Using the BayStack Ethernet Redundant Fiber Media Adapter

Bay Networks

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Related Publications

For more information about the installation and use of BayStack™ hubs and optional equipment, refer to the following publications:

- *Using the BayStack 10BASE-T Hubs*
  (Bay Networks™ part number 893-839-B)

- *Using the BayStack Ethernet Network Management Modules*
  (Bay Networks part number 893-841-A)

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Introduction

This guide describes the Bay Networks 10BASE-FL RDN Media Adapter for the BayStack 10BASE-T Hubs and provides instructions for installing, connecting, and configuring the adapter in the hub.

Each BayStack 10BASE-FL RDN Media Adapter consists of one optional 10BASE-FL port that provides flexible, redundant backbone connectivity and two diagnostic LEDs.

This guide contains the following sections:

*   BayStack 10BASE-FL RDN Media Adapter

*   LEDs

*   Jumper

*   Remote Signaling

*   Redundant Links

*   Fiber Optic Cable Length Limitations

*   Installing a Media Adapter in a BayStack Hub

For more information about how the media adapter operates in the hub, refer to *Using the BayStack 10BASE-T Hubs* (Bay Networks part number 893-839-B). For more information about hub compatibility with the 10BASE-FL RDN Media Adapter, refer to *Release Notes for the BayStack 10BASE-T Hubs* (Bay Networks part number 896-086-A).
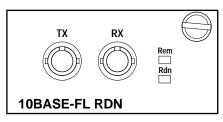
BayStack 10BASE-FL RDN Media Adapter

The BayStack 10BASE-FL RDN Media Adapter is a modular 10BASE-FL port.

The port is compatible with the IEEE 802.3 10BASE-FL specification for Ethernet running over 62.5/125 µm or 50/125 µm multimode fiber optic cable.

10BASE-FL (fiber link) asynchronous signaling is fully interoperable with fiber optic interrepeater link (FOIRL). Remote signaling and redundant links are also supported. The redundant 10BASE-FL media adapter provides Rem (remote) and Rdn (redundant) status LEDs. Jumpers allow you to set remote and redundant link configuration.

Connection is made to the port using two fiber optic straight-tip (ST) connectors (Tx and Rx).

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For more information on fiber optic cable connection and limitation, see "Fiber Optic Cable Length Limitations" later in this guide.

LEDs

The BayStack 10BASE-FL RDN Media Adapter provides LEDs to indicate remote signaling and redundant link status. These LEDs are used in combination with the BayStack 10BASE-T Hub "Media Adapter" LED to indicate the status of the active and standby link.

Table 1 describes the redundant 10BASE-FL media adapter LEDs.

Table 1. 10BASE-FL RDN Media Adapter LEDs

Label	Color	Meaning
Rem	Green	Fiber port is connected to a remote port that uses remote signaling, and that port is not sending a remote fault signal; both Tx and Rx connections are good.
	Amber	Fiber port is connected to a remote port that uses remote signaling, but the Tx link to the remote Rx connector detects a remote fault.
	Off	Fiber port is not connected to another port that is capable of remote signaling.
Rdn	Green	Port is in redundant mode and detects no fault.
	Amber	Port is in redundant mode, but this redundant port connection has failed.
	Off	Port is not in redundant mode.

Table 2 describes the LED combinations of the hub "Media Adapter" LED and the redundant fiber media adapter LEDs.

Table 2. LED status combinations

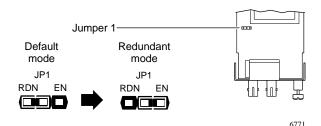| Hub LED	Rem	Rdn	Meaning
Green	Green	Green	Active link in a redundant port pair; link status is good, and remote link is good.
Amber	Green	Green	Standby link in a redundant pair; link status is good, and remote link is good.
Amber	Green	Amber	Standby link in a redundant pair is partitioned or not ready; remote link is good, but port is partitioned by detection of a local fault (or possibly network management).
Amber	Amber	Amber	Standby link in a redundant pair is partitioned for remote fault; check Tx link.
Off	Off	Amber	Standby link in a redundant pair has failed connection; check Tx and Rx links.

Remote Signaling

The BayStack 10BASE-FL RDN Media Adapter supports remote signaling to indicate a far end receiver failure/remote fault detection. Bay Networks uses a proprietary version of remote fault signaling, because remote signaling is not specified in the IEEE 802.3 10BASE-FL standard. Remote signaling is used to verify the connection status of both the transmit and receive fibers.

A Rem LED on the media adapter indicates remote signaling status. For more information about this LED, see "LEDs" earlier in this guide.

Redundant Enable Jumper

Jumper JP1 is used to set the port to operate in the redundant port mode. The 10BASE-FL RDN Media Adapter is shipped with the redundant port mode set to off.

Jumper 1

Default mode	Redundant mode

JP1
RDN   EN

JP1
RDN   EN

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To set the port to operate in the redundant port mode, perform the following steps:

- Locate the shunt covering the JP1 jumper pins on the media adapter board.

- Gently remove the shunt from the two far left pins.

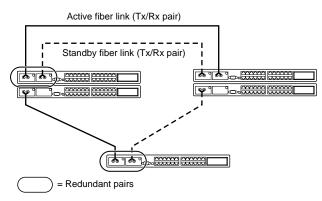- Replace the shunt over the two far right pins.

> **!** **NOTE:** *Jumpers JP2, JP3, and JP4 are not user-configurable.*

Redundant Links

The BayStack 10BASE-FL RDN Media Adapter supports redundant links between Bay Networks BayStack Ethernet hubs, System 5000 hubs, and other Bay Networks hubs that support redundant links. If one fiber connection in a redundant pair breaks, the standby link automatically takes over in less than 10 microseconds. This redundant link feature allows you to build Ethernet dual-homing and mesh-type topologies. The port at both ends of the fiber connection must support Bay Networks remote signaling.

A jumper is used to set the redundant 10BASE-FL media adapter port to operate in redundant mode with a 10BASE-FL fiber port on another hub.

Active fiber link (Tx/Rx pair)

Standby fiber link (Tx/Rx pair)

= Redundant pairs

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For a pair of ports to operate in redundant mode:

- Enable the JP1 jumper for redundant port mode on both of the media adapters in the redundant port pair. For more information about this jumper, see "Redundant Enable Jumper" earlier in this guide.

- Disable any redundant port mode on the port at the other end of each redundant link.

A Rdn LED media adapter indicates redundant link status. For more information about this LED, see "LEDs" earlier in this guide.

Fiber Optic Cable Length Limitations

The 10BASE-F standard permits you to use fiber optic cables up to 2000 meters long. However, the fiber connection must meet the following criteria:

- Optical power budget (shown in Table 3)
- Ethernet repeater rules

For more information about simple rules for Ethernet network compliance, refer to *Using the BayStack 10BASE-T Hubs.*

The optical power budget is shown in Table 3. Power loss in the link cannot exceed the value for the type of fiber optic cable you are using.

Table 3. 10BASE-FL RDN Media Adapter Power Budget

Parameter	62.5/125 μm	50/125 μm
Transmitted power (average)	–20 dBm	–25.7 dBm
Receiver sensitivity (average)	–32.5 dBm	–32.5 dBm
Optical power budget	12.5 dB	6.8 dB

Only in-line fiber-to-fiber connections (a connection between two fibers terminated with fiber connectors, using a fiber-to-fiber connector) count against the optical power budget. The loss in a fiber connection at the ends of the link are included in the optical power budget and does not count as an in-line connection.

Table 4 lists the most common cable and connector combinations, assuming the maximum permitted attenuation with ST connectors. The table lists the maximum (total) distance allowed in the fiber connection. However, your fiber connection may have to be shorter to meet the optical power budget and Ethernet repeater rules.

Table 4. 10BASE-FL cable and connector combinations

Number of in-line fiber-to-fiber connections	62.5/125-μm cable	50/125-μm cable
0	2000 m (6560 ft)	2000 m (6560 ft)
1	2000 m (6560 ft)	2000 m (6560 ft)
2	2000 m (6560 ft)	2000 m (6560 ft)
3	2000 m (6560 ft)	1710 m (5620 ft)
4	2000 m (6560 ft)	1430 m (4690 ft)
5	2000 m (6560 ft)	1140 m (3750 ft)
6	1750 m (5740 ft)	860 m (2810 ft)
7	1500 m (4920 ft)	570 m (1870 ft)
8	1250 m (4100 ft)	290 m (940 ft)
9	1000 m (3280 ft)	0
10	750 m (2460 ft)	
11	500 m (1640 ft)	
12	250 m (820 ft)	
13	0	

Installing a Media Adapter in a BayStack Hub

The BayStack 10BASE-FL RDN Media Adapter is installed in a slot on the front of the BayStack 10BASE-T Hub.

To install a media adapter, follow these steps:

1. **Unplug the BayStack 10BASE-T Hub power cord from the AC power source.**

2. **Remove the filler panel from the media adapter slot on the front panel of the hub.**

3. **Install the media adapter into the media adapter slot.**

    a. Align the media adapter with the card guides and gently slide in the media adapter until you feel it align with the connector on the hub motherboard.

    b. Firmly push the media adapter into the connector.

    ⚠️ **CAUTION:** *Do not force or overtighten the captive retaining screw on the media adapter.*

    c. Tighten the captive retaining screw on the media adapter by turning the screw clockwise.

4. **Reconnect the power cord.**

    The hub powers up and performs a self-test.

5. **Make appropriate cable connections.**

    For cabling information, see the section earlier in this guide that refers to the media adapter you are installing.

6. **Verify the installation for the media adapter.**

    Observe for the installed media adapter that the respective
    Media Adapter LED on the front panel of the hub lights
    according to Table 5.

    Table 5. Media adapter status LEDs

Hub media adapter LEDs	10BASE-FL RDN Media Adapter LEDs
Green	Link status is good, port not partitioned.
Amber	Link status is good, port is partitioned.
Off	Link status is bad or connection is not present.

    For more information about interpreting media adapter
    LEDs, refer to Chapter 1, "Quick Reference Information," in
    Using the BayStack 10BASE-T Hubs.

Bay Networks, Inc. One-year Limited Hardware Warranty

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Electromagnetic Emissions

Meets requirements of:

FCC Part 15, Class A Digital Devices
VCCI Class 1 ITE
EN 55 022 (CISPR 22, Class B)
General License Vfg 243 (Class B)

Compliance with the VCCI regulation is dependent upon the use of shielded AC power cables. The user is responsible for procuring the appropriate cables.

Compliance with Class B regulations is dependent upon the use of shielded cables. The user is responsible for procuring the appropriate cables.

For the complete electromagnetic emissions statements and declaration of conformance, see *Using the BayStack 10BASE-T Hubs* (Bay Networks part number 893-839-A).

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