



Panchip Microelectronics Co., Ltd.

Pan108x Usb Device RF Tool user's guide

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Shanghai Panchip Microelectronics Co., Ltd.

Address: The 3rd Floor, No. 666 Shengxia Road

Zhangjiang Hi-Tech Park, Shanghai

People's Republic of China

Tel: 021-50802371

Website: <http://www.panchip.com>

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1 Summarize

PAN108xUsbDeviceRfTool is an RF testing tool designed for PAN108x chip mouse projects.

The version format is PAN108xUsbDeviceRfTool _vx.x.xx

Vx. x.xxx: indicates the version number.

2 The main interface

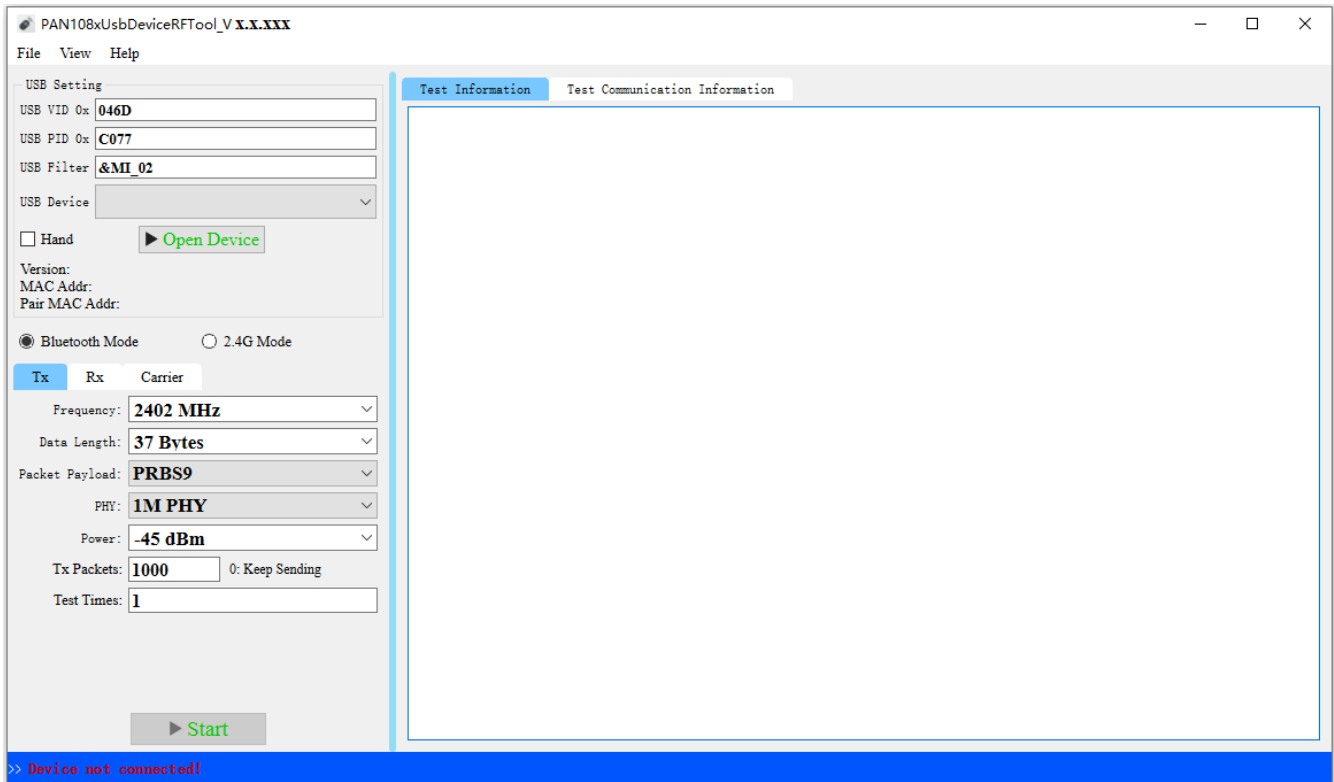


Figure 2-1

As shown in Figure 2-1, the main screen consists of the **menu bar**, **function screen**, and **status bar**.

2.1 The menu bar

2.1.1 File

Figure 2-1-1- shows the file menu.

Open Configuration: To load the configuration file generated by saving the configuration and follow the interface configuration set when saving. The shortcut key is **Ctrl+Alt+O**.

Note: This operation is not allowed during the upgrade, otherwise it will fail.

Save Configuration: To save all the current configurations of the interface to the configuration file. The shortcut key is **Ctrl+Alt+S**.

Exit: Closes the screen for exit.

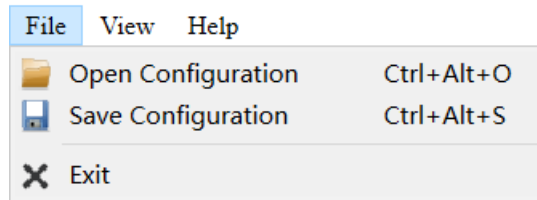


Figure 2-1-1-1

2.1.2 View

The display menu in the **menu bar** is clicked, as shown in Figure 2-1-2-1.

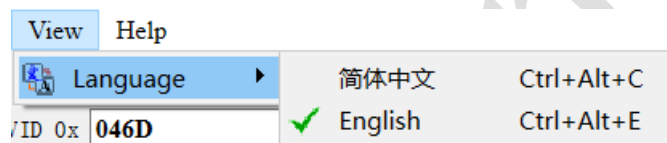


Figure 2-1-2-1

Support language mode selection. The selected display mode can be **Simplified Chinese** or **English**.

简体中文: For setting the interface Chinese display. The shortcut key is **Ctrl+Alt+C**.

English: Set the English display on the interface. The shortcut key is **Ctrl+Alt+E**.

2.1.3 Help

Click the help menu in the menu bar, as shown in Figure 2-1-3-1.

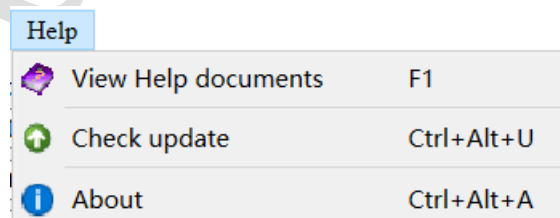


Figure 2-1-3-1

View Help documents: Export and open the help document. The shortcut key is **F1**.

Check update: Access the latest version on the server and the current version of the comparison, and support for downloading server versions. The shortcut key is **Ctrl+Alt+U**.

About: The information box for the current version is displayed. The shortcut key is **Ctrl+Alt+A**.

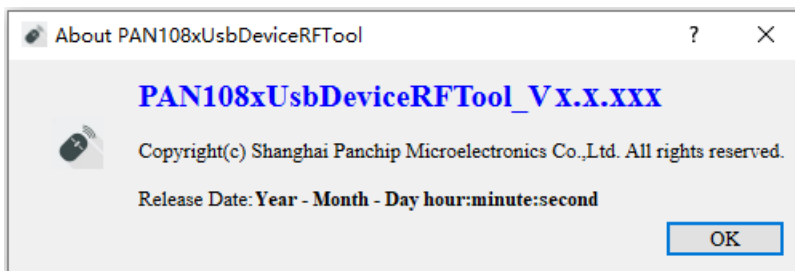


Figure 2-1-3-2

The About dialog box is shown in Figure 2-1-3-2.

2.2 The status bar

The interface displays some status information.

2.3 Function Screen

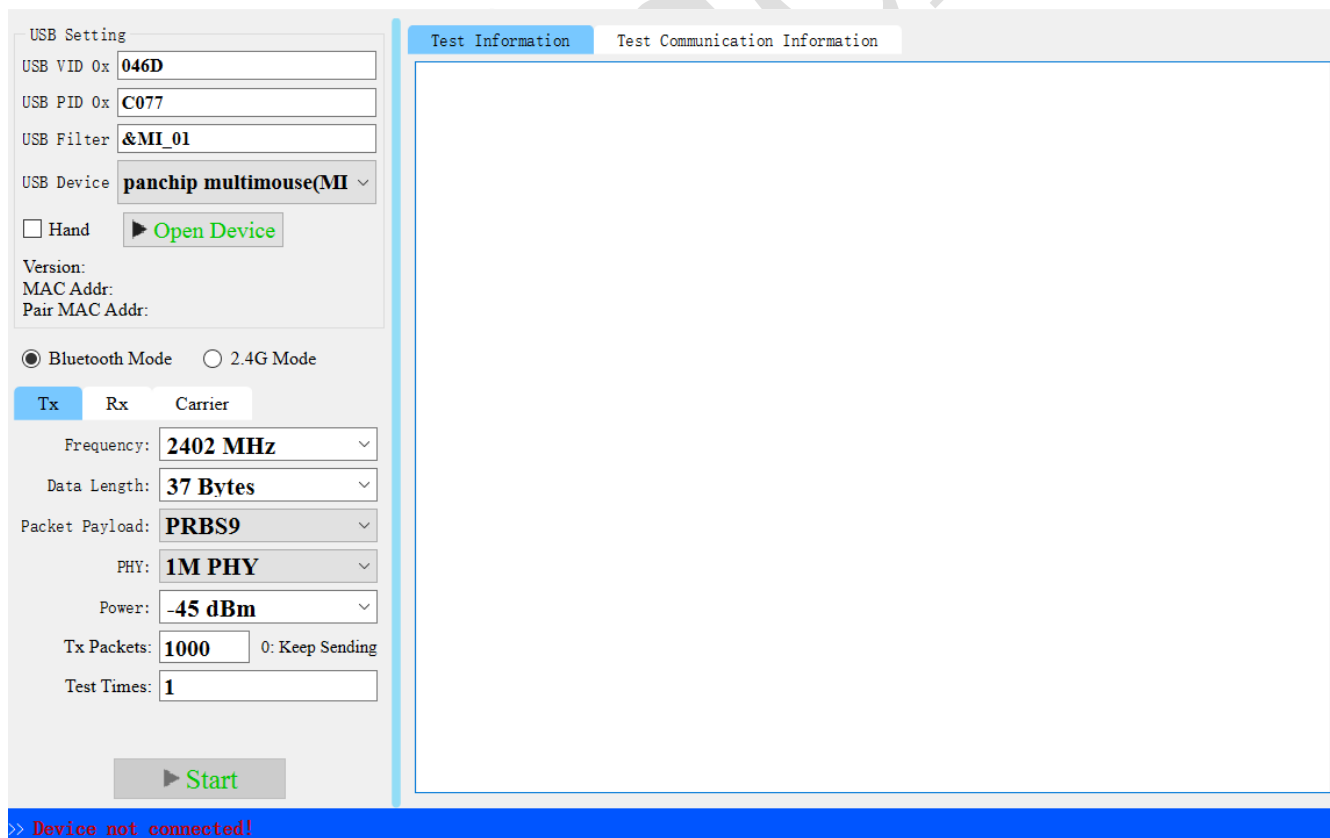


Figure 2-3-1

Figure 2-3-1 shows the mouse RF test function interface.

RF test of PAN108x chip mouse device is realized by USB.

2.3.1 USB Setting

To set the USB device communication interface for the device, and USB device selection.

USB VID: To set the VID of a specified USB device, the system queries the device based on the specified VID.

When the VID value is changed, the system automatically queries the USB device based on the changed value.

USB PID: To set the PID value of a specified USB device, the system queries the device based on the set PID value.

When the PID value is changed, the system automatically queries the USB device based on the changed PID value.

USB filter: To filter the USB devices queried according to the specified string VID\PID, only the devices with the same string can be added to the USB device list.

When the USB filter value is changed, the system automatically queries the USB device based on the changed value.

USB Devices: Add USB devices to the list based on VID, PID and USB filtering.

When you click USB Device List Box, the USB device is automatically displayed in the list.

Hand/Auto: When checked, turn on USB device mode for automatic detection; If this parameter is not selected, the USB device mode is enabled for manual detection. In automatic mode, after clicking "**Start**", it will enter the automatic detection device connection and enter the corresponding test mode automatically if the connection is successful.

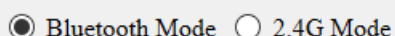
Open Device: Open the selected USB device connection and read the device version number and MAC address information.

Version: The version number of the USB device opened for display.

MAC Addr: MAC address of a USB device for display.

2.3.2 Test Mode

Mouse RF test mode support, Bluetooth mode and 2.4G mode two. See Figure 2-3-2-1.



☒ Bluetooth Mode ☐ 2.4G Mode

Figure 2-3-2-1

2.3.3 Bluetooth Mode

2.3.3.1 Bluetooth Mode Tx Test

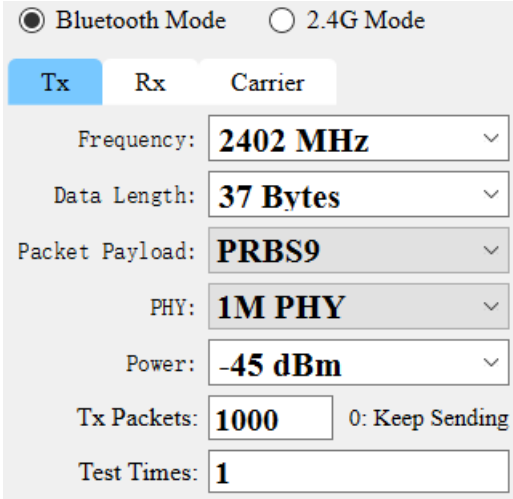


Figure 2-3-3-1-1

Figure 2-3-3-1-1 shows the transmission test configuration in Bluetooth mode.

Frequency: Set the frequency point of transmission. The value ranges from 2402MHz to 2480MHz. 2MHz is the step value.

Data Length: Set the data length of the transmitted packet. The value ranges from 0 Bytes to 255 Bytes.

Packet Payload: Sets the data load type of the transmitted packet. Support: PRBS9, 1111000, PRBS15, 11111111, 00000000, 00001111, 01010101.

PHY: To set the transmit PHY parameter. 1M PHY, 2M PHY, Coded PHY(S=8), and Coded PHY(S=2) are supported.

Power: Set the transmitting power. The value ranges from -45 dBm to 7 dBm.

Tx Packets: Set the parameters for sending packets. When the value is set to 0, it is the transmitting mode all the time. Set value > 0 indicates the specified number of packets to be transmitted.

Test Times: This parameter is valid only when the **Tx Packets** is > 0. To set the number of loop tests.

After opening the device connection and selecting this mode, click "Start Test" to set the corresponding configuration to the device for launch test.

When [USB Setting](#) is selected **Hand**, after the device connection is opened, click "**Start**" when selecting this mode, the corresponding configuration will be set to the device for launch test.

When [USB Setting](#) is selected **Auto**, click "**Start**" to enter the automatic detection and turn on the device. After the auto-

matic opening is successful, the corresponding configuration is set to the device for launch test. You can automatically connect to start the test process by simply inserting a USB device.

2.3.3.2 Bluetooth Mode Rx Test

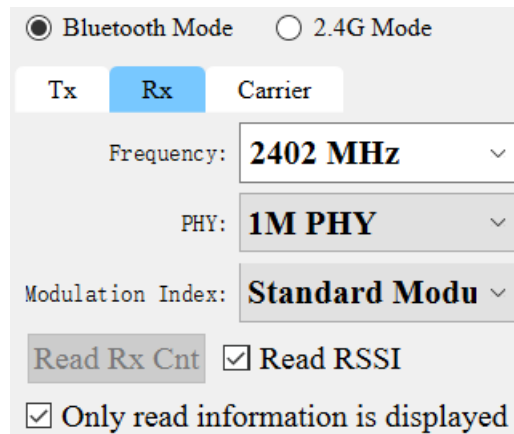


Figure 2-3-3-2-1

Figure 2-3-3-2-1 shows the configuration of the Bluetooth mode receiving test.

Frequency: Set the frequency point received. The value ranges from 2402MHz to 2480MHz. 2MHz is the step value.

PHY: To set the received PHY parameters. Supports 1 MB PHY, 2 MB PHY, and Coded PHY.

Modulation Index: Set the receive modulation index. Standard Modulation Index and Stable Modulation Index are supported.

Read Rx Cnt: After the receiving test is successfully started, click to read the number of received packets.

Read RSSI: Whether to read RSSI information when setting the number of received packets. Select Enable.

Only read information is displayed: Set the Log display Settings for the read test. When checked, only the number of packets read and received and RSSI information are displayed in the test information. If this parameter is not selected, information about all test processes during the test is displayed.

When [USB Setting](#) is selected **Hand**, after the device connection is opened, click "**Start**" when selecting this mode, the corresponding configuration will be set to the device for receiving test. When you click "**Stop**", the number of packets received before stopping will be read. If Read RSSI is selected, RSSI information is also read.

When [USB Setting](#) is selected **Auto**, click "**Start**" when selecting this mode to enter the automatic detection and turn on the device. After the automatic opening is successful, set the corresponding configuration to the device for receiving test. You can automatically connect to start the test process by simply inserting a USB device.

2.3.3.3 Bluetooth Mode Carrier Test

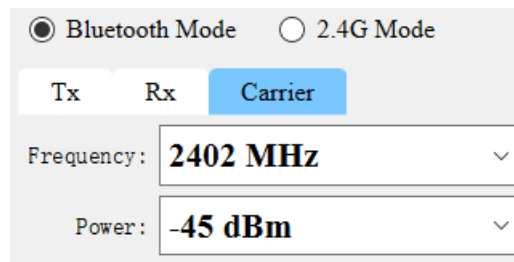


Figure 2-3-3-1

Figure 2-3-3-1 shows the carrier transmission test configuration in Bluetooth mode.

Frequency: Set the frequency point of transmission. The value ranges from 2402MHz to 2480MHz. 2MHz is the step value.

Power: Set the transmitting power. The value ranges from -45 dBm to 7 dBm.

When [USB Setting](#) is selected **Hand**, after the device connection is opened, click "**Start**" when selecting this mode, the corresponding configuration will be set to the device for single carrier emission test.

When [USB Setting](#) is selected **Auto**, click "**Start**" when selecting this mode to enter the automatic detection and turn on the device. After the automatic opening is successful, the corresponding configuration is set to the device for single carrier emission test. You can automatically connect to start the test process by simply inserting a USB device.

2.3.4 2.4G Mode

2.3.4.1 2.4G Mode Carrier Test

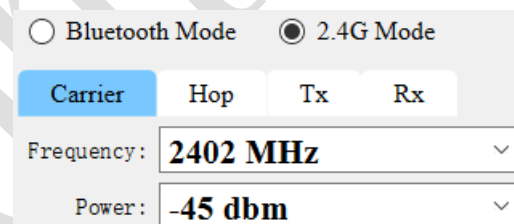


Figure 2-3-4-1-1

Figure 2-3-4-1-1 shows the carrier emission test configuration in 2.4G mode.

Frequency: Set the frequency point of transmission. The value ranges from 2402MHz to 2480MHz. 1MHz is the step value.

Power: Set the transmitting power. The value ranges from -45 dBm to 7 dBm.

When [USB Setting](#) is selected **Hand**, after the device connection is opened, click "**Start**" when selecting this mode, the corresponding configuration will be set to the device, and the single carrier transmission test will be carried out. Until you click "**Stop**" to send a stop signal, ending the single carrier transmission.

When [USB Setting](#) is selected **Auto**, click "**Start**" when selecting this mode to enter the automatic detection and turn on the device. After the automatic opening is successful, the corresponding configuration is set to the device for single carrier emission test. You can automatically connect to start the test process by simply inserting a USB device.

2.3.4.2 2.4G Mode Hop Test

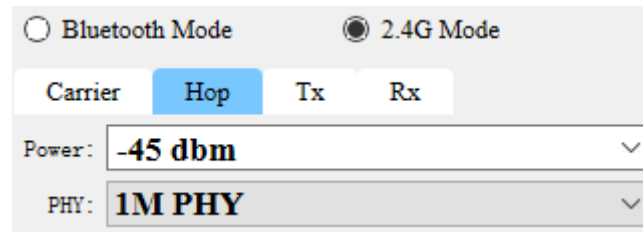


Figure 2-3-4-2-1

Figure 2-3-4-2-1 shows the test configuration of frequency hopping emission in 2.4G mode.

Power: Set the transmitting power. The value ranges from -45 dBm to 7 dBm.

PHY: To set the received PHY parameters. Supports 1M PHY and 2M PHY.

When [USB Setting](#) is selected **Hand**, after the device connection is opened, click "**Start**" when selecting this mode, the corresponding configuration will be set to the device for frequency hopping emission test. Click "**Stop**" to send a stop signal to end the test.

When [USB Setting](#) is selected **Auto**, click "**Start**" when selecting this mode to enter the automatic detection and turn on the device. After the automatic opening is successful, set the corresponding configuration to the device for frequency hopping emission test. You can automatically connect to start the test process by simply inserting a USB device.

2.3.4.3 2.4G Mode Tx Test

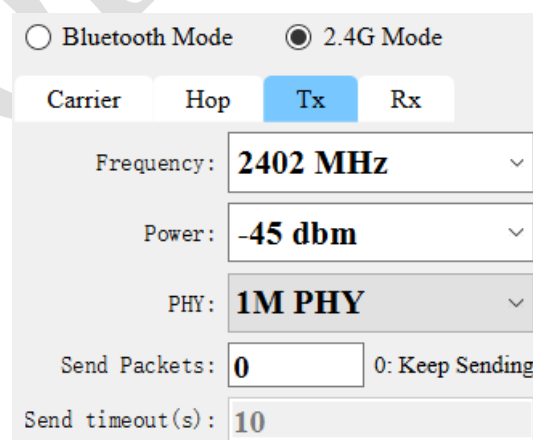


Figure 2-3-4-3-1

Frequency: Set the frequency point received. The value ranges from 2402MHz to 2480MHz. 1MHz is the step value.

Power: Set the transmitting power. The value ranges from -45 dBm to 7 dBm.

PHY: To set the received PHY parameters. Supports 1M PHY and 2M PHY.

Send Packets: when set to 0, it means transmitting all the time; When setting >0 indicates the specified number of packets to be transmitted.

Send timeout: only in the number of launch packets >0 is valid, and is the end time of reply after waiting for the launch to end. Unit s.

When [USB Setting](#) is selected **Hand**, after the device connection is opened, click "**Start**" when selecting this mode, the corresponding configuration will be set to the device for launch test.

If **Send Packets** is 0:: after the start of transmission, it has been transmitted, click "**Stop**" to send a stop signal and end the transmission.

If **Send Packets** is >0: After the transmission starts, the transmission is carried out according to the set number of packets, and the end signal will be reported at the end of the transmission, and then the test will automatically stop. If the end of transmission signal is not received, the timeout exits.

When [USB Setting](#) is selected **Auto**, click "**Start**" when selecting this mode to enter the automatic detection and turn on the device. After the automatic opening is successful, set the corresponding configuration to the device for launch test. You can automatically connect to start the test process by simply inserting a USB device.

2.3.4.4 2.4G Mode Rx Test

Figure 2-3-4-4-1 shows the reception test configuration in 2.4G mode.

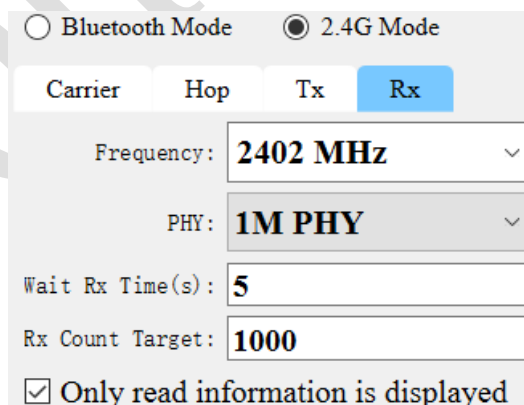


Figure 2-3-4-4-1

Frequency: Set the frequency point received. The value ranges from 2402MHz to 2480MHz. 1MHz is the step value.

PHY: To set the received PHY parameters. Supports 1M PHY and 2M PHY.

Wait Rx Time (s) : To set the waiting time after entering the receiving mode, the waiting time will automatically end and the number of received packets will be read.

Rx Count Target: To set the accept package target value. Used as a parameter to calculate the packet rate.

Only read information is displayed: To set test information display. When checked, only the number of packets read is displayed in the test information. If this parameter is not selected, the test information displays the complete test process.

When [USB Setting](#) is selected **Hand**, after the device connection is opened, click "**Start**" when selecting this mode, the corresponding configuration will be set to the device for receiving test. Then count down the waiting time, when the count-down is 0, read the number of received packets.

When [USB Setting](#) is selected **Auto**, click "**Start**" when selecting this mode to enter the automatic detection and turn on the device. After the automatic opening is successful, set the corresponding configuration to the device for receiving test. You can automatically connect to start the test process by simply inserting a USB device.

3 Test Example

3.1 Bluetooth Mode Test Example

3.1.1 Hand

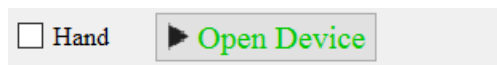


Figure 3-1-1-1

As shown in Figure 3-1-1-1, the manual mode is set.

Two devices were used for the test.

One device acts as the receiving end and the other as the transmitting end.

1. Open the tool and connect to the receiving device

Connect the receiving device to the computer via USB cable.

Open the upper computer, select USB device, and then click "**Open device**" to connect to the receiving device.

Ensure that the device connection is successfully opened.

2. Select Bluetooth receiving mode

On the upper computer, click "**Bluetooth Mode**" to select.

Then select **Rx**.

3. Set the receiving configuration

Configure the receiving configuration as required.

4. Enter the receiving mode

The host computer at the receiving end clicks "**Start**" to enter the receiving state.

5. Open a new tool to connect to the sending device

Connect the transmitter device to the computer via USB cable.

Open a new upper computer select USB device and click "**Open Device**" to connect to the transmitter device.

Ensure that the device connection is successfully opened.

6. Select Bluetooth emission mode

Click "**Bluetooth Mode**" on the newly opened upper computer to select.

Then select **Tx**.

7. Set the launch configuration

Set the transmit frequency to the same as the receive frequency.

Then set other configurations as required.

To test the packet receiving rate, you can set the specified number of packets to be sent.

8. Enter for launch

Click "**Start**" on the upper computer at the transmitting end to enter the transmitting state.

If the specified number of packets is set, the transmission will automatically end; otherwise, the transmission will continue.

9. Read and receive

If the specified number of packets is transmitted, wait for the transmitter to send the result, and then click "**Read Rx Cnt**" on the upper computer of the receiving end to read the number of packets received. You can calculate the received packet rate by comparing the number of sent packets.

If the transmitting mode is always transmitting, click "**Read Rx Cnt**" to read the number of received packets within a period of time.

3.1.2 Auto

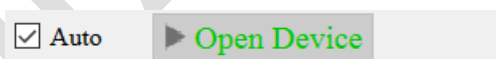


Figure 3-1-2-1-

As shown in Figure 3-1-2-1, the automatic mode is set.

1. Select Auto and set it to automatic mode.

2. Select Bluetooth carrier mode.

On the upper computer, click "**Bluetooth Mode**" to select.

Then select "**Carrier**".

3. Set the carrier configuration.

Set frequency and power.

4. Start testing.

Click "**Start**" to enter the automatic detection connection start test mode.

5. Test.

At this time, you only need to insert the USB device connection, and the device connection will be automatically detected and opened to start the single carrier transmission test.

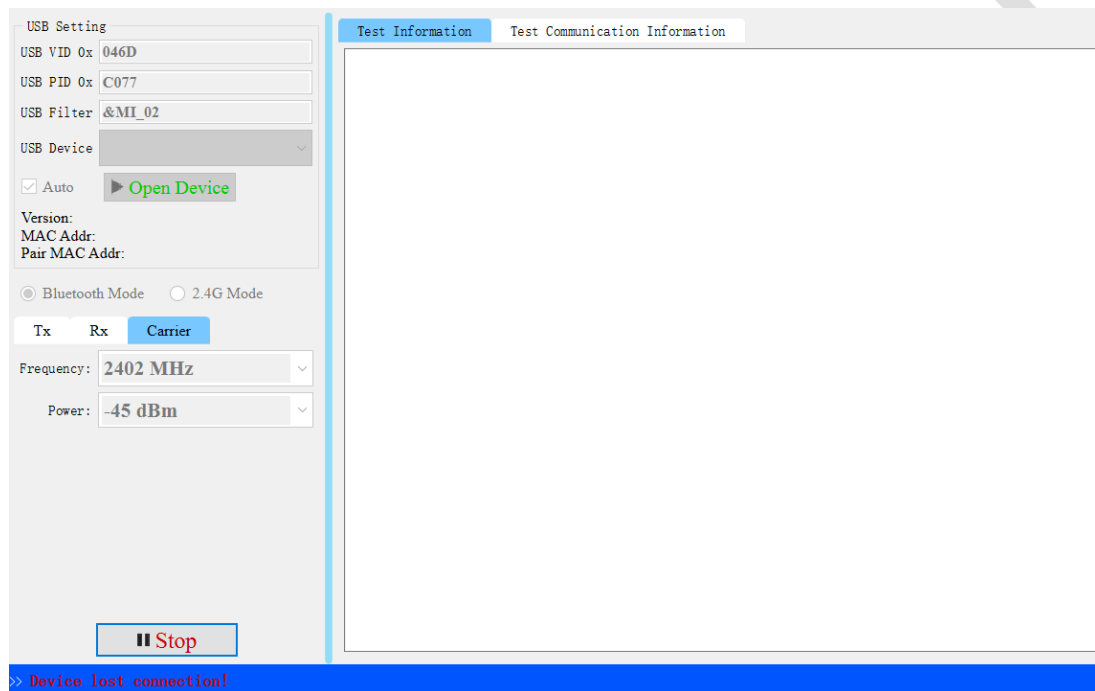


Figure 3-1-2-2

As shown in Figure 3-1-2-2, after clicking "**Start**", the USB device is not connected or removed.

As shown in Figure 3-1-2-3, when the USB device is inserted, the device is automatically connected and the single carrier transmission test display is performed.

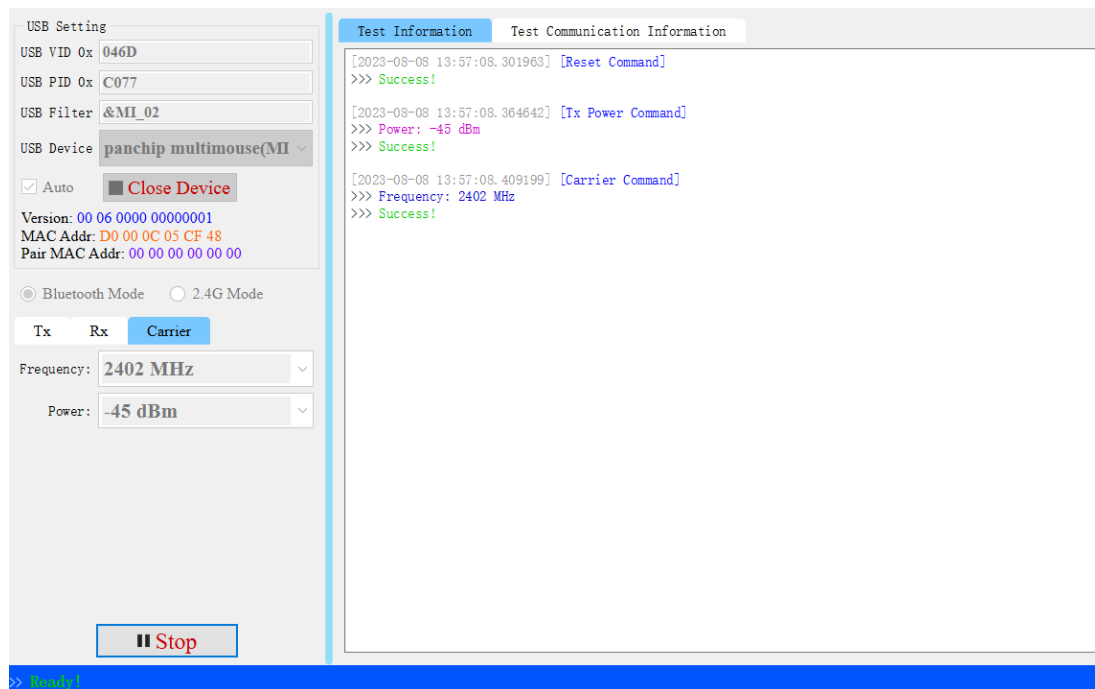


Figure 3-1-2-3

3.2 2.4G Mode Test Example

3.2.1 Hand

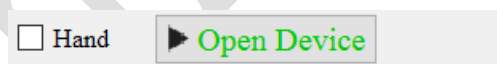


Figure 3-2-1-1

As shown in Figure 3-2-1-1, the manual mode is set.

Two devices were used for the test.

One device acts as the receiving end and the other as the transmitting end.

1. Open the tool and connect to the receiving device

Connect the receiving device to the computer via USB cable.

Open the upper computer, select USB device, and then click "**Open device**" to connect to the receiving device.

Ensure that the device connection is successfully opened.

2. Select 2.4G receiving mode

On the upper computer, click "**2.4G Mode**" to select.

Then select **Rx**.

3. Set the receiving configuration

Configure the receiving configuration as required.

4. Open a new tool to connect to the sending device

Connect the transmitter device to the computer via USB cable.

Open a new upper computer select USB device and click "**Open Device**" to connect to the transmitter device.

Ensure that the device connection is successfully opened.

5. Select 2.4G frequency hopping mode

Click "**2.4G Mode**" to select the newly opened upper computer.

Then select "**Tx**".

6. Set the launch configuration

The frequency Settings are the same as the receiving frequency Settings.

Then set other configurations as required.

To test the packet receiving rate, you can set the specified number of packets to be sent.

7. The receiving end enters to receive

Set the wait time for receiving, as well as the target value for accepting packets.

Click "**Start**" on the upper computer at the receiving end to enter the launching state.

8. Enter for launch

Click "**Start**" on the upper computer at the transmitting end to enter the transmitting state.

If the specified number of packets is set, the transmission will automatically end; otherwise, the transmission will continue.

9. Read and receive

Wait to receive countdown automatically reads the number of received packets and calculates the rate of received packets.

3.2.2 Auto

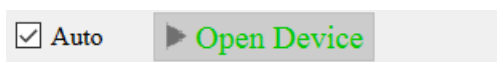


Figure 3-2-2-1-

As shown in Figure 3-2-2-1, the automatic mode is set.

1. Select Automatic and set it to automatic mode.
2. Select 2.4G carrier mode.

On the upper computer, click "**2.4G Mode**" to select.

Then select "**Carrier**".

3. Set the single carrier configuration.

Set frequency and power.

4. Start testing.

Click "**Start**" to enter the automatic detection connection start test mode.

5. Test.

At this time, you only need to insert the USB device connection, and the device connection will be automatically detected and opened to start the single carrier transmission test.

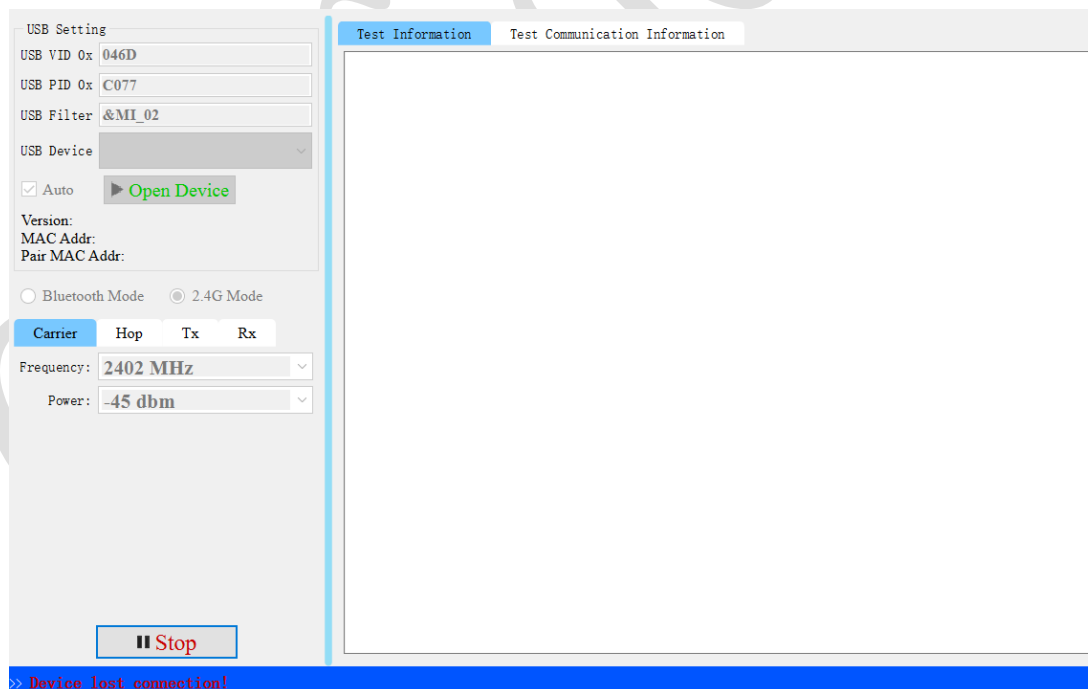


Figure 3-2-2-2

As shown in Figure 3-2-2-2, after clicking "Start test", the USB device is not connected or the USB device is removed.

As shown in Figure 3-2-2-3, when inserting a USB device, the device is automatically connected and a single carrier transmission test display is performed.

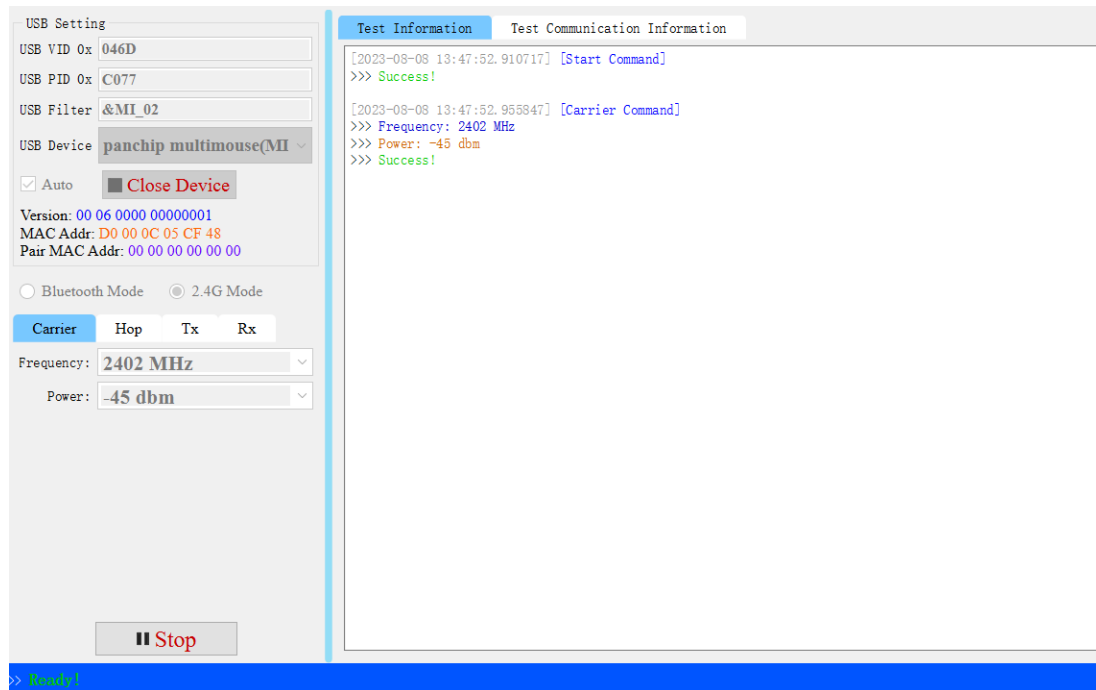


Figure 3-2-2-3