

Labgear

76615PI

Telephone/Network Complete Tool Kit

Multimeter/Cable Tester
Punch Down Tool/Soldering Iron
User Guide



1. Overview

This multimeter is characterized by a compact rugged construction with protective holster and stand. The 3½ digit LCD Screen with 23mm display gives clear readings. Features include dual slope A/D converter using C-MOS technology for auto-zeroing, polarity selection and over-range indication.

Before use you will need to fit a 9V PP3 battery (not supplied) in the compartment located on the back of the meter. To open the compartment remove the cross headed screw from the lid and slide open, clip the terminal studs over the battery terminal caps, close the compartment lid and screw tightly shut.

2. Panel Layout



- 1) 3½ Digit LCD Display 23mm
- 2) Rotary Power/Function Switch: use to select functions and ranges
- 3) 10A Input Socket,
- 4) mA Input Socket
- 5) COM Input Socket
- 6) VΩ Input Socket,
- 7) hFE Transistor Input Socket

3. Safety Warnings

- Do not expose the device to water. Wipe it dry immediately if it should get wet.
- If the unit is damaged in any way or malfunctions do not use. Consult a qualified service engineer.
- Never apply more than 1000VDC or 700V AC between an input jack and Earth.
- Use extreme caution when working with voltages in excess of 60VDC or 30VAC.
- Always discharge the filter capacitors in a power supply circuit before attaching the test leads.
- Never connect a voltage source to the multimeter when it is in current (DCA or ACA) mode, resistance or continuity mode.
- Before replacing the battery or a fuse, turn off the power and disconnect the test leads.
- Make sure the back cover is in place and secured before operating the multimeter
- To conserve the battery return the rotary power/function switch to the "Off" position as soon as a measurement is completed.
- If the meter is left on, after 20mins, a short audio tone will sound repeatedly (to remind you to switch it off) and after a further minute a longer tone and then the meter switches off automatically.
- To prevent possible leakage remove the battery during long periods of inactivity.

4. Specifications

- 4.1 3 ½ digit big LCD max. Indication 1999.
- 4.2 Auto-Zero & Auto-Polarity.
- 4.3 Overrange: indication of "OL" .
- 4.4 Low battery indication: .
- 4.5 Power supply: 9V alkaline battery.
- 4.6 Safety standards: The meter complies with IEC1010 Double Insulation, overvoltage Category II.
- 4.7 Protective terminal socket covers prevent operational mistakes
- 4.8 Optimum operating temperature for accuracy: 23°C±5°C
- 4.9 Temperature range: Operating: 0°C to 40°C
Storage: -20°C to 60°C
- 4.10 Humidity range: Operating: max 75%RH Storage: max 80%RH
- 4.11 Size including holster: 176mm x 87mm x 45mm
- 4.12 Weight: Approx 270g (including battery).
- 4.13 Accessories: Test leads

5. Operating Instructions

5.1 Preliminary Note:

- 5.1.1 If the battery is weak. Display will show . The battery should be replaced with a fresh PP3 9V battery.
- 5.1.2 The " " icon next to the test lead sockets warns that the input voltage or current should not exceed the indicated values. This is to prevent damage to the internal circuitry.

- 5.1.3 When setting the function switch, if the range is not known beforehand, always set the FUNCTION switch to the highest range and work down.
- 5.1.4 When "OL" is displayed, this indicates overrange/overload and the FUNCTION switch must be set to a higher range.

5.2 DC Voltage Measurement

- 5.2.1 Connect the BLACK test lead to the "COM" socket (5) and the RED test lead to the "VΩ" socket (6).
- 5.2.2 Set the FUNCTION switch to "V $\overline{\text{---}}$ " range to be used.
- 5.2.3 Connect the test leads across the source/load to be measured.

Note:

- a. Don't apply more than DC 1000V to the input, indication is possible at higher voltage but there is danger of damaging the internal circuitry.
- b. Use extreme caution to avoid contact with high tension circuits when measuring high voltages

Range	Resolution	Overload Protection : 1000V DC/700Vrms AC on other ranges. Input impedance : 10MΩ on all ranges
200mV	100μV	
2V	1mV	
20V	10mV	
200V	100mV	
1000V	1V	

5.3 AC Voltage Measurement

- 5.3.1 Connect the BLACK test lead to the "COM" socket (5) and the RED test lead to the "VΩ" socket (6).
- 5.3.2 Set the FUNCTION switch to the "V~" range to be used.
- 5.3.3 Connect the test leads in series with the load to be measured.

Note:

- a. Don't apply more than 700Vrms AC to the input, indication is possible at higher voltages but there is a danger of damaging the internal circuitry.
3. Use extreme caution to avoid contact with high tension circuits when measuring high voltage.

Range	Resolution	Frequency Range: 40 to 400Hz Response: average, calibrated in rms of sine wave
2V	1mV	
20V	10mV	
200V	100mV	
700V	1V	

5.4 DC Current Measurement

- 5.4.1 Connect the BLACK test lead to the "COM" socket (5) and the RED test lead to the "mA" socket (4) for a maximum of 200mA, for a max. of 10A, move the RED test lead to "10A" socket (3).
- 5.4.2 Set the FUNCTION switch to the "A $\overline{\text{---}}$ " range to be used.
- 5.4.3 Connect the test leads in series with the load to be measured.

Note: The maximum input current is 200mA or 10A depending upon the socket used. Excessive current will blow the fuse which must be replaced. The fuse rating should be 200mA or 10A and no more to avoid damage to internal circuitry.

Range	Resolution	Overload protection: 0.2A/250V fuse 10A/250 fuse 10A up to 15 seconds Note: [1] 10A range: not fused
2mA	1 μ A	
20mA	10 μ A	
200mA	100 μ A	
10A	10mA	

5.5 AC Current Measurement

5.5.1 Connect the BLACK test lead to the "COM" socket (5) and the RED test lead to the "mA" socket (4) for a maximum of 200mA, for a maximum of 10A, move the RED test lead to the "10A" socket (3).

5.5.2 Set the FUNCTION switch to "A~" range to be used.

5.5.3 Connect the test leads in series with the load to be measured.

Note: The maximum input current is 200mA or 10A depending upon the socket used. Excessive current will blow the fuse which must be replaced. The fuse rating should be 200mA or 10A and no more to avoid damage to internal circuitry.

Range	Resolution	Frequency : 40~200Hz Overload protection : 0.2A /250V fuse, 10A/250V fuse 10A up to 15 seconds
2mA	1 μ A	
20mA	100 μ A	
10A	10mA	

5.6 Resistance Measurement

5.6.2 Connect the BLACK test lead to the "COM" socket (5) and the RED test lead to the "V Ω " socket (6).

5.6.1 Set the FUNCTION switch to " Ω " range to be used

5.6.3 Connect the test leads across the resistance to be measured.

Note:

1. For resistance of approximately 1 Mega Ohm and above, the meter may take a few seconds to stabilize. This is normal for high resistance readings.
2. When the input is not connected (open circuit), "1" will be displayed to indicate overrange condition.
3. When checking in-circuit resistance, be sure the circuit under test has all power removed and that all capacitors are fully discharged.

Range	Resolution	Overload protection :250V DC/250Vrms AC for all range.
200 Ω	0.1 Ω	
2K Ω	1 Ω	
20K Ω	10 Ω	
200K Ω	100 Ω	
2M Ω	1K Ω	
20M Ω	10K Ω	
200M Ω	100K Ω	

5.7 Capacitance Measurement

5.6.2 Connect the BLACK test lead to the "COM" socket (5) and the RED test lead to the "V Ω " socket (6).

5.7.1 Set the FUNCTION switch to the "F" range to be used.

5.7.2 Connect the test leads to the wires of the capacitor to be measured.

Note:

- 1. Capacitors **must** be discharged before being connected to probes.
- 2. When testing large capacitance, note that there will be a certain time lag before the final indication.
- 3. Do not connect to an external voltage or charged capacitor (especially larger capacitors)

Range	Resolution	Overload Protection :36V DC/36V AC for all ranges
2nF	1pF	
20nF	10pF	
200nF	100pF	
2μF	1nF	
20μF	10nF	

5.8 Transistor hFE Test

- 7-6-1 Set the rotary switch at 'hFE' position.
- 7-6-2 Determine whether the transistor under test is NPN or PNP and locate the emitter, base and collector leads. Insert the leads into the correct holes of hFE socket (7) on the front panel.
- 7-6-3 Read the approximate hFE value at the testing condition of base current Ib10μA and Vce 3V.

Range	Test Range	Test Current / Voltage
hFE	Display reads approx. hFE value (0~1000) of transistor under test (NPN and PNP Type)	Best Current approx 10μA Voltage approx 3V

5.9 Diode test and Audible Continuity Test

- 5.9.1. Connect the BLACK test lead to "COM" socket (5) and the RED test lead to the "VΩH" socket
- 5.9.2. Set the FUNCTION switch to the "➡🔊" range.
- 5.9.3. For diode testing Connect the red lead to the anode and the black lead to the cathode of the diode to be tested, display shows the approximate forward voltage of the diode.
- 5.9.4. For continuity testing, connect the test leads to either ends of the part of the circuit to be tested, if the resistance is lower than approx. 80Ω, the buzzer will sound.

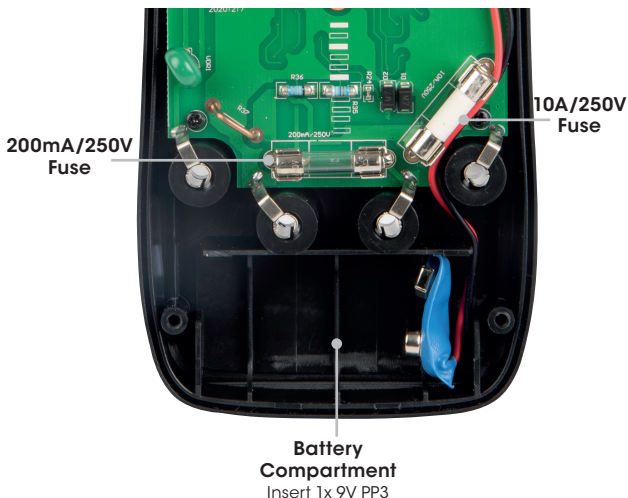
Range	Description	Test Condition
➡	Display shows approximate forward Voltage of diode.	Forward DC current approx 1.5mA Reversed DC voltage approx. 3V
🔊	Built-in buzzer sounds if resistance is less than 80Ω.	Open circuit voltage approx 3V

Overload protection: 250V DC/250Vrms AC

6. Maintenance

This multimeter is a precision electronic device. Do not tamper with the circuitry to avoid damage. Before replacing the battery or a fuse, turn off the power and disconnect the test leads.

- If the  sign appears in the display, remove the retaining screw and open the battery compartment cover, remove the spent battery and replace it with a battery of the same type (9V PP3).
- If either of the fuses need to be replaced, first remove the holster, then unscrew the four screws holding the back cover to the meter housing. Make sure replacement fuses have the same rating as the original fuses and are F-type fuses. The fuse rating should be 200mA or 10A and no more to avoid damage to internal circuitry.



9. Accessories

- [1] Test Leads: Rating 1000V 10A
- [2] Fuses: F-200mA/250V and F-10A/250V - fitted
- [3] User Guide
- [4] Holster

For further information or any queries please contact

Technical Support:

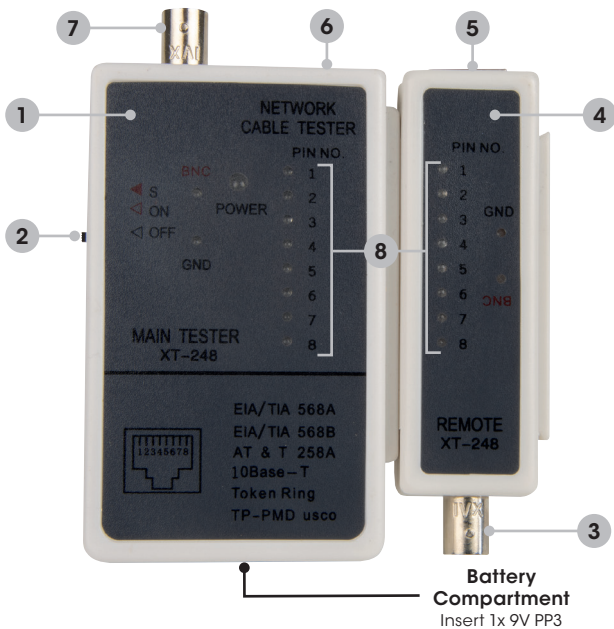
www.labgear.co.uk/support

Network Cable Tester Guide

WARNING!

- This cable tester should NOT be used to test powered cables.
- If pin activity lights appear weak, replace the battery (1x PP3 9V battery, not included.).
- Testing cannot be verified if connector ends are not fully inserted into the units.
- Always ensure you use quality tools to crimp connections.
- This cable tester is for use with RJ45 and BNC connectors only.

Main Features



- 1) Main Unit
- 2) Test Switch: Off/Test/Slow Test
- 3) BNC Socket - In
- 4) Remote Unit

- 5) RJ45 Input Socket
- 6) RJ45 Output Socket
- 7) BNC Socket - Out
- 8) Pin Indicator LEDs

Introduction

The tester has two main functions:

1) Testing individual leads RJ45 or BNC:

Cables with both ends accessible can be quickly be tested without the need to separate the remote unit from the main unit.

2) Testing installed cables with RJ45 or BNC terminations:

To test cables installed in ceilings or walls or in applications that prevent the ends from being in the same location, the remote can be detached from the main unit. Once detached, the remote can be attached to one end of the cable run, and the main unit attached to the other end. For example the main unit can be attached with a lead to a patch panel and then the remote unit can be attached with a patch lead to an RJ45 wall outlet in another room.

Before Use

The tester requires 1x PP3 9V battery (not included), to power the main unit and send a test current to the remote unit.

Slide open the battery compartment on the back of the main unit, attach the terminal cap to the battery, insert the battery and replace the cover.

To Operate

1. Connect one end of the cable to be tested to a socket on the main unit and the other end of the cable to the corresponding socket on the remote unit.
2. Slide the OFF/ON/S switch (2) to "ON" or "S" (for Slow) on the main tester.
3. For RJ45 cables, if correctly wired all lights from 1-8 will light up green on both units one after the other in sequence and the position of the lights will correspond on both units. For RJ12 lights 1-6 will light up green and for RJ11 lights 1-4 will light up.
4. If the cable is cross-wired or incorrectly wired lights from 1-8 will light up green on the main unit in sequence but the sequence will be different on the smaller unit; i.e. if the cable is cross-wired (T568B) the order on the main unit will be 1, 2, 3, 4, 5, 6, 7, 8 but on the smaller unit will be 3, 6, 1, 4, 5, 2, 7, 8.
5. If some lights don't activate there is a break in the cable.
6. If a single light is lit on the main unit and more than one light comes on the small unit this indicates a short circuit.
7. If the light sequence is too fast, slide the Test Switch (2) to the "S" position to slow the sequence down.
8. The G (Ground) light is for FTP shielded cable and will light up on both units if an FTP cable is properly shielded.
9. For BNC cables the BNC and GND LEDs will light up alternately on both units if the cable is correctly wired.

110 Punch Down Tool Guide

Introduction

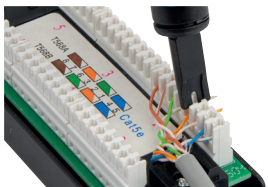
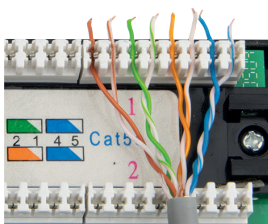
This punch down tool is designed for making secure IDC connections (and trim the conductor wire at the same time) for CW1308 telephone cable and CAT3, CAT5e, CAT6 & CAT6e network cable types.

It is ideal for terminating IDC telephone sockets, RJ45 network sockets and IDC patch panels

To prepare cables and make secure connections you will need the following tools from the kit: Cable Cutter, Cable Stripper and the 110 Punch Down Tool.

1. Strip a suitable length* of the outer cable jacket, trim back any plastic insulation and rip cord, and separate any twisted pairs.
2. Untwist each wire pair by about 12mm, keeping the remaining twists as tight as possible.
3. Slot the cable pairs into the IDC terminals
4. Then use the 110 punch down tool* to terminate the wires and trim them. Make sure the CUT side of the tool is positioned facing the outside of the IDC unit. Press the tool down on the conductor wires. Be sure to punch straight down and not at an angle. You should hear a loud click when you punch down. This means that you've terminated the wire correctly.
5. Adjust the HI and LO setting according to the wire gauge (thickness) that is being used
Use LO for 24AWG (typically Cat5e) conductor wires
Use HI for 23AWG (typically Cat6 or Cat6A) conductor wires

**110 Punch
Down Tool**



*Check IDC socket/panel instructions for recommended lengths

Soldering Iron Safety Guide

Hazards and Safety Precautions

Solder flux is irritating and sensitising, and may cause an allergic reaction. Wear gloves when handling solder and especially solder flux.

Lead based solders are toxic as heavy metal poisoning is cumulative and irreversible. All solders are potentially hazardous, just because there is no lead does not make them completely safe.

Soldering irons get very hot (up to 400°C), to prevent burns never touch the element or tip. They also can be a fire hazard, always return the soldering iron to its stand when not in use and turn the unit off or unplug the iron after you finish soldering.

Solder fume is potentially irritating, toxic and sensitising. Always work in very well ventilated area, i.e. use an extractor fan.

The most common hazards in use are damage to the soldering iron or things in the work area due to careless routing of soldering iron supply cable and soldering iron stands that are not stable enough. You have to be very careful not to catch the supply cable with the iron.

Soldering iron cleaning sponges should be kept wet as if they are not you just burn the sponge and release more potentially toxic vapour (and it won't clean your iron it will clog it up). This is why metallic (brass wool) cleaning balls are popular.



Labgear VK8L
Output: 6x
Noise Fig:
UK
CE

Labgear

voltage indicator
operating range: 90-600V AC

powered by KEWTECH



Waste electrical and electronic products should not be disposed of with household waste. Please recycle where facilities exist. Check with your local authority for recycling advice.



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