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Safety Notices

⚠ **Danger:** Before you begin to install this product, read the safety information in *Caution: Safety Information—Read This First*, SD21-0030. This booklet describes safe procedures for cabling and plugging in electrical equipment.

LED Safety Information

The 2-Port Token-Ring Fiber Universal Feature Card (UFC) contains two light-emitting diodes (LEDs). The UFC is classified as a Class 1 LED product and is certified to conform to the requirements of EN60825-1:1994 and IEC 825-1:1993.

Class 1 laser products are not considered to be hazardous. The IBM 2-Port Token-Ring Fiber UFC has two embedded, Class 3a LED assemblies operating at a nominal wavelength of 850 nanometers and a maximum potential output power of 1.25 milliwatts. The design of the 2-Port Token-Ring Fiber UFC incorporates engineering features including current-limiting, to ensure that there is no human access to LED radiation greater than Class 1 under any set of operating, maintenance, or service conditions, including a single fault.

There are fewer than 0.442 milliwatts propagating in the link, or in any portion of the UFC. Therefore, according to IEC825-2:1993, Hazard Level 1 prevails in all parts of the system.

The LEDs are located in fiber optic connectors marked "Tx" on the faceplate of the 2-Port Token-Ring Fiber UFC. See Figure 1 on page 2.

Prerequisite Publications

- *Caution: Safety Information—Read This First*, Form Number SD21-0030-02
- *827x Universal Feature Cards Notices and Warranties*
- *Nways 8272 Token-Ring LAN Switch Planning Guide*, Form Number GA27-4982-01

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Universal Feature Card Slot

The Universal Feature Card (UFC) slot is a feature of the IBM 8272 Nways Token-Ring LAN Switch Models 108 and 216, and other similar machines. Hereafter, the term *base machine* applies to any machine with a UFC slot that is functionally equivalent to the UFC slot in the 8272. The UFC slot accommodates optional, field-installable UFCs that provide additional connections.

Universal Feature Cards

The 2-Port Token-Ring/Enhanced Fiber UFC provides two fiber optic Token-Ring connections. The 4-Port Token-Ring/Enhanced UTP/STP UFC provides four UTP/STP wire connections. In the case of the 4-Port UFC, the cables are either unshielded twisted pair (UTP) or shielded twisted pair (STP).

Package Contents

Along with this manual, your UFC package should contain:

☐ One Universal Feature Card
☐ One MIB diskette
☐ One Safety Manual
☐ One Notices and Warranties booklet

If any item is missing or damaged, contact your place of purchase.

Note: A three-ring binder was included with the base machine to accommodate both the base machine manual and any related publications. Place this publication in that binder.

2-Port Token-Ring/Enhanced Fiber UFC

This UFC provides two token-ring fiber optic ports for the base machine. These ports default to a mode that is compatible with the Ring In/Ring Out (RI/RO) ports of machines such as the IBM 8260 Nways Multiprotocol Switching Hub, and the IBM 8230 Controlled Access Unit RI/RO ports.

The ports support token-ring fiber optic media via dual ST**-compatible, optical receptacles. Each of these ports provides either shared half-duplex (HDX), 4- or 16-Mbps connections to an 8230 RI/RO port or to a full-duplex (FDX) 32-Mbps connection between 8272s.

In addition to the connectors for the token-ring ports, there are three operational LEDs for each port and three status LEDs for the UFC overall. See Figure 1 for LED locations.
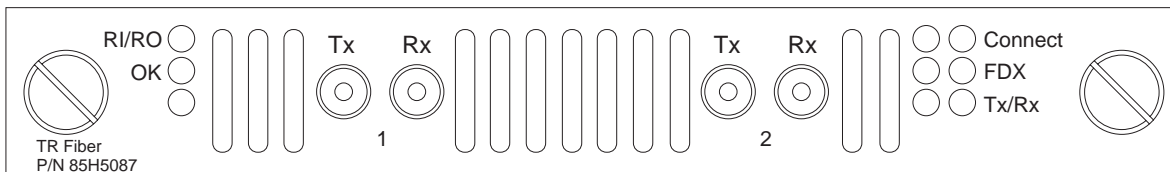
Figure 1. 2-Port Token-Ring/Enhanced Fiber UFC Faceplate

4-Port Token-Ring/Enhanced UTP/STP UFC

This UFC provides four additional UTP/STP token-ring ports for the base machine. These ports are configured and function in the same manner as the base token-ring ports.

The functions include operation over twisted-pair (UTP/STP) media via RJ-45 connectors as shared HDX 4- or 16-Mbps connections or dedicated FDX 32-Mbps connections.

In addition to the RJ-45 connectors for the token-ring ports, there are three operational LEDs for each port and two status LEDs for the UFC overall. See Figure 2 for LED locations.
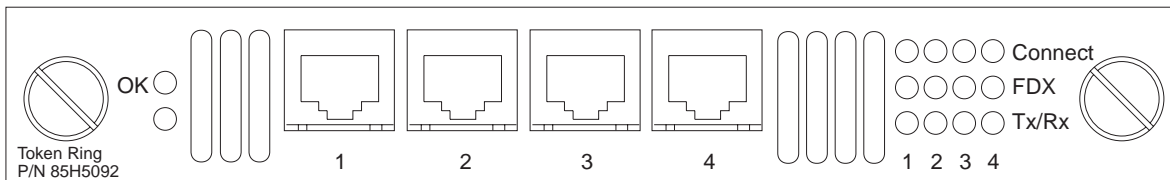
Figure 2. 4-Port Token-Ring/Enhanced UTP/STP UFC Faceplate

LED Function and Description

Table 1 provides a description of the function and meaning of the status LEDs for both UFCs.

Note: Only the 2-Port UFC has the RI/RO LED.

Table 1. Status LEDs and Their Meanings

LED (color)	Position	State	Meaning
RI/RO (green)	Top	On	The UFC is in RI/RO compatible mode.
		Off	The UFC is not in RI/RO compatible mode.
OK (green)	Middle	On	The UFC is working correctly.
		Off	The UFC is not working correctly.
		Blinking	Diagnostics are in progress when blinking in unison with the Fault LED.
Fault (unlabeled) (amber)	Bottom	On	A UFC failure has occurred.
		Off	The UFC is working correctly.
		Blinking	Diagnostics are in progress.

Note: All of the status LEDs will illuminate during reset, then go off before the start of diagnostics. This can last several seconds.

Table 2 provides a description of the function and meaning of the port LEDs for both UFCs.

Table 2. Port LEDs and Their Meanings

LED	Position	State	Meaning
Connect	Top	On	Connected.
		Off	Disabled or faulty port, if the UFC Fault LED is on.
		Blinking	Attempting to connect.
FDX	Middle	On	The port is set to FDX mode.
		Off	The port is set to HDX mode.
Tx/Rx	Bottom	On	Data is being transferred or received by the port.
		Off	Data is not being transferred or received by the port.

Planning for Installation

2-Port Token-Ring/Enhanced Fiber UFC

For backbone cabling, IBM recommends 62.5/125-micron, multimode optical fiber cable that meets the international cable standard (ISO/IEC 11801) or North American cabling standard (EIA/TIA 568A). The recommended maximum cable lobe length is 2000 m (1.2 miles). Each port is terminated in an ST fiber connection. Detailed planning procedures are documented in the base machine publication.

4-Port Token-Ring/Enhanced UTP/STP UFC

Cabling considerations for the 4-Port UFC are the same as for the base machine token-ring ports. Refer to the planning information contained in the base machine documentation.

Attention: Be sure to check the release notes that shipped with your latest 8272 microcode for any additional planning and configuration considerations for these UFCs.

Installing a UFC

Follow these steps to install a UFC:

Step **1** Power OFF the base machine.

Step **2** Remove the blank cover from the UFC slot on the front of the base machine by removing the two thumbscrews holding it in place. Retain the cover and thumbscrews for use in the event that you ever remove the UFC.

Step **3** Carefully insert the card into the rails on each side of the UFC slot, sliding it back until the connector on the card is seated in the connector at the back of the slot. To ensure that the connector is correctly seated, press firmly on the bottom edge of the UFC faceplate just inside the thumbscrews. See Figure 3 on page 5.

When the card is fully seated, the UFC faceplate will rest against the front of the base machine.

Step **4** Secure the card with the two thumbscrews attached to the UFC faceplate.

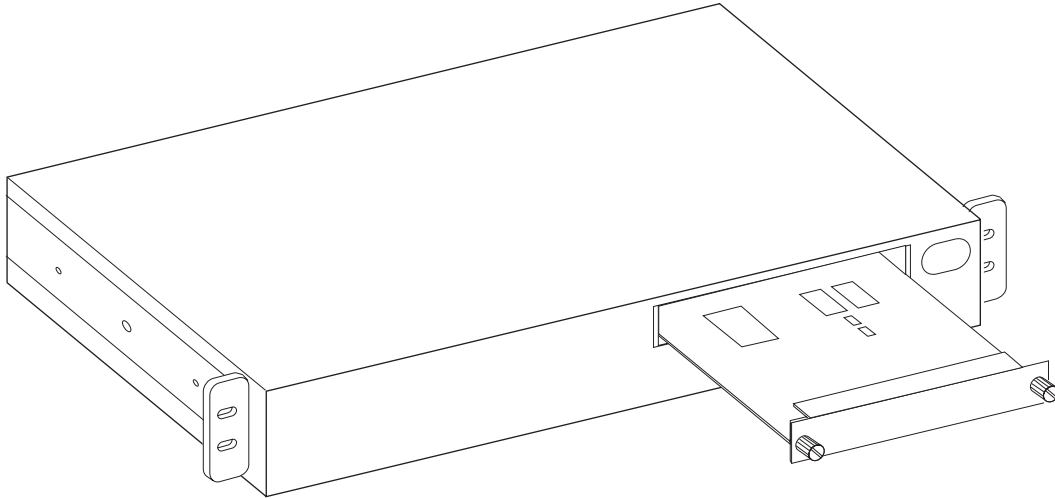**Step** **5** Continue with "Updating the Microcode" on page 5.

Figure 3. Installing a UFC

Updating the Microcode

You might need to update your microcode to support the UFC before you configure the UFC ports. To determine whether or not you need to do this, perform the following check:

Step 1 Start a console session using the procedure in your base machine documentation. Or you can conduct a Telnet session through your SNMP management station.

Step 2 Go to the Switch Information panel, one of the selections on the Configuration panel.

Step 3 Make sure that the value of the Interface Description entry for Software is 2.0 or higher.

Step 4 If the software level is 2.0 or higher, you do not need to update the base machine microcode. Continue with "Cabling Tips" on page 6.

Step 5 If the software level is not 2.0 or higher, you must update the base machine microcode. To do so, refer to the section in the base machine documentation that discusses procedures for downloading software.

Step 6 After completing the software update, continue with "Cabling Tips" on page 6.

Obtaining Microcode Updates from the Web

You can obtain 8272 microcode updates at the following URL.

`http://www.raleigh.ibm.com/822/822fix.html`

Cabling Tips

Observe these precautions when connecting cables:

- Make sure that you are using appropriate cable types and lengths.

- Avoid stretching or bending the cables excessively.

- Avoid trip hazards by routing the cables away from aisles and other areas where people walk. If such routes cannot be avoided, use floor cable covers or similar material to secure and protect the cables.

- When installing UTP/STP cables, avoid routing the cables near sources of electromagnetic interference, such as electric motors and florescent lights.

- Be sure that the cables connected to the UFC are supported so that the cable connectors are not excessively strained.

Cabling

Step 1 Using the cabling chart provided by your network administrator as a guide, connect the cables between the UFC and other devices.

Step 2 Label each end of the cable so that it will be easy to find the connected devices if you have to troubleshoot a network problem. You should also put the information in the Cable Destination area of the base machine's Service Information Card. Your cable label should include the following information:

- The room location of the connected device
- A unique cable identification number
- The MAC address of the connected device
- The number of the port to which the cable is attached

Testing

This section provides instructions for verifying operation of the UFC.

Step 1 Power ON the base machine to initiate diagnostics. The 8272 indicates that diagnostics are in progress by blinking the Fault and OK LEDs in unison. (Other base machines, such as the 8230, might give a different indication.) About a minute after power-on, the UFC Fault and OK LEDs will also blink in unison.

Step 2 Verify that the base machine diagnostics have been completed successfully. In the 8272, this is indicated when the Fault and OK LEDs stop blinking and the OK LED stays on. Diagnostics can take up to 7 minutes to complete. If the base machine does not complete diagnostics successfully, use the troubleshooting procedures in the base machine documentation.

Step 3 Verify that the Fault LED on the UFC is off. If it is off, continue with "Configuration" on page 7. If the UFC Fault LED is on, power OFF the base machine, verify that the UFC has been correctly seated in the slot, and power ON the base machine.

Step 4 If the UFC Fault LED remains on again, the UFC is defective. Refer to the *827x Universal Feature Cards Notices and Warranties* booklet that accompanies this publication.

Step 5 If your UFC is the 2-Port Token-Ring/Enhanced Fiber UFC, the RI/RO LED should now be on.

Configuration

UFC ports are configured in the same manner as the base token-ring ports. The UFC ports appear as additional ports on any configuration panel where base machine ports are listed. The UFC port numbers begin where the numbers of the base machine end, and identify the slot and port within the slot. For example, the number 2-3 identifies port 3 in slot 2. The first or only UFC slot in a base machine is slot 1, the second is slot 2, and so on, from left to right. If the base machine has eight ports and a single UFC slot, the UFC ports appear after port 8 on the port configuration panels and are designated 1-1, 1-2, and so on. If the base machine has 16 ports and two UFC slots, the UFC ports appear after port 16 as 1-1, 1-2, 2-1, 2-2, and so on.

Configuring the 2-Port Token-Ring/Enhanced Fiber UFC

The default mode for each port of the 2-Port UFC is compatible with the RI/RO ports of the IBM 8260 Nways Multiprotocol Switching Hub and the IBM 8230 Controlled Access Unit. No additional configuration is required to establish a fiber connection between RI/RO ports of 8260s and 8230s.

Check the release notes shipped with your latest 8272 microcode to determine whether 8272-to-8272 connections have any additional requirements.

Configuring the 4-Port Token-Ring/Enhanced UTP/STP UFC

Follow the instructions contained in the base machine publication for configuring the 4-Port UFC.

Troubleshooting

Here are some quick checks for isolating problems:

- If the LEDs do not come on when the base machine is powered on, verify that the UFC is seated. All LEDs should illuminate during reset.

- During diagnostics, the UFC OK and Fault LEDs blink in unison. If the UFC Fault LED is on at any other time, it indicates that the UFC is defective and needs to be serviced.

- Troubleshoot the UFC ports like any other token-ring port. Follow the instructions contained in the base machine publication to troubleshoot individual port problems on the UFC.

- If you have been unable get the Connect LED to come on after installing a cable (or cables) between a UFC port and another device, make sure that:

  – You are using the correct type of cable

  – For the 2-Port UFC, you do not have the transmit (Tx) and receive (Rx) connections interchanged or split across two different ports

    Important: When connecting fiber optic ports, a pair of fiber optic cables must be used for each port. The Tx (output) connector of one device must be connected to the Rx (input) connector of the other device. Also, the Tx/Rx cable pair must be connected to the Tx and Rx connectors of the *same* port at both devices.

Support from the Web

For additional information about switch problems and fixes, as well as information about a variety of IBM Networking products, do the following:

1. Go to **http://www.raleigh.ibm.com**.
2. Select **Customer and remarketer support**.
3. Select **IBM Networking web resources, reports and forums**.
4. Select **Network Environment Support**.
5. Choose one of the options presented.

Operating Environment and Dimensions

Table 3. Operating Environment

Temperature	10° to 40°C (50° to 104°F)
Relative humidity	8% to 80%
Maximum wet-bulb temperature	27°C (81°F)
Caloric value	2-Port UFC: 7 kcal/hr (27 BTU/hr) 4-Port UFC: 10 kcal/hr (40 BTU/hr)
Electrical power (at 5 V dc ± 5%)	2-Port UFC: 8 watts maximum 4-Port UFC: 12 watts maximum

Table 4. Dimensions

Width	170 mm (6.7 in.)
Depth	214 mm (8.4 in.)
Height	25 mm (1 in.)
Weight	0.3 kg (0.6 lb)

Table 5. 2-Port UFC Optical Transmitter/Receiver Specifications

Optical Power	Minimum	Typical	Maximum	Units
Transmitter (LED)	-16.0	-14.5	-12.0	dBm
	25.1	35.5	63.1	microwatts
Receiver (Pin Diode)	-31.0		-11.0	dBm
	0.8		79.4	microwatts

Note: The operating wavelength is 850 nanometers.

Replacement Part Numbers

UFC	Part Number
2-Port Token-Ring/Enhanced Fiber UFC	85H5091
4-Port Token-Ring/Enhanced UTP/STP UFC	85H5096

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2-Port Fiber and 4-Port UTP/STP Token-Ring
Enhanced Universal Feature Cards
Planning and Installation Guide

Publication No. GA27-4168-00

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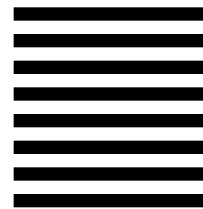
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