

KIT1126B Linux6.1 User Manual

V1.0



Boardcon Embedded Design

Overview

This document applies only to the KIT1126B development board. It is intended to help users quickly understand the hardware interfaces of the board and provides guidance for environment setup, source code compilation, firmware flashing, and functional testing of onboard hardware interfaces.

System Support

Development Board	Debian12	Buildroot
LGA1126B-V1 + KIT1126B-V1	Y	Y

Revision History

Version	Date	Author	Revision History
V1.0	2026-07-31	Liu Yuan	Initial version

Disclaimer

The information in this manual is provided for reference only. While Boardcon has made every effort to ensure the accuracy and reliability of the content, no guarantee is given regarding its completeness or correctness. All information in this manual is subject to change without prior notice.

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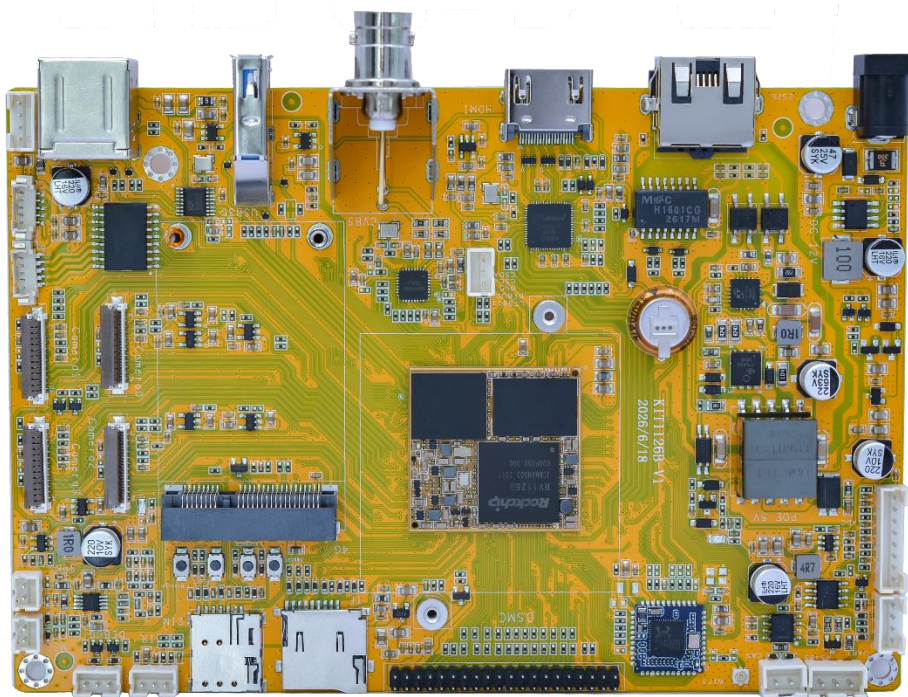
1. Introduction

1.1 Overview

KIT1126B is an embedded AI vision development board based on the Rockchip RV1126B processor. It adopts a modular design with a removable LGA1126B core board, providing a flexible platform for AI vision, intelligent recognition, security monitoring, industrial applications, and edge computing solutions.

The board provides rich peripheral interfaces for development and system integration, including four camera inputs, HDMI output, CVBS video input, USB3.0 DRD, three USB2.0 host interfaces, Ethernet with PoE support, Wi-Fi/BT, CAN, RS485, UART, ADC, MicroSD, 4G module expansion, IR, MIC input, speaker output, and motor control interface.

With its soldered core-board and carrier-board design, KIT1126B provides higher reliability, better thermal performance, and improved system stability. This design makes KIT1126B suitable for AI application development, product evaluation, and mass-production deployment.

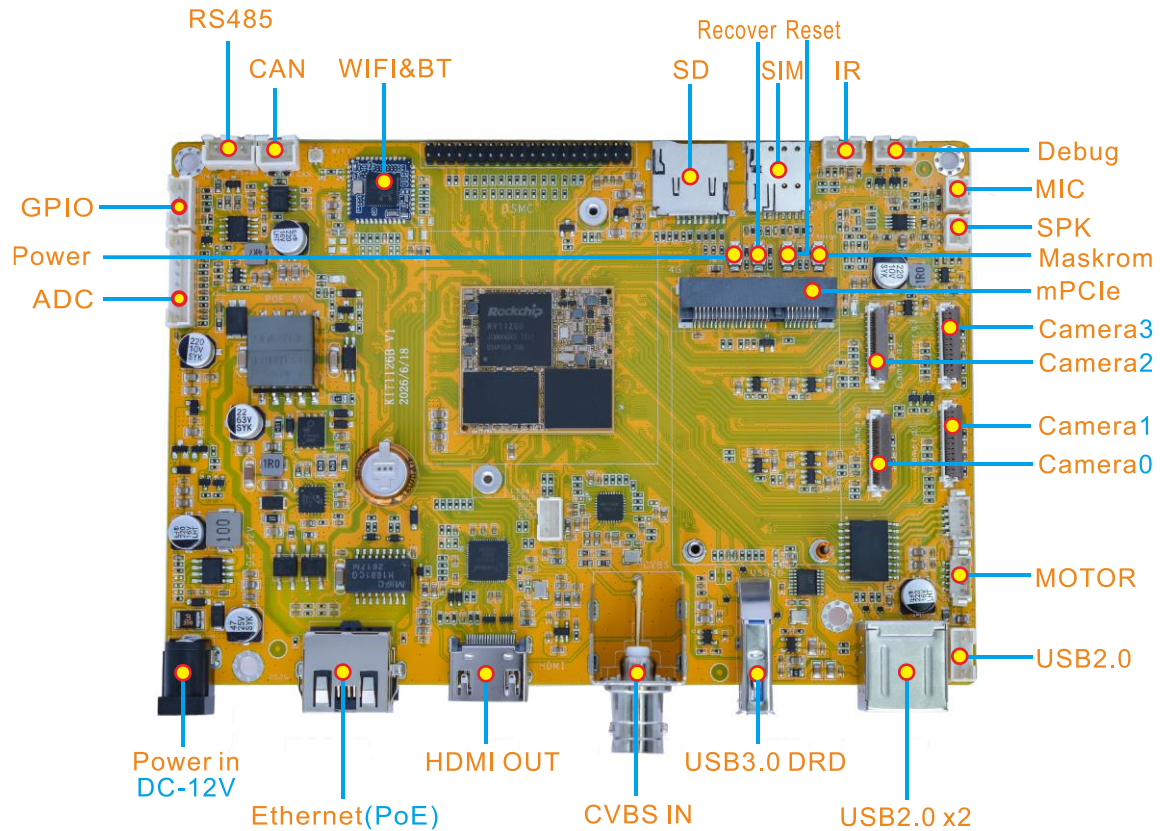


1.2 Product Parameters

Basic Parameters		
SOC		RV1126B
CPU		• Quad-core Arm Cortex-A53 64-bit processor • Neon SIMD and FPU support • 32 KB I-cache and 32 KB D-cache per core • 512 KB unified L2 cache
NPU		• Up to 3 TOPS AI computing power • Supports INT4, INT8, INT16, and FP16 operations • Supports mainstream AI frameworks, including TensorFlow, Caffe, TFLite, PyTorch, ONNX NN, and Android NN
Video	Decoder	• H.265/H.264 video decoding up to 3840×2160@30fps • JPEG decoding
	Encoder	• H.265/H.264 video encoding up to 3840×2160@30fps • JPEG encoding
AI-ISP		• Built-in AI-ISP engine • Supports up to 8MP@30fps • Supports AI-assisted image enhancement and spatial noise reduction
RAM		2GB LPDDR4x (up to 4GB)
ROM		8GB eMMC (up to 256GB)
Support system		Debian, Buildroot
Hardware Parameters		
Extended Storage		• Support 1x MicroSD Card
Display		• Support 1x HDMI
Audio		• Support 1x Speaker

	• Support 1x MIC
USB	• Support 3x USB2.0 • Support 1x USB3.0 DRD
Network	• Support 1x 100M Ethernet(PoE) • Support 1x WIFI/BT module
Camera	• Support 4x MIPI Camera • Support 2x CVBS Camera
Peripheral communication	• Support 1x RS485 • Support 2x CAN
Other parameters	Support 1xDebug UART, 1xADC, 1xIR, 1xMotor
Electrical Parameters	
Power supply input voltage	12V/3A
RTC input voltage	3V/0.6uA
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 85°C
Structural Parameters	
Core board dimensions	28.75mm x 30.0mm
Motherboard dimensions	155.0mm x 105.0mm

1.3 Hardware Interface Introduction



Interface parameters	
Power in DC 12V	12V DC power input interface
Ethernet(PoE)	100M Ethernet RJ45 interface with PoE support
HDMI OUT	HDMI OUT interface
CVBS IN	CVBS video input interface
USB3.0 DRD	USB 3.0 DRD interface, supporting Host and Device modes
USB2.0 x2	Dual-layer USB2.0 HOST interface
USB2.0	USB2.0 Host interface via GPIO header
MOTOR	Stepper motor control interface
Camera0	Camera0 interface
Camera1	Camera1 interface
Camera2	Camera2 interface

Camera3	Camera3 interface
mPCIe	4G module interface
SPK	Speaker output interface
MIC	Differential microphone input interface
Debug	Debug interface
IR	IR interface
SIM	SIM card interface
SD	MicroSD card slot
WIFI&BT	WIFI and Bluetooth module
Maskrom	Maskrom key
Reset	Reset key
Recovery	Recovery key
Power	Power key
CAN	CAN communication interface
RS485	RS485 communication interface
ADC	ADC interface

2. Install Drivers and Tools

To download firmware and debug in the terminal, the following drivers and software need to be installed (for Windows computers):

Number	Driver name	Driver	Use
1	RK Driver Assistant	DriverInstall.exe	OTG USB driver installation assistant
2	CH9102x	SETUP.EXE	Serial port debugging driver
3	Serial Terminal Tool	SecureCRT.exe	Debugging tool

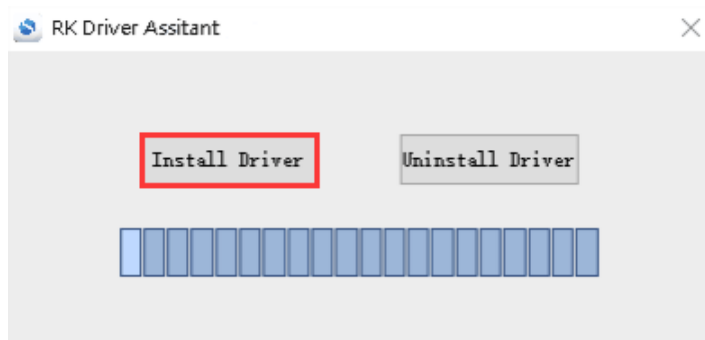
2.1 Install RK Driver Assistant

Step 1: Open *DriverAssistant/DriverInstall.exe*.

Step 2: To avoid driver conflicts, click “**Uninstall Driver**” to uninstall the driver.

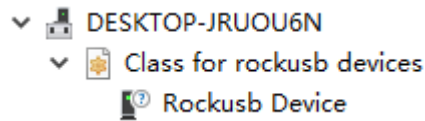


Step 3: Click button “**Install Driver**” to install.

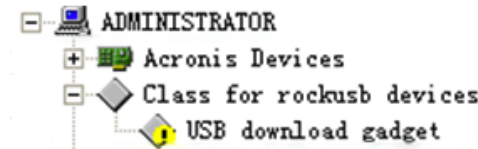


Step 4: After the installation is complete, connect the board and PC with USB_A cable and press the **Recovery** key and hold then power the board, the following information is displayed in the Computer **Device Manager**, indicating that the USB driver was

successfully installed.

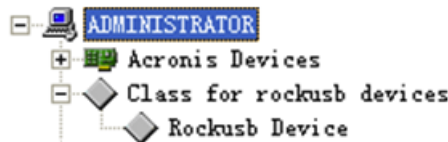


Step 5: If the following device information appears in the **Device Manager** after the operation in Step 4, user need to proceed to the next step.



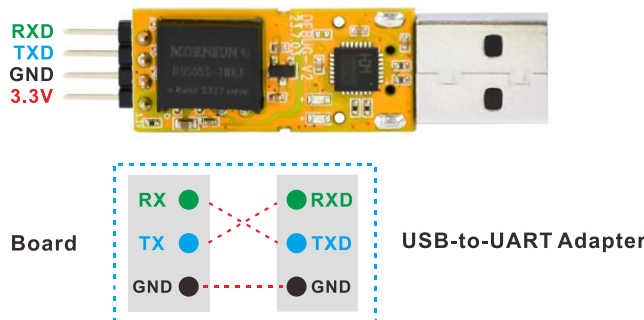
Step 6: The WINDOW will pop up found New Hardware Wizard dialog box, choose to install from the specified location, and then select: *DriverAssistant/ADBDriver*.

Step 7: After the installation is completed, the following device information can be seen in the Computer **Device Manager**.



2.2 Install CH9102X Driver

2.2.1 How to Connect the Serial Port Tool



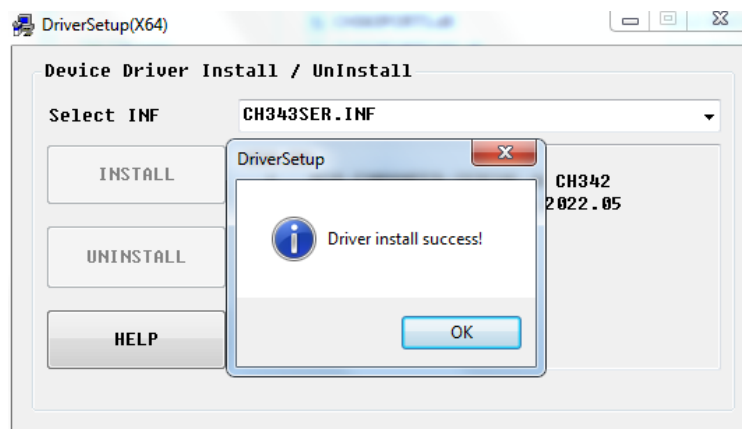
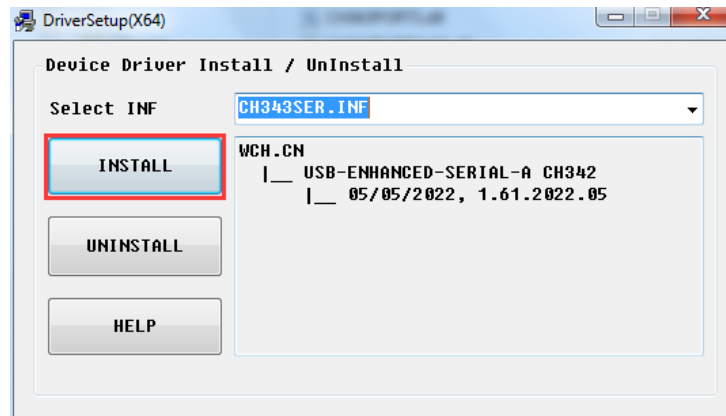
Pin	Connection Description
RXD	Receive, connect to TX pin of the board.
TXD	Transmit, connect to RX pin of the board.
GND	Ground, connect to GND pin of the board.
3V3	No need to connect.

2.2.2 Install Driver

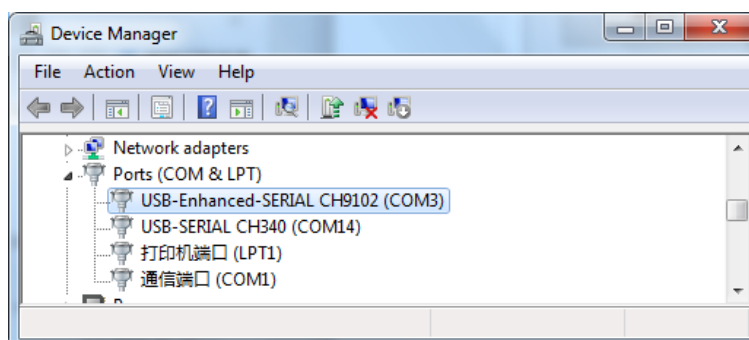
Step 1: Connect the CH9102X module to the PC.

Step 2: Unzip *CH343SER.ZIP* on Windows.

Step 3: Select and install the corresponding *SETUP.EXE* according to the computer properties.



Step 4: After the installation is completed, the device will be listed under **Device Manager** ports with unique serial port assigned.

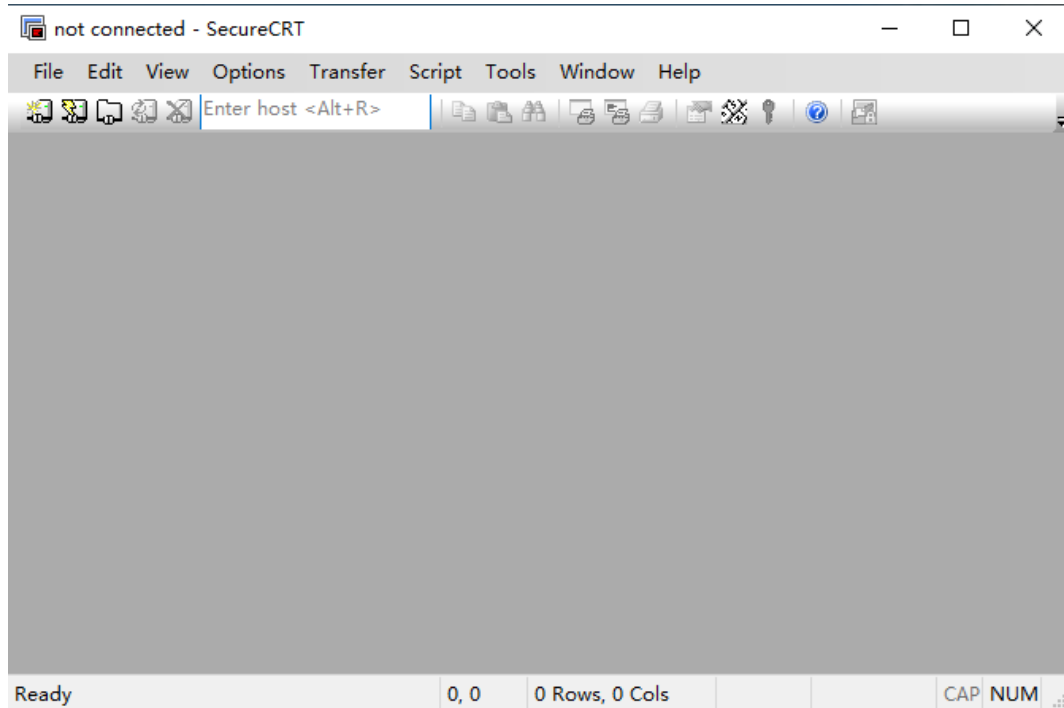


2.3 Install Serial Terminal Tool

The serial terminal SecureCRT is used for debugging in Windows. It can be used directly after decompression.

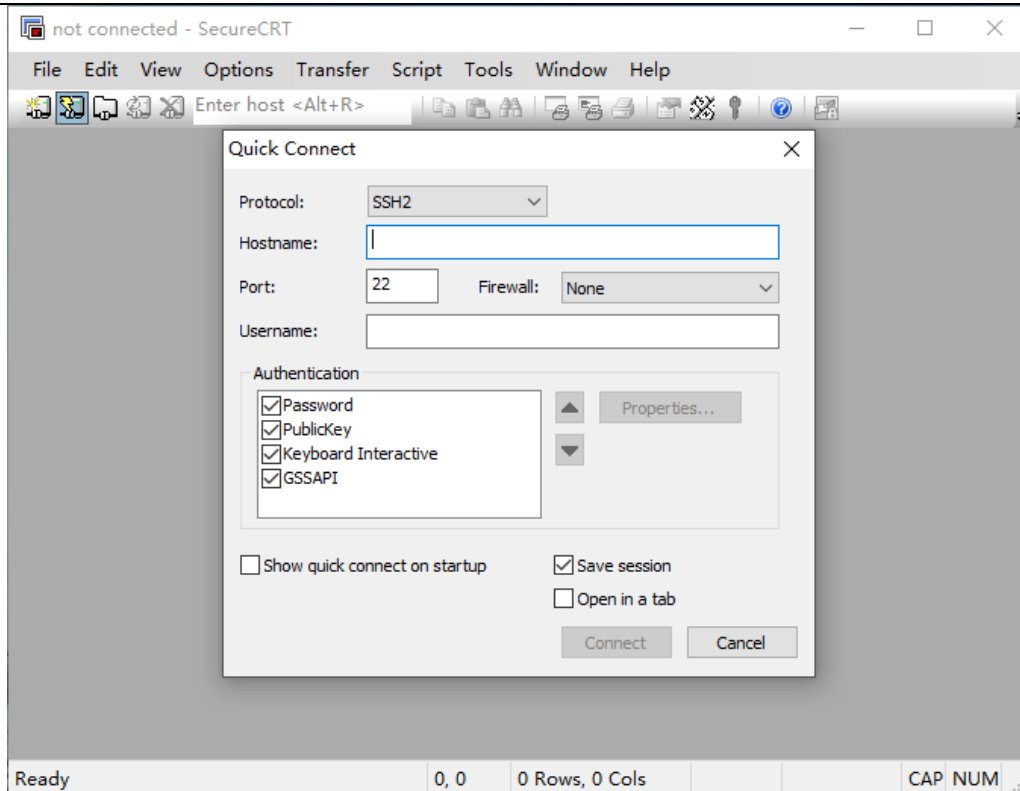
Step 1: Unzip *Platform/SecureCRT.rar* on PC.

Step 2: Click *SecureCRT/SecureCRT.exe* open to the SecureCRT.

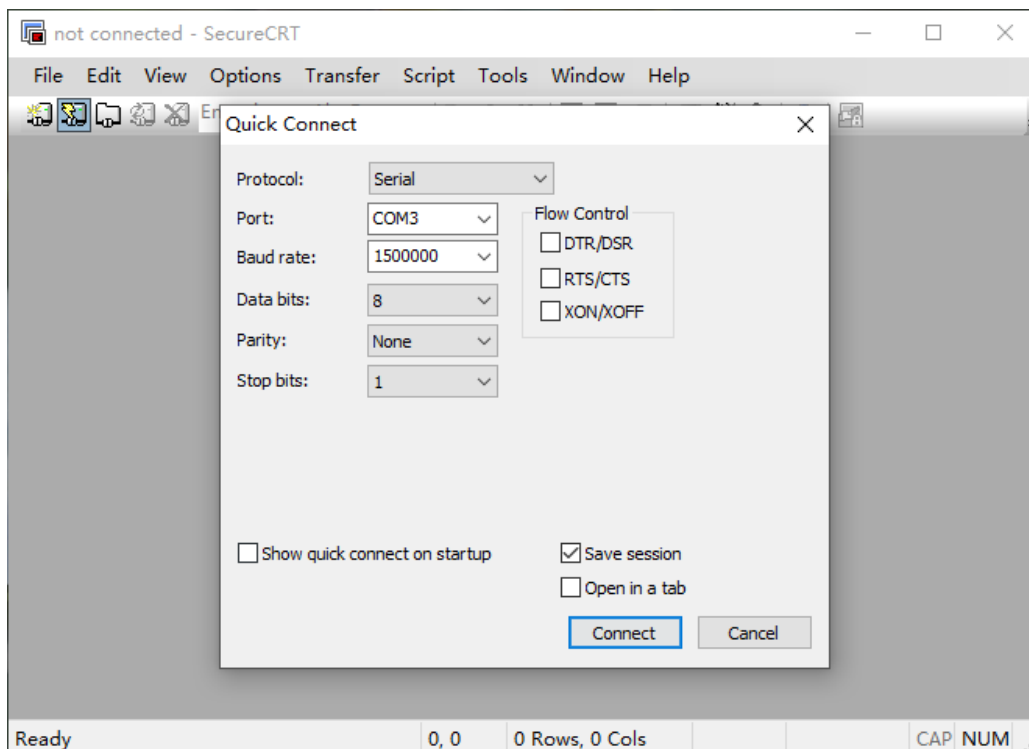


Step 3: Confirm that the CH9102X driver has been installed and the CH9102X module is connected to the PC.

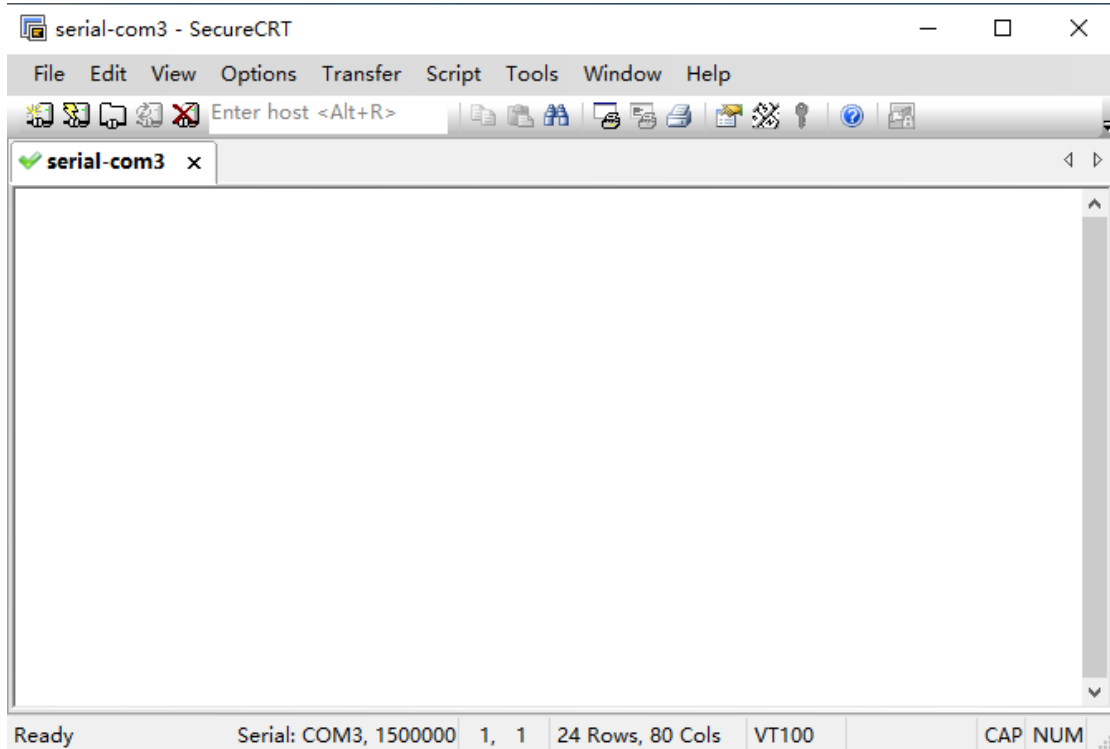
Step 4: Click the “**Quick Connect**” button to go to the Quick Connect configuration screen.



Step 5: Configure as shown in the following figure.



Step 6: After clicking the “**Connect**” button, the terminal serial interface will be successfully accessed.



3. Upgrade Introduction

3.1 Upgrade Mode

The firmware can be upgraded via a USB cable in the following two modes:

1. Loader Mode:

Loader Mode is the standard mode used for firmware upgrade.

2. MaskRom Mode:

MaskRom Mode is a recovery mode used for firmware upgrade and system recovery, especially when the device cannot enter Loader Mode or fails to boot properly. The device can enter MaskRom Mode by pressing the MaskRom key.

Prerequisite:

Before upgrading the firmware via USB cable, make sure the required USB driver has been installed on the PC. For driver installation instructions, refer to the section [2.1 Install RK Driver Assistant](#).

3.1.1 How to Enter Loader Mode

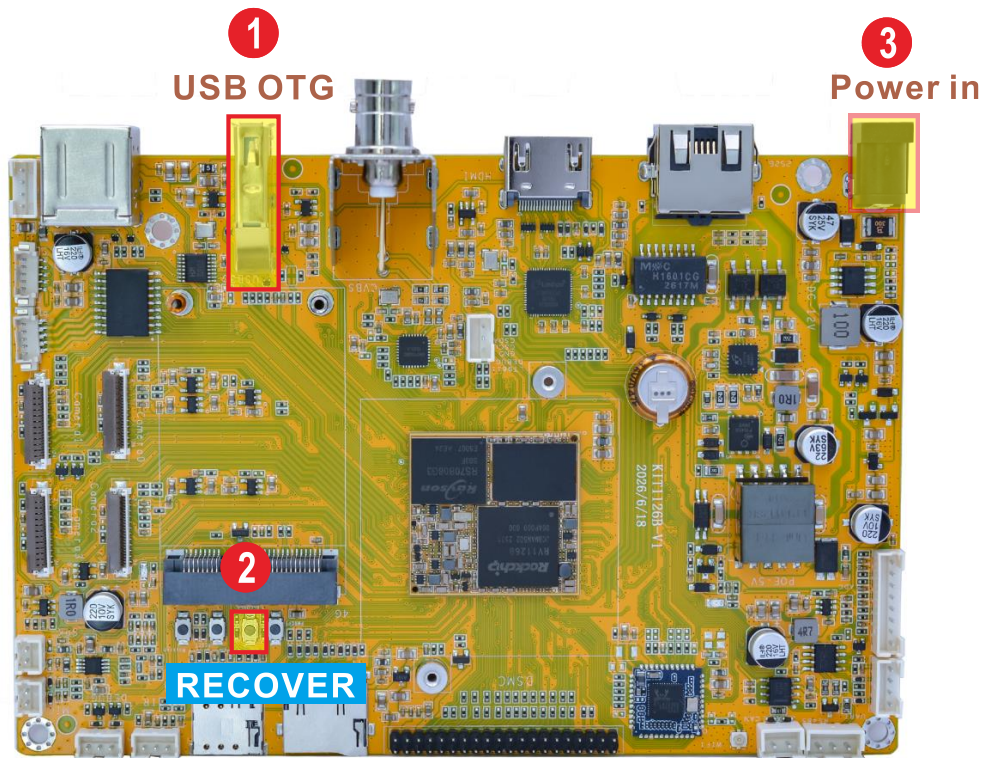
3.1.1.1 Hardware Method

Step 1: Disconnect the power adapter.

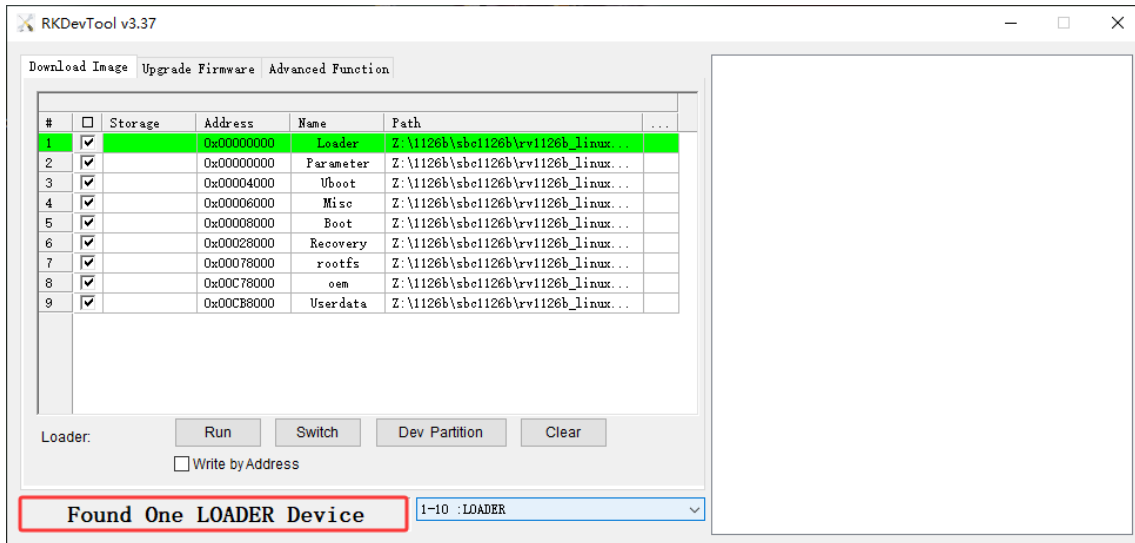
Step 2: Connect one end of the USB-A cable to the host PC and the other end to the development board.

Step 3: Press and hold the **Recovery** button on the board.

Step 4: Connect the power supply.



Step 5: After a few seconds, release the **Recovery** button when the flashing tool shows “Found one LOADER Device”.



3.1.1.2 Software Method

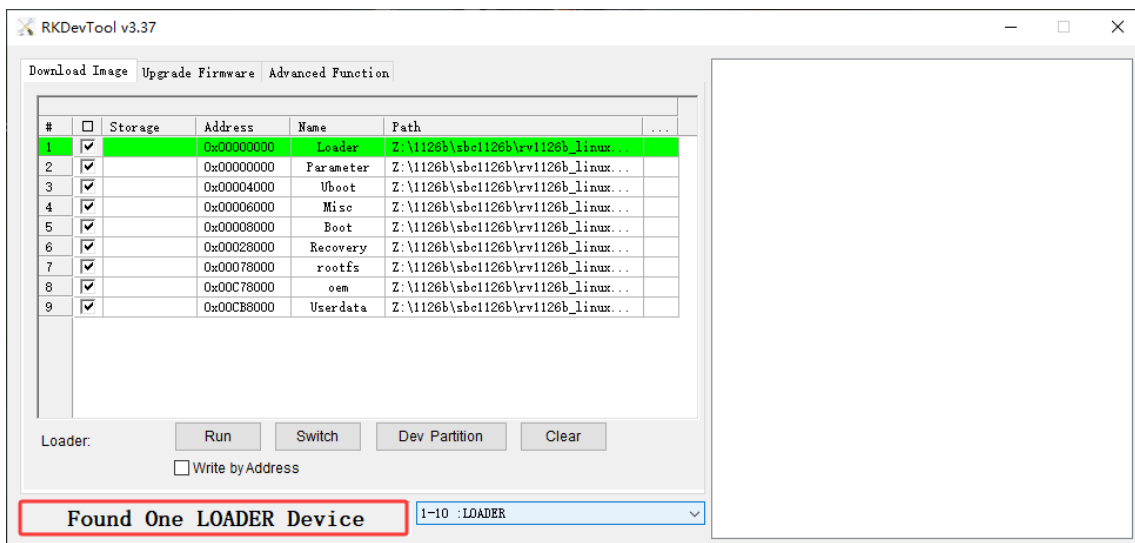
After the USB_A cable is connected and the board is powered on, run the following command from the serial debug terminal or ADB shell:

```
# reboot loader
```

3.1.1.3 Serial Terminal Method

Step 1: Connect one end of the USB_A cable to the host PC and the other end to the development board, then open the serial debug terminal.

Step 2: Press and hold **Ctrl + D** in the serial terminal, then power on the board. Release **Ctrl + D** when the flashing tool shows “**Found one LOADER Device**”.



3.1.2 How to Enter MaskRom Mode

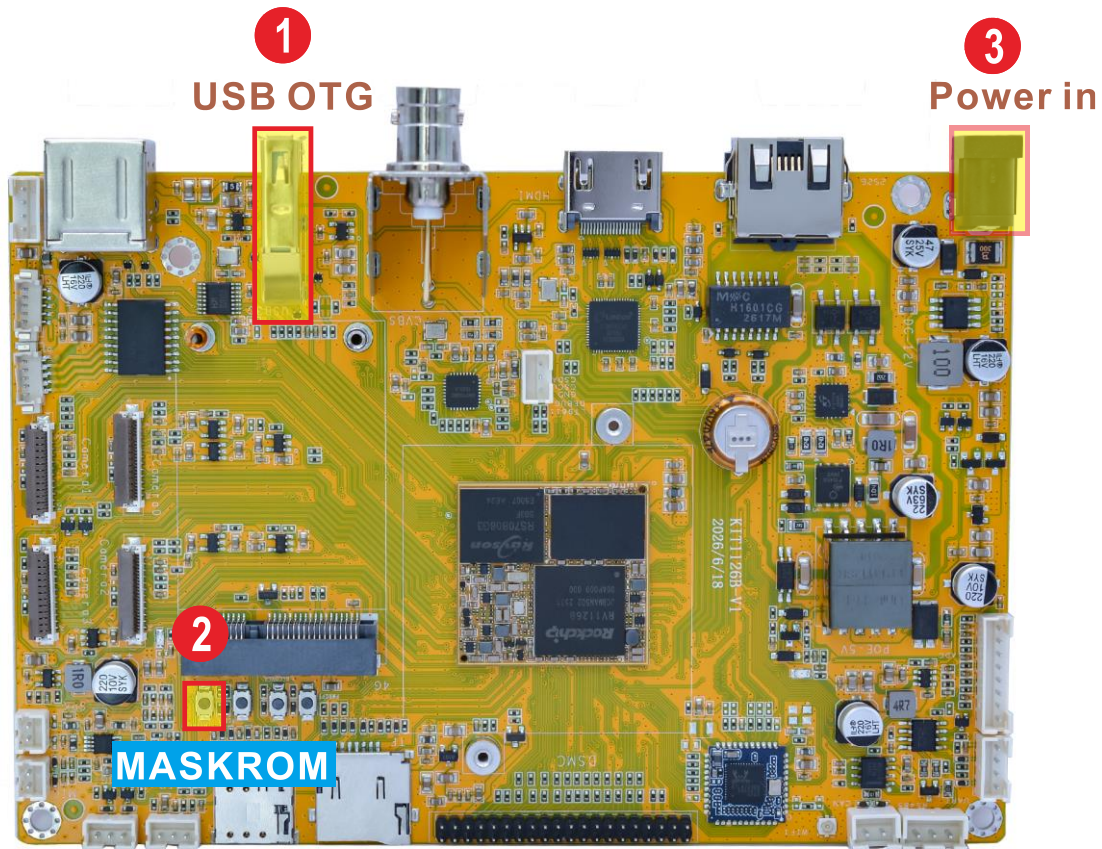
3.1.2.1 Hardware Method

Step 1: Disconnect the power adapter.

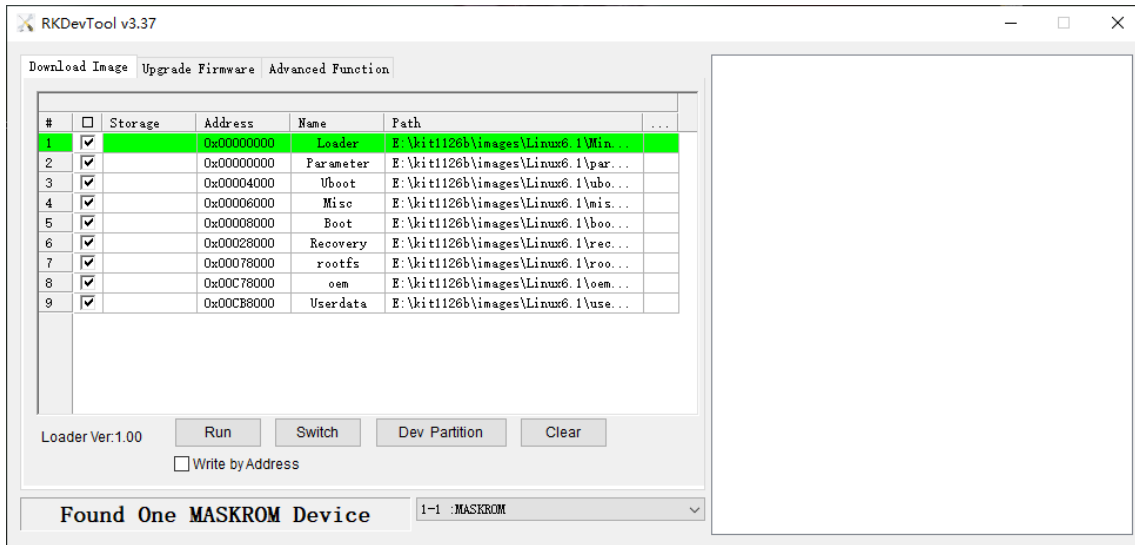
Step 2: Connect one end of the USB-A cable to the host PC and the other end to the development board.

Step 3: Press and hold the **Maskrom** button on the board.

Step 4: Connect the power supply.



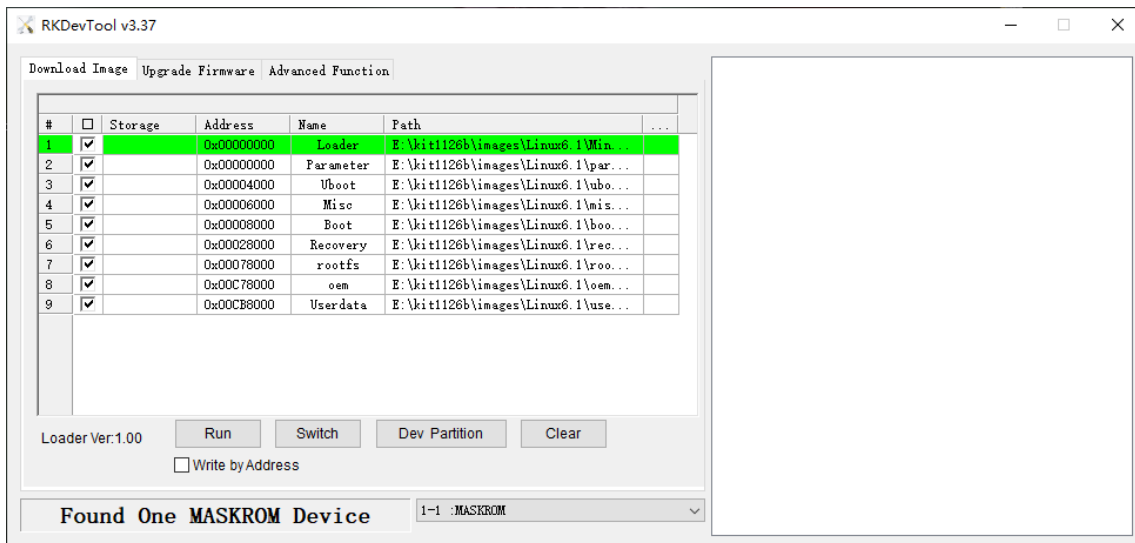
Step 5: After a few seconds, release the **Maskrom** button when the flashing tool shows “Found one MASKROM Device”.



3.1.2.2 Serial Terminal Method

Step 1: Connect one end of the USB_A cable to the host PC and the other end to the development board, then open the serial debug terminal.

Step 2: Press and hold **Ctrl + B** in the serial terminal, then power on the board. Release **Ctrl + B** when the flashing tool shows “Found one MASKROM Device”.

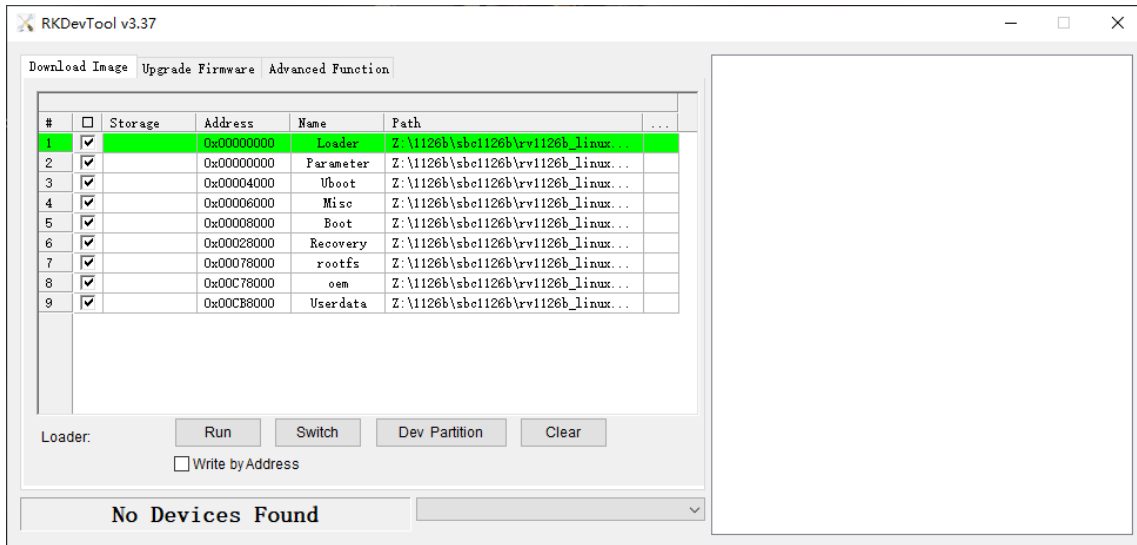


3.2 Firmware Flashing

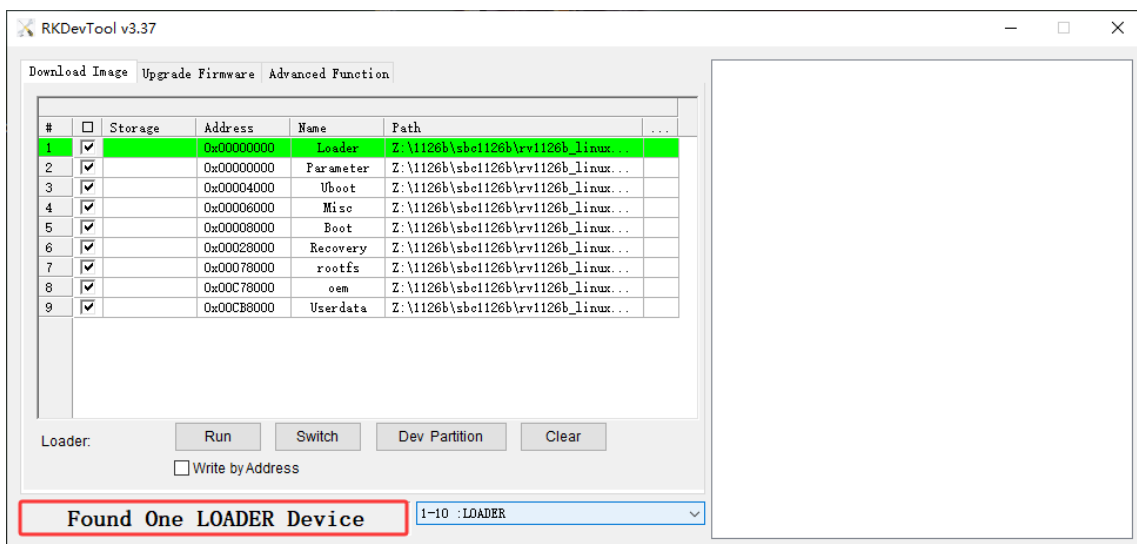
Environment: Windows OS

3.2.1 Flash Full Firmware Image

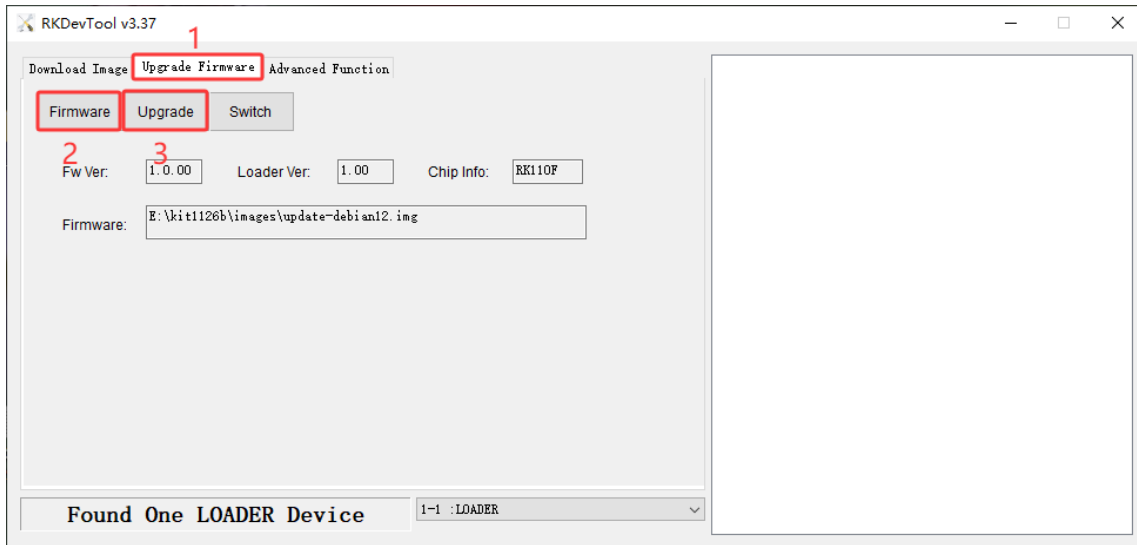
Step 1: Open *RKDevTool\RKDevTool_Release\RKDevTool.exe*.



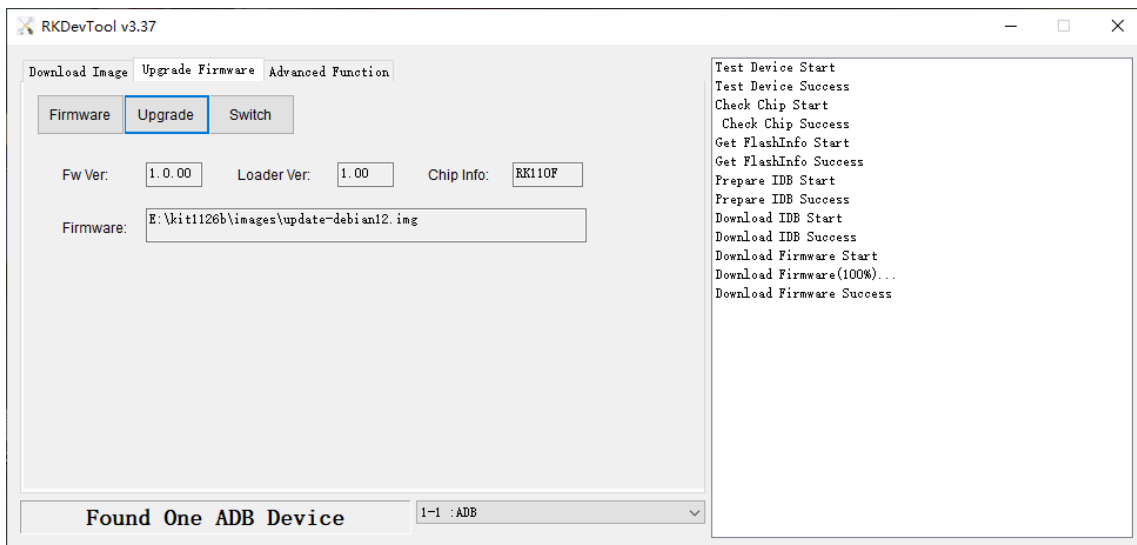
Step 2: Put the board into Loader mode. For details, refer to Section [3.1.1 How to Enter Loader Mode](#).



Step 3: Click **Upgrade Firmware** -> **Firmware**, select **update.img**, and then click **Upgrade** to start flashing.



After the flashing is complete, the board will automatically reboot.



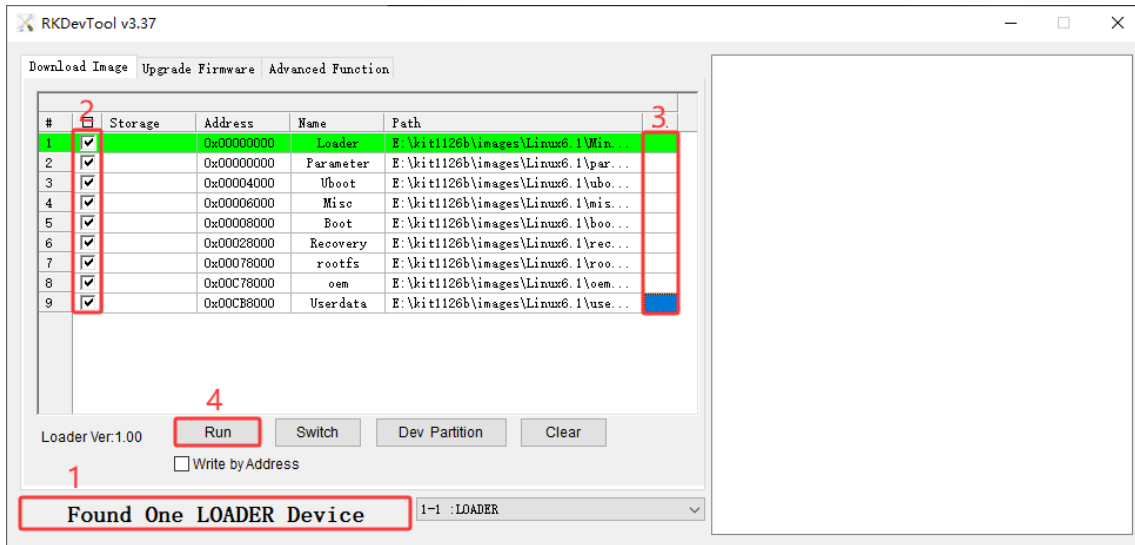
3.2.2 Flash Separate Partition Images

Step 1: Put the board into Loader mode. For details, refer to Section [3.1.1 How to Enter Loader Mode](#).

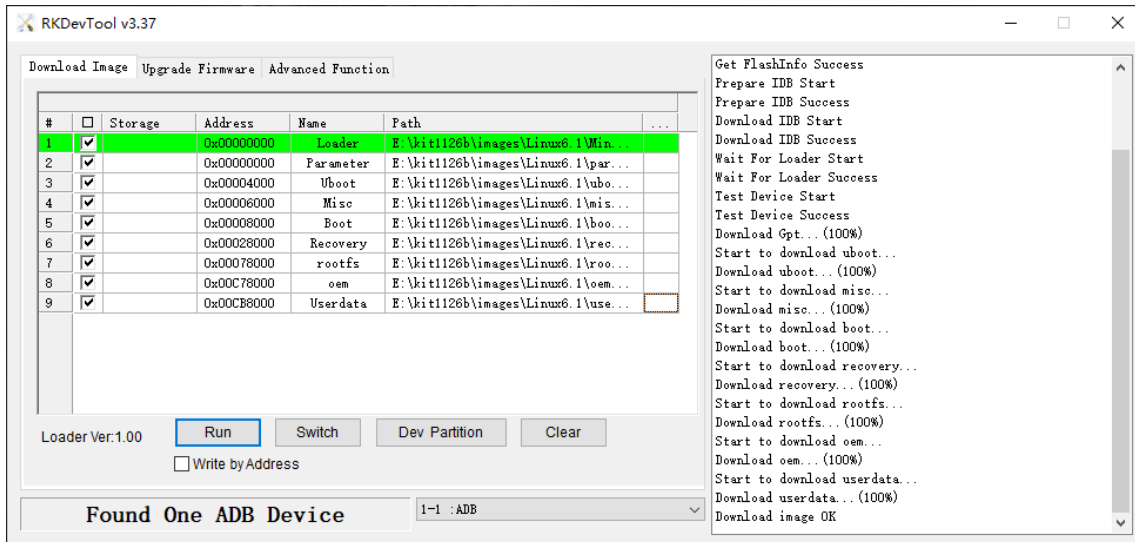
Step 2: Select the partitions to be flashed. Multiple partitions can be selected.

Step 3: Make sure the image file paths are correct. If necessary, click the blank cell next to each path to reselect the corresponding image file.

Step 4: Click **Run** to start flashing.



After flashing is complete, the board will automatically reboot.



4. Development Environment

4.1 Preparing the Development Environment

Ubuntu 22.04 or later is recommended for SDK compilation. If an error occurs during compilation, check the error message and install the required software packages accordingly. For other Linux distributions, the package names or installation commands may need to be adjusted.

In addition to the operating system requirements, the following hardware and software requirements should be met:

Hardware requirements	Software requirements
64-bit system, hard disk space should be greater than 200G. If you do multiple builds, you will need more hard drive space.	Ubuntu 22.04

4.2 Installing Libraries and Toolkits

This section provides the commands for installing the software packages required to build the SDK compilation environment. Other tools, such as Samba and SSH, should be installed as needed.

PC OS	Network	Permission
Ubuntu 22.04	online	root

To install the required tools, execute the following commands:

```
$ sudo apt-get install git ssh make gcc libssl-dev liblz4-tool libmpc-dev
$ sudo apt-get install expect g++ patchelf chrpath gawk texinfo chrpath diffstat
$ sudo apt-get install binfmt-support live-build bison flex fakeroot libgmp-dev
$ sudo apt-get install cmake gcc-multilib g++-multilib unzip device-tree-compiler
$ sudo apt-get install ncurses-dev libgucharmap-2-90-dev bzip2 expat gpgv2
$ sudo apt-get install cpp-aarch64-linux-gnu g++-aarch64-linux-gnu
$ sudo apt install python2 python-is-python3
```

5. Compile Source Code

Step 1: Extract the Source Code

To extract the source code package, execute the following commands:

```
$ tar xvf rv1126b_linux6.1_rk*.tar.bz2
$ cd rv1126b_linux6.1_rkr2
```

Step 2: Configure the Target Board

To configure the target board, execute the following command:

```
$ ./build.sh lunch
```

After running **./build.sh lunch**, the system will list available defconfig files.

For the Buildroot system, select the corresponding configuration according to the required version:

- **GStreamer version:**

2. [boardcon_kit1126b_defconfig](#)

- **Rockit version:**

3. [boardcon_kit1126b_multi_ipc_64_defconfig](#)

Note:

Only the Buildroot system provides both the GStreamer version and the Rockit version.

For the Debian system, use the GStreamer version.

The following steps use the GStreamer version as an example:

```
##### Rockchip Linux SDK #####
Manifest: rv1126b_linux6.1_release_v1.2.0_20251220.xml
GIT commit: "41613ab rv1126b: update wifibt to RK960 on rv1126bp evb1 board"
Log colors: message notice warning error fatal
Log saved at /home/qinxueqin/1126b/sbc1126b/rv1126b_linux6.1_rkr2/output/sessions/2026-07-27_19-45-00
Pick a defconfig:
1. rockchip_defconfig
2. boardcon_kit1126b_defconfig
3. boardcon_kit1126b_multi_ipc_64_defconfig
4. boardcon_sbc1126b_defconfig
5. boardcon_sbc1126b_ipc_64_defconfig
6. boardcon_sbc1126b_multi_ipc_64_defconfig
7. rockchip_rv1126b_dv_64_evb1_v10_defconfig
8. rockchip_rv1126b_dv_64_evb1_v12_defconfig
9. rockchip_rv1126b_evb1_v10_defconfig
10. rockchip_rv1126b_evb4_v10_defconfig
11. rockchip_rv1126b_fastboot_defconfig
12. rockchip_rv1126b_ipc_32_evb1_v10_defconfig
13. rockchip_rv1126b_ipc_64_evb1_v10_defconfig
14. rockchip_rv1126b_robot_defconfig
15. rockchip_rv1126b_tiny_32_evb2_v10_defconfig
16. rockchip_rv1126bp_evb1_v10_defconfig
17. rockchip_rv1126bp_fastboot_defconfig
18. rockchip_rv1126bp_ipc_32_evb1_v10_defconfig
19. rockchip_rv1126bp_ipc_64_evb1_v10_defconfig
20. rockchip_rv1126bp_robot_defconfig
Which would you like? [1]:2
```

Step 3: Compile U-Boot

To compile U-Boot, execute the following command:

```
$ ./build.sh uboot
```

Step 4: Compile the Kernel

To compile the kernel, execute the following command:

```
$ ./build.sh kernel
```

Step 5: Compile Recovery

To compile recovery, execute the following command:

```
$ ./build.sh recovery
```

Step 6: Compile rootfs

(1) Compile Debian12

Root privileges are required to compile Debian12. Execute the following command:

```
$ sudo ./build.sh debian
```

After compilation is complete, [linaro-rootfs.img](#) will be generated in the debian directory.

Note:

The required dependencies must be installed before compiling Debian12.

```
$ cd debian
$ sudo apt-get install binfmt-support qemu-user-static live-build
$ sudo dpkg -i ubuntu-build-service/packages/*
$ sudo apt-get install -f
```

(2) Compile Buildroot

To compile buildroot, execute the following command:

```
$ ./build.sh buildroot
```

Step 7: Generate and Package Firmware Images

To generate and package the firmware images, execute the following command:

```
$ ./build.sh firmware
```

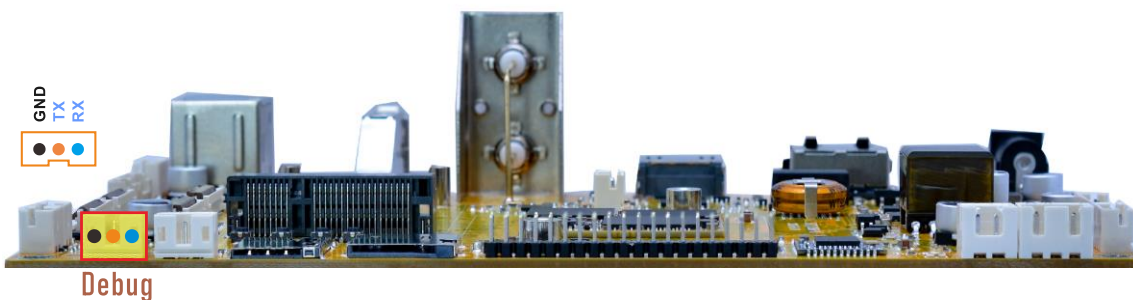
After the command is completed, the image files and [update.img](#) will be generated in the [rockdev/](#) directory.

6. Debian12 Test

Account: [linaro](#)
 Password: [linaro](#)

6.1 Serial Terminal

Step 1: Connect the USB-to-serial module to the PC and connect the other end to the Debug UART interface on the board.



Step 2: Open a serial terminal tool on the PC, select the corresponding serial port, and set the baud rate to 1500000.

Step 3: Power on the board and check whether the boot log is displayed in the serial terminal.

```

serial-com6 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com6 x
13.673174] stream_cif_mipi_id1: update sensor info failed -19
13.673301] rkCIF-mipi-lvds3: rkCIF_update_sensor_info: stream[2] get remote terminal sensor failed!
13.673309] stream_cif_mipi_id2: update sensor info failed -19
13.673415] rkCIF-mipi-lvds3: rkCIF_update_sensor_info: stream[3] get remote terminal sensor failed!
13.673422] stream_cif_mipi_id3: update sensor info failed -19
13.673578] rkCIF-mipi-lvds3: rkCIF_update_sensor_info: stream[0] get remote terminal sensor failed!
13.673586] rkCIF_scale_ch0: update sensor info failed -19
13.673672] rkCIF-mipi-lvds3: rkCIF_update_sensor_info: stream[1] get remote terminal sensor failed!
13.673679] rkCIF_scale_ch1: update sensor info failed -19
13.673762] rkCIF-mipi-lvds3: rkCIF_update_sensor_info: stream[2] get remote terminal sensor failed!
13.673770] rkCIF_scale_ch2: update sensor info failed -19
13.673855] rkCIF-mipi-lvds3: rkCIF_update_sensor_info: stream[3] get remote terminal sensor failed!
13.673864] rkCIF_scale_ch3: update sensor info failed -19
13.674020] rkCIF-mipi-lvds3: rkCIF_update_sensor_info: stream[0] get remote terminal sensor failed!
13.674028] rkCIF_tools_id0: update sensor info failed -19
13.674108] rkCIF-mipi-lvds3: rkCIF_update_sensor_info: stream[1] get remote terminal sensor failed!
13.674115] rkCIF_tools_id1: update sensor info failed -19
13.674183] rkCIF-mipi-lvds3: rkCIF_update_sensor_info: stream[2] get remote terminal sensor failed!
13.674190] rkCIF_tools_id2: update sensor info failed -19
13.745541] gm7150bc 0-005c: __gm7150_power_on(258)
13.832220] gm7150bc 0-005c: __gm7150_power_off(323)
22.321809] platform mtd_vendor_storage: deferred probe pending

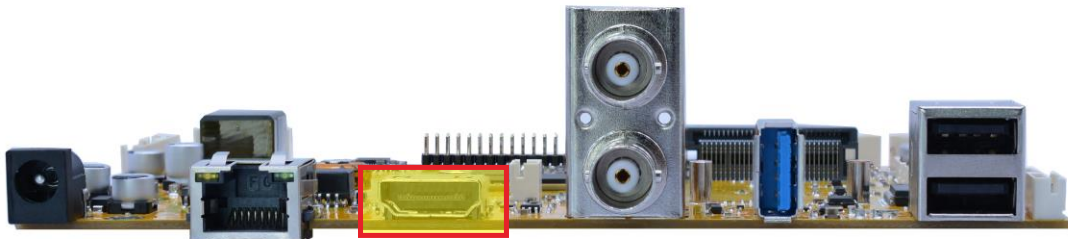
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#
root@linaro-alip:/#

```

For details about installing and using the serial terminal tool, please refer to Section [2.2](#) [Install CH9102X Driver](#) and [2.3 Install Serial Terminal Tool](#).

6.2 Display

The KIT1126B uses an LT9611 MIPI-to-HDMI bridge chip to convert the MIPI DSI display signal to HDMI output. The HDMI interface supports 1920×1080@60Hz video output.



HDMI OUT

The HDMI status can be checked using the following command:

```
# cat /sys/class/lt9611/hdmi/status
```

The display output is shown in the following figure:



6.3 USB

6.3.1 USB OTG

The USB OTG port of the KIT1126B is configured as Device mode by default after system boot.



- To switch the USB OTG port to Host mode, execute the following command:

```
# echo host > /sys/kernel/debug/usb/21500000.usb/mode
```

```
root@linaro-alip:/# echo host > /sys/kernel/debug/usb/21500000.usb/mode
root@linaro-alip:/# [ 181.246010] dwc3 21500000.usb: request 00000000ff01b354 was not queued to
ep0out
[ 181.246123] android_work: did not send uevent (0 0 0000000000000000)
[ 181.292970] read descriptors
[ 181.293003] read strings
[ 181.353390] phy phy-21400000.usb2-phy.2: illegal mode
[ 181.353439] xhci-hcd xhci-hcd.1.auto: xHCI Host Controller
[ 181.353715] xhci-hcd xhci-hcd.1.auto: new USB bus registered, assigned bus number 3
[ 181.353869] xhci-hcd xhci-hcd.1.auto: hcc params 0x0220fe64 hci version 0x110 quirks
0x0002008022010010
[ 181.353914] xhci-hcd xhci-hcd.1.auto: irq 76, io mem 0x21500000
[ 181.354037] xhci-hcd xhci-hcd.1.auto: xHCI Host Controller
[ 181.354289] xhci-hcd xhci-hcd.1.auto: new USB bus registered, assigned bus number 4
[ 181.354321] xhci-hcd xhci-hcd.1.auto: Host supports USB 3.0 SuperSpeed
[ 181.354481] usb usb3: New USB device found, idVendor=1d6b, idProduct=0002, bcdDevice= 6.01
[ 181.354497] usb usb3: New USB device strings: Mfr=3, Product=2, SerialNumber=1
[ 181.354505] usb usb3: Product: xHCI Host Controller
[ 181.354512] usb usb3: Manufacturer: Linux 6.1.141 xhci-hcd
[ 181.354518] usb usb3: SerialNumber: xhci-hcd.1.auto
[ 181.355185] hub 3-0:1.0: USB hub found
[ 181.355232] hub 3-0:1.0: 1 port detected
[ 181.355586] usb usb4: We don't know the algorithms for LPM for this host, disabling LPM.
[ 181.355699] usb usb4: New USB device found, idVendor=1d6b, idProduct=0003, bcdDevice= 6.01
[ 181.355712] usb usb4: New USB device strings: Mfr=3, Product=2, SerialNumber=1
[ 181.355719] usb usb4: Product: xHCI Host Controller
[ 181.355726] usb usb4: Manufacturer: Linux 6.1.141 xhci-hcd
[ 181.355732] usb usb4: SerialNumber: xhci-hcd.1.auto
[ 181.356199] hub 4-0:1.0: USB hub found
[ 181.356240] hub 4-0:1.0: 1 port detected
```

- To switch the USB OTG port back to Device mode, execute the following command:

```
# echo device > /sys/kernel/debug/usb/21500000.usb/mode
# usbdevice start
```

```

root@linaro-alip:/# echo device > /sys/kernel/debug/usb/21500000.usb/mode
[ 135.621011] xhci-hcd xhci-hcd.1.auto: remove, state 4
[ 135.621056] usb usb4: USB disconnect, device number 1
root@linaro-alip:/# [ 135.622239] xhci-hcd xhci-hcd.1.auto: USB bus 4 deregistered
[ 135.622541] xhci-hcd xhci-hcd.1.auto: remove, state 4
[ 135.622569] usb usb3: USB disconnect, device number 1
[ 135.624313] xhci-hcd xhci-hcd.1.auto: USB bus 3 deregistered
[ 137.050107] read descriptors
[ 137.050143] read strings
[ 137.404721] dwc3 21500000.usb: device reset
[ 137.491762] android_work: sent uevent USB_STATE=CONNECTED
[ 137.525471] android_work: sent uevent USB_STATE=CONFIGURED

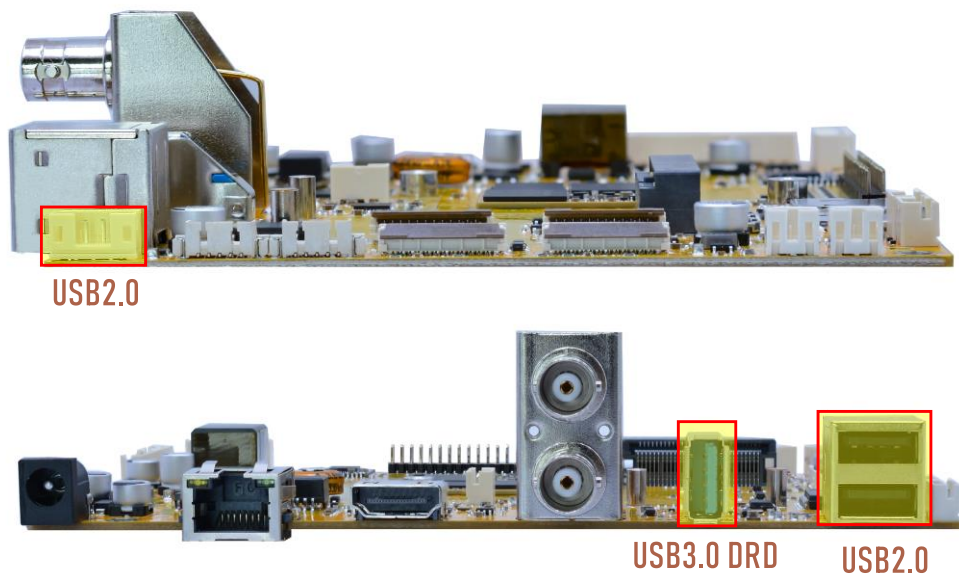
root@linaro-alip:/# usbdevice start
[2026-04-28 03:26:50] usbdevice [3848]: Sending start request to service...
[2026-04-28 03:26:50] usbdevice [3848]: Check /var/log/usb-gadget.log for usb-service log...
  
```

6.3.2 USB HOST

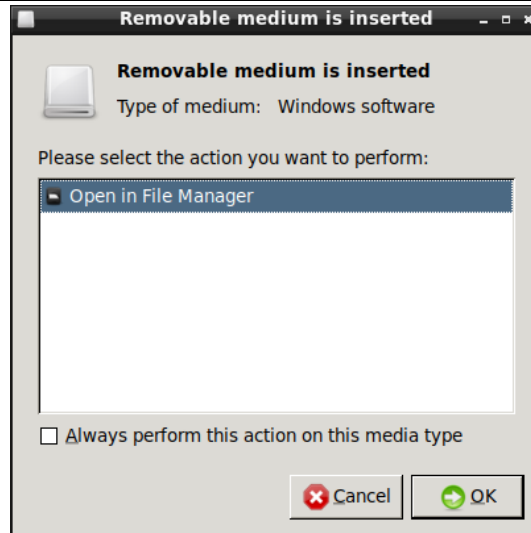
The KIT1126B provides USB 2.0 Host interfaces and one USB 3.0 DRD interface. The USB Host interfaces can be used to connect USB peripherals, such as a USB mouse, USB keyboard, USB flash drive, and other USB devices.

Note:

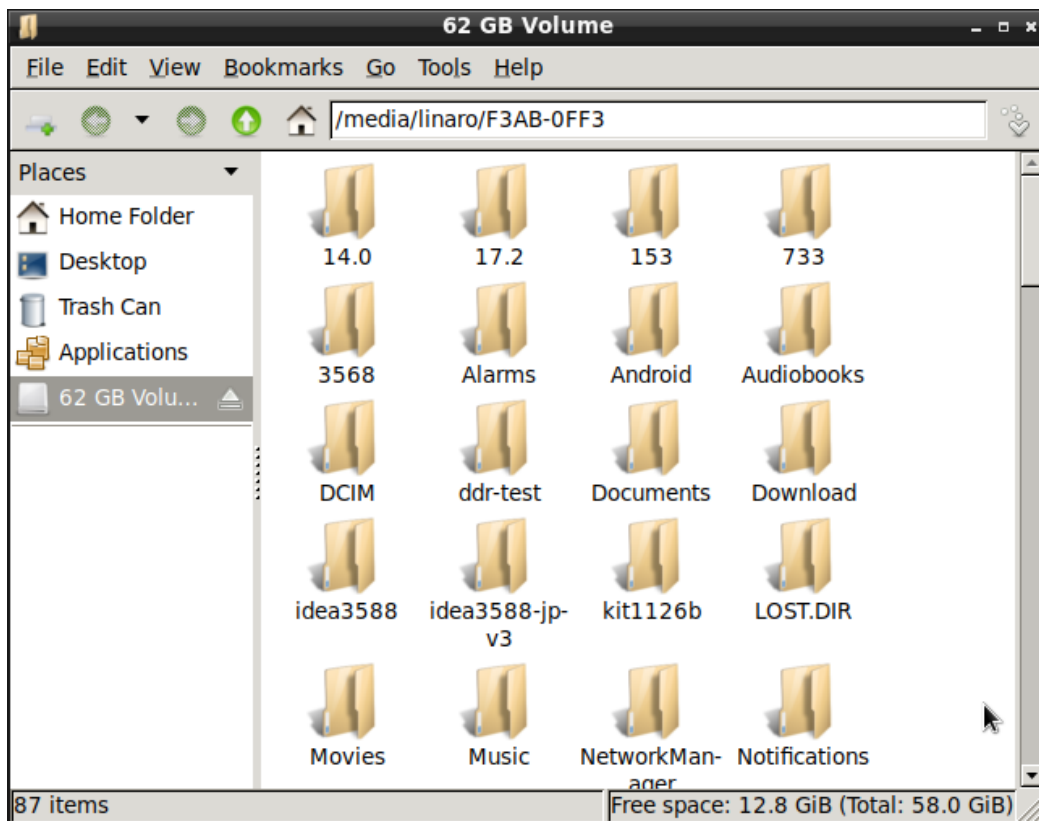
The USB 3.0 interface is an OTG interface. To use it as a Host interface, switch it to Host mode first. For details, refer to Section [6.3.1 USB OTG](#).



After a USB flash drive is inserted and recognized successfully, a removable media dialog box will pop up automatically.



Keep “Open in File Manager” selected and click “OK”. The system will then open the USB flash drive directory, and users can access the files on the USB flash drive.



The current USB connection speed can be checked from the kernel log.

- When the device operates in USB 2.0 mode, the log usually shows “**high-speed**”:

```

root@linaro-alip:/# [ 29.129173] usb 1-1.4: new high-speed USB device number 4 using ehci-platform
[ 29.271041] usb 1-1.4: New USB device found, idVendor=0dd8, idProduct=3b00, bcdDevice= 0.02
[ 29.271084] usb 1-1.4: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 29.271103] usb 1-1.4: Product: OnlyDisk
[ 29.271117] usb 1-1.4: Manufacturer: Netac
[ 29.271132] usb 1-1.4: SerialNumber: C0E8BFA3EC38F796
[ 29.272832] usb-storage 1-1.4:1.0: USB Mass Storage device detected
[ 29.273819] scsi host0: usb-storage 1-1.4:1.0
[ 30.369514] scsi 0:0:0:0: Direct-Access Netac OnlyDisk 8.01 PQ: 0 ANSI: 6
[ 30.375530] sd 0:0:0:0: [sda] 121610240 512-byte logical blocks: (62.3 GB/58.0 GiB)
[ 30.376532] sd 0:0:0:0: [sda] Write Protect is off
[ 30.377264] sd 0:0:0:0: [sda] Write cache: disabled, read cache: enabled, doesn't support DPO or FUA
[ 30.385346] sda: sda1
[ 30.385745] sd 0:0:0:0: [sda] Attached SCSI removable disk
[ 30.739171] FAT-fs (sda1): utf8 is not a recommended IO charset for FAT filesystems, filesystem will be
case sensitive!
[ 30.746158] FAT-fs (sda1): Volume was not properly unmounted. Some data may be corrupt. Please run fsck.
  
```

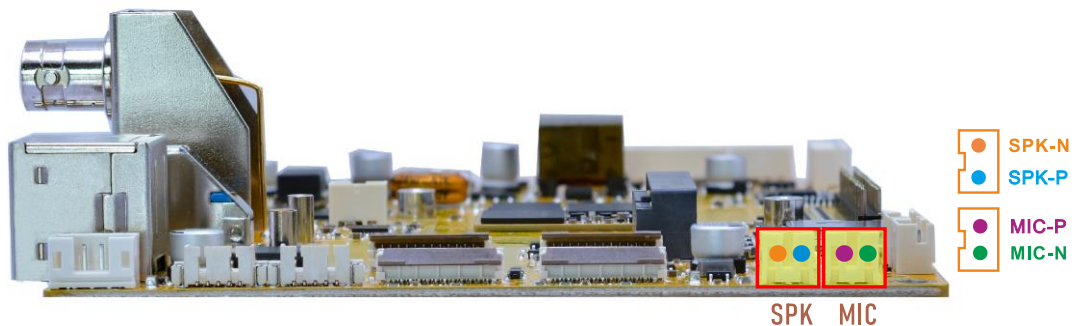
- When the device operates in USB 3.0 mode, the log usually shows “SuperSpeed”:

```

[12018.032123] usb 4-1: new SuperSpeed USB device number 2 using xhci-hcd
[12018.061656] usb 4-1: New USB device found, idVendor=0dd8, idProduct=3b00, bcdDevice= 0.02
[12018.061687] usb 4-1: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[12018.061696] usb 4-1: Product: OnlyDisk
[12018.061703] usb 4-1: Manufacturer: Netac
[12018.061710] usb 4-1: SerialNumber: C0E8BFA3EC38F796
[12018.063818] usb-storage 4-1:1.0: USB Mass Storage device detected
[12018.064352] scsi host0: usb-storage 4-1:1.0
[12019.809647] scsi 0:0:0:0: Direct-Access Netac OnlyDisk 8.01 PQ: 0 ANSI: 6
[12019.813201] sd 0:0:0:0: [sda] 121610240 512-byte logical blocks: (62.3 GB/58.0 GiB)
[12019.813803] sd 0:0:0:0: [sda] Write Protect is off
[12019.814173] sd 0:0:0:0: [sda] Write cache: disabled, read cache: enabled, doesn't support DPO or FUA
[12019.819871] sda: sda1
[12019.820429] sd 0:0:0:0: [sda] Attached SCSI removable disk
  
```

6.4 Audio I/O

Connect the speaker and microphone to the corresponding interfaces on the KIT1126B.



6.4.2 Audio Input Test

Step 1: Configure Audio Input Gain.

Set the audio input gain using the following command:

```
# amixer -c 0 cset name='ACodec Digital Gain Volume' 100
```

```
root@linaro-alip:/# amixer -c 0 cset name='ACodec Digital Gain Volume' 100
numid=44,iface=MIXER,name='ACodec Digital Gain Volume'
; type=INTEGER,access=rw---R--,values=1,min=0,max=127,step=0
: values=100
| dBscale-min=-95.00dB,step=0.75dB,mute=0
```

Step 2: Record Audio.

Execute the following command to start recording:

```
# arecord -D hw:0,0 -f cd -t wav test.wav
```

```
root@linaro-alip:/# arecord -D hw:0,0 -f cd -t wav test.wav
Recording WAVE 'test.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

6.4.1 Audio Output Test

Step 1: Check Audio Devices.

Execute the following command to check the available audio devices:

```
# cat /proc/asound/cards
```

```
root@linaro-alip:/# cat /proc/asound/cards
0 [rockchiprv1126b]: rockchip_rv1126 - rockchip,rv1126b-acodec
rockchip,rv1126b-acodec
1 [lt9611lex ]: simple-card - lt9611lex
lt9611lex
```

Step 2: Configure Audio Output Volume.

Configure the speaker output volume using the following command:

```
# amixer -c 0 cset name='DAC Digital Volume' 250,250
```

```
root@linaro-alip:/# amixer -c 0 cset name='DAC Digital Volume' 250,250
numid=47,iface=MIXER,name='DAC Digital Volume'
; type=INTEGER,access=rw---R--,values=2,min=0,max=510,step=0
: values=250,250
| dBscale-min=-956.25dB,step=3.75dB,mute=0
```

Step 3: Play the audio file.

Execute the following command to play the audio file:

```
# aplay -D hw:0,0 test.wav
```

```
root@linaro-alip:/# aplay -D hw:0,0 test.wav
Playing WAVE 'test.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

Note: The following commands can be used to select different audio output devices.

- `aplay -Dhw:0,0 record.wav # Speaker audio output`
- `aplay -Dhw:1,0 record.wav # HDMI audio output`

6.5 Ethernet

The KIT1126B provides a 100M Ethernet RJ45 interface with PoE support, allowing both data transmission and power supply through a single Ethernet cable.



Ethernet(PoE)

Step 1: Connect the network cable to the Ethernet port.

According to the log, it can be seen that the 100M Ethernet recognition is successful.

```
root@linaro-alip:/# [ 2764.898280] rk_gmac-dwmac 21c70000.ethernet end0: Link is Up - 100Mbps/Full - flow
control rx/tx
[ 2764.898305] IPv6: ADDRCONF(NETDEV_CHANGE): end0: link becomes ready
```

Step 2: Check the network interface information.

Execute the following command:

```
# ifconfig end0
```

```
root@linaro-alip:/# ifconfig end0
end0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.0.65 netmask 255.255.255.0 broadcast 192.168.0.255
    inet6 fe80::4c82:5f17:7cfd:99fb prefixlen 64 scopeid 0x20<link>
    ether 0a:11:04:25:8b:c9 txqueuelen 1000 (Ethernet)
    RX packets 239 bytes 23252 (22.7 KiB)
    RX errors 0 dropped 19 overruns 0 frame 0
    TX packets 121 bytes 11107 (10.8 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
    device interrupt 74
```

Step 3: Test the network connection.

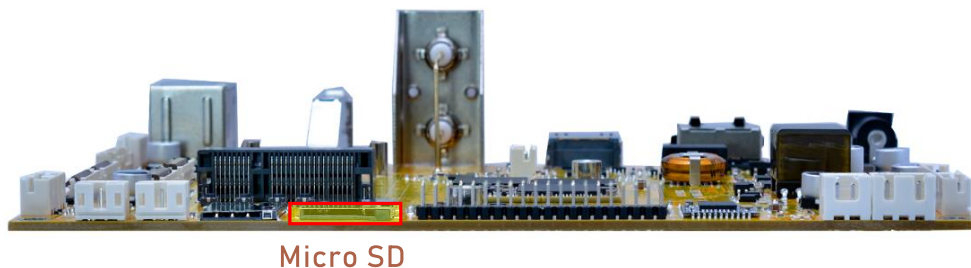
Execute the following command:

```
# ping -I end0 www.armdesigner.com
```

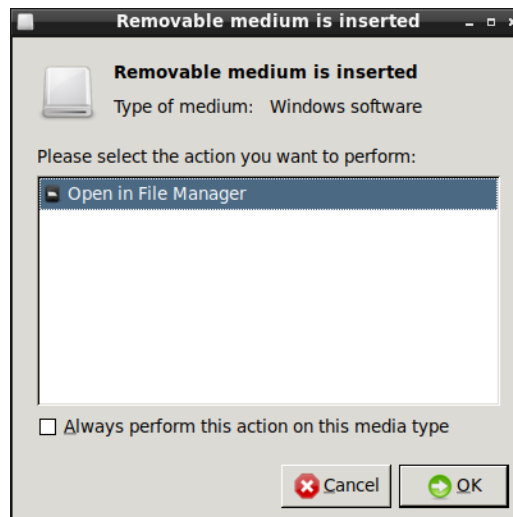
```
root@linaro-alip:/# ping -I end0 www.armdesigner.com
PING d3dsoj86mhwkk6.cloudfront.net (13.32.99.13) from 192.168.0.65 end0: 56(84) bytes of data.
64 bytes from server-13-32-99-13.fra60.r.cloudfront.net (13.32.99.13): icmp_seq=1 ttl=246 time=181 ms
64 bytes from server-13-32-99-13.fra60.r.cloudfront.net (13.32.99.13): icmp_seq=2 ttl=246 time=181 ms
64 bytes from server-13-32-99-13.fra60.r.cloudfront.net (13.32.99.13): icmp_seq=3 ttl=246 time=181 ms
64 bytes from server-13-32-99-13.fra60.r.cloudfront.net (13.32.99.13): icmp_seq=4 ttl=246 time=181 ms
64 bytes from server-13-32-99-13.fra60.r.cloudfront.net (13.32.99.13): icmp_seq=5 ttl=246 time=181 ms
^C
--- d3dsoj86mhwkk6.cloudfront.net ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 180.572/181.025/181.482/0.333 ms
```

6.6 SD Card

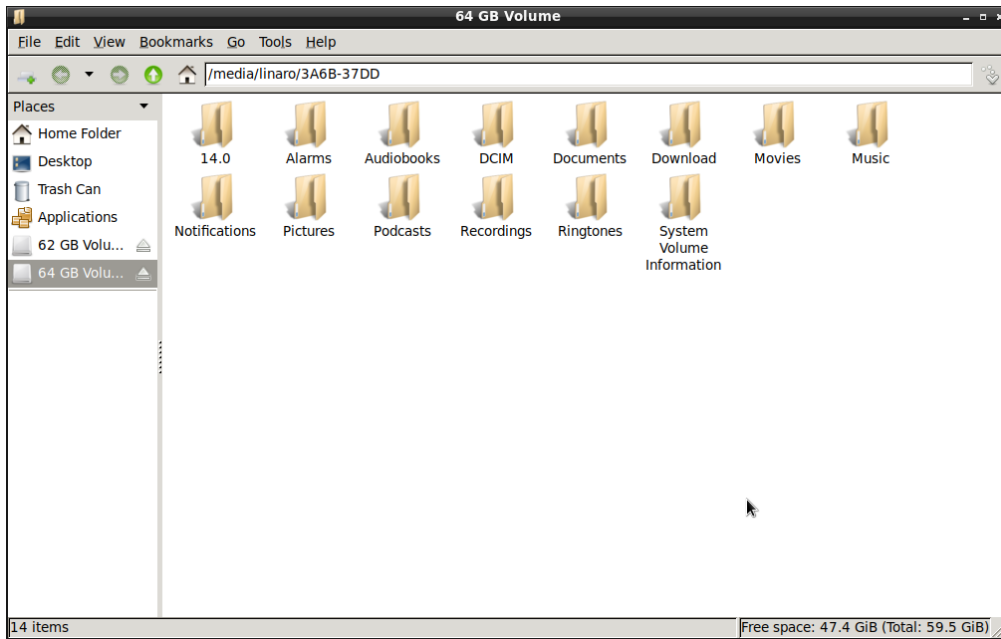
Step 1: Insert the micro SD card into the card slot.



After the micro SD card is inserted and recognized successfully, a removable media dialog box will pop up automatically.

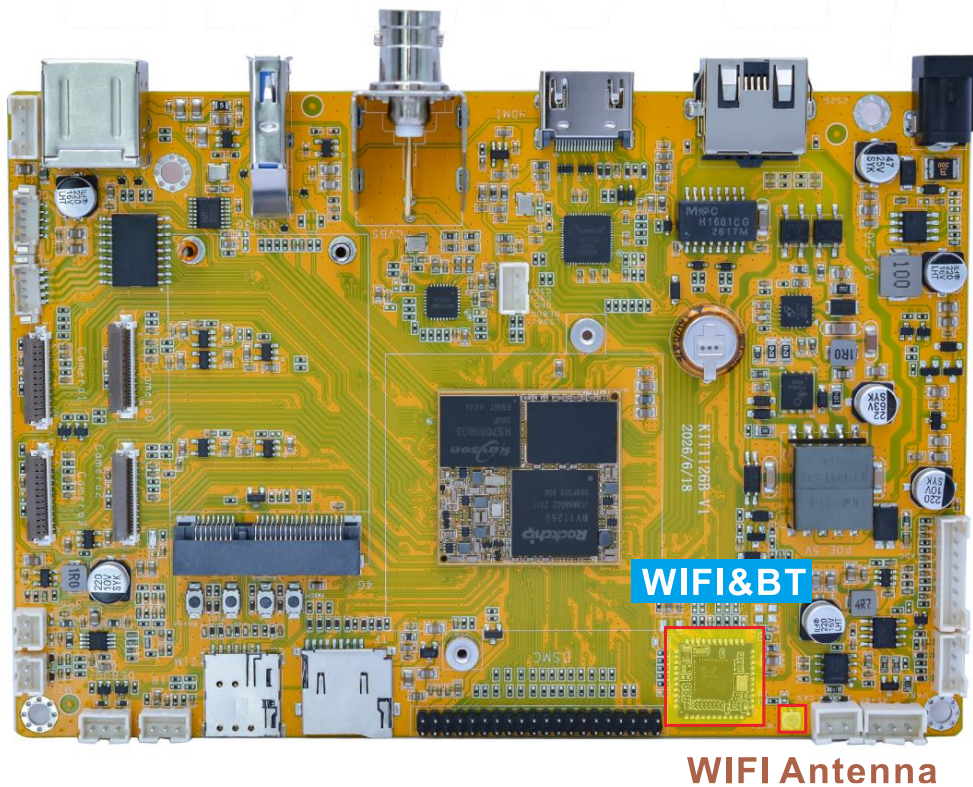


Step 2: Keep “Open in File Manager” selected and click “OK”. The system will then open the micro SD card directory, and users can access the files on the micro SD card.



6.7 WiFi & Bluetooth

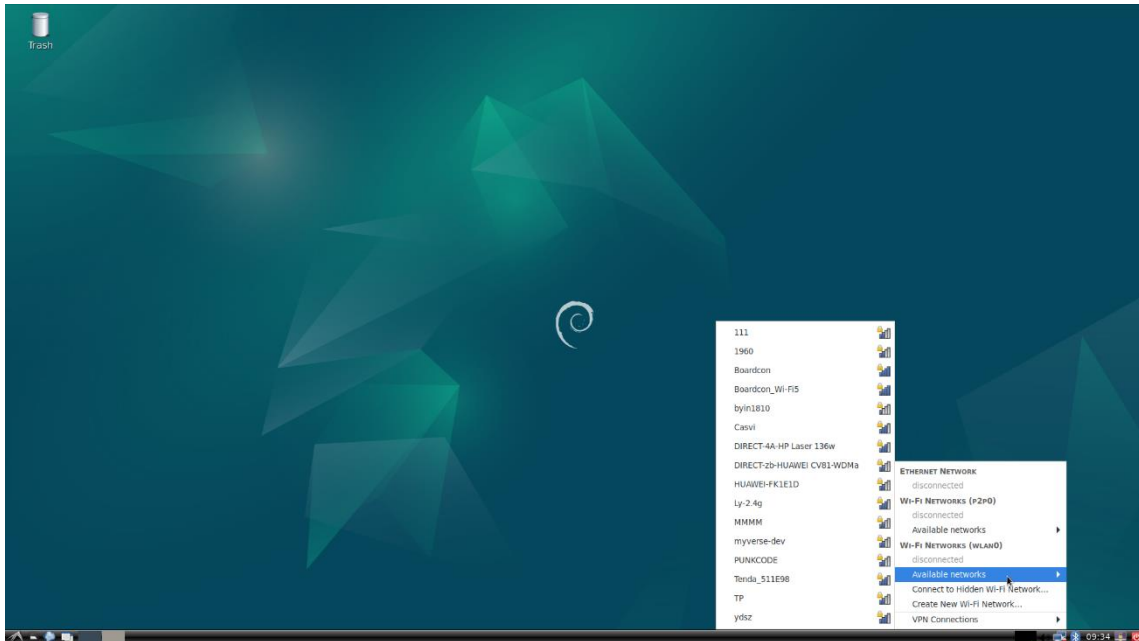
To use the WiFi and Bluetooth functions properly, make sure the antenna is connected.



6.7.1 WiFi

Step 1: Click the network icon in the lower-right corner of the desktop, then select

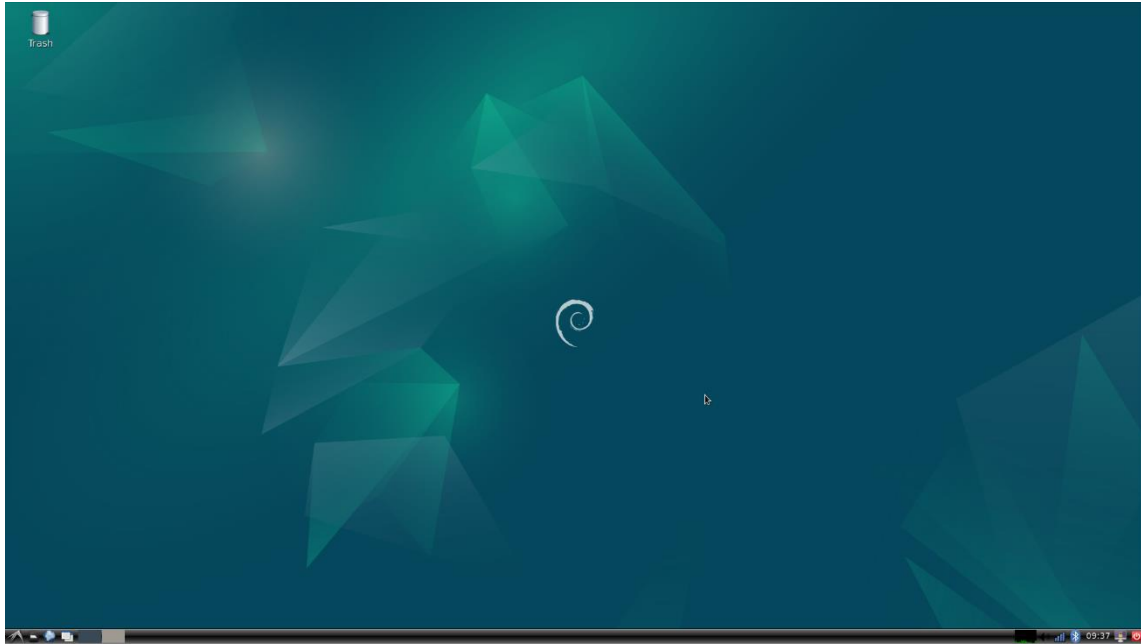
"Available Networks" to view the list of available WiFi hotspots.



Step 2: Select the target SSID from the available network list and enter the password.



Step 3: After the WiFi connection is established successfully, the corresponding network status icon will be displayed in the lower-right corner of the desktop.



Step 4: Verify the network connection.

(1) View network interface information.

Execute the following command:

```
# ifconfig wlan0
```

```
root@linaro-alip:/# ifconfig wlan0
wlan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.0.137 netmask 255.255.255.0 broadcast 192.168.0.255
    inet6 fe80::a7f5:ff59:d63d:cc33 prefixlen 64 scopeid 0x20<link>
    ether 14:0a:02:c9:0b:71 txqueuelen 1000 (Ethernet)
    RX packets 198 bytes 23938 (23.3 KiB)
    RX errors 0 dropped 19 overruns 0 frame 0
    TX packets 100 bytes 12026 (11.7 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

(2) Test network connectivity.

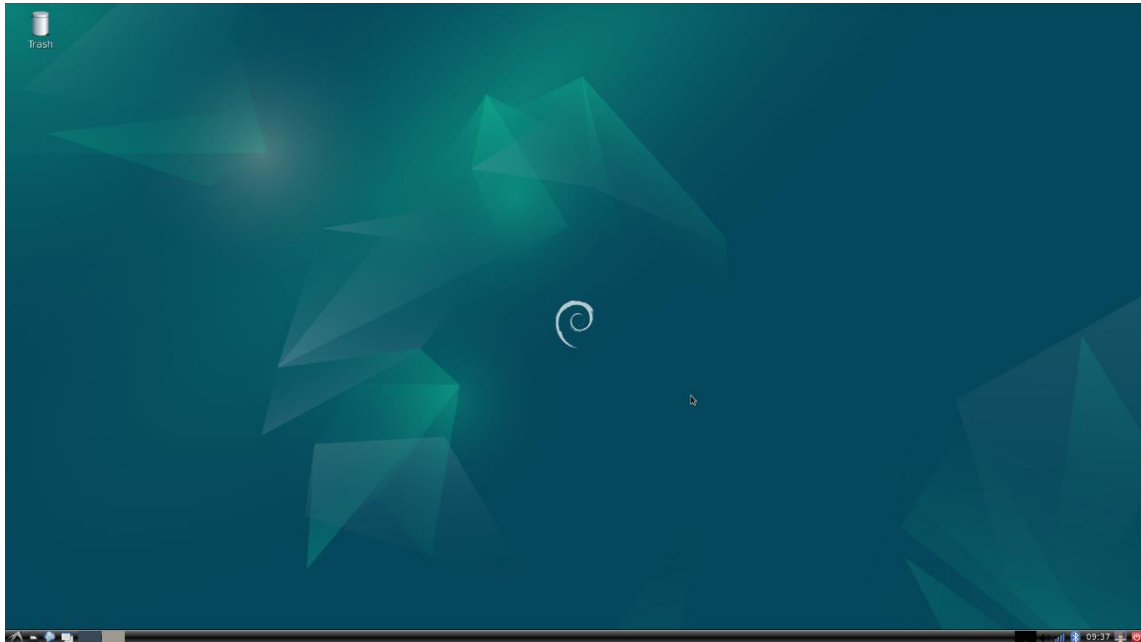
Execute the following command:

```
# ping -I wlan0 www.armdesigner.com
```

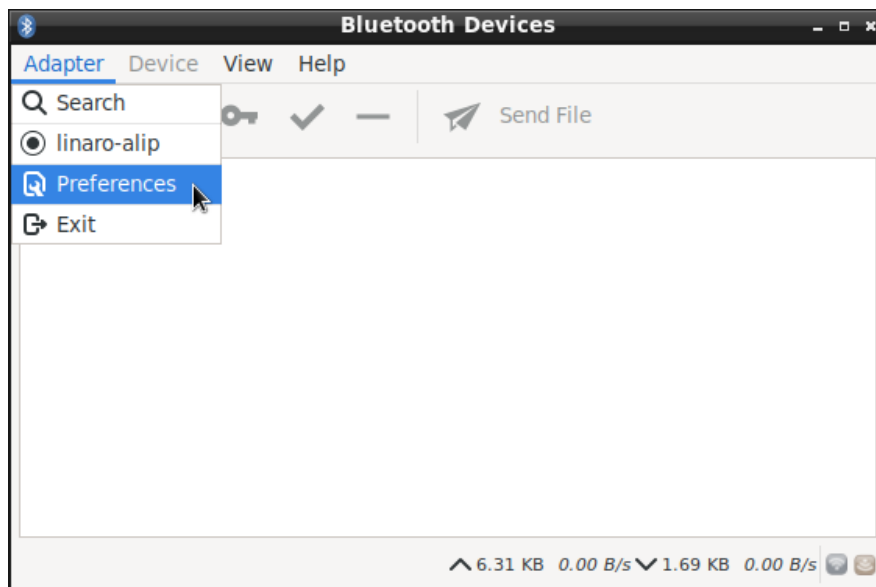
```
root@linaro-alip:/# ping -I wlan0 www.armdesigner.com
PING d3dsoj86mhwk6.cloudfront.net (13.32.99.46) from 192.168.0.137 wlan0: 56(84) bytes of data.
64 bytes from server-13-32-99-46.fra60.r.cloudfront.net (13.32.99.46): icmp_seq=1 ttl=246 time=200 ms
64 bytes from server-13-32-99-46.fra60.r.cloudfront.net (13.32.99.46): icmp_seq=2 ttl=246 time=408 ms
64 bytes from server-13-32-99-46.fra60.r.cloudfront.net (13.32.99.46): icmp_seq=3 ttl=246 time=407 ms
64 bytes from server-13-32-99-46.fra60.r.cloudfront.net (13.32.99.46): icmp_seq=4 ttl=246 time=241 ms
64 bytes from server-13-32-99-46.fra60.r.cloudfront.net (13.32.99.46): icmp_seq=5 ttl=246 time=355 ms
^C
--- d3dsoj86mhwk6.cloudfront.net ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 14455ms
rtt min/avg/max/mdev = 199.599/322.273/408.425/86.536 ms
```

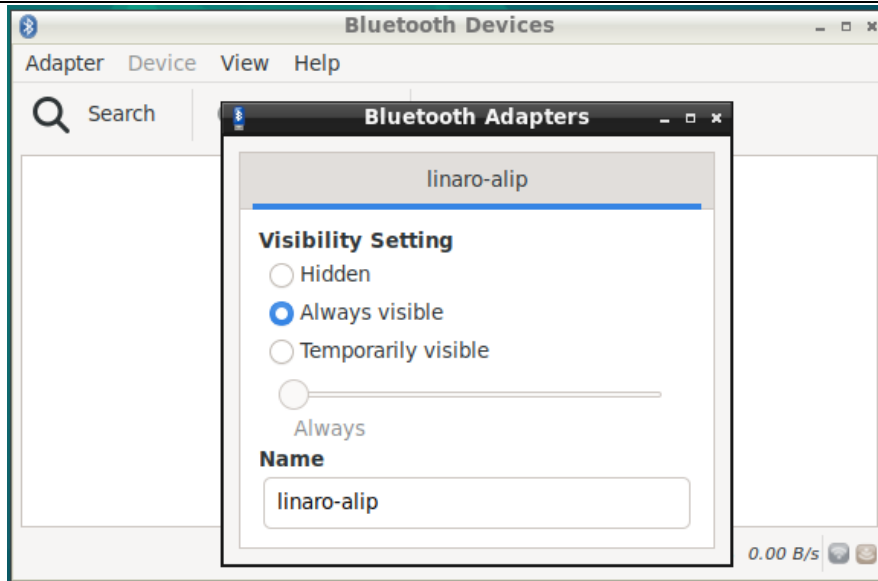
6.7.2 Bluetooth

Step 1: Click the Bluetooth icon in the lower-right corner of the desktop.

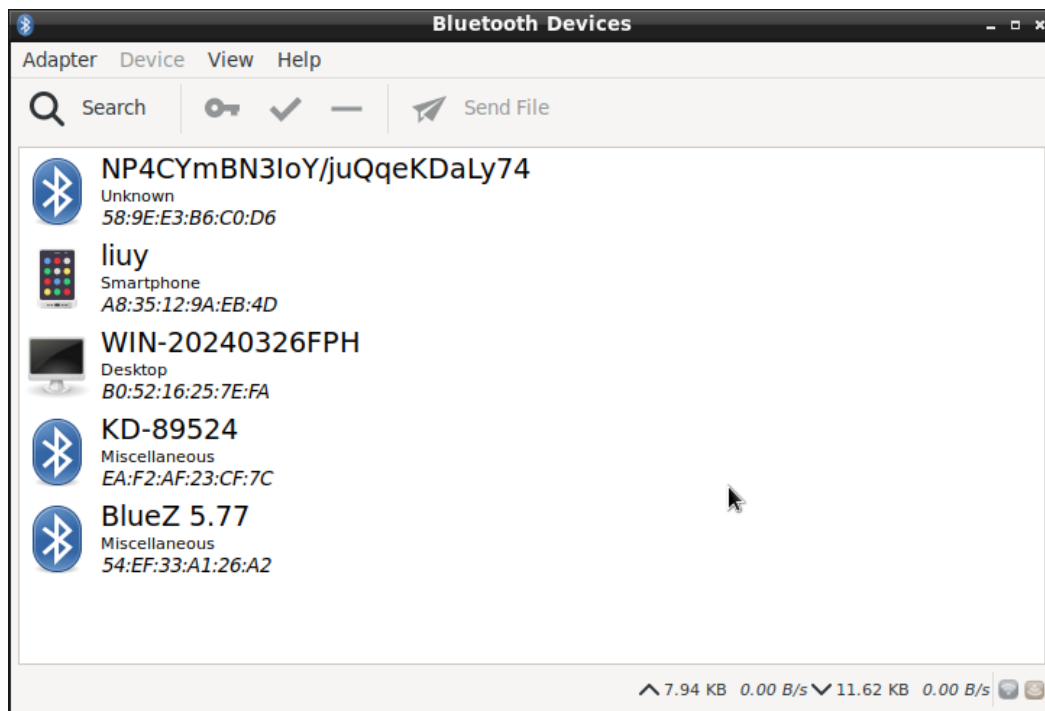


Step 2: The Bluetooth device name is hidden by default. To make it visible to other Bluetooth devices, select **Adapter** -> **Preferences** -> **Always visible**.





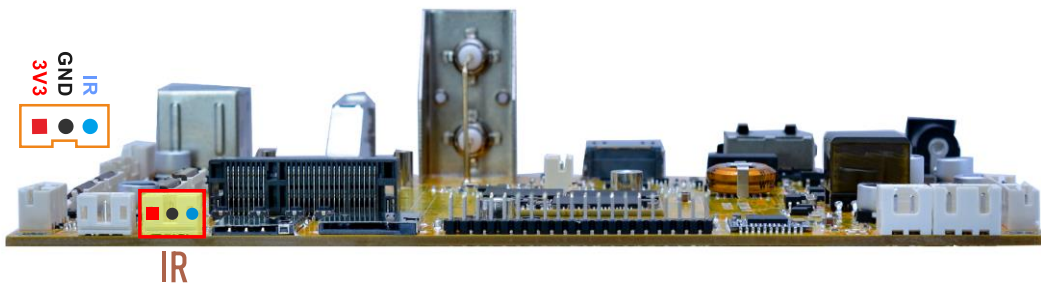
Step 3: Click "Search" to scan for nearby Bluetooth devices, then select the target device from the list and start pairing.



After the pairing is completed successfully, the Bluetooth device can be used normally.

6.8 IR

Step 1: Connect the IR receiver.



Step 2: Enable IR debug logs.

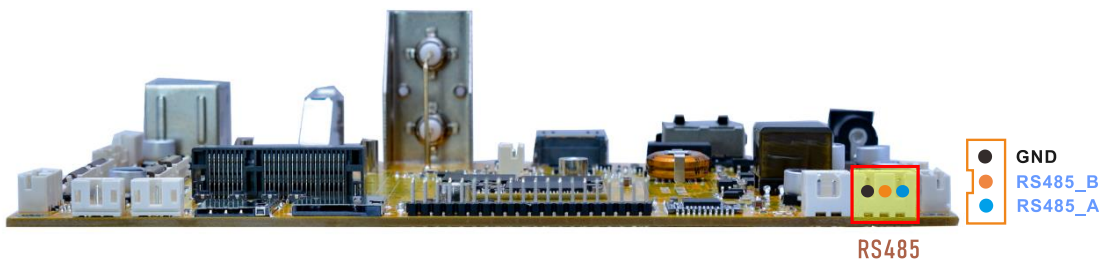
Execute the following command:

```
# echo 1 > /sys/module/rockchip_pwm_remotectl/parameters/code_print
```

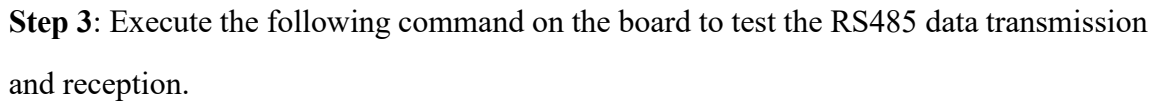
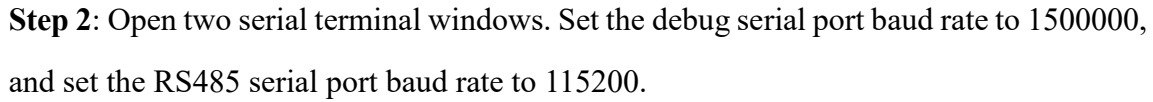
Step 3: Point the remote control at the IR receiver and press a button. The corresponding key value will be printed in the log.

```
root@linaro-alip:/# echo 1 > /sys/module/rockchip_pwm_remotectl/parameters/code_print
root@linaro-alip:/# [ 491.683319] USERCODE=0x1818
[ 491.710393] RMC_GETDATA=98
[ 492.139070] USERCODE=0x1818
[ 492.166245] RMC_GETDATA=9a
[ 492.497621] USERCODE=0x1818
[ 492.524752] RMC_GETDATA=99
[ 492.944628] USERCODE=0x1818
[ 492.971758] RMC_GETDATA=9b
[ 495.202257] USERCODE=0x1818
[ 495.229391] RMC_GETDATA=e4
[ 495.542678] USERCODE=0x1818
[ 495.569868] RMC_GETDATA=e5
[ 496.287006] USERCODE=0x1818
[ 496.314186] RMC_GETDATA=e6
```

6.9 RS485

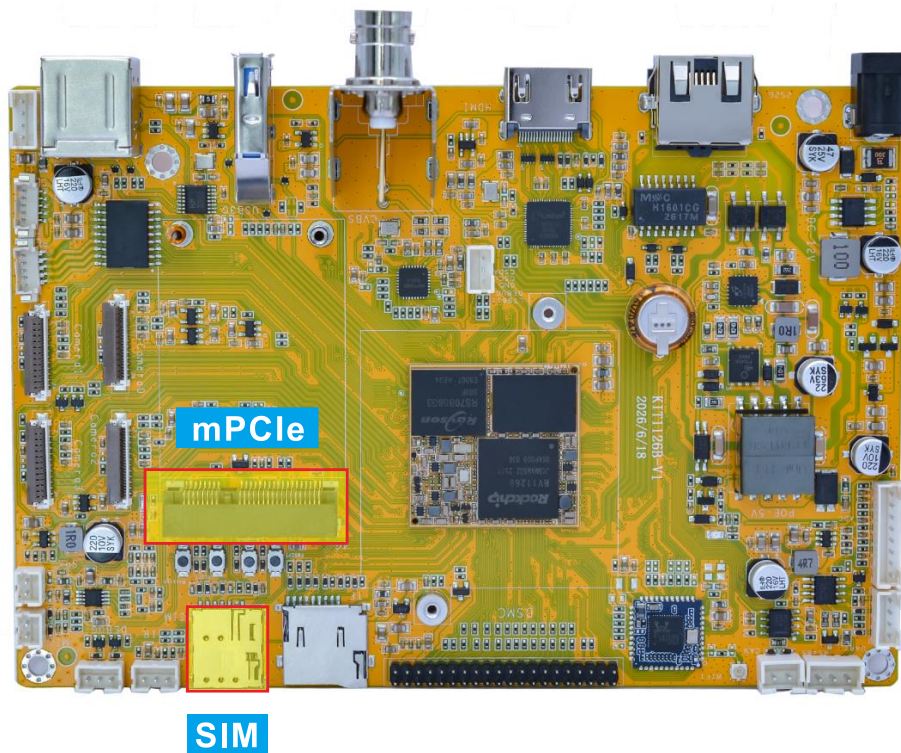


Step 1: Connect the RS485 test tool to the development board as shown in the diagram.



Step 2: Connect the antenna and insert the SIM card.

Step 3: Power on the board.



6.10.1 4G Test

Step 1: Initiate the PPP connection.

Execute the following command:

```
# pppd call quectel-ppp &
```



```
root@linaro-alip:/# pppd call quectel-ppp &
[1] 2311
root@linaro-alip:/# pppd options in effect:
debug          # (from /etc/ppp/peers/quectel-ppp)
nodetach        # (from /etc/ppp/peers/quectel-ppp)
dump           # (from /etc/ppp/peers/quectel-ppp)
noauth         # (from /etc/ppp/peers/quectel-ppp)
user test      # (from /etc/ppp/peers/quectel-ppp)
password ????? # (from /etc/ppp/peers/quectel-ppp)
remotename 3gppp # (from /etc/ppp/peers/quectel-ppp)
/dev/ttyUSB3 # (from /etc/ppp/peers/quectel-ppp)
115200      # (from /etc/ppp/peers/quectel-ppp)
lock        # (from /etc/ppp/peers/quectel-ppp)
connect chat -s -v -f /etc/ppp/peers/quectel-chat-connect # (from /etc/ppp/peers/quectel-ppp)
disconnect chat -s -v -f /etc/ppp/peers/quectel-chat-disconnect # (from /etc/ppp/peers/quectel-ppp)
nocrtscts   # (from /etc/ppp/peers/quectel-ppp)
modem       # (from /etc/ppp/peers/quectel-ppp)
asynmap 0   # (from /etc/ppp/options)
lcp-echo-failure 4 # (from /etc/ppp/options)
lcp-echo-interval 30 # (from /etc/ppp/options)
hide-password # (from /etc/ppp/peers/quectel-ppp)
novj        # (from /etc/ppp/peers/quectel-ppp)
novjccomp   # (from /etc/ppp/peers/quectel-ppp)
ipcp-accept-local # (from /etc/ppp/peers/quectel-ppp)
ipcp-accept-remote # (from /etc/ppp/peers/quectel-ppp)
ipparam 3gppp # (from /etc/ppp/peers/quectel-ppp)
noipdefault # (from /etc/ppp/peers/quectel-ppp)
ipcp-max-failure 30 # (from /etc/ppp/peers/quectel-ppp)
defaultroute # (from /etc/ppp/peers/quectel-ppp)
usepeerdns   # (from /etc/ppp/peers/quectel-ppp)
noccps       # (from /etc/ppp/peers/quectel-ppp)
noipx        # (from /etc/ppp/options)
abort on (BUSY)
abort on (NO CARRIER)
abort on (NO DIALTONE)
abort on (ERROR)
abort on (NO ANSWER)
timeout set to 30 seconds
send (AT^M)
expect (OK)
AT^M^M
OK
-- got it

send (ATE0^M)
expect (OK)
...
```

Step 2: Check the network interface status.

Execute the following command:

```
# ifconfig ppp0
```

```
root@linaro-alip:/# ifconfig ppp0
ppp0: flags=4305<UP,POINTOPOINT,RUNNING,NOARP,MULTICAST> mtu 1500
    inet 10.3.160.36 netmask 255.255.255.255 destination 10.64.64.64
    ppp txqueuelen 3 (Point-to-Point Protocol)
    RX packets 4 bytes 52 (52.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 14 bytes 198 (198.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Step 3: Test the PPP connection.

Execute the following command:

```
# ping -I ppp0 www.armdesigner.com
```

```
root@linaro-alip:/# ping -I ppp0 www.armdesigner.com
PING d3dsoj86mhwkk6.cloudfront.net (13.32.99.68) from 10.3.160.36 ppp0: 56(84) bytes of data.
64 bytes from server-13-32-99-68.fra60.r.cloudfront.net (13.32.99.68): icmp_seq=1 ttl=245 time=518 ms
64 bytes from server-13-32-99-68.fra60.r.cloudfront.net (13.32.99.68): icmp_seq=2 ttl=245 time=485 ms
64 bytes from server-13-32-99-68.fra60.r.cloudfront.net (13.32.99.68): icmp_seq=3 ttl=245 time=444 ms
64 bytes from server-13-32-99-68.fra60.r.cloudfront.net (13.32.99.68): icmp_seq=4 ttl=245 time=403 ms
64 bytes from server-13-32-99-68.fra60.r.cloudfront.net (13.32.99.68): icmp_seq=5 ttl=245 time=362 ms
64 bytes from server-13-32-99-68.fra60.r.cloudfront.net (13.32.99.68): icmp_seq=6 ttl=245 time=314 ms
^C
--- d3dsoj86mhwkk6.cloudfront.net ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5004ms
rtt min/avg/max/mdev = 313.526/420.887/517.775/69.843 ms
```

6.10.2 GPS Test

Step 1: Enable the GPS function.

Execute the following command:

```
# echo -e "AT+QGPS=1\r\n" > /dev/ttyUSB2
```

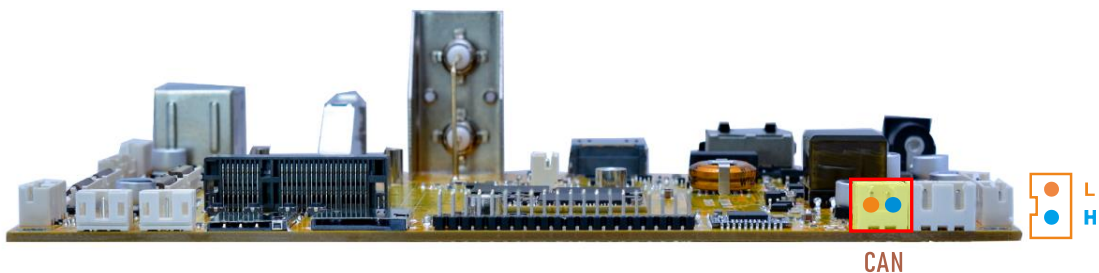
Step 2: Read the GPS data.

Execute the following command:

```
# cat /dev/ttyUSB1
```

```
root@linaro-alip:/# echo -e "AT+QGPS=1\r\n" > /dev/ttyUSB2
root@linaro-alip:/# cat /dev/ttyUSB1
$GPVTDG,,T,,M,,N,,K,N*2C
$GPGSA,A,1,,,,,,,,,,,,,*32
$GPGGA,,,,,0,,,,,,,,,*66
$GPRMC,,V,,,,,,,,,N,V*29
$GPVTDG,,T,,M,,N,,K,N*2C
$GPGSA,A,1,,,,,,,,,,,,,*32
$GPGGA,,,,,0,,,,,,,,,*66
$GPRMC,,V,,,,,,,,,N,V*29
```

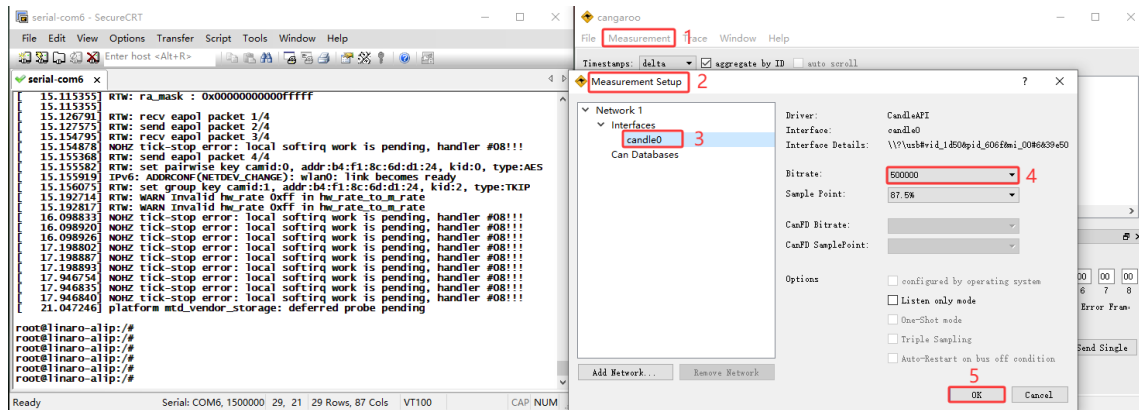
6.11 CAN



Step 1: Connect the CAN test tool to the board as shown in the diagram below.



Step 2: Open the CAN test software and set the baud rate to 500000.



Step 3: Configure and enable the CAN interface on the board with a bitrate of 500000.

Execute the following command:

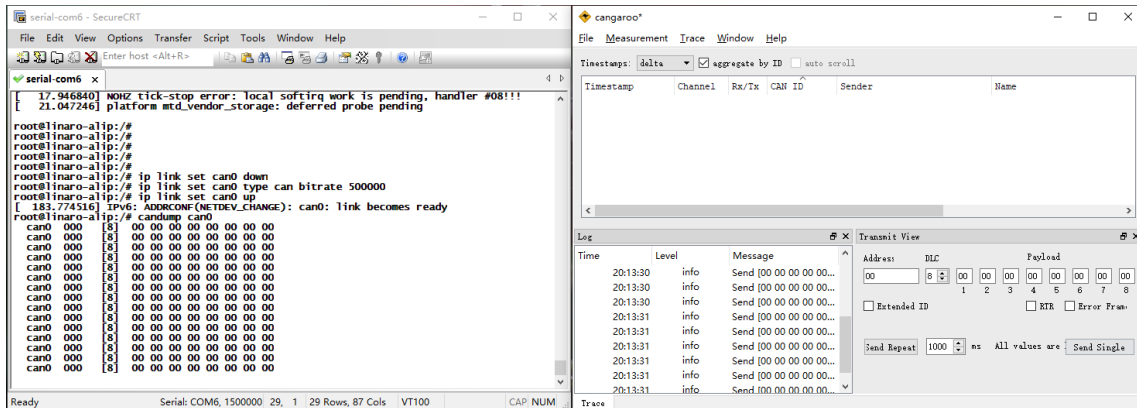
```
# ip link set can0 down
# ip link set can0 type can bitrate 500000
# ip link set can0 up
```

Step 4: Test CAN receiving.

Configure the CAN test tool as the sender, and configure CAN on the board as the receiver.

Execute the following command:

```
# candump can0
```

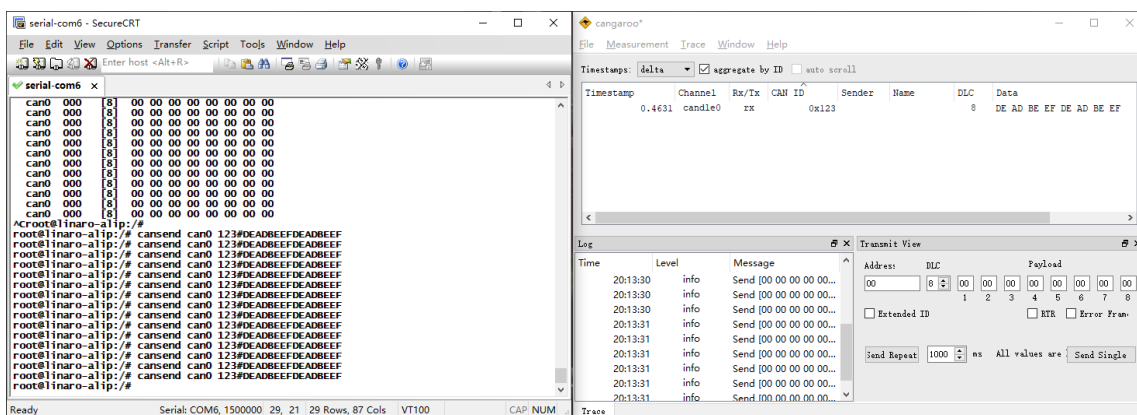


Step 5: Test CAN sending.

Configure the CAN test tool as the receiver, and configure CAN on the board as the sender.

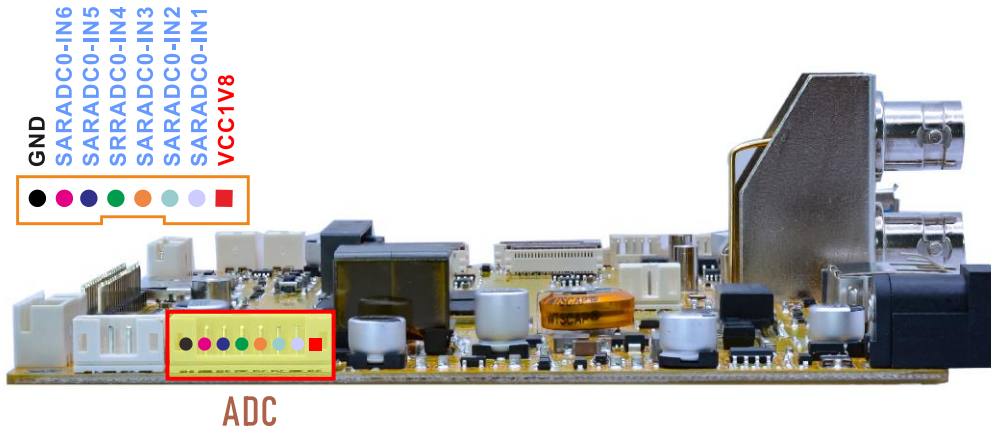
Execute the following command:

```
# cansend can0 123#DEADBEEFDEADBEEF
```



6.12 ADC

The board provides six ADC input interfaces: ADC1, ADC2, ADC3, ADC4, ADC5, and ADC6.



This test is used to check whether the ADC raw value changes according to the input voltage.

Step 1: Apply a voltage level to the ADC input pin.

Connect the ADC pin to GND for a low level, or connect it to 1.8 V for a high level.

Step 2: Read the ADC raw value.

Example for **ADC1**:

```
# cat /sys/bus/iio/devices/iio:device0/in_voltage1_raw
```

```
root@linaro-alip:/# cat /sys/bus/iio/devices/iio:device0/in_voltage1_raw
8181
root@linaro-alip:/# cat /sys/bus/iio/devices/iio:device0/in_voltage1_raw
0
```

For other ADC read commands, refer to the ADC read command description below:

Single-channel read commands:

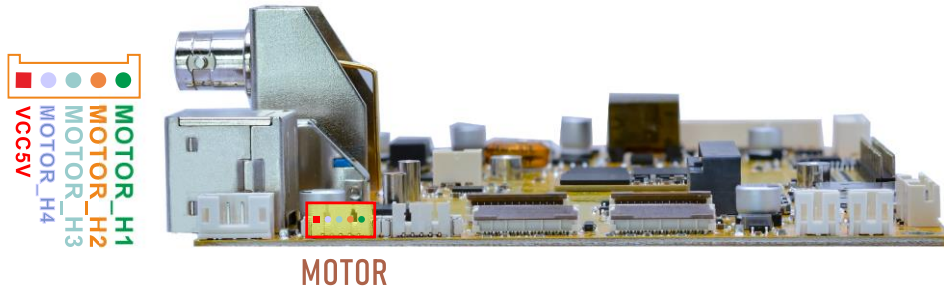
```
ADC1 : cat /sys/bus/iio/devices/iio:device0/in_voltage1_raw
ADC2 : cat /sys/bus/iio/devices/iio:device0/in_voltage2_raw
ADC3 : cat /sys/bus/iio/devices/iio:device0/in_voltage3_raw
ADC4 : cat /sys/bus/iio/devices/iio:device0/in_voltage4_raw
ADC5 : cat /sys/bus/iio/devices/iio:device0/in_voltage5_raw
ADC6 : cat /sys/bus/iio/devices/iio:device0/in_voltage6_raw
```

To read all ADC1-ADC6 raw values, execute the following command:

```
for i in 1 2 3 4 5 6; do
  echo -n "ADC$i: "
  cat /sys/bus/iio/devices/iio:device0/in_voltage${i}_raw
done
```

6.13 MOTOR

The KIT1126B provides a stepper motor control interface.



The motor can be controlled using the **motor_test** tool.

Test Command:

```
motor_test /dev/motorX <steps>
```

Note:

One complete motor rotation is equivalent to 4076 steps.

Test Examples:

Rotate the motor forward by 4076 steps:

```
# motor_test /dev/motor0 4076
```

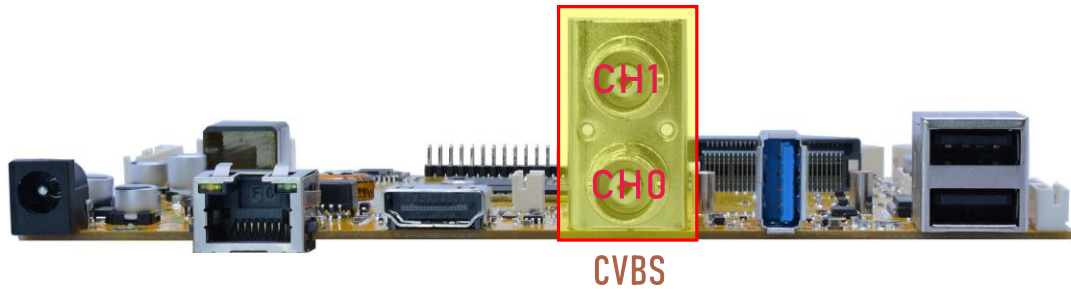
Rotate the motor backward by 1000 steps:

```
# motor_test /dev/motor0 -1000
```

6.14 Camera

6.14.1 CVBS Camera

The KIT1126B provides two CVBS input channels (CH0 and CH1). Only one channel can be used for video capture at a time.



Step 1: Start the video preview.

The CH0 channel is selected by default.

Execute the following command:

```
# gst-launch-1.0 v4l2src device=/dev/video0 ! video/x-raw,format=NV16,width=720,height=576, framerate=25/1 ! kmssink &
```

```
root@linaro-alip:/# gst-launch-1.0 v4l2src device=/dev/video0 ! video/x-raw,format=NV16,width=720,height=576, framerate=25/1 ! kmssink &
[1] 2291aro-alip:/# gst-launch-1.0 v4l2src device=/dev/video0 ! video/x-raw,format=NV16,width=720,height=576, framerate=25/1 ! kmssink &
root@linaro-alip:/# [ 159.121029] rkvpss-offline: CLK_CORE_VPSS set to 396000000 Hz (requested 400000000 Hz)
[ 159.123058] gm7150bc 0-005c: __gm7150_power_on(258)
[ 159.195172] gm7150bc 0-005c: __gm7150_power_off(323)
[ 159.533651] rkvpss-offline: CLK_CORE_VPSS set to 396000000 Hz (requested 400000000 Hz)
[ 159.535437] gm7150bc 0-005c: __gm7150_power_on(258)
[ 159.607115] gm7150bc 0-005c: __gm7150_power_off(323)
Setting pipeline to PAUSED ...
[ 159.827606] gm7150bc 0-005c: __gm7150_power_on(258)
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 159.909874] rkCIF-dvp: stream[0] start streaming
[ 159.910363] rkCIF-dvp: Allocate dummy buffer, size: 0x000cb000
[ 159.910382] rkCIF-dvp: get vblank fail, vblank_def 0, vblank_curr 0
[ 159.910402] rkCIF-dvp: set dual edge mode(off,0x2000000)!!!
[ 159.910890] gm7150bc 0-005c: gm7150_querystd: get PAL_B_D_N signal.
[ 159.910915] gm7150bc 0-005c: gm7150_stream: on: 1, 720x576
[ 159.911566] gm7150bc 0-005c: gm7150_full_init ok, channel: CH1
[ 160.432878] gm7150bc 0-005c: gm7150_check_signal: value:0x70.
[ 160.432919] gm7150bc 0-005c: =====No signal
[ 160.433523] gm7150bc 0-005c: gm7150_get_mode: get PAL_B_D_N signal.
[ 160.433542] gm7150bc 0-005c: stream on, wait for BT656 sync...
Redistribute latency...
0:00:06.0 / 99:99:99.
```

Step 2: Switch to the desired CVBS input channel.

After starting the preview, switch the CVBS input channel using the following commands.

Switch to CH0:

```
# echo 0 > /sys/class/gm7150/gm7150_4/input_channel
```

```
root@linaro-alip:/# 0:06:04.3 / 99:99:99.
0:06:05.7 / 99:99:99echo 0 > /sys/class/gm7150/gm7150_4/input_channel.
[ 525.697602] gm7150bc 0-005c: switch to input CH1 (reg=0x00)
[ 526.019496] gm7150bc 0-005c: gm7150_check_signal: value:0x7e.
[ 526.019538] gm7150bc 0-005c: have signal
[ 526.020008] gm7150bc 0-005c: gm7150_get_mode: get PAL_B_D_N signal.
0:06:09.0 / 99:99:99.:06:06.1 / 99:99:99.
```

Switch to CH1:

```
# echo 1 > /sys/class/gm7150/gm7150_4/input_channel
```

```
root@linaro-alip:/# 0:04:07.2 / 99:99:99.
0:04:09.7 / 99:99:99echo 1 > /sys/class/gm7150/gm7150_4/input_channel.
[ 409.804592] gm7150bc 0-005c: switch to input CH2 (reg=0x02)
[ 410.118774] gm7150bc 0-005c: gm7150_check_signal: value:0x7e.
[ 410.118814] gm7150bc 0-005c: have signal
[ 410.119351] gm7150bc 0-005c: gm7150_get_mode: get PAL_B_D_N signal.
0:04:46.7 / 99:99:99.:04:10.1 / 99:99:99.
```

Step 3: Verify that the corresponding CVBS camera image is displayed correctly after switching channels.

Additional Commands:

```
# Note: Ensure the GM7150 is powered on and the camera preview is running.
# Display supported V4L2 controls
v4l2-ctl -d /dev/v4l-subdev14 --list-ctrls

# Set image brightness (0~255)
v4l2-ctl -d /dev/v4l-subdev14 --set-ctrl brightness=200

# Set image contrast (0~255)
v4l2-ctl -d /dev/v4l-subdev14 --set-ctrl contrast=150

# Set image saturation (0~255)
v4l2-ctl -d /dev/v4l-subdev14 --set-ctrl saturation=100

# Set image hue (0~255)
v4l2-ctl -d /dev/v4l-subdev14 --set-ctrl hue=128

# Read current input channel (0=CH1, 1=CH2)
cat /sys/class/gm7150/gm7150_4/input_channel

# Switch to CH0
echo 0 > /sys/class/gm7150/gm7150_4/input_channel

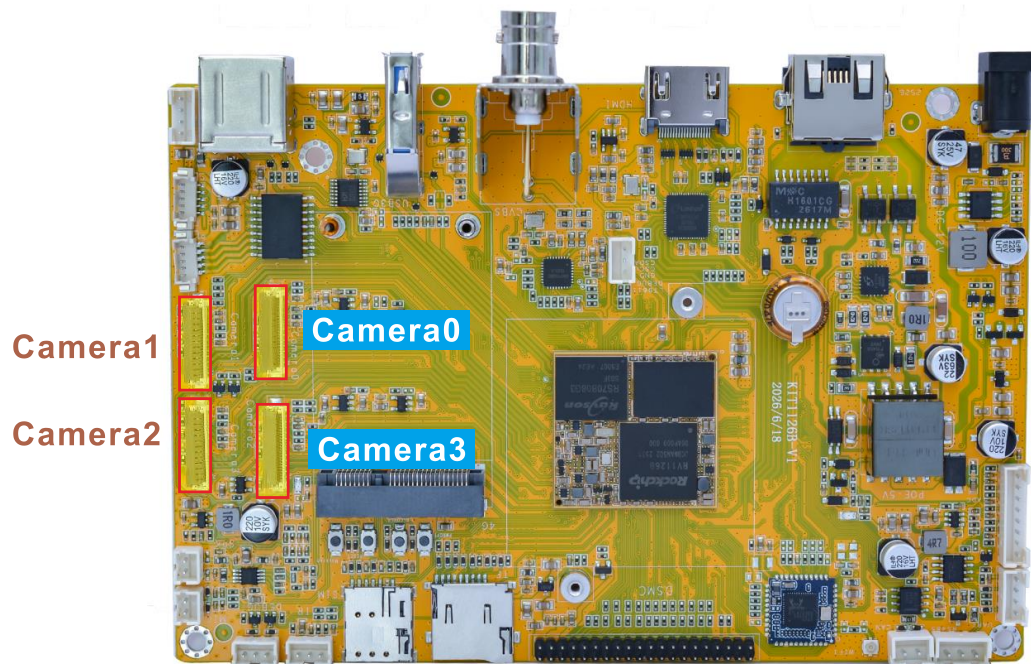
# Switch to CH1
echo 1 > /sys/class/gm7150/gm7150_4/input_channel

# Read signal status (1=signal detected, 0=no signal)
cat /sys/class/gm7150/gm7150_4/signal_status

# Read detected video standard (NTSC/PAL/SECAM)
cat /sys/class/gm7150/gm7150_4/video_standard
```

6.14.2 MIPI Camera

Step 1: Connect the camera module, then power on the board.



Step 2: Check the camera preview device nodes.

Execute the following command:

```
# grep "" /sys/class/video4linux/v*/name | grep mainpath
# grep "" /sys/class/video4linux/v*/name | grep selfpath
```

```
root@linaro-alip:/# grep "" /sys/class/video4linux/v*/name | grep mainpath
/sys/class/video4linux/video55/name:rkisp_mainpath
/sys/class/video4linux/video63/name:rkisp_mainpath
/sys/class/video4linux/video71/name:rkisp_mainpath
/sys/class/video4linux/video79/name:rkisp_mainpath
root@linaro-alip:/# grep "" /sys/class/video4linux/v*/name | grep selfpath
/sys/class/video4linux/video56/name:rkisp_selfpath
/sys/class/video4linux/video64/name:rkisp_selfpath
/sys/class/video4linux/video72/name:rkisp_selfpath
/sys/class/video4linux/video80/name:rkisp_selfpath
```

Step 3: Preview the camera.

Camera0:

```
# gst-launch-1.0 v4l2src device=/dev/video55 ! video/x-raw,format=NV16,width=1920,height=1080, framerate=25/1 ! xvimagesink
```

```

root@linaro-alip:/#
root@linaro-alip:/# gst-launch-1.0 v4l2src device=/dev/video55 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! xvimagesink
[ 495.817649] rkvpss-offline: CLK_CORE_VPSS set to 396000000 Hz (requested 400000000
Hz)width=1920,height=1080, framerate=25/1 ! xvimagesink
[ 495.819610] gm7150bc 0-005c: __gm7150_power_on(258)
[ 495.889448] gm7150bc 0-005c: __gm7150_power_off(323)
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 495.982917] rkisp_hw 21d00000.isp: set isp clk = 297000000Hz
[ 495.987927] rkisp rkisp-vir0: first params buf queue
[ 495.988194] rkCIF-mipi-lvds: stream[0] start streaming
[ 495.988429] rockchip-mipi-csi2 mipi0-csi2: stream on, src_sd: 00000000fcf2d8c5, sd_name:rockchip-
csi2-dphy1
[ 495.988447] rockchip-mipi-csi2 mipi0-csi2: stream ON
[ 495.988571] rockchip-csi2-dphy1: dphy1, data_rate_mbps 742
[ 495.988605] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream stream on:1, dphy1, ret 0
[ 495.988617] sc200ai 3-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
0:00:09.3 / 99:99:99.

```

Camera1:

```

# gst-launch-1.0 v4l2src device=/dev/video63 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! xvimagesink

```

```

root@linaro-alip:/# gst-launch-1.0 v4l2src device=/dev/video63 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! xvimagesink
[ 550.059145] rkvpss-offline: CLK_CORE_VPSS set to 396000000 Hz (requested 400000000
Hz)width=1920,height=1080, framerate=25/1 ! xvimagesink
[ 550.060883] gm7150bc 0-005c: __gm7150_power_on(258)
[ 550.131239] gm7150bc 0-005c: __gm7150_power_off(323)
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 550.224236] rkisp_hw 21d00000.isp: set isp clk = 297000000Hz
[ 550.229383] rkisp rkisp-vir1: first params buf queue
[ 550.229616] rkCIF-mipi-lvds1: stream[0] start streaming
[ 550.229899] rockchip-mipi-csi2 mipi1-csi2: stream on, src_sd: 0000000092dd0c0, sd_name:rockchip-
csi2-dphy2
[ 550.229920] rockchip-mipi-csi2 mipi1-csi2: stream ON
[ 550.229964] rockchip-csi2-dphy2: dphy2, data_rate_mbps 742
[ 550.229993] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream stream on:1, dphy2, ret 0
[ 550.230006] sc200ai 4-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
0:00:26.7 / 99:99:99.

```

Camera2:

```

# gst-launch-1.0 v4l2src device=/dev/video71 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! xvimagesink

```

```

root@linaro-alip:/# gst-launch-1.0 v4l2src device=/dev/video71 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! xvimagesink
[ 868.568179] rkvpss-offline: CLK_CORE_VPSS set to 396000000 Hz (requested 400000000
Hz)width=1920,height=1080, framerate=25/1 ! xvimagesink
[ 868.570115] gm7150bc 0-005c: __gm7150_power_on(258)
[ 868.643072] gm7150bc 0-005c: __gm7150_power_off(323)
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 868.735803] rkisp_hw 21d00000.isp: set isp clk = 297000000Hz
[ 868.738116] rkCIF-mipi-lvds3: stream[0] start streaming
[ 868.738408] rockchip-mipi-csi2 mipi3-csi2: stream on, src_sd: 000000008c505797, sd_name:rockchip-
csi2-dphy5
[ 868.738433] rockchip-mipi-csi2 mipi3-csi2: stream ON
[ 868.738480] rockchip-csi2-dphy5: dphy5, data_rate_mbps 742
[ 868.738511] rockchip-csi2-dphy csi2-dphy5: csi2_dphy_s_stream stream on:1, dphy5, ret 0
[ 868.738525] sc200ai 2-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
0:00:11.4 / 99:99:99.

```

Camera3:

```

# gst-launch-1.0 v4l2src device=/dev/video79 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! xvimagesink

```

```

root@linaro-alip:/# gst-launch-1.0 v4l2src device=/dev/video79 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! xvimagesink
[ 54.586050] rkvpss-offline: CLK_CORE_VPSS set to 396000000 Hz (requested 400000000
Hz)width=1920,height=1080, framerate=25/1 ! xvimagesink
[ 54.587750] gm7150bc 0-005c: __gm7150_power_on(258)
[ 54.658678] gm7150bc 0-005c: __gm7150_power_off(323)
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 55.070994] rkisp_hw 21d00000.isp: set isp clk = 297000000Hz
[ 55.073289] rkCIF-mipi-lvds2: stream[0] start streaming
[ 55.073566] rockchip-mipi-csi2 mipi2-csi2: stream on, src_sd: 00000000d7802eca, sd_name:rockchip-
csi2-dphy4
[ 55.073587] rockchip-mipi-csi2 mipi2-csi2: stream ON
[ 55.073632] rockchip-csi2-dphy4: dphy4, data_rate_mbps 742
[ 55.073661] rockchip-csi2-dphy csi2-dphy4: csi2_dphy_s_stream stream on:1, dphy4, ret 0
[ 55.073673] sc200ai 1-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
0:00:07.2 / 99:99:99.

```

Camera0& Camera1& Camera2& Camera3:



```
# killall gst-launch-1.0
# gst-launch-1.0 v4l2src device=/dev/video56 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! fpsdisplaysink
name=video22 video-sink="xvimagesink render-rectangle=\"<60,0,840,500>\"" text-
overlay=false &
gst-launch-1.0 v4l2src device=/dev/video64 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! fpsdisplaysink
name=video30 video-sink="xvimagesink render-rectangle=\"<920,0,840,500>\"" text-
overlay=false &
gst-launch-1.0 v4l2src device=/dev/video72 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! fpsdisplaysink
name=video22 video-sink="xvimagesink render-rectangle=\"<60,500,840,500>\"" text-
overlay=false &
gst-launch-1.0 v4l2src device=/dev/video80 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! fpsdisplaysink
name=video30 video-sink="xvimagesink render-rectangle=\"<920,500,840,500>\""
text-overlay=false &
```



```
root@linaro-alip:/# gst-launch-1.0 v4l2src device=/dev/video56 ! video/x-raw,format=NV16,width=1920,height=1080, framerate=25/1 ! fpsdisplaysink name=video22 video-sink="xvimagesink render-rectangle=\<60,0,840,500>\\" text-overlay=false &
gst-launch-1.0 v4l2src device=/dev/video64 ! video/x-raw,format=NV16,width=1920,height=1080, framerate=25/1 ! fpsdisplaysink name=video30 video-sink="xvimagesink render-rectangle=\<920,0,840,500>\\" text-overlay=false &
gst-launch-1.0 v4l2src device=/dev/video72 ! video/x-raw,format=NV16,width=1920,height=1080, framerate=25/1 ! fpsdisplaysink name=video22 video-sink="xvimagesink render-rectangle=\<60,500,840,500>\\" text-overlay=false &
gst-launch-1.0 v4l2src device=/dev/video80 ! video/x-raw,format=NV16,width=1920,height=1080, framerate=25/1 ! fpsdisplaysink name=video30 video-sink="xvimagesink render-rectangle=\<920,500,840,500>\\" text-overlay=false &
[1] 2796ch-1.0 v4l2src device=/dev/video72 ! video/x-raw,format=NV16,width=1920,height=1080, framerate=25/1 ! fpsdisplaysink name=video22 video-sink="xvimagesink render-rectangle=\<60,5[2]
279700>\\" text-overlay=false &
[3] 2798ch-1.0 v4l2src device=/dev/video80 ! video/x-raw,format=NV16,width=1920,height=1080, framerate=25/1 ! fpsdisplaysink name=video30 video-sink="xvimagesink render-rectangle=\<920,[4]
2799500>\\" text-overlay=false &
root@linaro-alip:/# [ 170.733466] rkvpss-offline: CLK_CORE_VPSS set to 396000000 Hz (requested 400000000 Hz)
[ 170.734007] rkvpss-offline: CLK_CORE_VPSS set to 396000000 Hz (requested 400000000 Hz)
[ 170.735214] gm7150bc 0-005c: __gm7150_power_on(258)
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
New clock: GstSystemClock
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
Using mplane plugin for capture
New clock: GstSystemClock
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 170.904880] rkisp_hw 21d00000.isp: set isp clk = 297000000Hz
[ 170.907563] rkCIF-mipi-lvds1: stream[0] start streaming
[ 170.907864] rockchip-mipi-csi2 mipi1-csi2: stream on, src_sd: 00000000d691b9f, sd_name:rockchip-csi2-dphy2
[ 170.907890] rockchip-mipi-csi2 mipi1-csi2: stream ON
[ 170.907937] rockchip-csi2-dphy2: dphy2, data_rate_mbps 742
[ 170.908002] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream stream on:1, dphy2, ret 0
[ 170.908037] sc200ai 4-0030: 1920x1080@10, mode 0, vts 0xd2f
[ 170.958894] rkCIF-mipi-lvds: stream[0] start streaming
[ 170.959179] rockchip-mipi-csi2 mipi0-csi2: stream on, src_sd: 0000000033602b05, sd_name:rockchip-csi2-dphy1
[ 170.959203] rockchip-mipi-csi2 mipi0-csi2: stream ON
[ 170.959250] rockchip-csi2-dphy1: dphy1, data_rate_mbps 742
[ 170.959279] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream stream on:1, dphy1, ret 0
[ 170.959291] sc200ai 3-0030: 1920x1080@10, mode 0, vts 0xd2f
[ 171.000855] rkisp_hw 21d00000.isp: set isp clk = 200000000Hz
[ 171.014660] rkisp rkisp-vir3: first params buf queue
[ 171.014842] rkCIF-mipi-lvds2: stream[0] start streaming
[ 171.015145] rockchip-mipi-csi2 mipi2-csi2: stream on, src_sd: 00000000e724c5d2, sd_name:rockchip-csi2-dphy4
[ 171.015167] rockchip-mipi-csi2 mipi2-csi2: stream ON
[ 171.015212] rockchip-csi2-dphy4: dphy4, data_rate_mbps 742
[ 171.015241] rockchip-csi2-dphy csi2-dphy4: csi2_dphy_s_stream stream on:1, dphy4, ret 0
[ 171.015254] sc200ai 1-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
[ 171.055886] rkisp_hw 21d00000.isp: set isp clk = 396000000Hz
[ 171.069084] rkisp rkisp-vir2: first params buf queue
[ 171.069378] rkCIF-mipi-lvds3: stream[0] start streaming
[ 171.069909] rockchip-mipi-csi2 mipi3-csi2: stream on, src_sd: 00000000ab298cc3, sd_name:rockchip-csi2-dphy5
[ 171.069940] rockchip-mipi-csi2 mipi3-csi2: stream ON
[ 171.070050] rockchip-csi2-dphy5: dphy5, data_rate_mbps 742
[ 171.070138] rockchip-csi2-dphy csi2-dphy5: csi2_dphy_s_stream stream on:1, dphy5, ret 0
[ 171.070157] sc200ai 2-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
[ 171.099634] rkisp_hw 21d00000.isp: set isp clk = 500000000Hz
Redistribute latency...
Redistribute latency...
0:00:06.7 / 99:99:99.
```

6.15 Video Playback

(1) Use the built-in video test scripts.

Execute the following command:

```
# /rockchip-test/video/test_gst_video.sh
```

```
root@linaro-alip:/# /rockchip-test/video/test_gst_video.sh
[ 8784.261311] rkvpss-offline: CLK_CORE VPSS set to 396000000 Hz (requested 400000000 Hz)
[ 8784.263250] gm7150bc 0-005c: __gm7150_power_on(258)
[ 8784.333829] gm7150bc 0-005c: __gm7150_power_off(323)
Setting pipeline to PAUSED ...
Pipeline is PREROLLING ...
Redistribute latency...
mpp[3017]: mpp_info: mpp version: 520ab553 author: Herman Chen    2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3017]: mpp_info: mpp version: 520ab553 author: Herman Chen    2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3017]: mpp_info: mpp version: 520ab553 author: Herman Chen    2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3017]: mpp: unable to create enc vp8 for soc rv1126b unsupported
mpp[3017]: mpp_info: mpp version: 520ab553 author: Herman Chen    2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3017]: mpp_info: mpp version: 520ab553 author: Herman Chen    2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
Redistribute latency...
mpp[3017]: h264d_api: is_avcC=1
mpp[3017]: mpp_buf_slot: mismatch h_stride_by_pixel 1472 - 1280
mpp[3017]: mpp_buf_slot: mismatch h_stride_by_byte 1472 - 1280
mpp[3017]: mpp_buf_slot: mismatch size_total 1589760 - 1843200
mpp[3017]: mpp_buf_slot: mismatch h_stride_by_pixel 1472 - 1280
mpp[3017]: mpp_buf_slot: mismatch h_stride_by_byte 1472 - 1280
mpp[3017]: mpp_buf_slot: mismatch size_total 1589760 - 1843200
Pipeline is PREROLLED ...
Prerolled, waiting for async message to finish...
Setting pipeline to PLAYING ...
Redistribute latency...
New clock: GstSystemClock
0:00:04.1 / 0:00:29.5 (14.1 %)
```

(2) Play videos using the gst-play-1.0 command.

Execute the following command:

```
# export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1
# gst-play-1.0 --flags=3 --videosink="kmssink plane-id=74" /media/linaro/F3AB-
0FF3/video/4KP30/4K30P-BLACKPINK-DDU-DU_DDU-DU.mp4 --audiosink="alsasink
device=hw:1,0"
```



```
root@linaro-alip:/# export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1
gst-play-1.0 --flags=3 --videosink="kmssink plane-id=74" /media/linaro/F3AB-0FF3/video/4KP30/4K30P-
BLACKPINK-DDU-DU_DDU-DU.mp4 --audiosink="alsasink device=hw:1,0"
Press 'k' to see a list of keyboard shortcuts.ideosink="kmssink plane-id=74" /media/linaro/F3AB-
0FF3/video/4KP30/4K30P-BLACKPINK-DDU-DU_DDU-DU.mp4 --audiosink="alsasink device=hw:1,0"
Now playing /media/linaro/F3AB-0FF3/video/4KP30/4K30P-BLACKPINK-DDU-DU_DDU-DU.mp4
Redistribute latency...
mpp[3091]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3091]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3091]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3091]: mpp: unable to create enc vp8 for soc rv1126b unsupported
mpp[3091]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
mpp[3091]: mpp_info: mpp version: 520ab553 author: Herman Chen 2025-12-16 fix[sys_cfg]: Fix decoder
sys_cfg crash
Redistribute latency...
mpp[3091]: h264d_api: is_avcC=1
mpp[3091]: mpp_buf_slot: mismatch h_stride_by_pixel 4032 - 3840
mpp[3091]: mpp_buf_slot: mismatch h_stride_by_byte 4032 - 3840
mpp[3091]: mpp_buf_slot: mismatch size_total 13063680 - 16588800
mpp[3091]: mpp_buf_slot: mismatch h_stride_by_pixel 4032 - 3840
mpp[3091]: mpp_buf_slot: mismatch h_stride_by_byte 4032 - 3840
mpp[3091]: mpp_buf_slot: mismatch size_total 13063680 - 16588800
WARNING No volume control found
WARNING debug information: ../gst/playback/gstplaysink.c(2908): gen_audio_chain ():
/GstPlayBin:playbin/GstPlaySink:playsink:
Volume/mute is not available
Redistribute latency...
Redistribute latency...
[ 8937.184627] [drm:vop_plane_atomic_check] *ERROR* Invalid source: 3840x2160. max input: 1920x1920
Redistribute latency...
0:00:12.1 / 0:03:28.8
```

Command explanation:

- export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1: [Open AFBC](#).
- --videosink="kmssink plane-id=74": [Specifies the plane](#). Which can be viewed using the command: `cat /sys/kernel/debug/dri/0/state | grep "plane\[\"`.
- /media/linaro/F3AB-0FF3/video/4KP30/4K30P-BLACKPINK-DDU-DU_DDU-DU.mp4: [The media file path to be played](#).
- --audiosink="alsasink device=hw:1,0": [Specifies the audio output device as hw:1,0](#).

7. Buildroot Test

In the Buildroot rokit version, the rkipc service starts automatically after system boot.

To avoid conflicts during function tests, stop the rkipc service before testing other functions.

Stop the rkipc service:

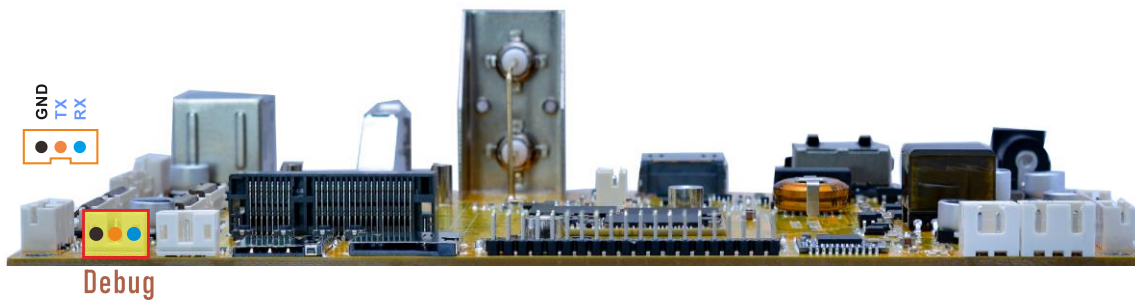
```
# RkLunch-stop.sh
```

Restart the rkipc service after testing:

```
# RkLunch.sh
```

7.1 Serial Terminal

Step 1: Connect the USB-to-serial module to the PC and connect the other end to the Debug UART interface on the board.



Step 2: Open a serial terminal tool on the PC, select the corresponding serial port, and set the baud rate to 1500000.

Step 3: Power on the board and check whether the boot log is displayed in the serial terminal.

```

serial-com6 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com6 x
[ 9.939195] RTW: [RF_PATH] ver_id.RF_TYPE:RF_1T1R
[ 9.939225] RTW: [RF_PATH] HALSPEC's rf_reg_trx_path_bmp:0x11, rf_reg_path_avail_num:1, m
ax_tx_cnt:1
[ 9.939233] RTW: [RF_PATH] PG's trx_path_bmp:0x00, max_tx_cnt:0
[ 9.939238] RTW: [RF_PATH] Registry's trx_path_bmp:0x00, tx_path_lmt:0, rx_path_lmt:0
[ 9.939243] RTW: [RF_PATH] HALDATA's trx_path_bmp:0x11, max_tx_cnt:1
[ 9.939248] RTW: [RF_PATH] HALDATA's rf_type:RF_1T1R, NumTotalRFPPath:1
[ 9.939254] RTW: [TRX_Nss] HALSPEC - tx_nss:1, rx_nss:1
[ 9.939259] RTW: [TRX_Nss] Registry - tx_nss:0, rx_nss:0
[ 9.939264] RTW: [TRX_Nss] HALDATA - tx_nss:1, rx_nss:1
[ 9.939270] RTW: txpath=0x1, rxpath=0x1
[ 9.939274] RTW: txpath_1ss:0x1, num:1
[ 9.939717] RTW: rtw_regsty_chk_target_tx_power_valid return _FALSE for band:0, path:0, r
s:0, t:-1
[ 9.940883] RTW: rtw_ndev_init(wlan0) if1 mac_addr=14:0a:02:c9:0b:71
[ 9.941840] RTW: rtw_ndev_init(p2p0) if2 mac_addr=16:0a:02:c9:0b:71
[ 9.943342] RTW: module init ret=0
Enabling p2p0...
Enabling wlan0...
Successfully init wi-Fi for RTL8723DS!
Done
[ 10.332182] Freeing drm_logo memory: 1384K
Successfully initialized wpa_supplicant
rfkill: Cannot open RFKILL control device

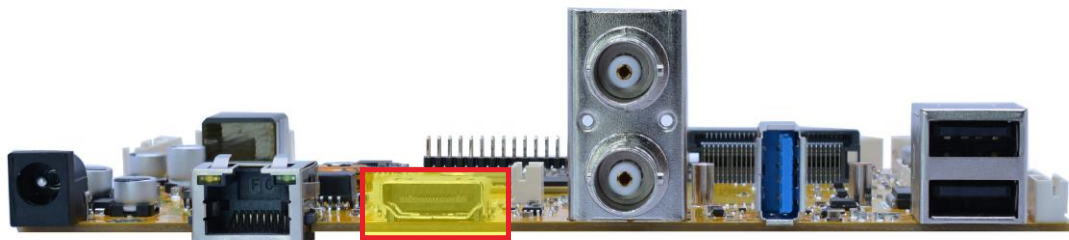
root@rv1126b-buildroot:/#
root@rv1126b-buildroot:/#
root@rv1126b-buildroot:/#
root@rv1126b-buildroot:/#
root@rv1126b-buildroot:/#
root@rv1126b-buildroot:/#
root@rv1126b-buildroot:/#
root@rv1126b-buildroot:/#

```

For details about installing and using the serial terminal tool, please refer to [Section 2.2 Install CH9102X Driver](#) and [2.3 Install Serial Terminal Tool](#).

7.2 Display

The KIT1126B uses an LT9611 MIPI-to-HDMI bridge chip to convert the MIPI DSI display signal to HDMI output. The HDMI interface supports 1920×1080@60Hz video output.



HDMI OUT

The HDMI status can be checked using the following command:

```
# cat /sys/class/lt9611/hdmi/status
```

7.2.1 GStreamer Version

After the GStreamer version is started, the display output is shown in the following figure:



7.2.2 Rockit Version

After the system boots with the Rockit version, if four MIPI cameras are connected before power-on, the system displays a combined preview of the four MIPI camera channels on the screen by default.



If the four MIPI cameras are not connected, the desktop UI will not be displayed after boot-up.

7.3 USB

7.3.1 USB OTG

The USB OTG port of the KIT1126B is configured as Device mode by default after system boot.



- To switch the USB OTG port to Host mode, execute the following command:

```
# echo host > /sys/kernel/debug/usb/21500000.usb/mode
```

```

root@rv1126b-buildroot:/# echo host > /sys/kernel/debug/usb/21500000.usb/mode
root@rv1126b-buildroot:/# [ 271.341126] dwc3 21500000.usb: request 0000000005f39b99 was not queued
to ep0out
[ 271.341260] android_work: did not send uevent (0 0 0000000000000000)
[ 271.386976] read descriptors
[ 271.387004] read strings
[ 271.447380] phy phy-21400000.usb2-phy.2: illegal mode
[ 271.447423] xhci-hcd xhci-hcd.1.auto: xHCI Host Controller
[ 271.447687] xhci-hcd xhci-hcd.1.auto: new USB bus registered, assigned bus number 3
[ 271.447832] xhci-hcd xhci-hcd.1.auto: hcc params 0x0220fe64 hci version 0x110 quirks
0x0002008022010010
[ 271.447880] xhci-hcd xhci-hcd.1.auto: irq 76, io mem 0x21500000
[ 271.447991] xhci-hcd xhci-hcd.1.auto: xHCI Host Controller
[ 271.448199] xhci-hcd xhci-hcd.1.auto: new USB bus registered, assigned bus number 4
[ 271.448227] xhci-hcd xhci-hcd.1.auto: Host supports USB 3.0 SuperSpeed
[ 271.448366] usb usb3: New USB device found, idVendor=1d6b, idProduct=0002, bcdDevice= 6.01
[ 271.448380] usb usb3: New USB device strings: Mfr=3, Product=2, SerialNumber=1
[ 271.448387] usb usb3: Product: xHCI Host Controller
[ 271.448392] usb usb3: Manufacturer: Linux 6.1.141 xhci-hcd
[ 271.448397] usb usb3: SerialNumber: xhci-hcd.1.auto
[ 271.448922] hub 3-0:1.0: USB hub found
[ 271.448971] hub 3-0:1.0: 1 port detected
[ 271.449293] usb usb4: We don't know the algorithms for LPM for this host, disabling LPM.
[ 271.449389] usb usb4: New USB device found, idVendor=1d6b, idProduct=0003, bcdDevice= 6.01
[ 271.449400] usb usb4: New USB device strings: Mfr=3, Product=2, SerialNumber=1
[ 271.449406] usb usb4: Product: xHCI Host Controller
[ 271.449412] usb usb4: Manufacturer: Linux 6.1.141 xhci-hcd
[ 271.449417] usb usb4: SerialNumber: xhci-hcd.1.auto
[ 271.449770] hub 4-0:1.0: USB hub found
[ 271.449801] hub 4-0:1.0: 1 port detected

```

- To switch the USB OTG port back to Device mode, execute the following command:

```

# echo device > /sys/kernel/debug/usb/21500000.usb/mode
# usbdevice start

```

```

root@rv1126b-buildroot:/# echo device > /sys/kernel/debug/usb/21500000.usb/mode
root@rv1126b-buildroot:/# [ 317.440818] xhci-hcd xhci-hcd.1.auto: remove, state 4
[ 317.440862] usb usb4: USB disconnect, device number 1
[ 317.441933] xhci-hcd xhci-hcd.1.auto: USB bus 4 deregistered
[ 317.442278] xhci-hcd xhci-hcd.1.auto: remove, state 4
[ 317.442306] usb usb3: USB disconnect, device number 1
[ 317.443691] xhci-hcd xhci-hcd.1.auto: USB bus 3 deregistered
[ 318.240785] read descriptors
[ 318.240825] read strings
[ 318.513988] dwc3 21500000.usb: device reset
[ 318.600372] android_work: sent uevent USB_STATE=CONNECTED
[ 318.644817] android_work: sent uevent USB_STATE=CONFIGURED

root@rv1126b-buildroot:/# usbdevice start
[2026-07-31 06:33:27] usbdevice [3870]: Sending start request to service...
[2026-07-31 06:33:27] usbdevice [3870]: Check /var/log/usb-gadget.log for usb-service log...

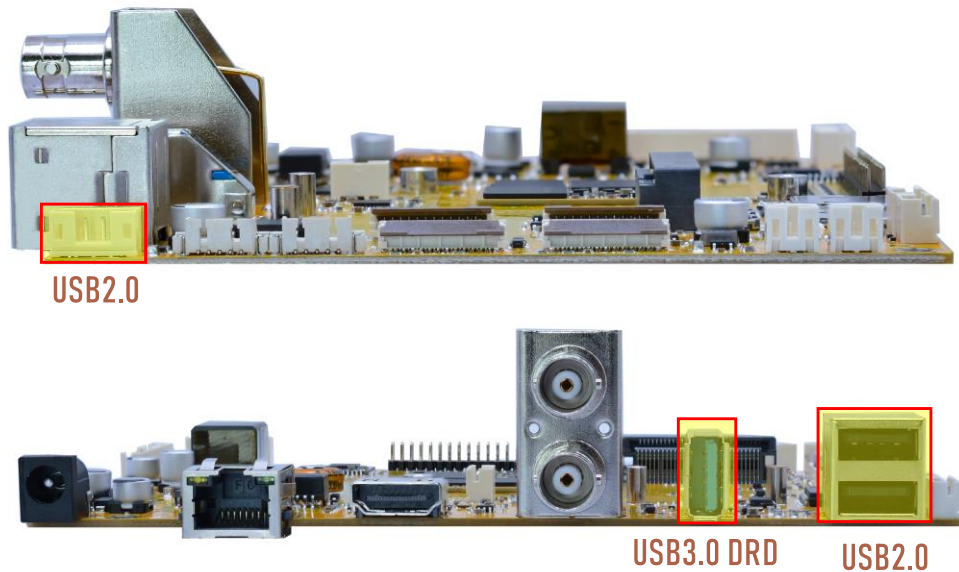
```

7.3.2 USB HOST

The KIT1126B provides USB 2.0 Host interfaces and one USB 3.0 DRD interface. The USB Host interfaces can be used to connect USB peripherals, such as a USB mouse, USB keyboard, USB flash drive, and other USB devices.

Note:

The USB 3.0 interface is an OTG interface. To use it as a Host interface, switch it to Host mode first. For details, refer to Section [7.3.1 USB OTG](#).



The current USB connection speed can be checked from the debug log.

- When the USB device operates in USB 2.0 mode, the log usually shows “high-speed”:

```
root@rv1126b-buildroot:/# [ 552.554828] usb 1-1.2: new high-speed USB device number 4 using ehci-platform
[ 552.664069] usb 1-1.2: New USB device found, idVendor=21c4, idProduct=0cc7, bcdDevice= 1.00
[ 552.664090] usb 1-1.2: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 552.664097] usb 1-1.2: Product: USB Flash Drive
[ 552.664102] usb 1-1.2: Manufacturer: Lexar
[ 552.664108] usb 1-1.2: SerialNumber: 0410280000031D7
[ 552.665690] usb-storage 1-1.2:1.0: USB Mass Storage device detected
[ 552.666647] scsi host0: usb-storage 1-1.2:1.0
[ 553.692095] scsi 0:0:0:0: Direct-Access Lexar USB Flash Drive 1.00 PQ: 0 ANSI: 4
[ 553.694492] sd 0:0:0:0: [sda] 120861886 512-byte logical blocks: (61.9 GB/57.6 GiB)
[ 553.695307] sd 0:0:0:0: [sda] Write Protect is off
[ 553.696107] sd 0:0:0:0: [sda] No Caching mode page found
[ 553.696128] sd 0:0:0:0: [sda] Assuming drive cache: write through
[ 553.702618] sda: sda1
[ 553.703327] sd 0:0:0:0: [sda] Attached SCSI removable disk
[ 554.227536] FAT-fs (sda1): utf8 is not a recommended IO charset for FAT filesystems, filesystem will be
case sensitive!
[ 554.233156] FAT-fs (sda1): Volume was not properly unmounted. Some data may be corrupt. Please run
fsck.
```

- When the USB device operates in USB 3.0 mode, the log usually shows “SuperSpeed”:

```
root@rv1126b-buildroot:/# [ 500.487295] usb 4-1: new SuperSpeed USB device number 3 using xhci-hcd
[ 500.517057] usb 4-1: New USB device found, idVendor=0dd8, idProduct=3b00, bcdDevice= 0.02
[ 500.517096] usb 4-1: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 500.517115] usb 4-1: Product: OnlyDisk
[ 500.517129] usb 4-1: Manufacturer: Netac
[ 500.517143] usb 4-1: SerialNumber: C0E8BFA3EC38F796
[ 500.518668] usb-storage 4-1:1.0: USB Mass Storage device detected
[ 500.519204] scsi host0: usb-storage 4-1:1.0
[ 501.594068] scsi 0:0:0:0: Direct-Access Netac OnlyDisk 8.01 PQ: 0 ANSI: 6
[ 501.597160] sd 0:0:0:0: [sda] 121610240 512-byte logical blocks: (62.3 GB/58.0 GiB)
[ 501.597653] sd 0:0:0:0: [sda] Write Protect is off
[ 501.597914] sd 0:0:0:0: [sda] Write cache: disabled, read cache: enabled, doesn't support DPO or FUA
[ 501.602848] sda: sda1
[ 501.603279] sd 0:0:0:0: [sda] Attached SCSI removable disk
[ 501.773323] FAT-fs (sda1): utf8 is not a recommended IO charset for FAT filesystems, filesystem will be
case sensitive!
[ 501.777260] FAT-fs (sda1): Volume was not properly unmounted. Some data may be corrupt. Please run
fsck.
```

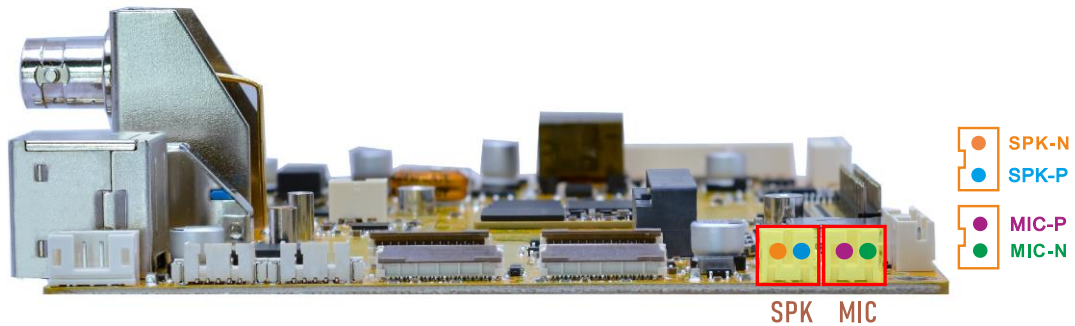
After a USB flash drive is connected, it will be mounted automatically. Run the following command to check the mount path of the USB flash drive:

```
# df -h
```

```
root@rv1126b-buildroot:/# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        5.9G  446M   5.3G   8% /
devtmpfs        959M    0   959M   0% /dev
tmpfs           987M  844K   986M   1% /run
tmpfs           987M  256K   987M   1% /var/log
tmpfs           987M    0   987M   0% /dev/shm
tmpfs           987M  136K   987M   1% /tmp
/dev/mmcblk0p8   881M  292K   880M   1% /userdata
/dev/mmcblk0p7   124M   5.3M   118M   5% /oem
/dev/sda1        58G   46G   13G   78% /mnt/udisk
```

7.4 Audio I/O

Connect the speaker and microphone to the corresponding interfaces on the KIT1126B.



7.4.2 Audio Input Test

Step 1: Configure Audio Input Gain.

Set the audio input gain using the following command:

```
# amixer -c 0 cset name='ACodec Digital Gain Volume' 100
```

```
root@rv1126b-buildroot:/# amixer -c 0 cset name='ACodec Digital Gain Volume' 100
numid=44,iface=MIXER,name='ACodec Digital Gain Volume'c Digital Gain Volume' 100
; type=INTEGER,access=rw---R--,values=1,min=0,max=127,step=0
: values=100
| dBscale-min=-95.00dB,step=0.75dB,mute=0
```

Step 2: Record Audio.

Execute the following command to start recording:

```
# arecord -D hw:0,0 -f cd -t wav test.wav
```

```
root@rv1126b-buildroot:/# arecord -D hw:0,0 -f cd -t wav test.wav
Recording WAVE 'test.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

7.4.1 Audio Output Test

Step 1: Check Audio Devices.

Execute the following command to check the available audio devices:

```
# cat /proc/asound/cards
```

```
root@rv1126b-buildroot:/# cat /proc/asound/cards
0 [rockchiprv1126b]: rockchip_rv1126 - rockchip,rv1126b-acodec
  rockchip,rv1126b-acodec
1 [lt9611lex      ]: simple-card - lt9611lex
  lt9611lex
```

Step 2: Configure Audio Output Volume.

Configure the speaker output volume using the following command:

```
# amixer -c 0 cset name='DAC Digital Volume' 250,250
```

```
root@rv1126b-buildroot:/# amixer -c 0 cset name='DAC Digital Volume' 250,250
numid=47,iface=MIXER,name='DAC Digital Volume'
; type=INTEGER,access=rw---R--,values=2,min=0,max=510,step=0
: values=250,250
| dBscale-min=-956.25dB,step=3.75dB,mute=0
```

Step 3: Play the audio file.

Execute the following command to play the audio file:

```
# aplay -D hw:0,0 test.wav
```

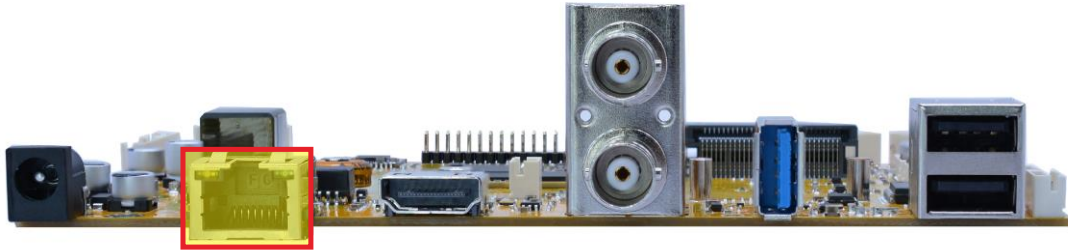
```
root@rv1126b-buildroot:/# aplay -D hw:0,0 test.wav
Playing WAVE 'test.wav' : Signed 16 bit Little Endian, Rate 44100 Hz, Stereo
```

Note: The following commands can be used to select different audio output devices.

- `aplay -Dhw:0,0 record.wav` # Speaker audio output
- `aplay -Dhw:1,0 record.wav` # HDMI audio output

7.5 Ethernet

The KIT1126B provides a 100M Ethernet RJ45 interface with PoE support, allowing both data transmission and power supply through a single Ethernet cable.



Ethernet(PoE)

Step 1: Connect the network cable to the Ethernet port.

According to the log, it can be seen that the 100M Ethernet recognition is successful.

```
root@rv1126b-buildroot:/# [ 724.401687] rk_gmac-dwmac 21c70000.ethernet eth0: Link is Up - 100Mbps/Full -
flow control rx/tx
[ 724.401713] IPv6: ADDRCONF(NETDEV_CHANGE): eth0: link becomes ready
```

Step 2: Check the network interface information.

Execute the following command:

```
# ifconfig eth0
```

```
root@rv1126b-buildroot:/# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 0A:11:04:25:8B:C9
          inet addr:192.168.0.65  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::180d:d65e:6eae:f110/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:264 errors:0 dropped:28 overruns:0 frame:0
          TX packets:11 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:21577 (21.0 KiB)  TX bytes:1410 (1.3 KiB)
          Interrupt:74
```

Step 3: Test the network connection.

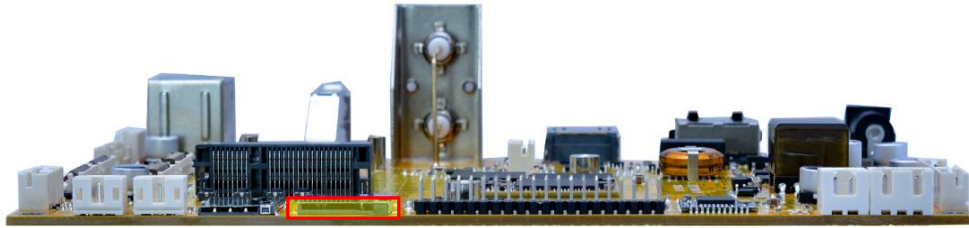
Execute the following command:

```
# ping -I eth0 www.armdesigner.com
```

```
root@rv1126b-buildroot:/# ping -I eth0 www.armdesigner.com
PING d3dsoj86mhwkk6.cloudfront.net (108.138.246.87) from 192.168.0.65 eth0: 56(84) bytes of data.
64 bytes from www.armdesigner.com (108.138.246.87): icmp_seq=1 ttl=246 time=164 ms
64 bytes from www.armdesigner.com (108.138.246.87): icmp_seq=2 ttl=246 time=164 ms
64 bytes from www.armdesigner.com (108.138.246.87): icmp_seq=3 ttl=246 time=164 ms
64 bytes from www.armdesigner.com (108.138.246.87): icmp_seq=4 ttl=246 time=164 ms
64 bytes from www.armdesigner.com (108.138.246.87): icmp_seq=5 ttl=246 time=163 ms
^C
--- d3dsoj86mhwkk6.cloudfront.net ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 163.430/163.820/164.399/0.335 ms
```

7.6 SD Card

Step 1: Insert the micro SD card into the card slot.



Micro SD

After the SD card is recognized, it will be mounted automatically.

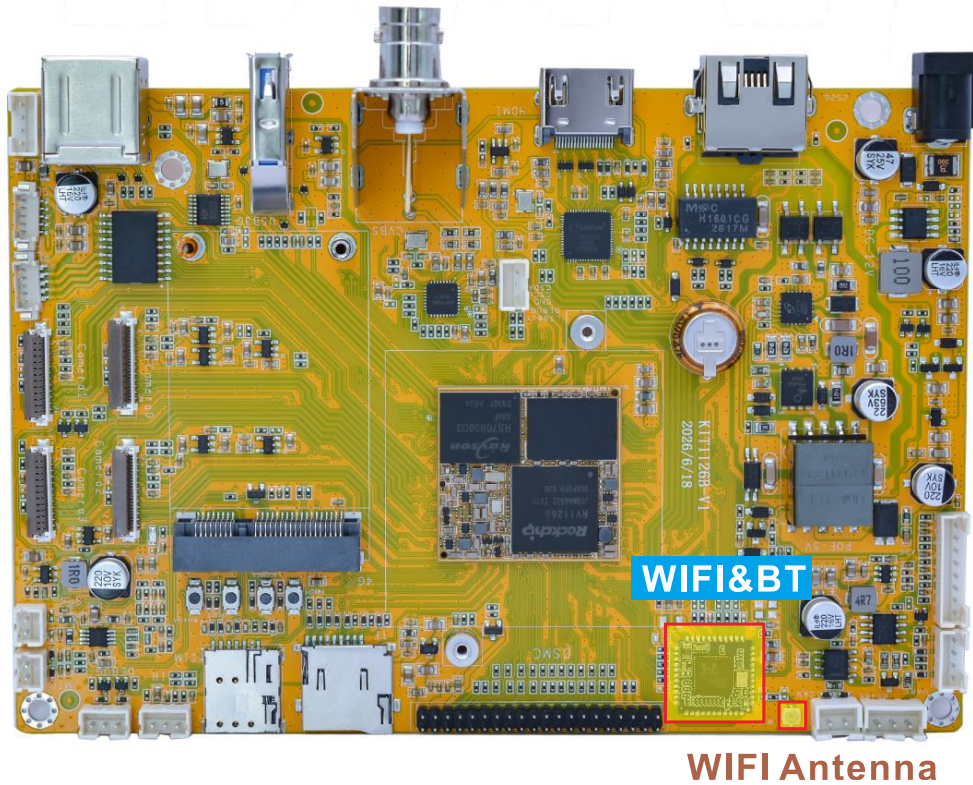
Step 2: Execute the following command to check the mount path of the SD card.

```
# df -h
```

```
root@rv1126b-buildroot:/# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        5.9G  447M   5.3G   8% /
devtmpfs         959M    0   959M   0% /dev
tmpfs            987M  856K   986M   1% /run
tmpfs            987M  260K   987M   1% /var/log
tmpfs            987M    0   987M   0% /dev/shm
tmpfs            987M  136K   987M   1% /tmp
/dev/mmcblk0p8   881M  292K   880M   1% /userdata
/dev/mmcblk0p7   124M   5.3M   118M   5% /oem
/dev/sda1        58G   46G   13G   78% /mnt/udisk
/dev/mmcblk1p1   60G   13G   48G   21% /mnt/sdcard
```

7.7 WiFi & Bluetooth

To use the WiFi and Bluetooth functions properly, make sure the antenna is connected.



7.7.1 WiFi

Step 1: Check the Wi-Fi device information.

Execute the following command:

```
# ifconfig wlan0
```

```
root@rv1126b-buildroot:/# ifconfig wlan0
wlan0    Link encap:Ethernet HWaddr 14:0A:02:C9:0B:71
UP BROADCAST MULTICAST  MTU:1500  Metric:1
RX packets:0 errors:0 dropped:0 overruns:0 frame:0
TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

Step 2: Scan for available WiFi hotspots.

• GStreamer Version

Execute the following command:

```
# iwlist wlan0 scan
```

```

root@rv1126b-buildroot:/# iwlist wlan0 scan
wlan0      Scan completed :
    Cell 01 - Address: C8:3A:35:51:1E:98
                ESSID:"Tenda_511E98"
                Protocol:IEEE 802.11bgn
                Mode:Master
                Frequency:2.437 GHz (Channel 6)
                Encryption key:on
                Bit Rates:150 Mb/s
                Extra:wpa_ie=dd180050f20101000050f20401000050f20401000050f2020c00
                IE: WPA Version 1
                    Group Cipher : CCMP
                    Pairwise Ciphers (1) : CCMP
                    Authentication Suites (1) : PSK
                Quality=95/100  Signal level=47/100
                Extra:fm=0003
    Cell 02 - Address: B4:F1:8C:6D:D1:24
                ESSID:"Boardcon"
                Protocol:IEEE 802.11bgn
                Mode:Master
                Frequency:2.462 GHz (Channel 11)
                Encryption key:on
                Bit Rates:300 Mb/s
                Extra:wpa_ie=dd1a0050f20101000050f20202000050f2040050f20201000050f202

```

• Rockit Version

Execute the following command:

```

# wpa_cli scan
# wpa_cli scan_results

```

```

root@rv1126b-buildroot:/# wpa_cli scan
Selected interface 'wlan0'
FAIL-BUSY
root@rv1126b-buildroot:/# [network.c][rk_network_get_cable_state]:read Cable state
[network.c][rk_network_get_cable_state]:
[wlan0] link down

root@rv1126b-buildroot:/# wpa_cli scan_results
Selected interface 'wlan0'
bssid / frequency / signal level / flags / ssid
b4:f1:8c:fd:d1:29      2462      -56      [WPA-PSK-CCMP+TKIP][WPA2-PSK-CCMP+TKIP][WPS][ESS]      Boardcon_Wi-
Fi5
b4:f1:8c:6d:d1:24      2462      -55      [WPA-PSK-CCMP+TKIP][WPA2-PSK-CCMP+TKIP][WPS][ESS]      Boardcon
b4:f1:8c:6d:d1:29      2462      -55      [WPA2-PSK-CCMP][WPS][ESS]
c8:3a:35:51:1e:98      2437      -66      [WPA-PSK-CCMP][ESS]      Tenda_511E98
b2:22:7a:5a:b6:4a      2462      -58      [WPA2-PSK-CCMP][ESS]      DIRECT-4A-HP Laser 136w
38:20:28:50:1e:a1      2437      -64      [WPA2-PSK-CCMP][ESS][UTF-8]      Casvi
44:6a:2e:20:83:60      2437      -70      [WPA-PSK-CCMP][WPA2-PSK-CCMP][ESS]      ydsz
38:20:28:50:0f:81      2412      -70      [WPA2-PSK-CCMP][ESS][UTF-8]      Casvi
9c:a6:15:10:e5:57      2462      -77      [WPA-PSK-CCMP+TKIP][WPA2-PSK-CCMP+TKIP][ESS]      TP
9c:a6:15:10:dd:6f      2412      -77      [WPA-PSK-CCMP+TKIP][WPA2-PSK-CCMP+TKIP][ESS]      TP
6a:df:e9:26:8a:1a      2412      -82      [WPA2-PSK-CCMP][ESS]      111
b4:f1:8c:6d:d1:25      2462      -53      [WPS][ESS]
9c:a6:15:10:da:c5      2437      -68      [WPA-PSK-CCMP+TKIP][WPA2-PSK-CCMP+TKIP][ESS]      TP
7c:7d:21:2c:95:34      2442      -68      [WPA-PSK-CCMP][WPA2-PSK-CCMP][WPS][ESS]      Ly-2.4g
42:bd:f6:cf:b7:70      2412      -80      [WPA2-PSK-CCMP][WPS][ESS]      HUAWAI-FK1E1D
50:0f:f5:a7:bb:e0      2452      -80      [WPA-PSK-CCMP][WPA2-PSK-CCMP][ESS]      1960
e2:ef:02:4e:67:8a      2462      -85      [WPA2-PSK-CCMP][ESS]
a0:36:79:34:39:24      2462      -89      [WPA2-PSK-CCMP][WPS][ESS]      ChinaNet-nT8z
02:2b:36:cf:22:b5      2412      -79      [WPA2-PSK-CCMP][WPS][ESS][UTF-8]      myverse-dev

```

Step 3: Connect to the WiFi hotspot.

Execute the following command:

```

# wifi-connect.sh SSID PSK

```

```
root@rv1126b-buildroot:/# wifi-connect.sh Boardcon Boardcon43435656
connect to WiFi ssid: Boardcon, Passwd: Boardcon43435656
Successfully initialized wpa_supplicant
```

Step 4: Check the network interface status.

Execute the following command:

```
# ifconfig wlan0
```

```
root@rv1126b-buildroot:/# ifconfig wlan0
wlan0      Link encap:Ethernet  HWaddr 14:0A:02:C9:0B:71
          inet addr:192.168.0.137  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::5835:ec7f:ec68:b244/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:203 errors:0 dropped:26 overruns:0 frame:0
          TX packets:21 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:22730 (22.1 KiB)  TX bytes:2794 (2.7 KiB)
```

Step 5: Test the WiFi network connection.

Execute the following command:

```
# ping -I wlan0 www.armdesigner.com
```

```
root@rv1126b-buildroot:/# ping -I wlan0 www.armdesigner.com
PING d3dsoj86mhwkk6.cloudfront.net (108.138.246.8) from 192.168.0.137 wlan0: 56(84) bytes of data.
64 bytes from www.armdesigner.com (108.138.246.8): icmp_seq=1 ttl=246 time=245 ms
64 bytes from www.armdesigner.com (108.138.246.8): icmp_seq=2 ttl=246 time=200 ms
64 bytes from www.armdesigner.com (108.138.246.8): icmp_seq=3 ttl=246 time=270 ms
64 bytes from www.armdesigner.com (108.138.246.8): icmp_seq=4 ttl=246 time=180 ms
64 bytes from www.armdesigner.com (108.138.246.8): icmp_seq=5 ttl=246 time=267 ms
64 bytes from www.armdesigner.com (108.138.246.8): icmp_seq=6 ttl=246 time=207 ms
^C
--- d3dsoj86mhwkk6.cloudfront.net ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5007ms
rtt min/avg/max/mdev = 180.017/228.160/269.796/34.430 ms
```

7.7.2 Bluetooth

In the Buildroot system, Bluetooth is configured to work as a Bluetooth speaker by default.

Step 1: Start the BlueALSA A2DP sink service.

Execute the following command:

```
# bluealsa -p a2dp-sink &
```

```
root@rv1126b-buildroot:/# bluealsa -p a2dp-sink &
[1] 3244
root@rv1126b-buildroot:/# bluealsa: [3244] D: storage.c:84: Initializing persistent storage:
/var/lib/bluealsa
bluealsa: [3244] D: main.c:604: Starting main dispatching loop
bluealsa: [3244] D: main.c:114: Acquired D-Bus service name: org.bluealsa
bluealsa: [3244] D: bluealsa-dbus.c:392: Registering D-Bus manager: /org/bluealsa
[ 1049.319181] Bluetooth: hu 00000000b39eb7e0 retransmitting 1 pkts
[ 1049.320372] rtk_btcoex: BTCOEX hci_rev 0xbab7
[ 1049.320393] rtk_btcoex: BTCOEX lmp_subver 0x6f72
bluealsa: [3244] D: bluez.c:783: Registering battery provider: /org/bluez/hci0/battery
bluealsa: [3244] D: bluez.c:598: Creating media endpoint object: /org/bluez/hci0/A2DP/SBC/sink/1
bluealsa: [3244] D: bluez.c:509: Registering media endpoint: /org/bluez/hci0/A2DP/SBC/sink/1
bluealsa: [3244] D: bluez.c:598: Creating media endpoint object: /org/bluez/hci0/A2DP/SBC/sink/2
bluealsa: [3244] D: bluez.c:509: Registering media endpoint: /org/bluez/hci0/A2DP/SBC/sink/2
```

Step 2: Enter the Bluetooth control tool.

Execute the following command:

```
# bluetoothctl
```

```
root@rv1126b-buildroot:/# bluetoothctl
hci0 new_settings: powered bondable ssp br/edr le secure-conn
Agent registered
[CHG] Controller 14:0A:02:C9:0B:72 Pairable: yes
[bluetooth]#
```

Step 3: Enable Bluetooth and set it to discoverable mode.

Execute the following commands in bluetoothctl:

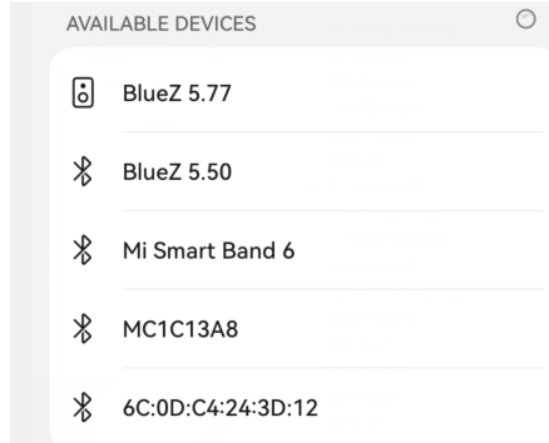
```
[bluetooth]# power on
[bluetooth]# discoverable on
```

```
root@rv1126b-buildroot:/# bluetoothctl
hci0 new_settings: powered bondable ssp br/edr le secure-conn
Agent registered
[CHG] Controller 14:0A:02:C9:0B:72 Pairable: yes
[bluetooth]# power on
Changing power on succeeded
[bluetooth]# discoverable on
[bluetooth]# [ 1101.501592] Bluetooth: hu 00000000b39eb7e0 retransmitting 1 pkts
hci0 new_settings: powered connectable bondable ssp br/edr le secure-conn
hci0 new_settings: powered connectable discoverable bondable ssp br/edr le secure-conn
Changing discoverable on succeeded
[CHG] Controller 14:0A:02:C9:0B:72 Discoverable: yes
[bluetooth]#
```

After this step, the Bluetooth device can be discovered by the phone.

Step 4: Pair and connect the Bluetooth device.

On the phone, find the Bluetooth device named “**BlueZ 5.77**” in the Bluetooth device list, then tap it to pair and connect.



If a pairing confirmation message appears, confirm it on both the phone and the board.

```
[bluetooth]# bluealsa: [3244] D: bluez.c:1199: Signal:
org.freedesktop.DBus.ObjectManager.InterfacesAdded()
[NEW] Device A8:35:12:9A:EB:4D liuy
Request confirmation
[agent] Confirm passkey 765960 (yes/no): yes
[liuy]# [ 1139.907919] rtk_btcoex: link key notify
hci0 new_link_key A8:35:12:9A:EB:4D type 0x05 pin_len 0 store_hint 1
hci0 device_flags_changed: A8:35:12:9A:EB:4D (BR/EDR)
      supp: 0x00000000 curr: 0x00000000
[CHG] Device A8:35:12:9A:EB:4D INFO: 0x0007 (7)
[CHG] Device A8:35:12:9A:EB:4D Bonded: yes
[liuy]# [ 1139.990926] rtk_btcoex: l2cap op 2, len 16, out 0
bluealsa: [3244] D: bluez.c:1199: Signal: org.freedesktop.DBus.ObjectManager.InterfacesAdded()
[CHG] Device A8:35:12:9A:EB:4D ServicesResolved: yes
[CHG] Device A8:35:12:9A:EB:4D INFO: 0x000f (15)
[CHG] Device A8:35:12:9A:EB:4D Paired: yes
Authorize service
[agent] Authorize service 0000110d-0000-1000-8000-00805f9b34fb (yes/no): yes
[liuy]# [ 1142.392439] rtk_btcoex: l2cap op 3, len 20, out 1
[liuy]# bluealsa: [3244] D: bluez.c:1199: Signal: org.freedesktop.DBus.ObjectManager.InterfacesAdded()
bluealsa: [3244] D: dbus.c:47: Called: org.bluez.MediaEndpoint1.SetConfiguration() on
/org/bluez/hci0/A2DP/SBC/sink/1
bluealsa: [3244] D: a2dp.c:383: Selected A2DP SBC bit-pool range: [2, 53]
[NEW] Transport /org/bluez/hci0/dev_A8_35_12_9A_EB_4D/fd0
[liuy]# bluealsa: [3244] D: storage.c:117: Loading storage: /var/lib/bluealsa/A8:35:12:9A:EB:4D
bluealsa: [3244] D: bluez.c:420: A2DP Sink (SBC) configured for device A8:35:12:9A:EB:4D
bluealsa: [3244] D: bluez.c:423: A2DP selected configuration blob [len=4]: 21150235
bluealsa: [3244] D: bluez.c:425: PCM configuration: channels: 2, sampling: 44100
bluealsa: [3244] D: bluez.c:598: Creating media endpoint object: /org/bluez/hci0/A2DP/SBC/sink/3
bluealsa: [3244] D: bluez.c:509: Registering media endpoint: /org/bluez/hci0/A2DP/SBC/sink/3
bluealsa: [3244] D: bluez.c:1199: Signal: org.freedesktop.DBus.ObjectManager.InterfacesAdded()
bluealsa: [3244] D: bluez.c:1290: Adding new Stream End-Point: A8:35:12:9A:EB:4D: SRC: SBC
bluealsa: [3244] D: bluez.c:1199: Signal: org.freedesktop.DBus.ObjectManager.InterfacesAdded()
bluealsa: [NEW] Endpoint /org/bluez/hci0/dev_A8_35_12_9A_EB_4D/sep1
[3244] D: bluez.c:1290: Adding new Stream End-Point: A8:35:12:9A:EB:4D: SRC: AAC[liuy]#
bluealsa: [3244] D: bluez.c:1199: Signal: org.freedesktop.DBus.ObjectManager.InterfacesAdded()
bluealsa: [3244] D: bluez.c:1290: Adding new Stream End-Point: A8:35:12:9A:EB:4D: SRC: LDAC
bluealsa: [3244] D: bluez.c:1199: Signal: org.freedesktop.DBus.ObjectManager.InterfacesAdded()
bluealsa: [3244] D: a2dp.c:289: Unknown vendor codec [len=12]: cf0c00001ca07140ff20800
bluealsa: [3244] D: bluez.c:1290: Adding new Stream End-Point: A8:35:12:9A:EB:4D: SRC: (null)
[liuy]# [ 1143.264791] rtk_btcoex: l2cap op 6, len 16, out 1
[ 1145.405747] input: liuy (AVRCP) as /devices/virtual/input/input3
bluealsa: [3244] D: bluez.c:1199: Signal: org.freedesktop.DBus.ObjectManager.InterfacesAdded()
[NEW] Player /org/bluez/hci0/dev_A8_35_12_9A_EB_4D/player0 [default]
[liuy]# [ 1145.418446] rtk_btcoex: l2cap op 2, len 16, out 0
[07:02:48.986] libinput: configuring device "liuy (AVRCP)".
[07:02:48.986] associating input device event3 with output DSI-1 (none by udev)
[liuy]#
```

Check the log output to confirm the MAC address. In this example, the MAC address of the mobile phone is **A8:35:12:9A:EB:4D**.

Step 5: Exit `bluetoothctl`.

Execute the following command:

```
[bluetooth]# exit
```

Step 6: Start Bluetooth audio playback.

Execute the following command:

```
bluealsa-aplay A8:35:12:9A:EB:4D &
```

```
[liuy]# exit
root@rv1126b-buildroot:/# bluealsa-aplay A8:35:12:9A:EB:4D &
[2] 3269
root@rv1126b-buildroot:/# bluealsa-aplay: [3269] D: aplay.c:846: Creating IO worker A8:35:12:9A:EB:4D
bluealsa-aplay: [3269] D: aplay.c:1194: Starting main loop
bluealsa-aplay: [3270] D: aplay.c:514: Opening BlueALSA source PCM:
/org/bluealsa/hci0/dev_A8_35_12_9A_EB_4D/a2dpsnk/source
bluealsa: [3271] D: dbus.c:47: Called: org.bluealsa.PCM1.Open() on
/org/bluealsa/hci0/dev_A8_35_12_9A_EB_4D/a2dpsnk/source
bluealsa-aplay: [3270] D: aplay.c:540: Starting IO loop
root@rv1126b-buildroot:/#
```

After the Bluetooth connection is established, play audio on the phone. The audio should be output from the board.

7.8 IR

IR test method is the same as Debian12. Please refer to section [6.8 IR](#).

7.9 RS485

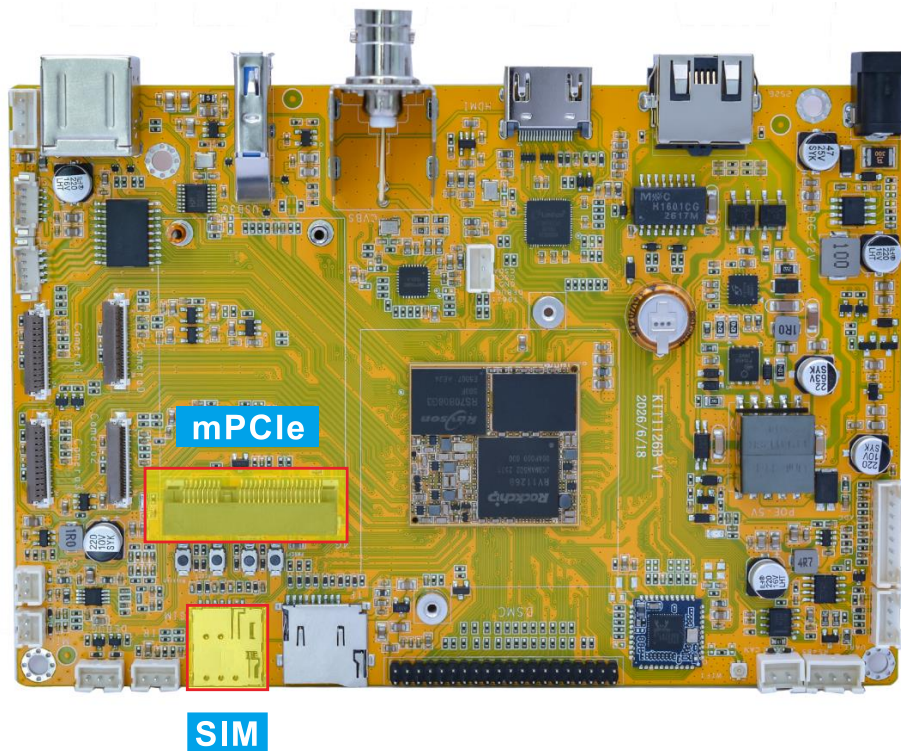
RS485 test method is the same as Debian12. Please refer to section [6.9 RS485](#).

7.10 4G & GPS

Step 1: Install the EC20 or EC25 4G module into the mPCIe socket.

Step 2: Connect the antenna and insert the SIM card.

Step 3: Power on the board.



6.10.1 4G Test

Step 1: Initiate the PPP connection.

- **GStreamer Version**

Execute the following command:

```
# mkdir -p var/run/pppd/lock
# pppd call quectel-ppp &
```

- **Rockit Version**

Execute the following command:

```
# RkLunch-stop.sh
# mkdir -p var/run/pppd/lock
# pppd call quectel-ppp &
```



```
root@rv1126b-buildroot:/# mkdir -p var/run/pppd/lock
root@rv1126b-buildroot:/#
root@rv1126b-buildroot:/# pppd call quectel-ppp &
[1] 1663
root@rv1126b-buildroot:/# pppd options in effect:
debug          # (from /etc/ppp/peers/quectel-ppp)
nodetach       # (from /etc/ppp/peers/quectel-ppp)
dump          # (from /etc/ppp/peers/quectel-ppp)
noauth        # (from /etc/ppp/peers/quectel-ppp)
user test     # (from /etc/ppp/peers/quectel-ppp)
password ????? # (from /etc/ppp/peers/quectel-ppp)
remotename 3gppp # (from /etc/ppp/peers/quectel-ppp)
/dev/ttyUSB3 # (from /etc/ppp/peers/quectel-ppp)
115200      # (from /etc/ppp/peers/quectel-ppp)
lock        # (from /etc/ppp/peers/quectel-ppp)
connect chat -s -v -f /etc/ppp/peers/quectel-chat-connect # (from /etc/ppp/peers/quectel-ppp)
disconnect chat -s -v -f /etc/ppp/peers/quectel-chat-disconnect # (from /etc/ppp/peers/quectel-ppp)
nocrtscts   # (from /etc/ppp/peers/quectel-ppp)
modem       # (from /etc/ppp/peers/quectel-ppp)
hide-password # (from /etc/ppp/peers/quectel-ppp)
novj        # (from /etc/ppp/peers/quectel-ppp)
novjccomp   # (from /etc/ppp/peers/quectel-ppp)
ipcp-accept-local # (from /etc/ppp/peers/quectel-ppp)
ipcp-accept-remote # (from /etc/ppp/peers/quectel-ppp)
ipparam 3gppp # (from /etc/ppp/peers/quectel-ppp)
noipdefault # (from /etc/ppp/peers/quectel-ppp)
ipcp-max-failure 30 # (from /etc/ppp/peers/quectel-ppp)
defaultroute # (from /etc/ppp/peers/quectel-ppp)
usepeerdns  # (from /etc/ppp/peers/quectel-ppp)
noccip     # (from /etc/ppp/peers/quectel-ppp)
abort on (BUSY)
abort on (NO CARRIER)
abort on (NO DIALTONE)
abort on (ERROR)
abort on (NO ANSWER)
timeout set to 30 seconds
send (AT^M)
expect (OK)
AT^M^M
OK
-- got it

send (ATE0^M)
expect (OK)
^M
ATE0^M^M
...
```

Step 2: Check the network interface status.

Execute the following command:

```
# ifconfig ppp0
```

```
root@rv1126b-buildroot:/# ifconfig ppp0
ppp0      Link encap:Point-to-Point Protocol
          inet addr:10.6.112.194 P-t-P:10.64.64.64 Mask:255.255.255.255
          UP POINTOPOINT RUNNING NOARP MULTICAST MTU:1500 Metric:1
          RX packets:4 errors:0 dropped:0 overruns:0 frame:0
          TX packets:14 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:3
          RX bytes:52 (52.0 B) TX bytes:198 (198.0 B)
```

Step 3: Test the PPP connection.

Execute the following command:

```
# ping -I ppp0 www.armdesigner.com
```

```

root@rv1126b-buildroot:/# ping -I ppp0 www.armdesigner.com
PING d3dsoj86mhwkk6.cloudfront.net (108.138.246.71) from 10.6.112.194 ppp0: 56(84) bytes of data.
64 bytes from server-108-138-246-71.sfo5.r.cloudfront.net (108.138.246.71): icmp_seq=1 ttl=245 time=871 ms
64 bytes from server-108-138-246-71.sfo5.r.cloudfront.net (108.138.246.71): icmp_seq=2 ttl=245 time=511 ms
64 bytes from server-108-138-246-71.sfo5.r.cloudfront.net (108.138.246.71): icmp_seq=3 ttl=245 time=487 ms
64 bytes from server-108-138-246-71.sfo5.r.cloudfront.net (108.138.246.71): icmp_seq=4 ttl=245 time=432 ms
64 bytes from server-108-138-246-71.sfo5.r.cloudfront.net (108.138.246.71): icmp_seq=5 ttl=245 time=391 ms
64 bytes from server-108-138-246-71.sfo5.r.cloudfront.net (108.138.246.71): icmp_seq=6 ttl=245 time=778 ms
^C
--- d3dsoj86mhwkk6.cloudfront.net ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5001ms
rtt min/avg/max/mdev = 391.112/578.153/870.522/180.112 ms

```

6.10.2 GPS Test

Step 1: Enable the GPS function.

Execute the following command:

```
# echo -e "AT+QGPS=1\r\n" > /dev/ttyUSB2
```

Step 2: Read the GPS data.

Execute the following command:

```
# cat /dev/ttyUSB1
```

```

root@rv1126b-buildroot:/# echo -e "AT+QGPS=1\r\n" > /dev/ttyUSB2
root@rv1126b-buildroot:/# cat /dev/ttyUSB1
$GPVTDG,,T,,M,,N,,K,N*2C

$GPGSA,A,1,,,,,,,,,,,,,*32

$GPGGA,,,,,0,,,,,,*66

$GPRMC,,V,,,,,,,,,N,V*29

$GPVTDG,,T,,M,,N,,K,N*2C

$GPGSA,A,1,,,,,,,,,,,,,*32

$GPGGA,,,,,0,,,,,,*66

$GPRMC,,V,,,,,,,,,N,V*29

```

7.11 CAN

CAN test method is the same as Debian12. Please refer to section [6.11 CAN](#).

7.12 ADC

ADC test method is the same as Debian12. Please refer to section [6.12 ADC](#).

7.13 MOTOR

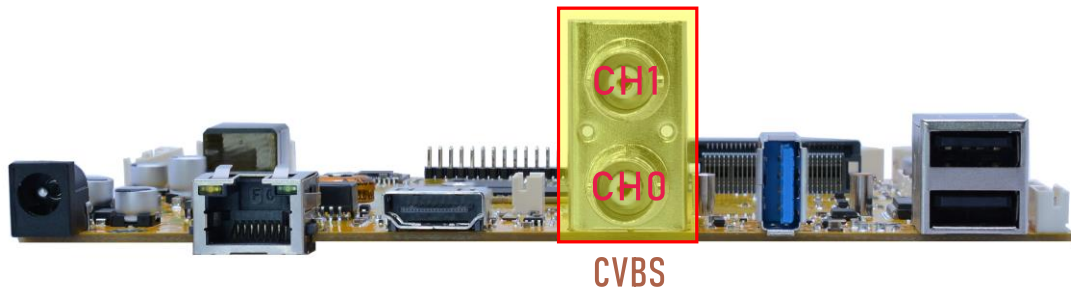
MOTOR test method is the same as Debian12. Please refer to section [6.13 MOTOR](#).

7.14 Camera

7.14.1 GStreamer Version

7.14.1.1 CVBS Camera

The KIT1126B provides two CVBS input channels (CH0 and CH1). Only one channel can be used for video capture at a time.



Step 1: Start the video preview.

The CH0 channel is selected by default.

Execute the following command:

```
# gst-launch-1.0 v4l2src device=/dev/video0 ! video/x-raw,format=NV16,width=720,height=576, framerate=25/1 ! waylandsink &
```

```
w,format=NV16,width=720,height=576, framerate=25/1 ! waylandsink &0 ! video/x-raw
[1] 2013
root@rv1126b-buildroot:/# mpp[2014]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26
fix[h265d_rkv]: Fix rkv ref and poc setup overflow
mpp[2014]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[2014]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
mpp[2014]: mpp: unable to create enc vp8 for soc rv1126b unsupported
mpp[2014]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref
and poc setup overflow
Setting pipeline to PAUSED ...
[ 611.365118] gm7150bc 0-005c: __gm7150_power_on(258)
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 611.438259] rkCIF-dvp: stream[0] start streaming
[ 611.439251] rkCIF-dvp: Allocate dummy buffer, size: 0x003f5000
[ 611.439265] rkCIF-dvp: get vblank fail, vblank_def 0, vblank_curr 0
[ 611.439277] rkCIF-dvp: set dual edge mode(off,0x2000000)!!!
[ 611.439837] gm7150bc 0-005c: gm7150_querystd: get PAL_B_D_N signal.
[ 611.439864] gm7150bc 0-005c: gm7150_stream: on: 1, 720x576
[ 611.440683] gm7150bc 0-005c: gm7150_full_init ok, channel: CH1
[ 611.972069] gm7150bc 0-005c: gm7150_check_signal: value:0x7e.
[ 611.972109] gm7150bc 0-005c: have signal
[ 611.972709] gm7150bc 0-005c: gm7150_get_mode: get PAL_B_D_N signal.
[ 611.972729] gm7150bc 0-005c: stream on, wait for BT656 sync...
Redistribute latency...
[08:16:17.785] seeing the first app
0:00:25.6 / 99:99:99.
```

Step 2: Switch to the desired CVBS input channel.

After starting the preview, switch the CVBS input channel using the following commands.

Switch to CH0:

```
# echo 0 > /sys/class/gm7150/gm7150_4/input_channel
```

```
0:02:03.2 / 99:99:99.m7150/gm7150_4/input_channel0:02:02.4 / 99:99:99.
[ 734.835008] gm7150bc 0-005c: switch to input CH1 (reg=0x00)
[ 735.169999] gm7150bc 0-005c: gm7150_check_signal: value:0x7a.
[ 735.170027] gm7150bc 0-005c: =====No signal
[ 735.170522] gm7150bc 0-005c: gm7150_get_mode: get PAL_B_D_N signal.
0:02:05.9 / 99:99:99.t:/# 0:02:03.6 / 99:99:99.
```

Switch to CH1:

```
# echo 1 > /sys/class/gm7150/gm7150_4/input_channel
```

```
0:01:23.9 / 99:99:99.m7150/gm7150_4/input_channel0:01:23.5 / 99:99:99.
[ 695.533641] gm7150bc 0-005c: switch to input CH2 (reg=0x02)
[ 695.842633] gm7150bc 0-005c: gm7150_check_signal: value:0x7e.
[ 695.842664] gm7150bc 0-005c: have signal
[ 695.843155] gm7150bc 0-005c: gm7150_get_mode: get PAL_B_D_N signal.
0:01:29.6 / 99:99:99.t:/# 0:01:24.3 / 99:99:99.
```

Verify that the corresponding CVBS camera image is displayed correctly after switching channels.

Additional Commands:

```
# Note: Ensure the GM7150 is powered on and the camera preview is running.
# Display supported V4L2 controls
v4l2-ctl -d /dev/v4l-subdev24 --list-ctrls

# Set image brightness (0~255)
v4l2-ctl -d /dev/v4l-subdev24 --set-ctrl brightness=200

# Set image contrast (0~255)
v4l2-ctl -d /dev/v4l-subdev24 --set-ctrl contrast=150

# Set image saturation (0~255)
v4l2-ctl -d /dev/v4l-subdev24 --set-ctrl saturation=100

# Set image hue (0~255)
v4l2-ctl -d /dev/v4l-subdev24 --set-ctrl hue=128

# Read current input channel (0=CH1, 1=CH2)
cat /sys/class/gm7150/gm7150_4/input_channel

# Switch to CH0
echo 0 > /sys/class/gm7150/gm7150_4/input_channel

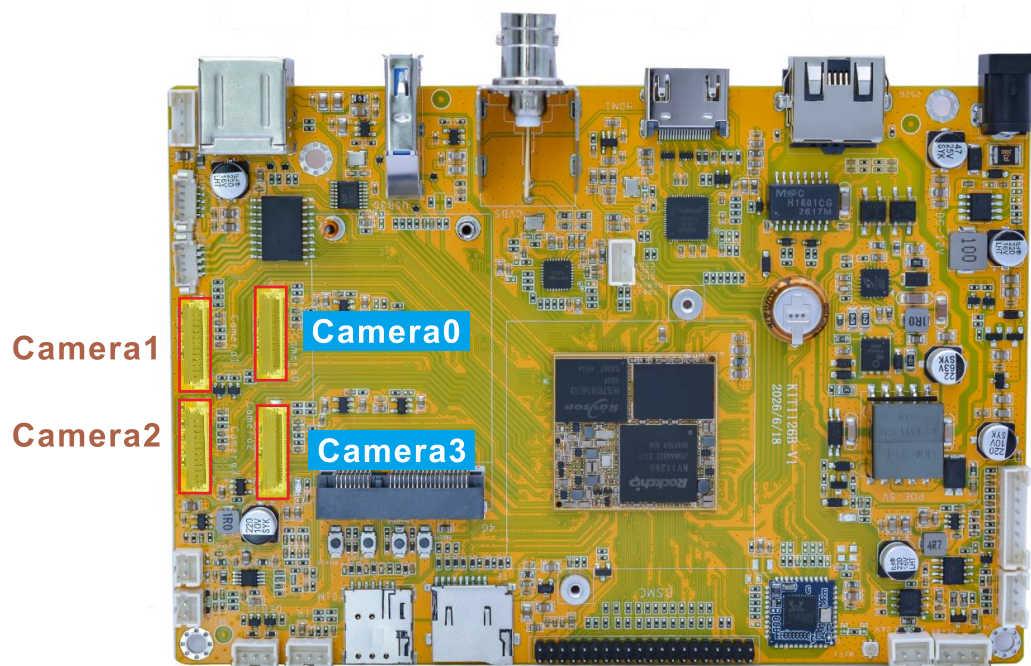
# Switch to CH1
echo 1 > /sys/class/gm7150/gm7150_4/input_channel

# Read signal status (1=signal detected, 0=no signal)
cat /sys/class/gm7150/gm7150_4/signal_status

# Read detected video standard (NTSC/PAL/SECAM)
cat /sys/class/gm7150/gm7150_4/video_standard
```

7.14.1.2 MIPI Camera

Step 1: Connect the camera module, then power on the board.



Step 2: Check the camera preview device nodes.

Execute the following command:

```
# grep "" /sys/class/video4linux/v*/name | grep mainpath
# grep "" /sys/class/video4linux/v*/name | grep selfpath
```

```
root@rv1126b-buildroot:/# grep "" /sys/class/video4linux/v*/name | grep mainpath
/sys/class/video4linux/video55/name:rkisp_mainpath4linux/v*/name | grep mainpath
/sys/class/video4linux/video63/name:rkisp_mainpath
/sys/class/video4linux/video71/name:rkisp_mainpath
/sys/class/video4linux/video79/name:rkisp_mainpath
root@rv1126b-buildroot:/# grep "" /sys/class/video4linux/v*/name | grep selfpath
/sys/class/video4linux/video56/name:rkisp_selfpath4linux/v*/name | grep selfpath
/sys/class/video4linux/video64/name:rkisp_selfpath
/sys/class/video4linux/video72/name:rkisp_selfpath
/sys/class/video4linux/video80/name:rkisp_selfpath
```

Step 3: Preview the camera.

Camera0:

```
# gst-launch-1.0 v4l2src device=/dev/video55 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! waylandsink
```

```
root@rv1126b-buildroot:/#
aw,format=NV16,width=1920,height=1080, framerate=25/1 ! waylandsink5 ! video/x-ra
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 91.615024] rkisp_hw 21d00000.isp: set isp clk = 297000000Hz
[ 91.617253] rkcif-mipi-lvds: stream[0] start streaming
[ 91.617503] rockchip-mipi-csi2 mipi0-csi2: stream on, src_sd: 00000000376b3e3c, sd_name:rockchip-
csi2-dphy1
[ 91.617521] rockchip-mipi-csi2 mipi0-csi2: stream ON
[ 91.617563] rockchip-csi2-dphy1: dphy1, data_rate_mbps 742
[ 91.617592] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream stream on:1, dphy1, ret 0
[ 91.617605] sc200ai 3-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
[08:20:26.168] seeing the first app
0:00:09.1 / 99:99:99.
```

Camera1:

```
# gst-launch-1.0 v4l2src device=/dev/video63 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! waylandsink
```

```

root@rv1126b-buildroot:/#
aw,format=NV16,width=1920,height=1080, framerate=25/1 ! waylandsink3 ! video/x-ra
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 177.267324] rkisp_hw 21d00000.isp: set isp clk = 297000000Hz
[ 177.271771] rkisp rkisp-vir1: first params buf queue
[ 177.271987] rkCIF-mipi-lvds1: stream[0] start streaming
[ 177.272229] rockchip-mipi-csi2 mipi1-csi2: stream on, src_sd: 00000002d301c00, sd_name:rockchip-
csi2-dphy2
[ 177.272244] rockchip-mipi-csi2 mipi1-csi2: stream ON
[ 177.272281] rockchip-csi2-dphy2: dphy2, data_rate_mbps 742
[ 177.272309] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream stream on:1, dphy2, ret 0
[ 177.272324] sc200ai 4-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
0:00:12.2 / 99:99:99.

```

Camera2:

```

# gst-launch-1.0 v4l2src device=/dev/video71 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! waylandsink

```

```

root@rv1126b-buildroot:/#
aw,format=NV16,width=1920,height=1080, framerate=25/1 ! waylandsink1 ! video/x-ra
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 222.282847] rkisp_hw 21d00000.isp: set isp clk = 297000000Hz
[ 222.290605] rkisp rkisp-vir2: first params buf queue
[ 222.290836] rkCIF-mipi-lvds3: stream[0] start streaming
[ 222.291084] rockchip-mipi-csi2 mipi3-csi2: stream on, src_sd: 0000000da73bfbb, sd_name:rockchip-
csi2-dphy5
[ 222.291101] rockchip-mipi-csi2 mipi3-csi2: stream ON
[ 222.291140] rockchip-csi2-dphy5: dphy5, data_rate_mbps 742
[ 222.291168] rockchip-csi2-dphy csi2-dphy5: csi2_dphy_s_stream stream on:1, dphy5, ret 0
[ 222.291181] sc200ai 2-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
0:00:09.7 / 99:99:99.

```

Camera3:

```

# gst-launch-1.0 v4l2src device=/dev/video79 ! video/x-
raw,format=NV16,width=1920,height=1080, framerate=25/1 ! waylandsink

```

```

root@rv1126b-buildroot:/#
aw,format=NV16,width=1920,height=1080, framerate=25/1 ! waylandsink9 ! video/x-ra
Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 256.383266] rkisp_hw 21d00000.isp: set isp clk = 297000000Hz
[ 256.385249] rkCIF-mipi-lvds2: stream[0] start streaming
[ 256.385600] rockchip-mipi-csi2 mipi2-csi2: stream on, src_sd: 000000094f596ac, sd_name:rockchip-
csi2-dphy4
[ 256.385620] rockchip-mipi-csi2 mipi2-csi2: stream ON
[ 256.385661] rockchip-csi2-dphy4: dphy4, data_rate_mbps 742
[ 256.385687] rockchip-csi2-dphy csi2-dphy4: csi2_dphy_s_stream stream on:1, dphy4, ret 0
[ 256.385701] sc200ai 1-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
0:00:08.2 / 99:99:99.

```

Camera0& Camera1& Camera2& Camera3:

```
# killall gst-launch-1.0
# gst-launch-1.0 v4l2src device=/dev/video55 ! video/x-
raw,format=NV16,width=1920,height=1080,framerate=30/1 ! fpsdisplaysink
name=video44 video-sink="waylandsink render-rectangle=\"<60,0,840,500>\"" &
gst-launch-1.0 v4l2src device=/dev/video63 ! video/x-
raw,format=NV16,width=1920,height=1080,framerate=30/1 ! fpsdisplaysink
name=video52 video-sink="waylandsink render-rectangle=\"<920,0,840,500>\"" &
gst-launch-1.0 v4l2src device=/dev/video71 ! video/x-
raw,format=NV16,width=1920,height=1080,framerate=30/1 ! fpsdisplaysink
name=video60 video-sink="waylandsink render-rectangle=\"<60,500,840,500>\"" &
gst-launch-1.0 v4l2src device=/dev/video79 ! video/x-
raw,format=NV16,width=1920,height=1080,framerate=30/1 ! fpsdisplaysink
name=video68 video-sink="waylandsink render-rectangle=\"<920,500,840,500>\"" &
```

```

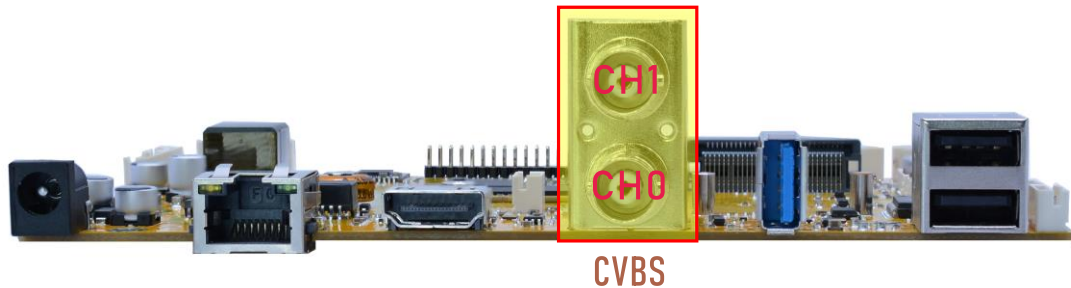
root@rv1126b-buildroot:/# killall gst-launch-1.0
killall: gst-launch-1.0: no process killed
root@rv1126b-buildroot:/#
44 video-sink="waylandsink render-rectangle=\"<60,0,840,500>\" &sink name=video4
[1] 2110
root@rv1126b-buildroot:/# Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 368.859868] rkisp_hw 21d00000.isp: set isp clk = 297000000Hz
[ 368.864573] rkisp rkisp-vir0: first params buf queue
[ 368.864791] rkCIF-mipi-lvds: stream[0] start streaming
[ 368.865080] rockchip-mipi-csi2 mipi0-csi2: stream on, src_sd: 0000000376b3e3c, sd_name:rockchip-
csi2-dphy1
[ 368.865098] rockchip-mipi-csi2 mipi0-csi2: stream ON
[ 368.865142] rockchip-csi2-dphy1: dphy1, data_rate_mbps 742
[ 368.865171] rockchip-csi2-dphy csi2-dphy1: csi2_dphy_s_stream stream on:1, dphy1, ret 0
[ 368.865184] sc200ai 3-0030: 1920x1080@10, mode 0, vts 0xd2f
52 video-sink="waylandsink render-rectangle=\"<920,0,840,500>\" &ink name=video5
[2] 2123
root@rv1126b-buildroot:/# Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 368.993184] rkisp rkisp-vir1: first params buf queue
[ 368.993394] rkCIF-mipi-lvds1: stream[0] start streaming
[ 368.993632] rockchip-mipi-csi2 mipi1-csi2: stream on, src_sd: 00000002d301c00, sd_name:rockchip-
csi2-dphy2
[ 368.993646] rockchip-mipi-csi2 mipi1-csi2: stream ON
[ 368.993684] rockchip-csi2-dphy2: dphy2, data_rate_mbps 742
[ 368.993712] rockchip-csi2-dphy csi2-dphy2: csi2_dphy_s_stream stream on:1, dphy2, ret 0
[ 368.993724] sc200ai 4-0030: 1920x1080@10, mode 0, vts 0xd2f
[ 369.004326] rkisp_hw 21d00000.isp: set isp clk = 200000000Hz
Redistribute latency...
60 video-sink="waylandsink render-rectangle=\"<60,500,840,500>\" &nk name=video6
[3] 2137
root@rv1126b-buildroot:/# Setting pipeline to PAUSED ...
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 369.153840] rkisp rkisp-vir2: first params buf queue
[ 369.153986] rkCIF-mipi-lvds3: stream[0] start streaming
[ 369.154205] rockchip-mipi-csi2 mipi3-csi2: stream on, src_sd: 0000000da73bfbb, sd_name:rockchip-
csi2-dphy5
[ 369.154219] rockchip-mipi-csi2 mipi3-csi2: stream ON
[ 369.154256] rockchip-csi2-dphy5: dphy5, data_rate_mbps 742
[ 369.154283] rockchip-csi2-dphy csi2-dphy5: csi2_dphy_s_stream stream on:1, dphy5, ret 0
[ 369.154296] sc200ai 2-0030: 1920x1080@10, mode 0, vts 0xd2f
[ 369.175898] rkisp_hw 21d00000.isp: set isp clk = 396000000Hz
Redistribute latency...
68 video-sink="waylandsink render-rectangle=\"<920,500,840,500>\" &k name=video6
[4] 2152
Setting pipeline to PAUSED ...:00.3 / 99:99:99.
Using mplane plugin for capture
Pipeline is live and does not need PREROLL ...
Pipeline is PREROLLED ...
Setting pipeline to PLAYING ...
New clock: GstSystemClock
[ 369.271192] rkisp_hw 21d00000.isp: set isp clk = 500000000Hz
[ 369.273201] rkisp rkisp-vir3: first params buf queue
[ 369.273398] rkCIF-mipi-lvds2: stream[0] start streaming
[ 369.273609] rockchip-mipi-csi2 mipi2-csi2: stream on, src_sd: 000000094f596ac, sd_name:rockchip-
csi2-dphy4
[ 369.273621] rockchip-mipi-csi2 mipi2-csi2: stream ON
[ 369.273659] rockchip-csi2-dphy4: dphy4, data_rate_mbps 742
[ 369.273684] rockchip-csi2-dphy csi2-dphy4: csi2_dphy_s_stream stream on:1, dphy4, ret 0
[ 369.273694] sc200ai 1-0030: 1920x1080@10, mode 0, vts 0xd2f
Redistribute latency...
Redistribute latency...
0:00:08.7 / 99:99:99.

```

7.14.2 Rokit Version

7.14.2.1 CVBS Camera

The KIT1126B provides two CVBS input channels (CH0 and CH1). Only one channel can be used for video capture at a time.



Step 1: Stop the default rkipc service.

Execute the following command:

```
# RkLunch-stop.sh
```

```
root@rv1126b-buildroot:/# RkLunch-stop.sh
Stop Application ...
[rkipc.c][sig_proc]:received signo 15
killall: udhpcp: no process killed
[network.c][rk_network_get_cable_state]:read Cable state
[network.c][rk_network_get_cable_state]:
[wlan0] link down
rkipc exit
ls: cannot access '/oem/usr/etc/init.d/S??*': No such file or directory
root@rv1126b-buildroot:/# [server.c][rkipc_server_deinit]:rkipc_server_deinit failed
[osd.c][osd_time_server]:exit
[video.c][rkipc_osd_bmp_destroy]:RK_MPI_RGN_Destroy [2] failed with 0xa0038005
```

Step 2: Check the network status and obtain the Ethernet IP address of the board.

Execute the following command:

```
# ifconfig eth0
```

```
root@rv1126b-buildroot:/# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 0A:11:04:25:8B:C9
          inet addr:192.168.0.65  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::39c0:5524:e017:def5/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:685 errors:0 dropped:1 overruns:0 frame:0
          TX packets:75 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:59446 (58.0 KiB)  TX bytes:7434 (7.2 KiB)
          Interrupt:76
```

Step 3: Start the cvbs camera demo.

Execute the following command:

```
# sample_demo_cvbs_camera &
```

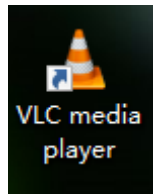
```
root@rv1126b-buildroot:/# sample_demo_cvbs_camera &
[1] 2221
root@rv1126b-buildroot:/# === V4L2 Single-Camera RTSP Streamer ===
Config: /dev/video0 720x576 @ 30fps -> H265 -> rtsp://*:554/live/0

[INFO rtsp_demo.c:280:rtsp_new_demo] rtsp server demo starting on port 554
[ 20.660672] vsys_release, 6
[DEBUG rtsp_demo.c:480:rtsp_new_session] add session path: /live/0
rockit_load start
v4l2_tx probe successv4l2_rx_probe success
rockit_load end
rockit_log path (null), log_size = 0
log_file = (nil)
(null) 09:31:26-152 {log_level_init :209}

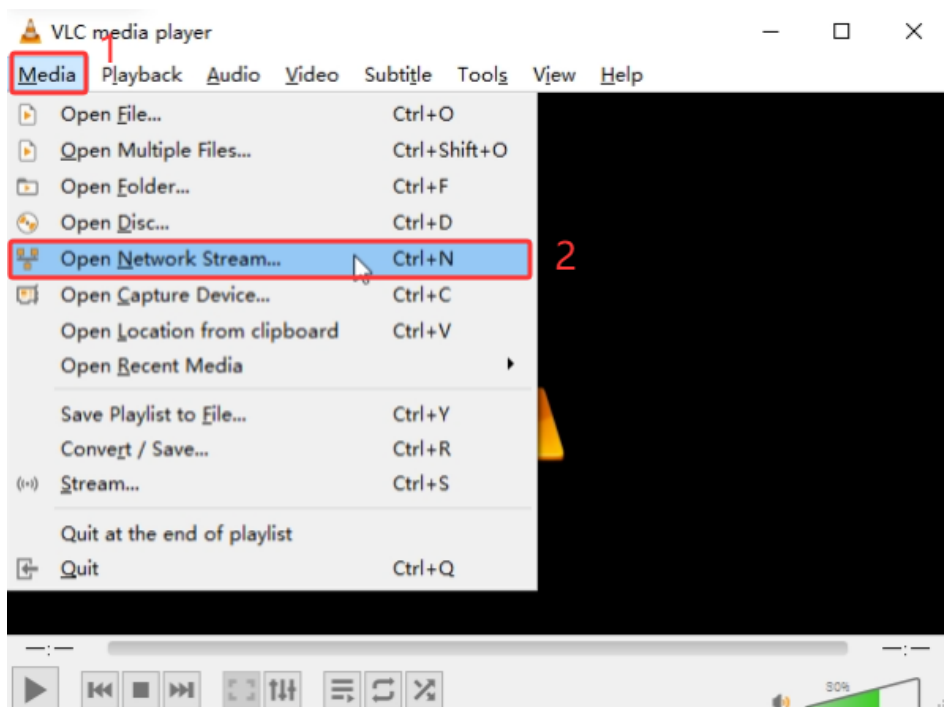
please use echo name=level > /tmp/rt_log_level set log level
name: all cmpi mb sys vdec venc rgn vpss vgs tde avs wbc vo vi ai ao aenc adec
log_level: 0 1 2 3 4 5 6

rockit default level 4, can use export rt_log_level=x, x=0,1,2,3,4,5,6 change
```

Step 4: Open VLC media player on the PC.

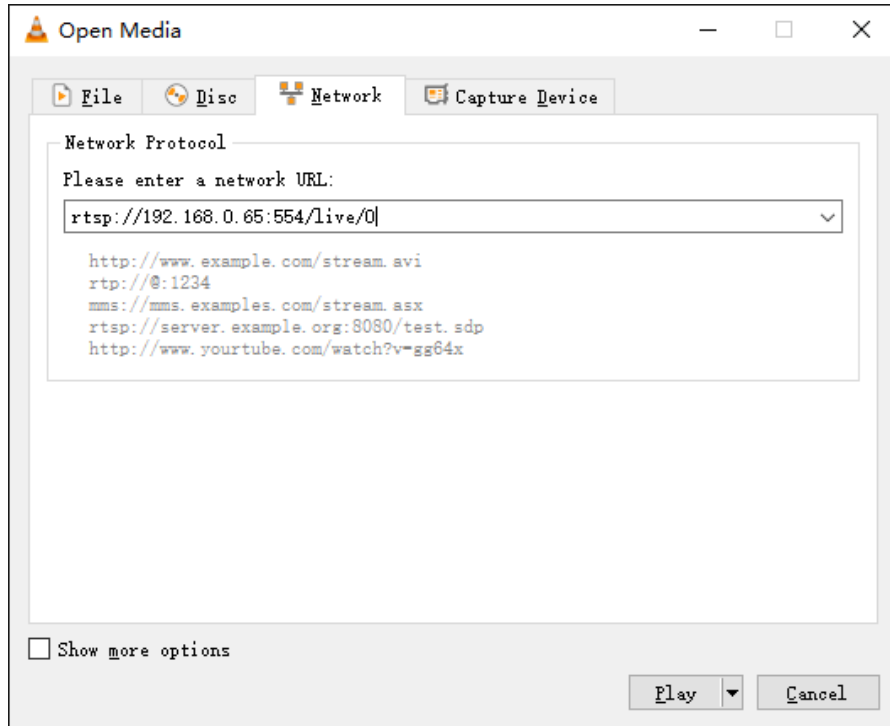


Step 5: Select Media -> Open Network Stream....



Step 6: Enter the following RTSP URL to preview the camera stream:

```
rtsp://192.168.0.65:554/live/0
```



Note:

Replace 192.168.0.65 with the actual Ethernet IP address of the board.

Step 7: Switch to the desired CVBS input channel.

After starting the stream, switch the CVBS input channel using the following commands.

Switch to CH0:

```
# echo 0 > /sys/class/gm7150/gm7150_4/input_channel
```

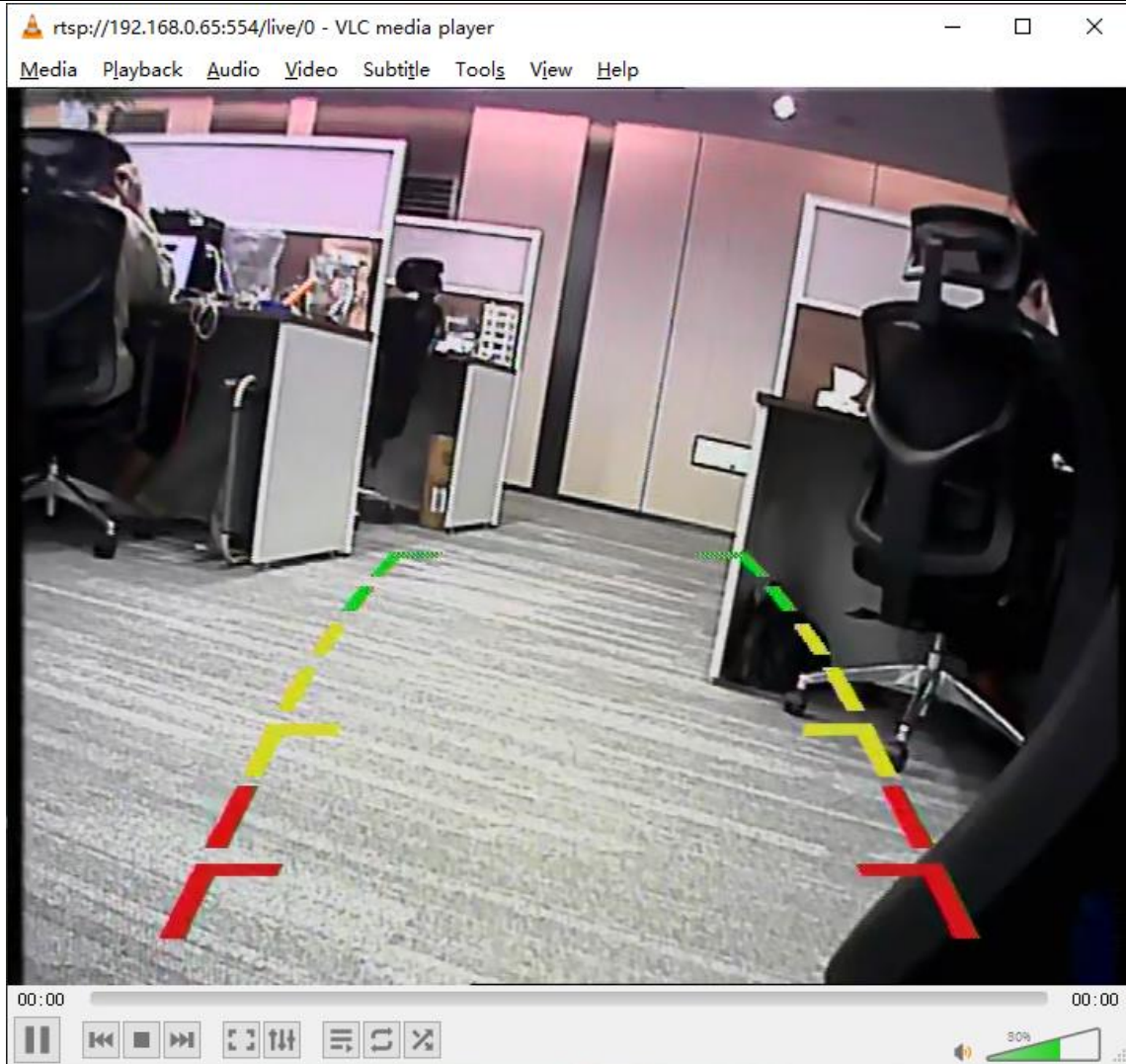
```
root@rv1126b-buildroot:/# echo 0 > /sys/class/gm7150/gm7150_4/input_channel
[ 175.293502] gm7150bc 0-005c: switch to input CH1 (reg=0x00)
[ 175.604151] gm7150bc 0-005c: gm7150_check_signal: value:0x70.
[ 175.604182] gm7150bc 0-005c: =====No signal
[ 175.604683] gm7150bc 0-005c: gm7150_get_mode: get PAL_B_D_N signal.
```

Switch to CH1:

```
# echo 1 > /sys/class/gm7150/gm7150_4/input_channel
```

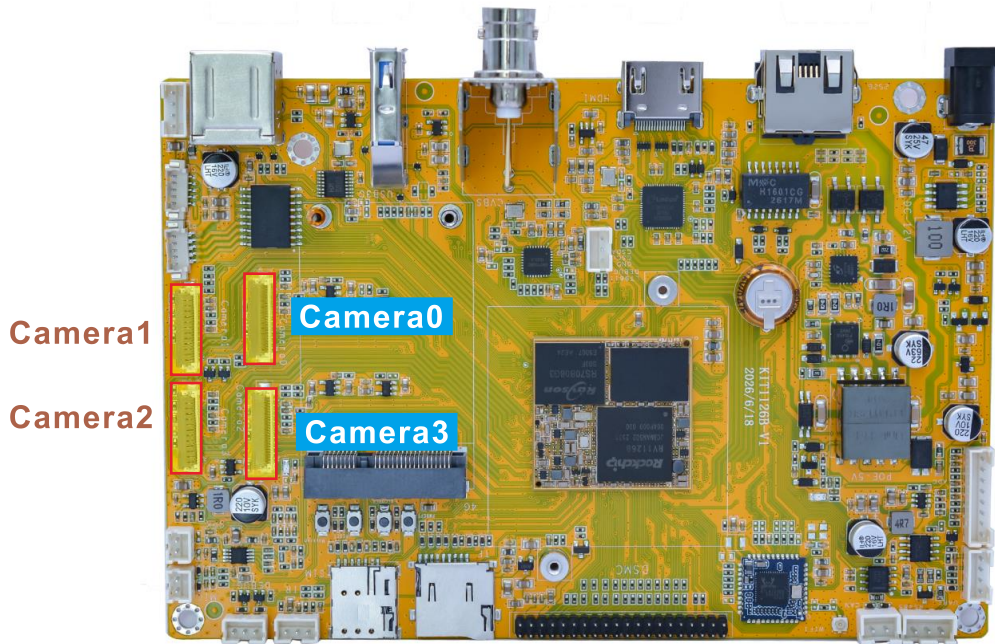
```
root@rv1126b-buildroot:/# echo 1 > /sys/class/gm7150/gm7150_4/input_channel
[ 158.819796] gm7150bc 0-005c: switch to input CH2 (reg=0x02)
[ 159.124674] gm7150bc 0-005c: gm7150_check_signal: value:0xfe.
[ 159.124705] gm7150bc 0-005c: have signal
[ 159.125249] gm7150bc 0-005c: gm7150_get_mode: get PAL_B_D_N signal.
```

Step 8: Verify that the corresponding CVBS camera image is displayed correctly after switching channels.



7.14.2.2 MIPI Camera

Connect the camera module, then power on the board.



After the system boots, the stitched preview image from all four camera channels is displayed by default.

Step 1: Stop the default rkipc service.

Execute the following command:

```
# RkLunch-stop.sh
```

```
root@rv1126b-buildroot:/# RkLunch-stop.sh
Stop Application ...
[rkipc.c][sig_proc]:received signo 15
killall: udhpcp: no process killed
[network.c][rk_network_get_cable_state]:read Cable state
[network.c][rk_network_get_cable_state]:
[wlan0] link down
rkipc exit
ls: cannot access '/oem/usr/etc/init.d/S??*': No such file or directory
root@rv1126b-buildroot:/# [server.c][rkipc_server_deinit]:rkipc_server_deinit failed
[osd.c][osd_time_server]:exit
[video.c][rkipc_osd_bmp_destroy]:RK_MPI_RGN_Destroy [2] failed with 0xa0038005
[video.c][rkipc_osd_bmp_destroy]:RK_MPI_RGN_Destroy [3] failed with 0xa0038005
[video.c][rkipc_osd_cover_destroy]:RK_MPI_RGN_Destroy [4] failed with 0xa0038005
[video.c][rkipc_osd_cover_destroy]:RK_MPI_RGN_Destroy [11] failed with 0xa0038005
[video.c][rkipc_osd_cover_destroy]:RK_MPI_RGN_Destroy [5] failed with 0xa0038005
[video.c][rkipc_osd_cover_destroy]:RK_MPI_RGN_Destroy [12] failed with 0xa0038005
[video.c][rkipc_osd_bmp_destroy]:RK_MPI_RGN_Destroy [6] failed with 0xa0038005
```

Step 2: Start the rkaiq_3A_server service.

Execute the following command:

```
# rkaiq_3A_server &
```

```

root@rv1126b-buildroot:/# rkaiq_3A_server &
[1] 2228
root@rv1126b-buildroot:/# media get entity by name: rkisp-isp-subdev is null
media get entity by name: rkisp-input-params is null
media get entity by name: rkisp-statistics is null
media get entity by name: rkisp_mainpath is null
Could not find rkisp dev names, skipped /dev/media0
ERR: Bad media topology for: /dev/media0
media get entity by name: rkisp-isp-subdev is null
media get entity by name: rkisp-input-params is null
media get entity by name: rkisp-statistics is null
media get entity by name: rkisp_mainpath is null
Could not find rkisp dev names, skipped /dev/media1
ERR: Bad media topology for: /dev/media1
media get entity by name: rkisp-isp-subdev is null
media get entity by name: rkisp-input-params is null
media get entity by name: rkisp-statistics is null
media get entity by name: rkisp_mainpath is null

```

Step 3: Check the network status and obtain the Ethernet IP address of the board.

Execute the following command:

```
# ifconfig eth0
```

```

root@rv1126b-buildroot:/# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 0A:11:04:25:8B:C9
          inet addr:192.168.0.65  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::39c0:5524:e017:def5/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:870 errors:0 dropped:2 overruns:0 frame:0
          TX packets:87 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:72538 (70.8 KiB)  TX bytes:8410 (8.2 KiB)
          Interrupt:76

```

Step 4: Start the four-channel camera demo.

Execute the following command:

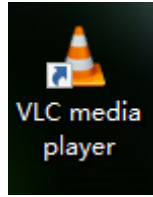
```
# sample_demo_four_camera
```

```

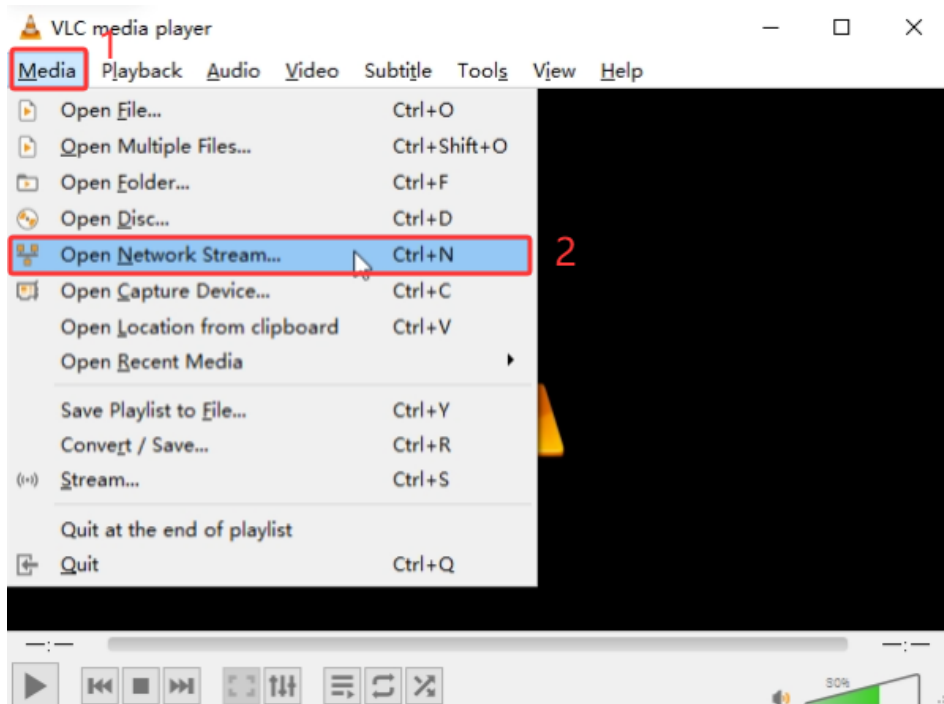
root@rv1126b-buildroot:/# sample_demo_four_camera
No arguments provided, using default settings for 4 cameras.
usage example:
  sample_demo_four_camera -s 0 -W 1920 -H 1080 -w 720 -h 576 -f 30 -r 0 -s 1 -W 1920 -H 1080 -w 720
  -h 576 -f 30 -r 0 -s 2 -W 1920 -H 1080 -w 720 -h 576 -f 30 -r 0 -s 3 -W 1920 -H 1080 -w 720 -h 576 -f 30
  -r 0 -n 0 -b 1
  rtsp://xx.xx.xx.xx/live/0, camera 0 main-stream
  rtsp://xx.xx.xx.xx/live/1, camera 0 sub-stream
  rtsp://xx.xx.xx.xx/live/2, camera 1 main-stream
  rtsp://xx.xx.xx.xx/live/3, camera 1 sub-stream
  rtsp://xx.xx.xx.xx/live/4, camera 2 main-stream
  rtsp://xx.xx.xx.xx/live/5, camera 2 sub-stream
  rtsp://xx.xx.xx.xx/live/6, camera 3 main-stream
  rtsp://xx.xx.xx.xx/live/7, camera 3 sub-stream
  -s | --sensor id (0~3)
  -f | --fps: frame per second, Default 30
  -r | --hdr: high dynamic range, Default 0
  -W | --main_width: main-stream width, Default 1920
  -H | --main_height: main-stream height, Default 1080
  -w | --sub_width: sub-stream width, Default 720
  -h | --sub_height: sub-stream height, Default 576
  -n | --enable_npu: enable npu, Default 0
  -b | --buf_share: enable buf share, Default 1
Starting with default config...

```

Step 5: Open VLC media player on the PC.



Step 6: Select Media -> Open Network Stream....



Step 7: Enter the following RTSP URL to preview the camera stream:

Camera0:

```
rtsp://192.168.0.65:554/live/0
```

Camera1:

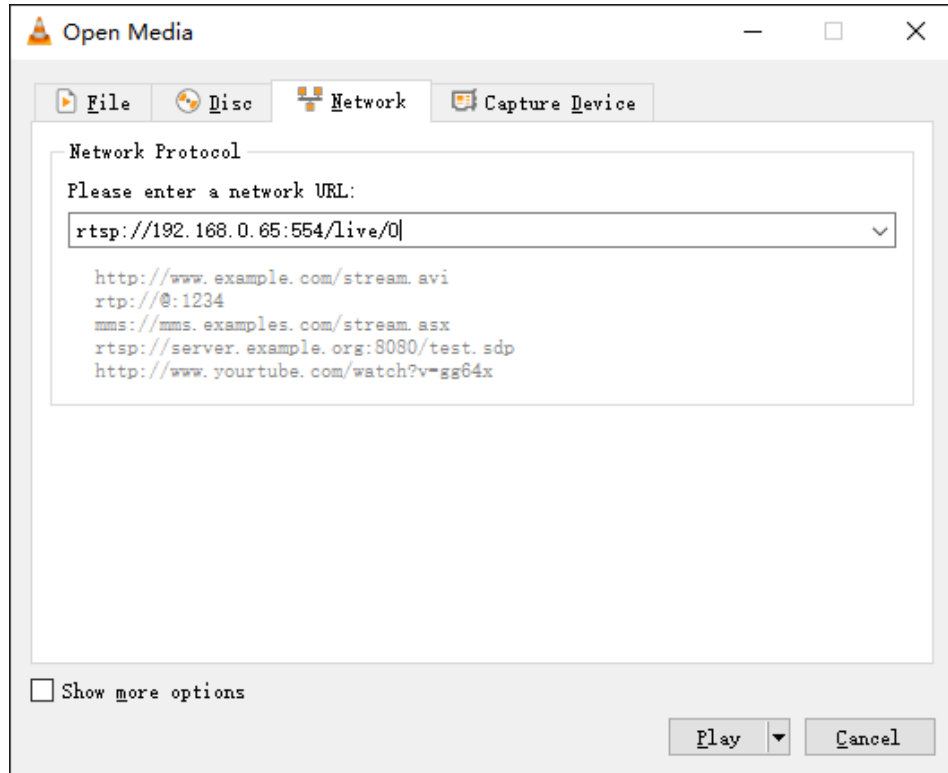
```
rtsp://192.168.0.65:554/live/2
```

Camera2:

```
rtsp://192.168.0.65:554/live/4
```

Camera3:

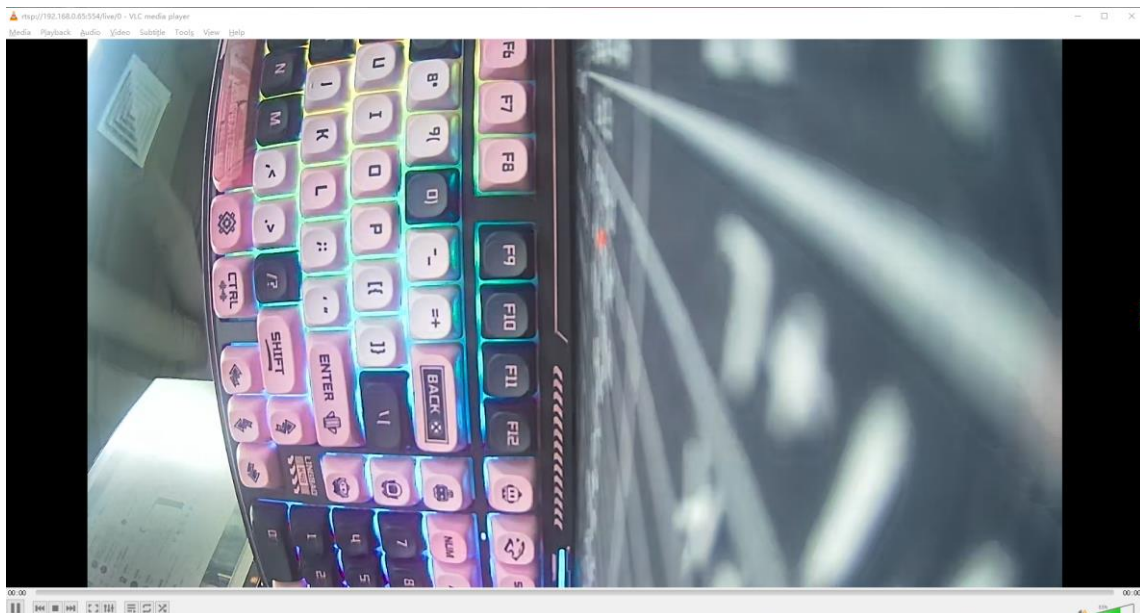
```
rtsp://192.168.0.65:554/live/6
```



Note:

Replace 192.168.0.65 with the actual Ethernet IP address of the board.

Step 8: Verify that the four MIPI camera images are displayed correctly.



7.15 Video Playback

7.15.1 GStreamer Version

(1) Use the built-in video test scripts.

Execute the following command:

```
# /rockchip-test/video/test_gst_video.sh
```

```
root@rv1126b-buildroot:/# /rockchip-test/video/test_gst_video.sh
mpp[2030]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2030]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2030]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2030]: mpp: unable to create enc vp8 for soc rv1126b unsupported
mpp[2030]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
Setting pipeline to PAUSED ...
Pipeline is PREROLLING ...
Redistribute latency...
mpp[2029]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2029]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2029]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2029]: mpp: unable to create enc vp8 for soc rv1126b unsupported
mpp[2029]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2029]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
Redistribute latency...
mpp[2029]: h264d_api: is_avcC=1
mpp[2029]: mpp_buf_slot: mismatch h_stride_by_pixel 1472 - 1280
mpp[2029]: mpp_buf_slot: mismatch h_stride_by_byte 1472 - 1280
mpp[2029]: mpp_buf_slot: mismatch size_total 1589760 - 1843200
mpp[2029]: mpp_buf_slot: mismatch h_stride_by_pixel 1472 - 1280
mpp[2029]: mpp_buf_slot: mismatch h_stride_by_byte 1472 - 1280
mpp[2029]: mpp_buf_slot: mismatch size_total 1589760 - 1843200
Pipeline is PREROLLED ...
Prerolled, waiting for async message to finish...
Setting pipeline to PLAYING ...
Redistribute latency...
New clock: GstSystemClock
0:00:05.0 / 0:00:29.5 (17.1 %)
```

(2) Play videos using the gst-play-1.0 command.

Execute the following command:

```
# export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1
# gst-play-1.0 /mnt/udisk/video/4KP30/4K30P-BLACKPINK-DDU-DU_DDU-DU.mp4 --
audiosink="alsasink device=hw:1,0"
```

```

root@rv1126b-buildroot:/# export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1
root@rv1126b-buildroot:/#
U-DU_DDU-DU.mp4 --audiosink="alsasink device=hw:1,0"de0/4KP30/4K30P-BLACKPINK-DDU
Press 'k' to see a list of keyboard shortcuts.
Now playing /mnt/udisk/video/4KP30/4K30P-BLACKPINK-DDU-DU_DDU-DU.mp4
Redistribute latency...
Redistribute latency...
mpp[2104]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2104]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2104]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2104]: mpp: unable to create enc vp8 for soc rv1126b unsupported
mpp[2104]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2104]: mpp_info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
Redistribute latency...
Redistribute latency...
mpp[2104]: h264d_api: is_avcC=1
mpp[2104]: mpp_buf_slot: mismatch h_stride_by_pixel 4032 - 3840
mpp[2104]: mpp_buf_slot: mismatch h_stride_by_byte 4032 - 3840
mpp[2104]: mpp_buf_slot: mismatch size_total 13063680 - 16588800
mpp[2104]: mpp_buf_slot: mismatch h_stride_by_pixel 4032 - 3840
mpp[2104]: mpp_buf_slot: mismatch h_stride_by_byte 4032 - 3840
mpp[2104]: mpp_buf_slot: mismatch size_total 13063680 - 16588800
[ 372.441075] [drm:vop_plane_atomic_check] *ERROR* Invalid source: 3840x2160. max input: 1920x1920
Redistribute latency...
0:00:08.3 / 0:03:28.8

```

Command explanation:

- `export GST_MPP_VIDEODEC_DEFAULT_ARM_AFBC=1`: [Open AFBC](#).
- `/mnt/udisk/video/4KP30/4K30P-BLACKPINK-DDU-DU_DDU-DU.mp4`: [The media file path to be played](#).
- `--audiosink="alsasink device=hw:1,0"`: [Specifies the audio output device as hw:1,0](#).

7.15.2 Rockit Version

Step 1: Stop the default rkipc service.

Execute the following command:

```
# RkLunch-stop.sh
```

```

root@rv1126b-buildroot:/# RkLunch-stop.sh
Stop Application ...
[rkipc.c][sig_proc]:received signo 15
killall: udhpcp: no process killed
rkipc exit
ls: cannot access '/oem/usr/etc/init.d/S??*': No such file or directory
root@rv1126b-buildroot:/# [server.c][rkipc_server_deinit]:rkipc_server_deinit failed
[osd.c][osd_time_server]:exit
[video.c][rkipc_osd_bmp_destroy]:RK_MPI_RGN_Destroy [2] failed with 0xa0038005
[video.c][rkipc_osd_bmp_destroy]:RK_MPI_RGN_Destroy [3] failed with 0xa0038005
[video.c][rkipc_osd_cover_destroy]:RK_MPI_RGN_Destroy [4] failed with 0xa0038005
[video.c][rkipc_osd_cover_destroy]:RK_MPI_RGN_Destroy [11] failed with 0xa0038005
[video.c][rkipc_osd_cover_destroy]:RK_MPI_RGN_Destroy [5] failed with 0xa0038005
[video.c][rkipc_osd_cover_destroy]:RK_MPI_RGN_Destroy [12] failed with 0xa0038005
[video.c][rkipc_osd_bmp_destroy]:RK_MPI_RGN_Destroy [6] failed with 0xa0038005
[video.c][rkipc_bind_deinit]:start
cmpi 10:09:42-500 {ivs chn getResults:1051} get result timeout

```

Step 2: The Rockit version supports video playback using the `simple_vdec_bind_vo` command.

Execute the following command:

```
# simple_vdec_bind_vo -i /mnt/udisk/testh264.h264
```

```
root@rv1126b-buildroot:/# simple_vdec_bind_vo -i /mnt/udisk/testh264.h264
param list: w = 1920, h = 1080, i = /mnt/udisk/testh264.h264, b = 1
rockit_load start
[ 36.661606] vsys_release, 6
v4l2_tx_probe successv4l2_rx_probe success
rockit_load end
rockit_log_path (null), log_size = 0
log_file = (nil)
(null) 10:10:24-800 {log_level_init :209}

please use echo name=level > /tmp/rt_log_level set log level
name: all cmpi mb sys vdec venc rgn vpss vgs tde avs wbc vo vi ai ao aenc adec
log_level: 0 1 2 3 4 5 6

rockit default level 4, can use export rt_log_level=x, x=0,1,2,3,4,5,6 change
(null) 10:10:24-800 {read_log_level :083} text is all=4
(null) 10:10:24-800 {read_log_level :085} module is all, log_level is 4
(null) 10:10:24-800 {dump_version :060} -----
(null) 10:10:24-800 {dump_version :061} rockit version: git-5057bd373 Thu Dec 11 09:34:24
2025 +0800
(null) 10:10:24-800 {dump_version :062} rockit building: built-Chu 2025-12-15 10:15:00
(null) 10:10:24-800 {dump_version :063} -----
(null) 10:10:24-800 {monitor_log_level :141} #Start monitor_log_level thread, arg:(nil)
vsys dev open 4
[ 77.796489] vsys dev open 6
[ 77.812092] rkvpss-offline: CLK_CORE_VPSS set to 396000000 Hz (requested 400000000 Hz)
load library(librga.so) in relative path
mpp[2202]: mpp info: mpp version: 958803d7 author: Herman Chen 2026-02-26 fix[h265d_rkv]: Fix rkv ref and
poc setup overflow
mpp[2202]: hal_264d_com: control info: fmt 0, w 1920, h 1080
mpp[2202]: mpp_dec: mpp_dec_proc_cfg found MPP_DEC_SET_FRAME_INFO fmt 0
mpp[2202]: mpp_buf_slot: mismatch h_stride by pixel 1984 - 1920
mpp[2202]: mpp_buf_slot: mismatch h_stride by byte 1984 - 1920
mpp[2202]: mpp_buf_slot: mismatch size_total 3237888 - 4177920
mpp[2202]: mpp_buf_slot: set frame info: w 1920 h 1080 hor 1920 ver 1088
mpp[2202]: mpp_dec: setting default w 1920 h 1080 h_str 1920 v_str 1088
Layer 0 is successfully bound to device 0.
get a hdl = 0x556eb53f00
[ 77.829244] phys = 54292000
get a hdl = 0x556eb64100
[ 77.836308] phys = 54500000
get a hdl = 0x556eb64950
mpp[2202]: mpp_buf_slot: mismatch h_stride by pixel 960 - 800
mpp[2202]: mpp_buf_slot: mismatch h_stride by byte 960 - 800
mpp[2202]: mpp_buf_slot: mismatch size_total 1843200 - 2048000
load library(librga.so) in relative path
rga_api version 1.10.5_[9]
```

Command explanation:

- `simple_vdec_bind_vo`: Video decoding and display test tool.
- `-i`: Specifies the input video file.
- `/mnt/udisk/testh264.h264`: Input H.264 file path.

Note:

This command supports H.264 elementary stream files, such as .h264 files. Standard MP4 files are not supported.