

January, 2003  
LE2041A-R5  
LE2006A-R3

## Black Box Mini-Transceivers Installation & User Guide

### TECHNICAL SPECIFICATIONS

#### PERFORMANCE

Data Rate: 10 Mbits/second

#### NETWORK STANDARDS

Ethernet V1.0 and 2.0, IEEE 802.3:  
10BASE-T, 10BASE2

#### MECHANICAL

Enclosure: High strength fabricated metal  
Dimensions: LE2041A-R5: 2.4 in x 1.7 in x 0.75 in  
(6.1 cm x 4.3 cm x 1.70 cm)  
LE2006A-R3: 2.1 in x 1.6 in x 0.6 in  
(5.5 cm x 4.2 cm x 1.8 cm)  
Weight: LE2041A-R5: 2.77 oz. (80.9g)  
LE2006A-R3: 2.88 oz. (81.7 g)

#### MEDIA INTERFACES

TP (10BASE-T): RJ-45 mod. 8-pin female connector  
BNC (10BASE2): Standard BNC connector, Slim-line  
AUI: D-Sub 15-pin D-type Male (w/slide lock)

#### OPERATING ENVIRONMENT

Ambient temperature: 32° - 122 F° (0° - 50° C)  
Ambient relative humidity: 5% to 95%  
(non-condensing)

#### SAFETY APPROVALS

UL Listed (UL 1950) EMI: Meets FCC  
Class A standard  
Made in USA

Black Box Mini-Transceivers are equipped with an AUI port and either a 10BASE-T (RJ-45) connector or a BNC (10BASE2) connector. The AUI port can be used to connect directly to the workstation or device in most cases. If this is not possible, an AUI drop cable (which does not exceed 3 feet in length) can be used.

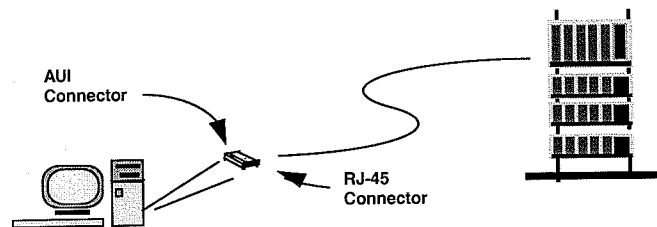


Figure 1: Black Box Mini Transceivers Provides Connectivity Between Workstation and 10BASE-T Network

### OPERATION

The function of a Black Box Mini-Transceivers converts the station signal to appropriate network media; i.e. it converts traffic signaling between station signaling and 10BASE-T signaling.

The LE2041A-R5, Twisted Pair Mini-Transceiver is designed to connect an existing AUI device to a 10BASE-T (TP) network. (Note: By using a shielded AUI extension cable, and selecting RED SQUELCH function switch to ON position, the unit can be used on shielded twisted pair (STP) networks.)

The LE2006A-R3, 10BASE2 ThinNet Mini-Transceiver is intended to be used with ThinNet coaxial, 50 Ohm, RG-58 A/U cable. Cable runs should not exceed 180 meters in total length. A 50 Ohm terminator is required at both ends of the segment. Taps should be at least 0.5 meters apart.

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### LED/SWITCH SETTING DESCRIPTION & OPERATION

Each Black Box Mini-Transceiver is equipped with switches and LEDs to allow for configuration and quick visual assessment of its operating condition.

#### Black Box LE2041A-R5

LED	Color	Indication (when lit)
LK	green	Connectivity established / normal operation
RX	green	Data is being received from attached segment; flashes to indicate data traffic
COL	yellow	Collision has occurred
JAB	yellow	Indicates a jabber (illegal packet length) condition
TX	green	Data is currently transmitted by attached station
POL	yellow	Polarity error on the TP segment.
PWR	green	Unit receiving power

#### SWITCH SETTING

LINK	On=10BASE-T; Off=Starlan 10 (ATT) polarity on the segment.
FDX/HDX	On=Full duplex Off=Half duplex
SQE	ON=Enables, OFF= Disables the SQE Test feature
LX/SX	ON=Shielded Twisted pair(STP) OFF= Unshielded Twisted Pair(UTP)

#### FACTORY SETTING OF SWITCHES

LINK	On
FDX/HDX	Off
SQE	Off
LX/SX (Low receipt threshold)	Off

#### 10BASE-T MODULAR JACK PINOUT

RJ45 PIN	SIGNAL	RJ45 PIN	SIGNAL
1	Transmit Data +	5	no connection
2	Transmit Data -	6	Receive Data -
3	Receive Data +	7	no connection
4	no connection	8	no connection

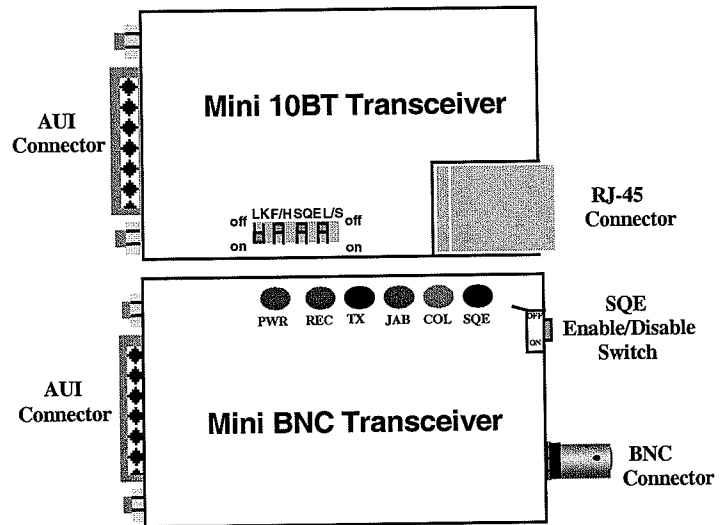


Figure 2: Front View – Black Box LE2041A-R5 & LE2006A-R3

#### Black Box LE2006A-R3

LED	Color	Indication (when lit)
PWR	green	Unit receiving power
REC	green	Data is being received from attached segment; flashes to indicate data traffic
TX	green	Data is currently transmitted by attached station
JAB	yellow	Indicates a jabber (illegal packet length) condition
COL	yellow	Collision has occurred
SQE	yellow	SQE enabled

#### SWITCH SETTING

SQE	Enables or Disables the SQE Test feature
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#### CUSTOMER SUPPORT INFORMATION

Order toll-free in the U.S. 24 hours, 7 A.M. Monday to midnight Friday: 877-877-BBOX  
FREE technical support, 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746  
Mail order: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018  
Web site: www.blackbox.com • E-mail: info@blackbox.com

**FACTORY SETTING OF SWITCH**  
SQE On

**POWER REQUIREMENTS**

The Black Box Mini-Transceiver derives power directly from the AUI port on the device to which it is connected. No external power supply is required.

**WORKSTATION INSTALLATION**

Black Box Mini-Transceivers attach directly to the AUI connector of the workstation. Note the following table of pin assignments for the AUI connector:

**Table 1: Pin Assignments for Ethernet Electrical Connectors**

Pin	Function	Pin	Function
1	Control in Circuit Shield	9	Control in Circuit B
2	Control in Circuit A	10	Data out Circuit B
3	Data out Circuit A	11	Data out Circuit shield
4	Data in Circuit Shield	12	Data in Circuit B
5	Data in Circuit A	13	Voltage Plus (+)
6	Voltage Common	14	Voltage Shield
7	Control out Circuit A	15	Control out Circuit B
8	Control out Circuit ShieldSHELL (conductive shell)		Protective Ground

- NOTES: 1) Voltage Plus (pin #13) and Voltage Common (pin #6) use a single twisted pair in the AUI cable  
2) Pins 4, 8, 11, and 14 may be connected to pin #1

**10BASE-T Wiring Connection - Twisted Pair Segment**

The following procedure describes how to connect a 10BASE-T twisted pair segment to the LE2041A-R5. The procedure is the same for both unshielded and shielded twisted pair segments.

- 1) Using standard 10BASE-T media, insert either end of the cable with an RJ-45 plug into the RJ-45 connector. Note that, even though the TP connector is shielded, either unshielded or shielded 10BASE-T cables and wiring may be used.
- 2) Connect the other end of the cable to the corresponding network device.
- 3) When proper connection and power have been established, the LE2041-R5's LINK LED will illuminate GREEN.

**BNC Connection - ThinNet Segment**

The following procedure describes how to connect a ThinNet (10BASE2) segment to a LE2006A-R3.

- 1) Attach a ThinNet BNC "T" connector to the BNC connector of the LE2006A-R3's.
- 2) Attach the ThinNet cable to each side of the "T" connector.
- 3) Ensure that the ThinNet cable segment is terminated with a cable terminator at both ends.

**TROUBLESHOOTING**

If difficulty is encountered during installation or operation, double check instructions and specifications as mentioned on previous page. Also, verify the following:

- 1) Cables/connectors: Check that they have been properly connected -- wires & cables not crimped or impaired.
- 2) Power to unit: Use PWR LED to verify that unit is receiving power
- 3) Problem isolated to Mini-Transceiver: Replace with a known working device. Verify if the problem has been corrected.

If problem continues after completing all above steps, contact Black Box Tech Support for assistance.

**CALLING BLACK BOX FOR ASSISTANCE**

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

Black Box will be able to provide more efficient and accurate assistance if you have a complete description, including:

- a. The nature and duration of the problem
- b. when the problem occurs
- c. The components involved in the problem
- d. Applications that appear to create problems or make the problems worse

**Shipping and Packaging Information**

If you need to transport or ship your Mini Fiber Transceiver:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the Mini Fiber Transceiver for repair, make sure you include everything that was in the original package. Before you ship, contact Black Box to get a Return Authorization (RA) number.

Ship the package to:

Black Box Corporation  
1000 Park Drive, Lawrence, PA 15055  
ph: (724) 746-5500 Fax: (724) 746-0746

**FEDERAL COMMUNICATIONS COMMISSION  
AND**

**CANADIAN DEPARTMENT OF COMMUNICATIONS  
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 the Canadian Department of Communications. Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.*

Black Box Mini Fiber Transceivers are designed and made in the USA.

**Black Box Corp.**  
**1000 Park Drive**  
**Lawrence, PA 15055**  
**phone: (724) 746-5500**  
**fax: (724) 746-0746**

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