



## Ease Network Segmentation

The BayStack™ family of Ethernet switches from Bay Networks offers powerful switching solutions, providing a simple, cost-effective method for improving performance and eliminating data bottlenecks.

## Improve Network Performance

The BayStack switches support industry-standard IEEE 802.3i 10BASE-T, enabling seamless integration into any existing Ethernet environment. Each 10BASE-T port delivers a switched 10 megabit-per-second (Mbps) link to individual desktops or network segments, allowing multiple data transfers to take place simultaneously. As a result, the switches relieve the congestion found on traditional shared media Ethernet networks, where all users share a single 10 Mbps of bandwidth.

## Increase Desktop Bandwidth

BayStack switches also support 100 Mbps 100BASE-T Fast Ethernet switched ports, allowing high-speed connections to high-utilization servers, backbones, and power users.

## Integrated with BayStack Product Family

BayStack Ethernet switches are fully integrated into the Optivity® family of network management solutions from Bay Networks, enabling complete Simple Network Management Protocol (SNMP) and RMON monitoring and control. With Optivity, network administrators can manage their entire network, including all hubs, switches, and routers, from a single management station.

Combined with other BayStack products, such as the 10BASE-T and 100BASE-T stackable hubs, Access Node (AN®), Advanced Remote Node (ARN™), and Access Node Hub (ANH™) routers, and Remote Annex™ 2000 and Instant Internet™ remote and Internet access devices, the BayStack switches offer a simple, affordable way to add high-performance capabilities to existing Ethernet networks.

## Benefits

### Ease Network Segmentation

BayStack Ethernet switches are capable of segmenting and supporting large networks. Adding a BayStack Ethernet switch to any existing Ethernet LAN offers a cost-effective alternative to routers for segmenting network traffic.

### Improve Network Performance

BayStack Ethernet switches reduce or even eliminate the bandwidth contention found on shared media Ethernet networks. Switching allows multiple conversations to take place simultaneously, improving overall network response times while protecting existing investments in equipment and cabling.

### Increase Desktop Bandwidth

Designed for low cost, easy implementation, and high port density, BayStack Ethernet switches can also be easily deployed at the desktop to cost-effectively provide individual power users with the bandwidth they need. Dedicated 10 Mbps switch ports eliminate network collisions to ensure smooth, uninterrupted performance, while 100BASE-T Fast Ethernet ports support high-speed, high-performance backbone or server connections.

### Integrated with BayStack Product Family

BayStack Ethernet switches are fully integrated with the entire BayStack product family, leveraging common resources such as the Optivity network management system. Working with other BayStack products, such as 10BASE-T and 100BASE-T stackable hubs, AN, ARN, and ANH routers, and Remote Annex 2000 and Instant Internet remote and Internet access devices, BayStack Ethernet switches contribute to one of the industry's most comprehensive, high-performance Ethernet solutions.

## Features

Four BayStack Ethernet switches are available, so you can mix and match to suit your specific application (see Figure 1).

### BayStack 301 Ethernet Switch

The BayStack 301 features 22 IEEE 802.3i 10BASE-T-compatible RJ-45 modular receptacles for supporting 10 Mbps switched Ethernet transmissions over unshielded twisted pair (UTP) cabling.

The BayStack 301 also includes two 100BASE-TX Fast Ethernet ports for high-speed connections to servers, shared Fast Ethernet hubs, and backbone switches. The 100BASE-TX ports utilize RJ-45 modular receptacles for supporting 100 Mbps links over Category 5 UTP cabling.

The BayStack 301 also includes a front panel DB-9 male RS-232 local console/service port for local setup, configuration, and diagnostic operations. In addition, a series of front panel LED indicators report individual link status, as well as power, fault, and redundant power supply status.

### BayStack 302 Ethernet Switch

Two models of the BayStack 302 Ethernet Switch are available, both offering eight 10BASE-T switch ports and one high-speed Fast Ethernet port for supporting 100 Mbps "big pipe" connections to servers, shared Fast Ethernet hubs, or backbone switches. The Fast Ethernet port also supports full-duplex communications, enabling it to simultaneously send and receive data to and from servers and other switches.

The BayStack 302T Ethernet Switch offers a single RJ-45 modular receptacle for supporting 100BASE-TX Fast Ethernet transmissions over Category 5 UTP. The BayStack 302F Ethernet Switch features an integrated SC-type fiber connector for supporting 100BASE-FX Fast Ethernet transmissions over 62.5/125  $\mu\text{m}$  multimode fiber optic cabling. In full-duplex mode, the fiber port supports connections up to 2 kilometers.

Both versions of the BayStack 302 include a front panel DB-9 male RS-232 local console/service port for local setup, configuration, and diagnostic operations. The switches also support outbound filtering based on destination addresses, providing integrated security firewalling capabilities.

### BayStack 28200 Modular Ethernet Switch

The BayStack 28200 features four front panel media dependent adapter (MDA) slots that hold any combination of 10 and 100 Mbps Ethernet and 100 Mbps Fiber Distributed Data Interface (FDDI) modules. The MDA modules offer a variety of media interfaces, allowing the switch to be configured to meet specific application requirements. A total of six MDA modules are available.

#### *Model 28200-14 10BASE-FL MDA*

The Model 28200-14 10BASE-FL MDA offers four ST-type fiber connectors for supporting 10 Mbps switched Ethernet over 50/125 and 62.5/125  $\mu\text{m}$  multimode fiber optic cabling.

#### *Model 28200-15 10BASE-T MDA*

The Model 28200-15 10BASE-T MDA provides eight RJ-45 modular receptacles for supporting 10 Mbps switched Ethernet connections over Category 3, Category 4, and Category 5 UTP cabling.

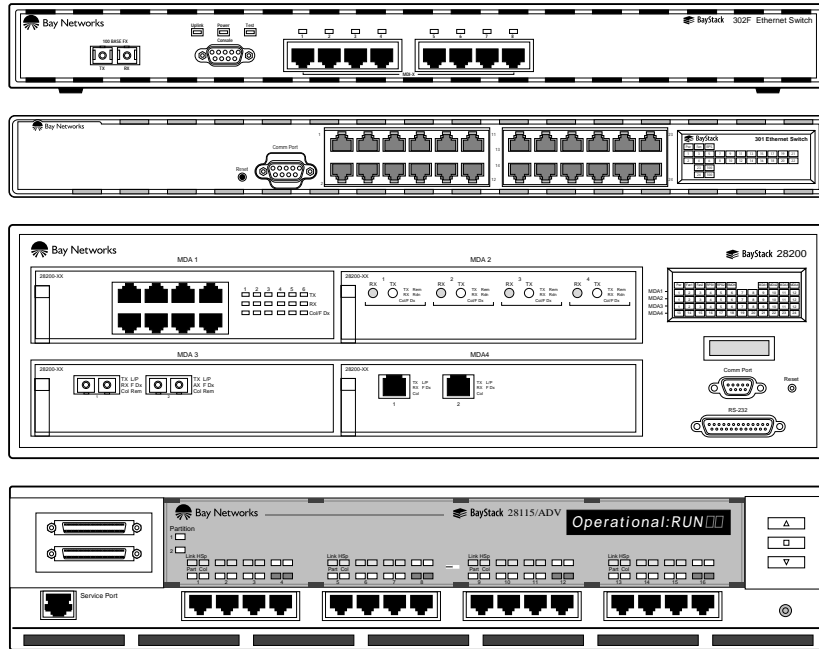
#### *Model 28200-104 100BASE-FX MDA*

The Model 28200-104 100BASE-FX MDA delivers two duplex SC connectors for supporting switched 100 Mbps Fast Ethernet connections over 50/125 and 62.5/125  $\mu\text{m}$  multimode fiber optic cabling.

#### *Model 28200-105 100BASE-TX MDA*

The Model 28200-105 100BASE-TX MDA offers two RJ-45 modular receptacles for supporting switched 100 Mbps Fast Ethernet connections over Category 5 UTP cabling.

Figure 1 | BayStack Ethernet Switches



**Model 28200-109 FDDI MDA** The Model 28200-109 FDDI MDA offers two multimode fiber MIC connectors for supporting dual attachment of the BayStack 28200 switch to a 100 Mbps FDDI backbone ring. The two-slot FDDI MDA, which implements IP fragmentation and frame translation, supports a sustained Ethernet-to-FDDI frame forwarding rate of more than 80,000 frames per second to facilitate communication between the Ethernet and FDDI networks. The FDDI MDA also includes a serial RS-232 local console port and front panel LED indicators to report FDDI network, connection, and system status.

**Model 28200-EXP Expansion Port MDA** The Model 28200-EXP Expansion MDA offers two 50-pin D connector ports for supporting direct connections to other BayStack 28000 Series switches at a maximum 400 Mbps using straight-through cascade cables or over Category 5 UTP or fiber optic cabling using the

appropriate transceivers. When switches are linked using a 1-meter cascade cable, the cascade link operates at 200 Mbps full duplex, providing a total bandwidth of 400 Mbps through one expansion port. If the switches are separated by more than 1 meter and need to be connected by a transceiver, the links can operate at 100 Mbps in full- or half-duplex mode.

All other BayStack 28200 Ethernet and Fast Ethernet MDAs feature user-configurable port types through which individual connections can be configured via software to operate in half- or full-duplex mode and to implement flow control for 100BASE-T full-duplex ports.

**BayStack 28115/ADV Fast Ethernet Switch**

The BayStack 28115/ADV features 16 RJ-45 modular receptacles, each supporting both 10 and 100 Mbps Ethernet transmissions over UTP cabling. At 10 Mbps, the BayStack 28115/ADV ports are compatible with the IEEE 802.3i 10BASE-T standard. At 100 Mbps, the ports support the IEEE 802.3u 100BASE-TX specification

for Fast Ethernet operation over high-performance Category 5 UTP cabling. These flexible port speed options, set through the console/service port on the switch or through the Optivity network management system, provide a smooth migration to high-speed networking while protecting the original investment in the BayStack 28115/ADV.

**Switch Scalability**

All BayStack Ethernet switches include built-in or optional high-speed cascade capabilities that deliver tremendous scalability for growing network environments.

Up to seven BayStack 28200 or BayStack 28115/ADV switches can be linked in a single stack, providing a scalable solution for high-performance environments. The switches automatically detect connections between units, creating a high-performance 400 Mbps backplane extension when used with cascade cables.

BayStack 301 and BayStack 302 Ethernet switches both support built-in high-speed ports for implementing direct 100 Mbps connections to other switches. The BayStack 301 offers two switched 100BASE-TX ports for supporting high-speed 100 Mbps links, while the BayStack 302 comes preconfigured with either a 100BASE-TX or 100BASE-FX Fast Ethernet port.

The BayStack 28200 and BayStack 28115/ADV both support an expansion feature that allows for 200 Mbps full-duplex connections between expansion ports. Full duplex enables devices at both ends of a link to transmit simultaneously, doubling available bandwidth. For the BayStack 28200, expansion ports are available as a configuration option using the Model 28200-EXP Expansion MDA, while the BayStack 28115/ADV comes preconfigured with two front panel 50-pin D connector expansion interfaces.

#### Fault Tolerance

To ensure reliable, fault-tolerant operations, all BayStack Ethernet switches support redundant links to mission-critical devices to ensure continued availability following a primary link failure.

The BayStack 301, BayStack 28200, and BayStack 28115/ADV switches also include a DC power input connector for supporting the Redundant Power Supply Unit (RPSU) to guard against potential power failures. The RPSU can be used to provide load sharing capabilities with each switch's internal power supply, or it can provide a backup power source in the event of a primary power supply failure. A single RPSU is capable of fully supporting up to four BayStack 301 switches and up to two BayStack 28200 or BayStack 28115/ADV switches.

**BayStack Ethernet Switch Management**  
BayStack Ethernet switches are integrated with the Optivity family of network management solutions, enabling complete monitoring and control of all network hubs, switches, routers, and endstations from a single console.

All BayStack Ethernet switches include Bay Networks Advanced agent functionality, which provides comprehensive performance, fault, and diagnostic management capabilities. The Advanced agent supports the Sphere Autotopology™ dynamic mapping feature, which provides a variety of system-generated views of the network topology on the Optivity management console. The Advanced agent also supports Optivity's LANArchitect™ tool, which allows network managers to create virtual LANs (VLANs) by assigning individual ports to various "logical" workgroups that are unrestricted by physical location.

In addition, the BayStack 28200 includes an integrated probe that supports full RMON functionality (RFC 1757 — all nine groups) to provide detailed packet capture and analysis capabilities. Full RMON capabilities are available for the BayStack 301 and BayStack 302 via port mirroring using a StackProbe™ or other compatible external probe. Port mirroring copies packets flowing through a specific port and sends the replicated data to the probe, which performs detailed RMON analysis operations.

All BayStack Ethernet switches also support the Internet Engineering Task Force (IETF) standard bridge MIB (RFC 1493) and Ethernet-like interface MIB (RFC 1398) on a per-port basis, facilitating complete monitoring and control in any standards-based management environment.

#### BayStack Ethernet Switch Applications

Many Ethernet LANs today are single-segment shared 10 Mbps segmented with routers. Increasing user demands, combined with faster processors, more

powerful applications, and increasingly powerful workstations, have put a tremendous strain on these networks, resulting in data bottlenecks and overall sluggish performance.

BayStack Ethernet switches restore network performance by delivering additional bandwidth where and when it is needed. BayStack Ethernet switches are optimized for two important applications: network segmentation and workgroup enhancement.

**Network Segmentation** Installed in wiring closets, BayStack 301, 302, or 28200 switches provide individual hubs, or multiple segments within a single hub, with 10 Mbps switch connections. They also offer dedicated ports for power desktops and local servers. BayStack switches are connected by a Fast Ethernet link to highly used servers and to other switches. A BayStack 28200 or 28115/ADV Fast Ethernet Switch supports multiple high-bandwidth connections for servers, other switches, and routers (see Figure 2).

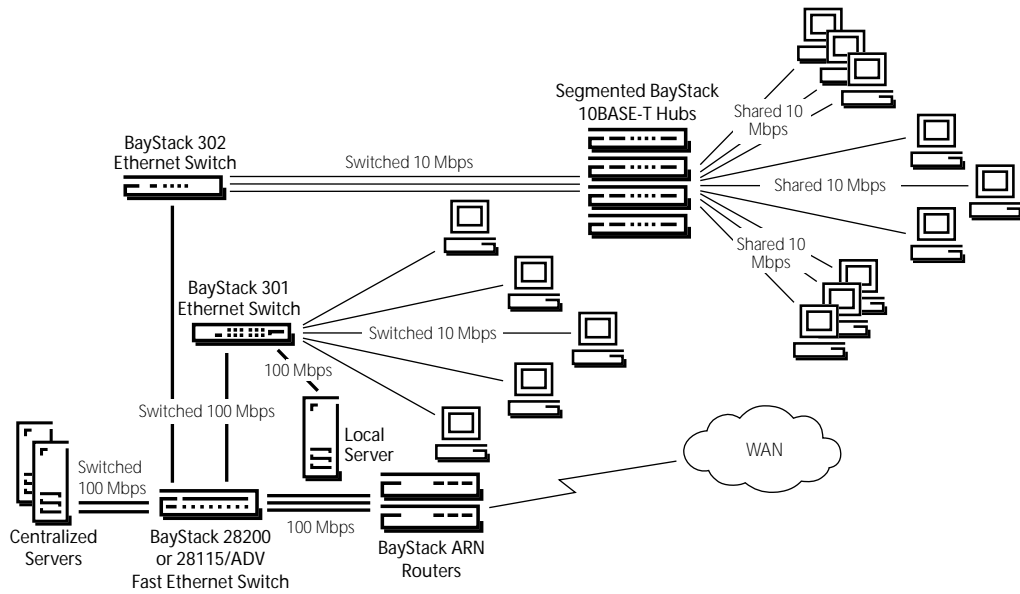
#### Workgroup Performance Enhancement

Individual power users running high-bandwidth applications can also be segmented from the workgroup and given dedicated 10 Mbps switched connections, further reducing network traffic and improving performance.

In high-utilization workgroups, where shared 10 Mbps Ethernet lacks the bandwidth that power users demand, the BayStack 301 Ethernet Switch offers dedicated 10 Mbps desktop connections. Two 100 Mbps interfaces can be used to support high-bandwidth links to local servers or high-speed connections to other network room switches (see Figure 3).

Switch ports can also provide individual segments with switched 10 Mbps connections to relieve congestion.

Figure 2 | Network Segmentation with BayStack Ethernet Switches

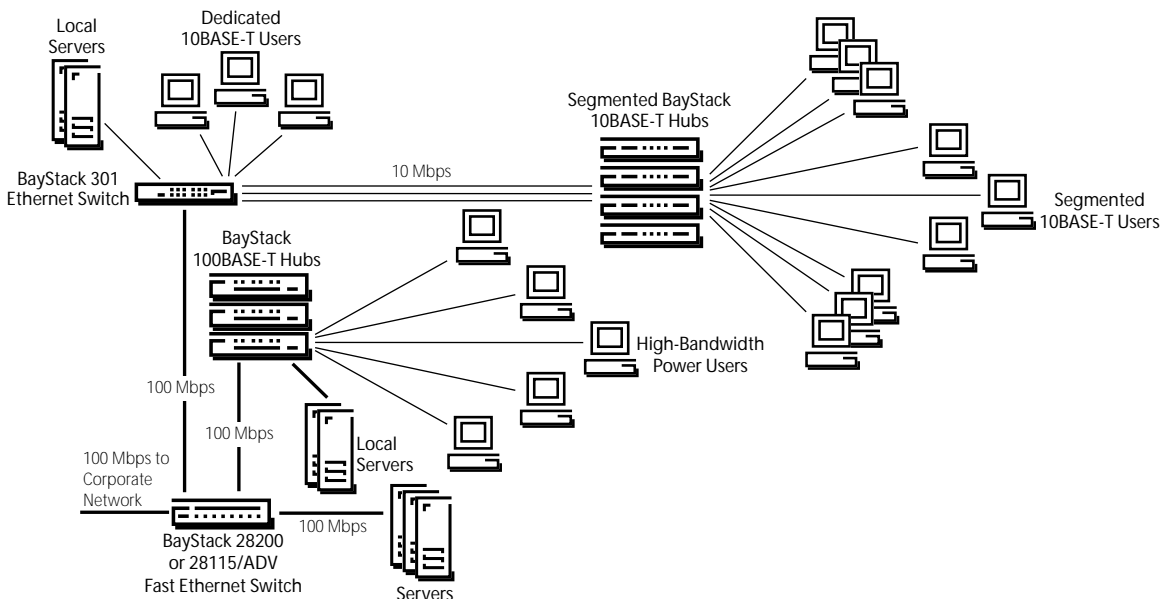


*Evolving to 100BASE-T* For networks planning a move to 100BASE-T, BayStack Ethernet switches represent an excellent, low-cost method for introducing the technology into existing Ethernet environments. BayStack switches support simple segmentation within the network, improving the performance

of individual hubs and workstations running high-bandwidth applications. As demands grow, BayStack switches' 100 Mbps interface supports high-bandwidth connections to local servers, Fast Ethernet segments, or a Fast Ethernet repeater in the network room to provide 100 Mbps access to centralized servers.

This configuration sets the stage for adding Bay Stack 100 Mbps hubs and switches, delivering a high-performance solution that alleviates network bottlenecks as performance requirements grow.

Figure 3 | Workgroup Performance Enhancement Using the BayStack Ethernet Switches



## Technical Specifications

Technical specifications for the BayStack Ethernet switches appear in Table 1.

Table 1 | BayStack Ethernet Switches Technical Specifications

<b>Network Protocol and Standards Compatibility</b>	IEEE 802.3 CSMA/CD (ISO/IEC 8802-3) IEEE 802.3i 10BASE-T (ISO/IEC 8802-3) IEEE 802.3u 100BASE-T (ISO/IEC 8802-3)
<b>Data Rates</b>	10 Mbps Manchester encoding (10BASE-T; 10BASE-FL) 100 Mbps 4B/5B encoding (100BASE-TX; 100BASE-FX)
<b>Electrical Specifications</b>	
Input Power	
BayStack 301 and BayStack 302	60 W max
BayStack 28115/ADV	200 W max
BayStack 28200	275 W max
Thermal Rating	
BayStack 301	57 Btu/hr
BayStack 302	200 Btu/hr
BayStack 28115/ADV and BayStack 28200	940 Btu/hr
AC Line Frequency	47 – 63 Hz
Input Voltage (rms)	
BayStack 301 and BayStack 302	100 – 240 VAC
BayStack 28115/ADV and BayStack 28200	90 – 264 VAC
Volt Amperes Rating	
BayStack 301	180 VA
BayStack 302	90 VA
BayStack 28115/ADV and BayStack 28200	500 VA
Fuses	
BayStack 301 and BayStack 302	Internal, not accessible to user
BayStack 28115/ADV and BayStack 28200	6.3 A at 250 V
<b>Physical Specifications</b>	
BayStack 301	(H) 1.75 in. x (W) 17.2 in. x (D) 11.0 in. (H) 4.5 cm x (W) 43.7 cm x (D) 27.9 cm
BayStack 302	(H) 1.75 in. x (W) 17.5 in. x (D) 9.5 in. (H) 4.5 cm x (W) 44.2 cm x (D) 24.1 cm
BayStack 28115/ADV	(H) 4.15 in. x (W) 17.21 in. x (D) 17.98 in. (H) 10.5 cm x (W) 43.7 cm x (D) 45.7 cm
BayStack 28200	(H) 5.25 in. x (W) 17.25 in. x (D) 16.98 in. (H) 13.3 cm x (W) 43.8 cm x (D) 43.1 cm
BayStack 28200-14, -15, -104, -105, -109, -EXP MDAs	(H) 1.75 in. x (W) 6.5 in. x (D) 10.0 in. (H) 4.4 cm x (W) 16.5 cm x (D) 25.4 cm

Table 1 | **BayStack Ethernet Switches Technical Specifications (continued)**

<b>Weight</b>	
BayStack 301	7.5 lb (3.4 kg)
BayStack 302	10 lb (4.5 kg)
BayStack 28115/ADV	26 lb (11.7 kg)
BayStack 28200	19.7 lb (8.9 kg) empty 23.15 lb (10.5 kg) with four MDAs installed
BayStack 28200-14, -15, -104, -105, -EXP MDAs	1.6 lb (0.65 kg)
<b>Environmental Specifications</b>	
Operating Temperature	5° to 40°C
Storage Temperature	-25° to 70°C
Operating Humidity	85% max relative humidity, noncondensing
Storage Humidity	95% max relative humidity, noncondensing
Operating Altitude	10,000 ft (3,000 m) max
Storage Altitude	10,000 ft (3,000 m) max
Free Fall/Drop	ISO 4180-s, NISTA 1A
Vibration	IEC 68-2-6/34
Shock/Bump	IEC 68-2-27/29
<b>Electromagnetic Emissions</b>	
Meets Requirements of	FCC Part 15, Subpart B, Class A EN 55022 (CISPR 22: 1985), Class A (BayStack 301, BayStack 302, and BayStack 28115/ADV) EN 55022 (CISPR 22: 1985), Class B (BayStack 28200) VCCI Class 1 ITE
<b>Electromagnetic Susceptibility</b>	
Electrostatic Discharge (ESD)	EC 801-2, Level 2
Radiated Electromagnetic Field	EC 801-3, Level 1
Electrical Fast Transient/Burst	EC 801-4, Level 2
<b>Safety Agency Approvals</b>	
	UL listed (UL 1950) CSA 22.2 #950 with D3 deviations CSA certified (CSA 22.2 #950, IEC950) IEC 950/EN 60 950 (TUV) UL-94-V1 flammability requirements for all PC boards TUV licensed (EN 60 950)

## Ordering Information

Ordering information for the BayStack Ethernet switches is shown in Table 2.

Table 2 | **BayStack Ethernet Switches Ordering Information**

Order Number	Description
<b>BayStack 301 Ethernet Switch</b>	
CW2001001	BayStack 301 Ethernet Switch with 22 10BASE-T switched ports and two 100BASE-TX ports
<b>BayStack 302 Ethernet Switch</b>	
AL2001002	BayStack 302T Ethernet Switch with eight 10BASE-T switched ports and one switched 100BASE-TX port
AL2001003	BayStack 302F Ethernet Switch with eight 10BASE-T switched ports and one switched 100BASE-FX port
<b>BayStack 28200 Modular Ethernet Switch</b>	
AQ2012001	BayStack 28200 Modular Ethernet Switch Chassis
AQ2012002	BayStack 28200-15 10BASE-T MDA for BayStack 28200
AQ2012003	BayStack 28200-14 10BASE-FL MDA for BayStack 28200
AQ2012004	BayStack 28200-105 100BASE-TX MDA for BayStack 28200
AQ2012005	BayStack 28200-104 100BASE-FX MDA for BayStack 28200
AQ2012006	BayStack 28200-EXP Expansion MDA for BayStack 28200
<b>BayStack 28115/ADV Fast Ethernet Switch</b>	
28115R	BayStack 28115/ADV Fast Ethernet Switch with Advanced Software and RPSU Connection
<b>Accessories</b>	
RPSU	Redundant Power Supply Unit



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

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