



### Compact, Cost-effective IoT Router

TR321 is a compact design entry-level IoT router built for industrial applications, such as vending machines, ATM, Kiosk, IP camera, digital signage, EV charging point, water treatment, solar panel power, etc.

TR321 provides high speed 4G LTE or dual mode LTE-M/NB-IoT for applications that require different data throughput. TR321 has 2-RJ45, 1-RS232, 1-RS485, WIFI, GNSS, and it is perfect for connecting the ethernet IP and serial port devices to cloud via cellular network. Besides, its auto switchover between wireless and wired WAN, multiple VPN features provide robust and secure connectivity for data transmission.

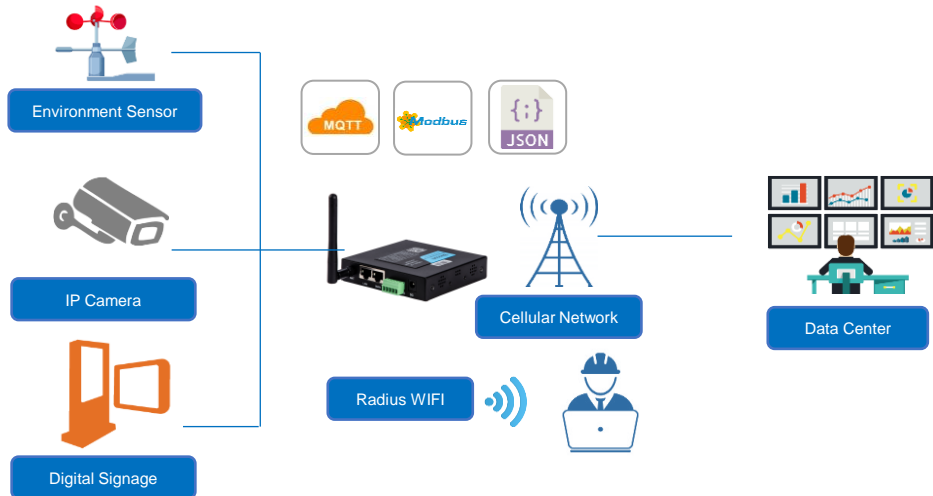


In addition, TR321 is an OpenWrt based Linux OS industrial IoT router, which provides C/C++, Python programmable embedded environment for IoT developers and programmers to implement their industrial applications in a flexible and fast way.

### Key Features

1. 4G LTE, 3G or LTE-M/NB-IoT version to choose
2. Auto switchover between wireless and wired WAN
3. 1-LAN, 1-WAN, 1-RS232, 1-RS485, WIFI(Optional) , GNSS(Optional)
4. OpenWrt based Linux OS, provides programmable environment for C/C++, Python, LUA developers<sup>1</sup>
5. Multiple VPN protocols, IPsec, L2TP, PPTP, GRE and OpenVPN, to ensure secure data transmission
6. LTE/3G/PPPoE DHCP and static address connection
7. DHCP server, DHCP binding MAC address, DDNS, firewall, NAT, DMZ host, QoS, traffic analysis
8. MQTT, Modbus RTU/TCP, TCP/UDP, HTTP, BGP, SNMP protocols
9. SPI Firewall, Port Mapping, DMZ Mapping, ACL, IP-MAC binding and Clone function
10. Web UI, telnet & SSH CLI, AT Command configuration
11. Web upgrade, local and remote syslog, serial port output log
12. SMS commands and DMP(Device Management Platform)<sup>2</sup> for remote configuration and management

### Applications



### Success Cases



# Specifications

## Cellular Interfaces

- **Antenna Connector** 1 × 50 Ω SMA Female
- **SIM Slot** 1
- **ESD Protection** 15KV

## Ethernet Interface

- **Ports** 2-RJ45 (1-WAN, 1-LAN or 2-LAN configurable)
- **Data Rates** 10/100 Mbps (Auto-Sensing), Auto MDI/MDIX
- **ESD Protection** 1.5KV

## Serial Interfaces

- **Connector** Terminal block, 3.5 mm female socket with lock
- **Ports** 1-RS232, 1-RS485
- **Baud Rate** 300bps to 230400bps
- **ESD protection** 8KV for RS232, 15KV for RS485

## Wi-Fi(Optional)

- **Antenna Connector** 1 × 50 Ω RP-SMA Female
- **Standard** IEEE 802.11b/g/n, AP and Client modes
- **Transmission Rate** IEEE802.11b/g: Up to 54Mbps  
IEEE802.11n: Up to 300Mbps
- **Security** Open, WPA, WPA2, WPA/WPA2 Enterprise, Radius
- **Tx Power** 18dBm (11g), 21dBm (11b)
- **Rx Sensitivity** <-72dBm@54Mbps

## GNSS (Option)

- **Module** GNSS from cellular module
- **Antenna Connector** 1 × 50 Ω SMA Female

## Software

- **Network Protocols** PPP, PPPoE, SNMP v1/v2c/v3, TCP, UDP, DHCP, RIPv1/v2, OSPF, BGP, DNS, DDNS, HTTP, ARP, QoS, SNTP, Telnet, SSH
- **Serial Port** MQTT, Transparent (TCP Client/Server, UDP Client/Server), Modbus Gateway (Modbus RTU to Modbus TCP)
- **VPN Tunnel** IPsec/PPTP/L2TP/GRE/OpenVPN
- **Firewall** ACL/DMZ/Port Mapping/MAC Binding
- **Management** Web, CLI, SMS, Cloud DMP (Device Management Platform)
- **Reliability** WWAN and WAN Failover, Hardware & Software Watchdog
- **Secondary Development** OpenWrt based Linux OS, support C/C++ Python, LUA and SDK

## Power Supply and Consumption

- **Connector** Plug-In
- **Standard Power** DC 12V/1.5A
- **Input Voltage** 5-35 VDC
- **Power Consumption** 123 ~ 250mA @12VDC
- **Idle Consumption** 110 ~ 200mA @12VDC

## Physical Characteristics

- **Ingress Protection** IP30
- **Housing & Weight** Metal, 320 g(0.71lbs), without accessories
- **Dimensions** 100 x 100 x 23mm (3.94 x 3.94 x 0.91 in)
- **Mounting** Desktop, Wall mount, DIN-Rail

## Environmental

- **Operating Temperature** -35°C to +75°C (-31°F to +167°F)
- **Storage Temperature** -40°C to +80°C (-40°F to +176°F)
- **Relative Humidity** 5% to 95% (non-condensing)
- **Ethernet Isolation** 1.5 kV RMS

## Others

- **Reset Button** 1
- **LED Indicators** Power, WAN, LAN, WIFI, System, Alarm, Online, Signal Strength Watchdog, RTC, Timer
- **Built-in** CE, RCM, MTC, FCC, NBTC
- **Approvals<sup>3</sup>** Standard: 12 Months
- **Warranty Period<sup>4</sup>** Extended: 2-5 Years

## Standard Package Content

- |    |   |       |
|----|---|-------|
| 1. | TR321 Router  | 1 PCS |
| 2. | Power Adapter(DC 12V/1.5A, EU/US/UK/AU plug optional) | 1 PCS |
| 3. | Mag-mount Cellular Antenna (SMA Male, 1 meter, 5dBi)  | 1 PCS |
| 4. | RS232 Cable (DB9 Female, 1 meter)                     | 1 PCS |
| 5. | Ethernet Cable(1 meter)                               | 1 PCS |
| 6. | 5-Pin Terminal Block                                  | 1 PCS |
| 7. | Wall mount kits                                       | 1 PCS |

## Order Information

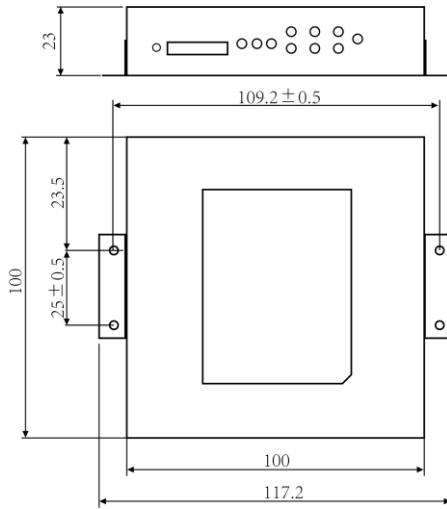
Model	Part Number	Description	Cellular Network	Frequency Band <sup>5</sup>
TR321-LF	TR321-L<1>-<2>	4G Router, 1-RS232, 1-RS485, 2-RJ45	4G LTE 3G/WCDMA/UMTS/HSPA+ EDGE/GPRS	4G LTE CAT 4 • EMEA/Asia: B1/B3/B5/B7/B8/B20/B38/B40/B41 • ANZ/LATAM: B1/B3/B5/B7/B8/B28 • NA: B2/B4/B5/B12/B13/B14
TR321-W	TR321-W<1>-<2>	3G Router, 1-RS232, 1-RS485, 2-RJ45	3G/WCDMA/UMTS/HSPA+ EDGE/GPRS	Global: 850/900/1900/2100
TR321-M	TR321-M<1>	LTE-M/NB-IoT Router, 1-RS232, 1-RS485, 2-RJ45	LTE CAT M1/NB-IoT, EDGE/GPRS	APAC: FDD-LTE B1/B3/B5/B8 GPRS/EDGE 900/1800 Mhz NA: FDD-LTE B2/B4/B12/B13 EU/AU: FDD-LTE B3/B8/B20/B28 GPRS/EDGE 900/1800Mhz Global: FDD-LTE B1/B2/B3/B4/B5/B8/B12/B13 B17/B18/B19/B20/B25/B26/B28/(CAT-M1 only); GPRS/EDGE 850/900/1800/1900Mhz

1. <1> means modules for different cellular network, countries and regions.  
2. <2> W=2.4G single band WIFI  
GN=GNSS(from cellular module, not an independent GPS module)

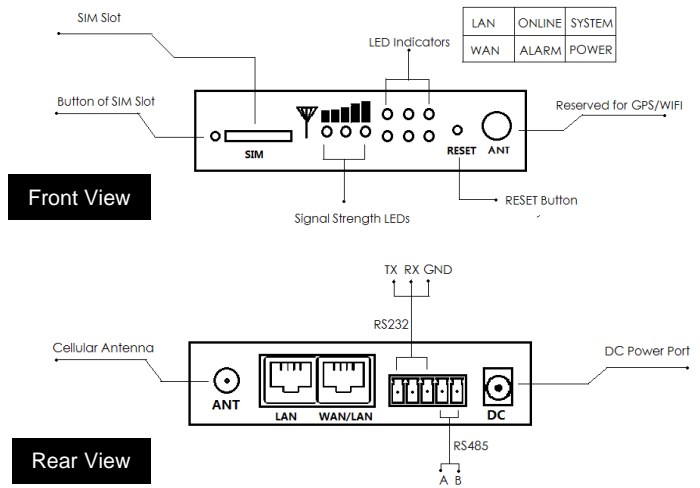
### Note:

1. Python, LUA requires customized hardware and firmware, please contact Bivocom to discuss your application.
2. There has a license fee for DMP
3. \* Under progress
4. Price of the extended warranty will be different.
5. If you couldn't find the frequency band for your regions or have any questions, please contact Bivocom sales representatives for more information.
6. To save the earth, Bivocom doesn't print the user guide, if you need it, please go to Bivocom website to [download](#).

## Dimensions(mm)



## Side Views



## Related Products

### Industrial IoT Router [TR341 Series](#)



- ✓ 4G LTE CAT 4 or CAT6
- ✓ 1-R232, 1-RS485, 5-RJ45, WIFI, GPS(Optional)
- ✓ OpenWrt based Linux OS, C/C++, Python programmable
- ✓ Modbus RTU/TCP, MQTT, VPN
- ✓ Captive port and Radius WIFI

### Industrial IoT Gateway [TG451 Series](#)



- ✓ 4G LTE CAT 4, or CAT6
- ✓ Dual SIM, or Dual Module
- ✓ Rich I/O and customizable industrial protocols
- ✓ OpenWrt based Linux OS, C/C++, Python programmable
- ✓ Captive port and Radius WIFI