# Industrial 5G LTE Router V528P Datasheet

## Contents

# 1. Introduction

1.1 Brief Introduction

V528P is a cellular wireless communication router that utilizes public or private 5G networks to provide users with wireless long-distance big data transmission services. It adopts a high-performance 32-bit communication processor and an industrial-grade 5G wireless module, uses an embedded real-time operating system as a software support platform, supports TTL serial ports, Gigabit Ethernet, WIFI and other interfaces, and realizes data transparent transmission and routing functions.

This router has been widely used in the M2M industry in the IOT industry chain, such as smart grid, intelligent transportation, smart home, finance, mobile POS terminal, supply chain automation, industrial automation, smart building, fire protection, public safety, environmental protection, meteorology, digital medical treatment, remote sensing survey, military, space exploration, agriculture, forestry, water affairs, coal mine, petrochemical and other fields.

**Industrial Design**
- Connector interface, convenient for industrial control equipment connection;
- Small size design, easy to integrate in industrial control equipment;
- The size is carefully designed, especially suitable for the security industry;
- Adopt high-performance dual-core processor;
- System safety isolation, especially suitable for industrial control field applications;

**Stable & Reliable**
- Software, hardware watchdog design to make sure the stability of system;
- Comprehensive anti-offline mechanism to guarantee data terminal will always be online;
- Anti-reversing protection, ESD surge projection, lightning protection;
- Wide Voltage Input: DC 7V~16V;
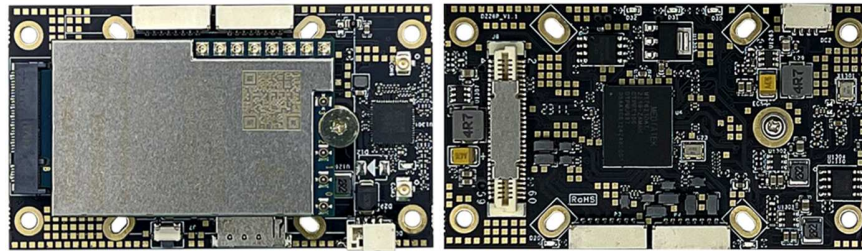- Industrial Temperature Range:-30°C ~ +70°C;

**Standard & Easy to Use**
- Standard TTL serial port, Gigabyte Ethernet Port and WiFi interface;
- Smart data terminal, power on and start data transmission;
- Convenient and flexible to use, multiple working modes for selection;
- Friendly use system configuration and maintenance interface;
- Built-in APNs of more than 100 countries, auto recognition and easy to surf;

**Powerful Functions**

- Multiple connection modes, 5G, PPPOE, wireless bridge, mixed mode;
- Support 5G/wired, WLAN dual link intelligent switching backup function;
- Multiple VPNs(IPSEC/PPTP/L2TP/GRE/OPenVPN);
- GPS, JT/T808 positioning protocol(Optional);



1.2 Parameters

| | |
|---|---|
| **SOC** | MT7621 |
| **Flash** | 1GB/128MB(Extendable to Max. 512MB) |
| **Baseband** | 5G SA/NSA Full Netcom |
| **WIFI(2.4G)** | Standard: IEEE802.11bgn 300Mbps(2T2R) |
| **Network Interface** | LAN/WAN Pin Interface x 2(10/100/1000Mbps Adaptive) 8PIN GH1.25, WAN/LAN Shared Port; |
| **COMM** | 8PIN GH1.25 x1 (TTLx3) |
| **Hardware Watchdog** | Available |
| **Antenna** | WIFI Omnidirectional IPEX Antenna x 2, 5G Omnidirectional IPEX Antenna x 4 |
| **SIM Card Slot** | NANO SIM slot, Gap Outwarded, Hot-Plugged Not Supported |
| **Button** | Reset Button(Press For More Than 6 Seconds to Reset) |
| **Indicator** | System LED(Blue): Steady Blue When Connected, Quick Flash When Dialing, Slow Flash For Failed Connection; Signal LED(Red): Red When 4G/5G Signal is Bad; Signal LED(Green): Green When Signal Is Strong; Signal LEDx 2 Both Not Lit Means No Signal, No SIM Card, No 5G Module |
| **Power Supply** | 4PIN GH1.25, DC 7~16V/2A, 12V Recommended |

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|---|---|
| **Power Consumption** | Less Than 500mA When Powered by 12V(Full Load)) |
| **Network Connection** | **Single connection to the Internet**: <br> 5G Internet, Wired Internet, Wireless Internet, Wireless Internet <br> **Hybrid Internet**: <br> Hot and cold backup and load balancing bandwidth superposition between 5G and wired Internet; <br> Cold and hot backup and load balancing bandwidth superposition between 5G and wireless Internet access; <br> Hot and cold backup and load balancing bandwidth superposition between wireless Internet access and wired Internet access; |
| **Software Features** | Support AP mode and Station mode; <br> Support more than 400 operators, automatically matching operators, APN customization; <br> Support SIM PIN code; <br> Industrial-grade watchdog and software watchdog double insurance (suitable for unattended industries); <br> Mutual backup VRRP (high availability HA) between multiple devices, a single device failure can be switched to the backup device; <br> Functions such as network keep-alive mechanism and continuous failure restart recovery (network can be configured with relevant details and thresholds) to ensure data terminal always online; <br> Automatic restart (timed or fixed point and restart when idle); <br> L2TP client, PPT client, GRE tunnel, OPENVPN (password and certificate); <br> GPS and base station positioning function (optional), support NMEA original protocol and HTTP JSON protocol; <br> Support uploading positioning data to a designated server; <br> DDNS (supports peanut shells and various operators inside and outside the network), UPNP, domain name redirection, IGMP forward/reverse proxy; <br> Network real-time traffic graph, terminal real-time traffic and usage statistics; <br> Terminal flow control, access control, scheduled network disconnection; <br> External network firewall, external network port proxy; <br> Port Forwarding (NAT) and DMZ Hosting; <br> Static routing table management, domain name redirection; <br> Dynamic routing protocols (RIPv1, RIPv2, RIPng, OSPFv2, OSPFv3, BGP-4, and BGP-4+); <br> 2.4G wireless hotspot, minimum signal threshold connection limit; <br> Wireless black and white list, transmit power adjustment; |
| **Developing Port** | LAN Discovery Protocol (Local Discovery of Devices); <br> LAN TCP control protocol (Local Control Device), LAN HTTP control protocol (Local Control Device); |

| | |
|---|---|
| | Remote HTTP Control Protocol (Cloud Platform Management); GPS sending protocol (Acquire GPS data locally or remotely), IO port remote control protocol; Terminal command line (SSH/Telnet/serial port); |
| **SDK** | SDK for Farm, Can Develop Related Application Based On This SDK |
| **Device Management** | Network Time Synchronization, Synchroninzed with PC and Cellphone; Backup and Import Configuration; Online and Local Upgrade; Remote Management; Telnet (Terminal) Command, Serial Port (TTL) Command; LED Indicator On/Off, Local and Remote Log; Recoverable upgrade failure (undead Bootloader). |
| **Max. Users** | Wireless Connection: 60nos, Wired Connection: 100nos (Theoretically) |
| **Browsers Requirement** | IE9.0/Chrome 60.0.0/Firefox 55.0.0/ Safari:5.0.0 Later Version |
| **Working Temperature** | -30°C ~ +70°C (-22°F ~ +158°F) |
| **Storage Temperature** | -45°C ~ +85°C (-49°F ~ +185°F) |
| **Dimension** | 73.4mm x 42mm x 15mm (2.89in x 1.65in x 0.59in) |

## 2. User Manual

**NOTE**:
- Below is the user manual with brief diagram and instructions, which will instruct you how to quickly use this router;
- Due to product upgrade, the contents below will be updated irregularly. All contents are only for instructions.

2.1 Quick Guide (Interfaces Introduction)
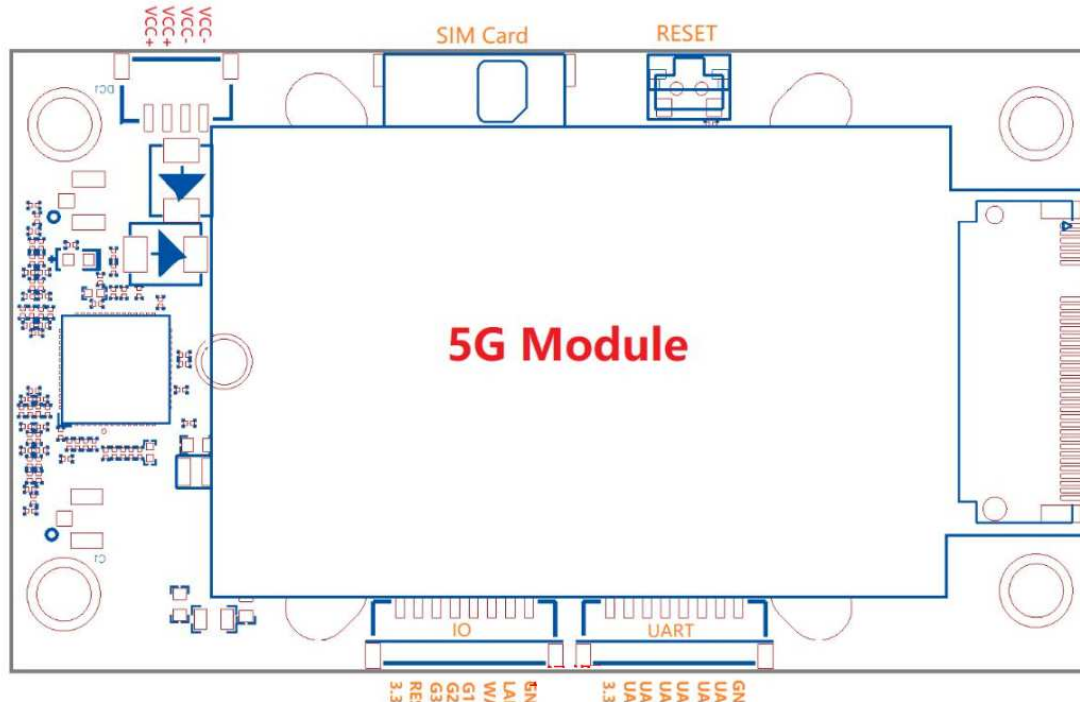
**Front Side**

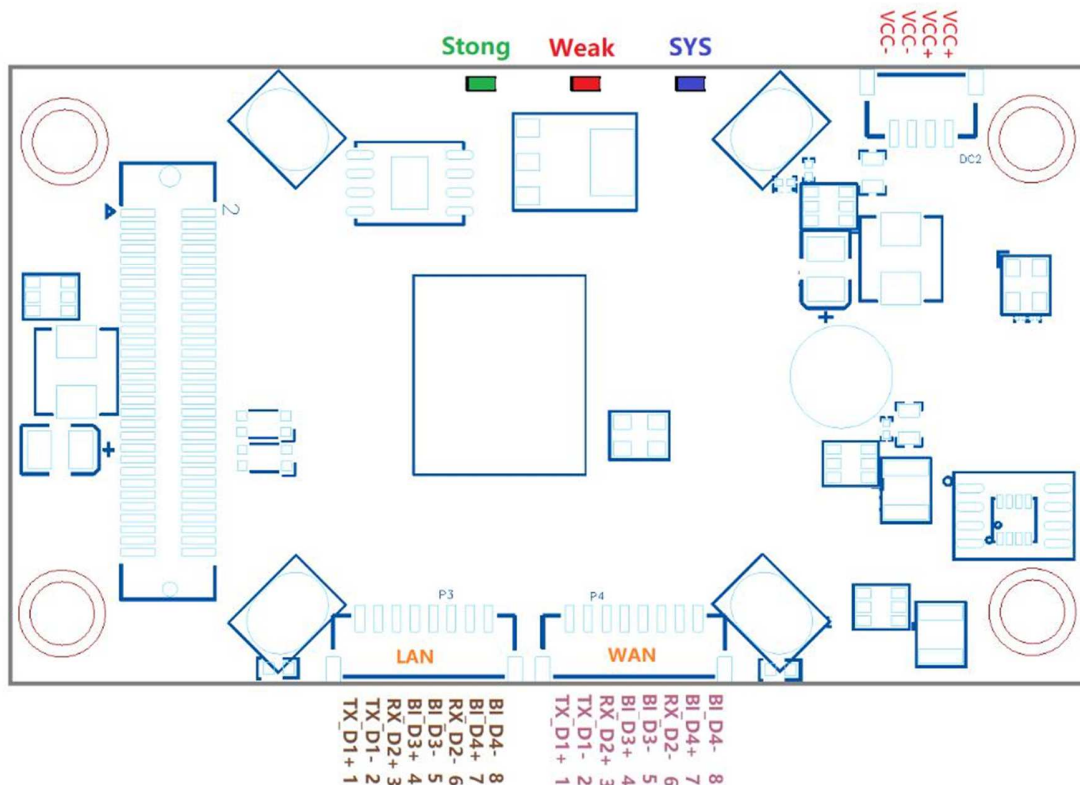2.1.2 VCC: Vertical 4PIN Socket(GH1.25), Front/Back Optional, DC 7-16V;

- VCC+ is positive, it's necessary to use 2x VCC+ at the same time;
- VCC- is negative, it's necessary to use 2x VCC- at the same time;

2.1.3 SIM Card Slot: NANO SIM Card, Gap Inward, Hot-Plugging Not Supported;

2.1.4 IO Port: 8PIN Socket (GH1.25mm), composed of 3x IO pins, 2x LED light pins, 1 reset button pin and GND/3.3V power supply

- 3.3V: provides 3.3V power supply for the outside;
- RESET, is the reset pin, pull it low for 6 seconds to reset;
- G3 is IO port 3, when configured as I2C, this pin is the SCL of I2C, that is, the serial clock line;
- G2 is IO port 2, when configured as I2C, this pin is the SD of I2C, that is, the serial data line;
- G1 is IO port 1, reserved for battery detection;
- WAN- LED, that is, the link indicator pin of the WAN port;
- LAN- LED, that is, the link indicator pin of the LAN port;
- GND is ground

2.1.5 UART Port: 8PIN Socket (GH1.25mm), 3x TTL serial ports

**Back Side**

2.1.6 VCC: Horizontal 4PIN Socket(GH1.25), Front/Back Optional, DC 7-16V;

- VCC+ is positive, it's necessary to use 2x VCC+ at the same time;
- VCC- is negative, it's necessary to use 2x VCC- at the same time;

2.1.7 Indicator

- Strong LED: 5G/4G Signal is strong;
- Weak LED: 5G/4G Signal is bad;
- SYS LED: System indicator, quick flashing when network connection abnormal, slow flashing when normal network connection;

2.1.8 Network port: 8PIN socket (1.25mm), Gigabit Ethernet port is composed of 8 wires such as TX_D1+, TX_D1-, RX_D2+, BI_D3+, BI_D3-, RX_D2-, BI_D4+, BI_D4-

- TX_D1+ is connected to network cable number 1;
- TX_D1- is connected to network cable number 2;
- RX_D2+ is connected to network cable number 3;
- BI_D3+ is connected to network cable number 4;
- BI_D3- is connected to network cable number 5;
- RX_D2- is connected to network cable number 6;
- BI_D4+ is connected to network cable number 7;

- BI_D4+ is connected to network cable number 8;

## 2.2 Reset

Two ways to reset to the default factory settings:

- Click "System>Management>Factory Defaults" and then the device will be reset to the default factory settings.
- Press "Reset" for 5 ~ 6 seconds and release, then it will be reset to the default factory settings and reboot automatically.

**NOTE**:

- Reverse connection between positive pole and negative pole probably result in module damage;
- Volts more than 16V or less than 5V might result in module damage;
- It might take 40 seconds or so to boot completely after connecting to power supply;

## 2.3 Login

2.3.1   Connect the router and PC by the above instructions.

2.3.2   If you're trying to connect your laptop or cellphone through WIFI (transmitted by the Router), please go to wireless configuration of your laptop or cellphone, select the corresponding SSID: V528P-XXXXXX (XXXXXX is the last 6-bit of device's MAC), enter the password of SSID (87654321 by default) and wait for connection.

2.3.3   Access from a Browser

- Start a browser (Internet Explorer, Chrome, Firefox, Safari).
- Enter the IP address or host name of the Router in the browsers' Location/Address field (192.168.8.1 by default).
- Enter user name and password (admin & admin by default) and click "Login" as below:
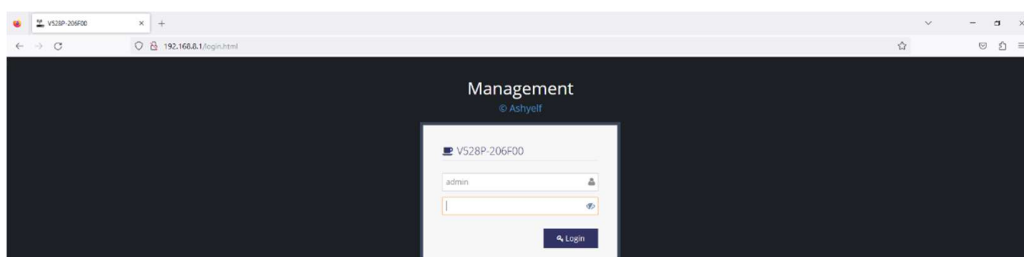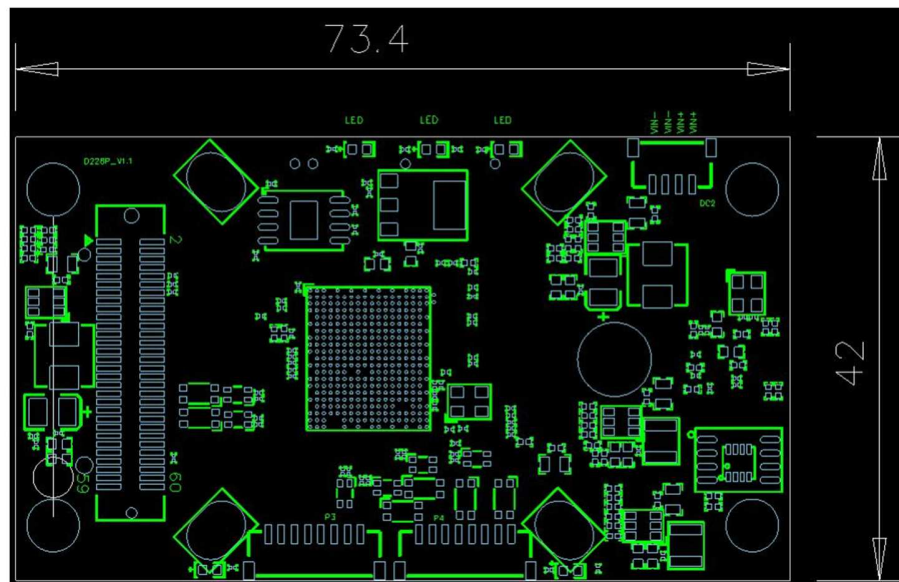


2.3.4   Home Page
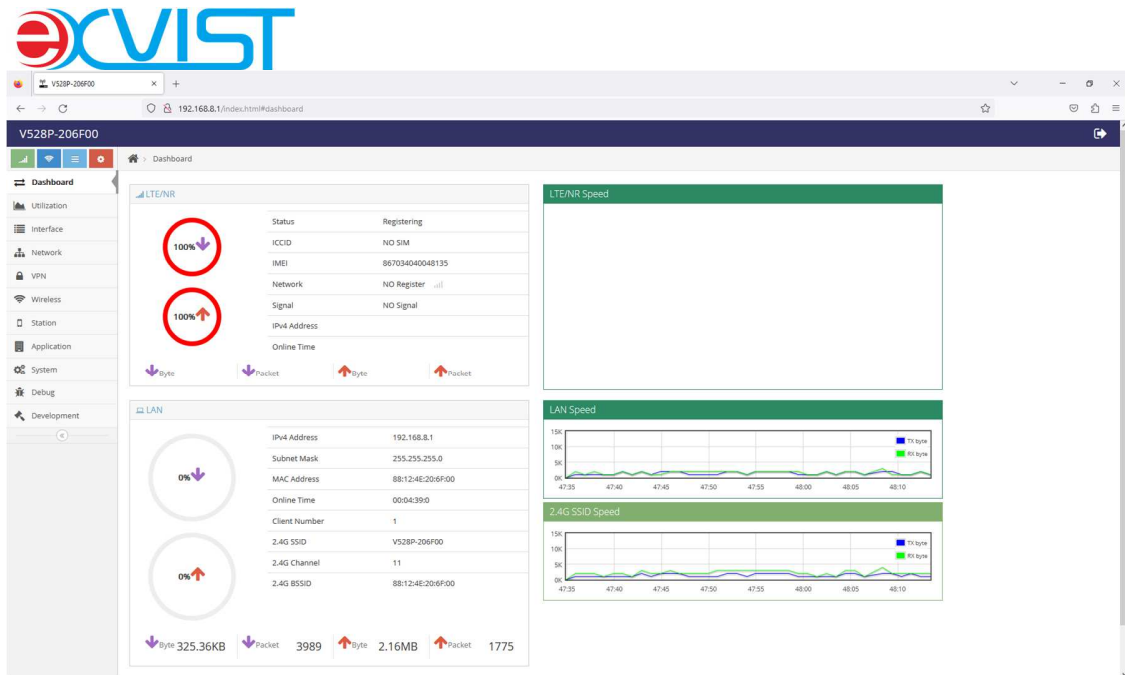
In this tab Dashboard, it primarily shows Status of LTE/NR, LAN Port, LTE/NR Speed, LAN Speed, 2.4G SSID Speed;
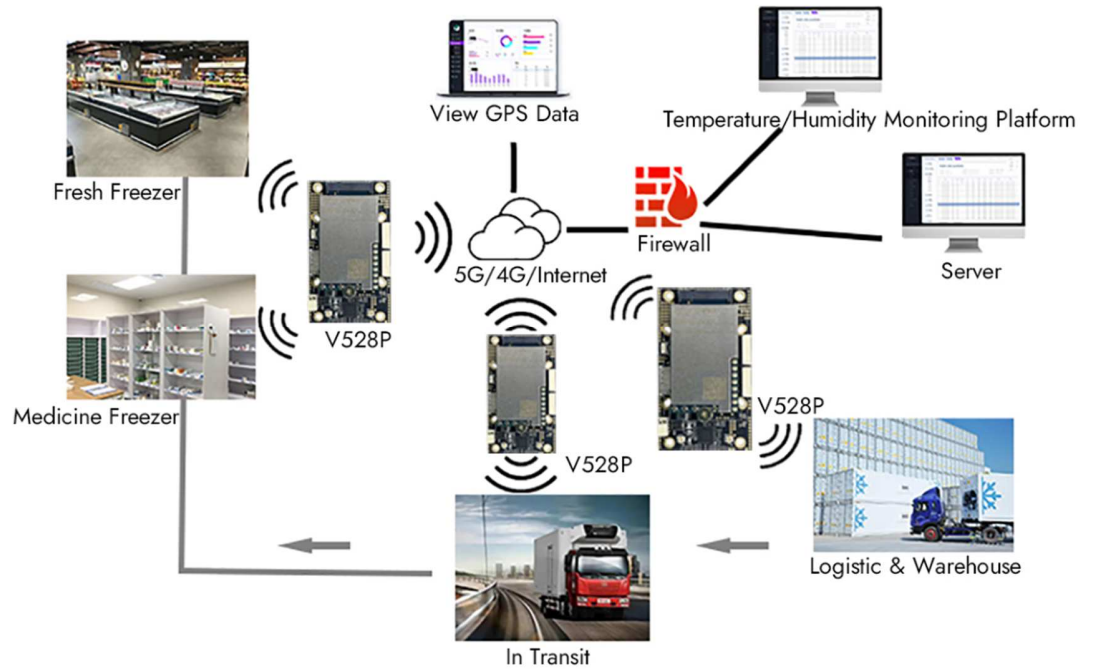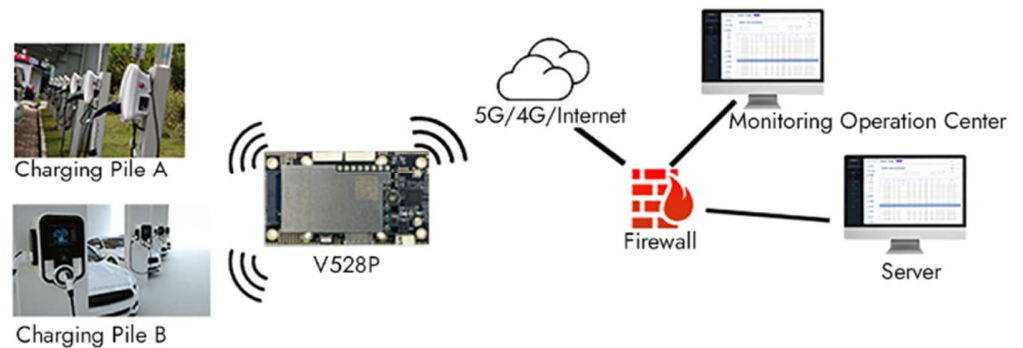
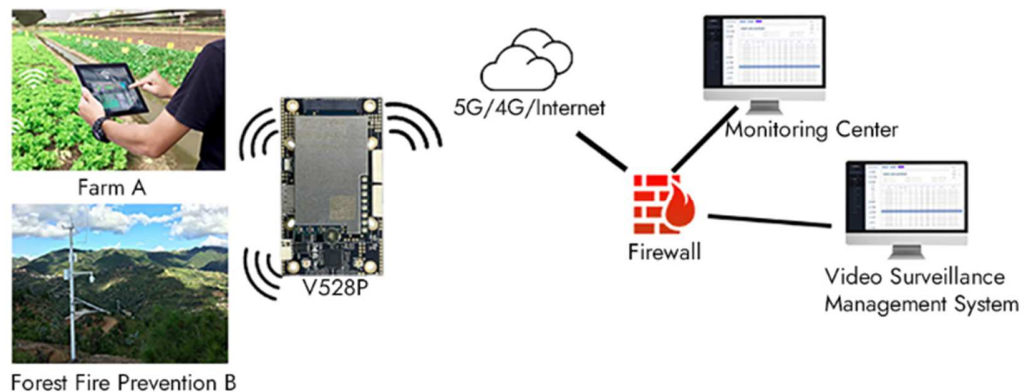## 3. Dimension

### 3.1 With Position Hole Only

# 4. Solutions

## 4.1 Cargo Cold Chain Positioning & Tracking Solution
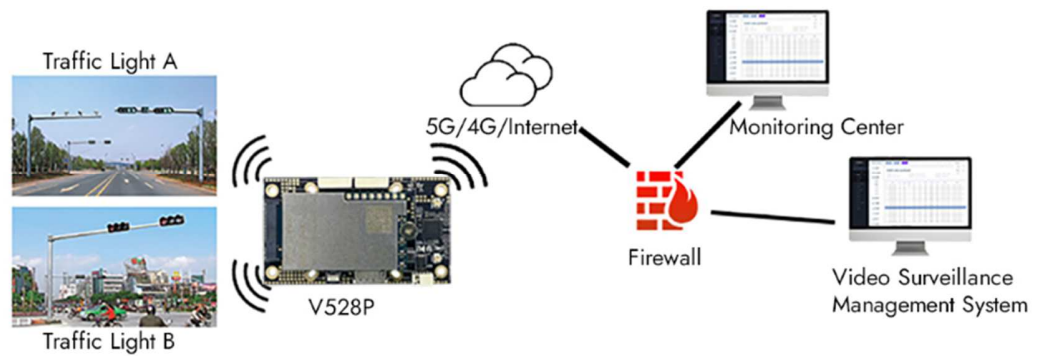


## 4.2 Smart Charging Pile Solution
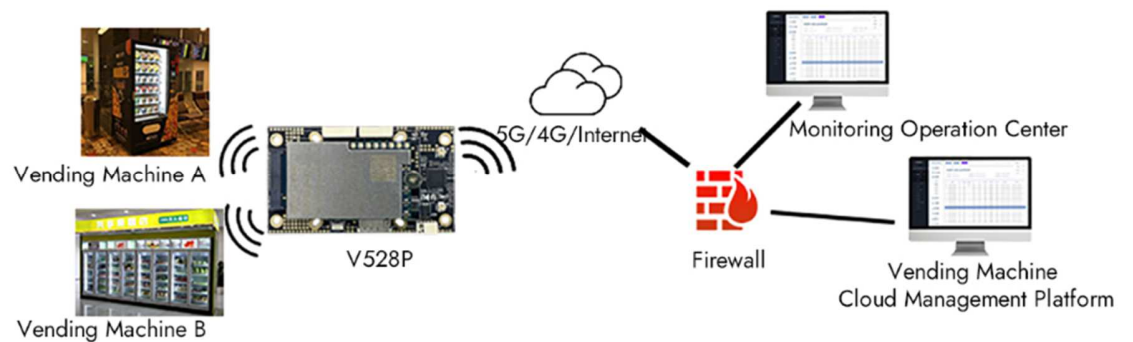


## 4.3 Intelligent Video Surveillance Solution

## 4.4 Traffic Light Monitoring Solution



## 4.5 Intelligent Vending Machine Solution



## 4.6 Smart Industrial Control Solution