

Digital Multimeter

User Manual

Read this manual thoroughly before use

INTRODUCTION

Digital Autorange multimeter prevent the problem of having to know which range of value of resistance, capacitance, voltage or whatever electrical characteristic you are finding falls under.

The multimeter automatically finds the value for you, easy to operate as you only need to select the desired function and this useful test tool does the rest.

The meter is supplied in a robust plastic case with a compact 3 3/4-digit digital display screen and will measure, DC and AC voltage, DC and AC current, resistance and carry out continuity tests with an audible warning. The meter other features include MIN MAX recording, data hold, recording mode, polarity and low battery indication and a backlight.

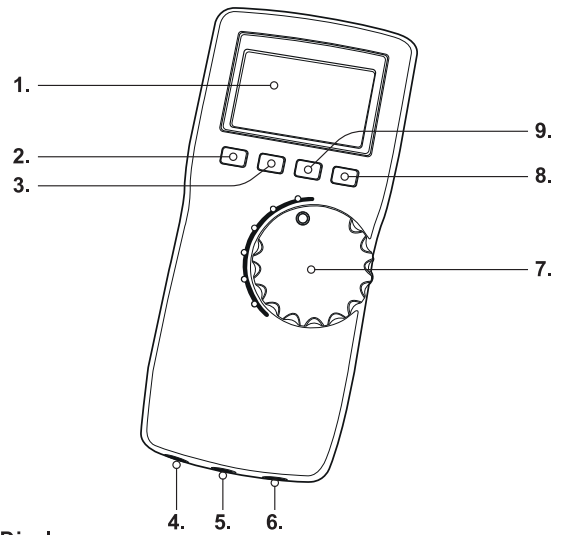
FEATURES

1. Auto range finding
2. Large LCD display screen
3. MIN / MAX recording
4. Data hold
5. Polarity and low battery indication
6. Conforms to EN 61010-1 CAT III safety requirements
7. Measure- AC and DC Voltage, DC and AC Current, Resistance and Continuity

IMPORTANT SAFETY INFORMATION

It is essential that you read and understand the instructions contained in this manual before using the digital multimeter for the first time. Failure to follow these instructions could result in an electrical shock or possible damage to the meter or to the equipment under test. This manual should be stored safely for future reference.

CAT III - Measurement Category III is for taking measurements and performing checks in a building's electrical installation. Examples are measurements on distribution boards, circuit breakers, wiring, including cables, bus-bars, junction boxes, switches, socket-outlets in the fixed installation, and equipment for industrial use and some other equipment, for example, stationary motors with permanent connection to the fixed installation. Do not use the meter for measurements within measurement categories IV.



- 1. Display**
3 1/2 digits LCD, with a max. reading of 1999.
- 2. " SELECT " Button**
Used to switch between DC current and AC current measurement functions.
- 3. " ☀ " Button**
Press this " ☀ " button to turn on or off the backlight. The backlight will turn off automatically about 30 secs later after it is turned on.
- 4. " 10A " Terminal**
Plug-in connector for the red test lead for current measurements.
- 5. " COM " Terminal**
Plug-in connector for the black test lead for all measurements.
- 6. " INPUT " Terminal**
Plug-in connector for the red test lead for all measurements except current measurements.
- 7. Rotary Switch**
Used to select desired function as well as to turn on or off the meter.
To save battery power, set this rotary switch in the " OFF " position to turn off the meter when the meter is not in use.
- 8. " MAX/MIN " Button**
Used to enter or exit MIN MAX recording mode.
- 9. " HOLD " Button**
Used to enter or exit Data Hold mode.

UNDERSTANDING THE DISPLAY

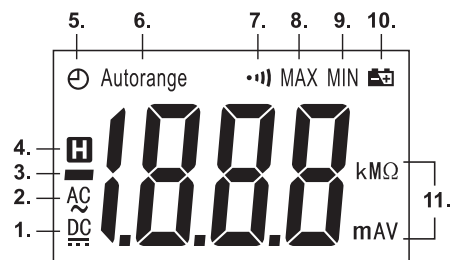








Figure 2

Explanations:

1. **DC** DC
2. **AC** AC
3. **-** Negative sign
4. **H** Data hold is enabled.


5.  Automatic power-off feature is enabled.
6.  Autorange mode is selected.
7.  Continuity test is selected.
8.  Maximum reading is being displayed.
9.  Minimum reading is being displayed.
10.  The batteries are low and must be replaced immediately.

11. Units

mV, V	Unit of voltage mV: Millivolt; V: Volt 1V = 10 ³ mV
A	Unit of current A: Ampere
Ω, kΩ, MΩ	Unit of resistance Ω: Ohm; kΩ: Kilohm; MΩ: Megohm 1MΩ = 10 ³ kΩ = 10 ⁶ Ω

General Specifications



Display:	3 1/2 digit LCD
Negative Polarity Indicator:	Negative sign “-” shown on the display
Sampling Rate:	About 2-3 times per sec
Low Battery Indication:	“  ” shown on display
Battery:	1.5V Battery / AAA
Operating Environment:	0°C to 40°C / <75%RH
Storage Environment:	-10°C to 50°C / <85%RH
IP Degree:	IP20
Operating Altitude:	0 ~ 2000m
Dimensions:	176 x 79 x 17.5mm
Weight:	~188g (including battery)

ACCURACY

Accuracy is specified for a period of one year after calibration and at 18°C - 28°C, with relative humidity up to 75%. Accuracy specifications take the form of: ± [(% of Reading) + (Number of Least Significant Digits)] Except where specified specially, accuracy is specified from 5 % to 100% of range.

CAUTION PRIOR TO USE

To avoid possible damage to the meter or to the equipment under test, follow these guidelines. Disconnect circuit power and discharge all capacitors before carrying out a resistance, diode or continuity test. Use the proper terminals and function for your measurement.

Before measuring current, check the meter's fuse and turn off the power to the circuit before connecting the meter to the circuit.

Before turning the rotary switch to change functions, disconnect test leads from the circuit under test.

NOTE:

When making connections, connect the Black test lead before you connect the Red test lead. When you disconnect test leads, disconnect the Red test lead first.

DC Voltage

Range	Resolution	Accuracy	Overrange Indication
200mV	0.1mV	± (0.8% + 5)	[1] shown on display
2V	0.001V		
20V	0.01V		
200V	0.1V		
600V	1V	± (1.0% + 5)	

Input Impedance: Approximately 10MΩ

Overload Protection: 600V DC/AC

[1] When the voltage being measured is more than 600V, the built-in buzzer will sound. When the voltage is more than 610V, "OL" will be shown on the display.

AC Voltage

Range	Resolution	Accuracy	Overrange Indication
2V	0.001V	± (1.0% + 5)	[1] shown on display
20V	0.01V	± (1.2% + 8)	
200V	0.1V		
600V	1V		

Input Impedance: Approximately 10MΩ

Frequency Range: 50Hz ~ 400Hz

Response: Average, calibrated in RMS of sine wave

Overload Protection: 600V DC/AC

[1] When the voltage being measured is more than 600V, the built-in buzzer will sound. When the voltage is more than 610V, "OL" will be shown on the display.

DC Current

Range	Resolution	Accuracy	Overrange Indication
2A	0.001A	± (1.2% + 5)	[1] shown on display
10A	0.01A	± (2.0% + 10)	

Overload Protection: 12A/600V Fast fuse

Max. Allowable Input Current: 10A (For measurements > 2A: duration < 10 seconds, interval > 15 minutes)

[1] When the current being measured is more than 10A, the built-in buzzer will sound.

AC Current

Range	Resolution	Accuracy	Overrange Indication
2A	0.001A	± (1.5% + 5)	[1] shown on display
10A	0.01A	± (3.0% + 10)	

Frequency Range: 50Hz ~ 400Hz

Response: Average, calibrated in RMS of sine wave

Overload Protection: 12A/600V Fast fuse

Max. Allowable Input Current: 10A (For measurements > 2A: duration < 10 seconds, interval > 15 minutes)

[1] When the current being measured is more than 10A, the built-in buzzer will sound.

Resistance

Range	Resolution	Accuracy	Overrange Indication
200Ω	0.1Ω	± (1.2% + 5)	[1] shown on display
2kΩ	0.001kΩ	± (1.0% + 5)	
20kΩ	0.01kΩ		
200kΩ	0.1kΩ		
2MΩ	0.001MΩ	± (1.2% + 5)	
20MΩ	0.01MΩ	± (1.5% + 5)	

Open Circuit Voltage: Approximately 1V

Overload Protection: 600V DC/AC

[1] When the resistance being measured is over 20MΩ, "OL" will be shown on the display.

Continuity Test

Range	Description	Remark
•)))	<p>The built-in buzzer will sound if the resistance is less than approx. 30Ω.</p> <p>When the resistance is between 30Ω and 100Ω, the buzzer may or may not sound.</p> <p>When the resistance is more than 100Ω, the buzzer will not sound.</p>	Open Circuit Voltage: about 2.2V

Overload Protection: 600V DC/AC

OPERATING INSTRUCTION

Data Hold Mode

Press the "HOLD" button to enter Data Hold mode. The present reading is held on the display and the "H" symbol appears on the display as an indication.

To exit Data Hold mode, just press this button again. The "H" symbol disappears.

MIN MAX RECORDING MODE

The MIN MAX recording mode stores the minimum and maximum input values. When the input goes below the stored minimum value or above the stored maximum value, the meter stores the new value.

Using the MIN MAX recording mode:

1. Ensure the meter is set for the correct function.
2. Press the "MAX/MIN" button sequentially to switch between the MIN or MAX recording mode.
3. MAX Mode the display shows the maximum reading of all the readings taken since the meter entered this mode, and "MAX" is shown on the display as an indication.
4. MIN Mode the display shows the minimum reading of all the readings taken since the meter entered this mode, and "MIN" is shown on the display as an indication.
5. To exit the "MAX/MIN" recording mode and erase all stored readings, press and hold down the "MAX/MIN" button for approximately two seconds and the meter will return to its normal operation.

NOTE: The meter will exit the Autorange mode automatically when the "MAX/MIN" button is pressed and will remain in the selected manual range mode until the "MAX/MIN" mode is cancelled. To cancel the "MAX/MIN" function hold down the "MAX/MIN" button for two seconds or rotate selector switch, the meter will then return to the Autorange mode. When the display shows "OL" it indicates overrange reading.

MEASURING DC VOLTAGE

1. Insert the plug of the Black test lead to the "COM" jack socket and the plug of the Red test lead into the "INPUT" jack socket.
2. Set the rotary switch to "V" position.
3. Connect the test leads across the source or circuit to be tested.
4. Read the voltage value on the LCD display. The polarity of the Red test lead connection will be indicated as well.

NOTE: Before the test leads are connected to the circuit to be tested, the LCD display may show an unstable reading. This is normal and will not affect any measurements that are to be taken.

To avoid electric shock or damage to the meter, do not measure a voltage higher than 600V.

MEASURING DC VOLTAGE

1. Insert the plug of the Black test lead to the "COM" jack socket and the plug of the Red test lead into the "INPUT" jack socket.
2. Set the rotary switch to "V" position.
3. Connect the test leads across the source or circuit to be tested.
4. Read the voltage value on the LCD display.

NOTE: Before the test leads are connected to the circuit to be tested, the LCD display may show an unstable reading. This is normal and will not affect any measurements that are to be taken.

To avoid electric shock or damage to the meter, do not measure a voltage higher than 600V.

MEASURING DC OR AC CURRENT

1. Insert the plug of the Black test lead to the "COM" jack socket and the plug of the Red test lead into the "10A" jack socket.
2. Set the rotary switch to "A" position.
3. If you wish to measure DC current, press the "SELECT" button until the display shows "DC".
4. If you wish to measure AC current, press the "SELECT" button until the display shows "AC".
5. Turn off the power to the circuit to be tested and then discharge all capacitors.
6. Break the circuit path to be tested and connect the test leads in series with the circuit.
7. Turn on the power to the circuit and read the value shown on the LCD display. For DC current measurements, the polarity of the Red test lead connection will be indicated as well.

MEASURING RESISTANCE

1. Insert the plug of the Black test lead to the "COM" jack socket and the plug of the Red test lead into the "INPUT" jack socket.
2. Set the rotary switch to the "Ω" position.
3. Connect the test leads across the resistor to be tested.
4. Read the measurement on LCD display.

NOTE: For resistance measurements > 1MΩ, the meter may take a few seconds to stabilize reading, this is normal for high-resistance measurements.

When the input is not connected, i.e. at open circuit "OL" will be displayed as an overrange indication.

Before you carry out a circuit resistance measurement, disconnect all power to the circuit to be tested and discharge all capacitors thoroughly.

CONTINUITY TEST

1. Insert the plug of the Black test lead to the " **COM** " jack socket, the plug of the Red test lead to the " **INPUT** " jack socket.
2. Set the rotary switch to the " **•|•** " position.
3. Connect the test leads across the circuit to be tested.
4. The built-in buzzer will sound when the resistance being measured is less than approximately 30Ω.

NOTE: Before you carry out a circuit resistance measurement, disconnect all power to the circuit to be tested and discharge all capacitors thoroughly.

AUTOMATIC POWER OFF

The meter will turn off automatically and switch to sleep mode if it has not been used for approximately fifteen minutes.

To wake the meter from the sleep mode, just press any button or turn the rotary switch.

To disable the automatic power-off function, hold down the " **SELECT** " button turn the rotary switch from the " **OFF** " position any other position while the display will not show the " **⊕** " symbol indicating that the timer is disabled.

MAINTENANCE

Warning

Except replacing fuse and battery, never attempt to repair or service the meter.

Store the meter in a dry place when not in use. Don't store it in an environment with intense electromagnetic field.

General Maintenance

Periodically wipe the case with a damp cloth and a little mild detergent. Do not use abrasives or solvents.

Dirt or moisture in the terminals can affect readings. Clean the terminals as follows:

1. Turn off the meter and remove all the test leads from the meter.
2. Shake out any dirt which may exist in the terminals.
3. Soak a new swab with alcohol.
4. Work the swab around in each terminal.

If the meter does not seem to work properly, check and replace (as needed) the batteries or fuse; and/or review this manual to verify correct operation.

Caution

To avoid possible damage to the meter or to the equipment under test, follow these guidelines:

- Disconnect circuit power and discharge all capacitors thoroughly before testing resistance or continuity.
- Use the proper terminals and function for your measurements.
- Before measuring current, check the meter's fuse and turn off power to the circuit before connecting the meter to the circuit.
- Before turning the rotary switch to change function, remove the test leads from the circuit under test.

BATTERY REPLACEMENT

When the symbol " **🔋** " appears on the LCD display, the batteries are low and should be replaced immediately. Remove the screw on the battery cover and slide the cover to the right. Replace the exhausted batteries with new ones of the same type (2 x 1.5V AAA or equivalent) ensure the polarity connections are correct as indicated in the battery compartment. Reinstall the back cover and replace the screw

FUSE REPLACEMENT

To replace a blown fuse, remove all the screws on the back including the battery compartment cover and remove the complete back cover. Replace the blown fuse with a new one of the same ratings. Reinstall the back cover and all the screws. The meter uses one fuse: 12N600V, Fast action, Min. Interrupt Rating 10kA, 6.35X32mm

WARNING

To avoid possible electric shock or personal injury, follow these guidelines:

- Do not use the meter if it is damaged. Before you use the meter, inspect the case. Pay particular attention to the insulation surrounding the connectors.
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity. Replace damaged test leads before you use the meter.
- Do not use the meter if it operates abnormally. Protection may be impaired. When in doubt, have the meter serviced.
- Do not operate the meter around explosive gas, vapor, or dust.
- Do not apply more than the rated voltage, as marked on the meter, between terminals or between any terminal and earth ground.
- Before use, verify the meter's operation by measuring a known voltage.
- When measuring current, turn off circuit power before connecting the meter in the circuit. Remember to place the meter in series with the circuit.
- When servicing the meter, use only specified replacement parts.
- Use caution when working with voltage above 30V ac rms, 42V peak, or 60V dc. Such voltages pose a shock hazard.
- When using the probes, keep your fingers behind the finger guards on the probes.
- When making connections, connect the common test lead before you connect the live test lead. When you disconnect test leads, disconnect the live test lead first.
- Remove the test leads from the meter before you open the battery cover or the case.
- Do not operate the meter with the battery cover or portions of the case removed or loosened.
- To avoid false readings, which could lead to possible electric shock or personal injury, replace the batteries as soon as the low battery indicator (**🔋**) appears.
- To avoid electric shock, do not touch any conductor with hand or skin; and do not ground yourself while using this meter.
- When in Data Hold mode, the symbol " **🔒** " is displayed. Caution must be used because hazardous voltage may be present.
- Do not use the meter in a manner not specified by the manufacturer or the safety features provided by the meter may be impaired.

- Adhere to local and national safety codes. Individual protective equipment must be used to prevent shock and arc blast injury where hazardous live conductors are exposed.
- Do not use the meter if the meter, a test lead or your hand is wet.
- For measurements on main or within Measurement Category III/IV circuits, the attached test probes must be set in Measurement Category III/IV mode; otherwise electric shock may occur!
- Remaining endangerment:
When an input terminal is connected to dangerous live potential it is to be noted that this potential can occur at all other terminals.
- **CAT III** - Measurement Category III is for measurements performed in the building installation. Examples are measurements on distribution boards, circuit breakers, wiring, including cables, bus-bars, junction boxes, switches, socket-outlets in the fixed installation, and equipment for industrial use and some other equipment, for example, stationary motors with permanent connection to the fixed installation.
Do not use the meter for measurements within Measurement Category IV.

NOTE

1. This manual is subject to change without notice.
2. Faithfull tools take no responsibility for any personal injury, loss or damage caused by the inappropriate or misuse of this product.
3. The contents of this manual cannot be used as the reason to use the meter for any other special application.

Every Faithfull electrical product is guaranteed for a period of one year, subject to the same exceptions as mentioned above. In the case of electrical products used for hire, the guarantee period is restricted to three months.

DISPOSAL OF THIS ARTICLE

Dear Customer,

If you at some point intend to dispose of this article, then please keep in mind that many of its components consist of valuable materials, which can be recycled. Please do not dispose of this product in the household waste bin, but check with your local council for recycling facilities in your area.

ELECTRICAL SYMBOLS

- ~ Alternating Current
- ≡ Direct Current
- ≈ DC or AC
- ⚠ Caution, risk of danger, refer to the operating manual before use.
- ⚡ Caution, risk of electric shock.
- ⏚ Earth ground
- ⚡ Fuse
- CE Conforms to European Union directives
- The equipment is protected throughout by double insulation or reinforced insulation.



FAITHFULL TOOLS

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