



LAN Pro LAN Pro Kit

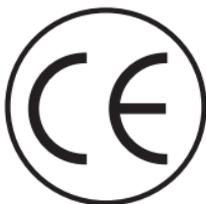


CUSTOMER SUPPORT INFORMATION

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

EUROPEAN UNION DECLARATION OF CONFORMITY

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



**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 líneas 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 objetos 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: 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.

TRADEMARKS USED IN THIS MANUAL

BLACK BOX and the  logo are registered trademarks of Black Box Corporation.

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

Contents

Chapter	Page
1. Specifications	6
2. Introduction	8
3. Operation	11
3.1 Conventions, Precautions, and Limitations	11
3.2 Testing UTP, STP, or Coax Cables	12
3.2.1 Possible Results for UTP Cables	14
3.2.2 Possible Results for STP Cables	15
3.2.3 Fault-LED Patterns at the Remote Unit for UTP and STP Cables	16
3.2.4 Possible Results for Coax Cables	17
3.3 Fault-Checking to Troubleshoot UTP or STP Cables	19
3.4 Tone Mode	20
3.5 Automatic Shutoff	24
4. If You Have Problems	25
4.1 Calling Black Box	25
4.2 Shipping and Packaging	26

1. Specifications

Compliance — CE

Interfaces — To coaxial and twisted-pair cable intended for any of a number of network types; refer to Figure 2-1

Output Signal — DC, 2-MHz pulse

User Controls — (2) Pushbuttons on local unit: ON/TEST and FAULT CHECK/TONE

Indicators —

Local unit: (13) Front-mounted LEDs;

Remote unit: (5) Front-mounted LEDs;

Refer to the remainder of this manual for how to interpret these

Connectors — Both the local and remote units: (1) BNC female (for coax) and (1) RJ-45 female (for twisted pair)

Temperature Tolerance — 32 to 122°F (0 to 50°C)

Humidity Tolerance — Up to 90% noncondensing

Power —

Local unit: From (1) 9-VDC battery (included); standard non-alkaline battery should last through an average of about 1000 tests;

Remote unit: Powered by signal from local unit

Size —

Local unit: 3.5"H x 2.9"W x 1.4"D (8.9 x 7.4 x 3.6 cm);

Remote unit: 3.4"H x 1.7"W x 1.4"D (8.6 x 4.3 x 3.6 cm)

Weight —

Local unit: 5.6 oz. (159 g);

Remote unit: 1.6 oz. (45 g)

Full TD050A-KIT: 1.2 lb. (0.5 kg)

2. Introduction

The LAN Pro might be the fastest and easiest cable tester that you'll ever use. It's ideal for testing the continuity of data, telephone, and coaxial cables as much as 328 ft. (100 meters) long. If you use it with twisted-pair or telephone cable, it can test these common network types:

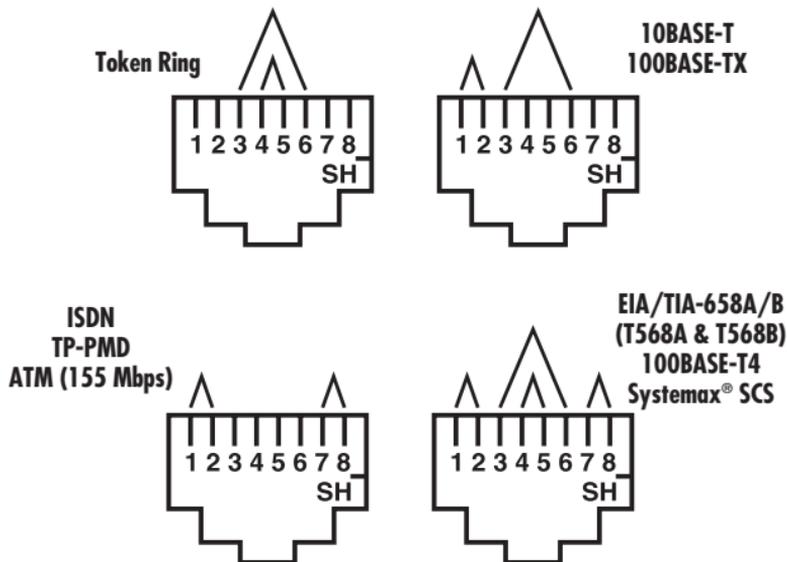


Figure 2-1. Supported network types.

If you ordered just the LAN Pro (product code TD050A), you should have received the tester local unit, the tester remote unit, two short RJ-45 patch cables, and two interchangeable belt clips. If you ordered the LAN Pro Kit (product code TD050A-KIT), you should also have received two short BNC coaxial patch cables, two CATV “F” female to BNC male adapters, one BNC female/female coupler, and an RJ-45 female/female coupler, all in a handsome carry case. If you didn’t receive everything, or if anything arrived damaged, call Black Box right away.

Here are some of the LAN Pro’s useful features:

- Can detect “split pairs” on cabling not less than 6 ft. (1.8 m) long, out to its maximum all-purpose testing distance of 328 ft. (100 m).
- Can also detect opens, shorts, crossed connections, and transposed pairs.
- Can test CAT4, CAT5, CAT5e, and CAT6 shielded and unshielded twisted-pair cables for proper pairing to EIA/TIA-568A and -568B standards.
- Can test both 50-ohm and 75-ohm coaxial cables.
- Test results are indicated by LEDs on both the local and remote units.

- Can generate an oscillating audio tone for tracing cables using remotes or tone probes.
- Either do a “quick test” (simple “pass” or “fail” indication) in one second, or use the “fault check” and/or “tone” functions to troubleshoot cable failures and trace wire pairs.
- Automatic shutdown conserves battery life.
- Uses standard 9-volt batteries; one is included.

3. Operation

3.1 Conventions, Precautions, and Limitations

Before you operate the LAN Pro, here are some things you should keep in mind:

- In this chapter, empty circles represent dark LEDs; plain solid circles represent steadily lit LEDs; and solid circles with spokes radiating from them represent flashing LEDs. Refer to Figure 3-1.

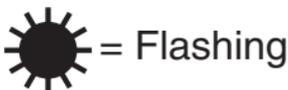
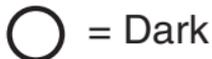


Figure 3-1. Representations of the LEDs.

- Make sure a working battery is installed in the local unit before trying to operate it. If the local unit doesn't begin operating when you press the ON/TEST button, unscrew the screw on the local unit's rear panel that holds the cover of the battery compartment on, install a new battery, replace the cover, and screw the cover back on.
- Aside from opening the battery compartment when necessary, *never* open the local unit's case.

- Don't use the LAN Pro in any environment where it might get wet.
- If you want to attach the included belt clips, use the included extra screw to attach one of the clips to the local unit. To attach the other clip to the remote unit, use the screw already attached to the back of the unit. (The two belt clips are interchangeable.)
- This test system does *not* test for network frequency, NEXT or other types of crosstalk, decibel level, data packets, or transmission rate. It especially doesn't indicate that a circuit is live—do *not* connect it to a live circuit, you could damage it.
- In order for the LAN Pro to successfully test a cable for split pairs, the cable must be at least 6 ft. (1.8 m) long. The LAN Pro can give misleading results for cables shorter than that.

3.2 Testing UTP, STP, or Coax Cables

- 1A. If you're testing uninstalled cable, attach the local unit and remote unit to opposite ends of the cable.
- 1B. If you're testing an installed cabling link, use one of the included patch cables to connect the local unit to the patch panel you're testing from. Use the other included patch cable to connect the

remote unit to the wall jack where the link you're testing is terminated. *Never* attach the tester to a live (powered) circuit or device!

2. Press and release the local unit's ON/TEST button. The POWER LED should light.
3. Press and release ON/TEST again. Some subset of the LEDs on the local and remote units will light, depending on the type of cable being tested and what type of faults (if any) are detected. See **Section 3.2.1** for UTP results, **Section 3.2.2** for STP results, or **Section 3.2.4** for coax results. (LED patterns on the remote unit will vary when UTP or STP cables are faulty; **Section 3.2.3** gives examples.)
4. If the cable you're testing is faulty, you can do a fault check to try to pinpoint the problem (see **Section 3.3**). You can also troubleshoot by using the LAN Pro's "tone mode" to identify and trace wire pairs (see **Section 3.4**).

If the cable is OK, allow the local unit to turn itself OFF (see **Section 3.5**) or turn it OFF manually by pressing and releasing ON/TEST a third time, then proceed to the next cable.

CAUTION!

Do *not* retest a cable, or test a second cable, until the local unit is turned OFF and back ON again. The results of the first test will *not* be cleared until the local unit powers down!

3.2.1 POSSIBLE RESULTS FOR UTP CABLES

When you press and release ON/TEST the second time with a UTP cable attached, all of the pair LEDs on the local unit (“1/2,” “3/6,” “4/5,” and “7/8”) should light steadily and the SHD LED should flash.

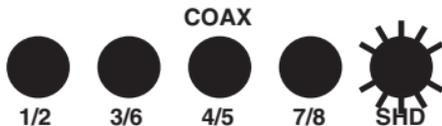


Figure 3-2. Local-unit LEDs during UTP testing.

If the cable is good, the PASS LED will light on the local unit, and all four pair LEDs will light on the remote unit as shown in Figure 3-3. If the cable is faulty, the FAIL LED will light on the local unit, and one or more pair LEDs will stay dark on the remote unit (see **Section 3.2.3**).

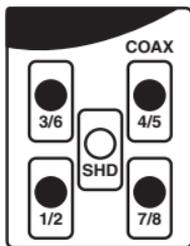


Figure 3-3. Indication of good UTP cable at the remote unit.

3.2.2 POSSIBLE RESULTS FOR STP CABLES

When you press and release ON/TEST the second time with an STP cable attached, the SHD LED and all of the pair LEDs on the local unit (“1/2,” “3/6,” “4/5,” and “7/8”) should light steadily.

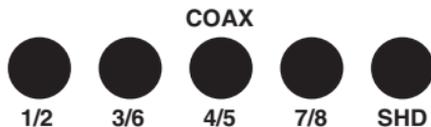


Figure 3-4. Local-unit LEDs during STP testing.

If the cable is good, the PASS LED will light on the local unit, and the SHD LED and all four pair LEDs will light on the remote unit as shown in Figure 3-5. If the cable is faulty, the FAIL LED will light on the local unit, and the SHD LED and/or one or more pair LEDs will stay dark on the remote unit (see **Section 3.2.3**).

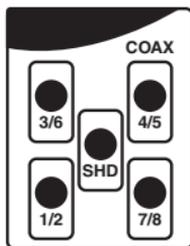


Figure 3-5. Indication of good STP cable at the remote unit.

3.2.3 FAULT-LED PATTERNS AT THE REMOTE UNIT FOR UTP AND STP CABLES

When the LAN Pro detects a fault in a UTP or STP cable, the lighting pattern of the SHD and pair LEDs on the remote unit will vary depending on which wire pair(s) are faulty. Just keep in mind that for all cables, the LEDs for good pairs will be lit, but the LEDs for faulty pairs will be dark. Similarly, for STP cables, SHD will be lit if the shield is OK or dark if it isn't. Figure 3-6 shows some sample LED patterns and what they mean:

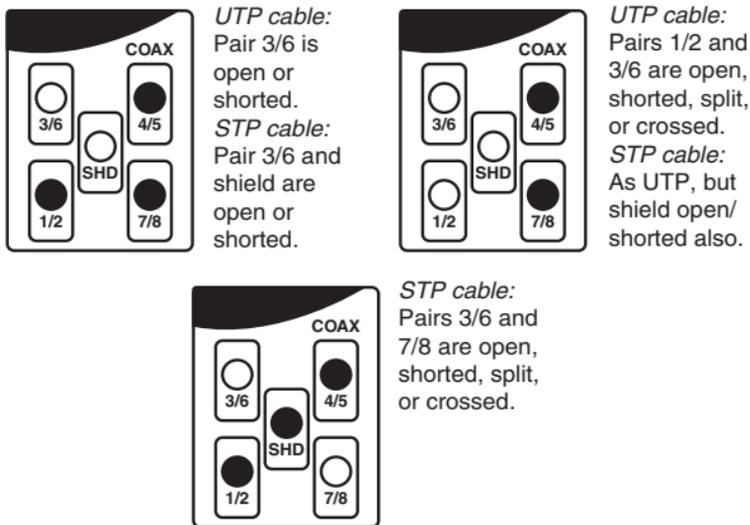


Figure 3-6. Sample remote-unit LED patterns for UTP and STP faults.

3.2.4 POSSIBLE RESULTS FOR COAX CABLES

When you press and release ON/TEST the second time with a coax cable attached, the COAX and SHD LEDs on the local unit should light steadily.

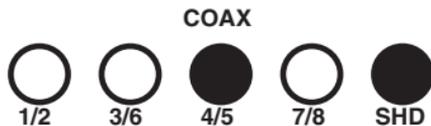


Figure 3-7. Local-unit LEDs during coax testing.

If the cable is good, the PASS LED will light on the local unit, and the COAX LED will light on the remote unit as shown in Figure 3-8.

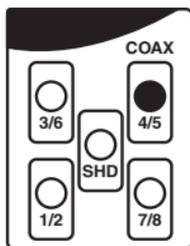


Figure 3-8. Indication of good coax cable at the remote unit.

If the cable is faulty, the local unit's FAIL LED will light, and its other LEDs will behave one of two ways. If the cable is *shorted*, the local unit's COAX and SHD LEDs will remain steadily lit. If the cable is *open*, the local unit's FAIL LED will light, all of its pair LEDs ("1/2," "3/6," "COAX"/"4/5," and "7/8") will become steadily lit, and its SHD LED will begin flashing, as shown in Figure 3-9.

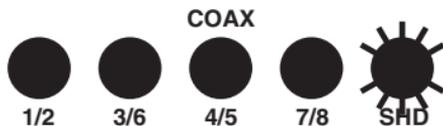


Figure 3-9. Local-unit SHD and pair LEDs if a coax cable is open.

3.3 Fault-Checking to Troubleshoot UTP or STP Cables

If the LAN Pro detects a fault in a UTP or STP cable when you do the testing described in **Section 3.2**, you can get more information about the fault by repeatedly pressing the FAULT CHECK/TONE button. Keep in mind that you must do this within about 20 seconds after the initial test results, or the LAN Pro will power off and clear its memory.

After the initial results, press FAULT CHECK/TONE once to get a specific readout for pair 1/2. The “1/2” pair LED will light along with “PASS” if the pair is good, or along with one of the fault LEDs (“OPEN,” “SHORT,” “CROSS,” or “SPLIT”) if the pair is affected by that fault. Continue pressing FAULT CHECK/TONE to step through similar LED readouts for pair 3/6, pair 4/5, pair 7/8, and shield.

The “CROSS” fault indicates that the cable pair is cross-pinned end to end (one or both wires in the pair are connected to different pins at either end of the cable). The “SPLIT” fault indicates that the cable is pinned correctly end to end, but the wires are mispaired; this will cause excessive crosstalk. Don’t test cables shorter than 6 ft. (1.8 m); you’ll get a lot of false “SPLIT” faults if you do.

3.4 Tone Mode

The LAN Pro can send an oscillating audio tone through cables or their individual pairs in order to assist you in identifying and tracing them. Take these steps:

1. Use one of the included patch cables to connect the local unit to the patch panel you're testing from. Use the other included patch cable to connect the remote unit to the wall jack where the link you're testing is terminated. *Never* attach the tester to a live (powered) circuit or device!
2. Press and release the local unit's ON/TEST button *once only*. The POWER LED should light.
3. Press the local unit's FAULT CHECK/TONE button and hold it down for five seconds (until the "1/2" LED flashes), then release it. If you're testing UTP or STP, a tone will be applied to pair 1/2; if you're testing coax, nothing will happen yet.
4. When you've finished working with this pair, or if you're testing a coax cable, press and immediately release the FAULT CHECK/TONE button. A tone will be applied to UTP/STP pair 3/6 (still no effect on a coax cable). The "3/6" LED will flash.

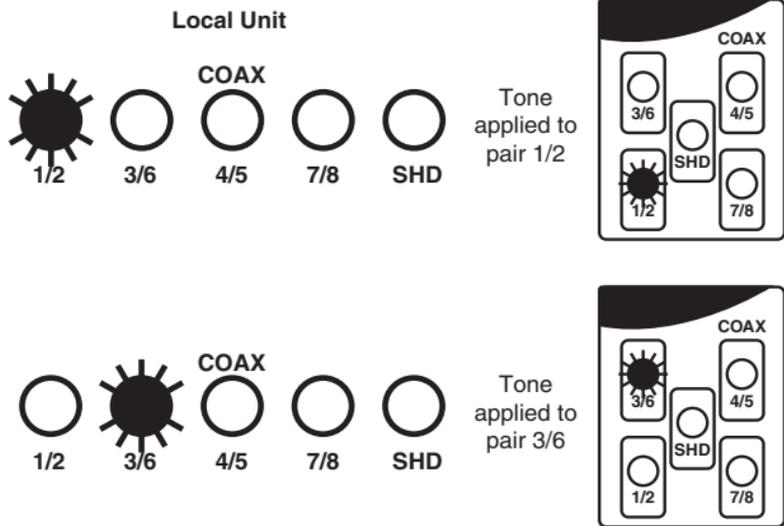
5. When you've finished working with this pair, or if you're testing a coax cable, press and release **FAULT CHECK/TONE** again. A tone will be applied to pair 4/5 of the attached UTP or STP cable, or to the center conductor of the attached coax cable. The "COAX"/"4/5" LED will flash.
6. When you've finished working with this pair, or with the center conductor of the coax cable, press and release **FAULT CHECK/TONE** a third time. A tone will be applied to UTP/STP pair 7/8 (no effect on a coax cable). The "7/8" LED will flash.
7. When you've finished working with this pair, or if you're testing a coax cable, press and release **FAULT CHECK/TONE** a fourth time. A tone will be applied to the entire cable (in a UTP or STP cable, all of the pairs), including the shield. The **SHD** LED and all of the pair LEDs will flash.

If you continue pressing and releasing **FAULT CHECK/TONE**, the test will cycle back to pair 1/2 again. To exit tone mode, press and release **ON/TEST** to turn the local unit **OFF**. You can also let the local unit turn itself off, but in tone mode this doesn't happen until about 30 minutes go by (see **Section 3.5**).

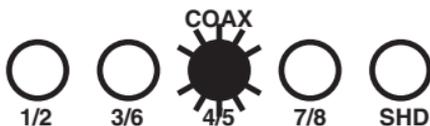
LAN PRO AND LAN PRO KIT

If you'll be trying to detect the audio signal by ear using a tone probe, note that the tone that the LAN Pro applies to the *individual pairs*, or to the *center conductor*, will be lower in volume than the tone applied to the entire cable. If you only need to trace cables and not individual pairs, always use the full-cable tone for the most audible signal. (If you *do* need to trace a specific pair, of course, press and release FAULT CHECK/TONE until the tone is applied to that pair and stop there.)

Here's what the local and remote units' SHD and pair LEDs will look like as you step through the tones:

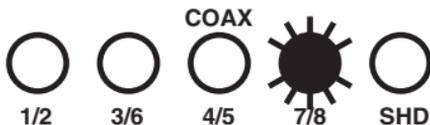
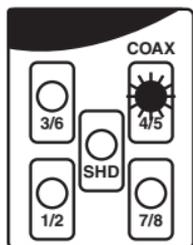


Local Unit

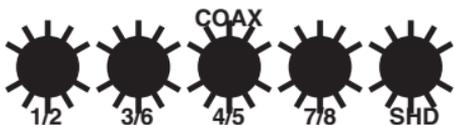
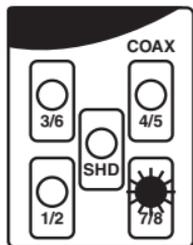


Tone applied to pair 4/5 or to center conductor

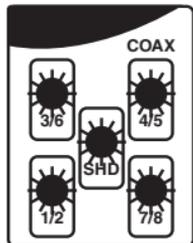
Remote Unit



Tone applied to pair 7/8



Tone applied to entire cable (all pairs and shield)



Note: On remote unit, **SHD** LED will remain dark for UTP cable.

3.5 Automatic Shutoff

The LAN Pro's local unit has an automatic power-shutdown circuit for conserving battery life.

During normal basic testing (press and release ON/TEST *twice*—see **Section 3.2**) or fault checking (press and release ON/TEST *twice*, then press and release FAULT CHECK/TONE repeatedly—see **Section 3.3**), the local unit will shut itself OFF if approximately 20 seconds go by without any activity (no buttons are pressed).

In tone mode (press and release ON/TEST *once*, then press, hold, and release FAULT CHECK/TONE, then press and release FAULT CHECK/TONE repeatedly—see **Section 3.4**), the local unit will shut itself OFF if approximately 30 minutes go by without any activity (no buttons are pressed).

To “reset the timer” and keep this from happening during fault checking or in tone mode, press and release FAULT CHECK/TONE until the test cycles back to the pair you are working with.

Remember that you can always turn the local unit OFF manually by pressing and releasing the ON/TEST button.

4. If You Have Problems

4.1 Calling Black Box

If your LAN Pro seems to be 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; the problem might be solvable over the phone.

Before you call, 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; and
- the results of any testing you might have already done.

4.2 Shipping and Packaging

If you need to transport or ship your LAN Pro:

- Package it carefully. We recommend that you use the original container.
- If the shipping is return- or repair-related, include everything you received with the LAN Pro when you pack it. Contact Black Box to get a Return Authorization (RA) number.

NOTES

NOTES



© Copyright 2001. Black Box Corporation. All rights reserved.

1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746