

# DIGITAL MULTIMETER

Owner's Manual EM 376



Read the Owner's Manual thoroughly before use.



# WARRANTY

This instrument is warranted to be free from defects in material and workmanship for a period of one year. Any instrument found defective within one year from the delivery date and returned to the factory with transportation charges prepaid, will be repaired, adjusted, or replaced at no charge to the original purchaser. This warranty does not cover expandable items such as batteries or fuses. If the defect has been caused by a misuse or abnormal operating conditions, the repair will be billed at a nominal cost.

## **SAFETY INFORMATION**

EM376 digital multimeter has been designed according to IEC-1010 concerning electronic measuring instruments with an overvoltage category (CAT II 600) and pollution degree 2.

## **ELECTRICAL SYMBOLS**


- ~ AC (Alternating Current)
- ≡ DC (Direct Current)
- ⚠ Important safety information. Refer to the manual.
- ⚡ Dangerous voltage may be present.
- ⏚ Earth ground
- ⏚ Fuse
- CE Conforms to European Union directives
- ⊞ Double insulated

## **SAFETY INFORMATION**

We have taken every precaution in designing this meter to ensure that it is as safe as we can make it. But safe operation depends on you, the operator. We recommend that you follow these simple safety rules:

- 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 servicing the meter, use only specified replacement parts.
- Use with caution when working 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.
- 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 door.
- Do not operate the meter with the battery door or portions of the cover 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.

### CAUTION

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

- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, diodes.
- Use the proper terminals, function, and range for your measurements.
- Before measuring current, check the meter's fuses and turn power OFF to the circuit before connecting the meter to the circuit.
- Before rotating the range switch to change functions, disconnect test leads from the circuit under test.
- Remove test leads from the meter before opening the meter case.

## **MAINTENANCE**

- Before opening the case, always disconnect the test leads from all live circuits.
- To continue protection against fire, replace fuse only with the specified voltage and current ratings: 250mA/250V (Fast Blown).
- Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.

## **INTRODUCTION**

Your EM376 Auto-Ranging Digital Meter is a portable compact multimeter that is ideal for field, lab, shop, and workbench applications. Its 3 1/2-digit digital display means it can display up to 1,999 units. It measures DC and AC voltage up to 600V, DC and AC current up to 10A, and resistance up to 20M $\Omega$ ; and has Diode Test, Data Hold and Auto Power-off (about 15 minutes after the last time you changed settings) functions as well.

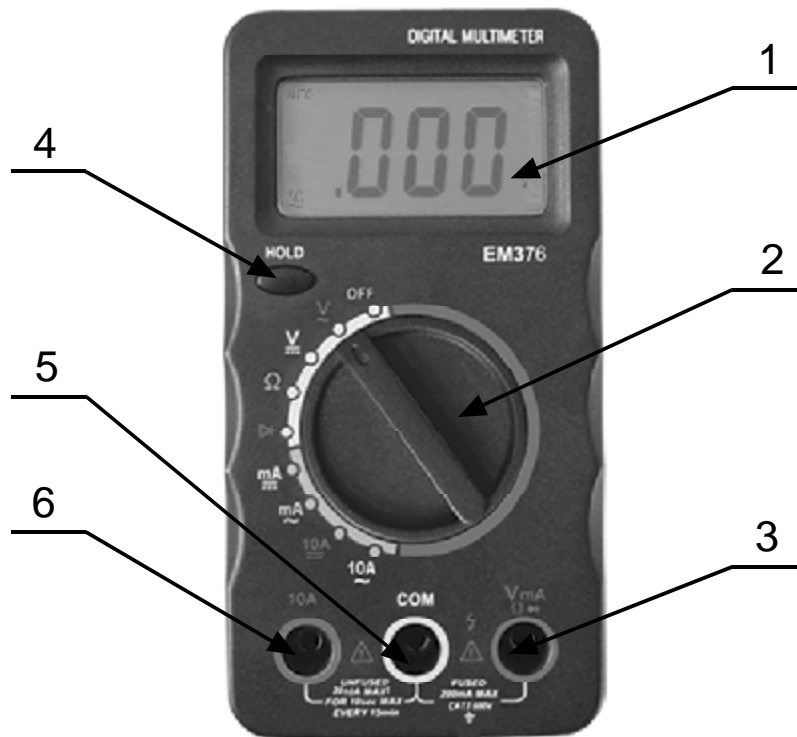
## **Front Panel Description**

### **1. DISPLAYS**

3 1/2 digit LCD, Max. reading 1999.

### **2. FUNCTION SWITCH**

This switch is used to select the function as well as to turn ON/OFF the instrument.



- To extend the life of the battery, the switch should be set to the "OFF" position when the instrument is not in use.

### 3. "10A" JACK

Plug in connector for the red (positive) test lead for current (between 200mA and 10A) measurements.

### 4. "HOLD"

Push button for selecting data hold function or arousing the meter from sleep .

### 5. "VmA Ω→+ " JACK

Plug in connector for the red (Positive) test lead for all voltage, resistance, diode and current (up to 200mA) measurements.

### 6. "COM" JACK

Plug in connector for the black (Negative) test lead.

## General Specifications

Maximum Voltage Between Any Terminal and Earth Ground	Rated voltage
Display	Max reading: 1999, updates 3times / sec
Response Time of Digital Display	V ac < 2sec V dc < 1sec $\Omega$ < 1sec (up to 200K $\Omega$ ) $\Omega$ < 2sec (up to 2M $\Omega$ ) $\Omega$ < 5sec (up to 20M $\Omega$ )
Operating Temperature	0°C to 50°C
Storage Temperature	-40°C to 60°C
Temperature coefficient	0.1 × (specified accuracy) / °C (<18°C or >28°C)
Total accuracy	Specified accuracy+0.1% of range.
Relative Humidity except 20M $\Omega$ range	0% to 90% (0°C to 35°C) 0% to 70% (35°C to 50°C)
20M $\Omega$ range only	0% to 80% (0°C to 35°C) 0% to 70% (35°C to 50°C)
Battery Type	1.5V x 2 (AAA R03 SUM-4)
Dimensions (H x W x L)	34mm x 68mm x 130mm
Weight	about 160 g



## Specifications:

Accuracy is specified for a period of one year after calibration, at 18°C to 28°C (64 F to 82 F) with relative humidity up to 75%.

Accuracy specifications take the form as:

$$\pm ( [ \% \text{ of reading} ] + [ \text{number of least significant digits} ] )$$

Function	Range	Accuracy
$\underline{\underline{V}}$	200mV	$\pm(0.5\%+2)$
	2V, 20V, 200V	$\pm(0.7\%+2)$
	600V	$\pm(0.8\%+2)$
$\underline{\sim}V$	2V	$\pm(0.8\%+3)$
	20V, 200V	$\pm(1.2\%+3)$
	600	$\pm(1.5\%+3)$
$\Omega$	200 $\Omega$	$\pm(1.2\%+2)$
	2K $\Omega$ , 20K $\Omega$ , 200K $\Omega$ , 2M $\Omega$	$\pm(1.0\%+2)$
	20M $\Omega$	$\pm(2.0\%+2)$
$\rightarrow\text{+}$	Test Voltage $\approx$ 1.5V; Test Current $\approx$ 0.5mA	
$\underline{\underline{A}}$	20mA, 200mA, 2A	$\pm(1.2\%+3)$
	10A	$\pm(2.0\%+3)$
$\underline{\sim}A$	20mA, 200mA, 2A	$\pm(1.5\%+5)$
	10A	$\pm(2.5\%+5)$

**NOTE:** For current between 2A and 10A, the measurement can not last for more than 10 seconds every 15 minutes.

## Operating Instruction

### Measuring DC Voltage

1. Connect the black test lead to the "COM" jack and the red test lead to the "VmAΩ↯" jack .
2. Set the Function switch to the "V" range.
3. Connect the test leads to the source or load under measurement.
4. Read the voltage value displayed on the LCD. The polarity of the red test lead will be indicated along with the voltage value.

### Measuring AC Voltage

1. Connect the black test lead to the "COM" jack and the red test lead to the "VmAΩ↯" jack .
2. Set the Function switch to the "V" range.
3. Connect the test leads to the source or load under measurement.
4. Read the voltage value displayed on the LCD.

### Measuring DC Current

1. Connect the black test lead to the "COM" jack and the red test lead to the "mA" or "10A" jack.
2. Set the Function switch to the "mA" or "10A" range.
3. Connect the test leads in series with the load under measurement.

4. Read the current value displayed on the LCD. The polarity of the red test lead will be indicated along with the current value .

### **Measuring AC Current**

1. Connect the black test lead to the "COM" jack and the red test lead to the "m A" or "10A" jack.
2. Set the Function switch to the " $\overset{\sim}{\text{mA}}$ ", or " $\overset{\sim}{\text{10A}}$ " range.
3. Connect the test leads in series with the load under measurement.
4. Read the current value displayed on the LCD.

### **Measuring Resistance**

1. Connect the black test lead to the "COM" jack and the red test lead to the "VmA $\Omega$ - $\nabla$ " jack .
2. Set the Function switch to the " $\Omega$ " range.
3. Connect the test leads to the resistor under measurement.
4. Read the resistance value displayed on the LCD.

### **Testing Diode**


1. Connect the black test lead to the "COM" jack and the red test lead to the "VmA $\Omega$ - $\nabla$ " jack .The polarity of the red test lead is "+".
2. Set the Function switch to the " $\nabla$ " range.

3. Connect the red test lead to the anode of the diode under test, and the black test lead to the cathode of it.
4. Read the value displayed on the LCD.

### **Note:**

1. The value displayed on the LCD is the approximate forward voltage drop of the diode.
2. If the connection is reversed, only figure "OL" will be displayed.

### **Replacing Batteries**

If the sign "  " appears on the LCD, it indicates that the batteries should be replaced. To replace the battery, loosen the screws on the back cover and open the case. Replace the exhausted battery with new ones of the same type.

### **Replacing Fuse**

The fuse rarely needs to be replaced and is blown generally as a result of the operator's error. To replace the fuse, loosen the screws on the back cover and open the case. Replace the blown fuse with the ratings specified: F 250mA/250V.

### **ACCESSORIES**

Owner's Manual: 1piece      Test Leads: 1pair  
Battery: 2 pieces (AAA size)      Fuse (F250mA/250V) 1piece