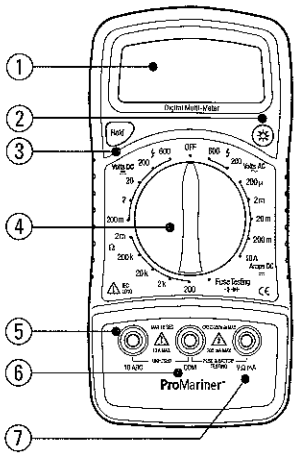
1. Overview

The handheld digital multi-meter provides excellent performance in a portable, durable housing with a large LCD display for clear visibility. With overall circuitry design centering on large-scale IC A/D converters in conjunction with over-load protection the meter makes a great utility instrument.

The meter can be used to measure DC & AC voltage, DC current, resistance, positive diode voltage fall and continuity.

2. Panel Layout

1. LCD Display: 3-1/2 digits, 16mm high characters
2. Back Light Button Switch: Press to switch on backlight, light will automatically turn off in 5 seconds. Press again to turn light on. If the battery is weak, the light will be dimmed.
3. Data-hold Switch (HOLD)
4. Rotary Switch: Use to select functions and range
5. 10A Input Jack
6. COM Input Jack
7. V Ω mA Input Jack



3. Safety Information

1. The meter is designed according to IEC-1010 for electronic measuring instruments with an over-voltage category (CAT III).
2. Follow all safety and operating instructions to ensure that the meter is used safely and maintained in good operating condition.
3. Safety Symbols:
   - ⚠ **Important safety information, refer to the operating manual**
   - ⚠ **Dangerous voltage may be present**
   - ⧈ **Double insulation (protection Class II)**

4. Special Cautions for Operation

1. The meter can be safe only according to standard procedures when used in conjunctions with the supplied test leads. Replace damaged test leads with the same model or electric specifications.
2. To avoid risk of electric shock, do not use the meter before the cover is in place.
3. The range switch should be set to the correct position for testing.
4. To avoid electric shock and damaging the instruments, the input signals are not to exceed the specified limits.
5. Range switch position should not to be changed during measurement.
6. Take caution against shock in the course of measuring voltage higher than 60 VAC & AC 30 VAC.
7. Protection fuse should be replaced only with the same type and specification.

5. General Specifications

1. Max voltage between input terminal and earth ground: CAT 600V
2. Over-range indication: display "1" for the significant digit.
3. Automatic display of negative polarity "—".
4. Low battery indicator: '🪫' displayed
5. Max LCD display: 1999 (3-1/2 digits)
6. Fuse protection: F-200mA/250V (Ø5 x 20mm)
7. Power supply: 9V battery, 6F22 or NEDA 1604
8. Operating temp: 32° F to 104° F (relative humidity <85%)
9. Storage temp: 14° F to 122° F (relative humidity <85%)
10. Guaranteed precision temp: 73.4° F ±5° F (relative humidity <85%)
11. Dimension: 5.8" x 3" x 1.6" (with holster)
12. Weight: approx. 0.4 lbs. (including battery)

6. Testing Specifications

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

DC VOLTAGE

RANGE	RESOLUTION	ACCURACY
200 mV	0.1 mV	± (0.5% of rdg + 10 digits)
2 V	1 mV	± (0.5% of rdg + 10 digits)
20V	10 mV	± (0.5% of rdg + 10 digits)
200 V	100 mV	± (0.8% of rdg + 10 digits)
600 V	1 V	± (1.2% of rdg + 10 digits)

- Input Impendence: 10MΩ∏
- Overload Protection: 250V for 200mV range, effective DC or AC 600V for other ranges

AC VOLTAGE

RANGE	RESOLUTION	ACCURACY
200 V	100 mV	± (1.2% of rdg + 20 digits)
600 V	1 V	± (1.8% of rdg + 20 digits)

- Frequency Range: 40 to 400Hz
- Response: average, calibrated in rms of sine wave

DC CURRENT

RANGE	RESOLUTION	ACCURACY
200 μA	0.1 μA	± (1.0% of rdg + 20 digits)
2 mA	1 μA	± (1.0% of rdg + 20 digits)
20 mA	10 μA	± (1.0% of rdg + 20 digits)
200 mA	100 μA	± (1.5% of rdg + 20 digits)
10 A	10 mA	± (3.0% of rdg + 20 digits)

- Overload Protection: F 200mA/250V fuse *Note: 10A range: not fused*

RESISTANCE

RANGE	RESOLUTION	ACCURACY
200 Ω	0.1 Ω	± (1.5% of rdg + 25 digits)
2K Ω	1 Ω	± (0.8% of rdg + 20 digits)
20K Ω	10 Ω	± (0.8% of rdg + 20 digits)
200K Ω	100 Ω	± (0.8% of rdg + 20 digits)
2M Ω	1K Ω	± (2.0% of rdg + 25 digits)

- Overload Protection: 250V effective value

DIODE TEST

RANGE	RESOLUTION	FUNCTION
→|←	1 mV	Display: read approximate forward voltage of diode

- Overload Protection: 250V effective value
- Forward DC current: approximate 1mA
- Reversed DC voltage: approximate 3.0V

FUSE AND DIODE TEST

RANGE	FUNCTION
•))	For fuse testing, a good fuse will have a tone and a reading of 0.0. Same applies to continuity testing so long as the resistance is less than 50 Ohms. Built-in buzzer will sound if resistance is lower than 50 Ω.

- Overload Protection: 250V effective value
- Open Circuit Voltage: approximate 3.0V

7. Operating Instructions

1. Attention before operation

1-1. Check 9 V battery. If the battery voltage is less than 9V, display will show "⊟+". Replace battery to ensure measuring precision.
1-2. Pay attention to the "⚠" near the input jack which shows that the input voltage or current should be within the specified value.
1-3. The range switch should be positioned to desired range for measurement before operation.

2. Measuring DC Voltage

2-1. Connect the black test lead to COM jack and the red to V Ω mA jack.
2-2. Set the rotary switch at the desired V ⎓ range position.
2-3. Connect test leads across the source or load under measurement.
2-4. You can get reading from LCD. The polarity of the red lead connection will be indicated along with the voltage value.

NOTE: When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
When only the figure'1' or '-1' is displayed, it indicates over-range situation and the higher range has to be selected.
"⚠" means you can't input the voltage more than 600V, it's possible to show higher voltage, but it may destroy the inner circuit or pose a shock.
Be cautious against shock when measuring high voltage.

3. Measuring AC Voltage

3-1. Connect the black test lead to COM jack and the red to VmA jack.
3-2. Set the rotary switch at the desired V~ range position.
3-3. Connect test leads across the source or load under measurement.
3-4. You can get reading from LCD.

NOTE: When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
When only the figure'1' or '-1' is displayed, it indicates over-range situation and the higher range has to be selected.
"⚠" means you can't input the voltage more than 600V, it's possible to show higher voltage, but it may destroy the inner circuit or pose a shock.
Be cautious against shock when measuring high Voltage.

4. Measuring DC Current

4-1. Connect the black test lead to COM jack and the red to the V Ω mA jack for a maximum 200mA current, for a maximum 10A current, move the red lead to the 10A jack.
4-2. Set the rotary switch at the desired A⎓ range position.
4-3. Connect test leads in series with the load under measurement.
4-4. You can get reading from LCD. The polarity of the red lead connection will be indicated along with the current value.

NOTE: When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
When only the figure'1' or '-1' is displayed, it indicates over-range situation and the higher range has to be selected.
"⚠" means the socket mA's maximum current is 200mA and 10A's maximum current is 10A, over current will destroy the fuse. Since 10A is not fused, the measuring time should be less than 1 second to prevent precision from affecting by circuit heating.

5. Measuring Resistance

5-1. Connect the black test lead to COM jack and the red to V Ω mA jack.
5-2. Set the rotary switch at the desired Ω range position.
5-3. Connect test leads across the resistance under measurement.
5-4. You can get reading from LCD.

NOTE: When only the figure'1' or '-1' is displayed, it indicates over-range situation and the higher range has to be selected.
For measuring resistance above 1MΩ, the meter may take a few seconds to get stable reading.
When the input is not connected, i.e. at open circuit, the figure '1' will be displayed for the over-range condition.
When checking in-circuit resistance, be sure the circuit under test has all power removed and that all capacitors have been discharged fully. the value scale to be measured is unknown beforehand, set the range selector at the highest position.

6. Diode Testing

6-1. Connect the black test lead to COM jack and the red to V Ω mA jack. (the polarity of red lead is '+')
6-2. Set the rotary switch at the ⊣ F range position.
6-3. Connect the red lead to the anode and the black lead to the cathode of the diode under testing.
6-4. You can get a reading from LCD.

NOTE: The meter will show approximate forward voltage drop of the diode. If the lead connections is reversed, only '1' will be displayed.

7. Continuity and Fuse Testing

7-1. Connect the black test lead to the COM jack and the red to the V Ω mA jack.
7-2. Set the rotary switch at the •)) range position.
7-3. Connect test leads across two points of the circuit under testing.
7-4. If continuity exists (i.e. resistance less than about 50 Ω), built-in buzzer will sound.

NOTE: If the input open circuit, the figure '1' will be displayed.

8. Maintenance

1. Before attempting to remove the battery door or open the case, be sure that test leads have been disconnected from measurement circuit to avoid electric shock hazard.
2. To avoid electrical shock, remove test leads from measurement circuits before replacing the fuse. For protection against fire, replace fuses only with specified ratings: F-200mA/250V fuse.
3. You must replace the test leads if the lead is exposed, replace with leads with specifications of original.
4. Clean with a damp cloth or with a small amount of detergent. Do not use a chemical solution for cleaning.
5. Do not use the meter before the back cover is properly closed and screw secured. Upon any abnormality, stop operation immediately and send the meter for maintenance.
6. Please take out the battery when not using for an extended period of time.

9. Included

[1] Test leads: electric rating 1000V 10A
[2] Battery: 9V, 6F22 or NEDA 1604
[3] Fuse: F-200mA/250V
[5] Operator's manual
[6] Holster