C I S C O **S** Y S T E M S

Doc. No. 78-0924-02

Installing and Configuring the Single-Port Token Ring Interface Card

Product Number: CSC-1R=

Caution The procedures in this document are recommended for experienced technicians and engineers because access to the chassis interior is required. We strongly advise that you read through the entire document. If you have any doubts about your ability to perform any part of this procedure, contact your service representative.

Description of the CSC-1R Single-Port Token Ring Interface Card

- The CSC-1R card supports one Token Ring interface that can connect to IEEE-802.5 and IBM Token Ring media.

- The CSC-1R card uses the Motorola 68EC030 microprocessor and the Texas Instruments TMS380 (second generation) Token Ring chip set.

- Clock speed is 60 megahertz (MHz) divided to provide an operational frequency of 30 MHz for the microprocessor.

- The CSC-1R card has the xBus interface that allows connections to the CSC-MC nonvolatile random access memory (NVRAM) card, as well as the optional Flash memory card (CSC-MC+). Neither of these cards require a chassis slot.

- The CSC-1R card provides a unique Media Access Control (MAC) address for the Token Ring interface.

- A single software command permits the user to configure the Token Ring port for either a 16-megabits per second (Mbps) or a 4-Mbps Token Ring local area network (LAN). No jumper changes are required by the user.

- The CSC-1R card, which will operates in all A+, A, and M chassis platforms, requires no additional multibus memory cards because multibus memory is present on the card.

- The CSC-1R card draws 6.0 amperes (A) at +5volts (V), 6.0 milliamperes (mA) at +12V, and 30mA at -12V. These values, measured with the Token Ring port enabled, have a tolerance of 5%. The CSC-1R card dissipates 30 watts (W).

Preventing Electrostatic Discharge Damage

Electrostatic discharge damage (ESD) occurs when electronic printed circuit cards are improperly handled and can result in complete or intermittent failures. ESD can impair electronic circuitry and equipment. Follow ESD prevention procedures when removing and replacing cards.

Following are recommendations for safely handling printed circuit cards:

- Slip on an ESD wrist strap, ensuring that it makes good skin contact.

- Connect the strap to an unpainted chassis frame surface or another proper grounding point or chassis surface to safely channel unwanted ESD voltages to ground.

- Use the edge ejectors to remove the card. Handle the card by its sides. Place the card on an antistatic surface or in a static shielding bag. To prevent further damage to the card by ESD voltages, defective card*s* must remain in the static shielding bag when returned for repair or replacement.

- Handling the new card by its edges only, insert it into the chassis. Avoid contact between the card and clothing. The wrist strap only protects the card from ESD voltages on the body; ESD voltages on clothing can still damage the card.

To ensure that the resistor in the ESD strap is providing proper ESD protection, use an ohmmeter to check the ESD wrist strap. For adequate safety and ESD protection the measurement should be in the range 1 to 10 Mohms.

Caveats

Following are the caveats associated with the CSC-1R card:

- Use of the CSC-1R card requires that System Software Version 9.0 or later be installed on the processor card. For current firmware (microcode) requirements and prerequisites, refer to the following publications: *Microcode Release Note* and *Upgrading the Microcode EPROM on the CSC-1R and CSC-2R Token Ring Interface Cards.*

- If an older CSC-R card is to be replaced with a CSC-1R card, the CSC-MT NVRAM card (required with the CSC-R) may have to be removed from the chassis, resulting in the loss of the system configuration stored in the CSC-MT NVRAM.

⚠ Caution   To prevent losing the system configuration, upload it to a Trivial File Transfer Protocol (TFTP) server before removing the CSC-MT card.

- Do not apply the external cable and back panel Token Ring interface labels until all ports have been configured, and the configuration has been stored in NVRAM.

- The CSC-1R card is not an available option in *any* C-chassis platform.

- The CSC-MC and CSC-MC+ (Flash) cards can be connected to the xBus connector on the CSC-1R card and the MCI-3 card; however, an MCI-3 card is *not* required for connection to the CSC-MC or Flash card if a CSC-1R card is present.

- Before a fix was implemented in Maintenance Release 9.1(10), the configuration data stored in NVRAM on the CSC-MC and Flash cards was formatted differently when these cards were connected to CSC-2R cards versus MCI-3 cards. Moving a CSC-MC or Flash xBus cable from the xBus connector on an MCI-3 card to the connector on a CSC-2R card (or back again) requires erasing and rewriting the contents of the memory on the relocated Flash or CSC-MC card. This caveat *does not* apply to system images stored on Flash cards.

About this Document

Select and read through the sections you will be using before beginning any procedures in this document.

The following procedures are included in this document:

Configuring the CSC-1R Card

The following sections discuss how to configure the CSC-1R card.

Selecting Port Speed

The speed of the Token Ring port on the CSC-1R card must be configured immediately after the first reboot (following installation) using the configuration dialog routine, the **config terminal** command, or the **setup** command.

The speed of the port on the CSC-1R must be configured by the user; there is no factory default for port speed. Following is sample output of how to configure the port on the CSC-1R Token Ring card for 16 MHz (using the **config terminal** command):

```
Router# configure terminal
Enter configuration commands, one per line.
Edit with DELETE, CRTL/W, and CRTL/U;end with CTRL/Z
interface tokenring 0
ring-speed 16
^z
Router# write memory
[ok]
Router#
```

Caution *Port speed must equal ring speed. Failure to match the port speed to the ring speed will bring down the ring.* The port inserts on the ring when you press Return after entering the command **ring-speed 16**. Only values of 4 or 16 Mbps will be accepted by the system because these are the only selectable speeds for the CSC-1R port.

Numbering CSC-1R Cards with the Software-Readable Switches

Card numbers are what the processor uses to distinguish one card from another. CSC-1R card numbers must be unique within the set of all Token Ring cards in the chassis, but will *not* interfere with non-Token Ring card numbers. The problem created with duplicate card numbers is called *bus contention*.

Note   A CSC-1R with a card number of 1 will not interfere with an MCI or SCI card also numbered as 1 in the same chassis; however, if other Token Ring cards are in the same chassis with the CSC-1R card, the card number of each Token Ring card must be unique to prevent bus contention.

There is no bus contention between the CSC-1R card and the cBus controller (CSC-CCTL) card in the AGS+. A CSC-1R can be configured as card number 0, while the CSC-CCTL is also configured as card number 0 by default (providing all above requirements are met); however, using a car number other than 0 is strongly recommended.

Software-readable switches, 1–3 on the front edge of the CSC-1R card (see Figure 1) control card numbering within the chassis (switches 4–8 have no function). Configure the switches on the CSC-1R card to select the desired card number (see Table 1). These switches are labeled from left to right as they appear in Figure 1.

Table 1   Switch Settings for Card Number Selection

Card Number	Switch 1	Switch 2	Switch 3
0	Down[1]	Down	Down
1	Up	Down	Down
2	Down	Up	Down
3	Up	Up	Down
4	Down	Down	Up
5	Up	Down	Up
6	Down	Up	Up

1. Down = Switch is off

Caution   When the processor polls the system to discover which cards are installed, CSC-R16M cards are identified first, and then the CSC-1R cards are identified. The interfaces on the CSC-R16M cards will be assigned unit addresses first, and then the interfaces on the CSC-1R cards will be assigned unit addresses; however, there is no slot hierarchy regarding physical placement of these cards in the chassis slots. Card numbers apply to the cards themselves, while unit addresses apply to the individual interfaces or ports on the cards.

Following is an example of card numbering with respect to unit addressing:

Consider three cards installed in a system: two CSC-R16M cards configured as card number 0 and 1 and one CSC-1R card configured as card number 2. The interface on the first CSC-R16M will be assigned a unit address of 0; the interface on the second CSC-R16M will be assigned a unit address of 1; and the interface on the third CSC-1R will be assigned a unit address of 2.

Now consider a system with the same three cards installed, but configure the CSC-1R as card number 0 and the two CSC-R16M cards as numbers 1 and 2.

The system will arbitrarily assign the interfaces on the CSC-R16M cards (card numbers 1 and 2) with unit addresses of 0 and 1 respectively, while the CSC-1R interface will still be assigned unit addresses of 2.

Note Card numbers are assigned by the user with software-readable switches, and unit addresses are assigned by the system based on the hierarchy of unit address assignments.

The hierarchy of unit address assignments is as follows:

1 CSC-R Token Ring cards

2 CSC-R16M Token Ring cards

3 CSC-1R Token Ring cards

Configuring a Chassis with CSC-1R Cards

The CSC-1R interoperates with the CSC-R and CSC-R16M Token Ring cards, with any of the MCI or SCI family of cards, and with any cards in the cBus complex.

The CSC-1R Token Ring interface card will operate from any slot in the chassis except the slots reserved for the environmental monitor card in the AGS+ and the processor card (typically the first or second slot from the top of the card cage is reserved for the processor card). If cBus cards (FCTL, MEC, and so forth) are required in the AGS+, the center cBus slot is reserved for the cBus controller card (CSC-CCTL).

Note The CSC-1R will not interoperate with the older Type 1 and Type 2 Ethernet cards or with the CSC-S and CSC-T cards.

Table 2 shows the maximum number of CSC-1R cards that can be configured with different card combinations and supported in the A+, A, and M chassis. These CSC-1R configurations assume that one of the available slots in the A+, A, M, and C chassis is taken by a processor card, and a second slot by the CSC-ENVM in the A+.

Table 2   Maximum Chassis Configurations with the CSC-1R Card

	Chassis Types		
Card Configurations	A+	A	M
CSC-1R Only	7	4	3
CSC-1R and 1 MCI/SCI	4	4	2
CSC-1R and 2 MCI/SCI	4	3	1
CSC-1R and 1 FCI or FCIT	4	0	0
CSC-1R and 2 FCI or FCIT	3	0	0
CSC-1R and 1 CSC-R16M	6	3	2
CSC-1R and 2 CSC-R16M	5	2	1

LED Initialization States

Along the front edge of the CSC-1R card are ten status LEDs: nine red and one green. The order of the LEDs is left to right when looking at the front edge of the card (see Figure 1).
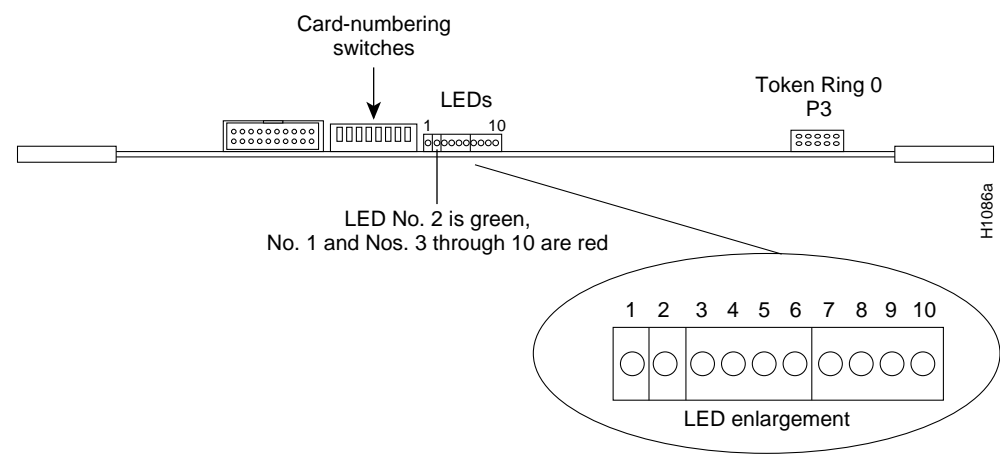

Figure 1   CSC-1R Single-Port Token Ring Interface Card—Front Edge View

The red LED (on the far left end of the bank of LEDs) is the Power-On LED (Number 1). The next LED (green) is the Processor LED (Number 2).

The remaining eight LEDs (3–10) are red. At system boot, these eight LEDs will change state to indicate that the CSC-2R card is being initialized.

The seven initialization states of LEDs 3–10 are shown in Table 3.

Table 3   CSC-1R Status LED States at System Boot

	LEDs[1]							
State	3	4	5	6	7	8	9	10
1	O	O	O	O	O	O	O	O
2	•	•	•	O	O	O	O	O
3	•	•	O	•	O	O	O	O
4	•	O	•	•	O	O	O	O
5	O	•	•	•	O	O	O	O
6	•	O	O	•	•	O	O	•
7	O	•	•	•	•	O	•	O

1.   • = LED off, O = LED on

In the first initialization state, all eight status LEDs (3–10) are on. During the next four states, LEDs 7–10 will be on, while LEDs 6–3 will consecutively turn on then off. States 6 and 7 will indicate a successful initialization.

The first seven LED states display consecutively at system boot. If a problem occurs during this initialization, the state that the LEDs were in when the problem occurred will flash on and off.

When the port inserts onto the ring, LEDs 3–10 will flash a series of patterns too fast to see, but following this, LEDs 3–10 will strobe back and forth to indicate correct operation. The speed of this strobing will change with the volume of data traffic; the heavier the traffic, the slower the strobing, and so forth.

Caution   If a CSC-R Token Ring card is to be replaced with a CSC-1R card, the CSC-MT Multibus memory card (required with the CSC-R card) may have to be removed from the chassis, so the system configuration (stored in NVRAM on the CSC-MT) will be lost. To prevent losing the system configuration, upload it to a TFTP server before removing the CSC-MT card; this saved configuration must then be downloaded after the new NVRAM card is installed. If a CSC-MC NVRAM card or a CSC-MC+ (Flash memory) NVRAM card is currently installed in the chassis, this upload/download procedure will not be required.

If this upload/download procedure is not required, proceed to "Installation Procedures for the CSC-1R Card."

If this upload procedure is required, proceed to "Uploading the Configuration File to a TFTP File Server."

Uploading the Configuration File to a TFTP File Server

The following procedure is required only if the system configuration resides in a NVRAM memory card that will be permanently removed from the chassis as a result of the CSC-1R installation.

The following upload procedure works on SUNOS 4.1.1. Before you upload (save) the running configuration to the TFTP file server, ensure the following:

- Your file server supports the TFTP application.

- The router is connected to a network supporting a TFTP file server.

Use the following procedure to create a file on the TFTP file server and to upload the running configuration to this file:

Step 1 Log on to the TFTP file server using the command **telnet** *TFTP file server name* or *IP address of the TFTP file server.*

Step 2 Once on the TFTP file server, change to the default TFTP boot directory using the UNIX command **cd** */directory name.*

Note The name "/tftpboot" is a typical Sun default TFTP directory name. To locate and verify the name of the default TFTP directory, use the UNIX command **more /etc/services**. The default directory will be listed on the line starting with TFTP. Consult your network administrator to ensure that a TFTP file service is available.

Step 3 Create a temporary file using the UNIX command **touch** *filename* (where *filename* is the name you create for your temporary configuration file).

Note Some implementations of TFTP file service require that the temporary file does *not* exist on the destination system. Conversely, Sun's TFTP daemon requires that a file that is being transferred must first exist (as a "dummy" file) on the destination system. For example, if using NetCentral™ or CiscoWorks™, make certain the TFTPTYPE variable has the default value of OVERWRITE in place (OVERWRITE is the Sun default). This value indicates that the file must exist and can be overwritten. Consult your network administrator to determine which implementation of TFTP file service is available.

Step 4 Give this file read/write permission using the UNIX command **chmod** *666 filename.*

Step 5 Return to the router enable mode using the UNIX commands **exit** or **logout.**

Step 6 Use the commands **write term** and **show config** to verify that the running configuration and the NVRAM configuration are the same.

Step 7 Use the **write net** command to upload the running configuration to the TFTP file server.

A sample output of the **write net** command follows:

```
Router# write net
Remote host []? 131.131.101.101
Name of configuration file to write [router-confg]?gsxx-confg
Write file gsxx-confg on host 131.131.101.101?[confirm]<Return>
Writing gsxx-confg:!!!! [ok]
```

The !!!! and [ok] indicate that the operation is successful and that the configuration is safely stored in the temporary file on the TFTP file server. A failure is indicated with ... [timed out] or [failed]. This failure would suggest a net fault or the lack of a writable, readable file on the TFTP file server.

Proceed to "Installation Procedures for the CSC-1R Card."

Installation Procedures for the CSC-1R Card

Before beginning the following procedures, it is strongly recommended that the chassis be removed from the rack if the chassis rear panel is not otherwise accessible.

Warning Before accessing the chassis interior and removing any cards, turn off power to the chassis and unplug the power cord. Attach appropriate ESD protection at this time.

Tools and Parts Required

Following is a list of tools, materials, and parts needed to perform these procedures:

- Two Phillips screwdrivers, sizes Number 1 and Number 2

- Two flat-blade screwdrivers, sizes medium and small

- One pair of medium needle-nosed pliers

- Antistatic mat or antistatic foam

- CSC-1R card and appropriate applique (see Table 4)

- Token Ring cable and applique labels 0–15 (included with card shipment)

If you *only* need to install the CSC-1R card, proceed to the section, "Accessing the A+, A, and M Chassis Card Cage."

If you need to install the CSC-1R card *and* the appropriate applique on the chassis back panel, proceed to the section, "Accessing the A+, A, and M Chassis Interior."

Accessing the A+, A, and M Chassis Card Cage

Select and use the procedure that matches your chassis type.

- A+ and A chassis card cage—Remove the front access panel. The front access panel on the A+ and A chassis is secured with two thumb screws.

- M chassis card cage—Remove the side access panel. The side access panel on the M chassis is secured with three nonremovable slotted screws along the top edge of the panel and three No. 2 Phillips screws along the bottom edge (do not remove the three Phillips screws completely).

Proceed to the section, "Installing the CSC-1R Card."

Accessing the A+, A, and M Chassis Interior

Select and use the following procedure that matches your chassis type.

- A+ and A chassis interior—Remove the top cover and front access panel. The top cover of the A+ and A chassis is secured by seven No. 1 Phillips screws. The front access panel on the A+ and A-chassis is secured with 2 thumb screws.

- M chassis interior—Remove the top cover and side access panel. The top cover on the M chassis is secured by fourteen No. 1 Phillips screws. The side access panel on the M chassis is secured with three nonremovable slotted screws along the top edge of the pane and three No. 2 Phillips screws along the bottom edge (do not remove the three Phillips screws completely).

To install the Token Ring applique, proceed to section, "Installing Token Ring Appliques."

Installing Token Ring Appliques

Use Table 4 as a guide for the type of chassis you have and the applique you will be installing.

Table 4   Token Ring Applique-types by Chassis

Applique type	A+	A	M
APP-IB1[1]	Yes	Yes	Yes
APP-JB1[2]	Yes	Yes	No
APP-SB2[3]	No	No	Yes

1. I = an individual plate with a short internal cable.
2. J = an individual plate with a long internal cable.
3. S = a medium plate with short internal cables,
and B = a Token Ring applique.

Note   The CSC-R appliques cannot be used with the CSC-1R cards.

- If you are installing appliques on an A+ or A chassis, proceed to the section, "Installing Appliques on the A+ or A Chassis."

- If you are installing appliques on the M chassis, proceed to the section, "Installing Appliques on the M Chassis."

Warning   Before accessing the chassis interior and removing any cards, turn off power to the chassis and unplug the power cord. Attach appropriate ESD protection at this time.

Installing Appliques on the A+ or A Chassis

Following is the procedure for installing a Token Ring applique on the rear panel of the chassis. The applique and the internal cable are one piece and cannot be disconnected.

Step 1   If you are replacing older the Token Ring card (CSC-R), the applique for this card must be removed as well. This will require disconnecting the internal Token Ring cable from the CSC-R card and removing the card.

Step 2   Gain access to the back panel of the chassis and label and disconnect all the exterior cables. The power cable should already be disconnected.

Step 3   Rotate the chassis so the back panel is facing you and determine which type of applique you will be using from Table 4. The individual (I) plates are located on the left side of the back panel just below the console/terminal applique; the long plates (L) are to the right.

Step 4   Use the No. 1 Phillips screwdriver to remove the appropriate blank filler plate (or old applique) from the chassis back panel and set this aside (save the screws to use with the new applique).

Step 5   Attach the new applique to the inside of the chassis back panel using the No. 1 Phillips screwdriver and the screws from the removed plate or applique.

Note Referring to Figure 1, use the relative position of the Token Ring connector (P3) on the CSC-1R card as a starting point for routing internal cables. Cable 0 would be routed underneath the left side of the rear of the card cage (with the rear of the card cage facing you).

Step 6 Rotate the chassis so the card cage is facing you (back panel to your right).

Step 7 Pass the internal cable underneath the card cage until its connector emerges from the front of the chassis. Do not force the cable past the other cables already beneath the card cage.

Step 8 Position the internal cable connector so that it is located to the right side of the card cage (with the front of the card cage facing you). Be careful not to force this cable past the other cables already beneath the card cage. Do not attach the Token Ring cable at this time.

Proceed to the section, "Installing the CSC-1R Card."

Installing Appliques on the M Chassis

Following is the procedure for installing a Token Ring applique to the back panel of the M chassis. The applique and the internal cable are one piece and cannot be disconnected.

Step 1 If you are replacing the older Token Ring card (CSC-R), the applique for this card must be removed as well. This will require disconnecting the internal cable from the CSC-R card and removing the card. Also remove the CSC-MT memory card since the CSC-1R does not require the CSC-MT to operate.

Step 2 Access the back panel of the chassis and label and disconnect all exterior cables. The power cable should already be disconnected.

Step 3 Rotate the chassis so the back panel is facing you and determine which type of applique you will be using from Table 4. The individual (I) plates are located (left of center) on the back panel below the console/terminal applique; the medium plates are located on the left side of the back panel.

Step 4 Use the No. 1 Phillips screwdriver to remove the appropriate blank filler plate (or old applique) from the chassis back panel and set these aside (save the screws to use with the new applique).

Step 5 Attach the new applique to the inside of the back panel using the No. 1 Phillips screwdriver and the screws from the removed plate or applique.

Step 6 Rotate the chassis so the card cage is facing you (back panel to your right).

Note With the chassis card cage facing you, the relative position of the back panel on the M chassis is to the right of the card cage, and the internal Token Ring cable will be routed underneath the card cage coming in from the right side.

Step 7 Pass the internal Token Ring cable underneath the card cage until its connector emerges from the front of the chassis. Position the internal cable connector so that it is located to the right side of the card cage (with the card cage facing you). Be careful not to force this cable past the other cables already beneath the card cage. Do not attach the Token Ring cable.

Proceed to the section, "Installing the CSC-1R Card."

Installing the CSC-1R Card

Before installing the CSC-1R card in the chassis, specific card number and unit address requirements must be satisfied. The following requirements are intended to simplify the CSC-1R installation and the application of cable and applique labels.

- If Token Ring interface cards are currently installed in the chassis, the card numbers of these cards cannot be used when assigning card numbers to the new CSC-1R cards to be installed. All Token Ring card numbers must be unique.

- Before installing the new CSC-1R cards, determine which card numbers (0–6) and unit addresses are already assigned, and which card numbers and unit addresses are available to apply to the CSC-1R cards to be installed.

Note To determine the unit addresses of the Token Ring cards already installed, i t may be necessary to boot the system and use the **show controller token** command. The card numbers are established by switches 1–3 (use the same left to right orientation as for the CSC-1R switches) on the front edge of the CSC-R16M card and by jumper (W9) settings on the CSC-R cards (see Table 5).

Table 5   CSC-R Card Number Jumper (W9) Settings

	Jumpers		
Card No.	A2	A3	A4
0	In	In	In
1	Out	In	In
2	In	Out	In
3	Out	Out	In

Note The W9 jumper on the CSC-R is located just left of the center of the card (the card orientation is with the edge ejectors away from you).

Completing the Card Number and Unit Address Worksheet

Before beginning the CSC-1R installation procedure, use the following worksheet (Table 6) to determine the card numbers and unit addresses of the Token Ring cards and interfaces already installed in the chassis. Determine the card numbers and unit addresses of the CSC-1R cards to be installed.

Following are the instructions for using this worksheet:

Step 1   Referring to the switch settings on the following worksheet, verify the card numbers of all of the Token Ring cards currently installed in the chassis. In the column "Unique Card Number," cross out those card numbers already used because a card number cannot be used for more than one card. Refer to the section "Numbering CSC-1R Cards with Software-Readable Switches" as needed.

Step 2   In the column "Type of Token Ring card," write in the card type of each Token Ring card installed: card types would be CSC-R, CSC-R16M, CSC-1R, and CSC-2R (this dual-port card requires two unit addresses per card number).

Step 3 In the columns "Unique Unit Address First Token Ring Port" and "Unique Unit Address Second Token Ring Port," assign a unique unit address to each Token Ring card as follows:

Assign to the newly installed CSC-1R card a card number and unit address of N+1 (where N = the highest card number and unit address existing in the chassis before the installation of the new card).

Following is an example of how the system assigns unit addresses:

If a CSC-R (card number of 0) a CSC-R16M (card number of 1) are currently installed in a chassis and a CSC-1R card is added, the following unit address assignments will be made by the system:

- CSC-R unit address of 0 (N=0)

- CSC-R16M unit address of 1 (N+1)

- CSC-1R unit address of 2 (N+2)

If 1 is the highest card number and unit address assigned before the new CSC-1R is added, the new CSC-1R will be card number 2, with unit address 2.

Note This 1:1 relationship applies only to Token Ring cards with a single port.

Step 4 When the worksheet is completed, make sure that all card numbers and unit addresses are unique. This worksheet will help to keep the card numbers and unit addresses of the various Token Ring cards in order and will greatly simplify the application of Token Ring interface labels.

Table 6   Card Number and Unit Address Worksheet

Software-Readable Switch Settings 1–3[1]	Unique Card Number	Type of Token Ring Card	Unique Unit Address Second TR Port[2] (CSC-2R only)	Unique Unit Address First TR Port
D–D–D	0			
U–D–D	1			
D–U–D	2			
U–U–D	3			
D–D–U	4			
U–D–U	5			
D–U–U	6			

1. D = Down, U = up.
2. First and second Token Ring ports are oriented right to left respectively.

Following is the unit addressing hierarchy. Adhering to this order of hierarchy will ensure that the Token Ring labels are applied correctly.

1 CSC-R Token Ring cards

2 CSC-R16M Token Ring cards

3 CSC-1R Token Ring cards

Note The CSC-R card uses jumpers for card numbering (see Table 5).

Installing the CSC-1R Card and Token Ring Labels

Following is the procedure for installing or replacing the CSC-1R card and applying Token Ring interface labels:

Step 1 If you are replacing an existing CSC-1R card, disconnect the internal Token Ring cable (if not done already) and the NVRAM or Flash memory cables (if installed), and remove the card from the chassis card cage. Follow card removal procedures described earlier.

Step 2 Referring to the worksheet, use the software-readable switches on the front edge of the new CSC-1R card to select the desired unique card number. This card number will depend upon the card numbers of the Token Ring cards currently installed in the chassis.

Step 3 Insert the new CSC-1R card into the card guides in the desired card cage slot (do not insert the card into the backplane or attach cables at this time).

Step 4 Repeat Steps 2–3 for each CSC-1R card to be installed.

Step 5 Attach the appropriate internal interface cable to the Token Ring connector (P3) on the CSC-1R card. Connector P3 is on the right front edge of the CSC-1R card (use Figure 1 as orientation). Verify the correct relationship from the connectors back through to the appropriate Token Ring applique on the back panel.

Step 6 Using the worksheet as a reference, apply the Token Ring interface label to the appropriate internal cable attached to the newly installed CSC-1R card (for example, an interface with a unit address of 2 would get the Token Ring 2 label). Wrap each label around the cable (just below the connector) so that the label is readable from the front of the card cage opening.

Step 7 Using the worksheet as a reference, apply the back panel Token Ring interface label to the appropriate applique attached to the back panel of the chassis. Apply each label directly below the applique connector so that the label is readable from the back of the chassis.

Step 8 Repeat Steps 5–7 for each CSC-1R card, internal cable, and applique installed.

Note In the M chassis, it may be necessary to reinstall all removed cards before attaching the Token Ring cable to the CSC-1R card., depending upon the slot placement chosen for the CSC-1R card.

Step 9 Reattach the NVRAM or Flash memory 50-pin flat cable (if installed) into the 50-pin connector on the top CSC-1R card in the A+ and A chassis or on the bottom CSC-1R card in the M chassis.

Step 10 Insert the newly installed CSC-1R cards into the backplane. Follow card replacement procedures described earlier.

Step 11 Eliminate the extra length of internal cable in the front of the card cage by doing one of the following:

- In the A+ and A chassis, carefully pull the extra internal cable from the rear of the card cage so that the excess is near the Token Ring applique. Be careful not to stress the cable or the connectors on the CSC-1R card.

- In the M chassis, carefully pull the extra internal cable from the right side of the card cage so that the excess is near the Token Ring applique. Be careful not to stress the cable or the connectors on the CSC-1R card.

This completes "Installing the CSC-1R Card."

Proceed to one of the following sections:

- If the configuration was uploaded before removing the old NVRAM card, proceed to the section, "Downloading the Configuration File from a TFTP File Server."

- If the configuration was not downloaded before removing the old NVRAM card, it will be necessary to reconfigure the system (after the installation is tested) using the configuration dialog routine or **setup** command. Proceed to the section, "Testing the Installation."

- If the old NVRAM card was not removed, proceed to the section, "Testing the Installation."

Downloading the Configuration File from a TFTP File Server

The following procedure is necessary only if the system configuration was uploaded to a TFTP server before the old NVRAM card was removed and before the new CSC-1R card was installed.

After the new NVRAM card is installed, the saved configuration must be downloaded (restored) to the system NVRAM.

Following is a list of what to do after the new NVRAM card is installed, but before the saved configuration can be restored:

Step 1 Make certain that one interface (not the CSC-1R Token Ring interface if possible) is physically connected to the network with the TFTP file server.

Note If the Token Ring interface is used, the port speed will have to be configured (see "Selecting Port Speed") before the TFTP download can take place.

Step 2 Power the system ON and reply **yes** to the configuration dialog query.

Step 3 Go through the configuration dialog routine and enable one interface to act as the path to the TFTP file server.

Step 4 Reply **no** to the query "Is this interface in use?" for all interfaces other than the interface connected to the TFTP file server. Reply **yes** only for the interface connected to the TFTP file server.

Note If the Token Ring interface is being used, the port speed must be entered at this time. Make certain to match the port speed with the ring speed.

Step 5 Verify the connection to the TFTP file server by transmitting a **ping** to the TFTP file server. The syntax for the **ping** command is as follows:

```
Router# ping 131.131.101.101 <Return>
```

Connectivity is indicated by !!!!!, while ... [timed out] or [failed] indicates none. If the connection fails, reconfigure the interface, check the physical connection to the TFTP file server, and re-transmit a **ping**.

Procedure

The file name (gsxx) used in the following example is intended as a sample. Use the following procedure to download the saved configuration from the TFTP file server and to write this configuration to NVRAM:

Step 1 Use the **config net** command to upload from the TFTP file server. A sample output of the **config net** command follows:

```
Router# config net
Host or network configuration file [host]? <Return>
IP address of remote host [255.255.255.255]? 131.131.101.101
Name of configuration file [router-confg]? gsxx-confg
Booting gsxx-confg from 131.131.101.101:!!!! [ok]
```

Step 2 Use the command **write term** to verify that the configuration is present in the running memory of the router.

Step 3 Use the router command **write memory** to write the configuration into NVRAM.

Step 4 Turn the system off, wait approximately thirty seconds, turn the system back on (power-cycle), and reboot.

Step 5 Use the router command **show config** to verify that the configuration is present in NVRAM.

This completes "Downloading the Configuration File from a TFTP File Server."

Proceed to the section, "Testing the Installation."

Testing the Installation

Following is the procedure for testing the CSC-1R installation:

Warning The next part of this procedure requires chassis operation with all covers removed. Use extreme caution because potentially hazardous voltages are present within. To avoid the chassis overheating during the following steps, apply power to the chassis *only* long enough to see the interfaces displayed and the correct LED functions.

Step 1 Plug in the power cord and turn chassis power ON for an installation check.

Step 2 Verify that the boot screen and all installed CSC-1R Token Ring interfaces are displayed. If a CSC-1R card is not seen by the system, the card may be inserted incorrectly. To check this, turn off the power, disconnect the power cable and Token Ring cable, reseat the CSC-1R card, reattach all internal cables, and reboot.

Note If the system does not boot properly, refer to Table 3 and verify the LED initialization sequence. If the LED sequence is incorrect, check the card installation and reboot.

Step 3 After the system boots correctly, turn the power OFF and unplug the chassis.

Step 4 Replace the card access panel and top cover (if removed) on the A+, A, or M chassis.

Step 5 Attach the external Token Ring cables to the appropriate back panel Token Ring appliques at this time.

Step 6 Power ON the system and go through the configuration dialog routine (or use the **setup** command) and enter the IP addresses, subnet masks, and ring speeds for the Token Ring interfaces you just installed.

Caution *Port speed must equal ring speed. Failure to match the port speed to the ring speed will bring down the ring.* The port inserts on the ring when you press Return after entering the command **ring-speed 16**.

Step 7 After the new Token Ring interfaces are configured, use the **show controller token** *unit* (where unit is the unit address number of the Token Ring port) command to verify that the unit addresses assigned by the system match those assigned in the worksheet. If the hierarchy of unit addressing was observed when installing the CSC-1R cards, all system assigned unit addresses will match the Token Ring labels.

This completes *Installing and Configuring the CSC-1R Single-Port Token Ring Interface Card*.

> **Note** For technical assistance, contact a service representative or the Cisco Technical Assistance Center (TAC) at 800 553-2447, 415 903-7209, or `tac@cisco.com`. For upgrade or product information, contact the Customer Response Center at 800 553-6387, 415 903-7208, or `cs-rep@cisco.com`.

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