



TR321 Series

Industrial Cellular IoT Routers

Introduction

TR321 is a compact, cost-effective, full-featured industrial IoT router ideal for scenarios including vending machines, ATMs, power meter reading, IP cameras, digital signage, air compressors and EV charging stations.

Equipped with 2-RJ45 Ethernet ports, 1-RS232 and 1-RS485 interface, the TR321 seamlessly connects Ethernet and serial devices to the cloud. It supports optional GNSS for remote asset tracking, while WAN/WWAN failover ensures stable network connectivity. Multiple VPN protocols guarantee secure and reliable industrial data transmission.

Powered by Bivocom OS, TR321 supports mainstream protocols including Modbus RTU/TCP, JSON and TCP/UDP, as well as customizable industrial protocols such as OPC UA*, IEC101/104/61850* and BACnet IP/MSTP*. It integrates WireGuard, OpenVPN and IPsec for encrypted network communication. The router also supports secondary development with C/C++, optional Python* and Lua*, and provides official Bivocom SDK and APIs to accelerate customized IoT project deployment.

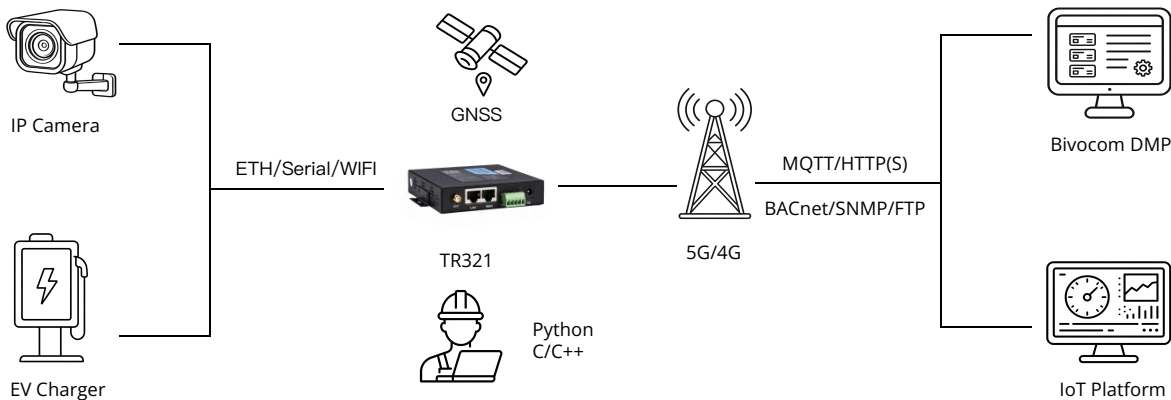
Key Features

- Optional 4G LTE, LTE-M/NB-IoT, or 5G RedCap
- 2-ETH, 1-RS232, 2-RS485, 2.4G WIFI (Optional), GNSS(Optional)
- Programming Bivocom OS: C/C++, Python (Optional)
- Modbus RTU/TCP, JSON, BACnet IP/MSTP*, OPC UA*, IEC 101/104/61850*, and customized industrial protocols
- MQTT, FTP*, HTTP(S), Wireguard VPN, SNMP*, Telnet, SSH
- Remote configuration and management by Bivocom DMP*

Applications

- Digital Signage
- Vending & ATM
- IP Camera
- Water & Waste Water
- EV Charger
- Power
- Smart Parking

Diagram



Specifications

Systems

CPU	32-bit MIPS
Flash	16MB (32MB Optional)
RAM	64MB

Cellular

Antenna	1 x 50 Ω SMA-K
SIM Slot	1 Mini SIM (2FF)

Ethernet

Ports	2 x 10/100 Mbps 1 x WAN, 1 x LAN, or 2 x LAN Configurable
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Serial

Ports	1 x RS232, 1 x RS485
Baud Rate	1200bps to 230400bps

Wi-Fi (Optional)

Antenna	1 x 50 Ω RP-SMA-J
Standard	IEEE 802.11b/g/n, AP/Client modes
Bands	2.4GHz
Security	Open, WPA, WPA2, Radius

GNSS (Optional)

Module	GNSS from cellular module
Antenna	1 x 50 Ω SMA-J

Power

Input	5-35VDC
Standard Power	12VDC/1.5A
Idle Mode	100 ~ 110mA@12VDC
Working Mode	180 ~ 210mA@12VDC

Physical Characteristics

IP Rating	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, DIN-Rail, Wall mount

Environmental

Operating Temp.	-35° C to +75° C (-31°F to +167°F)
Storage Temp.	-40° C to +80° C (-40°F to +176°F)
Relative Humidity	5% to 95% (non-condensing)

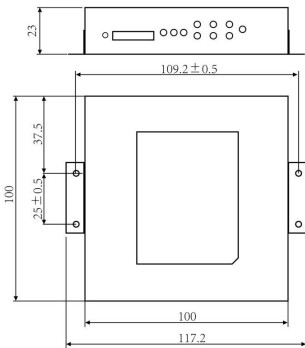
Others

Reset Button	1
LED Indicators	Power, WIFI*, System, Alarm, Online, Signal
Built-in	Watchdog, RTC, Timer
Approvals	CE, RCM, NBTC, FCC, MTC, IMDA
Warranty Period	Standard: 2-Year limited warranty Extended: 3-5 Years

Software

Programming	Bivocom OS (OpenWrt based Linux OS) C/C++, Python*, LUA* and SDK
Data Protocols	Modbus RTU/TCP, SMS, SNMP*, IEC101/104*, IEC61850*, BACnet IP/MSTP*, OPC UA*, etc.
Network Protocols	VXLAN, IPV6*, DDNS, DNS, ARP, Static Routing, NAT, Firewall, Telnet/SSH, PPP, PPPoE, DHCP, ICMP, NTP, etc.
Server Supported	MQTT, HTTP(S), Transparent TCP/UDP, FTP*
VPN	Wireguard/OpenVPN/IPsec/PPTP/L2TP
Firewall	ACL/DMZ/Port Mapping/MAC Binding
Management	Web, CLI, SMS, Bivocom DMP (Device Management Platform)*
Reliability	WWAN and WAN Failover, Hardware & Software Watchdog

Dimensions



Ordering Information

Model	Part Number	Cellular	Frequency Bands	Package Contents
TR321-LF	TR321 - L <1> - <2>	4G LTE	4G LTE CAT 4* (Optional Global or Regional Version) • 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	1. TR321 x 1 2. Cellular Antenna x 1 3. Ethernet Cable x 1 4. 5-Pin Terminal Block x 1 5. DIN-Rail Mount Kit x 1 6. Power Adapter x 1 (Optional EU/UK/AU/US/CN Type)
TR321-M	TR321 - M <1> - <2>	LTE CAT M1/NB-IoT	LTE CAT M1/NB-IoT 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	
TR321-RC	TR321 - RC <1> - <2>	5G RedCap	5G NR Sub-6 SA* (Optional Global or Regional Version) • n1/2/3/5/7/8/12/13/14/18/20/25/26/28/30/38/40/41/48/66/70/71/77/78/79 • LTE FDD B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/30/66/70/71 • LTE TDD B34/38/39/40/41/42/43/48	1. TR321 x 1 2. Cellular Antenna x 2 3. Ethernet Cable x 1 4. 5-Pin Terminal Block x 1 5. DIN-Rail Mount Kit x 1 6. Power Adapter x 1 (Optional EU/UK/AU/US/CN Type)
Part Number: <1>: 5G or 4G module for different countries and regions <2>: W=2.4G WIFI; GN=GNSS from cellular module				

Note:

1.

Region-specific cellular modules are available; consult Bivocom sales for details.
2.

Compiler & SDK are provided for secondary development. Python require dedicated hardware&firmware (32MB Flash version)
3.

Bivocom DMP (Device Management Platform) requires a license fee.
4.

*Optional functions rely on matching hardware/firmware versions; not all features supported on one device.
5.

Power consumption is measured under laboratory conditions and is for reference only.
6.

*Listed certifications are pending.
7.

Extended warranty pricing varies.
8.

Digital user manuals are free to download from [Bivocom](#) official website for environmental protection.

About Bivocom

Founded in 2014, Bivocom specializes in industrial IoT communication technology. Our comprehensive product portfolio covers IoT sensors, cellular gateways, industrial routers, RTUs, modems, as well as self-developed IoT cloud management platforms. We deliver ruggedized industrial wireless hardware, full-lifecycle OEM/ODM customization services and end-to-end IoT connectivity one-stop solutions to industrial partners worldwide.

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