

M7i Multiservice Edge Router Quick Start

January 2015
Part Number: 530-062009
Revision 01

This document describes how to install the Juniper Networks® M7i Multiservice Edge Router.

Contents

M7i Quick Start Description	3
Step 1: Prepare the Site for M7i Installation	4
M7i Rack-Mounting Requirements	4
Tools Required to Unpack and Prepare the M7i Router for Installation	5
Step 2: Prepare and Install the Router	5
Prepare for Front or Center Mounting	6
Install the Router	7
Step 3: Connect the Grounding Cable	9
Step 4: Connect External Devices and PIC Cables	10
Connect a Management Console or Auxiliary Device	10
Connect to a Network for Out-of-Band Management	10
Connect FIC and PIC Cables	10
Step 5: Connect Power Cables	12
Connect AC Power	12
Connect DC Power	12
Step 6: Power On the Router	14
Step 7: Perform Initial Software Configuration	15
Enter Configuration Mode	15
Configure User Accounts and Passwords	15
Configuring System Attributes	16
Commit the Configuration	17
Safety Warnings	18
Compliance Statements for NEBS	19
Compliance Statements for EMC Requirements	20
Canada	20
European Community	20
Israel	20
Japan	20
United States	21
Junos OS Documentation and Release Notes	21

Requesting Technical Support	21
Self-Help Online Tools and Resources	21
Opening a Case with JTAC	22
Revision History	22

M7i Quick Start Description

This Quick Start contains information you need to install and configure the router quickly. For complete installation instructions, see the *M7i Multiservice Edge Router Hardware Guide* at <http://www.juniper.net/techpubs/>.



WARNING: This Quick Start contains a summary of safety warnings in “[Safety Warnings](#)” on page 18. For a complete list of warnings for this router, including translations, see the *M7i Multiservice Edge Router Hardware Guide* at <http://www.juniper.net/techpubs/>.

The router is shipped in a cardboard carton, secured with foam packing material. Quick Start installation instructions and a cardboard accessory box are also included in the shipping container.

Step 1: Prepare the Site for M7i Installation

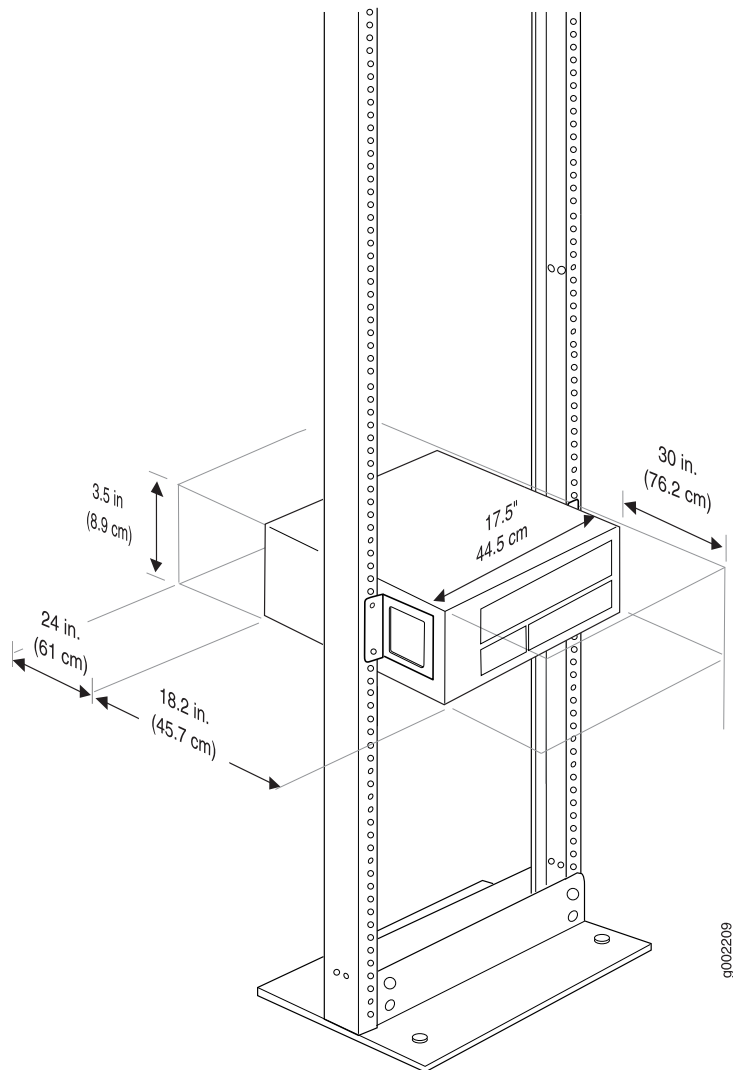
Before installing the router, read the site preparation guidelines in the *M7i Multiservice Edge Router Hardware Guide* to make sure that the site meets power, environmental, and clearance requirements for the router.

- [M7i Rack-Mounting Requirements on page 4](#)
- [Tools Required to Unpack and Prepare the M7i Router for Installation on page 5](#)

M7i Rack-Mounting Requirements

- You can install the router in a four-post rack or cabinet or an open-frame rack.
- The rack must be strong enough to support the weight of the fully configured router, up to about 36.5 lb (16.6 kg). You can mount up to 21 M7i routers in a floor-to-ceiling rack. If you do so, the rack must be capable of supporting a combined weight of over 766 lb (347 kg).
- The rack rails must be spaced widely enough to accommodate the router chassis's external dimensions: 3.5 in. (8.9 cm) high, 18.2 in. (45.7 cm) deep, and 17.5 in. (44.5 cm) wide. The mounting hardware extends the width to fit into standard 19-in. racks.
- For service personnel to remove and install hardware components, there must be adequate space at the front and back of the router. At least 24 in. (61.0 cm) both in front of and behind the rack or cabinet is required. NEBS GR-63 recommends at least 30 in. in front of the rack or cabinet.
- The rack or cabinet must have an adequate supply of cooling air:
 - 6 in. (15.2 cm) is required between the side of the router and any equipment that produces heat.
 - 2.8 in. (7.1 cm) is required between the side of the router and any large surface that does not produce heat, such as a wall.
 - In a closed cabinet, there must be a minimum of 6 in. (15.2 cm) of unobstructed airflow behind the router, or airflow baffles must be installed to prevent recirculation of hot air and overheating.
- If the router is the only unit in the rack, mount it at the bottom of the rack.
- When mounting the router in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

Figure 1: Rack Clearances and Router Dimensions



Tools Required to Unpack and Prepare the M7i Router for Installation

- Phillips (+) screwdriver, numbers 1 and 2
- Electrostatic discharge wrist strap
- Antistatic mat
- Blank panels to cover any slots not occupied by a component

Step 2: Prepare and Install the Router

- Prepare for Front or Center Mounting on page 6
- Install the Router on page 7

Prepare for Front or Center Mounting

The cable management system organizes and supports the PIC cables to prevent damage. The mounting brackets are shipped installed in the front-mounting position, but must be removed to install the cable management system.

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis.
2. Use a number 2 Phillips screwdriver to remove the screws from the front and rear of the mounting brackets on the chassis. Remove the mounting brackets.
3. Locate the cable management racks and appropriate screws in the accessory box.
4. Slide the cable management racks into the slots at the front of the chassis.
5. Use a number 2 Phillips screwdriver to tighten the screws that secure the cable management system to the chassis.
6. Reinstall the mounting brackets.
 - Front-mount: Reinstall the mounting bracket in the position shown in [Figure 2 on page 6](#) and replace the screws.
 - Center-mount: Install the mounting brackets in the center-mounting position and replace the screws.

Figure 2: Mounting Bracket in Front-Mounting Position

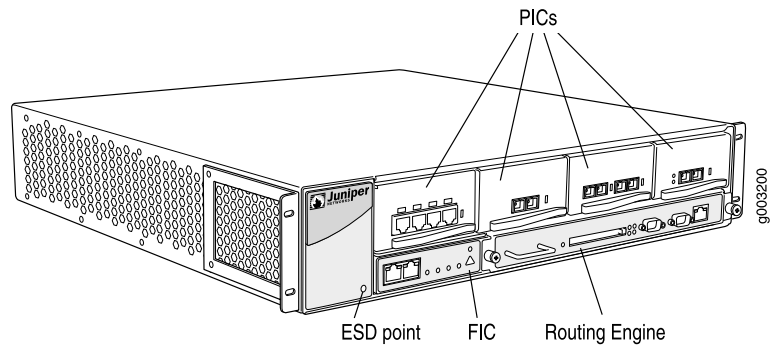
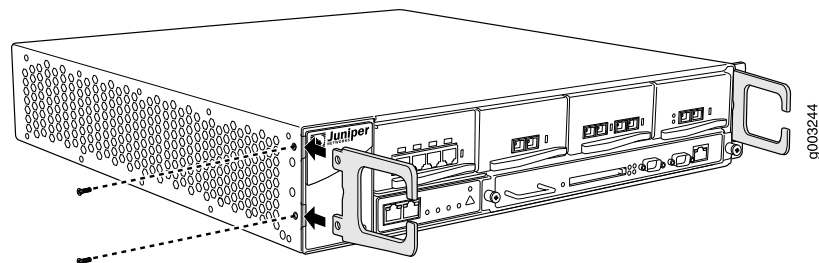


Figure 3: Cable Management System



Install the Router

1. Have one person grasp each side of the router, lift the router, and position it in the rack. See [Figure 4 on page 8](#).
2. Align the bottom hole in each mounting bracket with a hole in each rack rail, making sure the chassis is level.
3. Install a mounting screw (provided in the accessory box shipped with the router) into each hole. Use a Phillips screwdriver to tighten the screws.
4. Install a screw into the second hole in each mounting bracket.
5. Verify that all the mounting screws on one side of the rack are aligned with the mounting screws on the opposite side and that the router is level.

Step 3: Connect the Grounding Cable

1. Verify that a licensed electrician has attached the cable lug provided with the router to the grounding cable
2. Connect the grounding cable to a proper earth ground for each external DC power source, if it is not already connected.
3. Using a number 2 Phillips screwdriver, remove the screw next to the grounding symbol above the power supplies on the chassis rear. Secure the grounding cable lug to the grounding point by reinstalling and tightening the screw.

Step 4: Connect External Devices and PIC Cables

To connect external devices and PIC or FIC cables, perform the following procedures:

- [Connect a Management Console or Auxiliary Device on page 10](#)
- [Connect to a Network for Out-of-Band Management on page 10](#)
- [Connect FIC and PIC Cables on page 10](#)

Connect a Management Console or Auxiliary Device

1. Turn off the power to the console or auxiliary device.
2. Plug the female end of the RS-232 serial connector into the **CONSOLE** or **AUX/MODEM** port.
3. Use a 2.5 mm flat-blade screwdriver to tighten the screws on the connector.
4. Connect the other end of the cable to the console or auxiliary device.

Connect to a Network for Out-of-Band Management

1. Turn off the power to the networking device.
2. Plug one end of the Ethernet cable (with RJ-45/RJ-45 connectors) into the **MGMT** port on the Routing Engine.
3. Plug the other end into the networking device.

Connect FIC and PIC Cables



WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables connected to a transceiver. Fiber-optic transceivers contain laser light sources that can damage your eyes.

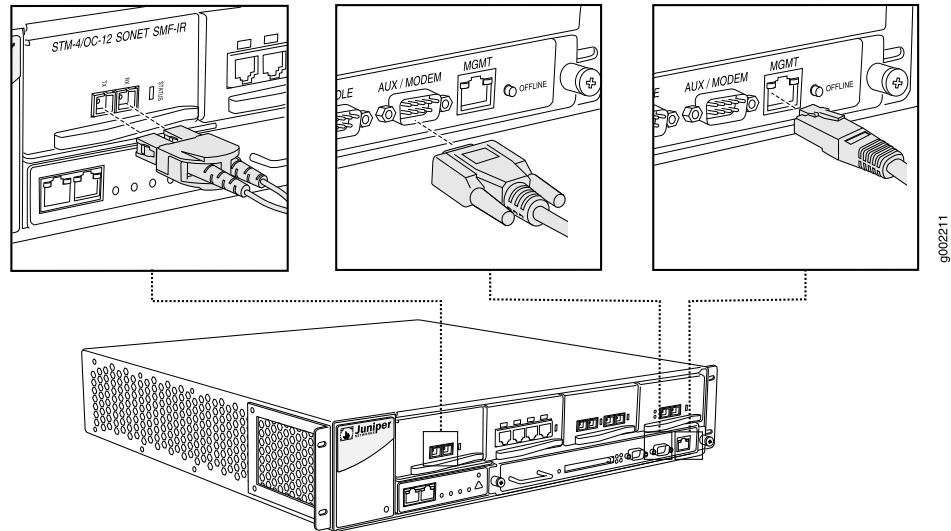


CAUTION: To prevent damage to fiber-optic transceivers and fiber-optic cables, observe the following precautions:

- Do not leave a fiber-optic transceiver uncovered except when inserting or removing cable. The safety plug keeps the port clean and prevents accidental exposure to laser light.
 - Do not bend fiber-optic cable beyond the maximum bend radius. An arc smaller than a few inches in diameter can damage the cable and cause problems that are difficult to diagnose.
 - Do not let fiber-optic cable hang free from the connector.
 - Do not allow fastened loops of cable to dangle, which stresses the cable at the fastening point.
-

1. Make sure you have the appropriate cable for the FIC or PIC.
2. If you are connecting to a FIC or PIC with removable transceivers, make sure the transceiver is installed.
3. If the transceiver is covered by a rubber safety plug, remove the plug.
4. If the cable connector is covered by a rubber safety cap, remove the cap.
5. Insert the appropriate cable connector into the cable connector port on the FIC or PIC faceplate.
6. Arrange the cable in the cable management system to prevent it from dislodging or developing stress points. Secure the cable so that it is not supporting its own weight as it hangs to the floor. Place excess cable out of the way in a neatly coiled loop in the cable management system. Placing fasteners on the loop helps to maintain its shape.

Figure 5: Connect External Devices and PIC Cables to Router



9002211

Step 5: Connect Power Cables



NOTE: Connect each power supply to a separate external power source.

The M7i router uses either AC or DC power supplies. Perform the appropriate procedure for each power supply in your router.

- [Connect AC Power on page 12](#)
- [Connect DC Power on page 12](#)

Connect AC Power

1. Locate the power cords shipped with the router, which should have a plug appropriate for your geographical location.
2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis.
3. Verify that the switch on each power supply faceplate is in the **OFF (O)** position.
4. For each power supply:
 - a. Insert the appliance coupler end of a power cord into the appliance inlet on a power supply faceplate.
 - b. Insert the plug into an AC power source receptacle.
 - c. Verify that the power cord does not block access to router components or drape where people could trip on it.

Connect DC Power

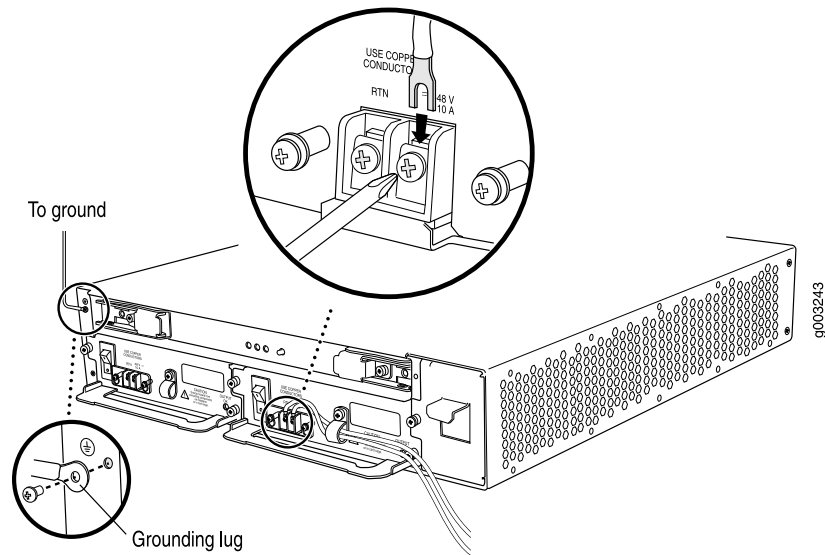


CAUTION: You must ensure that power connections maintain the proper polarity. The power source cables might be labeled (+) and (–) to indicate their polarity. There is no standard color coding for DC power cables. The color coding used by the external DC power source at your site determines the color coding for the leads on the power cables that attach to the terminal studs on the power faceplate.

1. Make sure that there is no power flowing from the external power source, so that the voltage across the leads of the power cables is 0 V. Ensure that there is no chance that the cable leads might become active during the procedure.
2. For each power supply, verify that the power switch on the power supply faceplate is in the **OFF (O)** position.
3. Verify that a licensed electrician has attached a listed power cable lug to each power source cable.

4. Loop the power cables through the hook located on the faceplate to the right of the field-wiring terminals.
5. Depending on the type of power cable lugs used, loosen or remove the screws on the field-wiring terminals.
6. Insert each power cable lug into the appropriate field-wiring terminal. Use a number 1 Phillips screwdriver to secure the power cable lug. Turn the screw on each field-wiring terminal clockwise, and apply between 8 lb-in. (0.9 Nm) and 9 lb-in. (1.02 Nm) of torque to each screw.
 - a. Insert the positive (+) source cable into the return terminal (labeled **RTN**).
 - b. Insert the negative (-) source cable into the input terminal (labeled **-48**).
7. Verify that the DC source power cabling and the grounding cabling are correct,
8. Verify that the power cables are not touching or blocking access to router components, and that they do not drape where people could trip on them.
9. Switch on the external circuit breakers to provide voltage to the DC power source cable leads.

Figure 6: Connect the Power Cables to a DC Router



Step 6: Power On the Router

1. Verify that an external management device is connected to one of the Routing Engine ports on the Routing Engine (**AUX/MODEM**, **CONSOLE**, or **MGMT**).
2. Turn on the power to the external management device.
3. Verify that the power supply is fully inserted in the chassis and the thumbscrews on their faceplates are tightened.
4. Verify that the power cord or cables are properly connected:
 - Verify that the ends of the AC power cord are firmly plugged into the appliance inlet on the power supply faceplate and the external power source receptacle.
 - Verify that the source DC power cables are connected to the appropriate terminal on the power supply faceplate: the positive (+) source cable to the return terminal (labeled **RTN**) and the negative (-) source cable to the input terminal (labeled **-48V**).
5. Press the power switch on the power supply faceplate to the **ON (I)** position.
6. Monitor the startup procedure on the external management device to ensure that the system boots properly.
7. Verify that the **OUTPUT OK** LED lights steadily.

If the LED does not light after 60 seconds, repeat Steps 3 through 7. If necessary, reinstall the AC power cord or DC power cables.
8. For routers with two power supplies, repeat Steps 3 through 7 for the second power supply.

Step 7: Perform Initial Software Configuration

This procedure connects the router to the network but does not enable it to forward traffic. For complete information about enabling the router to forward traffic, including examples, see the Junos OS configuration guides.

To configure the software:

- [Enter Configuration Mode on page 15](#)
- [Configure User Accounts and Passwords on page 15](#)
- [Configuring System Attributes on page 16](#)
- [Commit the Configuration on page 17](#)

Enter Configuration Mode

1. Verify that the router is powered on.
2. Log in as the “root” user. There is no password.
3. Start the CLI.

```
root# cli
root@>
```

4. Enter configuration mode.

```
cli> configure
[edit]
root@#
```

Configure User Accounts and Passwords

For information about using an encrypted password or an SSH public key string (DSA or RSA), see *authentication*.

1. Add a password to the root administration user account. Enter a clear-text password.

```
[edit]
root# set system root-authentication plain-text-password
New password: password
Retype new password: password
```

2. Create a management console user account.

```
[edit]
root# set system login user user-name authentication plain-text-password
New Password: password
Retype new password: password
```

3. Set the user account class to **super-user**.

```
[edit]
root@# set system login user user-name class super-user
```

Configuring System Attributes

For more information about the backup router and static routes, see the *Junos OS Administration Library for Routing Devices*.

1. Configure the name of the router. If the name includes spaces, enclose the name in quotation marks (" ").

```
[edit]
root@# set system host-name host-name
```

2. Configure the router's domain name.

```
[edit]
root@# set system domain-name domain-name
```

3. Configure the IP address and prefix length for the router's Ethernet interface.

```
[edit]
root@# set interfaces fxp0 unit 0 family inet address address/prefix-length
```

4. Configure the IP address of a backup router, which is used only while the routing protocol is not running.

```
[edit]
root@# set system backup-router address
```

5. Configure the IP address of a DNS server.

```
[edit]
root@# set system name-server address
```

6. Set the root authentication password by entering either a clear-text password, an encrypted password, or an ssh public key string (DSA or RSA).

```
[edit]
root@# set system root-authentication plain-text-password
New password: password
Retype new password: password
```

or

```
[edit]
root@# set system root-authentication encrypted-password encrypted-password
```

or

```
[edit]
root@# set system root-authentication ssh-dsa public-key
```

or

```
[edit]
root@# set system root-authentication ssh-rsa public-key
```

7. (Optional) Configure the static routes to remote subnets with access to the management port. Access to the management port is limited to the local subnet. To access the management port from a remote subnet, you must add a static route to that subnet within the routing table.


```
[edit]
root# set routing-options static route remote-subnet next-hop destination-IP retain
no-readvertise
```

- Configure the telnet service at the `[edit system services]` hierarchy level.

```
[edit]
set system services telnet
```

Commit the Configuration

- Display the configuration to verify that it is correct.

```
[edit]
root@# show
system {
  host-name host-name;
  domain-name domain-name;
  backup-router address;
  root-authentication {
    authentication-method (password | public-key);
  }
  name-server {
    address;
  }
}
interfaces {
  fxp0 {
    unit 0 {
      family inet {
        address address/prefix-length;
      }
    }
  }
}
}
```

- Commit the configuration to activate it on the router.

```
[edit]
root@# commit
```

- (Optional) Configure additional properties by adding the necessary configuration statements. Then commit the changes to activate them on the router.

```
[edit]
root@host# commit
```

- When you have finished configuring the router, exit configuration mode.

```
[edit]
root@host# exit
root@host>
```

Safety Warnings



WARNING: See installation instructions before connecting the router. This is a summary of safety warnings. For a complete list of warnings for this router, including translations, see the *M7i Multiservice Edge Router Hardware Guide* at <http://www.juniper.net/techpubs/>.



WARNING: The intrabuilding port(s) of the router is suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding port(s) of the router **MUST NOT** be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.



CAUTION: Before removing or installing components of a router, attach an ESD strap to an ESD point and place the other end of the strap around your bare wrist. Failure to use an ESD strap could result in damage to the router.



CAUTION: An external Surge Protective Device (SPD) should be used at the AC input of the router.

- Only trained and qualified personnel should install or replace the router.
- Perform only the procedures described in this quick start or the *M7i Multiservice Edge Router Hardware Guide*. Other services should be performed by authorized service personnel only.
- Read the installation instructions before you connect the router to a power source.
- Before installing the router, read the guidelines for site preparation in the *M7i Multiservice Edge Router Hardware Guide* to make sure that the site meets power, environmental, and clearance requirements for the router.
- For the cooling system to function properly, the airflow around the chassis must be unrestricted. Allow at least 6 in. (15.2 cm) of clearance between side-cooled routers. Allow 2.8 in. (7 cm) between the side of the chassis and any non-heat-producing surface such as a wall.
- When installing the router, do not use a ramp inclined more than 10 degrees.

- Manually installing the router requires two people to lift the chassis. To prevent injury, keep your back straight and lift with your legs, not your back. Do not attempt to lift the chassis by the power supply handles.
- The router should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting the router in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the router in the rack.
- When removing or installing an electrical component, always place it component-side up on a flat antistatic surface or in an electrostatic bag.
- When you install the router, always make the ground connection first and disconnect it last.
- Wire the DC power supply using the appropriate lugs. When connecting power, the proper wiring sequence is ground to ground, +RTN to +RTN, then –48 V to –48 V. When disconnecting power, the proper wiring sequence is –48 V to –48 V, +RTN to +RTN, then ground to ground. Always connect the ground wire first and disconnect it last.
- Do not work on the system or connect or disconnect cables during electrical storms.
- Before working on equipment that is connected to power lines, remove jewelry, including rings, necklaces, and watches. Metal objects heat up when connected to power and ground and can cause serious burns or become welded to the terminals.
- Failure to observe these safety warnings can result in serious physical injury.
- AC power cable warning (Japan):



WARNING: The attached power cable is only for this product. Do not use the cable for another product.

注意

附属の電源コードセットはこの製品専用です。
他の電気機器には使用しないでください。

g017253

Compliance Statements for NEBS

- The equipment is suitable for installation as part of the Common Bonding Network (CBN).
- The equipment is suitable for installation in locations where the National Electrical Code (NEC) applies.

- The battery return connection is to be treated as an isolated DC return (i.e. DC-I), as defined in GR-1089-CORE.
- For Juniper systems with AC power supplies, an external surge protective device (SPD) must be used at the AC power source.

Compliance Statements for EMC Requirements

- [Canada on page 20](#)
- [European Community on page 20](#)
- [Israel on page 20](#)
- [Japan on page 20](#)
- [United States on page 21](#)

Canada

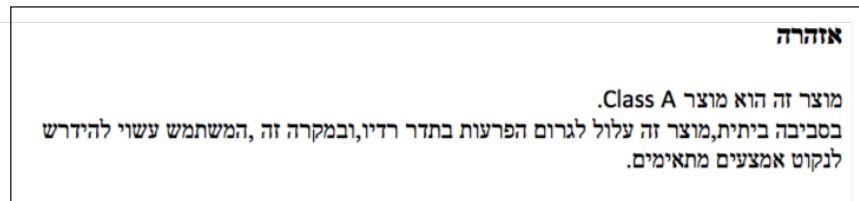
This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

European Community

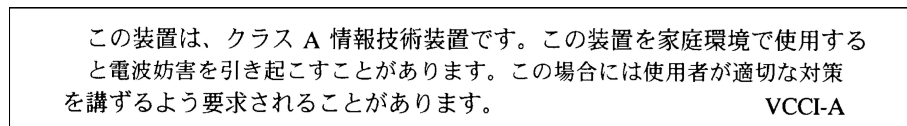
This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Israel



Translation from Hebrew—Warning: This product is Class A. In residential environments, the product may cause radio interference, and in such a situation, the user may be required to take adequate measures.

Japan



Translation from Japanese—This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. VCCI-A

United States

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

Junos OS Documentation and Release Notes

For a list of related Junos OS documentation, see <http://www.juniper.net/techpubs/software/junos/>.

If the information in the latest release notes differs from the information in the documentation, follow the *Junos OS Release Notes*.

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need postsales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC Hours of Operation —The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>

- Download the latest versions of software and review release notes:
<http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications:
<http://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum:
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, visit us at <http://www.juniper.net/support/requesting-support.html>

Revision History

January 2015—530-062009. Revision 1. Minor updates.

August 2010—530-036365. Revision 1. Minor updates.

April 2007—530-017640. Revision 2. Added NEBS requirements and safety warnings. Corrected DC connect procedure. Added list of technical publications.

January 2007—530-017640. Revision 1. Added EMC compliance statements.

June 2006—530-016682. Revision 1. Minor updates.

June 2004—530-010961. Revision 1. Initial release.

Copyright © 2015, Juniper Networks, Inc. All rights reserved.

Juniper Networks, Junos, Steel-Belted Radius, NetScreen, and ScreenOS are registered trademarks of Juniper Networks, Inc. in the United States and other countries. The Juniper Networks Logo, the Junos logo, and JunosE are trademarks of Juniper Networks, Inc. All other trademarks, service marks, registered trademarks, or registered service marks are the property of their respective owners.

Juniper Networks assumes no responsibility for any inaccuracies in this document. Juniper Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.