



JANUARY 2003

LB8505A

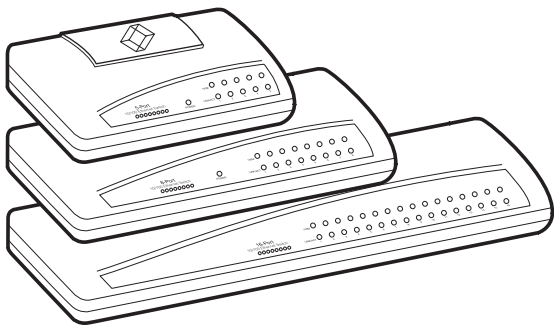
LB8508A

LB8516A

# 5-Port 10/100 Ethernet Switch

# 8-Port 10/100 Ethernet Switch

# 16-Port 10/100 Ethernet Switch



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## CUSTOMER SUPPORT INFORMATION

Order **toll-free** in the U.S.: Call **877-877-BBOX** (outside U.S. call **724-746-5500**)

FREE technical support 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**

Mailing address: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018

Web site: [www.blackbox.com](http://www.blackbox.com) • E-mail: [info@blackbox.com](mailto:info@blackbox.com)



**FEDERAL COMMUNICATIONS COMMISSION  
and INDUSTRY CANADA  
RADIO FREQUENCY INTERFERENCE STATEMENTS**

*Class B Digital Device.* This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.

## 10/100 ETHERNET SWITCHES

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an experienced radio/TV technician for help.

### CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To meet FCC requirements, shielded cables and power cords are required to connect this device to a personal computer or other Class B certified device.

*This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.*

*Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.*

**Normas Oficiales Mexicanas (NOM)  
Electrical Safety Statement**

**INSTRUCCIONES DE SEGURIDAD**

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:
- A: El cable de poder o el contacto ha sido dañado; u
  - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
  - C: El aparato ha sido expuesto a la lluvia; o
  - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
  - E: El aparato ha sido tirado o su cubierta ha sido dañada.



## **EUROPEAN UNION DECLARATION OF CONFORMITY**

This equipment complies with the requirements of the European EMC Directive 89/336/EEC.



### TRADEMARKS USED IN THIS MANUAL

*Any trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.*

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# 1. Specifications

**Buffer:** LB8505A: 128 KB;  
LB8508A: 256 KB;  
LB8516A: 512 KB

**Filtering and Forwarding Rate:** 148,800 pps

**MAC Address Table:** LB8505A: 1K;  
LB8508A, LB8516A: 8K

**Standards:** IEEE 802.3 10BASE-T, IEEE 802.3u  
100BASE-TX

**Switching Architecture:** Store and forward

**Connectors:** LB8505A: (5) RJ-45;  
LB8508A: (8) RJ-45; LB8516A: (16) RJ-45

**Indicators:** All models: (1) Power LED;  
LB8505A: (10) LEDs: Per port:  
(1) Link/Activity, (1) 100 M;  
LB8508A: (16) LEDs: Per port:  
(1) Link/Activity, (1) 100 M;  
LB8516A: (32) LEDs: Per port:  
(1) Link/Activity, (1) 100 M

**Power:** 120 VAC, 60 Hz, external power supply;  
Input Power: LB8505A, LB8508A: 12 VDC,  
0.5 amp, LB8516A: 12 VDC, 1 amp

**Size:** LB8505A: 1.3"H x 5"W x 3.3"D

(3.3 x 12.7 x 8.4 cm);

LB8508A: 1.4"H x 7.4"W x 3.9"D

(3.6 x 18.8 x 9.9 cm);

LB8516A: 1.4"H x 11.4"W x 3.9"D

(3.6 x 29 x 9.9 cm)

**Weight:** LB8505A: 0.4 lb. (0.2 kg);

LB8508A: 0.6 lb. (0.3 kg);

LB8516A: 1.1 lb. (0.5 kg)

## **2. Introduction**

### **2.1 Description**

The 10/100 Ethernet Switch provides extra Fast Ethernet ports to segment network traffic, extend Fast Ethernet connection distance, and convert data packets between different transmission speeds. All of the UTP ports on the switch support MDI/MDI-X, so you can connect either a straight-through or crossover cable to another switch or hub.

Three models are available. The LB8505A has 5 shielded, auto-negotiating 10BASE-T/100BASE-TX RJ-45 ports. The LB8508A has 8 RJ-45 ports, and the LB8516A has 16. All of the switch's UTP ports support full and half-duplex modes. When running in half-duplex mode, ports configured as 10BASE-T provide 10 Mbps of bandwidth; ports configured as 100BASE-TX give you 100 Mbps of bandwidth. In full duplex mode, this bandwidth doubles. Ports configured as 10BASE-T give you 20 Mbps of bandwidth; ports configured as 100BASE-TX provide 200 Mbps of bandwidth. The switch is

typically used to segment network traffic. This can improve the network performance by increasing the total bandwidth, as illustrated in Figure 2-1.

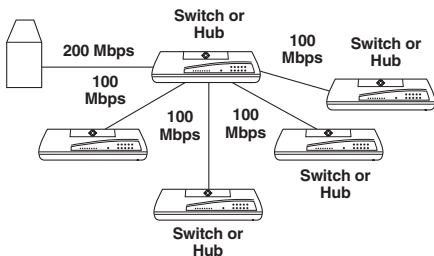


Figure 2-1. Increasing network bandwidth.

The switch uses store-and-forward switching architecture. It filters and forwards data after the complete data packet is received, examined, and determined to be free of errors.

Each individual port has (1) 100M LED and (1) Link/Activity LED. This compact switch fits neatly on a desktop, mounted on a wall, or mounted on the side of a desk.

## 10/100 ETHERNET SWITCHES

The front and back panels of the 5-Port 10/100 Ethernet Switch are shown in Figure 2-2.

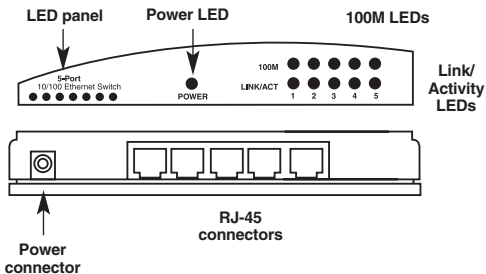
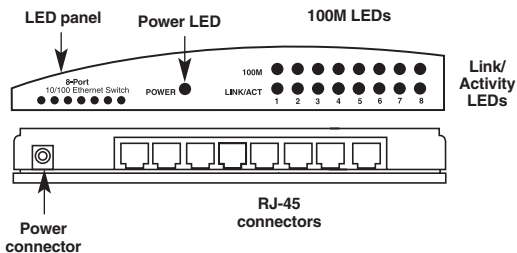


Figure 2-2. 10/100 Ethernet Switch, 5-Port.



The front and back panels of the 8-Port 10/100 Ethernet Switch are shown in Figure 2-3.



**Figure 2-3.** 10/100 Ethernet Switch, 8-Port.

## 10/100 ETHERNET SWITCHES

The front and back panels of the 16-Port 10/100 Ethernet Switch are shown in Figure 2-4.

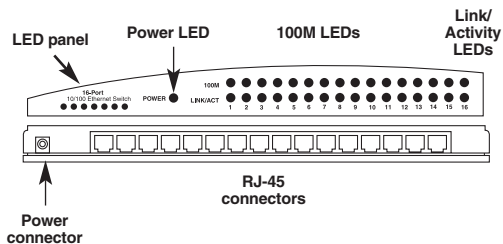


Figure 2-4. 10/100 Ethernet Switch, 16-Port.

Table 2-1 describes the LEDs on the 10/100 Ethernet Switches shown in Figures 2-2 through 2-4.

**Table 2-1. LED descriptions.**

<b>LED</b>	<b>Color</b>	<b>Status</b>	<b>Description</b>
Power	Green	On	Power is supplied.
		Off	No power.
LNK/ACT (Link/ Activity)	Green	On	A valid link is established.
		Flashing	Data packets received.
		Off	No link is established.
SPEED (100M)	Yellow	On	Port is running at 100 Mbps.
		Off	Port is running at 10 Mbps.

### 2.2 Features

- Complies with IEEE 802.3 10BASE-T Ethernet and 100BASE-TX Fast Ethernet standards.
- Simple and economical way to bridge a 10BASE-T network and a 100BASE-TX network.
- Easily connect Fast Ethernet hubs or segments.

### 2.3 What the Package Includes

Your package should include the following items.

- (1) 10/100 Ethernet Switch
- (1) External power supply
- This users' manual

If anything is missing or damaged, please contact Black Box at 724-746-5500.

## 3. Installation

### 3.1 Choosing the Proper Environment

Install and operate the switch within the limits of the specified temperature and humidity tolerance (see **Chapter 1**). Don't place objects on top of the switch or obstruct the switch's side vents. Also, don't position the switch near any heating source such as a heater, radiator, or in direct exposure to the sun. Protect the switch from water and moisture. If necessary, use a dehumidifier to reduce humidity.

### 3.2 Connecting to Network Devices

The RJ-45 ports on the switch support Auto-MDI/MDI-X, so you can use either straight-through or crossover cable to connect the switch to a workstation or hub.

Connect one end of the network cable to the RJ-45 port on the switch's rear panel. Connect the other end of the cable to the network device's RJ-45 port. Repeat this procedure until you've connected all of the switch's RJ-45 ports.

The UTP network cables must comply with EIA/TIA-568 specifications and the Category 5 standard for 100 Mbps data transmission. The maximum length of UTP cable allowed between the switch and a connected device is 100 m (328 ft.). Once the network cable is connected to the 10/100 Ethernet Switch and the networking device and the attached device is powered on, the green LNK/ACT LED should light.

### **3.3 Connecting the Power**

Connect the output end of the power adapter to the power connector on the rear panel of the switch. Connect the power adapter to a power outlet. The green Power LED on the front panel should light.

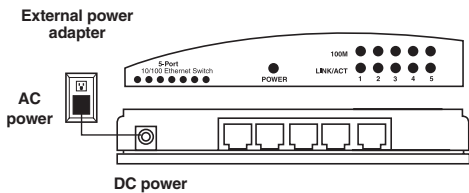


Figure 3-1. Connecting the power adapter.

## 4. Troubleshooting

### 4.1 Problems/Solutions

**Problem:** The Power LED is not lit.

**Solution:** Is the power cord properly connected to the external power adapter and the power outlet? Make sure the DC power jack is firmly plugged into the power socket of the switch.

**Problem:** The Link/Activity LED is not lit when connected to the 100-Mbps device.

**Solution:**

1. Is the network device's power switch attached to the switch? Is it turned on?
2. Check the network cable. Is it properly connected to the switch and the network device?
3. Make sure that the network UTP cables comply with EIA/TIA 568 and Category 5 specifications.



## **4.2 Calling Black Box**

If you determine that your 10/100 Ethernet Switch is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

### 4.3 Shipping and Packaging

If you need to transport or ship your 10/100 Ethernet Switch:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the 10/100 Ethernet Switch for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Authorization (RA) number.



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