



# Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WAN Interface Card

The Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WAN Interface Card (WIC) for Cisco 2600XM, Cisco 2691, Cisco 3700, and Cisco 3800 series multiservice platforms provide low-density integrated modems for remote management, dial-backup, and low-density remote-access servers (RAS).

## Feature History for the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WAN Interface Card

Release	Modification
12.2(2)XB	This feature was introduced.
12.2(8)T	This feature was integrated into the Cisco IOS Release 12.2(8)T.
12.3(14)T	This feature was integrated into the Cisco IOS Release 12.3(14)T to support the WIC-1AM-V2 and WIC-2AM-V2 WICs.

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

Use Cisco Feature Navigator to find information about platform support and Cisco IOS and Catalyst OS software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

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## Prerequisites for Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC

The following Cisco multiservice platforms are supported for the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC:

- Cisco 2600XM
- Cisco 2691
- Cisco 2800
- Cisco 3700
- Cisco 3800

## Restrictions for Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC

The Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC has the following memory requirements:

### Platform Memory Requirements

- Cisco 2600 ip —8M Flash, 32M DRAMM



#### Caution

Ensure that the RJ-11/CA11 telephone cable is disconnected from the modem WIC *before* installing or removing the modem WIC from the router. The phone jack can have DC potential (up to 56.5 VDC) and can have ring signal (up to 150 VAC) in the United States.



#### Caution

Ensure that the router is powered *OFF* before installing or removing the modem WIC from the router. The modem WICs do *not* support online insertion and removal (hot-swap).

Other than some currently unsupported commands, the V.90 modem WIC supports all commands available for modem WICs as described in the [Cisco IOS Wide Area Networking Configuration Guide](#). For troubleshooting and verification, use only the following commands:

```
clear modem [counters][slot/modem # | group group # | all]
```

```
debug modem
```

```
show modem slot/port
```

Most of the **show modem** commands do not display the WIC-1AM-V2 and WIC-2AM-V2 information. You may also see error messages, such as this example:

```
Router# show modem operational-status 0/0
Modem 0/0 doesn't exist.
```

# Information About Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC

The Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WAN Interface Card adds the following features to WAN interface card modems:

- Support for V.90/V.92/V.44.
- A Cisco IOS command is provided to update the modem firmware. This command allows for upgrading in the field.
- The country code is set by a modemcap.
- The modem uses the Conexant AT Command Set.
- More country codes are supported than on previous modems.

Three applications are available for the V.90 modem WIC on the Cisco 2600XM, Cisco 2691, Cisco 3700, and Cisco 3800 series multiservice platforms:

- [Remote Router Management and Out-of-Band Access](#)
- [Asynchronous Dial-on-Demand Routing and Dial-Backup](#)
- [Low-Density Analog RAS Access](#)

## Remote Router Management and Out-of-Band Access

In this mode, the modem WIC is used as a dial-in modem for remote terminal access to the router's command-line interface (CLI) for configuration, troubleshooting, and monitoring. The modem WIC acts similar to a modem that is connected to the AUX port of a router, but the integrated nature of the modem WIC greatly decreases configuration time and deployment and sustaining costs. Typically, the 1-port modem WIC is used for this application. Connection speeds up to 33.6 kbps are possible.

## Asynchronous Dial-on-Demand Routing and Dial-Backup

In this mode, the V.90 modem WIC transports network traffic. When ISDN service is not available and the traffic load does not justify a leased-line or Frame Relay connection, asynchronous dial-on-demand routing (DDR) is often the only choice for making a WAN connection. Even at sites that do have leased-line or Frame Relay connection, asynchronous DDR can increase bandwidth during sustained traffic load. In addition, when the primary leased-line or Frame Relay link is down during an outage, asynchronous dial-backup provides a secondary way to make the WAN connection. Both the 1-port and 2-port versions of the V.90 modem WIC can be used for this application.

For more information on Asynchronous Dial-on-Demand Routing and Dial-Backup, see the section [Configuring Dial Backup for Serial Lines](#) in the *Cisco IOS Dial Technologies Configuration Guide*.

Two ports on one modem WIC (or even three or more ports spanning multiple modem WIC cards) can be combined using Multilink PPP (MLP) to increase connection speeds in a scalar manner. Each connection is capable of V.90 speeds (up to 56 kbps) when connecting to a digital V.90 server modem.

For more information on MLP, see [Multilink PPP for DDR—Basic Configuration and Verification](#).

## Low-Density Analog RAS Access

In this application, the V.90 modem WIC enables the platform to provide the services of a typical small remote access server (RAS). One service allows remote users to dial in and gain access to resources on the LAN (or even across the WAN). The analog modems in the modem WIC allow dial-in connection speeds of up to 33.6 kbps, but MLP can bind multiple links together and increase the throughput.

Another service allows PCs (running Cisco DialOut Utility) on the LAN to use the modems for dial-out. Users can connect to other modems (bulletin boards, AOL, ISPs, and so on) or fax machines. The modem WIC allows dial-out connection speeds of up to 56 kbps when dialing a digital V.90 server modem or up to 33.6 kbps when dialing another analog modem. Fax calls connect at up to 14.4 kbps.

Typical RAS deployments with the V.90 modem WIC use the 2-port modem version. With enough slots, the V.90 modem WIC can be used to scale to up to 24 modems.

There is no limit for lines in the MLP bundle with WICs and population of WICs on any Cisco 2600 series or Cisco 3600 series multiservices platforms.

# How to Configure the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC

To configure the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC, complete the following tasks:

- [Configuring the Asynchronous Interface, page 5](#)
- [Configuring the Country Code, page 7](#)
- [Upgrading the Modem Firmware, page 11](#)
- [Verifying the Modem Firmware Upgrade, page 13](#)

## Configuring the Asynchronous Interface

Complete the following steps to configure the asynchronous interface on the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface async** *number*
4. **ip unnumbered** *type number*
5. **encapsulation ppp**
6. **dialer in-band** [**no-parity** | **odd-parity**]
7. **dialer string** *number*
8. **dialer-group** *group-number*
9. **async mode interactive**
10. **peer default ip address pool** *poolname*

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 3	<b>interface async</b> <i>number</i>  <b>Example:</b> Router(config)# interface async 2	Enters the interface configuration mode for the asynchronous serial interface. Enter the number of the interface you want to configure.
Step 4	<b>ip unnumbered</b> <i>type number</i>  <b>Example:</b> Router(config-if)# ip unnumbered ethernet 0	Conserves IP addresses by configuring the asynchronous interface as unnumbered, and assigns the IP address of the interface type that you want to leverage.
Step 5	<b>encapsulation ppp</b>  <b>Example:</b> Router(config-if)# encapsulation ppp	Sets the encapsulation protocol for Point-to-Point Protocol (PPP).
Step 6	<b>dialer in-band</b> [ <b>no-parity</b>   <b>odd-parity</b> ]  <b>Example:</b> Router(config-if)# dialer in-band no-parity	Specifies that dial-on-demand routing (DDR) is to be supported. This command specifies that chat scripts will be used on asynchronous interfaces. The parity keywords do not apply to asynchronous interfaces.
Step 7	<b>dialer string</b> <i>number</i>  <b>Example:</b> Router(config-if)# dialer string 5551212	Enters the dialer string (telephone) number.
Step 8	<b>dialer-group</b> <i>group-number</i>  <b>Example:</b> Router(config-if)# dialer-group 1	Controls access by configuring the interface to belong to a specific dialing group. The number to which the dialer access group belongs is defined with the <b>dialer-list</b> command. Acceptable values are within the range from 1 to 10.
Step 9	<b>async mode interactive</b>  <b>Example:</b> Router(config-if)# async mode interactive	Configures interactive mode on the asynchronous interface.
Step 10	<b>peer default ip address pool</b> <i>poolname</i>  <b>Example:</b> Router(config-if)# peer default ip address pool pool123	Assigns dial-in clients IP addresses from an address pool. To create an IP address pool, use the <b>ip local pool</b> global configuration command.
Step 11	<b>exit</b>  <b>Example:</b> Router(config-if)# exit	Exits interface configuration collection mode.

	Command or Action	Purpose
Step 12	<b>exit</b>  <b>Example:</b> Router(config)# exit	Exits global configuration mode.
Step 13	<b>exit</b>  <b>Example:</b> Router# exit	Exits privileged EXEC mode.

## Examples

The following provides an example configuration.

```
Router(config)# interface async 33
Router(config-if)# ip unnumbered f0/0
Router(config-if)# encapsulation ppp
Router(config-if)# dialer in-band
Router(config-if)# dialer string 14085551234
Router(config-if)# dialer-group 1
Router(config-if)# async mode interactive
Router(config-if)# peer default ip address pool pool123
```



### Note

The entry **pool123** is a name chosen for the pool used for defining the range of IP addresses for remote clients.

## Configuring the Country Code

Complete the following commands to configure the country code on the modem WIC.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **modemcap entry *init-string:MSC=+GCI=country code;configuration values;***
4. **line *line-number* [*ending-line-number*]**
5. **modem autoconfigure type *init-string***
6. **clear modem *slot/port***
7. **exit**
8. **exit**
9. **exit**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<pre>enable</pre> <p><b>Example:</b> Router&gt; enable </p>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
Step 2	<pre>configure terminal</pre> <p><b>Example:</b> Router# configure terminal </p>	<p>Enters global configuration mode.</p>
Step 3	<pre>modemcap entry init-string:MSC=+GCI=country code;configuration values;</pre> <p><b>Example:</b> Router(config)# modemcap entry CC-TBR21:FD=&amp;F\V1:AA=S0=1:MSC=V0&amp;S0=1+GCI=A6; </p>	<p>Change the country code in the modemcap. Use this chat script to initiate a country code.</p> <ul style="list-style-type: none"> <li><i>country code</i>—Use the codes in the <a href="#">Country Code Table</a>. (The example shown here, A6, is for Switzerland.)</li> <li><i>configuration values</i>—Enter values for configuring the operating characteristics of the modem. For more information about these parameters, see <a href="#">AT Command Set and Register Summary for NM-8AM-V2, NM-16AM-V2, WIC-1AM, and WIC-2AM Analog Modem WAN Interface Cards</a>.</li> </ul> <p><b>Note</b> The semicolon (;) is very important. The +GCI is an extended command that must come last in an AT string or must be followed by a semicolon (;).</p> <p><b>Note</b> To see the values configured for a modem, use the <b>show modemcap name</b> command.</p>
Step 4	<pre>line line-number [ending-line-number]</pre> <p><b>Example:</b> Router(config)# line 1 1 </p>	<p>Identify a specific line for configuration and enter line configuration collection mode.</p> <ul style="list-style-type: none"> <li><i>line-number</i>— Relative number of the terminal line (or the first line in a contiguous group) that you want to configure when the line type is specified. Numbering begins with zero.</li> <li><i>ending-line-number</i>— (Optional) Relative number of the last line in a contiguous group that you want to configure. If you omit any keyword, then line-number and ending-line-number are absolute rather than relative line numbers.</li> </ul>
Step 5	<pre>modem autoconfigure type init-string</pre> <p><b>Example:</b> Router(config-line)# modem autoconfigure type CC-TBR21 </p>	<p>Send the new modemcap string to the modem.</p>



	Command or Action	Purpose
Step 6	<code>clear modem slot/port</code>  <b>Example:</b> Router(config-line)# clear modem 0/0	Reset the hardware of the modem WIC.  • <i>slot/port</i> —Slot and modem port number. (Include the slash mark when entering this variable, for example: <b>1/1.</b> )
Step 7	<code>exit</code>  <b>Example:</b> Router(config-line)# exit	Exits line configuration collection mode.
Step 8	<code>exit</code>  <b>Example:</b> Router(config)# exit	Exits global configuration mode.
Step 9	<code>exit</code>  <b>Example:</b> Router# exit	Exits privileged EXEC mode.

## Country Code Table

Use the codes in this table to set the country code.

Country	Code	Country	Code	Country	Code
Argentina	07	India	53	Romania	8E
Australia	09	Ireland	57	Russia	B8
Austria	0A	Israel	58	Singapore	9C
Belgium	0F	Italy	59	Slovenia	FC
Brazil	16	Japan	00	South Africa	9F
Bulgaria	1B	Jordan	5E	Spain	A0
China	26	Korea	61	Sweden	A5
Croatia	FA	Malaysia	6C	Switzerland	A6
Czech and Slovak Federal Republic	2E	Mexico	73	Taiwan	FE
Denmark	31	Morocco	77	Thailand	A9
Finland	3C	Netherlands	7B	TBR21	FD
France	3D	New Zealand	7E	Turkey	AE
Germany	42	Norway	82	United Arab Emirates	B3
Greece	46	Poland	8A	United Kingdom	B4
Hong Kong	50	Portugal	8B	United States	B5
Hungary	51				


## Configuring the Line on the Analog Modem WIC

Use these steps to configure the line on the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **line *number***
4. **modem inout**
5. **autoselect { arap | ppp | slip | during login }**
6. **transport input { all | lat | mop | nasi | none | pad | rlogin | telnet | v120 }**
7. **exit**
8. **exit**
9. **exit**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>line <i>number</i></b>  <b>Example:</b> Router(config)# line 1	Enters interface mode line configuration submode.   <b>Note</b> The number entered here must be the same as the number entered for the asynchronous serial interface when the interface configuration mode was first entered.
Step 4	<b>modem inout</b>  <b>Example:</b> Router(config-if)# modem inout	Configures the line for both incoming and outgoing calls.
Step 5	<b>autoselect { arap   ppp   slip   during login }</b>  <b>Example:</b> Router(config-line)# autoselect ppp	Configures the line to automatically start an ARA, PPP, or SLIP session. For this feature, <b>ppp</b> is recommended.

	Command or Action	Purpose
Step 6	<b>transport input</b> {all   lat   mop   nasi   none   pad   rlogin   telnet   v120}  <b>Example:</b> Router(config-line)# transport input all	Defines which protocols can be used to connect to the line. For this feature, <b>all</b> is recommended.
Step 7	Router# <b>exit</b>  <b>Example:</b> Router(config-line)# exit	Exits the line configuration mode.
Step 8	<b>exit</b>  <b>Example:</b> Router(config)# exit	Exits global configuration mode.
Step 9	<b>exit</b>  <b>Example:</b> Router# exit	Exits privileged EXEC mode.

## Upgrading the Modem Firmware

Complete these steps to upgrade the firmware in the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC.

### SUMMARY STEPS

1. **enable**
2. **upgrade modem firmware** [all | slot *slot* | wic *nm-slot/wic-slot*] **file** *source*
3. **exit**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
Step 2	<b>upgrade modem firmware</b> [ <b>all</b>   <b>slot</b> <i>slot</i>   <b>wic</b> <i>nm-slot/wic-slot</i> ] <b>file</b> <i>source</i>  <b>Example:</b> Router# upgrade modem firmware all	Enters information needed for the modem firmware upgrade: <ul style="list-style-type: none"> <li><i>all</i>—Select all the modems in the router that are supported by the modem firmware file.</li> <li><b>slot</b>—Specify the router slot that is supported by the modem firmware file.</li> <li><i>slot</i>—Number of the slot selected.</li> <li><b>wic</b>—Specify a WIC supported by the modem firmware file.</li> <li><i>nm-slot</i>—Number of the slot where the network module is located.</li> <li><i>wic-slot</i>—Number of the slot where the WIC is located.</li> <li><b>file</b>—Obtains the firmware information from the file named as source.</li> <li><i>source</i>—Name of the file with the firmware upgrade.</li> </ul>
Step 3	<b>exit</b>  <b>Example:</b> Router# exit	Exits privileged EXEC mode.

## Examples

This example shows the output of the **upgrade modem firmware all** command with a 1-port Cisco WIC-1AM-V2 modem in 0/1 (slot/wic-slot) and a 2-port Cisco WIC-2AM-V2 modem in 1/0 (slot/wic-slot).

Example:

```

Loading mj-F48A-1824M-4M-Rev-2-bundle-image.bin from
192.188.100.26 (via FastEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 282816 bytes]

Verifying the modem firmware bundle - Passed
Decompressing modem firmware image - Done
TTY1: Upgrading modem firmware
TTY33: Upgrading modem firmware
TTY34: Upgrading modem firmware
Downloading modem firmware. Please Wait

```

```

.....
.....
TTY1: WIC-AM: Modem firmware download finished...
TTY34: WIC-AM: Modem firmware download finished.....
TTY33: WIC-AM: Modem firmware download finished...
Finished upgrading modem firmware.

```

## Verifying the Modem Firmware Upgrade

Use these steps to verify that the firmware was upgraded in the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC.

### SUMMARY STEPS

1. **enable**
2. **show modem**
3. **exit**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>show modem</b> [ <i>slot/port</i>   <b>group number</b> ]  <b>Example:</b> Router# show modem 0/0   inc firmware	Display a high-level performance report for all the modems or a single modem inside Cisco access servers. <ul style="list-style-type: none"> <li>• <i>slot/port</i>— (Optional) Location of a slot and modem port. The forward slash (/) is required when you are entering this variable.</li> <li>• <b>group number</b>— (Optional) Assigns the group to which a specified modem belongs. The group number range is from 1 to 200.</li> </ul>
Step 3	<b>exit</b>  <b>Example:</b> Router# exit	Exits privileged EXEC mode.

## Examples

The **show modem** [*slot/port* | **group number**] command shows the state of the specified asynchronous interface.

Example:

```

Router#show modem 0/0 | inc firmware
WIC-AM firmware ACF3_V1.922F-V90_4M_FSH

```

The **show modem** [*slot/port* | **group number**] command shows various performance statistics for a modem or group of modems.

Example:

```
Router# show modem 0/3/0

Mdm   Typ   Status   Tx/Rx   G   Duration   TX   RX   RTS   CTS   DSR   DCD   DTR
0/3/0 UnKn   Idle     /       0   00:00:00   -   -   x    x    x    x    x

Modem 0/3/0 [line 50], Async0/3/0, TTY50

WIC-AM firmware ACF3_V1.922F-V90_4M_FSH
Modem config: Incoming and Outgoing
Protocol: UnKn, Compression: UnKn

Last clearing of "show modem" counters: never
  0 incoming complete
  0 incoming failures
  0 outgoing complete
  0 outgoing failure
```

## Troubleshooting the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC

To troubleshoot the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC, use the following commands, starting in privilege EXEC configuration mode.

- [Debugging Call Connect, page 14](#)
- [Debugging Call Disconnect, page 16](#)

### Debugging Call Connect

Complete the following steps to debug call connect on the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC.

#### SUMMARY STEPS

1. **enable**
2. **debug modem**
3. **debug dialer**
4. **ping** *system-address*
5. **exit**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
Step 2	<b>debug modem</b>  <b>Example:</b> Router# debug modem	Aids in troubleshooting the modem WIC. <ul style="list-style-type: none"> <li>Use the no form of the command to stop the debugging process.</li> </ul>
Step 3	<b>debug dialer</b>  <b>Example:</b> Router# debug dialer	Aids in troubleshooting the modem WIC. <ul style="list-style-type: none"> <li>Use the no form of the command to stop the debugging process.</li> </ul>
Step 4	<b>ping system-address</b>  <b>Example:</b> Router# ping 10.0.0.2	Diagnose basic network connectivity with the modem WIC. <ul style="list-style-type: none"> <li><i>system-address</i>—Address of the system to ping. If a host-name or system-address is not specified, it will be required in the ping system dialog.</li> </ul>
Step 5	<b>exit</b>  <b>Example:</b> Router# exit	Exits privileged EXEC mode.

## Examples

This command shows the state of the TTY lines.

## Example:

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.0.0.2, timeout is 2 seconds:

Feb 10 20:33:53: Modem Registers - IMR:0x0 LED:0x0 RstCntrl:0x0 MSR:0xFF
Feb 10 20:33:53: As1 DDR: place call
Feb 10 20:33:53: As1 DDR: Dialing cause ip (s=10.0.0.1, d=10.0.0.2)
Feb 10 20:33:53: As1 DDR: Attempting to dial 2-2772
Feb 10 20:33:53: CHAT1: Attempting async line dialer script
Feb 10 20:33:53: Modem Registers - IMR:0x0 LED:0x0 RstCntrl:0x0 MSR:0xFF
Feb 10 20:33:53: CHAT1: Dialing using Modem script: dial & System script: none
Feb 10 20:33:53: CHAT1: process started
Feb 10 20:33:53: CHAT1: Asserting DTR
Feb 10 20:33:53: CHAT1: Chat script dial started....
Success rate is 0 percent (0/5)

Feb 10 20:34:18: Modem (0/0) DCD Asserted
Feb 10 20:34:18: Modem 0/0 WIC-AM: in modem state 'Connect'
dte = 115200 modulation= V34 protocol = LAPM compression_type = V42B tx_speed = 33600
rx_speed = 33600
Feb 10 20:34:18: CHAT1: Chat script dial finished, status = Success
Feb 10 20:34:18: Modem 0/0 WIC-AM: switching to PPP mode
Feb 10 20:34:18: TTY1: no timer type 1 to destroy
Feb 10 20:34:18: TTY1: no timer type 0 to destroy
Feb 10 20:34:18: TTY1: no timer type 2 to destroy
Feb 10 20:34:20: %LINK-3-UPDOWN: Interface Async1, changed state to up
```

```

Feb 10 20:34:20: As1 DDR: Dialer statechange to up
Feb 10 20:34:20: As1 DDR: Dialer call has been placed
Feb 10 20:34:20: Modem 0/0: PPP escape map: Tx map = FFFFFFFF, Rx map = 0
Feb 10 20:34:20: Modem 0/0: PPP escape map: Tx map = A0000, Rx map = 0
Feb 10 20:34:21: As1 DDR: dialer protocol up
Feb 10 20:34:21: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async1, changed state to
up

```

## Debugging Call Disconnect

Complete these steps to debug call disconnect on the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC.

### SUMMARY STEPS

1. **enable**
2. **debug modem**
3. **debug dialer**
4. **clear modem**
5. **exit**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>debug modem</b>  <b>Example:</b> Router# debug modem	Aids in troubleshooting the modem WIC. <ul style="list-style-type: none"> <li>• Use the <b>no</b> form of the command to stop the debugging process.</li> </ul>
Step 3	<b>debug dialer events</b>  <b>Example:</b> Router# debug dialer events	Aids in troubleshooting the modem WIC. <ul style="list-style-type: none"> <li>• Use the <b>no</b> form of the command to stop the debugging process.</li> </ul>
Step 4	<b>clear modem slot/port</b>  <b>Example:</b> Router# clear modem 0/0	Reset the hardware of the modem WIC. <ul style="list-style-type: none"> <li>• <i>slot/port</i> - Slot and modem port number. (Include the slash mark when entering this variable, for example: <b>1/1</b>.)</li> </ul>
Step 5	<b>exit</b>  <b>Example:</b> Router# exit	Exits privileged EXEC mode.



## Examples

The **debug modem** command shows the state of the TTY lines.

Example:

```
This command will disconnect any active calls.
Clear (reset) modem 0/0? [confirm]
  resetting slot 0/port 0 line 1
Router#
Feb 10 20:38:34: Modem (0/0) CTS UnAsserted
  Modem 0/0 WIC-AM: in modem state 'Idle'

Feb 10 20:38:36: Modem (0/0) DCD UnAsserted
Feb 10 20:38:36: TTY1: DSR was dropped
Feb 10 20:38:36: tty1: Modem: READY->(unknown)
Feb 10 20:38:37: Modem (0/0) CTS Asserted
Feb 10 20:38:37: TTY1: dropping DTR, hanging up
Feb 10 20:38:37: TTY1: Async Int reset: Dropping DTR
Feb 10 20:38:37: tty1: Modem: HANGUP->(unknown)
Feb 10 20:38:37: TTY1: cleanup pending. Delaying DTR
Feb 10 20:38:38: TTY1: cleanup pending. Delaying DTR
Feb 10 20:38:39: %LINK-5-CHANGED: Interface Async1, changed state to reset
Feb 10 20:38:39: TTY1: cleanup pending. Delaying DTR
Feb 10 20:38:40: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async1, changed state to
down
Feb 10 20:38:40: TTY1: cleanup pending. Delaying DTR
Feb 10 20:38:41: TTY1: cleanup pending. Delaying DTR
Feb 10 20:38:42: Modem 0/0 WIC-AM: switching to character modeFeb 10 20:38:42: TTY1: no
timer type 0 to destroy
Feb 10 20:38:42: TTY1: no timer type 1 to destroy
Feb 10 20:38:42: TTY1: no timer type 3 to destroy
Feb 10 20:38:42: TTY1: no timer type 4 to destroy
Feb 10 20:38:42: TTY1: no timer type 10 to destroy
Feb 10 20:38:42: TTY1: no timer type 2 to destroy
Feb 10 20:38:42: Async1: allowing modem_process to continue hangup
Feb 10 20:38:42: TTY1: restoring DTR
Feb 10 20:38:42: TTY1: Modem get info started
Feb 10 20:38:43: TTY1: Modem: ATS86? -> 021OK
Feb 10 20:38:43: TTY1: Modem: ATZ -> OK
Feb 10 20:38:44: TTY1: Modem: AT&F\V1S0=1 -> OK
Feb 10 20:38:44: %LINK-3-UPDOWN: Interface Async1, changed state to down
Feb 10 20:38:44: Modem Registers - IMR:0x0 LED:0x0 RstCntrl:0x0 MSR:0xFF
Feb 10 20:38:44: TTY1: autoconfigure probe started
Feb 10 20:38:44: TTY1: Modem command: --AT&F\V1+GCI=B5;S0=1--
Feb 10 20:38:46: TTY1: Modem configuration succeeded
Feb 10 20:38:46: TTY1: Detected modem speed 115200
Feb 10 20:38:46: TTY1: Done with modem configuration
Feb 10 20:38:54: As1 DDR: re-enable timeout
```

# Configuration Examples for Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC

This section contains the following examples:

- [Configuring for Asynchronous Dial Backup: Example](#)

## Configuring for Asynchronous Dial Backup: Example

In this example, the interface S2/0 is configured as a primary link. Configuring the route through the backup interface (the V.90 modem WIC in this case) is very important. 10.0.0.0 in the IP route indicates the network number of the remote end. Thus, all packets for the destination IP are routed through the backup link if the primary link goes down. The 180 in the route command indicates the cost of the route taken (It should be more than the cost of the primary route). This avoids the packets taking the backup link when the primary link is up.

The following example shows an asynchronous dial backup configuration:

```
interface Serial2/0
 ip address 70.1.1.2 255.255.255.0
 backup delay 15 15
 backup interface as33

interface Async33
 ip address 51.1.1.2 255.255.255.0
 encapsulation ppp
 dialer in-band
 dialer map ip 51.1.1.1 name m1_2621_33 modem-script cisco-default 101
 dialer-group 1
 ppp authentication chap
 async mode interactive
!
router eigrp 100
 redistribute static
 network 10.0.0.0
 network 70.0.0.0
!
ip route 10.0.0.0 255.0.0.0 51.1.1.2 180
!/very important/
line 33
 autoselect ppp
 modem InOut
 flowcontrol hardware
 transport input all
```

For more information on configuring dial backup, see the section [Configuring Dial Backup for Serial Lines](#) in the *Cisco IOS Dial Technologies Configuration Guide*.

## Additional References

The following sections provide references related to the Cisco WIC-1AM-V2 and WIC-2AM-V2 Analog Modem WIC.

### Related Documents

Related Topic	Document Title
Instructions for installing hardware.	<a href="#">WAN Interface Cards Hardware Installation Guide</a>
Instructions for connecting modems.	<a href="#">Modem-Router Connection Guide</a>
Detailed information for commands and registers.	<a href="#">AT Command Set and Register Summary for V.90 WIC-1AM and WIC-2AM Analog Modem WAN Interface Cards</a>
Quick reference information for configuration.	<a href="#">Cisco IOS Dial Services Quick Configuration Guide</a>
Configuration information for serial lines.	<a href="#">Configuring Dial Backup for Serial Lines</a>

### Standards

Standards	Title
ITU-T V.22 A/B	
ITU-T V.32	
ITU-T V.32 bis	
ITU-T V.90	
K56Flex	
V.22 bis	
V.34-1996	
V.92 Quick Connect	

## MIBs

MIBs	MIBs Link
<ul style="list-style-type: none"> <li>No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.</li> </ul>	<p>To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:</p> <p><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a></p>

## 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
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<p><a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a></p>

## Command Reference

This section documents new and modified commands. All other commands used with this feature are documented in the Cisco IOS Release 12.3 command reference publications.

### New Commands

- [upgrade modem firmware, page 21](#)

# upgrade modem firmware

To upgrade the modem firmware, use the **upgrade modem firmware** command in global configuration mode.

**upgrade modem firmware** [**all** | **slot** *slot* | **wic** *nm-slot/wic-slot*] **file** *source*

Syntax Description		
<b>all</b>	Select all the modems in the router that are supported by the modem firmware file.	
<b>slot</b>	Select the modem in the specified router slot that are supported by the modem firmware file.	
<i>slot</i>	Number of the slot selected.	
<b>wic</b>	Select the modems in the specified router slot/wic_slot that are supported by the modem firmware file.	
<i>nm-slot</i>	Number of the slot where the network module is located.	
<i>wic-slot</i>	Number of the slot where the WIC is located.	
<b>file</b>	Obtains the firmware information from the file named as source.	
<i>source</i>	Name of the file with the firmware.	

**Defaults** No default behavior or values.

**Command Modes** Global configuration mode.

Command History	Release	Modification
	12.3(13)	This command was introduced.

**Usage Guidelines** The source for the modem firmware file can be any of the following:

cns:	Firmware filename
flash:	Firmware filename
ftp:	Firmware filename
null:	Firmware filename
nvrn:	Firmware filename
rcp:	Firmware filename
system:	Firmware filename
tftp:	Firmware filename
xmodem:	Firmware filename
ymodem:	Firmware filename

It is best to copy the modem firmware file to Flash: or Slot0: before trying to upgrade the modems. After selecting the source, specify the filename. For example,

```
tftp://192.168.100.26/mj-F48A-1824M-4M-Rev-2-bundle-image.bin
```

If a modem has a call up, the call will be torn down (the modems selected in the upgrade command, are hardware reset before starting the download). A series of dots are printed (one per second) until the selected modems have been upgraded. The router must not be powered cycled during the upgrade command.

## Examples

The following example shows output of the **upgrade modem firmware all** command with a 1-port WIC-1AM-V2 in 0/1 (slot/wic-slot) and a 2-port WIC-2AM-V2 in 1/0 (slot/wic-slot):

```
Router# $em firmware all file flash:mj-F48A-1824M-4M-Rev-2-bundle-image.bin
Verifying the modem firmware bundle - Passed
Decompressing modem firmware image - Done
Loading /mj-F48A-1824M-4M-Rev-2-bundle-image.bin from 192.188.100.26 (via
FastEthernet0/0): !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 282816 bytes]

Verifying the modem firmware bundle - Passed
Decompressing modem firmware image - Done
TTY1: Upgrading modem firmware
TTY33: Upgrading modem firmware
TTY34: Upgrading modem firmware
Downloading modem firmware. Please Wait
.....
.....
TTY1: WIC-AM: Modem firmware download finished...
TTY34: WIC-AM: Modem firmware download finished.....
TTY33: WIC-AM: Modem firmware download finished...
Finished upgrading modem firmware.
```

## Related Commands

Command	Description
<b>clear modem</b>	Resets the hardware for a manageable modem.

# Glossary

- baud**—bits per second data rate of an asynchronous interface. The term is not used as **baud rate**, as that is redundant.
- DDR**—dial-on-demand routing. Also known as direct data routing or dial-up routing (PPP or IP).
- DRAMM**—Dynamic Random Access Memory Module.
- DS0**—A single 64 kbps channel of a T1 span.
- DSP**—digital signal processor.
- DSPM**—digital signal processing module—voice module card.
- IOS**—Internet Operating System.
- ISDN**—Integrated Services Digital Network.
- NM**—network module.
- MAR**—modular access router.
- MLP**—Multilink PPP.
- OIR**—Online insertion and removal (hot swap).
- POTS**—Plain old telephone service.
- PPP**—Point-to-Point Protocol.
- PSTN**—Public Switched Telephone Network.
- RAS**—remote access server.
- TDM**—time-division multiplexing. Also used to describe a single channel on a TDM bus.
- VFC**—voice feature card.
- VIC**—voice interface card.
- WIC**—WAN interface card.

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