

Express Ethernet Switches

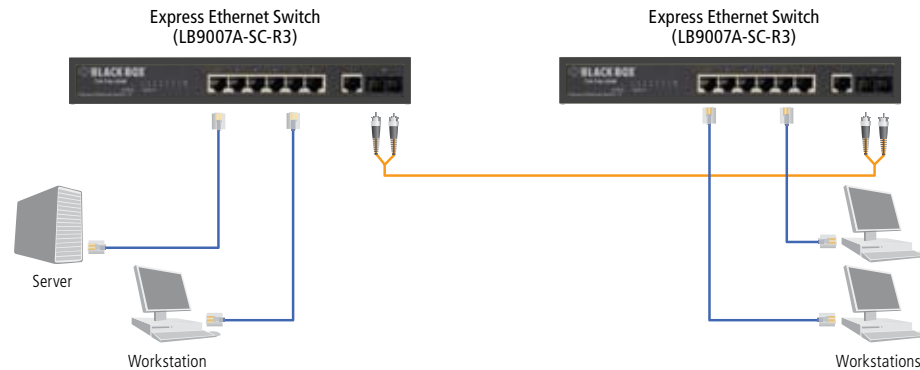
Segmenting your 10-/100-Mbps  
Ethernet LAN doesn't have to  
be expensive!



## FEATURES

- » Low-cost switching for small- or mid-sized networks.
- » Protocol-independent, MAC-layer switching.
- » Models for copper, fiber, copper and fiber, or copper with a fiber uplink.
- » Fiber ports provide extra distance of over a mile.
- » Half-/full duplex on all RJ-45 ports.
- » Reduce bottlenecks.
- » Include universal power supply.

Extend the distance between two 10-/100-Mbps switched copper network segments up to 1.2 miles (2 km) over fiber.



## OVERVIEW

High-speed switching technology at an affordable cost—get the best of both worlds with BLACK BOX® Express Ethernet Switches.

These well-engineered machines provide dedicated high-speed workgroups, plus they improve network performance and keep data moving freely and quickly.

Express Ethernet Switches enable you to put a full wire-speed switch right into a network without making a large investment. Plus they're available in a wide variety of port options, from a 2-port model for small network extension to a 24-port switch with optional fiber uplink for mid-sized networks.

Each switch provides true Layer 2 nonblocking switch architecture and a store-and-forward switching engine. With Layer 2 switching, you get the speed to handle lots of network data. The store-and-forward engine checks the integrity of each data packet and ensures accurate throughput.

All Express Ethernet Switches have an autosensing power supply that adapts to worldwide voltages. A crossover switch makes uplinking to other switches or hubs easy. Extensive LEDs provide port status.

All RJ-45 ports operate at 10/100 Mbps in half- or full-duplex mode. The fiber ports are for 100-Mbps connections in either half- or full-duplex mode.

### 10-/100-Mbps Copper (LB9108A-R2, LB9019A-R4, LB9020A-R3)

These switches feature 8, 16, or 24 autosensing 10-/100-Mbps RJ-45 ports. They're perfect for rapid, inexpensive network expansion or building workgroups. The autosensing ports adjust to the speed and duplexity of each port automatically. All ports have auto MDI/MDI-X.

The 8-port model supports 16,384 MAC address entries to support large numbers of end users. It's housed in a compact, sturdy enclosure suitable for desktop use or wallmounting.

The 16- and 24-port switches support 2048 MAC addresses with address filtering on all ports.

### 2-Port Express Ethernet Switches, Copper and Fiber (LB9002A-SC-R3, LB9002A-ST-R3)

These compact 2-port switches divide a network into a 10-/100-Mbps copper segment and a 100-Mbps fiber segment.

The 2-port switches are ideal for adding a 100-Mbps fiber island to your existing network or for extending a network long distances over fiber optic cable. To handle the heavy traffic load associated with this sort of network link, the 2-port switches support 8192 MAC address entries.

Choose from ST® or SC connectors on the 100BASE-FX side. Each switch features automatic MDI-X for linking to another device. The switches can be wallmounted or used on the desktop.

### 5-Port Express Ethernet Switch (LB9005A-FO-R2)

This compact copper plus fiber 5-port switch is ideal for adding small workgroups to your network. The single fiber port serves as an uplink to your network. Four 10/100 autosensing copper ports feature auto MDI/MDI-X, making it easy to connect workstations without fuss. The switch supports 2048 MAC addresses.

The compact chassis is only about six inches wide so you can tuck it in behind a PC. You may also mount it on any horizontal or flat surface.

### 8-Port Express Ethernet Switches (LB9006A-SC, LB9006A-ST, LB9021A-LB9022A, LB9007A-SC-R3, LB9007A-ST-R3)

The 8-port switches are good for integrating 100-Mbps fiber into your existing 10-/100-Mbps network. The extra distance from fiber means you can extend network segments up to 1.2 miles (1.9 km). The switches support 1024 MAC address entries.

The LB9006A-SC, LB9006A-ST, LB9021A, and LB9022A models provide DIP switches for controlling port operation manually. For greater versatility, the LB9007A-R3 models have a console port that enables you to control ports and set up port-based VLANs and trunking.

Both LB9007A-R3 models support management. The management type is an ASCII console port (cable included) that provides access to a text-based menu. The menu permits basic configuration of port parameters (such as changing speed or duplex settings), and has a proprietary method for assigning the ports into VLAN and Port-Trunking groups. The LB9007A-R3 models also feature auto MDI/MDI-X.

The LB9006A-SC, LB9006A-ST, LB9021A, and LB9022A models can be rackmounted (hardware is included). The LB9007A-R3 models are intended for desktop use; if you wish to rackmount them, contact Tech Support for the appropriate hardware.

#### **10-/100-Mbps Copper, 100-Mbps Fiber, Modular (LB9017A-R4, LB9024A-R2) and Optional Fiber Uplink Modules (LB9017C-SC-R2, LB9007C-ST-R2)**

These [Express Ethernet Switches](#) feature 16 or 24 auto-sensing 10-/100-Mbps RJ-45 ports. They're an economical way to quickly expand your 10BASE-T/100BASE-TX network with the option of adding a fiber uplink later if you need it.

Although the switches are easy to set up, they offer powerful features to help you control heavy network loads. The 2048 MAC address table handles a large number of end users.

These modular switches also include an RS-232 RJ-45 console port for basic management (cable included) that provides access to a text-based menu. The menu permits basic configuration of port parameters (such as changing speed or duplex settings) and has a proprietary method for assigning the ports into VLAN and Port-Trunking configuration groups. Remote configuration via the network is also possible.

Trunking provides extra bandwidth of up to 400 Mbps between two connected switches. You can also regulate standard backpressure and autonegotiation on individual ports. The crossover button enables you to configure one port as an uplink. These switches occupy only 1U of rack space and are easily rackmountable with the included hardware.

#### **100-Mbps Fiber Express Ethernet Switch (LB9008A-FO-R2)**

For simplicity, speed, and distance, choose this fiber-only switch. It provides eight ports of blazing speed and distances of up to 1.2 miles (1.9 km) with all the security of fiber. Best of all, this entry-level switch is simple to set up—just plug-and-play.

The switch has SC-style fiber connectors and supports 1024 MAC address entries. It has DIP switches and is easy to rack-mount with the included hardware.

#### **Modular Express Ethernet Switch (LB9217A-R2) and Modules (LB9213A–LB9216A, LB9218A–LB9219A, LB9220C-ST-R2, LB9220C-SC-R2)**

For the rapidly changing and growing network, the 2½-port Modular [Express Ethernet Switch](#) offers an affordable modular solution that enables you to customize your switch with any combination of copper and fiber ports as well as fiber uplinks.

The switch has two slots that you can fill with 8-port modules in combinations of 100-Mbps multimode fiber ports or 10/100 RJ-45 copper ports. A third “half” slot is reserved for a 1-port fiber uplink module.

The switch supports several “smart” features such as port-based VLAN and MAC-based trunking.

The 10/100 copper ports are autosensing for speed and duplex, and they support auto MDI/MDI-X. Speed and half- or full duplex can be programmed as either fixed or autonegotiating. Fiber ports are all 100-Mbps Fast Ethernet and come in a choice of ST or SC connectors.

The switch is rackmountable, occupying only 1U of rack space in a standard 19” rack. Rackmount ears are included.

## **Technically Speaking**

### **Layer 2 switching.**

A switch helps provide a clear path from each workstation to its destination on demand, whether that destination is another workstation or a server. In contrast with bridges and routers (which process data packets on an individual, first-come, first-served basis), switches maintain multiple, simultaneous data conversions among attached LAN segments.

From an end-user workstation’s perspective, a switched circuit appears as a dedicated connection—a direct, full-speed LAN link to an attached server or other remote LAN node. Although this technique is somewhat different from what a LAN bridge or router does, switching hubs are based on similar technologies.

Switching hubs that use bridging technologies are called Layer 2 switches—a reference to Layer 2 or the Data Link Layer of the OSI Model. These switches operate using the MAC addresses in Layer 2 and are transparent to network protocols. Layer 2 switches connect different parts of the same network, as determined by the MAC address contained in the packet. You can install a Layer 2 switch anywhere on a network without reconfiguring the LAN.

## TECH SPECS

**Auto MDI/MDI-X** — RJ-45 ports: LB9108A-R2, LB9019A-R4, LB9020A-R3, LB9002A-SC-R3, LB9002A-ST-R3, LB9005A-FO-R2, LB9006A-SC, LB9006A-ST, LB9021A-LB9022A, LB9007A-SC-R3, LB9007A-ST-R3, LB9217A-R2

**Distance (Maximum)** — RJ-45 ports: 328 ft. (100 m);  
Fiber ports: 1.2 mi. (1.9 km)

**Forwarding Rate** — 14,880 pps at 10 Mbps; 148,800 at 100 Mbps

**MAC Addresses** — LB9108A-R2: 16,384;  
LB9019A-R4, LB9020A-R3, LB9005A-FO-R2, LB9017A-R4, LB9024A-R2: 2048;  
LB9002A-SC-R3, LB9002A-ST-R3, LB9217A: 8192;  
LB9006A-SC, LB9006A-ST, LB9021A-LB9022A, LB9007A-SC-R3, LB9007A-ST-R3, LB9008A-FO-R2: 1024

**Standards** — IEEE 802.3, IEEE 802.3u

**Switching Method** — Store and forward

**VLAN Support** — LB9007A-SC-R3, LB9007A-ST-R3, LB9017A-R4, LB9024A-R2,  
LB9217A: Proprietary port-based

**Connectors** — LB9108A-R2, LB9213A: (8) RJ-45;  
LB9019A-R4: (16) RJ-45  
LB9020A-R3: (24) RJ-45;  
LB9002A-SC-R3: (1) RJ-45, (1) pair of SC;  
LB9002A-ST-R3: (1) RJ-45, (1) pair of ST;  
LB9005A-FO-R2: (4) RJ-45, (1) pair of SC;  
LB9006A-SC: (2) RJ-45, (6) pairs of SC;  
LB9006A-ST: (2) RJ-45, (6) pairs of ST;  
LB9021A, LB9218A: (6) RJ-45, (2) pairs of SC;  
LB9022A, LB9216A: (6) RJ-45, (2) pairs of ST;  
LB9007A-SC-R3: (7) RJ-45, (1) pair of SC;  
LB9007A-ST-R3: (7) RJ-45, (1) pair of ST;  
LB9017A-R4: (16) RJ-45, (1) RJ-45 console port;  
LB9024A-R2: (24) RJ-45, (1) RJ-45 console port;  
LB9017C-SC-R2, LB9220C-SC-R2: (1) pair of SC;  
LB9007C-ST-R2, LB9220C-ST-R2: (1) pair of ST;  
LB9008A-FO-R2, LB9215A: (8) pairs of SC;  
LB9217A-R2: All connectors are on the modules;  
LB9214A: (8) pairs of ST;  
LB9215A: (8) pairs of SC;  
LB9210A: (4) RJ-45, (4) pairs of ST;  
LB9219A: (4) RJ-45, (4) pairs of SC;  
LB9224C: (1) RJ-45

**Indicators** — LB9108A-R2: Per unit LEDs: (1) Power; Per port LEDs: (1) 100-Mbps, (1) TX, (1) Link, (1) Full-duplex, (1) Collision, (1) RX;  
LB9019A-R4, LB9020A-R3: Per unit LEDs: (1) Power; Per TX port LEDs: (1) LINK/ACT, (1) FDX/COLL; Ports 1-6 only: LEDs: (1) IP, (1) VLAN;  
LB9002A-SC-R3, LB9002A-ST-R3: Per unit LEDs: (1) Power; Per port LEDs: (1) Link, (1) 100 Mbps, (1) TX/RX, (1) Duplex/Collision, (4) Utilization;  
LB9005A-FO-R2: Per unit LEDs: (1) Power; Per Port LEDs: (1) Link/ACT;  
LB9006A-SC, LB9006A-ST, LB9021A-LB9022A, LB9007A-SC-R3, LB9007A-ST-R3: Per unit LEDs: (1) Power; Per TX port LEDs: (1) 100/TX, (1) 10/RX, (1) FDX/COLL; Per FX Port LEDs: (1) Link, (1) Activity, (1) Full-Duplex;  
LB9017A-R4, LB9024A-R2: Per unit LEDs: (1) Power, (1) Uplink, (1) Module Enable; Per TX port: (1) 100 Mbps/TX, (1) 10 Mbps/RX, (1) Full-Duplex/Collision;  
LB9007C-ST-R2, LB9017C-SC-R2: Per unit LEDs: (1) Power; Per port LEDs: (1) 100M/TX, (1) 10M/RX, (1) FDX/Collision;  
LB9008A-FO-R2: Per unit LEDs: (1) Power; Per FX port LEDs: (1) Link, (1) Activity, (1) Full-Duplex;  
LB9217A: Per unit: (1) Power; Per Port: (1) LNK/ACT, (1) FDX/COL;  
LB9214A-LB9216A, LB9218A-LB9219A, LB9220C-SC-R2, LB9220C-ST-R2: Per unit LEDs: (1) Power; Per port LEDs: (1) Link, (1) Collision;  
LB9213A: Per unit LEDs: (1) Power; Per port LEDs: (1) Link, (1) Collision, (1) 100M;  
LB9224C: (3) LEDs: 100/TX, 10/RX, FDX/COL  
**Power** — 100-240 VAC, 50-60 Hz, autosensing  
**Size** — LB9108A-R2, LB9002A-SC-R3, LB9002A-ST-R3, LB9007A-SC-R3, LB9007A-ST-R3: 1.4"H x 10"W x 5.3"D (3.6 x 25.4 x 13.5 cm);  
LB9019A-R4, LB9020A-R3: 1.8"H x 10"W x 5.25"D (4.6 x 25.4 x 13.3 cm);  
LB9005A-FO-R2: 1.1"H x 6.3"W x 3.2"D (2.8 x 16 x 8.1 cm);  
LB9006A-SC, LB9006A-ST, LB9021A-LB9022A, LB9017A-R4, LB9024A-R2, LB9008A-FO-R2: 1.75"H (1U) x 17.3"W x 8"D (4.4 x 43.9 x 20.3 cm);  
LB9017C-SC-R2, LB9007C-ST-R2: 0.8"H x 2.5"W x 2.5"D (2 x 6.4 x 6.4 cm);  
LB9217A-R2: 1.75"H (1U) x 17.3"W x 5.1"D (4.4 x 43.9 x 13 cm);  
LB9213A-LB9216A, LB9218A-LB9219A: 1.4"H x 6"W x 4.5"D (3.6 x 15.2 x 11.4 cm);  
LB9220C-SC-R2, LB9220C-ST-R2: 1.5"H x 2"W x 4.5"D (3.8 x 5.1 x 11.4 cm)  
**Weight** — LB9108A-R2, LB9008A-FO-R2: 6.5 lb. (2.9 kg);  
LB9019A-R4, LB9020A-R3, LB9007A-SC-R3, LB9007A-ST-R3: 3.5 lb. (1.6 kg);  
LB9002A-SC-R3, LB9002A-ST-R3: 2.1 lb. (1 kg);  
LB9005A-FO-R2: 0.9 lb. (0.4 kg);  
LB9006A-SC, LB9006A-ST, LB9021A-LB9022A: 5.5 lb. (2.5 kg);  
LB9017A-R4, LB9024A-R2: 6.2 lb. (2.8 kg);  
LB9017C-SC-R2, LB9007C-ST-R2, LB9213A-LB9216A, LB9218A-LB9219A, LB9220C-SC-R2, LB9220C-ST-R2: 0.4 lb. (0.2 kg);  
LB9217A-R2: 7.5 lb. (3.4 kg)



LB9022A



LB9007A-SC-R3



LGB1000A-R2



LB9217A-R2 with  
LB9214A, LB9218A, and LB9220C-SC-R2  
modules installed

## Why Buy From Black Box? Exceptional Value. Exceptional Tech Support. Period.

### Recognize any of these situations?

- You wait more than 30 minutes to get through to a vendor's tech support.
- The so-called "tech" can't help you or gives you the wrong answer.
- You don't have a purchase order number and the tech refuses to help you.
- It's 9 p.m. and you need help, but your vendor's tech support line is closed.

According to a survey by *Data Communications* magazine, 90% of network managers surveyed say that getting the technical support they need is extremely important when choosing a vendor. But even though network managers pay anywhere from 10 to 20% of their overall purchase price for a basic service and support contract, the technical support and service they receive falls far short of their expectations—and certainly isn't worth what they paid.

At Black Box, we guarantee the best value and the best support. You can even consult our Technical Support Experts before you buy if you need help selecting just the right component for your application. Don't waste time and money—call Black Box today.

### Item

### Code

#### Express Ethernet Switches

|                     |            |
|---------------------|------------|
| 10-/100-Mbps Copper |            |
| (8) RJ-45           | LB9108A-R2 |
| (16) RJ-45          | LB9019A-R4 |
| (24) RJ-45          | LB9020A-R3 |

|                                     |                            |               |
|-------------------------------------|----------------------------|---------------|
| 10-/100-Mbps Copper, 100-Mbps Fiber |                            |               |
| 2-Port                              | (1) RJ-45, (1) Pair of SC  | LB9002A-SC-R3 |
|                                     | (1) RJ-45, (1) Pair of ST  | LB9002A-ST-R3 |
| 5-Port                              | (4) RJ-45, (1) Pair of SC  | LB9005A-FO-R2 |
| 8-Port                              | (2) RJ-45, (6) Pairs of SC | LB9006A-SC    |
|                                     | (2) RJ-45, (6) Pairs of ST | LB9006A-ST    |
|                                     | (6) RJ-45, (2) Pairs of SC | LB9021A       |
|                                     | (6) RJ-45, (2) Pairs of ST | LB9022A       |
|                                     | (7) RJ-45, (1) Pair of SC  | LB9007A-SC-R3 |
|                                     | (7) RJ-45, (1) Pair of ST  | LB9007A-ST-R3 |

|  |            |
|--|------------|
| 10-/100-Mbps Copper, 100-Mbps Fiber, Modular |            |
| (16) RJ-45, (1) RJ-45 Console Port,          |            |
| (1) Slot for Optional Fiber Uplink           | LB9017A-R4 |
| (24) RJ-45, (1) RJ-45 Console Port,          |            |
| (1) Slot for Optional Fiber Uplink           | LB9024A-R2 |

For fiber uplinks on LB9017A-R4 or LB9024A-R2, order...

|                        |               |
|------------------------|---------------|
| 100-Mbps Fiber Modules |               |
| SC                     | LB9017C-SC-R2 |
| ST®                    | LB9007C-ST-R2 |

|  |             |
|--|-------------|
| 10-/100-Mbps Copper, Modular Managed     |             |
| (24) RJ-45 Ports, (2) Slots for Optional |             |
| 100BASE-SX Fiber Uplink                  | LGB1000A-R2 |

◆ Includes (1) switch and (1) rackmount kit.

For the LGB1000A-R2 Gigabit slots, order...

|                         |          |
|-------------------------|----------|
| 100BASE-SX Fiber Module | LGB1001C |
|-------------------------|----------|

|  |            |
|--|------------|
| 10-/100-/1000-Mbps Copper with (4) SFP Ports |            |
| (16) RJ-45                                   | LGB316A-R2 |
| (24) RJ-45                                   | LGB324A-R2 |

|                                   |               |
|-----------------------------------|---------------|
| 100-Mbps Fiber, (8) 100BASE-FX SC | LB9008A-FO-R2 |
| Modular Express Ethernet Switch   | LB9217A-R2    |

#### Modules for LB9217A-R2

|                                 |         |
|---------------------------------|---------|
| 8-Port 100BASE-FX Fiber Modules |         |
| ST                              | LB9214A |
| SC                              | LB9215A |

|   |         |
|---|---------|
| 2-Port 100BASE-FX Fiber, 6-Port 10-/100-Mbps, RJ-45 Modules |         |
| ST  | LB9216A |
| SC  | LB9218A |
|   | LB9213A |

|   |         |
|---|---------|
| 8-Port 10-/100-Mbps RJ-45 Module                |         |
| 4-Port 100BASE-FX SC Fiber, 4-Port 10-/100-Mbps |         |
| ST/RJ-45 Module                                 | LB9210A |
| SC/RJ-45 Module                                 | LB9219A |

|   |               |
|---|---------------|
| 1-Port 100BASE-FX Fiber Modules for Half-Slot |               |
| SC  | LB9220C-SC-R2 |
| ST  | LB9220C-ST-R2 |

|  |         |
|--|---------|
| 1-Port 100BASE-TX RJ-45 Module for Half-Slot |         |
| RJ-45  | LB9224C |