



Configuration Register

This appendix describes the factory default settings of the configuration register, and procedures for changing those settings.

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Configuration Register Settings

The router has a 16-bit configuration register in NVRAM. You can use the configuration register to perform the following tasks:

- Set and display the configuration register value
- Force the router into the ROM monitor (bootstrap program)
- Select a boot source and default boot filename
- Enable or disable the Break function
- Control broadcast addresses
- Load operating software from ROM

[Table C-1](#) describes each configuration register bit.

Table C-1 Configuration Bit Meanings

Bit Number	Hexadecimal	Meaning
00–03	0x0000-0x000F	Boot field. (See Table C-2 .)
06	0x0040	Causes the system software to ignore the contents of NVRAM.
07	0x0080	OEM bit enabled.
08	0x0100	Break disabled.
09	0x0200	Causes the system to use the secondary bootstrap. This is typically not used (set to 0).

Table C-1 Configuration Bit Meanings (continued)

Bit Number	Hexadecimal	Meaning
10	0x0400	IP broadcast with all zeros.
5, 11, 12	0x0020, 0x0800, 0x1000	Console line speed.
13	0x2000	Boots default ROM software if the network boot fails.
14	0x4000	IP broadcasts do not have net numbers.
15	0x8000	Enables diagnostic messages and ignores the contents of NVRAM.

Changing Configuration Register Settings

You might want to modify the value in the configuration register to perform the following tasks:

- Recover a lost password
- Change the console data rate
- Enable or disable the Break function
- Manually boot the operating system using the **b** command at the ROM monitor prompt
- Force the router to automatically boot its system image in flash memory, or boot in accordance with any **boot system** commands stored in the router's configuration file in NVRAM

You can change the configuration register from either the ROM monitor or the operating system software. To change the configuration register from the ROM monitor, see the “[Configuration Register Commands](#)” section on page B-7. To change the configuration register from the system software, do the following:

Step 1 Connect a console terminal to the console port of the router as described in the “[Connecting to the Console Port](#)” section on page 3-20, using the blue RJ-45 to DB-9 console adapter cable.



Note

If you have a terminal with a DB-25 port, use an RJ-45 rollover cable and DB-25 adapter. The RJ-45-to-DB-25 adapter (Cisco part number 29-0810-01) can be purchased from Cisco.

For information about cable pinouts, refer to the online document [Cisco Modular Access Router Cable Specifications](#). This document is available online and on the Cisco Documentation CD-ROM.

Step 2 Configure your terminal or terminal emulation software for 9600 baud (default), 8 data bits, no parity, and 1 stop bit.

Step 3 Power on the router.

Step 4 When asked if you would like to enter the initial dialog, answer **no**:

```
Would you like to enter the initial dialog? [yes]: no
```

Your router is now in the normal operating mode.

Step 5 After a few seconds, you see the user EXEC prompt (`Router>`). Enter the **enable** command and your password to enter privileged EXEC mode:

```
Router> enable
```

```
Password: password
```

Step 6 At the privileged EXEC prompt (Router#), enter the **configure terminal** command:

```
Router# configure terminal
```

```
Enter configuration commands, one per line.
Edit with DELETE, CTRL/W, and CTRL/U; end with CTRL/Z
```

Step 7 Enter the **config-register value** command, where *value* is a hexadecimal number preceded by 0x (see [Table C-2](#)), to set the contents of the configuration register:

```
Router# config-register 0x value
```



Note Cisco IOS software does not allow you to change the console speed bits directly with the **config-register** command. To change the console speed, complete this sequence:

```
Router# configure terminal
Router(config)# line console 0
Router(config-line)# speed 9600
```

Step 8 Press **Ctrl-z** to exit configuration mode.

Step 9 Copy the new console speed to NVRAM:

```
Router> copy run start
```

The new settings are saved to NVRAM, but they are not effective until the router restarts; for example, when you switch the power off and on or when you enter a **reload** command from the console.

Step 10 Enter the **show version** command to display the configuration register value currently in effect and the value that will be used at the next reload. The value is shown on the last line of the display:

```
Configuration register is 0x142 (will be 0x142 at next reload)
```

Step 11 Reboot the router. The new value is effective after the router reboots.

Configuring the Boot Field

The lowest four bits of the configuration register (bits 3, 2, 1, and 0) form the boot field. (See [Table C-2](#).)

Table C-2 Explanation of Boot Field Configuration Register Bits (00-03)

Boot Field	Meaning
00	Stays at the ROM monitor on a reload or power cycle
01	Boots the first image in flash memory as a system image
02-F	Enables default booting from flash memory
	Enables boot system commands that override default booting from flash memory

The boot field specifies a number in binary form. If you set the boot field value to 0, you must have console port access to boot the operating system manually. Refer to the **boot** command in the “ROM Monitor Command Descriptions” section on page B-4.

If you set the boot field to a value of 2 to F, and there is a valid **boot system** command stored in the configuration file, the router software processes each **boot** command in sequence until the process is successful or the end of the list is reached. If there are no **boot** commands in the configuration file, the router attempts to boot the first file in flash memory.

In the following example, the configuration register is set to boot the router automatically from flash memory and to ignore Break at the next reboot of the router:

```
Router# configure terminal

Enter configuration commands, one per line.
Edit with DELETE, CTRL/W, and CTRL/U; end with CTRL/Z
config-register 0x102
Ctrl-z
```

**Note**

A **boot system** command in the router configuration in NVRAM overrides booting from flash memory.

Bit 8 controls the console Break key. Setting bit 8 (the factory default) causes the processor to ignore the console Break key. Clearing bit 8 causes the processor to interpret Break as a command to force the router into the bootstrap monitor, halting normal operation. Break can always be sent in the first 60 seconds while the router is rebooting, regardless of the configuration settings.

Bit 9 controls the system boot. Clearing bit 9 (the factory default) causes the system to boot from flash memory. Clearing bit 9 causes the system to use the secondary bootstrap (netbooting). This is typically not used.

Bit 10 controls the host portion of the IP broadcast address. Setting bit 10 causes the processor to use all zeros; clearing bit 10 (the factory default) causes the processor to use all ones. Bit 10 interacts with bit 14, which controls the network and subnet portions of the broadcast address. Table C-3 shows the combined effect of bit 10 and bit 14.

Table C-3 Configuration Register Settings for Broadcast Address Destination

Bit 10	Bit 14	Address (<net> <host>)
Off	Off	<ones> <ones>
On	Off	<zeros> <zeros>
On	On	<net> <zeros>
Off	On	<net> <ones>

Bit 13 determines the router’s response to a bootload failure. Setting bit 13 causes the router to load operating software from ROM after six unsuccessful attempts to load a boot file. Clearing bit 13 causes the router to continue indefinitely to attempt loading a boot file. By factory default, bit 13 is set to 0.

Bit 5, bit 11, and bit 12 of the configuration register determine the baud rate of the console terminal. Table C-4 shows the bit settings for the eight available rates. (The default baud rate is 9600 bps.)

Table C-4 Console Terminal Baud Rate Settings

Baud	Bit 5	Bit 12	Bit 11
115200	1	1	1
57600	1	1	0
38400	1	0	1
19200	1	0	0
9600	0	0	0
4800	0	0	1
2400	0	1	1
1200	0	1	0

Enabling Booting from Flash Memory

To enable booting from flash memory, set bits 3, 2, 1, and 0 to a value between 2 to 15. To specify a filename to boot, enter the system software configuration command **boot system flash** [*device:*] [*partition:*] [*filename*] in the configuration file.

By specifying the device and partition in the command, you can configure the router to boot from the PCMCIA cards. If you specify only the filename, the router is configured to boot from flash memory.

To enter configuration mode while in the system software image, enter the **configure** command at the enable prompt as in the following example:

```
Router# configure

Configuring from terminal, memory, or network [terminal]? terminal

Enter configuration commands, one per line.
Edit with DELETE, CTRL/W, and CTRL/U; end with CTRL/Z
boot system flash filename
```

To disable Break and enable the **boot system flash** command, enter the **config-register** command with a value as follows:

```
config-reg 0x102
Ctrl-z
```

If you set the configuration register value to 0x102, as in this example, you do not need to enter the **boot system flash** command unless there is more than one image in flash memory.

