



InHand Networks



High-performance Vehicle Network,
Powerful Processing, Flexible Expansion

InVehicle G710 Series

Industrial-grade Vehicle Gateway

The InVehicle G710 is a new series of 4G vehicle gateway for the Internet of vehicles providing high-speed network access for vehicles and transportation services, incl. special-purpose, emergency, engineering, law enforcement, and ambulance vehicles. Working with cloud-based management platform, it provides uninterrupted operation management for logistics, asset tracking, mobile office, and safety supervision.

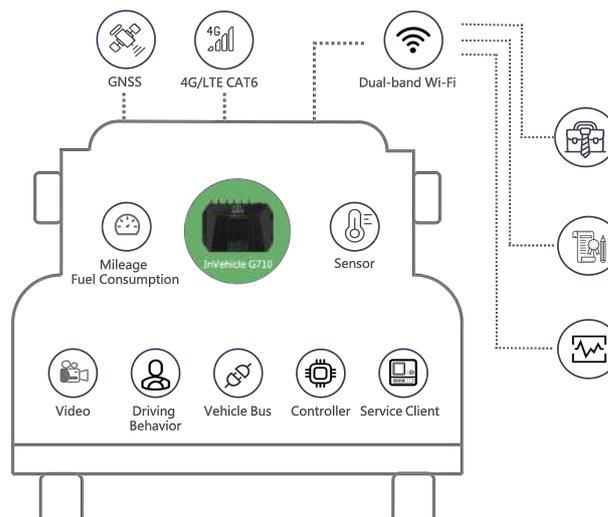
The InVG710 has transport grade hardware, high-speed in-vehicle network incl. LTE CAT6 WAN to provide fast, reliable and secure network access for vehicles and vehicle-mounted devices; CAN-II and J1939 bus to collect real-time vehicle diagnostic data; advanced satellite navigation system to provide continuous accurate positioning, and works with remote analysis software to monitor dangerous driving behaviors, ensure driving safety.

Powerful edge computing facilitates quick implementation of custom applications; remote management platform enables flexible development of enterprise applications; MS Azure and AWS provides more choices for enterprise application developers.

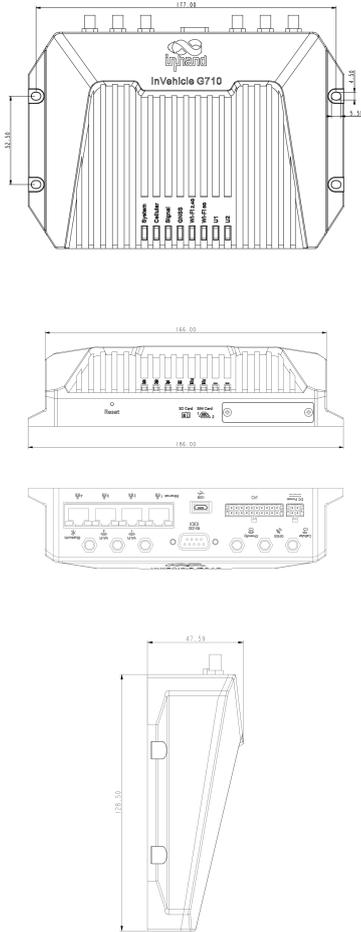
The InVG710 vehicle gateway is suitable for fleet management and use in vehicle operation process control. Applications may include:

- Public safety: law enforcement vehicles, fire engines, waste collection vehicles
- Defense forces: combat vehicles, emergency communication vehicles
- Public transportation: buses, long-distance buses
- First Aid: ambulance, telemedical vehicles
- Logistics transport: express logistics
- Special goods transport: hazardous goods, vaccines, cold chain

Application Case



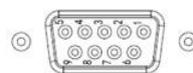
Features and Advantages



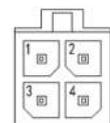
- Designed for use on-board vehicles**
 Specially designed to withstand the challenging environments in vehicles. Adoption of industrial-grade processor chip ensures continuous stable operation under harsh conditions. IP64 protection rating, resistant to water splash, dust, shock, vibration, damp heat, high and low temperatures.
- Global satellite positioning**
 72-channel high-precision high-sensitivity global satellite positioning system of global coverage, tracks vehicle locations precisely at any time anywhere.
- Inertial navigation**
 Integrates inertial navigation system. When vehicles are in tunnels, underground garage, or between urban high-rises so GNSS positioning becomes inaccurate due to poor/no signal or multipath effect, the gateway will still provide excellent positioning accuracy, enabling continuous accurate tracking.
- Driving behavior monitoring**
 Integrates 3D accelerometer and gyroscope to monitor in real time dangerous driving behaviors including rapid acceleration, sudden braking and sharp turns, and collision events, to reduce the occurrence of accidents and protect the safety of drivers, passengers, cargo, and personnel through preventive measures, and finally reduce operating costs and improve customer satisfaction.
- Vehicle diagnostic information collection**
 The gateway integrates OBD-II and J1939 interfaces to collect diagnostic information of vehicles, e.g. cars, light trucks and heavy trucks; and provides API interface to upload the information to the application platform in real time. By analyzing the diagnostic information, the online application platform can timely detect the operating status of vehicles, shorten response time.
- Rich vehicle-mounted I/O**
 Integrates multiple channels of I/O inputs and outputs, analog input, can connect a wide range of sensors; integrates Bluetooth 4.1 to connect Bluetooth vehicle-mounted electronic devices. Support RS232/RS485 serial port, can connect field service devices such as bar code scanners and RFID scanners used for asset management or business workflow.
- Edge computing**
 Edge computing capability extends analytic computing to edges where nearest to vehicle services, to provide faster service response, greatly improve data processing efficiency and reduce cloud load, meeting the basic needs of real-time service and application intelligence of the Internet of Vehicles.
- Fleet management platform**
 Support InHand or 3rd-party fleet management platforms to perform: task allocation, route planning, vehicle track monitoring, real-time messaging, geofencing, etc. Support DeviceManager network management, effectively reduce the complexity of device management and service deployment.
- Developer features**
 The comprehensive secondary development platform opens key system resources to users, to facilitate fast development and deployment of custom applications. Integrates cloud IoT SDK to quickly build AWS, MS Azure, Ali-Cloud and other mainstream cloud based applications.

Interfaces

Pin	Definition	Pin	Definition
1	GND	2	GND
3	AI1/DI1	4	AI2/DI2
5	AI3/DI3	6	AI4/DI4
7	AI5/DI5/WHEELTICK	8	AI6/DI6/FWD
9	GND	10	GND
11	DO1	12	DO2
13	DO3	14	DO4
15	GND	16	GND
17	CANH	18	CANL
19	485+	20	485-



Pin	Definition	Pin	Definition	Pin	Definition
1	DCD	4	DSR	7	
2	RXD	5	RTS	8	
3	TXD	6	CTS	9	



Pin	Definition	Pin	Definition
1	Power	2	Ground
3	Ignition sense	4	NC

Product Specifications

InVehicle G710 Specifications	
Hardware Platform	
ARM Cortex A CPU	
8GB eMMC storage	32MB Flash
Satellite Navigation	
Dedicated GNSS receiver, supports GPS, GLONASS, Beidou, and Galileo	
Inertial navigation sensor (accelerometer and gyroscope)	
Tracking sensitivity: -160dBm	Location update rate: MAX 30Hz
Positioning deviation: 1.5m (With SBAS), 2.5m (Autonomous)	
Interfaces	
4G LTE CAT6 high speed network	
4*10/100/1000 Mbps RJ45 Ethernet port	
RS232 serial port (DB-9)	Packet loss rate: hardware 0%
USB2.0 Micro-B (Reading and writing speed requirement: Max 480Mbps)	
Micro SD Card (up to 32GB, rate 20MB/s)	
Bluetooth 4.2	
6 SMA antenna connectors (cellular*2, Wi-Fi*2, GNSS, Bluetooth)	
Wi-Fi	
2.4G / 5GHz dual-band Wi-Fi	802.11ac/a/b/g/n Wave2
Maximum output power: 2.4G: 17dBm, 5G: 17dBm	
Working mode: AP / Client mode	
Industrial Interfaces (20 Pins in Total)	
Configurable I/O (10 pins in total)	
6 digital input/analog input (configurable) (AI: 0.5-36V ± 1.5%; DI: 0-36V, below 1V is low, above 2.7V is high)	
4 digital output, 4 pins (U: 0-36V, Low Side Current Sink Output: 0.5A)	
3 GND, 1 WIRE (driver ID / temperature sense)	
CanBus (CAN_H, CAN_L, CAN_SHLD), 3 pins	
RS485 serial port (A+, B-, GND), 3 pins	
Power Supply	
V+, V-, ignition signal, NC (4 pins)	Power consumption: --
Input voltage: 9-36VDC [configurable to 7-36VDC]	
Built-in voltage transient protection, with delayed ignition induction	
Environment	
Operating temperature: -30 °C to + 70 °C / -22 °F to + 158 °F	
Storage temperature: -40 °C to + 85 °C / -40 °F to + 185 °F	
Humidity: 95% RH @ 60°C	IP64
Mechanical Features	
Dimensions: 186mm x 128.5mm x48mm (140mm with connector)	
Wall-mounted, die-cast aluminum housing, radiation cooling	
Certificates	
CE, FCC, IC, RCM, PTCRB, IMDA	
Complies with technical standards of vehicle-mounted electronic products including CAM-STD-810GB, E-Mark, ISO 7637-2 (EMC), ISO11452 (EMI), and SAEJ1455, meeting requirements on impact, vibration, thermal shock, and humidity resistance	
EN 61000-6-2 (electrostatic)	

InVehicle G710 Specifications	
Functions	
Static IP, DHCP, PPPoE, link detection, auto redial, SIM card switch	
Built-in buffer, record key data when network is unavailable	
Network Security	
IPsec, L2TP, PPTP, GRE, OpenVPN, CA management Support PEM, PKCS12, SCEP (CA certificate)	
LDAP, RADIUS, TACACS+, 802.11 WPA2 Enterprise, 802.1Q VLAN/QoS, 802.1X authentication	
Support firewall filtering based on MAC, IP, port, and application protocols	
Reliability	
Floating route, VRRP	
Interface backup, auto reconnect when disconnected	
Built-in watchdog, auto recovers from operation faults	
Network Management	
Local or remote HTTP, HTTPS, Serial Port, Telnet, SSH	
Local or remote WEB, DM, TFTP, FTP, SFTP server	
Support Ping, Traceroute, Sniffer (network packet capturing tool)	
Dial-on-demand, data activation, SMS activation, scheduled online and offline, configuration backup	
Support local / Radius / TACACS +, user hierarchical management	
Edge Computing Frame	
An edge computing platform that integrates network, computing, storage and application	
Standard Python 3 development environment	
Support Python official, and custom function library	
Provide debugging client tool for programming design	
Support MQTT, DDS, AMQP, XMPP, JMS, REST, CoAP	
Support Azure, AWS IoT Hub	
Application Services	
InHand Smartfleet fleet management cloud platform, supports: - task allocation, route planning, vehicle tracking, real-time messaging, geofencing - Batch firmware upgrade, batch configuration backup, application upgrade	
Detect vehicle data: - Set geofence - ignition signal - Vehicle operating data (not limited to mileage, speed, engine speed, etc.)	
Monitor service status: - Rich communication interfaces support docking with various devices - Remote diagnosis and asset monitoring	
Customized event alarms: - Types: digital input, network, service status, power, temperature, voltage, etc. - Push methods: SMS, Email, App, device digital output	
Accessories	
I/O cable	Power cable
OBD-II cable	J1939 cable
Antenna (cellular *2, Wi-Fi*2, GNSS, Bluetooth)	
6 in 1 antenna (optional)	

Ordering Guide

Model	Transmission Rate	Cellular Type	CANBUS	GNSS	Wi-Fi	Bluetooth	Region
IVG710L-FB38	CAT4 150Mbps~50Mbps	LTE-FDD Band2/4/5/13/17 UMTS(DC-HSPA+) 850/1900MHz	√	√	√	√	South America
IVG710L-FS39	CAT6 300Mbps~50Mbps	LTE-FDD Band2/4/5/12/13/17/29 UMTS(DC-HSPA+) Band2/4/5 EDGE/GPRS/GSM 850/900/1800/1900MHz	√	√	√	√	North America
IVG710L-FB58	CAT4 150Mbps~50Mbps	LTE-FDD Band1/3/5/7/8/20 UMTS(DC-HSPA+) 850/900/1900/2100MHz EDGE/GPRS/GSM 850/900/1800/1900MHz	√	√	√	√	Europe, Asia Pacific
IVG710L-FB78	CAT4 150Mbps~50Mbps	LTE-FDD Band1/3/5/7/8/28 UMTS(DC-HSPA+) 850/900/1900/2100MHz EDGE/GPRS/GSM 850/900/1800/1900MHz	√	√	√	√	Europe, Asia Pacific
IVG710L-FS59	CAT6 300Mbps~50Mbps	LTE-FDD Band 1/3/5/7/8/18/20/28 LTE-TDD Band 38/39/40/41 UMTS(DC-HSPA+) Band1/3/5/6/8 GSM/GPRS/EDGE 850/1800MHz	√	√	√	√	Europe, Asia Pacific China
IVG710L-TL00	CAT4 150Mbps~50Mbps	LTE-FDD Band 1/3/8 LTE-TDD Band 38/39/40/41 UMTS (DC-HSPA+) Band 1/5/8/9 TD-SCDMA Band 34/39 EDGE/GPRS/GSM 900/1800MHz	√	√	√	√	China
IVG710L-TL01	CAT4 150Mbps~50Mbps	LTE-FDD Band 1/3/5/7/8 LTE-TDD Band 38/39/40/41 TD-SCDMA Band 34/39 UMTS (DC-HSPA+) Band 1/8 EVDO 800MHz CDMA-1x 800MHz EDGE/GPRS/GSM 850/900/1800/1900MHz	√	√	√	√	China
Example:	IVG710-FS59-CGWB: industrial-grade vehicle gateway with 4 Ethernet interfaces, one DB-9 RS232 serial port, RS485 serial port, MicroUSB2.0 serial port, support DC-HSPA+ network, support CANBUS, support GNSS global satellite positioning, Support WLAN dual-band Gigabit wireless LAN, support Bluetooth, can be used in Europe, Asia Pacific, and China (The only difference between the models of the series is network types of cellular communication, there is no other functional difference. The whole series can be referred to as IVG710.)						

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 Encompass Product Partner in Asia-Pacific and Schneider Electric CAPP Technology Partner, while listed on NEEQ 430642 as of February 18, 2014, InHand Networks defines industrial innovation and reliability.



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