InHand Networks

High-performance, Powerful, Programmable

VG710 5G Vehicle Gateway

· 5G   · Wi-Fi 5   · Telematics

The InVehicle G710 gateway provides high-speed and secure network access for vehicles and transportation services, including special-purpose, heavy equipment, law enforcement, emergency, engineering and ambulance vehicles. The cloud-based fleet management platform provides continuous supervision for logistics management, asset tracking, mobile offices and government security works.

The InVehicle G710 has industrial grade hardware platform, high-speed Wi-Fi and 5G WAN to provide fast, reliable and secure network access for vehicles and vehicle mounted devices. It supports CAN bus for real-time collection of vehicle data; built-in advanced satellite navigation system for continuous accurate positioning; combining with remote analysis software, it supports monitoring of dangerous driving behaviors.

The gateway is embedded with powerful edge computing capability and supports fast custom development by Python and C/C++. It also supports MS Azure and AWS IoT clouds.

Public Transport
Buses, long-distance coaches

Heavy Equipment
Trucks, excavators, cranes, loaders, bulldozers

Logistics
Asset tracking, cold chain

Public Safety
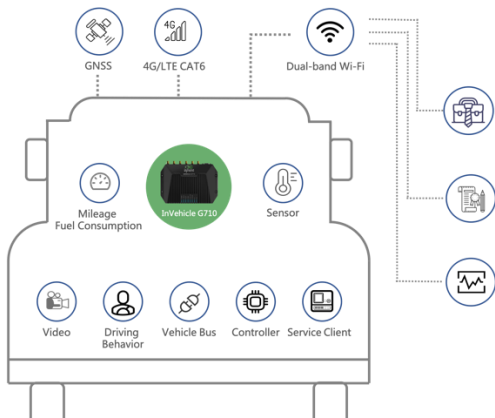Law enforcement vehicles, fire trucks, waste collection vehicles

First Aid
Ambulances, Tele-health Vehicles

Special Goods
Hazardous goods, vaccines, livestock

Solution

GNSS | 4G/LTE CAT6 | Dual-band Wi-Fi

Mileage Fuel Consumption | InVehicle G710 | Sensor

Video | Driving Behavior | Vehicle Bus | Controller | Service Client

Features and Advantages

Robust network access capability

Supports 5G both standalone (SA) and non-standalone (NSA) modes. Download speed up to 2.1Gbps and upload speed up to 450 Mbps. Support TDD and FDD two modes, backward compatible with 4G/3G.

Designed for vehicles

Designed for challenging operating environments in vehicles. Industrial-grade processor chip ensures continuous operation on-board vehicles. IP64 protection, resistant to challenging conditions like water splash, dust, shock, vibration, damp heat and high and low temperatures.

Driving behavior monitoring

Integrated 3D accelerometer and gyroscope can help to monitor in real time dangerous driving behaviors like rapid acceleration, sudden braking and sharp turns, as well as collision events. This will help to reduce accidents, protect personnels and cargoes safe with preventive measures, and finally reduce operation losses and improve customer satisfaction.

Vehicle diagnostics collection

Integrates multiple interfaces including OBD-II and J1939 to collect vehicles diagnostics, and API interface to upload the data to the application platform in real time. By analyzing the diagnostic data, the application platform can timely detect health issues of vehicles, shorten response duration.

Rich vehicle-mounted I/O

Integrates multiple channels of I/O inputs, outputs, and analog inputs, can connect a wide range of sensors. Integrates Bluetooth 4.1 to connect vehicle-mounted Bluetooth electronic devices. Supports RS232/RS485 serial port, can connect field service devices to implement asset management or service workflow.

Edge computing

Outstanding edge computing capabilities extend analytical calculation to the network edge within the vehicle, improving the efficiency of data processing, which meets the basic need for real-time business and application intelligence in the Internet of Vehicles (IoV) industry. Supports Node-RED Low-code edge computing solutions.

Global satellite positioning

72-channel high-precision high-sensitivity global satellite positioning system.

Inertial navigation

Integrates inertial navigation system. When GNSS positioning becomes inaccurate due to weak signal, no signal or multi-path effect, the gateway will still provide excellent positioning accuracy.

Fleet management platform

Supports access to InHand or a 3rd-party fleet management platform to perform: task assignment, route planning, vehicle tracking, real-time messaging, geofencing, etc.

Dimensions (mm)
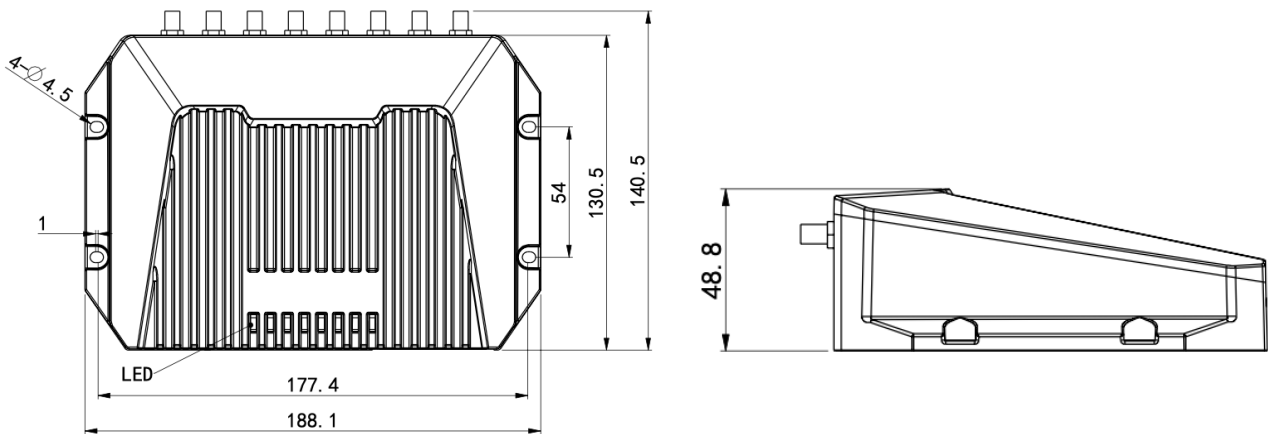
Dimensions: 188.1*140.5*48.8 (mm)

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Product Specifications

VG710 Hardware Specifications

Hardware Platform

CPU	ARM Cortex A7	RAM	1 GB DDR3
FLASH	8GB eMMc	Main Frequency	717 MHz

Satellite Navigation

GNSS Receiver	GPS, GLONASS, Galileo, Beidou		
Built-in Sensor	Inertial navigation sensor (accelerometer and gyroscope)		
Positioning Deviation	11.5m (With SBAS), 2.5m (Autonomous), ADR (Optional)		
Tracking Sensitivity	-160 dBm	Location Update Rate	MAX 10Hz

Interfaces

Cellular	5G SA/NAS Sub-6 or 4G CAT 6		
Ethernet	4*10/100/1000 Mbps RJ45 interface		
MicroSD	Up to 32GB, 20 MB/s	Bluetooth	Bluetooth 4.1
Antenna	SMA-K: Cellular, GNSS; RPSMA-K: 2*Wi-Fi, Bluetooth		
Indicator	System, Cellular, Signal, GNSS, Wi-Fi 2.4G, Wi-Fi 5G, U1, U2		

Wi-Fi

Frequency	2.4 / 5GHz dual-band	Protocol	Wi-Fi 5
Maximum Output	2.4G: 17dBm; 5G:17dBm	Working Mode	AP / Client

Automotive Interfaces

Diagnostics Interfaces	2*CAN bus, 1*J1708, 1*LIN Bus		
DO/DI/AI	2*DO, 4*DI/AI or 2*DI/AI	Audio/Voice	R, L, Mic
Serial Port	1*RS232, 1*RS485	Other	1 WIRE (driver ID / temperature sense)

Power Supply

PIN Definition	V+, V-, ignition signal, NC (4 pins)
Input Voltage	9-36VDC [configurable to 7-36VDC]
Protection	Built-in voltage transient protection, with delayed ignition induction
Standby Power	0.006W - monitors ignition signal only; system starts on ignition
Operating Power	12.00W - average when RF module not running at full load
Peak Power	18.20W - peak value when RF module running at full load

Mechanical Features

Installation	Wall-mounting	Protection Rating	IP64
Cooling	Radiation cooling	Housing	Die-cast aluminum
Dimensions (W*D*H)	188.1*104.5*48.8 (mm)	Weight	775g
SIM Card Slot	Dual SIM	SIM Card Spec.	2FF

Environment

Operating Temp.	-30 °C ~ +70 °C -22 °F ~ +158 °F	Storage Temp.	-40 °C ~ +85 °C -40 °F ~ +185 °F
Humidity	95% RH @ 60°C	Start-up	-35 °C / -35 °F

Vehicle

Vehicle Standard	ECE-R10, R118	Rail Standard	EN 50155, EN 50121 EN 61373, EN 45545
EMC	Level 3 (EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-18)		

Physical

Shock	IEC60068-2-27	Vibration	IEC60068-2-6
Free Fall	IEC60068-2-32		

Certification

Certification	CE, E-Mark, ITxPT, FCC, IC, PTCRB, RoHS, VZW, AT&T, TMO
Warranty	3 years

VG710 Software Specifications

Network Connection

Network Access	APN, VPDN	LAN Protocol	ARP, Ethernet
Access Authentication	CHAP/PAP/MS-CHAP/MS-CHAP V2		

Network Protocols

IP Application	IPv6, Ping, Traceroute, DHCP server/relay/client, DNS relay, DDNS, Telnet, SSH, HTTP, HTTPS, TFTP, FTP, SFTP, Portal
IP Routing	Static routing, RIP, OSPF, BGP, IGMP Proxy

Network Security

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

Reliability

Backup	Floating routing, VRRP, interface backup
Link Detection	Sends heartbeat packet to detect, auto redial when disconnected
Watchdog	Runs self-detection and auto-repairing of device faults
Offline Storage	Built-in cache, records key data when network unavailable

Ports

VLAN Partition	Supported

WLAN

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

Network Management

Configuration	Local or remote HTPP, HTTPS, Telnet, SSH
Upgrade	Local or remote WEB, DM, TFTP, FTP, SFTP server
AAA	Local / Radius / TACACS +
Network Diagnostics	Ping, Traceroute, Sniffer (network packet capturing tool)

Edge Computing Framework

Edge Computing Platform	An edge computing platform integrating network, computing, storage and applications
Programmable	Python, C/C++ & Docker
SDK	Python 3 SDK, Docker SDK and Azure IoT Edge SDK
IDE	Visual Studio Code
IoT Architecture	Supports MQTT, DDS, AMQP, XMPP, JMS, REST, CoAP
3rd Party Cloud	MS Azure, SmartFleet and development APIs for other third-party platforms
Docker Images	Node-RED, Ubuntu, Docker for ARM 32, etc.

Application Services

Cloud Services	Device Manager: remote management of VG710 online InConnect: Quickly building of private networks and access to devices connected to VG710 at any time
Vehicle Telemetry	Rich interfaces for vehicle telemetry and asset tracking devices
Event Alarm	Customizable event alarms: digital input, network, service status, power supply, temperature, voltage, etc.
Message Push	SMS, Email, App, device digital output

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Ordering Guide

| Model	Model code: VG710–H-<WMNN>				
	<WMNN>: Cellular Type & Module	3GPP	Wi-Fi 5	BLE	Region
VG710-H-NRQ5	5G NR 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 5G NR SA 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 46 WCDMA B1/2/4/5/8/19	3GPP Release 16	√	√	Global
VG710-H-NRQ3	5G NR NSA: n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38 /n40/n41/n48*/n66/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/B9/B12(B17)/B13/B14/B18 /B19/B20/B25/B26/B28/B29/B30/B32/B66/B71 LTE-TDD: B34/B38/B39/B40/B41/B42/B43/B48 LAA: B46 WCDMA Bands B1/B2/B3/B4/B5/B6/B8/B19	3GPP Release 15	√	√	Global
VG710-H-NRR2	5G NR NSA n41/n78/n79 5G NR SA n1/n28*/n41/n77/n78/n79 LTE FDD B1/B2/B3/B5/B7/B8/B20/B28 LTE TDD B34/B38/B39/B40/B41 WCDMA B1/B2/B5/B8	3GPP Release 15	√	√	China

Pin Out Diagram

IO 20PIN Definition

PIN	1	2	3	4	5	6	7	8	9	10
Def.	L_Channel	Mic IN	RS_485A	GND	RS232_TX	1Wire	DO1	GND	AI1/DI1	AI3/DI3/FWD
PIN	11	12	13	14	15	16	17	18	19	20
Def.	R_Channel	GND	RS_485B	GND	RS232_RX	GNSS_1PPS	DO2	GND	AI2/DI2	AI4/DI4/WHEELTICK

EXT 10PIN Definition

PIN	1	2	3	4	5
Def.	K_LINE	CAN0_H	GND	CAN1_H	J1708_A
PIN	6	7	8	9	10
Def.	L_LINE	CAN0_L	GND	CAN1_L	J1708_B

Power   I/O   EXT   Ethernet
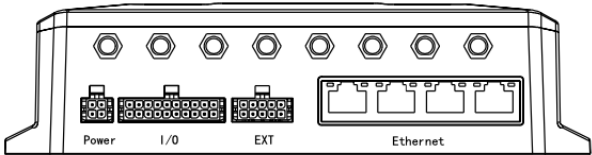
About Us

InHand Networks is a leading IoT solutions provider founded in 2001, dedicated to driving digital transformation across industries and empowering customers to unlock their full potential and achieve accelerated growth.

We specialize in delivering industrial-grade connectivity solutions for diverse sectors, such as enterprise networks, industrial and building IoT, digital energy, smart commerce, and mobility. Our comprehensive product portfolio and services cater to various applications worldwide, including smart manufacturing, smart grid, intelligent transportation, smart retail, etc. With a global footprint spanning over 60 countries, we serve customers in China, the United States, France, Germany, the United Kingdom, Italy, and beyond.

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