TG452 Series
Industrial Cellular Edge Gateways

Bivocom®

Programmable Entry-level Edge Gateway

TG452 is an entry-level edge gateway designed for integrating your legacy and modern sensors, meters and controllers into one system, it has rich interfaces, including serial port RS232/RS485, digital input, digital output relay, analog input, CAN, Ethernet port RJ45, WIFI, GNSS, which is a cost-effective solution for your applications like smart pole, remote asset monitoring, energy monitoring and management, water, waste water treatment, transportation, smart agriculture, etc.

TG452 supports 4G LTE/3G/2G cellular network, dual SIM or dual module for failover or load balance, WAN and WWAN failover, provides robust and reliable connectivity for your mission-critical industrial applications.
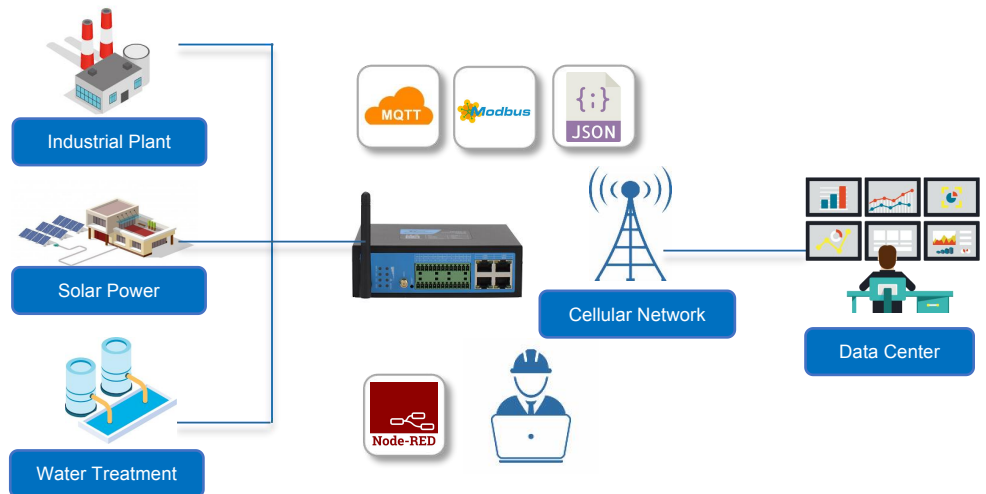
In addition, TG452 is designed based on OpenWrt Linux OS, allows the developers install their own application based on Node-Red, C/C++, Python or LUA with Bivocom SDK and API, which helps you to bring your IoT concept to reality easily and quickly.
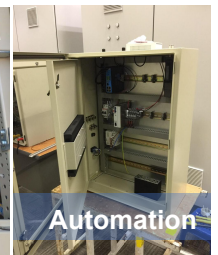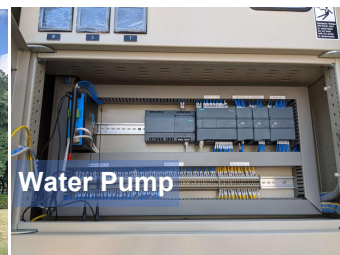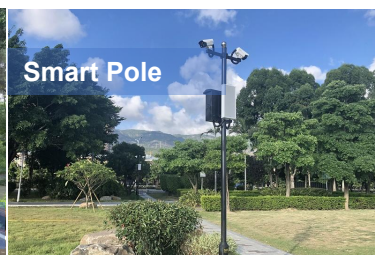
4G LTE | **Node-RED** | **python** | **Linux** | **C++**

Key Features

1. OpenWrt based Linux OS, programmable via Node-Red environment, or C/C++, Python, LUA via SDK[1]
2. Global 4G LTE/3G/2G cellular network supported
3. Dual SIM or Dual Module supports failover or load balance mode[2], auto switchover between wireless and wired WAN
4. Rich interfaces: 4-RJ45, 2-DI, 2-DO(Relay), 2-ADC, 2-RS232, 3-RS485, 1-TF card slot, 1-DC Power Output, 1-CAN(Option), WIFI(Option), GNSS/GPS(Option)
5. Up to 32G(via Micro SD card) local data storage and backup
6. LTE/3G/PPPoE DHCP and static address connection
7. APN/VPDN, and multiple VPN protocols, IPsec, L2TP, PPTP, GRE and OpenVPN, to ensure secure data transmission
8. DHCP server, DHCP binding MAC address, DDNS, firewall, NAT, DMZ host, QoS, traffic analysis
9. MQTT, Modbus RTU/TCP, TCP/UDP, HTTP, SNMP protocols
10. SPI Firewall, Port Mapping, DMZ Mapping, ACL, IP-MAC binding and Clone function
11. Web UI, telnet & SSH CLI, AT Command configuration
12. Web upgrade, local and remote syslog, serial port output log
13. SMS commands, DMP(Device Management Platform)[3] for remote configuration and management

Applications

Industrial Plant

Solar Power

Water Treatment

MQTT | Modbus | JSON

Cellular Network

Node-RED

Data Center

Success Cases

Wild Fire Alarm

Smart Pole

Water Pump

Automation

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)
- **ESD Protection**   15KV

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

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
- **Tx Power**   18dBm (11g), 21dBm (11b)
- **Rx Sensitivity**   <-72dBm@54Mpbs

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, supports 4-20mA current signal input(default), or 0-5V voltage signal input(Option)
- **Power Output**   1-channel 12V/1A output, for field devices

CAN(Option)

- **Port**   1

External Storage

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

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 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, 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℉ to +167℉)
- **Storage Temperature**   -40° C to +80° C (-40℉ to +176℉)
- **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[4]**   CE, RCM*, FCC*, NBTC*
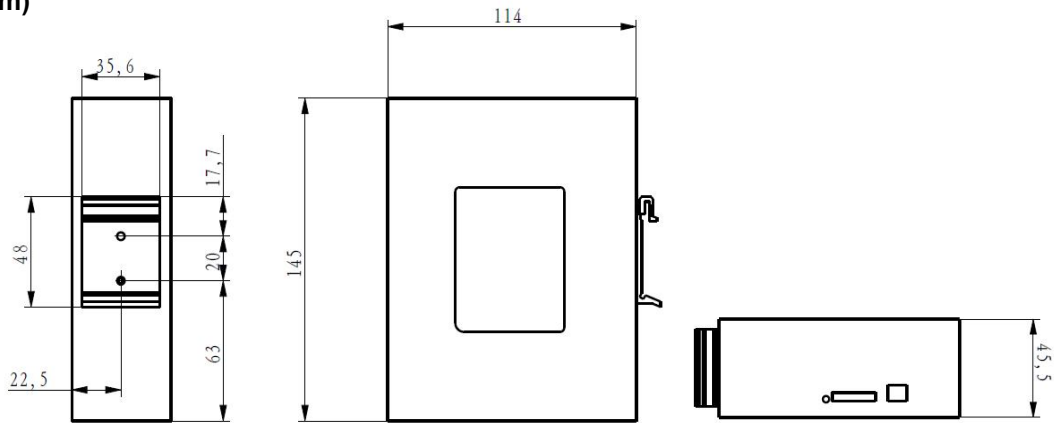- **Warranty Period[5]**   Standard: 12 Months / Extended: 2-5 Years

Standard Package Content

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

Order Information
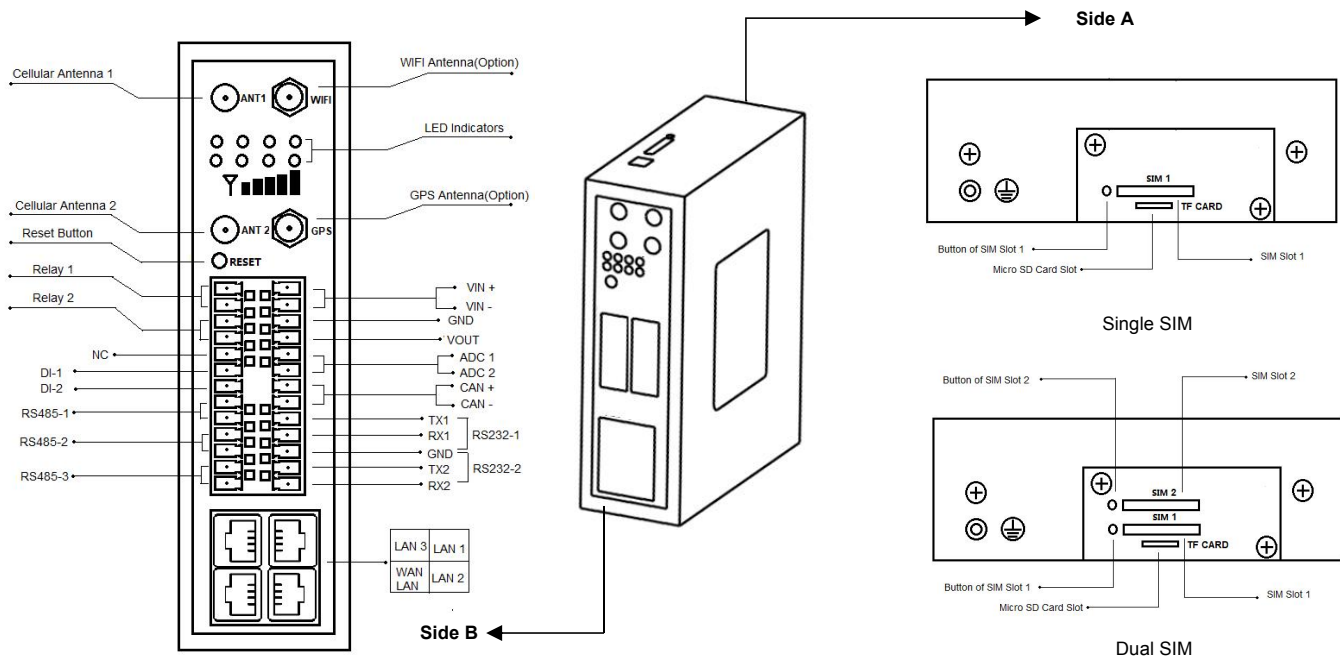
Model	Part Number	Description	Cellular Network	Frequency Band[6]
TG452-LF	TG452 - L<1><2> - <3>	4G Edge Gateway, 4-RJ45, 2-RS232, 3-RS485, 2-DI, 2-DO, 2-ADC, 1-Power output, 1-SD, CAN(Option)	4G LTE 3G/WCDMA/UMTS/HSPA+ EDGE/GPRS	4G LTE CAT 4 • EMEA/Asia: B1/B3/B5/B7/B8/B20/B38/B40/B41 • ANZ/LATAM: B1/B3/B5/B7/B8/B28 • NA: B2/B4/B5/B12/B13/B14

	<1>: Module for different cellular network, 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
	    1=1GB Flash			

TG452-W	TG452 - W<2><3> - <4>	3G Edge Gateway, 4-RJ45, 2-RS232, 3-RS485, 2-DI, 2-DO, 2-ADC, 1-SD, CAN(Option)	3G/WCDMA/UMTS/HSPA+ EDGE/GPRS	Global: 800/850/900/1900/2100

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Page 2/3

Dimensions(mm)

Side Views

Cellular Antenna 1
WIFI Antenna(Option)
ANT1 WIFI
LED Indicators
Cellular Antenna 2
GPS Antenna(Option)
ANT 2 GPS
Reset Button
RESET
Relay 1
Relay 2
VIN +
VIN -
GND
VOUT
NC
ADC 1
DI-1
ADC 2
DI-2
CAN +
CAN -
RS485-1
TX1
RX1 RS232-1
RS485-2
GND
TX2 RS232-2
RS485-3
RX2

LAN 3 | LAN 1
WAN LAN | LAN 2

Side B

Side A

Button of SIM Slot 1
SIM 1
TF CARD
Micro SD Card Slot
SIM Slot 1

Single SIM

Button of SIM Slot 2
SIM Slot 2
SIM 2
SIM 1
TF CARD
Button of SIM Slot 1
Micro SD Card Slot
SIM Slot 1

Dual SIM

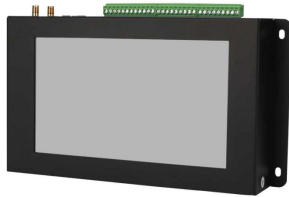
Related Products

Touch Screen Edge Gateway
TG462S Series

✓ 7" HD Touch screen, QT programmable UI
✓ Rich I/O and customizable industrial protocols
✓ OpenWrt based Linux OS, Node-Red, C/C++, Python programmable
✓ Edge computing, up to local 32G local data storage

Note:
1. Customized firmware is required.
2. 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
3. There has a license fee for DMP.
4. * Under progress
5. Price of the extended warranty will be different.
6. If you couldn't find the frequency band for your regions or have any questions, please contact Bivocom sales representatives for more information.
7. Optional features may require customized hardware and firmware, please contact Bivocom to discuss your IoT applications before your order.
8. To save the earth, Bivocom doesn't print the user guide, if you need it, please go to Bivocom website to download.