HT-BCT50A
Battery Pack Capacity Tester
Single Channel 5V 50A

User Manual

Thanks for choosing HELTEC ENERGY series produces.It will bring you convenience and efficiency for battery capacity testing work.For optimal user experience,please read the manual carefully before using and store it properly for future reference.

HELTEC ENERGY has the right to upgrade the machine and modify the manual without prior notice.Thanks for understanding!

1. Product Overview

The HT-BCT50A lithium battery capacity tester is suitable for battery cells within 0.3-5V and 1-2000Ah. The device has an accuracy of ±0.001A/V and is equipped with functions such as testing battery capacity, battery charging and discharging, and setting work steps on the upper computer. It can accurately collect battery voltage signals in real time and perform data storage and operation processing. It features high precision, strong timeliness, simple operation and practical reliability.

2. Product Features

1) Automatically collect the battery voltage for analysis and continuously output a constant current.
2) It can be controlled by software through connection to the upper computer of a computer, achieving convenient and efficient work.
3) The current is adjustable, with a peak value of up to 50A.
4) Built-in charging system to achieve integrated control of charging and discharging.
5) Simplified operation interface, supporting both Chinese and English languages.

3. Product model parameters

Model	HT-BCT50A
Scope of application	Battery cells within 0.3-5V and 1-2000Ah
Charging and discharging range	0.3 to 5V adjustable ;0.3 to 50A adjustable
Work step	Charging/Discharging/standing/cycling (5 times per unit, 9999 times online)
Communication	USB, Windows XP or above system, supports Chinese and English
Auxiliary function	Recharge or discharge equalization
Protective function	Battery over-voltage/reverse battery connection/battery disconnection/high temperature inside the machine/over-voltage and over-current protection

Calibration equipment	Voltage standard source: Fluke 8845A Current standard source: Guwen PCS-1000I
Accuracy range	Voltage ± 0.1%, current ± 0.1% (The accuracy guarantee period is within one year from the date of purchase)
Heat dissipation	The temperature-controlled fan is turned on at 40°C and protected at 83° C. (Please check and maintain the fan operation regularly.)
Attention	Do not test batteries with a voltage exceeding 5V
Power supply for equipment	AC200-220V 50/60HZ (110V can be preset)
Working environment	Ventilate at 0-40 ° C to prevent heat accumulation around the machine
Size and weight	Width: 167 mm, height: 165 mm, depth: 240mm, net weight: 2.6Kg

***Product application scope**

It is suitable for various battery manufacturers, small electric equipment, lithium battery dealers for battery charging and discharging or capacity testing, etc.

4. Attention

1) For batteries with a capacity of less than 10AH, considering the safety of the battery, it is required that the operation setting charging current should be less than or equal to 5A.

2) Only the battery clamps and connection wires that are compatible with the capacity tester must be used. It is strictly prohibited to extend or modify the matching connection devices. Otherwise, any accidents caused will be borne by the user themselves.

3) During the charging and discharging process of the battery, there must be personnel to monitor the instrument and the battery. It is strictly prohibited to use it when no one is on duty.

4) There are multiple circuits and components inside the capacity tester. It is strictly forbidden to disassemble or modify it by yourself. Otherwise, if any accident occurs as a result, the user will be held responsible.

5) The interior of the instrument is composed of precision components. Water or water mist must not enter the instrument, otherwise it will cause damage to the instrument.The result data will only be available after the machine has finished running.

6) Data will not be recorded if the operation lasts less than 2 minutes. Data recording will only start after 2 minutes of operation (overwriting the previous data).

5. General Tips

1) The effect of capacity testing is related to time and speed. The faster the speed, the more likely it is to cause a decrease in capacity (Pickett effect). It is recommended to set a smaller discharge current value to improve the test accuracy.

2) No capacity tester can test a damaged battery. Battery damage includes but is not limited to the

following aspects: a. The internal resistance of the battery increases; b. The terminal voltage of the battery is lower than the discharge termination voltage; c. Internal short circuit or open circuit of the battery.

3) Please read the instrument's user manual carefully. If you have any difficult problems, please contact the customer service hotline immediately.

6. Analysis of the display interface

6.1 Importance Reminder

1) When setting parameters, select the voltage setting that matches or corresponds to the battery type. Otherwise, the responsibility for battery damage caused thereby shall be borne by the user! (Ternary lithium battery is 2.8V; lithium iron phosphate battery is 2.5V)

2) Do not test batteries with a voltage exceeding 5V. Do not connect them in reverse; otherwise, the warranty will not be provided

3) If the battery cell overheats severely or the voltage rises or drops rapidly, it indicates that the current is too large or the contact between the fixture and the battery is poor, or the internal resistance of the battery cell is too high and it is close to being scrapped.

4) Do not test batteries that do not have a protection board, are not rechargeable, have zero voltage, or are swollen and damaged.

5) For the lithium battery pack of the port protection board, charging can only be done through the charging port and discharging through the discharging port. The cycle mode is strictly prohibited.

6) The surface of the radiator is at a high temperature and is connected to the positive terminal of the battery. Short-circuiting and touching are strictly prohibited.

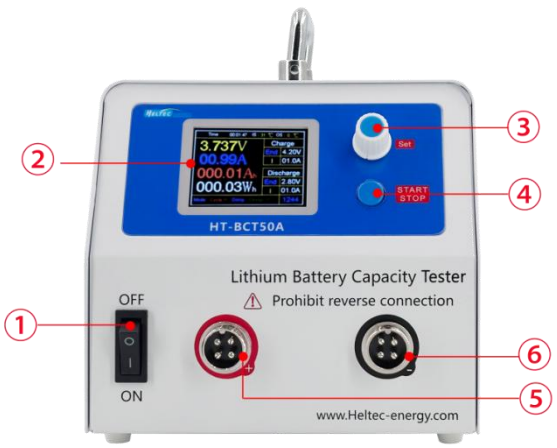
7) The charging cut-off voltage/current and discharging cut-off voltage/current must be set correctly and reasonably.

8) Tests must be conducted in an open and supervised environment, and there must be no high-temperature, flammable, explosive or valuable items around.

9) Please use a well-grounded socket (otherwise, there may be a risk of leakage or slight induced electricity).

10)

6.2 Product schematic diagram



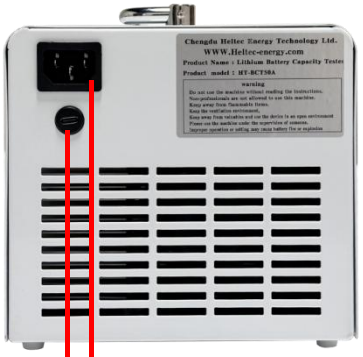
Front

Warning!

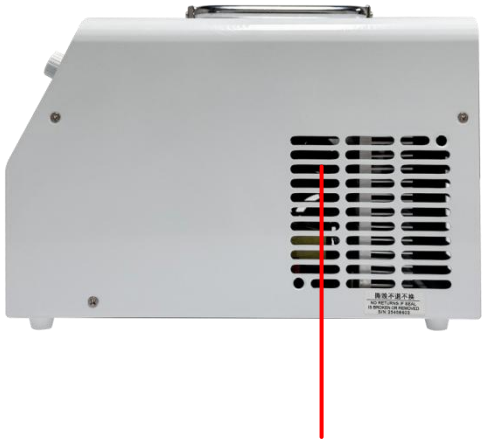
The battery charging and discharging parameters must be set correctly; otherwise, it may cause the battery to explode and catch fire

The battery under test is less than 30V, and the positive and negative terminals must not be reversed

Side



Back



① Power switch: If there is a sudden power outage during the test, the test data will not be saved

② Display screen: Shows various parameters of charging and discharging as well as the discharge curve

③ Encoding switch: Rotate to switch working modes and press to set parameters

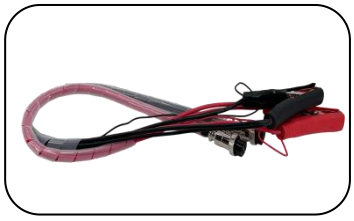
④ Start/Stop button: In the running state, any operation must be paused first

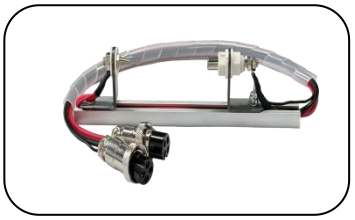
⑤ The positive terminal of the battery is connected (pin definition: Pins 1-3 are connected in parallel for excessive current, and pin 4 is the fine wire for voltage detection)

⑥ Battery negative terminal connection (Pin definition: 1-3 pins in parallel for excessive current,4 pins for voltage detection thin wire)

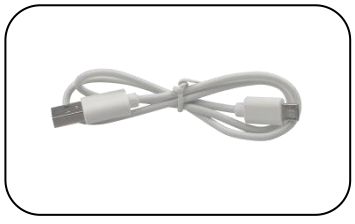
***Product List：**


Tester


Testing Clip


Testing Fixture（optional accessories）


Power Cord


USB Date Wire

Manual Instruction

7. Wiring display

7.1 Switch modes

Basic Operation Instructions: (Please note to turn on the machine first and then clamp the battery)

Start up	Rotate the button to adjust the mode	Set parameters
Connect the power cord to the back of the machine and press the power switch button on the front of the machine	Press the Settings knob to enter the Settings page	Rotate left and right to adjust the parameters. Press to confirm. After correctly setting all parameters, save and exit

*Detailed parameter Settings

1) Charging mode Settings

Charging cut-off voltage: 2.7-2.8V for lithium titanate, 4.1-4.2V for 18650/ ternary/polymer, 3.6-3.65V for lithium iron phosphate.

Charging current: Set it to 10-20% of the battery cell capacity. It is recommended to set a current that causes the battery cell to heat up less (please refer to the battery specification sheet first for correct and reasonable Settings).

Cut-off current: When the charging current is less than this value, it is judged as fully charged. It is recommended to set it at 0.2 -1A.

2) Discharge mode setting

Discharge cut-off voltage: Lithium titanate 1.6-1.7V, 18650/ ternary/polymer 2.75-2.8V, lithium iron phosphate 2.4-2.5V.

Discharge current: Set it to 10-50% of the cell capacity. It is recommended to set a current that causes the cell to heat up less (please refer to the battery specification sheet first for correct and reasonable Settings).

3) Loop mode Settings

First, set the above charging and discharging mode parameters, and then set the following parameters:

Save voltage: The cut-off voltage for the last charge in cycle mode, which can be set between the charging and discharging cut-off voltages.

Cycle: 1 double-charge - discharge - charge,2 double-charge - discharge - discharge - charge,3 double-charge - discharge - discharge - discharge - charge.

Standing time: The cooling time of the battery cell in the cycle mode, generally set to 10 minutes.

4) Discharge current setting

1. For cells with a capacity of less than 10Ah, the discharge rate is less than 1A; for those with a capacity of 10-50Ah, it is less than 5A; and for those with a capacity of over 50Ah, it is less than 20A.

2. The voltage difference between the actual voltage of the battery cell and the cut-off voltage is less than 0.2V <5A, and greater than 0.5V <20A. Discharge cut-off current: If the discharge current is less than this value, it is judged as the end of equalization. The default is 0.01A.

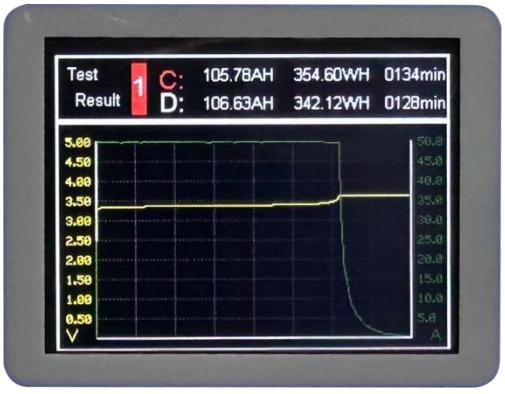
7.2 After returning to the main page, rotate the Settings buttons left and right to switch to the working mode you need. Press the start/stop button to enter the working state. Press it again to pause.

Charge mode **Discharge mode** **Cycle mode**

Rotation setting button
Can switch to
1) result page
2) charging mode
3) discharge mode
4) loop mode
5) balanced Mode

left and right rotation

7.3 After the test is completed (with an alarm prompt), the result page will pop up automatically (press any key to stop the alarm). Manually record the test results and then proceed to test the next battery.



If the cycle is repeated twice, press the start/stop button four times to view the result pages for each of the four cycles separately

Display the changes in the voltage and current curves during charging and discharging. The yellow curve represents the variation of voltage over time, and the green curve represents the variation of current over time

1)Test result 1 indicates the first cycle, which is represented as AH/WH per minute for charging

and discharging.

2)The yellow numbers represent the voltage axis, and the yellow curve is the voltage curve.

3)The green numbers represent the current axis, and the green curve is the current curve.

4)When the battery performance is good, the voltage and current should form a relatively smooth curve.

5)When the voltage-current curve shows a sharp rise or fall, it may be due to a pause during the test or excessive charging and discharging currents, or the battery's internal resistance is too high and it is close to being scrapped.

6)If the test result is empty, it indicates that the working time of this step is less than 2 minutes, so no data will be recorded.

8. Host computer operation

*Battery testing can be conducted through the host computer software

Software installation and connection:

Step 1: Find the installation software and open it.

Step 2: You can choose the installation location. Please do not install the C drive. For some systems without an installation location, the default selection is the D drive.

Step 3: After installation is complete, open the first Run to select the network (when the network firewall is normally enabled). Please be sure to check the public network.

Step 4: Click "Connect". In the window that appears, select the device you need to connect to. After it turns blue, click "Connect Device". A window for "IP Settings" will show up. Just click "OK" by default.

Matters need attention:

1. If it is installed on the C drive, it will cause errors when entering the username and password or adding the processing step plan. The solution is to run it as an administrator. If it doesn't work, please reinstall it on another drive.
2. If the public network is not selected during the first run, it may cause the connection status to always show as "connected" when connecting devices.

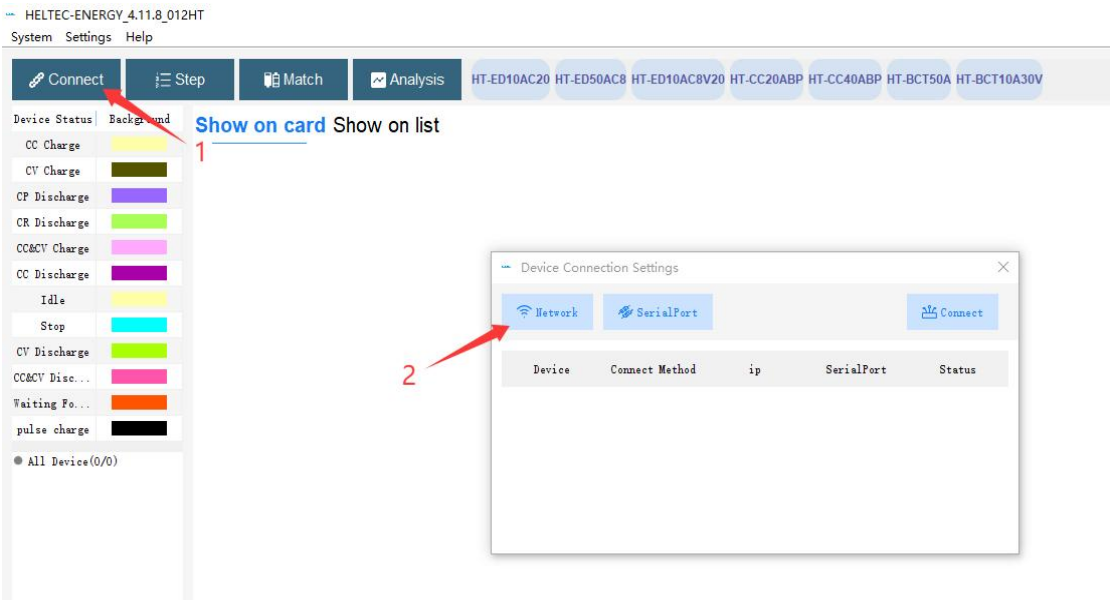
Solution:

1. Disable the public network firewall;
2. Modify the network connection mode for software operation. If it cannot be modified, reset the default value of the firewall. Restart the software and check the network connection again.

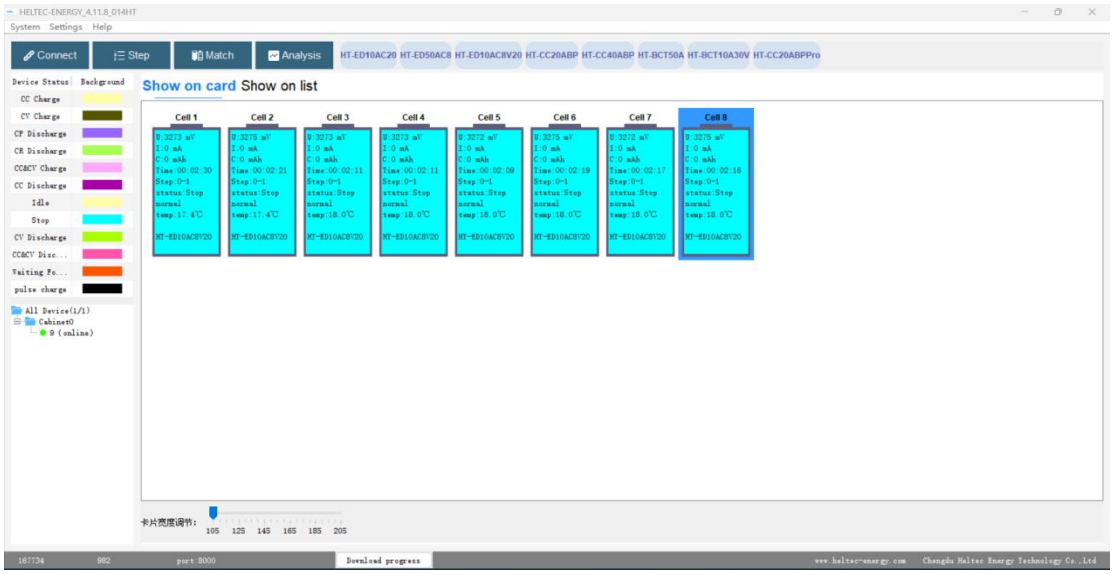
You may download the host computer software via the QR code or contact customer service for the software link.

1) **Main software interface:** After installing the software, connect the instrument to the computer using a communication cable. Click the "Connect" button on the top left corner of the interface, then click "Search". The IP address of the device will appear. Click "Connect" to control the instrument.

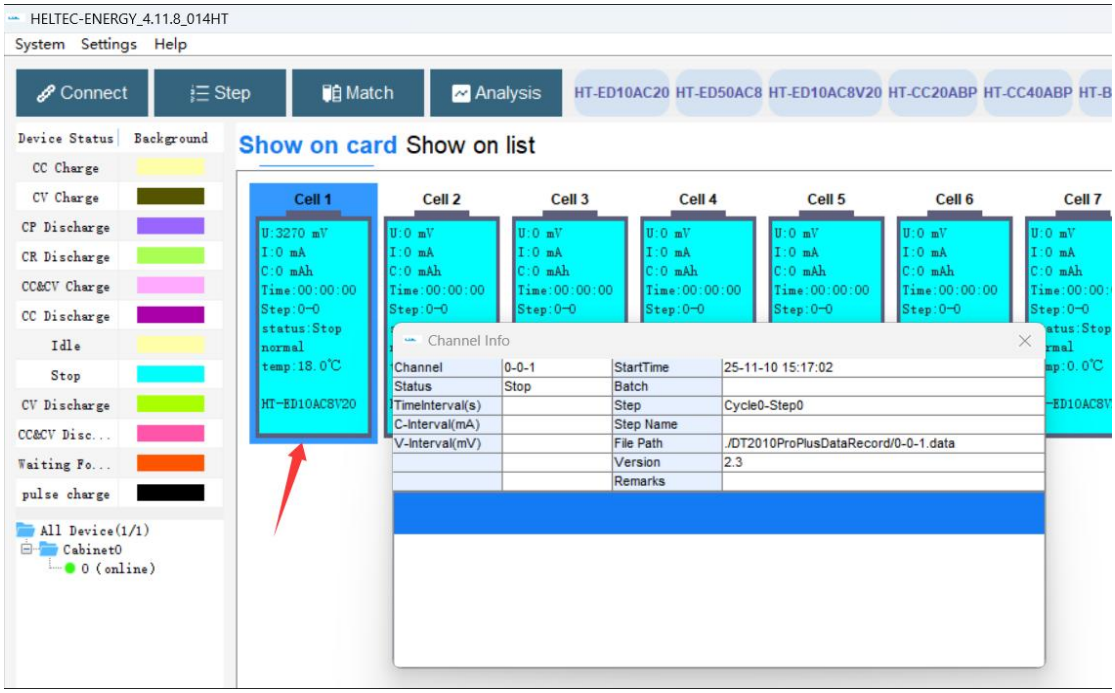
2)



After successful connection, battery information will be displayed, including current voltage, operating current, test capacity, test time, step sequence number, operating status, test status, temperature, and device model.



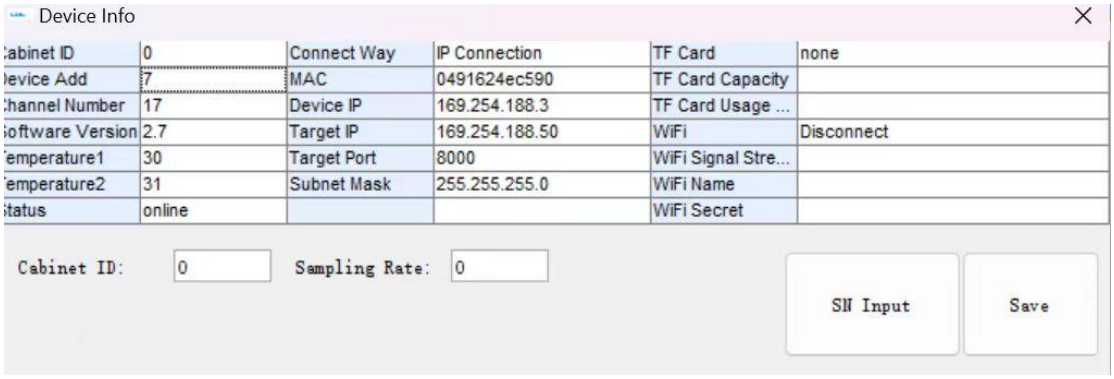
The device information displays a list of devices, indicating the connection status and connection number of the devices connected to the software. By double-clicking a device, you can view detailed device settings information.



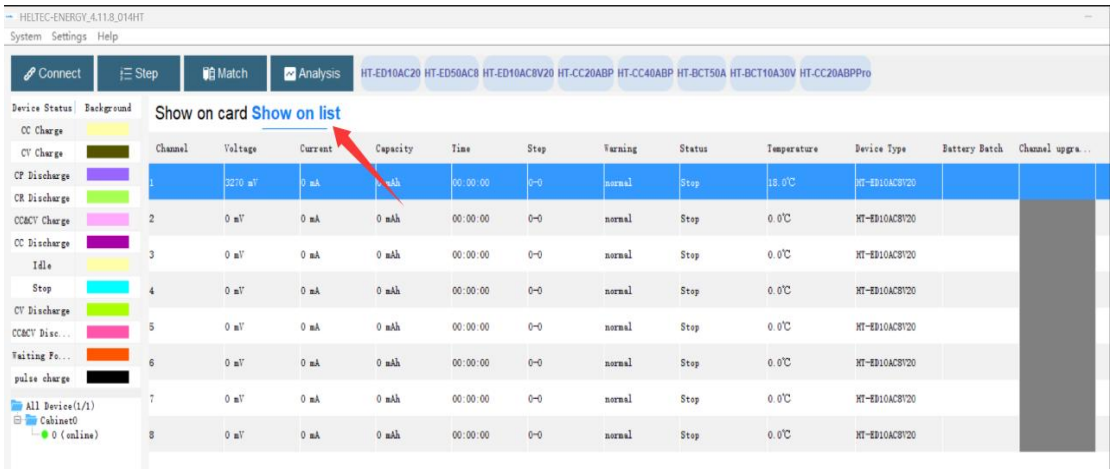
Cabinet number, equipment number, and equipment path number constitute the basic information of the equipment.

3) **Software version:** refers to the firmware version of the device; Connection method, IP, port, etc.: indicates the port and IP address information for connecting the device to the computer. Temperature 1/2: indicates the measured values of the two temperature sensors inside the device. When the temperature exceeds 30℃, the fan automatically operates for heat dissipation; Status: indicates the connection relationship between the device and the computer. Cabinet number: sets the cabinet number where the device is located, facilitating the random arrangement of cabinet sequence numbers during on-site wiring of cabinet-type devices. Sampling rate: indicates the

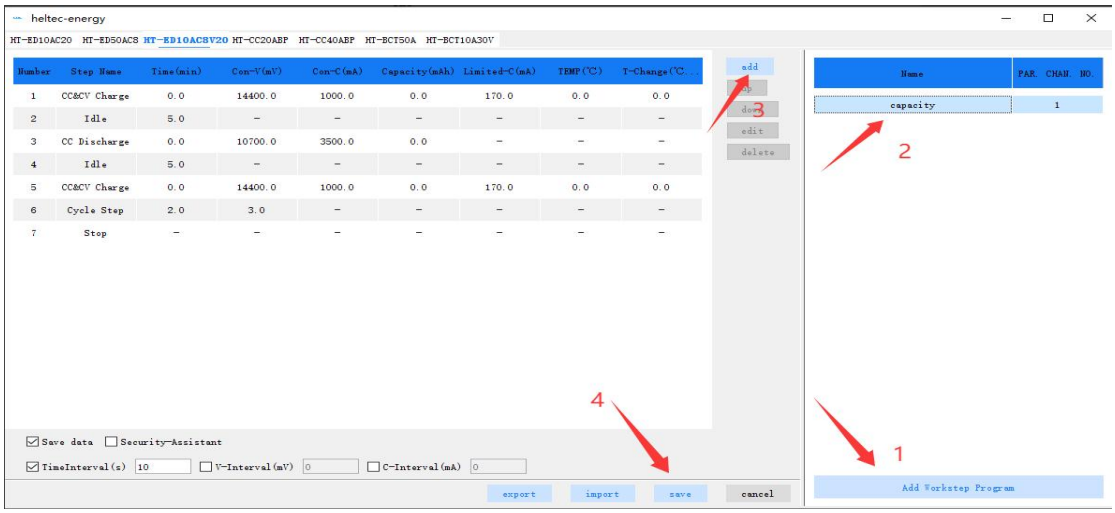
frequency of data collection and upload by the device.



If the selection list is clicked and displayed, the status of the device will be listed out. All operational functions remain unaffected.



Click the "Step Settings" button in the top left corner to enter the step settings interface. First, create a new step by naming it. After creation, click on the name of the newly created step to edit it. Then, click "Add Step" to set charging and discharging parameters, cycles, etc. Note that you need to set the desired working steps according to the specific type of battery.

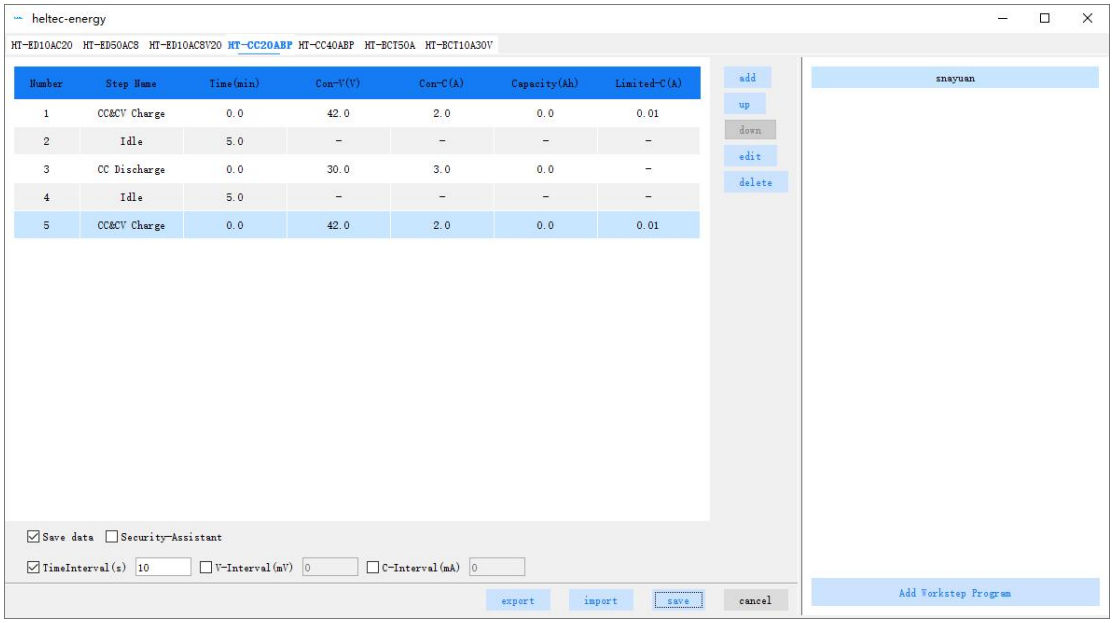


After setting, click the "Save" button at the bottom of the page to save the work step. After exiting, select one or multiple batteries for testing. Click and select the battery, right-click and choose

"Start" to use the saved work step (to select multiple batteries, hold down Ctrl and left-click the battery icons you want to select consecutively). During the test, you can judge the working status of the battery by its color, or right-click the battery icon to view the curve change diagram of the battery's operation. The battery data after the test can also be exported and saved for analysis and comparison.

4) **Step setting:** It is necessary to consider the battery as a whole, and set it according to the type of battery, total number of strings, total voltage, and total capacity. For example, for a 1-string lithium-ion battery with a total capacity of 3AH and a nominal voltage of 3.7V, the charging and discharging current should generally be less than half of the total capacity, which is 1A. The cut-off current should be 0.02 times the total capacity, which is 0.1A. The maximum charging cut-off voltage is 4.2V, and the minimum discharging cut-off voltage is 3V. Note that after each charge or discharge, it is necessary to let the battery rest for a period of time to allow it to dissipate heat. If one measurement is not accurate, multiple measurements can be taken to ensure correctness.

Battery Type	Nominal voltage	Recommended Voltage Settings	Recommended Current Settings
ternary lithium battery	3.7V	Vmax：4.2VxNumber of battery strings，Vmin：3VxNumber of battery strings	Charge and discharge current：Total battery capacityx0.5 Charge/Discharge Cut-off Current：Total battery capacityx0.02
Lithium iron phosphate battery	3.2V	Vmax：3.65VxNumber of battery strings，Vmin：2.7VxNumber of battery strings	
Lead-acid battery	12V	Vmax：14.4V，Vmin：10.5V	



Multiple test step schemes can be set for the work steps, and vivid names can be saved for easy memory, such as "Panasonic 18650 Standard Test"; clicking "New Step Scheme" can add a new scheme; right-clicking can delete or modify the scheme name. This name will appear in the menu of the operation interface. See "Device Settings Work Steps" for details; each step scheme supports the storage and setting of up to 64 steps. Step editing allows for mixed editing of step execution order. After step editing is completed, please add a stop step at the end to allow the device to stop working in case of abnormalities.

Add work step: Click "Add" to add a new work step. After adding a work step, it is necessary to set the corresponding execution parameters for the work step, otherwise incorrect parameters may pose a risk of damaging the battery.

Operation step modification: Click the "Edit" button to reset the parameters in the selected operation step, or double-click the step to open it directly.

Operation step deletion: Click the "Delete" button to delete a selected operation step.

Step movement: Click the up or down button to move the selected step.

Operation step saving: After editing the operation step, you must click the save button to save the current operation step to the software system.

Supporting steps:

@Constant current charging: Maximum voltage limit, constant current, and voltage return difference must be set. It is designed for nickel-chromium batteries and is not applicable to lithium batteries;

@Constant Voltage Charging: Constant voltage and maximum current must be set;

@Constant power discharge: The cut-off voltage, maximum current, and simulated power must be set;

@Constant resistance discharge: The cut-off voltage, maximum current, and simulated resistance must be set;

@Loop Settings: Jump step (jump within valid steps) and loop count (<64 times) must be set

@Constant current and constant voltage charging: Constant voltage, constant current, and cut-off

current must be set;

@Constant current discharge: The cutoff voltage, constant current, and capacity settings must be set;

@Hold: The work step time must be set

@Stop: No need to set parameters

4) Data storage conditions:

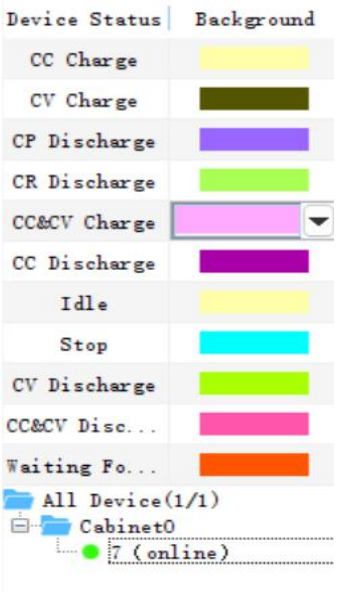
(1) When you need to save test data to your computer, please check this item; otherwise, the data will not be stored. There are 3 conditions to choose from for the storage rules on the computer.

(2) Time interval: Set the minimum time interval for data saving. After exceeding this time, the software system will automatically store data into the record file of each channel every time interval. This value should not be set too small, so as to avoid frequent data actions causing slow computer operation.

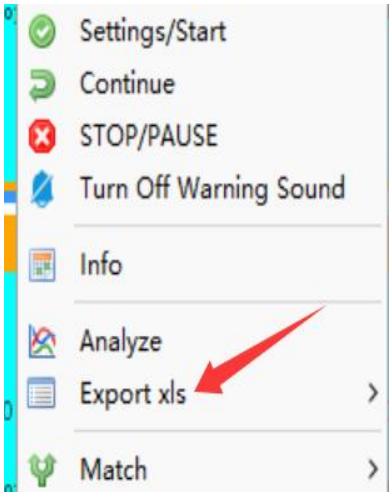
(3) Voltage Interval: Set the voltage difference condition for data saving. If set to 100, it indicates that the system will automatically store data once in the channel record file when the voltage changes from 3700mv to 3800mv. If the voltage changes from 3700mv to 3600mv, the storage action can also be triggered. This value should not be set too small, as frequent data actions may cause the computer to run slowly.

(4) Current interval: Set the condition for current difference values for data storage. If set to 100, it indicates that the system automatically stores data once in the channel record file when the current changes from 500mA to 400mA. If the current changes from 500mA to 600mA, the storage action can also be triggered. This value should not be set too small, as frequent data actions may slow down the computer.

***Status color setting：**



All the states supported by the device are displayed in color blocks, making it convenient for users to understand the current operating status or locate the test channel for abnormal states when applying the device in large quantities.



Export and import of configuration files: After the above configuration is completed, the configuration project file can be exported and saved. This file can be directly copied to other computers via a USB flash drive for import, facilitating one-time editing and use on multiple computers.

*Right mouse button function:

1) Setup/Startup

Right-click Settings/Start is an option to select and start the work steps. Before all channels are officially operated, it is necessary to ensure that the work steps you need to run are included in the work step settings. The setting method is detailed in the figure:

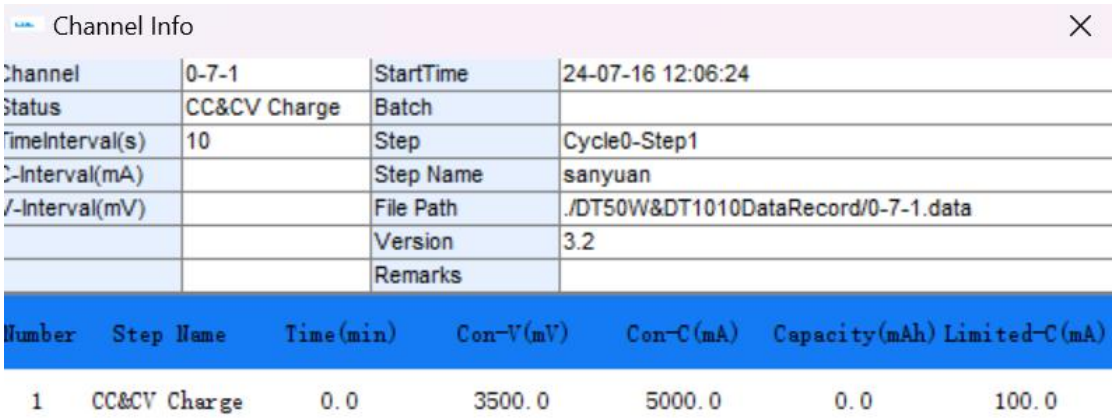
Select the name of the work step plan and click "Confirm"; for battery batch number and remarks, you can fill in some necessary test information here for easy memory and query.

2)Restore, stop

(1) Restore (when connected to the host computer): When in battery detachment warning state or manual stop state, selecting the restore function will cause the device to continue running the next step along the last stopped step number. Previous information is saved on the computer. If there was no previous start step, or if the machine was powered off and restarted, this function will be ineffective. The operation resumed is 5A discharge.

(2) Stop: If you want to temporarily stop the operation (for example, if you are worried about someone leaving), you can click the stop button to halt the operation. To resume the operation, click the resume button.

3)Information

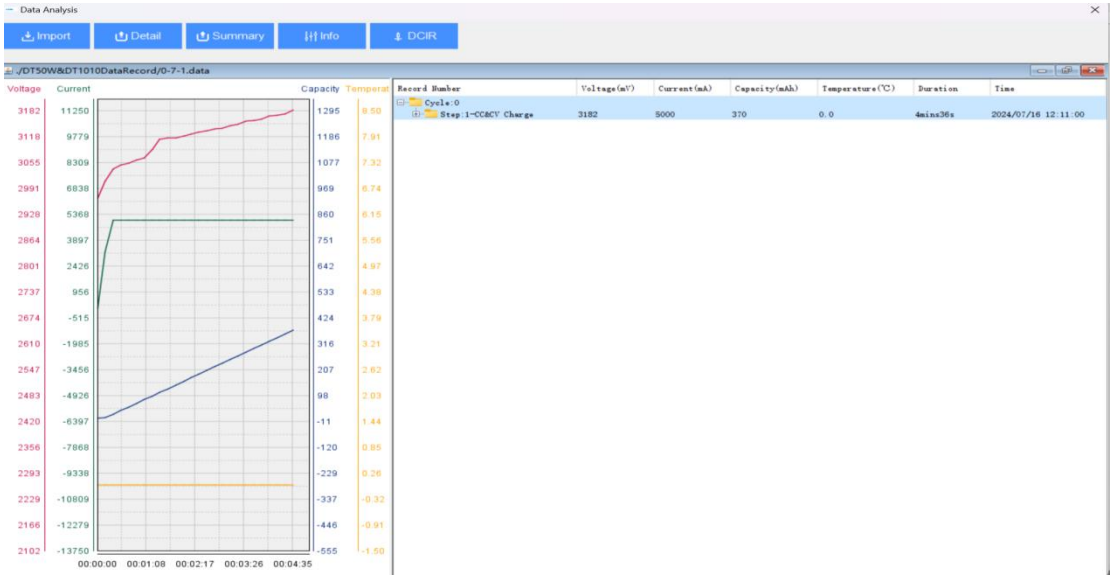


Right-click to select information to view detailed setup information for this channel, including the currently set work step details and the currently running work step.

Channel: Indicates the channel number of the currently displayed information.
Start time: The time when the last step of this channel was initiated.
Current status: The current operational status of the channel.
Work step and work step scheme name: indicates the name and serial number of the work step currently being executed on this channel.
Time interval, voltage interval, current interval: These indicate the parameter settings for saving data in this channel.
Data file path: Refers to the absolute path of the data record file for this channel.
Lower-level machine version: hardware version. Remarks: indicates the information entered when the work step settings were issued.

4) Data analysis

When the channel has been running for a period of time or has completed running, under normal circumstances, the test records from startup to the present have already been recorded. After selecting the analysis function, the record file can be automatically retrieved and the data curve analyzer can be launched. For the curve analysis software, please refer to the data analysis section.

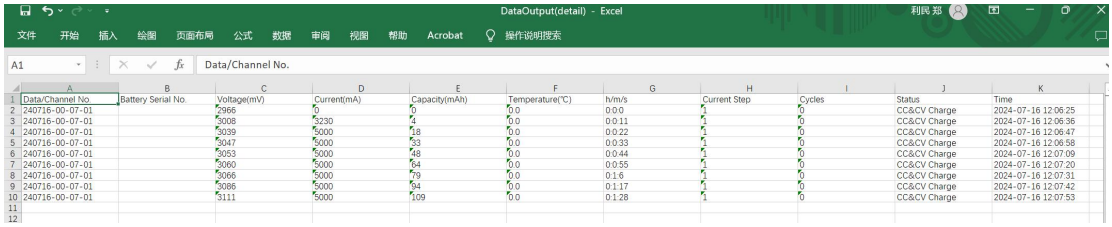


Data analysis software support functions:

Supports 3Y axes and a single timeline; all curves support up/down and left/right panning and zooming; holding the left button and moving the mouse up/down along a Y axis allows for up/down panning; holding the left button and moving the mouse left/right along the X axis allows for left/right panning of the curve; holding the right button and moving the mouse up/down along a Y axis allows for zooming in on the curve amplitude; holding the right button and moving the mouse left/right along the X axis allows for left/right zooming of the time curve.

5) Export

Export the relevant data of the selected channel test in a tabular format.



Data/Channel No.	Battery Serial No.	Voltage(mV)	Current(mA)	Capacity(mAh)	Temperature(℃)	h/m/s	Current Step	Cycles	Status	Time
240716-00-07-01		2966	0	0	0.0	0:0:0	1	0	CC&CV Charge	2024-07-16 12:06:25
240716-00-07-01		5008	5230	4	0.0	0:0:11	1	0	CC&CV Charge	2024-07-16 12:06:36
240716-00-07-01		3039	5000	18	0.0	0:0:22	1	0	CC&CV Charge	2024-07-16 12:06:47
240716-00-07-01		3047	5000	33	0.0	0:0:33	1	0	CC&CV Charge	2024-07-16 12:06:58
240716-00-07-01		3053	5000	48	0.0	0:0:44	1	0	CC&CV Charge	2024-07-16 12:07:09
240716-00-07-01		3060	5000	64	0.0	0:0:55	1	0	CC&CV Charge	2024-07-16 12:07:20
240716-00-07-01		3066	5000	79	0.0	0:1:6	1	0	CC&CV Charge	2024-07-16 12:07:31
240716-00-07-01		3086	5000	94	0.0	0:1:17	1	0	CC&CV Charge	2024-07-16 12:07:42
240716-00-07-01		3111	5000	109	0.0	0:1:28	1	0	CC&CV Charge	2024-07-16 12:07:53

6) Data import:

There are two ways to import data:

First:Right-click on the main menu grid, click the "Analysis" button, and the data will be automatically imported into the curve analysis software and opened.

Second: After starting the analysis software, click the "Import Data" button to enter the "Data Records" folder under the program's installation directory. Select the data record file you want to view, with a suffix format of *.dat

7) Data export

The data export function is used to output the imported data in the form of an XLS report.

When using, you must import the data record file you need to view and be able to view it in the window. After selecting the save data function, the software prompts for the save location and the input of a save name. Tip: When setting the grouping parameters, if you are not sure about the exact step number of the step you want to specify, you can first test a complete set of data and export it as an xls table. Find the position you want to determine in the table, locate the corresponding step, and record the cycle number and step number. Enter these values in the grouping parameters.

8) Multi-curve comparison

Multiple curve comparison allows for the comparison of differences between multiple data record files or a single data file.

9) Usage steps

Step 1: Set the data recording settings, work step settings, and grouping settings for the battery you need to test, and save them.

Step 2: Select the cells you want to initiate the test on. You can hold down the Ctrl key to select multiple cells, or hold down the Shift key to select a batch of cells.

Step 3: Right-click on a selected cell, choose "Set Operation Step", and select the operation step

you have previously set. You can choose to start immediately after setting.

Step 4: The device emits a startup test prompt tone, and the software interface status changes. By double-clicking a running single cell, you can view the actual operating step status and data of the device.

Step 5: During the testing process, you can choose to stop and resume to pause and resume the test. The previously tested data will not be cleared. If you choose to start, the device will start running the work steps again.

Step 6: After the test is completed, you can use the grouping function to perform grouping or utilize analysis tools for data analysis.

9. Common troubleshooting methods

Note: 90% of the faults are caused by too small contact area between the fixture and the battery TAB, poor contact, excessive charging and discharging current, or poor cell quality. Never think that simply clamping the clip onto the battery is enough. Insufficient contact area can lead to various problems. Therefore, it is strongly recommended to make your own clamps based on the battery cell tabs!

1) Why does the machine alarm?

Reasons: Reversed positive and negative poles/over-temperature/over-voltage.

Solution: Check if the fixture is clamped in reverse, if the heat dissipation of this machine is normal, and if the battery exceeds 5V.

2) Why is there no result data after the test is completed?

Reason: A certain work step did not work for more than 2 minutes.

Method: First, single charge/single discharge for 5 minutes, and then proceed with the normal test process.

3) Why does the cut-off voltage exceed the set value during charging?

Reason 1: The contact area between the fixture and the battery TAB is too small or there is severe poor contact. Solution: Increase the contact area and ensure good contact.

Reason 2: The set charging current seriously exceeds the capacity that the battery cell can withstand.

Solution: Set the parameters correctly and reasonably in accordance with the battery cell specification sheet.

4) Why is there a serious deviation in the test result data?

Reason 1: The Settings of the charging cut-off voltage/charging current/cut-off current are incorrect.

Solution: Set the parameters correctly and reasonably in accordance with the battery cell specification sheet.

Reason 2: The discharge cut-off voltage/discharge current is set incorrectly.

Solution: Set the parameters correctly and reasonably in accordance with the battery cell specification sheet.

Reason 3: The contact area between the fixture and the battery cell tabs is insufficient/The small crocodile clamp did not clamp onto the battery cell tabs.
Solution: Try to increase the contact area by attaching a small alligator clip to the base of the battery cell's terminal ear.

5) Why do the test results of the same battery vary multiple times?
Reason 1: The test environment was not made exactly the same.
Solution: For instance, ambient temperature, charging cut-off voltage/current/cut-off current, discharging cut-off voltage/current/standing time.
Reason 2: Fixture influence.
Solution: For instance, the contact area of the large crocodile clip and the position of the small crocodile clip are not exactly the same each time.
Reason 3: Chemical properties.
Solution: The charging and discharging process of lithium batteries is a chemical reaction and can be affected by various subtle external factors.

6) Why can't the set discharge cut-off voltage be reached?
Reason 1: The discharge current is too large, rapidly pulling the voltage to the cut-off voltage. After the machine stops discharging, the voltage gradually rises.
Solution: Reduce the discharge current.
Reason 2: The contact area between the fixture and the TAB is too small or the contact is poor.
Solution: Increase the contact area and ensure good contact.

7) Why can't the set charging cut-off voltage be reached?
Reason 1: The set saturation current is too large, resulting in incomplete charging.
Solution: Reduce the saturation current.
Reason 2: The charging current is too large, rapidly pulling the voltage to the cut-off voltage. After the device stops charging, the voltage gradually drops.
Solution: Reduce the charging current.
Reason 3: Poor battery cells (excessive self-discharge)
Solution: It is suggested to phase out this battery cell.
Reason 4: Poor contact between the fixture and the TAB.
Solution: Increase the contact area to ensure good contact.

8) Why does the voltage rise/drop a few hours after the test/equalization is completed?
Reason 1: Due to the physical characteristics of the battery cell, the voltage will naturally drop after being fully charged and left to stand for a period of time.
Solution: Physical properties that cannot be changed.
Reason 2: Due to the physical characteristics of the battery cell, the voltage will naturally rise after being discharged and left to stand for a period of time.
Solution: Physical properties that cannot be changed.

1) Both the small and large alligator clips should be clamped onto the battery tabs. The small alligator clip is for voltage sampling, while the large alligator clip is for over-current!

2) The contact area between the large crocodile clamp and the TAB must be large enough. It is strictly prohibited to clamp screws, nickel sheets or wires, otherwise it may cause overheating and damage or abnormal interruption of the testing process!

3) The small crocodile clip must be clamped at the root of the battery terminals; otherwise, it will cause inaccurate voltage sampling and lead to inaccurate capacity testing!

Thank you very much for purchasing this product. The content of this manual has fulfilled the obligation of full reminder and warning in accordance with the Work Safety Law! Before using this product, you must read and understand the content of the manual carefully! This product is for professional use only. You must be aware that any operation on lithium batteries is extremely dangerous! Therefore, you must set up this machine correctly and reasonably in accordance with the specification sheet provided by the battery manufacturer. Any direct or indirect consequences resulting from the use of this product are not the responsibility of our company! This product and its accessories may be upgraded from time to time without further notice.

Warranty Regulations

Warranty service period is 1 year.

The warranty service is limited to normal use: man-made damage, self-disassembly, modification and repair, use not in accordance with the instructions, and damage caused by external force majeure factors are not within the scope of free warranty.

Accessories such as test fixtures are consumables without warranty.

When you need warranty service, please contact your dealer for processing. If you cannot contact the dealer, you can contact our company by email or phone.

There are no after-sales service stations in other countries except China. If you need warranty service, please send the product to us for free repair, but you need to pay the freight for the round trip.