# Operating Instruction for
# True RMS
# Autoranging Digital Multimeter


Please read this manual before switching the unit on.
Important safety information inside.

## Content Page

**Content** **Page**

## 1.Introduction

- Professional True RMS Industrial Digital Multimeter and TFT color LCD display, providing fast A/D converting sampling time, high accuracy , built-in datalogging and Trend Capture feactures.
- It can trace any interrupted problems of the equipments and watch on without person.
- It is easy to find and solve the problems of the production equipments, providing Bluetooth technology and memory the datasheets.
- It is much more safe measurements.
- This meter measures AC/DC Voltage & Current, Resistance, Continuity, Capacitance, Frequency (Electrical & Electronic), Duty Cycle, Diode Test and plus Thermocouple Temperature.
- It can store and recall data.
- It features a waterproof, rugged design for heavy duty use.
- Proper use and care of this meter will provide many years of reliable service

## 2.Safety

### 2-1.Safety Symbols

This symbol adjacent to another symbol, terminal or operating device indicates that the operator must refer to an explanation in the operating instructions to avoid personal injury or damage to the meter.

**WARNING** This **WARNING** symbol indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

**CAUTION** This **CAUTION** symbol indicates a potentially hazardous situation, which if not avoided, may result damage to the product.

**MAX** This symbol advises the user that the terminal(s) so marked must not be connected to a circuit point at which the voltage with respect to earth ground exceeds (in this case) 1000 VAC or VDC.

This symbol adjacent to one or more terminals identifies them as being associated with ranges that may, in normal use, be subjected to particularly hazardous voltages. For maximum safety, the meter and its test leads should not be handled when these terminals are energized.

This symbol indicates that a device is protected throughout by double insulation or reinforced insulation.

### 2-2.Per IEC1010 Overvoltage Installation Category

**Overvoltage Category I**

Equipment of **Overvoltage Category I** is equipment for connection to circuits in which measures are taken to limit the transient overvoltages to an appropriate low level.

**Note:** Examples include protected electronic circuits.

**Overvoltage Category II**

Equipment of **Overvoltage Category II** is energy-consuming equipment to be supplied from the fixed installation.

**Note:** Examples include household, office, and laboratory appliances.

**Overvoltage Category III**

Equipment of **Overvoltage Category III** is equipment in fixed installations.

**Note:** Examples include switches in the fixed installation and some equipment for industrial use with permanent connection to the fixed installation.

**Overvoltage Category IV**

Equipment of **Overvoltage Category IV** is for use at the origin of the installation.

**Note:** Examples include electricity meters and primary over-current protection equipment.

### 2-3.Safety Instructions

- This meter has been designed for safe use, but must be operated with caution.
- The rules listed below must be carefully followed for safe operation.

1.Never apply voltage or current to the meter that exceeds the specified maximum:

**Input Protection Limits**

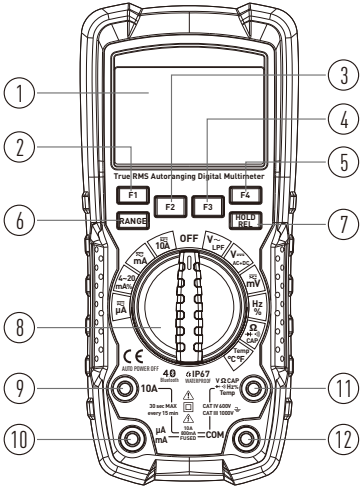
| Function | Maximum Input |
|---|---|
| V DC or V AC | 1000VDC/AC rms |
| mA AC/DC | 800mA 1000V fast acting fuse |
| A AC/DC | 10A 1000V fast acting fuse<br>(10A for 30 seconds max every 10 minutes) |
| Frequency, Resistance, Capacitance, Duty Cycle, Diode Test, Continuity | 1000VDC/AC rms |
| Temperature | 1000VDC/AC rms |
| Surge Protection: 8kV peak per IEC 61010 | |

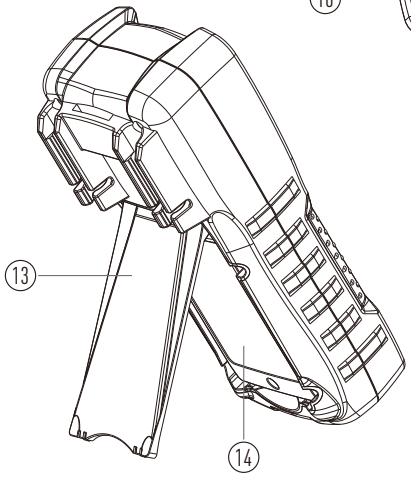
2. Use extreme CAUTION when working with high voltages.
3. Do not measure voltage if the voltage on the "COM" input jack exceeds 1000V above earth ground.
4. Never connect the meter leads across a voltage source while the function switch is in the current, resistance, or diode mode, doing so can damage the meter.
5. Always discharge filter capacitors in power supplies and disconnect the power when making resistance or diode tests.
6. Always turn off the power and disconnect the test leads before opening the covers to replace the fuse or batteries.
7. Never operate the meter unless the back cover and the battery and fuse covers are in place and fastened securely.
8. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

## 3.Description

### 3-1.Meter Description

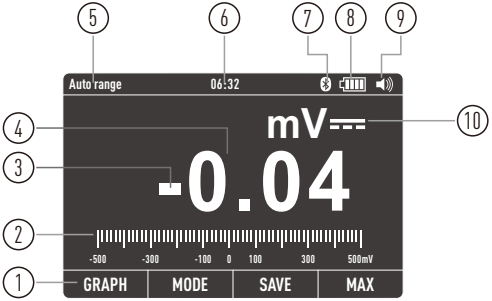
1-50,000 Counts LCD Display
2-F1 Software Key
3-F2 Software Key
4-F3 Software Key
5-F4 Software Key
6-RANGE Button
7-HOLD/REL Button
8-Function Switch
9-10A Input Jack
10-μA mA Input Jack
11-Positive Input Jack
12-COM Input Jack
13-Tilt Stand
14-Battery Cover



### 3-2.Understanding the Display

1-Soft key labels Indicates the function of the button just below the displayed label.
2-Bar graph Analog display of the input signal.
3-Minus sign Indicates a negative reading.
4-Displays measurement information about the input signal.
5-Indicates the range the Meter is in and the ranging mode (auto or manual).
6-Time Indicates the time set in the internal clock.
7-Buetooth Indicate.
8-Battery level Indicates the charge level batteries.
9-Beeper Indicates the Meter's beeper is enabled (not associated with the continuity beeper).
10-Units Indicates the units of measure.




### 3-3.Understanding the Push Buttons

The 6 push buttons on the front of the Meter activate features that augment the function selected using the rotary switch, navigate menus or control power to Meter circuits.

**F1 Software Key:** Default switch to Graph measure.

**F2 Software Key:** Default modes related to the rotary switch function

**F3 Software Key:** Default into save mode default Display, and wake up for APO.

**F4 Software Key:** Default modes MIN/MAX starts and stops MIN/MAX recording.

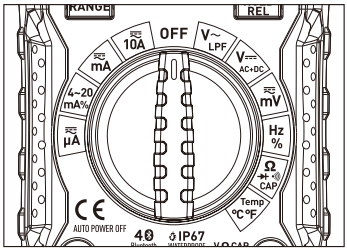
**RANGE Button:** Into manual range and select range of the measure, if pressing the Range Button for greater that 1 second will return Auto Range.

**HOLD/REL Button:** Freezes the present reading in the display and allows the display to be saved, if pressing the HOLD/REL Button for greater that 1 second will switch relative mode.


### 3-4.Understanding the Rotary Switch

- Select a primary measurement function by positioning the rotary switch to one of the icons around its perimeter.
- For each function, the Meter presents a standard display for that function (range, measurement units and modifiers).
- Button choices made in one function do not carry over into another function.

**10A⎓≂:** AC/DC Amps Measurements.
**mA⎓≂:** AC/DC Milliamps Measurements.
**4~20mA%:** % 4-20mA Measurements.
**μA⎓≂:** AC/DC Microampere Measurements up to 5,000μA.
**V⎓:** AC Voltage Measurements
**V⎓ AC+DC:** DC and AC+DC Voltage Measurements.
**mV⎓≂:** AC/DC Milli-Volts Measurements.
**Hz%:** Frequency and Duty Cycle Measurements.
**Ω•))) ⇥⊢ CAP:** Resistance, Diode Test, Capacitance and Continuity Measurements.
**Temp:** Temperature Measurements.



### 3-5.Using the Input Terminals

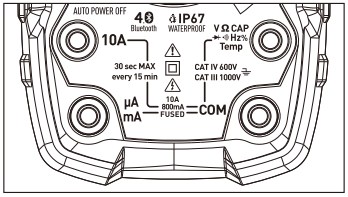
- All functions except current use the V/OHMS and COM input terminals.
- The two current input termin for 500mA and 10A current measurement.

**10A:** Input for 0A to 10.00A current (20A overload for 30 seconds on, 10 minutes off).

**μAmA:** Input for 0A to 500mA current measurements.

**COM:** Return terminal for all measurements.

**V Ω CAP •)) ⇥ Hz Temp:** Input for Voltage, Continuity, Resistance, Diode Test, Conductance, Capacitance.



## 4.Measure Function

### 4-1.AC Voltage Measurement

**WARNING:** Risk of Electrocution. The probe tips may not be long enough to contact the live parts inside some 240V outlets for appliances because the contacts are recessed deep in the outlets. As a result, the reading may show 0 volts when the outlet actually has voltage on it. Make sure the probe tips are touching the metal contacts inside the outlet before assuming that no voltage is present.

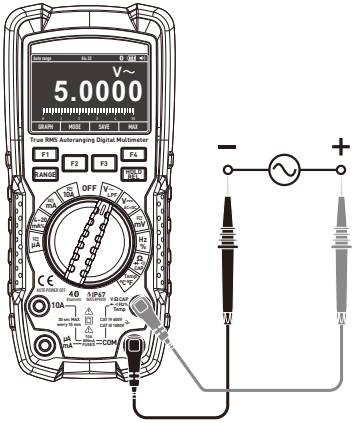
**CAUTION:** Do not measure AC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

1.Set the function switch to the **VAC** Position.

2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jacks.

3.Position the black test probe tip and red test probe tip respectively in the spots of the circuit to be measured.

4.Read the AC voltage in the display.



### 4-2.DC Voltage Measurement

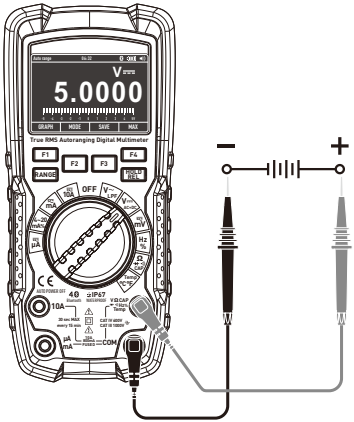
**CAUTION:** Do not measure DC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

1.Set the function switch to the **VDC AC+DC** Position.

2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jacks.

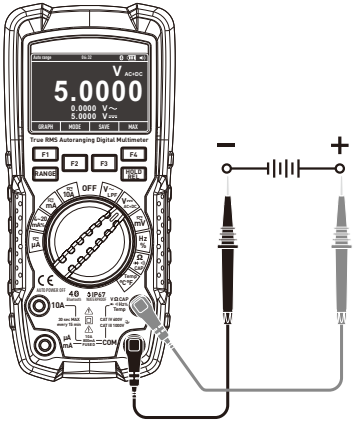
3.Position the black test probe tip and red test probe tip respectively in the spots of the circuit to be measured.

4.Read the DC voltage in the display.



### 4-3.AC+DC Voltage Measurement

1.Set the function switch to the **VDC AC+DC** Position.
2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jacks.
3.Press the **MODE** Button (**F2**) to indicate "**AC+DC**" on the display.
4.Position the black test probe tip and red test probe tip respectively in the spots of the circuit to be measured.
5.Read the AC+DC voltage in the display.



### 4-4.mV Voltage Measurement

**CAUTION:** Do not measure mV voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

1.Set the function switch to the **mVAC/DC** Position.

2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jacks.

3.Press the **MODE** Button (**F2**) to indicate "**AC**" or "**DC**" on the display.

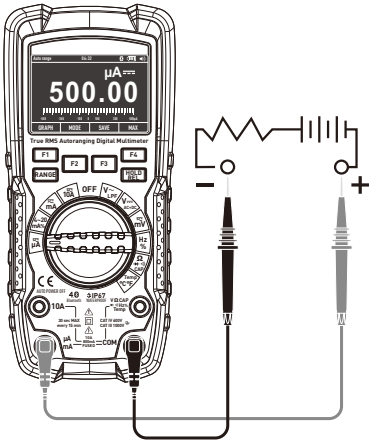
4.Position the black test probe tip and red test probe tip respectively in the spots of the circuit to be measured.

5.Read the mV voltage in the display.

### 4-5.DC Current Measurement

**CAUTION:** Do not make 10A current measurements for longer than 30 seconds, Exceeding 30 seconds may cause damage to the meter and/or the test leads.

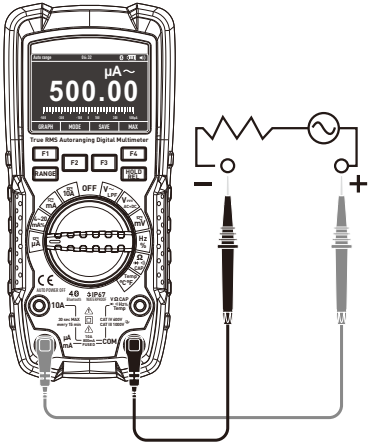
1.Insert the black test lead banana plug into the **COM** Input Jack.
2.For current measurements up to **5000μA DC**, set the function switch to the **μA AC/DC** Position and insert the red test lead banana plug into the **μA/mA** Input Jack.
3.For current measurements up to **500mA DC**, set the function switch to the **mA AC/DC** Position and insert the red test lead banana plug into the **μA/mA** Input Jack.
4.For current measurements up to **10A DC**, set the function switch to the **10A AC/DC** Position and insert the red test lead banana plug into the **10A** Input Jack.
5.Press the **MODE** Button (**F2**) to indicate "**DC**" on the display.
6.Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
7.Touch the black test probe tip to the negative side of the circuit; Touch the red test probe tip to the positive side of the circuit.
8.Apply power to the circuit.
9.Read the current in the display.



### 4-6.AC Current Measurement

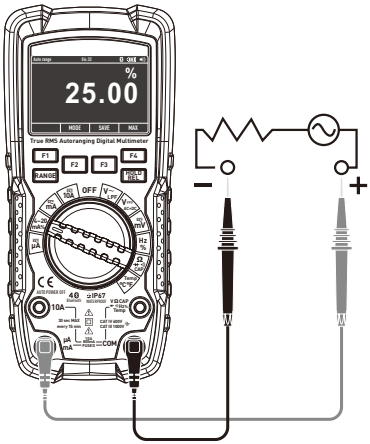
**CAUTION:** Do not make 10A current measurements for longer than 30 seconds, Exceeding 30 seconds may cause damage to the meter and/or the test leads.

1.Insert the black test lead banana plug into the **COM** Input Jack.
2.For current measurements up to **5000μA AC**, set the function switch to the **μA AC/DC** Position and insert the red test lead banana plug into the **μA/mA** Input Jack.
3.For current measurements up to **500mA AC**, set the function switch to the **mA AC/DC** Position and insert the red test lead banana plug into the **μA/mA** Input Jack.
4.For current measurements up to **10A AC**, set the function switch to the **10A AC/DC** Position and insert the red test lead banana plug into the **10A** Input Jack.
5.Press the **MODE** Button (**F2**) to indicate "**AC**" on the display.
6.Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
7.Touch the black test probe tip to the negative side of the circuit; Touch the red test probe tip to the positive side of the circuit.
8.Apply power to the circuit.
9.Read the current in the display.



### 4-7.% 4~20mA Measurement

1.Set up and connect as described for DC mA measurements.
2.Set the function switch to the **4~20mA%** Position.
3.The meter will display loop current as a % with 0mA=-25%, 4mA=0%, 20mA=100% and 24mA= 125%.



### 4-8.Frequency/Duty Cycle(%) Measurement

1.Set the function switch to the **Hz%** Position.
2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jacks.
4.Position the black test probe tip and red test probe tip respectively in the spots of the circuit to be measured.
5.Read the Frequency in the display.
6.Press the **MODE** Button (**F2**) again to indicate "**%**" on the display.
7.Read the % of duty cycle on the display.

### 4-9.Resistance Measurement

**WARNING:** To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements, Remove the batteries and unplug the line cords.

1.Set the function switch to the Ω•))) →+ CAP Position.

2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jacks.

4.Position the black test probe tip and red test probe tip respectively in the spots of the circuit to be measured.

5.Read the Resistance in the display.

### 4-10.Continuity Check

**WARNING:** To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any capacitance measurements. Remove the batteries and unplug the line cords.

1.Set the function switch to the Ω•))) ⇥| CAP Position.

2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jacks.

4.Press the **MODE** Button (**F2**) again to indicate ¨ Ω ¨ and ¨ •))) ¨ on the display.

5.Position the black test probe tip and red test probe tip respectively in the spots of the circuit to be measured.

6.If the resistance is less than approximately 25 Ω , the audible signal will sound. If the circuit is open, the display will indicate ¨**OL**¨.

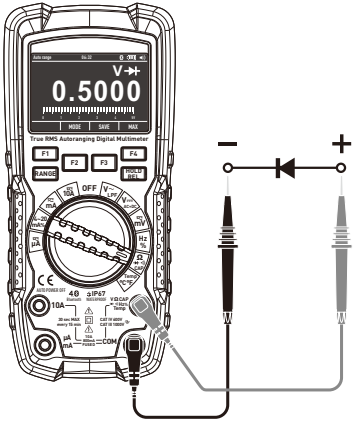
### 4-11.Diode Test

1.Set the function switch to the Ω•))) ⊣ CAP Position.

2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jacks.

4.Press the **MODE** Button (**F2**) again to indicate "**V**" and "⊣" on the display.

5.Forward voltage will typically indicate 0.400 to 3.200V, Reverse voltage will indicate "**OL**"; Shorted devices will indicate near 0V and an open device will indicate "**OL**" in both polarities.



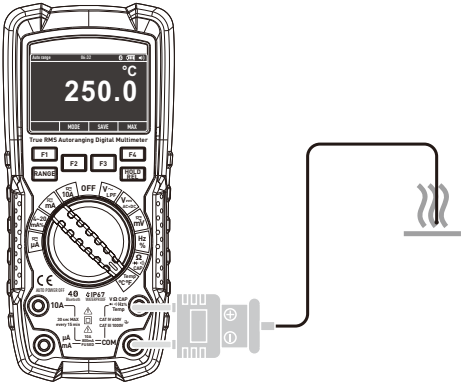
### 4-12.Capacitance Measurement

**WARNING:** To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any capacitance measurements. Remove the batteries and unplug the line cords.

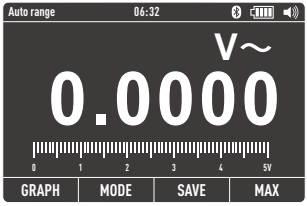
1.Set the function switch to the Ω•))) ⊣⊢ CAP Position.
2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jacks.
3.Press the **MODE** Button (**F2**) again to indicate "**nF**" on the display.
4.Position the black test probe tip and red test probe tip respectively in the spots of the circuit to be measured.
5.Read the Capacitance in the display.

### 4-13. Temperature Measurement

1. Set the function switch to the **Temp** Position.
2. Insert the Temperature Probe into the input jacks, making sure to observe the correct polarity.
3. Press the **MODE** Button (**F2**) to indicate **°C** or **°F.**
4. Touch the Temperature Probe head to the part whose temperature you wish to measure, Keep the probe touching the part under test until the reading stabilizes (About 30 seconds).
5. Read the temperature in the display.

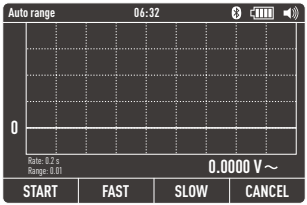


## 5.Default Display

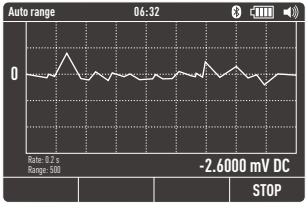



### 5-1.Graph Measure

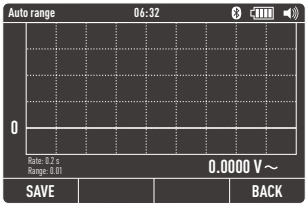
- Press the **GRAPH** Button (**F1**), Meter will switch to Graph measure.
- Press the **START** Button (**F1**).
- Press the **FAST** Button (**F2**) or the **SLOW** Button (**F3**) to adjust sampling rate.
- Press the **CANCEL** Button (**F1**) to exit Graph and return to normal measurement mode.




- Press the **STOP** Button (**F4**).

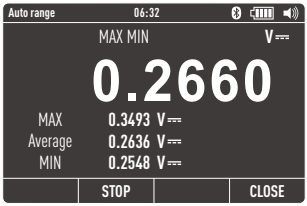


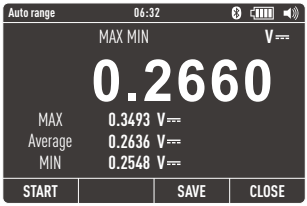
- Press the **SAVE** Button (**F1**) to save graph.
- Press the **BACK** Button (**F4**) to return.




**5-2.Capturing Minimum and Maximum Values**

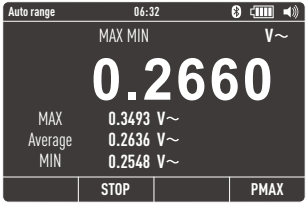
- To activate the MAX/MIN mode, Press **MAX** Button (**F4**) at measure mode .
- As shown in Figure, the Meter displays eat the top of the measurement page, and the MAX/MIN start date and time along the bottom of the page.
- In addition, the recorded maximum, average, and minimum values appear in the secondary display with their respective elapsed times.
- To stop a MAX/MIN recording session, press the **STOP** Button (**F2**).
- Thesummary information in the display freezes, and the softkeys change function to allow saving the collected data.
- Pressing the **CLOSE** Button (**F4**) exits the MAX/MIN record session without saving the collected data.
- To save the MAX/MIN screen data, the MAX/MIN session must be ended by pressing the **STOP** Button (**F2**), Next, press the **SAVE** Button (**F3**).

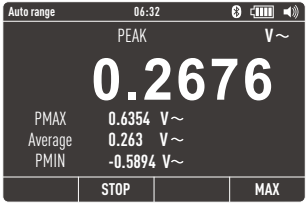


### 5-3.Capturing Peak Values

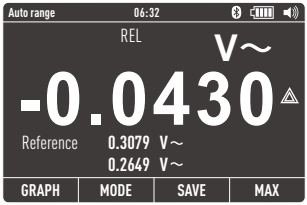
To activate the peak mode, at AC measure MAX/MIN mode , Press the **PMAX** Button (**F4**).



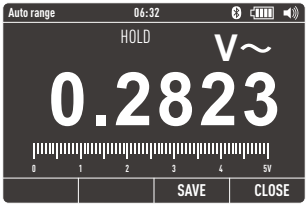

### 5-4.Relative Values

To activate the relative mode, Press the **HOLD/REL** Button for greater that 1 second.



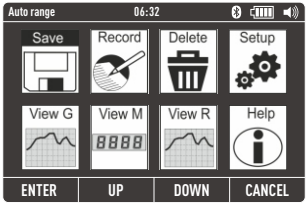

### 5-5.Hold Mode

- To freeze the display for any function, Press the **HOLD/REL** Button.
- Press the **SAVE** Button (**F3**) to memory and the **CLOSE** Button (**F4**) return measure.



### 5-6.Save Function

Press the **SAVE** Button (**F3**), into save menu.

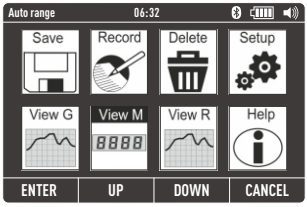


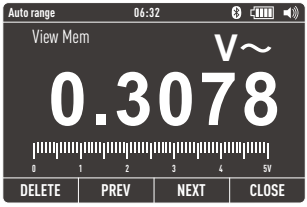

### 5-7.Storing Individual Measurement Data

- For common measurement functions, a snapshot of the screen data is saved by pressing the **SAVE** Button (**F3**).
- Then pressing the **DOWN** Button (**F3**) to the save select item, pressing the **ENTER** Button (**F1**).

### 5-8.Viewing Memory Data

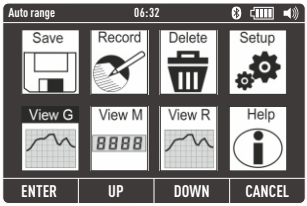
- Viewing data stored in the Meter's memory is performed through the save menu.
- Press the **DOWN** Button (**F3**), position the menu selector next to the menu item labeled **ViewM**, and pressing the **ENTER** Button (**F1**).

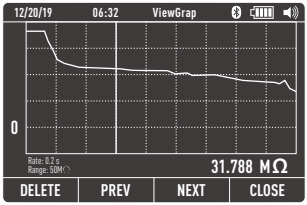


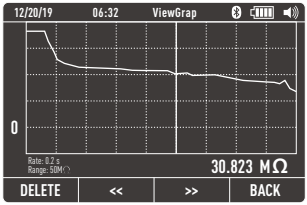



### 5-9.Viewing Graph Data

- Viewing data stored in the Meter's memory is performed through the save menu.
- Press the **DOWN** Button (**F3**), position the menu selector next to the menu item labeled **ViewG**, and pressing the **ENTER** Button (**F1**).
- Press the **<<** Button (**F2**) and the **>>** Button (**F3**) to move cursor.

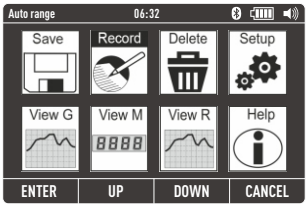


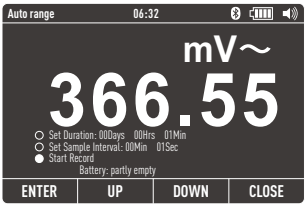




### 5-10.Recording Measurement Data

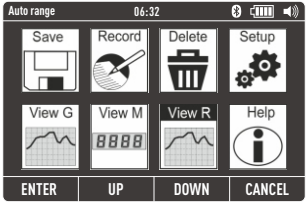
- Press the **SAVE** Button (**F3**), then pressing the **DOWN** Button (**F3**) to the **Record** select Item, pressing tthe **ENTER** Button (**F1**), Press the softkey labeled **Start** to start records.
- The recording session will continue until the allocated memory is used, the batteries expire, the rotary switch is moved, or the session is terminated by pressing the **CLOSE** Button (**F4**) labeled stop.

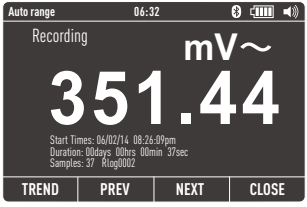


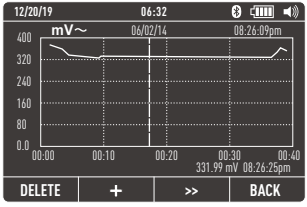



## 5-11.Viewing Trend Data

- Viewing data stored in the Meter's memory is performed through the save menu.
- Press the **DOWN** Button (**F3**), Position the menu selector next to the menu item labeled **ViewR** and pressing the **ENTER** Button (**F1**).
- Press the the **TREND** Button (**F1**).
- Press the **+** Button (**F2**) to increase graph resolution, press the **>>** Button (**F3**) to move cursor.

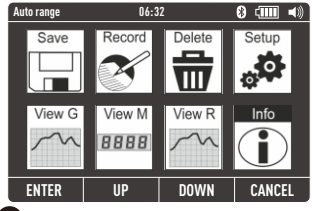


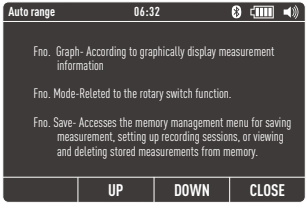




## 5-12.Info

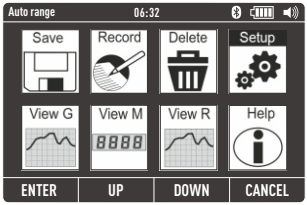
- Viewing data stored in the Meter's memory is performed through the save menu.
- Press the **DOWN** Button (**F3**), position the menu selector next to the menu item labeled **Info** and pressing the the **ENTER** Button (**F1**).

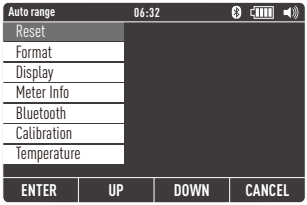


## 6.Setup Options

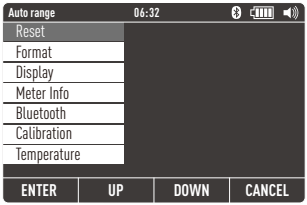
- Viewing data stored in the Meter's memory is performed through the save menu.
- Press the **DOWN** Button (**F3**), position the menu selector next to the menu item labeled **Setup** and pressing the **ENTER** Button (**F1**).

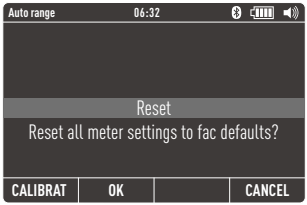



### 6-1.Resetting Meter

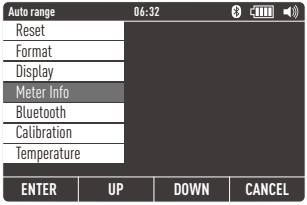
- The Meter's setup options can be reset to default values through the setup menu.
- Open the setup menu, position the menu selector next to the menu item labeled **Reset** and press the **ENTER** Button (**F1**).
- Then a message will appear asking to confirm the reset action.
- Press the **OK** Button (**F2**) to perform the reset.



### 6-2.Meter Info

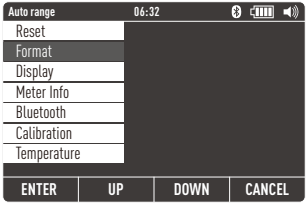
- The Meter Info selection lists the serial number, firmware version, are displayed.
- Open the setup menu, position the menu selector next to the menu item labeled **Meter Info** and press the **ENTER** Button (**F1**).

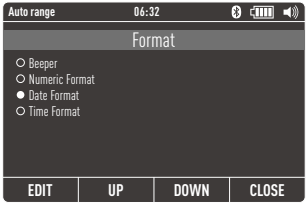


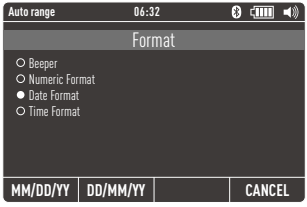


### 6-3.Setting Format

- Open the setup menu, position the menu selector next to the menu item labeled **Format** and press the **ENTER** Button (**F1**).
- Using the cursor buttons, move the menu selector next to the menu item labeled Numeric(Date\ Time) format, press the **EDIT** Button (**F1**) to edit, select 0.0000(0,0000) and MM/DD/YY(DD/MM/YY) and 24 HOUR(12 HOUR) format.

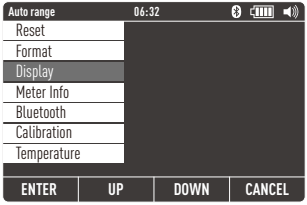


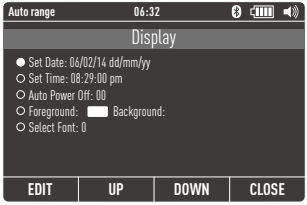



### 6-4.Setting Display

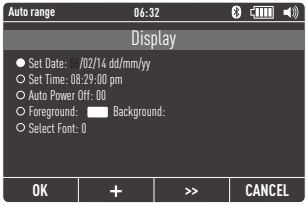
- Open the setup menu.
- Position the menu selector next to the menu item labeled **Display** and press the **ENTER** Button (**F1**).



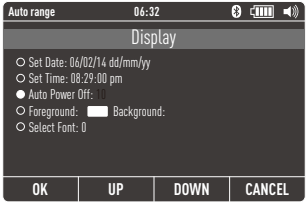

### 6-5.Setting Date and Time

- Open the setup menu, position the menu selector next to the menu item labeled **Display** and press the **ENTER** Button (**F1**).
- Next position the menu selector next to either the **Set Date** item or **Set Time** item and press the **EDIT** Button (**F1**).



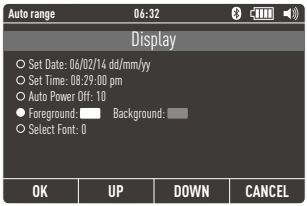
### 6-6.Auto Power Off

- Open the setup menu, position the menu selector next to the menu item labeled **Display** and press the **ENTER** Button (**F1**).
- Then Position the menu selector next to the menu item labeled **Auto Power Off** and press the **EDIT** Button (**F1**).
- To set Auto Power Off, use **UP** (**F2**) and **DOWN** (**F3**) to adjust the time to one of the preset values.
- **0** is disable the timeout feature.
- Press the **OK** Button (**F1**) to set the selected time, press the **CANCEL** Button (**F4**) to return.



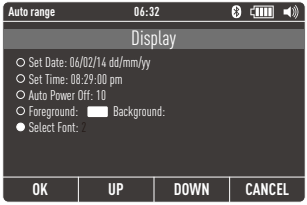

### 6-7.Foreground and Background

- Open the setup menu, position the menu selector next to the menu item labeled **Display** and press the **ENTER** Button (**F1**).
- Then position the menu selector next to the menu item labeled **Foreground** and **Background** and press the **OK** Button (**F1**).
- Use **UP** (**F2**) and **DOWN** (**F3**) to adjust.



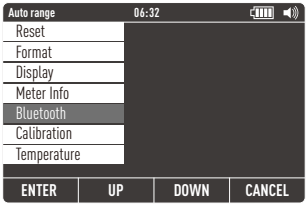
### 6-8.Set Font

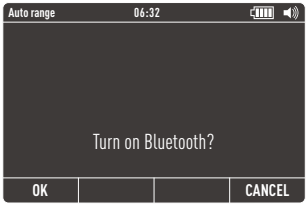
- Open the setup menu, position the menu selector next to the menu item labeled **Display** and press the **ENTER** Button (**F1**).
- Then Position the menu selector next to the menu item labeled **Select Font** and press the **EDIT** Button (**F1**)
- Use **UP** (**F2**) and **DOWN** (**F3**) to adjust.




### 6-9.Bluetooth

- You can use the Bluetooth communication link and transfer the contents of a meter's memory to a PC.
- Open the setup menu, position the menu selector next to the menu item labeled **Bluetooth** and press the the **ENTER** Button (**F1**).
- "Turn on Bluetooth" and press the **OK** Button (**F1**) ,"Turn off Bluetooth" and press the **OK** Button (**F1**).



## 7.Replacing the Batteries

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

**WARNING:** To avoid electric shock, do not operate the meter until the battery cover is in place and fastened securely.

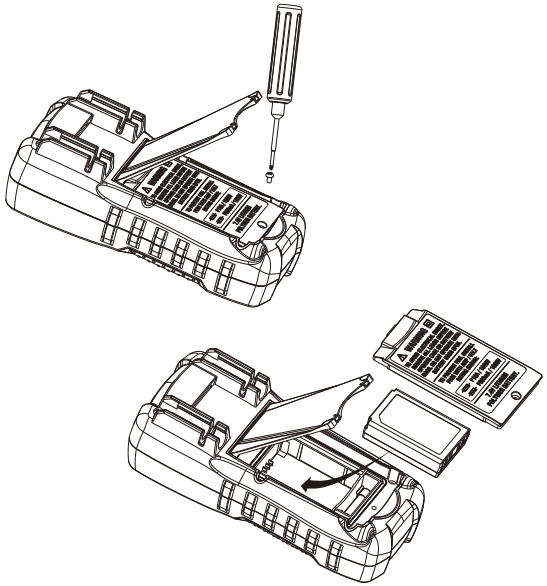
Refer to Figure and replace the batteries as follows:

1.Turn the Meter off and remove the test leads from the terminals.

2.Remove the battery door assembly by using a standard blade screwdriver to turn the battery door screw one-half turn counterclockwise.

3.Replace the batteries with 7.4 volt charge batteries Observe proper polarity.

4.Reinstall the battery door assembly and secure it by turning the screw one-half turn clockwise.



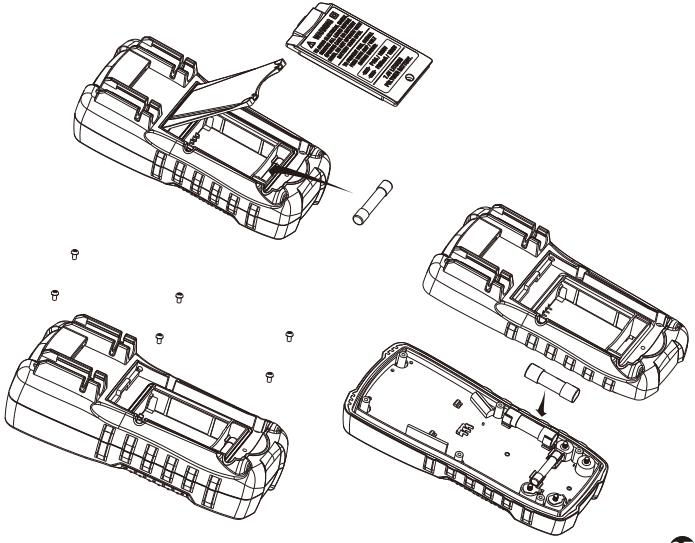
## 8.Replacing the Fuses

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

**WARNING:** To avoid electric shock, do not operate your meter until the fuse cover is in place and fastened securely.

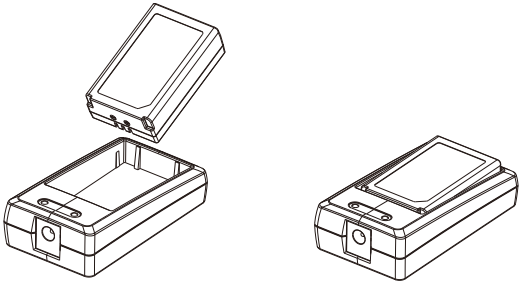
Referring to Figure , examine or replace the Meter's fuses as follows:

1.Turn the Meter off and remove the test leads from the terminals.
2.Remove the battery door assembly by using a standard blade screwdriver to turn the battery door screw one-half turn counterclockwise.
3.Remove the fuse by gently prying one end loose, then sliding the fuse out of its bracket.
4.Install only specified replacement fuses.
5.Reinstall the battery door assembly and secure it by turning the screw one-half turn clockwise.
6.Remove the six screws securing the rear cover.
7.Gently remove the old fuse and install the new fuse into the holder.
8.Replace and secure the rear cover, battery and battery cover.



## 9.Li-ion Battery Charge

1.Turn the Meter off and remove the test leads from the terminals.
2.Remove the battery door assembly by using a standard blade screwdriver to turn the battery door.
3.Install the battery to the external charging stand, plug in the special adapter and plug the adapter into a live socket. (Specific charging instructions are shown in the charging stand instructions).



# 10.Specifications

## 10-1.Specifications

| Function | Range | Resolution | Accuracy | | | |
|---|---|---|---|---|---|---|
| AC Voltage | | | 50/60Hz | <1kHz | <5kHz | <20kHz (1) |
| | 500mV | 0.01mV | ±(0.5% + | ±(3.0% + | ±(3.0% + | ±(5.5% + |
| | 5V | 0.0001V | 5 digits) | 5 digits) | 5 digits) | 20 digits) |
| | 50V | 0.001V | | ±(1.5% + | ±(3.5% + | Unspecified |
| | 500V | 0.01V | | 10 digits) | 10 digits) | |
| | 1000V | 0.1V | | | Unspecified | Unspecified |

(1): Upper 10 % of range.

| | | | |
|---|---|---|---|
| DC Voltage | 500mV (2) | 0.01mV | ±(0.1% + 5 digits) |
| | 5V | 0.0001V | ±(0.05% + 5 digits) |
| | 50V | 0.001V | |
| | 500V | 0.01V | |
| | 1000V | 0.1V | ±(0.1% + 5 digits) |

(2): When using the relative mode (REL Q) to compensate for offsets.

| | | | | |
|---|---|---|---|---|
| AC+DC Voltage | 5V | 0.0001V | <1kHz | <5kHz |
| | 50V | 0.001V | ±(1.2% + 20 digits) | ±(3.5% + 20 digits) |
| | 500V | 0.01V | | |
| | 1000V | 0.1V | | Unspecified |

| | | | |
|---|---|---|---|
| Resistance | 500Ω (3) | 0.01Ω | ±(0.20% + 10 digits) |
| | 5kΩ | 0.0001kΩ | ±(0.20% + 5 digits) |
| | 50kΩ | 0.001kΩ | |
| | 500kΩ | 0.1kΩ | ±(0.50% + 5 digits) |
| | 5MΩ | 0.0001MΩ | |
| | 50MΩ | 0.001MΩ | ±(2.0% + 20 digits) |

(3): When using the relative mode (REL Q) to compensate for offsets.

| | | | |
|---|---|---|---|
| DC Current | 500μA | 0.01μA | ±(0.5% + 5 digits) |
| | 5000μA | 0.1μA | |
| | 50mA | 0.001mA | |
| | 500mA | 0.01mA | ±(0.3% + 8 digits) |
| | 10A | 0.001A | ±(0.5% + 8 digits) |

| Function | Range | Resolution | Accuracy | |
|---|---|---|---|---|
| AC Current | 500µA | 0.01µA | 50/60Hz | <5kHz |
| | 5000µA | 0.1µA | ±(0.8% + 5 digits) | ±(3% + 5 digits) |
| | 50mA | 0.001mA | | |
| | 500mA | 0.01mA | | |
| | 10A | 0.001A | | |

10A: 30 sec max with reduced accuracy.
All AC current ranges are specified from 5% of range to 100% of range.

| | | | |
|---|---|---|---|
| Capacitance | 5nF (3) | 0.001nF | ±(1.5% + 20 digits) |
| | 50nF | 0.01nF | ±(1.5% + 8 digits) |
| | 500nF | 0.1nF | ±(1.0% + 8 digits) |
| | 5µF | 0.001µF | ±(1.5% + 8 digits) |
| | 50µF | 0.01µF | ±(1.0% + 8 digits) |
| | 500µF | 0.1µF | ±(1.5% + 8 digits) |
| | 10mF | 0.01mF | ±(2.5% + 20 digits) |

(3): With a film capacitor or better, using relative mode (REL $\Delta$) to zero residual.

| | | | |
|---|---|---|---|
| Frequency (Electronic) | 50Hz | 0.001Hz | ±(0.01% + 5 digits) |
| | 500Hz | 0.01Hz | |
| | 5kHz | 0.0001kHz | |
| | 50kHz | 0.001kHz | |
| | 500kHz | 0.01kHz | |
| | 5MHz | 0.0001MHz | |
| | 10MHz | 0.001MHz | Unspecified |

Sensitivity: 2V rms min. at 20% to 80% duty cycle and <100kHz; 5Vrms min at 20% to 80% duty cycle and >100kHz.

| | | | |
|---|---|---|---|
| Frequency (Electrical) | 10.00-10kHz | 0.01-0.001kHz | ±(0.5% reading) |

Sensitivity: 2Vrms.

| | | | |
|---|---|---|---|
| Duty Cycle | 0.1 to 99.90% | 0.01% | ±(1.2% + 5 digits) |

Pulse width: 100µs-100ms, Frequency: 5Hz to 150kHz.

| Function | Range | Resolution | Accuracy |
|---|---|---|---|
| Temp (Type-K) | -200 to 1350°C | 0.1°C | ±(1.0% + 3.0°C) |
| | -328 to 2462°F | 0.1°F | ±(1.0% + 5.4°C) |

Does not include error of the thermocouple probe.
Accuracy specification assumes ambient temperature stable to ±1°C.
Use a long time, reading will increase 2°C.
<-50°C Temp Rang accuracy ±(3%+5°C).

### 10-2.General Specifications

| | |
|---|---|
| Enclosure | Double molded |
| Shock (Drop Test) | 6.5 feet (2 meters) |
| Waterproof | IP67 |
| Diode Test | Test current of 1.5mA maximum, open circuit voltage 3.2V DC typical. |
| Continuity Check | Audible signal will sound if the resistance is less than 25 Ω (approx.), test current <0.35mA. |
| PEAK | Captures peaks >1ms |
| Temperature Sensor | Requires type K thermocouple |
| Input Impedance | >10MΩ VDC & >9MΩ VAC |
| AC Response | True rms |
| AC True RMS | The term stands for "Root-Mean-Square," which represents the method of calculation of the voltage or current value. Average responding multimeters are calibrated to read correctly only on sine waves and they will read inaccurately on non-sine wave or distorted signals. True rms meters read accurately on either type of signal. |
| ACV Bandwidth | 50Hz to 20000Hz |
| Display | 50,000 Counts TFT LCD |
| Overrange indication | "OL" is displayed |
| Auto Power Off | 5-30minutes (approximately) with disable feature |
| Polarity | Automatic (no indication for positive); Minus (-) sign for negative |
| Measurement Rate | 20 times per second, nominal |
| Low Battery Indication | "  " is displayed if battery voltage drops below operating voltage |
| Battery | One 7.4 volt (NEDA 1604) battery |
| Fuses | mA/μA ranges: 0.8A/1000V ceramic fast blow A range; 10A/1000V ceramic fast blow. |

| | |
|---|---|
| Operating Temperature | 5 to 40°C (41 to 104°F) |
| Storage Temperature | -20 to 60°C (-4 to 140°F) |
| Operating Humidity | Max 80% up to 31°C (87°F) decreasing linearly to 50% at 40°C (104°F) |
| Storage Humidity | 50% at 40°C (104°F) |
| Operating Altitude | <80% 7000ft. (2000meters) maximum. |
| Safety | This meter is intended for origin of installation use and protected, against the users, by double insulation per EN61010-1 and IEC61010-1 2nd Edition (2001) to Category IV 600V and Category III 1000V; Pollution Degree 2. The meter also meets UL 61010-1, 2nd Edition (2004), CAN/CSA C22.2 No. 61010 -1 2nd Edition (2004), and UL 61010-2-033, 1st Edition (2012). |

Rev.200602