# TWOWIN TW-T609 User Guide

Smarter World, Better Life

.

图为信息科技(深圳)有限公司
TWOWIN INFORMATION TECHNOLOGY Co. Ltd

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# Document Revision Catalog

Document Version

Version 2.1

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|---|---|---|
| V1.0 | 2020/07/23 | Initial release |
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| V2.0 | 2023/07/17 | Iterative Updates |
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# Preface

Before using this manual, please carefully read the following License Agreement. You may only use the products described herein if you agree to the terms of this License Agreement.

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## Technical Support and Feedback

If you encounter issues while using our products or identify potential functional defects, please visit our official website at https://www.twowintech.com to contact customer service. For technical support guidance or feedback, please reach out via the website or phone:

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Contact Information
Phone: +86 15920093612
Tel: +86 755-82840481
Website: https://www.twowintech.com
Address: 2512 Changhong Technology Building, Keji South 12th Road, Nanshan District, Shenzhen

# Safety Warnings and Precautions

- Safety Instructions

Before using this product, read this document carefully to understand its basic operation and comply with the safety instructions therein to ensure personal safety and avoid equipment damage. The manufacturer shall not be held liable for any issues related to equipment or personal property damage caused by improper operation.

Personal Safety

- Wear anti-static workwear and gloves/wrist straps before operating the device. Remove conductive items such as jewelry and watches to prevent electric shock or burns.
- In case of fire, evacuate the building/equipment area immediately, activate the fire alarm, or call the fire department. Under no circumstances should you re-enter a burning building.

Equipment Safety

- Securely fix the device to the floor or stable objects (e.g., walls or mounting racks) before operation.
- Do not block ventilation openings during system operation.
- Use tools to tighten screws when installing panels.
- Remove all packaging materials from the equipment area after installation.

- Power Requirements

Input power for the TW-T505 Edge Computing Platform must be stable and reliable, with a power rating of 25W. Power range: 12–24 V DC; Current: 5A (MAX).

- Environmental Requirements

Operating temperature: -20°C to +50°C.
Ventilation: Ensure proper airflow around the installed platform.

- Grounding Requirements

The power adapter's supply must be properly grounded. In special cases, use the grounding screw on the platform for grounding.

For grounded devices only:

- Ground the device before installation and remove the ground wire last during disassembly.
- Do not damage grounding conductors.
- Do not operate the device without a grounded conductor.
- Permanently connect the device to protective earth. Check electrical connections before operation to confirm reliable grounding.

- ESD Protection

Electronic components are sensitive to electrostatic discharge (ESD). While key interfaces on circuit boards are ESD-protected, not all components are fully shielded. Follow ESD safety measures when handling circuit boards:

- Store and transport boards in anti-static bags until deployment.
- Discharge body static (e.g., wear grounding wrist straps) before touching the device.
- Operate only in ESD-safe areas.
- Avoid moving the device on carpeted surfaces.

- Basic Installation Requirements

- Only trained and authorized personnel may install, operate, or maintain the device.
- Only qualified and trained personnel are allowed to install, operate, or maintain the device.
- Only certified professionals may dismantle safety features or repair the device.
- Replacements or modifications (including software) must be performed by TwoWin-certified personnel.
- Report any faults or errors that may compromise safety to the responsible person immediately.

# Introduction

The TW-609 is a computing platform based on the NVIDIA® Jetson AGX Xavier module. It comes with an integrated AGX Xavier module, pre-installed Ubuntu OS, and delivers 32 TOPS of AI processing power. Designed with ultra-durable lightweight aluminum alloy, it features conductive passive cooling for excellent thermal performance. Compact and stylish, it offers a rich variety of I/O interfaces, including 8-channel GMSL2 camera inputs, and a bottom-mounted bracket for easy field installation. With stable operation, high computing power, reliability, integration, and low power consumption, it is suitable for autonomous applications such as unmanned cleaning vehicles, delivery robots, smart inspection, AGVs, and other autonomous driving fields.

**Overview of the TW-609 Edge Computing Platform**

- Embedded NVIDIA® Jetson AGX Xavier
- Supports M.2 Key M SSD expansion (PCIe x4 NVMe 2280)
- Multiple interface options (e.g., CAN/USB/Ethernet/Serial/GPIO)
- Dual-band Wi-Fi/4G/5G module support
- JAE automotive-grade I/O connectors (1xPOWER, 2xCAN, 4xGPIO)
- Fanless passive cooling design
- Pre-installed Ubuntu OS and JetPack SDKs

# Product Specifications

## Processor and Core Module

| | |
|---|---|
| Processor | NVIDIA Jetson AGX XAVIER |
| AI | 32TOPS |
| CPU | 8-core NVIDIA Carmel Arm®v8.2 64-bit CPU<br>8MB L2 + 4MB L3<br>2.2 GHz |
| GPU | 512-core NVIDIA Volta architecture GPU with 64 Tensor Cores<br>1377 MHz |
| Memory | 32GB 256-bit LPDDR4x 136.5GB/s |
| DL Accelerator | 2x NVDLA Engines |
| Storage | 1x 32GB eMMC 5.1 (built-in module)<br>2x M.2 Key M NVMe 2280 (optional installation) |

## Interface

| | Interface | Quantity | Note |
|---|---|---|---|
| LED | LED | 3 | POWER (Power Indicator)<br>RUN (Run Indicator)<br>ALARM(This indicator is inactive) |
| Function Key | POWER | 1 | Button |
| | RES | 1 | Button |
| | REC | 1 | Button |
| Serial Port | COM1 | 1 | Standard RS232 serial port |
| | COM2 | 1 | Standard RS232 serial port |
| | TIME SNYC | 1 | Standard RS232 serial port |
| SIM | NANO SIM | 1 | Nano SIM card slot |
| DEBUG | Debug Serial Port | 1 | USB2.0 TYPE-C |
| OTG | For Flashing Firmware | 1 | USB2.0 TYPE-C |
| Audio | Audio Output Interface | 1 | 3.5mm |
| JAE Automotive-grade IO Connector | CAN | 2 | Supports CAN FD |
| | GND | 2 | GND |
| | GPIO | 4 | Bidirectional input/output configurable<br>No optocoupler isolation (3.3V@1mA) |
| | VCC | 2 | Power supply 9V-36V |
| USB | USB | 4 | USB 3.0 TYPE-A 5V@1A |
| Ethernet | RJ45 | 2 | Gigabit Ethernet port |
| Video output | HDMI | 1 | HDMI 2.0 compatible with 1.4 (output only) |
| CAMERA | GMSL-CAMERA | 8 | Fakra connector |
| WIFI | WIFI Antenna Port | 2 | SMA |
| 4/5G | 4/5G Antenna Port | 4 | SMA |

| | | | |
|---|---|---|---|
| GPS | GPS Antenna Port | 1 | SMA |

## Codec

| | |
|---|---|
| Video Encode | 4x 4K60 (H.265)<br>8x 4K30 (H.265)<br>16x 1080p60 (H.265)<br>32x 1080p30 (H.265) |
| Video Decode | 2x 8K30 (H.265)<br>6x 4K60 (H.265)<br>12x 4K30 (H.265)<br>26x 1080p60 (H.265)<br>52x 1080p30 (H.265) |

## Power supply

| Power supply | Spec |
|---|---|
| Input type | MX23A12SF1 |
| Input voltage | Wide input 13-36v |
| Typical consumption | 60w |

## Structure

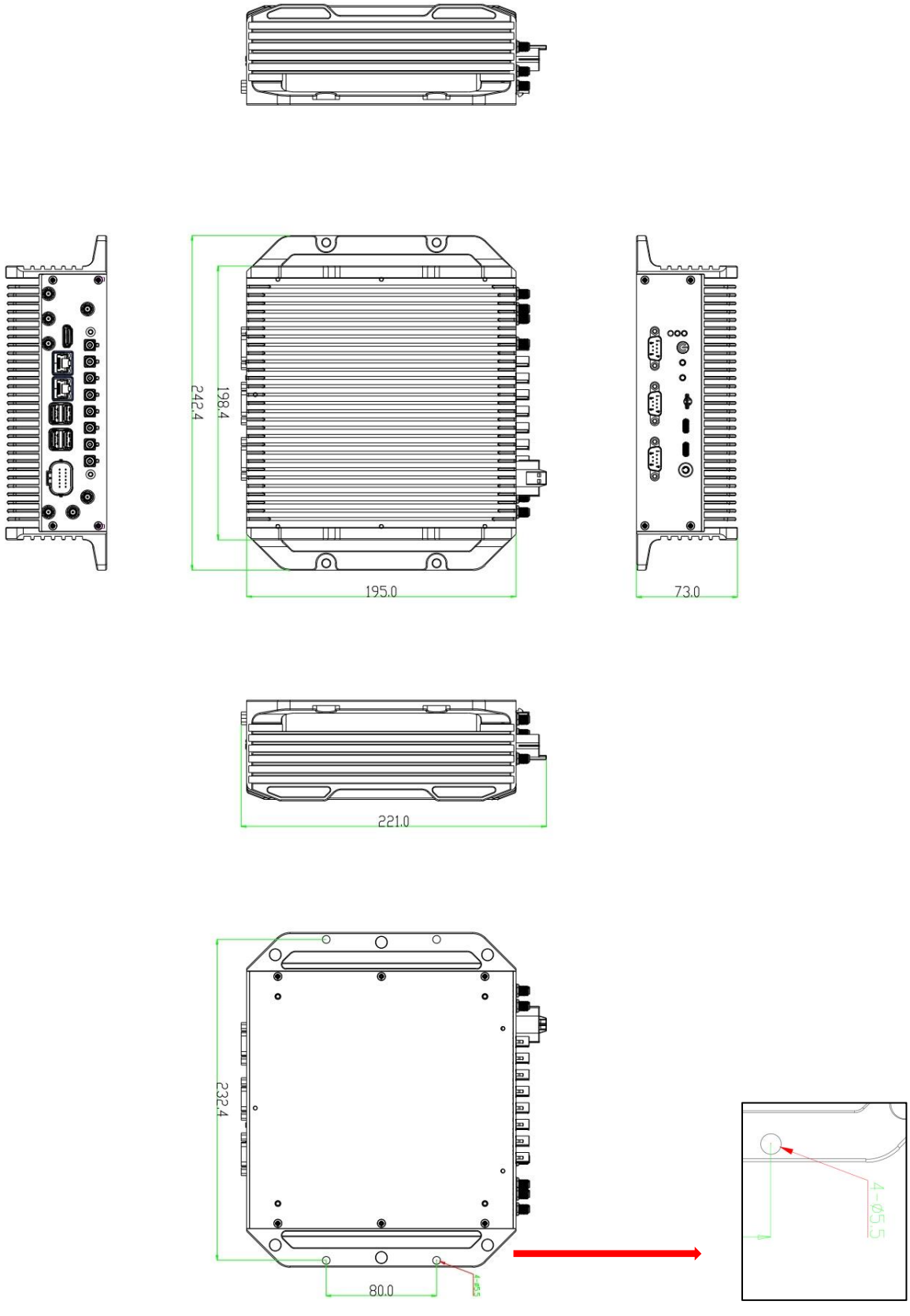
| Mechanical | Spec |
|---|---|
| Dimensions (w×h×d) | 242(w)mm×195(d)mm ×73.0(h)mm |
| Weight | 2500 g |

## Environment

| Environmental | Spec |
|---|---|

| | |
|---|---|
| Operating temperature | -20℃-60℃ |
| Storage humidity | 10%-90% non-condensing |

## Size



# Service and Support

## Technical Support

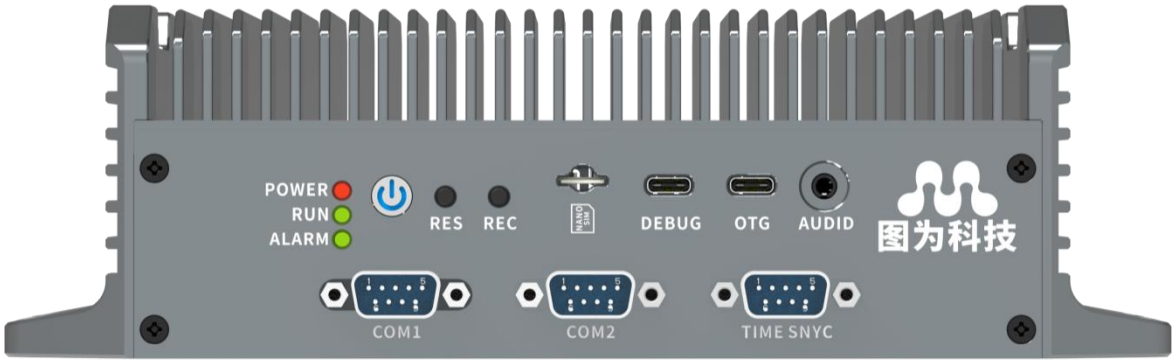
If you encounter any issues or believe your product is defective, please visit our official website and browse our FAQ section for solutions to common problems. You can also contact us via phone or WeChat. We will promptly arrange the necessary support to address your needs and resolve your concerns.

## Warranty

Warranty Period: The warranty period for the device is one year from the date of purchase. Warranty Terms: During the warranty period, if the product malfunctions due to non-human factors, we will provide free warranty service. Please contact customer service through the purchase platform or by phone for warranty assistance. (For details, please refer to the warranty terms of Twowin Information Technology (Shenzhen) Co., Ltd.).

# Interface Description

## Front Panel Interface




TW-609 Front Interface Diagram

| Interface | Interface Name | Description |
|---|---|---|
| POWER_LED | Power Status Indicator | After power is connected: The indicator light stays on |
| RUN_LED | System Status Indicator | After the system is running: The indicator light stays on. |
| ALARM | Reserved Indicator Light | no practical effect |
| POWER_key | Power button | Press and hold to power off |
| RES | Reset button | Standalone use for reset and reboot; combine with REC to enter recovery mode. |
| REC | Restore button | No effect when used alone; press together with the reset button to enter recovery mode |
| SIM | Nano SIM card slot | Insert the SIM card in the direction as shown in the diagram |
| DEBUG | Debug Serial Port | USB2.0 Type-C Debug Serial Port |
| OTG | Type-C interface | USB 2.0 Type-C firmware Flashing Guide |
| AUDIO | Audio output interface | 3.5mm |
| TIME SNYC | RS232 | Standard RS232 serial port (corresponding to device name: ttyTHS0) |
| COM1 | RS232 | Standard RS232 serial port (corresponding to device name: ttyTHS1) |
| COM2 | RS232 | Standard RS232 serial port (corresponding to device name: ttyTHS4) |

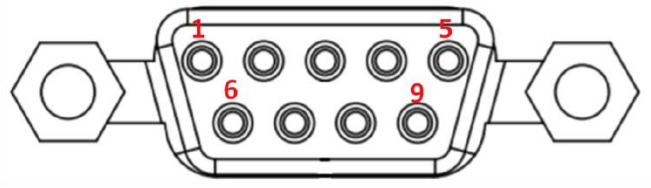
RECOVERY Mode:

This is the mode required for flashing the system, primarily used for system installation. The method to enter Recovery Mode on this device is as follows:

First, press and hold the REC button, then press and hold the RES button without releasing the REC button. After 2 seconds, release the RES button, and finally release the REC button.

On the host terminal, enter the command `lsusb` to check if "NVIDIA Corp" is listed. If it appears, it indicates a successful entry into Recovery Mode.

## Serial Port Description

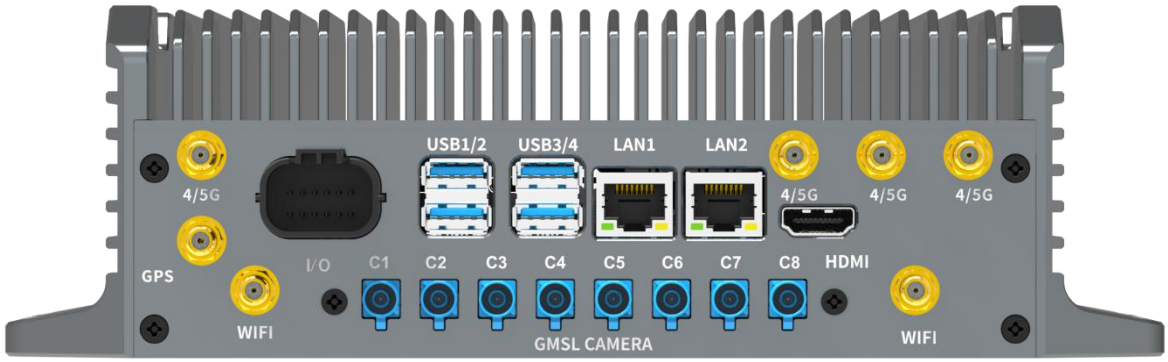



D-SUB connector pin sequence

COM1\COM2\TIME SNYC

| RS-232 Connector PIN Definition | | | |
|---|---|---|---|
| PIN# | Definition | PIN# | Definition |
| 1 | NC | 2 | RXD |
| 3 | TXD | 4 | NC |
| 5 | GND | 6 | NC |
| 7 | NC | 8 | NC |
| 9 | NC | | |

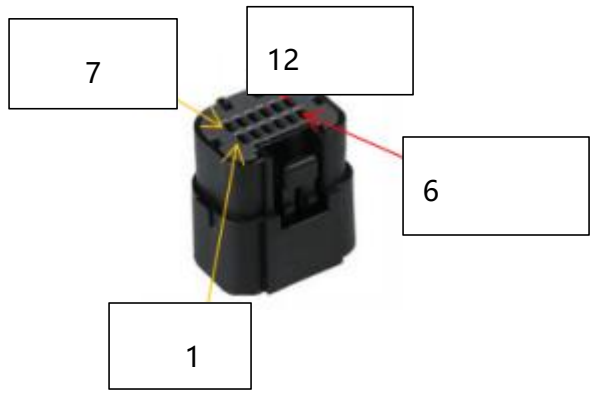
## Rear Interface




T609 Rear Interface Diagram

| Interface | Interface Name | Interface Description |
|---|---|---|
| WIFI | WIFI Antenna Port External | WIFI Antenna (SMA Interface) |
| 4/5G | 4/5G Antenna Port | External 4G/5G antenna (SMA interface) |
| GPS | GPS antenna interface | External GPS Antenna (SMA Interface) |
| JAE Automotive-grade IO Connector | Multi-functional IO Interface | Device power supply interface, including pins such as CAN and GPIO |
| USB×4 | USB 3.0 | USB 3.0 TYPE-A 5V@1A |
| LAN1 | Gigabit Ethernet Port | RJ45 Gigabit port, backward compatible with 100Mbps ports |
| LAN2 | Gigabit Ethernet Port | RJ45 Gigabit port, backward compatible with 100Mbps ports |
| HDMI | HDMI Interface | Standard HDMI2.0 output |
| GMSL CAMERA | GMSL2 Camera Interface | 8x GMSL2 (Fakra connector) |

JAE Automotive Grade IO Connector Definition




| 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| VCC-IN | GPIO3 | GND | CAN-H1 | CAN-H0 | GPIO1 |
| 12 | 11 | 10 | 9 | 8 | 7 |
| VCC-IN | GPIO4 | GND | CAN-L1 | CAN-L0 | GPIO2 |

GPIO Interface Definition:

| PIN# | Definition | PIN# | Defin |
|---|---|---|---|
| 1 | GPIO1_PQ.01<br>(GPIO 417) | 7 | GPIO2_PBB.02<br>(GPIO 258) |
| 5 | GPIO3_PA.02<br>(GPIO 290) | 11 | GPIO4_PG.07<br>(GPIO 343) |

**GPIO Testing:**

Example: GPIO3

```
sudo cat /sys/kernel/debug/gpio | grep 290    #Check the status of GPIO290

sudo chmod 777 /sys/class/gpio/export
sudo echo 290 > /sys/class/gpio/export
sudo chmod 777 /sys/class/gpio/gpio290/value
sudo chmod 777 /sys/class/gpio/gpio290/direction    #Add GPIO290
sudo echo "in" > /sys/class/gpio/gpio290/direction    #Set GPIO290 as input

sudo echo "out" > /sys/class/gpio/gpio290/direction    #Set GPIO290 as output
sudo echo 0 > /sys/class/gpio/gpio258/value    #Set GPIO258 to output low level
sudo echo 1 > /sys/class/gpio/gpio258/value    #Set GPIO258 to output high level
```

**CAN Testing:**

Refer to the file /home/nvidia/twork/can_test

# Feature Description

## System Introduction

**The TW-T609 device runs on the Ubuntu system. Default username: nvidia | Password: nvidia**

**Our company has not set a root username or password. If you need to access the root user, please execute the following commands:**

```
sudo -s
```

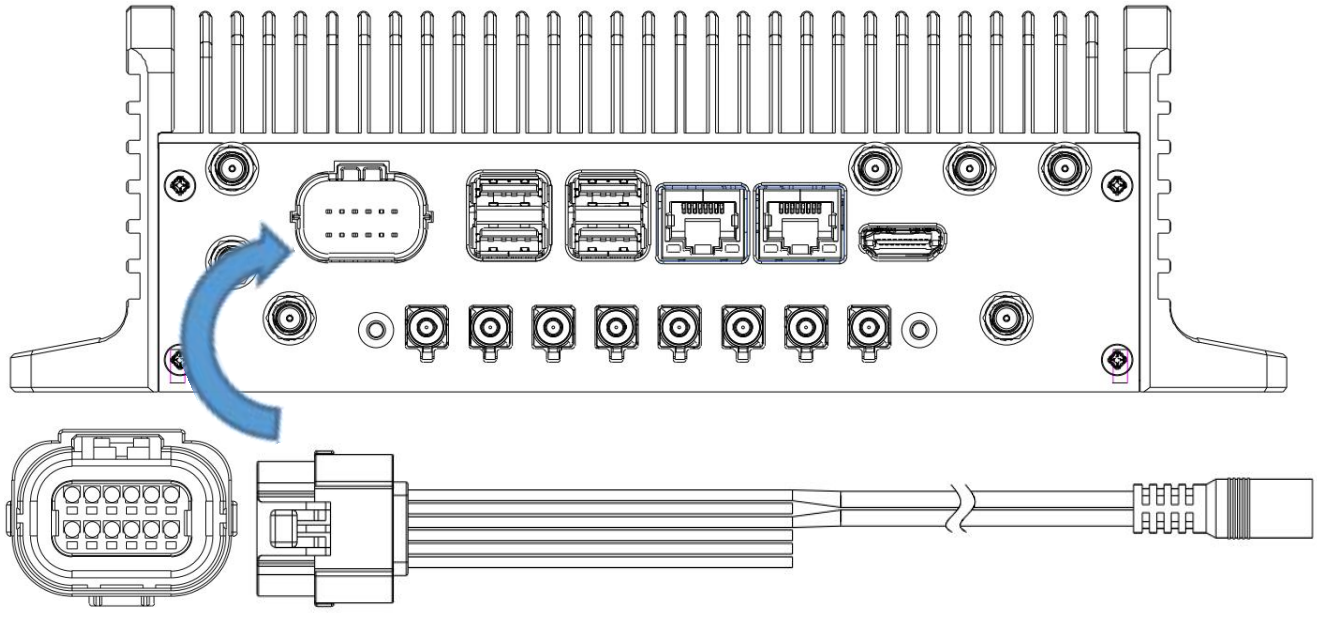
**Enter the password: nvidia**

**Note: Since the interface driver of this device is developed by our company and differs from the interface driver of the NVIDIA development board, using the `upgrade` command will update the kernel and overwrite the device tree. If you must use `upgrade` for updates, please run the following command before proceeding:**

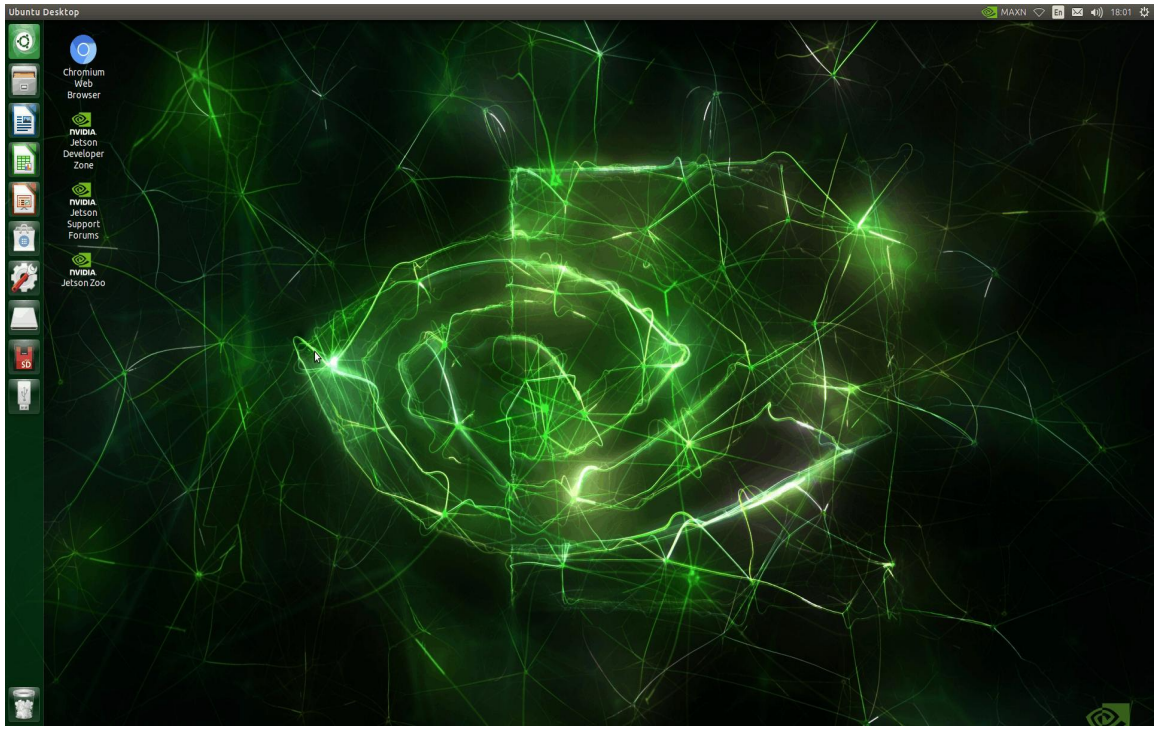
```
sudo mv /etc/apt/sources.list.d/nvidia-l4t-apt-source.list  /etc/apt/sources.list.d/nvidia-l4t-apt-source.list.bak
sudo apt-get update
sudo apt-get upgrade
```

## Power On/Off

Power On: The TW-T609 device defaults to automatic power-on upon connection. Insert the power supply and connect the cable to the device as shown in the figure below:



Connect the monitor to the device via the HDMI interface, and the desktop upon startup will appear as shown below:




Power-on desktop

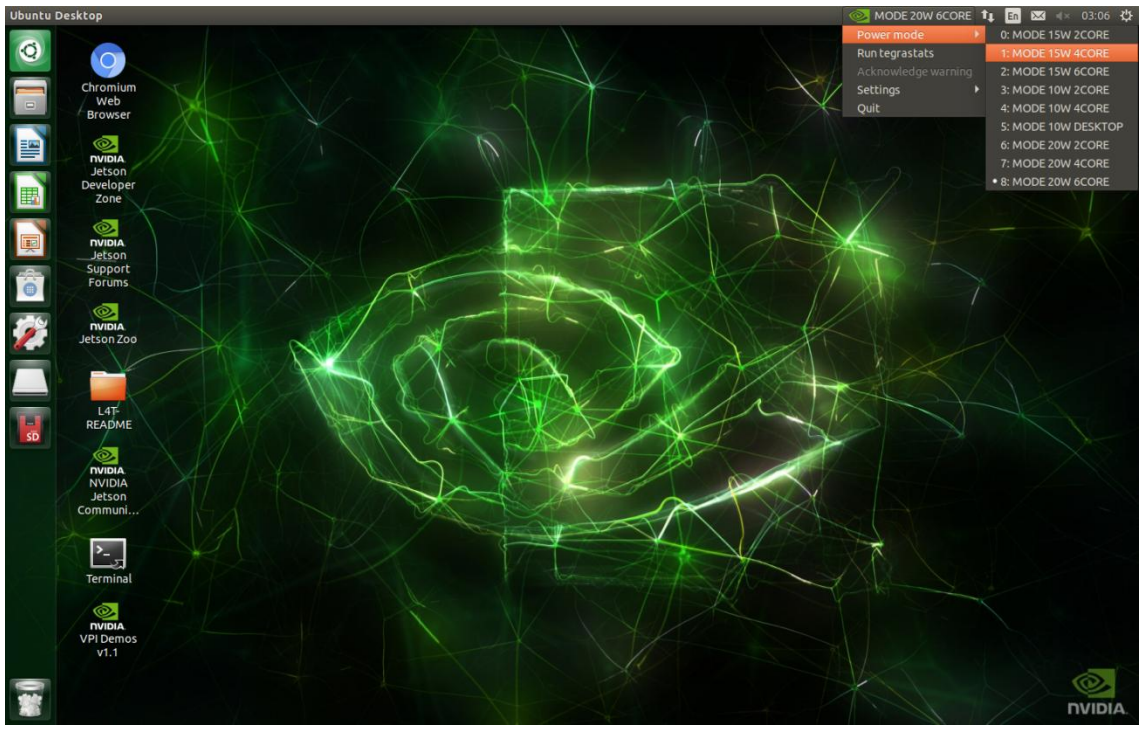
Power Off:Long press the POWER button to shut down, or execute `shutdown` within the system for a software-based power-off.

Restart: Execute `$ sudo reboot` in the command line to complete a restart. Alternatively, press the RESET button (a single press is sufficient).

Note: Do not directly disconnect the main power supply to shut down, as this operation carries the risk of damaging the disk.

## Work Mode Switching

Different work modes utilize varying CPU cores and power levels, allowing you to choose according to your needs. Click the option indicated by the arrow to select a mode (the example below shows the work modes for the Jetson NX module).

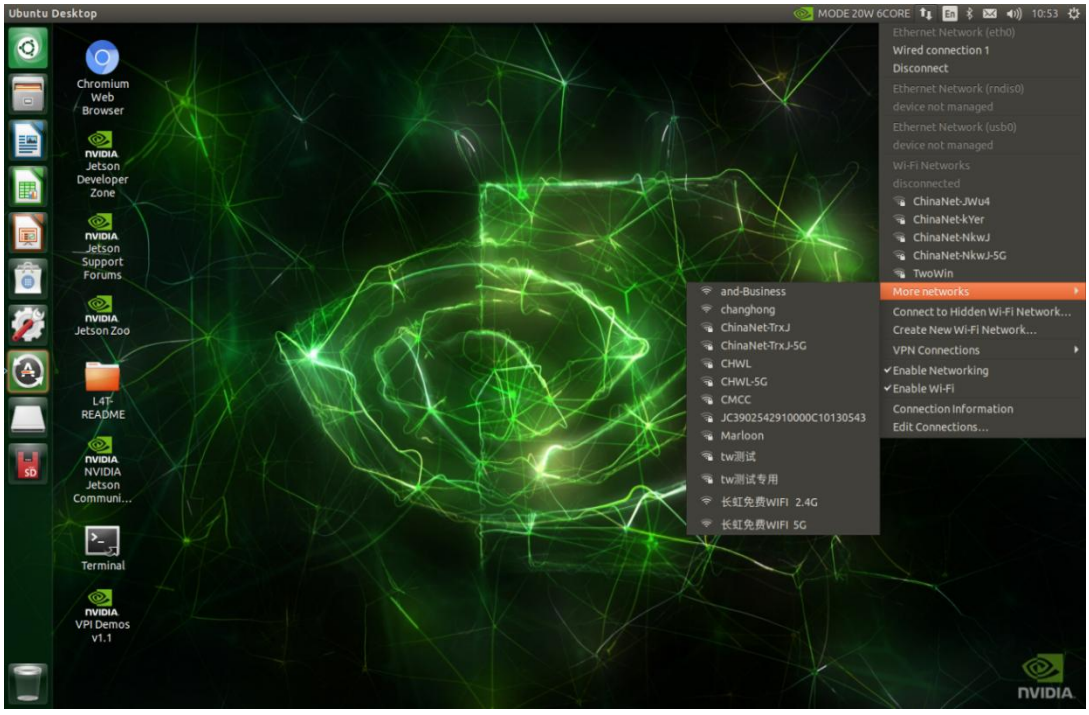


# WIFI Connection (If Equipped)

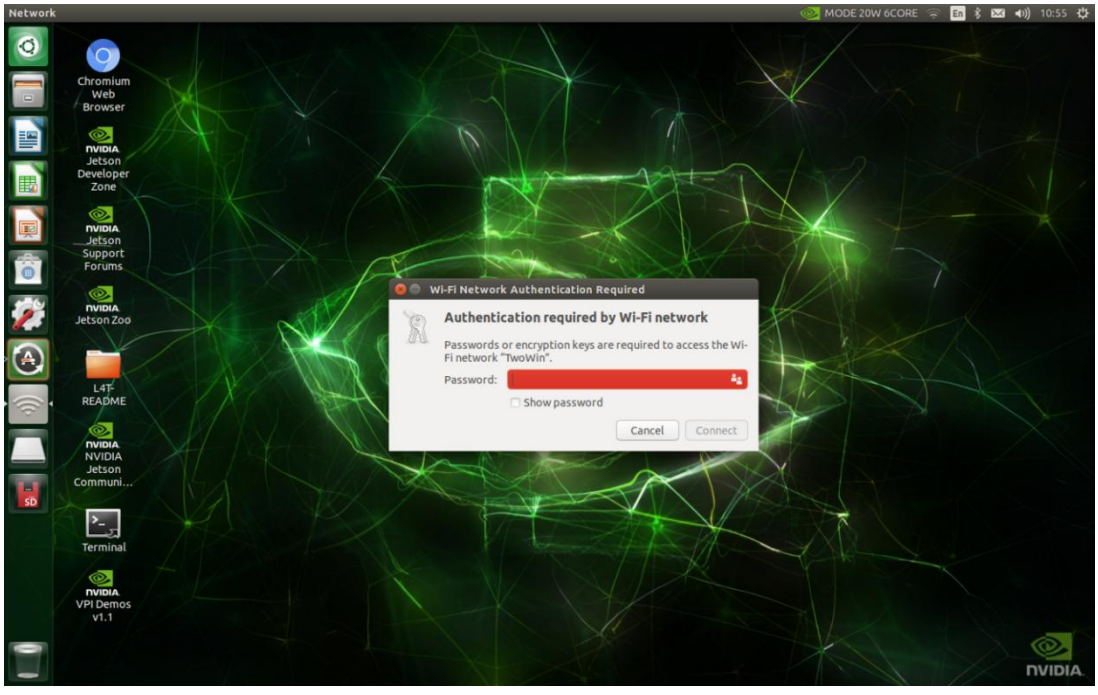
There are multiple ways to connect to WIFI. Below are the methods for connecting via the graphical interface and using the nmcli tool in the terminal command line:

1、Connect to Wi-Fi via graphical interface

Click on the network icon.

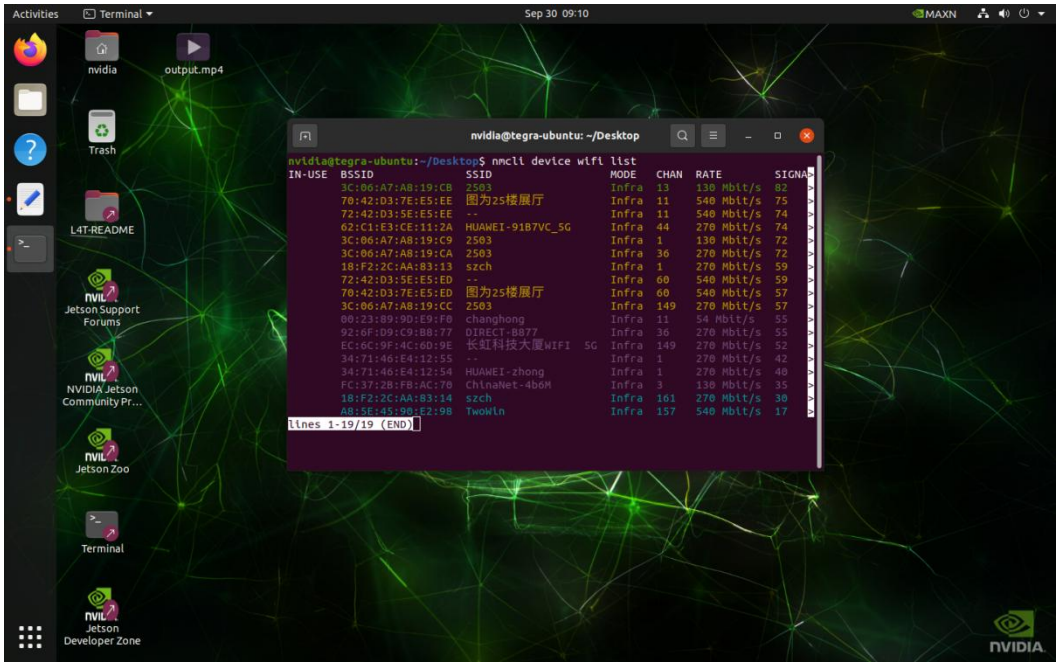



Select the Wi-Fi you want to connect to and enter the password.



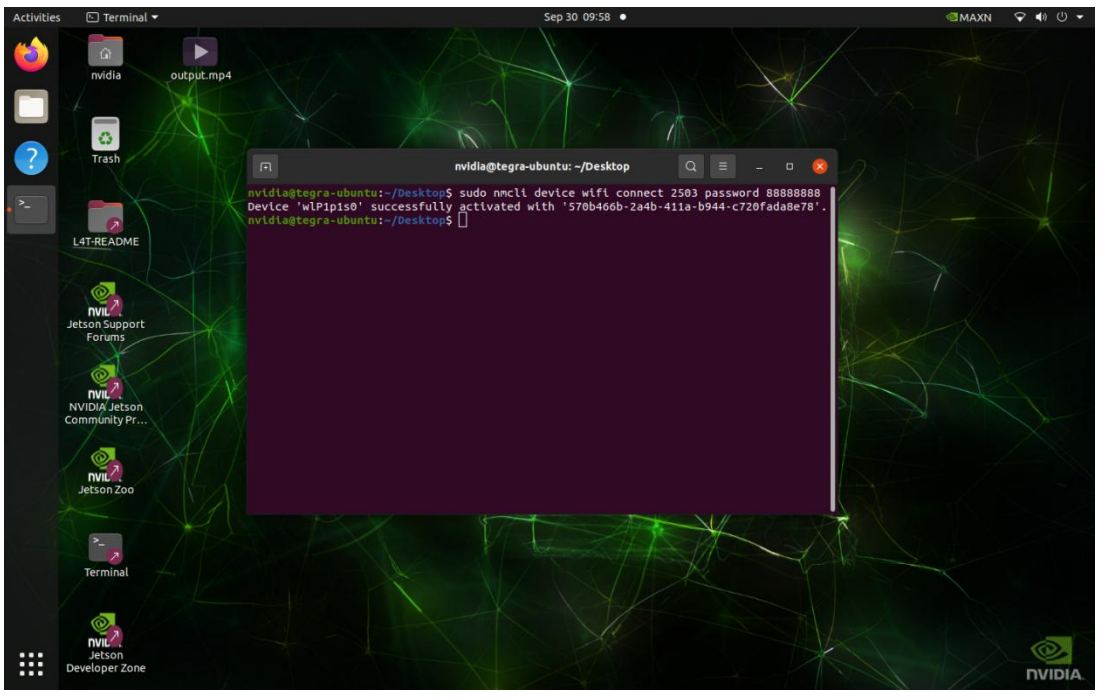
2、Connect to WiFi via Terminal Commands

Enter `nmcli device wifi list` in the terminal to list available WiFi networks:




Connecting to WiFi

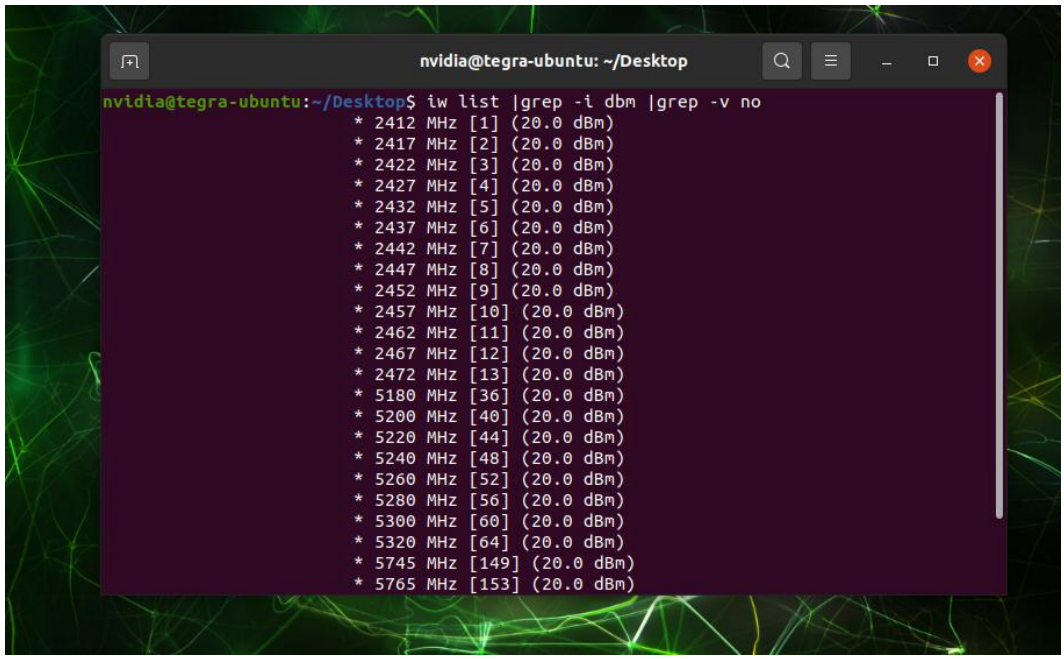
In the terminal, enter: `sudo nmcli device wifi connect MyWiFiSSID password MySecretPassword`




At this point, you can use the WiFi network.

3、Configure WiFi as a Hotspot

iw list | grep -i dbm | grep -v no # View currently available channels

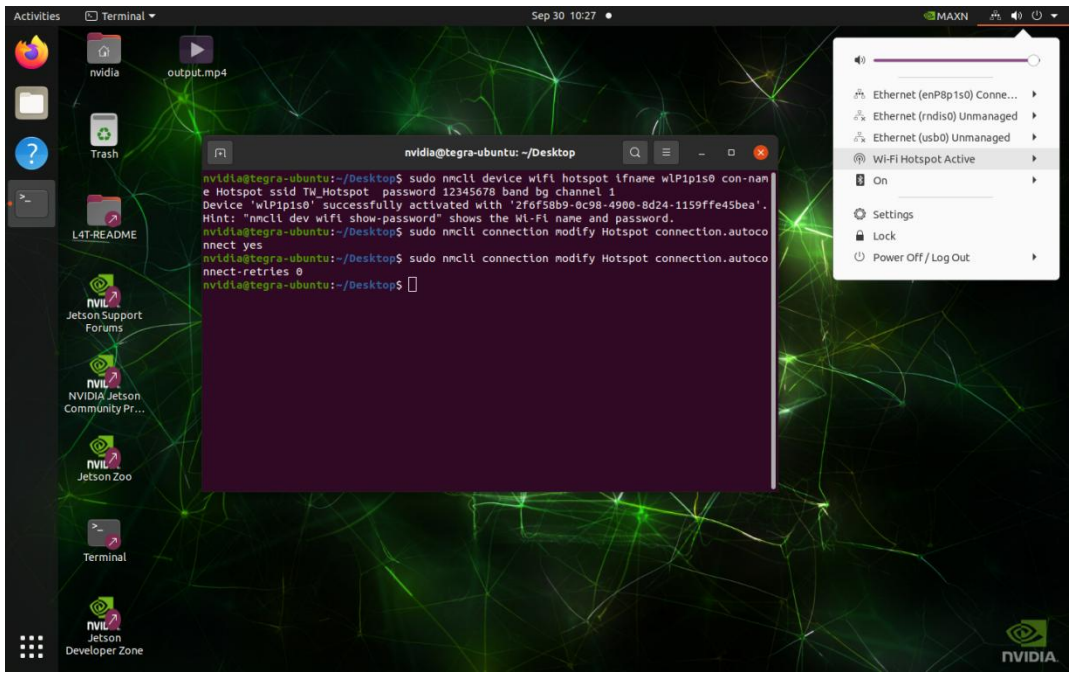



Creating a hotspot using the nmcli tool:

sudo nmcli device wifi hotspot ifname wlP1p1s0 con-name Hotspot ssid TW_Hotspot password 12345678 band bg channel 1

sudo nmcli connection modify Hotspot connection.autoconnect yes

sudo nmcli connection modify Hotspot connection.autoconnect-retries 0



# 4G Dial-up Internet Access (if equipped)

Using the nmcli Tool for Dial-up

1. Check existing connections and delete any GSM-type connection configurations if they exist. If none are present, skip this step.

nmcli connection

sudo nmcli connection delete uuid xxxxx(Fill in according to the actual ID number)

```
nvidia@nvidia-desktop:~$ nmcli connection
NAME                    UUID                                  TYPE      DEVICE
l4tbr0                  6a8f933c-73bb-42fa-9794-f5d611110faf  bridge    l4tbr0
docker0                 9d20eaac-a33c-420f-8ead-b66c47ed81d3  bridge    docker0
China Mobile Internet   60246731-703a-49ca-b80e-355ed602a237  gsm       --
Wired connection 1      d34ebb2e-8acb-3470-a3c1-cad4d96aa268  ethernet  --
Wired connection 2      b4cce976-8a88-3d15-aa55-b2076a71d671  ethernet  --
Wired connection 3      3e8d52cf-6e7d-3d27-a9ba-8ec330fe03d8  ethernet  --
netplan-eth0            626dd384-8b3d-3690-9511-192b2c79b3fd  ethernet  --
netplan-wlan0-图为2404  ffb0da53-9a6f-3fd3-8e7d-d153624e1f6d  wifi      --
图为2404                22db099b-8736-4527-ba75-c067465ce787  wifi      --
nvidia@nvidia-desktop:~$ sudo nmcli connection delete uuid 60246731-703a-49ca-b80e-355ed602a237
Connection 'China Mobile Internet' (60246731-703a-49ca-b80e-355ed602a237) successfully deleted.
nvidia@nvidia-desktop:~$ nmcli connection
NAME                    UUID                                  TYPE      DEVICE
l4tbr0                  6a8f933c-73bb-42fa-9794-f5d611110faf  bridge    l4tbr0
docker0                 9d20eaac-a33c-420f-8ead-b66c47ed81d3  bridge    docker0
Wired connection 1      d34ebb2e-8acb-3470-a3c1-cad4d96aa268  ethernet  --
Wired connection 2      b4cce976-8a88-3d15-aa55-b2076a71d671  ethernet  --
Wired connection 3      3e8d52cf-6e7d-3d27-a9ba-8ec330fe03d8  ethernet  --
netplan-eth0            626dd384-8b3d-3690-9511-192b2c79b3fd  ethernet  --
netplan-wlan0-图为2404  ffb0da53-9a6f-3fd3-8e7d-d153624e1f6d  wifi      --
图为2404                22db099b-8736-4527-ba75-c067465ce787  wifi      --
nvidia@nvidia-desktop:~$
```

2、Create a 4G Dial-up Connection

sudo nmcli connection add type gsm ifname '*' con-name twgsm

Some SIM cards require additional APN parameters to be successfully created. Add the parameter `gsm.apn <apn_name>` at the end.

For reference: - China Unicom: `3gnet` - China Mobile: `cmnet` - China Telecom: `ctnet`

sudo nmcli connection add type gsm ifname '*' con-name twgsm gsm.apn 3gnet

```
nvidia@nvidia-desktop:~$ sudo nmcli connection add type gsm ifname '*' con-name twgsm
Connection 'twgsm' (ac738f0c-59c8-4c8d-8945-95173781a696) successfully added.
nvidia@nvidia-desktop:~$ nmcli connection
NAME                    UUID                                  TYPE      DEVICE
twgsm                   ac738f0c-59c8-4c8d-8945-95173781a696  gsm       ttyUSB2
l4tbr0                  6a8f933c-73bb-42fa-9794-f5d611110faf  bridge    l4tbr0
docker0                 9d20eaac-a33c-420f-8ead-b66c47ed81d3  bridge    docker0
Wired connection 1      d34ebb2e-8acb-3470-a3c1-cad4d96aa268  ethernet  --
Wired connection 2      b4cce976-8a88-3d15-aa55-b2076a71d671  ethernet  --
Wired connection 3      3e8d52cf-6e7d-3d27-a9ba-8ec330fe03d8  ethernet  --
netplan-eth0            626dd384-8b3d-3690-9511-192b2c79b3fd  ethernet  --
netplan-wlan0-图为2404  ffb0da53-9a6f-3fd3-8e7d-d153624e1f6d  wifi      --
图为2404                22db099b-8736-4527-ba75-c067465ce787  wifi      --
```

3、Configure Connection Properties

```
nvidia@nvidia-desktop:~$ sudo nmcli connection modify twgsm connection.autoconnect yes
nvidia@nvidia-desktop:~$ sudo nmcli connection modify twgsm connection.autoconnect-retries  0
nvidia@nvidia-desktop:~$ sudo nmcli connection modify twgsm connection.autoconnect-priority 0
nvidia@nvidia-desktop:~$ sudo nmcli connection modify twgsm ipv6.method disable
nvidia@nvidia-desktop:~$ sudo nmcli connection modify twgsm connection.metered no
```

sudo nmcli connection modify twgsm connection.autoconnect yes # Enable auto-connect
sudo nmcli connection modify twgsm connection.autoconnect-retries 0 # Set retry attempts (0 means unlimited)
sudo nmcli connection modify twgsm connection.autoconnect-priority 0 # Set connection priority
sudo nmcli connection modify twgsm ipv6.method ignore # Disable IPv6 (disable IPv4 if using IPv6)
sudo nmcli connection modify twgsm connection.metered no # Disable metered connection

4、Check dialing status

```
nvidia@nvidia-desktop:~$ ifconfig ppp0
ppp0: flags=4305<UP,POINTOPOINT,RUNNING,NOARP,MULTICAST>  mtu 1500
        inet 10.19.48.238  netmask 255.255.255.255  destination 0.0.0.0
        ppp  txqueuelen 3  (Point-to-Point Protocol)
        RX packets 11  bytes 1031 (1.0 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 12  bytes 509 (509.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

nvidia@nvidia-desktop:~$ route -n
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0         0.0.0.0         0.0.0.0         U     700    0        0 ppp0
0.0.0.0         192.168.55.100  0.0.0.0         UG    32766  0        0 l4tbr0
169.254.0.0     0.0.0.0         255.255.0.0     U     1000   0        0 l4tbr0
172.17.0.0      0.0.0.0         255.255.0.0     U     0      0        0 docker0
192.168.55.0    0.0.0.0         255.255.255.0   U     0      0        0 l4tbr0
nvidia@nvidia-desktop:~$ nmcli connection
NAME                UUID                                  TYPE      DEVICE
twgsm               7f060dc2-d405-47eb-bbe1-129d12fbf132  gsm       ttyUSB2
l4tbr0              5ce18233-2a87-4670-a59e-79d97ea1b2cb  bridge    l4tbr0
docker0             8286c4c1-7408-4660-838d-159414eaa235  bridge    docker0
Wired connection 1  d34ebb2e-8acb-3470-a3c1-cad4d96aa268  ethernet  --
Wired connection 2  b4cce976-8a88-3d15-aa55-b2076a71d671  ethernet  --
Wired connection 3  3e8d52cf-6e7d-3d27-a9ba-8ec330fe03d8  ethernet  --
netplan-eth0        626dd384-8b3d-3690-9511-192b2c79b3fd  ethernet  --
netplan-wlan0-图为2404  ffb0da53-9a6f-3fd3-8e7d-d153624e1f6d  wifi      --
图为2404            22db099b-8736-4527-ba75-c067465ce787  wifi      --
nvidia@nvidia-desktop:~$
```

The information color on nmcli connection is:

Green: Connected

Yellow: Connected

White: Connected

6. Notes

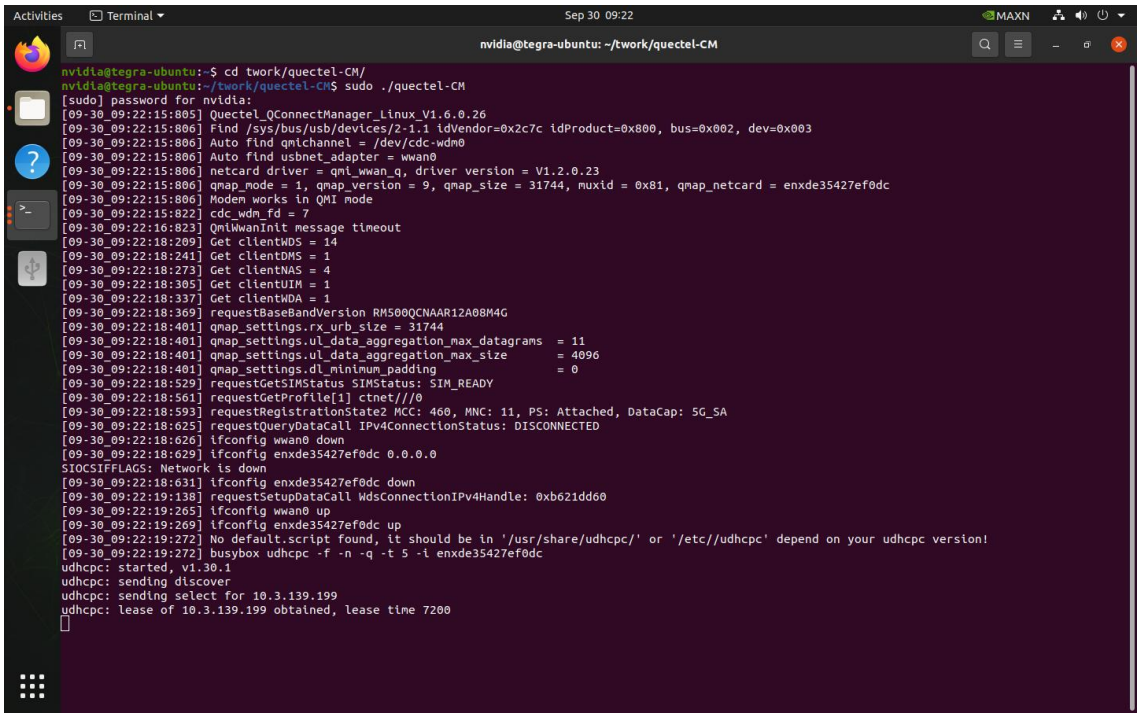
Some SIM cards (such as IoT cards) may fail to establish a dial-up connection. Please confirm the card's status with the provider. (IoT cards may have regional restrictions, lock restrictions, dedicated network restrictions, etc.)

## 5G Dial-Up Internet (if configured)

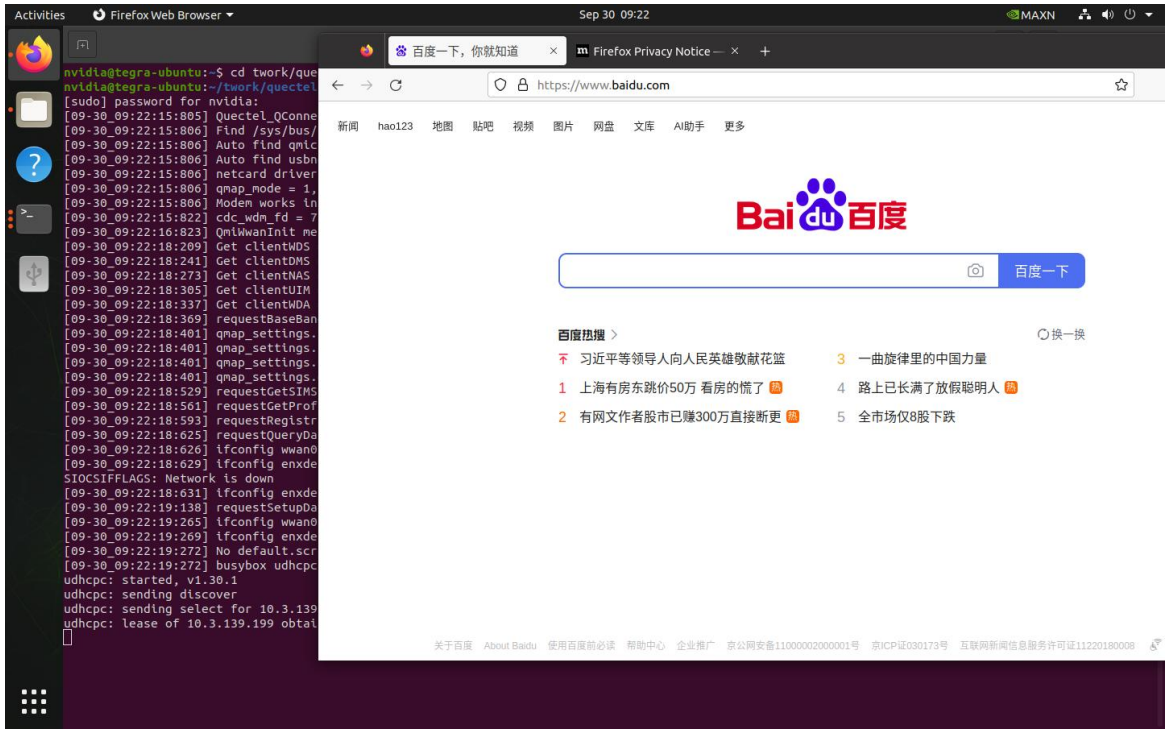
Find the 5G dial-up file in the main directory /home/nvidia/twork/quectel-CM #The path may be different, please search according to the actual path

sudo ./quectel-CM Locate the 5G dial-up file in the main directory: /home/nvidia/twork/quectel-CM #The path may vary; please verify the actual path.

sudo ./quectel-CM




The appearance of IP indicates that the dial-up is successful, and you can now access the Internet.



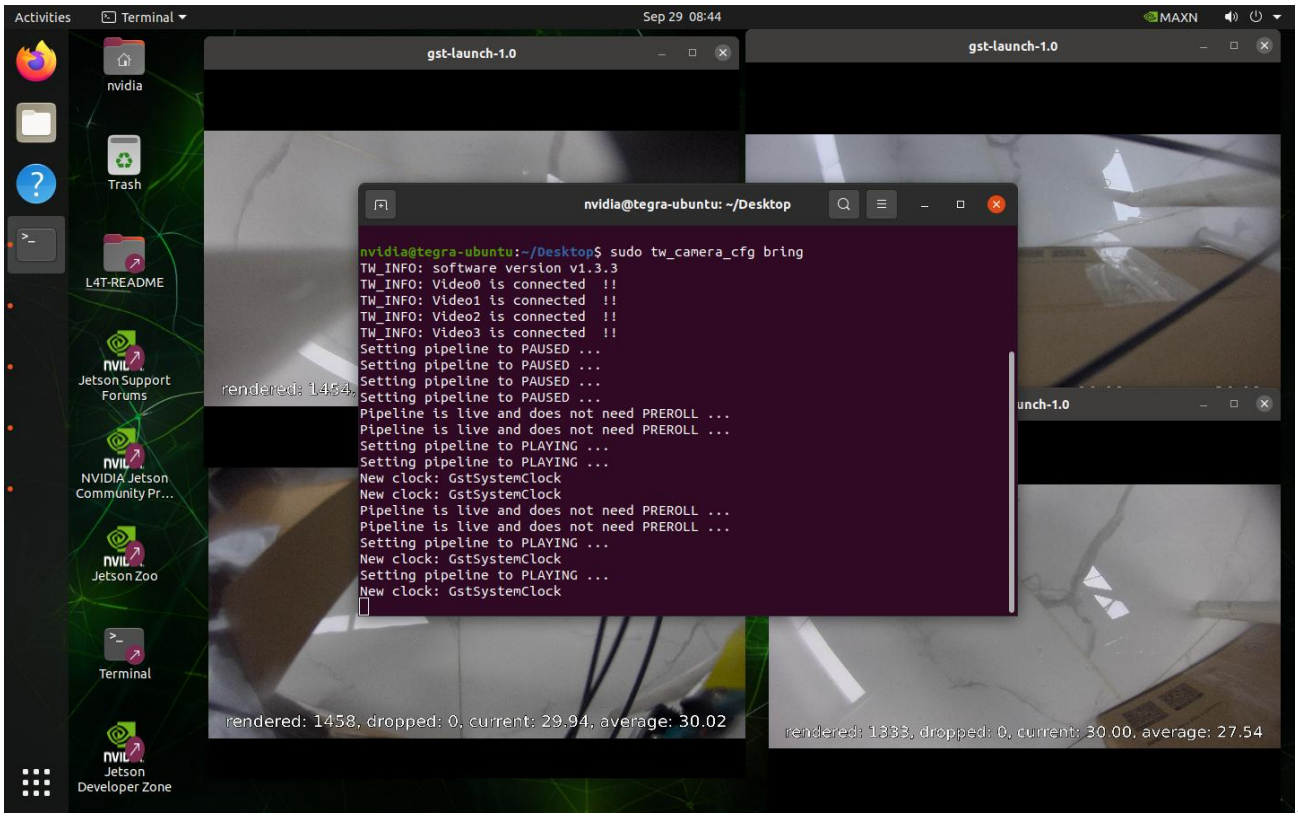

Note: The dialing port cannot be exited. If exited, the dialing process will terminate. You may choose to perform dialing in the background in advance.

## GMSL Camera

Taking the example of connecting 4 Senyun IMX-390 cameras:

The device comes with the Senyun IMX-390 driver by default. Execute the following command to enable preview:

gst-launch-1.0 v4l2src device=/dev/video0 ! 'video/x-raw,format=UYVY,width=1920,height=1080' ! videoconvert ! fpsdisplaysink video-sink=xvimagesink sync=false




其它

Command Usage Reference:

Recording video using hardware encoding with NVENC:

gst-launch-1.0 v4l2src device=/dev/video0 ! 'video/x-raw, width=1920, height=1080, format=UYVY' ! nvvidconv ! 'video/x-raw(memory:NVMM), format=I420' ! nvv4l2h264enc bitrate=5000000 ! h264parse ! matroskamux ! filesink location=output.mp4

# Twowin Information Technology Co., Ltd Warranty Regulations

Important Notes

Twowin Information Technology (Shenzhen) Co., Ltd. warrants that each embedded product provided is free from material or manufacturing defects to the best of its knowledge and complies fully with the original factory specifications at the time of shipment.

The warranty scope of Twowin covers all original factory products. For issues with dealer-configured accessories, contact the dealer for resolution. All products carry a one-year warranty (starting from the factory shipment date). Lifetime repair services are provided for products beyond the warranty period. Repaired components receive an extended warranty of 12 months. Unless otherwise notified by Twowin, the factory shipment date on the original delivery note shall be deemed the product's shipment date.

How to Obtain Warranty Services

If your product malfunctions during the warranty period, contact Twowin or an authorized dealer to initiate warranty services. When requesting warranty services, present a purchase invoice as proof of entitlement to warranty services (this serves as your legal documentation for claiming warranty services).

Warranty Resolution Measures

When requesting warranty services, you must follow the procedures established by Twowin for issue identification and resolution. You will need to undergo an initial diagnosis via phone or email with Twowin's technical staff. During this process, you must fully complete all details in the provided repair request form to ensure accurate diagnosis of the fault cause and damage location (for out-of-warranty products, a service quotation will be provided for your confirmation).

Twowin reserves the right to either repair or replace the reported product. If the product is replaced or repaired, the replaced "defective" product or repaired components will be returned to Twowin.

Since some repaired products require shipment to the original factory, Twowin strongly advises purchasing transportation insurance to avoid accidental loss/damage. If you decline insurance, Twowin shall not be held liable for any loss or damage during transit.

For warranty-covered products:
The user bears return shipping fees for products sent to Twowin for repair.
Twowin bears return shipping fees for repaired/replaced products delivered to users.

Exclusions from Warranty:
1.Damage due to improper installation, misuse, abuse (e.g., overload), or accidental mishandling.
2.Failures caused by improper maintenance, neglect (e.g., fire, explosion), or natural disasters (e.g., lightning, earthquakes, typhoons).
3.Unauthorized modifications to the product (e.g., circuitry, mechanical components, software, three-proof treatment).
4.Faults arising from:
Voltage irregularities (overvoltage, undervoltage, floating ground voltage).
Bent/pinched pins, incorrect bus connections, component detachment.
Electrostatic discharge, excessive temperature/humidity, poor transportation.
5.Tampering, removal, or alteration of product labels or part numbers.
6.Claims submitted after the warranty period expires.

Special Provisions:

If the same fault recurs in multiple products or the same device, our company reserves the right to require users to provide peripheral devices or technical documentation (e.g., monitors, I/O devices, cables, power supplies, connection diagrams, system architecture) to diagnose root causes.

Failure to comply will result in denial of warranty claims. Repairs will incur market-rate fees and a repair deposit.