TG452 LoRa Series

Industrial 4G LoRa Gateways

Key Features

- 4G LTE and LoRa supported[1]
- 4-RJ45, 2-DI, 2-Relay, 2-ADC, 2-RS232, 3-RS485, 1-TF card slot, 1-DC Power Output, 1-CAN*, WIFI*, GPS[2]
- Dual SIM/Dual Module for failover/load balance[3]
- Up to 32GB local data storage and backup via Micro SD
- OpenWRT based Linux OS, Node-Red, Python, C/C++ programmable[4]
- Modbus RTU/TCP, MQTT, JSON, TCP/UDP and customized industrial protocols
- VPN, SNMP, BGP, HTTP, Telnet, SSH, CLI, SPI firewall

Introduction

The Bivocom 4G LoRa Gateway TG452 is a state-of-the-art communication device designed to enhance connectivity in IoT applications. Combining 4G LTE and LoRa technology, this gateway ensures robust, long-range, and reliable data transmission for various industrial and commercial needs. With its versatile interface options, including 4 RJ45 ports, multiple digital inputs and relays, analog-to-digital converters, and serial communication interfaces, the Bivocom 4G LoRa gateway TG452 is an ideal solution for integrating different sensor types and devices into a unified network.

Key features include dual SIM support for failover and load balancing, ensuring uninterrupted connectivity in critical applications. The gateway offers local data storage of up to 32GB via a Micro SD card, enabling efficient data management and backup. Built on OpenWRT-based Linux OS, it supports programming in Node-Red, Python, and C/C++, allowing for custom application development tailored to specific operational requirements.

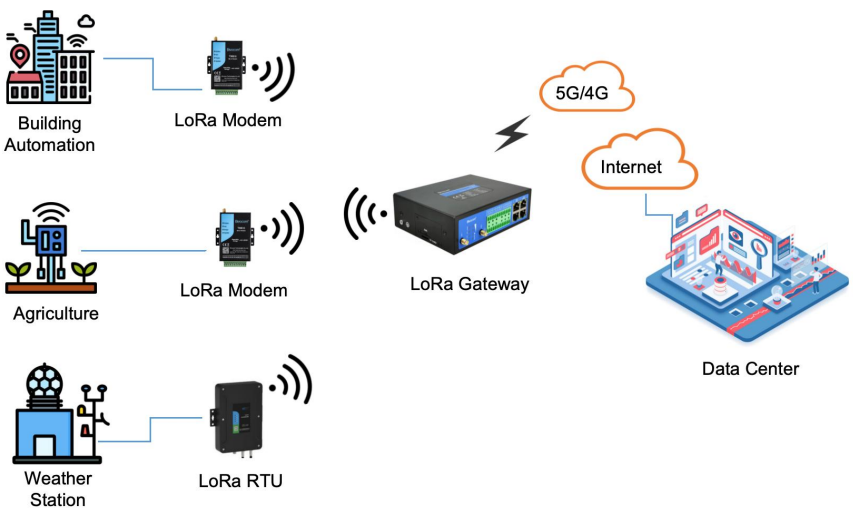
Additionally, this gateway facilitates a wide range of industrial communication protocols, including Modbus RTU/TCP, MQTT, JSON, and more, ensuring compatibility with existing infrastructures. Security features such as VPN, SNMP, BGP, HTTP, Telnet, SSH, and SPI firewall provide peace of mind when transmitting sensitive data.

Whether you are streamlining operations in smart agriculture, monitoring environmental sensors, or enhancing smart city infrastructure, the Bivocom 4G LoRa Gateway TG452 is your go-to solution for seamless, high-performance connectivity in the IoT landscape.

Applications

Bivocom 4G LoRa Gateway TG452 is versatile and can be applied in various fields due to its unique combination of 4G LTE and LoRa technologies.

- Smart Agriculture
- Smart Cities
- Asset Tracking
- Environmental Monitoring
- Smart Metering
- Connected Healthcare
- Flood and Weather Monitoring
- Industrial Automation
- Smart Home



Specifications

System

- **CPU** 32-bit ARM Cortex A7
- **Flash** 1GB
- **Memory** 256MB DDR3

Cellular Interfaces

- **Antenna Connector** 2 × 50 Ω SMA Female
- **SIM Slot** 1, or 2(DSSM, or DSDM, Option)

LoRa Interface

- **Frequency** 850~931MHz, or 410-490MHz(Option)[2]
- **Distance** Building: Up to 3KM
Open air: Up to 10KM
- **Sensitivity** Up to -129dBm
- **TX Power** 21-30dBm
- **Encryption** AES
- **Air Data Rate** 1.2~62.5kbps (default: 4.8kbps)
- **Single-packet Data Size** Up to 230 Bytes
- **Channel** 82 Channels
- **Antenna Connector** 1× 50 Ω SMA Female

Ethernet Interface

- **Ports** 4-RJ45 (1-WAN, 3-LAN or 4-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** 2-RS232, 3-RS485
- **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
- **DI** 2-DI (0-30V Input)
Status “0”: 0-3V, status “1”: 5-30V
- **DO** 2-Relay (Up to 5A and 30VDC/250VAC output)
- **ADC** 2 x 12-bit AD, 4-20mA or 0-5V (Option)
- **Power Output** 1-channel 12V/1A output, for field devices
- **CAN(Option)** 1

External Storage

- **SD Card Slot** 1x Micro SD interface, Up to 32G
- **Usage** User Program, Data Storage and Firmware Upgrade

Wi-Fi(Option)

- **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

GNSS/GPS (Option)

- **Module** Built-in independent GPS Module, or GNSS from cellular module
- **Antenna Connector** 1 × 50 Ω SMA Female

Power Supply and Consumption

- **Connector** 2-pin with 3.5 mm terminal block
- **Standard Power** DC 12V/1.5A
- **Input Voltage** 5-35 VDC
- **Power Consumption** 280～330mA@12VDC
- **Idle Consumption** 220～265mA@12VDC

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 / UDP), Modbus RTU/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)[5]
- **Reliability** WWAN and WAN Failover, Dual SIM/Dual Module Backup/Load Balance, Hardware & Software Watchdog
- **Secondary Development** OpenWrt based Linux OS, Node-Red, C/C++ Python, LUA and SDK

Physical Characteristics

- **Ingress Protection** IP30
- **Housing & Weight** Metal, 630g(1.39lbs), without accessories
- **Dimensions** 145 x 114 x 45mm (5.71 x 4.49 x 1.77in)
- **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)
- **Ethernet Isolation** 1.5 kV RMS

Others

- **Reset Button** 1
- **LED Indicators** Power, WIFI, System, Alarm, Online, Signal Strength
- **Built-in** Watchdog, RTC, Timer
- **Approvals**[6] CE, RCM*, FCC*, NBTC*
- **Warranty Period**[7] Standard: 12 Months
Extended: 2-5 Years

Standard Package Content

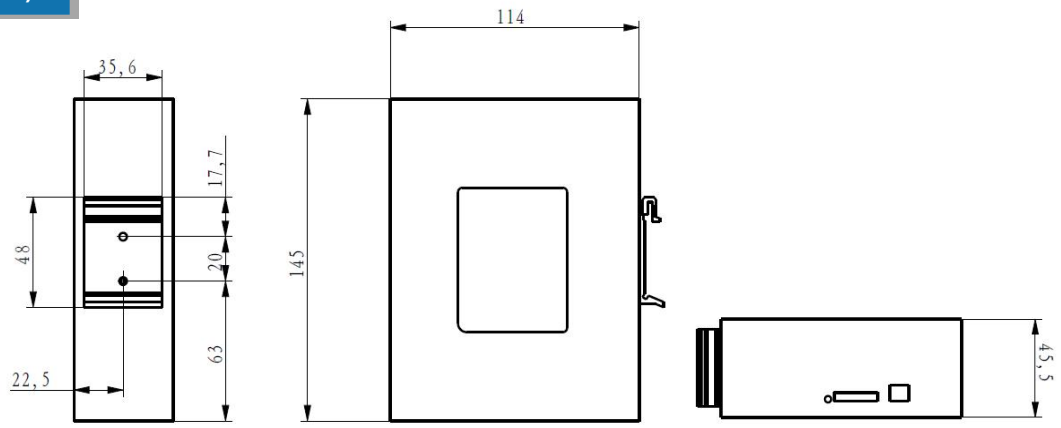
1.	TG452 Gateway	1 PCS
2.	Power Adapter(DC 12V/1.5A, EU/US/UK/AU plug, Option)	1 PCS
3.	Mag-mount Cellular Antenna (SMA Male, 1 meter, 5dBi)	2 PCS
4.	LoRa Antenna	1 PCS
5.	RS232 Cable (DB9 Female, 1 meter)	1 PCS
6.	Ethernet Cable(1 meter)	1 PCS
7.	13-Pin Terminal Block	2 PCS
8.	DIN-Rail mount kits	1 PCS

Order Information

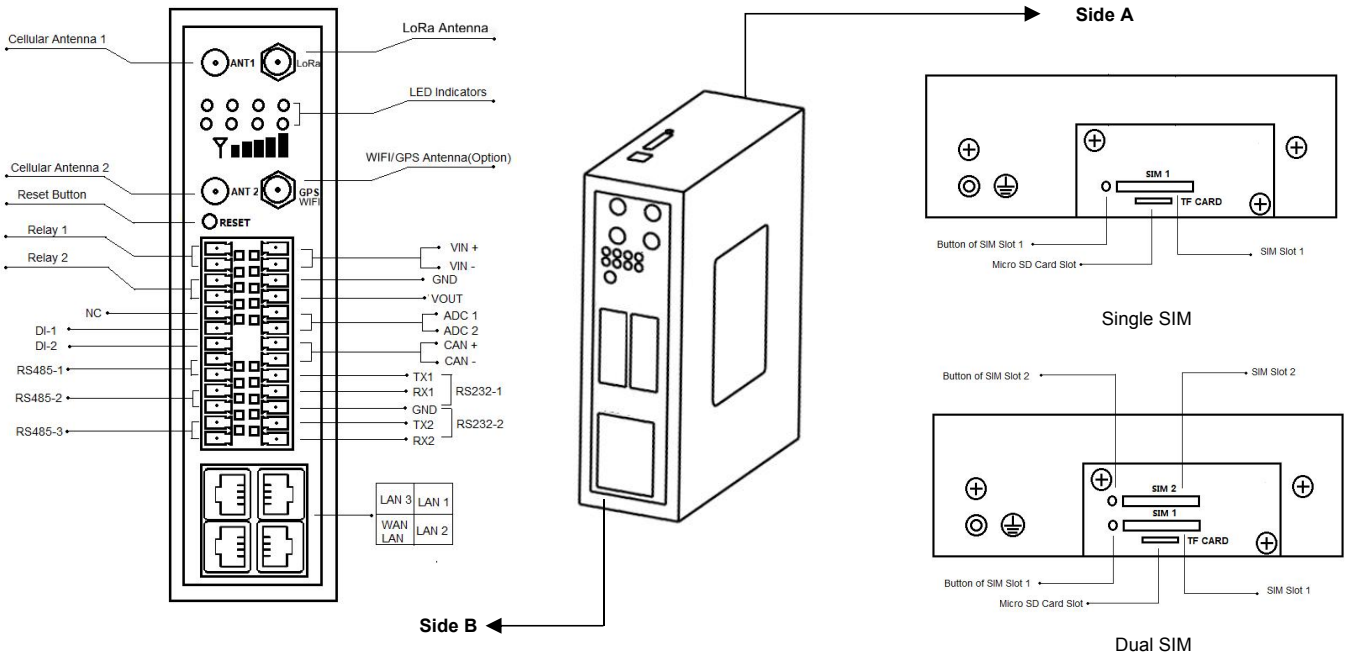
Model	Part Number	Description	LoRa[8]	4G LTE[9]
TG452-LR	TG452 - LR<1><2> - <3>	4G LoRa Gateway, 4-RJ45, 2-RS232, 3-RS485, 2-DI, 2-DO, 2-ADC, 1-Power output, 1-SD, CAN(Option)	• 850~931MHz • 410-490MHz	4G LTE CAT 4 • EMEA/Asia: B1/B3/B5/B7/B8/B20/B38/B40/B41 • ANZ/LATAM: B1/B3/B5/B7/B8/B28 • NA: B2/B4/B5/B12/B13/B14

<1>: 4G and LoRa module for different countries and regions
<2>: DS=Dual SIM(Dual SIM on single module, failover)
DM=Dual Module(Dual SIM on dual module, load balance)
<3>: W=WIFI
G=GPS(independent GPS module), GN=GNSS from cellular module

Dimension(mm)



Side Views



Note:

1. Different countries and regions require different 4G and LoRa module
2. * are optional features
3. Dual SIM is optional feature, there has Dual SIM on Single Module(DSSM), Dual SIM on dual module(DSDM) to choose, DSSM mode supports failover, while DSDM supports load balance
4. Customized firmware is required.
5. There has a license fee for DMP.
6. * Under progress
7. Price of the extended warranty will be different.
8. If you couldn't find the LoRa or 4G frequency band for your regions or have any questions, please contact Bivocom sales representatives for more information.
9. Optional features may require customized hardware and firmware, please contact Bivocom to discuss your IoT applications before your order.
10. To save the earth, Bivocom doesn't print the user guide, if you need it, please go to Bivocom website to download.
11. Icons are from Flaticon

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