



# Cisco NM-8AM-V2 and NM-16AM-V2 Analog Modem Network Modules with V.92

The Cisco NM-8AM-V2 and NM-16AM-V2 Analog Modem Network Modules with V.92 serve as integrated analog modem network modules (NMs) for the modular access routers (MARS) family of routers. These network modules terminate either 8 or 16 analog modem connections through POTS interfaces.

For information on new features and Cisco IOS commands supported by software for the Cisco NM-8AM-V2 and NM-16AM-V2 network modules, see the [“Additional References” section on page 8](#).

## Feature History for Cisco NM-8AM-V2 and NM-16AM-V2 Network Modules

Release	Modification
12.3(4)XD	This feature was introduced.
12.3(7)T	This feature was integrated into the Cisco IOS Release 12.3(7)T on the Cisco 2600XM series and Cisco 3700 series routers.

## Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

## Contents

- [Information About Cisco NM-8AM-V2 and NM-16AM-V2 Network Modules, page 2](#)
- [How to Configure the Cisco NM-8AM-V2 and NM-16AM-V2 Network Modules, page 5](#)
- [Configuration Examples for Cisco NM-8AM-V2 and NM-16AM-V2 Network Modules, page 8](#)
- [Additional References, page 8](#)
- [Command Reference, page 9](#)
- [Glossary, page 13](#)



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# Information About Cisco NM-8AM-V2 and NM-16AM-V2 Network Modules

This section contains information that you need to use the Cisco NM-8AM-V2 and NM-16AM-V2 network modules.

- [Overview](#)
- [Key Features and Benefits](#)
- [Chat Script](#)

## Overview

Two new analog modem network modules, the Cisco NM-8AM-V2 and NM-16AM-V2 network modules, support basic telephone service connections on Cisco 2600XM series routers, Cisco 3600 series, and Cisco 3700 series. These network modules allow the following:

- Standard telephone connections on RJ-11 connectors
- Up to 16 remote analog modem users to connect to a Cisco 2600XM series
- Up to 32 remote analog modem users to connect to a Cisco 3725
- Up to 64 remote analog modem users to connect to a Cisco 3745
- Up to 96 remote analog modem users to connect to a Cisco 3660

Combined with the differentiated services delivered through Cisco IOS software, users of Cisco 2600XM series, Cisco 3600 series, and Cisco 3700 series routers have best-of-breed scalability, flexibility, and investment protection, all in cost-effective, multifunctional platforms.

## Key Features and Benefits

The Cisco NM-8AM-V2 and NM-16AM-V2 network modules provide several new features and benefits.

- 8 or 16 internal V.34/V.42bis/V.44/V.90/V.92 analog modems per network module
- Up to 56-kbps data download and 14.4-kbps fax communication
- V.92 Quick Connect and Modem-on-Hold features
- Simple Network Management Protocol (SNMP) based tools with centrally-managed modem capabilities used to manage the rest of the network (such as CiscoView and Cisco Works 2000)
- Support for a broad range of dial-in features with Cisco IOS dial access software
- Software upgradable modem firmware to support possible future changes
- Support for all traditional Cisco IOS asynchronous encapsulations and WAN services
- Modem AT command interface
- Managed modem support via Cisco IOS CLI commands and Cisco Modem Management MIB
- Support for online insertion and removal (OIR) on Cisco 3660 and Cisco 3745 routers
- Compatible with approved Dialout Client applications

These features enable a wide variety of dial-in clients to use the applications and facilities of the branch office network.

- Virtual private network (VPN) support—This feature allows for cost-effective connections for a geographically dispersed user base. It can reduce access cost support and allow remote users straightforward access to their office LAN through a local Internet service provider (ISP), while maintaining a high degree of end-to-end security.
- Robust security features—Utilizing TACACS+, Challenge Handshake Authentication Protocol/Password Authentication Protocol (CHAP/PAP), Triple Data Encryption Standard (3-DES) encryption, and the built-in firewall capabilities of Cisco IOS software allows secure access for a wide variety of remote users to sensitive company data.

## Network Management

- CiscoWorks—Allows centralized management of multiple Cisco 2600XM, Cisco 3600, and Cisco 3700 routers.
- In-band management via TCP/IP and SNMP, including MIB II and other extensions, over TCP/IP.
- TCP/IP addresses can be assigned via DHCP, per user, or via an internal address pool, or they can be selected remotely.
- Maintains a detailed activity log for accounting, billing, and troubleshooting.
- Ability to download image and configuration across routers.

## Security

- Username, password, and dial-back security
- Multilevel administration password support
- CHAP and PAP support
- Centralized authentication via AAA
- IP device and network filtering
- AppleTalk zone and device filtering

## Modem Management

The Cisco 2600XM series, Cisco 3600 series, and Cisco 3700 series routers ship with general network management capabilities.



### Note

- The analog modem network module is being submitted for approval worldwide, but because of specific in-country approval processes, approval dates vary. For the latest availability status, please check online at <http://www.cisco.com>.
- For more information on the AT command set used by these modems, please check online at <http://www.cisco.com>.

## Chat Script

The Cisco NM-8AM-V2 and NM-16AM-V2 network modules support chat script as well as modem cap entries like other Cisco modem modules. There is no need to put a factory reset parameter in the chat script because this will interfere with the modem settings configured internally by the Cisco NM-*x*AM-V2 firmware. The same applies to the modem cap entry. If a factory reset parameter is included, the parameter may interfere with how the connection speed is collected and the modem may be unreliable in any reports on the speed.

When using the AT&F reset parameter in a chat-script with Cisco NM-8AM-V2 and NM-16AM-V2 network modules, the reset parameter should be used in conjunction with the connect string setting. For example:

```
AT&F\\v1s0=1
```

This setting gives a factory reset, a long connect string, and answers after one ring. For more information, refer to the documentation at:

[http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122cgcr/fdial\\_c/fnsprt2/dafmchat.htm](http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122cgcr/fdial_c/fnsprt2/dafmchat.htm)

When using the &f0 reset parameter in the modem cap entry with Cisco NM-8AM-V2 and NM-16AM-V2 network modules, the reset parameter should be used in conjunction with the connect string setting. For example:

```
modemcap entry NM-V2-CONEXANT-MAXSPEED-TEST2:MSC=&f0\V1S0=1
```

# How to Configure the Cisco NM-8AM-V2 and NM-16AM-V2 Network Modules

To configure the Cisco NM-8AM-V2 and NM-16AM-V2 network modules, perform the tasks listed below:

- [Configuring the Modems for the Country of Deployment, page 5](#) (required)
- [Verifying the Modem Configuration, page 6](#) (optional)

## Configuring the Modems for the Country of Deployment

The Cisco NM-8AM-V2 and NM-16AM-V2 network modules are designed to customize their settings to the country in which they are deployed. To configure a modem for the country of deployment, perform this configuration task.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **modem country smart\_acf *country-name***
4. **end**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> <b>enable</b>	Enables privileged EXEC mode.  • Enter your password if prompted.
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# <b>configure terminal</b>	Enters global configuration mode.
Step 3	<b>modem country smart_acf <i>country-name</i></b>  <b>Example:</b> Router(config)# <b>modem country smart_acf usa</b>	Sets the modem firmware to use settings for the country of deployment. See the table of country names in the “ <a href="#">modem country smart_acf</a> ” section on page 10.
Step 4	<b>end</b>  <b>Example:</b> Router(config)# <b>end</b>	Exits global configuration mode and returns to privileged EXEC mode.

## Verifying the Modem Configuration

Perform the following tasks to verify the modem configuration.

### SUMMARY STEPS

1. **enable**
2. **show modem version**
3. **debug modem**
4. **show modem version**
5. **exit**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> <b>enable</b>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>show modem version</b>  <b>Example:</b> Router# <b>show modem version</b>	Displays the modem firmware version and datapump version.
Step 3	<b>debug modem</b>  <b>Example:</b> Router# <b>debug modem</b>	Displays the modem events and state transitions.
Step 4	<b>show modem version</b>  <b>Example:</b> Router# <b>show modem version</b>	Displays the modem firmware version, the datapump version, and the firmware log.
Step 5	<b>exit</b>  Router# <b>exit</b>	Exits privileged EXEC mode.

## Troubleshooting Tips

Use the following **debug** commands to troubleshoot the modem:

- **debug async state**
- **debug dialer**
- **debug dialer forwarding**
- **debug dialer map**
- **debug dialer packets**

- **debug modem**
- **debug ppp events**
- **debug ppp forwarding**
- **debug ppp negotiation**
- **debug ppp packet**

Use the **debug modem** and **debug dialer** commands to troubleshoot the Cisco NM-8AM-V2 and NM-16AM-V2 network modules.

```
Router# debug modem
Router# debug dialer
Router# ping 10.1.1.1
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds:

```
*Jul 27 05:40:24.524 EST: As33 DDR: place call
*Jul 27 05:40:24.524 EST: As33 DDR: Dialing cause ip (s=10.1.1.1, d=10.1.1.1)
*Jul 27 05:40:24.524 EST: As33 DDR: Attempting to dial 102
*Jul 27 05:40:24.524 EST: CHAT33: Attempting async line dialer script
*Jul 27 05:40:24.524 EST: CHAT33: Dialing using Modem script: dial & System script: none
*Jul 27 05:40:24.524 EST: CHAT33: process started
*Jul 27 05:40:24.524 EST: CHAT33: Asserting DTR
*Jul 27 05:40:24.524 EST: CHAT33: Chat script dial started
*Jul 27 05:40:24.524 EST: Modem 1/0 ACF: CMD DTR set high
*Jul 27 05:40:24.888 EST: Modem 1/0 ACF: Event: Hook state: Off Hook Dialing.
*Jul 27 05:40:24.888 EST: Modem 1/0 ACF: State: Dialing...
*Jul 27 05:40:45.960 EST: Modem 1/0 ACF: Event: CONNECT V34/LAPM/V42B/33600:TX/33600:RX
*Jul 27 05:40:45.960 EST: Modem 1/0 ACF: State: Connected
*Jul 27 05:40:45.972 EST: CHAT33: Chat script dial finished, status = Success
*Jul 27 05:40:45.972 EST: TTY33: no timer type 1 to destroy
*Jul 27 05:40:45.972 EST: TTY33: no timer type 0 to destroy
*Jul 27 05:40:45.972 EST: TTY33: no timer type 2 to destroy
*Jul 27 05:40:45.972 EST: Modem 1/0 ACF: CMD PPP mode active
*Jul 27 05:40:47.972 EST: %LINK-3-UPDOWN: Interface Async33, changed state to up
*Jul 27 05:40:47.972 EST: As33 DDR: Dialer statechange to up
*Jul 27 05:40:47.972 EST: As33 DDR: Dialer call has been placed
*Jul 27 05:40:47.972 EST: Modem 1/0 ACF: CMD PPP escape maps set: TX map=00000000 RX
map=FFFFFFFF
*Jul 27 05:40:48.112 EST: Modem 1/0 ACF: CMD PPP escape maps set: TX map=00000000 RX
map=000A0000
*Jul 27 05:40:48.212 EST: As33 DDR: dialer protocol up
*Jul 27 05:40:48.972 EST: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async33, changed
state to up
```

# Configuration Examples for Cisco NM-8AM-V2 and NM-16AM-V2 Network Modules

## Example of the modem country smart\_acf Command

The following example shows the usage of the **modem country smart\_acf** command:

```
Router# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# modem country smart_acf usa
Router(config)# end
```

## Additional References

The following sections provide references related to Cisco NM-8AM-V2 and NM-16AM-V2 network modules.

## Related Documents

Related Topic	Document Title
AT Commands	<a href="#">AT Command Set and Register Summary for V.90 WIC-1AM and WIC-2AM Analog Modem WAN Interface Cards</a>
NM-8AM or NM-16AM Analog Modem Module Configuration	<a href="#">Configuring Dialin with the NM-8AM or NM-16AM Analog Modem Module</a>
Data Sheet on Network Modules	<a href="#">Integrated V.92 Analog Modem Network Modules for Cisco 2600 Series, 3660, and 3700 Series Routers</a>

## Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	



## MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

## RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	

## Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	<a href="http://www.cisco.com/public/support/tac/home.shtml">http://www.cisco.com/public/support/tac/home.shtml</a>

## Command Reference

This section documents modified commands only.

- [modem country smart\\_acf](#)

## modem country smart\_acf

To customize the modem firmware behavior according to the country of deployment, use the **modem country smart\_acf** command in global configuration mode. To set the default value, use the **no** form of this command.

**modem country smart\_acf** *country-name*

**no modem country smart\_acf** *country-name*

### Syntax Description

*country-name* Name of the country. For valid argument values, see the table in the “Usage Guidelines” section.

### Defaults

United States and Canada

### Command Modes

Global configuration

### Command History

Release	Modification
12.3(4)XD	This command was introduced.
12.3(7)T	This command was integrated in Cisco IOS Release 12.3(7)T on Cisco 2600 series and Cisco 3700 series routers.

### Usage Guidelines

Use this command to set the modem for use in a specific country. When a country name is specified, the firmware customizes the modem for use in the country where it is deployed. The following table includes valid values for the *country-name* argument and the country or countries associated with each argument value.

Valid Values for the <i>country-name</i> Argument	Country or Countries Where Located
<b>argentina</b>	Argentina
<b>australia</b>	Australia
<b>austria</b>	Austria
<b>belgium</b>	Belgium and Luxemburg
<b>brazil</b>	Brazil
<b>bulgaria</b>	Bulgaria
<b>china</b>	China
<b>croatia</b>	Croatia
<b>czech</b>	Czechoslovakia
<b>denmark</b>	Denmark and Iceland
<b>finland</b>	Finland
<b>france</b>	France

<b>Valid Values for the <i>country-name</i> Argument</b>	<b>Country or Countries Where Located</b>
<b>germany</b>	Germany
<b>greece</b>	Greece
<b>hongkong</b>	Hong Kong
<b>hungary</b>	Hungary
<b>india</b>	India
<b>ireland</b>	Ireland
<b>israel</b>	Israel
<b>italy</b>	Italy
<b>japan</b>	Japan
<b>jordan</b>	Jordan
<b>korea</b>	Korea
<b>malaysia</b>	Malaysia
<b>mexico</b>	Mexico
<b>morocco</b>	Morocco
<b>netherlands</b>	Netherlands
<b>newzealand</b>	New Zealand
<b>norway</b>	Norway
<b>poland</b>	Poland
<b>portugal</b>	Portugal
<b>romania</b>	Romania
<b>russia</b>	Russia
<b>safrica</b>	South Africa
<b>singapore</b>	Singapore
<b>slovenia</b>	Slovenia
<b>spain</b>	Spain
<b>sweden</b>	Sweden
<b>switzerland</b>	Switzerland
<b>taiwan</b>	Taiwan and Peru
<b>thailand</b>	Thailand
<b>turkey</b>	Turkey
<b>uae</b>	United Arab Emirates
<b>uk</b>	United Kingdom
<b>usa</b>	United States and Canada

---

**Examples**

The following example sets the modem for use in the United States and Canada:

```
Router# config terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)# modem country smart_acf usa
```

---

**Related Commands**

Command	Description
<b>show modem version</b>	Displays the software version and the crash log of the modem.

# Glossary

DHCP—Dynamic Host Configuration Protocol.

MARS— modular access routers family of routers.

**Note**

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Refer to [Internetworking Terms and Acronyms](#) for terms not included in this glossary.

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