



# Power Supply Installation

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## Power Supply Installation

This chapter describes how to remove and install a new or replacement power supply. Your switch ships with at least one power-supply module (AC or DC, depending on your order).

The power-supply modules are field-replaceable units (FRUs) and are hot-swappable when deployed in nonhazardous locations.

For translations of the safety warnings in this chapter, see the *Regulatory Compliance and Safety Information for the Cisco IE9300 Rugged Series Switches* on Cisco.com.

## Power Supply Modules

This section contains information about the power supply modules compatible with the switch.

All the power supply modules in the following table are compliant for hazardous environments.

**Table 1: Power Supply Modules**

Model	Description
PWR-RGD-LOW-DC-H	Low voltage DC.
PWR-RGD-AC-DC-H	AC and high-voltage DC.
PWR-RGD-AC-DC-250	AC and high-voltage DC.
PWR-RGD-AC-DC-400	AC and high-voltage DC.



**Note** For detailed specifications of the products in the preceding table, see the Cisco Catalyst IE9300 Rugged Series Switch data sheet.

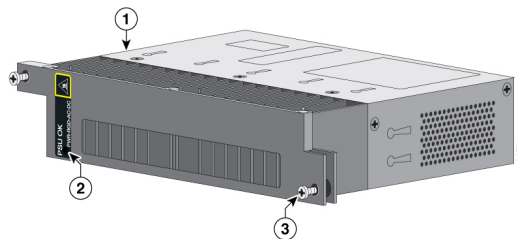
The 250- and 400-watt power supplies provide a higher PoE power budget on IE9310 and IE9320 systems that support PoE. These higher capacity supplies are also compatible with optical and non-PoE copper systems, although the higher capacity is not necessary for operation.



**Note** The power supplies in the preceding table are recommended for new installations. The older PWR-RGD-LOW-DC and PWR-RGD-AC-DC power supplies (without the -H suffix) are supported for users who already own them. However, these older supplies are not approved for use in hazardous locations and must not be used in HazLoc applications.

The following illustration shows a PWR-RGD-AC-DC-H power supply. The PWR-RGD-LOW-DC-H power supply appears identical; the only visual difference is the label. The PWR-RGD-AC-DC-250 power supply is similar to the other power supplies. However, it extends 30 mm (1.18 inches) from the rear of the switch. The PWR-RGD-AC-DC-400 switch also is similar to other power supplies, but extends 39.88 mm (1.57 inches) from the rear of the switch.

**Figure 1: PWR-RGD-AC-DC-H Power Supply**



1	Power-supply module	3	Captive screw
2	PSU OK LED		

The LED behavior is the same for all power supply models.

**Table 2: Power Supply LED**

LED Color	Status
Off	Power supply module is not installed.
Green	Valid input is present and operating properly.
Red	Valid input is present, but output has failed.
Blinking red	Power supply module is present but does not have power input.

# Power Supply Installation Guidelines

Observe the guidelines in this section when removing or installing a power-supply module.

A power-supply module that is only partially connected to the switch disrupts the system operation.

**Warning**

Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statement 1029

**Avertissement :**

Les plastrons et les panneaux de protection remplissent trois fonctions importantes : ils protègent l'utilisateur des tensions et des flux électriques dangereux présents à l'intérieur du châssis; ils aident à limiter les interférences électromagnétiques (EMI) qui pourraient perturber d'autres appareils; enfin, ils dirigent la circulation d'air de refroidissement dans le châssis. Utilisez le système uniquement si les cartes, les plastrons, ainsi que les caches avant et arrière sont en place. Énoncé 1029

**Warning**

Do not reach into a vacant slot while installing or removing a module. Exposed circuitry is an energy hazard. Statement 206

**Avertissement :**

Évitez de toucher à un logement vide lors de l'installation ou du retrait d'un module. Les circuits exposés représentent un risque de décharge électrique. Énoncé 206

**Warning**

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

**Avertissement :**

Toute installation, tout remplacement ou toute réparation de cet équipement doit être effectué par un personnel qualifié et compétent. Énoncé 1030

**Warning**

Avoid using or servicing any equipment that has outdoor connections during an electrical storm. There may be a risk of electric shock from lightning. Statement 1088

**Avertissement :**

es équipements pourvus de connexions extérieures ne doivent pas être utilisés ni entretenus pendant un orage. La foudre est susceptible de provoquer des décharges électriques. Énoncé 1088

# Installing a Power-Supply Module

Follow the guidelines and procedures in this section to install a power-supply module in the PSU1 or PSU2 slot.



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**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

**Avertissement :**

Les couvercles font partie intégrante de la sécurité du produit. N'utilisez pas l'unité si les couvercles ne sont pas installés. Énoncé 1077

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**Warning** This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

**Avertissement :**

Il se peut que cet appareil ait plus d'une connexion de bloc d'alimentation. Pour mettre l'appareil hors tension, vous devez débrancher toutes les connexions. Énoncé 1028

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**Caution** Equipment installation must comply with local and national electrical codes.

**Attention :**

l'installation de l'appareil doit respecter les codes électriques nationaux et locaux.

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## Required Tools and Equipment

Obtain the following tools and equipment:

- Torque driver(s) capable of 5 to 35 in-lbs
- Ring, spade, or flanged spade terminal (terminals should be insulated)
  - Ring terminal (such as TE part number 2-34158-1 for 16-14 AWG or 2-34852-1 for 12-10 AWG wire)
  - Spade terminal (such as TE part number 54367-2 for 16-14 AWG wire)
  - Flanged spade terminal (such as TE part number 2-324165-1 for 16-14 AWG wire or 1-324581-1 for 12-10 AWG wire)
- Use the 16-14 AWG wire and appropriate terminals for the AC or high-voltage DC power supply
- Use the 12-10 AWG wire and appropriate terminals for the low-voltage DC power supply.
- Crimping tool (such as Thomas & Bett part number WT2000, ERG-2001)

- 6-gauge copper ground wire
- 12-AWG wire (minimum) for the low-voltage power-supply module and 16-AWG (minimum) wire for the high-voltage power-supply module
- For power source connections, use wires rated for at least 194°F (90°C).
- UL- and CSA-rated style 1007 or 1569 twisted-pair copper wire
- Wire-stripping tools for stripping 6-, 10-, 12-, 14-, and 16-gauge wires
- Number-2 Phillips screwdriver
- Flat-blade screwdriver
- Ratcheting torque screwdriver with a number-2 and a number-1 Phillips head that exerts up to 15 pound-force inches (lbf-in.) or 240 ounce-force inches (ozf-in.) of pressure
- Panduit crimping tool with optional controlled-cycle mechanism (model CT-720, CT-920, CT-920CH, CT-930, or CT-940CH)
- Wire-stripping tools
- 12-gauge copper ground wire (insulated or noninsulated) when using the single-ground connection
- 6-gauge copper ground wire (insulated or noninsulated) when using the dual-ground connection
- The supplied dual-hole lug from the accessory kit for the dual ground connection
- Four leads of 16-gauge copper wire

## Ground the Switch

Follow the grounding procedures at your site and observe the following warnings:



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**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

**Avertissement :**

Cet équipement doit être mis à la terre. Ne supprimez jamais le conducteur de mise à la terre et n'utilisez jamais l'appareil en l'absence d'un conducteur de mise à la terre installé convenablement. Communiquez avec l'organisme d'inspection électrique approprié ou avec un maître-électricien si vous n'êtes pas sûr que la mise à la terre est adéquate. Énoncé 1024

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**Warning**

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

**Avertissement :**

Lors de l'installation ou du remplacement de l'appareil, la prise de terre doit toujours être branchée en premier et débranchée en dernier. Énoncé 1046

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**Caution** Follow the grounding procedure instructions, and use an appropriately Listed or certified lug (included with the switch) for number-6 AWG wire and 10-32 ground-lug screws.

**Attention :**

Suivez les instructions de la procédure de mise à la terre et utilisez une cosse répertoriée ou certifiée appropriée (incluse avec le commutateur) pour le fil AWG numéro 6 et les vis de cosse de mise à la terre 10-32.



**Note** You can use the grounding lug to attach a wrist strap for ESD protection during servicing.

Complete the following steps to install a dual-hole lug on the switch, making sure to follow any grounding requirements at your site.

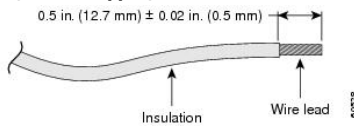
**Step 1** Use a Phillips screwdriver or a ratcheting torque screwdriver with a Phillips head to remove the ground screw from the cable side of the switch.

You need the screw in Step 4.

**Step 2** Strip the 6-gauge ground wire to 0.5 inch (12.7 mm)  $\pm$  0.02 inch (0.5 mm), as shown in the following illustration.

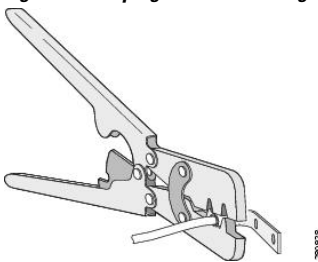
**Note** Stripping more than the recommended amount of wire can leave exposed wire from the connector.

**Figure 2: Stripping the Ground Wire**



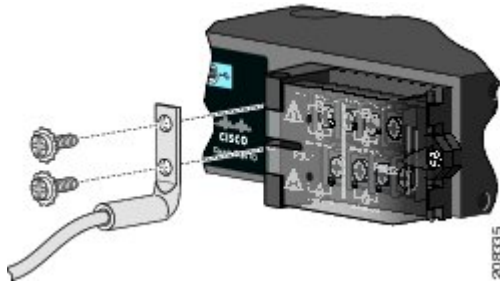
**Step 3** Insert the ground wire into the terminal lug, and crimp the terminal to the wire, as shown in the following illustration.

**Figure 3: Crimping the Terminal Lug**



**Step 4** Slide the ground screw from Step 1 through the terminal lug and insert the ground screws into the opening on the cable side, as shown in the following illustration.

**Figure 4: Attaching the Terminal Lug**



- Step 5** Use a ratcheting torque screwdriver to tighten the ground screws to 30 in-lb ( $\pm 2$  in-lb).
- Step 6** Attach the other end of the ground wire to an appropriate ground.

## Install the Power-Supply Module in the Switch

Complete the following steps to install the AC or DC power supply module or modules.



**Note** This procedure assumes that there are blanks installed in the switch.

### Before you begin

Ensure that you have the required tools and that you have properly grounded the switch.

- Step 1** Locate the circuit breakers or disconnects, turn them off, and then lock them out.

**Warning** If the power is not off at the AC or DC circuit breaker, do not touch the power-input terminal.

### Avertissement :

Si l'alimentation n'est pas coupée au niveau du disjoncteur CA ou CC, ne pas toucher la borne d'entrée d'alimentation.

- Step 2** Use a Phillips screwdriver to loosen the two captive screws of the blank power-supply module and gently pull it out, as shown in the following illustrations.

**Figure 5: Loosening the Screws on the Power-Supply Blank**



**Figure 6: Removing the Power-Supply Blank**

**Step 3** Insert the power-supply module into the slot and gently push it in, as shown in the following illustration.

**Figure 7: Insert the Power-Supply Module**

When correctly inserted, the PWR-RGD-LOW-DC-H or PWR-RGD-AC-DC-H power supply is flush with the switch rear panel. The PWR-RGD-AC-DC-250 extends 30 mm from the rear of the switch. The PWR-RGD-AC-DC-400 extends 40 mm from the rear of the switch.

**Step 4** Use a ratcheting torque screwdriver to torque each screw to 8 to 10 in-lb (0.904 -1.13 Nm).

**Step 5** If desired, repeat the preceding steps to add a second power supply.

## Wire the Power Source

### Before you begin

Review the following warnings:



**Note** The values in the following warning, Statement 1005, apply to North America only. Outside of North America, ensure that the rating is not greater than AC: 16 A, DC: 15 A.

### Note :

Les valeurs indiquées dans l'avertissement suivant, l'énoncé 1005, s'appliquent uniquement à l'Amérique du Nord. À l'extérieur de l'Amérique du Nord, assurez-vous que la valeur nominale n'est pas supérieure à CA : 16 A, CC : 15 A.



**Warning**

This product relies on the building installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: AC: 20 A, DC: 15 A. Statement 1005

**Avertissement :**

Ce produit repose sur l'installation du bâtiment en ce qui a trait à la protection contre les courts-circuits (surintensité). Assurez-vous que le dispositif de protection est inférieur ou égal à CA : 20 A, CC : 15 A. Énoncé 1005

**Note**

The following warning, Statement 1022, applies when power is supplied by more than one ungrounded conductor (such as Line-to-Line 208 VAC Three Phase or Line-to-Line on a center-tapped 240 VAC).

**Note :**

L'avertissement suivant, l'énoncé 1022, s'applique lorsque l'alimentation est fournie par plus d'un conducteur non mis à la terre (comme un courant phase à phase de 208 VCA triphasée ou phase à phase sur 240 VCA à prise médiane).

**Warning**

A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022

**Avertissement :**

Un dispositif de déconnexion bipolaire à accès rapide doit être intégré au câblage fixe. Énoncé 1022

**Warning**

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

**Avertissement :**

Toute installation, tout remplacement ou toute réparation de cet équipement doit être effectué par un personnel qualifié et compétent. Énoncé 1030

**Warning**

Hazardous voltage or energy may be present on power terminals. Always replace cover when terminals are not in service. Be sure that uninsulated conductors are not accessible when cover is in place. Statement 1086

**Avertissement :**

Une tension ou une énergie dangereuse peut être présente dans les bornes d'alimentation. Remplacez toujours le cache lorsque les bornes ne sont pas utilisées. Assurez-vous que des conducteurs non isolés ne sont pas accessibles lorsque le cache est installé. Énoncé 1086

**Step 1**

Ensure that the power is off at the AC or DC circuits.

Locate the circuit breakers, turn them OFF, and lock out the circuit.

**Warning** If the power is not off at the AC or DC circuit breaker, do not touch the power-input terminal.

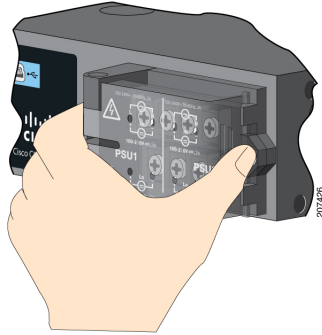
**Avertissement :**

Si l'alimentation n'est pas coupée au niveau du disjoncteur CA ou CC, ne pas toucher la borne d'entrée d'alimentation.

**Step 2**

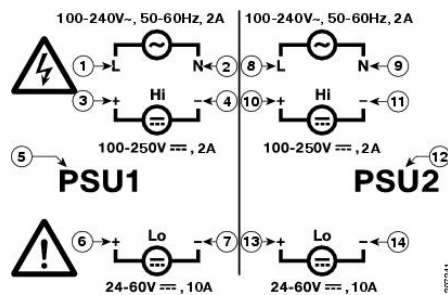
Use a Phillips screwdriver to loosen the captive screw on the power-input terminal, and open the cover, as shown in the following illustration.

**Figure 8: Opening the Power-Input Terminal Cover**



The terminal screws labels are on the power-input terminal cover.

**Figure 9: Power-Input Terminal Cover Label**



**Note** The power-supply module 1 connection is labeled PSU1, and the power-supply module 2 connection is labeled PSU2. Make sure that you connect the wires to the correct terminal screws.

1	Line connection for high-voltage AC (PSU1)	8	Line connection for high-voltage AC (for PSU2)
2	Neutral connection for high-voltage AC (PSU1)	9	Neutral connection for high-voltage AC (PSU2)
3	Positive connection for high-voltage DC (PSU1)	10	Positive connection for high-voltage DC (PSU2)
4	Negative connection for high-voltage DC (PSU1)	11	Negative connection for high-voltage DC (PSU2)
5	PSU1 (power-supply module 1)	12	PSU2 (power-supply module 2)

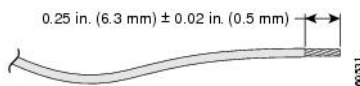
6	Positive connection for low-voltage DC (PSU1)	13	Positive connection for low-voltage DC (PSU2)
7	Negative connection for low-voltage DC (PSU1)	14	Negative connection for low-voltage DC (PSU2)

**Step 3** Use the appropriate copper wire to connect from the power-input terminal to the power source.

**Step 4** Strip each of the two wires to 0.25 inch (6.3 mm)  $\pm$  0.02 inch (0.5 mm), as shown in the following illustration.

**Note** 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 connector after installation.

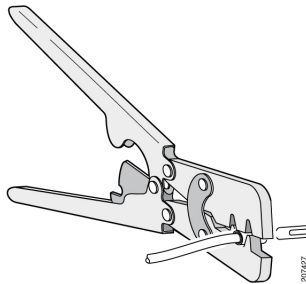
**Figure 10: Stripping the Input Power Source Wire**



**Step 5** Insert the wire into a spade terminal, and crimp it to the wire, as shown in the following illustration.

You can also use a ring or flanged spade terminal as listed in [Required Tools and Equipment, on page 4](#).

**Figure 11: Crimping the Spade Terminal Lug**



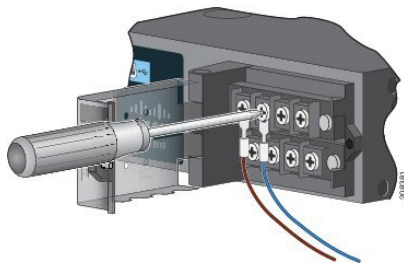
**Step 6** Loosen the terminal screw, and slide the terminal under the screw and washer.

**Note** Use the appropriate terminal screws based on power supply type: high-voltage (AC or DC) or low-voltage (DC).

**Step 7** Make the power connection, following the instructions appropriate to your connection:

- **AC Power Connection:** Connect the line wire into the terminal screw labeled *L* and the neutral wire into the terminal screw labeled *N* to complete the AC connection, as shown in the following illustration.

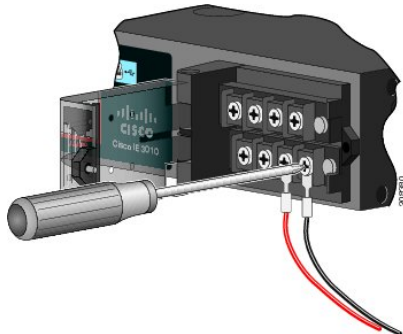
**Figure 12: Connecting the Wires to the High-Voltage AC Power (PSU1)**



- *DC Power Connection:* Connect the positive wire into the terminal screw labeled “+”, and the negative wire into the terminal screw labeled “-”.
- *Low-voltage DC Power-Supply Module:* Connect the wires to the terminals labeled "Lo."
- *High-voltage DC Power-Supply Module:* Connect the wires to the terminals labeled "Hi," as shown in the following illustration.

**Note** Ensure that you cannot see any wire lead. Only wire with insulation should extend from the terminal screw.

**Figure 13: Connecting the Wires to the Low-Voltage DC Power (PSU2)**



**Step 8** Torque the captive screws (above the wires) to 8.5 in-lb ( $\pm 0.5$  in-lb).

**Step 9** Complete the power connection, following the instructions appropriate to your connection:

- *AC Power Connection:* Connect the other end of the line wire (the one connected to L) to the line terminal on the AC-power source, and connect the other end of the neutral wire (the one connected to N) to the neutral terminal on the AC power source.
- *DC Power Connection:* Connect the other end of the positive wire (the one connected to “+”) to the positive terminal on the DC-power source, and connect the other end of the negative wire (the one connected to “-”) to the negative terminal on the DC power source.

**Note** Ensure that you cannot see any wire lead. Only wire with insulation should extend from the terminal screw.

**Note** If you have two power supplies, repeat steps 1 through 9.

**Step 10** Close the power-input terminal cover.

**Step 11** Use a ratcheting torque screwdriver to torque the screw to 7 in-lb ( $\pm 1$  in-lb) (0.79 Nm).

**Step 12** Turn on the power at the AC or DC circuit.

**Step 13** Verify that the PSU1 or PSU2 LED on the switch and PSU OK LED on the power-supply module are green.

# Remove the Power-Supply Module

The power-supply modules are hot-swappable. By removing the power-supply modules, you can power off the switch without disconnecting the wiring from the power-input terminal.

**Step 1** Ensure that the power is off at the AC or DC circuits.

Locate the circuit breakers, turn them OFF, and lock out the circuit.

**Warning** If the power is not off at the AC or DC circuit breaker, do not touch the power-input terminal.

**Avertissement :**

If the power is not off at the AC or DC circuit breaker, do not touch the power-input terminal.

**Step 2** Verify that the PSU LED and PSU OK LED is blinking red or is off.

**Step 3** Use a Phillips screwdriver to loosen the captive screws that secure the power-supply module to the switch, as shown in the following illustration.

**Warning** Hot surface. Statement 1079

**Avertissement :**

Surface chaude. Énoncé 1079

*Figure 14: Removing the Screws*



**Step 4** Remove the power-supply module from the power slot, as shown in the following illustration.

**Note** The power-supply module might be hot.

**Step 5** Install a new power-supply module or a blank cover.

**Caution** To prevent exposure to hazardous voltages and to contain electromagnetic interference (EMI), either a power-supply module or a blank cover must be in each power-supply module slot at all times.

**Attention :**

Pour éviter toute exposition à des tensions dangereuses et pour limiter les interférences électromagnétiques (IEM), un module d'alimentation ou un caisson vide doit se trouver en permanence dans chaque fente du module d'alimentation.

## Remove the Power-Supply Module

*Figure 15: Removing the Power-Supply Module*