



**INSTRUCTION MANUAL**  
**MTC50**  
**2-IN-1 LAN TESTER & MULTIMETER**





| <b>Contents</b>                                   | <b>Page no</b> |
|---|----------------|
| 1. Introduction.....                              | 4              |
| 2. Features.....                                  | 4              |
| 3. Safety.....                                    | 4              |
| 3.1. International Safety Symbols.....            | 4              |
| 3.2. Safety Precautions.....                      | 4              |
| 4. Meter Description.....                         | 5              |
| 5. Specifications.....                            | 6              |
| 5.1. Electrical Specifications.....               | 6              |
| 5.1.1. DC Voltage.....                            | 6              |
| 5.1.2. AC Voltage 50-60Hz.....                    | 6              |
| 5.1.3. DC Current.....                            | 6              |
| 5.1.4. AC Current.....                            | 6              |
| 5.1.5. Resistance.....                            | 6              |
| 5.2. General Specifications.....                  | 7              |
| 6. Operation.....                                 | 7              |
| 6.1. AC/DC Voltage Measurements.....              | 7              |
| 6.2. AC/DC Current Measurements.....              | 7              |
| 6.3. Resistance Measurement.....                  | 8              |
| 6.4. Continuity Check.....                        | 8              |
| 6.5. Diode Test.....                              | 8              |
| 6.6. MAX Hold Button.....                         | 9              |
| 6.7. Hold Button.....                             | 9              |
| 6.8. Auto Power Off.....                          | 9              |
| 6.9. Replacing the Battery.....                   | 9              |
| 6.10. Replacing the Fuses.....                    | 9              |
| 7. Multi-Network Modular Cable Tester Option..... | 9              |
| 7.1. 10 Base-T Test.....                          | 10             |
| 7.2. RJ11 Modular Cable Test.....                 | 10             |
| 7.3. Coaxial Cable Test.....                      | 10             |
| 7.4. Remote Test.....                             | 10             |
| 7.5. Sample Test Results.....                     | 11             |

## 1. INTRODUCTION

2-in-1 LAN Tester & Multimeter is a innovative tester that allows the user easy to measure DC/AC Voltage/Current, Resistance, Continuity, diode and verify the cable continuity, open short, cross-connect. The included remote terminator allows the user to test installed cable either at a wall jack or a patch panel adding up to value and convenience. Proper use and care of this meter will provide years of reliable service.

## 2. FEATURES

- 2-in1- LAN Tester & Multimeter
- Measures DC/AC Voltage, DC/AC Current, Resistance, Continuity ,diode and LAN tester
- 3-1/2 digit (2000 count) LCD display for multimeter functions
- LED Displays the actual pin configuration of 10BASE-T AND 10BASE-2 Thin Ethernet, RJ45/RJ11 modular, 258A, tia-568a/568b and Token Ring cables
- Double Molded housing
- CAT III 600V; CAT II 1000V
- Provides easy to read continuity and fault status display
- Checks for continuity, open wire, ground wire, shorted pair and crossed pair faults
- Allows for remote testing of installed cables from wall jack or patch panel
- Auto or manual scanning for LAN tester
- Auto ranging with auto power off for multimeter functions

## 3. SAFETY

### 3.1. International Safety Symbols



This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.



This symbol, adjacent to a terminal, indicates that, under normal use, hazardous voltages may be present.



Double insulation

### 3.2. Safety Precautions

1. Improper use of this meter can cause damage, shock, injury or death. Read and understand this users manual before operating the meter.
2. Make sure any covers or battery covers are properly closed and secured.

- Always disconnect the test leads from any voltage source before replacing the battery or fuses.
- Do not exceed the maximum rated input limits.

| Input Limits                        |                             |
|-------------------------------------|-----------------------------|
| Function                            | Maximum Input               |
| V DC or V AC                        | 600V DC/AC                  |
| $\mu$ A AC/DC                       | 200mA/250V fast acting Fuse |
| Resistance, Diode & Continuity Test | 600V DC/AC                  |

- Use great care when making measurements if the voltages are greater than 25VAC rms or 35VDC. These voltages are considered a shock hazard.
- Always discharge capacitors and remove power from the device under test before performing Diode, Resistance or Continuity tests.
- Remove the battery from the meter if the meter is to be stored for long periods.

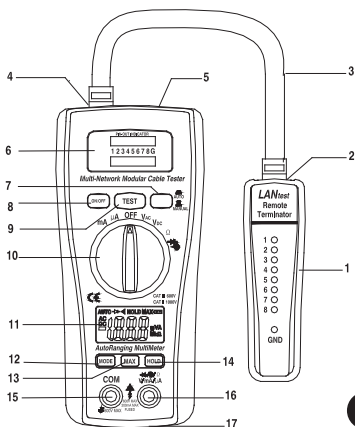
#### 4. METER DESCRIPTION

##### LAN tester part Description (1~9)

- Remote terminator with LED display for receiving end
- Jack RJ45
- LAN-connector
- Jack RJ45
- Jack RJ45
- Led display for sourcing end (Jack 1) & Led display for receiving end (Jack 2)
- Test switch for auto scan
- LAN tester Power switch
- Test switch for manual scan

##### Digital multimeter part Description (10~17):

- Function switch
- 3 1/2 Digit (2000 count) LCD display for DMM functions
- MODE button
- MAX Hold button
- Data Hold button
- COM input jack
- V,  $\Omega$ ,  $\mu$ A, mA input jack
- Battery Cover



## 5. SPECIFICATIONS

### 5.1. Electrical Specifications

#### 5.1.1. DC Voltage

| Range           | Accuracy                      |
|-----------------|-------------------------------|
| 200mV           | $\pm(0.5\% \text{ rdg} + 3d)$ |
| 2.000V, 20.00V, | $\pm(1.0\% \text{ rdg} + 3d)$ |
| 200.0V, 600V    | $\pm(1.0\% \text{ rdg} + 3d)$ |

#### 5.1.2. AC Voltage 50-60Hz

| Range          | Accuracy                       |
|----------------|--------------------------------|
| 2.000V, 20.00V | $\pm(1.0\% \text{ rdg} + 5d)$  |
| 200.0V, 600V   | $\pm(1.5\% \text{ rdg} + 10d)$ |

#### 5.1.3. DC Current

| Range                       | Accuracy                      |
|-----------------------------|-------------------------------|
| 200.0 $\mu$ A, 2000 $\mu$ A | $\pm(1.5\% \text{ rdg} + 3d)$ |
| 20.00mA, 200.0mA            | $\pm(2.0\% \text{ rdg} + 3d)$ |

#### 5.1.4. AC Current

| Range                       | Accuracy                      |
|-----------------------------|-------------------------------|
| 200.0 $\mu$ A, 2000 $\mu$ A | $\pm(1.8\% \text{ rdg} + 8d)$ |
| 20.00mA, 200.0mA            | $\pm(2.5\% \text{ rdg} + 8d)$ |

#### 5.1.5. Resistance

| Range  | Accuracy                      |
|--|-------------------------------|
| 200.00 $\Omega$                                      | $\pm(0.8\% \text{ rdg} + 5d)$ |
| 2.000k $\Omega$ , 20.00k $\Omega$ , 200.00k $\Omega$ | $\pm(1.2\% \text{ rdg} + 3d)$ |
| 2.000M $\Omega$                                      | $\pm(2.0\% \text{ rdg} + 5d)$ |
| 20.00M $\Omega$                                      | $\pm(5.0\% \text{ rdg} + 8d)$ |

## 5.2. General Specifications

| Function               | Range   |
|------------------------|---|
| Max input voltage      | 600V AC/DC  |
| Diode Test             | Test current 1mA max., open circuit voltage of 1.5V typical |
| Continuity Check       | Audible signal if the resistance is <150 $\Omega$           |
| Display                | 2000 count 3 -1/2 digit LCD                                 |
| Over range indication  | LCD displays "OL"   |
| Polarity               | Minus (-) sign for negative polarity.                       |
| Low Battery Indication | "BAT" symbol indicates low battery condition.               |
| Input Impedance        | >7.5M $\Omega$ (VDC & VAC)                                  |
| AC Response            | Average responding  |
| ACV Bandwidth          | 50Hz to 60Hz  |
| Auto Power Off         | 15 minutes (approximately)                                  |
| Fuse                   | mA, $\mu$ A ranges; 0.2A/250V fast acting Fuse              |
| Batteries              | 9V battery and two "AAA" batteries                          |
| Operating Temperature  | 0°C to 40°C (32°F to 104°F)                                 |
| Storage Temperature    | -10°C to 50°C (14°F to 122°F)                               |
| Weight                 | 308g  |
| Size                   | 162 x 74.5 x 44mm   |
| Standard               | IEC61010-1 CAT III-600V Pollution degree II, CE Approved    |

## 6. OPERATION

### 6.1. AC/DC Voltage Measurements

**CAUTION:** Do not measure AC/ DC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

1. Insert the black test lead into the negative COM terminal and the red test lead into the positive V terminal.
2. Set the function switch to VAC or VDC position.
3. Connect the test leads in parallel to the circuit under test.
4. Read the voltage measurement on the LCD display.

### 6.2. AC/DC Current Measurements

1. Set the function switch to the  $\mu$ A/mA position.
2. Insert the black test lead into the negative COM terminal and the red test lead into the positive  $\mu$ A/mA terminal.
3. For current measurements up to 2000 $\mu$ A DC/AC, set the function switch to the mA position

4. Press the MODE button to indicate "DC" / "AC" on the display.
5. Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
6. Touch the black test probe tip to the negative side of the circuit. Touch the red test probe tip to the positive side of the circuit.
7. Apply power to the circuit.
8. Read the current in the display.



### 6.3. Resistance Measurement

**WARNING:** To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements. Remove the batteries and unplug the line cords.



1. Set the function switch to the  $\Omega$  position.
2. Insert the black test lead into the negative COM terminal and the red test lead into the positive  $\Omega$  terminal.
3. Touch the test probe tips across the circuit or part under test. It is best to disconnect one side of the part under test so the rest of the circuit will not interfere with the resistance reading.
4. Read the resistance in the display.

### 6.4. Continuity Check

**WARNING:** To avoid electric shock, never measure continuity on circuits or wires that have voltage on them.

1. Set the function switch to the  position.
2. Insert the black test lead into the negative COM terminal and the red test lead into the positive  $\Omega$  terminal.
3. Press the MODE button to indicate  on the display.
4. Touch the test probe tips to the circuit or wire you wish to check.
5. If the resistance is less than approximately  $150\Omega$ , the audible signal will sound. If the circuit is open, the display will indicate "OL".

### 6.5. Diode Test

1. Set the function switch to the  position.
2. Press the MODE button, touch the test probes to the diode to indicate  on the display under test. Forward voltage will typically indicate 0.400 to 0.700V. Reverse voltage will indicate "OL". Shorted devices will indicate near 0V and an open device will indicate "OL" in both polarities.



## 6.6. MAX Hold Button

To hold the highest reading on the LCD.

1. Press the MAX hold button. The meter reading will not change as readings change.
2. Press the MAX hold button again to return to normal operation.

## 6.7. Hold Button

The Data Hold function allows the meter to "freeze" a measurement for later reference.

1. Press the "**DATA HOLD**" button to "freeze" the display, the "**HOLD**" indicator will appear.
2. Press the "**DATA HOLD**" button to return to normal operation.

## 6.8. Auto Power Off

The auto off feature will turn the meter off after 15 minutes.

## 6.9. Replacing the Battery

1. Remove the bottom cover and secure the screw.
2. Replace old battery with fresh Two 1.5V AAA & 9V type battery.
3. Replace the bottom cover and secure the screw.

## 6.10. Replacing the Fuses

**WARNING:** To avoid electric shock, disconnect the test leads from any source of voltage before removing the fuse cover.

1. Disconnect the test leads from the meter.
2. Remove the protective rubber holster.
3. Remove the battery cover (two "B" screws) and the battery.
4. Remove the four "A" screws securing the rear cover.
5. Lift the center circuit board straight up from the connectors to gain access to the fuse holders.
6. Gently remove the old fuse and install the new fuse into the holder.
7. Always use a fuse of the proper size and value (0.2A/250V fast blow for the 200mA range).
8. Align the center board with the connectors and gently press into place.
9. Replace and secure the rear cover, battery and battery cover.

## 7. Multi-Network Modular Cable Tester Operation

**Note:** Make sure the battery power is sufficient. Insufficient battery power will lead to dimmed LEDs and incorrect results.

### 7.1. 10 Base-T Test

1. Plug one end of the tested cable into the transmitting RJ45 jack on the master unit and the other end of the cable into the remaining receiving RJ45 jack.
2. Slide power switch on. The upper row of LEDs will start to scan in sequence if the Auto/Manual button is set on "Auto" mode. The LED for pin 1 will light up if the button is in "Manual" mode.
3. Switch back and forth from Auto or Manual scanning mode by pressing the Auto/Manual button on the side of the master-testing unit.
4. Once both ends of the cable are plugged in properly, the second row of LEDs will illuminate according to the corresponding LEDs in the top row.
5. Read the results of the LED display for the pin configuration status of the tested cable. If you fail to read the results the first time in Auto mode, you may wait for the second LED scan, or simply switch to Manual mode for pin by pin testing. In Manual mode, pressing the square "Test" button will advance testing to the next pin.

### 7.2. RJ11 Modular Cable Test

Please follow directions for the UTP/STP Cable Test and use the operations manual for the correct LED pin out display.

### 7.3. Coaxial Cable Test

1. Plug the two attached BNC adapter cables on both RJ45 jacks. Then connect the tested cable to each end of the BNC adapter cables
2. For the remaining testing procedures, please refer to 10Base-T Test steps 2 to 5.

**Note:** 1. The center pin of BNC should be read on LED 2.  
2. As Coaxial cable has only two wires, we suggest you read the result of the LED scan using Manual mode.

### 7.4. Remote Test

1. Plug one end of the tested cable to the transmitting RJ45 jack on the master unit and plug the other end into the remote terminator. If the tested cable is installed in a patch panel or wall plate, you may use the included patch cable to solve the connector gender problem.
2. Now, set the Auto/Manual switch to Auto mode for one-person testing.
3. Read the test results from the LED display on remote terminator.

**Note:** The LED display on the remote unit will scan in sequence corresponding to the transmitting end of the master unit.

## 7.5. Sample Test Results

1 2 3 4 5 6 7 8 G

1. Continuity: Pin 2 has continuity

1 2 3 4 5 6 7 8 G

2. Open: Pin 2 is opened

1 2 3 4 5 6 7 8 G

3. Short: Pin 2 and Pin 3 are shorted

1 2 3 4 5 6 7 8 G

4. Miswire: Pin 3 and Pin 6 are miswired

- |   |
|---|
| <p><b>CAUTION:</b> 1. Operating the tester in live circuits may damage the tester</p> <p>2. Leaving the battery in the tester for long periods of time without use could drain power from the battery</p> |
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