InHand Networks

High-performance, All in one, Open

# InVehicle G810 Series

Cellular Gateway for ITxPT

The InVehicle G810 cellular gateway provides high-speed and secure network access for public transportation, including bus, tram, metro, light rail and train. Its all in one design integrates high-speed Wi-Fi, LTE Advanced, Gigabit Ethernet and CANBus to provide fast, reliable and secure network access for in-vehicle networking and Internet connectivity.

The gateway is embedded with powerful edge computing capability and supports fast custom application development by using Python or Docker. It also supports Microsoft Azure and AWS IoT cloud platform integration.

The ITxPT compliant FAKRA RF connectors and M12 connectors are specially designed for plug & play ITxPT applications.

Applications

- Fleet Management & Telematics
- Passenger Wi-Fi
- Passenger Infotainment
- Public Transport ITS

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Product Specifications

InVehicle G814 Hardware Specifications

Core

CPU	ARM Cortex A7 (quad-core)	Frequency	717MHz
RAM	1GB DDR3L	FLASH	8GB eMMC

Cellular

UE Category	LTE CAT6/CAT4	SIM	2 x SIM 2FF
MIMO	2 x 2	Antenna Connector	FAKRA D-coded male

GNSS

GNSS Receiver	GPS, GLONASS, Galileo, Beidou	Antenna Connector	FAKRA C-coded male
Dead Reckoning	supported with builtin sensors (accelerometer and gyroscope)		
Accuracy	2.5m CEP		
Sensitivity	-160dBm	Location Update Rate	MAX 10Hz

Wi-Fi

Frequency	2.4G / 5GHz dual-band	Protocol	WiFi 5
Maximum Output	2.4G: 17dBm 5G: 17dBm	Working Mode	AP / Client
MIMO	2 x 2	Antenna Connector	FAKRA I-coded male

Ethernet

Ports	4 x Gigabit Ethernet	Connector	M12 X-coded female

CANBus FMS

Standard	1 x CAN 2.0B	Connector	M12 A-coded female

USB

Standard	1 x USB 3.0	Connector	Type A

IO

DI	11 x digital input
DO	7 x digital output

Additional Interfaces

CANBus	1 x CAN 2.0B		
RS485	1	RS232	2

LED

Indicator	System, Cellular, Signal, GNSS, Wi-Fi 2.4G, Wi-Fi 5G

Power Supply

Power Connector	M12 A-coded male		
Pin Definition	V+, V-, Ignition, NC (4 pins)		
Input Voltage	9-48VDC		

Mechanical

Mounting	Wall mounting	Ingress Protection	IP40
Cooling	Fanless cooling	Enclosure	Aluminum
Dimensions (W x H x D)	223 x 66.5 x 181.36mm	Weight	TBD

Environmental

Operating Temperature	-30 °C ~ +70 °C	Storage Temperature	-40 °C ~ +85 °C
Humidity	95% RH @ 40°C		

Compliance

Vehicle Standard	ECE R10*, ECE R118*
Certifications	CE, RoHS*, E-Mark*, ITxPT*
Other	EN50155 EN50121-3-2 EN61373 EN45545-2

InVehicle G814 Software Specifications

Network Connection

Network Access	APN, VPDN	LAN Protocol	ARP, Ethernet
Access Authentication	CHAP/PAP/MS-CHAP/ MS-CHAP V2	VLAN	Supported VIDs: 1-127

Network Protocols

IP Application	Ping, Traceroute, DHCP server/relay/client, DNS relay, DDNS, Telnet, SSH, HTTP, HTTPS, MQTT
IP Routing	Static routing, RIP, OSPF, BGP

Network Security

Firewall	SPI, DoS attack defense, multicast/Ping probe filter, ACLs Supports NAT, NAPT, DMZ, port mapping
User Level	2 levels: administrator; read-only user
AAA	Local authentication, Radius, TACACS+, LDAP
Certificate	PEM, PKCS12, SCEP, CRL
VPN	IPsec VPN, OpenVPN, L2TP, GRE

ITxPT

Services	Inventory, Time, GNSS, FMStoIP, VEHICLEtoIP, MQTT broker

Reliability

Redundancy	Floating Static Routes, VRRP, interface backup
Link Detection	Configurable target reachability detection to aid failover
Watchdog	Auto recovery from device faults
Offline Storage	Records key data to built-in storage when network is unavailable

WLAN

Protocol	IEEE802.11 a/b/g/n/ac
Security	Shared key, WPA/WPA2 Personal/Enterprise authentication WEP/TKIP/AES encryption

Network Management

Configuration	HTPP, HTTPS, Telnet, SSH
Upgrade	WebUI, Device Manager
Network Diagnostic	ping, traceroute, tcpdump, speed test

Edge Computing Framework

Edge Computing Platform	Integrates network, computing, storage, runtime and application hosting
Edge Computing Engine	Python & Docker
SDK	Standard Python 3 SDK, Docker SDK and Azure IoT Edge SDK
IDE	Visual Studio Code for APP development and debugging
Application Programming Interface	FlexAPI over MQTT/HTTP/TCP
Cloud Integration	Microsoft Azure, AWS IoT and other third-party platforms supported

Applications

Fleet Management	All in one design yet programmable with open interfaces. It's one stop hardware & software solution for your Fleet Management
Vehicle Telematics	Rich interfaces and data such as GNSS, OBD-II, J1939, Modbus, IO for vehicle telematics and asset tracking
Passenger Wi-Fi & Infotainment	Increase passenger satisfaction by high speed and stable Internet connectivity for content delivery, along with seamless Wi-Fi experience
Public Transport ITS	Ensure passenger and driver safety, improve operational efficiency and emission reduction to form a green, safe and sustainable society

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Connector Pin Assignment

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

4pins

A

FMS	PIN	Signal
	1	CAN_H
	2	CAN_L
	3	GND
	4	NC

4pins

A
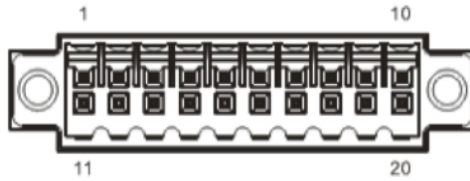
EXT

PIN	1	2	3	4	5	6	7	8	9	10
Signal	GND	DO2	DO4	DO6	GND	RS232_RX1	RS232_RX2	GND	CAN_L	RS485_A
PIN	11	12	13	14	15	16	17	18	19	20
Signal	GND	DO3	DO5	DO7	GND	RS232_TX1	RS232_TX2	GND	CAN_H	RS485_B
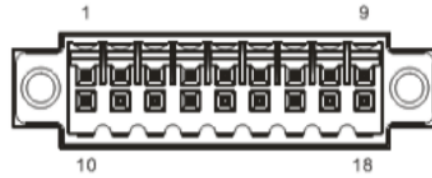
AUX

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

Ordering Guide

Model	Cellular Type	UE Category	CANBUS	GNSS	Wi-Fi	Antenna Connector	Region
VG814-FS59-W-G-V	LTE−FDD Band1/3/5/7/8/18/19/20/26/28A/28B LTE−TDD Band38/39/40/41 UMTS/HSPA+Band1/3/5/6/8 TD−SCDMA Band34/39 GSM/GPRS/EDGE900/1800MHz	Cat 6	2	√	√	FAKRA	Europe Africa APAC Ocenia
VG814-NRQ0-W-G-V	5G NR NSA:n38*/n41/n71/n77/n78/n79 5G NR SA:n1/n2/n3/n5/n7/n8/n12/n20/n25/n28*/ n38/n40/n41/n48/n66/n71/n77/n78/n79 LTE-FDD:B1/B2/B3/B4/B5/B7/B8/B12/B13/B14 /B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71 LTE-TDD:B34/B38/B39/B40/B41/B42/B43/B48 WCDMA:B1/B2/B3/B4/B5/B8/B19		2	√	√	FAKRA	Global (except North America)

Example: VG814-FS59-W-G-V contain Wi-Fi 5, 4GE-M12, 1FMS, EXT:2*RS232, 1*RS485, 6*DO 1*CAN2.0B AUX :11*DI 1*DO，ITxPT，FAKRA Antenna Connector

About Us

InHand Networks is a global leader of Industrial IoT, with a record of tremendous success following groundbreaking innovation since our inception in 2001.

InHand serves world-class partners and customers with industrial M2M routers, gateways, industrial Ethernet switches, rugged computers and IoT management platforms. We provide IoT solutions for various vertical markets including Smart Grid, Industrial Automation, Remote Machine Monitoring, Smart Vending, Smart City, Retail and more.

Proudly bearing the marks of both Rockwell Automation Technology Partner in Asia-Pacific and Schneider Electric Technology Partner, InHand Networks defines industrial innovation and reliability.

InHand Networks

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