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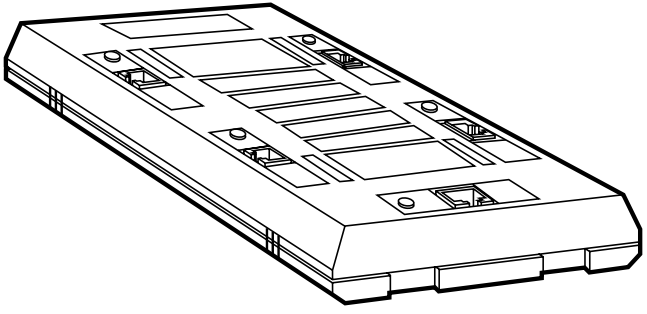
BLACK BOX®
NETWORK SERVICES

MARCH 1997

LT0007A-2U LT0007A-4U
LT0007A-2SU LT0007A-4SU

Smart Lobe Access Unit



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** • E-mail: **info@blackbox.com**

FEDERAL COMMUNICATIONS COMMISSION AND INDUSTRY CANADA RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

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

This digital apparatus does not exceed the Class A 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 A 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 fisica 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 lineas de energia.

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 objectos liquidos 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: Objectos 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.

TRADEMARKS USED IN THIS MANUAL

IBM is a registered trademark of International Business Machines Corporation.

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

DECLARATION OF CONFORMITY

The products listed in this manual conform to the following standard(s) or other normative document(s):

EMC: EN 55022 (1994): Limits and methods of measurement of radio disturbance characteristics of information technology equipment.

EN 50082-1 (1992): Electromagnetic compatibility—Generic immunity standard for residential, commercial, and light industry.

Supplementary Information: The products herewith comply with the requirements of the EMC Directive 89/336/EEC. The products were tested in a typical configuration.

1. Specifications

Unit Characteristics:

Input Voltage —	11 to 35 VDC (12 VDC typical)
Input Current —	100 mA @ 12 VDC (2-Port units); 140 mA @ 12 VDC (4-Port units)
Operating Current —	140 mA @ 5 VDC (2-Port units); 240 mA @ 5 VDC (4-Port units)

Phantom Circuit:

Operating Voltage —	4.5 ±0.7 volts
Operating Current —	1.0 mA @ 5 VDC
Resistance TX to RX —	4.8 ±0.2 kΩ
Insertion Time —	5 milliseconds (typical)
Removal Time —	5 milliseconds (typical)

Insertion Loss (Maximum) —

	0.5–4 MHz	4–16 MHz	16–32 MHz
SUB TX to SUB RX	0.65 dB	1.3 dB	2.6 dB
MAIN RX to SUB RX	0.85 dB	1.8 dB	3.7 dB
SUB TX to MAIN TX	0.85 dB	1.8 dB	3.7 dB

Crosstalk (Maximum) —

	10 KHz	0.5–4 MHz	4–16 MHz
SUB TX to SUB RX	55 dB	43 dB	37 dB
SUB WRAP to MAIN	50 dB	40 dB	35 dB

Pinout Signal —

	IBM Cabling System	RJ-45
RCV	Red	Pin 4
	Green	Pin 5
XMT	Orange	Pin 6
	Black	Pin 3
SHIELD		Pins 7 & 8
POWER FEED		
+V		Pin 1
-V		Pin 2

Radiation Suppression — Complies with FCC Par 15, subpart B, class A; EN55022 class A

Jumper —	4- or 16-Mbps rate selection (4M/16M)
Electrical Connectors —	*For UTP:* MAIN and lobes: RJ-45 jack; *For Screened UTP:* MAIN and lobes: Shielded RJ-45 jack
Indicators —	(3) or (5) Red LEDs, depending on which unit you have
Operating Temperature —	32 to 122°F (0 to 50°C)
Relative Humidity Tolerance —	10 to 90%, noncondensing
Size —	1.5"H x 4.5"W x 7.3"D (3.8 x 11.4 x 18.5 cm)
Weight —	12 oz. (340 g)

2. Introduction

2.1 Description

The Smart Lobe Access Unit allows connection of two or four token-ring workstations to a single lobe. Token-ring-network flexibility is increased by enabling users to expand the topology in a more cost-effective way. Cabling needs and installation costs are reduced by allowing workstations to be added to the ring without the need for additional lobe cables to the central hub.

Wire-fault detection, which senses any short, open, or illegal impedance in the main lobe connection, is incorporated. If a fault is detected, the Smart Lobe Access Unit deinserts all connected workstations.

The Smart Lobe Access Unit is powered from an external DC power adapter via modular power jack, or via the MAIN connector. In the latter case, 6-wire cabling is required.

There are four models—two- and four-port versions for either ordinary UTP cabling or "screened" UTP cabling. "Screened" UTP has some shielding, but has the same electrical characteristics as regular UTP

cabling. To get Screened UTP cabling from Black Box, ask for Product Code SVNSL60 (stranded) or EVNSL71 (solid, plenum-rated).

2.2 The 2-Port Smart Lobe Access Unit

The 2-Port Smart Lobe Access Unit has three ports, each using RJ-45 connectors for UTP or RJ-45 shielded connectors for screened UTP. Their functions are explained in the table below.

Table 2-1. 2-Port Smart Lobe Access Unit Functions

Port Name		Type	Function
MAIN	(UTP) (Screened UTP)	RJ-45 RJ-45 Shielded	Connection of unit to lobe.
SUB-1	(UTP) (Screened UTP)	RJ-45 RJ-45 Shielded	Connection of workstation #1 to unit.
SUB-2	(UTP) (Screened UTP)	RJ-45 RJ-45 Shielded	Connection of workstation #2 to unit.

2.3 The 4-Port Smart Lobe Access Unit

The 4-Port Smart Lobe Access Unit has five ports, each using RJ-45 connectors for UTP or RJ-45 shielded connectors for screened UTP. Their functions are explained in the table below.

Table 2-2. 4-Port Smart Lobe Access Unit Functions

Port Name		Type	Function
MAIN	(UTP) (Screened UTP)	RJ-45 RJ-45 Shielded	Connection of unit to lobe.
SUB-1	(UTP) (Screened UTP)	RJ-45 RJ-45 Shielded	Connection of workstation #1 to unit.
SUB-2	(UTP) (Screened UTP)	RJ-45 RJ-45 Shielded	Connection of workstation #2 to unit.
SUB-3	(UTP) (Screened UTP)	RJ-45 RJ-45 Shielded	Connection of workstation #3 to unit.
SUB-4	(UTP) (Screened UTP)	RJ-45 RJ-45 Shielded	Connection of workstation #4 to unit.

2.4 Applications

The Smart Lobe Access Unit's primary application is to double or quadruple a single lobe's capacity. Using the Smart Lobe Access Unit reduces cabling costs. If there is a wire fault, the entire lobe access unit is removed from the main ring. A typical application using Smart Lobe Access Units is described in the illustration below.

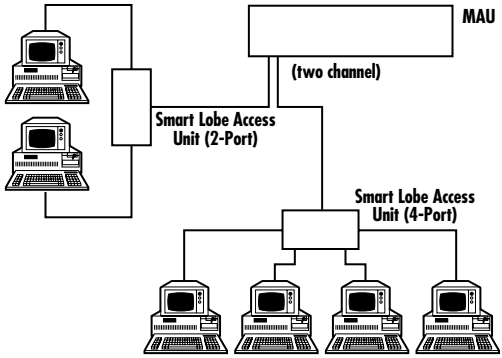


Figure 2-1. Typical Application of the Smart Lobe Access Unit.

A single 2-Port Smart Access Lobe enables connection of two workstations to a lobe or a single 4-Port Smart Access Lobe enables connection of four workstations to a lobe. A typical application is shown in the illustration on the next page. The main lobe cable (L) running from the distribution panel located at the wiring closet to the faceplate located at the workstation's area is low-cost unshielded IBM® Type 3 cable or screened UTP cable. All patching cables (P) are IBM Type 3 cable or screen UTP cable.

NOTE

The maximum lengths stated below are the "general rule." These lengths may be exceeded in rings where the topology allows.

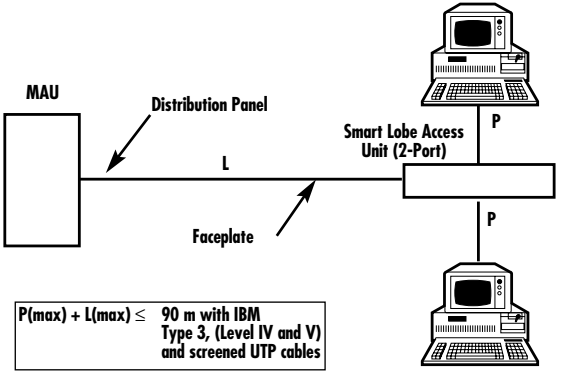


Figure 2-2. Recommended Maximum Cable Lengths (16 Mbps).

3. Installation

3.1 Site Preparation

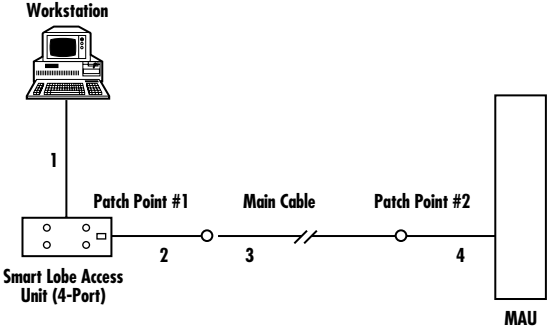


Figure 3-1. Smart Lobe Access Unit Application.

UTP (USING RJ-45 CONNECTORS)

Use a standard four-position (two twisted pairs) UTP or screened UTP cables for all connections.

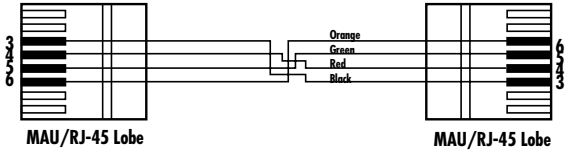


Figure 3-2. Cable Wiring.

REMOTE POWER FEEDING

The illustration below shows an example using 8-wire UTP cabling.

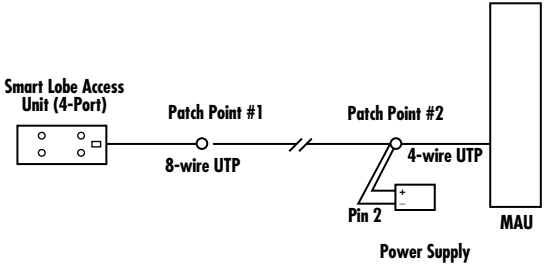


Figure 3-3. 8-Wire UTP Application.

Connect pin 1 of the eight-wire UTP cable to the positive terminal and pin 2 of the eight-wire UTP cable to the negative terminal of the power supply.

3.2 Set-Up Procedures

The Smart Lobe Access Unit has a rate-selection jumper, set to either 4 or 16 Mbps, that can be accessed by opening the unit box. The CPU refers to this selection after power-up. The factory-default setup is 16 Mbps.

Connect the unit to an external 11–35 VDC adapter (typically a 12-VDC, 300-mA adapter).

Remote feeding can be used as a primary or backup power source when using 8-wire UTP (see Figure 3-3).

3.3 Electrical Installation

Connect the Smart Lobe Access Unit to an external 11–35 VDC power source. Connect the cable between the unit's MAIN connector and the MAU. Connect the cable between the unit's SUB connector and the workstation's token-ring adapter card port.

4. Operation

When all required connections are made (as described in **Chapter 3**), the unit's operation becomes completely automatic and unattended. Upon request of the token-ring adapter card, the Smart Lobe Access Unit inserts the corresponding workstation into the network ring, lighting the LED adjacent to the connector. When a workstation removes itself from the active ring, the corresponding LED turns off.

A flashing LED indicates that management has disabled the lobe or that rate-detection circuitry has detected a mismatch between the station bit rate and the LAN bit rate or a physical disconnection between the Access Unit and the MAU.

The 4M or 16M LEDs are ON depending on the rate set by the rate-selection jumper.

5. Troubleshooting

5.1 Fault Isolation and Troubleshooting

Since this unit is logically controlled by a CPU, here are the things to try if there is any malfunction: 1) Disconnect and then reconnect the power to the unit; 2) Verify that the unit is performing a short test to the LEDs; 3) If the problem reoccurs, call for technical support.

SYMPTOM	ACTION
Corresponding LED is ON. Workstation remains out of the ring (network).	1. Check the switch for proper position. 2. If the problem still exists, disconnect all cables from the unit and repeat set-up procedures. Check all cables for proper wiring; then reconnect all cables back to the unit and resume operation.
Corresponding LED is OFF.	1. Check the cable attached to the port for proper wiring and connections. 2. If the problem still exists, disconnect all cables from the unit and repeat set-up procedures.

SYMPTOM	ACTION
LED is flashing; repeating clicks are heard from the unit.	1. Check whether the 4-position data connector is connected to the MAU. 2. If the problem still exists, check the cable running from the Smart Lobe Access Unit's MAIN to the MAU for a possible short circuit. If a short circuit is found, replace the cable.

If any of these problems still exist after trying the recommended action, call your supplier.

5.2 Calling Black Box

If you determine that your Smart Lobe Access Unit is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Call Black Box Technical Support at 724-746-5500.

Before you do, make a record of the history of the problem. We'll 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.

5.3 Shipping and Packaging

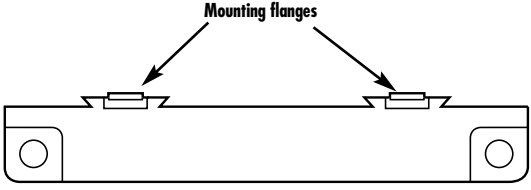
If you need to transport or ship your Smart Lobe Access Unit:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the Smart Lobe Access Unit for repair, make sure you include everything that came in the original package. Before you ship, call Technical Support to get a Return Authorization (RA) number.

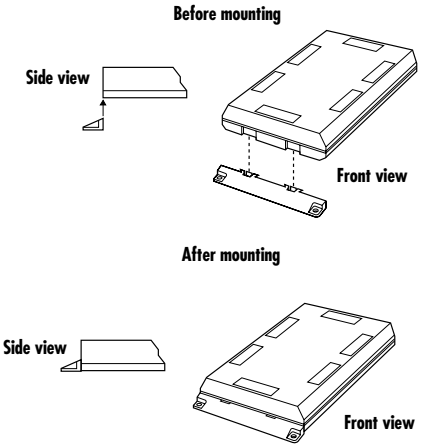
Appendix: Bracket Assembly

1) The K-10 case is provided with two mounting brackets, which mate with a pair of slots on each end of the K-10 case.

2) Each bracket has a pair of flanges that slide into the K-10 case slots.



3) To attach the brackets, the device must be held facing upward while the bracket flanges are firmly slid into their slots on the K-10 case. When slid all the way, the brackets snap into a locked position.



4) *Do not* place the device face down on a hard surface to insert the brackets, since this can cause internal damage or damage to connectors.