mount
- Indoor and outdoor
- Dual type-N socket connector

Electrical specifications:

- Frequency ranges: 698 to 960 MHz and 1710 to 2700 MHz
- VSWR: 2.0:1 maximum
- Gain: 5.5 to 10.5 dBi (698 to 960 MHz) and 6.5 to 9.0 dBi (1710 to 2700 MHz)

- 3-dB beam width (vertical plane): 55 to 70 degrees = 698 to 960 MHz, 53 to 98 degrees = 1710 to 2200 MHz, 60 to 70 degrees = 2200 to 2500 MHz, and 55 to 70 degrees = 2500 to 2700 MHz
- 3-dB beam width (horizontal plane): 55 to 70 degrees = 698 to 960 MHz and 50 to 90 degrees = 1710 to 2200 MHz
- F/B ratio: > 15 dB, typical 20 dB = 698 to 960 MHz, and > 17 dB, typical 23 dB = 1700 to 2700 MHz
- Isolation: > 30 dB
- Polarization: slant +/- 45 degrees
- Nominal impedance: 50 ohms
- Radiation pattern: directional

Mechanical specifications:

- Mount style: wall or mast mount
- Environment: outdoor
- Connector: dual type N female (direct connect or dual 12 in (30 cm))
- Antenna length (height): 11.6" (2.95 cm)
- Temperature Range (Operating): -22 to 158-degrees F (-30 to 70° C)
- Storage temperature: -40 to +85° C
- Wind rating: 160 km/H
- IP rating: IP54
- Radome: polycarbonate, UV resistant, white
- Material substance compliance: ROHS compliant

ANT-4G-SR-OUT-TNC

Description: Cisco integrated 4G LTE low-profile outdoor saucer antenna:

- Applicable for both 3G and 4G LTE solutions
- Domestic LTE 700 band and global LTE 2600 band
- Domestic cellular and global GSM
- Weatherproof UV stable radome
- Performance optimized
- Excellent flame rating

Electrical specifications:

- Frequency ranges: 698 to 960 MHz and 1710 to 2700 MHz
- Peak gain with 1-ft cable: 1.5 dBi (698 to 960 MHz) and 3.7 dBi (1710 to 2700 MHz)
- Peak gain with 15-ft cable: 0.8 dBi (698 to 960 MHz) and 0.2 dBi (1710 to 2700 MHz)

- Average efficiency with 1-ft cable: 90% (698 to 960 MHz) and 82% (1710 to 2700 MHz)
- Average efficiency with 15-ft cable: 60% (698 to 960 MHz) and 40% (1710 to 2700 MHz)
- Nominal impedance: 50 ohms
- VSWR (maximum): 2.0:1 (698 to 960 MHz) and 2.0:1 (1710 to 2700 MHz)

Mechanical specifications:

- H-plane 3 dB beam width: omnidirectional
- Polarization: linear and vertical
- Power: 3W
- Cable: 15-ft LMR 195
- RF connector: type N (f); TNC (plug) available
- Mount style: ceiling mount
- Radome: PC/ABS, UV stable, black
- Material substance compliance: RoHS compliant
- Operational temperature: -22° to 158°F (-30° to 70°C)
- Storage temperature: -40° to 185°F (-40° to 85°C)
- Environment: indoor
- Dimensions (H x Outside dimensions): 3.4 x 7.9 in. (87 x 200 mm)

ANT-4G-DP-IN-TNC

Description: Cisco indoor swivel-mount dipole antenna

- Low-profile blade style sheath
- Applicable for both 3G and 4G solutions
- Domestic LTE 700 and global LTE 2600 bands
- Domestic cellular and global GSM
- Conformance to RoHS
- Complete cellular and 4G data communications in a single antenna

Electrical Specifications:

- Operating frequency ranges: 698 to 806 MHz, 824 to 894 MHz, 880 to 960 MHz, 1710 to 1880 MHz, 1850 to 1990 MHz, 1920 to 2170MHz, 2100 to 2500 MHz and 2500 to 2690 MHz
- Peak gain: 0.5 dBi (698 to 960 MHz) and 2.2 dBi (1710 to 2700 MHz)
- Average efficiency: 55% (698 to 960 MHz) 73% (1710 to 2700 MHz)
- Maximum input power: 3 watts
- Voltage standing wave ratio (VSWR): < 2.5:1

- Characteristic impedance: 50 ohms
- Polarization: linear

Mechanical Specifications:

- Type: dipole
- Antenna dimensions (L x W x D): 229 mm x 30.5 mm x 15 mm
- Mount style: direct mount
- Environment: indoor
- RF Connector: TNC (m)
- Antenna weight: 49 g
- Temperature rating: -31 to 158 degrees F (-35 to +70 degrees C)
- Material substance compliance: RoHS compliant

4G-LTE-ANTM-0-3-X

Description:

- Multiband low profile indoor or outdoor omnidirectional antenna (IP67 ingress protection)
- Ceiling mount, dual 4G LTE and standalone GPS

Electrical Specifications:

- Frequency range: 698 to 960 MHz and 1710 to 2700 MHz
- Gain: 2.5 dBi
- Maximum power: 3W
- Connector: SMA with TNC male adapters, and SMA for GPS
- VSWR: < 2.5:1
- Nominal impedance: 50 ohms
- Polarization: linear vertical

Mechanical Specifications:

- Radome material: white, black, red, or blue ABS, UL-94 V0
- Cable: 4 ft RG174 VW-1 compliant
- Height and base diameter: 90 mm and 137 mm
- Temperature rating: -40° to 185°F (-40° to 85°C)
- Mounting: 5/8-inch lug with serrated face nut (5/8-inch diameter hole through mounting surface)
- Can be used with the following cable extensions: 4G-CAB-ULL-20 and 4G-CAB-ULL-50

4G-ANTM-OM-CM

Description:

- Multiband indoor omnidirectional antenna
- Ceiling mount

Electrical Specifications:

- Frequency range: 698 to 960 MHz, 1575 MHz, and 1710 to 2690 MHz
- Gain: 1 and 1.5 decibels relative to isotropic (dBi) (700 to 960 MHz), 1.7 and 3.2 dBi (1700 to 2200 MHz), 3 and 4 dBi (2500 to 2700 MHz)
- Maximum power: 50W
- Connector: TNC male
- VSWR: 2.0:1 and 3.01:1 or less for GPS
- Nominal impedance: 50 ohms
- Polarization: linear vertical

Mechanical Specifications:

- Radome material: white ABS
- Dimensions (outside dimensions x height): 5.64 in. x 2.0 in. (143.3 X 50.8 mm)
- Weight: 6.0 oz. (170.1 g)
- Temperature rating: -40° to 185°F (-40° to 85°C)
- Can be used with the following cable extensions: 3G-CAB-ULL-20 and 3G-CAB-ULL-50

Antenna Extension 4G-AE015-R

Description:

- Single-unit antenna extension base (15 ft [457.2 cm])

Electrical Specifications:

- Frequency range: 6 GHz
- Attenuation: less than 3 dB at or below 2.5 GHz
- Base connector: TNC socket
- Pigtail connector: TNC plug

Mechanical Specifications:

- Base material: Cisco gray UL94 V0 PC/ABS plastic
- Dimensions: 2.8 x 2.4 x 1.8 in. (7.1 x 6.1 x 4.6 cm)

- Weight: 6 oz. (0.17 kg)
- Cable: 15 ft. (457.2 cm) non-plenum rated Pro-Flex Plus 195

Antenna Extension 4G-AE010-R

Description:

- Single-unit antenna extension base (10 ft. [304.8 cm], one cable included)

Electrical Specifications:

- Frequency range: 6 GHz
- Attenuation: less than 3 dB at or below 2.5 GHz
- Base connector: TNC socket
- Pigtail connector: TNC plug

Mechanical Specifications:

- Base material: UL 94 V0PC and ABS plastic
- Dimensions: 2.8 x 2.4 x 1.8 in. (7.1 x 6.1 x 4.6 cm)
- Weight: 6 oz. (0.17 kg)
- Cable: 10 ft. (304.8 cm) non-plenum rated Pro-Flex Plus 195

Modem Support

The Cisco IR800 series Industrial routers use the MC73XX series modems. The software download page can be found here:

<https://software.cisco.com/download/navigator.html?mdfid=286288566&flowid=76082>

The MC73XX Firmware Upgrade Guide can be found here:

http://www.cisco.com/c/en/us/td/docs/routers/access/interfaces/firmware/Firmware_Upgrade.html

Power Supply

The Cisco IR809 comes with an external DC power connector. The 4-pin power entry connector (receptacle) is mounted to the unit. The 4-pin power entry mating connector (plug) is attached to the receptacle. It is removed during installation and used to connect to the DC power source, then reattached to provide power to the unit.

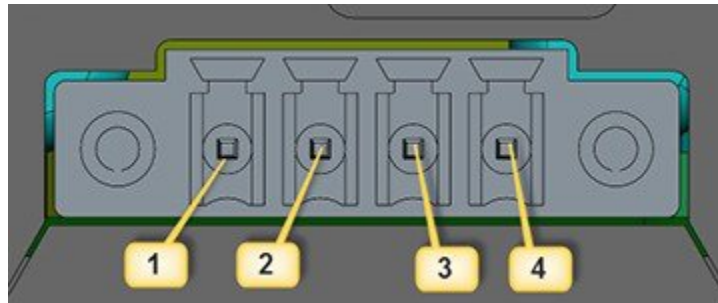
There is an optional AC power adapter with 110/220V AC and 88-300V DC input (Temperature: -40C to 60C). The part number is PWR-IE50W-AC.

**Note**

DC-Powered products have a nominal operating DC voltage of 24 and 48VDC. Reference American National Standard for Telecommunications (ATIS) 0600315.

Refer to the following figure for the location and values of the power connector.

Figure 5: Power Connector Pin-Outs



Pin Number	Name	Description	Color
1	DC In +	DC Power Positive Input	Red
2	DC In -	DC Power Return	Black
3	AC	Alarm Common	N/A
4	AI	Alarm Input	N/A

**Note**

Software support for the alarm input is not available at this time and will be available in a future release.

RJ45 Ports

Two RJ45 serial ports are provided to control and monitor RS232 or RS485 equipment. Serial port 0 can be configured for either RS232 DTE or RS485. Serial port 1 can be configured for RS232 DTE only.

The RJ45 serial ports of the IR809 match the RJ45 serial ports for the IR829 router. There is a complete section in the IR829 Hardware Installation Guide that covers port characteristics, cabling, pinouts and much more. Go to the following URL for additional information: <https://www.cisco.com/c/en/us/td/docs/routers/access/800/829/hardware/install/guide/829hwinst/pview.html#85723>

Accessories

Table 5: Cisco IR809 Accessories

Cisco Part Number	Accessory
53-100629-01	Contains Getting started with the Cisco 809 Integrated Services Router document, mounting screws and associated hardware, DC power plug, and the grounding kit.
IR809-DINRAIL	Standard DIN Rail mounting kit.
ANT-3-4G2G1-O	3 in 1 Antenna



Installing the Router

This chapter describes the equipment and the procedures for successfully installing the Cisco IR809.



Caution

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.



Caution

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



Warning

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



Warning

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



Warning

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

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

**Note**

Shielded cable (STP – shielded twisted pair) shall be used to achieve compliance for emission and immunity criteria.

**Note**

The ground lug need to be installed permanently.

- [Equipment, Tools, and Connections, page 20](#)
- [Installing the Router, page 21](#)
- [Accessing the SIM Cards, page 21](#)
- [Modems, page 22](#)
- [Installing Antennas, page 23](#)
- [Mounting on a Wall, Table, or Other Flat Surface, page 24](#)
- [Installing a DIN Rail, page 26](#)
- [Installing the Router Ground Connection, page 27](#)

Equipment, Tools, and Connections

This section describes the equipment, tools, and connections necessary for installing your Cisco 809 ISR.

Items Shipped with your Router

Unpack the box and verify that all items listed on the invoice were shipped with the Cisco 809 ISR.

The following items are shipped with your router:

- Grounding Lug Kit
- Mounting Screws
- Power Connector

Additional Items

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

- 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.
- Ethernet cables for connecting devices to the Ethernet ports.
- Ratcheting torque flathead screwdriver that exerts up to 15 in-lb (1.69 N-m) of pressure.
- A number-2 Phillips screwdriver.

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.

Installing the Router

This section describes how to install the Cisco 809 ISR. This router 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 inch on non-connector sides and 2 inches on top. 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



Warning

This equipment needs to be grounded. Use a green and yellow 14 to 18 AWG ground wire to connect the host to earth ground during normal use. Statement 242

Accessing the SIM Cards

Two USIM sockets are provided with easy access via a secured panel on the back side of the router. The SIM cards will be connected directly to the 4G radio.

This section describes how to install and/or replace a 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**

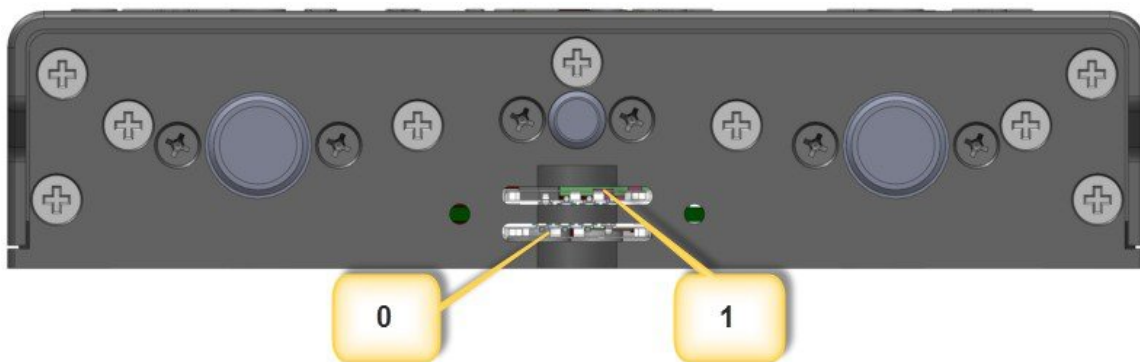
The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed. Statement 1077

**Warning**

Hot surface. Statement 1079

To access the SIM card in the Cisco IR809, 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 bottom and ensure that any installed antennas are carefully oriented or disconnected to be out of the way.
- Step 3** Remove the protective cover over the SIM slots by unscrewing the screws and setting them aside.
- Step 4** Locate the SIM card you wish to install/replace. The two slots are on the rear of the device. Slot 1 is the top and Slot 0 is the bottom. The following figure shows the slots with the protective cover removed.



- Step 5** If SIM card is present, then push the SIM card to eject it out of the slot. Install the new SIM card by pushing it into the slot until you hear a clicking sound.
- Step 6** Replace the protective cover and the screws.

Modems

There is one mini-PCIe connector to support a 4G modem. The 4G modems from Sierra Wireless MC73xx will be used:

Product	Modem Chipsets	Carrier	2G	3G (Diversity)	4G (MIMO)
MC7350	MDM9615 WTR1605L PM8018	Verizon Sprint	BC0 - CDMA -800 BC1 - CDMA -1900 BC10 - CDMA -800	BC0 - CDMA -800 BC1 - CDMA -1900 BC10 - CDMA -800	B4 - UMTS AWS B13 - UMTS-700 B25 - PCS 1900
MC7354	MDM9215 WTR1605L PM8018	ATT Canada	Quad GSM	B2 - UMTS 1900 B4 - UMTS AWS B5 - UMTS 850	B2 - UMTS 1900 B4 - UMTS AWS B5 - UMTS 850 B7 - UMTS-2600 B17 - UMTS-700
MC7304	MDM9215 WTR1605L PM8018	Europe New Zealand Australia	Quad GSM	B1 - UMTS 2100 B2 - UMTS 1900 B5 - UMTS 850 B6 - UMTS 800 B8 - UMTS 900	B1 - UMTS 2100 B3 - UMTS 1800 B7 - UMTS-2600 B8 - UMTS 900 B20 - UMTS - E800

Installing Antennas

There are two TNC connectors on the backside of the device. The TNC connectors are used to connect to the 4G modem. The SMA connector is for the GPS antenna.

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:

Before You Begin

Before you install the Cisco 809 Integrated Services Router on a table, wall, or DIN rail, install the antennas on the back panel. It is difficult to install the antennas after the router is installed.

In some cases it is necessary to install two antennas:

- Sierra Wireless MC73xx modem series supports MIMO on LTE. WCDMA UMTS HSPA DC-HSPA+ is diversity only, without MIMO.
- The IR809 must be installed with 2 antennas (Main & Aux) to guarantee the best performance level. Using a single antenna may impact downlink performance by a minimum of 3dB, and can be much more (10-20dB) due to multipath fading (destructive interference between direct and reflected radio waves).
- In case of 3G UMTS, a solo antenna would not be able to switch to the diversity port.

-
- Step 1** Manually screw the antenna tight to the TNC connectors on the back of the router.
- Step 2** Orient the antennas. For optimum wireless performance, antennas should be generally perpendicular to each other.
-

Mounting on a Wall, Table, or Other Flat Surface

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

Before You Begin

The Cisco 809 ISR has mounting holes on the bottom of the chassis for mounting the unit on a wall or other vertical surface.



Tip

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



Warning

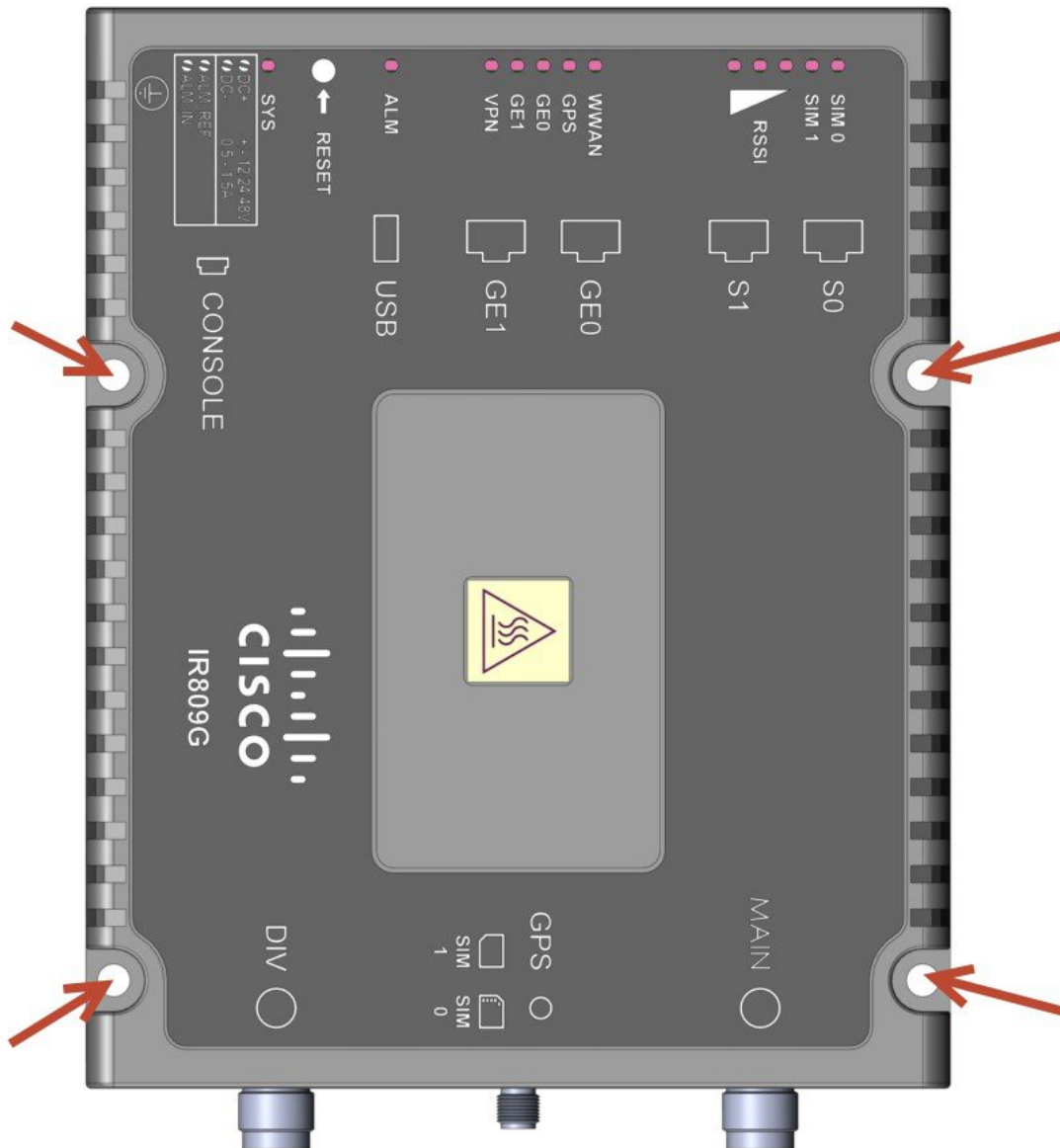
Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system. Statement 378



Note

When mounted from the back using #10 screws, the torque is 22-30 in-lbs. When mounted from front using #6 screws the torque is 8.3-11 in-lbs.

-
- Step 1** Locate the mounting holes on the router. There are 4 holes shown by red arrows in the following figure:

**Step 2**

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.

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

- Step 3** Route the cables so that they do not put a strain on the connectors or mounting hardware. To comply with IP 40, cables should be routed down relative to the router to prevent water from traveling on the cables.

Installing a DIN Rail

The DIN Rail can be installed in two different orientations. With the cable side of the device facing up or down. The DIN Rail bracket can be mounted on the front or the back of the router.



Note

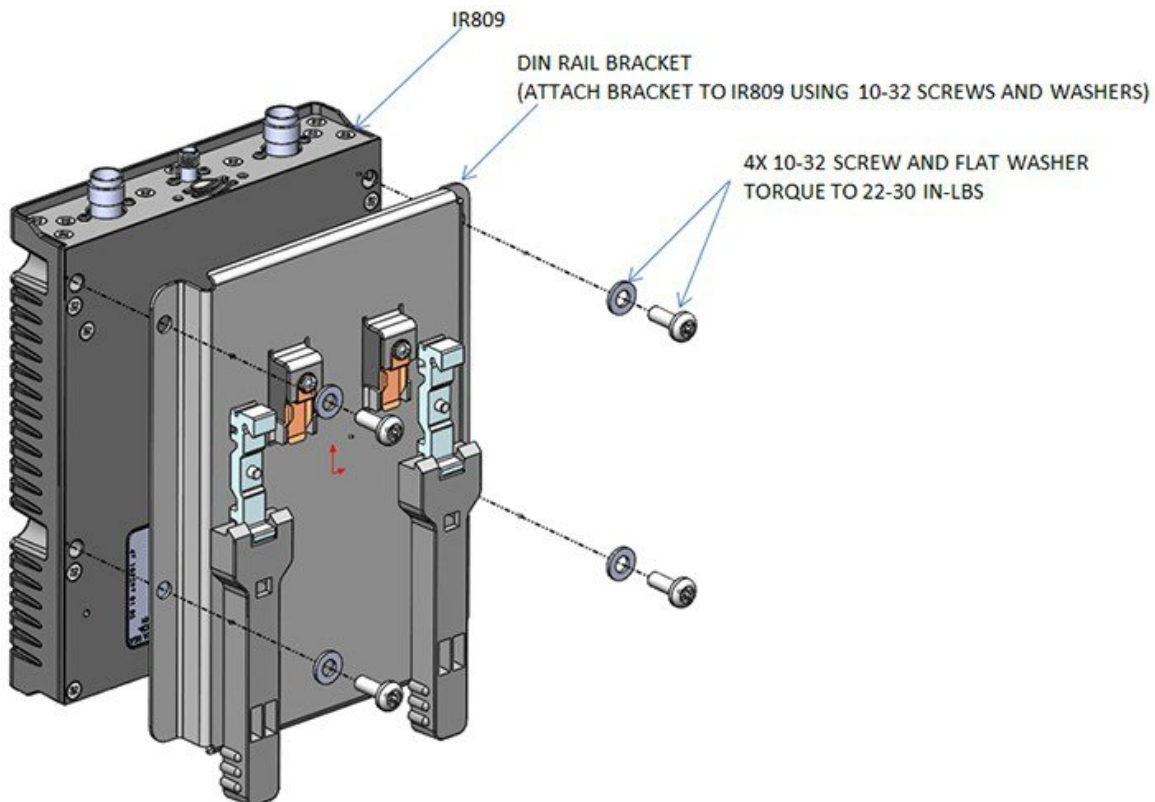
The IR809 meets IP30 rating when mounted vertically.

To attach the Cisco IR809 to a DIN rail, follow these steps:

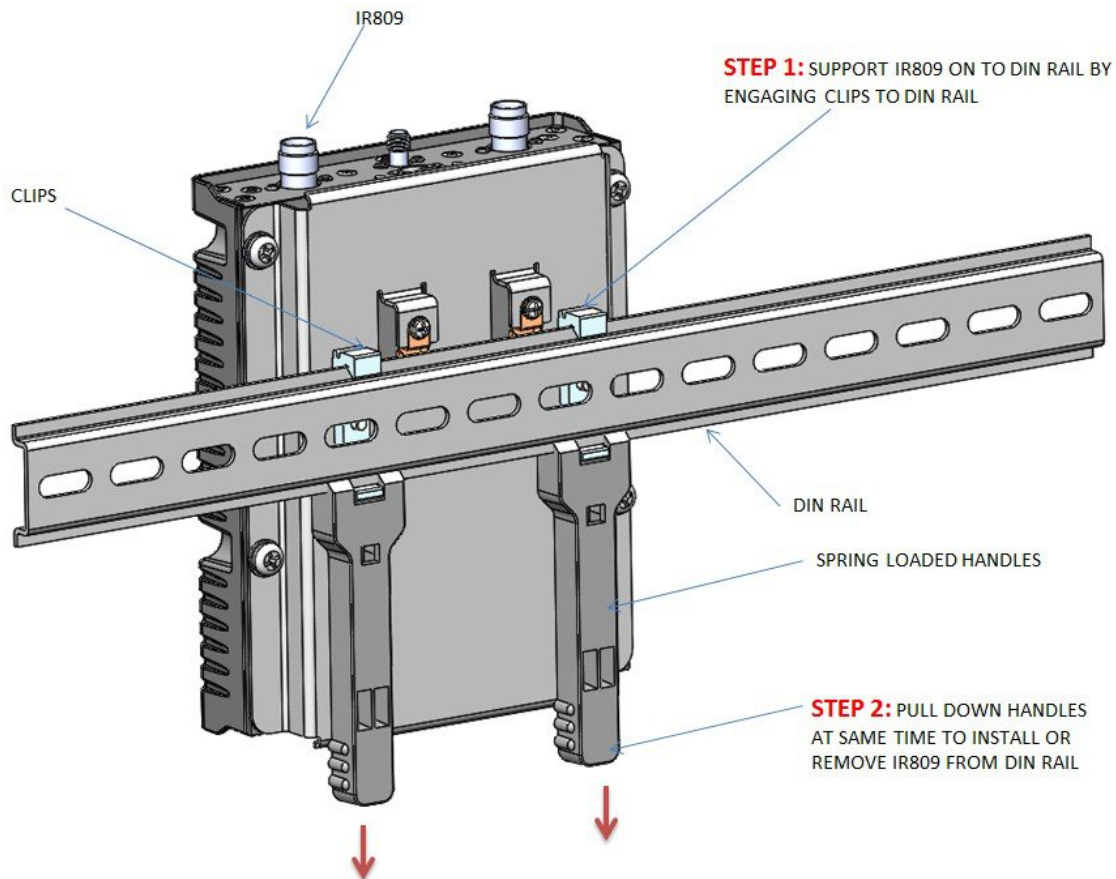
Before You Begin

The DIN Rail kit is ordered separately.

- Step 1** Attach the DIN rail bracket to the back of the router. Align the DIN rail bracket on the back of the router and secure/attach it to the 4 mounting points using the screws provided. See the following figure.



Step 2 Once the bracket is attached to the router, it can be mounted onto the DIN Rail. See the following figure.



- Step 3** 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 4** Pull down the spring loaded handles at the same time and slide the DIN Rail bracket up and over the latches.
- Step 5** 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.
- Step 6** To remove the router from the DIN Rail, simply reverse the procedure.

Installing the Router Ground Connection

To install the ground connection, follow these steps:

Before You Begin

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 (1.6mm) 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 (1.02mm) or larger copper wire.

**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**

This equipment needs to be grounded. Use a green and yellow 14 to 18 AWG ground wire to connect the host to earth ground during normal use. Statement 242

Step 1

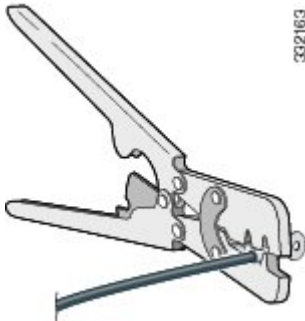
Locate the ring terminal lug and screw in the packaging kit. Store the ground screw for later use.

Step 2

Use a wire stripping tool to strip the 14-16 AWG (1.6mm -to- 1.3mm) grounding wire to 0.22 in. (5.56 mm).

Step 3

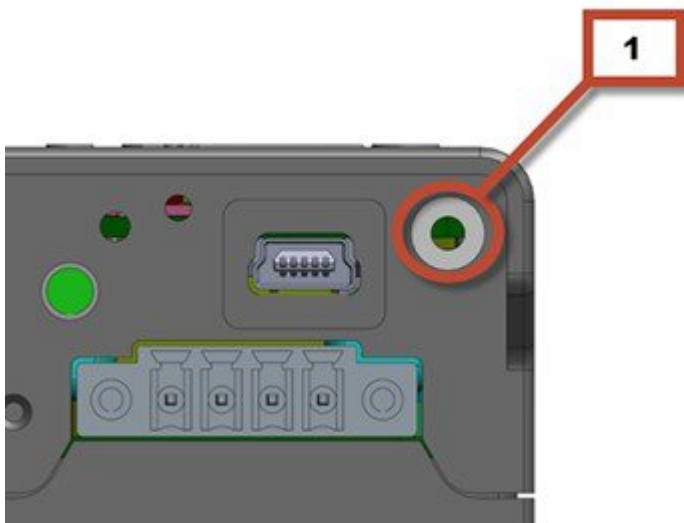
Insert the ground wire into the ring terminal lug, and using a crimping tool, crimp the terminal to the wire.

**Step 4**

Slide the ground screw through the ground lug.

Step 5

Insert the ground screw into the grounding point shown in the graphic.



- Step 6** Use a ratcheting torque screwdriver to tighten the ground screw and ring terminal to the router side panel to 3.5 in-lb (0.4 N-m). The torque should not exceed 3.5 in-lb (0.4 N-m).
- Step 7** Attach the other end of the ground wire(#1 in the graphic above) to a grounded bare metal surface, such as a ground bus, a grounded DIN rail, or a grounded bare rack.
-



Connecting the Router

This chapter describes how to connect the Cisco 809 Integrated Services Router to Ethernet devices and a network.

- [Preventing Damage to the Router, page 31](#)
- [Connecting a Terminal or PC to the Console Port, page 32](#)
- [Connecting to DC Power, page 33](#)
- [Connecting the Router to the AC-Input Power Supply, page 35](#)
- [Connecting the Router to the DC Source., page 36](#)
- [Connecting the Power Converter to an AC Power Source, page 38](#)
- [Verifying Connections, page 40](#)

Preventing Damage to the Router

Before installation, observe these general guidelines:

- Proper ESD protection should be observed.
- Ensure the router is properly grounded.
- Ensure there is proper airflow around the router.

If you must supply your own cable, see the [Technical Specifications, on page 41](#) for cabling specifications. If this appendix does not provide specifications for a particular cable, we strongly recommend ordering the cable from Cisco.



Warning

The intra-building ports of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly **MUST** NOT be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

**Warning**

The intra-building ports of the equipment or subassembly must use shielded intra-building cabling/wiring that is grounded at both ends.

Connecting a Terminal or PC to the Console Port

The Cisco 809 ISR does not provide the standard Cisco RJ45 RS232 serial port for Console. Instead, a USB Console port with a mini-Type B connector is provided. 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.

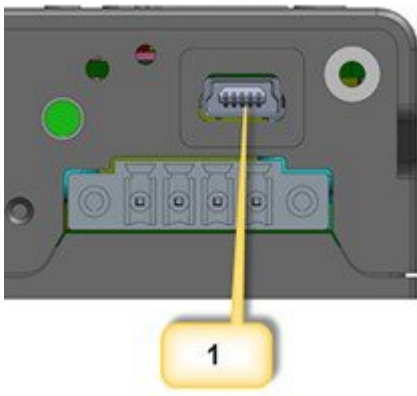
To connect a terminal or PC to the Console port on the router and access the CLI, follow these steps:

Before You Begin

Before you connect the router to the devices, install the router according to the instructions in [Installing the Router](#), on page 19.

Step 1

Connect the mini-USB side of a cable to the USB Console port on the router. The following figure shows the mini-USB location (1) for the Console port on the router.

**Step 2**

Connect the opposite end of the mini type B USB cable to the USB port on your laptop or PC.

Step 3

To communicate with the router, wait for your laptop or PC to discover the new device.

Step 4

If your laptop or PC warns you that you do not have the proper drivers to communicate with the router, you can obtain them from your computers manufacturer, or go here: <https://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx>

Connecting to DC Power


Warning

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than 10A 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

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


Caution

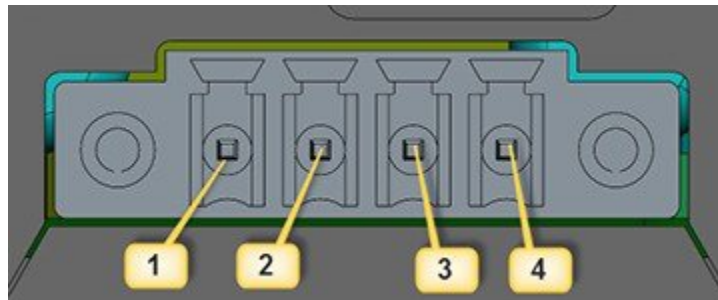
The Battery Return (BR) input terminal shall be an isolated DC return (DC-I). The DC return terminal or conductor shall not be connected to the equipment frame, or the grounding means of the equipment.

Plugs and Pin-Outs

The IR809 ships with a DC power accessory kit.

The power entry receptacle is on the IR809. The pin-outs are shown in the following figure.

Figure 6: Power Connector Pin-Outs

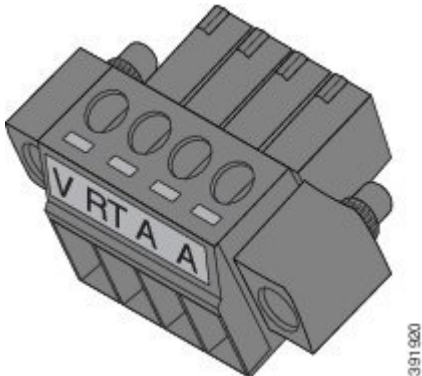


Pin Number	Name	Description	Color
1	DC In +	DC Power Positive Input	Red
2	DC In -	DC Power Return	Black
3	AC	Alarm Common	N/A
4	AI	Alarm Input	N/A

Wiring the DC Power and Alarm Connections

To connect the DC power and alarm connections on your Cisco 809 ISR, follow these steps:

Step 1 Locate the power and alarm connector on the router front panel.



Note Your connector may not have the labels V RT A A.

In the labeled connector, the pins are:

- V—Positive DC power connection
- RT— Return DC power connection
- A— Alarm Common
- A— Alarm Input

Step 2 Identify the connector positive and return DC power connections.
The connections left to right are:

- 1—Positive DC power connection
- 2—Return DC power connection
- 3—Alarm Common
- 4—Alarm Input

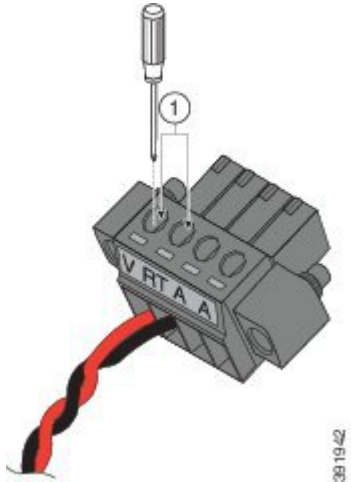
Step 3 Measure two strands of twisted-pair copper wire (18-to-20 AWG) long enough to connect to the DC power source.

Step 4 Using an 18-gauge wire-stripping tool, strip each of the two twisted pair wires coming from each DC-input power source to 0.25 inch (6.3 mm) \pm 0.02 inch (0.5 mm). Do not strip more than 0.27 inch (6.8 mm) of insulation from the wire. Stripping more than the recommended amount of wire can leave exposed wire from the power connector after installation.



Step 5 Remove the two captive screws that attach the power and alarm connector to the router, and remove the connector.

Step 6 On the power and alarm connector, insert the exposed part of the positive wire into the connection labeled "V" and the exposed part of the return wire into the connection labeled "RT". Make sure that you cannot see any wire lead. Only wire with insulation should extend from the connector.



1—Power connector captive screws

Note Use the same method for wiring the alarm connections.

Step 7 Use a ratcheting torque flathead screwdriver to torque the power connector captive screws (above the installed wire leads) to 2 in-lb (0.23 N-m).

Step 8 Connect the other end of the positive wire to the positive terminal on the DC power source, and connect the other end of the return wire to the return terminal on the DC power source. Connect the other end of the Alarm wires to your alarm source.

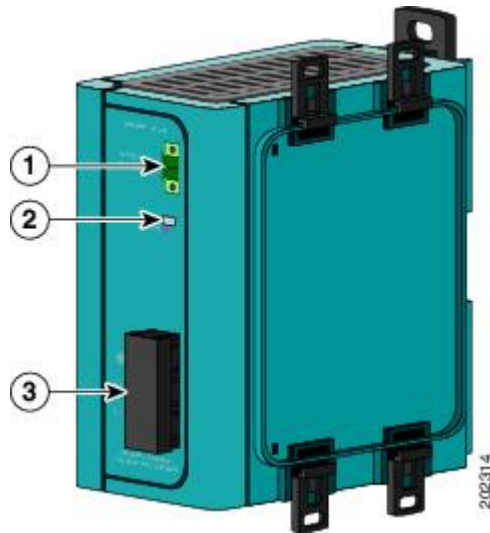
Connecting the Router to the AC-Input Power Supply

A 50 W AC-input power supply is available as an option for the router. The power supply comes in two styles:

- PWR-IE50W-AC—An AC-input power supply with a terminal block connector for the source AC cable.
- PWR-IE50W-AC-IEC— An AC-input power supply with an IEC C14 appliance connector for a detachable AC power cord.

The figure below shows the AC-input power supply.

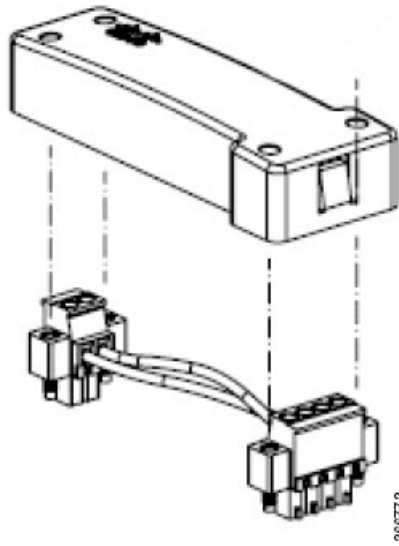
Figure 7: AC-Input Power Supply (PWR-IE50W-AC= Shown)



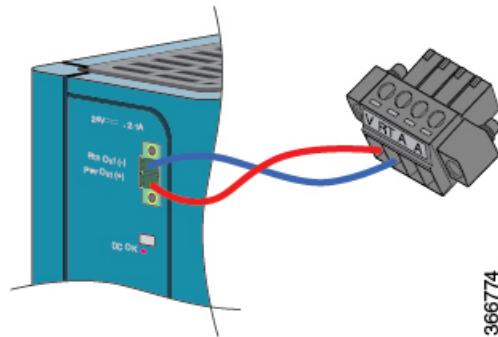
1	DC out connector
2	STATUS LED
3	Source AC terminal block (Cover shown installed) Note The source AC terminal block shown in the illustration is replaced by an IEC C14 appliance connector on the PWR-50W-AC-IEC= power supply.

Connecting the Router to the DC Source.

To connect the IR809 to the DC output, you will need to use a length of twisted pair along with connectors on both ends. The twisted pair should be sized to handle at least 1 Amp at 24VDC. Details on the connector and pin-outs for the IR809 side are found earlier in this guide at Wiring the DC Power and Alarm Connections. The PWR-IE50W-AC power source comes with a DC clip that can be reused to connect to the IR809. Disassemble the DC clip to expose the 2 pin and 4 pin connectors, as shown in the following diagram.



Dispose of the 4 pin connector and associated wiring. Keep the 2 pin connector. Measure an appropriate length of wire for your installation and wire the 2 pin connector back onto the PWR-IE50W-AC power source DC output as it was. Wire the opposite end of the wire to the IR809 4 pin connector as instructed previously in the Wiring the DC Power and Alarm Connections section. Your finished cabling will look like the connectors and wiring in the bottom of the following figure:



The connections should match up as in the following table:

Table 6: DC Source to IR809

PWR-IE50W-AC Pin Number	PWR-IE50W-AC Signal Name	Twisted Pair WireDC Power Connectivity	IR809 Pin Number	IR809 Signal Name
1 (Bottom)	Power Out +	—> (Blue in Figure)	1 (V)	DC In +
2 (Top)	Return Out -	—> (Red in Figure)	2 (RT)	DC In -

Connecting the Power Converter to an AC Power Source

The following instructions are provided for a qualified electrician to attach the AC power cord to the power supply.


Caution

AC power sources must be dedicated AC branch circuits. Each branch circuit must be protected by a dedicated two-pole circuit breaker.


Caution

Do not insert the power cord into the AC outlet until the process of wiring the line, neutral, and ground connections has been completed.

To connect the AC power cord to the power converter, follow these steps:

Before You Begin

To connect the power converter to an AC power source, you need an AC power cord. Power cord connector types and standards vary by country. Power-cord wiring color codes also vary by country. You must to have a qualified electrician select, prepare, and install the appropriate power cord to the power supply.

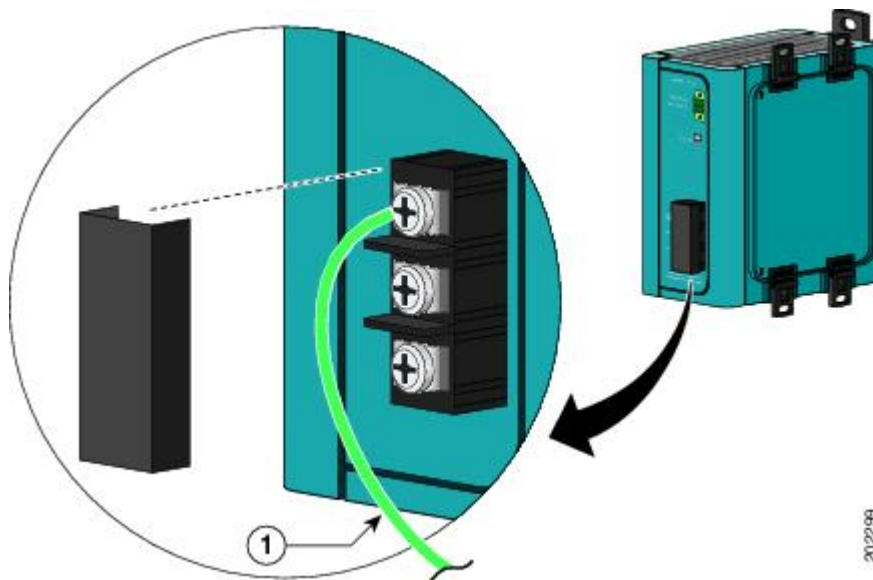

Note

Use copper conductors only, rated at a minimum temperature of 167°F (75°C).

Step 1

Remove the plastic cover from the input power terminals and set it aside.

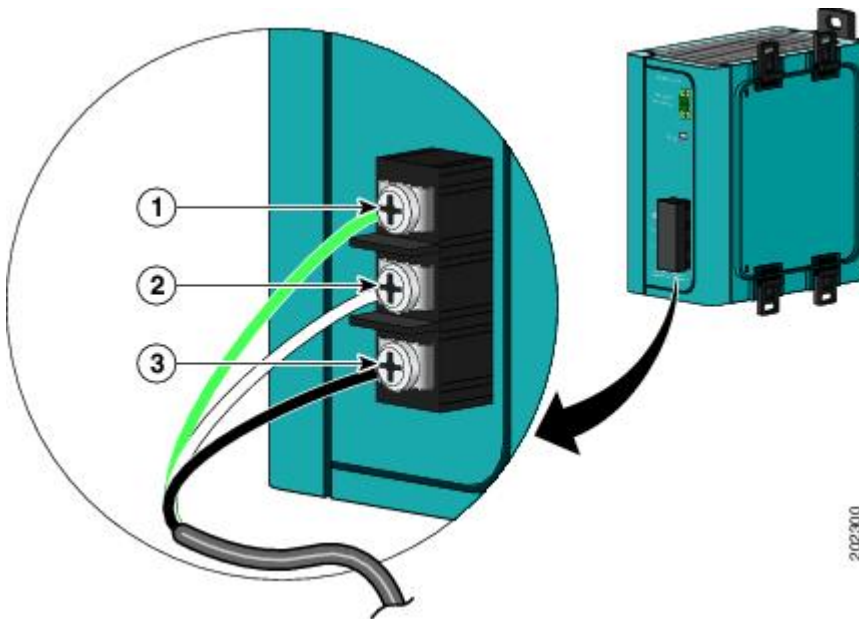
Figure 8: AC/DC Power Input Terminal Block



1. Ground Wire

- Step 2** Insert the exposed ground wire lead into the power converter ground wire connection. Ensure that only wire with insulation extends from the connector.

Figure 9: Connecting AC Power to the Power Converter



1	Ground
2	AC neutral
3	AC line

- Step 3** Tighten the ground wire terminal block screw.
The torque should not exceed 2.2 in-lb (0.25 Nm).
- Step 4** Insert the line and neutral wire leads into the terminal block line and neutral connections. Make sure that you cannot see any wire lead. Ensure that only wire with insulation extends from the connectors.
- Step 5** Tighten the line and neutral terminal block screws.
The torque should not exceed 2.2 in-lb (0.25 Nm).
- Step 6** Replace the plastic cover over the terminal block.
- Step 7** Connect the other end of the AC power cord to the AC outlet.
- Step 8** To apply power to the power converter, move the circuit breaker for the AC outlet or the DC control circuit to the on position. The LED on the power converter front panel is green when the unit is operating normally. The LED is off when the unit is not powered or is not operating normally.

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 the following table.

For full LED description, see [LEDs](#), on page 5.

Table 7: Verifying the Router Operation

Power and Link	LEDs to Check	Normal Patterns
SYS	Green steady On	Normal operation
	Green (blinking)	Boot up phase or in ROM Monitor mode
	Amber	Power is OK but possible internal FPGA program failure
GE0 (10/100/1000) WAN 0 GE0 (10/100/1000) WAN 1	Green Steady On	Link is up
	Flashing	Transmitting and Receiving data
	Off	No link.
SIM cards	SIM0/SIM1	Off—No USIM
		Green—USIM installed and active
Cellular Modem	CELLULAR0	Off—Module not powered on
		On—Module is powered on and connected but not transmitting or receiving
		Slow Blink—Module is powered on and searching for connection
		Fast Blink—Module is transmitting or receiving.



APPENDIX A

Technical Specifications

This appendix provides router, port, cabling specifications, and power adapters for the Cisco 809 Integrated Services Router.



Note

For compliance and safety information, see the [Regulatory Compliance and Safety Information for Cisco 800 Series](#)

- [Router Specifications, page 41](#)

Router Specifications

The following table lists the operational limits of the Cisco IR809. Operating the router outside of the limits specified is not supported.

Table 8: Cisco IR809 Specifications

Description	Design Specification
Physical Characteristics	
Dimensions (H x W x D)	(height x width x depth x) are 5.05" x 6.27" x 1.15" (12.8 x 15.9 x 2.9 cm).
Weight	1 lb 11 oz. (0.77 kg)
Environmental Operating Ranges	

Description	Design Specification
Operating Temperature and Altitude	<p>-40° to 140°F (-40° to 60°C) in a sealed NEMA cabinet with no airflow</p> <p>-40° to 158°F (-40° to 70°C) in a vented cabinet with 40 lfm of air</p> <p>-40° to 167°F (-40° to 75°C) in a forced air enclosure with 200 lfm of air</p> <p>(type tested at +85C for 16 hours)</p> <p>-500 to 5,000 feet. Derate max operating temperature 1.5°C per 1000 feet. 10,000 ft maximum</p>
Non-Operating Temperature	-40 to 158°F (-40 to 85°C)
Altitude	4570 m (15,000 ft)
Humidity	10% to 95% non-condensing
Environmental Tests	
Vibration	MIL-STD-810, EN50155, SAE-J1455
Shock	<p>Half Sine (operating)</p> <p>Duration = <2 ms</p> <p>Velocity = 2.11 m/s</p>
Certifications	
Standard Safety Certifications	<p>UL 60950-1, 2nd edition</p> <p>CAN/CSA C22.2 No. 60950-1, 2nd edition</p> <p>EN 60950-1, 2nd edition</p> <p>CB to IEC 60950-1, 2nd edition with all group differences and national deviations</p> <p>EN50155 and IEC61850</p> <p>NUP T2 shock testing, non-NEBS 3396</p>
EMC Emissions	EN55022/CISPR22, CFR 47 Part 15, ICES003, VCCI-V-3, AS/NZS 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

Description	Design Specification
Cellular Radio	EN 301 908-1, EN 301 908-2, EN 301 511, 47 CFR Part 22, 47 CFR Part 24 and EN 301 908-13
Compliance	IP30 compliant when vertical, IP40 compliant when mounted flat on a horizontal surface
Transportation/Storage Conditions	
Temperature	-40 to 85°F (−40 to +29°C)
Humidity	10% to 95%
Altitude	4570 m (15,000 ft)
Router DC Power Adapter	
Input Voltage	Nominal voltage: 12V to 48V DC Min/max voltage: 9.6 to 60V DC input Max, Min current: 2A, 0.4A
Maximum Power Consumption	20 Watts

