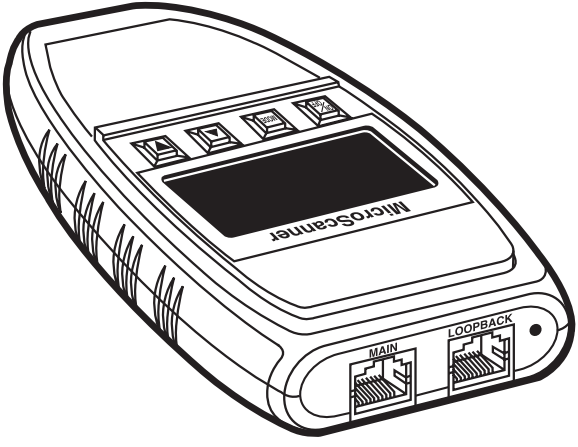
BLACK BOX
NETWORK SERVICES

JANUARY 2000
TS800A
TS801

MicroScanner™



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**

TRADEMARKS USED IN THIS MANUAL

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

Specifications

Applications — Shielded and unshielded twisted-pair cable

User Interface —*Display:* Custom LCD, 1.75" x 0.85" (4.4 x 2.2 cm); *Keypad:* Four momentary-contact keys

Test Interface — *Main:* Modular 8 connector for length, wiremap, office identifier, trace; *Loopback:* Modular 8 connector for patch cable wiremap; *Calibration:* User-selectable NVP [NVP calculation based on known cable length; minimum length of 50 feet (15.2 m), maximum length of 1500 feet (457.2 m)]; *Accessories:* Office Identifier (TS801)

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

Storage Temperature — 14 to 131°F (-10 to +55°C)

Humidity Tolerance — 10 to 90% noncondensing

Power Source — 9V alkaline battery

Size — *MicroScanner:* 5.5"H x 3.25"W x 1"D (14 x 8.3 x 2.5 cm); *Wiremap Adapter/Office Identifier:* 2.25"H x 0.5"W x 0.625"D (5.7 x 1.3 x 1.6 cm); *Ground pin receptacle size:* 0.08" (0.2 cm)

Weight — *MicroScanner:* 0.38 lb. (0.2 kg); *Wiremap Adapter/Office Identifier:* 0.02 lb. (<0.01 kg)

The Keypad

When turned on, the MicroScanner will flash the LCD power-up test and then resume the test mode that was last executed. MicroScanner will turn off automatically when no cable is detected and no key has been used for 10 minutes.

Press ▲▼ to quickly change pairs or adjust values. The ▲▼ keys are only active if the indicators are shown on the display.

Operating Mode

Press MODE to select the desired test. The available modes are: WIREMAP - OFFICE IDENTIFIER - LENGTH - TONER.

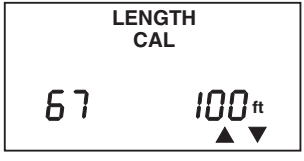
Calibration Mode

Turn the MicroScanner OFF, then hold the MODE key down while pressing the ON key to start “Calibrate” mode. Use MicroScanner to calibrate cable lengths of more than 50 feet (15.2 m) and up to 1500 feet (457.2 m).

SETTING THE NVP PERCENTAGE

Once in Calibrate Mode, the default NVP (Nominal Velocity of Propagation) will be displayed followed by the overall cable length. The cable length is measured with the currently stored NVP.

NVP is the measure of how fast a signal travels down a cable compared to the speed of light. The result will be represented as a percentage of the speed of light. For an accurate length test, the NVP must be set correctly.



If you know a cable's NVP, change the displayed numbers using the ▲▼ keys until the appropriate NVP is displayed. The cable length will automatically adjust to the new NVP.

If you know a cable's length, change the shown NVP using the ▲▼ keys until the appropriate length is

displayed. The NVP can be adjusted in 1% increments, and the length changes accordingly.

Cables used for calibration must be at least 50 feet (15.2 m) long. Cable lengths of less than 50 feet (15.2 m) will display FAULT.

Changing Display from Meters to Feet

During Calibration you will be able to switch the displayed length from meters to feet by simply pressing the MODE key.

Press the ON/OFF key once the desired cable length or NVP is displayed to terminate "Calibrate" mode and store the new calibration factor. MicroScanner will use it for future length measurements until another calibration is performed.

Battery

MicroScanner requires a 9-volt alkaline battery. The battery icon is displayed on the screen when MicroScanner detects a low battery condition.

Using MicroScanner with a low battery may effect the test accuracy. If MicroScanner is stored for more than one month, the battery should be removed.

NOTE

MicroScanner will not function properly with a 9-volt carbon battery.

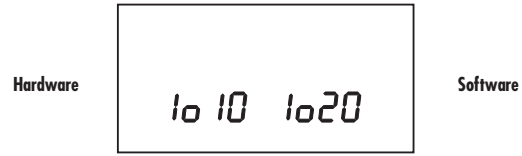
High Voltage Protection

MicroScanner is designed to withstand input voltage conditions that arise from normal telephony applications such as 48 VDC at less than 80 mA or 24 VAC used to power many keysets. Tests cannot be performed when hazard conditions exist on the inputs.

If you have technical questions, call Technical Support at 724-746-5500. Before calling, have your hardware and software version numbers available.

PRODUCT VERSIONS

Turn the MicroScanner OFF, then hold ▲ and MODE keys down while pressing the ON key to display your hardware version and software version.



MicroScanner Tests

Wiremap

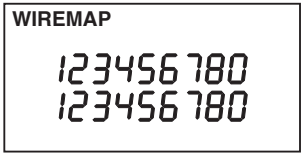
The Wiremap function tests twisted-pair cabling for proper wiring. Your cabling configuration is checked for shield continuity, opens, shorts, crossed pairs, split pairs, and reversed pairs. Test Results are displayed as a numeric representation, where the upper line of fixed digits shows the detected wires at the MicroScanner jack, and the lower line of digits indicates the actual wiring. This function requires the use of the Wiremap Adapter at the far end.

1. Connect the cable to be tested to the MAIN jack (identified on the unit right above the modular 8 jack).

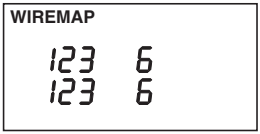
2. To display the Wiremap screen, press the MODE key until the word WIREMAP appears on the screen.

Below are examples where MicroScanner did not detect any faults.

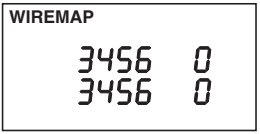
Full Wiremap with intact shield shown as a zero (0) on the right (4 pair, 8 wires)



10BASE-T Cable
(2 pair, 4 wires)

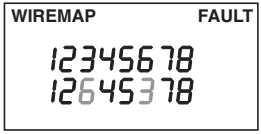


Token Ring
(2 pair, 4 wires)

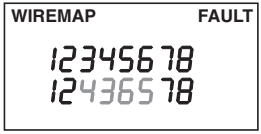


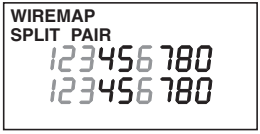
On the next page are examples of wiring faults. The FAULT indicator will be displayed and the numerical wire indicators will blink.

Reversed:
Pair 3-6



Crossed:
Pairs 4-5, 3-6

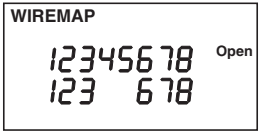




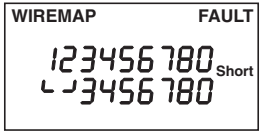
Split Pair

If the wire does not go to the far end, the numerical indicator for the open will be left blank. The word Open will be displayed. Shorted pairs are indicated with a connecting bracket, and the word SHORT will be displayed.

Open:
Pair 4-5



Short:
Pair 1-2



When the wiring fault includes shorted or swapped non-pair pins (that is, non-pair pins 1-3), the wiremap will display dashes for those numerical wire indicators.

Patch Cable Wiremap

The Wiremap function can also be used to verify patch cables.

1. Simply plug the two ends of a cable into the two modular 8 jacks (MAIN and LOOPBACK) on the MicroScanner.

2. To display the Wiremap screen, press the MODE key until the word WIREMAP appears on the screen.

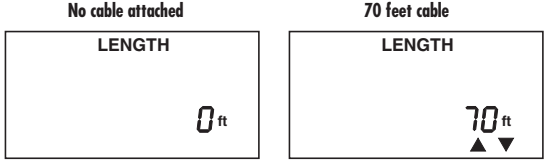
If there are any miswires, the number of the faulty wire will blink.

Length

The Length function measures the full length of a cable. If you are measuring standard pair length, MicroScanner will determine whether the cable is open, shorted, or connected to a hub.

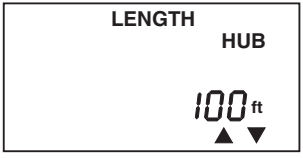
1. Connect the cable to be tested to the MAIN jack (identified on the unit right above the modular 8 jack).

2. To display the length screen, press the MODE key until the word LENGTH appears on the screen. The overall cable length will be shown.



If the far end of a cable is connected to a hub, MicroScanner will display HUB and the cable length. The cable is considered connected to a hub when the 3-6 pair is terminated and either pair 1-2 or 4-5 is terminated.

Length to Hub



PAIR LENGTH

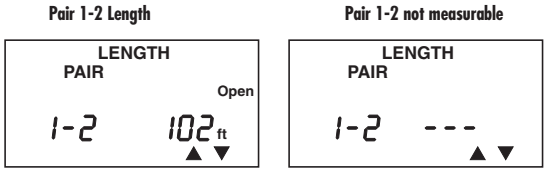
If ▲▼ are displayed, you will be able to show detailed pair information for each standard conductor pair.

1. Press the ▲ key to display Pair 1-2 length.

2. Press the ▲ key again to display the other pair combinations.

The pair length is not measured if the cable is too long, connected to a hub, or a wiremap adapter is used.

See the next page for pair length display examples.



Office Identifier

The Office Identifier function allows you to find the termination of an office cable drop from a wiring closet. By inserting the Office Identifier adapters into office wall outlets, MicroScanner can identify office locations at the patch panel.

The Office Identifier plugs are included in the optional Twisted-Pair Office Identifier accessory kit. They are uniquely numbered from 1 to 12. The Wiremap Adapter may also serve as an Office Identifier Plug and will be displayed as OFFICE 4.

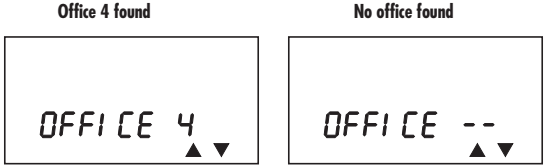
1. Connect the cable to be tested to the MAIN jack (identified on the unit right above the modular 8 jack).

2. To display the Office Identifier screen, press the MODE key until the word OFFICE is displayed on the screen.

3. Insert the Office Identifier plugs into wall outlets in the offices you wish to locate.

4. At the patch panel, run the Office Identifier function to identify which office is connected to a given port.

MicroScanner will display the number of the Office Identifier found.



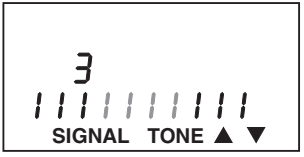
Toner

Toner is a cable-tracing function that assists in tracking cables hidden in walls, ceilings, floors, or patch panels by generating four distinct multi-tone signals that can be received by a cable tracer. To trace a cable, use Black Box's Cable Tracer II, or any equivalent tracing device, to convert a signal on the cable into an audible tone. To determine the cable path, simply trace along the wire using the audible tone as a guide. The tracer needs to be within one foot of the hidden cable. You may select one of four different tone sequences, displayed as the numbers 1 through 4 on the LCD.

1. To display the Toner screen, press the MODE key until the words Signal Tone are displayed on the screen.

2. To select a different tone sequence press the ▲ or ▼ key.

Display for time frames with #3 signal tone



To enhance the signal insert a grounding plug into the ground jack located next to the MAIN and LOOPBACK jacks. A grounding plug is included in the optional Cable Tracer II kit. You may use any grounding cable that has a standard insulated phone tip plug.

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