TP-BT User Manual

Dear Customers,

Thank you and congratulate you for your choice.

This patented Bluetooth Optical Probe, In order to meet your expectations about your electricity/water/gas/heat meters compliant with standards IEC62056-21/ANSI/ANSI-Type2, they are manufactured using first quality materials and subjected to strict quality control stages through all production process. This user manual has been prepared to help you about the using and programming.

We want you to get the best efficiency from our product. That‘s why, please read the entire user manual carefully before using the product and keep it as a guide. If you give the product to another person, hand it over with the manual too.

About TP-BT

TP-BT is a new series of Tespro China optical family, which supports Bluetooth communications with Mobile Phone, PDA, PC and other devices. TP-BT has unique features designed with MCU, TP-BT has been designed in such a way that one BT probe can be used as two. It functions both Bluetooth optical probe as well as normal Tespro USB connection optical probe.

Fig.1 Standard Support

Items in package

There are 4 accessories configured in the package. These accessories can be provided as a spare part separately. Please contact Tespro China for extra spare parts. The extra spare parts are the same quality as those equipped in the package. These accessories are custom designed so it is not possible to be supplied by a different manufacturer.

Fig.2 Accessories

1. Charger Adapter

To charge the Bluetooth optical probe

2. Charger-Cable / Data Cable

A. To communicate when TP-BT works as an USB probe
B. work as a charging cable

3. Satety Strap

To easily carry and to prevent accidental fall

4. USB Bluetooth Adapter (Option)

To enable the Bluetooth function of PC computer; Laptops usually come with BT function

5. Carrier Bag

To pack all items in one bag for easy carrying

Overview

TP-BT is a wireless optical probe with Bluetooth interface for meter reading, TP-BT has been designed in such a way that one BT probe can be used as two. It functions both Bluetooth optical probe as well as normal Tespro USB connection probe. Battery managing is achieved by special design to indicate the remains of energy available, and that charging control to prevent over-charging.

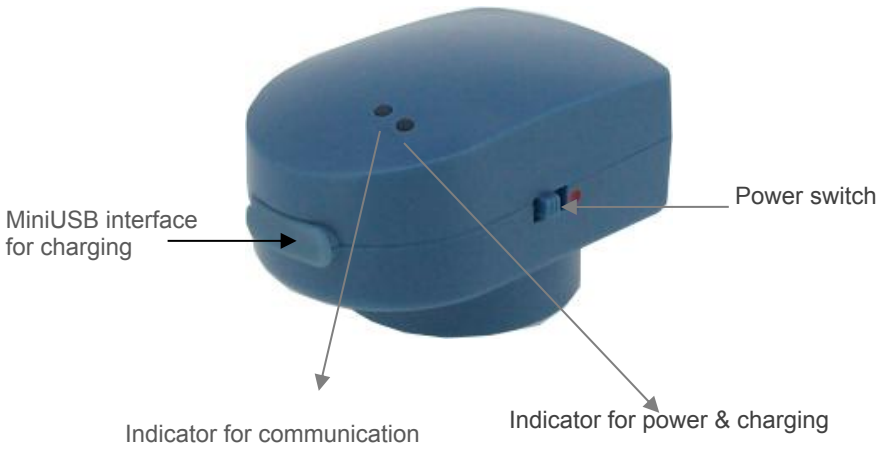


Fig.3 Component descriptions

1. Probe States:

- Standby: When power-on the power indicator lights up in green.
- Communication: During communication the blue LED twinkles.
- Charging: During charging the power indicator turns red, and turns green when battery is charging full.

2. Power Switch

If on 'ON' position, TP-BT is in the wireless Bluetooth mode
If on 'OFF' position, Bluetooth mode if off, and TP-BT can work as an USB probe.

3. Indicator for power & charging

When power-on the power indicator lights up in green.
During charging the power indicator turns red, and turns green when battery is charging full.

4. Indicator for communication

During communication the blue LED twinkles.

5. Mini-USB port for charging

A. Interface for charging
B. Interface to let TP-BT work as USB probe using data cable

6. Battery indication and charging

Power-on and battery states can be indicated by a green/red LED:

- Red: During battery charging the LED lights up in red, and it turns green when charging is done.
- Green: When the probe switches power on the LED lights up in green. The LED lights up in 5 different conditions to show the remains of energy in battery:
  1. LED lights up constantly: Energy in battery is 40% or more
  2. LED lights twinkling in 3Hz: Energy in battery is 20~30%
  3. LED lights twinkling in 1Hz: Energy in battery is 10~20%
  4. LED lights twinkling in 0.25Hz: Energy in battery is 10%
  5. LED shut down: Battery exhausted

7. Charging

- By connecting the mini-USB connector to Bluetooth optical probe, with other end of USB-A connector to the power adapter (DC5V /AC85~240V).
- Power adapter can be replaced by any of other USB Charging.

8. Bluetooth Probe Pairing in Tradition mode

① Switch on the power and the power indicator lights up in green.

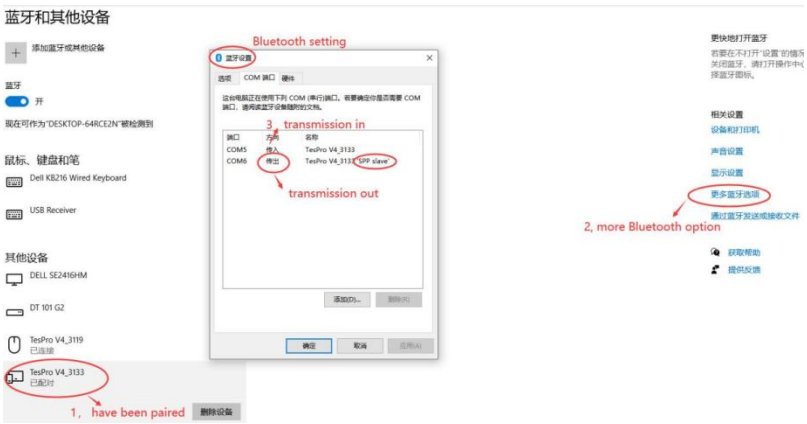
② For Win10/Win11 OS, please follow ' Bluetooth & other devices – add Bluetooth or other devices – add device – Bluetooth – find and connect the device with name TesPro V4_xxxx (Be sure the name without BLE in the end)

③ Bluetooth matching goes on with matching code 1234(default).

④ Check the mapping serial number, please go to page 'Settings – Bluetooth and other devices – More Bluetooth option – Bluetooth Setting', The COM port which marks transmission out, or say mark with SPP Slave' is the valid communication COM port.

⑤ Data communication will go on via this mapping serial number.

⑥ Switch off the power after work done for saving the energy of battery.



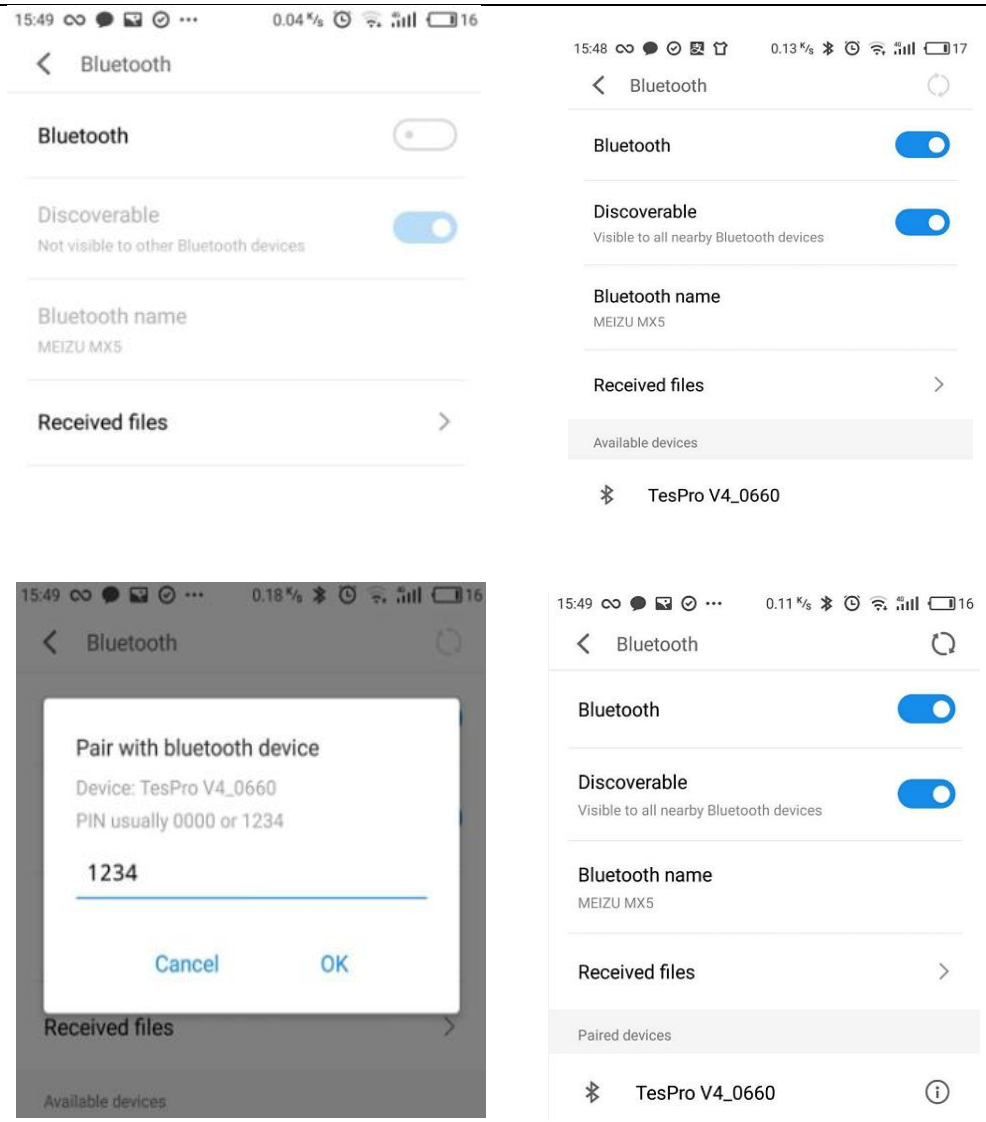


Fig.3 Bluetooth Probe Pairing in Android System (Tradition mode)

9. Bluetooth Probe using in IOS system (BLE mode)

Fig.4 Bluetooth Probe Pairing in IOS System (BLE mode)

Technical Specifications

Items	Features
Communication Interface	Bluetooth 4.0 SPP+BLE
Supported Standard	IEC 62056-21 / ANSI
Battery Feature	3,7 V / 800 mAh
Battery Charging Time	3 Hours-MiniUSB (Not Supported PD Fast Charge)
Computer Communication Port	USB 2.0 / MiniUSB /USB-OTG
Sensor Light Wave Length	~ 900 nm.
Number Of Keys	1 Keys (Power)
LED Indicators	3 LEDs (Power / Charge / Communication)
Magnet Holding Power	N40 / N52 (Optional)
Maximum Data Rate	57600 bps
USB Connection Optical Probe	Supported(Add Data Cable)
Diameter & Height	31,5 mm Diameter / 33,5 mm Height
Weight	65 gr
Transparent Communication Mode	IEC 62056-21 Mode C / Mode E /User Mode ANSI C12.18 / ANSI C12.18-2006 type2
Smart Communication Mode	There is (IEC 62056-21 Mode C / Mode E)
Maximum Frame Length	SPP-1024 / BLE 20 bytes
Silicone Protection	Yes (For option)
Safety Strap	Yes (For option)
Working Environment	-20° C ····· +70° C
Enclosure Material	ABS + PC
Protection Class	IP 54
Firmware And Configuration Update	Yes (with USB or Bluetooth)
Duration of communication	~24 Hours
Standby Time	~ 30 Days

Protocol

Dynamic Baud rate change protocol is as follows:

1. Hardware initial state should be 9600, N, 8, 1
2. Both USB probe and Bluetooth probe should support the command to change the baud rate.
3. The probe should change baud rate after getting the change baud rate command. After communication, it doesn't require to change back to default state automatically. It should wait for further change baud rate command.
4. Baudrate support range is 300-115200.
5. Support command mode and data mode

(1) Function 1：

The interface of the change baud rate AT command is：

BaudTran, baud, parity, data bits, stop bit + 0x0D, 0x0A

1. Parameters
    a. BaudTran: keyword
    b. Baud: 300-115200
    c. Parity: N: no parity E: Even Parity O: Odd Parity
    d. Data bits: 7 or 8
    e. Stop bit: 0: 1 1: 1.5 2: 2

   Note: each parameter must be separated by "," and ending is 0x0D, 0x0A
   For example BaudTran, 9600, N, 8, 1, 0x0D, 0x0A, the actual command to send is 42 61 75 64 54 72 61 6E 2C 39 36 30 30 2C 4E 2C 38 2C 31 2C 0D 0A

2. Return value
    4F 4B: OK / 42 41 44: BAD

(2) Function 2：

The interface of set baud rate after IEC Ack command is：

BaudTram, baud, parity, data bits, stop bit + 0x0D, 0x0A

1. Parameters
    a. BaudTram: keyword
    b. Baud: 300-115200
    c. Parity: N: no parity E: Even Parity O: Odd Parity
    d. Data bits: 7 or 8
    e. Stop bit: 0: 1 1: 1.5 2: 2

Note: each parameter must be separated by "," and ending is 0x0D, 0x0A

For example BaudTram, 9600, N, 8, 1, 0x0D, 0x0A, the actual command to send is 42 61 75 64 54 72 61 6D 2C 39 36 30 30 2C 4E 2C 38 2C 31 2C 0D 0A

2. Return value

4F 4B: OK / 42 41 44: BAD

(3) Function 3：

The interface of set baud rate for IEC handshake command is：

BaudTrai, baud, parity, data bits, stop bit + 0x0D, 0x0A

1. Parameters
   f. BaudTrai: keyword
   g. Baud: 300-115200
   h. Parity: N: no parity E: Even Parity O: Odd Parity
   i. Data bits: 7 or 8
   j. Stop bit: 0: 1 1: 1.5 2: 2

Note: each parameter must be separated by "," and ending is 0x0D, 0x0A

For example BaudTrai, 300, E, 7, 0, 0x0D, 0x0A, the actual command to send is 42 61 75 64 54 72 61 69 2C 33 30 30 2C 4E 2C 37 2C 30 2C 0D 0A

2. Return value

4F 4B: OK / 42 41 44: BAD

(4) Function 4：

Open the IEC support Switch command is：

BaudTrap, baud, parity, data bits, stop bit + 0x0D, 0x0A

For example BaudTrap, 9600, N, 8, 1, 0x0D, 0x0A, the actual command to send is： 42 61 75 64 54 72 61 70 2C 39 36 30 30 2C 4E 2C 38 2C 31 2C 0D 0A

Return value

4F 4B: OK / 42 41 44: BAD

(5) Function 5：

Close the IEC support Switch command is：

BaudTraq, baud, parity, data bits, stop bit + 0x0D, 0x0A

For example BaudTraq, 9600, N, 8, 1, 0x0D, 0x0A, the actual command to send is： 42 61 75 64 54 72 61 71 2C 39 36 30 30 2C 4E 2C 38 2C 31 2C 0D 0A

Return value

4F 4B: OK / 42 41 44: BAD

(6) Function 6：

Switch to command mode：

0x55, 0xde, 0xf2, 0xd6, 0xc1, 0x91, 0x5c, 0x9e, 0xb8, 0x31, 0xbd, 0x68, 0x11, 0x9f, 0x0d, 0x0a

For example the actual command to send is： 55-de-f2-d6-c1-91-5c-9e-b8-31-bd-68-11-9f-0d-0a

Return value

4F 4B: OK / 42 41 44: BAD

(7) Function 7：

Switch to data mode：

0x55, 0xbe, 0xd6, 0xc9, 0x9c, 0x21, 0x4c, 0x9e, 0xb6, 0x32, 0xbd, 0xc1, 0x00, 0x9f, 0x0d, 0x0a

For example the actual command to send is： 55-be-d6-c9-9c-21-4c-9e-b6-32-bd-c1-00-9f-0d-0a

Return value

4F 4B: OK / 42 41 44: BAD

Firmware Update

Operation Steps

1. Insert the configuration tool into USB port of PC, and a serial COM Port e.g. COM23 is created.
2. Switch off the BT/RF probe, and put the BT/RF probe and the configuration tool to even joint together like picture as below.

Fig.5 Diagram of the tool even joint with objective optical probe

3. Run the software ‘Firmware Update Tool.exe’, select the COM port (e.g. COM23) of the configuration tool.

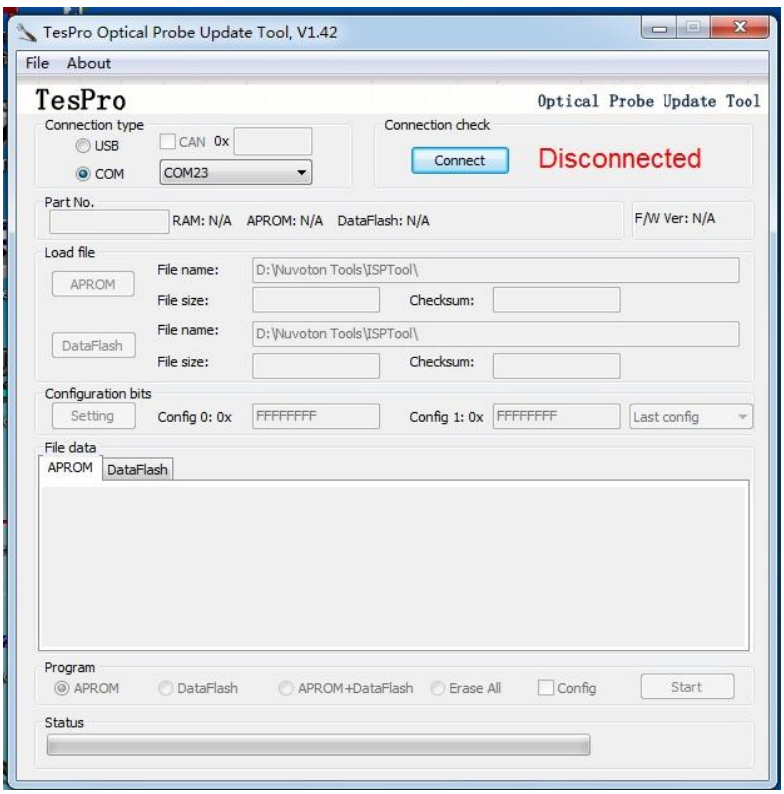


Fig.6 Software interface

4. Click ‘Connect’.

Fig.7 Connect interface

5. Switch on the BT/RF probe, and ‘Connected’ is displayed on the interface of the software.

Fig.8 Switch on the probe and optical probes keep status of even joint

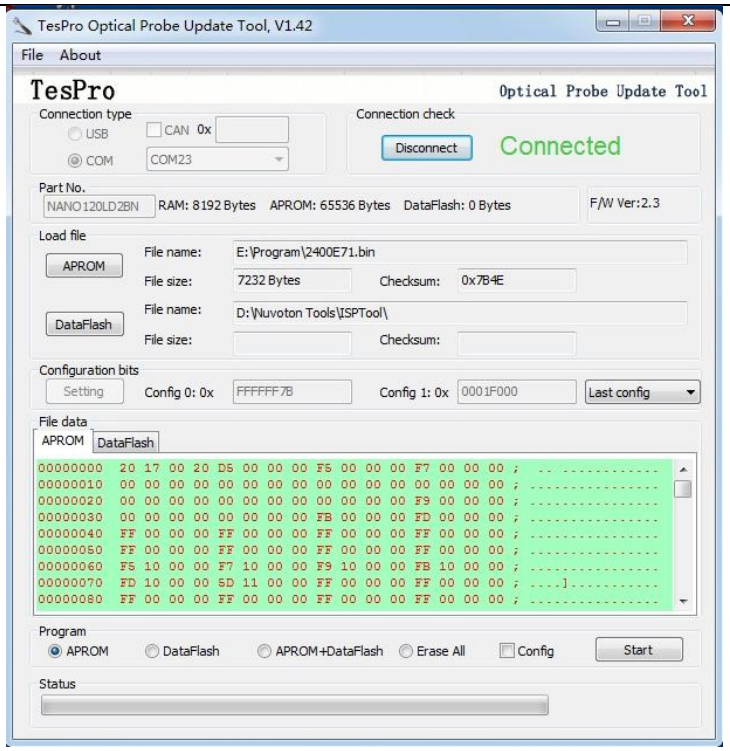


Fig.9 Optical probes connected

6. Click ‘APROM’ to select the new program, in this example, the program ‘2400E71.bin’ which is configured with 2400bps, Bits 7, Parity Even, STOPBIT 1

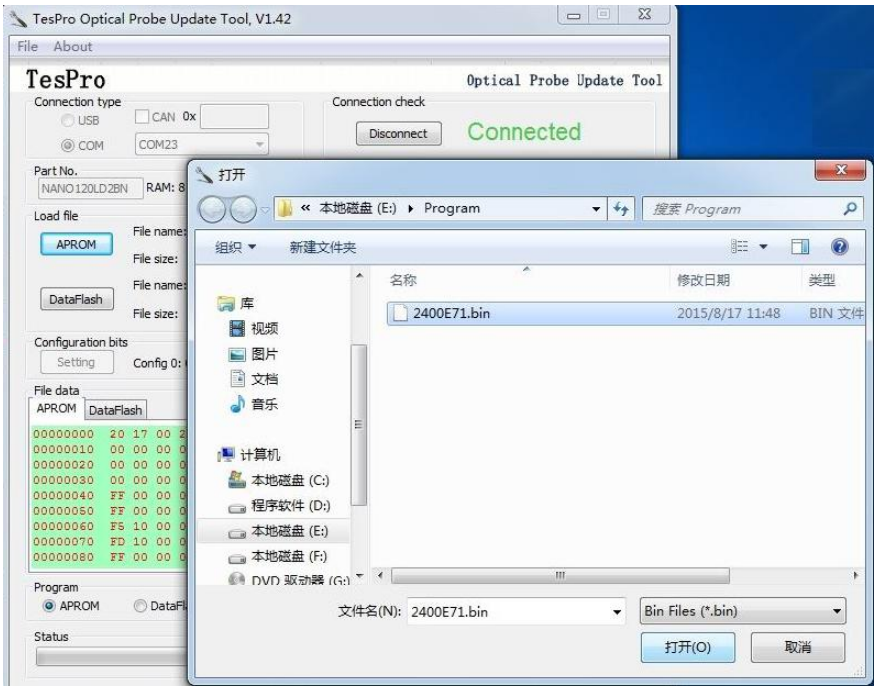


Fig.10 Select firmware

7. Click ‘Start’, and program downloading is in process.

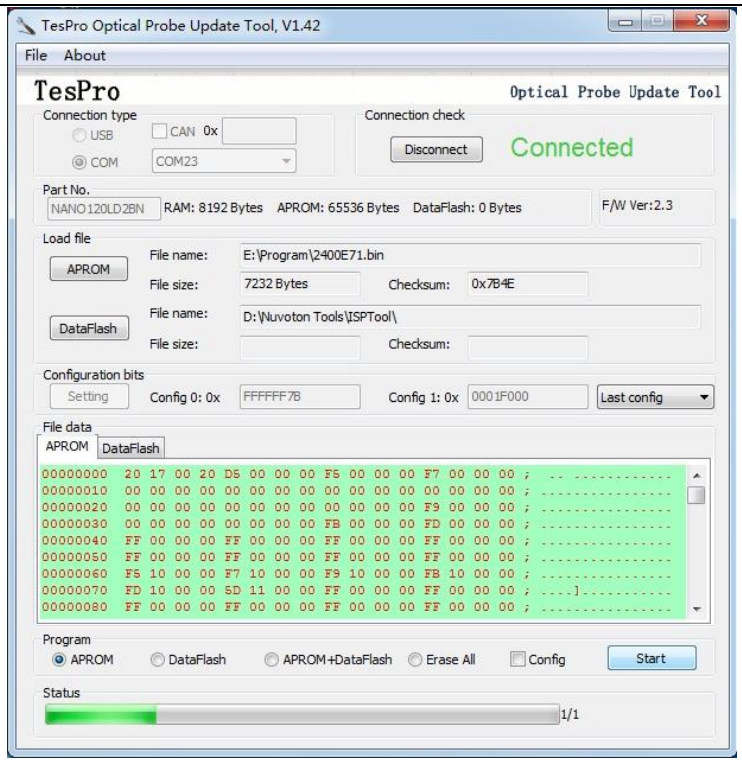


Fig.11 Program downloading

8. When ‘PASS’ is prompted, new program downloading is finished. Communication configuration of the Bluetooth probe has been changed successfully.

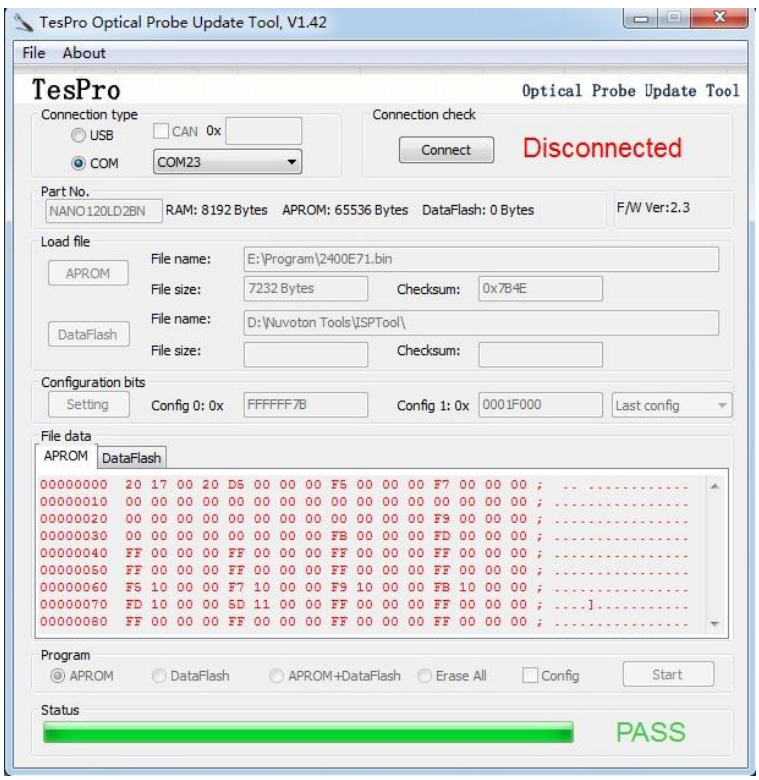


Fig.12 Download finished

9. If the Bluetooth probe doesn’t need to work immediately, please remember to switch off it to save power energy.

Fig.13 Switch off the probe or restart it on user’s requirement

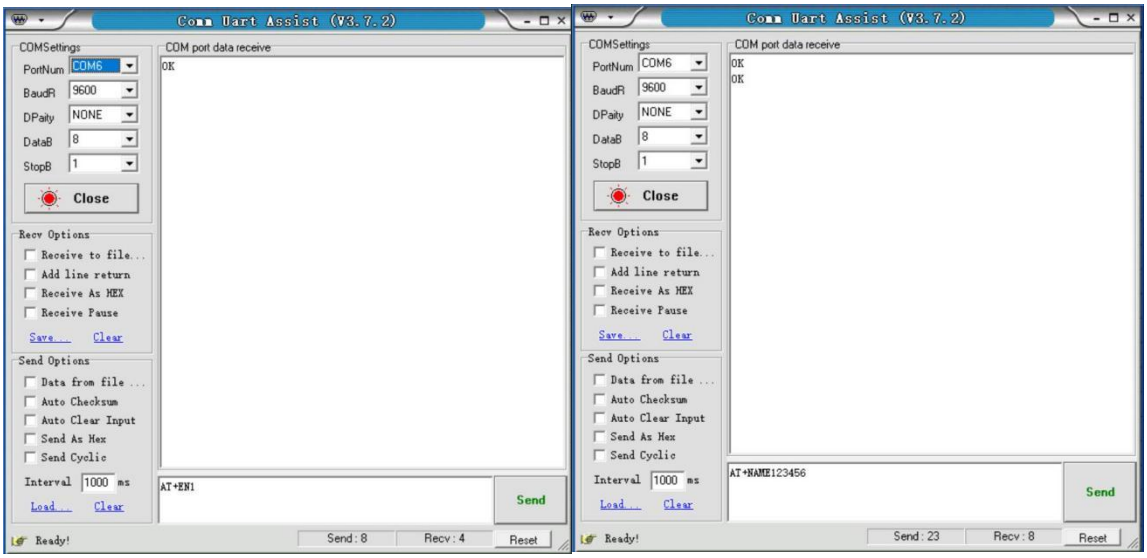
10. Update finished.

Rename TP-BT

Operation Steps

1. Insert the USB probe into USB port of PC, and a serial COM Port e.g. COM6 is created.
2. Switch on the BT (Bluetooth) probe, and put the BT probe and the USB probe to even joint/interface together like picture as below.

3. Run COM UART Assist similar software, select ‘COM6’, Type command ‘AT+EN1’ and then **click “Enter” key of keyboard**, and then click “Send” to send the command to check the status, if it is returned ‘OK’, it means normal state, then go on with next step.
4. Type command ‘AT+NAME**123456**’ (**123456** means the name you need to display), and then **click “Enter” key of keyboard**, and then click “Send” to send the command. If returned ‘OK’, the displayed name has been successfully changed.



Note:

Command **AT+NAME** - used to change the displayed name under traditional mode.

Command **AT+BNAME** - used to change the displayed name under BLE mode.

5. Restart the TP-BT, search the TP-BT again, the new name “123456” will be displayed.

Tespro Electronics Co., Ltd.
Web : https://www.tespro.com
Email: info@tespro.com / sales@tespro.com
Mobile/whatsapp : China: +86-13928019921, +86 13825632387, HK: +852-64809837, US: +1 8084918078
We have offices in multiple countries: China, US, UK, AUS, HK. If you encounter an agent, please contact us first to confirm.