User Manual

C2 USB Tester User Manual

High-performance USB tester

Ver	Date	Change log
V1.6	2026/04/27	1.The return key is described in the firmware upgrade for adding the DFU function.
V1.7	2026/06/08	1. Automatic detection and triggering entry options have been adjusted, adding PD type and supercapacitor enable switch in addition to the selected Emarker simulation type.
V1.7	2026/06/26	1.Add the description of using the Kelvin kit and explain how to turn off the backlight in the settings.

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Thank you for purchasing this product. To help you fully understand the product features and operation methods, we recommend reading this manual carefully before use.

Important Notes (Mandatory Reading)

1, When using the fast charge trigger function (AUTO or MANUAL), please do not connect to any other devices (such as computer, mobile phone, etc.), otherwise the high voltage may damage your device, and our company will not be responsible!!!

Note: Except for the Type C PC interface on the side opposite the keys, all other interfaces are approximately connected in parallel. If any interface has high voltage, all interfaces will output high voltage. At this time, if there are any electrical devices connected, they may be burned out!!! Do not connect them randomly!!!

2, The input voltage of the Type-C power input/output measurement port shall not exceed 48V

3, The input voltage of the USB Type-C interface connected to the PC shall not exceed 5.5V.

4, The C2 tester will generate a certain amount of heat during high-power measurement, which is a normal phenomenon.

5, The key is a side key.Please do not press it hard to avoid damaging the key.

6, After enabling the power bank mode, the dummy load may cause intermittent changes in the monitored voltage/current, which is a normal phenomenon.

7, Some fast charging adapters/power banks may stop supplying power when the load current is low (approximately <100mA). In this case, you can use the C2's power bank mode to provide a dummy load to maintain power supply.

8, If the tester is only connected to a C-port charger at the front stage and no electrical device with C-line pull-down at the rear stage, it will not power on. To power on in this way, long-press the right button. If long-pressing fails to power on when the female port is used as the front stage, flip the CC line and try long-pressing the right button again to power on.

1, Characteristic

The C2 Multi-Functional USB Tester is a high-performance USB tester newly launched by Guangzhou Starwing Electronic Technology Co., Ltd. (ALIENTEK). The main features of this product are as follows:

- 2 straight-through TYPE C USB3.0 male and female measurement ports, more user-friendly for fast charging measurement.
- High measurement accuracy, equipped with high-precision alloy sampling resistors and 16/20-bit ADC chips, with a maximum sampling rate of 1KSPS.
- High power capacity, with high-conductivity copper interface ports, supporting an input voltage of 3.6 ~ 48V and a maximum current of 7A[1]

- Rich functions, supporting detection and triggering of various fast charging protocols such as PD/QC/SCP/UFCS, as well as ripple measurement, line resistance measurement, data logging, PC-side PD packet capture, wire core identification, Apple charger SN reading, etc.
- Exquisite display, with a 1.54-inch 240*240 high-definition IPS large screen for richer display content.
- Support for 3D gravity direction sensing.
- Compact size, CNC integrated shell, exquisite and beautiful, easy to carry.
- Powerful PC software, supporting cross-platform use. The subsequent Bluetooth version supports mobile phone Bluetooth APP.

Detailed Specification Parameters of C2 Multi-Functional USB Tester：

Item	illustrate
Basic Parameters	Model：ATK-PTC2 Pro Screen Size：1.54-inch IPS HD large screen LCD Resolution：240*240 Product Size：37.5mm*35mm*9.2mm Net Weight：17.5g
Interface Features	TYPE C IN/OUT：7A，supports USB3.0 TYPE C USB PC：Only for communication with PC, no measurement function
Measurement System	ADC Resolution：20bit [1] Sampling Resistor：High-precision alloy resistor Measurement Speed：1Khz（Max）[2] Voltage Range：0～48V Current Range：0～7A
Fast Charging Protocols	BC1.2 detection QC2.0, QC3.0 detection and triggering QC4+, QC5.0 detection PD2.0, PD3.0, PD3.1, PD3.2 detection and triggering Huawei FCP, SCP detection and triggering Samsung AFC detection and triggering MTK PE detection VOOC, SVOOC detection VIVO VFCP detection and triggering APPLE 2.4A detection UFCS Universal Fast Charging detection and triggering Xiaomi proprietary PD detection and triggering
Tools	Line resistance measurement. E-Marker cable reding. Apple charger SN code reading.
Ripple	Supports a maximum sampling rate of 2M for measuring charger ripple and evaluating charger performance.

Data Record	Logging Points: 10,000 points, supporting a maximum of 2 groups of data logging. Logging Speed (Local): 0.1Sa/S, 0.5Sa/S, 1Sa/S, 5Sa/S, etc. Logging Speed (PC-side): 2Sa/S, 200Sa/S, 500Sa/S, 1000Sa/S, etc . Logging Start /Stop Threshold: Configurable (Local). Logging Mode: Manual, Threshold Auto.
PC Software	WinUSB driver-free design (Windows 7 and above), plug and play Rich functions, enabling full function control and measurement of the tester. Excellent interactive experience, easy to use Real-time curve drawing (Voltage, Current, Power, Energy, Resistance, D+/D-, CC1/CC2) Programmable maximum acquisition speed of 1000 times/second[3] Supports PC-side PD packet capture with millions of PD packets supported, comparable to professional PD packet capture devices Supports online data logging and storage (unlimited points) Supports offline data reading and curve drawing Supports firmware upgrade Supports log function Supports multi-platform: Windows, MAC, Ubuntu
Other Functions	Supports 360° gravity sensing to set screen display direction for different usage scenarios Supports power bank mode Screen dimming sleep Bluetooth function(not include lite ver)

Note 1: This speed can only be achieved in PC online mode with data acquisition and logging by the PC software。

Note 2: The maximum 1KSa/S logging speed can be achieved in PC online logging mode。

2, Quick Start

2.1 Preparation

Before using the C2 multi-functional USB tester, in addition to familiarizing yourself with the human-machine interaction method of the tester through the following two section s, some necessary preparations are also required:

(1) When using it simultaneously with the host computer, you need to download the C2 multi-functional USB tester data package. It contains configuration software. The download link is as follows.：http://www.openedv.com/docs/tool/USB/C2.html
(2) Read the subsequent content carefully for first-time use.

2.2 Appearance Description

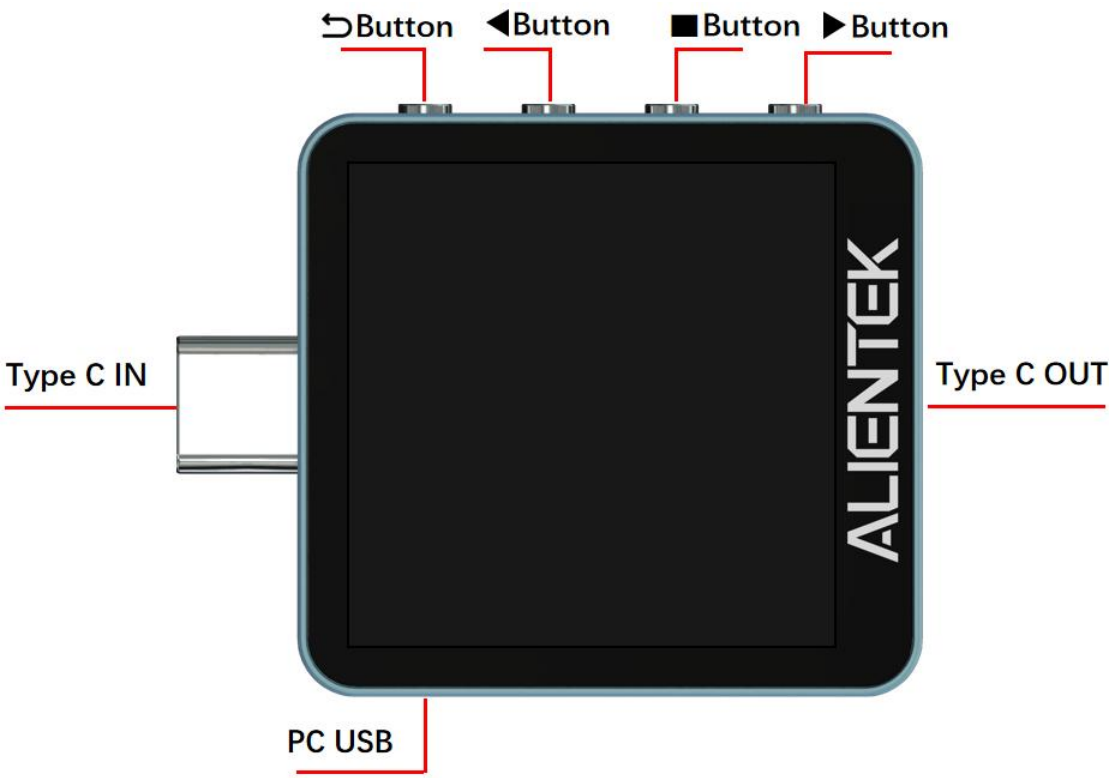


Figure 2.0 C2 Multifunctional USB Tester Appearance Diagram

Type C IN Interface：TYPE C USB3.0 input interface, maximum 7A current input.

Type C OUT Interface：TYPE C USB3.0 output interface, maximum 7A current output
PC USB Interface：Communication interface between the device and PC (Winusb communication)

2.3 Button Functions

◀ Button， Short press：left/up navigation. Long press：continuous decrease
■ Button， Short press：confirm/select. Long press：Different
▶ Button， Short press：right/down navigation. Long press：continuous increase
↩ Button， Short press：return to previous level. Long press：Different

The human-computer interaction of the C2 Multi-Functional USB Tester is realized via buttons. ◀ The Left Button / ▶ The right Button can switch interfaces or select options. ■ The middle button is for confirmation with different functions in different interfaces； ↩ the return button can return to the upper menu with a short press.

Note: The ↩ key serves as the DFU key during firmware upgrade. The ▶ key also functions as the incoming call key when only the CC line is connected and the device is turned on by an incoming call.

2.4 Function Description

2.4.1 Main interface

After the tester is powered on, it will default to the main interface. The main interface consists of 6 functional options: basic measurement, ripple measurement, data recording, protocol, tools, and settings.As shown in Figure 2.2：

Figure 2.1 Main interface

Short press: ◄ button, Switch function icons.
Short press: ■ button, Enter the selected function.
Short press: ► button, Switch function icons.

2.4.2 Basic Measurement Interface

The basic measurement interface displays the most basic measurement parameters, including voltage, current, power, etc. (see Figure 2.2).

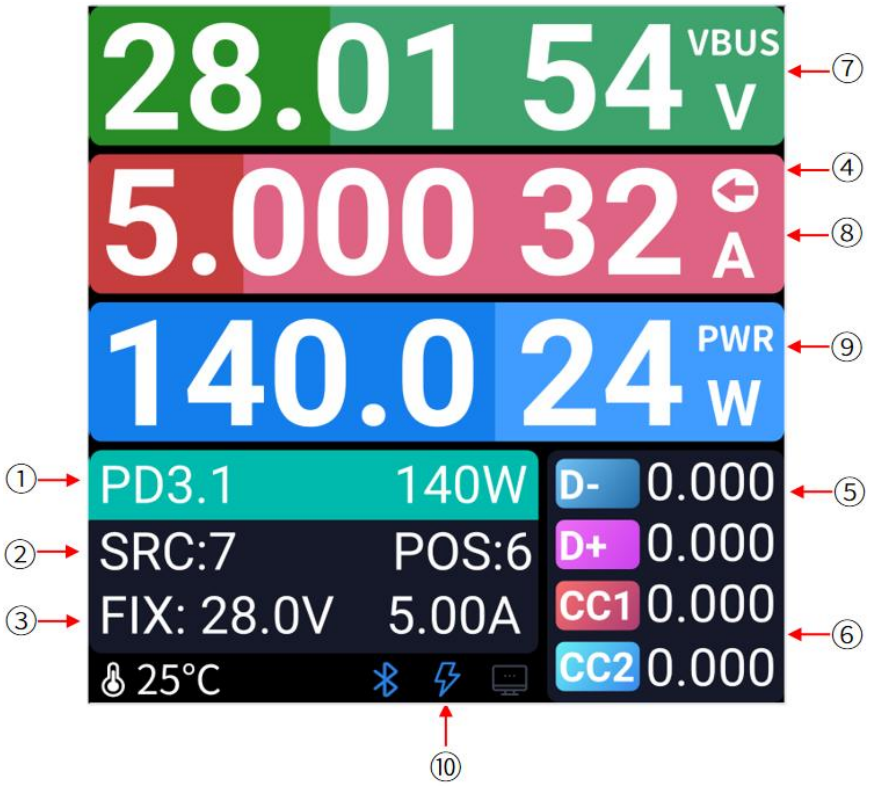


Figure 2.2 Basic Measurement Interface

Interface Overview:

①, Fast charging protocol type and total power monitored (displayed as Protocols if none) [2]

②, Total gear/Current requested gear index of the fast charging power supply voltage monitored (displayed as --NA-- if none)

③, Type and voltage/current information of the current requested gear (displayed as --NA-- if none)

④, Current direction indicator: Forward (input to output) →. Reverse (output to input) ←.

⑤, Measured USB D+/D- voltage value (Unit: V)

⑥, Measured USB C1/C2 voltage value (Unit: V)

⑦, Real-time monitored voltage (Unit: V)

⑧, Real-time monitored current (Unit: A)

⑨, Real-time monitored power (Unit: W)

⑩, Dummy load enable icon, BLE icon etc

Note 1: Due to the variety of fast charging protocols and similar characteristics of some protocols, there may be a certain probability of misjudgment or non-identification of the monitored fast charging protocol. The overall judgment accuracy is approximately: PD > QC2 > QC3 > BC1.2 > APPLE 2.4A > VOOC > FCP > SCP > AFC > VFCP > UFCS.

Operation Instructions:

Short press: ◄ button, Switch screen direction when gravity sensing is disabled

Long press: ◄ button, Lock/unlock screen direction. When the lock icon is displayed, the screen direction cannot be switched manually or by gravity sensing.

Short press: ■ button, View PD PDO quick message if PD power supply packets are available. The green-selected part in the PD PDO quick message represents the currently used gear.

Short press: ► button, Switch upload frequency

Short press: ⮌ button, Return to previous level

2.4.3 Ripple Measurement Interface

The waveform display interface shows the ripple magnitude corresponding to the voltage gear of the current device, and the ripple frequency (to be implemented) (see Figure 2.3).

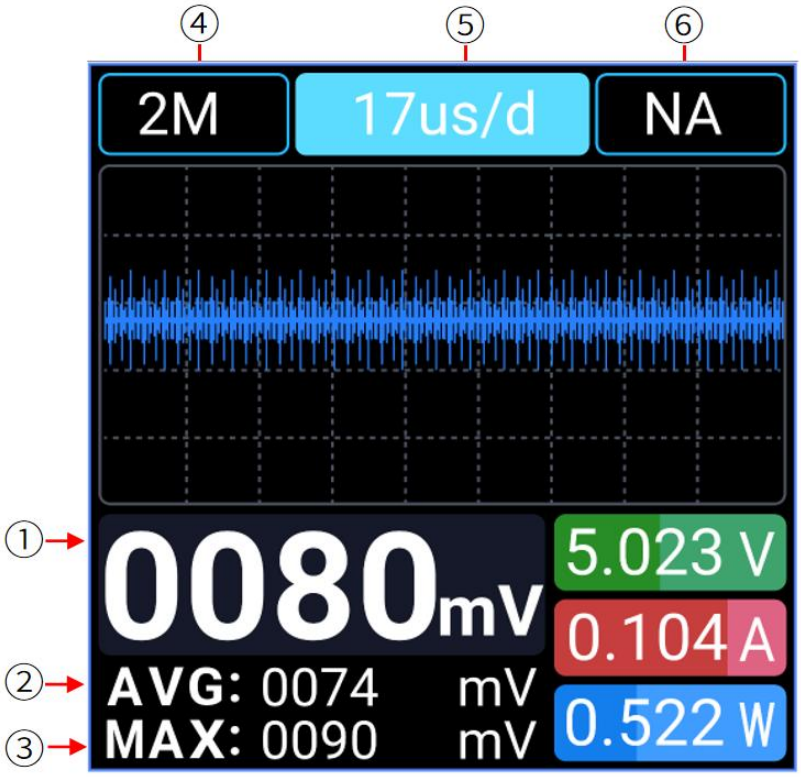


Figure 2.3 Ripple Measurement Interface

Interface Overview:

①, Real-time voltage ripple value under the current sampling rate

②, Average voltage ripple value under the current sampling rate

③, Maximum voltage ripple value under the current sampling rate

④, Sampling rate for the current monitored voltage ripple

⑤, Time scale (e.g. 17uS/div)

⑥, Ripple cycle frequency of the monitored voltage under the current sampling rate (to be implemented)

Operation Instructions:

Short press: ◀ button, Switch ADC sampling rate
Short press: ■ button, Pause waveform display
Short press: ▶ button, Switch ADC sampling rate
Short press: ↩ button, Return to previous level

2.4.4 Data Logging Interface

The data logging interface is used for offline logging of the electric quantity/energy flowing from the power supply to the device, supporting a maximum of 2 groups of data logging (see Figure 2.4).

Figure 2.4 Data Logging Interface

Interface Overview:

①, Current logging group
②, Start/Pause/Full stop icon
③, Maximum /AVG current and power logged in the current group
④, Real-time monitored voltage, current and power
⑤, Logging time of the current group
⑥, Energy (Wh) logged in the current group

⑦, Capacity (Ah) logged in the current group
⑧, Logging point progress bar (turns fully red when full)
⑨, Start and pause conditions of the logging group

The tester counts data every 50ms in data logging mode. A faster counting interval can be achieved via the PC software.。

The offline data logging time-segment curve can only be viewed by importing data to the PC software after logging starts. Note that only the logged voltage and current curve data will be uploaded for offline data, and the Wh/AH waveform curve data will not be uploaded (the PC software displays a final value straight line curve). Save the offline data as a CSV file via the PC software and manually record the corresponding Wh of the offline data logging group before deleting the group.

Battery capacity mAh refers to the cumulative current (mA) per hour. For example, discharging at 1000mA for 1 hour equals 1000mAh (1Ah).

Energy mWh refers to the cumulative value of voltage (V) multiplied by current (mA) per hour. For example, 10V output with a 1000mA load equals 10W, and discharging for 1 hour yields 10000mWh (10Wh), which is equivalent to 0.01 kWh (1 kWh = 1000Wh) in household electricity meter units.

This interface can be used to evaluate the battery capacity of mobile phones, tablets and power banks. For example, if 17.251Wh (17251.00mWh) is consumed for a single charge, the internal lithium battery pack of the mobile phone/tablet operates at 3.7V, and the charging conversion efficiency is approximately 90%. The battery capacity of the mobile phone/tablet is roughly 17.251Wh / 3.7V * 0.9 = 4.196Ah.

Note: The nominal working voltage of the battery cell should be based on the actual marking on the label. Some may not be 3.7V.

Operation Instructions:

Short press: ◄ button : Switch data logging group directly before logging starts; Pop up a prompt for group switching after logging starts.

Short press: ■ button, Start/stop data logging

Short press: ► button, Switch data logging group directly before logging starts; Pop up a prompt for group switching after logging starts.

Short press: ⮌ button, Return to previous level.

2.4.5 Fast Charging Protocol Test Interface

1. Automatic Detection Interface

On the main interface, click the [Protocol] icon to enter the automatic detection and trigger selection screen. Select the [Auto Detect Protocol] option. A pop-up window will appear, warning that high voltage has been detected — please disconnect all external load devices. Within the pop-up options, use the operation buttons to select the Emarker type simulation (use the male connector for triggering without wiring; the simulated Emarker type is typically 5A 240W. When using a wired connection via measuring the female socket, the simulated Emarker type is usually 3A 60W). Then select the PD trigger type (typically choose Default PD directly), and finally set the super capacitor to ON. After confirming all parameters, press the operation button to navigate to the [YES] option in the window, then press the center button to start automatic detection, as shown in the figure below. Note: Before starting detection, go to Settings → Auxiliary Function Settings and check whether the capacitor switch is enabled. If it's not enabled, turn it on to prevent the meter from going black during detection, which could cause trigger failure.

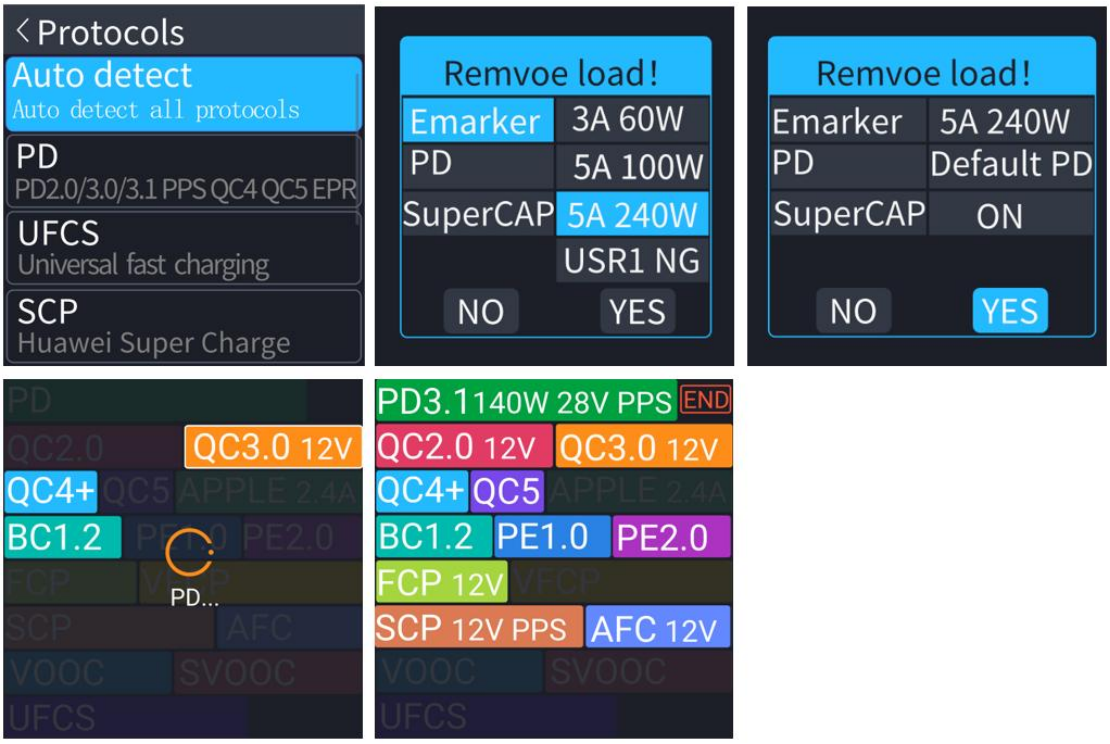


Figure 2.6 Automatic Detection Interface

After detection is completed, view the fast charging protocols and detailed parameters supported by the power supply device by switching the detected protocols with the left/right buttons and clicking confirm on the automatic detection completion interface (see Figure 2.7).

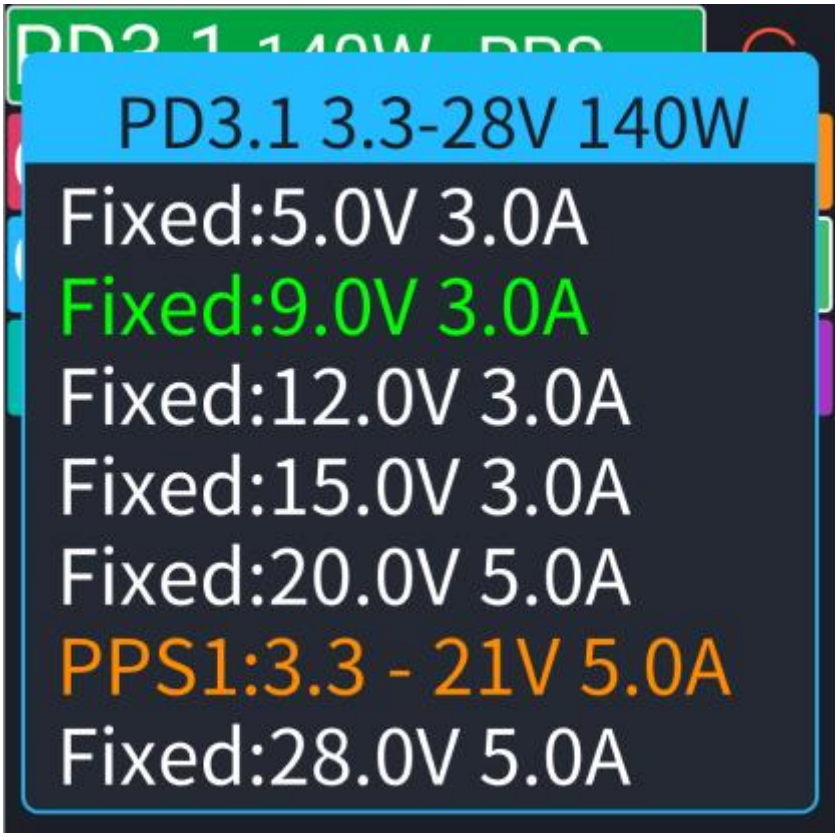


Figure 2.7 Auto-detect coordination details interface

In the pop-up window shown above, the yellow areas represent some private gears, such as the private high-power PPS gear of Xiaomi PD. The green-selected areas indicate the currently used gear, which is generally meaningful in protocol monitoring.

Operation Instructions:

During automatic detection:

Short press: ⮌button, Return to previous level

Long press: ⮌button, Return to main interface.

After automatic detection:

Short press: ◄button, Switch to the previous protocol result

Short press: ►button, Switch to the next protocol result

Short press: ■button, View details of the selected protocol result

Warning: High voltages will be induced during automatic fast charging protocol detection. Do not connect any electrical devices to prevent device damage or fire hazards. Our company shall not be liable for any device damage caused by non-compliance. If the tester powers off and fails to complete detection for some fast charging protocols, connect the USB PC port to maintain power supply for completion. For safety purposes, the machine implements some simple anti-fraud measures. When the words "Remove load" turn red, it indicates that fraud detection cannot be performed.

2. Manual Trigger Interface

The manual trigger interface is used to manually select fast charging protocols and corresponding trigger voltages. After successful protocol triggering, the voltage can be adjusted manually by triggering different gears of each protocol via buttons..

This article uses PD protocol triggering as an example. On the main interface, click the [Protocol] icon to enter the automatic detection and trigger selection screen. Select the [PD] option; a pop-up window will appear, warning that high voltage may occur during triggering—remove all external load devices. From the available options in the pop-up window, use the operation buttons to select the Emarker type simulation (for no-wire connection using male connector triggering, the simulated Emarker type is typically 5A 240W; for wired connection via measuring female socket triggering, it is usually 3A 60W). Then select the PD trigger type (typically choose Default PD directly), and finally set the supercapacitor to ON. After confirming all parameters, press the center button to move to the [YES] option in the window and then click the center button again to start manual triggering, as shown in the figure below. Please note: Before the Trig PD, go to Settings -> Auxfun Settings to check if the cap switch is enabled. If it is not, please turn it on to prevent the meter from blacking out during the detection and causing the trigger to fail.

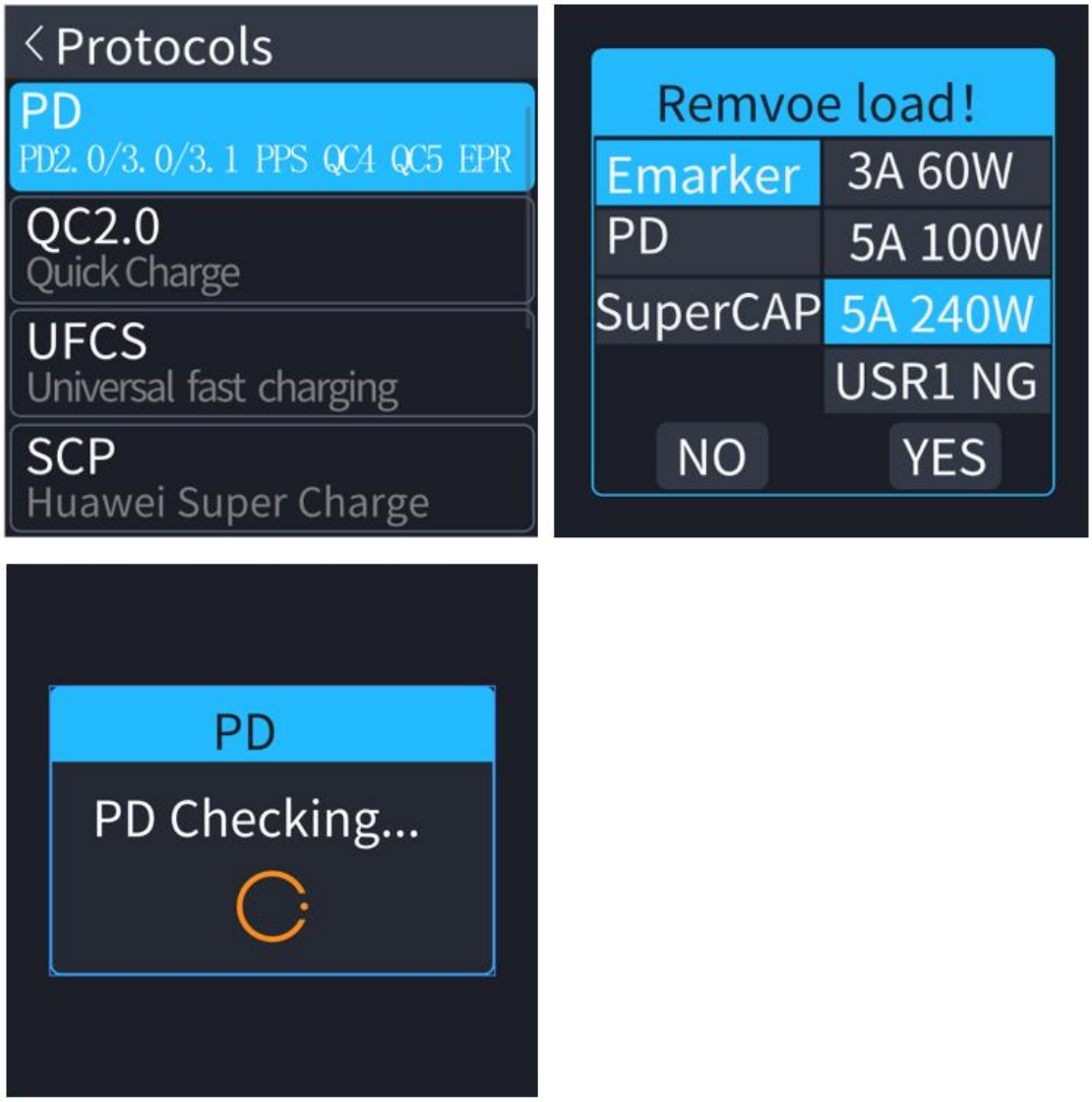


Figure 2.8 PD Manual Trigger Interface

If the protocol is triggered successfully, the adjustable gear detail interface of the protocol will be displayed (see Figure 2.9).

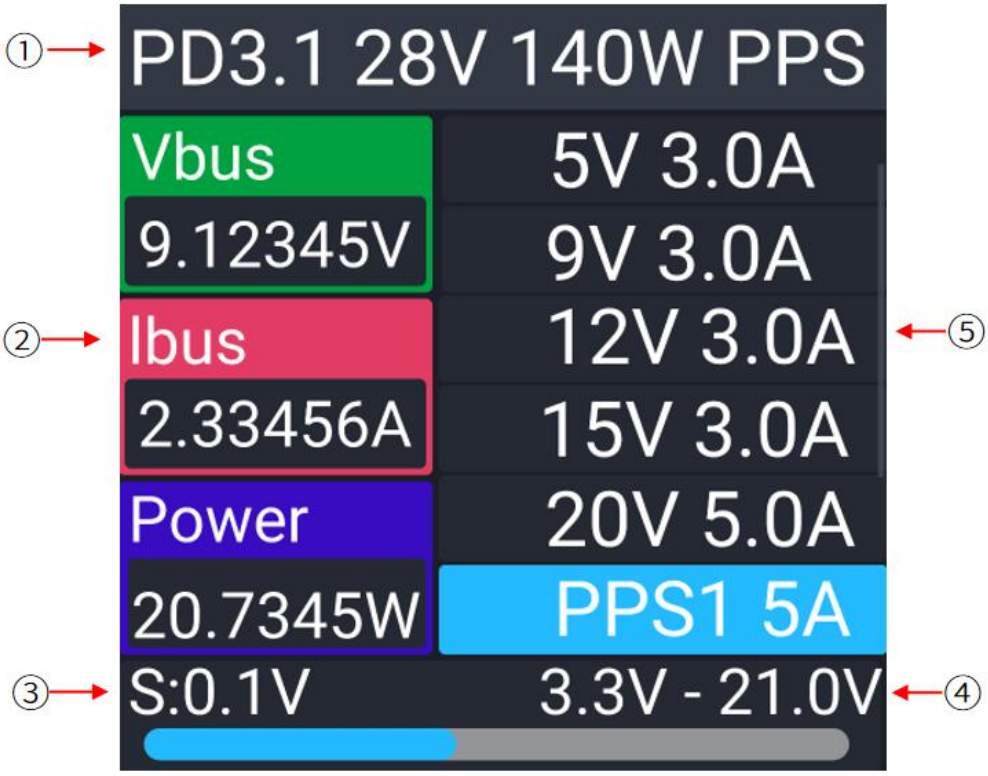


Figure 2.9 PD Manual Trigger Interface

Interface Overview:

①, Currently triggered protocol type and parameter range information.

②, Real-time monitored voltage, current and power

③, PPS step voltage regulation gear step value of the current protocol (0.1V)

④, PPS step voltage regulation range of the current protocol (3.3 to 21.0V),

⑤, Gear voltage and current information of the current protocol (including fixed gears and PPS gears).If a gear of the protocol is selected with the ◀ buttons/ ▶ buttons and confirmed with the middle ■ button,the real-time voltage value will be close to the gear value, indicating that the tested device supports this fast charging mode.

Operation Instructions:

During triggering:

Short press ⮌ button, Return to previous level

Long press: ⮌ button, Return to main interface

After successful triggering (Voltage selection):

Short press: ◀ button, Cycle up to switch the desired voltage

Short press: ▶ button, Cycle down to switch the desired voltage

Short press: ■ button, Trigger the currently selected gear

Warning: High voltages will be induced during manual fast charging protocol triggering. Do not connect any electrical devices to prevent device damage or fire hazards. Our company shall not be liable for any device damage caused by

non-compliance. If the tester powers off and fails to complete triggering for some fast charging protocols, connect the USB PC port to maintain power supply for completion. When the words "Remove load" turn red, it indicates that fraud detection cannot be performed.

2.4.6 Tool Interface

1. Apple Charger Identification Interface

Apple charger identification is used to read charger information (mainly SN code) and display it on the screen. The SN code can be entered on the official Apple website for authenticity verification.Operation: Main Interface → [Tools] → [Apple Power] to enter the Apple charger identification interface (see Figure 2.10 for successful identification).

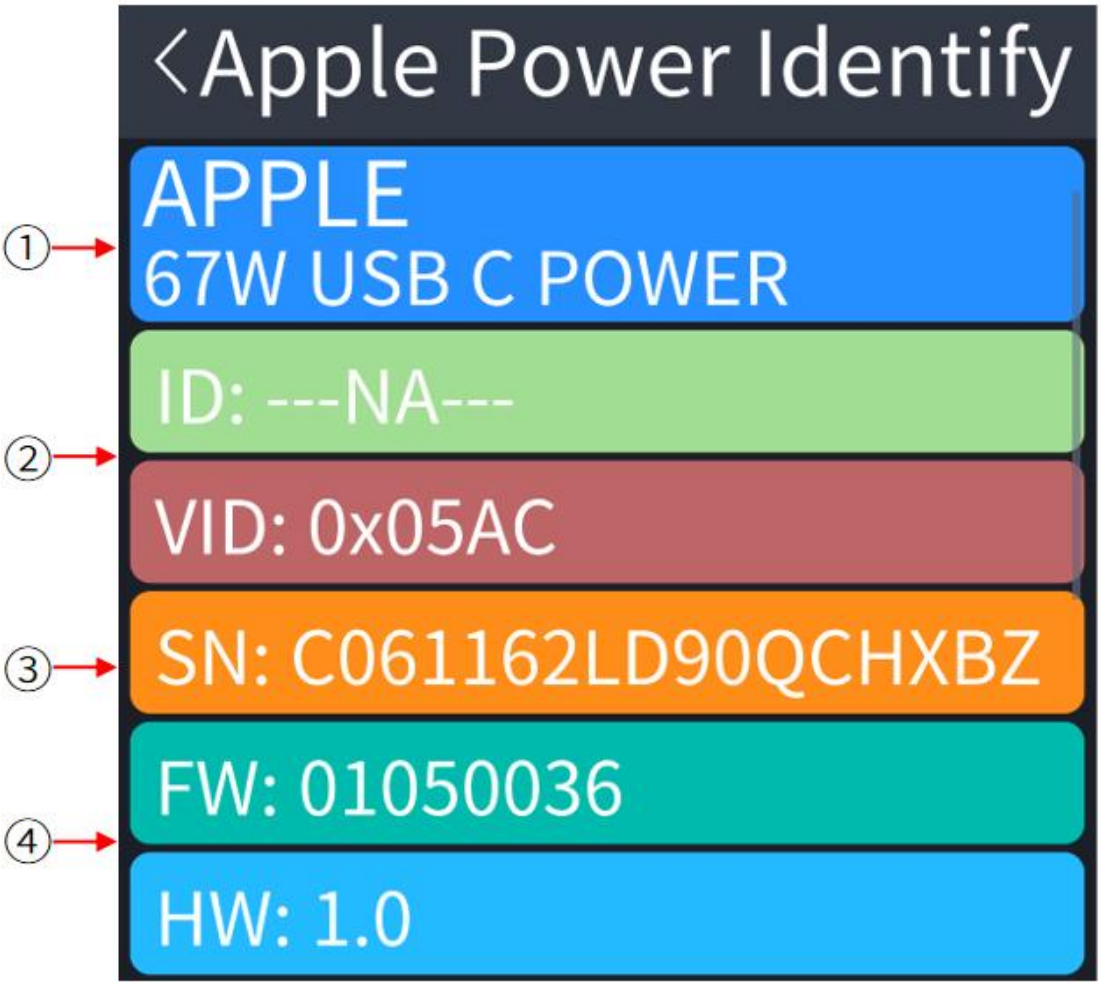


Figure 2.10 Apple Charger Identification Interface

Interface Overview:

①，Maximum possible charging power specification of the current Apple charger
②，VID and ID of the current Apple charger manufacturer
③，SN code of the current Apple charger (for authenticity verification on Apple's official website)
④，Hardware and firmware versions of the current Apple charger

Operation Instructions：

While identifying the Apple charger：

Short press：button，Return to previous level

After successful identification:：

Short press：button，Return to previous level

2. E-Marker Identification Interface

E-Marker identification is used to read the chip information of E-Marker cables and display it on the screen.Operation: Connect the C-cable connector to the female C-port of the tester, then go to Main Interface → [Tools] → [E-Marker] to enter the E-Marker cable identification interface (see Figure 2.11 for successful identification).

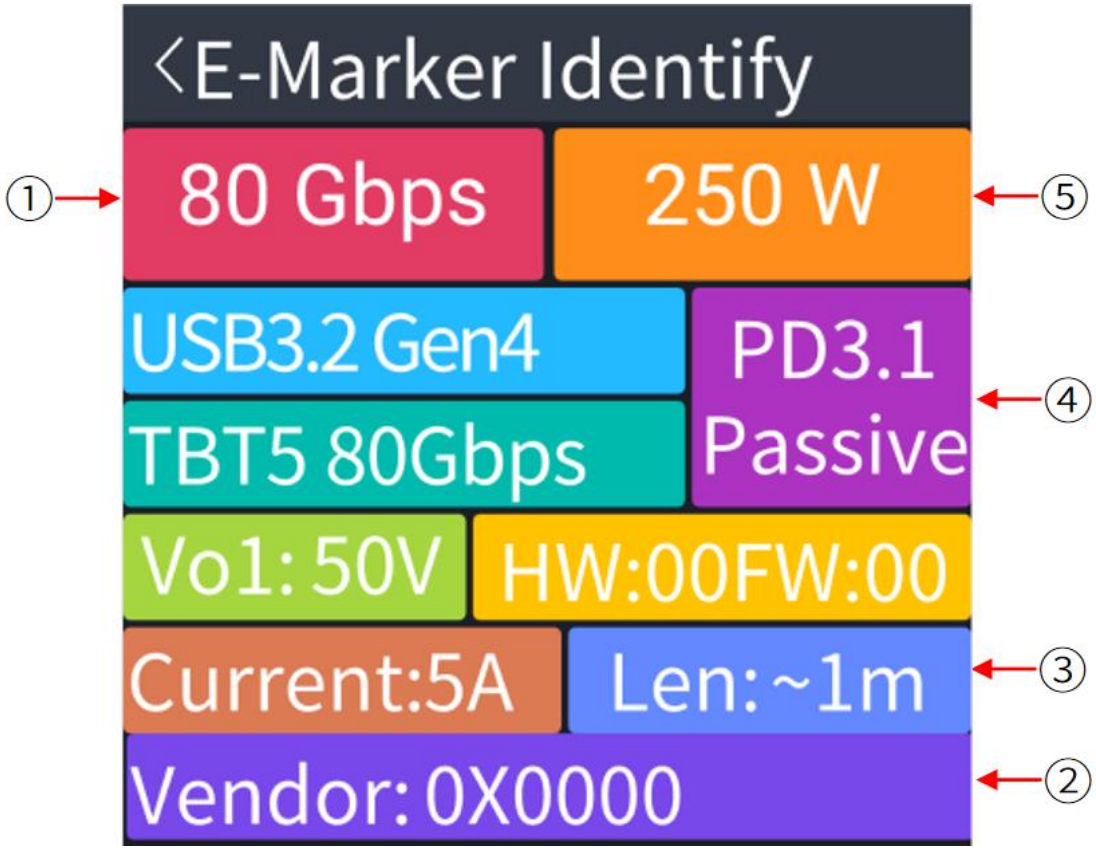


Figure 2.11 E-Marker Identification Interface

Interface Overview:

①, Transmission speed of the current cable type
②, VID of the current cable manufacturer
③, Approximate length of the current cable
④, Detected cable type (E-Marker)
⑤, Power specification of the current cable type

Operation Instructions:

During cable identification:

Short press: ⮌ button, Return to previous level

After successful cable identification:

Short press: ■ button, Pop up cable information box

Short press: ⮌ button, Return to previous level

Note for E-marker cable detection: Avoid powering the tester via the Type-C measurement port (recommend using the PC USB Type-C port instead) to prevent abnormal detection. If detection fails on one side, flip the cable and try again.

3. Measurement interface of differential pressure line resistance

The differential pressure line resistance measurement interface is used to measure the internal resistance (line resistance) of the power supply cable by the voltage difference method. A self-prepared power supply device (without line compensation function, most fast charging heads have line compensation, so a regular charger is recommended) is required for auxiliary measurement. This method only provides an estimated line resistance value for reference.

Preparation: At least 1 tested cable, 1 power supply device (supporting output above 500mA).

Operation: Main Interface → [Tools] → [Cable Res] to enter the measurement interface (see Figure 2.12):

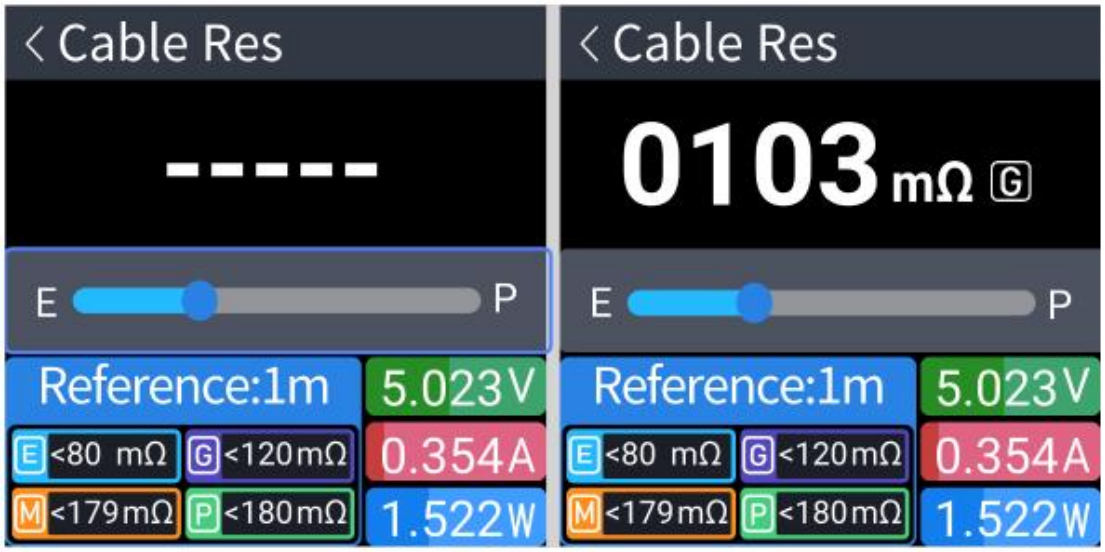


Figure 2.12 Differential pressure Line Resistance Measurement Interface

After entering the interface, start the test according to the following steps:

1，Connect the C2 to the power supply device with the tested cable

2，Press the ■ button to start measurement (an animation prompts ongoing measurement)

3，Wait for the measurement result; the internal resistance of the current cable will be displayed on the screen after successful measurement

Operation Instructions：

After entering the interface：

Short press：⮌button， Return to previous level

Short press：■button，Start line resistance measurement

After measurement：

Short press：⮌button， Return to previous level

Short press：■button，Restart measurement

4. Kelvin Line Resistance Measurement Interface

The Kelvin line resistance measurement interface is used for precisely measuring the internal resistance (i.e., line resistance) of the power supply line. It can only be used when paired with the corresponding C2 Kelvin kit..

Preparation: This test requires at least the following preparations: 1 tested cable, 1 power supply device and additional power supply cables, as well as a Kelvin kit module.

Operation: Main Interface → [Tools] → [Kelvin Cable Res] to enter the measurement interface (see Figure 2.12)：

Figure 2.13 Kelvin line resistance measurement interface

After entering the interface, start the test according to the following steps:

1，Connect the cable to be tested to the Kelvin kit. If the cable to be tested is a CC cable, simply connect it between the C1 and C2 ports. If the cable to be tested is an AC cable, connect it between the A port and the C2 port.

2，At the same time, connect the Kelvin kit to the test port of the male connector of the C2 table, and then connect the female port of C2 to the power supply line and connect it to the power supply device. As shown in the following figure:

CC connection method

AC connection method

Note: At this time, the power supply voltage must not exceed 20V. Exceeding this voltage will damage the Kelvin kit module.

3， At this point, the internal resistance of the cable will be automatically measured. If the automatic measurement fails, clicking the ■ button will start the measurement. Measurement - The animation effect during startup indicates that the measurement is in progress.

4，Waiting for the measurement results. If the measurement is successful, the current cable's internal resistance and the type of the measured cable will be displayed on the screen.

Whether the cable's internal DM/DP, CC1/CC2, SUB1/SUB2 is conducting or not, and whether there is any damage, will be indicated. If the measurement fails, "--- NA ---" will be displayed.

Operation Instructions:

After entering the interface:

Short press: ⮌button, Return to previous level

Short press: ■button, Start measuring the resistance with the Kelvin method.

Long press: ■button, Switch the form of displayed measurement results.

After measurement:

Short press: ⮌button, Return to previous level

Short press: ■button, Restart measurement

2.4.7 Settings Interface

Operation: Main Interface → [Settings] to enter the settings interface (see Figure 2.13).

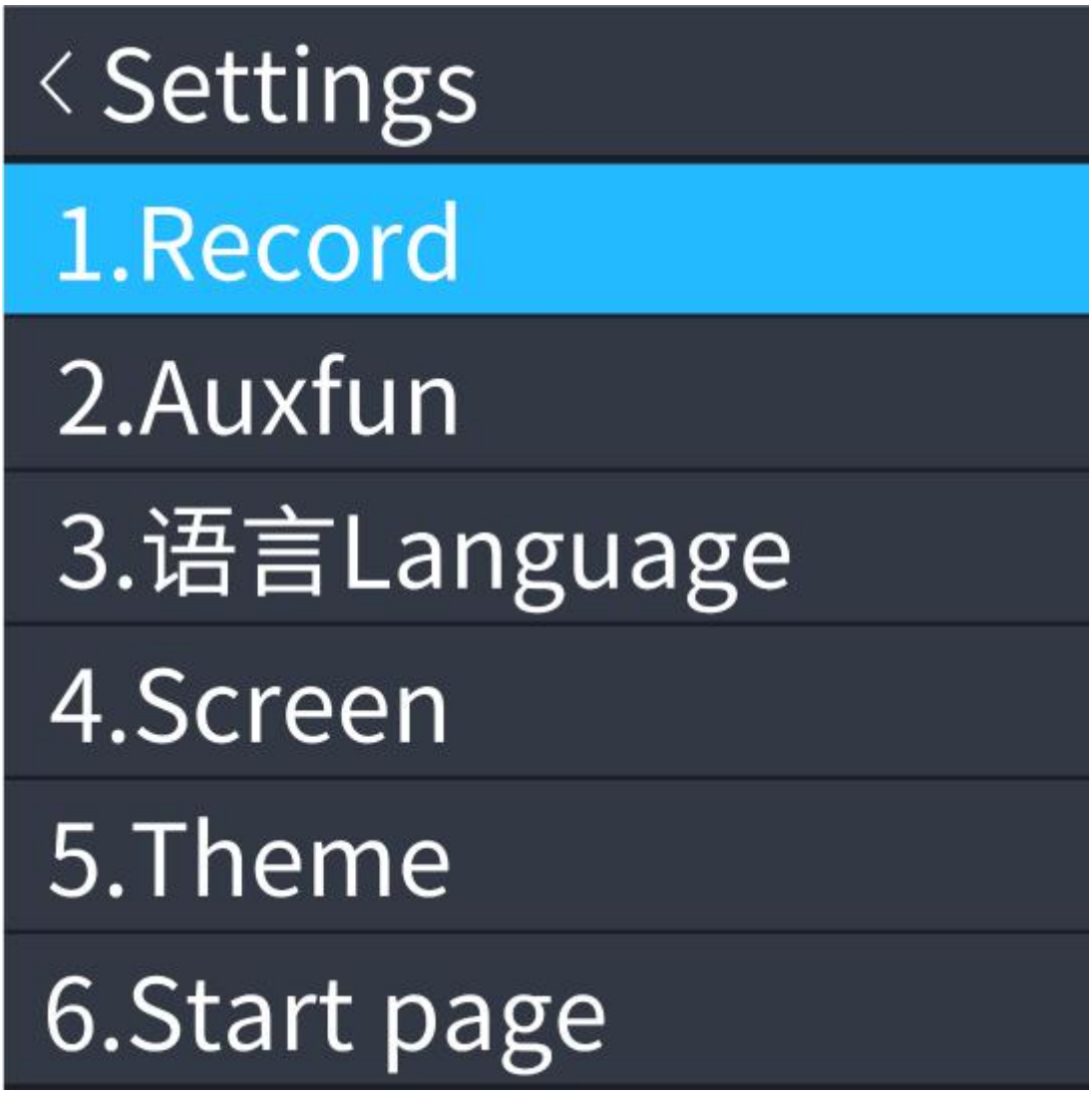


Figure 2.13 Settings Interface

1. Data Logging Settings Interface

Select [Data Logging] on the Settings interface and short press to enter the settings interface. The settings are as follows:

Function Item	Definition	Operation Method	Adjustable Range
Save Interval	Set the interval for offline data logging of the group	Short press the middle button → adjust with left/right buttons	50mS - 120S
Start Rule	Set the start rule for offline data logging of the group	Short press the middle button → adjust with left/right buttons	Manual / Threshold Start
Stop Rule	Set the stop rule for offline data logging of the group	Short press the middle button → adjust with left/right buttons	Manual / Threshold Stop
Data List	View logging point information of all groups	Short press the middle button	
Delete All Data	Delete logging information of all groups	Short press the middle button	

Table 2.4.4.1 Data Recording Setting Options

After setting the data logging rules for the group, you can return to the data logging interface on the main interface to start offline logging.

2. Auxiliary Function Settings Interface

Select [Auxiliary Functions] on the Settings interface and short press to enter the settings interface. The settings are as follows:

。

Function Item	Definition	Operation Method	Adjustable Range
Power Bank Mode	Enable this mode to turn on the dummy load at intervals, simulate device power consumption, and prevent power bank power-off at low current (recommended to enable only in the basic measurement interface with 5V voltage)	Short press the middle button to enable	
Load On Interval	Interval (in seconds) for turning on the dummy load in power bank mode (dummy load current: 300-550mA). The tester will consume current intermittently after enabling, resulting in heat generation during long-term operation	Short press the middle button → adjust with left/right buttons	1S-10S

Capacitor Switch	Control the on/off of the super capacitor (only available for hardware versions 1.5 and above)	Short press the middle button to enable	

Table 2.4.4.2 Auxiliary Function Setting Options

3. Language Settings Interface

Select [Language Settings] on the Settings interface and short press to enter the settings interface. The settings are as follows:

Function Item	Definition	Operation Method	Adjustable Range
Language Settings	Set the display language of the interface	Adjust with left/right buttons → short press the middle button to confirm	简体中文 English

Table 2.4.4.3 Language Setting Options

4. Screen Settings Interface

Select [Screen Settings] on the Settings interface and short press to enter the settings interface. The settings are as follows:

Function Item	Definition	Operation Method	Adjustable Range
Backlight Brightness	Set the default backlight brightness	Short press the middle button → adjust with left/right buttons	3%-100%
Screen Dimming	Time Set the time for the screen to dim automatically	Short press the middle button → adjust with left/right buttons	0 to 30 minutes (0 = disabled)
Dark screen brightness	Set the default brightness when the screen is on standby	Short press the middle button → adjust with left/right buttons	0% - 20% (0% indicates screen off)
3D Gravity Sensing	The screen automatically rotates according to gravity sensing when enabled. Manual screen direction switching via the ◀ button in the basic measurement interface is available when disabled	Short press the middle button to enable	

Table 2.4.4.4 Screen Settings Options

5. Theme Settings Interface

Select [Theme Settings] on the Settings interface and short press to enter the settings interface. The settings are as follows:

Function Item	Definition	Operation Method
Theme Color	Switch the selected theme color	Adjust with left/right buttons → short press the middle button to confirm

Table 2.4.4.5 Theme Color Settings Options

6. Boot Interface Settings

Select [Boot Interface] on the Settings interface and short press to enter the settings interface. The settings are as follows:

Function Item	Definition	Operation Method
Main Interface, Basic Measurement, Ripple Measurement, Logging, Protocol	Set the default interface after power-on	Adjust with left/right buttons → short press the middle button to confirm

Table 2.4.4.6 Boot InterfaceSettings Options

7. Other Settings Interface

Select [Others] on the Settings interface and short press to enter the settings interface. The settings are as follows:。

Function Item	Definition	Operation Method
Bluetooth Switch	Enable Bluetooth function for connection with mobile phone Bluetooth APP (for Bluetooth-supported versions)	Short press the middle button
LOGO Interface	Display the boot LOGO first when enabled	Short press the middle button

Virtual E-Marker	Enable the tester to simulate an E-Marker cable when enabled	Short press the middle button
Restore Factory Settings	Restore all default parameters (all data logging groups will be deleted)	Short press the middle button
User Manual	Pop up a QR code for scanning the electronic manual	Short press the middle button

Table 2.4.4.6 other setting

8. About Interface

Select [About] on the Settings interface and short press to enter the system information interface. The settings are as follows:

Function Item	Definition	Operation Method
About	Display the current manufacturer, hardware and firmware versions, etc	Short press the middle button

Table 2.4.4.7 about sys

3, PC Software User Guide

3.1 Automatic Driver Installation for C2 Tester on PC

Connect the C2 Multi-Functional USB Tester to the PC via a Type-C cable for the first time; the PC will automatically install the driver (for Windows 7 and above). Wait for the driver installation to complete before using the PC software with the tester.

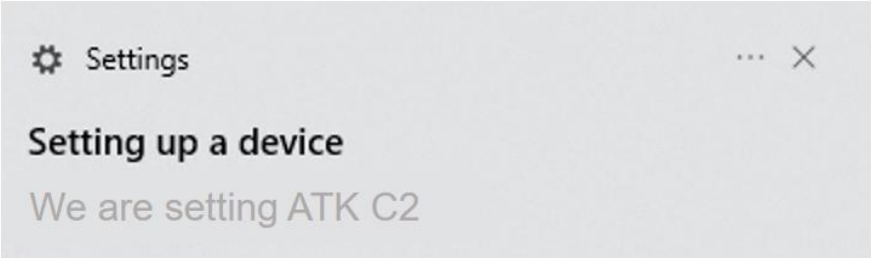


Figure 3.1 USB driver

The driver is integrated in the PC operating system and no additional driver is required. After successful installation, an ATK C2 USB Device will appear in the Universal Serial Bus devices section of the Device Manager, with the hardware ID: VID_2E88&PID_C2C2.

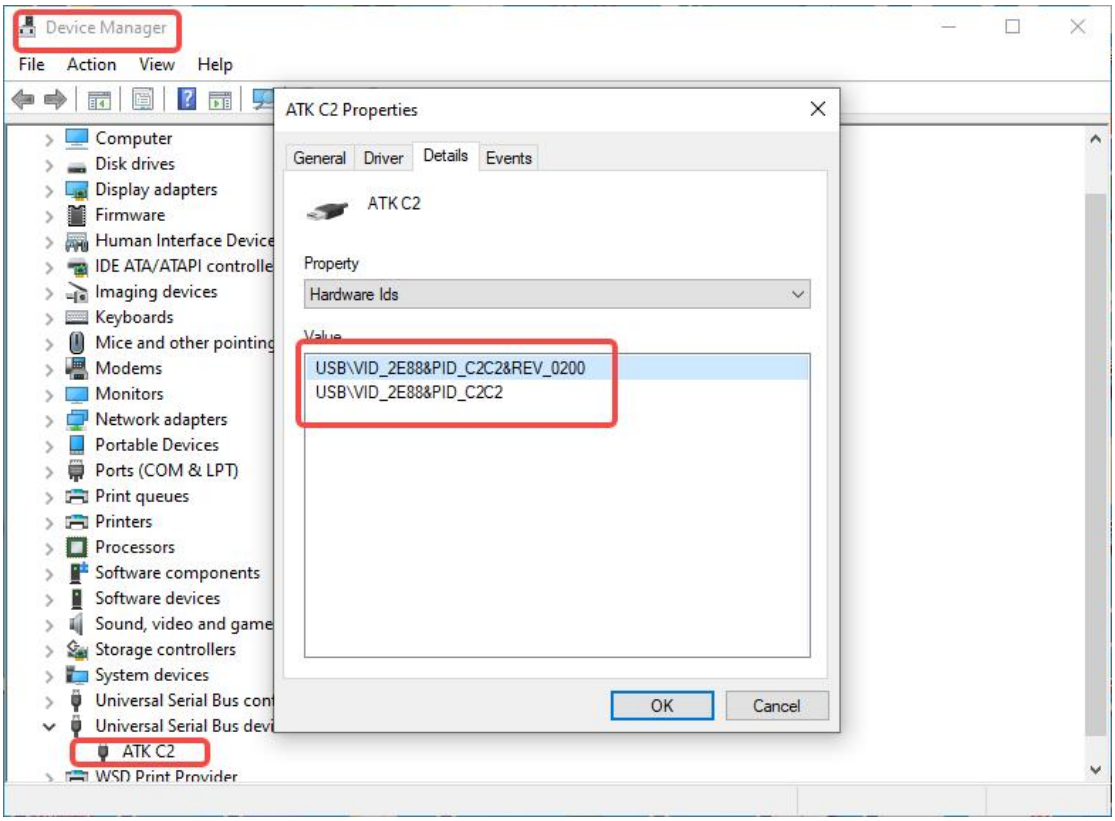


Figure 3.2 C2 USB device

3.2 PC Software Installation

The ATK-C PC software is a powerful software tool specially designed for the C2 tester by the ALIENTEK team.Supported Operating Systems：

- Windows： Windows 7 and above
- Linux：Ubuntu 20.04 and above
- Mac：OS 10.14 and above

ATK-C Software of PC Configuration Requirements：

- CPU：Minimum 3.0GHz dual-core, recommended 4.0GHz and above
- Memory：2G and above
- GPU：No requirement
- Hard Disk：300M and above available space
- USB： USB2.0 and above

Note: Software performance may be affected if the PC configuration is lower than the above requirements！

Select the corresponding installation package according to the PC operating system, double-click the installation file in the downloaded C2 data package (path: C2 Multi-Functional USB Tester Data Package/Configuration Software), and follow the prompts to complete the installation.

3.3 PC Software Function Description

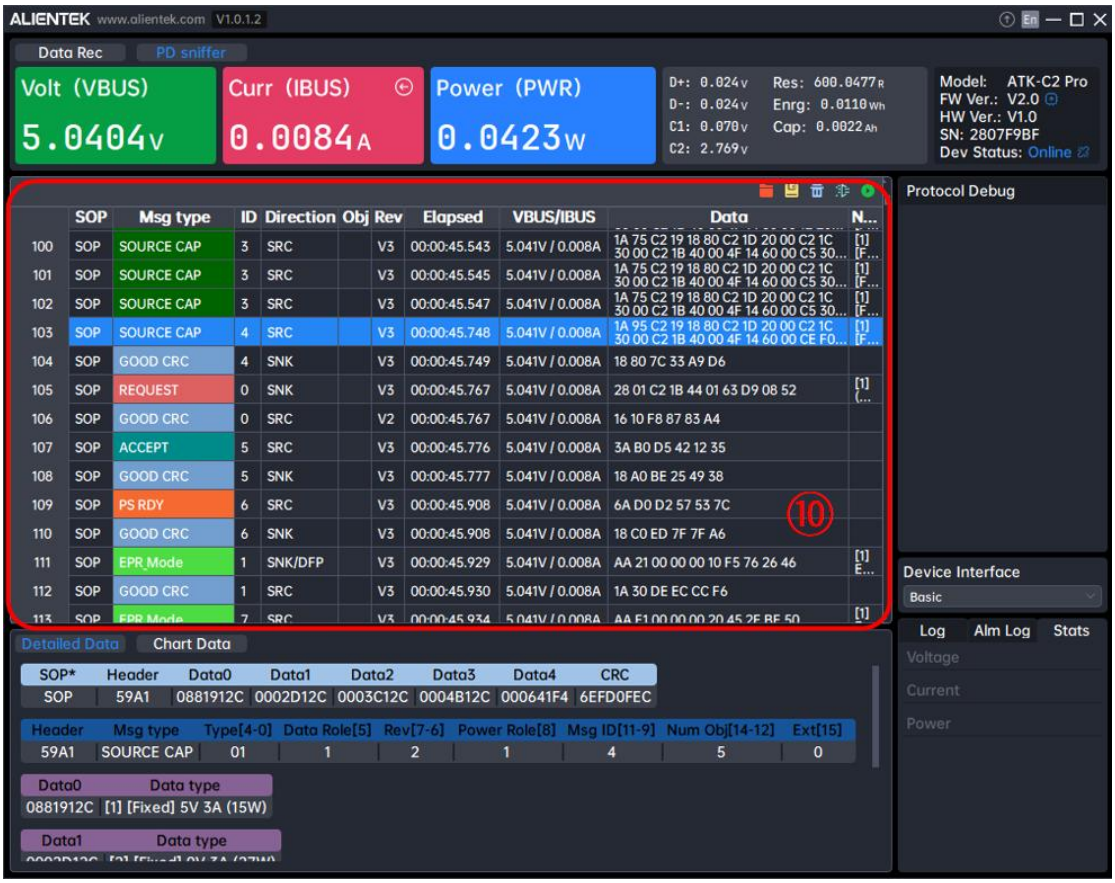


Figure 3.3 for the main interface of the PC software.

Interface Overview:

①, Device/PC Software Function Control: Displays the model and version of the tester (slave device)。

1: Connect/Disconnect control – displays the connection status between the PC software and the USB tester

2: Language setting – sets the display language of the PC software

3: Firmware update – updates the firmware version and functions of the tester

②, Voltage/Current Display: The tester uploads voltage, current, D+/D- and other data for calculation and display

③, Quick Waveform Drag Window: For positioning waveforms easily

④, Main Waveform Display Window: Selectable waveform types, support scaling and dragging for viewing; hover the mouse to view detailed waveform values. The top-right button can pause/resume waveform display and set the data acquisition rate

⑤, Function Control Bar: Controls protocol trigger/detection, alarm settings, and offline data reading of the tester.

1: Protocol trigger and detection selection. Highlighted during automatic detection with log display; highlighted gear information for successfully triggered protocols during manual trigger.

2：Alarm settings – set upper/lower limits for voltage, current and power to trigger on-screen alarms and log prompts.

3：Offline data – retrieve offline logging data of the USB tester and display each group of offline data in waveform

⑥，Waveform Window Settings Bar: Supports automatic waveform saving, secondary waveform display, waveform color setting, etc.

1：Auto-save – save the voltage/current data acquired by the PC software as CSV or SQLite database files

2：Restart – clear waveforms and historical voltage/current data, restart display and logging

3：Offline data – retrieve offline logging data of the USB tester and display each group in waveform.

4：Save data – save all currently received voltage/current data as CSV or SQLite database files.

5：Load data – read previously saved online/offline data files (CSV/SQLite) for waveform display.

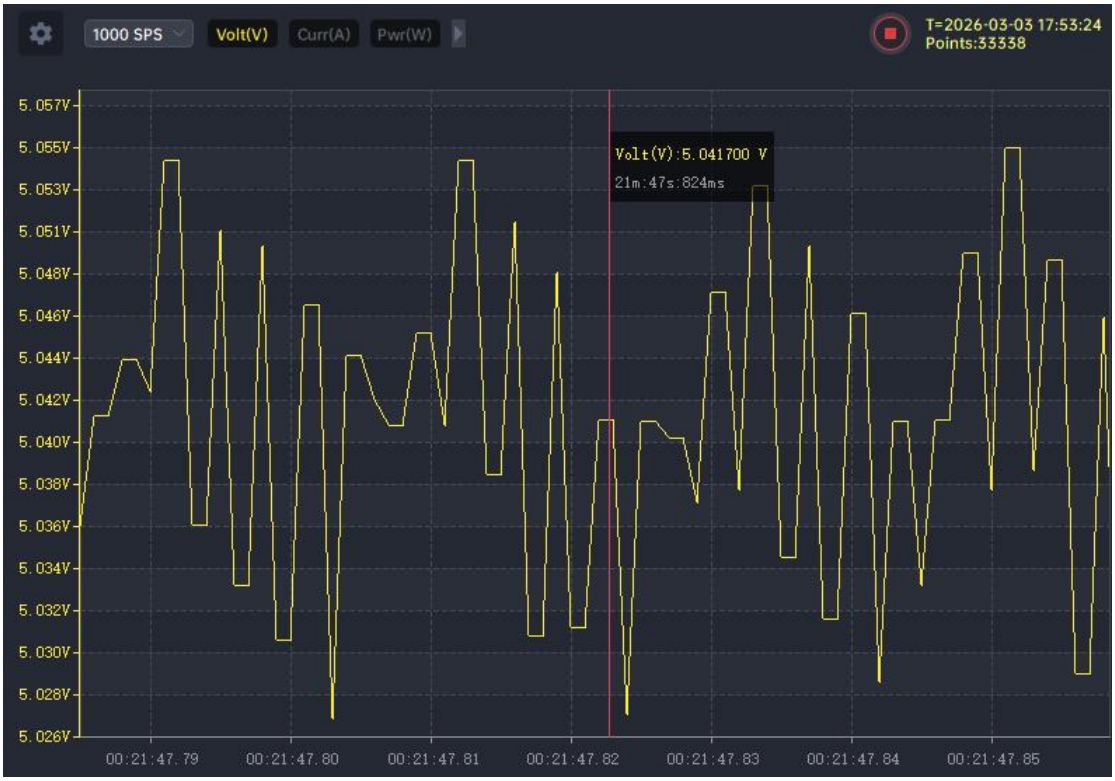
⑦，PC Software Log Information: For operation reference and interface switching via control settings.

⑧，Data Recorder & Protocol Analyzer Switch Bar: Switch between data logging and protocol analysis; the PC software supports PD packet capture when protocol analysis is selected

⑩，Protocol Analyzer PD Packet Capture Display: Supports millions or even tens of millions of PD packets, with expandable PD packet details.

3.3.1 PC Software Waveform Scaling Rules

Hover the mouse over the waveform display area: Scroll the wheel to scale the waveform left/right. Hover the mouse near the vertical axis: Scroll the wheel to scale the waveform up/down，As shown in the figure below：



3.3.2 Observing Power Supply Voltage Ripple via PC Software Waveform

If you need to observe quality parameters such as power supply voltage ripple, you can select only the voltage waveform curve for display on the host computer and leave the others unchecked. At the same time, set the sampling frequency to the maximum of 1000 Hz. In this way, the peak-to-peak voltage Vp-p calculated from the voltage data by the host computer can be used to assist in analyzing the power supply voltage ripple, as shown in the figure below.：

3.3.3 Multi-instance Support for PC Software

Similar to app cloning on mobile phones, the PC software supports multi-instance operation – the number of connected C2 USB testers equals the number of opened PC software instances.

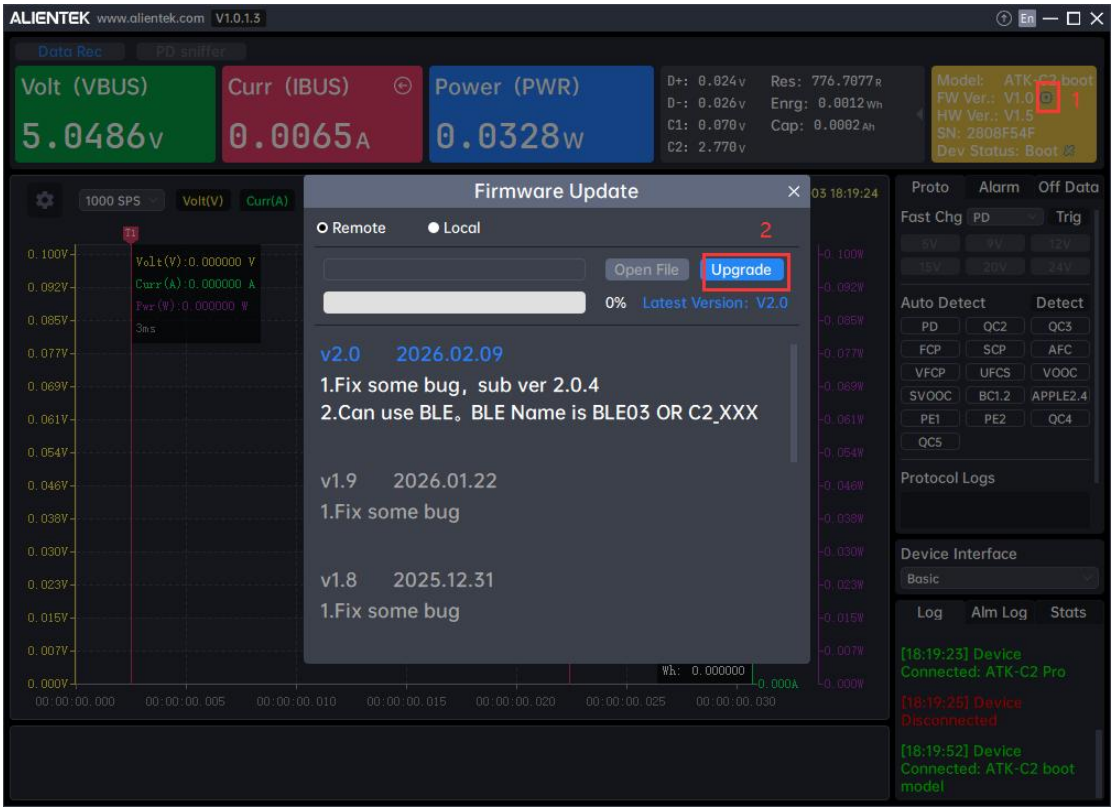
3.4 Firmware Update via PC Software

The C2 PC software supports two firmware upgrade methods: Local Mode and Remote Mode.

Local Mode: Users need to obtain the latest firmware from ALIENTEK and follow the on-screen instructions to upgrade。

Remote Mode: The software automatically retrieves the latest firmware from the server and prompts the firmware version (no manual download required). The operation steps are the same as Local Mode.

The remote mode upgrade process is shown in the figure below:



Operation Instructions:

One-click upgrade is available via the PC software. If one-click upgrade fails，Press and hold the ⮌Return button (DFU button)of the tester while powering on to enter the upgrade mode, Wait for the PC software to identify the tester (the tester displays UPGRADE VerX.X Ready)，shown in the figure below：

Then operate the host computer sequentially according to the following steps:

① Click [Firmware Update] in the PC software, pop up the upgrade window and select [Remote]
② Click [Start Upgrade] in the upgrade window; the tester will switch to the upgrade mode and display the upgrade interface, then wait for the PC software to identify the tester in upgrade mode
③ The firmware will update automatically after successful identification (if the firmware is valid)

Note: If remote online upgrade fails or is not feasible for any reason, contact our company to obtain the local firmware, select [Local] in the upgrade window, click [Open File] to select the firmware file, and finally click [Start Upgrade] for local upgrade.

3.5 Firmware Update Notes

If an update fails, causing the device to malfunction or display a black screen, first hold down the tester esc button(DFU Button) and power it on, then connect it to the PC USB port and power it on again. After the host computer recognizes it, try the above steps again to perform the firmware upgrade.

4, Instructions for Using BLE Function

When using it for the first time, obtain the mobile Bluetooth APP installation program from the data package or download it from the app store (for IOS version) and install it. After installing the mobile APP:

① First, operate the C2 USB tester to enter the settings Other Settings option. Then, turn on the Bluetooth switch of the device itself. The Bluetooth name of the device is BLE03 or C2_XXX.

② Turn on the Bluetooth function of the mobile phone, open the atk-xtool APP. The APP can support up to 4 devices (slight lag may occur when multiple devices are connected). Click on any one of the squares to enter. The mobile APP will automatically scan the nearby Bluetooth devices and select the device with the default Bluetooth name (BLE03 or those starting with C2_XXX) of the tester. After successful connection, a preview measurement value square will appear, and clicking on it will enter the full-function interface of the mobile APP. The button functions at the bottom of the mobile APP interface are not clear? Click "?" and view the icon explanations.
At the same time, after Bluetooth connection on the C2 device, the Bluetooth icon will light up in the status bar of the basic measurement interface on the screen.

③The interface of the mobile phone Bluetooth APP currently supports the following functions:

1. Support waveform curve selection, waveform start/stop, waveform cursor measurement, full-screen zoom display, etc.
2. Display the fast charging protocol obtained by monitoring.
3. Online statistics of capacity in Ah and Wh.
4. Alarm settings, used to trigger alarms when certain conditions are met.
5. Automatic stop settings, used to automatically stop Ah/Wh, time, etc. when certain conditions are met.
6. Support modifying the C2 Bluetooth name in the APP, with a maximum of 12 characters of English name.
7. Save waveform curves and load saved waveform curves, etc.
8. View the system version information of the C2 USB tester device.

①Turn on the BlE

②Connect the dev and enter

③Mobile App interface

5，Services

1. After – sales Service：

C2 has a one-year free warranty service in the case of non-artificial damage. Please contact the dealer for warranty service.

2. Website

Download : www.alientek.com/download
Company : www.alientek.com
Aliexpress : www.aliexpress.com/store/1102909571

3. Contact US

E-mail : fae-smt@alientek.com

FCC Caution：

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.