6 channels
Lead-acid/NIMH Battery Tester
Single channel 7-23V 10A

HT-ED10AC6V20D

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-ED10AC6V20D is a six-channel capacity testing and maintenance instrument. Each channel is suitable for lead-acid or nickel-metal hydride batteries operating at voltages between 7 and 23 volts. The device features a current accuracy of ±0.03A and can test individual batteries or battery packs within this voltage range. Featuring battery capacity testing, charge/discharge cycles, and pulse repair functionality, it offers high precision, high responsiveness, straightforward operation, and proven reliability. This instrument provides comprehensive battery testing and maintenance services for both manufacturers and end-users.

2.Product Features

①Features both simple and professional modes, catering to both novices and experts.

② Incorporates pulse repair functionality to restore the chemical activity within the battery's internal materials.

③ Pulse charge-discharge capability enables capacity testing while simultaneously performing gradual battery restoration.

④ Supports up to 50 charge-discharge cycles, meeting the requirements of most application scenarios.

⑤ The device continuously monitors the unit's temperature during charging and discharging, adjusting fan speed accordingly.

3.Product model parameters

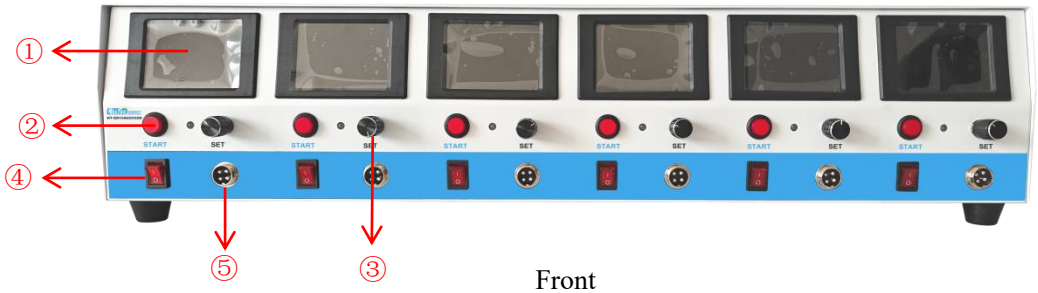
Machine weight	10kg	Maximum charge-discharge cycle count	50
Machine dimensions	Length 66cm, width 28cm, height 16cm	Current and Voltage Regulation Methods	Rotary Encoder
Warranty period	1 year	Maximum Charge Power	138w
Input voltage	220V	Maximum duration per charge/discharge cycle	90 hours
Charge voltage range	Adjustable from 7 to 23 volts, with 0.1-volt increments	Single-time standby power consumption	20w
Charge current	Adjustable from 0.5 to 6	Maximum Discharge	200w

range	amperes, with current adjustable in increments of 0.1 amperes.	Power (per channel)	
Charge current accuracy	±0.03A	Display language	Chinese/English
Discharge voltage range	Adjustable from 2 to 20 volts, with 0.1-volt increments	Number of charge and discharge channels	6
Discharge current range	Adjustable from 0.5 to 10 amperes, with 0.1-ampere increments	Discharge current accuracy	±0.03A
emperature Control / Cooling System	Continuously monitor the internal temperature during charging and discharging and adjust the fan speed accordingly.		

***Product application scope**

It is widely applied in fields such as battery testing and maintenance, and is used for charging and discharging tests and maintenance of electric vehicle batteries, energy storage batteries, and solar batteries, etc.

4.Product Appearance Diagram



Front

Back

①Display screen: Displays various parameters such as current, voltage, capacity, and time.

② Start/Stop button: Pressing it starts the operation. Pressing it again while the machine is running will pause the operation (any operation in the running state must be paused first).

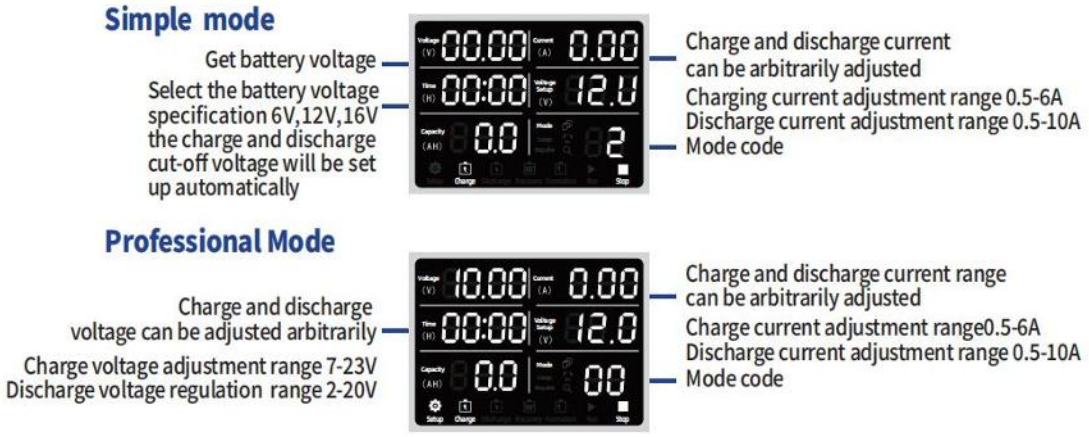
③ Switch/Settings button: Rotate to switch the working mode, and press to set parameters.

④ Channel On/Off button

⑤ Channel Output Port
⑥ Machine power cord interface

5.Operating Mode Descriptions

Note: This product features both Simple and Professional modes, with Simple mode activated by default upon start-up. Simply select the battery type from 6V/12V/16V, along with the charging and discharging currents. All other discharge parameters are automatically configured according to the battery's characteristics. Simple mode is suitable for novice users unfamiliar with battery specifications. Professional users may switch to Professional mode when higher precision is required. To switch modes: whilst the unit is inactive, press and hold the ‘set’ knob for 3 seconds, then release. Upon hearing a prolonged ‘beep’ alarm, the unit will enter Professional mode. In Professional mode, battery charging voltage, charging current, discharging voltage, and discharging current can be freely configured.

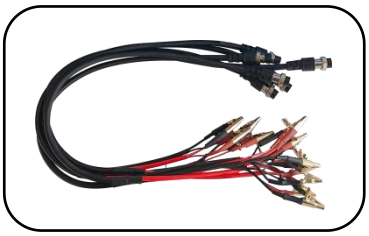


Mode Code	Mode function
00	Historical data query
01	Capacity test (discharge mode)
02	Charge mode
03	Start with discharge and end with charge, with a cycle count of 1-50 times
04	Start with charge and end with charge, with a cycle count of 1-50 times
05	Start with discharge and end with discharge, with a cycle count of 1-50 times
06	Start with charge and end with discharge, with a cycle count of 1-50 times
07	Network mode: When the computer starts up, it will automatically switch to this mode.
08	Pulse Repair Mode

09	Charge—>Pulse repair—>Discharge—>Charge

***Product List：**

Tester



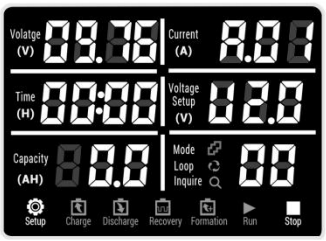
Testing clip

Power cord

6.Basic Operating Instructions

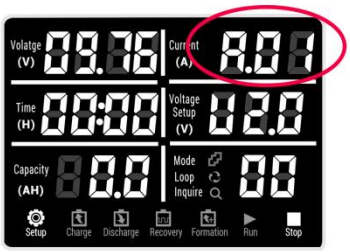
After connecting the power supply, select one or several channels to connect the battery, then press the start button. The current battery voltage will be displayed. Rotate the settings button to select the desired working mode and charging/discharging parameters. After setting, click "Start Working" to begin.

Mode 0 Query Mode



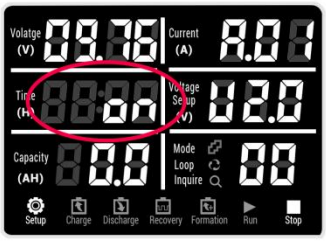
Press the black rotary knob until the mode indicator at the bottom right flashes. Rotate the knob to select mode "00", then press to confirm

1



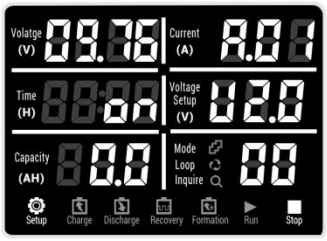
After the mode is set,Press and hold the setting knob until the current display "A.01" flashes (this sets the device address for networking)

2



Continue to press the setting knob and the time setting column “on”flashes(turn on or off the fan detection function,normally on by default)

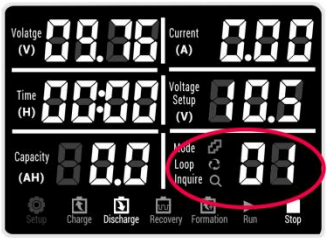
3



Continue to press the setting knob,the screen flashes again to the right to turn the black knob to see the record of historical data

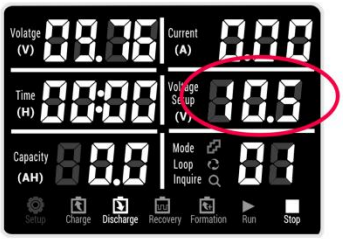
4

Mode 1 Discharge Mode



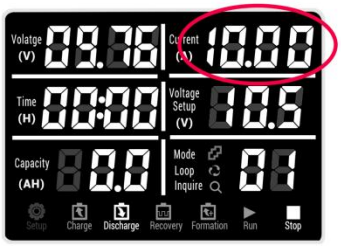
Press the black rotary knob,the mode selection bar at the button right flashes,and turn the black setting knob to set it to “01”mode.

1



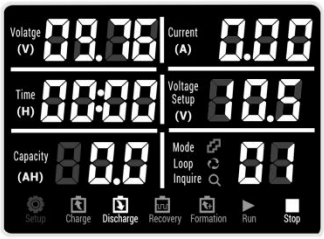
After the mode is set,press the voltage setting column of the setting knob to flash,and turn the black setting knob to set the discharge cut-off voltage.

2



After the mode is set,continue to press the black setting knob,the current bar flashes and turn the black setting knob to set the discharge current.

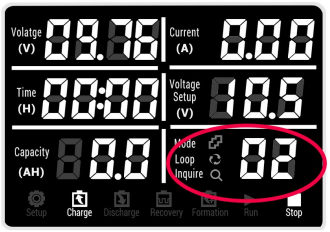
3



After setting the discharge current continue to press the black setting knob,and press the red starting knob after the current display 00.0is set.

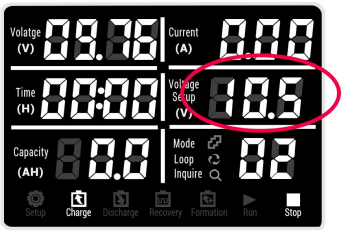
4

Mode 2 Charging Mode



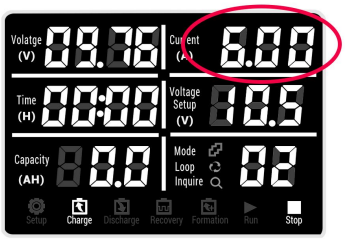
Press the black rotary knob,the mode selection bar at the button right flashes,and turn the black setting knob to set it to “02”mode.

1



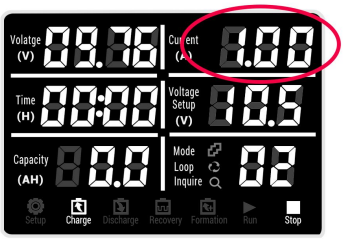
After the mode is set,press the voltage setting column of the setting knob on flash,and turn the black setting knob to set the charging cut-off voltage.

2



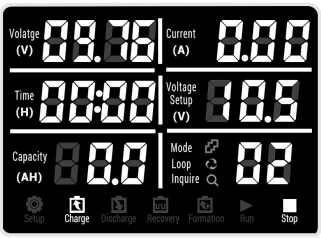
After the voltage is set,continue to press the black setting knob,the current bar flashes,and turn the black setting knob to set the charging current.

3



After setting the charging current,continue to press the black setting knob,the current bar display 1.00,and rotate the setting knob to select the cut-off current.

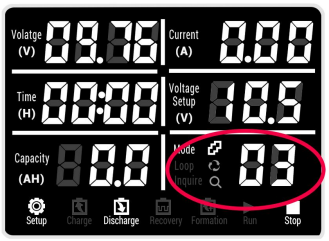
4



After the cut-off current is set,press the black setting knob again wait for the setting bar to stop flashes,when the current display 0.00 setting is completed,press the red starting knob.

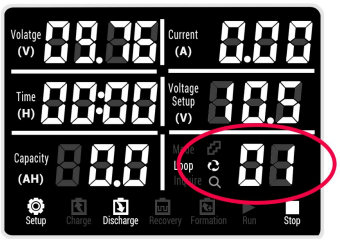
5

Mode 3 Cycle Test Dischargr-Charge



Press the black setting knob,the mode selection bar at the button right flashes,and turn the black setting knob to set it to “03”mode.

1

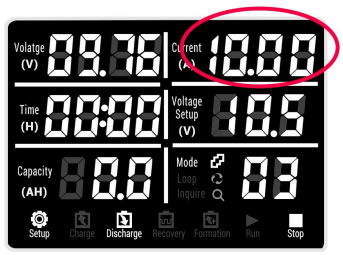


After the mode is set,press the cycle number at the button right of the setting knob to flash and rotate the black setting knob to select the number of cycles(0-50times)

2

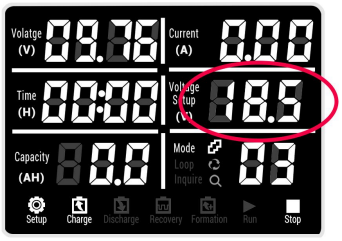
Press the voltage setting column of the black setting knob to flash,and turn the black setting knob to set the discharge cut-off voltage.

3



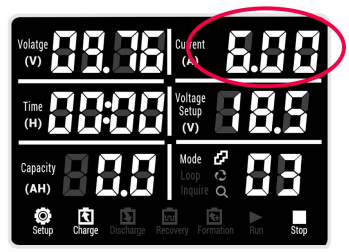
After the voltage is set,press the black setting knob,the current bar flashes,and turn the black setting knob to set the discharge current.

4



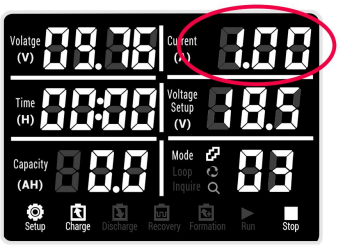
Press the black setting knob,the voltage column flashes,and turn the black knob to set the cut-off voltage for the second step of charging.

5



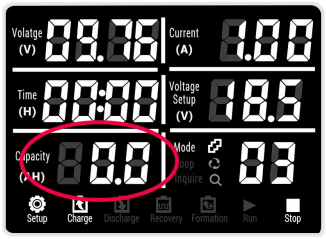
After the charging cut-off voltage is set,press the black setting knob,and the current bar flashes and rotates the black setting knob to set the charging current.

6



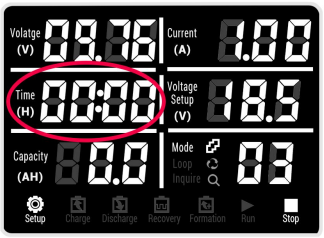
After setting the charging current,press the black setting knob to display “1.00”and turn the black setting knob to select the charging cut-off current.

7



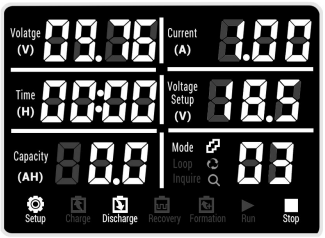
After the charging cut-off current is set,the accumulated capacity display “00.0”and rotates the black setting knob to set the charging capacity in the second step leave it at "00.0" to skip this setting. If a charging capacity limit is required, it must be set lower than the battery's nominal capacity.

8



After setting the charging capacity,press the black setting knob,and the time display “00.00”sets the rest time in the charging and discharging interval.

9



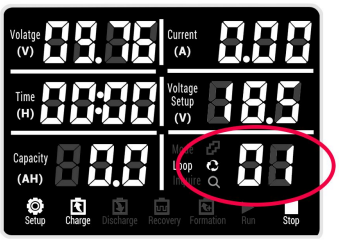
After the setting is completed,press the red start knob,Press the red Start button to begin the automatic Discharge-Charge cycle

10

Mode 4 Charge -Discharge-Charge

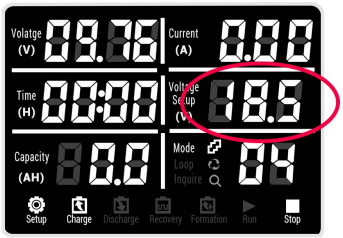
Press the black setting knob,the mode selection bar at the button right flashes,and turn the black setting knob to set it to “04”mode.

1



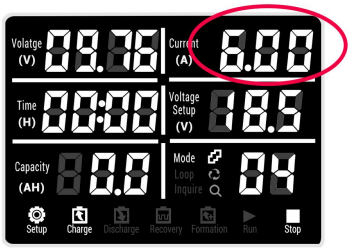
After the mode is set,press the cycle number at the button right of the setting knob to flash and rotate the black setting knob to select the number of cycle(1-50times)

2



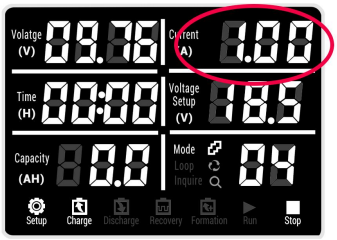
Press the voltage setting column of the black setting knob to flash,and turn the black setting knob to set the charging cut-off voltage.

3



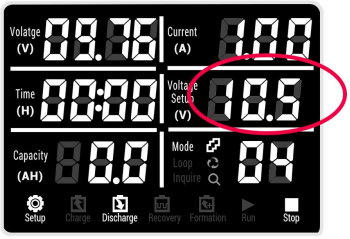
After the voltage is set,press the black setting knob,the current bar flashes,and turn the black setting knob to set the charging current.

4



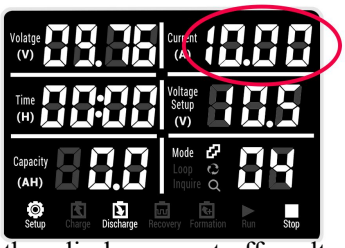
After setting the charging current,press the black setting knob to display “1.00”and turn the black setting knob to select the charging cut-off current.

5



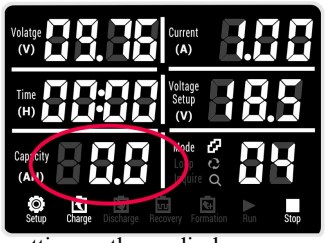
After the cut-off current is set,press the black setting knob,the voltage bar will flash,and turn the black knob to set the cut-off voltage of the second step discharge.

6



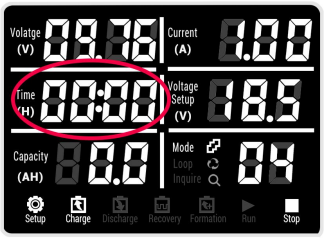
After the discharge cut-off voltage is set,press the black setting knob,and the current bar flashes and rotates the black setting knob to set the discharge current.

7



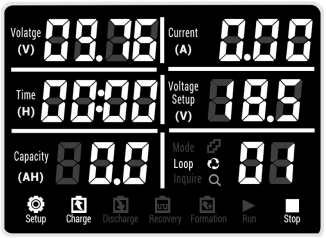
After setting the discharge current,the accumulated capacity display “00.0”and rotates the black setting knob to leave it at "00.0" to skip this setting. If a charging capacity limit is required, it must be set lower than the battery's nominal capacity

8



After setting the charging capacity,press the black setting knob,and the time display “00.0”setting the rest time in the charging and discharging interval.

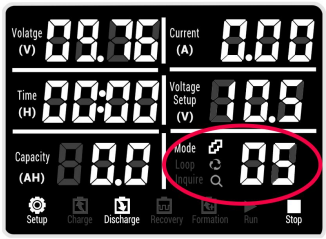
9



After the setting is completed,press the red start knob,Press the red Start button to begin the automatic charging--discharging--charging.

10

Mode 5 Cycle Test Discharge-Charge

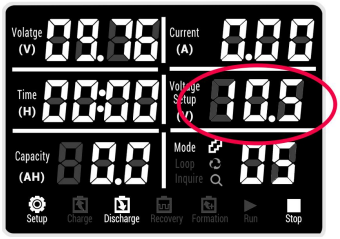


Press the black setting knob,the mode selection bar at the bottom right flashes,and turn the black setting knob to set it to “05”mode.

1

After the mode is set,press the cycle number at the bottom right of the setting knob to flash and rotate the black setting knob to select the number of cycles(1-50times)

2



Press the voltage setting column of the black setting knob to flash,and turn the black setting knob to set the discharge cut-off voltage.

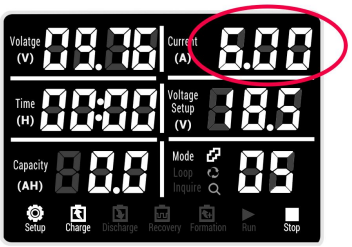
3

After the voltage is set,press the black setting knob,the current bar flashes,and turn the black setting knob to set the discharge current.

4

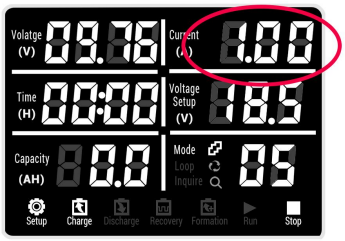
Press the black setting knob,the voltage column flashes,and turn the black knob to set the cut-off voltage for the second step of charging.

5



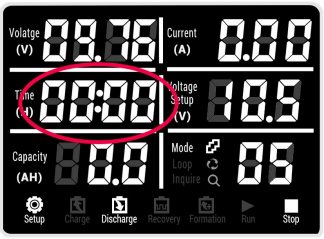
After the charging cut-off voltage is set,press the black setting knob,and the current bar will flash and rotate the black setting knob to set the charging current.

6



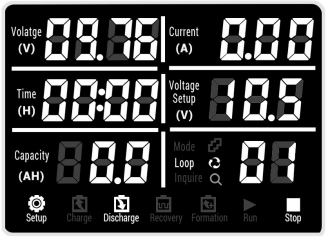
After setting the charging current,press the black setting knob to display “1.00”and turn the black setting knob to select the charging cut-off current.

7



After setting the charging cut-off current,press the black setting knob,and the time display “00:00”sets the rest time in the charging and discharging interval.

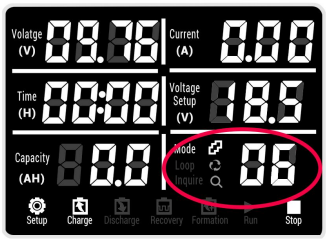
8



After the setting is completed,press the red start knob,set automatic jump step discharge--charge--discharge.

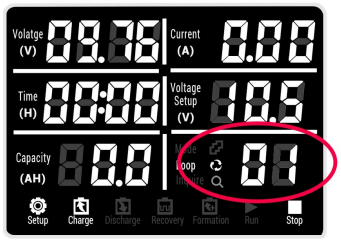
9

Mode 6 Cycle Test Charge-Discharge



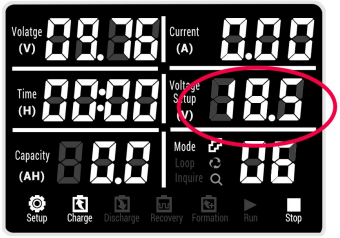
Press the black setting knob,the mode selection bar at the bottom right flashes,and turn the black setting knob to set it to :06"mode.

1



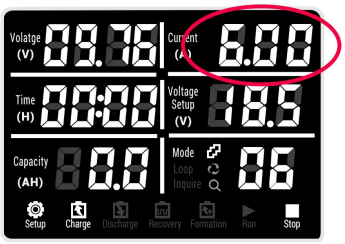
After the mode is set,press the cycle number at the bottom right of the setting knob to flash and rotate the black setting knob to select the number of cycles(1-50times)

2



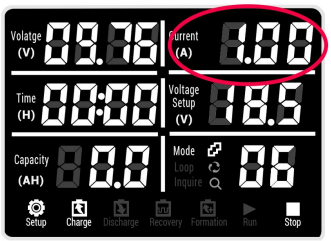
Press the voltage setting column of the black setting knob to flash,and turn the black setting knob to set the charging cut-off voltage.

3



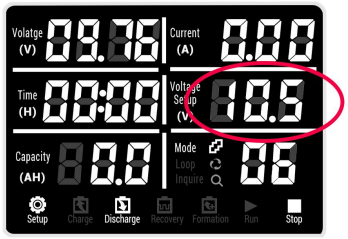
After the voltage is set,press the black setting knob,the current bar flashes,and turn the black setting knob to set the charging current.

4



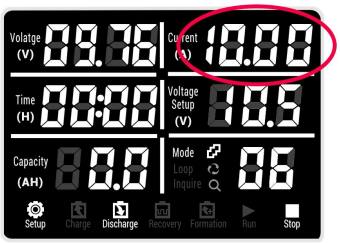
After setting the charging current,press the black setting knob to display "1.00"and turn the black setting knob to select the charging cut-off current.

5



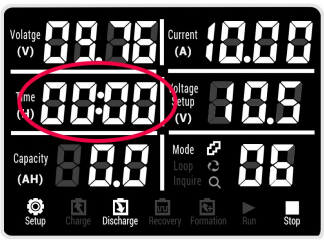
After the cut-off current is set,press the black setting knob,the volatge bar will flash,and turn the black setting knob to set the cut-off voltage of the second discharge

6



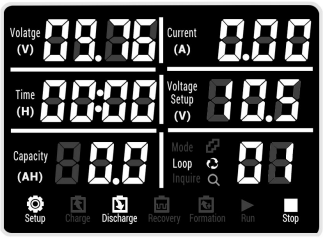
After the discharge cut-off voltage is set,press the black setting knob,and the current bar flashes and rotate the black setting knob to set the discharge current.

7



After setting the discharge current,press the black setting knob,and the time display "00:00"sets the time in the charge and discharge interval.

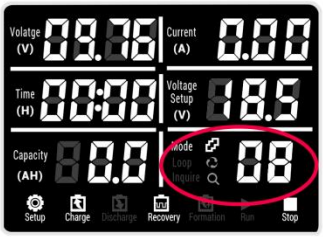
8



After the setting is completed,press the red start knob,set automatic jump step charging--discharging.

9

Mode 8 Pulse Repair

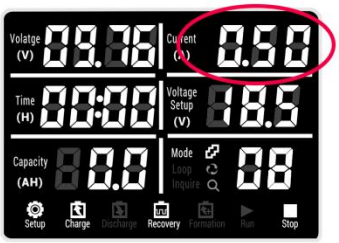


Press the black setting knob,the mode selection bar at the bottom right flashes,and rotate the black setting knob to set it to “08”mode.

1

Press the voltage setting column of the black setting knob to flash,and turn the black setting knob to set the charging cut-off voltage.

2

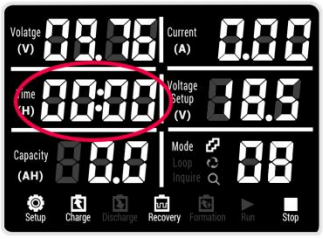


After the voltage is set,press the black setting knob,the current bar flashes,and turn the black setting knob to set the pulse charging current.

3

After setting the charging current,press the black setting knob to display “00:00”and turn the black setting knob to set the pulse repair time.

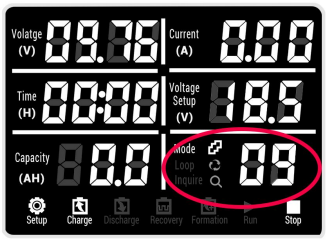
4



After the setting is completed,press the red start knob,Press the red Start button to begin the automatic pulse repair.

5

Mode 9 Charge-Pulse Repair-Discharge-Charge

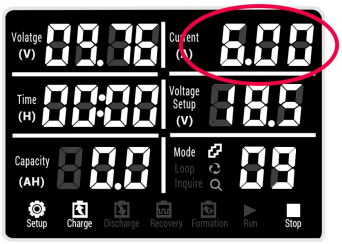


Press the black setting knob,the mode selection bar at the bottom right flashes,and turn the black setting knob to set it to “09”mode.

1

Press the voltage setting column of the black setting knob to flash,and turn the black setting knob to set the charging cut-off voltage.

2

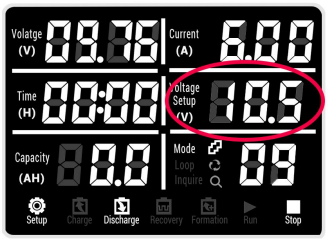


After the voltage is set,press the black setting knob,the current bar flashes,and turn the black setting knob to set the charging current.

3

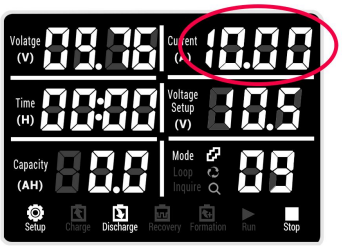
After setting the charging current,press the black setting knob display “1.00”and tuen the black setting knob to select the charging cut-off current.

4



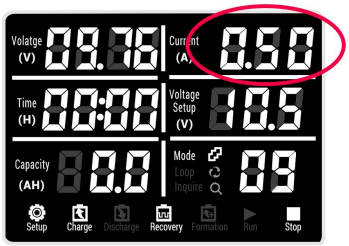
After the cut-off current is set,press the black setting knob,the voltage bar will flash,and turn the black setting knob to set the cue-off voltage of the second discharge.

5



After the discharge cut-off voltage is set,press the black setting knob,and the current bar flashes and rotates the black setting knob to set the discharge current.

6

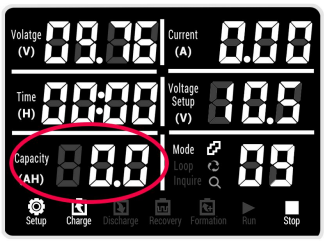


After setting the discharge current,press the black setting knob to enter the second step,and the pulse repair current display “0.50”to set the pulse current.

7

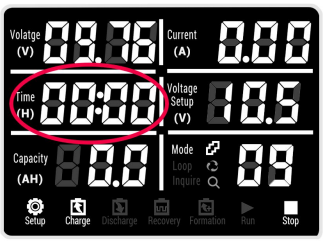
After setting the pulse current,press the black setting knob,and the time display “12:00”rotates the black setting knob to set the pulse repair time.

8



After setting the pulse repair time,press the black setting knob,the accumulated capacity display “00.0”rotate the black setting knob,and set the third step charging capacity to keep :00.0”as direct charging.if it is necessary to set the charging capacity,the setting capacity muse be less than the normal capacity.

9



After setting the charging capacity,press the black setting knob,and the accumulated time “00:00”sets the rest time in the charging and discharging interval.

10

The setting is completed by pressing the red start knob,set automatic jump work to complete charging--pulse repair--discharging--charging.

11

7.General advice

① The capacity test effect is related to time and speed. The higher the discharge current, the greater the capacity loss (Peukert effect). It is recommended to set a smaller discharge current value to improve the test accuracy.

② No capacity tester can accurately test damaged batteries. Battery damage includes but is not limited to the following aspects: a. Increased internal resistance of the battery; b. Battery terminal voltage lower than the discharge termination voltage; c. Internal short circuit or open circuit of the battery.

③ Please read the user manual of the instrument in detail. If you encounter any technical issues, please contact the customer service hotline immediately.

Safety Instructions:

Connect the battery with the correct polarity and maintain a good connection.

Keep away from flammable and explosive items that are in use, and store them in a cool and well-ventilated place. Do not block the air intake and exhaust ports.

Please store, use and transport properly. Avoid vigorous actions such as collisions during use and transportation.

Encounter a problem	Reason	Solution
After the power is turned on, the display does not light up.	1. Check if the power plug is properly connected to the socket. 2. The fuse of the power socket has blown. 3. The fuse of the internal circuit board of the instrument has blown. 4. The connection line between the display screen and the mainboard is loose. 5. The switching power supply is not working properly.	1. Reinsert the power plug 2. Replace with a 5A fuse 3. Replace with a 1.5A fuse 4. Secure the connection wires 5. Return to the factory for repair or replacement of the motherboard
After the power is turned on, the display lights up but shows no content.	1. The connection line between the display screen and the motherboard is loose. 2. The display screen is broken. 3. There is a problem with the communication on the circuit board.	1. Secure the connection cables. 2. Replace the display screen. 3. Return to the factory for repair or replacement of the motherboard.
Rotary encoder malfunction.	1. Loose connection cable between knob and main board 2. Knob pressed too tightly or too deeply, preventing reset 3. Encoder damaged	1. Reconnect the Ribbon cable 2. Remove and reinstall it 3. Replace the setting knob
The equipment is making abnormal noises.	1. Foreign object present within the fan 2. Equipment fan is damaged	1. Open the case and remove any foreign objects 2. It is advisable to replace the fan
No voltage displayed after connecting the battery	1. Poor contact in the battery connection cable 2. Damage to the battery connection cable 3. The microcontroller is unable to detect voltage	1. Check whether the connection is securely inserted or properly connected 2. Reinsert or replace the connecting cable 3. Return to the factory for repair or replace the motherboard
The charging process cannot be carried out after the start button is pressed.	1. Microcontroller fails to detect current or switching	1. Return to factory for repair or motherboard

Encounter a problem	Reason	Solution
	power supply is faulty 2. Loose connection cables 3. Start button is damaged	replacement 2. Ensure all cables are securely connected 3. Replace the power button

8.Software Usage Instructions

*Battery testing can be conducted through the PC Software 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 to 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 select Public Network when prompted by the firewall.

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.

Important Notes:

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.

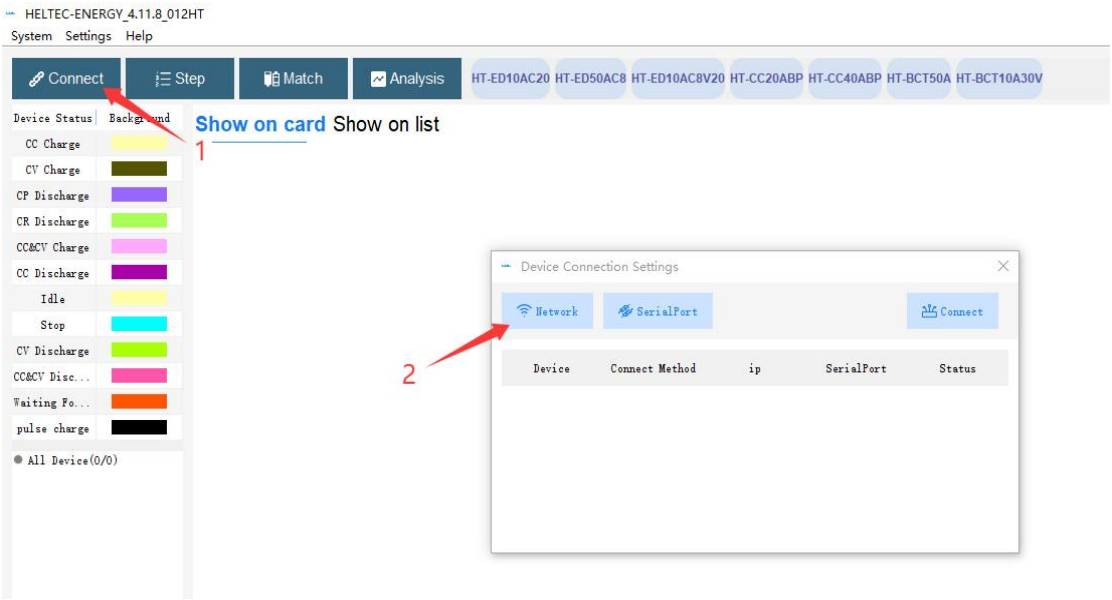
Solution:

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.

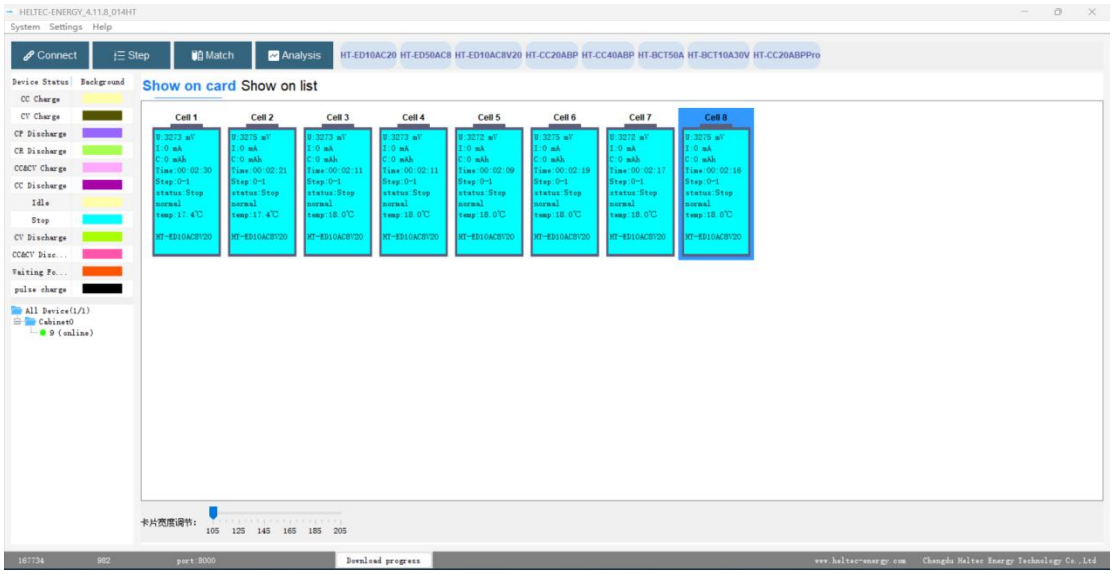
You may download the PC Software software via the QR code or contact customer service for the software link.

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.

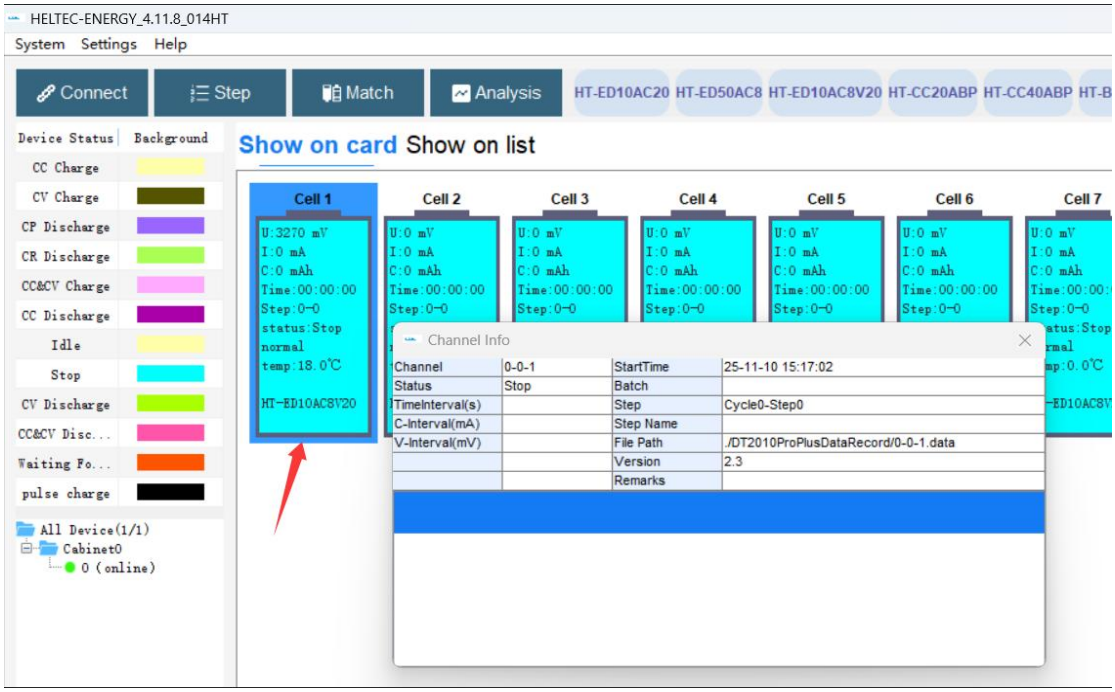
2)



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.



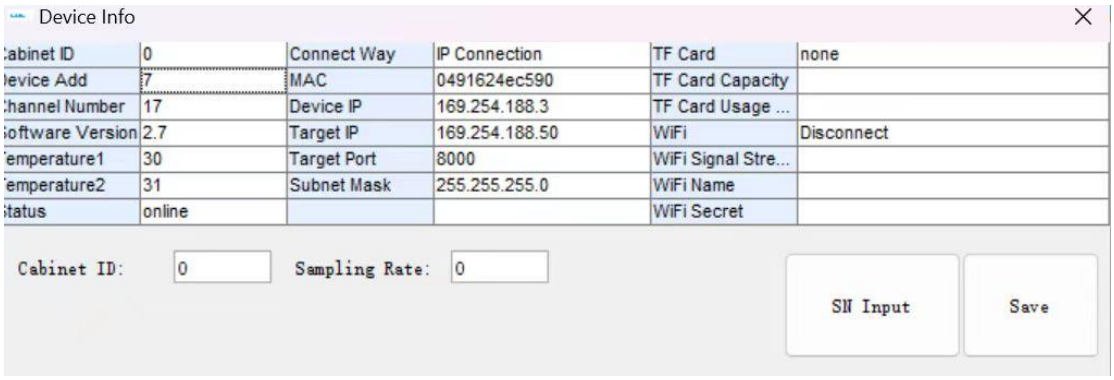
The device information displays a list of devices, indicating the connection status and connection number of the devices connected to the software. By double-clicking a device, you can view detailed device settings information.



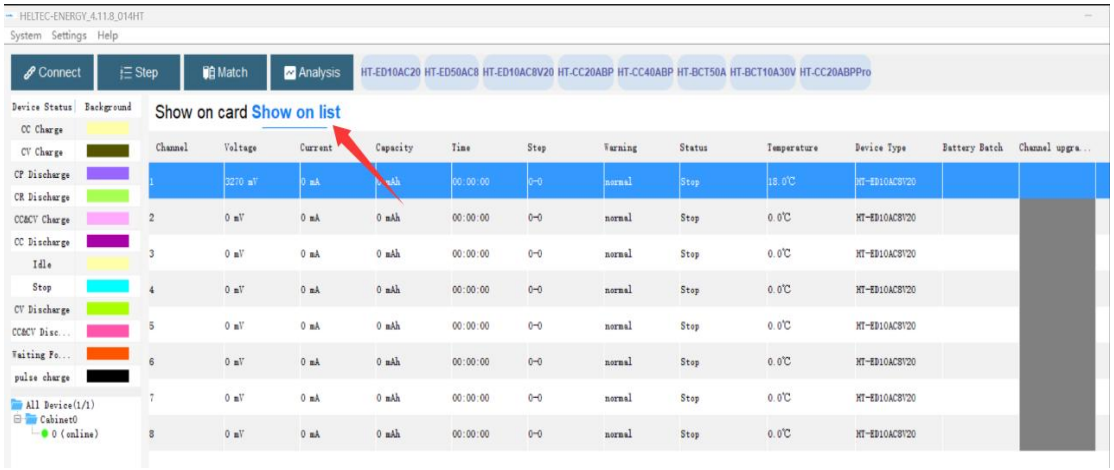
Cabinet number, equipment number, and equipment path number constitute the basic information of the equipment.

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 flexible arrangement of cabinet

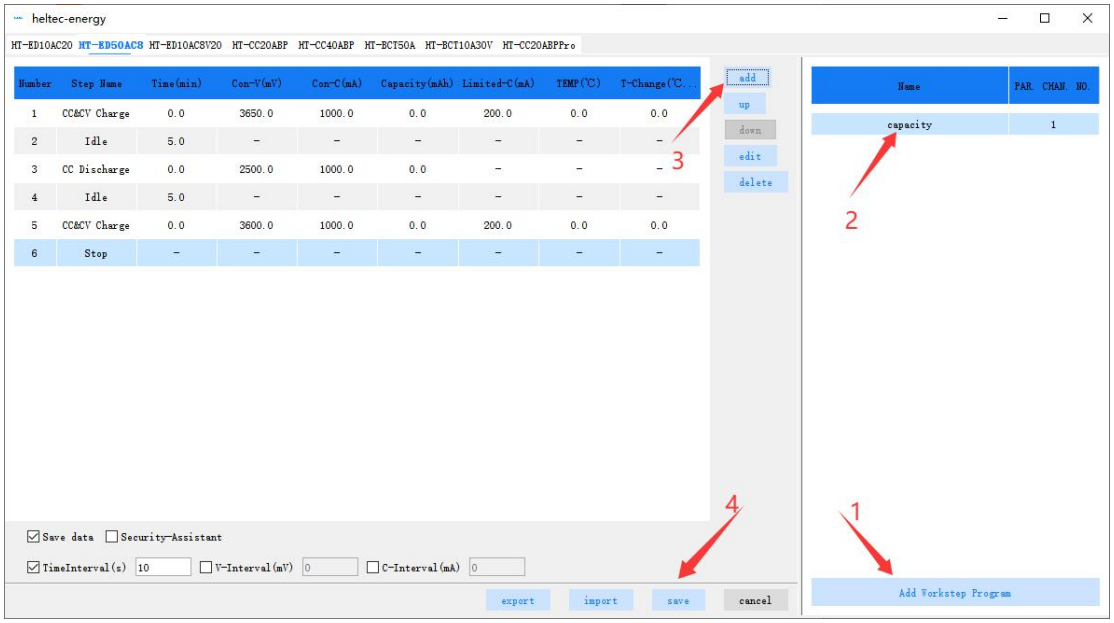
sequence numbers during on-site wiring of cabinet-type devices. Sampling rate: indicates the frequency of data collection and upload by the device.



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



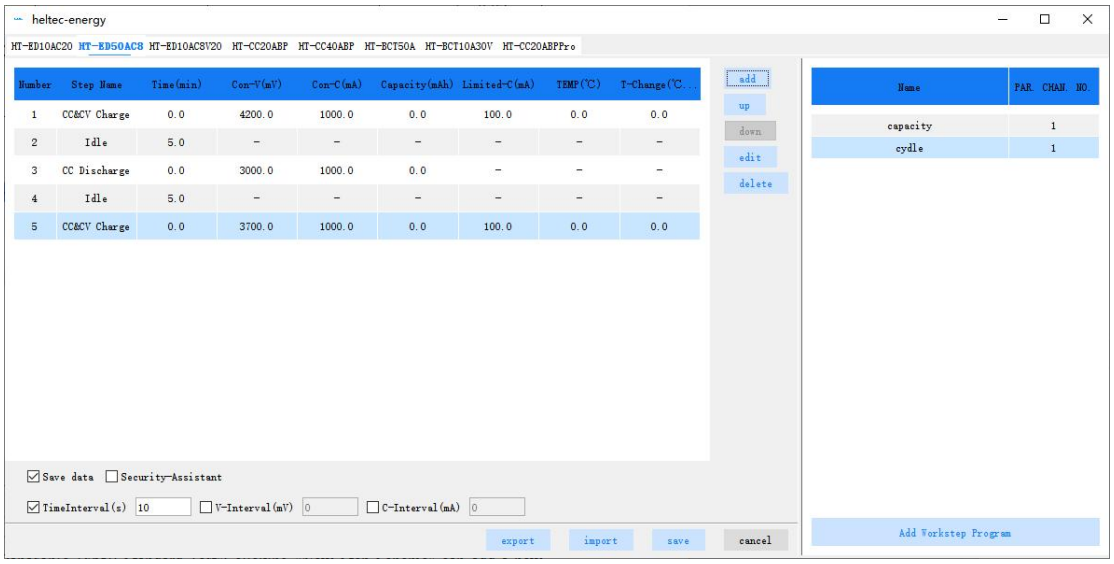
Click the "Step Sets" button in the top left corner to enter the step sets interface. First, create a new step by naming it. After creation, click on the name of the newly created step to edit it. Then, click "Add Step" to set charge and discharge parameters, cycles, etc. Note that you need to set the 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.

4) **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 descriptive names can be saved for easy identification, 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.

Move Steps: 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 step types:

@Constant current charging: Maximum voltage limit, constant current, and voltage return difference must be set. It is designed for Ni-Cd 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

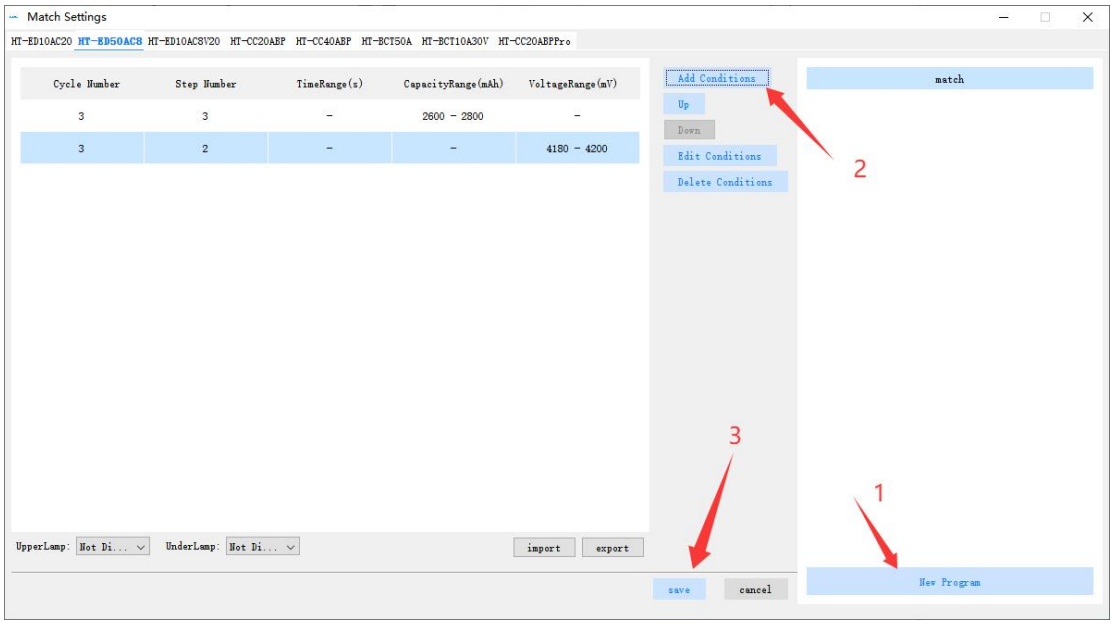
@Stop: No need to set parameters

Matching Conditions:

The Grading Scheme 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 2650mAh nominal 18650 battery is : 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:

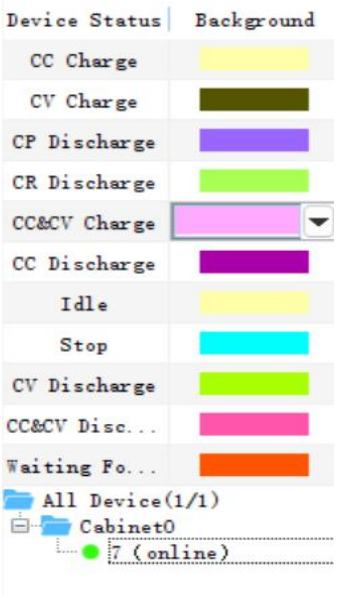
(1) When you need to save test data to your computer, please check this item; otherwise, the data will not be stored. There are 3 conditions to choose from for the storage rules on the computer.

(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.

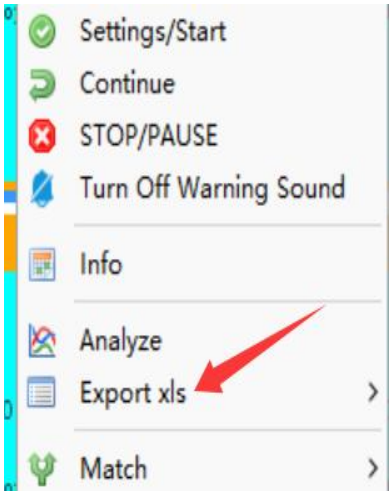
(3) Voltage Interval: Set the voltage difference condition for data saving. If set to 100, it indicates that the system will automatically store data once in the channel record file when the voltage changes from 3700mv to 3800mv. If the voltage changes from 3700mv to 3600mv, the storage action can also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

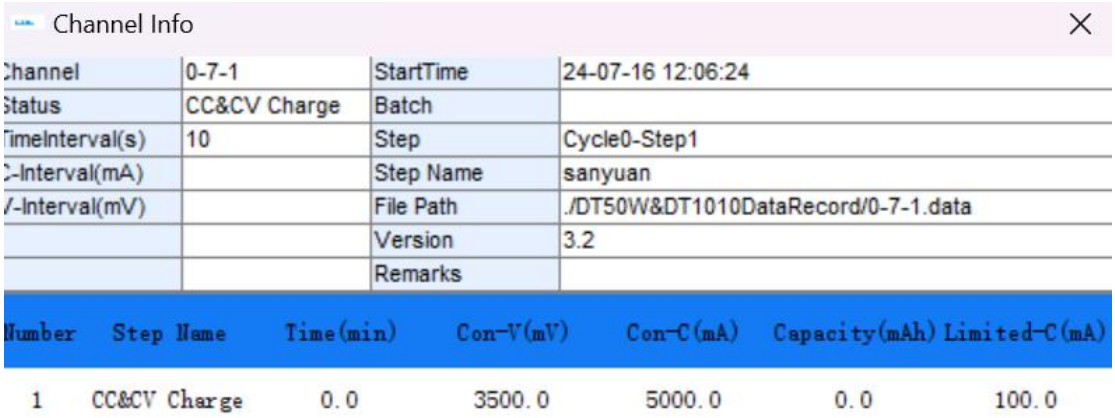
Select the name of the work step plan and click "Confirm"; for battery batch number and remarks, you can fill in some necessary test information here for

2)Restore, stop

(1) Restore (when connected to the PC Software): 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 disabled.

(2) Stop: If you want to temporarily stop the operation (for example, if you need to leave the device unattended), 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.

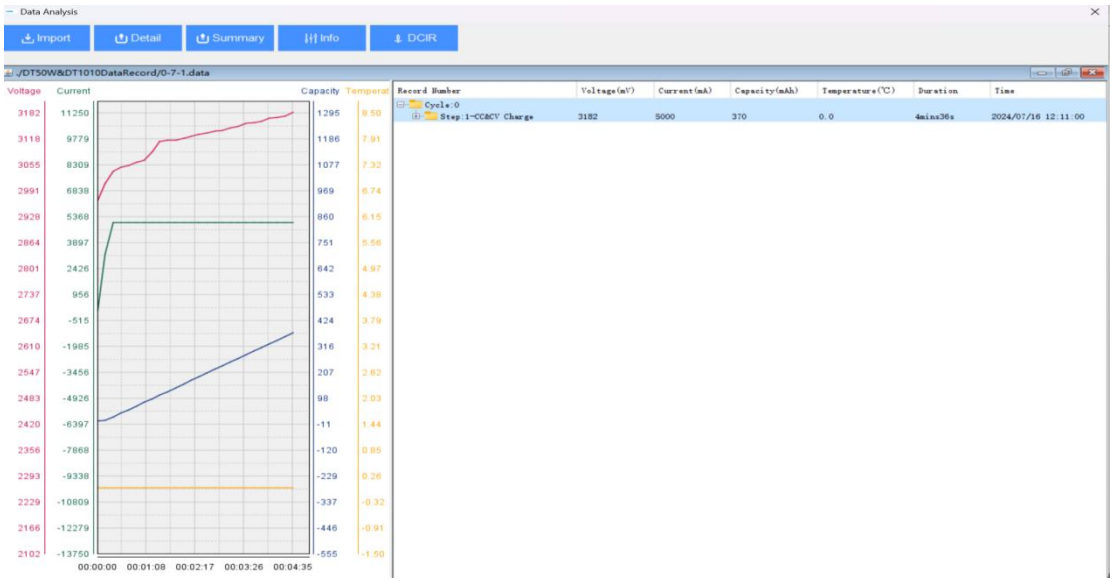
Time interval, voltage interval, current interval: These indicate the parameter settings for saving data in this channel.

Data file path: Refers to the absolute path of the data record file for this channel.

Firmware 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.

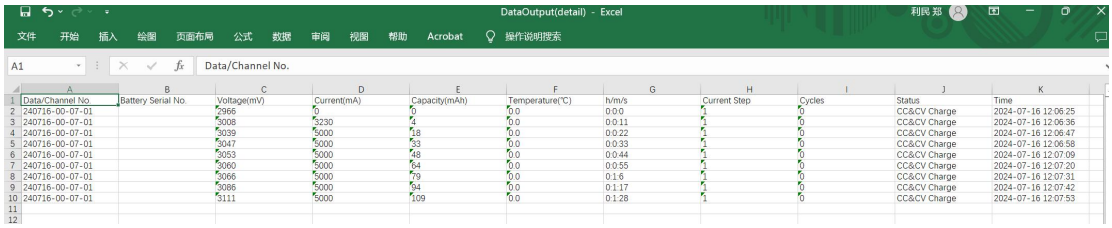


Data analysis software support functions:

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: Damage caused by misuse, self-disassembly, modification and repair, use not in accordance with the instructions, and damage caused by force majeure 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.

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