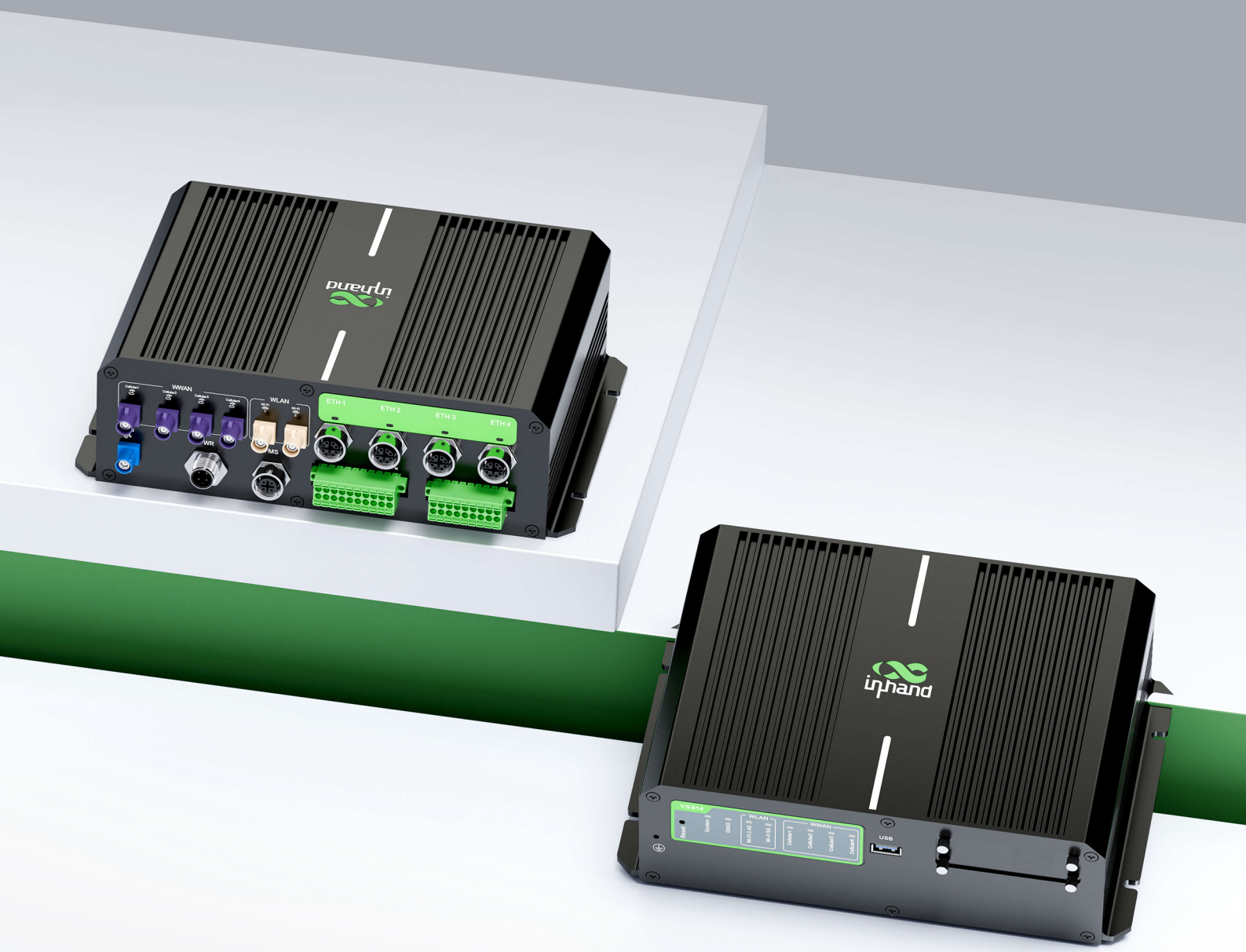
InHand Networks

High-performance, all-in-one, open vehicle gateway



VG814 Series Cellular Vehicle Gateway

- 5G/LTE CAT6
- Dual-band Wi-Fi 5
- GNSS
- M12 + FAKRA

1. Product Overview

The VG814 is an ITxPT certificated cellular gateway for public transportation, delivering secure, high-speed onboard networking for buses, trams, metro, and rail scenarios.

Positioning: Rugged all-in-one vehicle gateway with high-speed WAN, Wi-Fi, GNSS, and edge computing

Key Features:

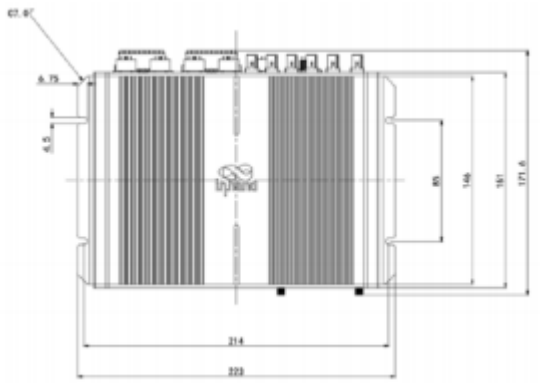
- **High-speed connectivity:** 5G/LTE CAT6 with dual SIM and link backup for always-on access
- **Vehicle-ready design:** FAKRA RF and M12 connectors built for harsh mobile environments
- **Integrated vehicle interfaces:** Supports OBD-II, J1939, CAN, serial, USB, and rich I/O
- **Open edge platform:** Supports Python, C/C++, Docker, and cloud integration
- **Fleet operation ready:** Supports fleet tracking, messaging, geofencing, and OTA

Core Technical Specifications

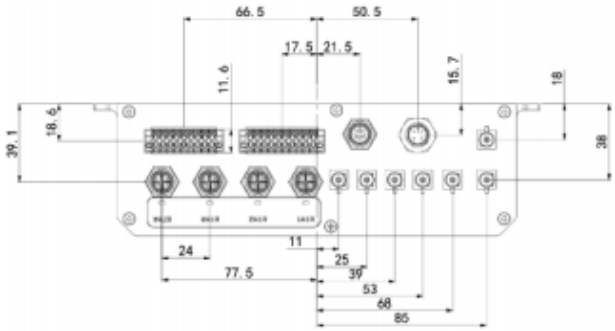
Technical Indicator	Specification
Cellular Network	LTE CAT6 / 5G / 5G+5G RedCap
Network Features	APN, VPDN, DHCP, DNS, DDNS, static routing/RIP/OSPF/BGP
Positioning Capability	GPS/GLONASS/Galileo/Beidou, 2.5 m CEP accuracy, up to 10 Hz
Security Capability	SPI firewall, ACL, NAT/NAPT, IPsec/OpenVPN/L2TP/GRE
Wi-Fi Capability	Wi-Fi 5 dual-band (2.4/5 GHz), AP/Client, multi-SSID, Captive Portal

Technical Indicator	Specification
Edge and Cloud	Supports C/C++, Python, Docker; compatible with Azure/AWS IoT; FlexAPI
Processing Platform	ARM Cortex-A7 quad-core 717 MHz, 1 GB DDR3L, 8 GB eMMC
Interface Capability	4 x Gigabit Ethernet (M12 X-coded), CAN, RS232, RS485, USB 3.0, 11DI/4DO
Power Supply and Consumption	9-48 VDC, typical power consumption 6.240 W, peak 15.192 W
Mechanical Dimensions	223 x 66.2 x 171.6 mm, 1340 g, wall mounting
Environmental Adaptation	-30 C to +70 C operating, -40 C to +85 C storage, 95% RH @ 40 C
Protection and Certifications	IP54, ECE R10/R118, EN45545-2/EN50155/EN50121/EN61373, CE/UKCA/RoHS/E-Mark/ITxPT

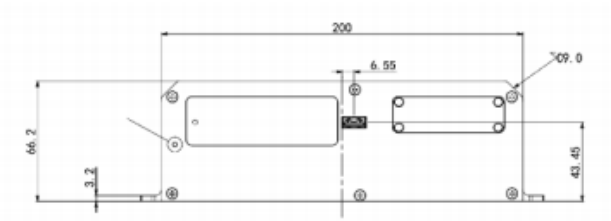
2. Product Dimensions



Front View



Interface View



Side View

Notes:

1. All dimensions are in millimeters (mm).
2. All dimensions are approximate and **for reference only**.
3. Drawings **must not be used for manufacturing**.
4. Dimensions are subject to part and manufacturing tolerances.
5. Specifications may change without prior notice.

3. Hardware Specifications

Category / Parameter	Specification
Core Platform	
CPU	ARM Cortex-A7 (quad-core)
Frequency	717 MHz
RAM	1 GB DDR3L

Category / Parameter	Specification
Flash	8 GB eMMC
Cellular & Networking	
Cellular	LTE CAT6 / 5G / 5G+5G RedCap
SIM	2 x SIM (2FF)
Ethernet	4 x Gigabit Ethernet, M12 X-coded female
Antenna Connector	Cellular: FAKRA D-coded; Wi-Fi: FAKRA I-coded
Satellite Positioning	
GNSS Receiver	GPS, GLONASS, Galileo, Beidou
Dead Reckoning	Built-in accelerometer and gyroscope supported
Position Accuracy	2.5 m CEP
Tracking Sensitivity	-160 dBm
Update Rate	Up to 10 Hz
Vehicle Interfaces	
CAN Bus	1 x CAN 2.0B + 1 x CAN 2.0B FMS
Serial	1 x RS232, 1 x RS485
USB	1 x USB 3.0 (Type-A)
I/O	11 x DI, 4 x DO
Audio	Left/Right channel, Mic In
Wi-Fi	
Frequency	2.4 / 5 GHz dual-band
Protocol	Wi-Fi 5 (IEEE 802.11 a/b/g/n/ac)

Category / Parameter	Specification
Output Power	2.4G: 17 dBm; 5G: 17 dBm
Working Mode	AP / Client
Power	
Power Connector	M12 A-coded male
Input Voltage	9-48 VDC
Pin Definition	V+, V-, Ignition, NC (4 pins)
Standby Power	0.0416 W
Typical Operating Power	6.240 W
Peak Power	15.192 W
Mechanical & Environment	
Dimensions (W x H x D)	223 x 66.2 x 171.6 mm
Weight	1340 g
Mounting	Wall mounting
Protection Rating	IP54
Cooling	Fanless
Enclosure	Aluminum
Operating Temperature	-30 C to +70 C
Storage Temperature	-40 C to +85 C
Humidity	95% RH @ 40 C
Compliance & Certifications	

Category / Parameter	Specification
Vehicle Standard	ECE R10, ECE R118，ISO16750
Rail Standard	EN45545-2, EN50155, EN50121, EN61373
Certifications	CE, UKCA, RoHS, E-Mark, ITxPT

4. Software Specifications

Category / Parameter	Specification
Network Features	
Network Access	APN, VPDN
LAN Protocol	ARP, Ethernet
Access Authentication	CHAP/PAP/MS-CHAP/MS-CHAP V2
VLAN	VIDs 1-127
IP Applications	DHCP server/relay/client, DNS relay, DDNS, Telnet, SSH, HTTP, HTTPS, MQTT
IP Routing	Static routing, RIP, OSPF, BGP
Diagnostics	Ping, Traceroute, tcpdump, speed test
Security	
Firewall	SPI, DoS defense, multicast/Ping filtering, ACL
NAT	NAT, NAPT, DMZ, port mapping
User Levels	Administrator and read-only user
AAA	Local authentication, Radius, TACACS+, LDAP
Certificates	PEM, PKCS12, SCEP, CRL

Category / Parameter	Specification
VPN	IPsec VPN, OpenVPN, L2TP, GRE
Reliability	
Redundancy	Floating static routes, VRRP, interface backup
Link Detection	Configurable reachability detection for failover
Watchdog	Auto recovery from device faults
Offline Storage	Built-in storage for data caching during disconnection
WLAN Features	
Security	Shared key, WPA/WPA2 authentication
Encryption	WEP/TKIP/AES
Other	Multiple SSIDs, captive portal
Edge Computing & Services	
Programmability	C/C++, Python, Docker
SDK	Python 3 SDK, Docker SDK, Azure IoT Edge SDK
API	FlexAPI over MQTT/HTTP/TCP
Cloud Integration	Microsoft Azure, AWS IoT, and third-party platforms
Built-in Services	Inventory, time, GNSS, FMStoIP, MQTT broker

5. Ordering Information

Model Rule

Model code: VG814-<WMNN>-W-G-V

<WMNN>: Cellular Type & Module

Product Models

Model	Region	<WMNN>: Cellular Type & Module
VG814-FQ09-W-G-V	LTE CAT6 Global	LTE-FDD B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71 LTE-TDD B34/38/39/40/41/42/43/46(LAA)/48(CBRS) WCDMA B1/2/3/4/5/6/8/19
VG814-NRQ3-W-G-V	5G Global	5G NSA n1/2/3/5/7/8/12/20/25/28/38/40/41/48/66/71/77/78/79 5G SA n1/2/3/5/7/8/12/20/25/28/38/40/41/48/66/71/77/78/79 LTE-FDD B1/2/3/4/5/7/8/9/12(17)/13/14/18/19/20/25/26/28/29/30/32/66/71 LTE-TDD B34/38/39/40/41/42/43/48 LAA B46 WCDMA B1/2/3/4/5/6/8/19

VG814-NRQ5-W-G-V	5G Global	5G SA/NSA n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29/30/38/40/41/48/66/70/71/75/76/77/78/79 LTE-FDD B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71 LTE-TDD B34/38/39/40/41/42/43/48 LAA: B46 WCDMA: B1/2/4/5/8/19

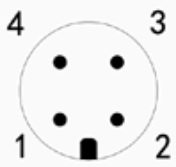
6. Contact Us

- **Website:** InHand Networks
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7. Terminal Definition

PWR	PIN	Signal
	1	VIN+
	2	IGT
	3	VIN–
	4	NC

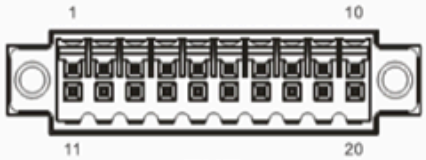
PWR 4 PIN



FMS	PIN	Signal
	1	CAN1_H
	2	CAN1_L
	3	GND
	4	NC

FMS 4 PIN

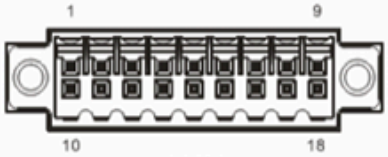




EXT

PIN	1	2	3	4	5	6	7	8	9	10
Signal	GND	DO2	DO4	WHEEL TICK*	GND	RS232_RX1	L-Channel	GND	CAN0_L	RS485_B
PIN	11	12	13	14	15	16	17	18	19	20
Signal	GND	DO3	PPS	FWD*	GND	RS232_TX1	R-Channel	Mic In	CAN0_H	RS485_A

* WHEEL TICK and FWD is ADR function reserve PIN, VG814-NRQ3-W-Ga-V is supported.



AUX

PIN	1	2	3	4	5	6	7	8	9
Signal	DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8	GND
PIN	10	11	12	13	14	15	16	17	18
Signal	GND	GND	GND	GND	DI9	DO1	DI10	DI11	GND