Raspberry Pi Series Robot Network Configuration Instruction

This tutorial uses the MasterPi vision robot car as an example, and it applies to other Raspberry Pi models as well.

1. Network Configuration Overview

The robot's network can be configured in two modes:

① AP Mode: The controller creates a hotspot that can be connected to by a smartphone. (Note: This mode does not connect to the external internet.)

② STA mode: The controller connects directly to a specified hotspot/Wi-Fi network. (This mode allows access to the external internet.)

By default, the robot operates in AP (direct connection) mode. The features and functions of the robot remain the same whether in AP mode or STA (local area network) mode.

2. AP Direct Connection Mode

2.1 Mode Switching through Phone

Using the Android system as an example, these instructions also apply to iOS.

1) Open the "**WonderPi**" app on your phone. Then, go to "**Basic**" and select "**MasterPi**".
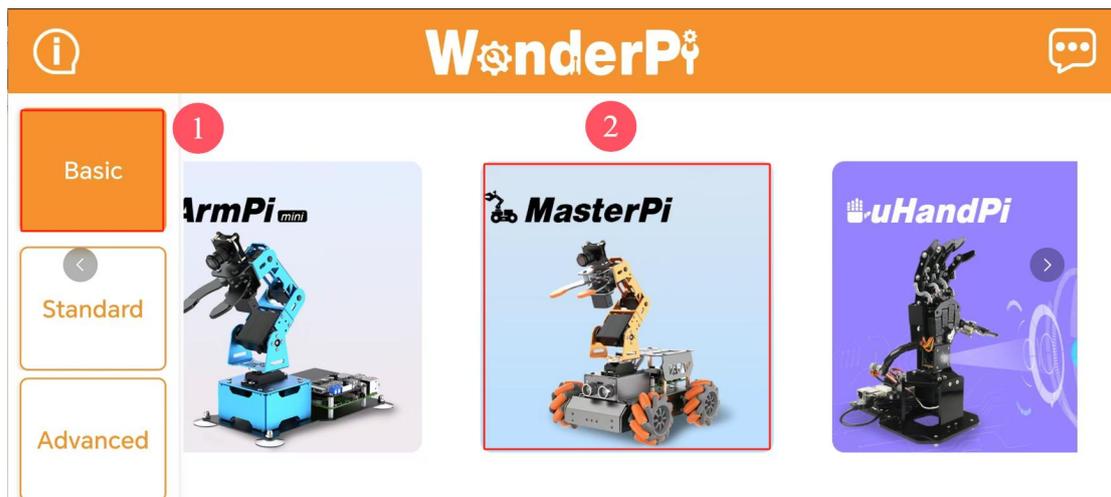
2) Tap the "**+**" button in the bottom right corner of the screen, and choose "**Direct Connection Mode**".

Note: If you prefer to connect in LAN mode, refer to Section 3: Connecting in LAN Mode (optional).

3) Tap "**Go to Connect Device Hotspot**". This will take you to your phone's settings to connect to the hotspot created by the robot.

4) Look for a hotspot name starting with "**HW**". The password is "**hiwonder**".

Note for iOS: Wait until the Wi-Fi icon appears in your phone's status bar before returning to the app. If you don't see the device listed, you can refresh by

tapping the refresh icon **in the upper-right corner of the app.**

5) Return to the app, and tap the robot icon to enter the mode selection screen.

Note: If a pop-up message appears saying "Network Unavailable, Continue Connection?", simply tap "Keep Connection".

6) If you see a prompt asking "**Switch to and enter the searched interface?**", it indicates that an incorrect product version was selected in Step 1. Tap "**OK**" to switch directly to the correct version's mode selection screen.
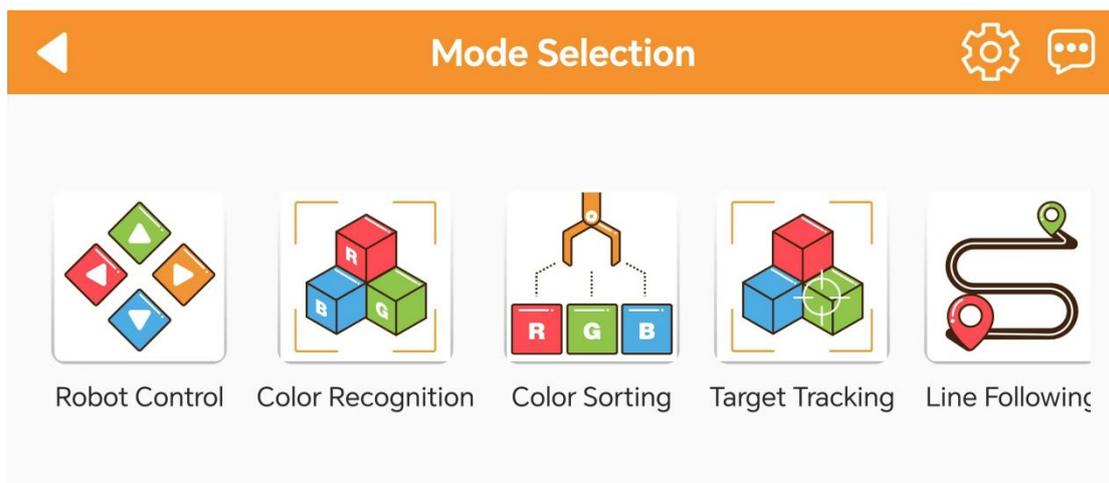
PROMPT

Whether to switch and enter the searched product interface?

CANCEL   CONFIRM

7) The mode selection screen appears as shown below:

For details on each mode, refer to the documentation provided earlier.

2.2 Switching via Network Configuration File

1) Power on the robot and connect it to the remote control software, VNC.

2) Double-click the terminal icon on the desktop to open the command line terminal.

3) Enter the following command and press Enter to navigate to the
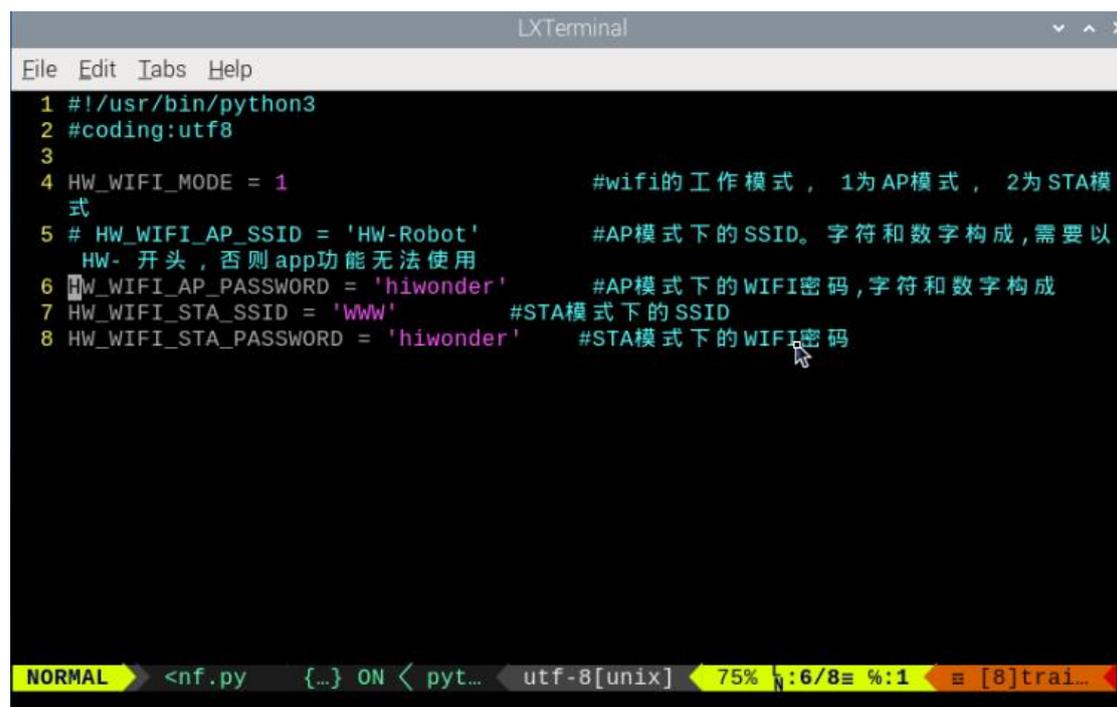
   configuration file directory.

cd hiwonder-toolbox/

4) Enter the command and press Enter to open the configuration file.

`vim wifi_conf.py`

Note: The configuration file defaults to AP Direct Connection Mode. If all code

lines are commented out, it will be set to AP Direct Connection Mode.

5) If there are multiple devices nearby, you can modify `**HW_WIFI_AP_SSID**`

   and `**HW_WIFI_AP_PASSWORD**` to set a unique name and password for

   each device. For example, use "**HW-Robot"** as the name and "**hiwonder"**

   as the password, as shown below.

6) After verifying the entries, press the ESC key, then type `:wq` to save and
exit the file.

7) Next, enter the command `vim wifi.py` and press Enter to open another
configuration file.

8) Change the value of `HW_WIFI_AP_GATEWAY` to set a new IP address,
such as '192.168.149.2' for example.

9) After confirming the entries, press the ESC key, then type `:wq` to save
and exit the file.

10) Enter the command `sudo systemctl restart hw_wifi.service` to restart
the robot's Wi-Fi service.

**sudo systemctl restart wifi.service**

```
> sudo systemctl restart wifi.service
```

11) Wait for the service to restart. You should see that the hotspot has been
   successfully updated.

12) To connect using VNC, enter the new IP address in the search bar, and
   click on the connection icon that appears. Log in with the username "pi"
   and password "raspberry", then click "OK" to access the system desktop.
   (For the Pi5 version, the username is the same as the 4B version, but the
   password is "raspberrypi".)
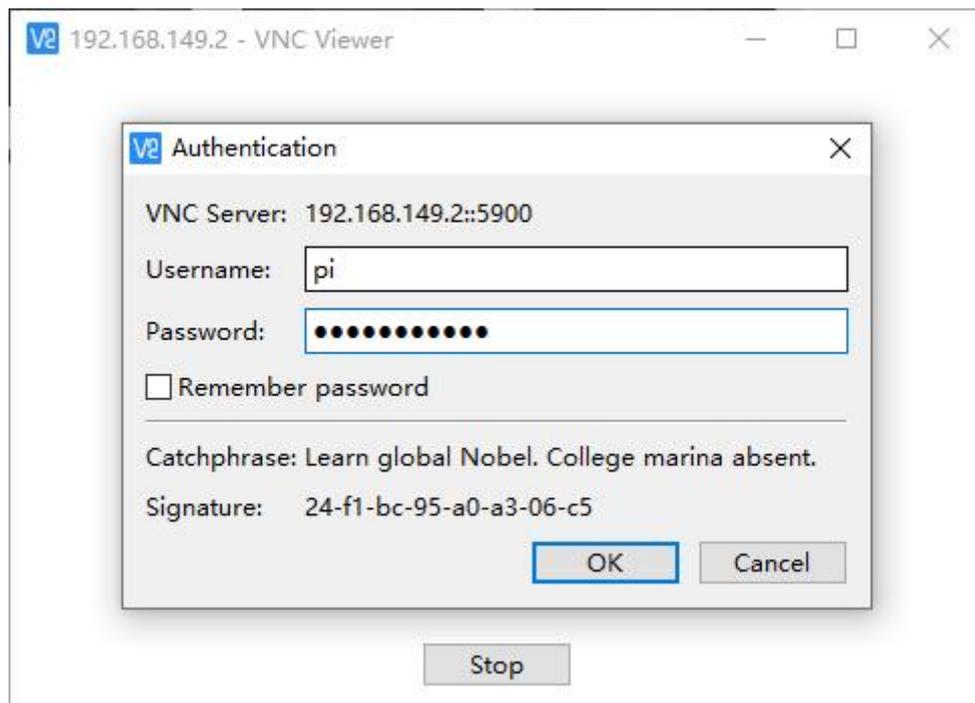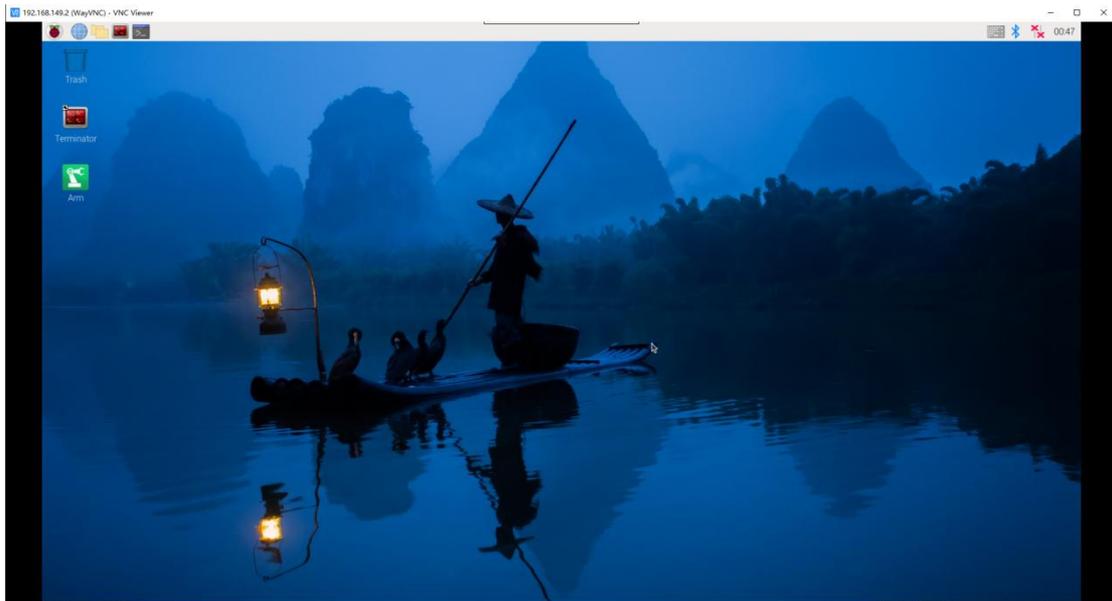
3. Connecting in LAN Mode (optional)

Please Note:

① **To configure the LAN mode using a smartphone, you must first enable the phone's location services.**

② **Switching to LAN mode cannot be done directly through the system's network settings, as the Wi-Fi has custom configurations. Please follow the instructions in Section 3.2 to switch modes using the network configuration file.**
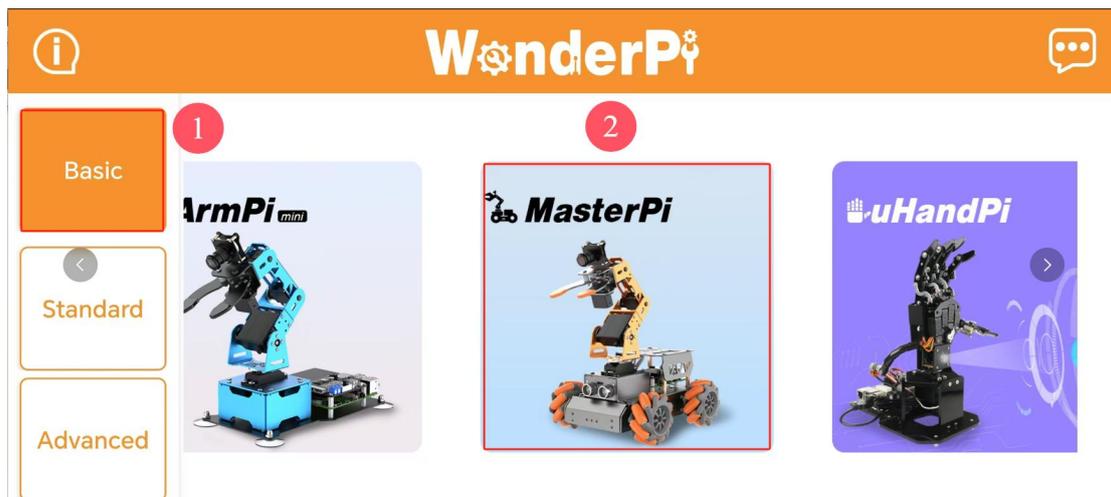
3.1 Switching via the Mobile App

Note: For LAN mode, please enable location services on your smartphone.

1) First, connect your phone to Wi-Fi. In this example, we connect to "**Hiwonder_5G**" Wi-Fi. (For dual-band routers with separated frequencies, the Wi-Fi names may differ, such as "**Hiwonder**" for the 2.4G band and "**Hiwonder_5G**" for the 5G band.)

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CONNECTED TO WLAN

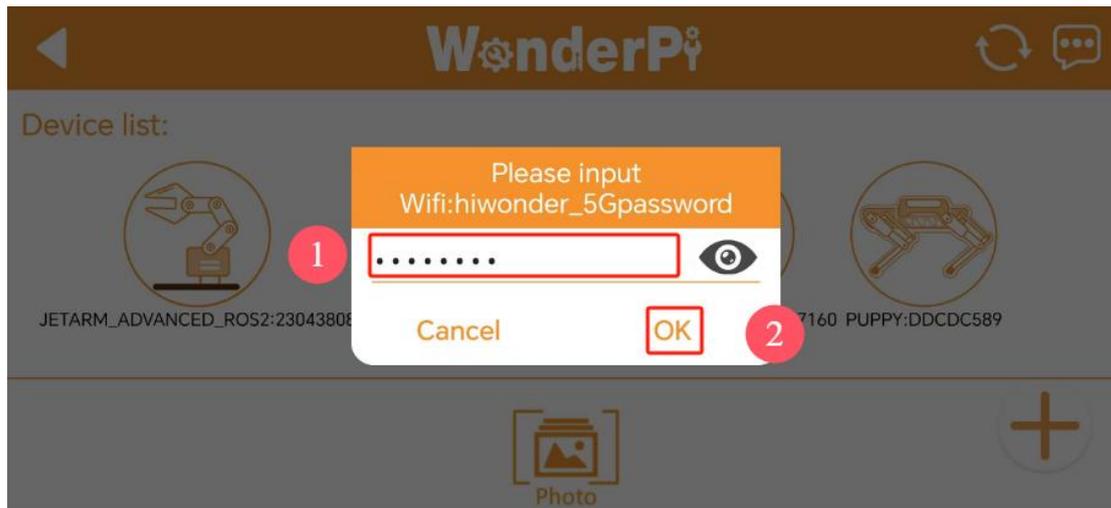**hiwonder_5G**
Connected (good quality)　　🛜🔒

AVAILABLE NETWORKS

2) Open the "WonderPi" app on your phone, then select "Basic" and "MasterPi".

3) Tap the "+" button in the bottom right corner, and choose "LAN Mode".

4) The app will prompt you to enter the password for the connected Wi-Fi network. (Please ensure the password is correct, as an incorrect password will result in connection failure.) After entering the password, tap "OK".

5) Tap "Go to connect device hotspot".

6) Your phone will automatically navigate to the Wi-Fi settings page. Find the hotspot starting with "HW" and enter the password "hiwonder". Once connected, tap the "Return" button.

7) The app will now begin the connection process.

8) After a short wait, the robot's icon will appear on the main screen, and the LED on the expansion board will remain steadily lit.

9) Press and hold the robot icon in the app to view the robot's assigned IP address and device ID.

10) Use a remote desktop tool to search for the robot's IP address and connect to the remote desktop.

11) To switch back to direct connection mode from LAN mode, press and hold the KEY1 button on the expansion board until the blue LED flashes, indicating that the switch is complete.

3.2 Switching via Network Configuration File

1) Power on the robot and connect it to the remote control software,

NoMachine.

2) Click the terminal icon at the top of the system screen to open the command line terminal.

3) Enter the command and press Enter to access the configuration file directory.

cd hiwonder-toolbox

4) Enter the command and press Enter to open the configuration file.

vim wifi_conf.py

5) First, change the value of `HW_WIFI_MODE` to 2:

- 1 represents Direct Connection Mode

- 2 represents LAN Mode

- 3 represents Direct Sharing Mode

6) Next, modify `**HW_WIFI_STA_SSID**` and `**HW_WIFI_STA_PASSWORD**` to match your router's Wi-Fi name and password.

Note: Selecting a 5G Wi-Fi signal will provide higher transfer speeds. If there is lag on standard Wi-Fi, consider switching to a 5G signal.

7) After confirming the entries are correct, press the ESC key, then type `:wq` to save and exit the file.

8) Enter the following command to restart the robot's Wi-Fi service.

sudo systemctl restart wifi.service

9) To switch back to Direct Connection Mode, edit the configuration file again, comment out all lines, save, and restart.