



# Connecting Cisco IP VSAT Satellite WAN Network Modules to the Network

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This guide describes how to connect Cisco IP VSAT satellite WAN network modules to your network. It contains the following sections:

- [NM-1VSAT-GILAT Network Module, page 1](#)
- [Prerequisites for the NM-1VSAT-GILAT Network Module, page 2](#)
- [Restrictions for the NM-1VSAT-GILAT Network Module, page 2](#)
- [Information About the NM-1VSAT-GILAT Network Module, page 3](#)
- [How to Install, Connect, or Replace the NM-1VSAT-GILAT Network Module, page 10](#)
- [Related Documents, page 19](#)
- [Obtaining Documentation, Obtaining Support, and Security Guidelines, page 20](#)

## NM-1VSAT-GILAT Network Module

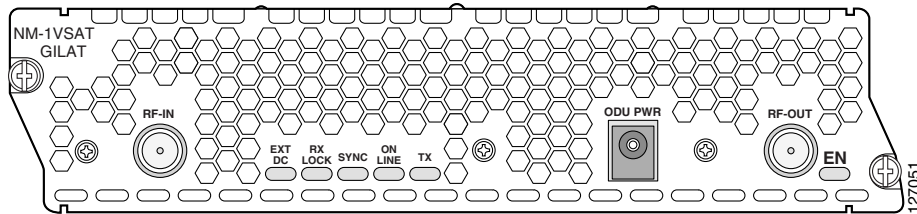
The NM-1VSAT-GILAT network module provides Cisco modular access routers with two-way satellite WAN connectivity in Gilat SkyEdge-compatible satellite communications networks. The NM-1VSAT-GILAT network module functions as the indoor unit (IDU) of a very small aperture terminal (VSAT), or earthbound station of a satellite communications network. A “very small” dish antenna is called the outdoor unit (ODU) of a VSAT. As the IDU, the NM-1VSAT-GILAT network module serves as the interface between the ODU and the VSAT LAN. The ODU receives and sends signals to a satellite, and the satellite sends and receives signals from an earthbound central hub, which controls the entire operation of the satellite network. [Figure 1](#) shows the NM-1VSAT-GILAT network module faceplate.



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Figure 1 Cisco IP VSAT Satellite WAN Network Module (NM-1VSAT-GILAT) Faceplate



## Prerequisites for the NM-1VSAT-GILAT Network Module

- You need a router that supports the NM-1VSAT-GILAT network module. For a list of supported platforms, see the *Cisco IP VSAT Satellite WAN Network Module (NM-1VSAT-GILAT) Data Sheet*.
- The NM-1VSAT-GILAT network module requires an associated central hub, which monitors and controls the satellite network. Therefore, you must take one of the following actions:
  - Subscribe to service from a Gilat SkyEdge satellite service provider.
  - Purchase your own Gilat SkyEdge hub equipment.
- The NM-1VSAT-GILAT network module requires a “Sat Kit” provided by a Gilat SkyEdge satellite service provider. The Sat Kit includes the dish antenna equipment and an external power supply.



### Warning

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



### Note

For software-related prerequisites, see the [Cisco IP VSAT Satellite WAN Network Module \(NM-1VSAT-GILAT\)](#) Cisco IOS feature module.

## Restrictions for the NM-1VSAT-GILAT Network Module

- The NM-1VSAT-GILAT network module is supported only in Gilat SkyEdge-compatible satellite communications networks. For more information, go to <http://www.gilat.com/>.
- One-way satellite connectivity is currently not supported.
- The NM-1VSAT-GILAT network module is designed for Ku-band and C-band satellite networks using the Gilat SkyEdge Frequency and Time Division Multiple Access (FTDMA) technology. The NM-1VSAT-GILAT network module is *not* compatible with these items:
  - Other frequency bands, such as Ka-band
  - Other satellite TDMA systems, including Digital Video Broadcasting–Return Channel by Satellite (DVB-RCS), and Data Over Cable Service Interface Specification (DOCSIS)
  - Other media access methods, such as Single Channel Per Carrier (SCPC)
- The following hardware tasks are not described in this document and must be performed by a Gilat SkyEdge-certified installer:
  - Installing and aligning the dish antenna

- Running cables from the ODU to the IDU area
- Connecting two NM-1VSAT-GILAT network modules to one ODU for Hot Standby Router Protocol (HSRP) redundancy
- To avoid damaging the NM-1VSAT-GILAT network module, disconnect the power supply from the ODU PWR connector on the NM-1VSAT-GILAT network module *before* you attempt any of the following actions:
  - Connecting a cable to the RF-IN or RF-OUT connector
  - Disconnecting a cable from the RF-IN or RF-OUT connector
  - Inserting the NM-1VSAT-GILAT network module into the router chassis
  - Removing the NM-1VSAT-GILAT network module from the router chassis
- After completing the hardware installation, moving the router with the installed NM-1VSAT-GILAT network module may require longer radio frequency (RF) cables. Depending on the ODU type and the additional length required for the cables, you may need a technician to install line amplifiers. Contact your satellite service provider if you plan to extend your cables by more than 35 feet (11 m).

**Note**

For software-related restrictions, see the [Cisco IP VSAT Satellite WAN Network Module \(NM-1VSAT-GILAT\)](#) Cisco IOS feature module.

## Information About the NM-1VSAT-GILAT Network Module

Before performing the tasks in this document, you should understand the following concepts:

- [General Satellite Network Components](#), page 3
- [NM-1VSAT-GILAT Network Module Connectors](#), page 6
- [Outbound and Inbound Directions in a Satellite Communications Network](#), page 7
- [NM-1VSAT-GILAT Network Module LEDs](#), page 7

**Note**

For NM-1VSAT-GILAT network module features and benefits, supported hardware and software, and other product information, see the [Cisco IP VSAT Satellite WAN Network Module \(NM-1VSAT-GILAT\) Data Sheet](#).

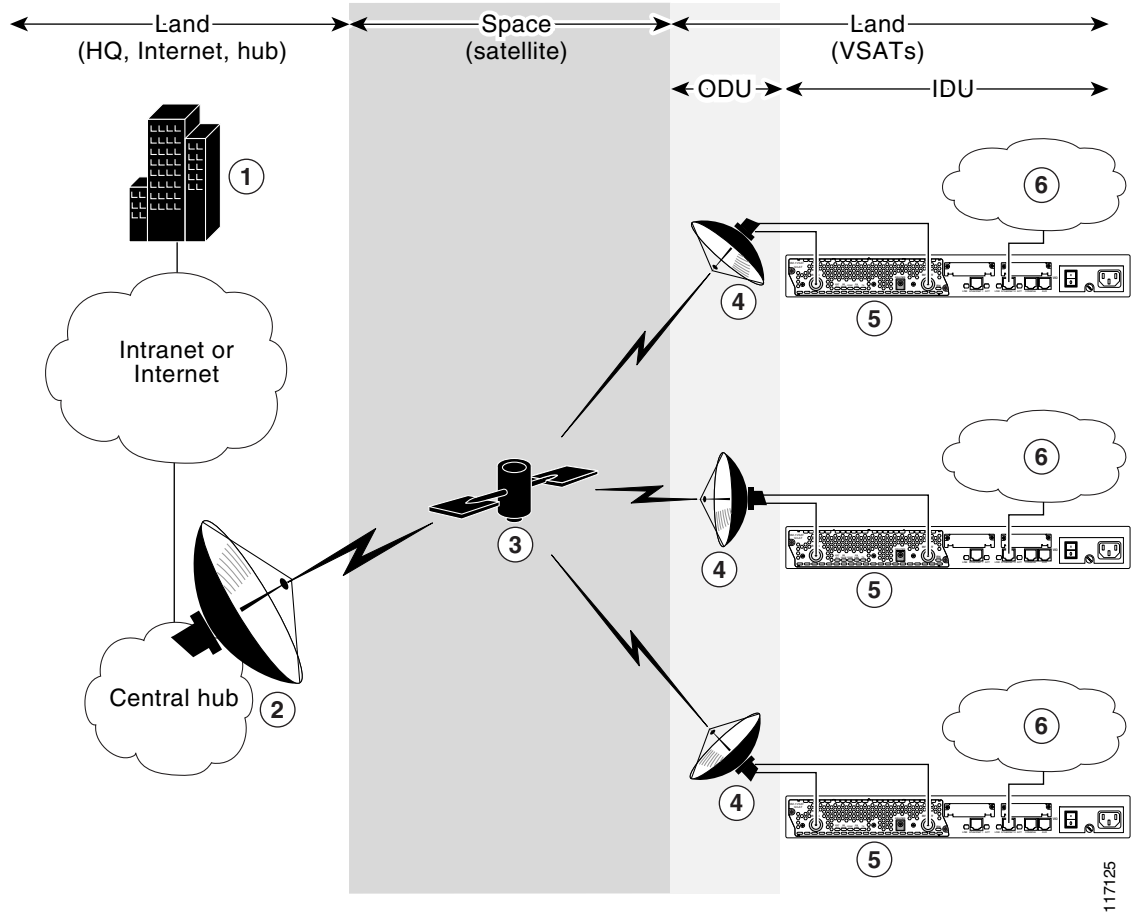
## General Satellite Network Components

[Figure 2](#) shows a satellite communications network that includes NM-1VSAT-GILAT network modules.

**Note**

Not shown in [Figure 2](#) are the terrestrial WAN connections that are also commonly used to connect VSAT routers to the Internet or an intranet. A terrestrial WAN connection can be used to back up a satellite link or can serve as a primary link that is backed up by a satellite link.

**Figure 2** Satellite Communications Network Using the NM-1VSAT-GILAT Network Module



<b>1</b>	Corporate headquarters/campus	<b>4</b>	Dish antenna (ODU <sup>1</sup> ) at VSAT <sup>2</sup>
<b>2</b>	Dish antenna at hub	<b>5</b>	NM-1VSAT-GILAT network module at VSAT
<b>3</b>	Satellite in space	<b>6</b>	Local network at VSAT; for example, a branch office network connected to an Ethernet port on the router

1. ODU = outdoor unit
2. VSAT = very small aperture terminal

At a high level, the many components of an enterprise satellite communications network can be divided into three categories:

- [Satellite](#)
- [Hub](#)
- [VSATs](#)

## Satellite

Placed in orbit around the earth, a satellite is a specialized repeater that receives radio-frequency signals from earth stations and retransmits them to other earth stations. The satellite also amplifies the signals and switches the frequencies between the uplink and the downlink carriers. Gilat SkyEdge systems use geostationary satellites with a fixed satellite-to-earth delay of about 250 ms.

## Hub

The central hub—sometimes referred to as the “master earth station” but most often simply called the “hub”—contains many components, including:

- Large dish antenna (15 to 36 feet [4.5 to 11 m] in diameter)
- Satellite network management system (NMS) and provisioning stations, from which a network operator can monitor and control all components of the enterprise satellite communications network.
- Baseband equipment that handles satellite access, routing between the hub and remote earth stations, dial backup, quality of service (QoS), TCP acceleration, and HTTP acceleration.
- Optional components: web caches, MPEG transport coder/decoder, application server farms, and audio/video broadcast programming devices.



**Note**

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Throughout this document, the “hub” refers specifically to a Gilat SkyEdge hub.

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## VSATs

A very small aperture terminal (VSAT) is an earth station that can be divided into two areas:

- Indoor unit (IDU), which generally serves to connect the local network to the hub through the satellite link. The IDU components vary, depending on the functions required, but the components typically include these items:
  - Integrated receiver decoder (IRD) for the tuning
  - Demodulation and decoding of L-band or other type of intermediate frequency (IF) passed from the dish
  - End-user input/output
- Outdoor unit (ODU), which includes a “very small” dish antenna (2 to 6 feet [0.5 to 2 m] in diameter) and its components, shown in [Figure 3](#). The ODU is typically mounted on a building roof or outer wall, or placed on the ground.

The NM-1VSAT-GILAT network module functions as the IDU of a VSAT and is connected to the ODU through coaxial cables. A power supply is connected to the NM-1VSAT-GILAT network module to provide power over the coaxial cables to the ODU.



**Note**

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The NM-1VSAT-GILAT network module supports only the ODU equipment and power supply that comes in the “Sat Kit” provided by a Gilat SkyEdge satellite service provider.

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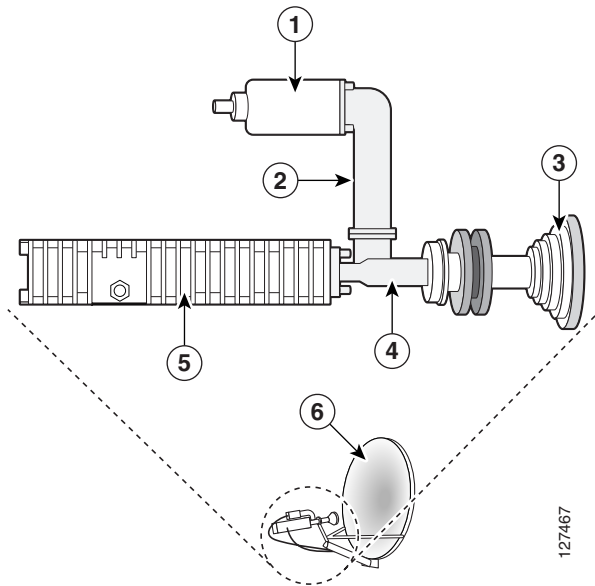
**Figure 3** ODU Components

Figure Callout	ODU Component	Function
1	Low noise block converter (LNB)	Amplifies and converts high-frequency satellite signals into lower-frequency signals.
2	Transmit reject filter	Filters out transmitted signals so that only signals received from the satellite enter the LNB.
3	Feed horn	Captures signals from and transmits energy to the reflector.
4	Orthomode transducer (OMT)	Separates transmitted signals from received signals, which have different polarization and frequency.
5	Solid state block converter and power amplifier (SSPA)	Amplifies and converts the low-frequency signals from the IDU to high-frequency signals for transmission across the satellite link.
6	Reflector	Concave dish surface which focuses the energy received from the satellite to the feed horn and which transfers the energy transmitted by the feed horn to the satellite.

## NM-1VSAT-GILAT Network Module Connectors

Table 1 lists the physical connectors that appear on the NM-1VSAT-GILAT network module faceplate.

**Table 1** NM-1VSAT-GILAT Network Module Connectors

Connector	Type	Connects To
RF-IN	75-ohm female F connector	LNB on the dish antenna
RF-OUT	75-ohm female F connector	SSPA on the dish antenna
ODU PWR	2-mm DC jack	External 24 V-DC power supply

## Outbound and Inbound Directions in a Satellite Communications Network

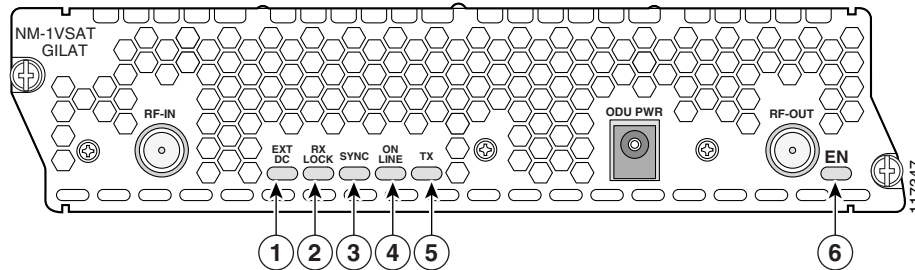
The *outbound* direction applies to signals transmitted from the hub to the VSAT. Within a VSAT network, the outbound direction applies to RF communication from the dish antenna (ODU) to the NM-1VSAT-GILAT network module (IDU). From the VSAT perspective, the outbound direction is the *receive* path. Gilat SkyEdge outbound signals include user data and timing data that are compatible with the Digital Video Broadcasting–Satellite (DVB-S) standard.

The *inbound* direction applies to signals transmitted from the VSAT to the hub. Within a VSAT network, the inbound direction applies to RF communication from the NM-1VSAT-GILAT network module (IDU) to the dish antenna (ODU). From the VSAT perspective, the inbound direction is the *transmit* path. Inbound signals include user data and retransmission requests.

## NM-1VSAT-GILAT Network Module LEDs

The Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT) has six LEDs, shown in Figure 4 and described in Table 2.

**Figure 4** NM-1VSAT-GILAT Network Module LEDs



**Table 2** NM-1VSAT-GILAT Network Module LED Descriptions

Figure Ref.	LED	State	Meaning	Possible Causes and Corrective Actions
1	EXT DC	Blinking	ODU <sup>1</sup> power DC level is correct, and the network module VSAT <sup>2</sup> software is running.	Normal indication. No action required.
		Steady on	ODU power supply is connected properly, but the network module VSAT software is not running.	Wait until the VSAT software completes the boot process.
		Off	ODU power supply is not connected or is outside the specified DC range.	Check ODU power supply connections. See the “Connecting the NM-1VSAT-GILAT Network Module to the External Power Supply” section on page 12.

Table 2 NM-1VSAT-GILAT Network Module LED Descriptions (continued)

Figure Ref.	LED	State	Meaning	Possible Causes and Corrective Actions
2	RX LOCK	On	DVB <sup>3</sup> (outbound <sup>4</sup> ) receiver is locked.	Normal indication. No action required.
		Off	NM-1VSAT-GILAT network module does not see or recognize the DVB carrier signal from the hub.	<p>The VSAT parameters are configured incorrectly. See the <a href="#">Cisco IP VSAT Satellite WAN Network Module (NM-1VSAT-GILAT)</a> Cisco IOS feature module.</p> <p>The network module is not properly connected to the LNB.<sup>5</sup> Check the RF<sup>6</sup> cables or contact your satellite service provider.</p> <p>The dish antenna is misaligned. Contact your satellite service provider.</p> <p>There is a hub failure, or the hub is configured incorrectly. Contact your satellite service provider.</p>
3	SYNC	On	NM-1VSAT-GILAT network module is synchronized with the hub timing.	Normal indication. No action required.
		Off	NM-1VSAT-GILAT network module is not synchronized with the hub timing.	<p>If the RX LOCK LED is also off, then see the corrective actions for RX LOCK.</p> <p>If the RX LOCK LED is on while the SYNC LED is off, then the following apply:</p> <ul style="list-style-type: none"> <li>The VSAT parameters are configured incorrectly. See the <a href="#">Cisco IP VSAT Satellite WAN Network Module (NM-1VSAT-GILAT)</a> Cisco IOS feature module.</li> <li>There is a hub failure, or the hub is configured incorrectly. Contact your satellite service provider.</li> </ul>



Table 2 NM-1VSAT-GILAT Network Module LED Descriptions (continued)

Figure Ref.	LED	State	Meaning	Possible Causes and Corrective Actions
4	ON LINE	On	IP connectivity to the hub is fully established.	Normal indication. No action required.
		Off	IP connectivity to the hub was unsuccessful.	<p>If the SYNC LED is also off, then see the corrective actions for SYNC.</p> <p>If the SYNC LED is on while the ON LINE LED is off, then the following apply:</p> <ul style="list-style-type: none"> <li>• There is a problem somewhere in the return path from the network module to the hub. Check the cabling between the RF-OUT connector and the SSPA.<sup>7</sup></li> <li>• The SSPA may not be working. Contact your satellite service provider.</li> <li>• The dish antenna is misaligned. Contact your satellite service provider.</li> <li>• There is a hub failure, or the hub is configured incorrectly. Contact your satellite service provider.</li> </ul>
5	TX	Flickering	Inbound <sup>8</sup> transmission is in progress.	Normal indication. No action required.
		Off	No inbound transmission is in progress.	<p>If you are concerned about the TX LED being off, then try to ping the hub or another destination on the other side of the satellite link. If the TX LED does not flicker during the ping, then the network module is not attempting to send data to the hub.</p> <ul style="list-style-type: none"> <li>• Wait until the VSAT software completes the boot process.</li> <li>• Verify that your Cisco IOS software configuration is correct. See the <a href="#">Cisco IP VSAT Satellite WAN Network Module (NM-1VSAT-GILAT)</a> Cisco IOS feature module.</li> <li>• The VSAT software has failed. Contact your satellite service provider.</li> </ul>

Table 2 NM-1VSAT-GILAT Network Module LED Descriptions (continued)

Figure Ref.	LED	State	Meaning	Possible Causes and Corrective Actions
6	EN	On	The router's Cisco IOS software recognizes the network module.	Normal indication. No action required.
		Off	The router's Cisco IOS software does not recognize the network module.	Verify that the network module is properly installed in the router chassis. See the <a href="#">"Installing Cisco Network Modules in Cisco Access Routers"</a> guide.

1. ODU = outdoor unit.
2. VSAT = very small aperture terminal.
3. DVB = Digital Video Broadcasting.
4. The *receive* direction at the remote VSAT is called the *outbound* direction from the hub. See the ["Outbound and Inbound Directions in a Satellite Communications Network"](#) section on page 7.
5. LNB = low noise block converter.
6. RF = radio frequency.
7. SSPA = solid state block converter and power amplifier.
8. The *transmit* direction at the remote VSAT is called the *inbound* direction to the hub. See the ["Outbound and Inbound Directions in a Satellite Communications Network"](#) section on page 7.

## How to Install, Connect, or Replace the NM-1VSAT-GILAT Network Module

This section contains the following procedures, each of which may or may not be required, depending on which tasks your satellite service provider performs for you:

- [Installing the NM-1VSAT-GILAT Network Module in the Router Chassis](#), page 10
- [Connecting the NM-1VSAT-GILAT Network Module to the ODU](#), page 10
- [Connecting the NM-1VSAT-GILAT Network Module to the External Power Supply](#), page 12
- [Replacing the NM-1VSAT-GILAT Network Module in the Router Chassis](#), page 14

### Installing the NM-1VSAT-GILAT Network Module in the Router Chassis

To install the NM-1VSAT-GILAT network module in the router chassis, see the ["Installing Cisco Network Modules in Cisco Access Routers"](#) guide.

### Connecting the NM-1VSAT-GILAT Network Module to the ODU

This section describes how to connect the NM-1VSAT-GILAT network module to the ODU.

Shielded RG-6, RG-11, or both types of RF cables are used to connect the NM-1VSAT-GILAT network module to the ODU. Typically, a satellite service provider installation technician installs the ODU, connects RG-11 cables to the dish antenna, and runs the RG-11 cables to the area near the router. The technician also typically terminates the RG-11 cables and adds short RG-6 cables, which are then connected to the NM-1VSAT-GILAT network module in the router.

**Note**

If an installation technician has already connected the NM-1VSAT-GILAT to the ODU, then do not perform this task. Instead, proceed directly to the [“Connecting the NM-1VSAT-GILAT Network Module to the External Power Supply”](#) section on page 12.

## Prerequisites

- Install the NM-1VSAT-GILAT network module in the router chassis.
- Make sure that your ODU is installed and connected to RF cables that lead to the area near the NM-1VSAT-GILAT network module. Contact your satellite service provider for ODU and cable installation information.

## Steps

To connect the NM-1VSAT-GILAT network module to the ODU, follow these steps:

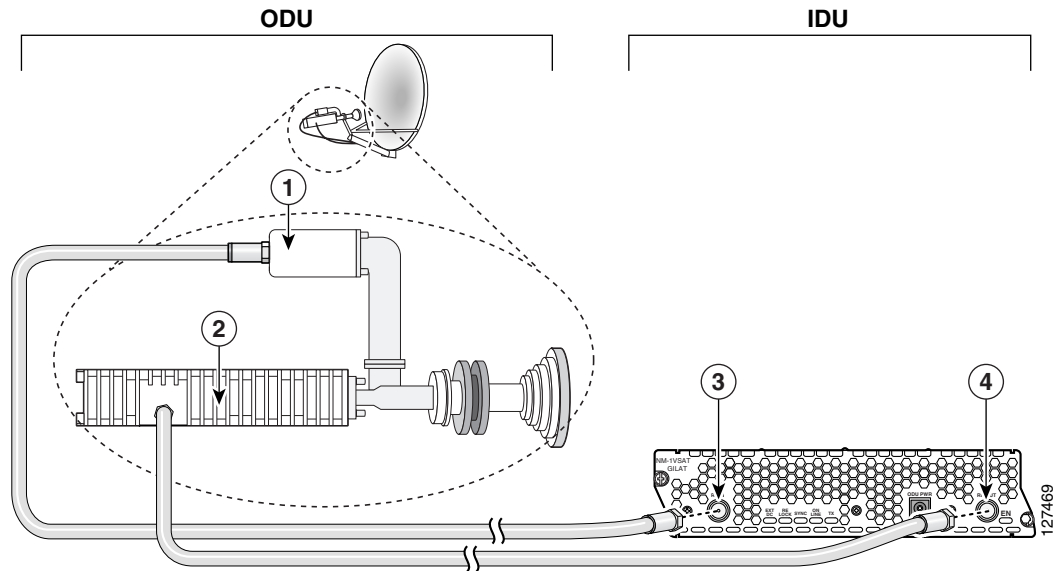
- 
- Step 1** Disconnect the power supply from the ODU PWR connector on the NM-1VSAT-GILAT network module.

**Caution**

Make sure that the external power supply is disconnected from the NM-1VSAT-GILAT network module before connecting cables to the RF-IN or RF-OUT connectors. If the external power supply is connected to the ODU PWR connector while you connect or disconnect cables to the RF-IN or RF-OUT connectors, you might short-circuit the NM-1VSAT-GILAT network module F connectors. This may cause the network module to reset itself or lose data.

- Step 2** Take the indoor end of the cable that leads to the LNB, and connect it to the RF-IN connector on the NM-1VSAT-GILAT network module. (See [Figure 5](#).)
- Step 3** Take the indoor end of the cable that leads to the SSPA, and connect it to the RF-OUT connector on the NM-1VSAT-GILAT network module. (See [Figure 5](#).)

Figure 5 Connecting the NM-1VSAT-GILAT Network Module to the ODU



1	LNB	3	RF-IN connector
2	SSPA	4	RF-OUT connector

## What to Do Next

Proceed to the [“Connecting the NM-1VSAT-GILAT Network Module to the External Power Supply”](#) section on page 12.

## Connecting the NM-1VSAT-GILAT Network Module to the External Power Supply

This section describes how to connect the NM-1VSAT-GILAT network module to the external power supply that comes in the “Sat Kit” provided by a Gilat SkyEdge satellite service provider. The NM-1VSAT-GILAT network module requires additional power to operate the ODU, which includes the dish antenna and its parts, such as the LNB, SSPA, OMT, and feed horn.



### Note

If an installation technician has already connected a power supply to the ODU, then do not perform this task. Instead, proceed directly to the software configuration tasks for your NM-1VSAT-GILAT network module. See the [Cisco IP VSAT Satellite WAN Network Module \(NM-1VSAT-GILAT\)](#) Cisco IOS feature module.

## Prerequisites

- Install the NM-1VSAT-GILAT network module in the router chassis.
- Connect the NM-1VSAT-GILAT network module to the ODU. See the [“Connecting the NM-1VSAT-GILAT Network Module to the ODU”](#) section on page 10.

## Restrictions

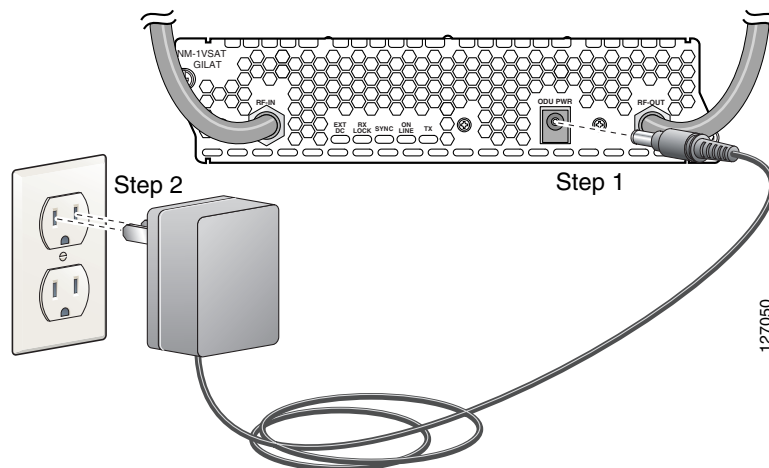
Only use the power supply provided in the Gilat ODU kit. Use of any other power supply will void the warranties for your NM-1VSAT-GILAT network module and outdoor equipment.

## Steps

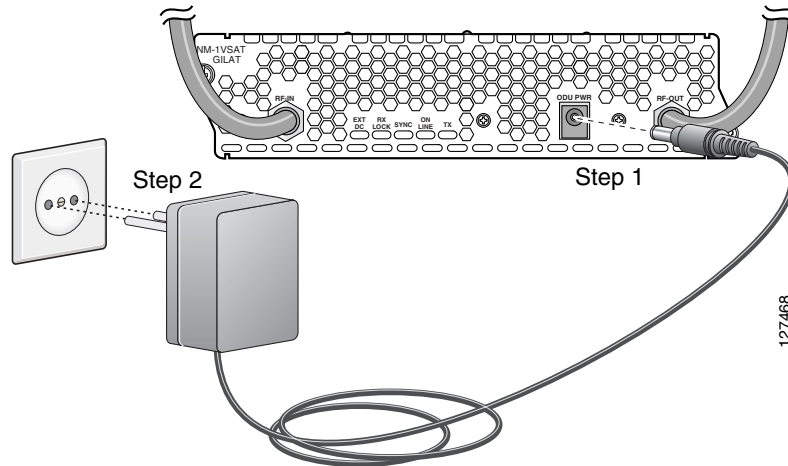
To connect the NM-1VSAT-GILAT network module to the external power supply, follow these steps:

- Step 1** Connect the power supply cable to the ODU PWR connector on the NM-1VSAT-GILAT network module. (See [Figure 6](#).)
- Step 2** Connect the power supply to a general-purpose electrical outlet. (For the United States, see [Figure 6](#). For Europe, see [Figure 7](#).)

**Figure 6** Connecting the NM-1VSAT-GILAT Network Module to the Power Supply (USA)



**Figure 7** Connecting the NM-1VSAT-GILAT Network Module to the Power Supply (Europe)



## What to Do Next

Proceed to the software configuration for your NM-1VSAT-GILAT network module. See the [Cisco IP VSAT Satellite WAN Network Module \(NM-1VSAT-GILAT\)](#) Cisco IOS feature module.

## Replacing the NM-1VSAT-GILAT Network Module in the Router Chassis

This section describes how to replace the NM-1VSAT-GILAT network module in your router. Complete one of the following tasks, depending on whether or not your router supports online insertion and removal (OIR):

- [Performing Online Insertion and Removal of the NM-1VSAT-GILAT Network Module](#), page 14
- [Replacing the NM-1VSAT-GILAT Network Module in a Router](#), page 17

## Performing Online Insertion and Removal of the NM-1VSAT-GILAT Network Module

The online insertion and removal (OIR) feature enables some Cisco modular access routers to support the replacement of network modules without switching off the router or affecting the operation of other interfaces. Also, routing information is maintained during OIR of network modules.

If your router does not support OIR, do not perform this task to replace your NM-1VSAT-GILAT network module. Instead, go to the [“Replacing the NM-1VSAT-GILAT Network Module in a Router”](#) section on page 17.

### Restrictions

- Only the Cisco 3745 and Cisco 3845 routers support OIR of the NM-1VSAT-GILAT network module.
- All connections made through the NM-1VSAT-GILAT network module are reset during OIR.
- You must perform OIR with similar modules. If you remove a network module, install another network module exactly like it in its place.

## Steps

To perform OIR of the NM-1VSAT-GILAT network module in your router, follow these steps:

- 
- Step 1** Initiate a console session with your router.
- Step 2** Enter satellite interface configuration mode and shut down the interface:
- ```
Router> enable
Router# configure terminal
Router(config)# interface satellite slot/0
Router(config-if)# shutdown
Router(config-if)# end
Router#
```
- Step 3** Disconnect the power supply cable from the ODU PWR connector on the NM-1VSAT-GILAT network module.



### Caution

Make sure that the external power supply is disconnected from the NM-1VSAT-GILAT network module before connecting or disconnecting cables from the RF-IN or RF-OUT connectors. If the external power supply is connected to the ODU PWR connector while you connect or disconnect cables from the RF-IN or RF-OUT connectors, you might short-circuit the NM-1VSAT-GILAT network module F connectors. This may cause the network module to reset itself or lose data.

- Step 4** (Optional but recommended) Label the RF cables “RF-IN” and “RF-OUT.”
- Step 5** Disconnect the cables from the RF-IN and RF-OUT connectors on the NM-1VSAT-GILAT network module.
- Step 6** Using a number 1 Phillips or flat-blade screwdriver, loosen the captive mounting screws on the network module faceplate.

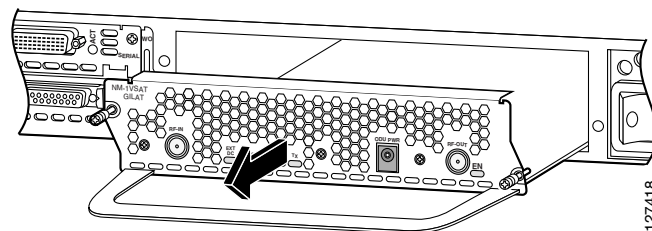


### Caution

To avoid damaging the network module, always handle the network module by the handle or faceplate. Do not touch the circuit board.

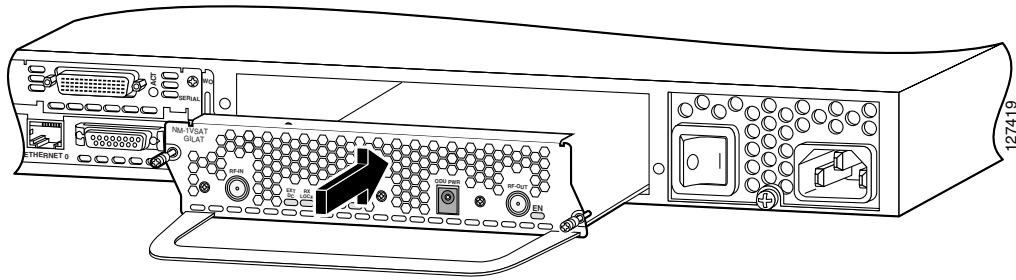
- Step 7** Using the module handle, pull the network module from the router slot. (See [Figure 8](#).)

**Figure 8** Removing a Single-Wide Network Module



- Step 8** Align the replacement network module with the guides in the chassis walls or slot divider and slide it gently into the slot. (See [Figure 9](#).)

**Figure 9** Installing a Single-Wide Network Module



- Step 9** Using the network module handle, push the NM-1VSAT-GILAT network module into place until you feel the edge connector seat securely into the connector on the router backplane. The network module faceplate should contact the chassis rear panel.
- Step 10** Using a number 1 Phillips or flat-blade screwdriver, tighten the captive mounting screws on the network module faceplate.



**Caution**

Make sure that the external power supply is disconnected from the NM-1VSAT-GILAT network module before connecting or disconnecting cables from the RF-IN or RF-OUT connectors. If the external power supply is connected to the ODU PWR connector while you connect or disconnect cables from the RF-IN or RF-OUT connectors, you might short-circuit the NM-1VSAT-GILAT network module F connectors. This may cause the network module to reset itself or lose data.

- Step 11** Connect the RF cables to the RF-IN and RF-OUT connectors on the NM-1VSAT-GILAT network module.
- Step 12** Connect the power supply cable to the ODU PWR connector on the NM-1VSAT-GILAT network module.
- Step 13** Confirm that the network module LEDs come on. For more information about the LEDs, see the [“NM-1VSAT-GILAT Network Module LEDs”](#) section on page 7.
- Step 14** Initiate a console session with your router.
- Step 15** Enter satellite interface configuration mode, and enable the satellite interface:

```
Router> enable
Router# configure terminal
Router(config)# interface satellite slot/0
Router(config-if)# no shutdown
Router(config-if)# end
Router#
```



## What to Do Next

Configure the initial VSAT parameters for the new NM-1VSAT-GILAT network module. See the [Cisco IP VSAT Satellite WAN Network Module \(NM-1VSAT-GILAT\)](#) Cisco IOS feature module.



### Note

Satellite initial configuration mode can only be accessed by a password that is unique to each NM-1VSAT-GILAT network module. If an installation technician does not configure the initial VSAT parameters, then your satellite service provider will provide the password for your new NM-1VSAT-GILAT network module.

## Replacing the NM-1VSAT-GILAT Network Module in a Router

This section describes how to replace the NM-1VSAT-GILAT network module when your router does not support online insertion and removal (OIR). If your router supports OIR, do not perform this task. Instead, go to the [“Performing Online Insertion and Removal of the NM-1VSAT-GILAT Network Module”](#) section on page 14.

To replace the NM-1VSAT-GILAT network module in your router, follow these steps:

- Step 1** Disconnect the power supply cable from the ODU PWR connector on the NM-1VSAT-GILAT network module.



### Caution

Make sure that the external power supply is disconnected from the NM-1VSAT-GILAT network module before connecting or disconnecting cables from the RF-IN or RF-OUT connectors. If the external power supply is connected to the ODU PWR connector while you connect or disconnect cables from the RF-IN or RF-OUT connectors, you might short-circuit the NM-1VSAT-GILAT network module F connectors. This may cause the network module to reset itself or lose data.

- Step 2** (Optional but recommended) Label the RF cables “RF-IN” and “RF-OUT.”
- Step 3** Disconnect the cables from the RF-IN and RF-OUT connectors on the NM-1VSAT-GILAT network module.
- Step 4** Turn off electrical power to the router. Leave the power cable plugged in to channel ESD voltages to ground.

The following warning applies only to routers that use DC power.



### Warning

**Before performing any of the following procedures, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.** Statement 7



### Timesaver

Label the cables or prepare a network cabling diagram before removing cables.

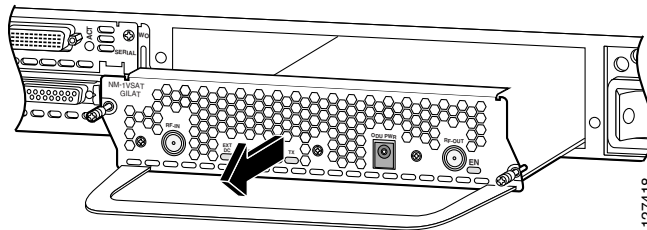
- Step 5** Remove all network cables, including telephone cables, from the rear panel of the router.
- Step 6** Using a number 1 Phillips or flat-blade screwdriver, loosen the captive mounting screws on the NM-1VSAT-GILAT network module faceplate.

**Caution**

To avoid damaging the network module, always handle the network module by the handle or faceplate. Do not touch the circuit board.

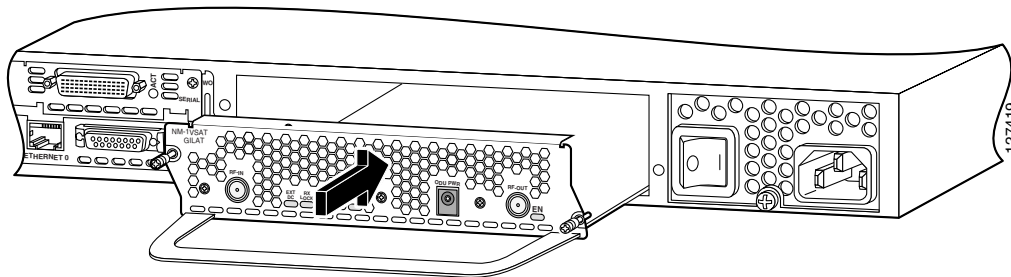
- Step 7** Using the module handle, pull the network module from the router slot. (See [Figure 10](#).)

**Figure 10** Removing a Single-Wide Network Module



- Step 8** Align the replacement network module with the guides in the chassis walls or slot divider and slide it gently into the slot. (See [Figure 11](#).)

**Figure 11** Installing a Single-Wide Network Module



- Step 9** Using the network module handle, push the module into place until you feel the edge connector seat securely into the connector on the router backplane. The network module faceplate should contact the chassis rear panel.
- Step 10** Using a number 1 Phillips or flat-blade screwdriver, tighten the captive mounting screws on the network module faceplate.
- Step 11** Turn on electrical power to the router.
- The following warning applies only to routers that use DC power.

**Warning**

**After wiring the DC power supply, remove the tape from the circuit breaker switch handle and reinstate power by moving the handle of the circuit breaker to the ON position.** Statement 8

**Caution**

Make sure that the external power supply is disconnected from the NM-1VSAT-GILAT network module before connecting or disconnecting cables from the RF-IN or RF-OUT connectors. If the external power supply is connected to the ODU PWR connector while you connect or disconnect cables from the RF-IN or RF-OUT connectors, you might short-circuit the NM-1VSAT-GILAT network module F connectors. This may cause the network module to reset itself or lose data.

- Step 12** Connect the RF cables to the RF-IN and RF-OUT connectors on the NM-1VSAT-GILAT network module.
- Step 13** Connect the power supply cable to the ODU PWR connector on the NM-1VSAT-GILAT network module.
- Step 14** Reconnect all other network cables, including telephone cables, to the rear panel of the router.
- Step 15** Confirm that the NM-1VSAT-GILAT network module LEDs come on. For more information about the LEDs, see the “[NM-1VSAT-GILAT Network Module LEDs](#)” section on page 7.

## What to Do Next

Configure the initial VSAT parameters for the new NM-1VSAT-GILAT network module. See the [Cisco IP VSAT Satellite WAN Network Module \(NM-1VSAT-GILAT\)](#) Cisco IOS feature module.



### Note

Satellite initial configuration mode can only be accessed by a password that is unique to each NM-1VSAT-GILAT network module. If an installation technician does not configure the initial VSAT parameters, then your satellite service provider will provide the password for your new NM-1VSAT-GILAT network module.

## Related Documents

For additional information, see the following documents and resources.

| Related Topic                                                          | Document Title                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cisco IOS software configuration for the NM-1VSAT-GILAT network module | <i>Cisco IP VSAT Satellite WAN Network Module (NM-1VSAT-GILAT)</i><br><a href="http://www.cisco.com/en/US/docs/ios/12_3t/12_3t14/feature/guide/gtstltnm.html">http://www.cisco.com/en/US/docs/ios/12_3t/12_3t14/feature/guide/gtstltnm.html</a>                        |
| Regulatory compliance and safety information                           | <i>Cisco Network Modules and Interface Cards Regulatory Compliance and Safety Information</i><br><a href="http://www.cisco.com/en/US/docs/routers/access/interfaces/rcsi/IOHrcsi.html">http://www.cisco.com/en/US/docs/routers/access/interfaces/rcsi/IOHrcsi.html</a> |
| Cisco IOS software website and reference documentation                 | <i>Cisco IOS Software</i><br><a href="http://www.cisco.com/web/psa/products/index.html?c=268438303">http://www.cisco.com/web/psa/products/index.html?c=268438303</a>                                                                                                   |

# Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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