



Connected Grid Modules

This section discusses how the Cisco 1240 Connected Grid Router (CGR 1240 or router) supports up to four Cisco Connected Grid modules that enable Neighborhood Area Network (NAN) connections from the router to field devices such as meters and Intelligent Electronic Devices (IEDs), and from the router to the central utility station or data management center.

These topics are discussed:

- [Installing or Replacing Modules, page 115](#)
- [Installing Modules in the Router, page 115](#)
- [Module Documentation, page 119](#)

Installing or Replacing Modules

The router supports up to four modules. Depending on the configuration, your router could arrive in the shipping container with all required modules already installed. However, you might need to install a module when you:

- Add modules to your current installation.
- Replace a faulty module.

Installing Modules in the Router

Installation Steps for Specific Modules

This section provides general instructions for installing modules in the router. For information specific to a particular module, refer to the module installation and configuration guides on Cisco.com, at: www.cisco.com/go/cg-modules.

Preparing to Install Modules

Before installing modules in the router, ensure that the following guidelines have been met:

Note: The Connected Grid modules support online insertion and removal (OIR).

- Verify that there is adequate airflow around the router. See [Installation Safety and Site Preparation, page 3](#).
- The ambient installation environment temperature must not exceed 140°F (60°C). When modules are installed in a closed assembly (such as inside the router), the temperature around it might be higher than normal room temperature.
- The installation environment humidity must not exceed 95% (non-condensing).
- The installation site altitude must be no higher than 10,000 feet.

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- After replacing or installing a module in the router, you must update the label (on the router exterior) that lists the module types contained in the router. The label must list the FCC ID number and the IC Certification number for each module installed in the router.

Installation Warning Statements

This section includes the installation warning statements. Translations of these warning statements appear in the *Regulatory Compliance and Safety Information for Cisco Connected Grid Router 1000 Series Routers* documents on Cisco.com, at: www.cisco.com/go/cgr1000-docs.

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

Warning: To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 158° F (70° C). Statement 1047

Warning: To prevent airflow restriction, allow clearance around the ventilation openings to be at least: 1.75 in. (4.4 cm) Statement 1076

Installing and Removing Modules

The Connected Grid modules support OIR, and a module can be installed or removed while the router is online or offline. Online refers to power-on status; offline refers to power-off status.

This section provides general module installation steps and refers to additional documentation for detailed information:

- [Referenced Installation Documents, page 116](#)
- [Tools and Materials You Supply, page 116](#)
- [Module Installation Locations, page 117](#)
- [Installing a Module in an Offline Router, page 117](#)
- [Installing a Module in an Online Router, page 118](#)
- [Removing a Module from an Offline Router, page 119](#)
- [Removing a Module from an Online Router, page 119](#)

Referenced Installation Documents

The following documents are referenced in these installation procedures:

- [Connected Grid Antenna Installation Guide](#)—Located on Cisco.com at www.cisco.com/go/cg-modules
- [Connected Grid Modules Installation and Configuration Guides](#)—Located on Cisco.com at www.cisco.com/go/cg-modules
- [Cisco Connected Grid Device Manager Installation and User Guide](#) on Cisco.com at www.cisco.com/go/cgr1000-docs

Tools and Materials You Supply

You must provide the following tools to install and remove modules:

- #1 Phillips screwdriver

Module Installation Locations

To ensure support for all module types and allow convenient cabling, Cisco recommends the following installation location guidelines:

- Connected Grid modules and module slot compatibility are listed in [Table 22 on page 117](#) and illustrated in [Figure 76 on page 118](#).
- Module antenna installation locations are illustrated in [Antenna Installation Location, page 128](#).

Table 22 Connected Grid Module Locations in the CGR 1240 Router

| Connected Grid Module Type | Cisco CG-OS Installation Slot | Cisco IOS Installation Slot |
|----------------------------|---|---|
| 3G Cellular | Slot 3 | Slot 3 |
| 4G LTE | Slots 3 or 6 | Slots 3 or 6 |
| WPAN/CG-Mesh | Slot 4 | Slot 4 |
| WPAN/RFLAN | Slot 4 | N/A |
| WiMAX | Slot 6 | Slot 6 |
| Compute | Slot 5 (Slot 6 must remain empty to dissipate heat) | Slot 5 (Slot 6 must remain empty to dissipate heat) |

Installing a Module in an Offline Router

Note: This is a general installation procedure for installing modules in the chassis of an offline router. For hardware installation and software configuration steps that are specific to your module, see the installation and configuration guide for the module, at: www.cisco.com/go/cg-modules.

To install a module in an available slot of an offline router:

1. Disconnect the router from AC power and disable any installed battery backup units by following the steps in [Powering Off the Router, page 107](#).
2. Open the chassis door by following the steps in [Opening and Closing the Router Chassis, page 75](#).
3. Use the screwdriver to remove the faceplate that covers the empty module slot.
4. Align the module edge with the slot edge guide and insert the module in the router module slot until fully seated in the PCI connector ([Figure 76 on page 118](#)).
5. Use the screwdriver to tighten the captive module mounting screws (two per module) into the connectors on the router front panel. Torque to 10 to 12 inch-pounds.

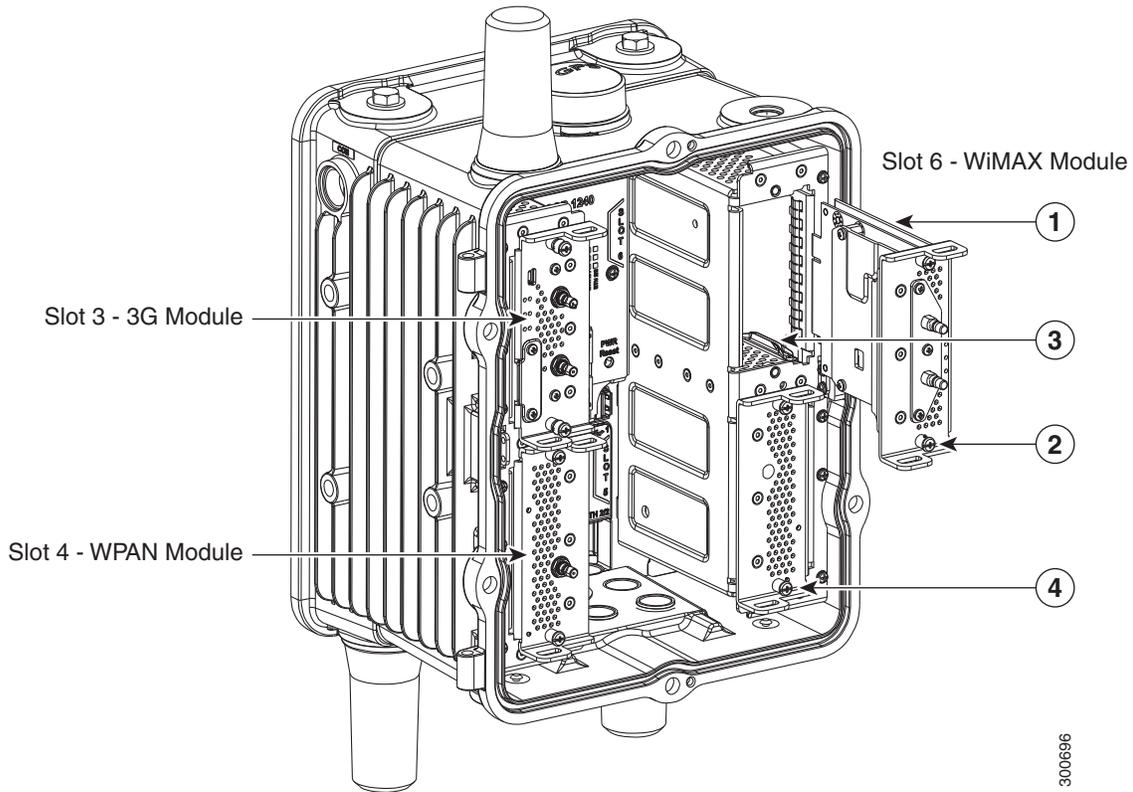
6. Attach any required cables to the module. This step is specific to the module type.

Note: Refer to the installation and configuration guide for the module, at www.cisco.com/go/cg-modules.

Note: Cut the excess tie material away holding the cables in place.

7. Close the router door, following the steps in [Opening and Closing the Router Chassis, page 75](#).
8. Connect the router to AC power and to the network, following the steps in [Installing the Router, page 85](#).
9. Re-enable the BBU using the commands in [Related Commands, page 160](#).

Figure 76 Insert Modules into Router



| Item | Description | Quantity |
|------|-------------------|--|
| 1 | Module guide edge | Slide module guide edge along the module guide (inside the slot) when inserting module. |
| 2 | Captive screws | Two captive screws hold each module (and module slot cover) in place in the module slot. |
| 3 | Slot module guide | Slide module guide edge along the module guide (inside the slot) when inserting module. |
| 4 | Module slot cover | Module slots WITHOUT modules installed should be covered with a module slot cover. |

Installing a Module in an Online Router

The Cisco Connected Grid Device Manager (Device Manager) is used to install a module in an online router. Device Manager is a Windows-based application that field technicians can use to manage the Cisco 1000 Series Connected Grid Routers (CGR 1000) over WiFi or Ethernet.

Note: The Device Manager can only be used on routers using the Cisco CG-OS operating system. It will not work on routers using the Cisco IOS operating system.

For routers using the Cisco IOS operating system, modules must be installed when the router is offline.

Note: For instructions on how to install a module in an online router, see the “Manage Modules” and “Add a Module” sections in the “Using the Device Manager” chapter of the *Cisco Connected Grid Device Manager Installation and User Guide* on Cisco.com.

Note: This is a general installation procedure for installing modules in the chassis of an online router. For hardware installation and software configuration steps that are specific to your module, see the installation and configuration guide for the module, at: www.cisco.com/go/cg-modules.

Removing a Module from an Offline Router

To remove a module from an offline router:

1. Disconnect the router from AC power and disable any installed battery backup units by following the steps in [Powering Off the Router, page 107](#).
2. Open the chassis door by following the steps in [Opening and Closing the Router Chassis, page 75](#).
3. Remove any antenna cables that are connected to module. Ensure that you are using a ??? tool to remove the MCX connector from the ports. This step is specific to the module type.

Note: Refer to the installation and configuration guide for the module, at www.cisco.com/go/cg-modules.

4. Move the 10.5 in cable connected to port 5 away from the BBU cable before removing the MCX connector.
5. Use the screwdriver to loosen the module captive screws (two per module) from the connectors on the router front panel.
6. Use your hands to gently pull the module from the router.
7. Close the router door by following the steps in [Opening and Closing the Router Chassis, page 75](#).
8. Connect the router to AC power and to the network by following the steps in [Installing the Router, page 85](#).
9. Re-enable the BBU using the commands in [Related Commands, page 160](#).

Removing a Module from an Online Router

The Cisco Connected Grid Device Manager (Device Manager) is used to remove a module from an online router. Device Manager is a Windows-based application that field technicians can use to manage the Cisco 1000 Series Connected Grid Routers (CGR 1000) over WiFi or Ethernet.

Note: For instructions on how to remove a module from an online router, see the “Manage Modules” and “Remove a Module” sections in the “Using the Device Manager” chapter of the *Cisco Connected Grid Device Manager Installation and User Guide* on Cisco.com.

Module Documentation

For instructions on how to install, replace, and configure the modules, see these installation and configuration guides on Cisco.com, at: www.cisco.com/go/cg-modules.

Table 23 Connected Grid Modules for CGR 1000 Series Routers Documentation

| Connected Grid Module | Related Documentation |
|---|---|
| Cisco Connected Grid Modules for CGR 1000 Series – Cellular 3G CDMA (Cisco IOS) | Connected Grid 3G CDMA Module for CGR 1000 Series Installation and Configuration Guide (Cisco IOS) |
| Cisco Connected Grid Modules for CGR 1000 Series – Cellular 3G GSM (Cisco IOS) | Cisco Connected Grid 3G GSM Module for CGR 1000 Series Installation and Configuration Guide (Cisco IOS) |
| Cisco Connected Grid Modules for CGR 1000 Series – Cellular 3G CDMA/GSM | Cisco Connected Grid Cellular 3G Module for CGR 1000 Series Installation and Configuration Guide |
| Cisco Connected Grid Modules for CGR 1000 Series – Cellular 4G LTE (Cisco IOS) | Cisco Connected Grid 4G LTE Module Installation and Configuration Guide |

Table 23 Connected Grid Modules for CGR 1000 Series Routers Documentation (continued)

| Connected Grid Module | Related Documentation |
|---|--|
| Cisco Connected Grid Modules for CGR 1000 Series - WiMAX | Cisco Connected Grid WiMAX Module for CGR 1000 Series Installation and Configuration Guide |
| Cisco Connected Grid Modules for CGR 1000 Series -WiFi | Cisco Connected Grid Routers WiFi Software Configuration Guide |
| Cisco Connected Grid Modules for CGR 1000 Series - WPAN/CG-Mesh | Cisco Connected Grid WPAN Module for CGR1000 Series Installation and CG-Mesh Configuration Guide (Cisco IOS) |
| Cisco Connected Grid Modules for CGR 1000 Series - WPAN/RFLAN | Cisco Connected Grid Cellular WPAN Module for CGR 1000 Series Installation and RFLAN Configuration Guide |