



# Model 380505 Big Digit DMM

- Super Large LCD 0.95"
- 7 Functions including Temperature
- Built-in Rear Tilt-Stand for Convenience
- Diode and Audible Continuity Functions



### **1. INTRODUCTION**

Congratulations on your purchase of Extech's Big Digit DMM. This professional meter, with proper care, will provide years of safe reliable service.

# 2. SPECIFICATIONS

# 2.1 General Specifications

Display	±1999 (3-1/2 digit) count 0.95" LCD with Auto Polarity		
Over-range Indication	"1 or –1" is displayed		
Power Supply	9V battery (NEDA 1604 or equivalent) alkaline or carbon-zinc		
Battery Life	Approx. 100 hours: carbon-zinc battery; 200 hours: alkaline		
Input Impedance	10ΜΩ		
Temp. Coefficient	0 to 18°C and 28 to 50°C (Less than 0.1 x accuracy per °C)		
Operating Temperature/Hu midity	32°F to 122°F (0°C to 50°C) / < 80% RH to 35°C, < 70% RH 35°C to 50°C		
Storage Temperature/Hu midity	-4°F to 122°F (-15°C to 50°C) / < 80% RH with battery removed		
Dimension / Weight	6.7 x 3.5 x 1.4" (171x88x36mm) 9.4 oz. (292g)		
NMRR	Normal mode rejection ratio: >46dB at 50/60Hz unbalanced		
Supplied accessories	Test leads and thermocouple probe		

**2.2 Range Specifications** Accuracy specified for a period of 1 year after calibration at 18 to 28°C

Mode	Range	Resolution	Accuracy (%Rdg)	Input Protect		
DCV	200mV	100uV	±(0.25% +2 digits)	1000VDC peak AC		
	2V	1mV	$\pm (0.6\% + 4 \text{ digits})$			
	20V	10mV	· · · · · ·			
	200V	100mV				
	1000V	1V	±(0.8% +4d)			
ACV	200mV	100uV	±(1.2% +3 digits)	750VAC		
	2V	1mV	· · · · · ·	50 – 400Hz		
	20V	10mV				
	200V	100mV				
	750V	1V	±(1.5% + 5 digits)			
Ω	200Ω	0.1Ω	±(0.8% +4 digits)	Test current 1.2mA		
	2kΩ	1Ω	-	Max. Voc: 2.8V		
	20kΩ	10Ω				
	200kΩ	100Ω				
	2MΩ	1kΩ	±(1.5% + 5 digits)			
	20MΩ	10kΩ	±(5% + 10 digits)			
DCA	200uA	100nA	±(0.8% + 4 digits)	250V/2A fuse		
	20mA	10uA				
	200mA	100uA	±(1.0% + 5 digits)			
	10A	10mA	±(1.5% + 5 digits)	250V/10A fuse		
ACA	200uA	100nA	±(1.2% + 3 digits)	250V/2A fuse		
	20mA	10uA				
	200mA	100uA	±(1.5% + 5 digits)			
	10A	10mA	±(2.0% +5 digits)	250V/10A fuse		
Diode	Measure forward resistance at 1mA max test current					
Continui	Continuity 200 $\Omega$ max Audible tone <50 $\Omega$ (<100ms response)					
Temp.	-20° to 1370°C 0° to 1999°F	1°C/F	$\pm (3^{\circ} + 2d)$ to $150^{\circ}C$ , $\pm (5^{\circ} + 2d)$ to $225^{\circ}F$ ,	±3% over 150°C ±3% over 225°F		

# **3. FRONT PANEL DESCRIPTION**

- 1. LCD
- 2. Rotary function switch
- 3. 10A current input jack
- 4. mA current input jack
- 5. Temp, Voltage, Resistance input jack
- 6. COM input jack
- Note: Tilt Stand and Battery compartment are located on rear of meter.



# 4. PREPARATION FOR MEASUREMENT

# 4.1 General Safety Information

The following information must be observed to insure maximum personal safety while operating this meter.

- 1. Do not use the meter if the meter/test leads appear damaged or if you suspect that the meter is not operating properly.
- 2. The user should never be grounded when taking measurements. Do not touch exposed metal pipes, outlets, fixtures, etc. which may be at ground potential. The user should be isolated from ground by using dry clothing, rubber-soled shoes, rubber mats, or other approved insulating material.
- 3. Remove power to the circuit under test before cutting, unsoldering, or breaking the circuit. Small amounts of current can be dangerous.
- 4. Use caution when working above 60V DC or 30V AC rms. Such voltages pose a shock hazard.
- 5. When using the test leads or probes, keep fingers behind the probe's finger guard.
- 6. Measuring voltage that exceeds the limits of the multimeter may damage the meter and endanger the user. Always recognize the meter's limits as stated on the front of the meter.

# 4.2 Meter-Specific Measurement Considerations and Precautions

- 1. Remove test leads from measurement area before turning the rotary function switch.
- 2. Electrical noise can interfere with the meter's display and cause display errors.
- 3. Accuracy can be compromised if the ambient temperature fluctuates quickly.
- 4. Do NOT exceed the 150V (continuous) or 300V (momentary) input limit between the "Temp/V/ohms" and "COM" inputs.

# 4.3 International Symbols

	DC Voltage DC Current		Refer to explanation in owners manual
$\sim$	AC Voltage AC Current	Â	Dangerous voltage risk of electrical shock
Ŧ	Ground		Double Insulation

#### 5. OPERATION

#### 5.1 Meter Power

The Rotary Function switch permits the user to select a measurement range or function. In the process of doing so, the meter powers up automatically. To remove power to the meter, turn the Rotary Function switch to the OFF position.

#### 5.2 AC/DC Voltage Measurements

- Connect the RED test lead to the "Temp/V/Ω" input jack and connect the BLACK test lead to the COM (-) input terminal.
- 2. Set the rotary switch to the desired AC or DC voltage range. If the magnitude of the voltage is not known, set the switch to the highest range and reduce until a satisfactory reading is obtained.
- 3. Connect the test leads to the UNPOWERED device under test (load, circuit, etc.).
- 4. Power the device under test and observe reading on the LCD. For DC, negative polarity is automatically displayed.

#### 5.3 AC/DC Current Measurements

- 1. Connect the RED test lead to the "10A" or "mA" input depending upon expected current measurement. Connect the BLACK test lead to the COM (-) input terminal.
- 2. Set the rotary switch to the desired AC or DC current range. If the magnitude of the current is not known, set the switch to the highest range and reduce until a satisfactory reading is obtained.
- 3. Connect the test leads in series to the UNPOWERED device under test (load, circuit, etc.).
- 4. Power the device under test and observe reading on the LCD. For DC, negative polarity is automatically displayed.

#### 5.4 Resistance and Continuity Measurements

- 1. Set the rotary switch to the desired resistance range or continuity position (Buzz).
- 2. Remove power to the circuit under test (external voltage across device under test will cause invalid readings).
- Connect the RED test lead to the "Temp/V/Ω" input terminal and the BLACK lead to the COM (-) input terminal.
- 4. Connect the other ends of the test leads to the circuit under test. For resistance measurements, the LCD reading is the value of resistance measured. In Continuity mode, the audible alert sounds if the resistance measured is below 50Ω.

#### 5.5 Diode Measurements

- 1. Set the rotary switch to the diode position (which is the 2000 ohm range position).
- 2. Remove power to the circuit under test (external voltage across device under test will cause invalid readings).
- 3. Connect the RED test lead to the "Temp/V/ $\Omega$ " input terminal.
- 4. Touch probes to the diode. A correct forward voltage drop is 0.6V (silicon diode) and 0.3V (germanium diode).
- 5. Reverse the probe connection to the diode. If the diode is good, "1\_\_\_" (overload) will display. If the diode is shorted, a value near 0mV will be displayed.
- 6. If the diode is OPEN, "1\_\_\_" will display in both measurement directions.

#### 5.6 Temperature Measurements

- 1. Set the rotary switch to the Temperature position.
- Connect the K-type thermocouple probe with banana jacks to the "Temp" and "COM" input terminals. Observe proper polarity: The "Temp" terminal is for the positive probe lead and the "COM" input is for the negative probe lead.
- 3. Read the temperature from the LCD display.

#### 6. BATTERY REPLACEMENT

**WARNING**: To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery/fuse cover.

- 1. Remove the test leads from the device under test and the meter itself. Remove power from the meter also.
- 2. Remove the two (2) screws from the bottom, rear of the meter. Open the meter housing.
- 3. Replace the battery with a 9V (NEDA 1604 or equivalent).
- 4. Close the meter housing and affix the two rear screws.

#### 7. FUSE REPLACEMENT

**WARNING**: To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery/fuse cover.

- 1. Remove the test leads from the device under test and the meter itself. Remove power from the meter also.
- 2. Remove the two (2) screws from the bottom, rear of the meter. Open the meter housing.
- 3. To replace one or both fuses, carefully pull the Printed Circuit (PC) Board from the meter housing. The fuses will be visible on the opposite side of the PC Board (down near the battery location). Replace the appropriate fuse(s) with the same type(s). There is a 250V/2A fuse and a 250V/10A fuse; be careful to distinguish between the two.
- 4. Replace the PC Board to its original position.
- 5. Close the meter housing and affix the two rear screws.

### 8. CALIBRATION / REPAIR SERVICES

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.

#### 9. WARRANTY

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 for authorization. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit.

This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product.

The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

Copyright © 1999 Extech Instruments Corporation. All rights reserved including the right of reproduction in whole or in part in any form.

