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# ACM-1500DC SOLAR+ CLAMP METER CAT III 1500 V INSTRUCTION MANUAL

## Preface

Thank you for purchasing the ACM-1500DC Solar+ Clamp Meter CAT III 1500 V. In order to use this product safely and correctly, please read this manual thoroughly, especially the “**Safety Information**” section.

## Limited Warranty and Liability

This product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover fuses, disposable batteries, or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling.

Resellers are not authorized to extend any other warranty on behalf of Jonard Tools. To obtain service during the warranty period, contact your nearest Jonard Tools authorized service center to obtain return authorization information, then send the product to that Service Center with a description of the problem.

This warranty is your only remedy. No other warranties, such as fitness for a particular purpose, are expressed or implied. Jonard Tools is not liable for any special, indirect, incidental or consequential damages or losses, arising from any cause or theory.

Since some states or countries do not allow the limitation of an implied warranty and of incidental or consequential damages, this limitation of liability may not apply to you.

## TABLE OF CONTENTS

<b>I.</b>	<b>Overview</b> .....	<b>3</b>
<b>II.</b>	<b>Features</b> .....	<b>3</b>
<b>III.</b>	<b>Accessories</b> .....	<b>4</b>
<b>IV.</b>	<b>Safety Information</b> .....	<b>4</b>
<b>V.</b>	<b>Electrical Symbols</b> .....	<b>6</b>
<b>VI.</b>	<b>General Characteristics</b> .....	<b>7</b>
<b>VII.</b>	<b>External Structure</b> .....	<b>8</b>
<b>VIII.</b>	<b>Rotary Switch</b> .....	<b>9</b>
<b>IX.</b>	<b>Button Functions</b> .....	<b>10</b>
<b>X.</b>	<b>LCD Display</b> .....	<b>12</b>
<b>XI.</b>	<b>Operating Instructions</b> .....	<b>13</b>
<b>XII.</b>	<b>Other Functions</b> .....	<b>20</b>
<b>XIII.</b>	<b>Technical Specifications</b> .....	<b>21</b>
<b>XIV.</b>	<b>Bluetooth</b> .....	<b>26</b>
<b>XV.</b>	<b>Maintenance</b> .....	<b>28</b>

## I. OVERVIEW

The ACM-1500DC is a photovoltaic true-RMS 9999-count AC/DC clamp meter (abbreviated as “Clamp Meter”), designed for photovoltaic high-voltage environments particularly and characterized by all-featured automatic ranging. It can be used to measure AC/DC voltage, AC/DC current, LPF voltage/current, INRUSH current, peak current, DC power, flex current sensor, resistance, continuity, diode, capacitance, temperature, and more. The ACM-1500DC has data storage function and Bluetooth function, which enable remote control and monitoring on the measurement data via the “ACM-1500DC” APP.

The ACM-1500DC is an ideal meter for installation and maintenance in the photovoltaic field. This Clamp Meter can also be applied in the energy storage system, UPS (uninterrupted power supply), large-scale motor, and other high voltage environments.

## II. FEATURES

1. Measure 2500V DC, 1000A DC, and DC power of 2500KW.
2. Measure 1500V AC, 1000A AC.
3. Bluetooth function: Enable remote control and monitoring via the APP.
4. Low pass filter (LPF) measurement for AC voltage/current.
5. AC INRUSH current and peak value (PEAK) measurement
6. Dual displays to show voltage/frequency, current/frequency, DC voltage/current, and DC power/current at the same time.
7. Temperature measurement (Degrees Celsius/Fahrenheit) electrical specification.
8. Data storage function
9. Full-scale overload protection for multifunctional measurement; Capable to withstand voltage surge of max. 1500Vrms/DC2500V; Overvoltage and overcurrent alarm.
10. IP54 rating: Suitable for outdoor uses, such as solar array, wind energy system, etc.
11. Slim clamp jaws (jaw opening: 35 mm) to allow measurement for concentrated cables, inverter, copper busbar of combiner box, etc.

### III. ACCESSORIES

Please carefully check if any accessory below is missing or damaged.

1. User manual: 1 pc
2. Test leads: 1 pair
3. Carrying case: 1 pc
4. Warranty certificate: 1 pc
5. AA 1.5V battery: 2 pcs

Please contact your local distributor if any accessory is missing or damaged.

### IV. SAFETY INFORMATION

Please pay attention to the warning labels and messages. A Warning identifies hazardous conditions and procedures that are dangerous to the user. A Caution identifies conditions and procedures that can cause damage to the product or the equipment under test.

The product is designed in accordance with IEC/EN61010-1, 61010-2-032, 61010-031, and Electromagnetic Radiation Protection of EN61326-1, and conforms to Double Insulation, Overvoltage CAT III 1500V/CAT IV 600V, and Pollution Degree 2. If the product is not used according to the operating instructions, the protection supplied by the product can be compromised or lost.

1. Please check the product and test leads before use to avoid any damage or problem. Please stop use if exposed test lead, damaged case, abnormal display and other problems occur.
2. It is forbidden to use without the cover closed in place. Otherwise it may present a risk of electric shock.
3. If the test lead is damaged, please replace with new test lead (its rated parameter shall conform to the product or be higher) meeting EN 61010-031.
4. Do not touch the exposed wire, connector, unused input terminal or circuit during measurement.
5. Use caution when working with voltages over 60V DC, 30Vrms AC, or peak voltage over 42.4V. Keep fingers behind the tactile barrier.
6. Set the product to maximum range if the measured value is unknown.
7. Do not exert voltage over the specified value between terminals or between any terminal and earth ground.
8. Set the rotary switch to correct position for measurement. Disconnect the test leads from the measured circuit before turning the rotary switch. It is forbidden to switch over during measurement to prevent product damage.

9. Before measuring in-circuit resistance, diode, circuit, please disconnect all powers in the circuit of measured object and discharge all capacitors thoroughly.
10. Do not use the product in a circuit with voltage over the rated value.
11. To avoid electric shock, please disconnect the test probe from the measured circuit before opening the battery cover or rear cover.
12. Grip the probe behind the finger protector during the use of the probe.
13. Do not keep or use the product in environments with high temperature, high humidity, strong electromagnetic field, or inflammable and explosive substances.
14. Do not alter the internal wiring without authorization to avoid product damage and safety hazard.
15. When the symbol "" appears on the LCD, please replace the battery in time to ensure measurement accuracy.
16. Switch off the power after completing measurement. Remove the batteries when the product is not in use for an extended period of time.
17. Please measure a known intrinsic voltage before use to ensure the product works normally.
18. Please use the product according to the User Manual, otherwise the supplied protection will be lost.
19. Please wipe the case with wet cloth and neutral cleaning agent. Do not use abrasives or solvents.

## V. ELECTRICAL SYMBOLS

Symbol	Description
	Do not place equipment and its accessories in trash. Items must be properly disposed of in accordance with local regulations.
	Double Insulated
	AC (Alternating Current)
	DC (Direct Current)
	Grounding
	Warning
	Application around and removal from UNINSULATED HAZARDOUS LIVE conductors is permitted.
	Low battery
	Adopting Bluetooth communication technology
	Conforms to European Union directives
	Conforms to UL STD 61010-1, 61010-2-032, 61010-031 Certified to CSA STD C22.2 NO. 61010-1, 61010-2-032, 61010-031
<b>CAT III</b>	MEASUREMENT CATEGORY III is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.
<b>CAT IV</b>	MEASUREMENT CATEGORY IV is applicable to test and measuring circuits connected at the source of the building's low-voltage MAINS installation.

## VI. GENERAL CHARACTERISTICS

- Display count: 9999
- Polarity indication: Auto
- Overload indication: "OL" or "-OL"
- Low battery indication: The symbol " " appears on the LCD to indicate the battery voltage is lower than the working voltage. Please replace the batteries with new ones in time.
- Position error: An error of  $\pm 1.0\%$  will be produced if the measured object is not located at the center of the clamp jaws.
- Drop proof: 1 m
- Jaw opening: 35 mm
- Power supply: AA 1.5V battery  $\times 2$
- Auto power off: No operation for about 15 minutes will turn off the Clamp Meter. This function can be disabled if needed.
- Dimensions: 295 mm  $\times$  73 mm  $\times$  50 mm
- Weight: 540g approx.
- Operating altitude: 2000 m
- Protection degree: IP54
- Operating temperature and humidity: 0°C~30°C ( $\leq 80\%RH$ ); 30°C~40°C ( $\leq 75\%RH$ ); 40°C~50°C ( $\leq 45\%RH$ )
- Storage temperature and humidity: -20°C~+60°C ( $\leq 80\%RH$ )

Electromagnetic compatibility: In an RF field of 1 V/m, total accuracy = specified accuracy +5% of range; In an RF field of over 1 V/m, there is no specified specification.

## VII. EXTERNAL STRUCTURE (Figure 1)

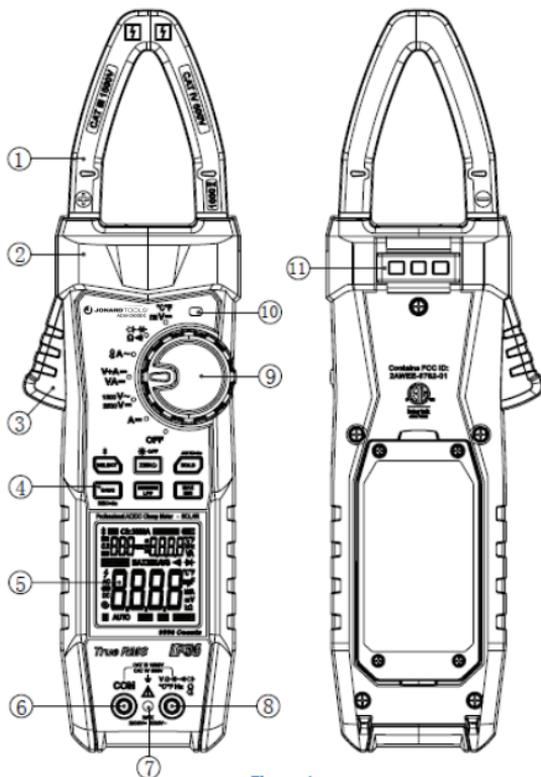


Figure 1

- |    |   |     |  |
|----|---|-----|--|
| 1. | Clamp jaw                                     | 7.  | Light-guide area for infrared transmission           |
| 2. | Tactile barrier                               | 8.  | Signal input terminal (connected with red test lead) |
| 3. | Trigger                                       | 9.  | Rotary switch  |
| 4. | Functional buttons                            | 10. | Light-sensitive area                                 |
| 5. | LCD display                                   | 11. | For hanging strap                                    |
| 6. | COM terminal (connected with black test lead) |     |  |

## VIII. ROTARY SWITCH (Figure 2)

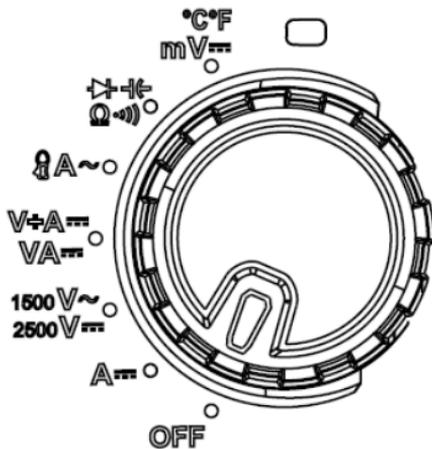


Figure 2

Position	Description
<b>OFF</b>	Power off
<b>A</b>	DC current measurement
<b>V<math>\sim</math>/V<math>\sim</math></b>	AC/DC voltage measurement
<b>VA<math>\sim</math>/V+A<math>\sim</math></b>	DC power measurement/DC voltage + DC current measurement
<b>A<math>\sim</math></b> (with clamp icon)	AC current measurement (clamp jaws)
<b><math>\cdot\cdot\cdot</math>)/<math>\Omega</math>/<math>\rightarrow</math>/<math>\rightarrow</math></b>	Continuity/resistance/diode/capacitance measurement
<b>mV<math>\sim</math>/<math>\sim</math>°C°F</b>	mV AC/DC current measurement/Temperature measurement

## IX. BUTTON FUNCTIONS (Figure 3)

**Short press:** Press for <2 seconds / **Long press:** Press for ≥2 seconds

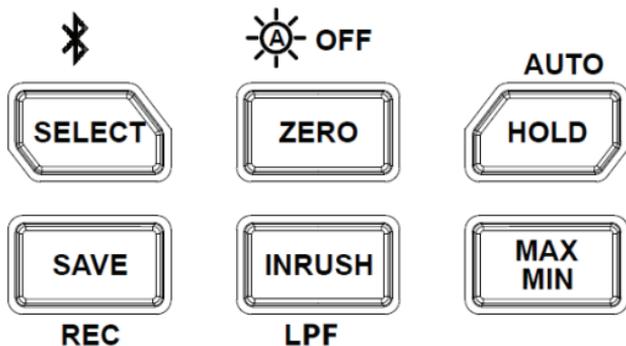


Figure 3

Button	Description
	<p><b>Short press:</b></p> <ol style="list-style-type: none"> <li>1. DCV/ACV position: Short press to select DCV and ACV positions cyclically. Default position: DCV</li> <li>2. VA/V+A position: Short press to select VA and V+A positions cyclically. Default position: VA</li> <li>3. ACA (Clamp jaw)</li> <li>4. <math>\Omega</math>/Diode/CAP position: Short press to select <math>\Omega</math>, diode, and CAP positions cyclically. Default position: <math>\Omega</math></li> <li>5. DCmV/<math>^{\circ}</math>C: Short press to select DCmV and <math>^{\circ}</math>C <math>^{\circ}</math>F cyclically. Default position: DCmV</li> </ol> <p><b>Long press:</b></p> <p>Long press to turn ON/OFF Bluetooth communication.</p>

## IX. BUTTON FUNCTIONS (cont'd)

**Short press:** Press for <2 seconds / **Long press:** Press for ≥2 seconds

Button	Description
 	<p>Short press to zero the residual reading of DCA.            Long press to turn ON/OFF the automatic backlight function.</p>
	<p>Short press to turn ON/OFF the data hold mode.            Long press to turn ON/OFF the automatic hold mode            (See "<b>Table of Auto Hold Function</b>").</p>
	<p>With Bluetooth OFF: Short press to save measurement data once.            With Bluetooth ON: Short press to start one-time recording via mobile phone.            With Bluetooth OFF: Long press to save measurement data continuously.            With Bluetooth ON: Long press to start continuous recording via mobile phone.</p> <p><b>NOTE:</b></p> <ol style="list-style-type: none"> <li>1. Clear the data saved in the Clamp Meter: Hold down INRUSH and press SELECT while turning on the Clamp Meter (by turning the rotary switch), then "cLr?" appears on the LCD. Press SELECT a second time, then "ErAS" is displayed on the LCD. When data clearing is done, "donE" appears on the LCD.</li> <li>2. Maximum 999 sets of data can be saved in the Clamp Meter.</li> </ol>
	<p>Short press to turn ON/OFF the INRUSH current and peak current measurement function. For ACA.            Long press to turn on/off the low pass filter function. For ACV, ACA, and CS_A (Flex current sensor).</p>
	<p>Short press to select MAX, MIN, and AVG cyclically.            Long press to exit MAX/MIN/AVG mode</p>

## X. LCD DISPLAY (Figure 4)

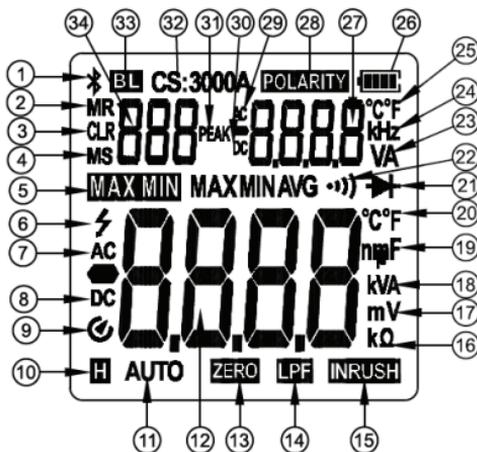


Figure 4

- |   |  |                                   |
|---|--|-----------------------------------|
| 1. Bluetooth                                | 14. Low pass filter                    | 25. Temperature (sub-display)     |
| 2. Auto-save data                           | 15. INRUSH measurement                 | 26. Low battery                   |
| 3. Clearing storage data                    | 16. Resistance unit                    | 27. Displayed value (sub-display) |
| 4. Recording data                           | 17. Voltage unit                       | 28. Polarity                      |
| 5. MAX/MIN/Average measurement              | 18. Current/Power unit                 | 29. AC measurement (sub-display)  |
| 6. Hazardous voltage                        | 19. Capacitance unit                   | 30. DC measurement (sub-display)  |
| 7. AC measurement                           | 20. Temperature (main display)         | 31. Peak measurement              |
| 8. DC measurement                           | 21. Diode measurement                  | 32. Backlight                     |
| 9. Auto power off                           | 22. Continuity measurement             | 33. Number of saved data          |
| 10. Data hold                               | 23. Voltage/Current unit (sub-display) |                                   |
| 11. Auto data hold                          | 24. Frequency unit                     |                                   |
| 12. Displayed value (main display)          |  |                                   |
| 13. Zero the residual reading of DC current |  |                                   |

## XI. OPERATING INSTRUCTIONS

Please check the built-in batteries (AA 1.5V × 2) before use. If low battery occurs after the Clamp Meter is turned on, the symbol “” will be displayed on the LCD. To ensure measurement accuracy, please replace the batteries in time. The warning symbol “” at the terminal indicates the measured voltage/current shall not exceed the specified value.

### MEASURING DC CURRENT USING THE CLAMP JAWS (Figure 5)

1. Set the rotary switch to “**A**”.
2. Press and hold the trigger to open the clamp jaws, clamp the conductor to be measured, then release the trigger slowly to close the clamp jaws completely.
3. Read the measurement result from the LCD.

#### WARNING

- Measure only one current conductor at a time. Otherwise the measurement result will be incorrect.
- To ensure an accurate measurement result, please set the measured conductor at the center of the clamp jaws. Otherwise an additional error of  $\pm 1.0\%$  will be produced.
- If residual reading occurs for DC current measurement, press the ZERO button to clear the residual reading.
- “OL” will be displayed when measuring DC current of  $\geq 1000$  A.

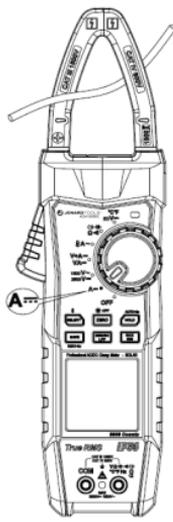
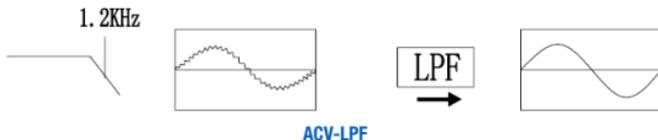


Figure 5

### AC/DC VOLTAGE MEASUREMENT (Figure 6)

1. Connect the red test lead to “V” terminal and black to “COM”.
2. Set the rotary switch to “**1500V~/2500V**”, short press the SELECT button to switch to ACV or DCV function, then connect (in parallel) the test leads with the source or load to be measured.
3. Read the measurement result from the LCD.
4. Displayed measured AC voltage: True-RMS value. Sub-display: Frequency

5. To start the ACV-LPF function, long press the INRUSH button when measuring ACV. In A CV-LPF function, the composite sine signal generated by the inverter and variable-frequency motor can be measured (as shown in the image below).



### ⚠ WARNING

- Do not input voltage over 2500V DC or 1500V AC. It is possible to measure higher voltage, but it may cause damage to the Clamp Meter.
- For high voltage measurement, please pay special attention to avoid electric shock.
- If the measured voltage is  $\geq 30V$  (AC/DC), the high-voltage warning symbol "⚡" will be displayed. "OL" will appear on the LCD if the measured voltage is  $>2510V$  DC and  $<-2510V$  DC or  $>1510V$  AC.
- If the DC voltage is less than  $-10V$ , the red backlight is lit up and the LED blinks for 10 seconds, the buzzer sounds for 10 seconds, and the symbol "POLARITY" blinks.
- If frequency is displayed on the sub-display, then the input amplitude shall be  $\geq 5V$  rms for 20Hz~100Hz and  $\geq 10V$  rms for 100Hz~1000Hz.
- The low pass filter attenuates at  $-3dB$  and the cutoff frequency is 1.2 KHz.

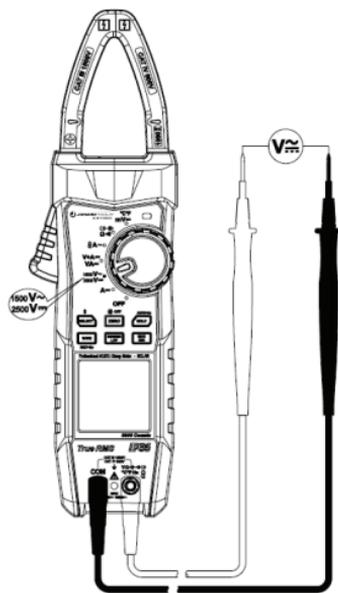


Figure 6

## MEASURING DC POWER AND DC VOLTAGE/CURRENT (Figure 7)

1. Connect the red test lead to "V" terminal and black to "COM".

- Set the rotary switch to “**V+A**  $\overline{\text{m}}$  / **VA**  $\overline{\text{m}}$ ”, short press the SELECT button to switch to VA or V+A function, connect (in parallel) the test leads with the source or load to be measured, press and hold the trigger to open the clamp jaws, clamp the conductor to be measured, then release the trigger slowly to close the clamp jaws completely.
- Read the measurement result from the LCD (Main display: DC power or voltage; Sub-display: DC current).

### **WARNING**

- Do not input voltage over 2500V DC. It is possible to measure higher voltage, but it may cause damage to the Clamp Meter.
- For high voltage measurement, please pay special attention to avoid electric shock.
- If the measured voltage is  $\geq 30\text{V}$  (AC/DC), the high-voltage warning symbol “” will be displayed. “OL” will appear on the LCD if the measured voltage is  $> 2510\text{V}$  DC and  $< -2510\text{V}$  DC.
- The power range is switched using the voltage range.

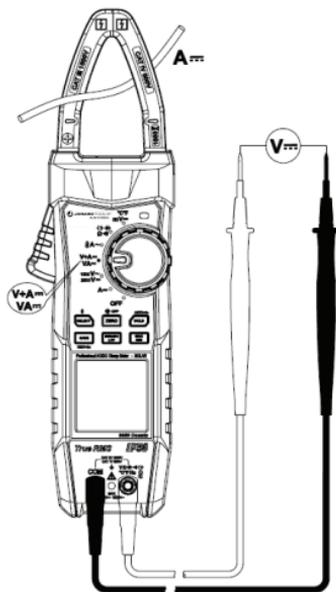


Figure 7

## **AC CURRENT MEASUREMENT – CLAMP JAWS (Figures 8 & 9)**

- Set the rotary switch to “**A**  $\sim$  / **2500V**  $\overline{\text{m}}$ ”.
- Press and hold the trigger to open the clamp jaws, clamp the conductor to be measured, then release the trigger slowly to close the clamp jaws completely.
- Read the measurement result from the LCD (Main display: True-RMS current; Sub-display: Frequency).
- At ACA (clamp jaw), short press the INRUSH button to enter the AC INRUSH and peak measurement function. Instantaneous current at startup of electric appliances can be measured. The INRUSH current is the maximum current for an integral of 100 ms. Short press the INRUSH

button again to exit the INRUSH and peak measurement function (as shown in the image below).

## ⚠ WARNING

- Measure only one current conductor at a time. Otherwise the measurement result will be incorrect.
- To ensure an accurate measurement result, please set the measured conductor at the center of

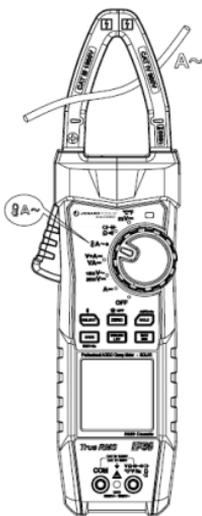
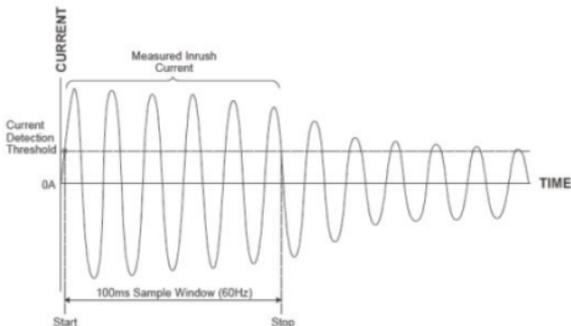


Figure 8

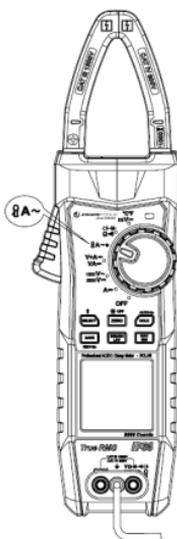


Figure 9

the clamp jaws. Otherwise an additional error of  $\pm 1.0\%$  will be produced.

- When monitoring the in-circuit frequency at AC current measurement position, the amplitude shall meet the requirements below:  
 5 Hz~10 Hz:  $\geq 10$  A  
 10 Hz~100 Hz:  $\geq 5$  A  
 100 Hz~999.9Hz:  $\geq 10$  A
- The error specified by the flex current sensor is the intrinsic error of ACM-1500DC.

## RESISTANCE MEASUREMENT (Figure 10)

1. Connect the red test lead to "V" terminal and black to "COM".
2. Set the rotary switch to " $\Omega$  (蜂鸣)", short press the SELECT button to switch to the resistance measurement position, then connect (in parallel) the test leads with both ends of the resistor to be measured.
3. Read the measurement result from the LCD.

### WARNING

- For continuity test at  $999.9\Omega$ , fast response cannot be achieved. For resistance  $\leq 30\Omega$ , continuous sound is generated and green backlight is lit up. For resistance  $\geq 50\Omega$ , no sound is made.
- Before measuring in-circuit resistance, please switch off all powers of the measured circuit and discharge all capacitors thoroughly.
- If the resistance of shorted test lead is  $\geq 0.5\Omega$ , please check if the test lead is loose or other problems occur.
- Do not input voltage over 30 V DC/AC to avoid personal injury.

## DIODE MEASUREMENT (Figure 10)

1. Connect the red test lead to "V" terminal and black to "COM".
2. Set the rotary switch to " $\Omega$  (蜂鸣)", then short press the

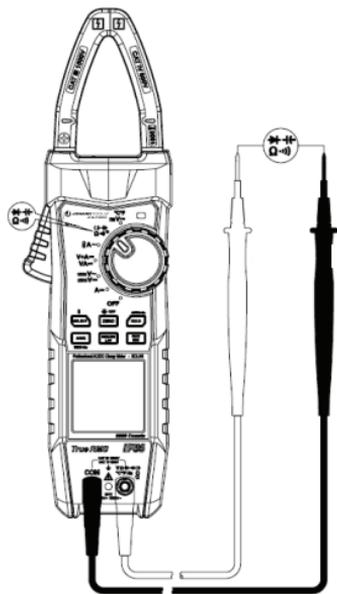


Figure 10

SELECT button to switch to the diode

measurement position. The polarity of red test lead is “+” and black is “-”. Connect the red test lead to the positive pole of the measured diode and black to negative.

3. Read from the LCD the approximate forward voltage of PN junction of the measured diode. The normal voltage of silicone PN junction is about 0.5~0.8 V typically.

### **WARNING**

- “OL” is displayed if the measured diode is open or the polarity is reversed.
- Before measuring in-circuit diode, please switch off all powers of the measured circuit and discharge all capacitors thoroughly.
- The open-circuit voltage for diode measurement is about 3.0 V.
- Do not input voltage over 30 V DC/AC to avoid personal injury.
- Please disconnect the test leads from the measured circuit after all measurement operations are completed.

## **CAPACITANCE MEASUREMENT (Figure 10)**

1. Connect the red test lead to “V” terminal and black to “COM”.
2. Set the rotary switch to “

### **WARNING**

- “OL” will be displayed if the measured capacitor is shorted or the capacitance exceeds the specified maximum range.
- To avoid damage to the Clamp Meter and personal injury, please switch off all powers of the measured circuit and discharge all capacitors thoroughly before measurement, especially the capacitor with high voltage.
- Please disconnect the test leads from the measured circuit after all measurement operations are completed.

## **DC VOLTAGE (mV) MEASUREMENT (Figure 11)**

1. Connect the red test lead to "V" terminal and black to "COM".
2. Set the rotary switch to " $^{\circ}\text{C}/\text{mV}^{\ominus}$ ", short press the SELECT button to switch to DCmV measurement mode, then connect (in parallel) the test leads with the source or load to be measured.
3. Read the measured voltage from the LCD.

### WARNING

- The input impedance is about 10 M $\Omega$  for DC mV. Measurement error can be produced when measuring circuit with high impedance. The circuit impedance is below 10 k $\Omega$  in most cases, thus the error ( $\leq 0.1\%$ ) is negligible.
- Do not measure input voltage over the range. Otherwise accurate measurement result cannot be obtained and damage to the Clamp Meter or personal injury may occur.
- Do not input voltage over 999.9 mV. It is possible to measure higher voltage, but the protection supplied by the Clamp Meter may be damaged.
- For high voltage measurement, please pay special attention to avoid electric shock.
- Please measure a known voltage before use to check if the product functions normal.
- The high-voltage warning symbol "" appears on the LCD if the measured voltage is  $>999.9$  mV DC or  $<-999.9$  mV DC.
- Please disconnect the test leads from the measured circuit after all measurement operations are completed.

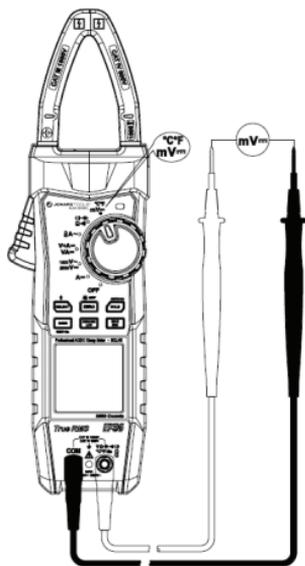


Figure 11

## TEMPERATURE MEASUREMENT (Figure 12)

1. Connect the Type K thermocouple to the input terminal.
2. Set the rotary switch to " $^{\circ}\text{C}/\text{mV}^{\ominus}$ ", then short press the SELECT button to switch to the temperature measurement mode.
3. Place the temperature probe at the surface of the object to be measured, then (a few seconds later) read from the LCD the temperature of the measured object.

 **WARNING**

- The ambient temperature shall be in the range of 18~28°C. Otherwise it will cause a measurement error. Obvious error can occur in low temperature.
- Do not input voltage over 30 V DC/AC to avoid personal injury.
- Please remove the temperature probe after all measurement operations are completed.

## XII. OTHER FUNCTIONS

- Long press the SELECT button to turn on/off the Bluetooth. If the Clamp Meter with the Bluetooth on fails to connect with the APP, the Bluetooth symbol on the LCD will blink. Open the "ACM-1500DC" APP, search ACM-1500DC, make connection, and then perform data communication, button control and other operations. The Bluetooth symbol on the LCD is displayed continuously with the connection established. If the Clamp Meter with the Bluetooth on fails to connect with the APP in 5 minutes or the data communication interrupts for more than 5 minutes after the connection is established, then the Bluetooth will be off automatically. The auto power off function will be disabled with the Bluetooth on.
- Auto power off: No operation for 15 minutes will turn off the Clamp Meter automatically (To power on the Clamp Meter, please turn the rotary switch from OFF position to any other position). To disable the auto power off function, please turn the rotary switch while pressing the SELECT button. The symbol "🔌" will not appear on the LCD after the auto power off function is disabled. To enable the auto power off function, please restart the Clamp Meter.
- Buzzer: The buzzer sounds once with any enabled buttons pressed; and twice with disabled ones.
- Low voltage detection: If the supply voltage is  $<2.2\pm 0.2V$  approximately, the symbol "🔋" appears on the LCD. If  $\leq 2.1\pm 0.2V$  approximately, the Clamp Meter powers off automatically.

## XIII. TECHNICAL SPECIFICATIONS

Accuracy:  $\pm$  (a% of rdg. + b dgt.); guaranteed for 1 year

Ambient temperature and humidity: 23°C $\pm$ 5°C;  $\leq$ 80% RH

Temperature coefficient: The temperature condition to ensure accuracy is 18°C~28°C. The fluctuation range of ambient temperature keeps within  $\pm$ 1°C. If the temperature is <18°C or >28°C, the additional error of temperature coefficient is 0.1  $\times$  (specified accuracy)/°C.

### 1. DC Current (DCA)

Range	Resolution	Accuracy	Overload Protection
999.9A	0.1A	$\pm$ (2.0%+5)	1000A AC/DC

- Press the ZERO button to zero the reading before measurement.
- Please perform measurement at the center of the clamp jaws. An error of 1% is added if deviated from the center.
- Accuracy guarantee range: 1~100% of range

### 2. DC Voltage (DCV, DCmV)

Range	Resolution	Accuracy	Overload Protection
999.9mV	0.1mV	$\pm$ (1.0%+5)	2500V DC/1500V AC
999.9V	0.1V		
2500V	1V		

- Accuracy guarantee range: 1~100% of range
- Input impedance:  
DCV: About 2 M $\Omega$   
DCmV: About 10 M $\Omega$

### 3. AC Voltage (ACV)

#### a.) ACV

Range	Resolution	Accuracy	Overload Protection
999.9V	0.1V	±(1.0%+5)	2500V DC/1500V AC
1500V	1V		

#### b.) ACV-LPF

Range	Resolution	Accuracy	Overload Protection
999.9V	0.1V	±(2.0%+9) (45Hz~100Hz)	2500V DC/1500V AC

- Input impedance: About 2 MΩ
- Frequency response (ACV): 40~1000 Hz (Display: True RMS)
- Accuracy guarantee range:  
ACV: 1%~100% of range  
ACV-LPF: 10%~100% of range
- Add an error for the AC crest factor of non-sine wave
  - a.) Add 3% for crest factor of 1~2
  - b.) Add 5% for crest factor of 2~2.5
  - c.) Add 7% for crest factor of 2.5~3
- If frequency is displayed on the sub-display, then the input amplitude shall meet the requirements below:  
5 Hz~100 Hz: ≥5 V  
100 Hz~999.9Hz: ≥10 V

#### 4. DC Power (VA)

Range	Resolution	Accuracy	Overload Protection
999.9KVA	0.1KVA	$\pm(2.0\%+20)$	2500V DC/1500V AC 1000A AC/DC
2500KVA	1KVA		

- Precision range: 5~100% of range

#### 5. AC Current (ACA)

##### a.) ACA

Range	Resolution	Accuracy	Overload Protection
999.9A	0.1A	$\pm(2.0\%+5)$ (40Hz~100Hz) $\pm(2.5\%+5)$ (100Hz~1000Hz)	1000A AC/DC

##### b.) ACA\_LPF

Range	Resolution	Accuracy	Overload Protection
999.9A	0.1A	$\pm(2.5\%+9)$ (45Hz~100Hz)	1000A AC/DC

- RMS of sine wave
- Accuracy guarantee range:  
ACA: 1%~100% of range  
ACA-LPF: 10~100% of range
- AC crest factor (50/60HZ): 2.5 (at 600.0A); 3.0 (at 500.0A); 1.42 (at 999.9A)  
Add an error for the crest factor of non-sine wave:  
a.) Add 4% for crest factor of 1~2

b.) Add 5% for crest factor of 2~2.5

c.) Add 7% for crest factor of 2.5~3

- Perform measurement at the center of the clamp jaws. An error of 1% is added if deviated from the center.
- If frequency is displayed on the sub-display, then the input amplitude shall meet the requirements below:  
5 Hz~10 Hz:  $\geq 10$  A  
10 Hz~100 Hz:  $\geq 5$  A  
100 Hz~999.9Hz:  $\geq 10$  A
- 3db frequency (ACA-LPF): About 1.2 KHz

## 6. Resistance ( $\Omega$ )

Range	Resolution	Accuracy	Overload Protection
999.9 $\Omega$	0.1 $\Omega$	$\pm(1.0\%+5)$	2500V DC/1500V AC
9.999k $\Omega$	0.001k $\Omega$		
99.99k $\Omega$	0.01k $\Omega$		

- Precision range: 1~100% of range
- For continuity test at 999.9 $\Omega$ , fast response cannot be achieved. For resistance  $\leq 30\Omega$ , continuous sound is generated and green backlight is lit up. For resistance  $\geq 50\Omega$ , no sound is made.

## 7. Diode

Range	Resolution	Accuracy	Overload Protection
2.800V	0.001V	$\pm(1.0\%+5)$	2500V DC/1500V AC

- Open-circuit voltage: About 3 V
- Residual reading under short-circuit condition:  $\leq 3$  digits

## 8. Capacitance

Range	Resolution	Accuracy	Overload Protection
100.0 $\mu$ f	0.1 $\mu$ f	$\pm(1.0\%+5)$	2500V DC/1500V AC
1000 $\mu$ f	1 $\mu$ f		

- Residual reading under open-circuit condition:  $\leq 5$  digits
- Measured value = Displayed value - Residual reading
- Precision range: 5~100% of range

## 9. Table of Auto Hold Function

Function	Threshold	Fluctuation Range/Increment
ACV	10V	2V
DCV	10V	2V
$\Omega$	99.99K $\Omega$	2.0 $\Omega$ /20 $\Omega$ /0.2K $\Omega$
CAP	10 $\mu$ f	2 $\mu$ f
DCA	10A	2A
ACA (Clamp Jaw)	10A	2A
CSA	1A/10A/100A	0.2A/2A/2A
VA	10KVA	2.0KVA

## XIV. BLUETOOTH SOFTWARE

### 1. Introduction

The Bluetooth software is a mobile APP and supports iOS 10.0 or newer and Android 5.0 or newer.

### 2. Download the ACM-1500DC APP

#### FOR ANDROID

**Method 1:** Search “ACM-1500DC” in “Google Play”.

**Method 2:** Turn on the scanning function of “Google Play”, then scan the QR code below.

#### FOR iOS

**Method 1:** Search “ACM-1500DC” in the “App Store”.

**Method 2:** Turn on the scanning function of mobile phone, then scan the QR code below.



For Android



For iOS

### 3. Usage

Open the Bluetooth functions of both the Clamp Meter and mobile phone, tap the “ACM-1500DC” APP icon on your phone desktop to open the software, the software then enters the navigation interface and searches nearby Bluetooth-enabled meters automatically. After that, select the corresponding meter and make connection. Alternatively, scan the QR code at the meter to make direct connection. In connected state, data communication, measurement result display, button control and other operations can be achieved.

The “ACM-1500DC” APP has multiple functions including Bluetooth communication, data recording, device management, report generation, data sharing, data synchronizing, and more. For the operating instructions about these functions, please refer to the “ACM-1500DC” User Manual (in the APP, tap the menu button, “Setting” button, and then “Help Guide” button for the User Manual).

### 4. Uninstallation

Uninstall the software through the uninstallation function of your mobile phone.

## XV. MAINTENANCE

### WARNING

To avoid electric shock, please remove the test leads before opening the bottom cover.

1. If the Clamp Meter is not in use, please turn it off to avoid consuming battery power continuously.
2. **General maintenance:**
  - a.) The maintenance and service must be performed by qualified maintenance personnel or designated service center.
  - b.) Please clean the case with dry cloth regularly. Do not use abrasives or solvents.

### 3. **Battery replacement (Figure 13)**

Power supply: AA 1.5 V battery × 2

Please follow the procedure below for battery installation/replacement.

- a.) Power off the Clamp Meter and remove the test lead from the input terminal.
- b.) With the front side of the Clamp Meter facing down, loosen the screws, remove the battery cover, take out the batteries, and then install new batteries (Do not reverse the battery polarity).
- c.) Install the battery cover and tighten the screws.

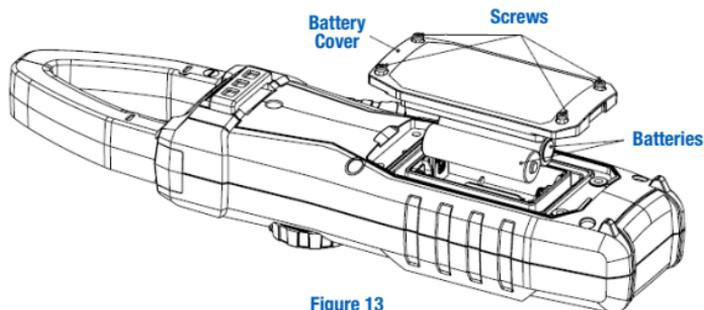


Figure 13

The contents in the User Manual are subject to change without further notice.