NETBUILDER II® ETHERNET 2-PORT 10BASE-FL MODULE INSTALLATION GUIDE

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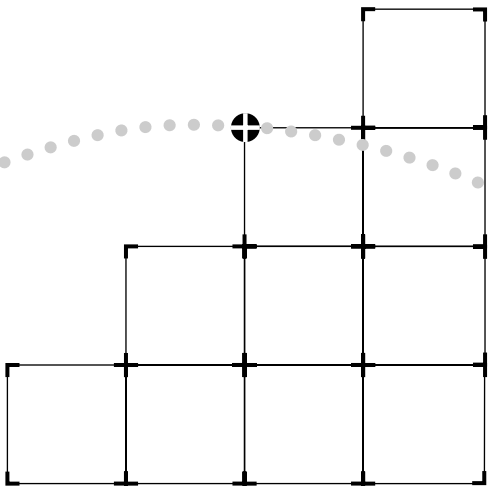

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CAUTION: *This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules, VDE specification 0871 and CISPR22 (EN55022). These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at the user's own expense.*

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CAUTION: *The ports, console, auxiliary, diagnostic, ST fiber-optic connector(s) on the backplane do not provide isolation sufficient to satisfy the requirements of the relevant parts of BS 6301. Apparatus connected to these ports must have been approved to the relevant parts of BS 6301 or have previously been evaluated against British Telecom (Post Office) Technical Guides 2 or 26 and given permission to attach. Other usage will invalidate any approval given to the apparatus.*

Interconnect directly, or by way of other apparatus, of ports marked "SAFETY WARNING - See Instructions for Use" as indicated above, with ports marked or not so marked may produce hazardous conditions on the network and advice should be obtained from a competent engineer before such a connection is made.

About This Guide

Introduction

This guide provides the information necessary to install, cable, maintain, and troubleshoot the Ethernet 2-port 10Base-FL module for the NETBuilder II® base system. The NETBuilder II system is available with a 4- and 8-Slot chassis. Information applies to both chassis whenever the generic NETBuilder II system name is used in a description. References to the 4-Slot or 8-Slot chassis are specifically identified.

For more information on the NETBuilder II base system, refer to the *NETBuilder II Base System Installation Guide*.

This guide is intended for the system administrator, network equipment installer, or network manager who is responsible for installing and managing the network hardware. It assumes a working knowledge of network operations, but does not assume prior knowledge of 3Com® internetworking equipment.

If the information in the release notes shipped with your product differs from the information in this guide, follow the release notes.

Conventions

Table 2 and Table 1 list conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Type	Description
	Information Note	Information notes call attention to important features or instructions.
	Caution	Cautions alert you to personal safety risk, system damage, or loss of data.
	Warning	Warnings alert you to the risk of severe personal injury.

Table 2 Text Conventions

Convention	Description
"Enter" vs. "Type"	When the word "enter" is used in this guide, it means type something, then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says "type."
"Syntax" vs. "Command"	When the word "syntax" is used in this guide, it indicates that the general form of a command syntax is provided. You must evaluate the syntax and supply the appropriate port, path, value, address, or string; for example: Enable RIPIP by using the following syntax: `SETDefault !<port> -RIPIP CONTrol = Listen` In this example, you must supply a port number for !<port>. When the word "command" is used in this guide, it indicates that all variables in the command have been supplied and you can enter the command as shown in text; for example: Remove the IP address by entering the following command: **`SETDefault !0 -IP NETaddr = 0.0.0.0`**  *For consistency and clarity , the full form syntax (upper- and lowercase letters) is provided. However, you can enter the abbreviated form of a command by typing only the uppercase portion and supplying the appropriate port, path, address, value, and so forth. You can enter the command in either upper- or lowercase letters at the prompt.*
Text represented as `screen display`	`This typeface` is used to represent displays that appear on your terminal screen, for example: `NetLogin:`
Text represented as **`commands`**	**`This typeface`** is used to represent commands that you enter, for example: **`SETDefault !0 -IP NETaddr = 0.0.0.0`**
Keys	When specific keys are referred to in the text, they are called out by their labels, such as "the Return key" or "the Escape key," or they may be shown as [Return] or [Esc]. If two or more keys are to be pressed simultaneously, the keys are linked with a plus sign (+), for example: Press [Ctrl]+[Alt]+[Del].
Italics	*Italics* are used to denote *new terms* or *emphasis*.

1 INSTALLATION

This chapter contains information and procedures for installing the Ethernet 2-port 10Base-FL module into the NETBuilder II base system.

In the interest of clarity, the Ethernet 2-port 10Base-FL module will be referred to as the Ethernet 2-port module for the remainder of this manual.

Before Installing the Module

Before you install the module, follow these preliminary steps:

1 Observe appropriate ESD precautions.

Electrostatic discharge (ESD) can damage circuit board components. Failures resulting from ESD may not be covered under your warranty. To prevent this, follow these handling procedures:

- Keep the Ethernet 2-port module in its antistatic shielded bag until you are ready to install it.
- Do not touch pins, leads, or solder connections on the board.
- Handle the board by the edges only.
- Store or ship the Ethernet module in static-protective packaging.

Observe proper grounding techniques when handling the Ethernet 2-port module. These techniques include using a foot strap and grounded mat or wearing a grounded static discharge wrist strap.

2 Inspect the Ethernet 2-port module for shipping damage.

If you find any damage, contact the shipping company to file a report. If the module must be returned to your network supplier, ship it in its original antistatic bag and shipping carton. If the original carton was damaged in shipment, repack the system in a carton that provides equivalent protection.

3 Write down the serial number shown on the solder (back) side and the two Media Access Control (MAC) addresses shown on the component (front) side of the Ethernet 2-port board (see Figure 1-1).

Serial number example: S/N :1BH12345

MAC address example: 080002 1A2B3C (hexadecimal)

You will need this information if you have to contact your network supplier.

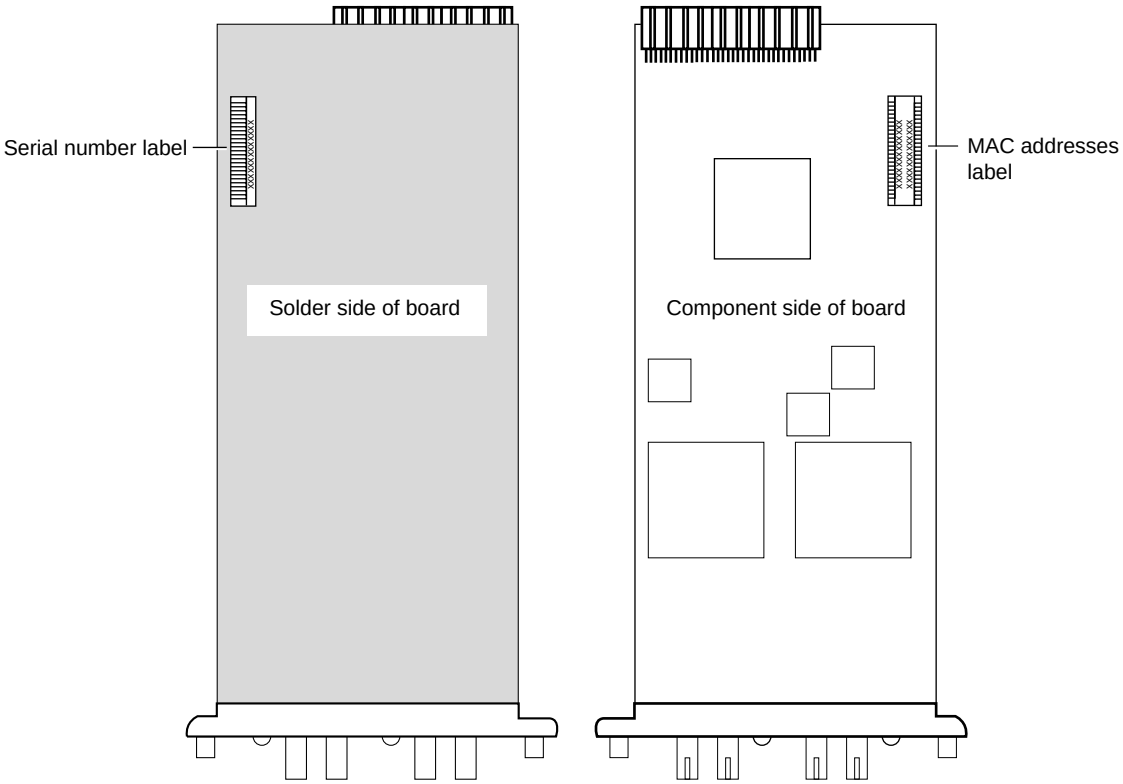

Figure 1-1 Serial Number and MAC Addresses on the Ethernet 2-port Module

Write the serial number and MAC addresses of your Ethernet 2-port board in the space provided below, or in another location where you will have easy access to the information.

Serial number: _____

MAC address : _____

MAC address : _____

4 Select the slot for the Ethernet 2-port module.

You can install the module into any available I/O slot in the rear of the NETBuilder II system. The wide top slot is designated for the CEC module only.

5 Obtain a small flathead screwdriver. You may need it to remove a blanking plate from the NETBuilder II system.

6 Obtain the ST fiber-optic cables required for connecting the Ethernet 2-port module to the network.

The Ethernet 2-port board only supports fiber-optic cabling.

Once you have performed all the preinstallation steps, you are ready to install the Ethernet 2-port module.

Installing the Ethernet 2-port Module

Ethernet 2-port module installation involves inserting the module into the NETBuilder II base system to connect with the backplane, and then connecting the module to the network using fiber-optic cables.

Inserting the Module

Insert the Ethernet 2-port module into the NETBuilder II chassis by performing the following steps:

1 Remove the blanking plate (if one is in place) from the slot you have selected for the Ethernet 2-port module (see Figure 1-2).

Loosen the captive screws (use a screwdriver if necessary), push the ejector clips apart, and slide the blanking plate from the slot.

CAUTION: *Remove the blanking plate only from I/O slots that will house an I/O module. All unused I/O slots require the blanking plate covers to maintain proper cooling of the unit and regulatory compliance. Failure to cover open slots can cause the NETBuilder II system to overheat, which will void the warranty.*

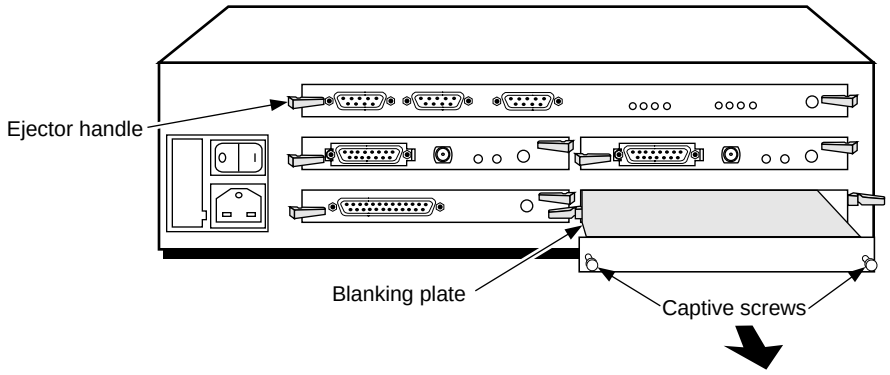

Figure 1-2 Removing a Blanking Plate

All NETBuilder II chassis are shipped with two open slots. Use these open slots for your first installations. Leave the blanking plates on the other slots in place until you install additional modules.

2 Insert the Ethernet 2-port module into the uncovered I/O slot as follows:

a Make sure the slot ejector handles are in the open position, as shown in Figure 1-3.

b With the connector end toward the backplane and the board panel facing you, grasp the left and right sides of the front panel and fit the board into the board guide channels on either side of the I/O slot opening.

The board fits in only one way, but to be sure the correct side is facing up, check that the label imprints on the connector/LED panel are right side up.

c Slide the module in until the I/O panel edges just engage with the notches in the ejector handles.

3 Press the ejector handles on both sides of the I/O slot toward the connector/LED panel to engage the module and backplane connectors and secure the module board in the slot.

Figure 1-3 shows ejector handles in open and closed positions.

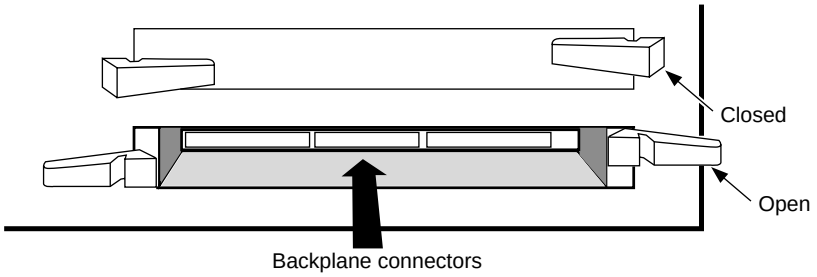

Figure 1-3 View of Open and Closed I/O Slot Ejector Handles

You will feel a slight resistance as you press these handles into the closed position, which indicates the connectors are engaging.

CAUTION: *If the resistance is too great, it may mean that the module and backplane connectors are not aligned. Forcing the module forward can damage board or backplane connectors. If necessary, remove and reinsert the module, making sure the connectors are properly aligned.*

4 Check that the connector/LED panel of the newly inserted module is flush with the NETBuilder II chassis, and is aligned with the connector/LED panel(s) of any other installed module(s) (see Figure 1-4). This ensures that the board is seated correctly.

5 Use your fingers to attach the two captive screws and tighten them "finger tight" only.

A solid connection of the I/O panel to the chassis is required for proper operation, but the screws should *not* be used to force the board into place.

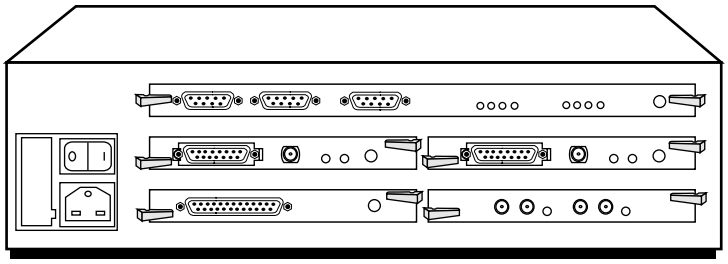

Figure 1-4 Ethernet 2-port Module Board Installed

When the module is inserted and secured in the slot, you are ready to attach the cabling and connect the module to the network.

Cabling the Module for Network Connection

To cable and connect the Ethernet 2-port module, connect the ST fiber-optic network cables to the RX and TX connectors on the Ethernet 2-port module, as illustrated in Figure 1-5 (this cable is not provided with the module). Connect one cable to the RX connector and one to the TX connector per port.

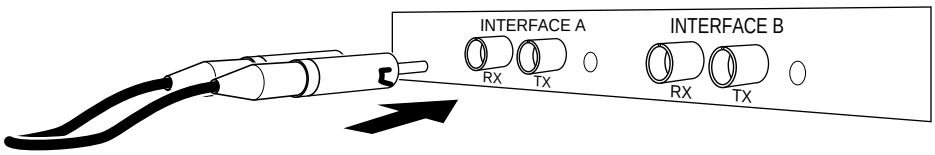

Figure 1-5 Connecting ST Fiber-optic Cables to the Ethernet 2-port Board

Install and cable any other I/O modules, referring to the appropriate I/O module installation guide.

When you have finished installing all I/O modules, refer to the *NETBuilder Base System Installation Guide* to complete the NETBuilder II base system installation steps.

Your NETBuilder II system must be running NETBuilder 6.2 or later software in order for your Ethernet 2-port module to function.

2 TROUBLESHOOTING AND MAINTENANCE

This chapter describes how to troubleshoot and replace the Ethernet 2-port module. Possible malfunctions that can occur include:

- Nonfunctional module
- Self-test failure at startup
- Transmission failure

The following sections describe the symptoms of a malfunction and the suggested corrective action to take.

Troubleshooting Startup Problems

The following symptoms indicate a self-test failure at startup, or at Reset if parameters are set to run a self-test.

Symptoms The port's LED, normally yellow when the module self-test is running, changes to red.

Action A red LED indicates that an error has occured during self-test. Check the operator console for the error message and take the appropriate corrective action, if possible. If you cannot correct the problem, and the module fails after removing and reinstalling it, contact 3Com or your network supplier for assistance.

Troubleshooting Module Failures

The LEDs on the Ethernet 2-port's connector/LED panel monitor the status of each port and provide feedback for troubleshooting. Refer to Table A-3 in Appendix A for a complete list of LED operating states. This section describes the symptoms of common module failures, and the recommended actions for solving the problem.

Symptom The port's LED is off when there is power to the system and other installed modules are operating.

Action An unlit LED when the system is operating usually indicates that the module itself is not getting any power. Verify that your NETBuilder II system is turned on and using NETBuilder 6.2 or later software. If it is, the module may not be properly connected to the NETBuilder II backplane. Remove and reinsert the module. If it is still nonfunctional, replace the module.

Symptom The port's LED remains yellow when the module is connected to an operational local network.

Action The software port/path for the port has been disabled. First, be sure the port/path is enabled (see the *NETBuilder Family Bridge/Router Operation Guide* for information on

enabling ports and paths). After enabling the port/path, the LED should change to red or green. If the LED remains yellow after enabling the port/path, contact 3Com for module replacement.

Symptom The port's LED is red or blinking red.

Action A red LED indicates an error condition. When this occurs, complete the steps in the following checklist:

- Check that all cable connections are intact.
- Verify that the tx and rx cables are connected to the correct connectors. Swap the positions of the cables if they are reversed.
- Check that the NETBuilder II base system is operating correctly.
- Check that the Ethernet network you are connected to is operating correctly. Refer to your *NETBuilder II Base System Installation Guide* for information about system operation checks.

If none of these actions solve the problem, contact your network supplier for assistance.

Startup Terminal Message

There are several startup messages specific to the Ethernet 2-port module. These startup messages appear on the terminal which is attached to the console port on the CEC module. You can determine most of the Ethernet 2-port module status by the status LEDs on the Ethernet 2-port module's connector/LED panel. Appendix A, *Overview*, describes the Ethernet 2-port LEDs.

The NETBuilder II base system's terminal messages include a check of the Ethernet system.

ETHERNET CONTROLLER: Self-Tests Failed - path=X, error code=Y

Meaning: This message appears if an error is encountered in the Ethernet controller tests.

Action: If you receive this message, write down the path and error code information, and call 3Com Technical Support for assistance.

ETHERNET CONTROLLER: Self-Tests Failed - path=X, error code=Y

Meaning: This message indicates that the self-test failure is probably due to a bad cable connection. Verify that all cables are connected properly.

Action: Check network &/or cable, then card

ETHERNET CONTROLLER: carrier test timeout path X

Meaning: This message appears when the NETBuilder system software is unable to transmit a packet.

Action: Verify that all cable connections are good, and that any external transceiver being used is functioning properly. If these actions don't correct the problem, call 3Com Technical Support for assistance.

Restarting self test on interface X

Meaning: This message appears if an error is encountered which requires the hardware associated with the port to be reset.

Action: The NETBuilder system software will automatically reset the hardware chips and restart the controller self test. If this condition persists, call 3Com Technical Support for assistance.

Maintaining the Module

This section describes preventive maintenance for the Ethernet 2-port module, as well as replacement procedures for the module.

Preventive Maintenance

3Com recommends the following procedures for preventive maintenance:

- Observe the guidelines listed in the *NETBuilder II Base System Installation Guide* for minimum and maximum electrical and environmental requirements.
- Keep the area around the NETBuilder II base system clean; avoid accumulated dust.
- Allow sufficient air space around the NETBuilder II base system for proper ventilation, so that the module is protected from excessively high temperatures.
- Observe ESD guidelines whenever handling the Ethernet 2-port module.

Refer to the *NETBuilder II Base System Installation Guide* for preventive maintenance tips that apply to the entire system.

Replacing the Module

If any component in the Ethernet 2-port module fails, you will need to replace the entire module. The Ethernet 2-port module is hot-swappable, which means that you can safely remove and install a new one without turning off or rebooting the NETBuilder II base system. However, if you want to remove a module in which software ports and paths are active, you should first disable the appropriate ports and paths. For more information, refer to the *NETBuilder Family Bridge/Router Operation Guide*.

To replace a module, follow these steps:

To perform the following procedure, you may need a small, flathead screwdriver.

1. Disconnect any network cabling from the Ethernet 2-port module, and remove the cable from the strain relief bracket. You do not need to remove the bracket itself.
2. Loosen the two captive screws securing the board in the slot, by hand or with a flathead screwdriver.
3. Release the ejector handles on both sides of the Ethernet 2-port module by pressing on them firmly and evenly until they are in the open position, as shown in Figure 2-1.

   The Ethernet module will disengage from the NETBuilder II backplane and partially eject from the slot.

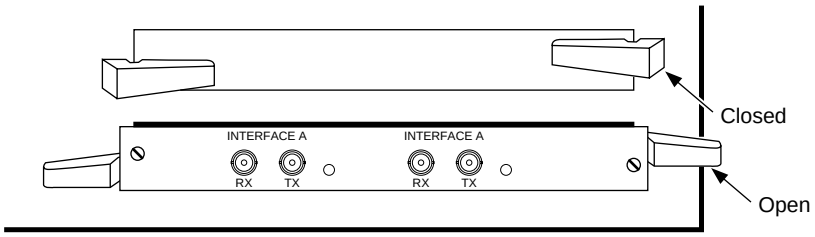

Figure 2-1 Ethernet 2-port Board Partially Ejected From NETBuilder II

4 Carefully slide the failed Ethernet 2-port module out of the slot.

5 Follow the procedures outlined in Chapter 1 to install a new Ethernet 2-port module.

CAUTION: *All empty slots require blanking plates to maintain proper cooling of the unit and regulatory compliance. Failure to use a blanking plate or another module in an emply slot may cause the unit to overheat and will void the warranty. If no blanking plate or other module is available, reinsert the failed module until a replacement is obtained.*

A OVERVIEW

This appendix describes the Ethernet 2-port module for the NETBuilder II base system and gives a brief summary of its features.

Module Components

The NETBuilder II base system is a modular internetworking platform. The Ethernet 2-port module board provides two Ethernet fiber-optic interfaces for the NETBuilder II base system.

Board

Figure A-1 provides a component-side view of the Ethernet 2-port module board showing major components, and a view of the connector/LED panel showing the connectors and the LED indicator lights.

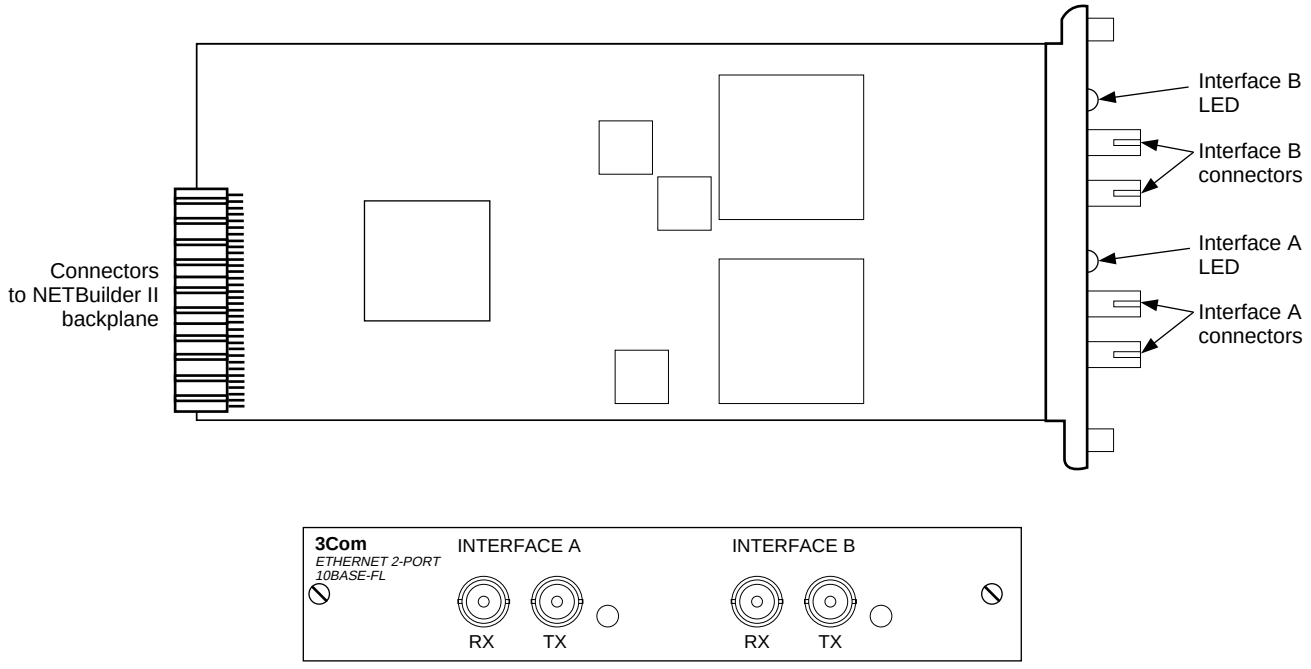

Figure A-1 Ethernet 2-port I/O Module Board and Connector/LED Panel

Table A-1 Table A-2 briefly describe the Ethernet 2-port module external and internal components.

Table A-1 Ethernet 2-port Module External Components

Component	Description
Interface board	IEEE 802.3 Ethernet Version 2 interface board with its own bus.
Front panel connectors	ST fiber-optic connector.
LEDs	Status indicators for each Ethernet port.

Table A-2 Ethernet 2-port Module Internal Components

Component	Description
Core memory peripheral interface (CMPI)	Interface between the controller chip to the NETBuilder II high-speed bus.
Controller	Provides the basic data link controller functions.
Electrically erasable programmable read-only memory (EEPROM)	Contains product information and repair data on the Ethernet module. Refer to the *NETBuilder II Base System Installation Guide* for details on accessing EEPROM information.
Soft-start circuit	Supports the hot-swap feature (described in Table A-4).

LEDs

The Ethernet 2-port module's connector/LED panel has one LED per port for displaying status information.

Figure A-2 shows the LED's location on the module's front panel. Table A-3 lists the states for each LED and their meanings.

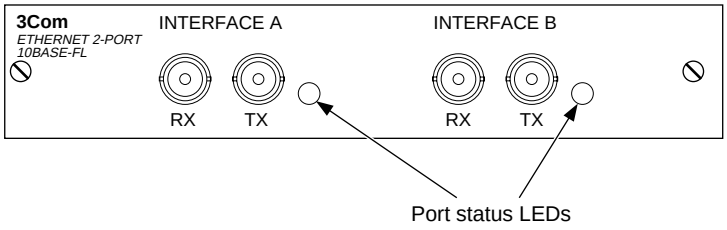

Figure A-2 Port Status LEDs

Table A-3 Ethernet 2-port Module LED Assignments

State	Indicates
Off	Module is not functioning; for example, there is no power to the system or the wrong system software is installed.
Red	Reset, error condition, broken fiber-optic link, or self-test failure (red light appears to be blinking when self-test fails as system intermittently checks the status).
Green	Module is functioning normally.
Yellow	Module is in self-test mode or port/path has been disabled.

Connectors

The two ports on the Ethernet 2-port module's connector/LED panel (shown in Figure A-1) provide access to the Ethernet network. There are two connectors per port: receive (RX) and transmit (TX).

Ethernet 2-port Module Features

Table A-4 summarizes the Ethernet 2-port module features.

Table A-4 Ethernet 2-port Module Features

Feature	Summary
Hot-swap capability	Can be inserted or removed without turning off or rebooting the NETBuilder base system.
Cable support	Supports all Ethernet media through an external transceiver.
Self-test and diagnostic capability	Monitors network and signals status via LEDs.
Accessible information on the EEPROM	Provides Ethernet module product information and repair data that can be accessed via the monitor utility. Refer to the *NETBuilder II Base System Installation Guide* for details on accessing EEPROM information.

Specifications

Table A-5 lists the operating attributes and physical dimensions of the Ethernet 2-port module.

Table A-5 Physical Dimensions and Operating Attributes

Attribute	Description
Length	3.9 in (9.9 cm)
Width	8.8 in (22.4 cm)
Height:	
Board	0.6 in (1.52 cm)
Connector/LED panel	1.0 in (25 cm)
Weight	0.75 lbs (0.34 kg)
Transceiver	Integrated 10Base-FL transceiver
Ethernet data rate	10 Mbps

Refer to the *NETBuilder II Base System Installation Guide* for a detailed list of minimum and maximum electrical and environmental requirements for the Ethernet 2-port module.

Table A-6 lists the maximum current consumption for the Ethernet 2-port module.

Table A-6 Maximum Current Consumption

+5 Volts	-5 Volts	+12 Volts	-12 Volts
1.8 amps	0.0 amps	0.5 amps	0.0 amps