ED-IPC2500

User Manual

by EDA Technology Co., Ltd

built: 2025-08-01

1 Hardware Manual

This chapter introduces the product overview, packing list, appearance, button, indicator and interface.

1.1 Overview

The ED-IPC2500 is a 5G industrial computer based on the Raspberry Pi CM4. Depending on the application scenario and user requirements, computer systems with different RAM and eMMC specifications can be selected.

- RAM options include 1GB, 2GB, 4GB, and 8GB.
- eMMC options include 8GB, 16GB, and 32GB.

The ED-IPC2500 provides commonly used interfaces such as HDMI, USB 2.0, and Ethernet. It supports network access via Wi-Fi, Ethernet, and 5G. The integration of a supercapacitor backup power supply (optional), RTC (Real-Time Clock), Watch Dog, EEPROM, and an encryption chip enhances the product's ease of use and reliability. It is mainly used in industrial control and Internet of Things (IoT) fields.

1.2 Packing List

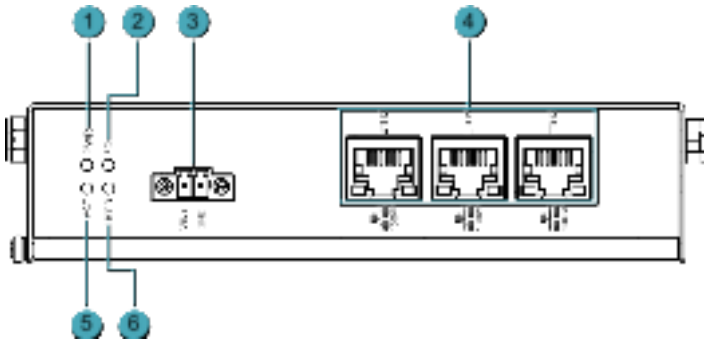
- 1 x ED-IPC2500 Unit
- [WiFi/BT Version - optional] 1 x 2.4GHz/5GHz Wi-Fi/BT Antenna

1.3 Appearance

Introducing the functions and definitions of interfaces on each panel.

1.3.1 Front Panel

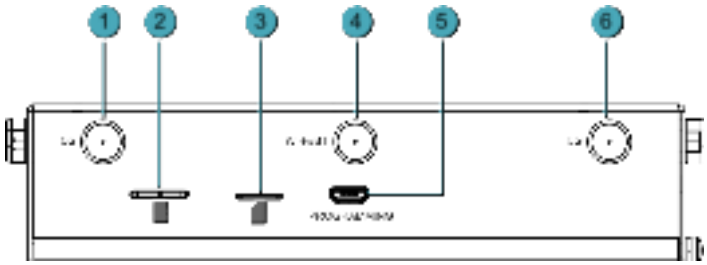
This section introduces functions and definitions of front panel.



NO.	Function Definition
1	1 x red power indicator, which is used to check the status of device power-on and power-off.
2	1 x green 5G indicator, which is used to check the status of 5G signal.
3	1 x DC input, 2-Pin 3.5mm spacing phoenix terminals with screw holes. It supports 9V~36V input, the signal is defined as VIN+/GND.
4	3 × 1000M Ethernet interfaces (ETH0–ETH2), RJ45 connector with LED indicators, 10/100/1000M auto-sensing interfaces for Ethernet connection.
5	1 x green system status indicator, which is used to check the working status of device.
6	1 x green user indicator, user can customize a status according to actual application.

1.3.2 Rear Panel

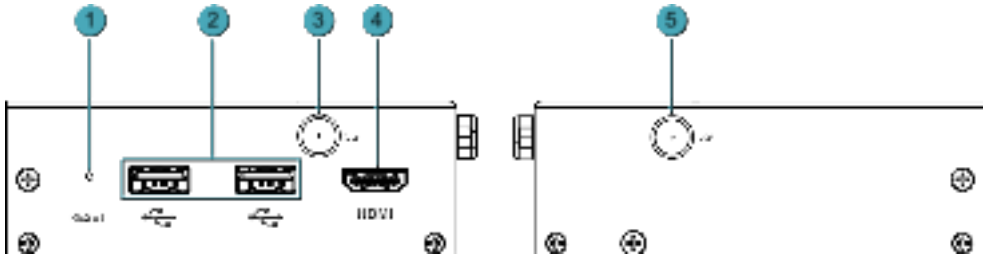
This section introduces interfaces and definitions of rear panel.



NO.	Function Definition
1	1 x 5G antenna port, SMA connector, which can connect to 5G antenna.
2	1 x Micro SD card slot, functionally reserved only.
3	1 x Nano SIM card slot for installing a Nano SIM card to access 5G signals.
4	1 x Wi-Fi/BT antenna port (optional), SMA connector, which can connect to Wi-Fi/BT antenna.
5	1 x Micro USB port, it supports to flash to eMMC for the system.
6	1 x 5G antenna port, SMA connector, which can connect to 5G antenna.

1.3.3 Side Panel

This section introduces interfaces and definitions of side panel.



NO.	Function Definition
1	1 x Reset button, hidden button, press the button to restart the device.
2	2 x USB 2.0 ports, Type-A connector, each channel supports up to 480Mbps.
3	1 x 5G antenna port, SMA connector, which can connect to 5G antenna.
4	1 x HDMI port, Type-A connector, which is compatibles with HDMI 2.0 standard and supports 4K 60Hz. It supports to connect a displayer.
5	1 x 5G antenna port, SMA connector, which can connect to 5G antenna.

1.4 Button

ED-IPC2500 device includes a RESET button, which is a hidden button, and the silkscreen on the case is "RESET". Pressing the RESET button will reset the device.

1.5 Indicator

Introducing the various statuses and meanings of indicators contained in ED-IPC2500 device.

Indicator	Status	Description
PWR	On	The device has been powered on.
	Blink	Power supply of the device is abnormal, please stop the power supply immediately.
	Off	The device is not powered on.
ACT	Blink	The system started successfully and is reading and writing data.
	Off	The device is not powered on or does not read and write data.
USER	On	User can customize a status according to actual application.
	Off	

Indicator	Status	Description
		The device is not powered on or not defined by the user, and the default status is off.
5G	On	The dial-up is successful and the connection is normal.
	Off	5G signal is not connected or the device is not powered on.
Yellow indicator of Ethernet port	On	The data transmission is abnormal.
	Blink	Data is being transmitted over the Ethernet port.
	Off	The Ethernet connection is not set up.
Green indicator of Ethernet port	On	The Ethernet connection is in the normal state.
	Blink	The Ethernet connection is abnormal.
	Off	The Ethernet connection is not set up.

1.6 Interface

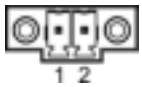
Introducing the definition and function of each interface in ED-IPC2500 device.

1.6.1 SIM Card Slot

The ED-IPC2500 device includes one Nano SIM card slot labeled with the silkscreen "", which is used for installing a SIM card to access 5G signals.

1.6.2 Power Interface

The ED-IPC2500 device features one power input terminal, implemented as a 2-Pin 3.5mm-pitch phoenix connector. The interface is labeled with the silkscreen "VIN+/GND", and the pin definitions are as follows.

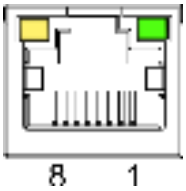


Pin ID	Pin Name
1	GND
2	9V~36V

1.6.3 1000M Ethernet Interface (ETH0 ~ ETH2)

The ED-IPC2500 device includes three auto-sensing 10/100/1000M Ethernet interfaces, labeled with the silkscreen "". These interfaces utilize RJ45 connectors, and for Ethernet connectivity, it is recommended to use Category 6 (Cat6) or higher-specification network cables. The pin definitions for the terminals are as follows:

	Pin ID	Pin Name



1	TX1+
2	TX1-
3	TX2+
4	TX2-
5	TX3+
6	TX3-
7	TX4+
8	TX4-

1.6.4 HDMI Interface

The ED-IPC2500 device features one HDMI interface with a silkscreen label "HDMI", designed as a standard Type-A connector. It supports connection to HDMI displays and delivers video output up to 4K resolution at 60Hz (4K@60).

1.6.5 USB 2.0 Interface

The ED-IPC2500 device features two USB 2.0 interfaces, labeled with the silkscreen "". These utilize standard Type-A connectors, supporting connectivity with standard USB 2.0 peripherals and providing data transfer speeds up to 480 Mbps.

1.6.6 Micro USB Interface

The ED-IPC2500 device includes one Micro USB interface with a silkscreen label " PROGRAMMING". It supports flashing to eMMC when connected to a PC.

1.6.7 Wi-Fi Antenna Interface (optional)

The ED-IPC2500 device features one Wi-Fi antenna interface using an SMA connector, with a silkscreen label "WiFi/BT", for connecting a dual-purpose Wi-Fi/Bluetooth antenna.

> TIP
>
> If the selected device model is a non-Wi-Fi version, this interface will not be included.

1.6.8 5G Antenna Interface

The ED-IPC2500 device features four 5G antenna interfaces using SMA connectors, with silkscreen labels "5G", for connecting 5G antennas.

1.7 Supercapacitor (optional)

The ED-IPC2500 supports an optional supercapacitor backup power source, which provides the following functions:

- Power Failure Data Preservation: In the event of sudden power loss to the IPC device, the supercapacitor provides brief power support to critical circuitry within the IPC. Depending on the load, it can maintain operation for approximately one minute under lighter loads or about 30 seconds under heavier loads. This ensures that essential data (such as the device's runtime state, current values of counters/timers, etc.) is preserved, preventing loss due to unexpected power interruption. This is critical for industrial applications requiring rapid process recovery without loss of key information.
- Real-Time Clock (RTC) Sustenance: The device's RTC is crucial for recording event timestamps and sequencing operations. The supercapacitor supplies sufficient power to sustain the RTC circuit after primary power failure, allowing it to continue operating normally for a period.
- Assisting Graceful Shutdown: The supercapacitor supports an orderly shutdown procedure during power loss by supplying energy to the device's control circuits. This enables the system to safely terminate active functions per predefined protocols—e.g., closing communication ports, halting complex calculations, or stopping runtime processes methodically.

> TIP
>
> The supercapacitor requires at least five minutes of charging while the device is powered on. Full functionality is guaranteed only after the supercapacitor is fully charged.

2 Installing Components

This chapter describes the specific operational procedures for installing antennas and SIM card.

2.1 Installing Antennas

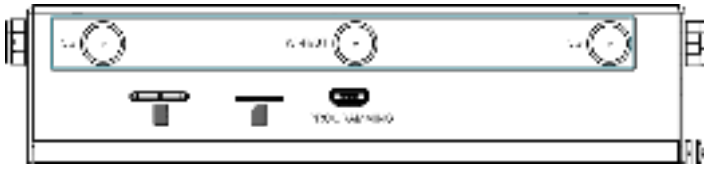
The ED-IPC2500 device supports 5G and optional Wi-Fi functionality, with 5G requiring four antennas and Wi-Fi requiring one antenna. Antennas must be installed before operating the device.

Preparation:

Ensure the corresponding antennas have been retrieved from the packaging box. When multiple antennas are included, they should be identified by the labels on each antenna.

Steps:

1. Locate the antenna interfaces on the device side as indicated in the diagram below.



> TIP
>
> The antenna interfaces are located on both the rear panel and side panel of the device. This demonstration will exclusively use the rear panel as an example for explanation.

2. Align the corresponding interfaces on both the device and antenna, then tighten clockwise to ensure a secure connection.

2.2 Installing Nano SIM Card

The ED-IPC2500 device with 5G capability requires a SIM card to be installed first before utilizing the 5G functionality.

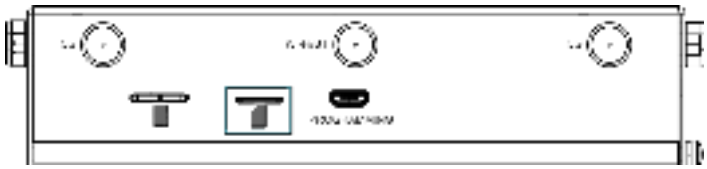
> NOTE
>
> Hot-swapping of the SIM card is NOT supported.

Preparation:

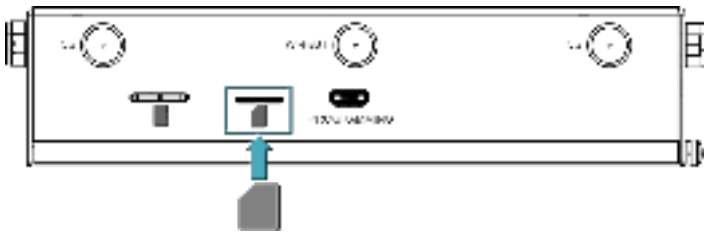
The 5G Nano SIM card to be used has been obtained.

Steps:

1. Locate the position of the Nano SIM card slot on the device side as indicated in the diagram below.



2. Insert the Nano SIM card with its golden contacts facing down into the corresponding slot. An audible click indicates successful installation.



3 Booting The Device

This chapter introduces how to connect cables and boot the device.

3.1 Connecting Cables

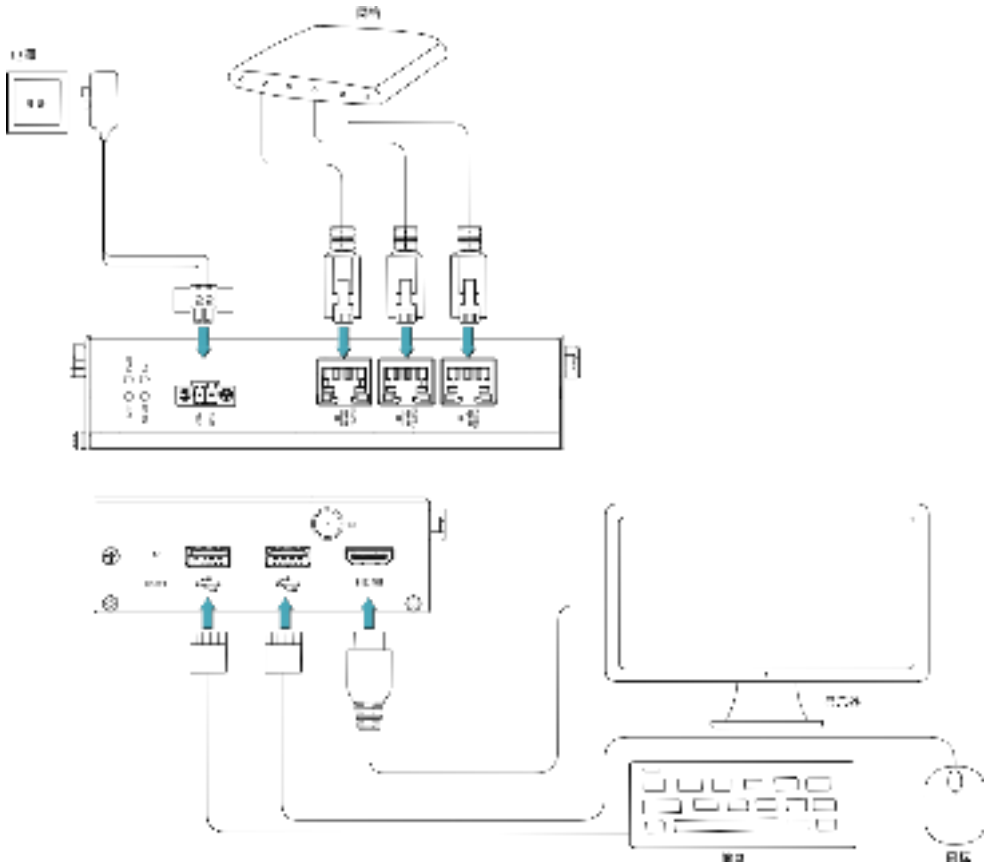
This section describes how to connect cables.

Preparation:

- Verified operational peripherals have been obtained, including display, mouse, keyboard, and power adapter.
- A functional network connection has been established.
- Operational HDMI and Ethernet cables have been secured.

Schematic diagram of connecting cables:

For specific pin definitions of each interface and wiring methods, refer to 1.6 Interface.



3.2 Booting The System For The First Time

The ED-IPC2500 device does not feature a power switch. Upon connecting to a power source, the system will initiate startup.

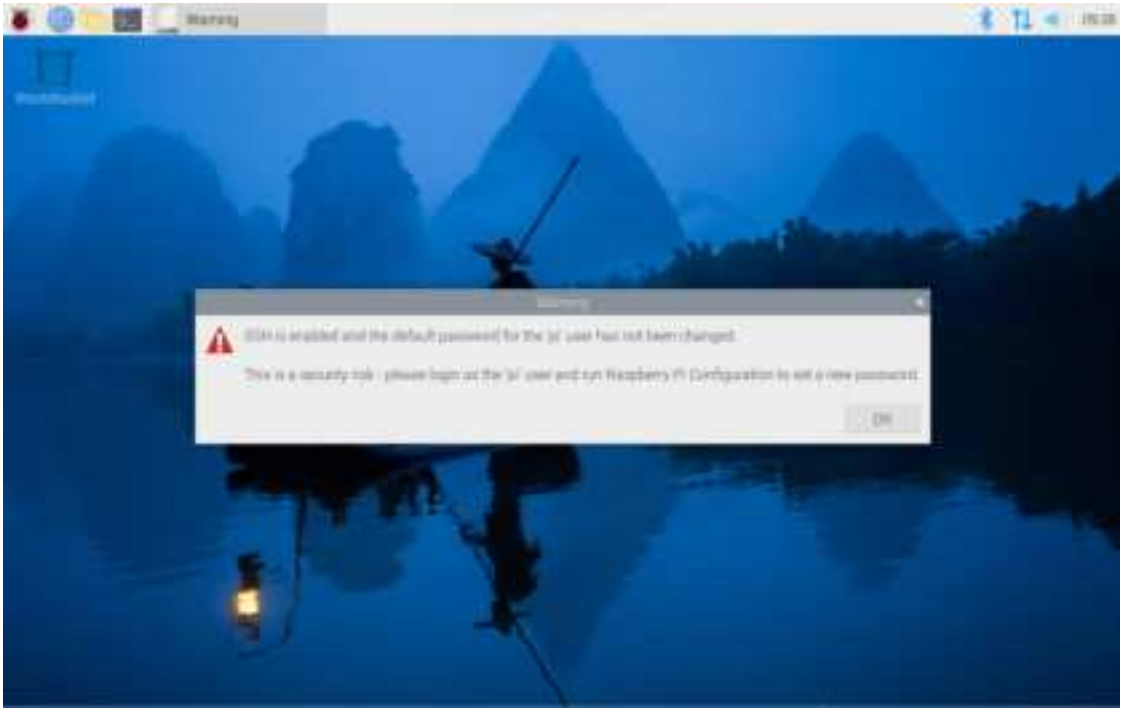
- Solid red PWR LED: Indicates normal power supply to the device.

- Blinking green ACT LED: Signals successful system initialization, followed by the Raspberry Pi logo appearing in the top-left corner of the display.

> TIP
>
> - Default username: `pi`
> - Default password: `raspberry`

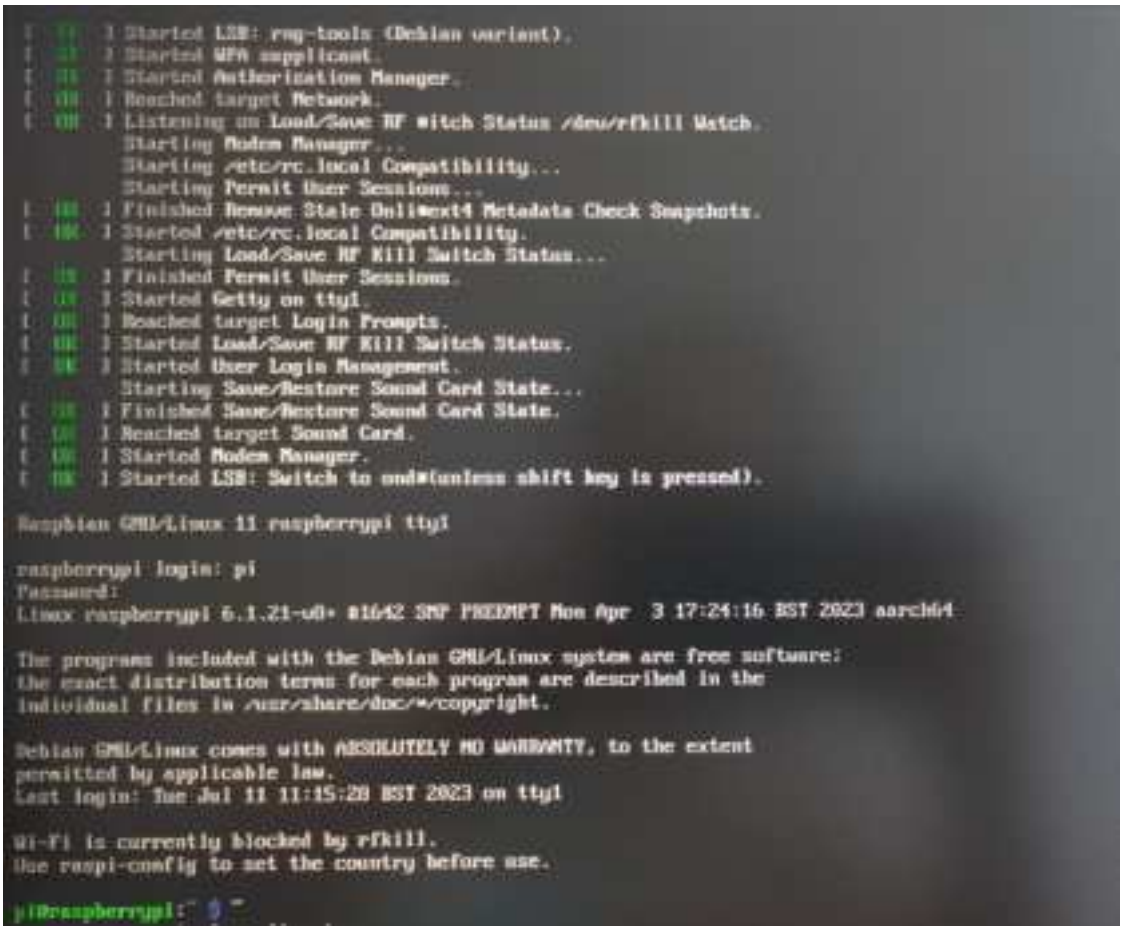
3.2.1 Raspberry Pi OS (Desktop)

If the Desktop edition of the system is preinstalled at the factory, the device will boot directly into the desktop environment upon completion of startup, as shown in the figure below.



3.2.2 Raspberry Pi OS (Lite)

If the Lite edition of the system is preinstalled at the factory, the device will automatically log in using the default username `pi` (password: `raspberry`) upon startup completion. The interface shown below signifies a successful system boot.


Started LSB: rng-tools (Debian variant).
Started WPA supplicant.
Started Authorization Manager.
Reached target Network.
Listening on Load/Save RF Kill Switch Status /dev/rfkill Watch.
Starting Modem Manager...
Starting /etc/rc.local Compatibility...
Starting Permit User Sessions...
Finished Remove Stale Onli ext4 Metadata Check Snapshots.
Started /etc/rc.local Compatibility.
Starting Load/Save RF Kill Switch Status...
Finished Permit User Sessions.
Started Getty on tty1.
Reached target Login Prompts.
Started Load/Save RF Kill Switch Status.
Started User Login Management.
Starting Save/Restore Sound Card State...
Finished Save/Restore Sound Card State.
Reached target Sound Card.
Started Modem Manager.
Started LSB: Switch to ond (unless shift key is pressed).
Raspbian GNU/Linux 11 raspberrypi tty1
raspberrypi login: pi
Password:
Linux raspberrypi 6.1.21-v8+ #1642 SMP PREEMPT Mon Apr 3 17:24:16 BST 2023 aarch64
The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Jul 11 11:15:28 BST 2023 on tty1
Wi-Fi is currently blocked by rfkill.
Use raspi-config to set the country before use.

4 Configuring System

This chapter introduces how to configure system.

4.1 Finding Device IP

Finding Device IP

4.2 Remote Login

Remote Login

4.3 Configuring Storage Devices

Configuring Storage Devices

4.4 Configuring Ethernet IP

Configuring Ethernet IP

4.5 Configuring Wi-Fi (Optional)

Configuring Wi-Fi

4.6 Configuring Bluetooth (Optional)

Configuring Bluetooth

4.7 Configuring 5G

The ED-IPC2500 natively supports 5G functionality, but specific configurations must be performed before utilizing the 5G network.

4.7.1 Scenarios Requiring No APN Configuration

If the user's 5G network operates without APN configuration, connect by proceeding as follows:

Preparation:

- The ED-IPC2500 device has completed normal startup.
- A 5G-enabled Nano SIM card has been correctly installed in the device's SIM card slot.

> NOTE

> Hot-swapping of the SIM card is NOT supported.

Steps:

1. Open a terminal window and execute the following command to launch the 5G monitoring utility and automatically connect to the 5G network.

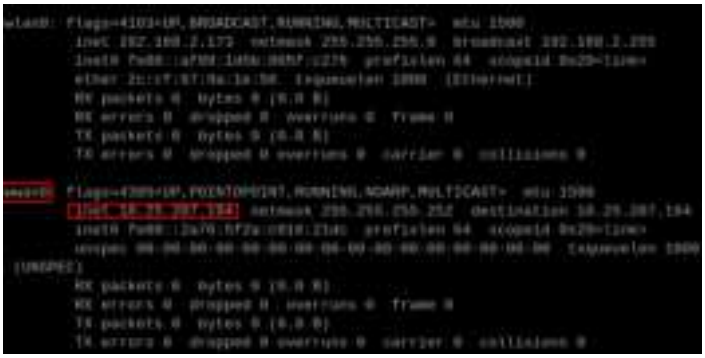
```sh
sudo ed-lte-tool --daemon
```

> TIP
>
> After executing the command, the terminal window will display relevant log information.

3. Open a new terminal window and execute the following command to check the status of the 5G interface (wwan interface).

```sh
ifconfig
```

The returned information is shown in the following figure:



- If the returned information includes the wwan0 interface and displays an assigned IP address, this indicates that the 5G network is connected.
- If the returned information shows no wwan0 interface, this signifies that the 5G network is disconnected.

4.7.2 Scenarios Requiring APN Configuration

If the user's 5G network requires APN configuration, configure the settings by proceeding as follows:

Preparation:

- The ED-IPC2500 device has completed normal startup.
- A 5G-enabled Nano SIM card has been correctly installed in the device's SIM card slot.

- APN credentials have been acquired, including the APN name, username, and password. The following example information will be used for demonstration:
  - APN Name: APN1
  - Username: admin
  - Password: admin

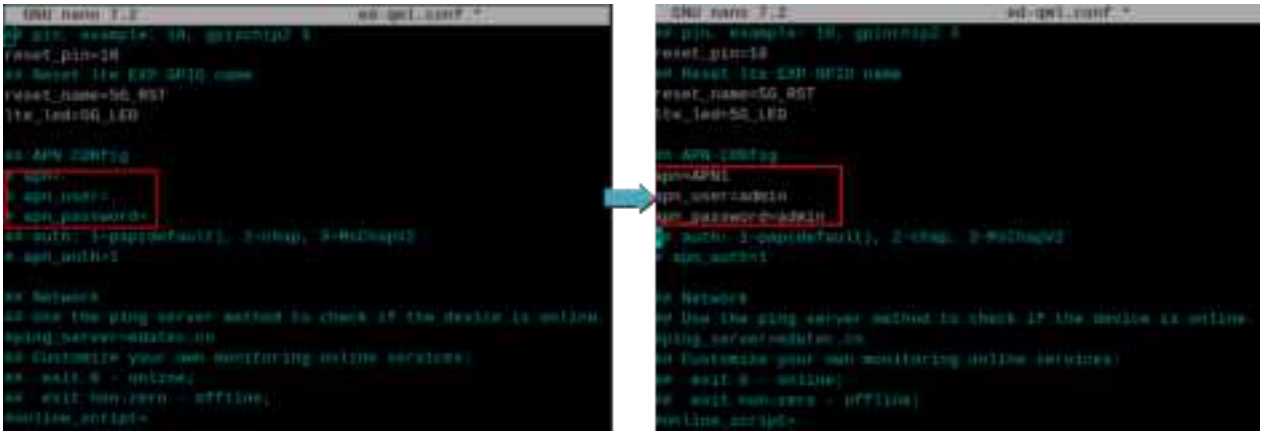
> NOTE
>
> Hot-swapping of the SIM card is NOT supported.

Steps:

1. Open a terminal window and sequentially execute the following commands to access the `ed-qml.conf` configuration file.

```sh
cd /etc/
sudo nano ed-qml.conf
```

2. Configure the "APN CONfig" settings as required by setting the "apn", "apn_user", and "apn_password" parameters.



> TIP
>
> The "ping_server" and "online_script" parameters under the "Network" section also support user-specific configuration as required.

3. Enter `ctrl+o` to save the file, then press `Enter` to confirm, and finally input `ctrl+x` to exit file editing mode.
4. Execute the following command to launch the 5G monitoring utility and automatically establish the 5G network.

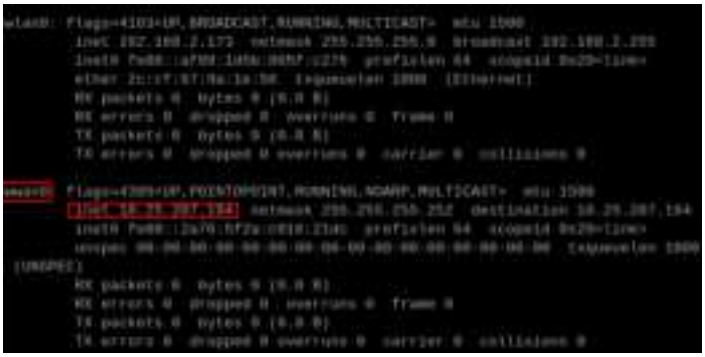
```sh
sudo ed-lte-tool --daemon
```

> TIP
>
> After executing the command, the terminal window will display relevant log information.

3. Open a new terminal window and execute the following command to check the status of the 5G interface (wwan interface).

```sh
ifconfig
```

The returned information is shown in the following figure:



- If the returned information includes the wwan0 interface and displays an assigned IP address, this indicates that the 5G network is connected.
- If the returned information shows no wwan0 interface, this signifies that the 5G network is disconnected.

4.7.3 Essential Configuration Commands

Command	Description
sudo systemctl start ed-lte-daemon.service	Establishing the 5G Network Connection via Service
sudo systemctl enable ed-lte-daemon.service	Automatically start the service during boot
sudo ed-lte-tool -r	Resetting the 5G Module
sudo ed-lte-tool -m	Viewing 5G Module Information
sudo ed-lte-tool -s	Viewing 5G Signal Strength
sudo ed-lte -c	Dial-up networking does not support automatic reconnection after disconnection.
sudo ed-lte -d	Disconnect the network connection
cd /var/log/ed-qmi/ sudo nano xxxx-xx-xx.log	Navigate to the `/var/log/ed-qmi/` directory and review the log files, where `xxxx-xx-xx` denotes the date in Year-Month-Day format (e.g., 2025-06-18).
journalctl -u ed-lte-daemon.service	Monitor real-time logs for the 5G network

4.8 Configuring Buzzer

Configuring Buzzer

4.9 Configuring RTC

Configuring RTC

4.10 Configuring USER Indicator

Configuring USER Indicator