

Hubs

Modules

## System 5000 Ethernet/Fast Ethernet Host Modules



### Improve Network Connectivity

System 5000™ Ethernet and Fast Ethernet host modules from Bay Networks provide a variety of flexible, high-speed connectivity and configuration solutions for System 5000 network center and wiring closet applications.

### Simplify Network Configuration

Occupying a single slot in a System 5000 hub, the modules deliver advanced capabilities for supporting structured Ethernet network environments. Operating at 10 megabits per second (Mbps) or 100 Mbps over a wide range of unshielded twisted pair (UTP) and fiber optic cabling, System 5000 Ethernet and Fast Ethernet host modules offer tremendous configuration flexibility for highly segmented structured networking environments.

### Improve Network Performance

System 5000 Ethernet and Fast Ethernet host modules support Bay Networks configuration group and port switching feature, which simplifies network moves, additions, and changes. Group and port switching enables entire modules or individual ports to be software-assigned to specific network segments, tailoring the network's configuration to satisfy user needs without requiring any physical changes. The modules also work with the System 5000 Ethernet Switching Module, which provides high-speed switching between internal hub segments to increase available bandwidth and improve overall throughput.

### Support Dynamic Network Environments

The System 5000 is the industry's leading platform for supporting today's enterprise networks as well as the switched internetworks of the future. The System 5000 simultaneously supports shared media, routing, Ethernet and asynchronous transfer mode (ATM) switching, and remote access capabilities, delivering the most versatile network platform available today. Installed in network centers or high-density wiring closets, System 5000 hubs — the Model 5000 and Model 5005 — provide highly diverse enterprise networks with central points of integration and administration.

System 5000 Ethernet host modules are compatible with the IEEE 802.3i 10BASE-T standard, while Fast Ethernet host modules support IEEE 802.3u 100BASE-T, providing seamless integration with other standards-based solutions. Working with Bay Networks hubs, switches, and routers, the System 5000 Ethernet and Fast Ethernet host modules contribute to a comprehensive enterprise networking solution.

## Benefits

### Improve Network Connectivity

Operating over a variety of twisted pair and fiber optic cabling media, the System 5000 Ethernet and Fast Ethernet host modules offer flexible connectivity solutions for nearly any environment. IEEE 802.3-compatible 10BASE-T, 10BASE-F, 100BASE-TX, and 100BASE-FX interfaces are supported, providing a perfect fit for any standards-based networking environment.

### Simplify Network Configuration

System 5000 Ethernet and Fast Ethernet host modules support Bay Networks group and port switching features, enabling entire modules or individual ports to be software-assigned to one of 12 Ethernet or three Fast Ethernet backplane segments, or to three local segments on the modules themselves. Segment assignments can be changed at any time from the management console without requiring any changes to the physical wiring, reducing network downtime, overhead, and errors.

### Improve Network Performance

Port switching helps fine-tune 10 Mbps Ethernet network performance through microsegmentation while avoiding the administrative costs normally associated with moves, additions, and changes. Where performance is critical, the Fast Ethernet host modules deliver high-bandwidth links to high-performance workgroups and individual power users, as well as 100 Mbps “big pipe” connections to critical resources located in the network center. Working with the System 5000 Ethernet Switching Module, which provides high-speed internal switching among the hub’s Ethernet and Fast Ethernet backplane segments, the modules improve network performance by alleviating network bottlenecks.

### Support Dynamic Network Environments

In the wiring closet, System 5000 Ethernet and Fast Ethernet host modules provide connectivity for distributed, highly segmented network environments. Port and group switching allows the modules to support up to 12 independent Ethernet or three independent Fast Ethernet segments for maximum configuration flexibility. In the network center, the modules provide distributed network segments with access to centralized resources, consolidating the network to simplify maintenance and troubleshooting.

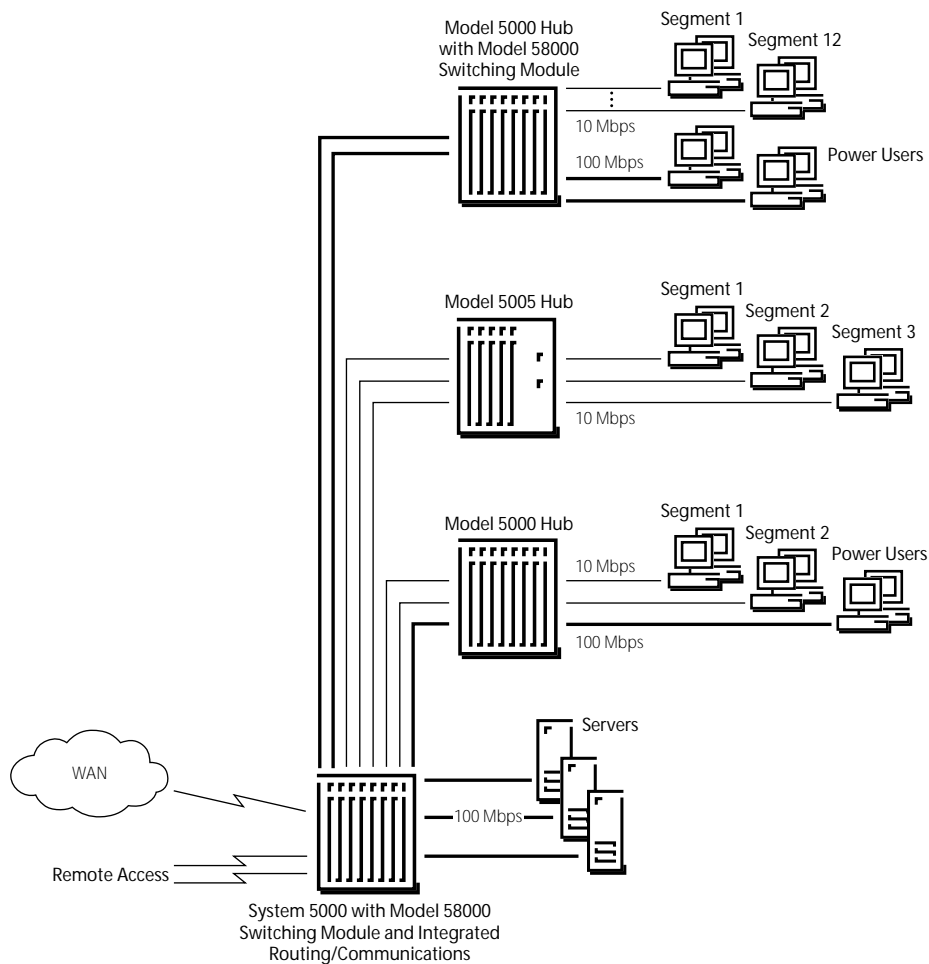
## Features

System 5000 Ethernet host modules provide standards-based IEEE 802.3 Ethernet connectivity for System 5000-based networks, while System 5000 Fast Ethernet host modules support IEEE 802.3u 100BASE-T connections. Operating over both UTP and fiber optic cabling, the modules deliver configuration and management flexibility for highly distributed enterprise networks.

### Configuration Flexibility

The System 5000 Ethernet and Fast Ethernet host modules provide tremendous configuration flexibility for the System 5000 platform. The modules can be installed in a System 5000 chassis in any combination, enabling users to deploy mixed 10 Mbps Ethernet and 100 Mbps Fast Ethernet solutions to meet their specific needs. The modules also work with the System 5000 Ethernet Switching Module, as well as existing System 5000 Token Ring and FDDI host and network management modules, to support highly diverse network environments.

Figure 1 | System 5000 Multisegment Ethernet/Fast Ethernet Network



The System 5000 Ethernet and Fast Ethernet modules also support powerful port and group switching capabilities, which offer the ability to fine-tune network performance while providing a low-cost entry point for transitioning to switching in the future. Entire modules or individual ports can be software-assigned to specific network segments through the Optivity® network management system's LANarchitect™ tool, tailoring the network's configuration to meet specific application requirements (see Figure 1). Connectivity between Ethernet and Fast Ethernet segments is provided by the System 5000

Ethernet Switching Module, which supports 10 Mbps switching between hub backplane segments and 100 Mbps connections to desktops, servers, and routers, greatly improving network performance.

A total of nine System 5000 Ethernet and two System 5000 Fast Ethernet modules are available, each supporting a variety of features and cabling options.

**Port Switching: Model 5308P, Model 5307P, and Model 5304P**  
The Model 5308P, Model 5307P, and Model 5304P 10BASE-T host modules support Bay Networks port switching feature, delivering tremendous network design flexibility and control for today's enterprise networking environments.

Port switching allows individual ports to be selectively assigned to any one of 12 Ethernet segments available on the System 5000 hub backplane, or to three local segments supported by each module. With port switching, the network's performance can be fine-tuned through microsegmentation without physically rewiring the hub, reducing network downtime, errors, and operations overhead.

The Model 5308P and the Model 5307P Ethernet host modules both support up to 24 10BASE-T host stations operating over UTP cabling. Featuring 24 RJ-45 modular receptacles (Model 5308P) or two Telco 50-pin D-type connectors (Model 5307P), the modules offer compact, high-density

solutions for 10BASE-T wiring closet environments. The Model 5307P also includes a single RJ-45 MDI-X/MDI break-out port, available for supporting local devices such as network analyzers, or for linking other hubs with simple UTP patch cables.

The Model 5304P features dual metal ST-type bayonet connectors for supporting up to 10 host stations over 50/125  $\mu\text{m}$  and 62.5/125  $\mu\text{m}$  multimode fiber optic cabling. Adjacent port pairs on the module can also be configured as redundant links, providing backup paths in the event of a primary link failure to ensure uninterrupted network operation.

**Port Switching and Network Security:** Model 5307PS, Model 5307PS-HD, Model 5308PS, and Model 5300PS In environments where network security is a concern, the Model 5307PS, Model 5307PS-HD, Model 5308PS, and Model 5300PS Ethernet host modules include Bay Networks BaySecure™ LAN Access technology to guard against eavesdropping and other types of network intrusion.

All four modules support port switching capabilities and include integrated BaySecure LAN Access Eavesdrop Prevention and Intrusion Control technology, turning Ethernet's traditional

“party line” into a private person-to-person link. Eavesdrop Prevention allows users attached to a Model 5307PS, Model 5307PS-HD, Model 5308PS, or Model 5300PS to receive only those packets addressed to their endstation; all other network activity appears as meaningless “jam” signals. As a result, promiscuous monitors such as LANalyzers are prevented from reading network traffic unless authorized by the network manager.

Intrusion Control enables network managers to maintain a list of authorized stations; if an unauthorized user attempts to join the network, the network manager is immediately notified and the offending station is automatically barred from the network.

BaySecure LAN Access also allows network managers to establish and enforce endstation locations on a per-port basis. All network moves are monitored by the network management system and can be prohibited unless specifically authorized by the manager, preventing intruders from accessing the network via another user's connection.

The Model 5307PS and Model 5308PS are functionally identical to the Model 5307P and Model 5308P, offering two Telco 50-pin D-type connectors or 24 RJ-45 modular receptacles, respectively, for supporting up to 24 Ethernet host connections. The Model 5307PS-HD is a high-density version of the Model 5307PS, offering three 50-pin Telco D-type connectors for supporting up to 36 Ethernet host connections.

The Model 5300PS features eight RJ-45 modular receptacles for supporting Ethernet host connections, plus four media dependent adapter (MDA) slots that hold any combination of 10 Mbps MDA modules for maximum configuration flexibility. A total of six Model 5300 MDA modules are available, each supporting different media options. All Model 5300 MDAs support BaySecure LAN Access and the Bay Networks port switching feature.

**Model 5300-F 10BASE-F MDA** The Model 5300-F 10BASE-F MDA offers a single ST-type fiber connector for supporting 10BASE-FL Ethernet connections over 50/125 and 62.5/125  $\mu\text{m}$  multimode fiber optic cable.

**Model 5300-A AUI MDA** The Model 5300-A AUI MDA offers a single attachment unit interface (AUI) connector for supporting 10 Mbps Ethernet connections over coaxial cabling. The AUI ports can also support connections over a variety other cabling media using the appropriate transceiver.

**Model 5300-2 10BASE2 MDA** The Model 5300-2 10BASE2 MDA features a single BNC connector for supporting 10 Mbps Ethernet connections over thin coaxial (Thinnet) cabling.

**Model 5300-T 10BASE-T MDA** The Model 5300-T 10BASE-T MDA offers a single RJ-45 modular receptacle for supporting 10BASE-T connections over Category 3, 4, or 5 UTP cabling.

**Model 5300-SM 10BASE-F Single-Mode Fiber MDA** The Model 5300-SM 10BASE-F Single-Mode Fiber MDA features a single ST-type connector for supporting 10 Mbps Ethernet connections over 8.5/125  $\mu\text{m}$  single-mode fiber optic cabling.

**Model 5300-D Male AUI MDA** The Model 5300-D Male AUI MDA offers a single reverse AUI port for supporting 10 Mbps Ethernet over coaxial cabling employing female connectors.

**Model 5378-F Quad Cluster Ethernet Host Module**

The Model 5378-F Quad Cluster Ethernet Host Module provides distributed wiring closet hubs with full access to centralized resources located in the network center. The module includes four port “clusters,” each featuring one ST-type fiber port and four 10BASE-T connections. The fiber ports support downlinks from distributed workgroups, while the four RJ-45 10BASE-T ports associated with each fiber link provide the workgroups with efficient access to servers, bridges, routers, and other centralized resources (see Figure 2).

Each of the four clusters support the Bay Networks group switching feature and can be selectively assigned to any one of the 12 Ethernet segments on a System 5000 hub backplane. The clusters can also be assigned to two local module-level segments, or they can be isolated from the backplane to create standalone segments.

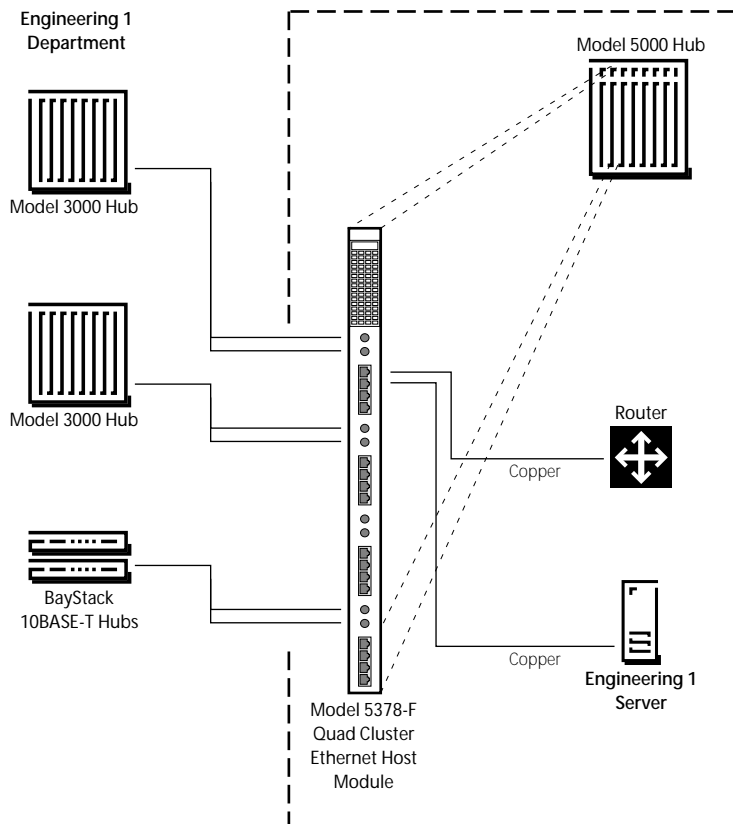
**Group Switching: Model 5308A, Model 5307, and Model 5308-AF 10BASE-T Host Modules**

The Model 5308A, Model 5307, and Model 5308-AF 10BASE-T host modules deliver high-density wiring closet solutions for supporting distributed end users in a structured networking environment. The modules support the group switching feature that allows all ports to be collectively assigned, via software, to any System 5000 Ethernet backplane segment or to a local board-level segment, providing cost-effective configuration flexibility for stable network environments.

The Model 5308A and Model 5307 are physically identical to the Model 5308P and Model 5307P, offering 24 RJ-45 modular receptacles or two Telco 50-pin D-type connectors, respectively, for supporting host stations over UTP cabling.

The Model 5308-AF offers a hierarchical wiring closet solution for supporting 10BASE-T workgroups while providing direct access to System 5000 hubs in the network center. The module features 16 RJ-45 modular receptacles for supporting Ethernet host stations operating over UTP cabling, plus one attachment unit interface (AUI) and one dual metal ST-type fiber interconnect port for supporting connections to local devices. The fiber port supports connections over 62.5/125  $\mu\text{m}$  and 50/125  $\mu\text{m}$  fiber optic cabling, while the AUI port supports links over a variety of media, including shielded twisted pair (STP), UTP, fiber optic, and coaxial cabling, using the appropriate transceiver.

Figure 2 | Distributed Access to Centralized Resources via the Model 5378-F



### High-Performance Networking: Model 5405 and Model 5475-FX Fast Ethernet Host Modules

System 5000 Fast Ethernet host modules deliver standards-based, 100 Mbps connectivity for particularly demanding network environments. Installed alongside System 5000 Ethernet modules in a System 5000 chassis, the modules ease the transition to high-performance Fast Ethernet while preserving investments in the existing network infrastructure.

Two Fast Ethernet host modules are available, each designed for a specific application. The Model 5405 Fast Ethernet Host Module provides high-speed 100 Mbps connections for individual power users and shared resources such as local servers and printers. The Model 5405 features 16 RJ-45 modular receptacles for supporting 100BASE-TX Fast Ethernet connections over Category 5 UTP cabling.

The Model 5475-FX Fast Ethernet Host Module supports local 100 Mbps connections to power users and shared resources, as well as high-speed backbone connections to the network center in structured networking environments. The Model 5475-FX offers 14 RJ-45 modular receptacles for supporting 100BASE-TX host connections over Category 5 UTP cabling, as well as two SC-type connectors for supporting 100BASE-FX backbone links over 62.5/125  $\mu\text{m}$  and 50/125  $\mu\text{m}$  multimode fiber optic cabling. The fiber interfaces can support high-speed downlinks up to 2 kilometers to centralized 100BASE-T switches or routers, or they can be used to provide direct server or network links in configurations where fiber optic cabling is required.

The Model 5405 and the Model 5475-FX support the group switching feature, enabling all ports to be collectively assigned to one of three System 5000 Fast Ethernet backplane segments. The modules can also be isolated from the backplane to create standalone 16-port Fast Ethernet segments. Segment assignments can be made locally through jumper settings on the modules, or remotely through the Optivity network management system.

### Optimal Applications

The System 5000 Ethernet and Fast Ethernet host modules are optimally designed for one of two applications: the network center or the wiring closet.

*Network Center* The Model 5304P and Model 5378-F are designed mainly for network center applications, where they support downlinks from distributed logical workgroups. The fiber ports support connections up to 2 kilometers, meeting the needs of widely dispersed enterprise networks. In addition, the Model 5304P supports high-density redundant links, while the module's per-port configuration switching feature contributes additional network design flexibility.

When extra bandwidth is required, the Model 5405 and Model 5475-FX Fast Ethernet modules support high-speed 100 Mbps links to centralized resources such as servers and routers, eliminating data bottlenecks and immediately improving response times in the network center.

*Wiring Closet* The Model 5308P, Model 5307P, Model 5308A, Model 5307, and Model 5308-AF represent excellent wiring closet solutions for structured networking environments. The modules deliver the high-density platforms required to support multiple end users in the wiring closet, while the port switching capabilities of the Model 5308P and Model 5307P offer the flexibility required to fine-tune the network's design for maximum performance.

For high-utilization wiring closets, the System 5000 Ethernet Switching Module provides 10 Mbps switching between the hub backplane segments, improving overall performance by eliminating bandwidth bottlenecks. A single 100 Mbps switched Fast Ethernet port on the switching module provides all hub segments with high-speed access to the network center, improving network reliability by reducing the number of backbone risers required.

In wiring closets where performance is critical, the Model 5405 and Model 5475-FX Fast Ethernet host modules provide sufficient bandwidth for highly demanding environments. The 100 Mbps ports deliver 10 times the bandwidth available with traditional Ethernet, providing "big pipe" connections to appropriately configured workstations, servers, printers, and other resources. The Model 5475-FX module's two 100BASE-FX fiber interfaces support high-speed backbone connections to critical resources such as 100BASE-T hubs, switches, or routers located in the network center.

**System 5000 Ethernet/Fast Ethernet Module Management**  
System 5000 Ethernet and Fast Ethernet modules are fully integrated into the Optivity network management system, enabling managers to monitor and control network activity from a central management station.

Each module includes onboard circuitry to collect, count, and categorize detailed management statistics on a per-port and per-cluster basis. This information is forwarded to System 5000 Ethernet network management modules over a high-speed Common Management Bus (CMB) on the System 5000 hub backplane, ensuring rapid, timely reporting of network performance data. The network management modules evaluate and consolidate the information before forwarding it to the Optivity management station.

The modules appear in the Expanded View™ graphical user interface, providing network managers with unprecedented visibility into the network infrastructure. A variety of other views are also available, including the LANarchitect tool, which performs the port and group switching operations. Full management capabilities are available for the System 5000 Ethernet host modules, while core management statistics for the System 5000 Fast Ethernet modules are available through a simple software upgrade to existing System 5000 Ethernet network management modules.

#### System 5000 Ethernet/

#### Fast Ethernet Module Features

All System 5000 Ethernet and Fast Ethernet host modules include connectivity ASICs, which perform retiming and repeater functions for each backplane segment. Each module also stores its own boot configuration image in nonvolatile memory, allowing them to retain user settings following power cycles or removal and replacement in a System 5000 hub.

All System 5000 Ethernet and Fast Ethernet modules are fully compatible with industry standards. The RJ-45 and Telco D-type connectors on the Ethernet and Fast Ethernet modules satisfy the following specifications:

- **Ethernet** IEEE 802.3i 10BASE-T for 10 Mbps Ethernet over Category 3, 4, and 5 UTP copper cabling.

- **Fast Ethernet** IEEE 802.3u 100BASE-TX for 100 Mbps Fast Ethernet over Category 5 UTP copper cabling.

The 10BASE-T and 100BASE-TX RJ-45 ports can also connect to IBM data grade Type 1 STP cabling using appropriate Type 1-to-10BASE-T or Type 1-to-100BASE-T adapters.

All fiber ports comply with the following specifications:

- **Ethernet** IEEE 802.3 10BASE-F for 10 Mbps Ethernet over 50/125 μm and 62.5/125 μm multimode fiber optic cabling.
- **Fast Ethernet** IEEE 802.3u 100BASE-FX for 100 Mbps Fast Ethernet over 50/125 μm and 62.5/125 μm multimode fiber optic cabling.

In addition, each Ethernet fiber port also includes a 10BASE-FL/FB autoconfiguration feature, which enables the ports to automatically configure themselves as either 10BASE-FL asynchronous or 10BASE-FB synchronous connections, depending on the equipment at the other end of the link.

The System 5000 Ethernet modules include an autopartitioning feature that disables connections in the event of excessive consecutive collisions, a single collision of excessive length, or jabbering nodes. Ports are automatically reconnected once the fault is corrected. The Ethernet modules also include a per-port autopolarity feature that automatically detects and corrects wire-pair signal inversions on receive data pairs, while a link integrity test function allows users to determine the operating status of a 10BASE-T link.

#### LED Indicators

Each System 5000 Ethernet and Fast Ethernet module includes a comprehensive front panel LED matrix that reports module performance, configuration, and status at a glance.

All modules include a top-level annunciator LED to report overall board status; a Segment Connection LED field to indicate which backplane and/or local segments are being used or if the module or ports are isolated from the hub backplane; and a per-port LED field to indicate the status of individual ports. In addition, the Model 5378-F includes segment-level LEDs to report received packets on each of the module's four clusters, and the Model 5378-F, Model 5304P, and Model 5475-FX include an LED to indicate the presence of a redundant fiber link.



## Technical Specifications

Technical specifications for the System 5000 Ethernet and Fast Ethernet host modules appear in Table 1.

Table 1 | System 5000 Ethernet/Fast Ethernet Host Modules Technical Specifications

<b>Network Protocol and Standards Compatibility</b>	
Ethernet Modules	IEEE 802.3 CSMA/CD IEEE 802.3i 10BASE-T IEEE 802.3 10BASE-F (FB/FL/FOIRL; Model 5304P, Model 5308-AF, Model 5300-F Multimode and Single-Mode MDAs, and Model 5378-F) IEEE 802.3 10BASE2 (Model 5300-2 MDA) ISO 88023
Fast Ethernet Modules	IEEE 802.3u 100BASE-TX IEEE 802.3u 100BASE-FX (Model 5475-FX only)
<b>Data Rate</b>	
Ethernet Modules	10 Mbps
Fast Ethernet Modules	100 Mbps
<b>Electrical Specifications</b>	
Power Consumption	
Model 5378-F, 5304P	46 W at 48 V dc
Model 5308A, 5308P, 5307, 5307P, 5307PS, 5308PS	50 W at 48 V dc
Model 5308-AF	35 W at 48 V dc
Model 5300PS, 5405, 5475-FX	75 W at 48 V dc
Model 5307PS-HD	55 W at 48 V dc
Thermal Rating	
Model 5378-F, 5304P	157 Btu/hr max
Model 5307, 5307P, 5307PS, 5308A, 5308P, 5308PS	171 Btu/hr max
Model 5308-AF	119 Btu/hr max
Model 5300PS	256 Btu/hr max
Model 5307PS-HD	188 Btu/hr max
Model 5405, 5475-FX	256 Btu/hr max
<b>Physical Dimensions</b>	
	(H) 19.0 in. x (W) 1.2 in. x (D) 11.0 in.
	(H) 48.3 cm x (W) 3.0 cm x (D) 28.0 cm

Table 1 | System 5000 Ethernet/Fast Ethernet Host Modules Technical Specifications (continued)

<b>Environmental Specifications</b>	
Operating Temperature	5° to 40°C
Operating Humidity	85% max relative humidity, noncondensing
Operating Altitude	10,000 ft (3,048 m) max
Storage Temperature	-25° to 70°C
Storage Humidity	95% max relative humidity
Free Fall/Drop	ISO 4180-2, NISTA 1A
Vibration	IEC 68-2-6/34
Shock/Bump	IEC 68-2-27/29
<b>Weight</b>	
Model 5304P, 5307, 5307P, 5307PS, 5308A, 5308P, 5308PS, 5308-AF, 5378-F	4.2 lb (1.9 kg)
Model 5300PS	4.7 lb (2.1 kg)
Model 5307PS-HD, 5405, 5475-FX	4.5 lb (2.0 kg)
<b>Safety Agency Approvals</b>	
	UL 1950 with D3 deviations
	CSA 22.2 #950 with D3 deviations
	IEC 950 / EN 60 950 (TUV)
	PCB designed to meet UL94-V1 flammability requirements
<b>Electromagnetic Emissions</b>	
Meet Requirements of	FCC Part 15, Subparts A and B, Class A
	EN 55 022 (CISPR 22:1985), Class B
	General License VDE 0871, Class B (AmtsbIVfg No. 243/1991 and Vfg 46/1992)
	VCCI Class 1 ITE

## Ordering Information

Ordering information for the System 5000 Ethernet and Fast Ethernet host modules appears in Table 2.

Table 2 | System 5000 Ethernet/Fast Ethernet Host Modules Ordering Information

Order Number	Description
<b>Ethernet Host and Cluster Modules</b>	
5304P	Model 5304P Fiber Optic Ethernet Host Module with Port Switching
5307	Model 5307 10BASE-T Host Module with Group Switching
5307P	Model 5307P 10BASE-T Host Module with Port Switching
5308A	Model 5308A 10BASE-T Host Module with Group Switching
5308-AF	Model 5308-AF 10BASE-T Host Module with Group Switching and AUI and Fiber Uplink Ports
5308P	Model 5308P 10BASE-T Host Module with Port Switching
5378-F	Model 5378-F Quad Cluster Ethernet Host Module with Group Switching
<b>BaySecure LAN Access Ethernet Host Modules</b>	
AD1004001	Model 5300PS BaySecure LAN Access 10BASE-T Host Module with 8 10BASE-T Ports and Four MDA Slots
AD1004006	Model 5307PS BaySecure LAN Access 24-port Telco 10BASE-T Host Module with Port Switching
AD1004002	Model 5307PS-HD High-Density BaySecure LAN Access 36-port Telco 10BASE-T Host Module with Port Switching
AD1004004	Model 5308PS BaySecure LAN Access 10BASE-T Host Module with Port Switching
<b>Model 5300 BaySecure LAN Access MDA Modules</b>	
AD1033001	Model 5300-F 10BASE-F Media Dependent Adapter
AD1033002	Model 5300-A AUI Media Dependent Adapter
AD1033003	Model 5300-2 10BASE2 Media Dependent Adapter
AD1033004	Model 5300-T 10BASE-T Media Dependent Adapter
AD1033005	Model 5300-SM 10BASE-F Single Mode Fiber MDA
AD1033006	Model 5300-D male AUI Media Dependent Adapter
<b>Fast Ethernet Host Modules</b>	
AD2204001	Model 5405 Fast Ethernet Host Module with Group Configuration Switching
AD2204002	Model 5475-FX Fast Ethernet Host Module with Group Switching



For more sales and product information, please call **1-800-8-BAYNET**.

**United States**

Bay Networks, Inc.  
4401 Great America Parkway  
Santa Clara, CA 95054  
1-800-8-BAYNET

Bay Networks, Inc.  
8 Federal Street  
Billerica, MA 01821-5501  
1-800-8-BAYNET

**Europe, Middle East, and Africa**

Bay Networks EMEA, S.A.  
Les Cyclades – Immeuble Naxos  
25 Allée Pierre Ziller  
06560 Valbonne, France  
+33-92-966-996 Fax  
+33-92-966-966 Phone

**Pacific Rim, Canada, and Latin America**

**Australia** +61-2-9927-8888  
**Brazil** +55-11-247-1244  
**Canada** 416-733-8348  
**Hong Kong** +852-2-539-1388  
**India** +91-11-301-0404

**Japan** +81-3-5402-7001  
**Mexico** +52-5-202-7599  
**China** +8610-238-5177  
**Singapore** +65-323-3522

World Wide Web: <http://www.baynetworks.com>

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