Instructions for USB Tester with Full Colour Display

-Model: UM25/UM25C

Date：2019.9.24

Dear Customer,

   Thank you for purchasing this Full Colour USB Tester from Hangzhou Ruideng Technologies Co., Ltd. Prior to using this product we recommended that you briefly familiarize yourself with these instructions. In order to ensure the correct operation and use of the device. We also advise that you keep these instructions in a safe place for future reference as may be needed.

CONTENT

1.1 Technical Parameters:

Model: UM25/UM25C

Voltage measurement range:4-24.000V

Current measurement range: 0-5.0000A

Capacity accumulation range: 0-99999mAh

Energy accumulation range:0-99999mWh

Load impedance range: 0.8Ω-9999.9Ω

Temperature range:-10℃~100℃/0℉~200℉

Screen brightness setting: Levels 0-5

Voltage graphing range: 4-24.00V

Product weight:23.74g(UM25C)/19.26g (UM25)

Display screen：1.44 Inch color LCD display

Voltage measurement resolution:0.001V

Current measurement resolution: 0.0001A

Voltage measurement accuracy:±（0.5‰+2digits）

Current measurement accuracy:±（1‰ +4 digits）

Time measurement range:0-99h59min59s

Temperature measurement error:±3℃/±6℉

Delay off the screen time：0-9minutes

Current graphing range:0-5.000A

Refresh rate: 2Hz

(No packaging)；54.56g(UM25C)/50.08g (UM25)(With packaging)

Dimensions：71.2mmx30.5mmx12.4mm(UM25C)/71.2mmx30.5mmx11.3mm(UM25)

Quick charge recognition mode：QC2.0、QC3.0、APPLE 2.4A/2.1A/ 1A/0.5A、Android DCP、SAMSUNG

1.2 Function Interfaces

Measurement Main Interface	Quick Charge Recognition Interface	Charging Recording Interface

Data Connection Cable Impedance Measurement Interface	Measurement Graphing Interface	System Parameter Setting Interface

1.3 The Core Function:

· PC Bluetooth Communication
· Android Phone APP Control
· Quick Charge Recognition
· Data Record and Store
· Capacity/Energy Detection

· Differential Voltage Method Measurement Data Connection Cable Impedance Voltage/Current/Power Detection
· Load Connecting Detection Function (Screen Auto Off, Plug The Load, Screen Auto Lighting)

1.4 Device Layout

A：Micro USB Port

B：Multifunction buttons (4)

C：Bluetooth Switch

D：USB A Female Port

E：USB A Male Port

F：Type-C Input Port (Only VBUS、GND、CC1、CC2 four wires)

G：1.44 Inch Color Screen

H：Type-C Output Port (Only VBUS、GND、CC1、CC2 four wires)

I：Bluetooth Indicator: When connected to the host computer control software, the Bluetooth indicator changes from flashing to steady state. When connecting, the Bluetooth icon is displayed on the screen. (Bluetooth communication version only).

1.5 Interface Prompt Representing Functions

J：   Press and hold the key to rotate the Screen Left

K：   Press the key to close the screen

L：   Press the key to open the help interface

M：   Press and hold the key to rotate the screen right

N：   Press PREV to previous page

O：   Press Next to next page

2

1.6 Operating Instructions

When the unit is first powered on the welcome screen is displayed followed shortly by the main interface screen.

Hidden interface: Pressing any button whilst powering on the module will display three options. Option 1 selects the Chinese Interface and option 2 selects the English interface.

The third option is to reset（after reset, system setting data was restored to the factory setting, all the stored data was not reset）.Release the button at the desired selection. Pressing and holding the button after stepping to the third option will exit the hidden interface.
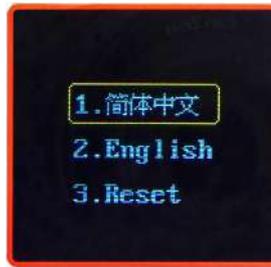
Hidden Interface

Welcome Interface

1.6.1 Interface 1: Main Measurment Interface.(As shown below)

P：Voltage Measurement
Q：Current Measurement
R：Accumulated Capacity
S：Accumulated Energy
T：Temperature Measurement
U：Number of the Data Group in use
V：Load Equivalent Impedance
W：Power Measurement

Press the ' ? ' button to enter the interface as shown above:

Press and hold the 'NEXT' button to switch Data Group. The USB tester can provide a total of 10 groups of data to save and view. These are numbered 0-9.

With Data Groups 1-9 selected the current mAh and mWh are saved after power off. They will continue accumulating the next time the tester is powered on. When the data group selected is 0 then the current value of mAh and mWh will be temporarily saved at power off. When the device is next powered on these values will be recalled and will begin flashing. When the accumulated mAh exceeds 1 mAh, the previous data will be cleared and accumulation will restart.

With a Data Group selected, press and hold the 'PREV' button to clear the mAh and mWh. (As shown)

Press 'NEXT' to switch to the Quick Charge Recognition Interface.

1.6.2 Interface 2: Quick Charge Recognition Interface

X：D +: (DP) data positive signal level.

Y：D-: (DM), data negative signal level.

Z：Mode display

The product will automatically identify a device with a supported fast charging mode. At this time the device supports the QC2.0、QC3.0、APPLE 2.4A/2.1A/ 1A/0.5A、Android DCP、SAMSUNG.(**Note**：*This quick charge agreement recognition model is for reference only, because cell phone updated quickly, it can't be absolutely accurate identification*〉

Press 'NEXT' to switch to the Charging Recording Interface.
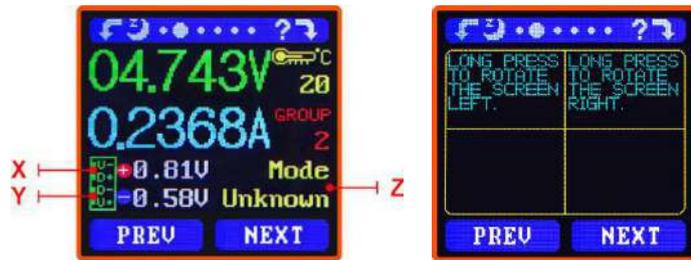
1.6.3 Interface 3: Charging Recording Interface

AA：Accumulated Capacity

AB：Accumulated Energy

AC ：Time display：The total accumulated recording time.

AD：Capacity/Energy statistics trigger current

AE：REC：recording status indicator.

'REC' displayed in red indicates that recording is stopped. 'REC' displayed in green indicates that recording is in progress.

After power on, when the current flowing is greater than the Low Current trigger value. The system automatically begins to record the accumulated capacity, energy, and time elapsed. The 'REC' indicator will change from red to green.

To set the Current trigger value, press and hold the "Next" button to highlight the value then press the 'PREV' button to adjust the value as required. The value can be set anywhere between 0.01A- and 0.30A. (10mA to 300mA).

Press "Next" button to switch to the Data Connection Cable impedance Measurement Interface.

1.6.4 Interface 4: Data Connection Cable Impedance Measurement Interface.

The Tester can use differential voltage method to measure the resistance of a data connection cable

AF：USB Tester directly connected to the power supply with Voltage and Current values displayed

AG：USB Tester connected via a data connection cable with Voltage and Current values displayed.

AH：R: Data Connection Cable resistance.

Measurement procedure:

First, connect the USB Tester directly to the power supply and adjust the appropriate load
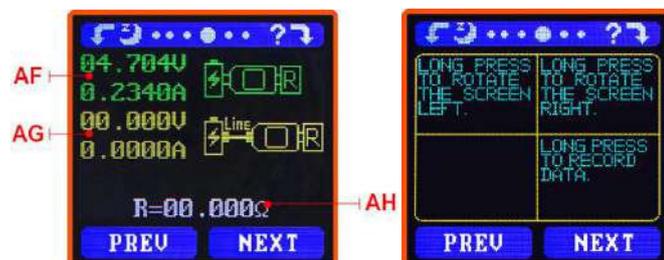
current (recommended value 1A) . Press and hold the 'NEXT' button to begin recording data. The indicator prompt will stop flashing .

Second, unplug the USB Tester and then reconnect it to the power supply via the Micro USB/Type-C IN data connection cable and adjust the load current to the same value as in the first step. Press and hold the 'NEXT' button to begin recording data. The indicator prompt stops flashing and the Data Connection Cable resistance measurement test is completed and the value displayed.

Note: If during the second step the screen turns black, this indicates that the voltage difference is too high and the tester will enter the 4V power-down state. The load current needs be reduced. Then re-start the measurement from the first step. After the Data Connection Cable resistance test is completed, the Tester needs to be powered off and then on again to resume measurement.

Press the 'NEXT' button to switch to the Measurement Graphing Interface.

1.6.5 Interface 5: Measurement Graphing Interface

This interface displays the voltage measurement over time in the 4-24V range and will automatically adjust the displayed range in real time to account for voltage fluctuations. And the current measurement over time in the 0-5.000A range and will automatically adjust the display range in real time to account for current fluctuations.
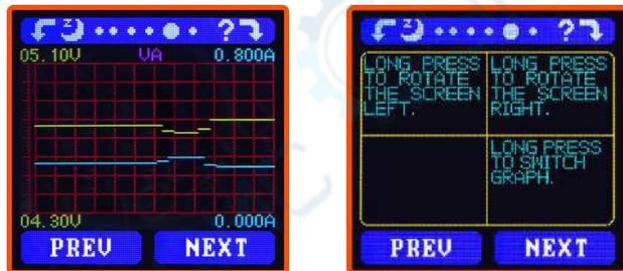
Press and hold "NEXT" to switch to D+D- graphing, as picture

This interface displays the D+ /D-voltage measurement over time in the 0-3.3V range and will automatically adjust the displayed range in real time to account for D+/D- voltage fluctuations.
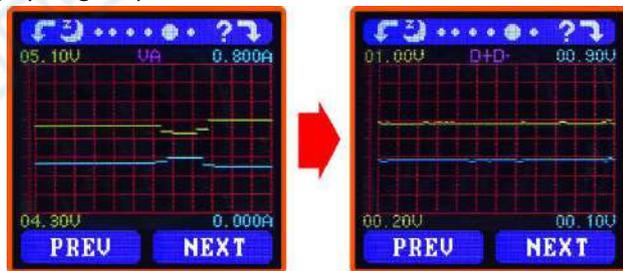
Press the 'NEXT' button to switch to the system parameter setting interface.

1.6.6 Interface 6: System Parameter Setting Interface

AI：Auto screen off time
AJ：Screen brightness
AK：Temperature display C /F
AL：Theme background color
AM：Theme foreground color
Press and hold the "Next" button to enter into setting state, press

"NEXT" button to step through the options of auto screen off time, brightness level, temperature display units, theme background color and theme foreground color. Stop on the value you wish to change then press the "PREV" button to change the setting.

For auto screen off time setting press 'PREV' to repeatedly step though the 10 options from 0 to 9 minutes. Default time is 1 minutes.

For the screen brightness setting, press 'PREV' to repeatedly step though the 6 options from 0 to 5 where 0 is the lowest brightness level and 5 is the highest. Default brightness is 4.

For the temperature display units, pressing the 'Next' button toggles the setting between C and F. default temperature unite is C.

For theme background color, press 'PREV' to repeatedly step though the 7 options from 0 to 6 where the color sequence is red, green, blue, yellow, light blue, pink, white and black. Default color is 2, blue.

For theme foreground color, press 'PREV' to repeatedly step though the 7 options from 0 to 6 where the color sequence is red, green, blue, yellow, light blue, pink, white and black. Default color is 6, white.

At any setting state, press and hold the 'Next' button to exit the settings menu.
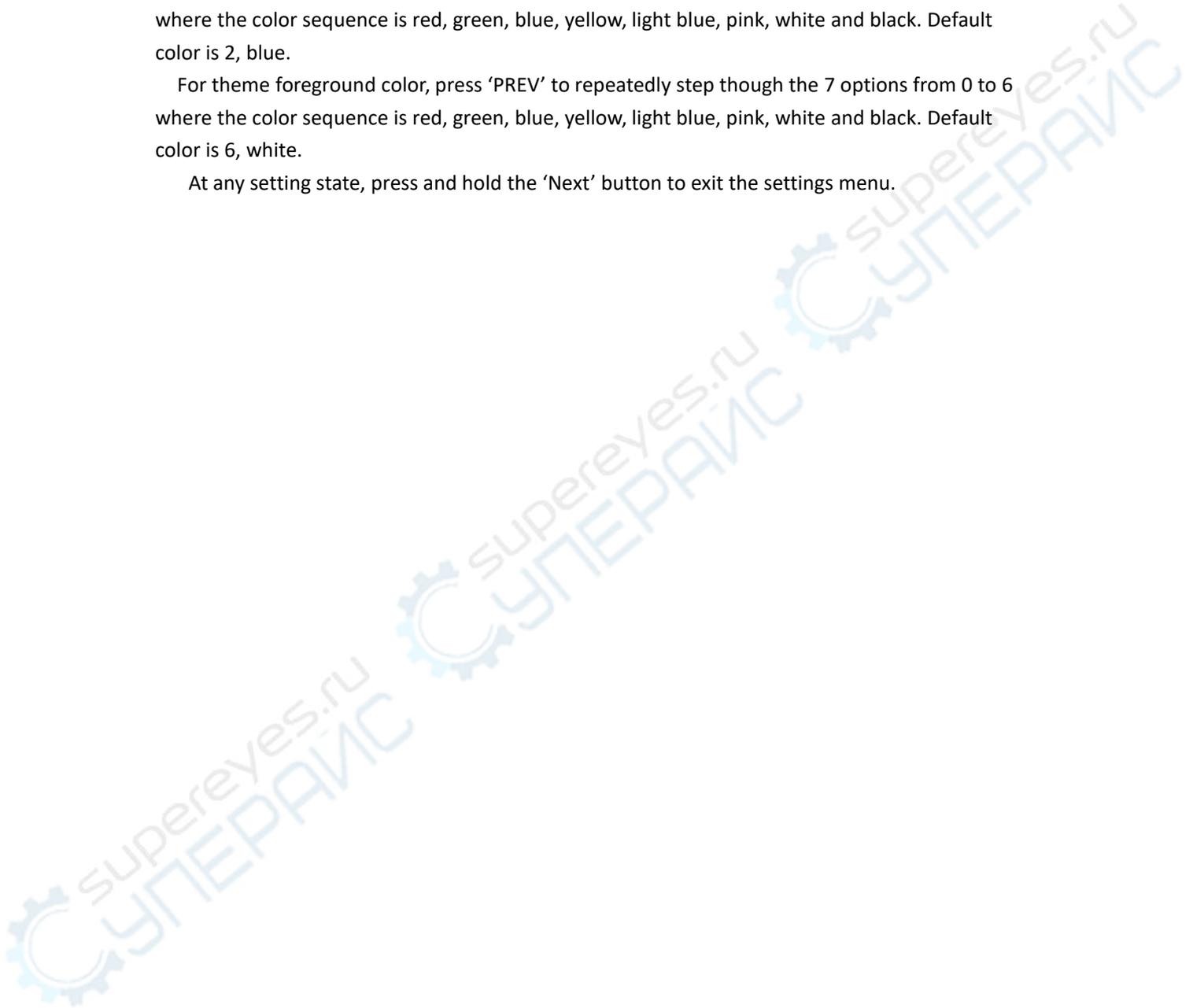
UM25C Android APP Instruction

2.1 APP Installation:

NOTE：The APP only support Android 5.0 and above

2.1.1 APP download

There are two download ways:

① APP download link : http://www.mediafire.com/folder/q2b8h079hpywq/UM25, choose UM25C android APP file to download, you can use the computer to download , then sent the phone, or use the phone download directly.

② Search **"UM Meter"** on Google Play and click download.

2.1.2 Open the installation package

（1）	（2）
（3）	（4）

2.2 Installation succeed

After Installation APP icon as the picture

UM Meter

2.2.1 APP Connection & Operation

Click the APP icon, after the APP starts, the system will automatically detect whether the APP version is updated in the background. The new version will prompt the box to update the interface. The interface is displayed as follows:
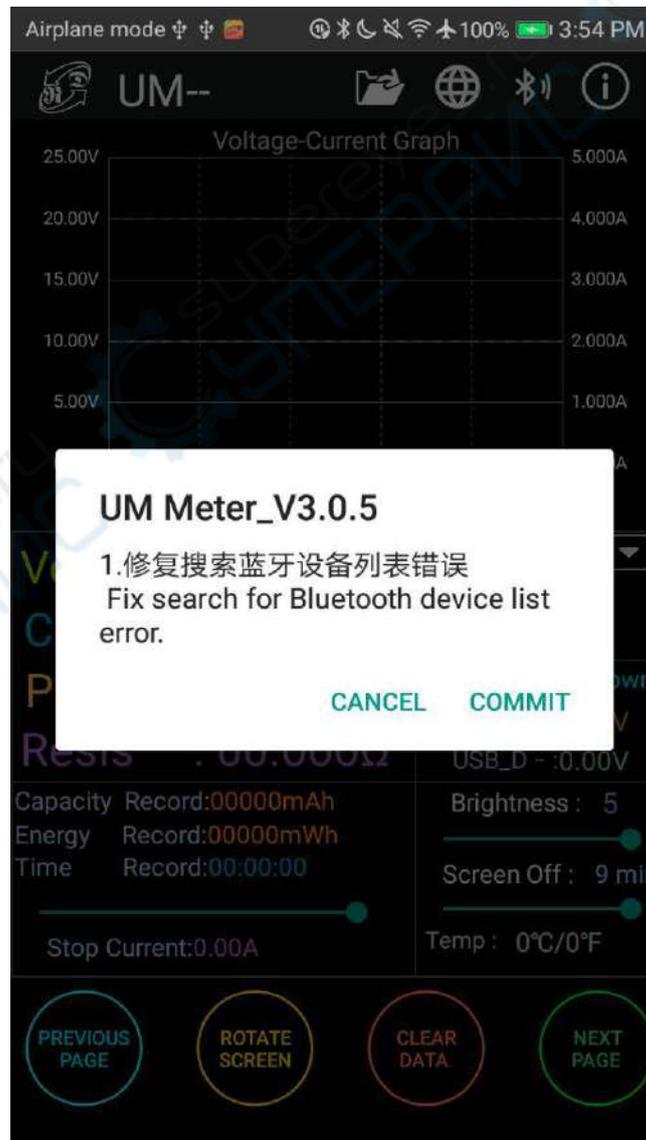
2.2.2 APP interface

Update progress succeed, you can see the interface below(picture 01):

| Picture01 | Picture02 |
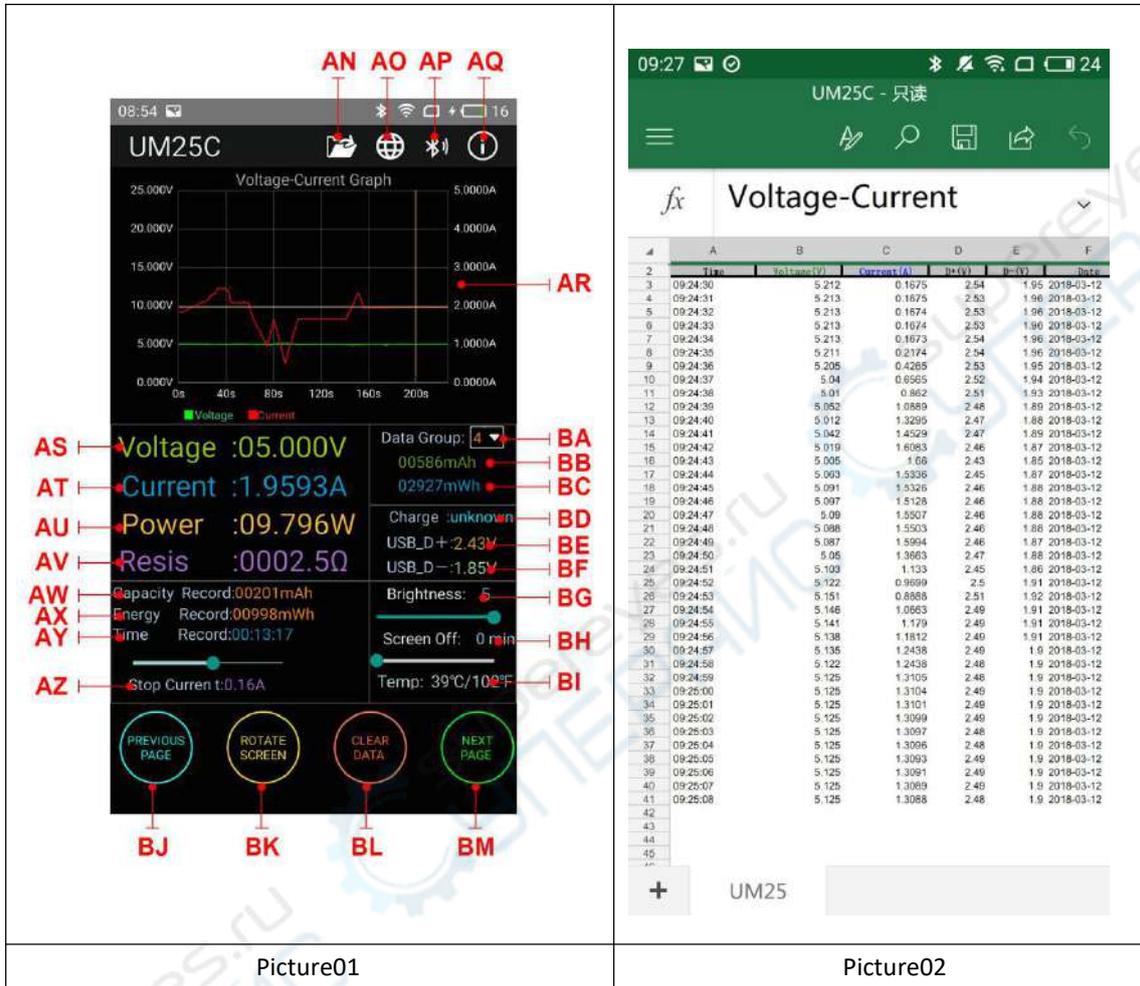
AN: Export data to the phone folder (mobile phone memory or SD card root directory, repeat writing, can directly generate graphs in Excel), and can share files to other APP (picture 2)

AO: Muti-language option, click to select languages, currently 22 languages (简体中文 / 繁体中文), English, русский, Polskie, español, हिन्दी, Slovenskýjazyk,Latvietis, 日本語, Deutsche, Nederlands, 한국어 , Français, Türk, ไทย, Bahasa Indonesia, čeština, Українська, Ελληνικά, Magyar, Português...), more languages are constantly being updated.

AP: Bluetooth connection: Click to enter the device selection, search for the Bluetooth name of the device, enter the pairing code 1234, click the connection (first connection, first set the Bluetooth connection on the phone, then open the APP and click the Bluetooth icon to connect.)

AQ: Program information: version number description, assist developer information

AR: Voltage-current measurement curve

AS: Voltage Measurement

AT: Current Measurement

AU: Accumulated Capacity

AV: Load Equivalent Impedance

AW: mAh

AX: mWh

AY: recording time

AZ: Off current

BA: Data group number(click the triangle to switch data group)

BB: Accumulated capacity

BC: Accumulated energy

BD: Quick charge recognize mode

BE: Voltage on D+ data cable

BF: Voltage on D- data cable

BG: Screen brightness adjustment

BH: Screen off delay adjustment

BI: Temperature display(℃/℉)

BJ: Switch to previous page

BK: Rotate key: rotate the screen

BL: Delete key: clean the data group being used

BM: Switch to the next page

Note:

1. Due to the wide variety of Android phones, the UI interface is displayed differently on different scale screens of Phones.

2. Application permission requirements, allow the necessary permissions when the program is installed (allow background running, allow Bluetooth, allow operation of the folder, allow reading of the application list, etc.) and also set the permissions of the program in the phone after installation: Allow background running, The lock screen operation won't shut down the APP, self-starting is allowed, etc. (the system is prevented from forcibly exiting the APP when data is continuously recorded).

3.Language selection memory, you only need to select the language when you open the app for the first time.

UM25C IOS APP Instruction

Apple APP only supports the official version system of IOS8.0 or above. Search "UM Meter" in the Apple Store to download.
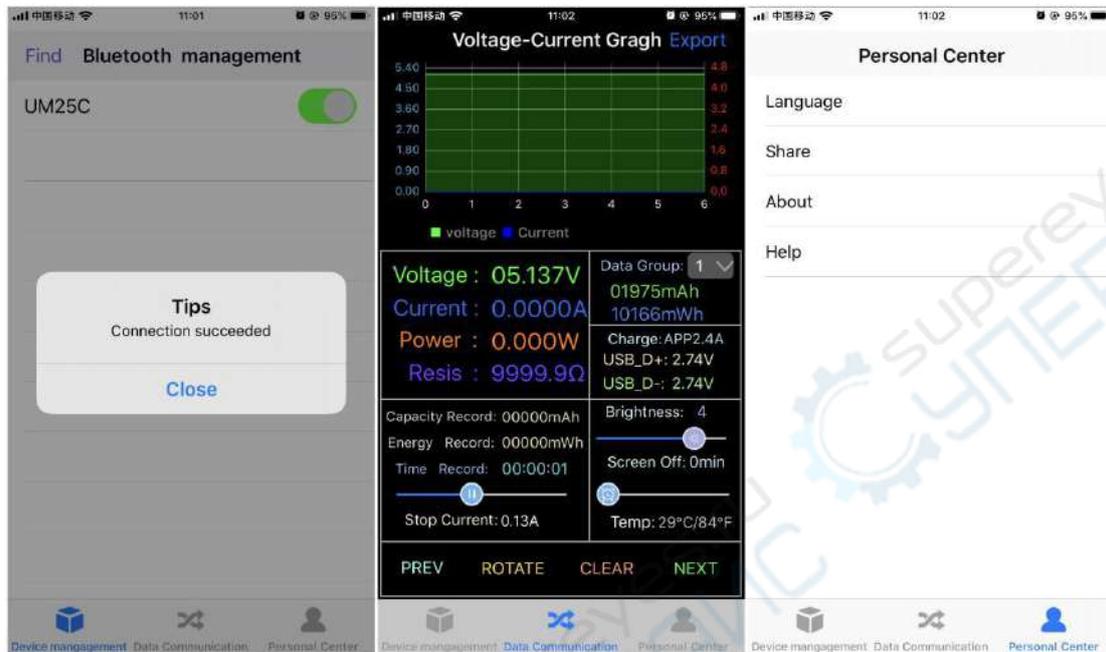
3.1 APP Connection & Operation

After opening the app, click **"Find"** to search a nearby Bluetooth device. After the screen prompts the connection is successful, click the **"data communication"** to go to the second page. The table can be zoomed in and out. Other functions are the same as Android APP. After clicking **"Export"**, the curve can be exported to a form file. Click **"Share"** in the **"personal center"** to copy the form file to other apps to open or share. Click **"Language"** on the personal center to choose language, you can choose English, Simplified Chinese, Traditional Chinese, Russian, Japanese, German, Korean, French, Spanish, Polish, Hindi, Slovak, Latvian, Dutch, Turkish, Ukrainian, Ukrainian, Thai, Indonesian, Czech, Hungarian, etc. Click **"Help"** to learn about simple operation.

3.2 APP update

When there is a large version update, the software will automatically prompt for the update, or you can get the latest software from the Apple Store. The IOS APP version corresponding to the current manual is 1.2.1.

The PC Control Software Installation Instruction

-mode: UM25C

Note: This product only supports Windows 7 and above.

Download link:

http://www.mediafire.com/file/o1yujrmbwyp445c/UM25C_PC_Software_V1.3.zip/file

4.1 Unzip the installation package

Note: Before unzip the installation package , please install the font package "Arial Unicode MS".

Arial Unicode MS.ttf   2017/11/4 16:41   TrueType 字体文件   23,566 KB

4.2 Click setup to install

UM25C PC Software V1.3

Start Installation
Review the following summary before continuing.

Adding or Changing
• UM25C PC Software V1.3 Files

Click the Next button to begin installation. Click the Back button to change the installation settings.

Save File...   << Back   Next >>   Cancel

UM25C PC Software V1.3

Installation Complete

The installer has finished updating your system.

<< Back   Next >>   Finish

4.3 Bluetooth connection

4.3.1 open the bluetooth switch on the UM25C.

4.3.2 Use the compute to search bluetooth device.
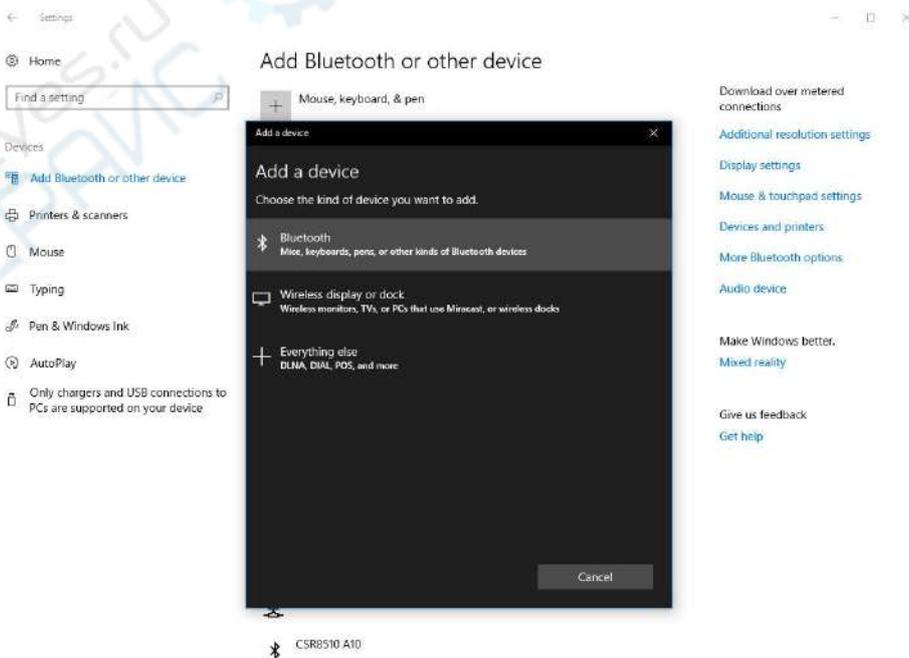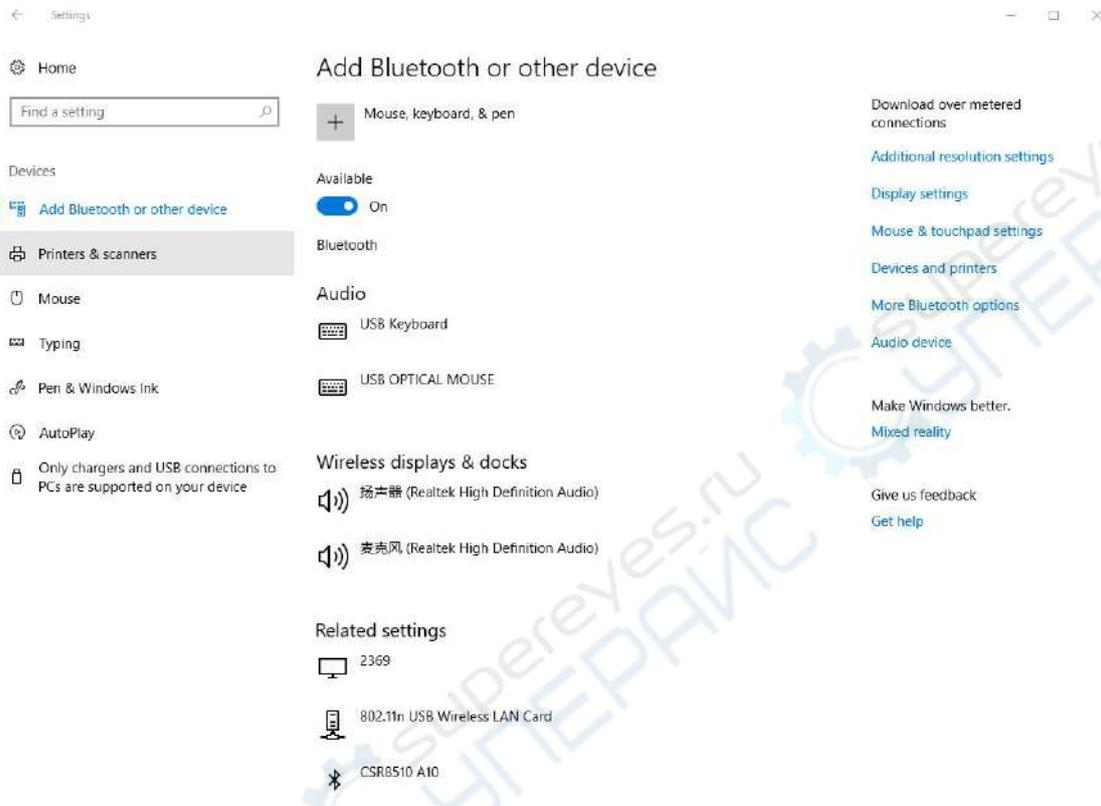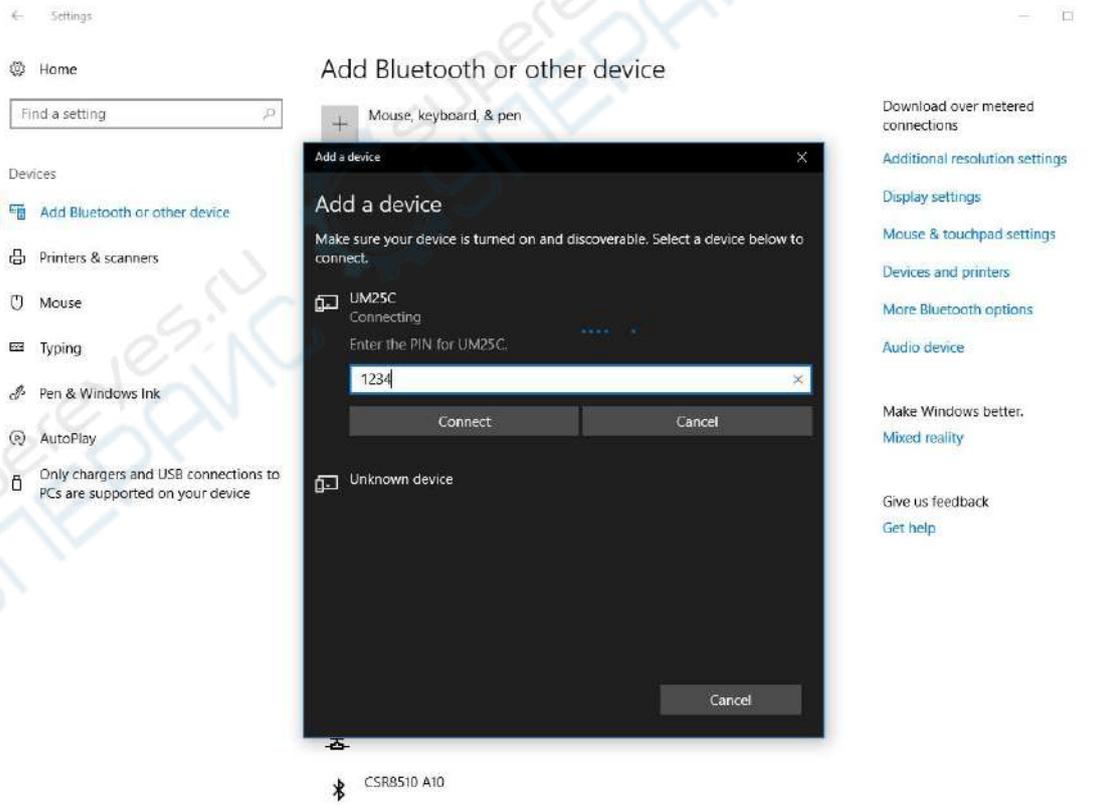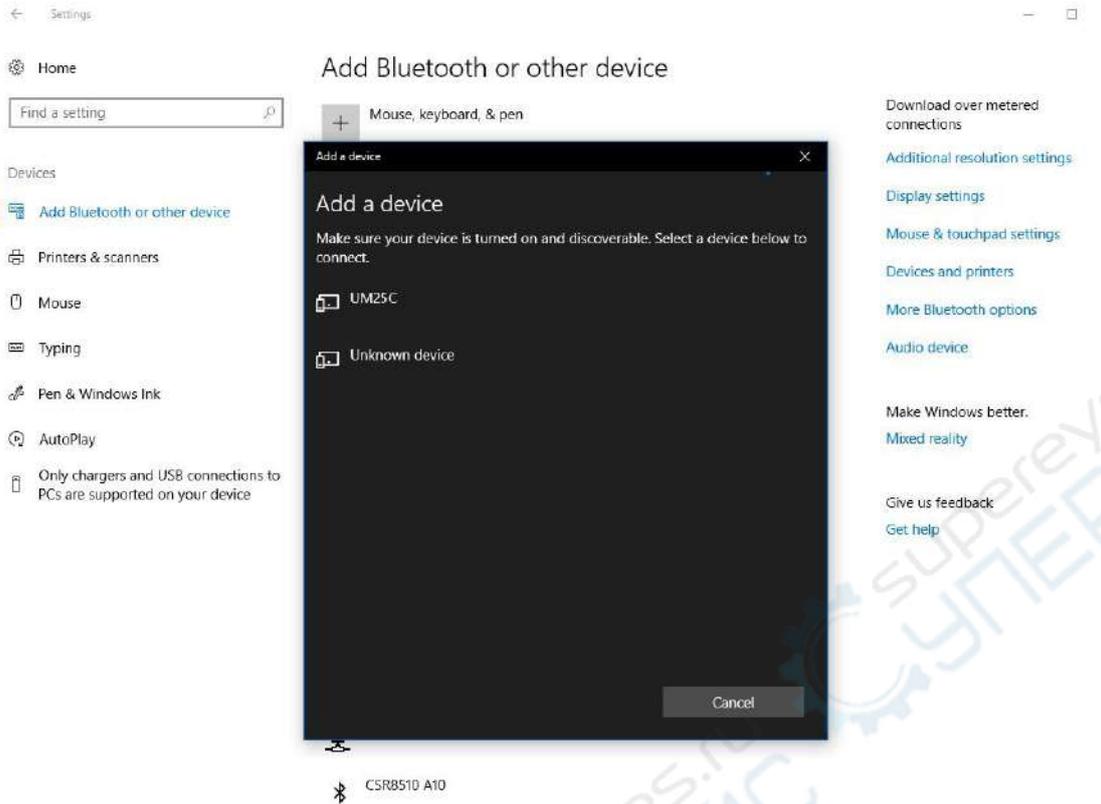
4.3.3 View bluetooth setting

Select the device connected with bluetooth, view the bluetooth series port COM what PC was using. Efferent direction COM (UM25C'Port') is bluetooth connection port. (note: at win7 system, select bluetooth device, right-click to view properties, display the following widows, view COM port of bluetooth setting, select efferent direction series port to connect. At win10 system, select bluetooth device, click "more bluetooth option", view COM port of bluetooth setting, select efferent direction series port to connect.)
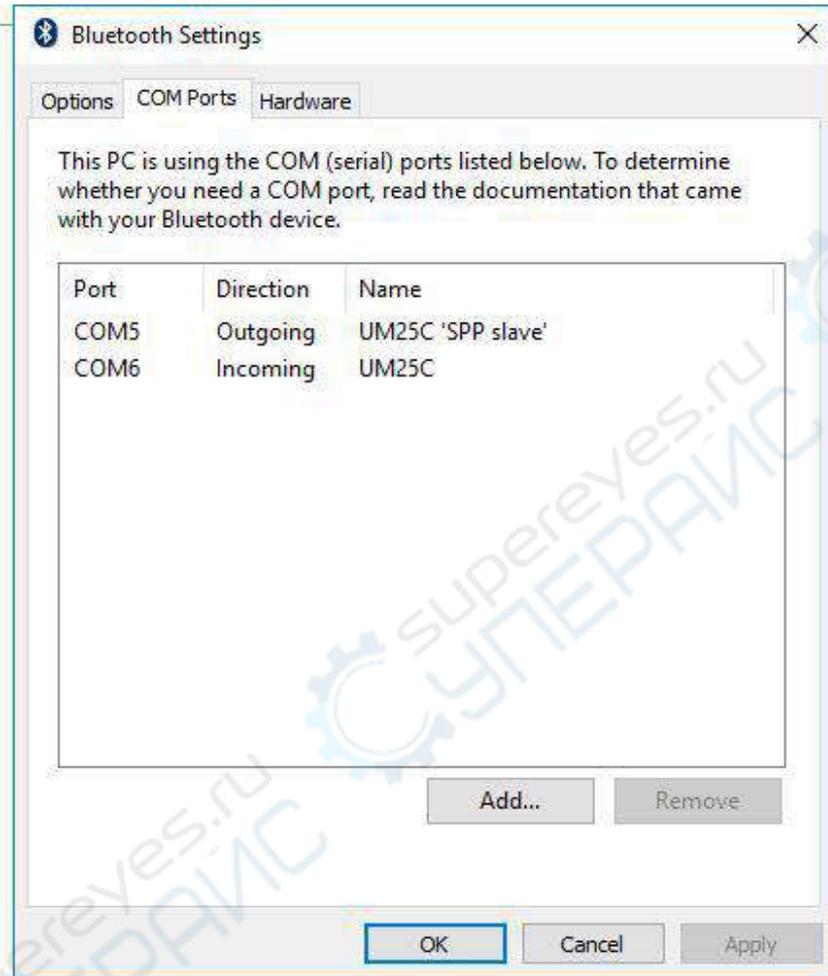
4.4 Connect bluetooth:

When the Bluetooth indicator changes from blinking to static, click "Connect"
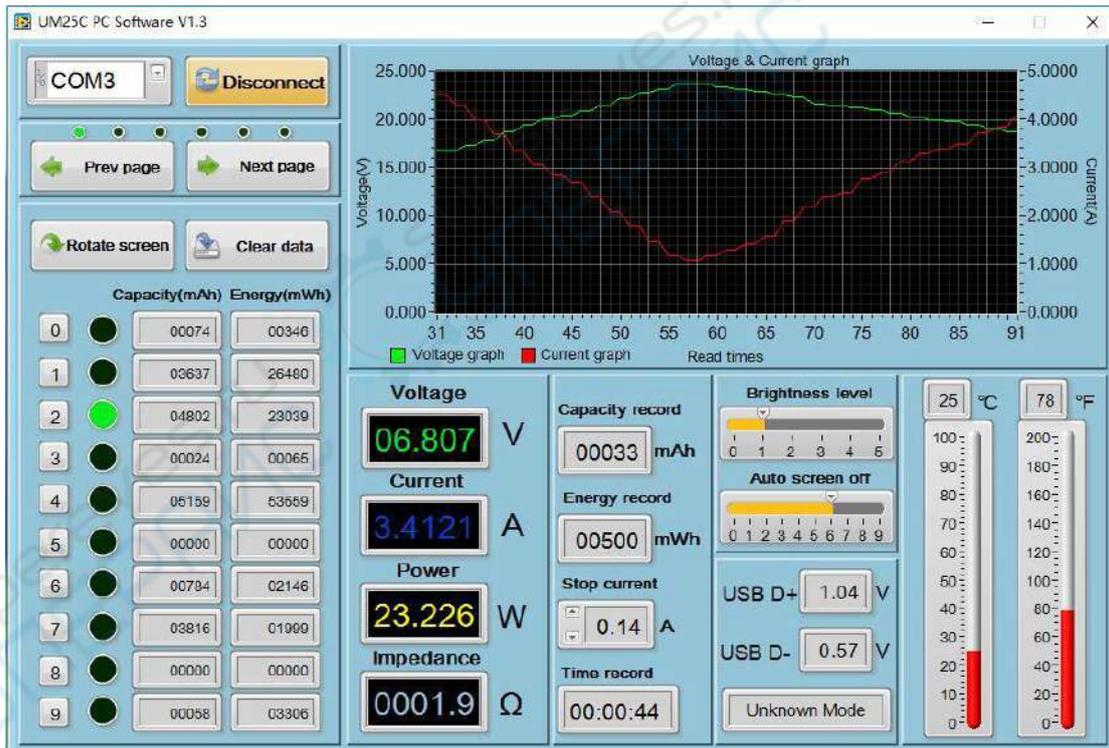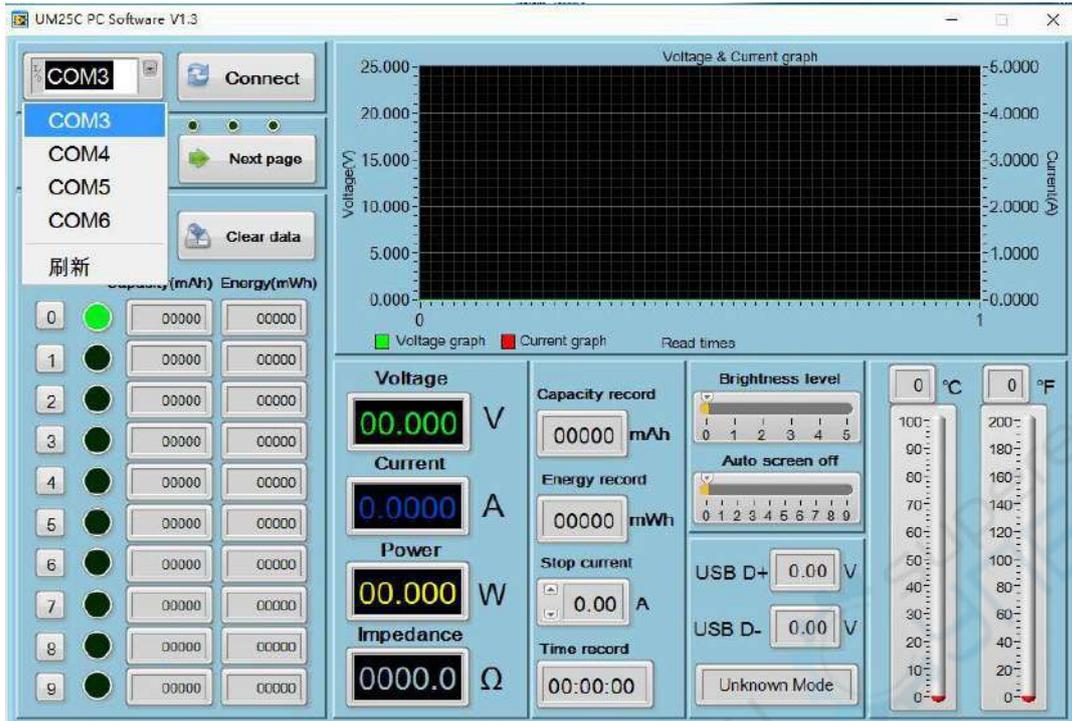
4.5 Function Introduction

4.5.1 Program interface overview:
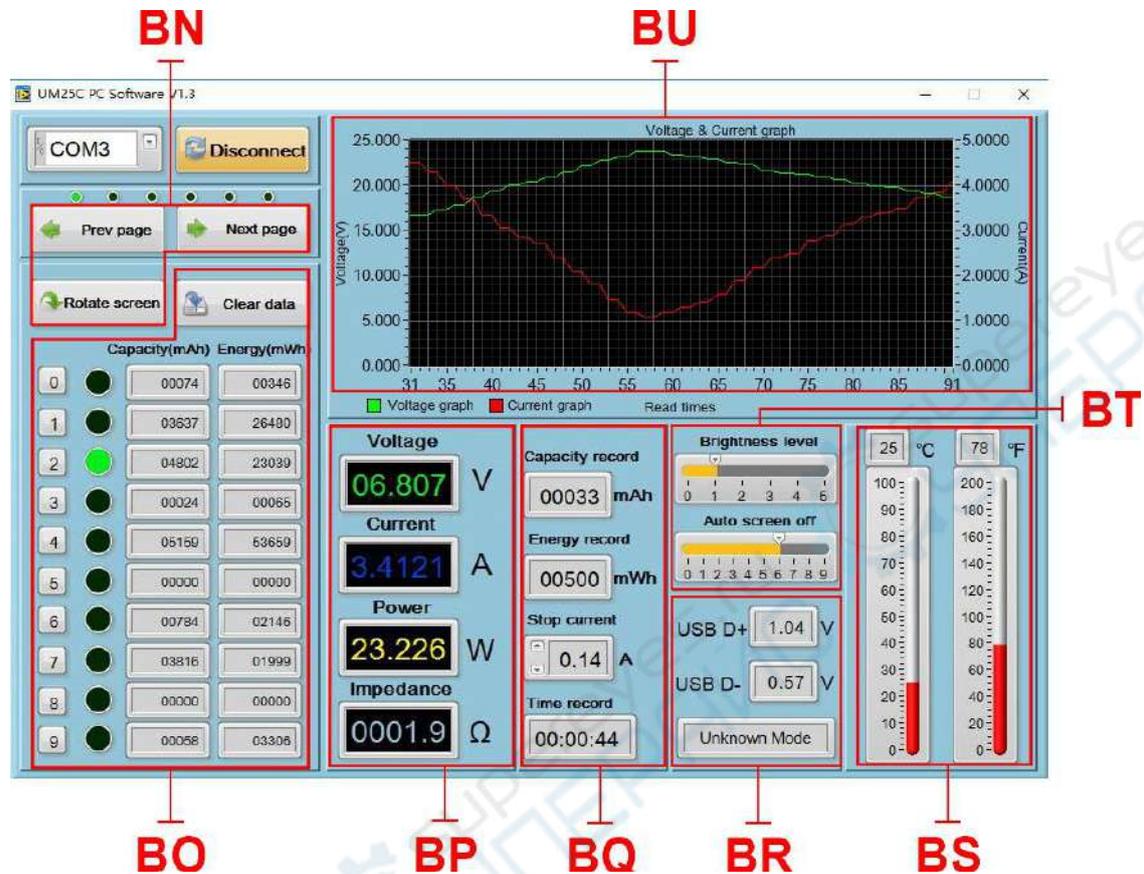
1: Basic functions: Previous page, Next pages, Rotate screen,

2: Corresponding data group: data group switch (click the corresponding number to switch directly into this data group), data group data clear

3: Corresponding the main display interface 1: main measurement interface

4: Corresponding the main display interface 3: Data recording interface

5: Corresponding the main display interface 2: Quick Charge Recognition interface

6: Corresponding the main display interface 6: temperature unite switch, dual format temperature display

7: Corresponding the main display interface 6: screen brightness, auto screen off time.

8: Corresponding the main display interface 5: Voltage-Current Graphing Interface.

4.5.2 Graphing and Data Export:

Move mouse over the Voltage / Time measurement graph then right-click and select the following options:
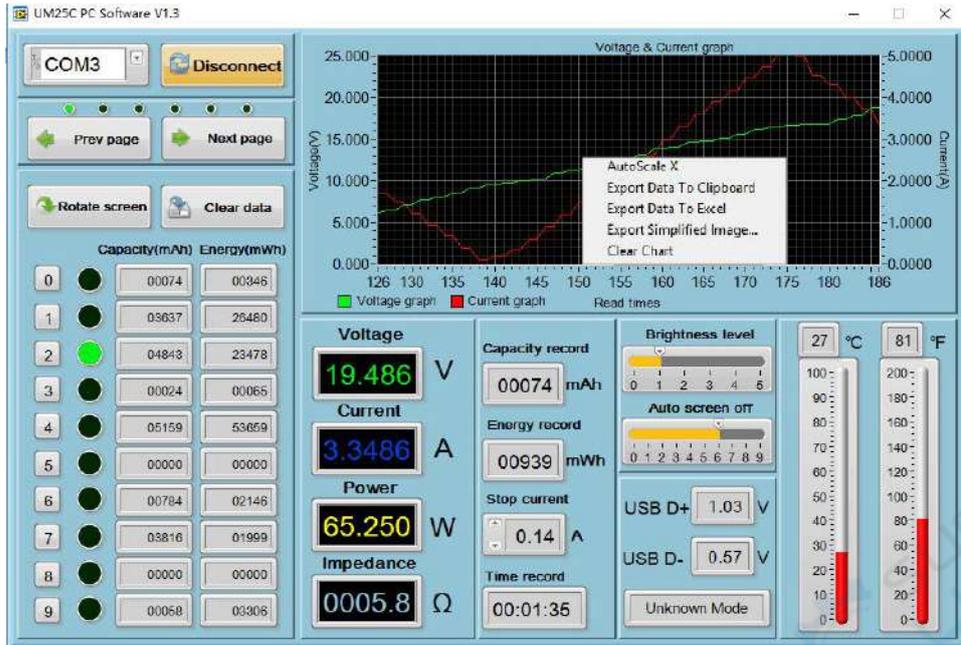
4.5.2.1: Automatically adjust the X axis:
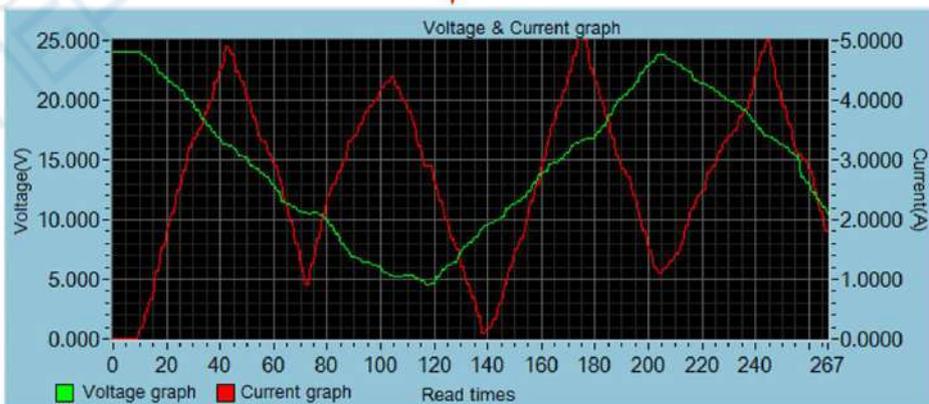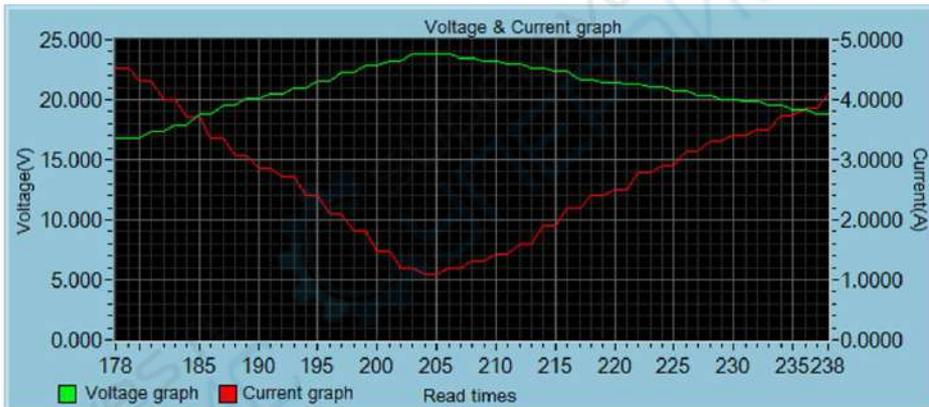
4.5.2.2: Export data to the clipboard:

Format : Reference point number on X Axis,   Voltage value at that reference point.
Read times - Voltage graph Voltage(V) - Voltage graph Read times - Current graph
Current(A) - Current graph
0 23.998 0 0.0002
1 23.998 1 0.0002
2 23.998 2 0.0001
3 23.998 3 0.0001
4 23.998 4 0.0002
5 23.998 5 0.0002
6 23.998 6 0.0021
7 23.998 7 0.0021
8 23.998 8 0.0018
9 24.084 9 0.0018
…

4.5.2.3: Export data to Excel:

The X scale is adjustable to your preference. You can export up to 120 data reference points, or, only export the current recording data set. Please note, the exported data is only for Microsoft Office Excel.

	A	B	C	D
	Read times - Voltage graph	Voltage(V) - Voltage graph	Read times - Current graph	Current(A) - Current graph
2	0	23.998	0	0.0002
3	1	23.998	1	0.0002
4	2	23.998	2	0.0001
5	3	23.998	3	0.0001
6	4	23.998	4	0.0002
7	5	23.998	5	0.0002
8	6	23.998	6	0.0021
9	7	23.998	7	0.0021
10	8	23.998	8	0.0018
11	9	24.084	9	0.0018
12	10	24.084	10	0.201
13	11	23.686	11	0.201
14	12	23.686	12	0.4862
15	13	23.44	13	0.4862
16	14	23.44	14	0.6776
17	15	22.972	15	0.6776
18	16	22.972	16	1.1439
19	17	22.317	17	1.1439
20	18	22.317	18	1.5536

4.5.2.4: Export simplified images:
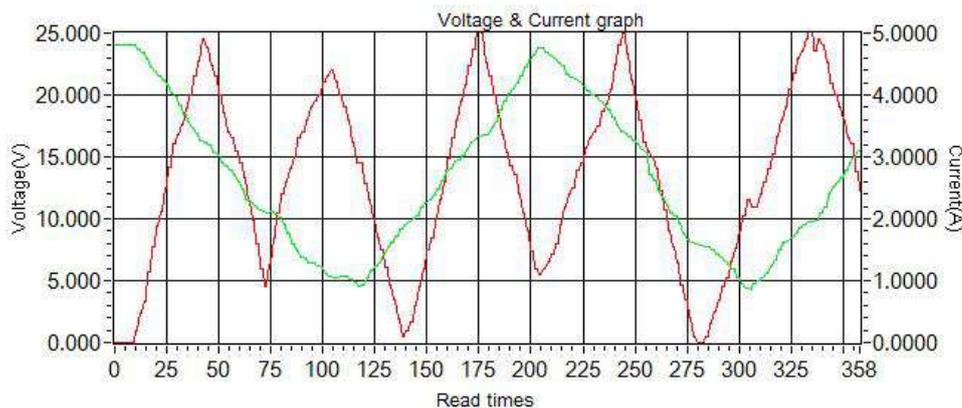
4.2.5: Clear chart:
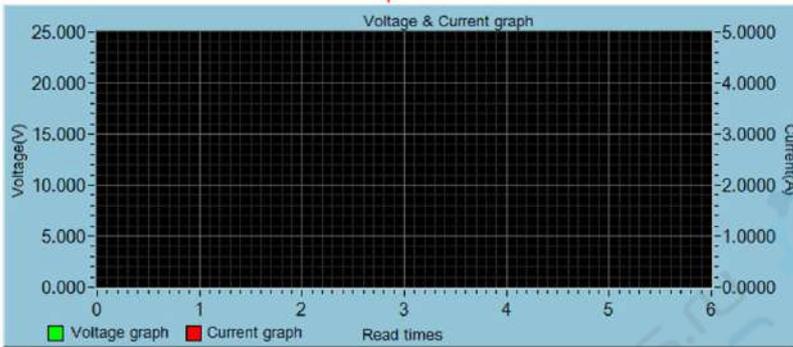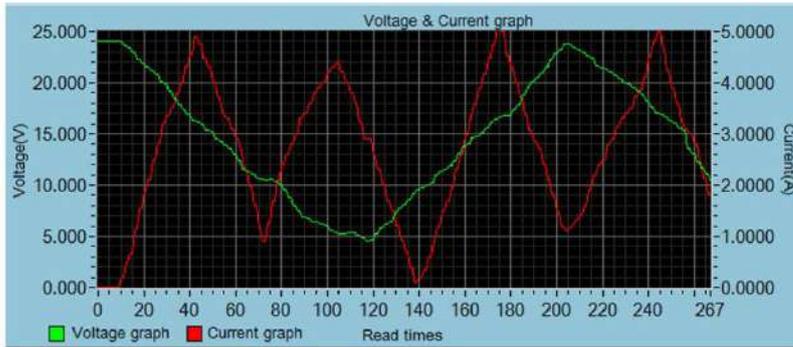
Note:

1. for desktop, when you use the bluetooth adapter to make bluetooth connection, Please don't use the adapter own driver, and use the windows system bluetooth driver, otherwise the module can't make SSP series port communication. If you have installed the adaptor driver, you can uninstall it and unplug the adaptor, then plug in again, the system will install it automatically.

2. after power off, when power on again, you need to select the COM port again. When the bluetooth indicator is lighting, you can connect the PC with module

3. ease use windows official version, simple version may lose some part.

4. en communicating, don't press the button on tester, otherwise there will be some error data.

5. The exported data is only for Microsoft Office Excel.

Appendix 1: Explanation of terms

Quick charge: fast charging, modern fast charging mostly refers to the charging process when the charging current is greater than 2A or the charging power is greater than 10W.

Quick Charge Protocol Detection: Detect which quick charge protocols are supported by the charger.

Quick Charge Protocol/Quick Charge Mode Recognition: Identify what fast quick is currently in progress.

Decoy/trigger: Simulates a quick charge protocol sequence that allows the charger to output high voltage/high current.

Quick Charge Simulation: Analog　protocols which chargers do not support to improve charger compatibility.

Common part of the quick charge agreement:

Qualcomm: QC2.0, QC3.0, QC4+

Media Tek: PE2.0, PE3.0

Huawei: FCP SCP

OPPO: VOOC, Super VOOC

One plus: DASH, Warp

USB Type-C: PD2.0, PD3.0, PPS

mAh, mWh: milliampere hour, milliwatt hour, milliampere is the capacity unit. Milliwatt hours is the unit of energy.

Appendix 2: Basic Operational Knowledge

I: measure the capacity of power bank

Preparation materials: power bank to be tested, USB tester, HD35 electric load or mobile phone, charging head.

the data need to view：　the capacity energy value of the power bank (mAh mWh), the voltage and current value of the power bank output

First charge the power bank, then adjust the current meter to the non-zero data group, then use the power bank to charge the mobile phone or use the HD35 electronic load to discharge to the power bank to automatically shut down, use the charging head to supply power to the tester, and then Record the mAh, mWh values on the tester.

Method 1: The comparison tester shows that the mWh is divided by efficiency (like 90%) and the power bank mWh. If the difference is not large, the capacity of power bank is real (the most accurate method).

Method 2: If the mobile phone is 5V charging, the tester displays mAh multiplied by 1.5. If the mobile phone is a 9v charging tester, the mAh multiplied by 2.7. If the value is not much different from the technical parameter of power bank. The power bank's capacity is real. (only applicable to power bank without mWh).

Since many mobile power sources are currently tens of thousands of mAh, if you simply charge the mobile phone to measure the capacity of the power bank. You need to charge the mobile phone many times. It takes even a week to measure the capacity of power bank, in

order to quickly discharge the power of the power bank. Test with a constant current load. Take xiaomi power bankII as an example, it can support 5V/2A output, 38.5Wh/(5V*2A)=3.85. It can discharge the power of power bank in about 4 hours. If you use HD35 electronic load, it can be triggered 9V. Thus 18W quick discharge, 38.5Wh / (9V * 2A) = 2.13h, so that it takes only two hours to complete the power bank capacity test, quickly identify whether the capacity of power bank is false (high power discharge, inversion rate will decrease and the actual measured capacity will be smaller).

II. Measuring the quality of data cable

The quality of the data cable directly affects the speed of charging, even worse the inferior data cable has the risk of burning the phone, so measuring the quality of the data cable is also a necessary function. We have two ways to measure the quality of the data cables, each with its own advantages and disadvantages, you can choose the better way which suits you .
The common data cable length has a great influence on the actual test results. Generally speaking, the shorter cable 's performance should be better.

1. Current measurement method:

Test materials: mobile phone, original charger, original data cable, USB tester, data cable to be tested.

Test procedure: Discharge the phone to between 50% and 60% power. Use the original charger, USB tester and original data cable to measure the charging current and record this current. Then replace the original data cable with the data cable to be tested, and record the charging current again. The time between the two measurements should not be too long. The higher the charging current, the better the quality of the line. If the charging current values differ a lot, it may indicate that the quality of the cable is very bad or the mobile phone is not supported to the cable(Note: you must use UM25 to test Huawei Super Quick Charge).

2.Cable resistance measurement method:

Test materials: charger, UM series tester, constant current load (such as HD35), data cable to be tested.

Test procedure: Insert the tester into the charger,switch to the line resistance measurement interface, plug in the load, adjust the current to about 1A, hold the button and wait for the tester to flash, then remove the tester.

Connect the data cable. Plug it into the charger, plug the other end of the data cable into the tester input, turn on the load, and hold the button. The resistance of this cable will be displayed on the tester.

Advantages of current measurement method: It can intuitively judge whether the data cable supports the fast charge and fast charge current value, and you only need to buy a USB tester.

Disadvantages of current measurement method: relying on mobile phones and original accessories of the phone as a comparison.

Advantages of line resistance measurement: It is possible to measure the actual parameters for comparison between different wires. Generally, the micro data line resistance will be above 400mΩ, and the Type-C data line can be made smaller. No need to use a mobile phone for measurements

Disadvantages of line resistance measurement: the tester and load are required to measure, and the price is higher.