

FLUKE®

620
CableMeter

Users Manual

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620 CableMeter

Introduction

The Fluke 620 LAN CableMeter™ (hereafter the test tool) is a battery operated, handheld instrument that identifies cable failures, measures length, and checks the wiring of cables used for DeviceNet™, ControlNet™, and Ethernet Local Area Network (LAN) systems.

The test tool is designed around a “Test as You Go” philosophy. This reduces the time necessary to install and service LAN cables by allowing ONE PERSON to detect most cable failures from only one end of the cable.

The test tool tests for incorrect pairing (split pairs), miswires, shorted and open wires on all twisted pair cables, as well as shorts on coaxial cables.

The test tool comes with the following:

- 1 620 Softcase
- 1 RJ45-RJ45 Straight-Through Patch Cable (EIA/TIA 4 Pair Cat5)
- 1 RJ45-RJ45 Female Coupler
- 1 User Manual
- 1 Cable Identifier #1
- 1 Quick Reference Card
- 1 Warranty Registration Card

Caution





To reduce wear on the test tool connector, leave the patch cable connected to the test tool and use the patch cable to connect to the cable under test.

Plugging a 4 or 6 position plug into the test tool's UTP/FTP jack can cause permanent damage to the jack pins.

Safety Information

The international electrical symbols used on the instrument or in this manual are described in Table 1.

Table 1. International Electrical Symbols

	Warning or Caution: Risk of damage or destruction to equipment or software. See explanations in the manual.
	Equipment is protected by double insulation or reinforced insulation to protect the user against electric shock.
	Do not connect this terminal to public communications networks, such as telephone systems.
	Conforms to relevant European Union Directives.

Warning

To avoid possible fire, electric shock, personal injury, or damage to the test tool.

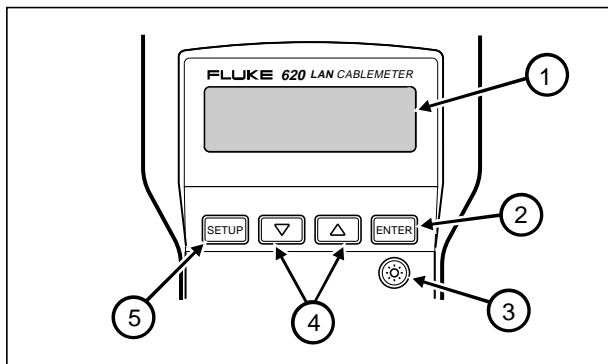
- To avoid false test results, replace the batteries as soon as “LOW BATTERY” appears in the display.

- Never connect the test tool to any telephony inputs, systems, or equipment, including ISDN. Doing so is a misapplication of this product, which can result in damage to the instrument and create a potential shock hazard to the user.
- Never connect the test tool to active LAN inputs, systems, or equipment. Doing so is a misapplication of this product, which can result in damage to the instrument and create a potential shock hazard to the user.
- Always turn on the test tool before connecting it to a cable. Turning the test tool on activates the tool's input protection circuitry.
- When servicing the test tool, use only specified replacement parts.
- Do not use the test tool if it is damaged. Protection may be impaired.
- Do not use the test tool if it is damaged. Inspect the test tool before use.

- Never operate portable transmitting devices during a cable test. Doing so might cause erroneous test results.

Getting Acquainted








Display, Switches, and Connections

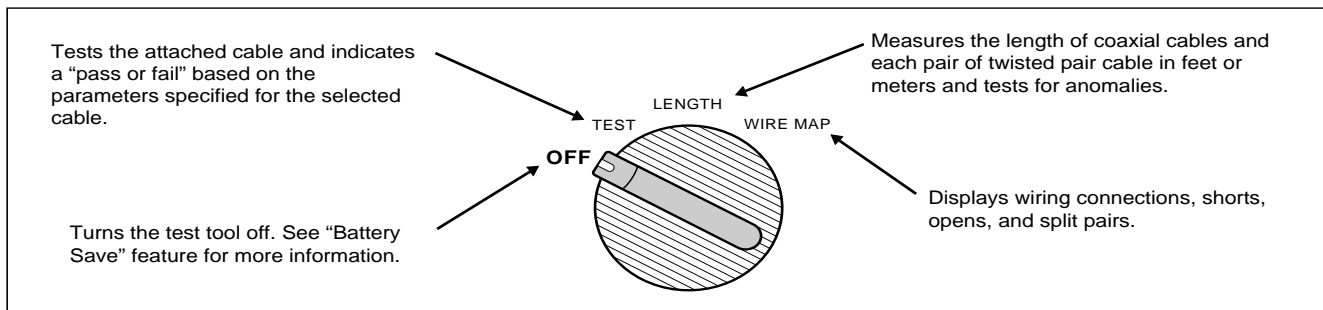


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Figure 1. Cable Meter System

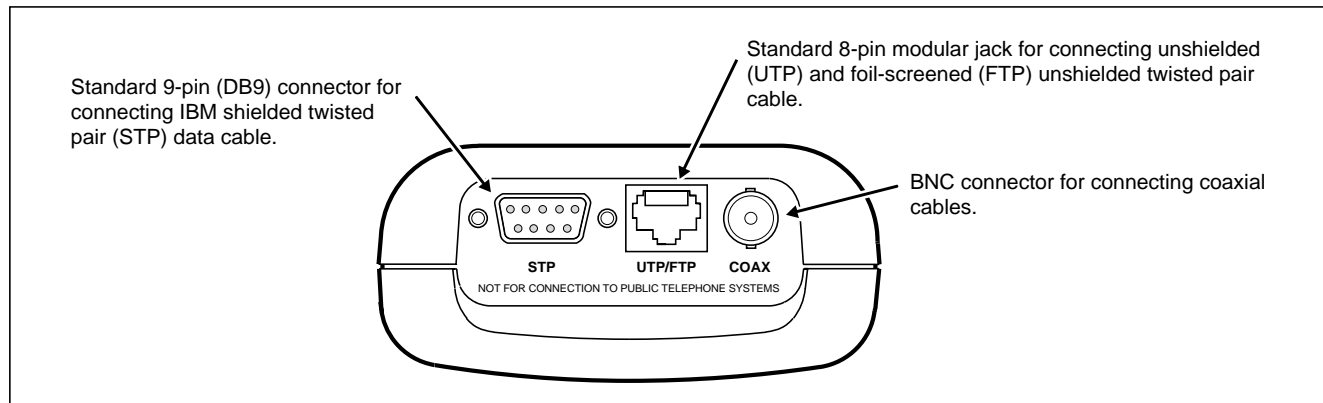
Table 2. Features

ITEM	FUNCTION
①	LCD A 2-line by 16-character LCD display. When there is more information than can be displayed on two lines, and up arrow, down arrow, or bidirectional arrow appears in the left side of the display. Press the corresponding  or  key to display the additional information.
②	 Enters a selection into the test tool and moves to the next setup selection. Causes current cable selection to be displayed and a new measurement cycle initiated when not in Setup Mode.
③	 Turns the display backlight on or off. Backlighting turns off automatically after 70 seconds.
④	  Scrolls through a selection of choices or multiple displays
⑤	 Provides access to cable selection, calibration, and other test tool settings.



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Figure 2. Rotary Switch



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Figure 3. Connections

Audible Signal (Beeper)

The test tool uses an audible tone to signal different operational conditions. A single short tone indicates a pass condition without a Cable ID detected. A two frequency tone signals a pass condition with a Cable ID detected. Three short tones signal a test failure. A long tone sounds whenever an invalid key is pressed. A continuous, varying-pitch tone signals the test tool is connected to an active cable and should be disconnected immediately. To disable the audible signal for the PASS and FAIL conditions, see "Setup Selection".

Low Battery Indication

When the battery voltage is low but it is OK to continue, the test tool displays "LOW BATTERY" once during a power-on session. When this message first appears there will be about 8 hours of use left. When the battery voltage is too low to continue, the unit displays "REPLACE BATTERY". To continue using the test tool, you must replace the batteries. Refer to "Replacing Batteries".

Battery Save Mode

The test tool turns itself off when there is no switch or key activity for 10 minutes. To return the test tool to operation, you must turn the rotary switch to OFF and wait 5 seconds before turning the test tool back on. The Battery

Save feature may be disabled by turning the rotary switch to OFF, then pressing and holding **[ENTER]** while turning the rotary switch to TEST.

Cable ID Unit

The Cable ID Unit permits the detection of far end wiring failures and helps identify cables between a room and a wiring closet. For use with twisted pair cable only.

Selecting the Display Language

The test tool displays messages in English, French, German, Spanish, and Italian. To change the display language, perform the following:

1. With the test tool off, press and hold **[SETUP]** while turning the rotary switch to TEST.
2. Press **[▲]** or **[▼]** until the desired language is displayed, then press **[SETUP]**.

Preparing the Test Tool for Use

Note

The noise filter should be set to the frequency of the local power mains (50 Hz or 60 Hz). See "Setup Selections" for this and other customizing selections.

After connecting the cable under test to the appropriate connector on top of the test tool, you must select proper cable type, category, and size before testing or measuring. It may also be necessary to calibrate the test tool to the cable under test.

Caution

Having more than one cable connected to the test tool causes erroneous measurements

Note

If you think the test tool is not performing properly, refer to "When Something Goes Wrong".

Selecting a Cable Type

Characteristics for a variety of LAN cables are designed into the test tool and can be accessed through SETUP. See Table 3.

Table 3. Predefined Cable List

UTP	STP	FTP	COAX
EIA/TIA 4PR	IBM TYPE 1	EIA/TIA 4PR	10BASE2 (Thin)
10BASE-T 2PR	IBM TYPE 6	10BASE-T 2PR	10BASE5 (Thick)
TOKEN RG 2PR		TOKEN RG 2PR	RG-58
TP-PMD2PR		TP-PMD 2PR	RG-58F (Foam)
USOC 4PR			RG 59
USOC 3 PR			RG-59F (Foam)
USOC 2PR			RG-62
DEC/MMJ 3PR			
Note: Refer to Table 11 later in this manual to identify actual wires tested.			

Note

Cables not wired according to the predefined cable list cause the test tool to detect failures. However, the test tool will determine the cable's length and display the actual cable wiring with the wire map function. It may be possible to use the test function by making an adapter that causes the cable to appear to be properly wired to the test tool.

To set up the test tool for the desired cable, perform the following:

Note

The number of steps necessary to select a cable definition will depend on the type of cable selected.

1. Turn the test tool on by selecting TEST, LENGTH, or WIRE MAP.
2. Press **SETUP**.
3. Press **▲** or **▼** until the desired cable type is displayed, then press **ENTER**.
4. Press **▲** or **▼** until the desired wiring standard is displayed, then press **ENTER**.

5. Press **▲** or **▼** until the desired category is displayed, then press **ENTER**.
6. Press **▲** or **▼** until the desired wire size is displayed.

Note

*You can check the cable selection at any time other than during the setup mode by pressing the **ENTER** key.*

The cable characteristics are now defined by the factory settings for the cable selected. However, cables coming from different batches or manufacturers can have characteristic variances of up to 20 %, causing deviations in length measurements. To obtain more accurate measurements, calibrate the test tool to the specific cable under test.

Calibrating the Test Tool to the Cable

When calibrating the test tool to a specific cable, the cable should be at least 100 feet (30 m) long and of the same type and category as the cable under test. Calibrating with cables longer than 100 feet (30 m) will improve length measurement accuracy. During the calibration process, if the cable is found to be defective or if the cable is less than 50 feet (15 m), "BAD CABLE" is displayed and the calibration process is terminated.

Caution

For proper calibration, connect the cable under test directly to the test tool, not through a patch cable.

Caution

To ensure accurate measurements, make sure conductive objects, including fingers, do not come in contact with any of the connectors while the test tool is measuring the cable under test.

To calibrate the test tool to the currently selected cable, perform the following:

1. Connect a good cable of known length, 100 feet (30 m) or longer, to the appropriate test tool connector and turn the rotary switch to TEST, LENGTH, or WIRE MAP.

Note

If you have just completed the cable selection process, the test tool should already be in the calibration setup selection.

2. Press **SETUP** and then **ENTER** until the following display appears.

```
CAL TO CABLE?
↵NO          ENTER
```

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Note

*When you select a cable type for which the test tool has already been calibration, "CAL" will appear in the second line of the display. To erase this calibration and use the factory settings, remove all cables from the test tool, press **▼** **▼** until "YES" is displayed, and press **ENTER**.*

3. Press **▲** **▼** until YES is displayed, and then press **ENTER**. The test tool takes a few measurements on the attached cable and displays the measured length.

```
ADJUST LENGTH:
↵98'          ENTER
```

abm05f.eps

4. Press   until the known cable length is displayed, and then press **ENTER**. These cable parameters are stored and will remain in memory even if the test tool is turned off. All future measurements for this cable type are compared to these new parameters until another cable is selected or another calibration is performed.

Making Tests and Measurements

The test tool displays test results in relation to individual pin numbers. For example, in the LENGTH mode, the following display indicates the twisted pair connected to pins 1 and 2 is 301 feet long while the pair connected to pins 3 and 6 is 300 feet long.

12	301'
36	300'

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When you are testing STP cabling, the pin number displayed always corresponds to the pins at the STP (DB-9) connector. Table 4 shows the connections for the active pins.

Table 4. Active Pin Connections

DB-9	Line Name	Data Connector Color	8-Pin RJ45
1	RX+	Red	4
6	RX-	Green	5
5	TX-	Black	3
9	TX+	Orange	6

Note

When you test STP cables, the IBM Data Connector in the STP Adapter Kit or AMP part number 555414-2 must be used with the Cable ID Unit.

Testing Cables

The TEST function tests the attached cable and indicates PASS or FAIL based on the cable's compliance with the parameters stored in the test tool for the selected cable. The tests that are performed (Table 5) depend on whether or not a Cable ID unit is connected to the far end of the cable.

Table 5. Twisted Pair Tests

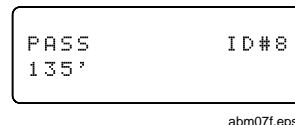
Failures Detected	No Cable ID	With Cable ID
Short	X	X
Open (near end)	X	X
Open (far end)		X
Length	X	X
Split Pair	X	X
Miswire		X
Faults	X	X

To test a cable, do the following:

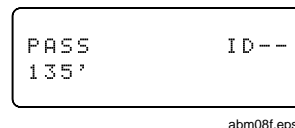
1. Connect the cable under test to the appropriate connector on the test tool.
2. Turn the rotary switch to TEST.
3. This step can be omitted if you know the cable selection is correct for the cable under test. Press **ENTER** to check the cable selection. The test tool displays the cable selection for a few seconds, the starts the test. "CAL" appears in the second line of the display if a cable calibration has been performed

for the selected cable type. If the test tool is not set up for the cable under test, refer to "Preparing the Test Tool for Use".

When you are testing twisted pair cables, the test tool checks for a Cable ID Unit at the other end of the cable and displays one of the following when a pass condition exists:



Good cable, Cable ID#8 detected.



Good cable, No cable ID detected.

Note



The test tool may not sense the Cable ID Unit under some open and short conditions. The test tool will alternately display a ? and a number when the Cable ID is detected but its number can not be determined with certainty.

When testing coaxial cables with a termination, the test tool displays the total resistance of the termination and cable wires.



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Coaxial cables must be unterminated for the test tool to display the cable's length. An open in a coaxial cable looks just like an unterminated cable. A length measurement that is less than the known cable length would indicate a possible open in the cable.





The test tool sounds three short tones and displays FAIL if a failure is detected. Additional information about the failure is printed on the second line of the display and if the ∇ symbol is displayed, additional information can be viewed with the   keys.

Note

The failure messages refer to individual wires rather than pairs of wires.

Failure messages for the TEST mode are described in Tables 6 and 7.

Table 6. Test Failures (without Cable ID Unit)

Failure	Display	Description
Short* (UTP/FTP/STP)		Displays shorted wires and the most likely distance to the short.
Short* COAX		Displays the most likely distance to the short.
Open		Displays open wires and whether the open is at the near or far end of the cable.
Split Pair		Display wire pairings that are incorrect based on the cable selected.
<p>* A short greater than zero ohms causes the test tool to display a length greater than the actual distance to the short. See Figure 4. The test tool uses ohms/foot to calculate distance to a short.</p>		

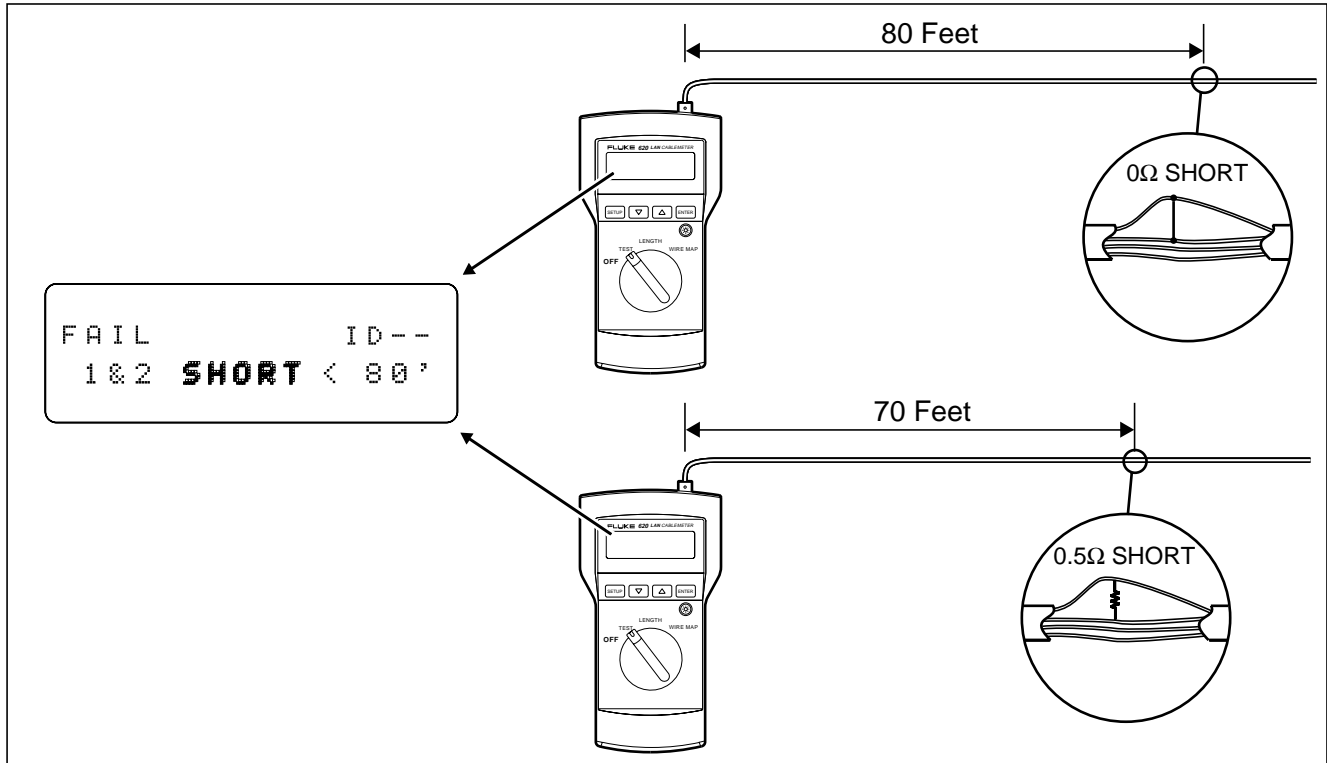


Figure 4. Testing for Shorts

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Table 7. Test Failures (with Cable ID Unit)

Failure	Display	Description
Miswire	<div> FAIL ID#8 ▾ MISWIRE </div> <div> ▲ 12 63 45 78 12 36 45 78 </div>	Displays the incorrect wiring of the end connectors.*
Open	<div> FAIL ID#8 3 OPEN @150' </div>	Displays the broken wire(s) and the distance to the break.
Pair Length	<div> FAIL ID#8 PAIR LENGTH </div>	Indicates that the length of the pairs within a cable are abnormally different. Use LENGTH to check pair lengths.
Split Pair	<div> FAIL ID#8 ▾ 13 SPLIT PR </div>	A portion of the cable assembly has split pairs or a poor quality cable such as telephone wire was used instead of LAN type cabling which may cause excessive crosstalk.
Fault	<div> STP FAULT </div>	Detects anomalies that do not fit a specific category or failure.**

*Flashes the number of the wires incorrectly connected.

**These non-specific faults are as follows:

- A cable with a resistive path between the wires. Displays measured resistance.
- Shield connected with UTP cable selected.
- UTP cable connected with STP or COAX selected.

Measuring Cable Length

The test tool measures the length of both twisted-pair and coaxial cables. If the test tool is not calibrated to the cable under test, then factory default characteristics are used to compute the length. If a more accurate length measurement is desired, refer to "Calibrating the Test Tool to the Cable".

Before a length measurement is made, the test tool performs diagnostic tests to prevent any cable failures from corrupting the length measurement. All failures are described in the "Testing Cables".

To measure the length of a cable, do the following:

1. Connect the cable under test to the appropriate connector on the test tool.
2. Turn the rotary switch to LENGTH.
3. This step can be omitted if you know the cable selection is correct for the cable under test. Press **ENTER** to check the cable selection. The test tool displays the cable selection for a few seconds and then starts the test. "CAL" appears in the second line of the display if a cable calibration has been performed for the selected cable type. If the test tool is not set up for the cable under test, refer to

"Preparing the Test Tool for Use" to select a new cable setting.

Note

When the display flashes 999' (350 m) during a length measurement, the length of the cable exceeds the test tool's range of measurement.

The information that is displayed depends on the type of cable selected. For twisted pair cables, each pair has its corresponding length measurement. A 5 percent difference in length between pairs is not uncommon.

For EIA/TIA 4PR cable with no failures, the display shows the following:

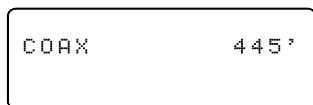
12	305'
36	300'

abm21f.eps

45	309'
78	301'

abm22f.eps

Length of a coaxial cable terminated in a resistance cannot be determined by the test tool. Only the total resistance of the wire and termination is displayed. An unterminated coaxial cable 445 feet long will display the following:



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Checking the Wire Map

Using the test tool's Wire Map function and a Cable ID Unit, you can determine the wiring of both the near and far end of the cable. To test the Wire Map, perform the following:

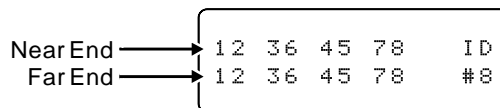
1. Connect the cable under test to the appropriate connector on the test tool.
2. Turn the rotary switch to WIRE MAP.
3. This step can be omitted if you know the cable selection is correct for the cable under test. Press **ENTER** to check the cable selection. The test tool displays the cable selection for a few seconds and then starts the test. "CAL" appears in the second line

of the display if a cable calibration has been performed for the selected cable type. If the test tool is not set up for the cable under test, refer to "Preparing the Test Tool for Use" to select a new cable setting.

Note

If you select the COAX wire type while in the WIRE MAP mode, the test tool will perform the LENGTH function on the cable.

Assuming the cable attached to the test tool is a EIA/TIA 4 pair cable with no failures, the following display indicates a good cable:



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The top line always displays the near end of the cable; the second line always displays the far end.

When the test tool detects a Cable ID Unit but cannot determine the ID number, #? is displayed for the ID number. The test tool will alternately display a ? and a

number when the Cable ID is detected but the Cable ID number cannot be determined with certainty.

Without a Cable ID Unit connected to the far end of the cable, the test tool displays “—” for the ID number.

The following display indicates the near end wiring of a cable without a Cable ID Unit connected.

1 2	3 6	4 5	7 8	ID
				--


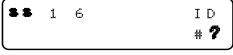
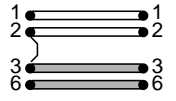





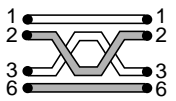
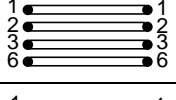
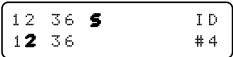
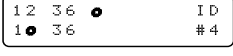
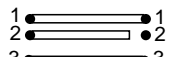


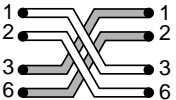
abm25f.eps

The IBM data connector contains self-shorting connections between pins 5 and 6 (TX- and RX-) and 1 and 9)RX+ and TX+) on the STP connector. Since this is a normal connection for the IBM data connector, the test tool does not display a failure. In the wire map function, the presence of these shorts are displayed as shown below:

5 9	1 6	S	ID
. .	. .		--

abm26f.eps

Table 8. Wire Map Failures (using Cable ID Unit)

Failure	Display	Wiring	Description
Short (near end)	 		Alternately displays an "s" with the actual wire number of each wire shorted. Because pins 2 and 3 are shorted, pins 1 and 6 do not appear to be paired.
Short (far end)*	 		Flashes an "s" below the wire number of each wire shorted. Because pins 2 and 3 are shorted, pins 1 and 6 do not appear to be paired.*
Split Pair	 	 	<p>Flashes the Wire numbers involved in the split.</p> <p>Flashes wire pairs that are either poor quality, such as using telephone wire instead of LAN type cabling or a portion of the assembly has split pairs which may cause excessive crosstalk.</p>
Open	 	 	Alternately displays "o" with the number of each open wire.
Miswire			Displays the wiring detected by the test tool and flashes the wire numbers involved in the anomaly.

* The test tool will alternately display a ? and a number when the Cable ID is detected, but the Cable ID number cannot be determined with certainty.

Setup Selections

The setup mode allows you to select cable characteristics and customize the test tool's operation. Once changed, these settings are stored and remain in the test tool even when it is turned off. Setup selections that rarely need changing are under a special "Power-up" menu.

Setup allows you to:

- Select cable type (UTP, STP, FTP, or COAX)
- Select a wiring standard
- Select a cable category
- Select a wire size
- Calibrate the test tool to a specific cable
- Enable or display the Beeper for PASS and FAIL
- Adjust the display contrast
- * Select the display language
- * Select length measurement units between feet (') and meters (m)
- * Select wire size units between AWG and millimeters (mm)
- * Set the noise filter for 50 Hz or 60 Hz

- * "Power-up" setup selections.

To make a SETUP selection, do the following"

1. Press **SETUP**.
2. Press **SETUP** to step through the selections.
3. Press **▲** or **▼** to select the desired setup condition.
4. Press **SETUP** to exit the setup mode, or press **ENTER** to move to the next setup selection.

To make a "Power-up" setup selection, do the following:

1. With the test tool OFF, press and hold **SETUP** while turning the rotary switch to TEST.
2. Press **ENTER** to step through the selections.
3. Press **▲** or **▼** to select the desired setup condition.
4. Press **SETUP** to exit the setup mode, or press **ENTER** to move to the next setup selection.

Maintenance

General

Periodically wipe the case with a damp cloth and detergent; do not use abrasives or solvents. Clean and dry as required. If the test tool will remain unused for an extended period, remove the batteries to prevent damage from leakage.

Replacing Batteries

Two 1.5 V AA alkaline batteries power the test tool and typically provide 50 hours of operation. Using the backlight may significantly reduce battery life. The battery compartment is located at the bottom of the test tool. To remove the battery cover, push the lip in and lift the cover off (see Figure 5).

When Something Goes Wrong

If it appears that the test tool is not working properly, perform the checks in Table 9 before returning the test tool to Fluke for repair. Repairs or servicing not covered in this manual should be performed only at an authorized Fluke Service Center.

To contact Fluke, call one of the following telephone numbers:

USA and Canada: 1-888-99-FLUKE (1-888-993-5853)

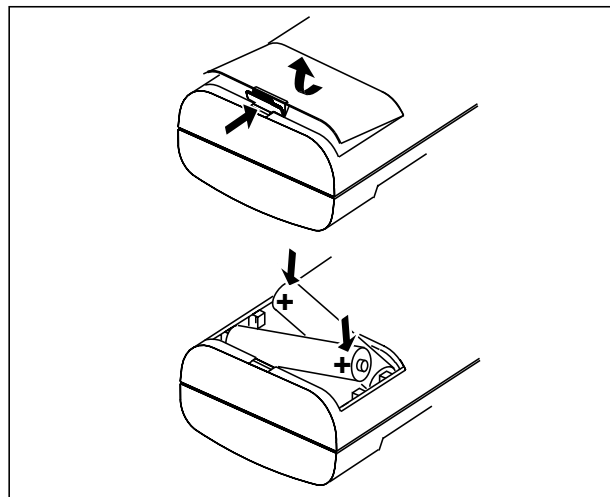
Europe: +31 402-678-200

Japan: +81-3-3434-0181

Singapore: +65-738-5655

Anywhere in the world: +1-425-356-5500

Or, visit Fluke's Web site at www.fluke.com.



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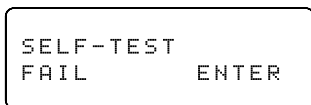
Figure 5. Battery Compartment

Table 9. Basic Troubleshooting

Action	Result	Explanation
Symptom 1: Display goes blank.		
1. Turn the rotary switch to off, wait 5 seconds and turn the switch to TEST.	Display is active	The Battery Save feature turned the test tool off.*
	Display still blank	Go to step 2.
2. Replace the batteries.	Display is active	Batteries were too low to run the test tool.
	Display still blank	Go to step 3.
3. Return the test tool for repair.		Problem appears to be a test tool malfunction.
Symptom 2: The test tool doesn't appear to be measuring correctly.		
1. Perform a self-test on the test tool.	Self-test fails	Internal circuitry is defective. Go to step 3.
	Self-test passes	Go to step 2.
2. Perform the steps under "Verifying Proper Operation".	Verification Fails	Test tool defective. Go to step 3.
	Verification Passes	Problem was an operational problem. Check your procedure and setup.
3. Return the test tool for repair.		Problem appears to be a test tool malfunction.
* The Battery Save feature may be disabled by turning the rotary switch to OFF, then press and hold ENTER while turning the rotary switch to TEST.		

Performing a Self-Test

The test tool periodically performs an internal self-test. When the internal self-test detects a problem, the test tool displays the following message:



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A more thorough self-test can be performed by using the following self-test procedure:

1. With the test tool off, press and hold **SETUP** while turning the rotary switch to TEST.
2. Press **ENTER** until "SELF-TEST?" is displayed.
3. Press **▲** or **▼** to select YES.

Note

*To exit without performing a self-test, either press **SETUP** or ensure that the second line is displaying "NO" and press **ENTER** to move to the next setup selection.*

4. Press **ENTER** to activate the self-test program.

You will be prompted to install the Cable ID Unit on the UTP/FTP connector. (NOT on the end of the cable.)

5. After installing the Cable ID Unit, press **ENTER** to continue the self-test program.

The test tool displays PASS or FAIL. The self-test continually repeats until **SETUP** is pressed or the test tool turns itself off (Battery Save Mode). If any failure is detected, return the unit to a service center for repair.

Verifying Proper Operation

1. Connect the provided patch cable to the UTP/FTP connector.
2. Set up the test tool for the patch cable's type, wiring, category, and wire size.
3. Connect a Cable ID Unit to the end of the patch cable.
4. Verify that the Cable ID Unit is properly identified by the test tool and the cable length is within ± 1.0 m (± 2 ft) of the patch cable length.

Returning the Test Tool for Repair

If after performing the previous tests you believe the test tool is not performing properly, you can send it to your

local service center for repair. Pack the test tool and its Cable ID Unit in the original shipping container. Forward Them, postage paid and insured, to the nearest Service Center. Fluke assumes NO responsibility for damage in transit.

A 620 LAN CableMeter™ covered by the limited warranty will be promptly repaired or replaced (at Fluke's option) and returned to you at no charge. See the registration card for the warranty terms. If the warranty has lapsed, the test tool will be repaired and returned for a fixed fee. Contact the nearest Service Center for information and prices.

Parts and Accessories

Table 10. Parts and Accessories

Description	PN
N6201 Cable ID Kit (2 through 4)	946801
N6202 Cable ID Kit (5 through 8)	946806
N5620 Cable Kit:	935957
2 ea. RJ45 Straight through patch cables	
2 ea. RJ45 – 8 Clip lead	
2 ea. RJ 45 In-line Couplers	
1 ea. 50 ohm BNC Coaxial Patch Cable	
N6203 STP Cable Kit:	
1 ea. IBM Type 1 Adapter cable (DB9 to Data Connector)	946970
1 ea. RJ45 to IBM Data Connector Adapter	

Table 10. Parts and Accessories (cont)

Description	PN
Users Manual	938386
Main PCA	936570
LCD Module, 32 Character	949107
Cable Identifier #1	946830
Cable Identifier #2	946835
Cable Identifier #3	946843
Cable Identifier #4	946855
Cable Identifier #5	946897
Cable Identifier #6	946921
Cable Identifier #7	942926
Cable Identifier #8	946934
Case, Top	949102
Case, Bottom	938449
Battery Door	938451
620 Shaft extender	938456
Knob	880815
Softcase	454389
Lens	946868
Battery, AA, Alkaline	376756
RJ45 Straight through patch cable	927868
RJ45 – 8 Clip Lead	938394
RJ45 In-Line Coupler	927884
BNC Coaxial Patch Cable	927876
Type 1 Adapter Cable (DB9 to Data Conn)	928499
RJ45 to IBM Data Connector Adapter	929435

Specifications

Assumes test tool was calibrated using 100 foot (or longer) cable of the type and batch of the cable being measured. Accuracy is specified for a period of two years after calibration.

Cable Length Measurements

Range : 1.0 to 350 m (2 ft to 999 ft)

Accuracy: 5 % +0.5 m (7 % + 2 ft)

Resolution:

Measurement Units in Feet: 1 ft

Measurement Units in Meters

Cables < 100 meters: 0.5 m

Cables > 100 meters: 1 m

Failures Detected

Shorts

Range of short detection: 0 m to 350 m (1 ft to 999 ft)

Accuracy of distance to a short (Assumes short is 0 Ω):

UTP/FTP/STP: 7 % + 3 m (7 % + 10 ft)

Coaxial Cables 10 % + 10 m (10 % + 30 ft)

Resolution of distance to a short:

UTP/FTP/STP: 0.5 m (1 ft)

Coaxial Cables: 1 m (5 ft)

Opens

Range of open detection: 0 m to 350 m (0 ft to 99 ft)

Accuracy of distance to an open:

UTP/FTP/FTP: 10 % + 1 m (10 % + 3 ft)

Resolution of distance to an open:

Cables < 100 meters: 0.5 m (1 ft)

Cables > 100 meters: 1 m (3 ft)

Split Pairs

Range of detection: 2 m to 350 m (6 ft to 999 ft)

Split pair part of the cable must be at least 2 meters (6 ft) in length and greater than 10 % of the total cable length.

Coax Termination Measurements

Any loop resistance value between 5 ohms and 350 ohms is interpreted as a termination resistance.

Resistance values below 5 ohms are considered shorts and resistance values greater than 350 ohms are not displayed.

LAN Input Connectors

RJ45, DB-9, and BNC

Input Protection

56 V dc continuously through a balanced source impedance of 400 Ω . 175 V peak, 20 Hz to 60 Hz through 100 Ω , superimposed on 56 V dc through 400 Ω .

“ACTIVE CABLE” is displayed and an audible signal sounds when the test tool is connected to a cable with voltage present.

The test tool is not intended to be connected to a public telephone network.

Table 11. Cable Test Characteristics

Cable	Wiring	PASS/FAIL Pins
UTP/FTP* (RJ45)	EIA/TIA 4 PR	Pins 12 36 45 78
	10BASE-T 2 PR	Pins 12 36
	TOKEN RING 2 PR	Pins 36 45
	TP-PMD 2 PR	Pins 12 78
	USOC 4 PR	Pins 18 27 36 45
	USOC 3 PR	Pins 16 25 34**
	USOC 2 PR	Pins 25 34***
	DEC/MMJ 3 PR	Pins 16 23 45**
STP* (DB-9)	IBM Type 1	Pins 15 69
	IBM Type 6	Pins 15 69
* Tests for open or shorted Shield on FTP and STP cables. ** RJ25 PINS ***RJ11 PINS		

Table 12. Coax Cable Characteristics

620 Coax Setup	Impedance	Resistance (Center Conductor + Shield)	Capacitance	Example
10 BASE2	50Ω	14.6Ω/1000 ft 47.9Ω/km	25.4 pF/ft 83.3 pF/m	Trade No. 9907
10BASE5	50Ω	2.94Ω/1000 ft 9.66Ω/km	26.0 pF/ft 85 pF/m	Trade No. 9880
RF58	50Ω	14.9Ω/1000 ft 48.8Ω/km	30.8 pF/ft 101 pF/m	Trade No. 9203 RF-58/U
RG-58F	50Ω	12.9Ω/1000 ft 42.3Ω/km	26.0 pF/ft 85.3 pF/m	Trade No. 8219
RG-59	75Ω	49.6Ω/1000 ft 160.9Ω/km	20.5 pF/ft 67.2 pF/m	Trade No. 9204 RG-59/U
RG-59F	75Ω	17.6Ω/1000 ft 57.7Ω/km	17.3 pF/ft 56.8 pF/m	Trade No. 9259
RG-62	93Ω	44.1Ω/1000 ft 144.6Ω/km	13.5 pF/ft 44.3 pF/m	Trad No. 9862 RG-62-U

Power

Two AA size 1.5 V alkaline batteries
Battery Type: ANSI/NEDA-15A or IEC-LR6
Low Battery indicated in the display
Typical Battery Life: 50 hours
Timed Power-Off Function

Dimensions

18.4 cm x 9.8 cm x 4.6 cm
(7.25 in x 3.875 in x 1.8 in)

Weight

354.4 g (12.5 oz)

Environmental Conditions**Temperature:**

Non Operating (storage): -20 °C to +60 °C
Operating: 0 °C to +45 °C

Operating Humidity:

10 °C to 30 °C: 95 % \pm 5 % RH (without condensation)
30 °C to 40 °C: 75 % \pm 5 % RH (without condensation)
40 °C to 45 °C: 45 % \pm 5 % RH (without condensation)

Altitude:

Non Operating: 0 km to 12 km (40,000 ft)
Operating: 0 km to 4.57 km (15,000 ft)

Electromagnetic Compatibility:

Meets FCC part 15-b
Meets EN 50081-1
Meets EN 50082-1
Meets vfg 243/1991

Display

2 lines of 16 characters LCD with backlight.

Controls

Four position rotary switch plus 5 tactile-feedback momentary switches.

Warranty

One year from date of purchase

Calibration Period

Two years