MULTI-FUNCTIONAL TESTER

Multi-functional measurement device

1. GENERAL INFORMATION

Dear customer,

thank you for choosing our product. In the following, we will show you how to use this device.

Should you encounter any unexpected problems during use, please do not hesitate to contact us.

2. SPECIFICATION

This LCR meter offers a wide range of functions at a low price. The LCR meter can measure capacitance, resistance, and inductance among other things. In addition, it can automatically recognize components, for example, it can distinguish between different types of transistors, such as NPN or PNP transistors. The device is particularly easy to operate, as all measurements are started at the touch of a single button.

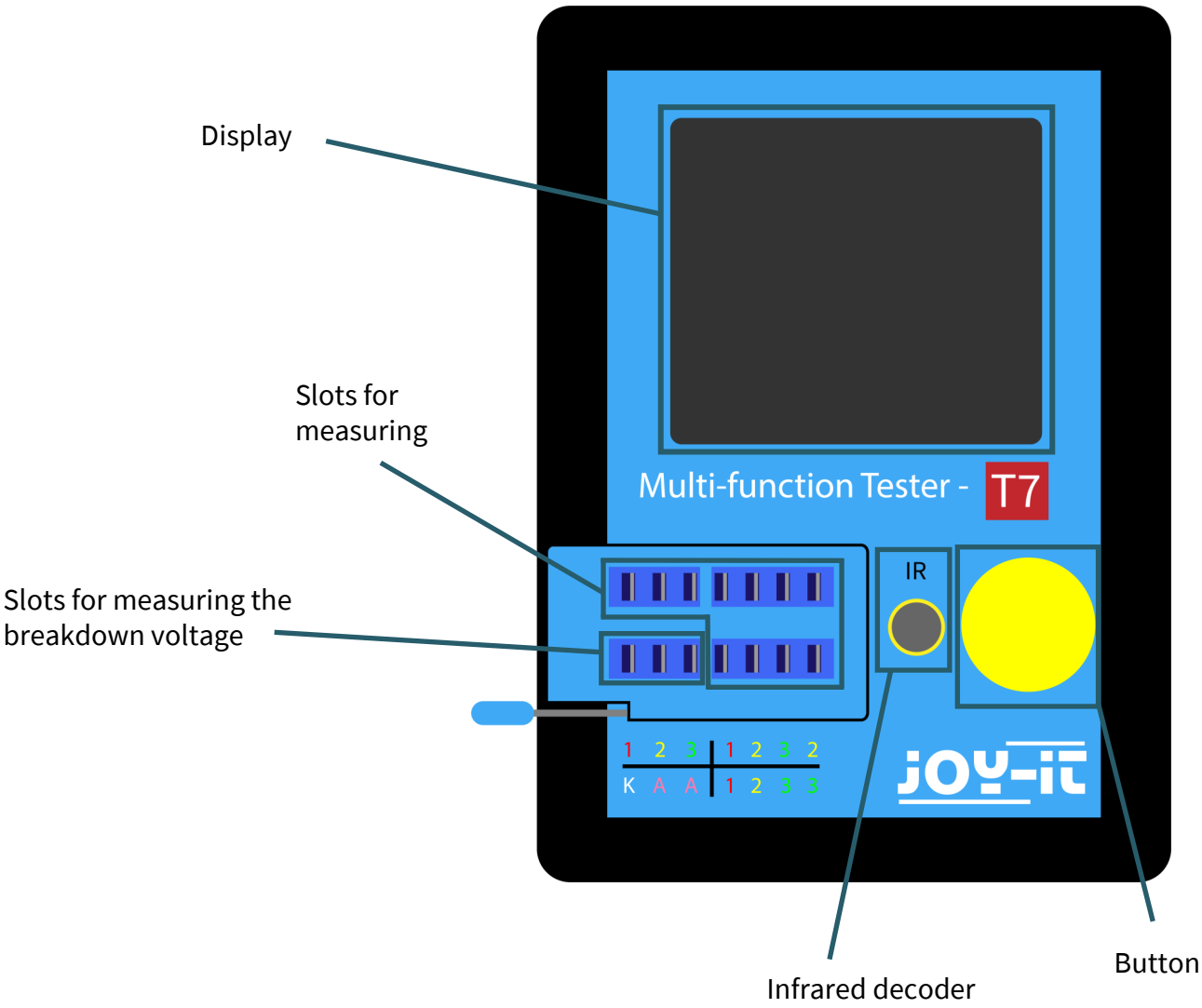
Thanks to the integrated about 300 mAh battery, measurements can also be carried out on the road. The battery is charged with the help of a 5V power supply unit (available separately) and the enclosed micro-USB cable. In addition, this measuring device can decode infrared signals and show them as a waveform on the display.

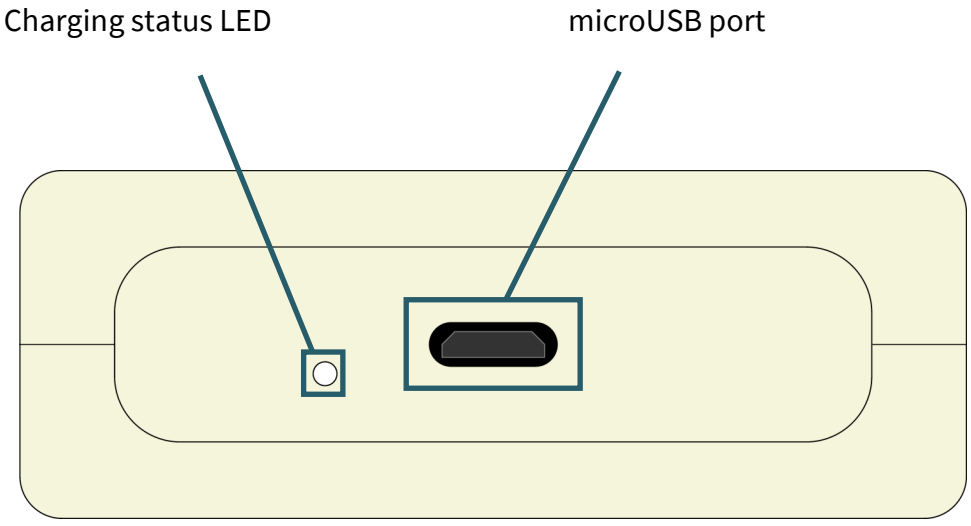
The LCR-T7 is not a professional measurement instrument and due to the large number of different components on the market, it cannot be guaranteed that all components will be correctly detected.

MAIN FEATURES	
Measurable components	Resistor, capacitor, inductor, thyristor, triac, (double) diode, Z-diode, field effect transistor, bipolar transistor, infrared decoder
Supported IR-protocol	NEC
Display type	1.8″ TFT LCD (160 x 128 p)
Special features	Automatic calibration, One key operation
Built-in battery	Lithium Ion rechargeable, 3,7 V, about 300 mAh
Size	90 x 70 x 27 mm

MEASURING RANGES	
Capacitance	25 pF - 100 mF
Resistance	0,01 Ω - 50 MΩ
Inductance	0,01 mH - 20 H
Battery	0,1 V - 4,5 V
Z-diode breakdown voltage	0,01 V - 30 V
Z-diode	0,01 V - 4,5 V
Diode	U_F < 4,5 V
Thyristor / Triac	I_{GT} < 6 mA

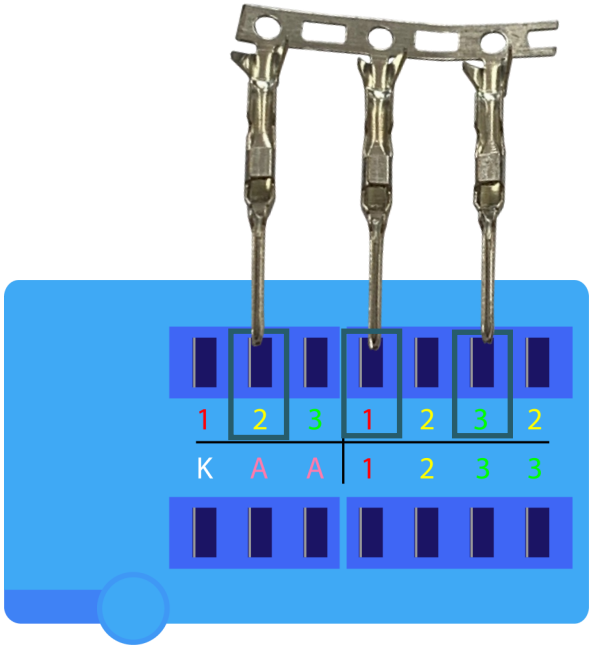
3. STRUCTURE


Display
Slots for measuring
Slots for measuring the breakdown voltage
Multi-function Tester - T7
IR
1 2 3 1 2 3 2
K A A 1 2 3 3
joy-it
Infrared decoder
Button

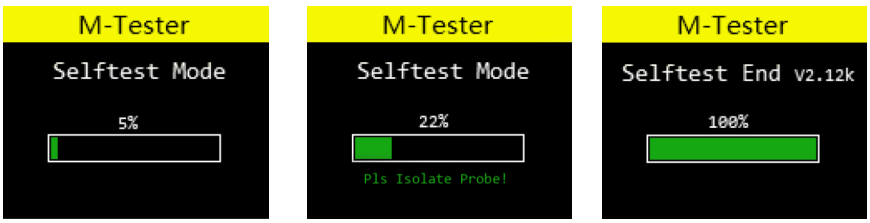

Charging status LED
microUSB port

4. INITIAL OPERATION

When you start the measuring device for the first time, you should first perform a self-test of the device. For this purpose, you must short-circuit the slots 1, 2 and 3. You do this as follows:



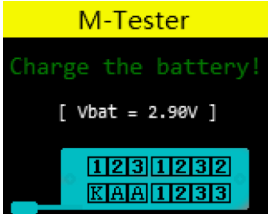
Now press ***Start*** to perform the self-test. You will be asked by the device at approx. 22% to remove the component so that the self-test can be completed successfully. Now you can start measuring your components. You start the measuring process with the Start button.



A 3.7 V battery with about 300 mAh is built into the multifunction tester. You can charge it with microUSB and a 5 V power supply. The LED shows the
status of the battery. That means it shines red when the battery is charging and green when the battery is fully charged.

The battery of this measuring device is also measured during each component measurement. Therefore, the residual voltage of the battery is also displayed during each measurement.

This residual voltage is displayed with *Vbat = ...V*.
The device will also tell you when the battery needs to be charged again.



This device will automatically turn off after 20 seconds of inactivity. You can also turn it off manually, by pressing and holding the Start button. Pressing and holding the Start button for 3 seconds will put the device into standby mode. Holding for 5 seconds will turn the device off.

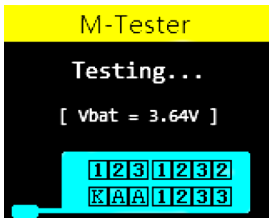
5. MEASURING COMPONENTS

This measuring instrument can detect and measure diodes, Z-diodes, double diodes, resistors, capacitors, inductors, thyristors, triacs, field effect transistors, bipolar transistors, and batteries. In the following, you will find information on how to measure a component and which values can be measured for the specific components.

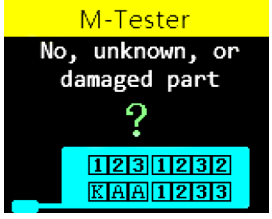
To measure a component you can use slots 1-3. Just make sure that you do not connect two cables to the same channel, i.e. the same digit. So you have to select any slot at 1, 2, and 3 for three connections.
To measure the breakdown voltage, use channels K and A. Connect the positive pin to K and the negative pin to A. You will find further information under Z-Diode.

You can either plug the component directly into the terminals of the device or use the cable clamps provided.

When you have connected your component, press down the lever and start the measurement with the start button.

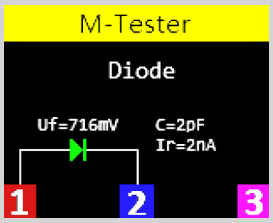


If no component or a defective component has been connected, or the component has been connected incorrectly, the following message is displayed on the screen.



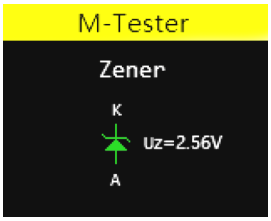
Diode

Uf - forward voltage
C - capacity
Ir - leakage current



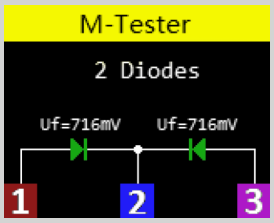
Z-Diode

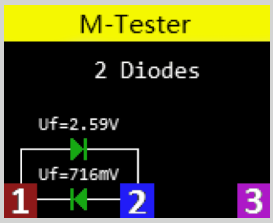
Uz - reverse breakdown voltage / Z-voltage
Here the breakdown voltage of a component is measured, so here the positive line must be connected to K and the negative line to A. Up to 30 V can be measured in the reverse voltage.



Double diode

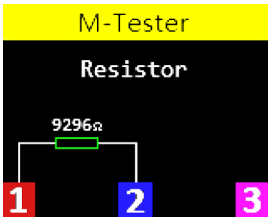
Uf - forward voltage





Resistor

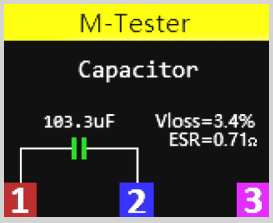
Here the resistance in Ω is displayed.



Capacitor

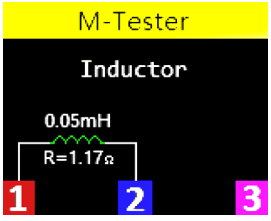
The capacity is displayed here.
Vloss - Loss factor
ESR - equivalent series resistance

Attention!
The capacitors must always be discharged before you can test them, otherwise the multifunction tester may be damaged!



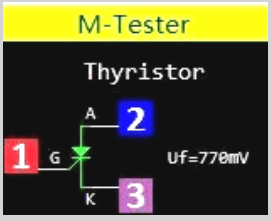
Inductor

The inductance is displayed here.
R - resistance



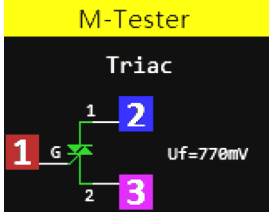
Thyristor

Uf - forward voltage



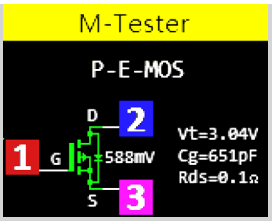
Triac

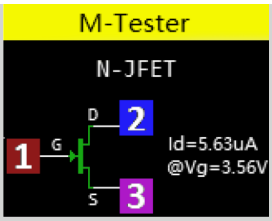
Uf - forward voltage

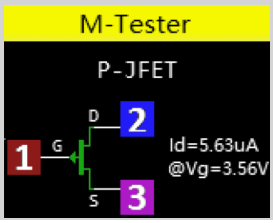


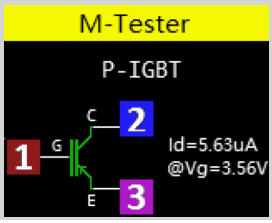
Field effect transistor

Vt - threshold voltage
Cg - gate capacity
Rds - drain source resistance
Uf - forward voltage
@Vg - gate voltage
Here the multifunction tester can distinguish between N-E-MOS, P-E-MOS, N-MOS, P-MOS, N-JFET, P-JFET, N-IGBT and P-IGBT.



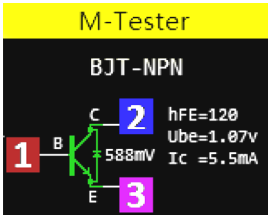


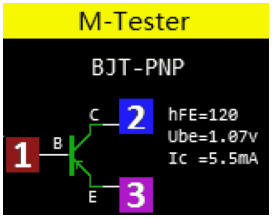




Bipolar transistor

hFE - current amplification factor
Ube - base voltage
Ic - collector current
Uf - forward voltage
Here the multifunction tester can distinguish between BJT-NPN, BJT-NPN with diode, BJT-PNP and BJT-PNP with diode.

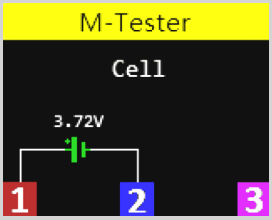




Batteries

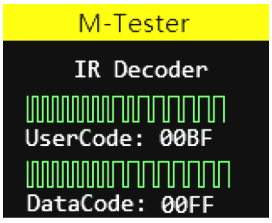
The battery voltage is displayed here.

Attention! The battery must have less than 4.5 V, otherwise the multifunction tester may be damaged!



Infrared-Decoder

The infrared decoder is located next to the start button and does not need to be activated separately. You can simply e.g. activate your infrared remote control in front of the device, which decodes it immediately. You can then see the UserCode and the DataCode in hexadecimal format on the screen. The UserCode is the specific code of the remote control you are using and the DataCode is the code of the button you pressed.



However, **only** the NEC protocol (which is used by many manufacturers) can be decoded.

6. EXAMPLE COMPONENTS

A capacitor and an LED are included in the delivery, you can use these for first measurements with your LCR meter to get familiar with the device.

7. PROBLEMS

The JT-LCR-T7 is not a professional measuring device, and due to the wide variety of components available in the market, it cannot be guaranteed that all components will be correctly identified.

Please note that the JT-LCR-T7 is primarily designed for small-signal components and the maximum measuring current is usually around 6 mA. When dealing with power semiconductors, difficulties may arise in identifying or measuring the junction capacitance due to high residual currents. For thyristors and triacs, the trigger and holding currents are often not sufficient, leading to misidentifications such as recognizing a thyristor as an NPN transistor or diode. There are also instances where a thyristor or triac may not be identified at all. Similar challenges occur with semiconductors that have built-in resistors. For example, the base-emitter diode of a BU508D transistor often goes unrecognized due to an internally parallel-connected 42Ω resistor, making it impossible to test the transistor function. High-power Darlington transistors, which also have base-emitter resistors, can likewise be difficult to identify, especially given the small measuring currents used by this device.

8. FURTHER INFORMATION

Our information and redemption obligation according to the Electrical and Electronic Equipment Act (ElektroG)

Symbol on electrial and electronic products :
This crossed-out bin means that electrical and electronic products do not belong into the household waste. You must hand over your old appliance to a registration office. Before you can hand over the old appliance, you must remove used batteries and accumulators which are not enclosed by the device.

Return options :
As the end user, you can hand over with the purchase of a new device your old appliance (which has essentially the same functions as the new one) free of charge for disposal. Small devices which do not have outer dimensions greater than 25 cm can be submitted independently of the purchase of a new product in normal household quantities.

Possibility of restitution at our company location during our opening hours:
SIMAC GmbH, Pascalstr. 8, D-47506 Neukirchen-Vluyn

Possibility of restitution nearby :
We send you a parcel stamp with which you can send us your old appliance free of charge. For this possibility, you must contact us via e-mail at
service@joy-it.net or via telephone.

Information about packaging:
Please package your old appliance safe during transport. Should you not have a suitable packaging material or you do not want to use your own material, you can contact us and we will send you an appropriate package.

9. SUPPORT

If any questions remain open or problems arise after your purchase, we are available by email, telephone and ticket support system to answer these.

E-Mail: service@joy-it.net
Ticket-System: http://support.joy-it.net
Telephone: +49 (0)2845 9360 – 50 (Mon –Thur: 09:00 - 17:00 o‘clock,
Fri: 09:00 - 14:30 o‘clock)

For more information visit our website:
www.joy-it.net

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