



TP-BT-PLUS with Protective Case



TP-BT-Plus User Manual

Dear Customers,

Thank you for your purchase, and congratulations on choosing our product.

This patented Bluetooth Optical Probe has been designed to meet your expectations for compatibility with electricity, water, gas, and heat meters in compliance with IEC62056-21, ANSI, and ANSI-Type2 standards. It is manufactured using high-quality materials and undergoes strict quality control throughout the entire production process.

This user manual is provided to guide you in using and programming the device.

To ensure optimal performance and efficiency, we highly recommend that you read the entire user manual carefully before using the product. Please retain this manual for future reference. If you pass the product on to another user, kindly ensure the manual is included.

About TP-BT-Plus

TP-BT-Plus Bluetooth optical probe supports Classic Bluetooth and Bluetooth LE 5.4, with a low-power chip, the battery life is extended multiple times, lasting up to a month on a single charge. It features 30-minutes PD fastcharging, a Type-C port, an LED flashlight, and IP65 durability. With a silicone protective case and Bluetooth OTA updates, it is compatible with IEC, ANSI, and DL/T-645 protocols for global use. Certified by the Bluetooth SIG, our product ensures high quality and reliability.



Android



IOS



Bluetooth SPP+BLE



Identification



Protection IP65

Fig.1 Standard Support

Items in package

The package includes 5 configured accessories, which are also available as separate spare parts. For additional spare parts, please contact Tespro China. As these accessories are custom-designed, they cannot be supplied by other manufacturers.



(1)USB Charger Adapter



(2)Charger Cable



(3)Safety Strap



(4)USB Cable(Optional)



(5)Protective Case

Fig.2 Accessories

1. Charger Adapter

To charge the Bluetooth optical probe

2. Charger-Cable

Work as a charging cable

3. Safety Strap

To easily carry and to prevent accidental fall

4. USB Data Cable (Option)

To communicate when TP-BT-Plus works as an USB probe

5. Protective Case

Silicone protective cover, shockproof and drop-resistant, provides enhanced protection for the Bluetooth optical probe.

Overview

The TP-BT-Plus is a high-performance optical probe for smart metering, offering seamless data communication and calibration. Compact and user-friendly, it supports both USB and Bluetooth connectivity, featuring dual modes with BLE (Bluetooth Low Energy) for extended battery life and SPP (Classic Bluetooth) for versatile communication. Key features include long battery life, fast charging, IP65 waterproof rating with a Type-C charging port, built-in flashlight, and OTA wireless firmware upgrades. The device is equipped with a durable silicone protective cover for shock resistance, ensuring reliable performance. The TP-BT-Plus is the ideal tool for efficient meter testing, data management, and long-lasting performance.

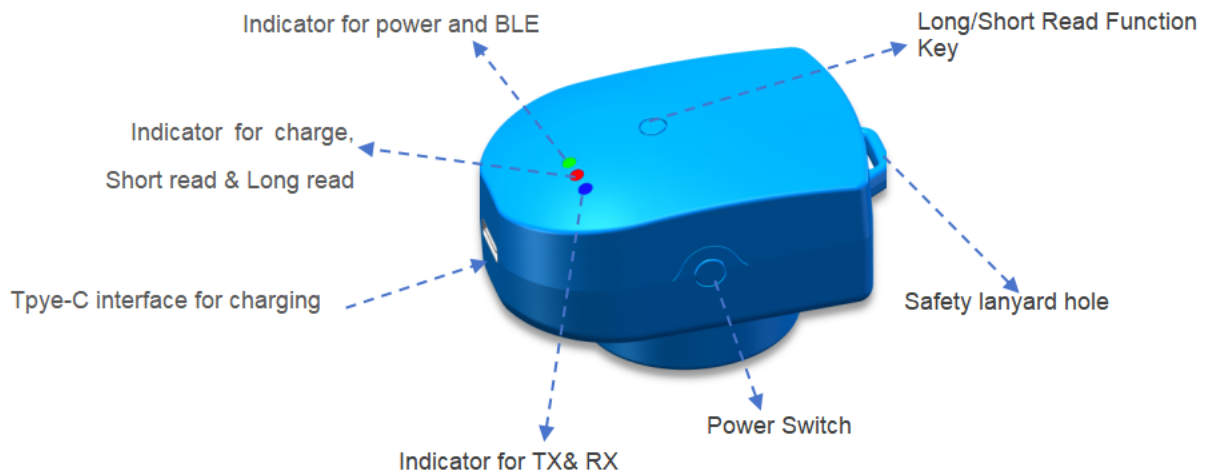


Fig.3 Component descriptions

Bluetooth Indicator Definitions

1. Probe States Indicator:

- Standby: When power-on the power indicator lights up in green.
When the device is powered on, a single green light flash indicates that the current operating mode is Classic Bluetooth (SPP). If there is no flash, the current operating mode is Low Energy Bluetooth (BLE).
- 5 seconds after startup, the green light enters the connection detection status. If the optical probe is not connected, the green light will flash at 1-second intervals. Once the Bluetooth connection is established, the green light will remain steadily on.
- Communication: During communication the green LED stays on.

2. Power Switch

- A short press and hold for 1 seconds will make the green light remain on, indicating that the device has finished powering on.
- A short press and hold for 10 seconds will cause the green light to turn off, indicating that the device has finished powering off.
- Automatic shutdown: The device will automatically power off if there is no communication for 5 minutes (shutdown time can be configured).

3. Flashlight Function:

- Double-click the power button to turn on the flashlight mode.
- Double-click the power button to turn off the flashlight.

4. Indicator for power & charging

- Charging: During charging the power indicator turns red.
- During charging, the green light will be off. Once charging is complete, the red light will turn off, and the green light will resume normal indication.

5. Indicator for communication

- The blue & yellow lights is the data transmission indicator, The blue light will flash when the optical probe is sending data, and the yellow light will flash when it is receiving data.

6. USB Type-C port for charging

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

7. Battery indication and charging

Power-on and battery states can be indicated by the red LED:

- When the probe power on the red LED lights up in different conditions to show the remains of energy in battery:
 1. If the battery level is above 30%, the red light will not be illuminated.
 2. If the battery level is between 20% and 30%, the red light will flash 3 times.
 3. If the battery level is between 10% and 20%, the red light will flash 2 times.
 4. If the battery level is between 0% and 10%, the red light will flash 1 time.

8. Charging

- The red light turns on, and the green light turns off.
- Once complete, the red light turns off, and the green light resumes its normal sampling state .

9. Two Different Bluetooth Modes at Startup:

- If the green LED remains on, the startup mode is BLE (Bluetooth Low Energy).
- If the green LED flashes once, the startup mode is SPP (Serial Port Profile, Classic Bluetooth).

10. Bluetooth Probe Pairing in BLE mode

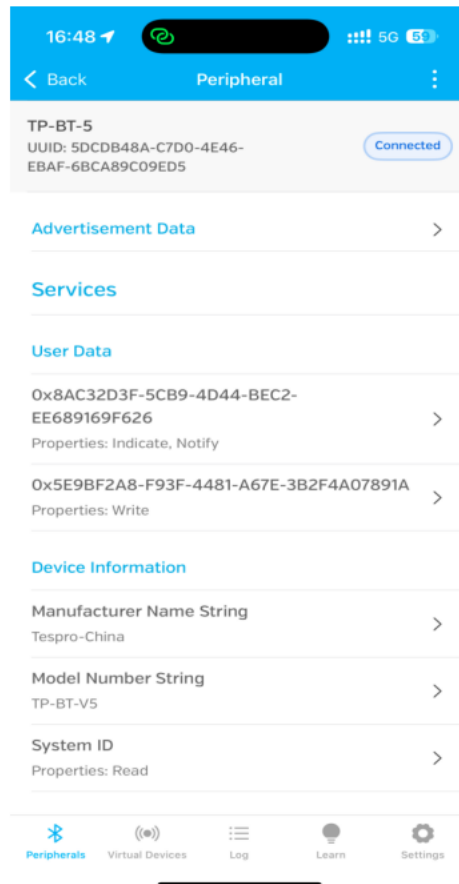


Fig.4 Bluetooth Probe Pairing in IOS System (BLE mode)

11. Operation Instructions for Mode Switching

➤ Switching to SPP Mode:

- While the device is powered on, press and hold the button for 12 seconds.
- At the 10-second mark, the device will indicate with two quick flashes of red and green lights.
- Continue holding until the full 12 seconds have passed.
- Upon completion, the device will confirm by flashing the green light twice, indicating a successful switch to SPP mode.

➤ Switching to BLE Mode:

- While the device is powered on, press and hold the button for 12 seconds.
- At the 10-second mark, the device will indicate with two quick flashes of red and green lights.
- Continue holding until the full 12 seconds have passed.
- Upon completion, the device will confirm by flashing the green light once, indicating a successful switch to BLE mode.

Note: Do not release the button before the full 12 seconds to ensure proper mode switching.

Note: BLE Service List:

User Data: UUID = 181C Includes:

- Data Subscription Reception Service: UUID = 0x8AC32D3F-5CB9-4D44-BEC2-EE689169F626
- Data Writing and Sending Service: UUID = 0x5E9BF2A8-F93F-4481-A67E-3B2F4A07891A

Device Information: UUID = 180A Includes:

- Manufacturer Name String: UUID = 2A29
- Model Number String: UUID = 2A24
- System ID: UUID = 2A23

Battery Service: UUID = 181C Includes:

- Battery Level: UUID = 2A19

OTA Service: UUID = AE5D1E47-5C13-43A0-8635-82AD38A1381F Includes:

- Data Subscription Reception Service: UUID = 0xA3DD50BF-F7A7-4E99-838E-570A086C661B
- Data Sending Service: UUID = 0xA2E86C7A-D961-4091-B74F-2409E72EFE26

Technical Specifications

Items	Features
Communication Interface	BLE and SPP dual-mode
Supported Standard	IEC-62056, ANSI, and DL/T-645 protocols, fitting global meter standards
Battery Feature	800 mAh (Optional)
Battery Charging Time	30 mins-2C PD Fast Charge
Computer Communication Port	Type C- USB 3.0/ OTG
Sensor Light Wave Length	~ 900 nm.
Number Of Keys	2 Keys (Power/ Reading)
LED Indicators	5 LEDS (Power/ Communication/ Charge/ BLE/ Reading)
Magnet Holding Power	N40 / N52 (Optional)
Maximum Data Rate	57600 in normal and max.115200 available
USB Connection Optical Probe Model	Supported(Add Data Cable)
Width & Height	31,5 mm / 33,5mm
Weight	65 gr
Transparent Communication Mode	IEC 62056-21 Mode C / Mode E /User Mode
Smart Communication Mode	There is (IEC 62056-21 Mode C / Mode E)

Maximum Frame Length(MTU)	512 bytes
Silicone Protection	Yes (Included)
Safety Strap	Yes (Included)
Working Environment	-40 ° C - +70 ° C
Enclosure Material	PC
Protection Class	IP 65
Firmware And Configuration Update	OTA
Working Days	Max 100 hours
Standby Time	~ 1 Year
LED Flashlight	Yes (Include)
Auto power-off	Default auto power-off after 5 minutes (adjustable)

Bluetooth Device AT Commands

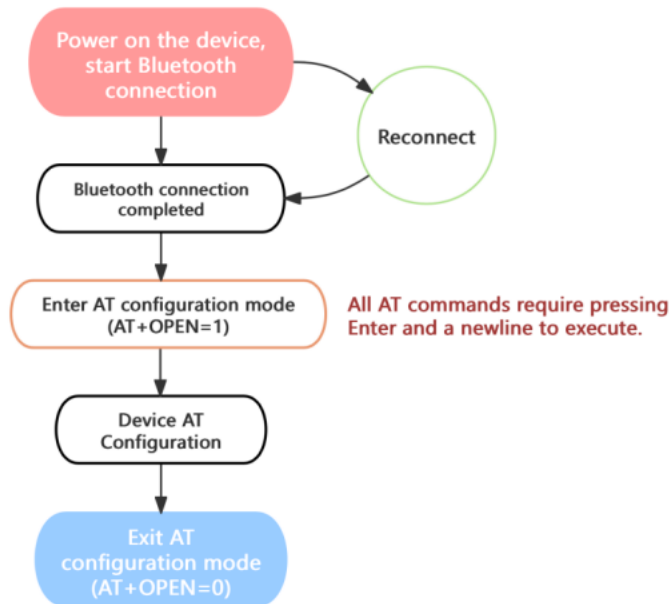


Fig.5 AT Mode

The TP-BT-Plus optical probe supports an integrated AT protocol stack for configuring internal parameters. By default, the AT command support is disabled. To enable the AT command support, you need to send the following command via Bluetooth: `at+open=1\n\r`,

Once the probe receives this command, it will return: ok, This indicates that the AT command support has been enabled.

Note:

Each AT command must end with a carriage return and newline (\n\r: 0x0D 0x0A). If you're unsure how to use the commands, simply enter: at+help\n\r

The device will return help information.

Help Command: at+help\n\r

Return: [Help Information]

1. AT Command Password Authentication

To prevent unauthorized access to AT commands for system parameter configuration, a password verification step is required before enabling AT command mode.

1.1 Default Password Verification

- The factory default password is 000000.
- When attempting to unlock AT commands using AT+OPEN=1, the system will respond with "Permission Denied", indicating that password verification is required.
- To authenticate, send the command: AT+PASSWORD=000000
- If correct, the response will be: AT PASSWORD OK (authentication successful).
- If incorrect, the response will be: AT PASSWORD ERROR (authentication failed).
- Only after successful authentication will AT+OPEN=1 be accepted, allowing full access to AT commands.

1.2 Changing the Password

To set a new 6-digit password, use the following format:

AT+SETPASSWORD=XXXXXX

XXXXXX must be an 6-digit number (e.g., 654321).

Once updated, the new password will be required for future authentication.

2. Enable/Disable AT Configuration Mode

When this expression is sent, the device enters or exits the AT configuration mode. When enabled, the device is ready to accept and execute AT commands for configuration. When disabled, the device stops accepting AT commands.

- ✧ Expression: `CMD("AT+OPEN=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+OPEN=1"`
- ✧ Expression: `CMD("AT+OPEN=1")`
- ✧ Positive Feedback: `RESPONSE:"OK"`
- ✧ Expression: `CMD("AT+OPEN=0")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

3. AT Command Help

When this expression is sent, the device will display a list of available AT commands.

- ✧ Expression: `CMD("AT+HELP")`
- ✧ Positive Feedback: `RESPONSE:"[list of commands]"`

4. AT Test Command

This expression checks if the device is responsive.

- ✧ Expression: `CMD("AT")`
- ✧ Positive Feedback: `RESPONSE:"AT+OK-[memory info]"`

5. Enable/Disable Logs

When this expression is sent, it either enables or disables the logging on the device.

- ✧ Expression: `CMD("AT+TRACE=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+TRACE=1"`
- ✧ Expression: `CMD("AT+TRACE=1")`
- ✧ Positive Feedback: `RESPONSE:"OK"`
- ✧ Expression: `CMD("AT+TRACE=0")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

6. Enable/Disable BLE Mode

When this expression is sent, it either enables or disables Bluetooth Low Energy (BLE) mode.

- ✧ Expression: `CMD("AT+BLEOPEN=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+BLEOPEN=1"`
- ✧ Expression: `CMD("AT+BLEOPEN=1")`
- ✧ Positive Feedback: `RESPONSE:"OK"`
- ✧ Expression: `CMD("AT+BLEOPEN=0")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

7. Enable/Disable SPP Mode

When this expression is sent, it either enables or disables the Serial Port Profile (SPP) mode.

- ✧ Expression: `CMD("AT+SPPOPEN=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+SPPOPEN=1"`
- ✧ Expression: `CMD("AT+SPPOPEN=1")`
- ✧ Positive Feedback: `RESPONSE:"OK"`
- ✧ Expression: `CMD("AT+SPPOPEN=0")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

8. Query/Modify BLE Name

When this expression is sent, it queries or sets the Bluetooth name of the device.

- ✧ Expression: `CMD("AT+BLENAME=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+BLENAME=TP-BT-BLE"`
- ✧ Expression: `CMD("AT+BLENAME=TP-BT-BLE")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

9. Query/Modify SPP Name

When this expression is sent, it queries or sets the SPP name of the device.

- ✧ Expression: `CMD("AT+SPPNAME=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+SPPNAME=TP-BT-SPP"`
- ✧ Expression: `CMD("AT+SPPNAME=TP-BT-SPP")`

- ✧ Positive Feedback: RESPONSE:"OK"

10. Enable/Disable/Query/Set BLE Password

When this expression is sent, it enables, disables, queries, or sets the BLE password.

- ✧ Expression: CMD("AT+BLEPINOPEN=1")
- ✧ Positive Feedback: RESPONSE:"OK"
- ✧ Expression: CMD("AT+BLEPINOPEN=0")
- ✧ Positive Feedback: RESPONSE:"OK"
- ✧ Expression: CMD("AT+BLEPIN=?")
- ✧ Positive Feedback: RESPONSE:"AT+BLEPIN=123456"
- ✧ Expression: CMD("AT+BLEPIN=123456")
- ✧ Positive Feedback: RESPONSE:"OK"

11. Enable/Disable/Query/Set SPP Password

When this expression is sent, it enables, disables, queries, or sets the SPP password.

- ✧ Expression: CMD("AT+SPPPINOPEN=1")
- ✧ Positive Feedback: RESPONSE:"OK"
- ✧ Expression: CMD("AT+SPPPINOPEN=0")
- ✧ Positive Feedback: RESPONSE:"OK"
- ✧ Expression: CMD("AT+SPPPIN=?")
- ✧ Positive Feedback: RESPONSE:"AT+SPPPIN=123456"
- ✧ Expression: CMD("AT+SPPPIN=123456")
- ✧ Positive Feedback: RESPONSE:"OK"

12. Query/Set Transmit Power Level (0/1/2/3/4)

When this expression is sent, it queries or sets the transmit power level of the device.

- ✧ Expression: CMD("AT+TXPOWER=?")
- ✧ Positive Feedback: RESPONSE:"AT+TXPOWER=4"
- ✧ Expression: CMD("AT+TXPOWER=4")
- ✧ Positive Feedback: RESPONSE:"OK"

13. Query/Set Broadcast Power Level (0/1/2/3/4)

When this expression is sent, it queries or sets the broadcast power level of the device.

- ✧ Expression: `CMD("AT+ADVTXPOWER=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+ADVTXPOWER=4"`
- ✧ Expression: `CMD("AT+ADVTXPOWER=4")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

14. Query/Set UART Communication Parameters

When this expression is sent, it queries or sets the UART (Universal Asynchronous Receiver/Transmitter) communication parameters.

- ✧ Expression: `CMD("AT+SETUART=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+SETUART=300,1,7,0"`
- ✧ Expression: `CMD("AT+SETUART=300,1,7,0")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

15. Query/Set Broadcast Time

When this expression is sent, it queries or sets the broadcast time.

- ✧ Expression: `CMD("AT+BROADCASTTIME=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+BROADCASTTIME=300"`
- ✧ Expression: `CMD("AT+BROADCASTTIME=300")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

16. Query/Set Sleep Time

When this expression is sent, it queries or sets the sleep time parameter.

- ✧ Expression: `CMD("AT+SLEEPTIME=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+SLEEPTIME=300"`
- ✧ Expression: `CMD("AT+SLEEPTIME=300")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

17. Query/Enable/Disable Stop Broadcasting After Connection

When this expression is sent, it queries or enables/disables the automatic stopping of broadcasting after a connection is established.

- ✧ Expression: CMD("AT+CNTSTOPADV=?")
- ✧ Positive Feedback: RESPONSE:"AT+CNTSTOPADV=1"
- ✧ Expression: CMD("AT+CNTSTOPADV=1")
- ✧ Positive Feedback: RESPONSE:"OK"
- ✧ Expression: CMD("AT+CNTSTOPADV=0")
- ✧ Positive Feedback: RESPONSE:"OK"

18. Query/Enable/Disable IRDA Mode

When this expression is sent, it enables or disables IRDA (Infrared Data Association) mode. This feature requires special customization

- ✧ Expression: CMD("AT+IRDA=?")
- ✧ Positive Feedback: RESPONSE:"AT+IRDA=1"
- ✧ Expression: CMD("AT+IRDA=1")
- ✧ Positive Feedback: RESPONSE:"OK"
- ✧ Expression: CMD("AT+IRDA=0")
- ✧ Positive Feedback: RESPONSE:"OK"

19. Query/Enable/Disable Bad Device Address

When this expression is sent, it enables or disables the mobile device serial number that the adapter can be paired to.

- ✧ Expression: CMD("AT+BDAOPEN=?")
- ✧ Positive Feedback: RESPONSE:"AT+BDAOPEN=1"
- ✧ Expression: CMD("AT+BDAOPEN=1")
- ✧ Positive Feedback: RESPONSE:"OK"
- ✧ Expression: CMD("AT+BDAOPEN=0")
- ✧ Positive Feedback: RESPONSE:"OK"

20. Query/Set Bad Device Address

When this expression is sent, it queries or sets the Bad Device Address (BDA).

- ✧ Expression: `CMD("AT+BDA=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+BDA=FF:FF:FF:FF:FF:FF"`
- ✧ Expression: `CMD("AT+BDA=FF:FF:FF:FF:FF:FF")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

21. Query/Set Maximum Frame Buffer Size

When this expression is sent, it queries or sets the maximum frame buffer size. This feature is not recommended for ordinary users.

- ✧ Expression: `CMD("AT+FRAMEMAX=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+FRAMEMAX=256"`
- ✧ Expression: `CMD("AT+FRAMEMAX=256")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

22. Query/Set Minimum Frame Buffer Size

When this expression is sent, it queries or sets the minimum frame buffer size. This feature is not recommended for ordinary users.

- ✧ Expression: `CMD("AT+FRAMEMIN=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+FRAMEMIN=64"`
- ✧ Expression: `CMD("AT+FRAMEMIN=64")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

23. Restore Factory Settings

When this expression is sent, it restores the device.

- ✧ Expression: `CMD("AT+RESET")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

24. Save Parameter Settings

When this expression is sent, the device will write the modified parameters into Flash for permanent storage.

- ✧ Expression: `CMD("AT+SAVE")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

25. Query Version Number

When this expression is sent, it queries the version number of the device.

- ✧ Expression: `CMD("AT+VERSION")`
- ✧ Positive Feedback: `RESPONSE:"[version number]"`

26. Query/Set Default Uart Initial Baud Rate

When this expression is sent, it queries or sets default uart Initial baud rate.

- ✧ Expression: `CMD("AT+INITUART=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+INITUART=9600,0,8,0"`
- ✧ Expression: `CMD("AT+INITUART=9600,0,8,0")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

27. Query/Enable/Disable IEC Protocol

When this expression is sent, it enables or disables IEC protocol.

- ✧ Expression: `CMD("AT+IEC=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+IEC=1"`
- ✧ Expression: `CMD("AT+IEC=1")`
- ✧ Positive Feedback: `RESPONSE:"OK"`
- ✧ Expression: `CMD("AT+IEC=0")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

28. Query/Enable/Disable ANSI Protocol

When this expression is sent, it enables or disables ANSI protocol.

- ✧ Expression: `CMD("AT+ANSI=?")`
- ✧ Positive Feedback: `RESPONSE:"AT+ANSI=1"`
- ✧ Expression: `CMD("AT+ANSI=1")`
- ✧ Positive Feedback: `RESPONSE:"OK"`
- ✧ Expression: `CMD("AT+ANSI=0")`
- ✧ Positive Feedback: `RESPONSE:"OK"`

29. Print Parameter Information

When this expression is sent, it print the parameter information.

- ✧ Expression: CMD("AT+PRINT")
- ✧ Positive Feedback: RESPONSE:"[list of the parameter info]"

30. Query/Set AT Password

When this expression is sent, it enables, disables, queries, or sets the BLE password.

- ✧ Expression: CMD("AT+SETPASSWORD=?")
- ✧ Positive Feedback: RESPONSE:"AT+SETPASSWORD=123456"
- ✧ Expression: CMD("AT+SETPASSWORD=123456")
- ✧ Positive Feedback: RESPONSE:"OK"

31. Response Short Read Function

When this expression is sent, it response the short read function for getting the meter data.

- ✧ Expression: CMD("AT+SHORTREAD")
- ✧ Positive Feedback: RESPONSE:"OK"

32. Response Long Read Function

When this expression is sent, it response the long read function for getting the meter data.

- ✧ Expression: CMD("AT+LONGREAD")
- ✧ Positive Feedback: RESPONSE:"OK"

33. Query/Modify Hdlc List Name

When this expression is sent, it queries or sets the HDLC List name for support the HDLC protocol of the device.

- ✧ Expression: CMD("AT+HDLCLIST=?")
- ✧ Positive Feedback: RESPONSE:"AT+HDLCLIST=KFM"
- ✧ Expression: CMD("AT+HDLCLIST=KFM|NAME2|NAME3")
- ✧ Positive Feedback: RESPONSE:"OK"

34. Print/Query/Set TaskObis Parameter

When this expression is sent, it print、query and set the taskobis parameter information。
(About taskobis see the following introduction)

- ✧ Expression: CMD("AT+TASKOBIS=?")
- ✧ Positive Feedback: RESPONSE:"[list all of the taskobis parameter info]"
- ✧ Expression: CMD
("AT+TASKOBIS=1|1|0,0,1,0,0,255|8|2")
- ✧ Positive Feedback: RESPONSE:"OK"

35. Reboot The Device

When this expression is sent, it reboot the device.

- ✧ Expression: CMD("AT+ROOT")

TaskObis Information Settings

TP-BT-Plus supports automatic meter reading via buttons, including data reading via protocols such as IEC-62056-21, DLMS, ANSI, and Modbus. TP-BT-Plus supports storage 32 types of Task Obis list for short or long read. When TP-BT-Plus reads meters, it can make judgments based on the stored HdLcList name information and use different communication Protocol for communication, achieving automatic meter reading.

Command Format Explanation:

AT+TASKOBIS=[[idx(1~32)]][[ReadTag(0~3)]][[TaskObisList(0~255)]][[ClassID]][[Attribute]]

- Cmd: **AT+TASKOBIS=**
- Data Index: **idx** – up to 32 groups, numbered 1 to 32.
- Long/Short ReadTag: **ReadTag**
 - ✧ 0: Neither
 - ✧ 1: Only short read
 - ✧ 2: Only long read
 - ✧ 3: Both short and long read
- Task Obis List: **TaskObisList** – 0,0,1,0,0,255
- Class ID: **ClassID** – 8
- Attribute: **Attribute** – 2
- Sample Command: **AT+TASKOBIS=1|1|0,0,1,0,0,255|8|2**

OTA Firmware Update Instructions

Overview

The TP-BT-Plus Optical Probe supports Over-the-Air (OTA) wireless firmware updates, allowing customers to easily upgrade device firmware for performance improvements or customized functionalities. If firmware modifications are required, customers may contact Tespro China for tailored firmware solutions. Once the updated firmware (.bin file) is provided, users can perform the upgrade using the LE OTA app, available for both Android and iOS platforms.

➤ Prerequisites:

- ① Install the "LE OTA APP" app (compatible with Android & iOS).
- ② Ensure the device is powered on and in BLE mode (refer to Mode Switching Instructions if needed).
- ③ Obtain the correct firmware file (.bin format) from Tespro China.

➤ Step-by-Step Update Process:

- ① Open the LE OTA App
 - Launch the "LE OTA" application on your smartphone.
- ② Connect to the Device
 - Tap "Tap to select a device".
 - Select your TP-BT-Plus probe from the Bluetooth list.
 - Click "Connect" and wait for the "Connected successfully" confirmation.
- ③ Select the Firmware File
 - Tap "Tap to select OTA image".
 - Browse and select the provided firmware file (.bin format).
- ④ Start the Update
 - Click "Update" to begin the firmware upgrade.
 - Do not disconnect or power off the device during the process.
 - Wait for the "Update successful" notification.
- ⑤ Completion
 - The device will turnoff automatically.

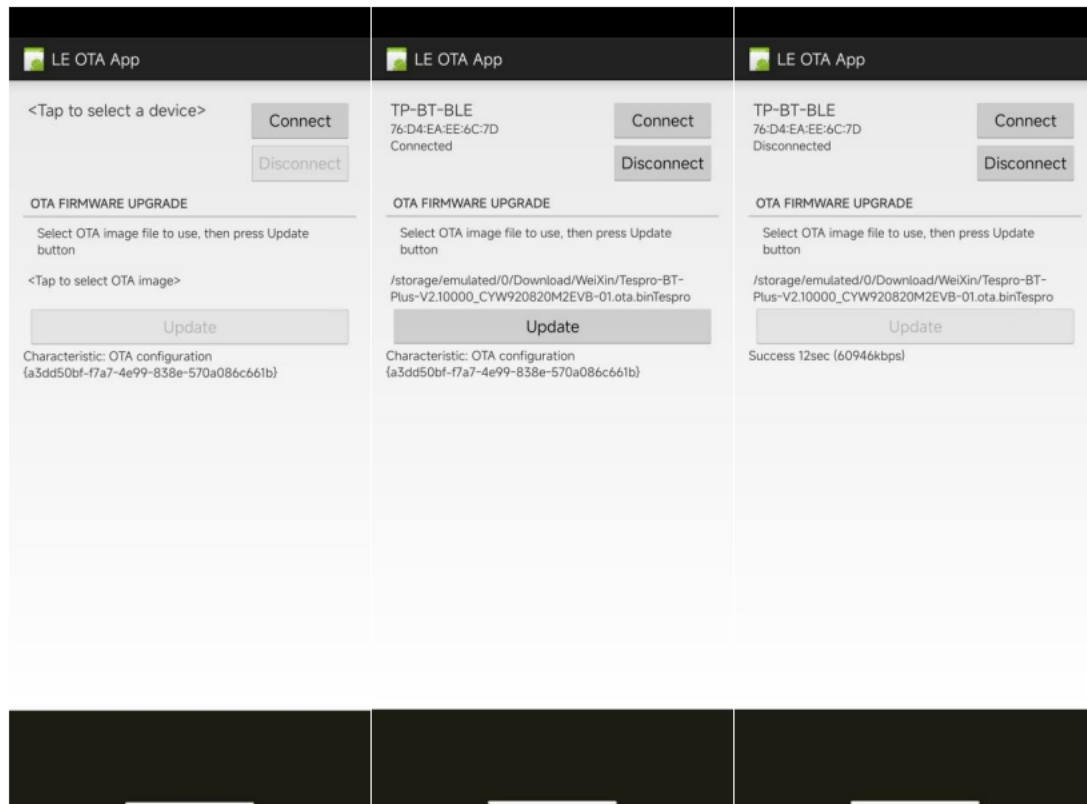


Fig. 5: Bluetooth Probe OTA Tools (BLE mode)

Application SDK

The TP-BT-Plus optical probe provides BLE SDK and OTA SDK examples for both Android and iOS. These are Java source code samples that allow customers to quickly integrate Bluetooth functionality into their own applications.