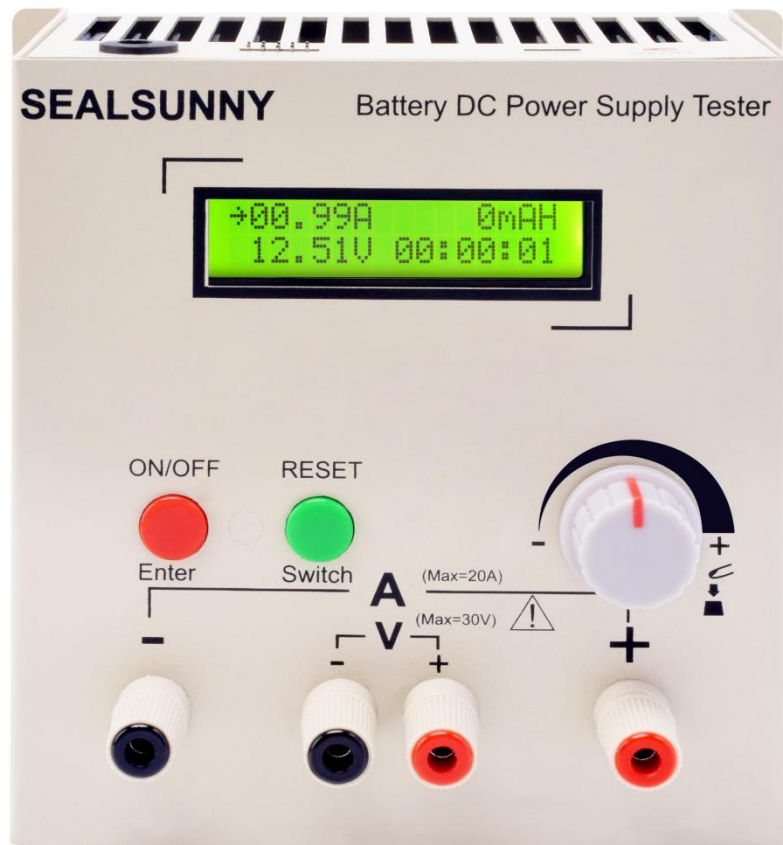


MD Series Intelligent Battery Power Comprehensive Tester Manual

Please read this manual carefully before using the equipment



I. Product features and uses

This product adopts LCD screen display friendly human-computer interaction interface, true four-line measurement accuracy and small error. A variety of discharge modes are available to meet diversified testing requirements, in addition to additional power-down memory and testing internal resistance functions, as well as a variety of protection measures to ensure the safety of the equipment.

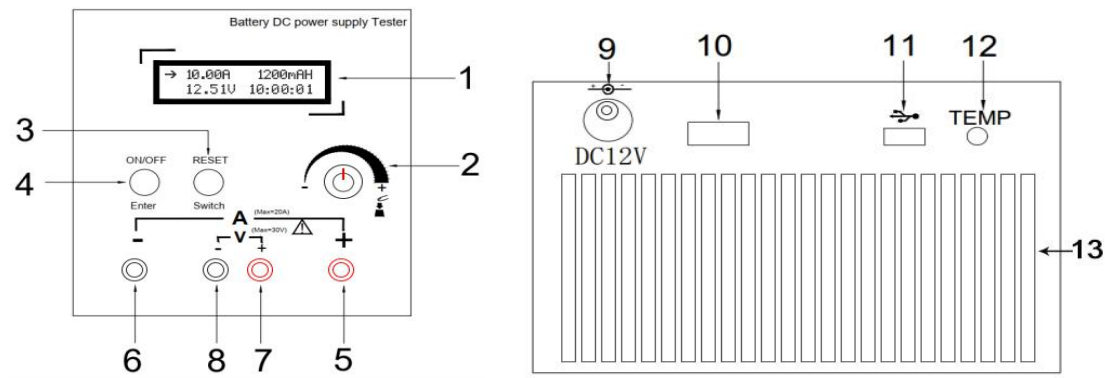
① Power supply performance test



For current, power and dynamic testing of all types of DC power supplies, ageing tests, etc.

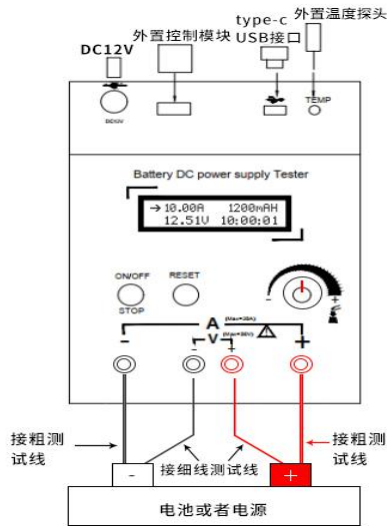
② Various battery performance tests

For the discharge time, capacity test and internal resistance test of various types of batteries (packs) such as NiMH, NiCr, Li-ion cells, lead-acid and ternary.

2、 Introduction of product panel interface and keys and connection diagram



1. LCD display.
2. **Knobs:** Function keys (left and right turn Press to confirm and next function) Instruction manual knob pattern  is rotating and  is pressing the knob.
3. **[RESET]:** Return key / reset key / toggle key (**Long press [RESET] for 2 seconds to clear the time and capacity**).
4. **[ON/OFF]:** Start/stop button.
5. Positive current (thick red wire) 6. Negative current (thick black wire) 7. Positive voltage (thin red wire) 8. Negative voltage (thin black wire).
9. Power supply holder 10. Expansion interface 11. Communication interface 12. External temperature probe interface 13. Heat dissipation port.

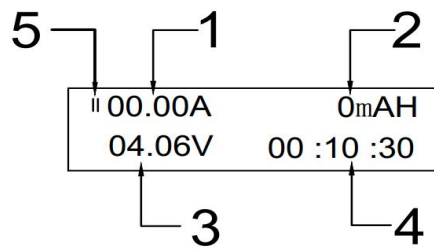


III. Specifications

Model	MD150	MD250
Power supply method	DC12V/2A	
Constant current discharge current adjustment range	0.1 - 20A	0.1 - 20A
Maximum error in discharge current	0.01A	
Discharge maximum power	150W	250W
Discharge voltage	DC 0.5V - 30V	
Discharge mode	Constant Current (Cc) Constant Voltage (Cv) Constant Resistance (Cr) Constant Power (Cp) Dynamic Load Testing (DS)	
Constant current resistor range	0.1-30Ω	
Discharge current regulation accuracy	0.1A	
Internal resistance range	1mR~500mR	
Discharge maximum capacity	99999mAh	
Maximum discharge time	99:99:99s	
Reverse polarity protection + -	√	√
Overvoltage protection OVP	Stops working above 30V	
Overcurrent protection OCP	Greater than 10A stops working	Greater than 20A stops working
Over Power Protection OPP	Greater than 150w stops working	Greater than 250w stops working
Built-in over-temperature protection OTP	Stop working above 75°C	

IV. Description of product display functions and operating functions

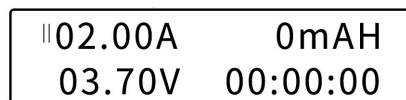
A. Introduction to the main interface





1. Real-time current/setting current
2. Display different working modes: (constant power CW, constant resistance CR, constant voltage CV, dynamic load test DS), discharge capacity (mA_H), internal resistance (mΩ), temperature (°C). **In the current working mode, switch temperature, internal resistance and discharge capacity through the [RESET] key.**
3. Real-time voltage
4. Running time (minutes)
5. Start/pause status

B. Display of working mode function settings


(1) Constant current mode (CC)



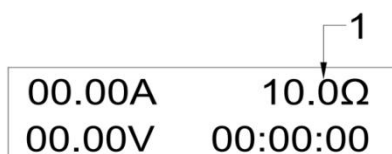
A. Setting constant current (CC): Click the knob  at intervals, and adjust the current size by rotating  when the current bit flickers.


(2) Constant power mode (CW)



B. Setting constant power (CW): The power can be modified during the rotation  to discharge.


(3) Constant resistance mode (CR)



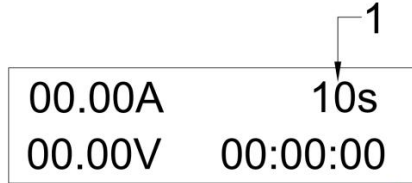
C. **Setting the constant resistance (CR):** The resistance can be modified during the rotation  to discharge.


(4) Constant voltage mode (CV)



D. **Setting the constant voltage (CV):** the voltage can be modified during the rotation  to discharge..



(5) Dynamic load test mode (DS)

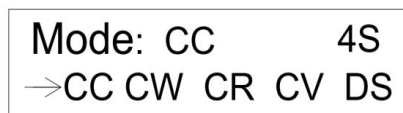



E. **Setting the dynamic load discharge time (DS):** The discharge time is set in the dynamic load test mode (DS) and the discharge current can be set by rotating the key . If the time is set to T seconds, start running to discharge T seconds, stop discharging T seconds to test the target device, so as to cycle dynamic test.

C. Basic operating procedures for product functions



I. Working mode settings

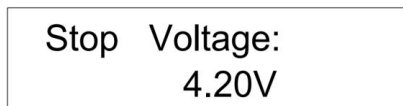
(1). Long press the key  to enter the five modes when the power is turned on and enter the main interface, and rotate  to switch the working mode as follows.



Note: In "DS" mode, click the [ON/OFF] key to enter the setting time, rotate  to set the time, the time change amplitude 1S (This function is mostly used for aging load power).


II. Cut-off voltage setting

(2). When the operating mode is set, click on the key  to enter the cut-off voltage setting and rotate the voltage value , the device will automatically stop working when the voltage is below the cut-off voltage, indicating that the discharge work has been completed.



III. External probe temperature setting (additional function can be ignored, optional on request)




(3). When the cut-off voltage is set, click on the key  to enter the external temperature setting:

Rotate  to set the temperature level above 75°C. The device stops working automatically.

Exit NTC:
56°C

Note: To start this function, the device needs to be connected to an external temperature probe, which is inserted in the socket "Temp" of the discharge instrument, and then set the parameters to achieve temperature protection, the temperature probe should be fitted with the target product.




IV. Internal resistance measurement settings

(4). When the above settings are completed, click the key  to enter the internal resistance setting, and check whether the  is turn on, and finally click the key  to confirm. **Note: Do not open this function directly ignore the [RESET] key to return to the main interface**

BT Resistance:
Yes →No

Note: To test the internal resistance, set the corresponding parameters and the internal resistance of the battery can be measured within 20 seconds of the start of discharge. To improve the accuracy of the resistance test, the internal resistance of the battery must be tested at the maximum discharge current of the battery with the battery fully charged.

V. Restore factory settings

(5). When the above settings are completed, click the key  to enter the factory settings, and check whether the  is turn on, and finally click the key  to confirm. **Note: Do not open this function directly ignore the [RESET] key to return to the main interface**

System default:
Yes →No


When you have finished the above settings, click the key  to exit to the main screen and press the [ON/OFF] key to turn it on.

V. Built-in temperature description



The device has a built-in temperature probe, when the external temperature probe is not connected, the default use of built-in temperature probe. Assuming that the temperature rises to 75°C with a 5A current discharge, the device will stop discharging. When the temperature drops to 65°C, the equipment automatically sets the discharge and starts discharging when the current is 90% of 5A. If the temperature continues to rise to 75°C, the device will stop discharging again and wait for the temperature to fall back to 65°C, the device will automatically set the discharge current to 90% of 45A (5A*90%) to start discharging, and so on until the temperature is below 75°C.

VI. Examples of setting parameters



Example 1: Battery discharge setting (3.7V Li-ion battery with a constant current discharge 2A cut-off voltage of 3.2V)

(1) Turn on the adapter to power on the test screen, as follows: **Press and hold** the key  .

00.00A	0mAH
00.00V	00:00:00

(2) Enter the working mode interface as shown below, rotate  to set to constant current CC mode. Click  ;.



Mode: CC
→CC CW CR CV DS

(3) Enter the cut-off voltage setting as shown below and rotate  to set the voltage to 3.2 V. Click  .

Stop Voltage:
3.20V

(4) Enter the external temperature setting as shown below, the setting is only required if an external temperature probe is connected. (b) Click **[RESET] to return.**

Exit NTC:
56°C

(5) When entering the return test interface and connecting the test battery, after the discharge meter detects the battery voltage of 3.7V, **click the blinking digit**  **at intervals to switch the digit and rotate**  to adjust the **current**, e.g. set the discharge current to 2A as shown in the figure below.

02.00A	0mAH
03.70V	00:00:00

- (6) **If the historical operation capacity and time is not zero, press and hold the [RESET] key for 2 seconds to zero the capacity and time, click the [ON/OFF] key to start the test, the arrow symbol is displayed in front of the current to indicate that it is working, as shown in the figure below.**

→02.00A	0mAH
03.70V	00:00:00

- (7) When the voltage is lower than the cut-off voltage during the discharge process, the discharge instrument will emit three short beeps and automatically stop working after the test is completed, and the **pause symbol will be** displayed in front of the current, as shown in the figure below.

02.00A	0mAH
03.70V	00:00:00

- (8) When prompted for an input error, as shown below, click **the [RESET] key to** return to the test screen

>>ERROR<<
Input v Error

VII. Explanation of error message.

- (1) Input V Error: The voltage of the power supply under test is lower than the Stop Voltage setting.
- (2) Current Err: current error
- (3) OVP: Overvoltage protection
- (4) OCP: Over-current protection
- (5) OPP: Over Power Protection
- (6) OTP: Built-in over-temperature protection
- (7) NTC Over: NTC setting temperature exceeded

VIII. Precautions for use.

- (1) It cannot work properly when the input discharge voltage is below 2V, otherwise an error message will appear when starting the discharge!
- (2) In the discharge mode, the measured battery voltage must be higher than the cut-off voltage, otherwise an error message will appear when starting the discharge!
- (3) Always pay attention to the polarity when connecting to the target power supply.
- (4) If you want to eliminate the influence of line resistance on the display voltage, to put the power supply

output two points (+, -), each out of two lines, such as the above wiring diagram wiring can be!

(5) The supply voltage must not be greater than 13VDC.

(6) In constant current discharge mode, when the discharge power is equal to the maximum power of the discharger, but the discharge current does not exceed the maximum current of the discharger, setting the discharge current will be limited, e.g. if the battery voltage is 30V and the discharger with MD150 is used to discharge, setting the current to a maximum of 5A (150W/30V).

(7) In constant power discharge mode, when the discharge current is equal to the maximum current of the discharger, but the discharge power does not exceed the maximum power of the discharger, setting the discharge power will be limited, for example: the battery voltage is 3.8V, discharging with a 150W discharger, setting the maximum power to 38W (3.8V*10A).

IX. Causes of faults and troubleshooting with questions and answers.

(1) The screen does not display when the device is powered on

Check that the supply voltage is normal and that there is no loose wiring.

(2) After powering on the tested power supply or battery, the discharge meter shows abnormal voltage

Check whether the voltage of the power supply or battery to be tested ranges from 0.5V to 30V, and whether the positive and negative polarity is correct

(3) Power on and access load cannot be discharged

Check whether the cables are in bad contact or the load polarity is correct.

Q: How does testing internal resistance work?

A: When the next mode of operation is running, press the [RESET] key to switch the temperature display, internal resistance display and discharge capacity display

Q: Pressing [RESET] does not switch the internal resistance display

A: The internal resistance setting is not switched on

X. Breakdown of packing accessories.

Discharge meter main unit, USB cable, power adapter, crocodile clip test wire, manual