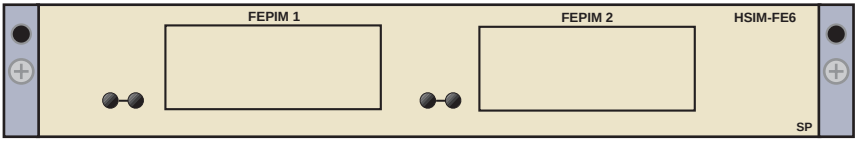
HSIM-FE6
User's Guide



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Only qualified personnel should perform installation procedures.

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Part Number: 9032555-03 July 1998

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NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment uses, generates, and can radiate radio frequency energy and if not installed in accordance with the operator's manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at his own expense.

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Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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SAFETY INFORMATION

CLASS 1 LASER TRANSCEIVERS

THE HSIM-FE6 GIGABIT ETHERNET MODULES USE CLASS 1 LASER TRANSCEIVERS. READ THE FOLLOWING SAFETY INFORMATION BEFORE INSTALLING OR OPERATING THESE ADAPTERS.

The Class 1 laser transceivers use an optical feedback loop to maintain Class 1 operation limits. This control loop eliminates the need for maintenance checks or adjustments. The output is factory set, and does not allow any user adjustment. Class 1 laser transceivers comply with the following safety standards:

- 21 CFR 1040.10 and 1040.11 U.S. Department of Health and Human Services (FDA).
- IEC Publication 825 (International Electrotechnical Commission).
- CENELEC EN 60825 (European Committee for Electrotechnical Standardization).

When operating within their performance limitations, laser transceiver output meets the Class 1 accessible emission limit of all three standards. Class 1 levels of laser radiation are not considered hazardous.

SAFETY INFORMATION

CLASS 1 LASER TRANSCEIVERS

LASER RADIATION AND CONNECTORS

When the connector is in place, all laser radiation remains within the fiber. The maximum amount of radiant power exiting the fiber (under normal conditions) is -12.6 dBm or 55 x 10^{-6} watts.

Removing the optical connector from the transceiver allows laser radiation to emit directly from the optical port. The maximum radiance from the optical port (under worst case conditions) is 0.8 W cm^{-2} or 8 x 10^{3} W m^{2} sr-1.

Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

DECLARATION OF CONFORMITY

Application of Council Directive(s):	**89/336/EEC** **73/23/EEC**
Manufacturer's Name:	**Cabletron Systems, Inc.**
Manufacturer's Address:	**35 Industrial Way** **PO Box 5005** **Rochester, NH 03867**
European Representative Name:	**Mr. J. Solari**
European Representative Address:	**Cabletron Systems Limited** **Nexus House, Newbury Business Park** **London Road, Newbury** **Berkshire RG13 2PZ, England**
Conformance to Directive(s)/Product Standards:	**EC Directive 89/336/EEC** **EC Directive 73/23/EEC** **EN 55022** **EN 50082-1** **EN 60950**
Equipment Type/Environment:	**Networking Equipment, for use in a Commercial or Light Industrial Environment.**

We the undersigned, hereby declare, under our sole responsibility, that the equipment packaged with this notice conforms to the above directives.

Manufacturer	Legal Representative in Europe
Mr. Ronald Fotino	Mr. J. Solari
Full Name	Full Name
Principal Compliance Engineer	Managing Director - E.M.E.A.
Title	Title
Rochester, NH, USA	Newbury, Berkshire, England
Location	Location

CONTENTS

FIGURES

TABLES

CHAPTER 1
INTRODUCTION

Welcome to the Cabletron Systems **HSIM-FE6 User's Guide**. This manual describes the HSIM-FE6 and provides information concerning features, installation, troubleshooting, and specifications.

A general working knowledge of Ethernet and data communications networks and their physical layer components is helpful when installing this device.

The HSIM-FE6 has two Fast Ethernet ports in which Cabletron Systems Fast Ethernet (Port) Interface Modules (FEPIMs) can be installed. Figure 1-1 shows the HSIM-FE6.

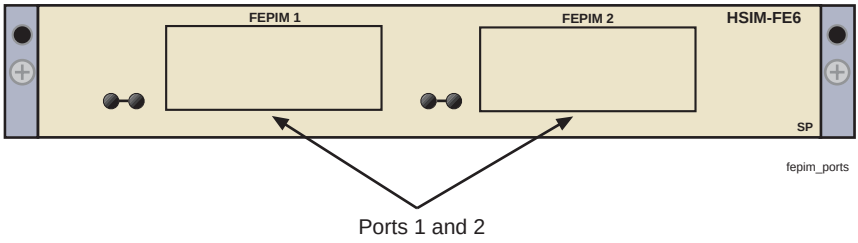


Figure 1-1 HSIM-FE6

1.1 USING THIS MANUAL

Reading through this manual completely will help you understand the features and capabilities of the HSIM-FE6. The following list provides an overview of each section of this manual:

Chapter 1, **Introduction**, outlines the contents of this manual, describes the HSIM-FE6 features and concludes with a web site address where related manuals can be obtained.

Chapter 2, **Installation**, describes how to install an HSIM-FE6 into an interface module or a standalone device (host platform).

NOTE

The term "host platform" is used to describe the interface module, or standalone device, into which the HSIM-FE6 can be installed.

Chapter 3, **LANVIEW LEDs**, describes how to use the HSIM-FE6 LEDs to monitor the HSIM performance and status.

Appendix A, **Specifications**, lists the operating specifications and regulatory compliance of the HSIM-FE6.

Appendix B, **FEPIM Specifications**, describes the FEPIM specifications and regulatory compliance.

1.2 OVERVIEW

The HSIM-FE6 extends the functionality of certain Cabletron Systems interface modules or standalone devices by providing high-speed uplink capability through Fast Ethernet technology with different types of media.

1.2.1 Connectivity

The HSIM-FE6 module supports Fast Ethernet technology, using interchangeable Fast Ethernet Port Interface Modules (FEPIMs). The FEPIMs support three types of media connectivity: RJ45 Category 5 unshielded twisted pair, and SC connectors for either single or multimode fiber. The FEPIMs support an uplink to 100 Mbps Fast Ethernet backbones or a high speed connection to a local server.

1.2.2 Local Management

The HSIM-FE6 is managed through the host device in which it is installed. For information concerning Local Management for the HSIM-FE6, refer to the manual for the host platform. For details on obtaining the host platform manual, refer to Section 1.6.

1.2.3 Full Duplex Switched Ethernet

The optional Fast Ethernet (Port) Interface Modules for the HSIM-FE6 can be configured to operate in Full Duplex Switched Ethernet mode.

1.2.4 LANVIEW Diagnostic LEDs

Cabletron Systems provides a visual diagnostic and monitoring system called LANVIEW. The HSIM-FE6 LANVIEW LEDs help you quickly identify transmit and receive status. Chapter 3 provides information on the HSIM-FE6 LEDs and the FE-100TX LED.

1.3 FEPIM OPTIONS

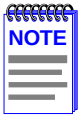
The FEPIM options for the HSIM-FE6 are listed in Table 1-1. Check the Release Notes with the host platform for changes or additions to this list.

Table 1-1 FEPIM Options

Part Number	Connector	Media type
FE-100TX	RJ45	category 5 unshielded twisted pair
FE-100FX	SC fiber	multimode fiber
FE-100F3	SC fiber	single mode fiber

1.4 DOCUMENT CONVENTIONS

The following conventions are used throughout this document:



Note symbol. Calls the reader's attention to any item of information that may be of special importance.

Caution symbol. Contains information essential to avoid damage to the equipment.

Electrical Hazard Warning symbol. Warns against an action that could result in personal injury or death due to an electrical hazard.

Tip symbol. Conveys helpful hints concerning procedures or actions.

1.5 GETTING HELP

For additional support related to this device or document, contact the Cabletron Systems Global Call Center:

World Wide Web	http://www.cabletron.com/ For technical support, select *Service and Support*
Phone	(603) 332-9400
Internet mail	support@ctron.com
FTP Login Password	ctron.com (134.141.197.25) *anonymous* *your email address*
BBS Modem setting	(603) 335-3358 8N1: 8 data bits, No parity, 1 stop bit
To send comments or suggestions concerning this document, contact the Cabletron Systems Technical Writing Department via the following email address: **TechWriting@ctron.com** *Make sure to include the document Part Number in the email message.*	

Before calling the Cabletron Systems Global Call Center, have the following information ready:

- Your Cabletron Systems service contract number
- A description of the failure
- A description of any action(s) already taken to resolve the problem (e.g., changing mode switches, rebooting the unit, etc.)
- The serial and revision numbers of all involved Cabletron Systems products in the network
- A description of your network environment (layout, cable type, etc.)
- Network load and frame size at the time of trouble (if known)
- The device history (i.e., have you returned the device before, is this a recurring problem, etc.)
- Any previous Return Material Authorization (RMA) numbers

1.6 RELATED DOCUMENTATION

The documentation for the host device in which the HSIM-FE6 is to be installed provides additional information about the setup of the HSIM-FE6. This user's guide references procedures in these documents, where appropriate, but does not repeat them.

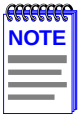
These documents can be obtained on the World Wide Web in Adobe Acrobat Portable Document Format (PDF) at the following site:

http://www.cabletron.com/

CHAPTER 2
INSTALLATION

To install the HSIM-FE6 the following items are required:

- Antistatic wrist strap
- Phillips screwdriver
- Fast Ethernet (Port) Interface Modules (FEPIMs) in the appropriate media



Before attempting to use the HSIM-FE6 you should be familiar with the *IEEE 802.3, 802.3 10BASE-T,* and *802.3u 100BASE-T Specifications.*

2.1 UNPACKING THE HSIM-FE6

The HSIM-FE6 and the host platform are sensitive to static discharges. Use an antistatic strap and observe all static precautions during this procedure. Failure to do so could result in damage to the HSIM-FE6, host module or device.

Unpack the HSIM-FE6 as follows:

1. Remove the HSIM-FE6 from the shipping box.
2. Leave the module in its antistatic bag until you are ready to install it.
3. Attach the antistatic wrist strap (refer to the instructions on the antistatic wrist strap package for proper use).
4. After removing the module from its antistatic bag, visually inspect the device. If you notice any sign of damage, contact the Cabletron Systems Global Call Center immediately. Refer to Section 1.5 for instructions. Save the antistatic bag in the event the module must be reshipped.

2.2 INSTALLING FAST ETHERNET (PORT) INTERFACE MODULES

Only qualified personnel should perform installation procedures.

Fast Ethernet (Port) Interface Modules (FEPIMs) must be installed in the HSIM-FE6 before installing the HSIM-FE6 in the host device. The FEPIMs provide connectivity to the network. At least one FEPIM must be installed in either port one or port two. To install an FEPIM in the HSIM-FE6, proceed as follows:

The FEPIM and the HSIM-FE6 are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could damage the FEPIM or the HSIM-FE6.

The FE-100F3 uses Class 1 lasers. Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

1. Remove the coverplate from the port slot where the FEPIM will be installed.

To remove the coverplate, refer to Figure 2-1 and proceed as follows:

a. Remove the two screws fastening the coverplate to the standoffs. Save the screws.

b. Lift and remove the coverplate from the top of the front standoffs.

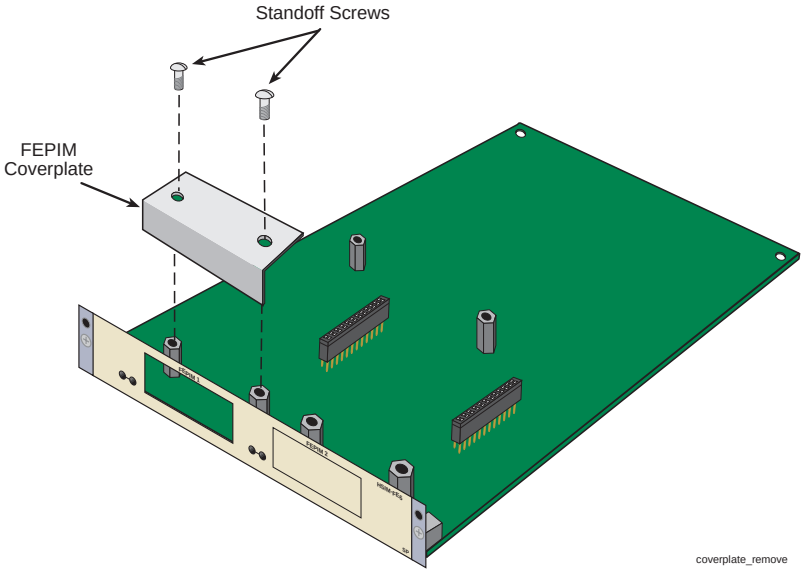


Figure 2-1 Removing the FEPIM Coverplate

CAUTION

Before installing an FE-100FX or FE-100F3 module into the host module, remove the protective cover on the SC connector.

2. Refer to Figure 2-2. Gently pull the faceplate of the HSIM-FE6 forward to allow room for the FEPIM to be aligned over the connector.
3. Align the FEPIM connector into the HSIM-FE6 connector pins. See Figure 2-2.

CAUTION

Ensure that the FEPIM connector aligns with the HSIM-FE6 connector pins to prevent bending the pins. This can damage both the HSIM-FE6 and the FEPIM.

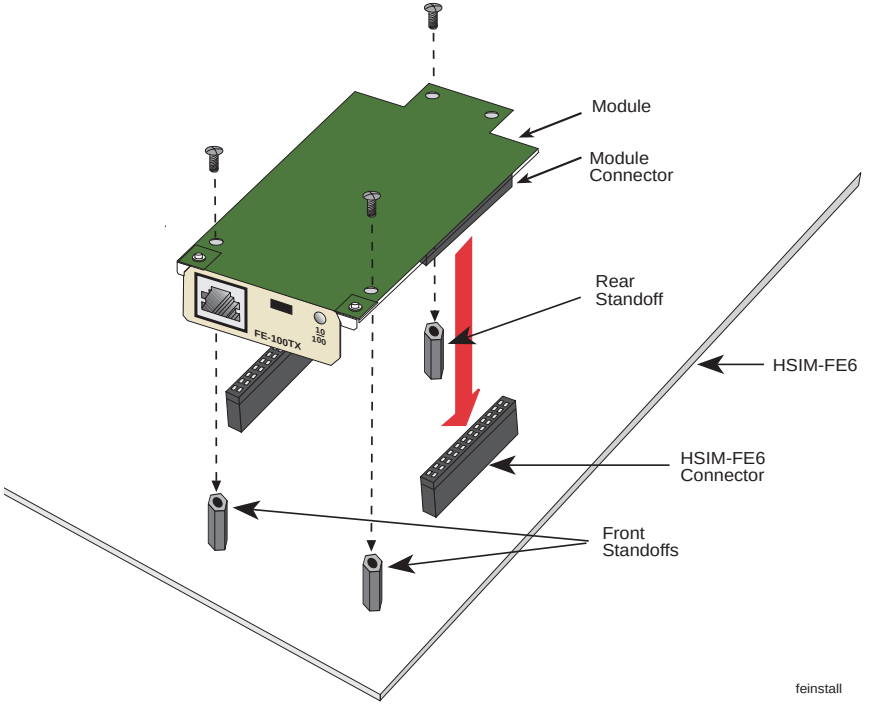


Figure 2-2 Installing the FEPIM

4. Press down firmly on the FEPIM until the pins slide all the way into the HSIM-FE6 connector. Ensure that the FEPIM seats flush on the standoffs.

5. Secure the FEPIM using the screws enclosed in the FEPIM packaging. The screw used to attach the rear of the FEPIM to the standoff is optional and not necessary for proper installation. Refer to Figure 2-2.

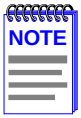
TIP

If SC protective covers were removed from a fiber FEPIM, replace the covers until the port is connected to the network to reduce the chance of dust and contaminants entering the port.

2.3 INSTALLING THE HSIM-FE6

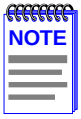
Only qualified personnel should install or service this unit.

An HSIM-FE6 can be installed in any Cabletron Systems device that supports HSIM technology (e.g., 2H252-25R, 2E42-27, 6E132-25).



Refer to the Release Notes for the version of firmware running on the Cabletron Systems host platform to ensure that the HSIM-FE6 is supported.

The following subsections provide generic instructions for installing an HSIM-FE6 in either an interface module or in a standalone device. Refer to the specific interface module or standalone device documentation for exact HSIM slot and connector locations.



The FEPIMs should already have been installed in the HSIM-FE6 at this time. If the FEPIMs have not been installed, return to Section 2.2.

2.3.1 Installing the HSIM-FE6 in an Interface Module

To install an HSIM-FE6 in an interface module that supports HSIM technology, perform the following steps.

1. Note the ports of the interface module that have cables attached to them. Write down the ports and label the cables to make it easier to reattach the network properly after the installation. Then disconnect the cables from the ports.
2. Attach the antistatic wrist strap (refer to the instructions outlined on the antistatic wrist strap package).
3. If the interface module is installed in a chassis, unlock the top and bottom plastic locking tabs of the module faceplate.
4. Remove the module from the chassis, and place it down flat with the internal components facing up.

5. Remove and save the two faceplate mounting screws securing the HSIM coverplate and remove the coverplate. See Figure 2-3.

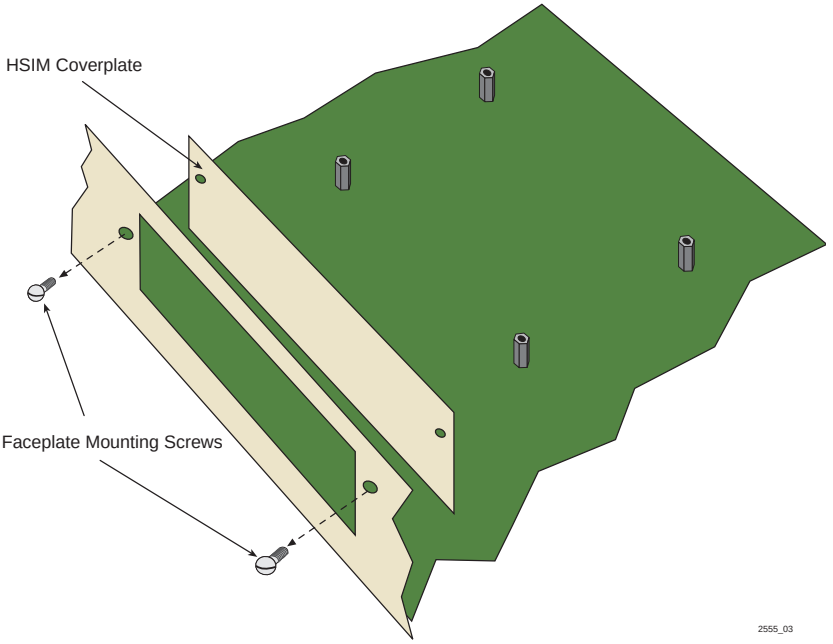


Figure 2-3 Removing the HSIM Coverplate

6. Refer to Figure 2-4 and place the HSIM-FE6 behind the module faceplate.

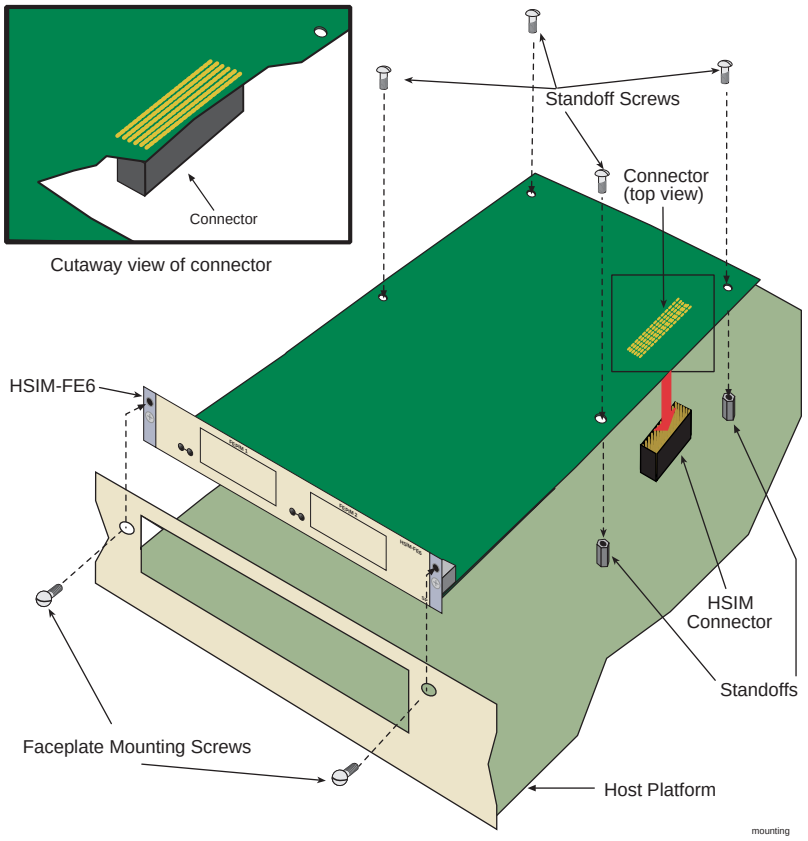


Figure 2-4 Installing the HSIM-FE6

7. Align the connector on the HSIM-FE6 with the connector on the module.

CAUTION

Ensure that the HSIM-FE6 connector aligns with the module connector pins to prevent bending the pins. This can damage both the HSIM-FE6 and the module.

8. Press down firmly on the connector area of the HSIM-FE6 until the connector slides all the way onto the pins. Ensure that the standoffs on the interface module align with the standoff screw holes on the HSIM-FE6.

9. Secure the HSIM-FE6 to the module faceplate using the mounting screws saved in step 5.
10. Secure the HSIM-FE6 to the module standoffs using the standoff screws included in the HSIM-FE6 shipping materials.
11. Reinstall the interface module in the chassis.
12. Reattach the network cabling to the interface module.

2.3.2 Installing the HSIM-FE6 in a Standalone Device

To install an HSIM-FE6 into a standalone device (e.g., 2H252-25R) perform the following steps:

1. Power down the device and remove the power cord.
2. Note the ports that have cables attached to them. Write down the ports and label the cables to make it easier to reattach the network properly after the installation. Then disconnect the cables from the ports.

To install the HSIM-FE6 in a standalone device, the device must first be powered down. Ensure that you remove the power cord and ONLY the screws required to remove the chassis cover.

3. Attach the antistatic wrist strap (refer to the instructions outlined on the antistatic wrist strap package).
4. Remove the standalone device chassis cover (refer to your specific standalone device documentation for instructions on removing the chassis cover).
5. Refer back to Figure 2-3 and remove the two faceplate mounting screws and the HSIM coverplate. Save the screws.
6. Refer back to Figure 2-4 and place the HSIM-FE6 behind the standalone device faceplate.
7. Align the HSIM connector of the HSIM-FE6 with the pins on the standalone device.

Ensure that the HSIM-FE6 connector aligns with the device connector pins to prevent bending the pins. This can damage both the HSIM-FE6 and the device.

8. Press down firmly on the HSIM-FE6 until the connector slides all the way onto the HSIM pins. Ensure that the standoffs on the standalone device align with the standoff screw holes on the HSIM-FE6.

9. Secure the HSIM-FE6 to the module faceplate using the mounting screws saved in step 5.

10. Secure the HSIM-FE6 to the module standoffs using the standoff screws included in the HSIM-FE6 shipping materials.

Ensure that the chassis cover is in place before reconnecting the power cord.

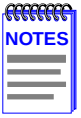
11. Replace the chassis cover on the standalone device, reconnect the power cord, and reconnect the standalone device to the network.

2.4 CONNECTING TO THE NETWORK

The HSIM-FE6 can be connected to the network using either fiber optic cable or twisted pair cable. The media chosen determines which type of FEPIM to be used. When using fiber optic cable, use either the FE-100FX or the FE-100F3. The FE-100FX is used for multimode fiber cable, and the FE-100F3 is used for single mode fiber cable. Refer to Appendix B for details on which FEPIM to use with the appropriate fiber optic cable. To connect to the network using fiber optic cable, refer to Section 2.4.1. When using twisted pair cabling, use the FE-100TX. To connect to the network using twisted pair cable, refer to Section 2.4.2.

2.4.1 Connecting a Fiber Optic Segment to the FEPIM

Cabletron Systems offers fiber optic cables that use SC style connectors which are keyed to ensure proper crossover of the transmit and receive fibers.



An odd number of crossovers (preferably one) must be maintained between like devices so that the transmit port of one device is connected to the receive port of the other device and vice versa.

If the fiber optic cable being used has SC style connectors that do not resemble MIC style connectors, or has SC connectors on one end and a different type on the other, such as ST connectors, ensure that the proper crossover occurs.

1. Remove the protective covers from the fiber optic ports and from the ends of the connectors.

Leave the protective covers in place when the connectors are not in use to prevent contamination.

Certain FEPIMs use Class 1 lasers. Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

Do not touch the ends of the fiber optic strands, and do not let the ends come in contact with dust, dirt, or other contaminants. Contamination of the ends causes problems in data transmissions. If the ends become contaminated, blow the surfaces clean with a canned duster. A fiber port cleaning swab saturated with optical-grade isopropyl alcohol may also be used to clean the ends.

2. Insert one end of the SC connector into the FEPIM.
3. At the other end of the fiber optic cable, attach the SC connector to the other device.

4. Verify that a link exists by checking that the port receive LED is ON (flashing amber, blinking green, or solid green). If the receive LED is OFF and the transmit LED is not blinking amber, perform the following steps until it is ON:

   a. Check that the power is turned on for the device at the other end of the link.

   b. Verify proper crossover of fiber strands between the port on the HSIM-FE6 and the fiber optic device at the other end of the fiber optic link segment.

   c. Verify that the fiber connection meets the dB loss specifications outlined in Appendix B.

If a link has not been established, refer to Chapter 3, **LANVIEW LEDs**, before contacting the Cabletron Systems Global Call Center. Refer to Section 1.5 for details.

2.4.2 Connecting a Twisted Pair Segment to the FE-100TX

An FE-100TX has an internal crossover switch. When connecting a workstation, use a straight-through cable and set the FEPIM crossover switch shown in Figure 2-5 to the crossed over position marked with **X**. When connecting networking devices, such as another bridge, repeater, or router, use a straight-through cable and set the FEPIM crossover switch shown in Figure 2-5 to the straight-through position, marked with =.

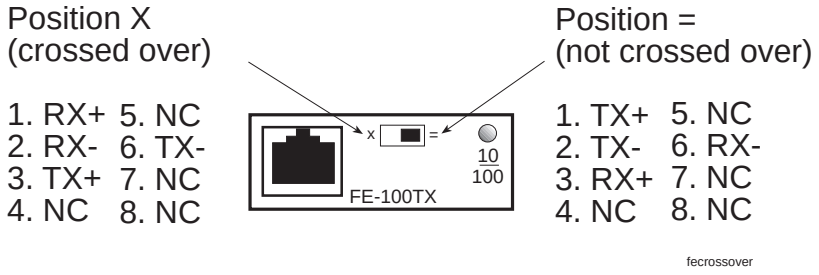


Figure 2-5 FE-100TX Crossover Switch

A schematic of a straight-through and a crossover cable is shown in Figure 2-6. If the wires do not cross over, use the switch on the FE-100TX to internally cross over the RJ45 port. Figure 2-5 shows how to properly set the FE-100TX crossover switch.

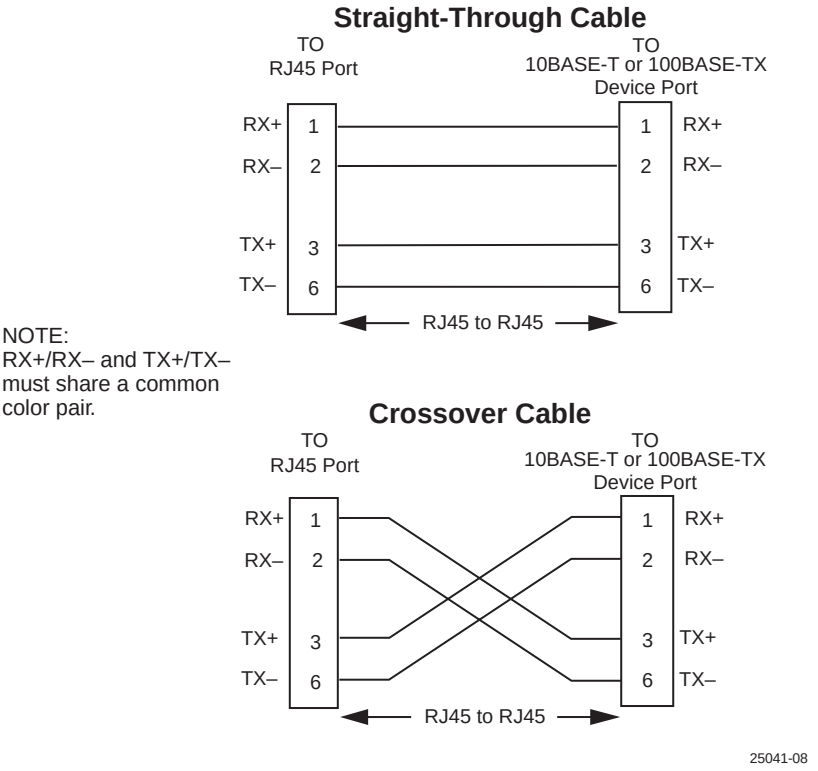


Figure 2-6 Twisted Pair Cabling

Connect an FE-100TX to a twisted pair segment as follows:

1. Ensure that the device connected to the other end of the segment is powered ON.
2. Connect the twisted pair segment to the module by inserting the RJ45 connector on the twisted pair cable into the RJ45 port on the module shown in Figure 2-5.

3. Verify that a link exists by checking that the port receive LED is on (flashing amber, blinking green, or solid green). If the receive LED is off, perform the following steps until it is on:

   a. Verify that the 100BASE-TX device at the other end of the twisted pair segment is powered up.

   b. Verify that the RJ45 connector on the twisted pair segment has the proper pinouts.

   c. Check the cable for continuity.

   d. Make sure that the twisted pair connection meets cable specifications outlined in Appendix B.

   e. Confirm that the crossover switch is in the correct position.

If a link is not established, refer to Chapter 3, **LANVIEW LEDs**, for information before contacting the Cabletron Systems Global Call Center. Refer to Section 1.5 for details.

CHAPTER 3
LANVIEW LEDs

This chapter describes how to use the LANVIEW LEDs to monitor the HSIM-FE6 status and diagnose HSIM-FE6 problems.

3.1 HSIM-FE6 LEDs

Refer to Figure 3-1 for the location of the HSIM-FE6 LEDs and Table 3-1 for a description of the LED indications.

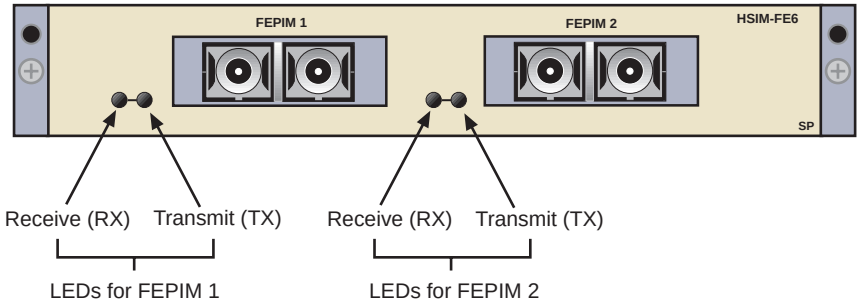


Figure 3-1 HSIM-FE6 LANVIEW LEDs

NOTE

The terms **flashing**, **blinking**, and **solid** used in Table 3-1 indicate the following:

Flashing indicates an irregular LED pulse.

Blinking indicates a steady LED pulse (approximately 50% on and 50% off).

Solid indicates a steady LED light. No pulsing.

Table 3-1 HSIM-FE6 LEDs

LED	Color	Definition
Receive	Green	Link, no activity. Port enabled.
	Green (Blinking)	Link, port disabled.
	Amber (Flashing)	Link, activity. Port enabled.
	Off	No link, no activity. Port enabled or disabled.
	Red (Solid)	Diagnostic failure.
Transmit	Green (Flashing)	Activity, port enabled.
	Amber (Blinking)	Port in standby.
	Off	No activity, port enabled.
	Red (Flashing)	Collision.
	Red (Solid)	Diagnostic failure.

3.2 FE-100TX LED

The optional FE-100TX has one LED labeled 10/100. The 10/100 LED together with the RX LED allows the user to determine the link status and the operating speed of the Fast Ethernet (Port) Interface Module. The 10/100 LED and the Receive (RX) LED are shown in Figure 3-2.

Table 3-2 and Table 3-3 provide a functional description of the 10/100 LED when the RX LED is on or off, respectively.

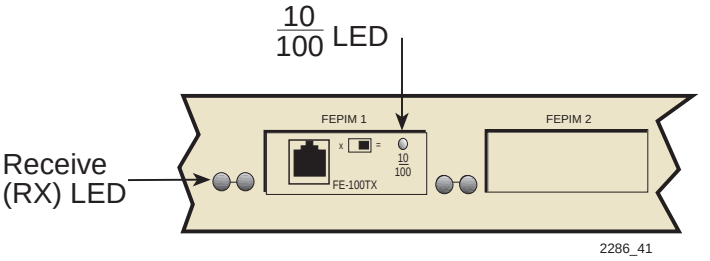
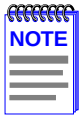


Figure 3-2 FE-100TX LED



A link exists if the associated port RX LED is on.

Table 3-2 10/100 LED Indications When RX LED Is On

LED	Color	Indication
10/100	Off	FE-100TX is operating at 10 Mbps.
	Green	FE-100TX is operating at 100 Mbps.

No link exists if the associated port RX LED is off.

Table 3-3 10/100 LED Indications When RX LED Is Off

LED	Color	Indication
10/100	Off	No link or no cable attached. FE-100TX forced to 10 Mbps operation, or is manually set to “auto-negotiate” mode.
	Green	No link or no cable attached. FE-100TX is forced to 100 Mbps operation.

3.3 HSIM-FE6 LOCAL MANAGEMENT

For information concerning Local Management for the HSIM-FE6, refer to the host device manual.

APPENDIX A
SPECIFICATIONS

This chapter lists the specifications and regulatory requirements for the HSIM-FE6. Cabletron Systems reserves the right to change these specifications at any time without notice.

A.1 PHYSICAL PROPERTIES

Dimensions	4.8H x 15.5W x 28.6D (cm) 1.9H x 6.1W x 11.3D (in)
Weight	0.34 kg (0.75 lb)
MTBF (Predicted)	200,000 hours

A.2 ENVIRONMENTAL REQUIREMENTS

Operating Temperature	5°C to 40°C (41°F to 104°F)
Storage Temperature	-30°C to 73°C (-22°F to 164°F)
Operating Relative Humidity	5% to 90% (non-condensing)

A.3 FEPIM OPTIONS

The FEPIM options for the HSIM-FE6 include the FE-100TX, FE-100FX, and the FE-100F3. Refer to Appendix B for FEPIM specifications.

A.4 REGULATORY COMPLIANCE

This equipment meets the following safety and electromagnetic compatibility (EMC) requirements:

Safety	UL 1950, CSA C22.2 No.950, EN 60950, IEC 950, and 73/23/EEC
Electromagnetic Compatibility (EMC)	FCC Part 15, EN 55022, CSA C108.8, EN 50082-1, VCCI V-3, 89/336/EEC, and AS/NZS 3548

APPENDIX B
FEPIM SPECIFICATIONS

This appendix provides specifications for the Fast Ethernet (Port) Interface Modules. Cabletron Systems reserves the right to change these specifications at any time without notice. The HSIM-FE6 supports the following Fast Ethernet (Port) Interface Modules: the FE-100TX, the FE-100FX, and the FE-100F3.

B.1 FE-100TX

The FE-100TX uses an RJ45 connector supporting Category 5 (85 – 111 ohms) Unshielded Twisted Pair (UTP) and Shielded Twisted Pair (STP) cabling.

The slide switch on the FE-100TX determines the crossover status of the cable pairs. If the switch is on the **X** side, the pairs are internally crossed over. If the switch is on the **=** side, the pairs are not internally crossed over. Figure B-1 shows the pinouts for the FE-100TX with the switch in each position.

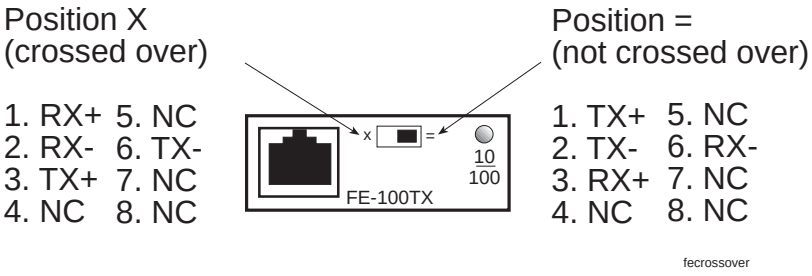


Figure B-1 FE-100TX Pinouts

B.2 FE-100FX

The FE-100FX shown in Figure B-2 uses an SC style connector that supports multimode fiber optic cabling. Specifications for the FE-100FX are listed in Table B-1, below.

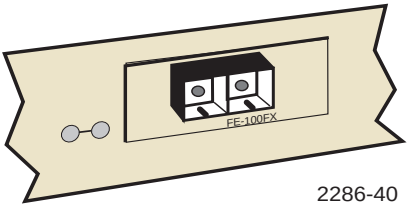


Figure B-2 FE-100FX

Table B-1 Transmitter Power

Cable Type	Worst Case Budget	Typical Budget
50/125 µm fiber optic	6.0 dB	9.0 dB
62.5/125 µm fiber optic	9.0 dB	12.0 dB
100/140 µm fiber optic	15.0 dB	18.0 dB

NOTE

The transmitter power levels and receive sensitivity levels listed are peak power levels after optical overshoot. A peak power meter must be used to correctly compare the values given above to those measured on any particular port. If power levels are being measured with an average power meter, add 3 dB to the measurement to compare the measured values to the values listed above.

B.3 FE-100F3

The FE-100F3 shown in Figure B-3 uses an SC style connector that supports single mode fiber optic cabling. Specifications for the FE-100F3 are listed in Table B-2, below.

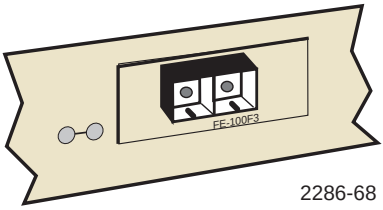


Figure B-3 FE-100F3

Table B-2 Transmitter Power

Cable Type	Worst Case Budget	Typical Budget
8/125 µm fiber optic	>10.0 dB	<10.0 dB
12.5/125 µm fiber optic	>10.0 dB	<10.0 dB

NOTE

The transmitter power levels and receive sensitivity levels listed are peak power levels after optical overshoot. A peak power meter must be used to correctly compare the values given above to those measured on any particular port. If power levels are being measured with an average power meter, add 3 dB to the measurement to compare the measured values to the values listed above.