

M40e and M160 PCG Installation Instructions

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This document describes how to remove and replace a Packet Forwarding Engine Clock Generator (PCG) in a Juniper Networks M40e Internet router or M160 Internet router.

For additional installation and configuration information, see the following documentation:

- *M40e Internet Router Hardware Guide*
- *M160 Internet Router Hardware Guide*
- *JUNOS Internet Software Operational Mode Command Reference*
- JUNOS Internet software configuration guides

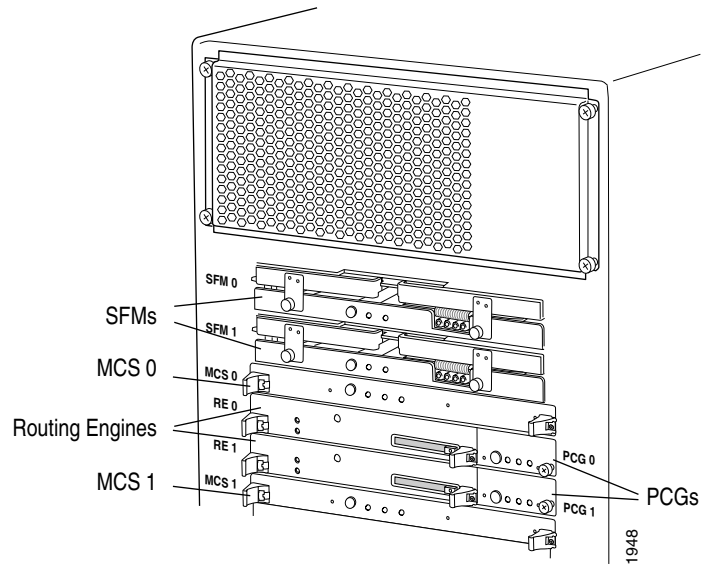
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PCG Description

The router has two Packet Forwarding Engine Clock Generators (PCGs) installed in the slots at the rear of the chassis that are labeled **PCG0** and **PCG1**, as shown in Figure 1. The PCGs generate a 125-MHz clock signal used to gate packet processing. During startup, the Routing Engine determines which PCG is master and which is backup, and the MCS relays the decision to the PCGs and to the modules and ASICs in the Packet Forwarding Engine that use the clock signal. The modules and ASICs then use only the signal from the master source.

PCGs are hot-pluggable. Removal or failure of the backup PCG does not affect router function. When the master PCG fails or is removed from the chassis, however, the Packet Forwarding Engine resets so that the components start using the signal from the other PCG (which becomes the master). Packet forwarding halts while there is no clock signal, because the Packet Forwarding Engine does not accept incoming packets.

Figure 1: Rear of Chassis with Rear Component Cover Removed

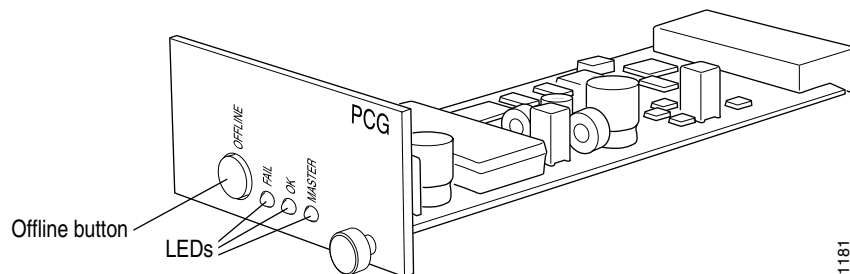


PCG Components

Each PCG (shown in Figure 2) has the following components:

- Signal generator—Provides a 125-MHz system clock signal.
- EEPROM—Stores the serial number and revision level of the PCG.
- Three LEDs—Indicate PCG status. There is a blue one labeled MASTER, a green one labeled OK, and an amber one labeled FAIL. Table 1 describes the LED states.
- Offline button—Prepares the PCG for removal from the router when pressed.

Figure 2: Packet Forwarding Engine Clock Generator



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Table 1: States for PCG LEDs

Label	Color	State	Description
MASTER	Blue	On steadily	PCG is master.
OK	Green	On steadily	PCG is functioning normally.
		Blinking	PCG is starting up.
FAIL	Amber	On steadily	PCG has failed.

Tools and Parts Required

To replace a PCG you need the following tools and parts:

- Phillips (+) screwdriver, number 2
- Electrostatic bag or antistatic mat for each PCG removed
- ESD grounding wrist strap

Replace a PCG

The router has two Packet Forwarding Engine Clock Generators (PCGs) installed in the slots on the rear of the chassis that are labeled **PCG0** and **PCG1** and located to the right of the Routing Engine slots, as shown in Figure 1. Each PCG weighs approximately 1 lb (0.5 kg).

To replace a PCG, perform the following procedures:

- Remove a PCG on page 3
- Install a PCG on page 4

Remove a PCG

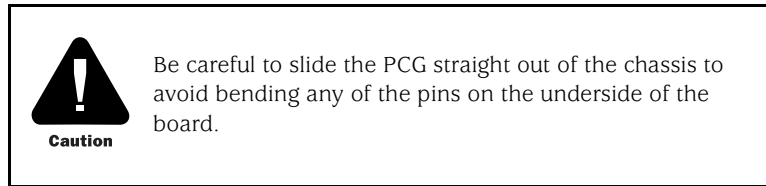
To remove a PCG, follow this procedure:

1. Place an electrostatic bag or antistatic mat on a flat, stable surface to receive the PCG.
2. Attach an ESD strap to your bare wrist and connect the strap to one of the ESD points on the chassis.
3. Remove the rear component cover by loosening the thumbscrews at its corners and pulling it straight off of the chassis.
4. Press and hold the offline button on the PCG faceplate until the amber LED labeled **FAIL** lights, which takes about 3 seconds.

(Keep in mind that if you are removing the master PCG, forwarding halts while the Packet Forwarding Engine resets so that the components start using the clock signal from the other PCG, which becomes the master. For more information, see “PCG Description” on page 1.)

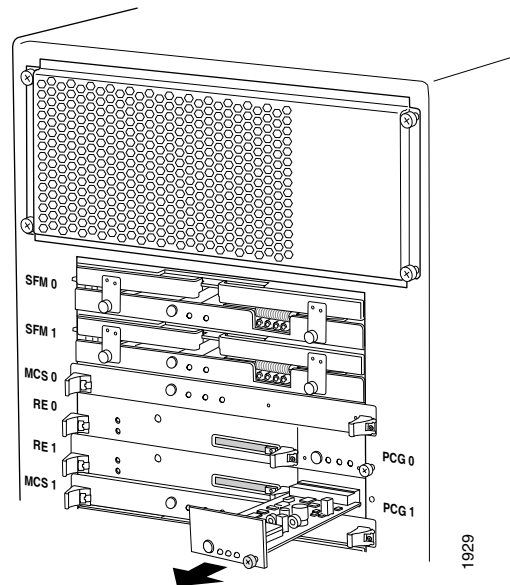
5. Loosen the thumbscrew at the right edge of the PCG faceplate, using a Phillips screwdriver if necessary.

- Grasp the screw and slide the PCG about halfway out of the chassis (see Figure 3).



- Place one hand under the PCG to support it, slide it completely out of the chassis, and place it on the antistatic mat or in the electrostatic bag prepared in Step 1.

Figure 3: Remove a PCG



Install a PCG

To install a PCG, follow this procedure:

- Attach an ESD strap to your bare wrist and connect the strap to one of the ESD points on the chassis.
- Place one hand under the PCG to support it and grasp the thumbscrew on the faceplate with the other hand.
- Align the rear of the PCG with the guides inside the chassis and slide it in completely (see Figure 4).
- Tighten the thumbscrew on the faceplate, making sure that the PCG is seated properly.

5. Verify that the green LED labeled OK lights steadily, which takes about 3 seconds.

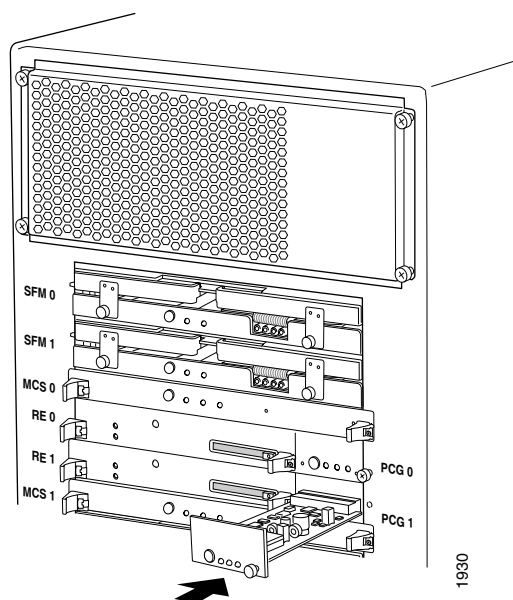
You can also issue the following CLI command to verify correct PCG functioning:

```
user@host> show chassis environment pcg
```

The master PCG is marked as **Online – PFE clock source** in the output. For more information, see the *JUNOS Internet Software Operational Mode Command Reference*.

6. Reinstall the rear component cover and tighten the thumbscrews at the corners to secure it to the chassis.

Figure 4: Install a PCG



Contact Juniper Networks

For technical support, contact Juniper Networks at support@juniper.net. If you are reporting a software problem, please issue the following command from the CLI before contacting support:

```
user@host> request support information | save filename
```

For documentation issues, contact Juniper Networks at tech-doc@juniper.net.

To provide a core file to Juniper Networks for analysis, **gzip** the file, rename the file to include your company name, copy it to [ftp.juniper.net:pub/incoming](ftp://ftp.juniper.net/pub/incoming), and then send the filename, along with software version information (the output of the **show version** command) and the configuration, to support@juniper.net.

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