



InHand Networks



High-performance, Powerful, Programmable

InVehicle G710 Series

Automotive Grade Cellular Gateway

The InVehicle G710 4G LTE 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.

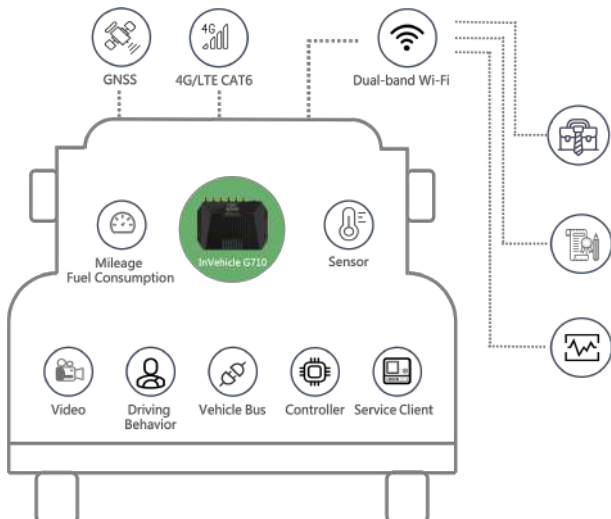
The InVehicle G710 has automotive-grade hardware platform, high-speed Wi-Fi and LTE CAT6 WAN to provide fast, reliable and secure network access for vehicles and vehicle-mounted devices. It supports CAN bus for real-time collection of vehicle data; built-in advanced satellite navigation system for continuous 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. It also supports MS Azure and AWS IoT clouds.

The InVG710 vehicle gateway is suitable for fleet management as well as vehicle operation process control. Applications include:

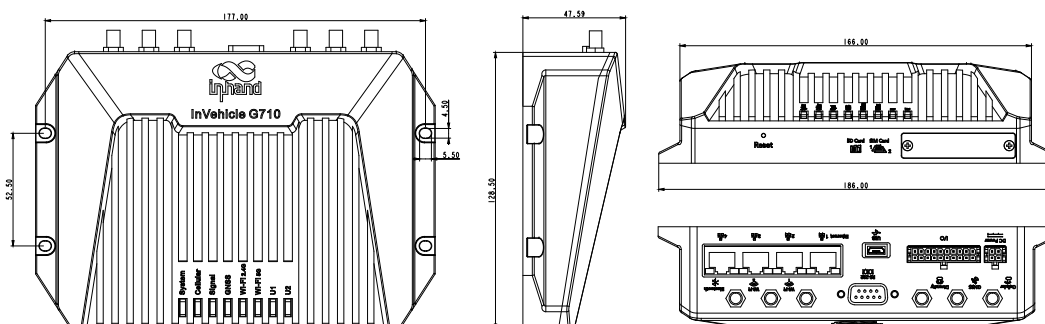
- Heavy equipment: trucks, excavators, cranes, loaders, bulldozers
- Public safety: law enforcement vehicles, fire engines, waste collection vehicles
- Defense forces: combat vehicles, emergency communication vehicles
- Logistics transport: express logistics
- Special goods transport: hazardous goods, vaccines, cold chain
- First Aid: ambulances, tele-medical vehicles
- Public transportation: buses, long-distance buses

Application Case



Features and Advantages

- + Supports 4G LTE CAT6
 - + Built-in link redundancy, dual SIM, link backup
 - + Dual-band Gigabit Wi-Fi and Ethernet
 - + Easy to manage and deploy in large scale
 - + Vehicle-mounted OTA upgrade service
 - + Integrated OBD-II/J1939/diagnostic interface
 - + Industrial-grade chip, communication module and electronic components
 - + Supports Python and Docker for secondary development
- **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.
 - **Global satellite positioning**
72-channel high-precision high-sensitivity global satellite positioning system, tracks vehicle locations precisely at any time anywhere.
 - **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, enabling continuous accurate tracking of the vehicle.
 - **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.
 - **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. Supports network management, reducing the complexity of device management and service deployment.
 - **Developer features**
The comprehensive secondary development platform opens key system resources to users, facilitating fast development and deployment of custom applications. Integrating cloud-end IoT SDK, enables quick building of AWS, Azure and other mainstream clouds based applications.



| 20PIN Definition | | | |
|------------------|------------|-----|------------|
| PIN | Definition | PIN | Definition |
| 1 | -485 | 11 | 485 |
| 2 | CANL | 12 | CANH |
| 3 | 1-Wire | 13 | GND |
| 4 | DO4 | 14 | DO3 |
| 5 | DO2 | 15 | DO1 |
| 6 | GND | 16 | GND |
| 7* | A16/D16 | 17* | A15/D15 |
| 8 | A14/D14 | 18 | A13/D13 |
| 9 | A12/D12 | 19 | A11/D11 |
| 10 | GND | 20 | GND |

7* : A16/D16/FWD
17* : A15/D15/WHEELTICK

Product Specifications

| InVehicle G710 Hardware Specifications | | | |
|--|---|----------------------|--|
| Hardware Platform | | | |
| CPU | ARM Cortex A7 | RAM | 1GB/512MB DDR3 |
| FLASH | 8GB eMMC | Main Frequency | 717MHz |
| Satellite Navigation | | | |
| GNSS Receiver | GPS, GLONASS, Galileo, Beidou | | |
| Built-in Sensor | Inertial navigation sensor (accelerometer and gyroscope) | | |
| Positioning Deviation | 1.5m (With SBAS); 2.5m (Autonomous) | | |
| Tracking Sensitivity | -160dBm | Location Update Rate | MAX 10Hz |
| Interfaces | | | |
| Cellular | LTE CAT6/CAT4 | Ethernet | 4*10/100/1000 Mbps RJ45 interface |
| Serial Port | RS232 serial (DB-9) | USB Port | USB2.0 Micro-B (Read-write: Max 480Mbps) |
| MicroSD | Micro SD Card (up to 32GB, 20MB/s) | Bluetooth | Bluetooth 4.1 |
| Antenna | SMA-K: Cellular, GNSS, Diversity; RPSMA-K: 2*Wi-Fi, Bluetooth | | |
| Indicator | System, LTE, Signal, GNSS, Wi-Fi 2.4G, Wi-Fi 5G, U1, U2 | | |
| Wi-Fi | | | |
| Frequency | 2.4G / 5GHz dual-band | Protocol | Wi-Fi 5 |
| Maximum Output | 2.4G: 17dBm 5G: 17dBm | Working Mode | AP / Client |
| Automotive Interfaces | | | |
| Diagnostic Interface | CanBus | DI | 6 * digital input |
| DO | 4 * digital output | AI | 6 * analog input |
| RS485 | RS485 serial (A+, B-, GND) | 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 (mm) | 186 x 128.5 x 48 | Real Time Clock | Supported |
| Weight | 775g | | |
| SIM Card Slot | Dual SIM | SIM Card Spec | 2FF |
| Environment | | | |
| Operating Temperature | -30 °C ~ +70 °C -22 °F ~ +158 °F | Storage Temperature | -40 °C ~ +85 °C -40 °F ~ +185 °F |
| Humidity | 95% RH @ 60°C | | |
| Vehicle | | | |
| Automotive Standard | ECE-R118, IEC60068-2-31 | Rail Standard | EN50155, EN50121, EN61373, EN45545 |
| 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 |
| Fall | IEC60068-2-32 | | |
| Certificate | CE, FCC, IC, PTCRB, AT&T, E-Mark, RoHS | | |

| InVehicle G710 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, PPTP, 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 | Port Mirroring | 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 HTTP, HTTPS, Telnet, SSH | | |
| Upgrade | Local or remote WEB, DM, TFTP, FTP, SFTP server | | |
| AAA | Local / Radius / TACACS + | | |
| Network Diagnostic | Ping, Traceroute, Sniffer (network packet capturing tool) | | |
| Edge Computing Framework | | | |
| Edge Computing Platform | An edge computing platform integrating network, computing, storage and applications | | |
| Edge Computing Engine | Python & 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 | | | |
| Fleet Management Cloud | InHand SmartFleet cloud platform: task allocation, route planning, vehicle tracking, real-time messaging, geofencing, batch firmware upgrade, batch configuration backup, application upgrade | | |
| 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 | | |

Ordering Guide

| Model | Cellular Type | UE Category | RAM | CANBUS | GNSS | Wi-Fi | Bluetooth | Region |
|--------------|--|-------------|-------|--------|------|-------|-----------|--|
| VG710-L-FS39 | LTE-FDD Band2/4/5/12/13/17/29 UMTS/HSPA+Band2/4/5 GSM/GPRS/EDGE 850/900/1800/1900MHz | LTE CAT6 | 1GB | ✓ | ✓ | ✓ | ✓ | NorthAmerica LatinAmerica CaribbeanCoast |
| VG710-L-FS59 | L T E - F D D 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/EDGE/900/1800MHz | LTE CAT6 | 1GB | ✓ | ✓ | ✓ | ✓ | Europe Africa Asia Oceania |
| VG710-L-FQ78 | LTE-FDD Band1/2/3/4/5/7/8/28 LTE-TDD Band40 WCDMA Band1/2/5/8 GSM/EDGE Band2/3/5/8 | LTE CAT4 | 1GB | ✓ | ✓ | ✓ | ✓ | LatinAmerica Australia NewZealand |
| VG710-L-LQ20 | LTE-FDD Band1/3/5/8 LTE-TDD Band38/39/40/41 TD-SCDMABand34/39 UMTS (DC-HSPA+) Band1/8 EVDO800MHzCDMA-1x800MHz E D G E / G P R S / GSM850/900/1800/1900MHz | LTE CAT4 | 1GB | ✓ | ✓ | ✓ | ✓ | China |
| VG710-FS39 | LTE-FDD Band2/4/5/12/13/17/29 UMTS/HSPA+Band2/4/5 GSM/GPRS/EDGE 850/900/1800/1900MHz | LTE CAT6 | 512MB | ✓ | ✓ | ✓ | ✓ | NorthAmerica LatinAmerica CaribbeanCoast |
| VG710-FS59 | L T E - F D D 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/EDGE/900/1800MHz | LTE CAT6 | 512MB | ✓ | ✓ | ✓ | ✓ | Europe Africa Asia Oceania China |
| VG710-LQ20 | LTE-FDD Band1/3/5/8 LTE-TDD Band38/39/40/41 TD-SCDMABand34/39 UMTS (DC-HSPA+) Band1/8 EVDO800MHzCDMA-1x800MHz E D G E / G P R S / GSM850/900/1800/1900MHz | LTE CAT4 | 512MB | ✓ | ✓ | ✓ | ✓ | China |
| VG710-FQ78 | LTE-FDD Band1/2/3/4/5/7/8/28 LTE-TDD Band40 WCDMA Band1/2/5/8 GSM/EDGE Band2/3/5/8 | LTE CAT4 | 512MB | ✓ | ✓ | ✓ | ✓ | LatinAmerica Australia NewZealand |
| Example : | VG710-FS59 vehicle-mounted gateway, 4 Ethernet interfaces, one DB-9 RS232 serial port, RS485 serial port, MicroUSB2.0 serial port, supports DC-HSPA+ networks, supports CANBUS, GNSS global satellite positioning, WLAN dual-band Gigabit wireless LAN, and bluetooth, can be used in Europe, Asia Pacific, and China. | | | | | | | |

Accessories

| Antenna | Order Code | Specifications |
|----------------------------------|------------|---|
| LTE 4G Antenna | AANT090025 | LTE/GSM/CDMA/DCS/PCS/WCDMA/UMTS/HSDPA/GPRS/EDGE 824–960MHz, 1710–2700MHz 1M RG–174 cable with SMA–J1.5 connector, dimensions: 2000 ± 20mm |
| GNSS Antenna | AANT040005 | GPS/GALILEO: 27 ± 2 dB@1575.42MHz GLONASS: 27 ± 2 dB@1602MHz, dimensions: 55.6x50.5mm |
| GNSS Antenna | AANT040006 | GPS/GALILEO: 27 ± 2 dB@1575.42MHz GLONASS: 27 ± 2 dB@1602MHz, dimensions: 50x38.5mm |
| Wi-Fi Antenna (Rubber Ducky) | AANT060016 | 2400~2500MHz / 4900~5850MHz, peak gain 5 ± 0.5dBi, |
| Wi-Fi Antenna (Antenna Adhesive) | AANT060018 | 2400~2500MHz / 4900~5850MHz, peak gain ≤ 3dBi, dimensions: 2000 ± 20mm |
| Bluetooth Antenna (Rubber Ducky) | AANT060017 | 2.4GHz, peak gain ≤ 2dBi |

| Cable | Order Code | Specifications |
|------------------------|------------|--|
| Power Cable | SCAB000216 | The cable has A and B ends: A is 4PIN end to connect to VG710; B is open end, suitable for field engineering projects. To perform indoor testing, a power adapter needs to be prepared separately. |
| 20 PIN Extension Cord | SCAB000219 | The cable has A and B ends: A is 20PIN end to connect to VG710; B is open end, suitable for field engineering projects and testing. |
| OBD–II Power Cable | SCAB000235 | P1 is 20PIN; P2 is 4PIN power terminal; P3 is OBD–II male; P4 is I/O open end, suitable for engineering projects; P5 is ignition signal cable, please connect to the ignition signal of the vehicle before use. Suitable for field engineering projects. |
| J1939 9PIN Power Cable | SCAB000234 | P1 is 20PIN; P2 is 4PIN power terminal; P3 is J1939 9PIN female; P4 is I/O open end, suitable for engineering projects; P5 is ignition signal cable, please connect to the ignition signal of the vehicle before use. Suitable for field engineering projects. |
| J1939 6PIN Power Cable | SCAB000233 | P1 is 20PIN; P2 is 4PIN power terminal; P3 is J1939 6PIN female; P4 is I/O open end, suitable for engineering projects; P5 is ignition signal cable, please connect to the ignition signal of the vehicle before use. Suitable for field engineering projects. |
| 20 PIN to OBD–II | SCAB000215 | This cable has A, B, C and D ends: A is 20PIN female; B is OBD female; C is A duplicate but male; D is OBD male, suitable for field engineering projects and testing. |

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.



43671 Trade Center Place, Suite 100, Dulles, VA 20166, USA
 T: +1 (703) 348-2988
 E: info@inhandnetworks.com
www.inhandnetworks.com