

Programmable Intelligent 5G IoT Gateways



Key Features

- ✓ Quad-core 64-bit ARM Cortex-A55 up to 2GHz
- ✓ NPU up to 1 TOPS, ARM G52 2EE GPU
- ✓ Up to 2GB RAM (DDR4, 8GB Option) and 16GB Flash(eMMC, 128GB Option), NVMe SSD(Optional, up to 2TB)
- ✓ Bivocom OS with Python/C/C++ programmable, or Ubuntu Linux OS, docker container, flexible for secondary development¹
- ✓ 5G NR or 4G LTE to choose²
- ✓ 4-RJ45(GbE), 1-RS232, 6-RS485, 4-DI, 4-Relay, 2-power output, 1-USB3.0, 1-USB2.0, 1-TF, WIFI6(Optional), HDMI, Super capacitor(Optional)
- ✓ MQTT broker/client, Modbus RTU/TCP, JSON, TCP/UDP, OPC UA, DNP3, IEC101/104 and VPN³

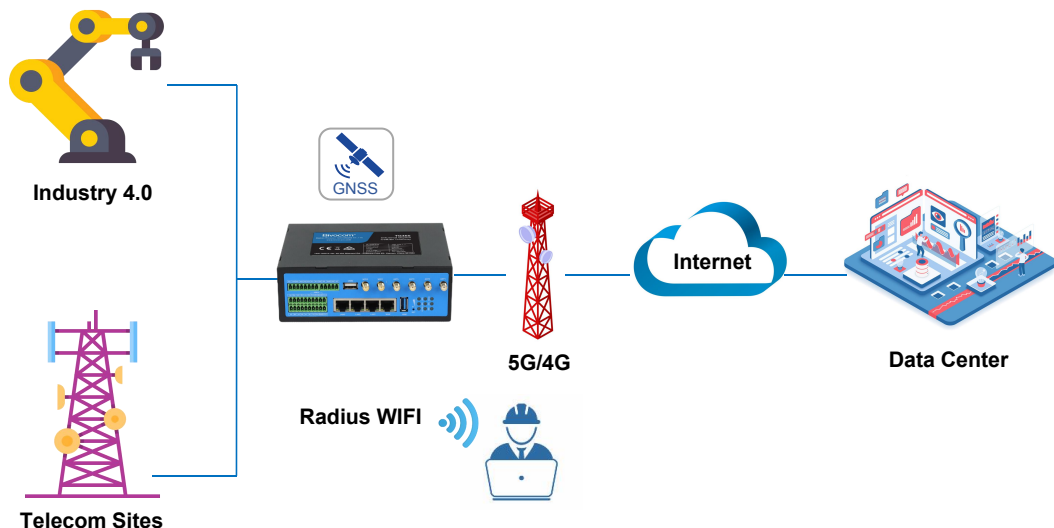
Introduction

The TG465 is a powerful and intelligent next generation IoT Gateway built-in with ARM CPU, GPU and NPU. It's designed for mission-critical IoT applications that demands advanced connectivity, edge computing, enhanced security, AI and machine learning, improved energy efficiency. It finds great utility in sectors such as industry 4.0, telecom sites, smart city, smart grid, renewable energy, transportation, etc.

The TG465 offers an embedded environment with OpenWRT-based Linux OS, enabling IoT developers to program and install their own applications using Python, C/C++ directly on the hardware via SDK. Additionally, it provides a flexible secondary development option through the Ubuntu programming environment.

The TG465 has wide range of interfaces and I/Os, allowing seamless connectivity with various equipment, controllers, and sensors. It facilitates data transfer to the cloud server via a 5G/4G LTE cellular network. It also supports crucial industrial protocols like MQTT broker/client, Modbus RTU/TCP, JSON, TCP/UDP, OPC UA, DNP3, IEC101/104, SNMP and VPN, ensuring efficient and secure IoT data connectivity between field devices and the cloud server.

Applications



Specifications

System

● CPU	ARM Cortex-A55, 64-bit, quad-core
● RAM	DDR4, 2GB(up to 8GB, Option)
● Flash	eMMC, 16GB(up to 128GB, Option)
● NPU	512MAC , up to 1 TOPS
● GPU	Mali-G52, OpenGL ES 1.1/2.0/3.2, OpenCL 2.0, Vulkan 1.1

Cellular Interfaces

● Antenna Connector	4 × 50 Ω SMA Female(5G Version TG465-NR)
● SIM Slot	2 × 50 Ω SMA Female(4G Version TG465-LF)
● ESD Protection	1 × Micro SIM(Dual SIM, Option) ⁴ 15KV

Ethernet Interface

● Ports	4-RJ45 (1-WAN, 3-LAN or 4-LAN configurable)
● Data Rates	10/100/1000 Mbps (Auto-Sensing), Auto MDI/MDIX
● ESD Protection	1.5KV

Serial Interfaces

● Connector	Terminal block, 3.5 mm female socket
● Ports	2-RS232(1-Debug, 1-Shared via RS485), 6-RS485(or 5-RS485, 1-Shared by RS232)
● Baud Rate	300bps to 230400bps
● ESD protection	8KV for RS232, 15KV for RS485

I/O

● Connector	Terminal block, 3.5 mm female socket with lock
● Digital Input	4-DI (0-30V Input) Status "0": 0-3V, status "1": 5-30V
● Relay Output	4-Relay (Up to 5A and 30VDC/250VAC switch)
● Power Output	2(5-60VDC, controlled via device power input)

Wi-Fi 6(Optional)

● Antenna Connector	2 × 50 Ω RP-SMA Female
● Standard	2T2R 802.11 a/b/g/n/ac/ax, AP and Client modes
● Security	Open, WPA, WPA2, WPA/WPA2 Enterprise, Radius

GNSS (Option)

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

External Storage & Display(Optional)

● TF Card Slot	1x Micro SD interface, Up to 32G
● SSD	1x M2.0 NVMe SSD(Option, up to 2TB)
● USB	1x USB3.0, 1x USB2.0
● Usage	User Program, Data Storage and Firmware Upgrade
● HDMI	1 HDMI 2.0 (Reserved, up to 4K display)
● Others(Optional)	AI computing card, Audio

Power Supply and Consumption

● Connector	Terminal block, 3.5 mm female socket
● Standard Power	DC 12V/1.5A
● Input Voltage	5-60 VDC
● Super Capacitor(Optional)	Power-off alarm, data&log storage

Software

● Network Protocols	PPP, PPPoE, SNMP v1/v2c/v3, TCP, UDP, DHCP, RIPv1/v2, OSPF, BGP, DNS, DDNS, HTTP, ARP, QoS, SNTP, Telnet, SSH
● Industrial Protocols	MQTT client/broker, Transparent (TCP/UDP Client/Server), Modbus RTU/TCP, OPC UA, DNP3, IEC101/104, DL/T645-2007, PLC(S7, FP) ⁵ IPsec/PPTP/L2TP/GRE/OpenVPN ACL/DMZ/Port Mapping/MAC Binding Web, CLI, SMS, Cloud DMP (Device Management Platform) ⁶
● VPN Tunnel	Dual SIM, WWAN and WAN Failover, Hardware & Software Watchdog
● Firewall	OpenWrt based Linux OS, C/C++, Python SDK; or Ubuntu, Docker container
● Management	
● Reliability	
● Secondary Development	

Physical Characteristics

● Ingress Protection	IP30
● Housing & Weight	Metal, 799g(1.76lbs), without accessories
● Dimensions	162x125x55mm (6.38 x 4.92 x 2.16in)
● Mounting	Desktop, 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)

Others

● Reset Button	1
● LED Indicators	Signal strength, Alarm, GPS, WIFI, SSD, System, 5G/4G
● Built-in	Watchdog, RTC, Timer
● Approvals ⁷	CE*, RCM*, FCC*
● Warranty Period ⁸	Standard: 12 Months; Extended: 2-5 Years

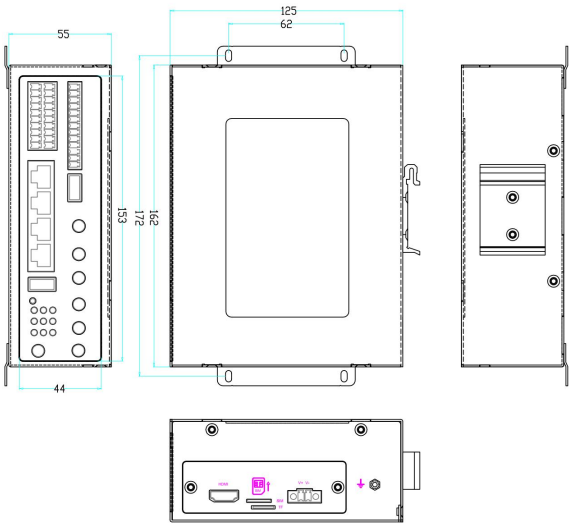
Standard Package Content

1.	TG465 Gateway	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)	5G Version: 4 PCS 4G Version: 2 PCS
4.	Ethernet Cable(1 meter, option)	1 PCS
5.	10-Pin Terminal Block	3 PCS
6.	2-Pin Terminal Block	1 PCS
7.	DIN-Rail Mount Kits	1 PCS

Order Information

Model	Part Number	Description	Frequency Band ⁹
TG465-NR	TG465 - N<1><2> - <3>	5G IoT Gateway, 4-GbE, 1-RS232, 6-RS485, 4-DI, 4-Relay, 2-USB, 1-TF, 1-HDMI, 2-power output, WIFI(Optional), GNSS(Optional)	5G NR Sub-6 - n1/n2/n3/n5/n7/n8/n12/n20/n28/n41/n66/n71/n77/n78/n79 - LTE FDD: B1/B2/B3/B4/B5/B7/B8/B9/B12/B13/B14/B17/B18/B19/B20/B21(TBD)/B25/B26/B28/B29/B30/B32/B66/B71 - LTE TDD: B34/B38/39/B40/B41/B42/B43/B48
TG465-LF	TG465 - L<1><2> - <3>	4G IoT Gateway, 4-GbE, 1-RS232, 6-RS485, 4-DI, 4-Relay, 2-USB, 1-TF, 1-HDMI, 2-power output, WIFI(Optional), GNSS(Optional)	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
Option features: <1>: 5G or 4G module for different countries and regions <2>: DS=dual SIM on single module, failover only <3>: W6=2WIFI 6 GN=GNSS from cellular module HDMI=HIM SSD=SD Super capacitor=SC			

Dimensions



Interfaces

Terminal Block 1	K4+	K4-	K3+	K3-	K2+	K2-	K1+	K1-	DI4	DI3	GND	DI2	DI1
	Relay 4		Relay 3		Relay 2		Relay 1		DI 1~4				

Terminal Block 2	RS485-6		RS485-5		RS485-4		Debug			Power Output 2
	A6	B6	A5	B5	A4	B4	TX2	RX2	GND	VCC2
Terminal Block 3	A3	B3	A2	B2	A1	B1	TX1	RX1	GND	VCC1
	RS485-3		RS485-2		RS485-1		RS232			Power Output 1

LED Indicators	Signal Strength	WIFI	5G/4G
		GPS	SYS
		ALARM	SSD

Ethernet Ports	LAN3	LAN2	LAN1	WAN
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Antenna Ports	5G: ANT 1~4 4G: ANT 1~2			
	ANT4	ANT3	ANT2	ANT1

Related Products

5G NR IoT Gateway
TG463 Series



- ✓ 5G NR NA/NSA dual mode
- ✓ Rich I/O and customizable industrial protocols
- ✓ OpenWrt based Linux OS, C/C++, Python programmable

5G NR IoT Gateway
TG453 Series



- ✓ 5G NR NA/NSA dual mode
- ✓ Serial and Gigabit ethernet ports, with mainstream industrial protocols
- ✓ OpenWrt based Linux OS, C/C++, Python programmable

- Note:
1. Customized firmware or SDK may be required.
 2. There are different modules for different regions to choose.
 3. Some protocols may require customized firmware.
 4. DSSM=dual sim on single module, supports failover.
 5. Customized firmware may be required.
 6. There has a license fee for DMP.
 7. * Under progress
 8. Price of the extended warranty will be different.
 9. If you couldn't find the frequency band for your regions or have any questions, please contact Bivocom sales representatives for more information.
 10. To save the earth, Bivocom doesn't print the user guide, if you need it, please go to Bivocom website to [download](#).