



**INSTRUCTION MANUAL**  
**MT255**  
**AC POWER DATA LOGGER**













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## 1. SAFETY WARNINGS

- This instrument has been designed, manufactured and tested according to IEC 61010: Safety requirements for Electronic Measuring apparatus, and delivered in the best condition after passing inspection.
- This instruction manual contains warnings and safety rules which must be observed by the user to ensure safe operation of the instrument and to keep the instrument in a safe operating condition.
- Read through these operating instructions before using the instrument.

### 1.1. International Safety Symbols

-  The symbol indicated on the instrument means that the user must refer to the related parts in the manual for safe operation of the instrument, it is essential to read the instructions wherever the symbol appears in the manual.
-  **DANGER** is reserved for conditions and actions that are likely to cause serious or fatal injury.
-  **WARNING** is reserved for conditions and actions that can cause serious or fatal injury.
-  **CAUTION** is reserved for conditions and actions that can cause injury or instrument damage
-  Indicates a instrument with double or reinforced insulation.
-  Indicates that this instrument can clamp on live bare conductors when the voltage to be tested is below circuit-ground to earth voltage against the indicated measurement category.
-  Indicates AC.
-  Indicates DC.

### 1.2. WARNING

- Read through and understand the instructions contained in this manual before using the instrument.
- Keep the manual on hand to enable quick reference whenever necessary.
- The instrument is to be used only in its intended applications.
- Understand and follow all the safety instructions contained in the manual.
- It is essential that the above instructions are adhered to, failure to follow the above instructions may cause injury, instrument damage and/or damage to equipment under test.
- Never attempt to make a measurement if any abnormal conditions, such as broken case and exposed metal parts are found on the instrument.
- Do not install substitute parts or make any modification to the instrument. For repair or re-calibration, return the instrument to your local distributor from where it was purchased.
- Do not try to replace the batteries if the instrument is wet or being operated.

- Disconnect all the cords and cables from the object under test and power off the instrument before opening the Battery Cover for Battery replacement.
- Use only the correct supplied current clamp and voltage lead.

### 1.3. DANGER

- Never make a measurement on a circuit with voltage over AC 1000V.
- Do not make measurement during thunder and lightning, stop measurement immediately and disconnect the instrument from the circuit under test.
- Do not attempt to make a measurement in the presence of flammable gasses, otherwise, the use of the instrument may cause sparks, which can lead to an explosion.
- The clamp jaws are designed not to short the circuit under test. If the circuit under test has exposed conductive parts, however, extra precaution should be taken to minimize the possibility of shorting.
- Never attempt to use the instrument if it or your hand is wet.
- Do not exceed the maximum allowable input of any measuring range.
- Never open the Battery Cover during a measurement.
- Verify proper operation on a known source before use or taking action as a result of the indication of this meter.

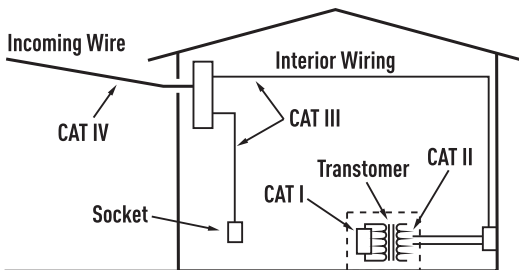
### 1.4. CAUTION

- Put the instrument on a stable place where it is free from vibration or live parts.
- Keep Mag Cards, PCs and Displays away from the magnet, which is attached to the backside of the instrument.
- Do not expose the instrument to the direct sun, high temperature and/or humidity.
- Be sure to power off the instrument after use, when the instrument will not be in use for a long period, place it in storage after removing the batteries.
- Use a cloth dipped in water or neutral detergent for cleaning the instrument. Do not use abrasives or solvents.

### 1.5. Measurement Categories (Over-voltage Categories)

- To ensure safe operation of measuring instruments IEC 61010, establishes safety standards for various electrical environments, categorized as CAT I to CAT IV, called measurements categories.
- Higher-numbered categories correspond to electrical environments with greater momentary energy, so a measuring instrument designed for CAT III environments can endure greater momentary energy than one designed for CAT II.
- **CATI:** Secondary electrical circuits connected to an AC electrical outlet via a transformer or similar device.

- **CAT II:** Primary electrical circuits of equipment connected to an AC electrical outlet by a power cord.
- **CAT III:** Primary electrical circuits of the equipment connected directly to the distribution panel, and feeders from the distribution panel to outlets.
- **CAT IV:** The circuit from the service drop to the service entrance, and to the power meter and primary over-current protection device (distribution panel).



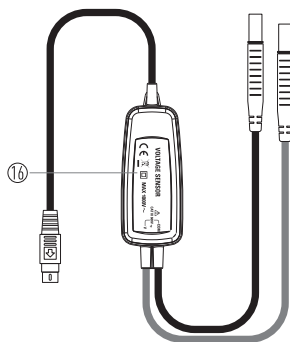
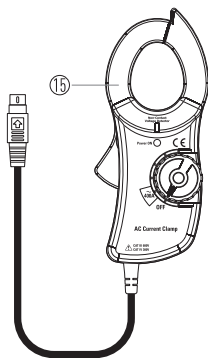
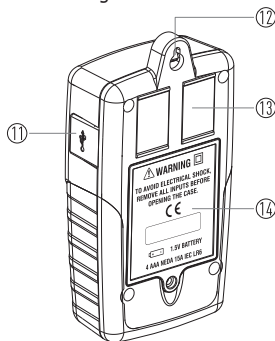
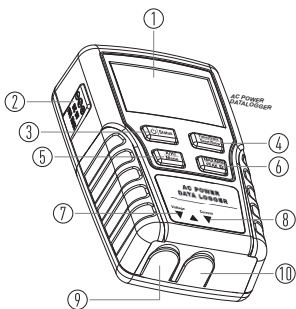
## 2. FEATURES

- The Data Logger is capable of measuring Load Current and Voltage, logging items include: Voltage RMS, Current RMS, Active Power, Apparent Power, Power Factor, Energy, Instantaneous Voltage Value, Instantaneous Current Value.
- Built-in flash, data is not lost when meter is turned off.
- Use the external power AC adapter [optional] for long-term recording.
- You can view the real-time data of the meter through the Meter-X mobile app.
- View the data recorded by the instrument through computer software (included).
- Computer software graphically records data.
- Three recording modes and two storage modes, which can be set as needed.
- The LCD flashes to indicate that a recorded event has been triggered.
- Record mode parameters can be set to record at time intervals or can be triggered to record at certain voltage and current parameters.
- Measurement and recording of RMS values of AC current [50/60Hz] and AC voltage [50/60Hz].
- When using the meter, use the correct voltage sensor and current clamp sensor, failure to do so may result in damage to the instrument or the circuit under test.

### 3. DESCRIPTION

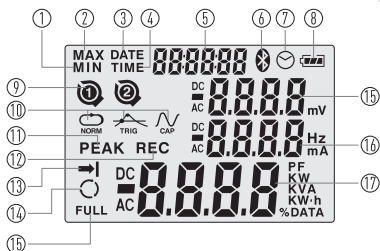
#### 3.1. Meter Description

- 1 - LCD Display
- 2 - External Power Interface
- 3 - Power/Status Button
- 4 - Clock/Date, Recording Start/Stop Button
- 5 - Current/Frequency Switching, Menu Mode Button
- 6 - PEAK/MAX/MIN switching, Bluetooth Button
- 7 - Voltage LED Indicator
- 8 - Current LED Indicator
- 9 - Voltage Sensor Interface
- 10 - Current Sensor Interface
- 11 - USB Interface
- 12 - Mounting Bracket
- 13 - Magnet
- 14 - Battery Cover
- 15 - AC Current Clamp
- 16 - Voltage Sensor



### 3.2. Symbols Used on LCD Display

- |  |  |
|--|--|
| 1 - Minimum  | 10 - Record Mode: Normal, Trigger, Capture                         |
| 2 - Maximum  | 11 - Instantaneous Peak Mode                                       |
| 3 - Date   | 12 - Record: Indicates recording is active                         |
| 4 - Time   | 13 - Set to stop recording when the recording capacity is full     |
| 5 - Time/Date Area: Indicates Time, Date and Time Interval | 14 - Set to overwrite old data when the recording capacity is full |
| 6 - Bluetooth Indicator                                    | 15 - Storage capacity full indicator                               |
| 7 - Auto Power Off   | 16 - Voltage effective value display area                          |
| 8 - Battery  | 17 - Current effective value/frequency display area                |
| 9 - Channel Number & Sensor Indication                     |  |



### 3.3. Displayed Message

Message	Meaning
NC	Sensor is not connected/not detected
OL	Over-Range
SEt.1	Menu: Setting 1: Record mode setting
SEt.2	Menu: Setting 2: Record mode parameter setting
SEt.3	Menu: Setup 3: Storage Mode Settings
SEt.4	Menu: Setting 4: Date Time Settings
SEt.5	Menu: Setting 5: Auto Power Off
CLr	Clear Data
-PC-	Communicating with PC/Connected to PC
ON	Turn On
NO	Cancel
OFF	Power Off



### 3.4. Function of Buttons

Power ON/OFF	Power ON	Power OFF
Power/Status Button	Press for at least 1 sec (while the instrument is off)	Press for at least 2 sec (except for recording status)

Non-Menu Mode	Press Function	Long Press Function
Power/Status Button	Power Factor/Active Power/Apparent Power/Energy Accumulation/Used Storage Capacity	Power On/Off
Clock/Date, Recording Start/ Stop Button	Date/Time	Record Mode On/Off
Current/Frequency Switching, Menu Mode Button	Current/Voltage Frequency	Enter Menu/Return
PEAK/MAX/MIN switching, Bluetooth Button	Instantaneous Value/MAX/MIN/PEAK	Bluetooth On/Off

Menu Mode	Menu	Setting Change
Power/Status Button	Select Menu	Setting Change, Enter
Clock/Date, Recording Start/ Stop Button	Switch Menu Item	Increase Number
Current/Frequency Switching, Menu Mode Button	Back	Setting Cancel/Enter
PEAK/MAX/MIN switching, Bluetooth Button	Switch Menu Item	Decrease Number

## 4. RECORDING PROCEDURES



### 4.1. Recording Data

The following describes the operational flow: from preparation to completing recording.

#### 4.1.1. Boot




- Press and hold the **Power/Status** Button to switch on MT255.
- If the LCD shows " " please replace the batteries.

#### 4.1.2. Sensor Connection

- Insert the Voltage Sensor into the voltage channel, then the LCD will display " " upon successful connection.
- Insert the Current Sensor into the current channel, then the LCD will display " " upon successful connection.




**WARNING:** The sensor must be inserted correctly, otherwise the instrument will be damaged, or measurements will be invalid, and the sensors may not be detected.

#### 4.1.3. Set The Recording Mode


1. To set recording functions and parameters, press and hold the **A/HZ/Menu** button to enter the set up mode. Press the **Time/Date/Start/Stop** button or **Peak/Min/Max/Bluetooth** button to adjust the LCD display until it shows "**SET 1**".
2. Press the **Power/Status** button to enter the recording mode setting.
3. Press the **Time/Date/Start/Stop** button to scroll up and the **Max/Min/Peak** button to scroll down. Use these buttons to adjust the flashing "  " on the LCD. Press the **A/HZ/Menu** button to set the recording mode settings and exit.

#### 4.1.4. Set The Recording Parameters

1. Press the **Max/Min/Peak** button to scroll down to the setup screen "**SET 2**".
2. Press the **Power/Status** Button to enter the recording mode time setting.

Record Mode	Setting	Operation
Normal Mode  NORM	Set the recording interval: 1 sec to 60min.	Press the <b>Power/Status</b> Button to switch minutes and seconds, the <b>Clock/Date, Recording Start/Stop</b> Button <b>NORM</b> and <b>PEAK/ MAX/MIN</b> switching, <b>Bluetooth</b> Button to adjust the time, and press the <b>Current/Frequency Switching, Menu Mode</b> Button to keep exiting.
Trigger Mode  TRIG	Set the low voltage trigger value: 1 to 1000V,	Press the <b>Power/Status</b> Button to switch voltage and current, the <b>Clock/Date, Recording Start/Stop</b> Button and
Capture Mode  CAP	Set the high current trigger value: 1 to 400A.	<b>PEAK/ MAX/MIN</b> switching, <b>Bluetooth</b> Button to adjust the value, press the <b>Current/Frequency Switching, Menu Mode</b> Button to keep exiting.

#### 4.1.5. Set The Storage Mode

1. Press the **Max/Min/Peak/Bluetooth** button to scroll down to the setup screen "**SET 3**".
2. Press the **Power/Status** Button to enter the storage mode setting.
3. Press the **Time/Date/Start/Stop** button to scroll up and the **Max/Min/Peak/Bluetooth** button to scroll down. Use these buttons to adjust the flashing "" on the LCD.
4. Press the **Power/Status** Button to set the memory mode settings and exit.

#### 4.1.6. Set the Date and Time

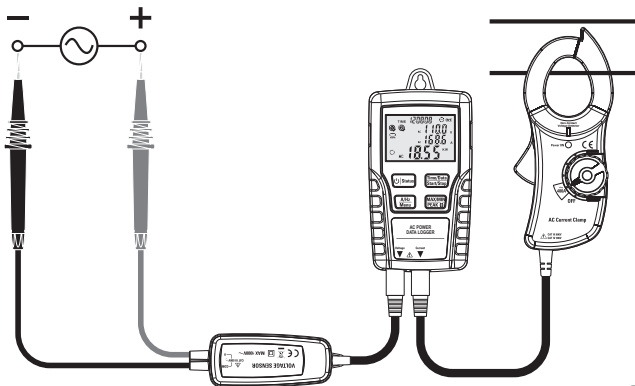
1. Push and hold the **Max/Min/Peak/Bluetooth** button to scroll down to the setup screen "**SET 4**".
2. Press the **Power/Status** button to enter the time setting.
3. Press the **Power/Status** button to move through Year/Month/Day and Time.
4. Press the **A/HZ/Menu** Button to save the time and date settings and exit.

#### 4.1.7. Setting Up Auto Power Off

1. Press the **Max/Min/Peak/Bluetooth** button to scroll down to the setup screen "**SET 5**".
2. Press the **Power/Status** button to enter the auto power off setting.
3. Press the **Time/Date/Start/Stop** button and the **Max/Min/Peak/Bluetooth** button to change the auto power off setting. "**ON**" means the Auto power Off is turned on and "**OFF**" means the Auto Power Off is turned off.
4. Press the **Power/Status** button to save the settings and exit, or press the **A/HZ/Menu** Button to cancel the setup.

#### 4.1.8. Connecting To The Circuit Under Test

- Connect the black test lead of the voltage sensor to the neutral line conductor, connect the red test lead to the live line conductor.
- The clamp of the current sensor should be clamped over one of the main conductors for the circuit under test.



#### 4.1.9. Start Recording

- Settings cannot be changed during recording, check all settings before initiating a recording.
  - Previously recorded data will be cleared before starting a recording (in this case, the LCD will display “**CLR**” when you press and hold the **Time/Date/Start/Stop** button).
1. **Check** the recording mode.
  2. **Check** the recording parameters.
  3. “**○**” Storage mode.

**NOTE:** If you do not want to clear the previously recorded data, unplug the sensors and transfer the recorded data to your PC

- Press the **Clock/Date, Recording Start/Stop** Button until “**REC**” stops flashing to indicate the start of recording.
- If the previously recorded data is not required, it is recommended to clear the previously recorded data before recording.
- “**① ②**” Indicates that the corresponding sensor is not connected and recording cannot be started.
- “**CLR**”Blinking indicates that the previously recorded data will be cleared before the recording starts.
- “**FULL**”Blinking: The storage space is full and the recording mode cannot be started, please clear the data and try again.
- Recording mode parameters cannot be modified during recording, you can press and hold the **A/Hz/Menu** Button to view the parameters set for the recording mode.
- Cannot shut down during recording.
- You cannot communicate with PC data during recording.
- “**REC**” The corresponding LED light flashes when recording is active.
- “**REC**” does not allow datalogger data to be read by PC.

#### 4.1.10. Stop Recording

- Press the **Time/Date/Start/Stop** Button until “**REC**” is no longer displayed.
- Remove the voltage sensor leads and remove the current clamp from the circuit.
- Disconnect the voltage sensor connector and the current sensor connector.

#### 4.1.11. View Recorded Data Through PC




- Make sure the instrument LCD is not displaying “**REC**”.
- Make sure the PC has the correct drivers and software installed.
- The instrument cannot perform any operations while the instrument is plugged into USB.

- See **Chapter 7 (page 14)** for data viewing and PC software operations.

#### 4.2. Clearing Record Data

- Press and hold the **A/Hz/Menu** Button to enter the setting mode, turn on **PEAK/MAX/MIN/Bluetooth** Button to adjust the LCD display “**ELr**”, press the **Power/Status** Button to enter the data clear.
- Press the **Time/Date/Start/Stop** Button and **PEAK/MAX/MIN/Bluetooth** Button to adjust “**ELr**” until it flashes, press the **Power/Status** Button to clear the data and exit.
- If “**fl**” flashes, pressing will not clear the data, as it is already clear.

### 5.RECORDING MODES

Record Mode	Ordinary Record 	Trigger Record 	Intercepted Record 
Work Summary	Record the voltage effective value, current RMS, power factor, active power, apparent power, voltage frequency, and accumulated energy at the time interval.	The voltage and current RMS sampling frequency is 0.1 ms. If a trigger occurs, a total of 200 points are recorded before and after. <b>Voltage RMS record:</b> Trigger recording when the voltage RMS value is lower than the set voltage value. <b>Current RMS record:</b> The record is triggered when the current RMS value is higher than the set current value.	The voltage and current instantaneous value sampling frequency is 1 ms. If a trigger occurs, a total of 200 points are recorded before and after. <b>Instantaneous Voltage Value Recording:</b> The recording is triggered when the instantaneous value of the voltage is lower than the set voltage value multiplied by $\sqrt{2}$ . <b>Instantaneous Current Value Recording:</b> The current instantaneous value is higher than the set current value multiplied by $\sqrt{2}$ to trigger the recording.
Use	Status Monitoring Monitoring Electricity	Abnormal voltage and current monitoring	Abnormal voltage and current waveform observation
Set Value	Recording Interval: 1 s-60min	Trigger Voltage RMS: 1-1000V Trigger Current RMS: 1-400A	Trigger Voltage RMS: 1-1000V Trigger Current RMS: 1-400A
Recording Time	Recording time point record	Record on trigger	Record on trigger
The Sampling Period	100ms	100ms	1ms
Max Groups	1000	1000	1000
Number of Group Data	Max 25350	Fixed 200	Fixed 200

## 6. BLUETOOTH AND MOBILE APP

- Hold down the **MAX/MIN/PEAK/BLUETOOTH** button to turn Bluetooth on.
- Open the Meter-X app on your mobile device to connect via Bluetooth and view data.




## 7. PC SOFTWARE AND DRIVERS

- Click **"Install Package"** and follow the instructions to perform the installation process.
- During installation you can choose whether to install drivers.
- After installing, connect the MT255 via the PC on which the Software has been installed. Transfer the recorded data on the logger to the PC.
- For more help, see the software manual for details.

## 8. BATTERY REPLACEMENT

**WARNING:** In order to avoid electrical shock, remove sensors from the instrument when replacing batteries.

**CAUTION:** Do not mix new and old batteries, install batteries in the correct orientation as shown inside the battery compartment, observing correct polarity.

- The battery level indicator " " at the top right of the LCD has 1/3 segments remaining, indicating that the battery capacity is insufficient, if it is continuously displayed, please replace the batteries before logging.
  - Please note that when the battery is depleted, the display will turn off.
1. Loosen the two Battery cover fixing screws on the backside of the instrument and remove the cover.
  2. Replace the batteries with new ones (Battery: Alkaline, LR6, 1.5V AAAx4).
  3. Install the Battery cover, and tighten the screws.



## 10. SPECIFICATIONS

### 10.1. General Specifications

Range	Function
Number of Input Channels	2 Channels
Measuring Method	True RMS
Display	Liquid Crystal Display (LCD)
Low Battery Warning	Battery Indicator (3 levels)
Over-range Indication	"OL" mark is displayed when exceeding a measuring range
Auto Power Off	Power-off function turns the MT255 off automatically after 10 minutes with no input while not recording.
Location For Use	Indoor use, Altitude up to 2000m
Temperature & Humidity Range or (Guaranteed Accuracy)	23°C ±5°C / Relative Humidity 85% less (Non condensing)
Storage Temperature & or Humidity Range	20°C to 60°C / Relative Humidity 85% less (Non condensing)
Battery	4 x 1.5V AAA Alkaline Batteries (Optional AC Adapter)
Current Consumption	Approx. 60mA
Maximum Recording Time	Approx. 3 days.
Dimensions	114 x 63 x 34mm
Weight	248g

### 10.2. Technical Specifications

#### 10.2.1. AC Voltage

Range	Resolution	Tolerances
1000.0V	0.1V	±(3.5% + 3 digit)

Sine wave, Maximum Input: 1000.0AC RMS, 45 to 65Hz.

#### 10.2.2. AC Current

Range	Resolution	Tolerances
400.0A	0.1A	±(3.5% + 3 digit)

Sine wave, Maximum Input: 400.0AC RMS, 45 to 65Hz.



### 10.2.3. Active Power

Range	Resolution	Tolerances
9.999kW	0.001kW	$\pm(4\% + 10 \text{ digit})$
99.99kW	0.01kW	$\pm(4\% + 1 \text{ digit})$
400.0kW	0.1kW	

Accuracy defined for: Sine wave, AC V RMS <1000.0V and AC A RMS <400.0A, Frequency 45-65Hz, PF=1.00.

When the power factor is closer to 0, the error margin is greater.

To ensure effective measurement, ensure that the absolute value of the power factor is greater than 0.90.

### 10.2.4. Apparent Power (kVA)

Range	Resolution	Tolerances
9.999kVA	0.001kVA	$\pm(4\% + 10 \text{ digit})$
99.99kVA	0.01kVA	$\pm(4\% + 1 \text{ digit})$
400.0kVA	0.1kVA	

Accuracy defined for: Sine wave, AC V RMS <1000.0V and AC A RMS <400.0A, Frequency 45-65Hz.

### 10.2.5. Power Factor

Range	Resolution	Tolerances
-1.00 to 1.00	0.01	$\pm 3^\circ \pm 2 \text{ digits}^*$

Accuracy defined for: Sine wave,  $1000.0 \text{ V} > \text{AC V RMS} > 10.0 \text{ V}$  and  $400.0 \text{ A} > \text{AC A RMS} > 2.0 \text{ A}$ , Frequency 45-65Hz.

\* The error margin is the greatest when the phase shifts between voltage and current is  $90^\circ$ , maximum  $\pm 0.07$ .

### 10.2.6. Active Energy (kWh)

Range	Resolution	Tolerances
9.999kWh	0.001kWh	$\pm(4\% + 3 \text{ digit})$
99.99kWh	0.01kWh	
999.9kWh	0.1kWh	
9999kWh	1kWh	

Accuracy defined for: Sine wave, AC V RMS <1000.0V and AC A RMS <400.0A, Frequency 45-65Hz, PF= 1.00.

When the power factor is closer to 0, the error margin will be greater.

Ensure that the absolute value of the power factor is around 1.00.







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