

Installation

This chapter covers the following information:

- Pre-installation guidelines and network configuration examples
- Unpacking
- Installing and connecting devices
- Verifying port connections
- Removing the BMM

Cabling Guidelines

This section describes the cabling requirements and provides sample configurations. Each port type has its own cabling requirements, including the kind of cable and devices you can connect to the ports and the length and type of wiring you can use:

- The 10BaseT ports require Category 3, 4, or 5 unshielded twisted pair (UTP) wiring. Attached devices must be within 100 meters of the BMM and 10BaseT-compatible.
- 100BaseTX ports require Category 5 UTP cabling. Attached devices must be within 100 meters of the BMM and 100BaseTX-compatible.
- The 100BaseFX port uses two-strand, 50/125- or 62.5/125-micron multimode fiber-optic cabling. Attached devices must be within 2 kilometers of the BMM and 100BaseFX-compatible.

10BaseT and 100BaseT Cabling

The following cabling guidelines apply to a 10BaseT or 100BaseT network:

- The maximum length for an UTP cable segment is 100 meters.
- Any cable segment longer than 100 meters must be fiber-optic cabling. The maximum cable length between any two nodes is 2 kilometers.

The 100BaseT standard specifies that individual cable lengths do not exceed an overall cable budget. To determine your cable budget, use the following formula:

$$400 - (R \times 90) = \text{Maximum cable length between any two nodes (in meters).}$$

R represents the number of repeaters (shared 100BaseT modules or standalone hubs) between any two nodes.

For example, in a network with two repeaters, $R = 2$; the maximum cable length between two nodes is $400 - (2 \times 90) = 220$ meters.

Straight-Through and Crossover Cables

When connecting to other devices, identify the type of port on the other device to which the BMM will connect. If the port on the other device is marked with an **X** (such as a 100BaseTX-compatible hub, switch, or router) use a crossover cable. If the port on the other device is not marked with an **X** (such as a server or workstation), use a straight-through cable. Pinouts for the BMM connectors are described in the appendix “Connectors and Cables.”

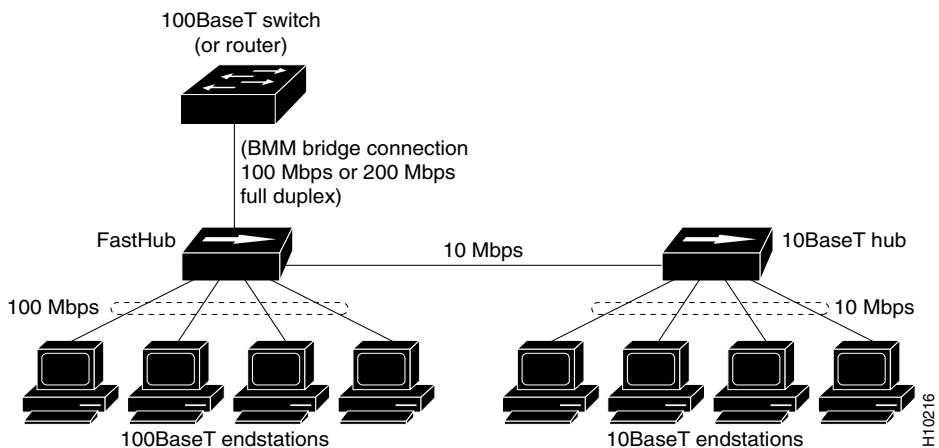
Network Configuration Examples

This section describes possible network configurations using a FastHub with a BMM. One BMM is required per four interconnected FastHubs. One BMM is also required in each cascaded FastHub. Refer to the *FastHub 300 Series Installation and Configuration Guide* for a description of the difference between interconnected and cascaded FastHubs and additional FastHub network configuration examples.

Interconnecting 10BaseT and 100BaseT Devices

The BMM can connect 10BaseT devices (such as hubs, switches, and routers) and at the same time interconnect to 10BaseT and 100BaseT networks. Figure 2-1 shows how the BMM can provide a connection between a 10BaseT device and a 100BaseT switch or router. In this example, the FastHub has a distance between end-nodes of up to 100 meters.

Figure 2-1 Connecting 10BaseT and 100BaseT Devices Example

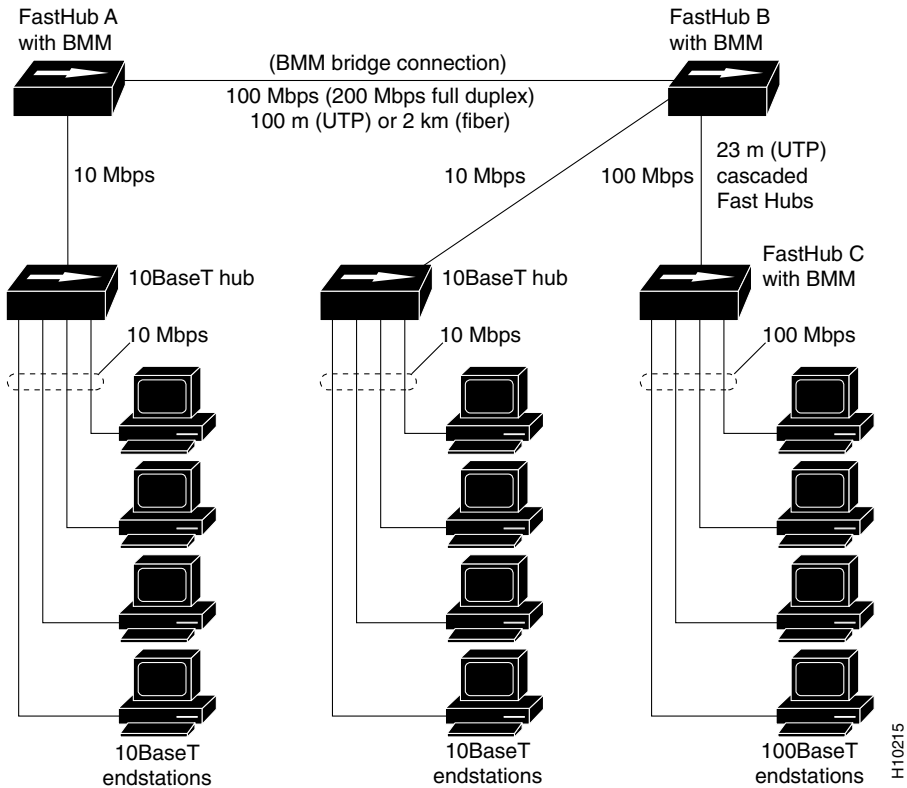


Interconnecting Remote Hubs

The BMM can interconnect two or more FastHubs or FastHub stacks in cases where wiring closets are further apart than the allowable distance defined by Class II repeater configuration guidelines. In the following example of this configuration (see Figure 2-2), each FastHub is a standalone unit.

FastHubs A and B each contain a BMM and can be linked with a 100BaseT connection either at a distance of 100 meters (using UTP) or 2 kilometers (using full-duplex fiber-optic cabling). FastHubs A and B also connect to 10BaseT environments and can support 100BaseT nodes (not shown). FastHubs B and C are cascaded (to a maximum of 23 meters) by using the 100BaseT uplink port.

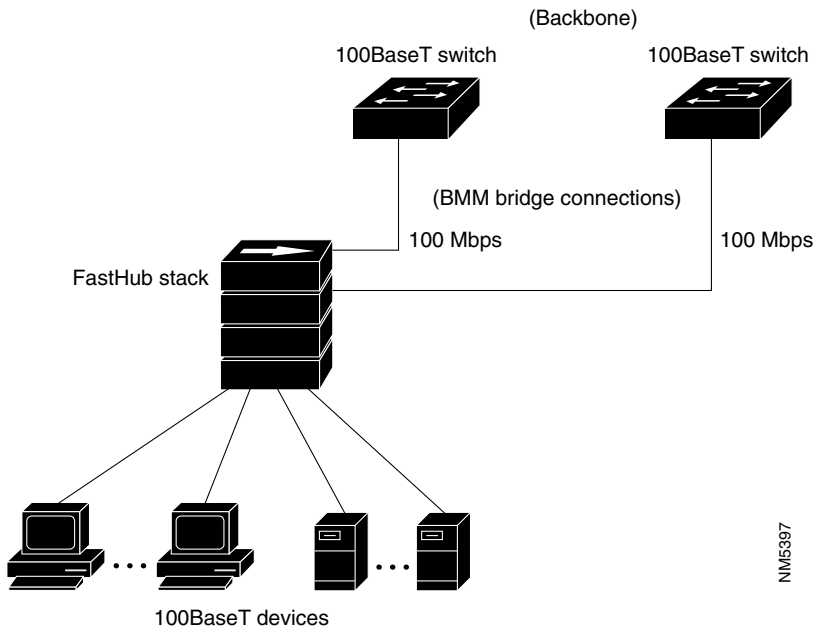
Figure 2-2 Interconnecting Remote Hubs Example



Connecting 100BaseTX Devices to a Backbone

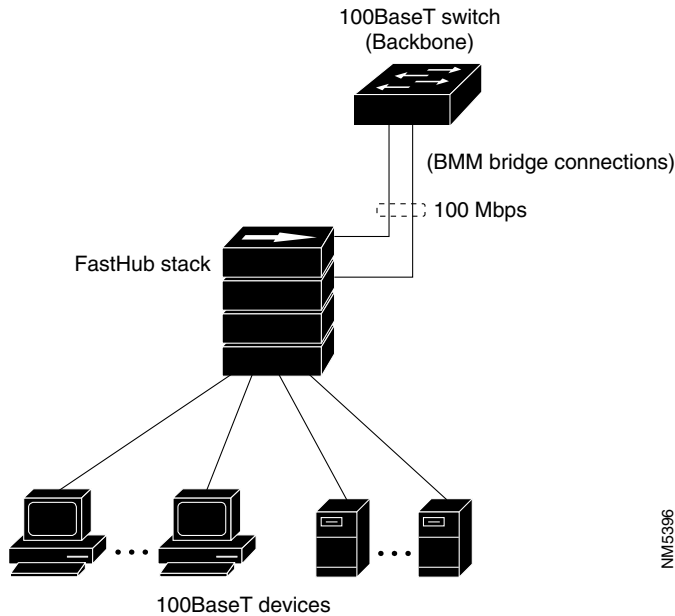
Using a BMM, 100BaseT devices can be connected to a backbone of 100BaseT switches. BMMs in a FastHub stack can be connected to separate backbone switches (see Figure 2-3) or redundantly connected to the same backbone switch (see Figure 2-4).

Figure 2-3 Connecting BMMs to Backbone Switches Example



NM5397

Figure 2-4 Redundantly Connecting BMMs to a Backbone Switch Example



NM5396

Unpacking the BMM

Follow these steps to unpack the BMM:

- Step 1** Open the shipping container and carefully remove the contents.
- Step 2** Return all packing materials to the shipping container and save it.
- Step 3** Ensure that all packing-list items are included in the shipment. The packing list is provided in the “Package Contents” section of the “Fast Install Guide” chapter. Check each item for damage.

Warnings

Translated versions of the following safety warnings are provided in the “Translated Safety Warnings” appendix of this guide.



Warning Do not work on the system or connect or disconnect cables during periods of lightning activity.



Warning Ultimate disposal of this product should be handled according to all national laws and regulations.



Warning Only trained and qualified personnel should be allowed to install or replace this equipment.



Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.

Installing the BMM

Follow these steps to install the BMM.

Step 1 Remove the slot cover from the lower, right FastHub slot by loosening the thumbscrews on each side.

Step 2 Unpack the .



Caution To prevent ESD damage, handle the BMM by its front panel or board edges only.

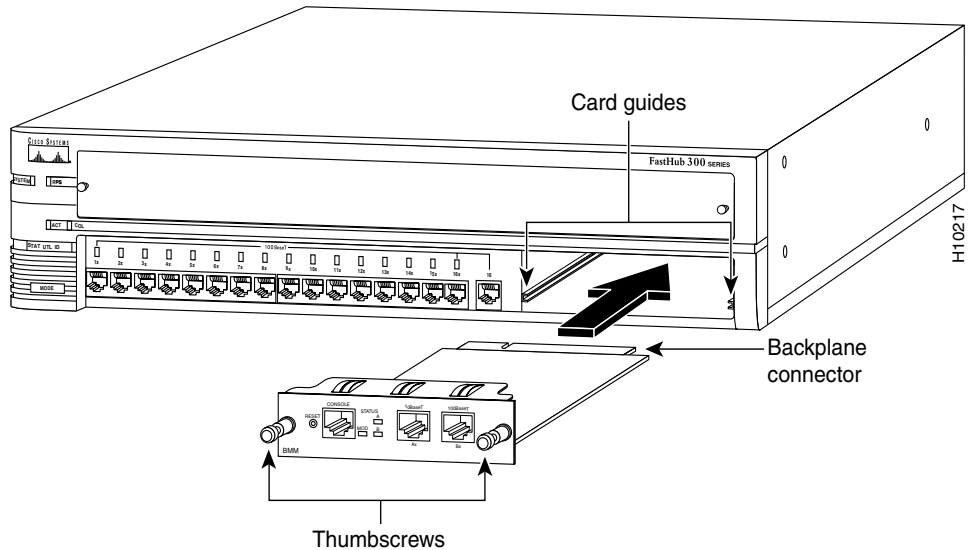
Note The BMM is hot-insertable; it can be added to the FastHub without powering down or adversely affecting network performance.

Step 3 Hold the BMM by its front panel, align the sides of the BMM with the card guides in the slot, and carefully slide it into the slot until the BMM faceplate is flush with the FastHub front panel (see Figure 2-5).

Step 4 Press firmly on the faceplate to ensure that the backplane connector is fully seated in the backplane.

Step 5 Tighten the thumbscrews on each side of the BMM.

Note An added BMM enters primary supervisor or standby mode according to the prioritized attributes described in the “Fault-Tolerant Redundancy” section of the “Overview” chapter.

Figure 2-5 Installing the Bridge Management Module

Step 6 Use the following module LED color indications to verify the operating status of the BMM:

MOD LED Color	Module Status
Green	BMM running POST (approximately 30 seconds).
Green	POST completed; BMM operational and acting as primary supervisor.
Solid amber	BMM powered up and in standby mode (appears when multiple BMMs are in a FastHub stack).
Flashing amber	BMM failed POST.

Note If the BMM failed the POST, refer to the “BMM POST Failures” section of the “Troubleshooting” chapter.

Connecting Ports

You can connect a PC, UNIX station terminal, or modem to the console port to access the FastHub management console. You can then manage a variety of FastHub and FastHub stack functions. When connecting a BMM 10BaseT port, 100BaseTX Port, or 100BaseFX port to the network, follow the guidelines described in the “Connecting 10BaseT and 100BaseTX Ports” and “Connecting the 100BaseFX Port” sections in this chapter.

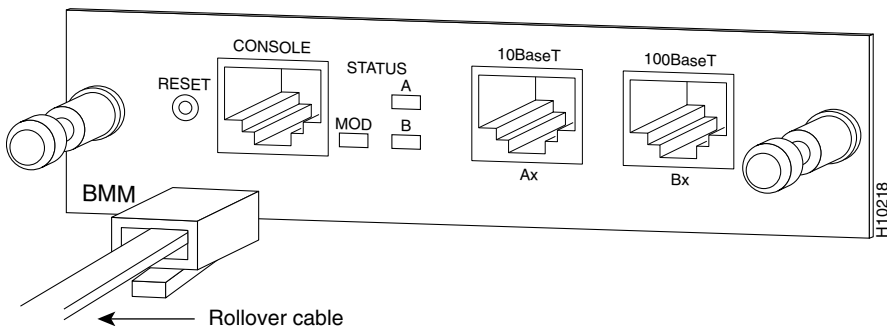
Connecting the Console Port

Use the thin, flat, RJ-45-to-RJ-45 rollover cable and appropriate adapter, both supplied with the BMM, to connect the FastHub RJ-45 console port to a PC, terminal, or modem. Perform the following steps to connect the cable. See the “Console Cables and Adapters” section in the “Connectors and Cables” appendix for cable and adapter pinouts and to identify the rollover cable.

Note The terminal connected to the BMM console port must support VT100 terminal emulation.

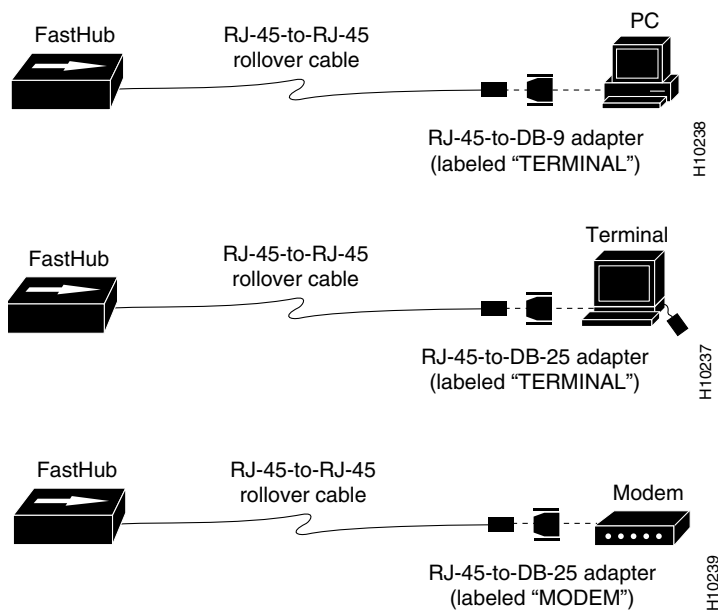
Step 1 Insert one end of the rollover cable into the BMM console port (see Figure 2-6).

Figure 2-6 Connecting the Console Port to a PC, Terminal, or Modem



- Step 2** Attach one of the following adapters to a PC, terminal, or modem (see Figure 2-7):
- Use the RJ-45-to-DB-9 female DTE adapter (labeled “TERMINAL”) to connect the console to a PC running terminal emulation software.
 - Use the RJ-45-to-DB-25 female DTE adapter (labeled “TERMINAL”) to connect the console to a UNIX station terminal.
 - Use the RJ-45-to-DB-25 male DCE adapter (labeled “MODEM”) to connect the console to a modem.

Figure 2-7 Connecting the BMM to a PC, Terminal, or Modem



- Step 3** Insert the other end of the rollover cable into the adapter.

Connecting Ports

Step 4 From the console terminal, boot the terminal emulation program. The BMM Log-In Security Menu is displayed.

Note If the Log-In Security Menu does not display, see the “Troubleshooting” chapter for assistance.

Configuring the Console Port

The BMM console port must be configured to the same baud rate and character format as the PC, terminal, or modem. Although the match-baud-rate option (auto baud, configured through the Console Port menu) matches the baud rate when the BMM is answering an incoming call, the BMM does not change from its configured rate when dialing out. In addition, the BMM only matches a baud rate lower than its configured rate. When it completes a call and disconnects, the BMM always returns to the last configured baud rate.

Following are the default characteristics for the BMM console port:

- 9600 baud
- Eight data bits
- One stop bit
- Parity: none

Use the Console Port menu to change any defaults. Refer to the “Out-of-Band Management” chapter for details on using the BMM management console.

Note If you change any of the console port defaults, make sure you also change the PC, terminal, or modem configuration.

Connecting 10BaseT and 100BaseTX Ports

Always observe the following general rules when connecting devices: Use a straight-through cable to connect two ports when one of the ports is designated with an **X**; use a crossover cable to connect two ports when both ports are designated with an **X**. Use crossover or straight-through cabling, as required, to connect the BMM to the network (see Figure 2-8).

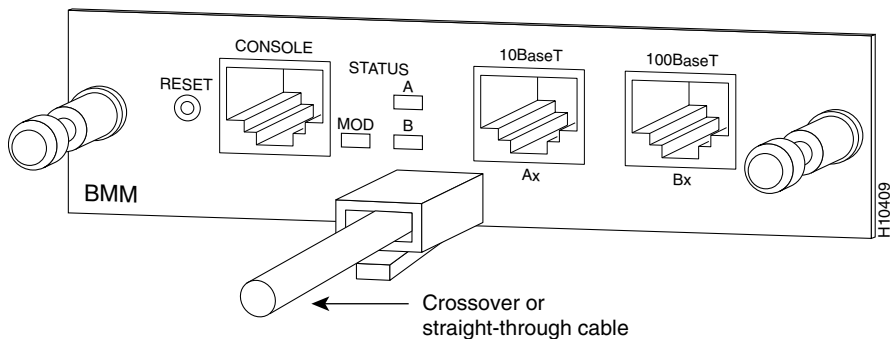
The 10BaseT RJ-45 connector requires Category 3, 4, or 5 UTP cabling. The internally-crossed 10BaseT port is compatible with the 10BaseT IEEE-802.3 specification. Servers or workstations attached to the 10BaseT port must use a 10BaseT-compatible adapter.

The 100BaseTX RJ-45 connector requires Category 5 UTP cabling. The internally-crossed 100BaseTX port is compatible with the 100BaseTX IEEE-802.3u specification. Servers or workstations attached to the 100BaseTX port must use a 100BaseTX-compatible adapter.



Caution Connect the supplied rollover cable to the console port only. Do not connect it to the 10BaseT or 100BaseTX ports.

Figure 2-8 Connecting BMM Ethernet Ports to the Network

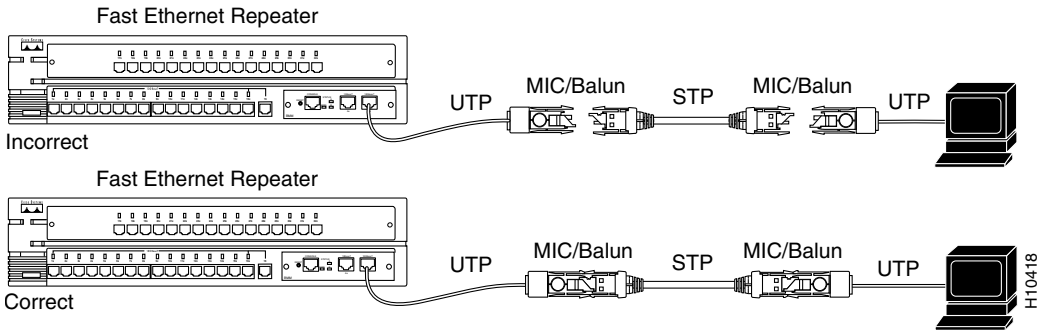


Verifying Port Connections



Caution To prevent potential loopback problems when using shielded twisted pair (STP) cable in a Token Ring network environment, make sure media interface connectors (MICs) and baluns are always connected when they are part of a link connected to a Fast Ethernet repeater (see Figure 2-9).

Figure 2-9 STP Cable Connections



Connecting the 100BaseFX Port

The 100BaseFX SC-type connector requires fiber-optic cabling. The internally-crossed 100BaseFX port is compatible with the 100BaseFX IEEE-802.3u specification. Servers or workstations attached to the 100BaseFX port must use a 100BaseFX-compatible adapter.

Note SC-to-ST adaptors are available from third-party vendors.

Verifying Port Connections

The A and B port LEDs indicate port status as follows:

- If the port LEDs are solid green, the links are operational with no activity.
- If the port LEDs are flashing green, the links are operational with activity.

- If the port LEDs are alternating green/amber or are solid amber, see the “Troubleshooting” chapter to determine the source of the problem.
- If the port LEDs are off, a reset is in progress, the port is not connected, or the BMM is not operational.

Removing the BMM

You can remove the BMM from the FastHub chassis without powering down the FastHub. Loosen the thumbscrews on each side of the module, and carefully slide it out of the FastHub.



Caution Always install a slot cover in an empty module slot to keep dust out of the unit, maintain the cooling air flow, and help prevent electromagnetic interference (EMI).



Caution If you remove a FastHub with a BMM and there is no backup BMM in the FastHub stack, you lose manageability for the entire stack.

