

## **EN** Digital Multimeter SOLIGHT V15

Thank you for purchasing this product. Before using it for the first time, read this manual carefully. Otherwise, you risk danger to your health and damage to your device.

### **Important symbols**



**Warning!** High voltage (danger of accident)



**(AC)** alternating current



**(DC)** direct current



either **DC** or **AC**



**earthing**

### **Important safety instructions**

A fundamental safety precaution when using this device is to reduce the risk of fire, electric shock and personal injury. Therefore, make sure to observe the following instructions:

1. Never use this device for any other purpose or in any way other than that described in the present manual, otherwise the protection provided by the device may be impaired.
2. Your finger or any other part of your body must not touch the measuring probes. Do not carry out measurements with wet hands.
3. Use additional protective equipment if you measure in areas of danger to life and health.
4. Do not use the device if its body or measuring probes are damaged. Do not use in humid environment.
5. Before each measurement, check the function of the main switch and make sure it is set correctly.
6. When making a current measurement, make sure the circuit is not live so that you can connect the measuring probes.
7. Do not carry out resistance and diode measurements or circuit continuity testing on a live circuit.
8. Do not exceed the selected range of measured values on the rotary switch.

9. Take extra care when measuring live on a circuit above 60V DC (direct voltage) or 30V AC (alternating voltage).
10. If a battery symbol appears on the display, replace the battery to prevent poor measurement results.
11. Use the device only indoor at altitudes up to 2000m, temperatures between 0°C and +40°C. Maximum permitted humidity up to 40°C is 80%.

## **General specifications**

- Display: LCD with maximum display value 1999.
- Manual range adjustment
- Automatic negative polarity indication.
- Display zero setting: automatic
- Range excess indication: "1" or "-1"
- Indication of low battery voltage by symbol
- Safety standards: CE EMC/LVD, CAT II 600V, CAT III 250V, IEC1010 double insulation. Degree of pollution 2, overvoltage category II.

- Storage conditions:  $-10^{\circ}\text{C}$  to  $-50^{\circ}\text{C}$ , humidity up to 85%
- Fuse: F 0.5A / 600V, 5 x 20mm
- Power supply: 2x AAA 1,5V alkaline batteries
- Dimensions: W: 29 x L: 70 x H: 125mm, weight: approx. 128g incl. batteries
- Sound signalization

## **Electrical specifications**

Measurement accuracy is provided based on the following formula:  $\pm[(\% \text{ of range}) + (\text{last digit of the measurement})]$  at a temperature of  $23 \pm 5^{\circ}\text{C}$  and humidity of  $\leq 75\%$ .

## Direct voltage

<i>Scope</i>	<i>Resolution</i>	<i>Accuracy</i>
200mV	0.1mV	$\pm (0.5\% + 3 \text{ digits})$
2000mV	1mV	$\pm (0.8\% + 5 \text{ digits})$
20V	10mV	
200V	100mV	
600V	1V	$\pm (1.0\% + 5 \text{ digits})$

Overload protection: 230V rms AC for 200mV range; 600V rms or 600V DC for other ranges.

## Alternating voltage

<i>Scope</i>	<i>Resolution</i>	<i>Accuracy</i>
200V	100mV	$\pm 2\% + 10 \text{ digit}$
600V	1V	

Frequency range: 45 — 450Hz

Overload protection: AC or DC 600V rms.

Indication: Average value (rms or sine wave)

## Direct current

<i>Scope</i>	<i>Resolution</i>	<i>Accuracy</i>
2000 $\mu$ A	1 $\mu$ A	$\pm 1.8\%$ + 2 digits
20mA	10 $\mu$ A	
200mA	100 $\mu$ A	$\pm 2.0\%$ + 2 digits
10A	10mA	$\pm 2.0\%$ + 1 digits

Overload protection: fuse 0.5A/600V,  
F10A/600V

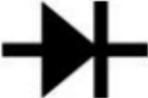
Note: 10A within 10 seconds

## Resistance

<i>Scope</i>	<i>Resolution</i>	<i>Accuracy</i>
200 $\Omega$	0,1 $\Omega$	$\pm 1.0\% + 10$ digit
2000 $\Omega$	1 $\Omega$	$\pm 1.0\% + 4$ digits
20k $\Omega$	10 $\Omega$	
200k $\Omega$	100 $\Omega$	
2000k $\Omega$	1k $\Omega$	$\pm 1.0\% + 4$ digits

Maximum circuit voltage: 3V. Overload protection: 15s max. 230V rms.

## Diode and circuit continuity test

Icon	Description	Measuring conditions
	The display shows the approximate value of the diode cut-off voltage	Current in reverse direction - direct current approx. 10 $\mu$ A.
	Built-in buzzer sounds when the electric resistance is less than 50 $\Omega$	Circuit voltage approx. 1.8V

Overload protection: 15s max. 230V rms.

## Operating manual

### Direct voltage measurement

1. Connect the red test lead to the "V $\Omega$ mA" socket, then the black lead to the "COM" socket
2. Set the switch to the appropriate "DC V" range. If you don't know the measured voltage, select the highest range and gradually reduce it until readability is reached.
3. Connect the test leads in parallel with the measured circuit.
4. Read the displayed voltage from the LCD including voltage polarity.

#### Note:

- Values "1" or "-1" on the display indicate exceeded measuring range. Choose higher measuring range.
- Do not measure circuits with a voltage expected to be higher than 600V AC or DC rms as this would damage the multimeter electronics.
- Use extreme caution when measuring high voltages

## **Alternating voltage measurement**

1. Connect the red test lead to the "V $\Omega$ mA" socket, then the black lead to the "COM" socket
2. Set the switch to the appropriate "AC V" range.
3. Connect the test leads in parallel with the measured circuit.
4. Read the indicated voltage and polarity from the LCD.

Note: The same notes as in "Direct voltage measurement" above apply

## **Direct voltage measurement**

1. Connect the black lead to the "COM" socket. When measuring current up to 200mA, connect the red lead to the "V $\Omega$ mA" socket. To measure currents from 200mA to 10A, connect the red lead to the "10A" socket.
2. Set the switch to the appropriate "DC A" range. If you don't know the measured current, select the highest

range and gradually reduce it until readability is reached.

3. Connect the test leads in series with the measured circuit.
4. Read the measured current on the display.

Note:

- Values "1" or "-1" on the display indicate exceeded measuring range. Choose higher measuring range.
- The maximum input current is 500mA or 10A depending on what socket the measuring lead is connected to. A 0.5A/600V fuse protects the circuit measuring currents from 200mA to 10A. When measuring 10A, do not exceed the measuring time of 10 seconds.

## **Resistance measurement**

1. Connect the red test lead to the "V $\Omega$ mA" socket, then the black lead to the "COM" socket
2. Set the switch to the appropriate " $\Omega$ " range.

3. Connect the test leads to the measured resistance.
4. Read the measured value on the display

**Note:**

- If the measured resistance is connected to the power supply circuit, the power supply must be turned off and all the circuit capacitors must be discharged. Only then can the test leads can be connected to the measured resistance.
- For resistance of around 1 megaohm or more, it may take some time for the measurement to stabilize. This is a normal condition when measuring high resistance values.
- Values "1" or "-1" on the display indicate exceeded measuring range. Choose higher measuring range.

**Diode measurement**

1. Connect the red test lead to the "V $\Omega$ mA" socket, then the black lead to the "COM" socket

2. Set the switch to the position with symbol 
3. Connect the test leads to the measured diode. Red lead to the anode, black lead to the cathode.
4. If "1" is displayed, the diode is connected inversely.
5. Read the approximate value of the cut-off voltage on the display.

### **hFe parameters measurement**

1. Set the range to hFe parameters measurement.
2. Connect the multi-purpose plug to the "COM" and "mA" sockets. Ensure that "-" is connected to "COM" and "+" to "mA".
3. Determine whether the transistor is an NPN or PNP transistor, and connect the base, collector and emitter to the adapter.
4. The multimeter will display the approximate value of the hFe parameter at the base current  $I_b = 10\mu\text{A}$  and voltage  $U_{CE} = 2.8\text{V}$ .

Note: If the measured diode is connected to the power supply circuit, the power supply must be turned off and all the circuit capacitors must be discharged. Only then can the test leads can be connected to the measured diode.

### **Acoustic test of circuit continuity**

1. Connect the red test lead to the "V $\Omega$ mA" socket, then the black lead to the "COM" socket
2. Set the switch to the position with symbol 
3. Connect test leads to two points of the circuit. If the resistance is less than about 50 $\Omega$ , the buzzer will sound.

Note: If power supply is connected to the circuit during this test, the power supply must be turned off and all the circuit capacitors must be discharged. Only then can the test leads can be connected.

### **Changing batteries**

If the battery symbol appears on the display, it needs to be replaced. Set the

switch to "OFF" and unscrew the screw on the rear side and open the battery cover. Replace batteries with the same type, i.e. 2x AAA LR03 alkaline batteries. Then close the battery cover and re-tighten the screw.

## **Fuse replacement**

This measuring instrument is equipped with one F0.5A/600V fuse and one F10A/600V fuse protecting the internal circuits of the device. When changing a fuse, ensure that the meter is not connected to any external circuits and set the switch to "OFF".

1. Remove the screws on the rear side of the body and one screw in the battery cover.
2. Remove the batteries.
3. Push on the fuse in the battery compartment using a flat-tip screwdriver. This will release the front part and the rear part of the device. Lightly pull the two parts apart.
4. Replace the fuse with the same type. Do not interfere with other parts of the device or its circuits.

5. Then reassemble the device, secure the screws and insert batteries.

Note: If you don't know exactly how to replace the fuse or if you are not technically competent, have the replacement done by an expert or contact your dealer.

### **Package content**

- user manual
- test leads set
- 2x 1.5V AAA battery
- adapter for measurement of hFe parameters

### **Maintenance**

Clean with a normal piece of cloth, allow to dry thoroughly; do not use solvents for cleaning.

