



Cisco Fourth-Generation LTE Network Interface Module Installation Guide

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This document provides an overview of the hardware and installation information for Cisco Fourth-Generation Long-Term Evolution (4G-LTE) Network Interface Module (NIM) on Cisco 4000 Series Integrated Services Router (ISR).

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Hardware Overview

Cisco 4G-LTE NIM addresses the modular 4G-LTE cellular connectivity on the Cisco 4000 Series ISRs. Cisco 4G-LTE-NIM is feature-compatible with Cisco EHWIC-4G-LTE.

Table 1 describes the Cisco 4G LTE NIM SKUs.

Table 1 Cisco 4G LTE NIM SKUs

Cisco 4G LTE NIM	Description	Mode	Operating Regions	Frequency Band
NIM-4G-LTE-GA NIM-4G-LTE-GA= (Spare) NIM-4G-LTE-GA++= (TAA Spare)	Cisco LTE 2.0 4G NIM for global Wireless networks (Europe, Australia, and so on). This SKU is based on Sierra Wireless MC7304 modem.	<ul style="list-style-type: none"> • LTE • HSPA+ • UMTS 	Global	LTE: <ul style="list-style-type: none"> • 800 MHz • 900 MHz • 1800 MHz • 2100 MHz • 2600 MHz UMTS, HSPA+: <ul style="list-style-type: none"> • 850 MHz • 900 MHz • 1900 MHz • 2100 MHz
NIM-4G-LTE-NA NIM-4G-LTE-NA= (Spare) NIM-4G-LTE-NA++= (TAA Spare)	Cisco LTE 2.0 4G NIM for wireless networks in North America (AT&T and Canada). This SKU is based on Sierra Wireless MC7354 modem.	<ul style="list-style-type: none"> • LTE • HSPA+ • UMTS 	North America (AT&T and Canada)	LTE: <ul style="list-style-type: none"> • 700 MHz • 1900 MHz • AWS UMTS, HSPA+: <ul style="list-style-type: none"> • 850 MHz • 900 MHz • 1900 MHz

Table 1 Cisco 4G LTE NIM SKUs

Cisco 4G LTE NIM	Description	Mode	Operating Regions	Frequency Band
NIM-4G-LTE-VZ NIM-4G-LTE-VZ= (Spare) NIM-4G-LTE-VZ++= (TAA Spare)	Cisco LTE 2.0 4G NIM for Verizon wireless networks. This SKU is based on Sierra Wireless MC7350 modem.	<ul style="list-style-type: none"> • LTE • EVDO Rev-A • 1xRTT 	North America (Verizon)	LTE: <ul style="list-style-type: none"> • AWS • 700 MHz EVDO Rev A/ 1xRTT: <ul style="list-style-type: none"> • band class 0 • band class 1 • band class 10
NIM-4G-LTE-ST NIM-4G-LTE-ST= (Spare) NIM-4G-LTE-ST++= (TAA Spare)	Cisco LTE 2.0 4G NIM for Sprint wireless networks. This SKU is based on Sierra Wireless MC7350 modem.	<ul style="list-style-type: none"> • LTE • EVDO Rev-A • 1xRTT 	North America (Sprint)	LTE: <ul style="list-style-type: none"> • PCS 1900 MHz EVDO Rev A/ 1xRTT: <ul style="list-style-type: none"> • band class 0 • band class 1 • band class 10

Ports and LEDs

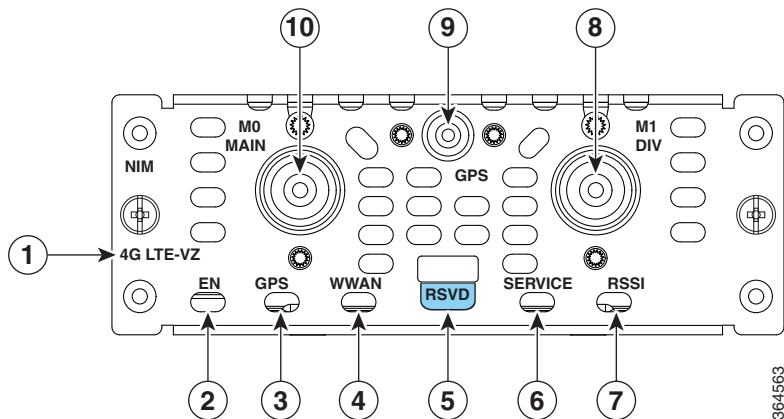
Figure 1 shows the 4G-LTE-NIM front panel. Table 2 lists the 4G-LTE-NIM ports and LED indicators and describes their behavior. The LEDs provide a visual indication of the NIM status and the currently-selected services.



Note

You should remove the caps before attaching the antennas.

Figure 1 Front Panel of the Cisco 4G-LTE-NIM



1	PID Name	2	LED—EN
3	LED—GPS ¹	4	LED—WWAN
5	RSVD (reserved) port, USB 2.0 mini type B	6	LED—SERVICE
7	LED—RSSI ²	8	M1 DIV—Diversity Antenna Connector (TNC ³), with dust cap removed.
9	GPS—GPS Antenna Connector (SMA ⁴), with knurled metal cap removed.	10	M0 MAIN—Main Antenna Connector (TNC), with dust cap removed.

- 1. GPS = Global Positioning System.
- 2. RSSI = Received Signal Strength Indicator.
- 3. TNC = Threaded Neill–Concelman.
- 4. SMA = SubMiniature version A.

Table 2 Cisco 4G-LTE-NIM Ports and LED Indicators

Ports, Connectors, and LEDs	Description
RSVD (Port)	The reserved (RSVD) diagnostic port is not required for normal activation or operation. This port supports modem debug or provisioning.
EN (LED)	The Enable (EN) LED is standard on NIMs and indicates the module state, as shown in Figure 1 . Solid green —Indicates powered on and functioning normally. Solid amber —Indicates Module has some type of failure. Off —Indicates Module does not have power. It may also remain off the first time when the NIM is powered on, until it is configured by the host software.

Table 2 Cisco 4G-LTE-NIM Ports and LED Indicators (continued)

Ports, Connectors, and LEDs	Description
WWAN (LED)	<p>Indicates the modem status.</p> <p>Solid green—Indicates the modem is powered, associated and authenticated but not receiving or transmitting data.</p> <p>Slow blinking green—Indicates the modem is powered, but not associated or authenticated; still searching for service. Check the antenna, cable, SIM card, or the user account with your service provider.</p> <p>Fast blinking green—Indicates the modem is powered and is transmitting or receiving. The blink rate is proportional to the transmitted and received data rate.</p> <p>Solid Amber—Indicates the modem is reserved for future use.</p> <p>Off—Indicates the modem is in reset mode.</p>
RSSI (LED)	<p>Indicates the level of signal strength received by the NIM.</p> <p>Solid green—Indicates a high RSSI (greater than -69 dBm).</p> <p>Solid blue—Indicates medium RSSI (-89 to -69dBm).</p> <p>Solid amber—Indicates low RSSI (-99 to -89dBm).</p> <p>Amber blink—Indicates RSSI is below -100dBm.</p> <p>Off—Indicates no service detected.</p>
SERVICE (LED)	<p>Indicates which cellular service is available.</p> <p>Solid green—Indicates 4G service is enabled (LTE).</p> <p>Solid blue—Indicates 3G service is enabled, e.g. EDVO, HSPA+.</p> <p>Solid amber—Indicates 2G service is enabled, e.g. 1xRTT, EDGE.</p> <p>Off—Indicates no service detected.</p>
GPS (LED)	<p>Indicates whether GPS service is enabled.</p> <p>Solid green—Indicates GPS service is enabled.</p> <p>Off—Indicates the GPS is not active or not detected.</p>
M1 DIV (Port)	Diversity Antenna Connector (TNC), with dust caps removed.
GPS (Port)	GPS Antenna Connector (SMA), with knurled metal cap.
M0 MAIN (Port)	Main Antenna Connector (TNC), with dust caps removed.

Supported Antennas and Cables

Table 3 lists the Cisco antennas that are supported for use on the Cisco 4G-LTE NIM.

Table 3 Supported Antennas

Cisco Part Number	Description	Maximum Gain and Frequency Ranges	Notes
4G-LTE-ANTM-D	Indoor 4G dipole omnidirectional	2 dBi <ul style="list-style-type: none"> • 698–806 MHz • 824–894 MHz • 925–960 MHz • 1710–1885 MHz • 1920–1980 MHz • 2110–2170 MHz • 2500–2690 MHz 	Multiband dipole antenna. For more information, see Cisco 4G/3G Omnidirectional Dipole Antenna (4G-LTE-ANTM-D) .
4G-ANTM-OM-CM	Indoor ceiling-mount omni-directional	698 MHz–2690 MHz	Multiband omnidirectional ceiling-mount antenna. For more information, see Cisco 4G Indoor Ceiling-Mount Omnidirectional Antenna (4G-ANTM-OM-CM) .
ANT-4G-OMNI-OUT-N	Multiband outdoor omnidirectional stick antenna	1.5 dBi <ul style="list-style-type: none"> • 698–960 MHz 3.5 dBi <ul style="list-style-type: none"> • 1710–2710 MHz • 2300–2700 MHz 	Multiband outdoor omnidirectional stick antenna. For more information, see Cisco Outdoor Omnidirectional Antenna for 2G/3G/4G Cellular (ANT-4G-OMNI-OUT-N) .
ANT-4G-SR-OUT-TNC	Multiband outdoor omnidirectional saucer antenna	1.5 dBi (peak gain with 10-foot cable) or 0.8 dBi (peak gain with 15-foot cable) <ul style="list-style-type: none"> • 698–960 MHz 3.7 dBi (peak gain with 10-foot cable) or 0.2 dBi (peak gain with 15-foot cable) <ul style="list-style-type: none"> • 1710–2700 MHz 	Low-profile outdoor saucer antenna. For more information, see Cisco Integrated 4G Low-Profile Outdoor Saucer Antenna (ANT-4G-SR-OUT-TNC) .
4G-AE010-R	Extension base with integral 10-foot cable	0.7–6.0 GHz	This is the default antenna extension base. For more information, see Cisco Single-Port Antenna Stand for Multiband TNC Male-Terminated Portable Antenna (Cisco 4G-AE015-R, Cisco 4G-AE010-R) .

Table 3 Supported Antennas (continued)

Cisco Part Number	Description	Maximum Gain and Frequency Ranges	Notes
4G-AE015-R	Extension base with integral 15-foot cable	0.7–6.0 GHz	Single-port antenna extension base with 15-foot cable. For more information, see Cisco Single-Port Antenna Stand for Multiband TNC Male-Terminated Portable Antenna (Cisco 4G-AE015-R, Cisco 4G-AE010-R) .
4G-ACC-OUT-LA	Lightning Arrestor	800–2200 MHz	4G lightning arrestor kit for use on Cisco 4G wireless devices. For more information, see Cisco 4G Lightning Arrestor (4G-ACC-OUT-LA) .
CGR-LA-NF-NF	Lightning Arrestor	800–2200 MHz	4G lightning arrestor kit for use on Cisco 4G wireless devices. For more information, see Lightning Arrestor for the Cisco 1240 Connected Grid Router .

Table 4 lists loss information and operating frequency levels for the ultra-low-loss (ULL) LMR 200 cables and LMR 400 cables available from Cisco for use with Cisco 4G-LTE-NIM.

Table 4 Cisco Extension Cables for Use with 4G-LTE-NIM

Cisco Product Number	Cable Length	Maximum Insertion Loss	Frequency (MHz)	Color	Plenum Rated? ¹
4G-CAB-ULL-20	20 ft (6 m)	1.8 dB	700–2600 MHz	Black	Yes
4G-CAB-ULL-50	50 ft (15 m)	4.2 dB	700–2600 MHz	Black	Yes
4G-CAB-LMR240-25	25 ft (7.5 m)	2.1 dB @ 700 MHz 4.0 dB @ 2.6 GHz	800–1000 MHz 1700–2600 MHz	Black	Yes
4G-CAB-LMR240-25N	25 ft (7.5 m)	2.1 dB @ 700 MHz 4.0 dB @ 2.6 GHz	700–1000 MHz 1700–2600 MHz	Black	No
4G-CAB-LMR240-50	50 ft (15 m)	4.1 dB @ 700 MHz 7.4 dB @ 2.6 GHz	800–1000 MHz 1700–2600 MHz	Black	Yes
4G-CAB-LMR240-75	75 ft (23 m)	6.1 dB @ 700 MHz 11.0 dB @ 2.6 GHz	800–1000 MHz 1700–2600 MHz	Black	Yes
CAB-L400-20-TNC-N	20 ft (6 m)	1.75 dB	700–2600 MHz	Black	No
CAB-L400-50-TNC-N	50 ft (15 m)	4.0 dB	700–2600 MHz	Black	No
CAB-L400-20-N-N	20 ft (6 m)	2.75 dB	700–2600 MHz	Black	No
4G-AE010-R	10 ft (3 m)	1.4 dB @ 700 MHz 2.0 dB @ 1.9 GHz 2.1 dB @ 2.1 GHz 2.3 dB @ 2.5 GHz 2.4 dB @ 2.7 GHz	700–2600 MHz	Black	No
4G-AE015-R	15 ft (4.6 m)	2.3 dB @ 700 MHz 3.3 dB @ 1.9 GHz 3.7 dB @ 2.1 GHz 4.0 dB @ 2.5 GHz	700–2600 MHz	Black	No

1. Cable can be routed within building plenum spaces.

Recommended Practices for the 4G-LTE-NIM

This section describes recommended practices for safe and effective installation of the hardware described in this document.

- Safety Recommendations
- Preventing Electrostatic Discharge Damage
- General Maintenance Guidelines
- Safety Warnings

Safety warnings included in this section apply to the 4G-LTE-NIMs that are used on the Cisco 4000 series ISRs.

Safety Recommendations

To prevent hazardous conditions, follow these safety recommendations while working with this equipment:

- Keep tools away from walk areas where you or others could fall over them.
- Do not wear loose clothing around the router. Fasten your tie or scarf and roll up your sleeves to prevent clothing from being caught in the chassis.
- Wear safety glasses when working under any conditions that might be hazardous to your eyes.
- Locate the emergency power-off switch in the room before you start working. If an electrical accident occurs, shut the power off.
- Before working on the router, turn off the power and unplug the power cord.
- Disconnect all power sources before doing the following:
 - Installing or removing a router chassis
 - Working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Always check that power is disconnected from a circuit.
- Remove possible hazards from your work area, such as damp floors, ungrounded power extension cables, or missing safety grounds.
- If an electrical accident occurs, proceed as follows:
 - Use caution; do not become a victim yourself.
 - Turn off power to the room using the emergency power-off switch.
 - Determine the condition of the victim and send another person to get medical aid or call for help.
 - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Preventing Electrostatic Discharge Damage

Electrostatic discharge can damage equipment and electrical circuitry. Electrostatic discharge occurs when electronic printed circuit cards, such as those used in Cisco network modules, are improperly handled and can result in complete or intermittent equipment failure. Always observe the following electrostatic discharge damage (ESD) prevention procedures when installing, removing, or replacing any electronic printed circuit cards:

- Make sure that the router chassis is electrically connected to earth ground.
- Wear an ESD-preventive wrist strap, and make sure that it makes good contact with your skin.
- Connect the wrist strap clip to an unpainted portion of the chassis frame to channel unwanted ESD voltages to ground.



Caution

The wrist strap and clip must be used correctly to ensure proper ESD protection. Periodically confirm that the resistance value of the ESD-preventive wrist strap is between 1 and 10 megohms (Mohm).

- If no wrist strap is available, ground yourself by touching the metal part of the router chassis.

General Maintenance Guidelines

The following maintenance guidelines apply to the Cisco Network Interface Module for 4G-LTE-NIM:

- Keep the router chassis area clear and dust-free during and after installation.
- If you remove the chassis cover for any reason, store it in a safe place.
- Do not perform any action that creates a hazard to people or makes equipment unsafe.
- Keep walk areas clear to prevent falls or damage to equipment.
- Follow installation and maintenance procedures as documented by Cisco Systems, Inc.

Safety Warnings

The following safety warning statements apply to all hardware procedures involving the 4G-LTE-NIM for Cisco 4000 series ISRs. Translations of these warnings are available in the *Cisco Network Modules and Interface Cards Regulatory Compliance and Safety Information* document, which ships with all individual NIM orders, and is also available on <http://www.cisco.com/c/en/us/td/docs/routers/access/interfaces/rcsi/IOHrcsi.html>.



Warning

IMPORTANT SAFETY INSTRUCTIONS

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

SAVE THESE INSTRUCTIONS


Warning

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


Warning

To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord. Statement 1023


Warning

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


Warning

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


Warning

Do not use this product near water; for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool. Statement 1035


Warning

Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations. Statement 1036


Warning

Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface. Statement 1037


Warning

Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning. Statement 1038


Warning

To report a gas leak, do not use a telephone in the vicinity of the leak. Statement 1039


Warning

Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040


Warning

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

The following warnings apply in Australia:

**Warning**

Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43

**Warning**

Because invisible laser radiation may be emitted from the aperture of the port when no fiber cable is connected, avoid exposure to laser radiation and do not stare into open apertures. Statement 125

**Warning**

Do not work on the system or connect or disconnect cables during periods of lightning activity. Statement 1001

**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. Both LAN and WAN ports may use RJ-45 connectors. Use caution when connecting cables. Statement 1021

**Warning**

Hazardous network voltages are present in WAN ports regardless of whether power to the router is OFF or ON. To avoid electric shock, use caution when working near WAN ports. When detaching cables, detach the end away from the router first. Statement 1026

**Warning**

Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages. Statement 1041

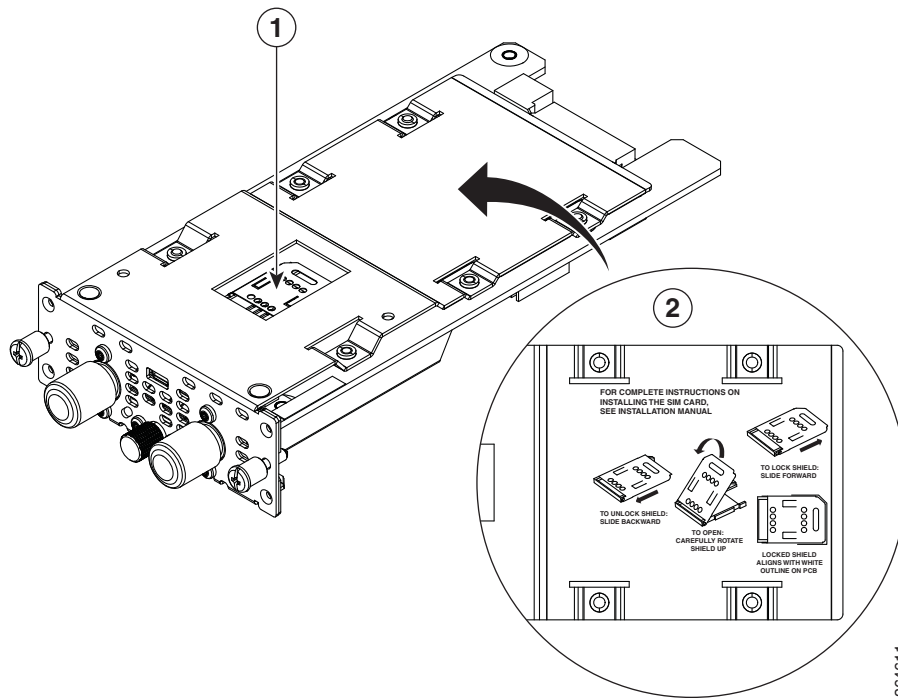
**Warning**

The telecommunications lines must be disconnected 1) before unplugging the main power connector and/or 2) while the housing is open. Statement 1043

Installing the SIM card on the Cisco 4G-LTE-NIM

The SIM card socket is located on the bottom side of the NIM. [Figure 2](#) shows the silk-screen of the NIM.

Figure 2 Silkscreen of the NIM



1	SIM Socket	2	SIM Installation Instruction on Module
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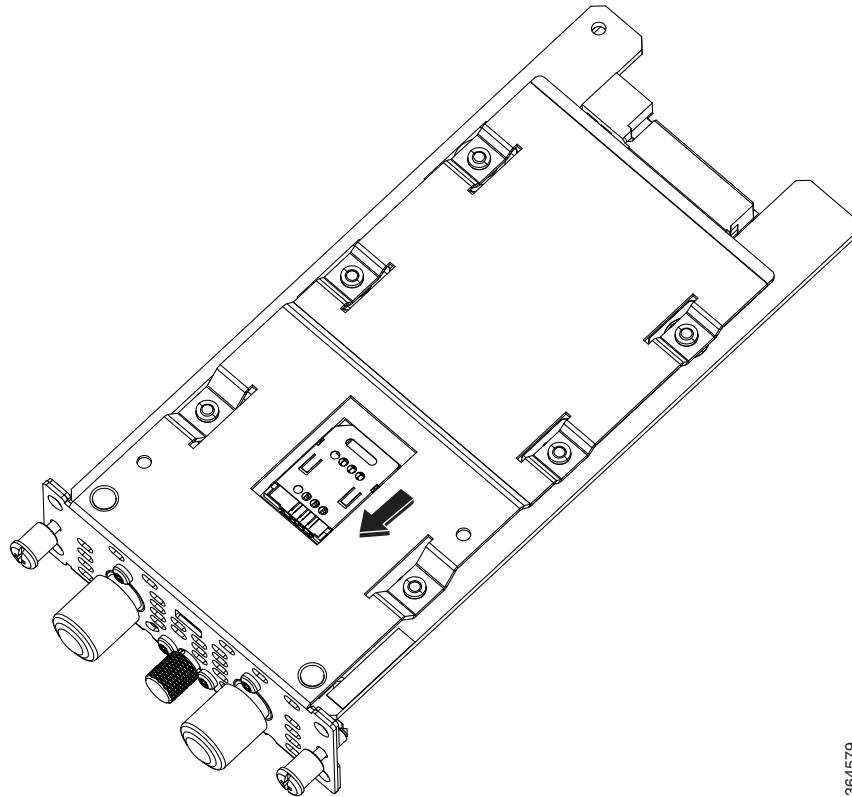
Follow these steps to install the SIM card:

- Step 1** To unlock the SIM socket cover, slide the cover toward the faceplate in the direction of the unlock arrow, as shown in [Figure 3](#).



Note The SIM cover unlocks and locks with a tactile 'click'.

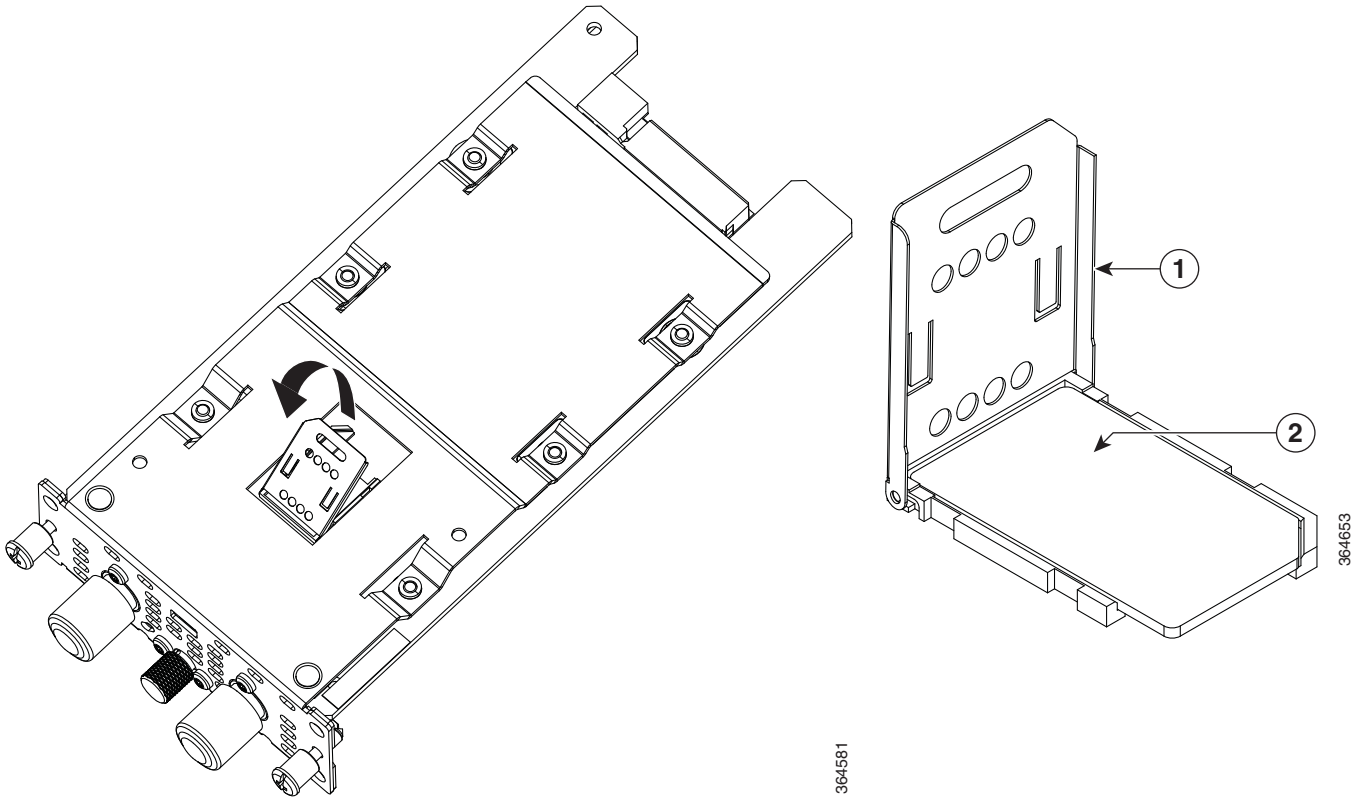
Figure 3 *Unlock the SIM Socket Cover*



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Step 2 Gently lift the cover on its hinges, and place the SIM card down on the metallic contacts, as shown in [Figure 4](#).

Figure 4 Open the SIM cover, and Place the SIM Card on the Contacts

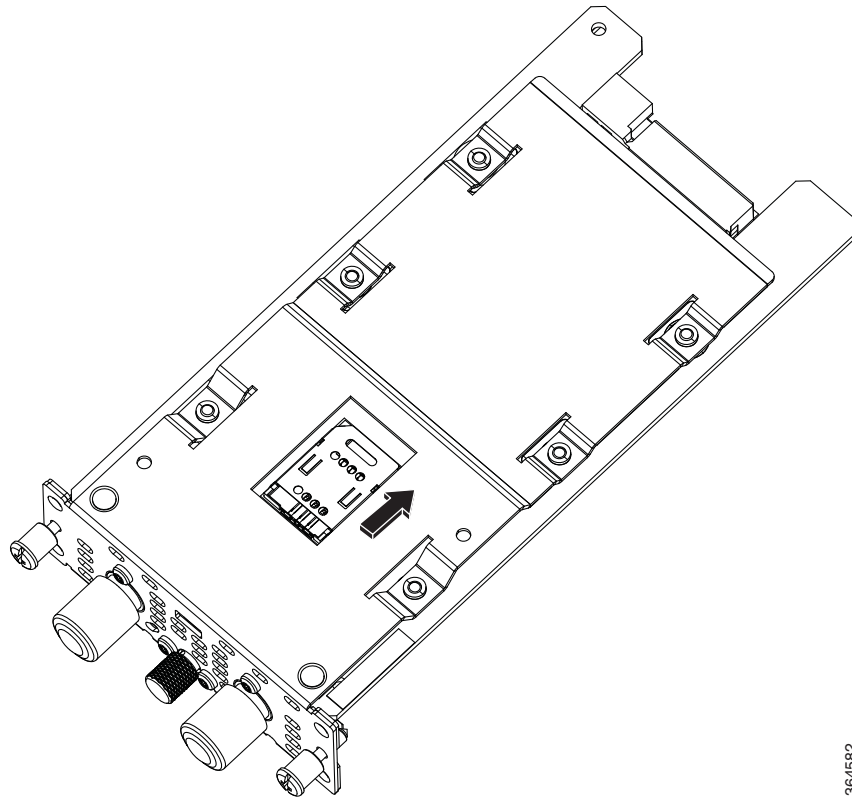


1	SIM Card	2	SIM card installed on socket contacts
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Step 3 Gently push down the cover to close.

Step 4 To lock the cover, slide it away from the faceplate in the direction of the lock arrow, as shown in [Figure 5](#).

Figure 5 **Lock the SIM Socket Cover**

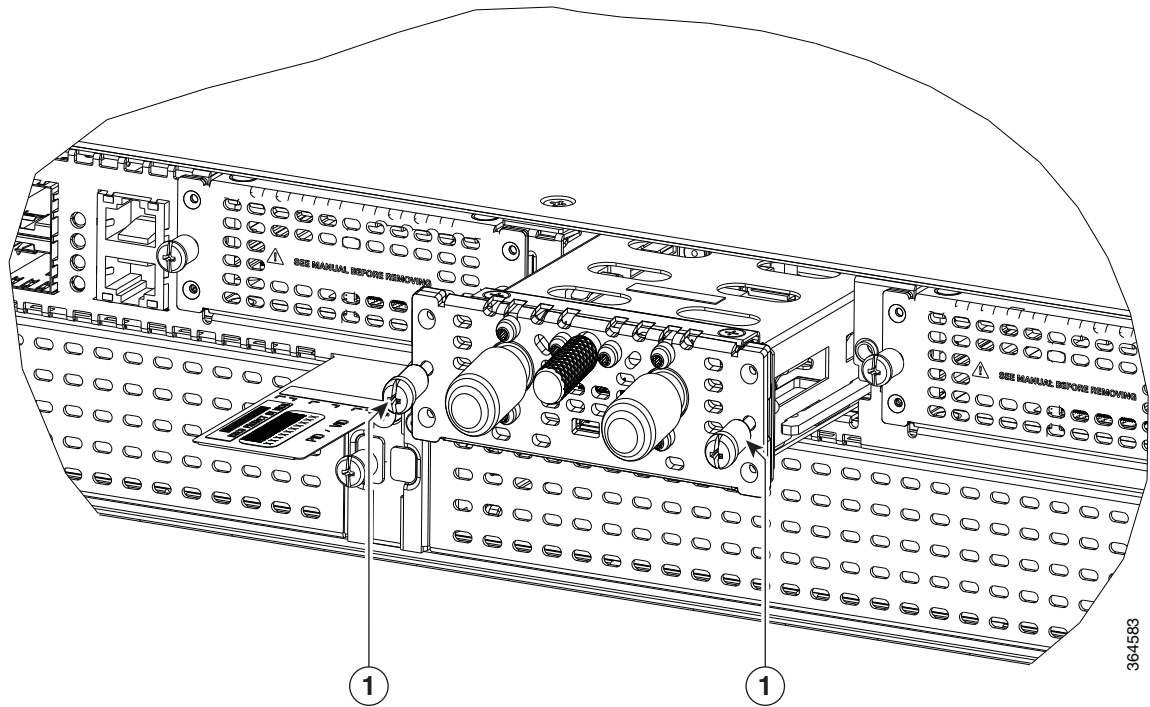


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Installing the Cisco 4G-LTE-NIM into a Cisco 4000 Series ISR

To install the 4G-LTE-NIM into a Cisco 4000 series ISR, see the following [Figure 6](#) and the procedure that follows:

Figure 6 Installing the Cisco 4G-LTE-NIM into a Cisco 4000 Series ISR



- | | |
|----------|--|
| 1 | Captive screws holding the NIM to the router |
|----------|--|

Before You Begin

Make sure that you connect the wrist-strap clip to an unpainted portion of the chassis frame to channel unwanted ESD voltages to ground.

Procedure

Use the following procedure to install the Cisco 4G-LTE-NIM on your router:

- Step 1** Read the “[Safety Warnings](#)” section before you perform any module replacement.
- Step 2** Remove the blank faceplate installed over the NIM slot of the ISR.
- Step 3** Insert the NIM into the router. (See [Figure 6](#)).
- Step 4** Tighten the captive mounting screws on the module faceplate with the help of a number 1 Phillips or flat-blade screwdriver.
- Step 5** Check the LEDs and confirm proper operation.

Removing the Cisco 4G-LTE-NIM from a Cisco 4000 Series ISR

Procedure

Use the following procedure to remove the Cisco 4G-LTE-NIM from your router:

-
- Step 1** Read the “Safety Warnings” section before you perform any module replacement.
- Step 2** Locate the 4G-LTE-NIM card to be removed.
- Step 3** Unscrew the captive mounting screws on the module faceplate with the help of a number 1 Phillips or flat-blade screwdriver.
- Step 4** Pull the 4G-LTE-NIM out of the chassis.
- Step 5** Place the 4G-LTE-NIM card in an antistatic bag to protect it from electrostatic discharge (ESD) damage.

Related Documents

Related Topic	Document Title
Cisco Fourth-Generation LTE Network Interface Module Configuration Guide for Cisco 4000 Series ISR	Cisco Fourth-Generation LTE Network Interface Module Software Configuration Guide
Hardware installation instructions for service modules	Hardware Installation Guide for the Cisco 4000 Series Integrated Services Router
General information about configuration and the command reference.	Software Configuration Guide for the Cisco 4000 Series Integrated Services Router
Regulatory compliance information for the Cisco 4000 Series ISR.	Regulatory Compliance and Safety Information for the Cisco 4000 Series Integrated Services Router

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