8-channel Battery Charge/Discharge & Equalization Repair Instrument

User Manual

（HT-ED10AC8V20）

Heltec Energy

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-ED10AC8V20 is an 8-channel capacity testing and maintenance instrument. Each channel is suitable for batteries with voltages ranging from 1 to 20V, including lithium-ion, NiMH, NiCd, and lead-acid batteries. The instrument features voltage and current accuracy of ±0.02V/A, offering functions including battery capacity testing, cycle charging/discharging, data analysis, and battery balancing. It also supports controlling battery operation steps via PC software. Characterized by high precision, strong timeliness, simple operation, and practical reliability, it provides comprehensive battery testing and maintenance services for manufacturers and users.

2.Product Features

① Each channel is equipped with a dedicated processor to ensure optimal performance in capacity calculation, timing, and voltage/current control.

②Offers multiple charge/discharge capacity testing modes for flexible selection: constant current charging, constant voltage charging, constant current/constant voltage charging, constant current discharging, constant voltage discharging, constant current/constant voltage discharging, constant power discharging, and constant resistance discharging—meeting diverse application requirements.

③Computer software supports up to 9999 charge/discharge cycles with intuitive, intelligent operation.

④Real-time display of battery operating parameters including voltage, current, capacity, and operating time.

⑤Features full-channel isolation technology, allowing each channel to be freely configured with distinct charge/discharge parameters or identical settings to achieve battery pack balancing.

⑥Enables group matching functionality, where test results are grouped according to custom criteria and marked/displayed on the device.

⑦ Fully compatible with physical specifications including 18650, 26650, pouch cells, prismatic cells, AA NiMH batteries, and NiCd batteries.

⑧ Customizable test status pane colors enable easy visual monitoring of all device statuses during high-volume testing

3.Product model parameters

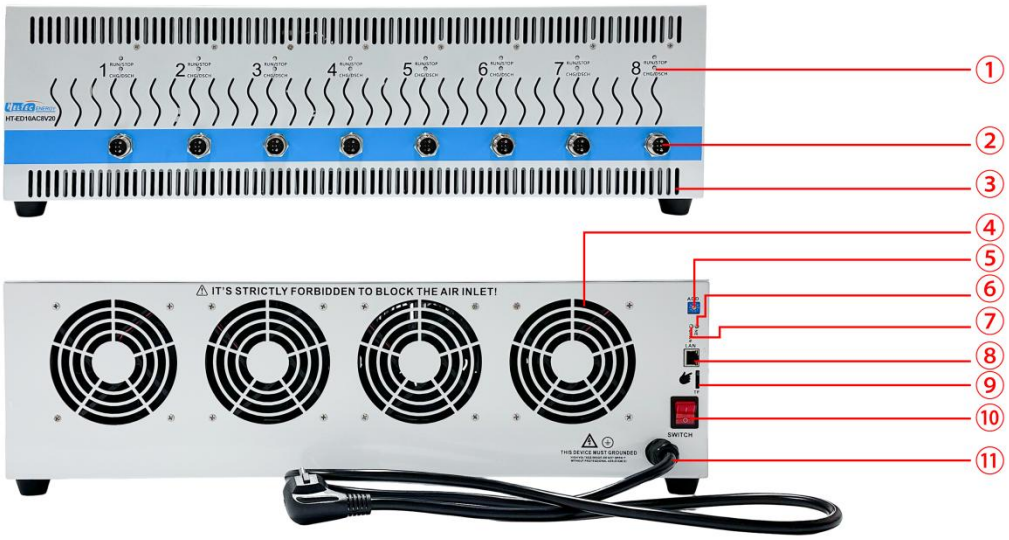
input power	AC200~245V 50HZ/60HZ 50A

standby power	80W
full-load power	2400W
Permissible temperature and humidity	Ambient temperature<35℃；humidity<90%
number of channels	8channels
Inter-channel voltage	AC1000V/2min No abnormalities
maximum charge current	10A
maximum discharge current	10A
maximum output voltage	20V
minimum voltage	1V
Voltage measurement accuracy	±0.02V
Current measurement accuracy	±0.02A
Host Computer Software System Requirements and Configuration	Systems with network port configuration, Windows XP or later versions

Product Application Scope:

Widely used in battery testing and maintenance by battery manufacturers, suitable for consumer electronics repair, quality inspection, fault diagnosis, aging tests, and other application scenarios.

4.Product appearance schematic



①	②	③	④	⑤	⑥
Status display light	Battery connection line output interface	Radiator air intake	Fan air outlet	Device serial number setting	Communication indicator light
⑦	⑧	⑨	⑩	⑪	
Network indicator light	LAN transmission interface	TF card jack	Main power switch	Power cord	

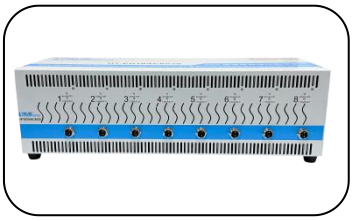
The serial number sets the relationship between gears and the number of devices

Set the gear	0	1	2	3	4	5	6	7	8	9
Equipment number	1	2	3	4	5	6	7	8	9	10

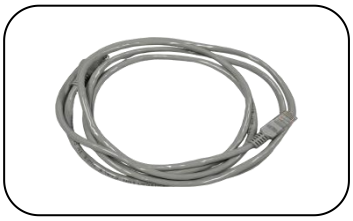
Status and Meaning of Communication and Network Indicator Lights

Signal light	**Status**	**Meaning**
Channel indicator light	Continuous flashing	Internal sampling is normal
Channel indicator light	Intermittent flashes	Poor connection of the data bus
Network indicator light	Flash once per second	Sample data upload
Network indicator light	The light is not on	There is no data upload or setting error

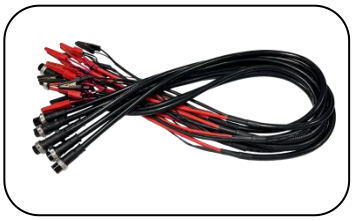
***Product List:**



Machine *1



Data line *1



Clip cord *8

5. Equipment connection and software installation instructions

5.1 Note before use

1. Please maintain the ambient temperature and humidity when using the equipment.

2.The air inlet at the rear of the equipment must not be blocked and there should be a ventilation space of more than 5CM.

3. The air outlets on both sides of the equipment need to be kept unobstructed to ensure a ventilation space of more than 5CM. There is an air inlet at the top of the equipment. It is necessary to ensure that the air inlet at the bottom is unobstructed and not blocked by debris.

5.2 Preparations for connecting and using the equipment：

Step 1: Connect the AC 220V socket to the power input socket of the device, and turn on the power switch. After observing the initialization display of the indicator light on the front of the entire machine, it will eventually show the stop state.

Step 2: Set the device numbers 1 to 16 on the rear panel of the device (in the single-machine version device connection, one computer is allowed to connect 8 HT-ED50AC8 devices). When multiple devices are used simultaneously, the device numbers must be set to be different from each other.

5.3 Battery connection

1. Physically, it supports the connection of 18650、 26650 lithium iron phosphate batteries、No. 5 nickel-metal-hydride batteries、 pouch batteries、block batteries、large single cells and other types of batteries.

1. The minimum height of the probe can be adjusted to 32mm and the maximum height to 130mm

2. Adjust the height of the lower fixture for nickel-metal hydride battery No. 5, 18650 lithium battery, 26650 lithium iron phosphate, and refer to the scales on both sides to make the adjustment.

Note: After installing the battery, it is necessary to check whether the battery's electrode plates are in full and good contact with the probe housing. Only when the middle needle is in contact during the test will there be no current.

3. 3.7V 240mah pouch battery, 3.2V/10Ah lithium iron phosphate pouch battery. Install the output cable provided randomly, and connect the battery to the alligator clip or flat clip according to the positive and negative terminals.

Note: The output line is made by a four-wire sampling connection method to ensure sampling accuracy. After the alligator clip or flat clip is properly connected to the battery's electrode sheet, it is necessary to check whether the alligator clip or flat clip on the signal sampling side is in reliable contact.

6.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).

7.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 after-sales customer service immediately for handling.

8.Software Usage Instructions

*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:

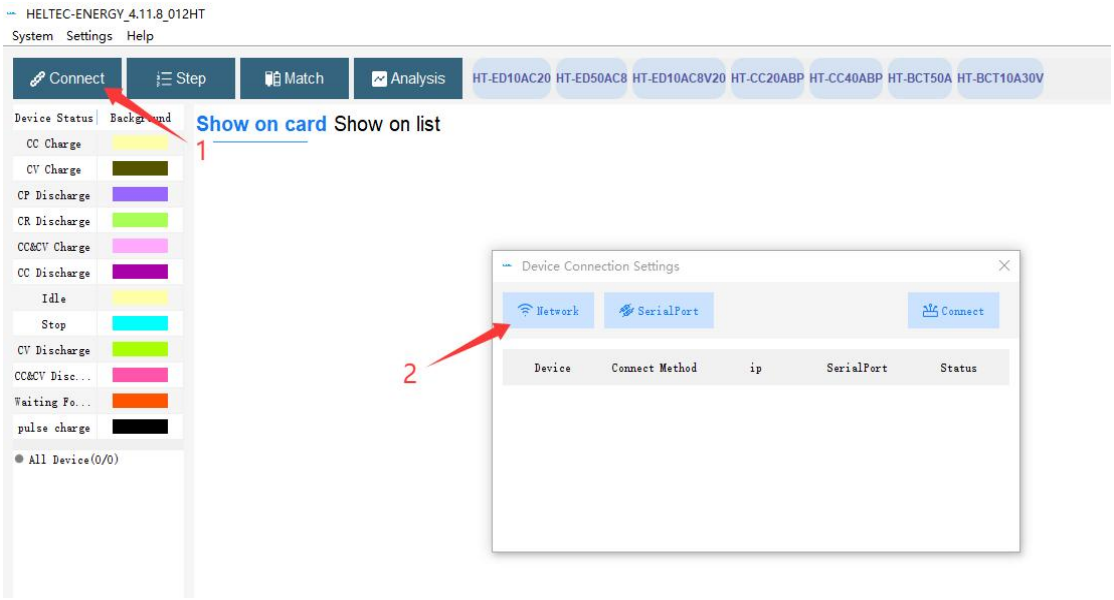
1. If it is installed on the C drive, it will cause errors when entering the username and password or adding the processing step plan. The solution is to run it as an administrator. If it doesn't work, please reinstall it on another drive.
2. If the public network is not selected during the first run,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

Solution:

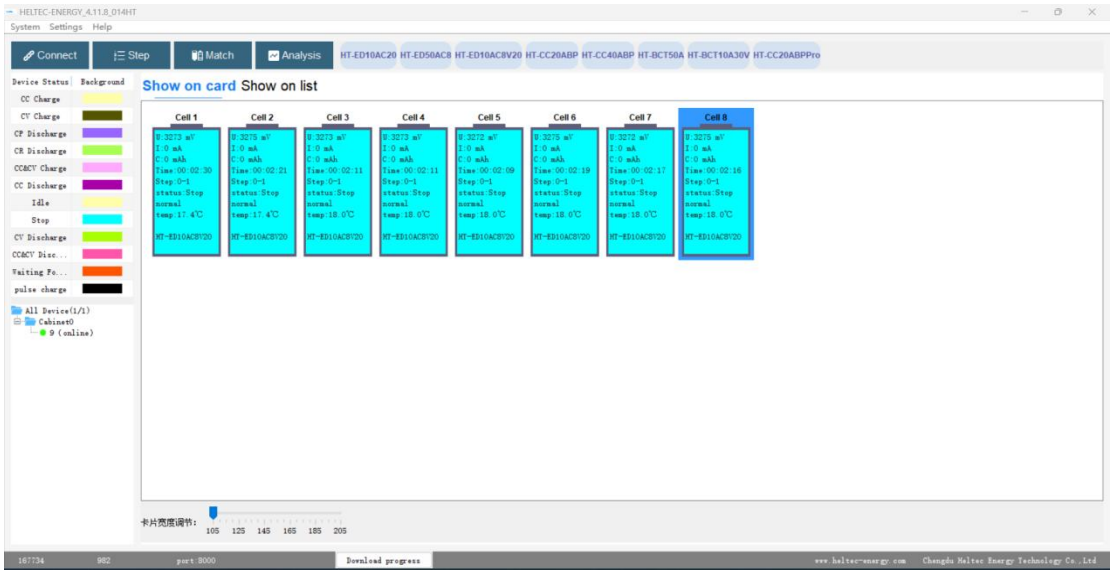
1. Disable the public network firewall;
2. Modify the network connection mode for software operation. If it cannot be modified, reset the default value of the firewall. Restart the software and check the network connection again.

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

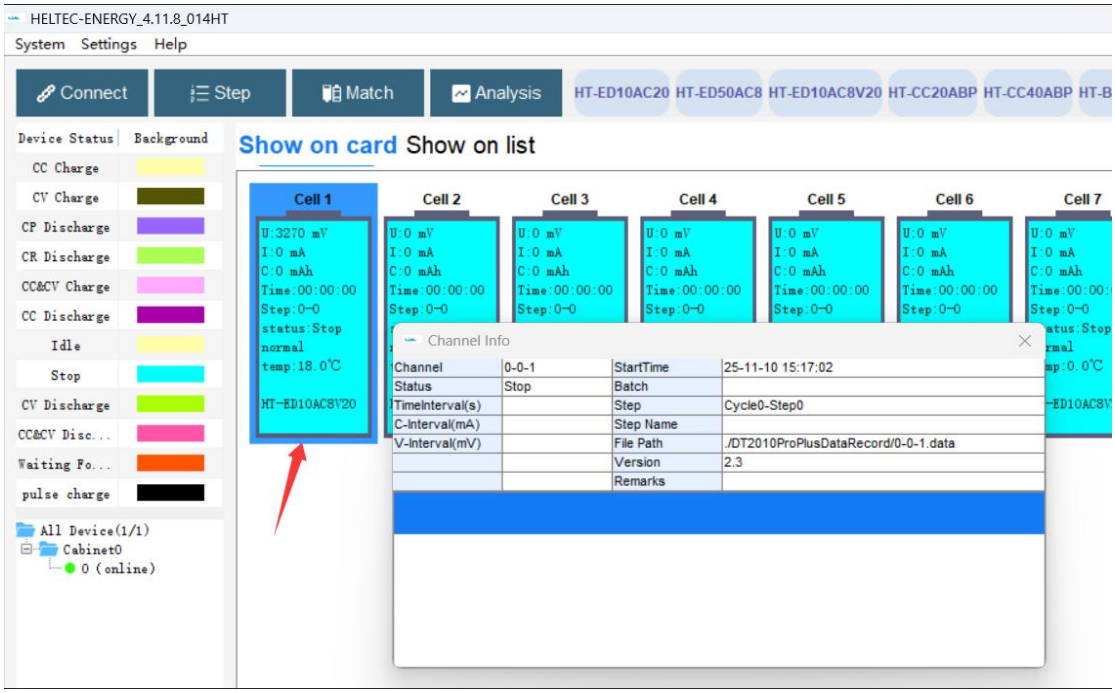
1)**Main software interface:** After installing the software, connect the instrument to the computer using a communication cable. Click the "Connect" button on the top left corner of the interface, then click "Search". The IP address of the device will appear. Click "Connect" to control the instrument.



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.

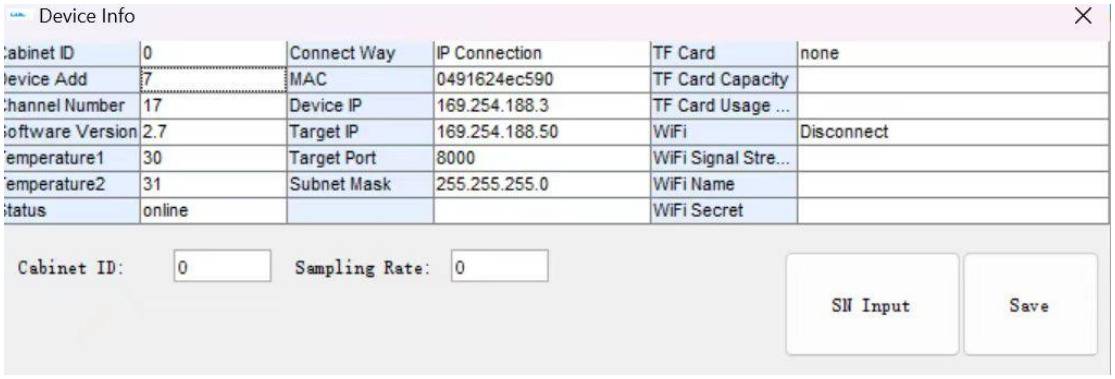


The device information displays a list of devices, indicating the connection status and connection number of the devices connected to the software. By double-clicking a device, you can view detailed device settings information.

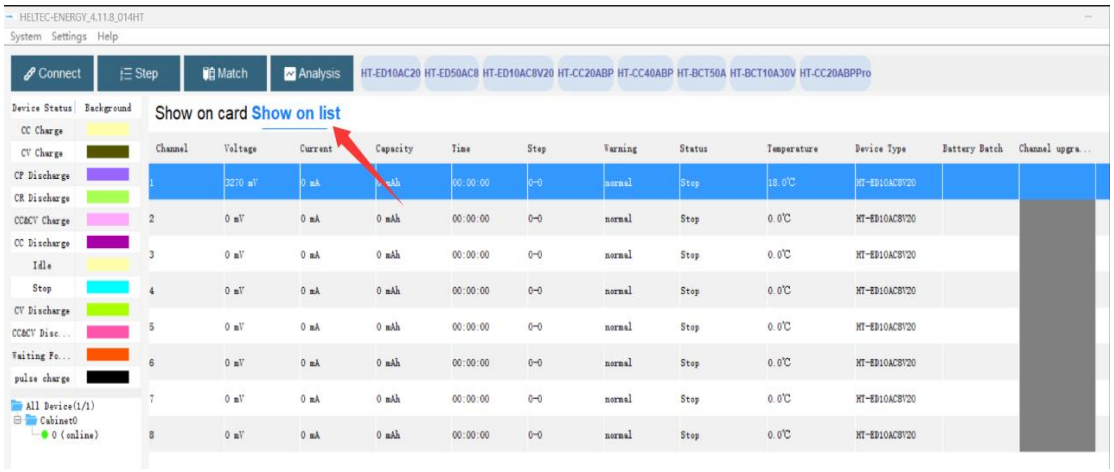


Cabinet number, equipment number, and equipment path number constitute the basic information of the equipment.

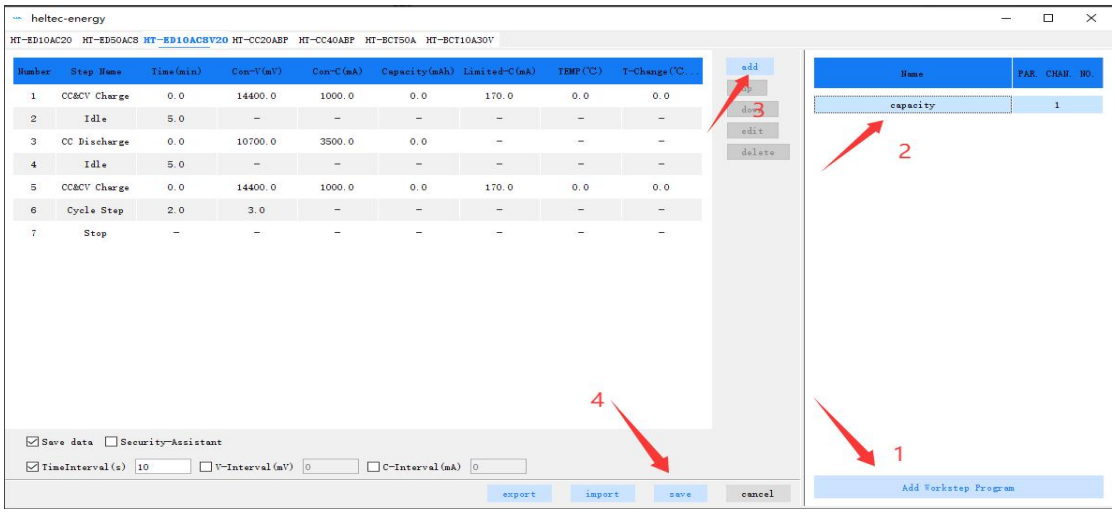
1) **Software version:** refers to the firmware version of the device; Connection method, IP, port, etc.: indicates the port and IP address information for connecting the device to the computer. Temperature 1/2: indicates the measured values of the two temperature sensors inside the device. When the 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 Sets" button in the top left corner to enter the step sets 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 charge and discharge parameters, cycles, etc. Note that you need to set the desired work steps according to the specific type of battery.

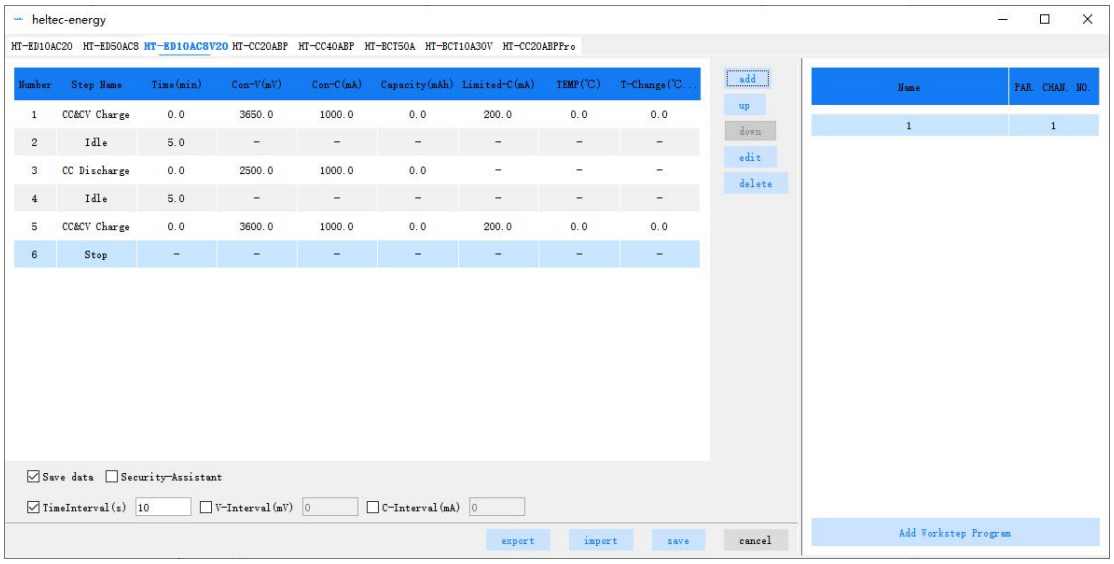


After setting, click the "Save" button at the bottom of the page to save the work step. After exiting, select one or multiple batteries for testing. Click and select the battery, right-click and choose "Start" to use the saved work step (to select multiple batteries, hold down Ctrl and left-click the 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.

2) **Step setting:** It is necessary to consider the issue from the perspective of a single battery, 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	V-max：4.2VxNumber of battery strings，V-min：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	V-max：3.65V*Number of battery strings，V-min：2.7VxNumber of battery strings	
Lead-acid battery	12V	V-max：14.4V V-min：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

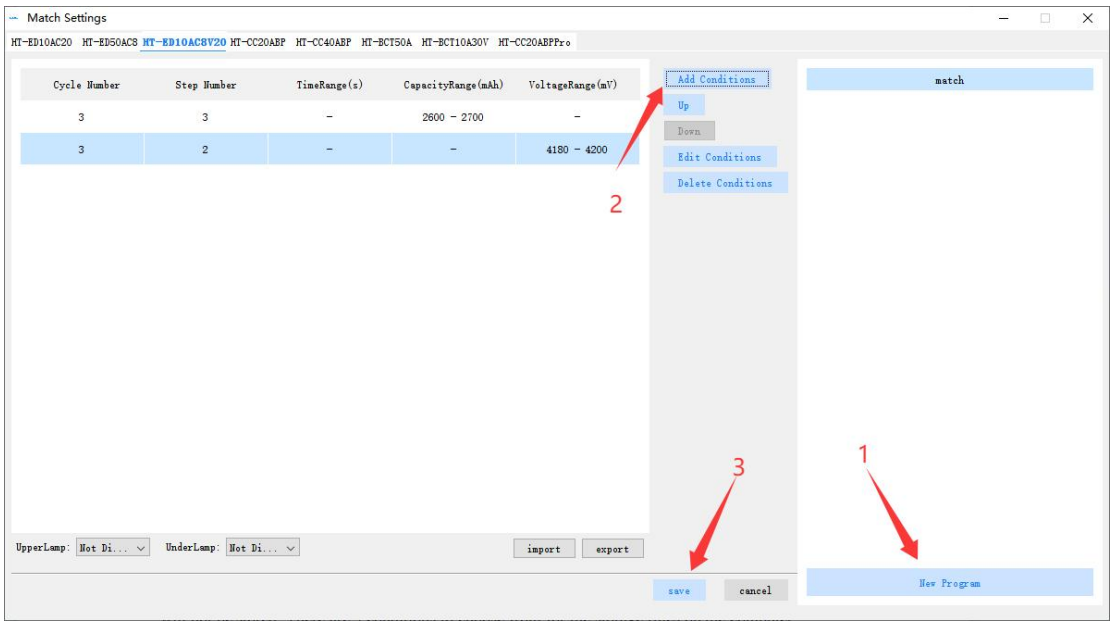
@Stop: No need to set parameters

Pairing conditions:

The assembly plan can set a set of qualified standards with multiple conditions. If all the conditions are met, they will be marked with a tick. For details, please refer to the 2.5 Quick Assembly diagram. The support for configuration conditions is based on capacity, time, and voltage results as judgment conditions. However, only one range of each condition can be filled in. It can support specifying the result of a certain work step as the judgment condition.

For example, the qualified standard for the 2650mA nominal 18650 battery is (for detailed work steps, please refer to the work step setting diagram in 3.1) : Condition 1: The test capacity of the third work step (discharge) in the third cycle reaches 2600 to 2700mAH. Condition 2: The voltage (full and static) of the second working step in the third cycle is within the range of 4180 to 4200mV. The two conditions are concurrent.

Then the Settings should be as shown in the figure



After the Settings are completed, you must click the Save button to save the configuration conditions.

4) Data storage conditions:

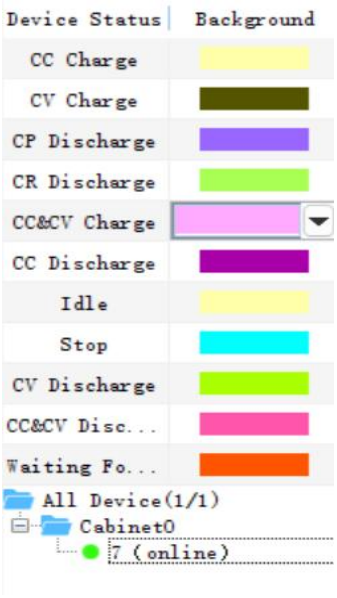
(1) When you need to save test data to your computer, please check this item; otherwise, the data will not be stored. There are 3 conditions to choose from for the storage rules on the computer.

(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.

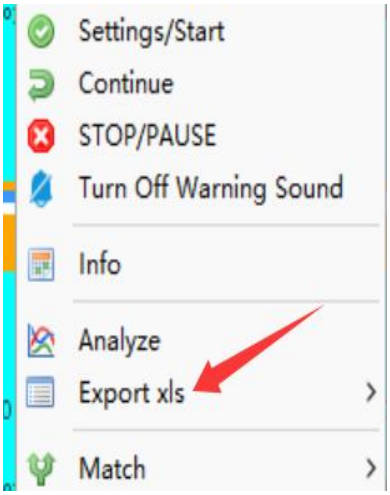
(3) Voltage Interval: Set the voltage difference condition for data saving. If set to 100, it indicates that the system will automatically store data once in the channel record file when the voltage changes from 3700mv to 3800mv. If the voltage changes from 3700mv to 3600mv, the storage action can also 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:

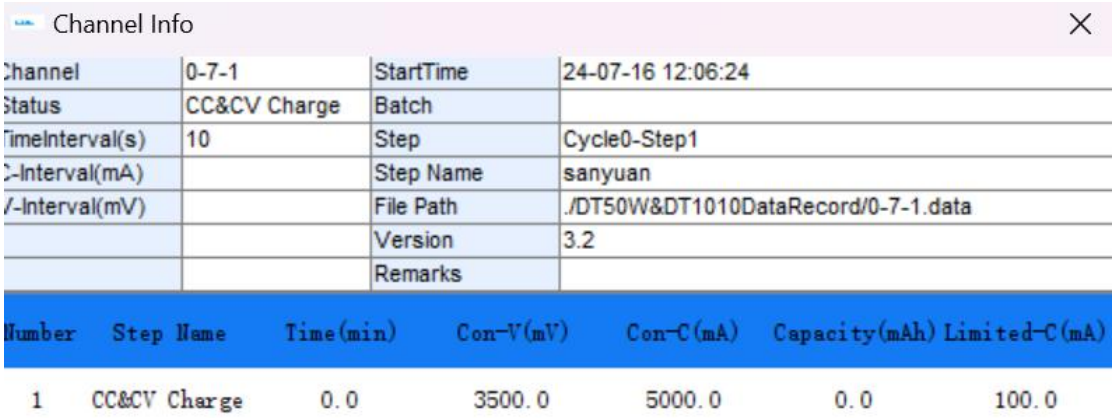
Select the name of the work step plan and click "Confirm"; for battery batch number and remarks, you can fill in some necessary test information here for

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.

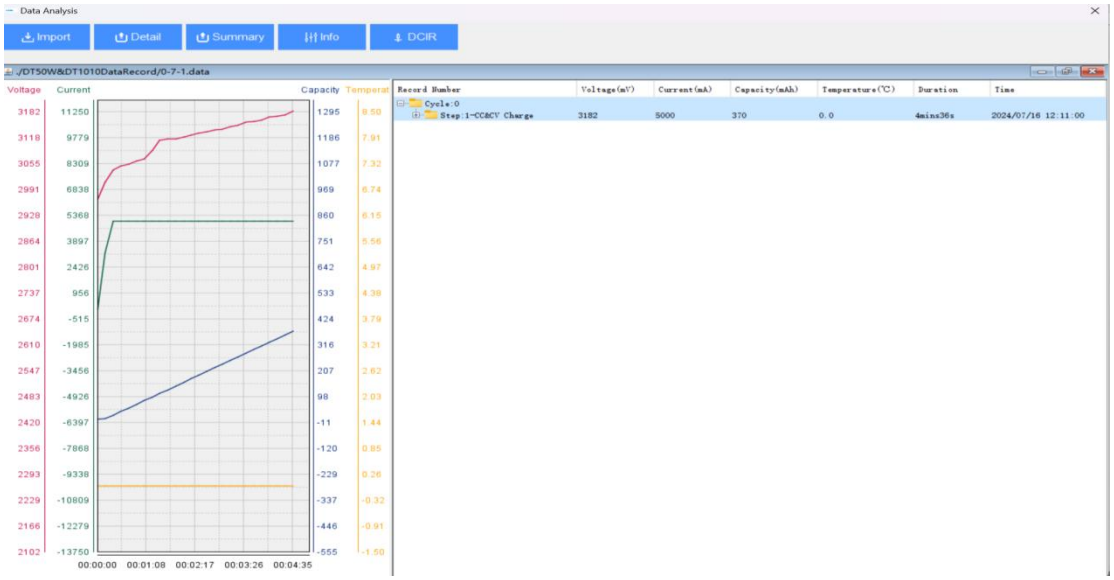
Time interval, voltage interval, current interval: These indicate the parameter settings for saving data in this channel.

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.

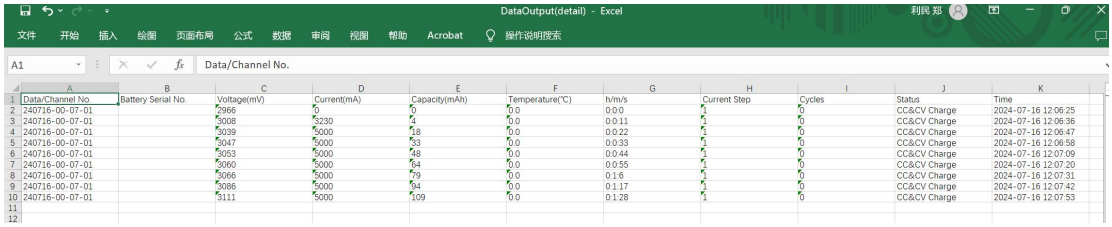


Data analysis software support functions:

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.



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.

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.