Products & Services
Mobility

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.
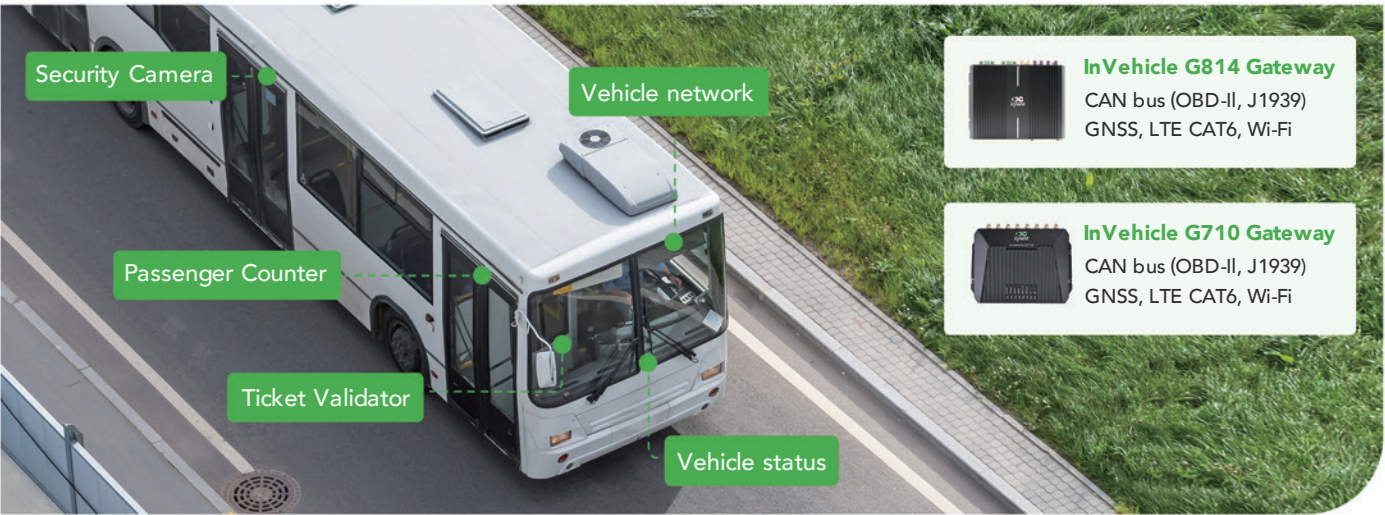
Contents

Public Transport

Shape a future of integrated services, low-carbon operations, and digitalization through the utilization of emerging digital technologies.

New market entrants are transforming travel patterns with enhanced services. Accustomed to the convenience of ride-hailing and other new business models, people now expect more from public transport. How can authorities create a future that prioritizes customer experience, integrated services, low-carbon operations, and digitalization?

Digital technologies hold the key. Harness the power of 5G, IoT, AI, and more to transform the public transportation ecosystem. InHand provides intelligent digital solutions, enhancing agility, operational efficiency, safety, reliability, and passenger experience for transportation authorities.

Intelligent Solution for Public Transport

Security Camera
Vehicle network
Passenger Counter
Ticket Validator
Vehicle status

InVehicle G814 Gateway
CAN bus (OBD-II, J1939)
GNSS, LTE CAT6, Wi-Fi

InVehicle G710 Gateway
CAN bus (OBD-II, J1939)
GNSS, LTE CAT6, Wi-Fi

Why InHand Networks?

Enhanced Operation Efficiency

Reduced Costs

Enhanced Reliability
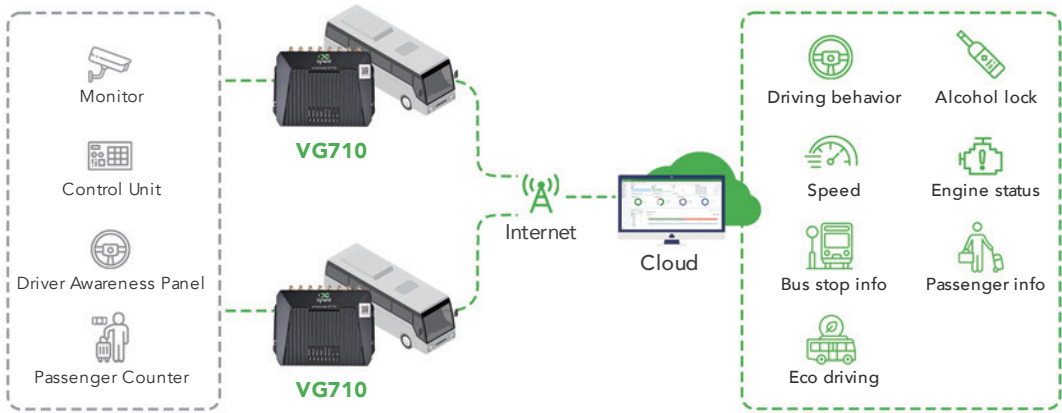
Better Security

Optimized Management

Higher-quality Services

Success Story: Multi-channel on-board Communications & Remote Management

Challenges

- Fast, reliable and uninterrupted networking of vehicles;
- Plenty of interfaces for connection to a variety of devices and applications;
- Sophisticated data security mechanism and encrypted data transmission;
- Connected to cloud for easier management and deployment;
- Industrial design, stable operation for long time in harsh environments.

Solution

Monitor
Control Unit
Driver Awareness Panel
Passenger Counter
VG710
VG710
Internet
Cloud
Driving behavior
Alcohol lock
Speed
Engine status
Bus stop info
Passenger info
Eco driving

The VG710 connects a wide range of applications on board, including the monitor, control unit, driver awareness panel, passenger counter, etc. Integrating OBD-II and J1939, the VG710 keeps updating the operation status of each bus. With high-precision GNSS and inertial navigation system, the VG710 continuously tracks the bus's location whether GNSS signal is available or not.

Data from different interfaces are constantly transmitted over high-speed LTE CAT6 network via secure VPN tunnels. From the Remote Maintenance Center, each bus can be monitored in real time, and when a fault occurs, the problem equipment can be immediately identified, which facilitates troubleshooting and reduces downtime.

Benefits

Fast, reliable and uninterrupted 4G connectivity
The VG710 delivers continuous access to high speed LTE CAT6 networks. Multi-layer auto link detection and recovery ensure that all the buses are online 24/7.

Real-time monitoring of vehicle status
Integrating OBD-II and J1939, the VG710 keeps monitoring location, oil consumption, temperature, etc. on the bus, enabling customers to better manage energy use and ensuring driving safety.

Multiple interfaces for a wide range of peripherals
Featuring extensive interfaces, the VG710 is able to host a variety of devices on board, providing users with all-around understanding of the buses.

Uninterrupted high-accuracy vehicle location
Embedded with 72-channel high-accuracy GNSS positioning system, the VG710 delivers real-time location information of the vehicles. Inertial navigation system enables buses to be constantly tracked even when GNSS signal is unavailable.

Engineering Machinery

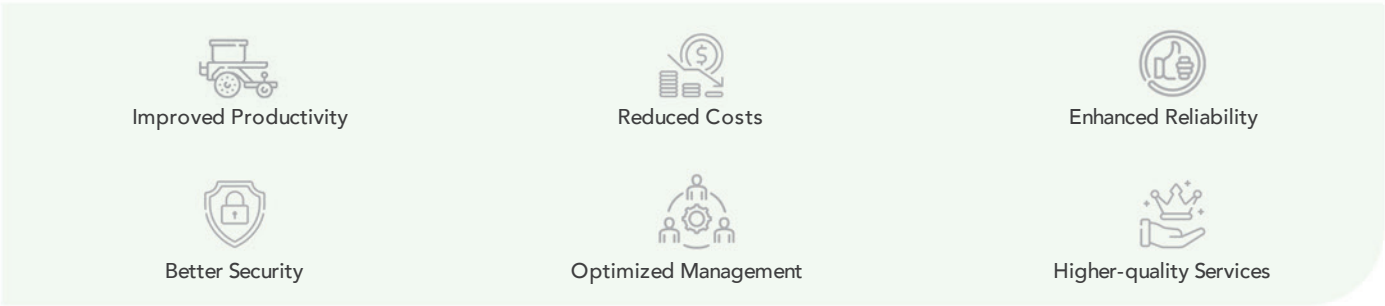## Take a solid step towards efficiency and sustainability.

Digitalizing engineering vehicles enables real-time monitoring, data analysis, operational optimization, and decision support, leading to improved efficiency, cost reduction, safety, and compliance. It is driven by the adoption of information technology, the need for operational efficiency, safety and compliance, data-driven decision-making, as well as customer demand and industry trends.

As a provider of digitalization solutions of engineering vehicles, InHand Networks is committed to offering comprehensive solutions to our customers, which combine advanced information technology with expertise in engineering vehicles, including vehicle communication devices, vehicle monitoring systems, operation planning and scheduling systems, data analysis and predictive platforms, and more.

Integrated Management, Operation & Maintenance of Engineering Vehicles

Vehicle Controller

Temperature Sensor

Pressure Sensor

VT300 Series Vehicle Telematics Gateway

CAN bus (OBD-II, J1939)
GNSS, LTE CAT6, Wi-Fi

InVehicle G710 Gateway

CAN bus (OBD-II, J1939)
GNSS, LTE CAT6, Wi-Fi

Why InHand Networks?

Improved Productivity

Reduced Costs

Enhanced Reliability

Better Security

Optimized Management

Higher-quality Services

Success Story: Remote Monitoring of Heavy Equipment

Challenges

- Real-time monitoring and management: Monitor the location, status, and operations of construction vehicles in real-time, enabling remotely supervision and prevent unauthorized route deviations
- Enhance driver safety: Assess driver behavior, analyze driving data, identify and address unsafe driving habits, provide targeted training and recommendations, and avoid non-compliant operations.
- Preventive maintenance and fault diagnosis: Real-time monitoring of the health condition of construction vehicles and providing predictive maintenance.

Solution

Angle X/Y

Drilling location

Main pump Pressure

Total Work Time

Instant Fuel Consumption

PM Sensor

Pressure Device

Office Device

Location

Acceleration/ Angular Velocity

Speed

VT310

LTE

Internet

Data Flow

Operation Analysis

Diagnose Management

Vehicle Access

Work Plan

Operational Analysis

The intelligent solution for heavy-duty vehicle connectivity includes components such as lower-end devices, VT310 vehicle telematics gateway, and remote management platform. The VT310 connects to devices such as pressure sensors and vehicle controllers.

Equipped with dual CAN bus interfaces, the VT310 allows simultaneous collection of diagnostic information from both the heavy-duty vehicle and its installed equipment. By monitoring construction processes comprehensively from various angles such as vehicle location, fuel consumption, drilling positions, and total working time, it enables an information-rich and intelligent construction process.

Benefits

Stable 4G cellular network
Equipped with an industrial-grade 4G communication module, supporting 4G CAT1/CAT4 communication, ensuring real-time network stability.

Low power consumption and power backup
Designed with low power consumption and a 1200mAh lithium battery, enabling long-term monitoring even when the vehicle is turned off.

Specially designed for vehicle environments
With an IP67 protection rating and industrial-grade specifications, it can withstand environmental pressures such as impact, vibration, humidity, and extreme temperatures, ensuring reliable operation even in harsh conditions.

Cost-effective with rich network interfaces
Providing two CAN bus interfaces, one J1708, one 1-Wire, multiple I/O ports, and Bluetooth 5.0, meeting various application scenarios.

FlexAPI functionality
Adhering to the MQTT protocol-based third-party platform access specification, offering high flexibility for customers to customize data collection and frequency according to their needs.

Smart Logistics

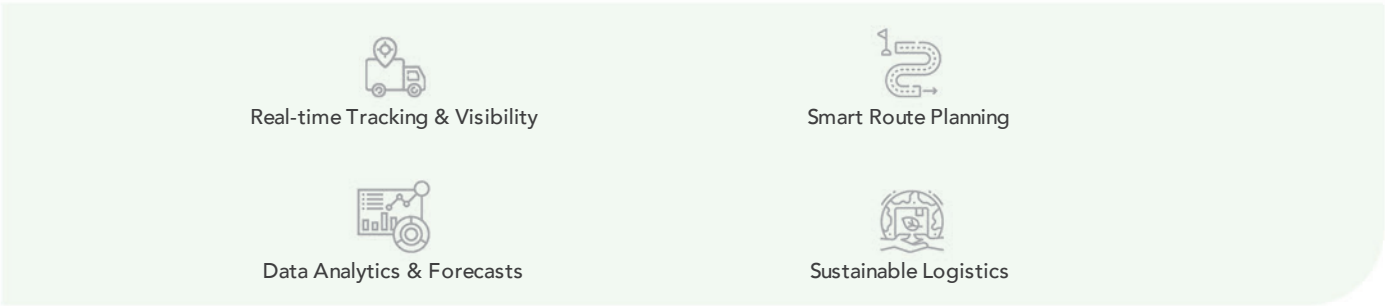## Finely-tuned, dynamic, and visualized management for each process.

Continuous technical advances, especially the development of information technology, are bringing a digital revolution to the logistics industry. This transformation aims to improve the efficiency, visibility and sustainability of logistics transportation through the adoption of advanced digital technologies.

Challenges abound in traditional logistics transportation, such as information opacity, inefficiency and high costs. With the rise of digital technologies, cloud computing, Internet of Things (IoT), artificial intelligence (AI) and big data analytics are being applied to addressing those problems.

Innovative Solution for Smart Logistics

Humidity Sensor

Temperature Sensor

Pressure Sensor

InVehicle G710 Gateway
CAN bus (OBD-II, J1939)
GNSS, LTE CAT6, Wi-Fi

VT300 Series Vehicle Telematics Gateway
CAN bus (OBD-II, J1939)
GNSS, LTE CAT6, Wi-Fi

Why InHand Networks?

Real-time Tracking & Visibility

Smart Route Planning

Data Analytics & Forecasts

Sustainable Logistics

Success Story: Telematics Solution of Cold Chain Logistics

Challenges

- Uninterrupted and stable 4G/5G connectivity for constant acquisition and uploading of multiple variables from the on-board refrigeration system through different interfaces;
- Support for Modbus protocol, capable of connection to multiple clouds;
- Available with GNSS (Beidou and GPS) location tracking capabilities;
- Remote control of the refrigeration system
- Power saving, capable of working long hours in harsh environments and enduring extreme temperatures and vibration during transportation.

Solution
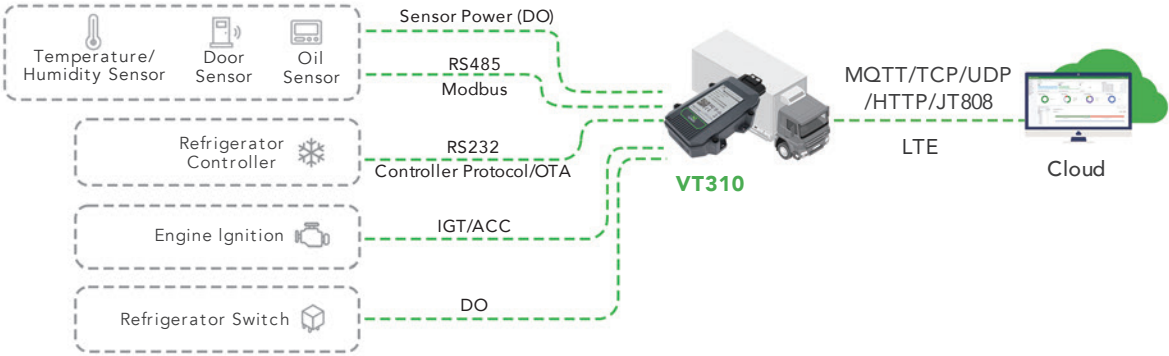
The solution includes cooler equipment, the VT310, a generator set, and the cloud platform, etc. The gateway is connected through RS485 to the sensors of temperature, humidity, oil and doors, and through RS232 to the refrigeration system controller. Coolers for train and road transportation are thus monitored. Operation data of the cooler are collected in real time, and control commands of the coolers are sent out from the cloud. The I/O ports help identify the status of the engine, and location information of the vehicle is also constantly uploaded. When the vehicle is not moving and the cooler is not working, the VT310 enables automatic sleep and supports wake-up.

Benefits

Extended machinery lifetime
With all devices connected and enable remote monitoring to help deliver real-time alerts to the right person, take proper actions, provide feedback, and even predict equipment failure to avoid damage of the quality of goods.

Reduced load loss
With the remote monitoring the thresholds of temp and any other indicators on board to have a efficient and fast response to keep the safety and high quality of temperature-sensitive products and overall in your revenue growth.

Improved efficiency with data
Improve the efficiency of the supply chain with data analytics. With many operational data that collected and forwarded to the control center. It is easy to find insights, predict, get feedback, and share across the entire business. In addition, analytics can improve asset utilization efficiency with predictive maintenance.

Municipal & Public Safety

Embark on an era of greater intelligence and efficiency.

Traditional management methods are no longer sufficient to meet the growing number of vehicles and increasingly complex operations. Digitalization becomes must-have as it can optimize resource allocation, enhance operational efficiency, and improve services through real-time data collection, intelligent decision support, and automated process management.

With urbanization and environmental concerns on the rise, traditional management is insufficient to handle increasingly severe challenges. Digital transformation is the only way to survive and lead the market as it enables intelligent traffic management, safe operations and sustainability.

Innovative Solution for Municipal & Public Safety

Humidity Sensor

Temperature Sensor

Pressure Sensor

InVehicle G710 Gateway
CAN bus (OBD-II, J1939)
GNSS, LTE CAT6, Wi-Fi

VT300 Series Vehicle Telematics Gateway
CAN bus (OBD-II, J1939)
GNSS, LTE CAT6, Wi-Fi

Why InHand Networks?

Improved Operation Efficiency & Services

Reduced Operation & Maintenance Costs

Greater Security of Transportation

Strengthened Security and Privacy Protection

Optimized Decision-making

Driving Sustainability

Success Story: Firetruck Management: In-vehicle Connectivity & Fleet Management

Challenges

- Reliable and uninterrupted in-vehicle Wi-Fi
- Fast and reliable 4G cellular connectivity to communicate with the fleet management center
- High-precision and reliable GNSS location tracking function
- Extensive interfaces such as I/Os to connect to vehicles' status inputs and upload data
- Easy integration to the customer's fleet management cloud

Solution
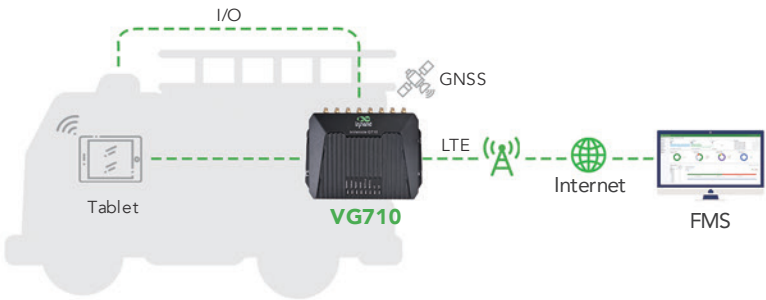
Emergency lights and siren of each firetruck is connected to the VG710 via I/O. The VG710 also offers fast and reliable on-board Wi-Fi to the navigation tablet which helps the driver receive dispatch routes from the management center. Built with 72-channel GNSS, the VG710 keeps locating each firetruck and sends the data back to the fleet management system.

Data collected by the VG710 include time, location, speed, vehicle battery voltage, etc. While parked in the fire hall, firetrucks need to report their location to the FMS once per hours, and every few seconds in motion. Everything can be seen from the management center, so that staff can locate each vehicle and dispatch them when emergencies occur. Technicians also monitor the vehicle status for troubleshooting purposes and adjust configuration settings if needed.

Benefits

Strong in-vehicle Wi-Fi, uninterrupted communications on board
The VG710 delivers high-speed and reliable Wi-Fi for on-board devices, which enables the driver to receive dispatch routes from the fleet managers at the earliest possible time and hence better carry out their fire protection duties.

Fast, reliable and uninterrupted 4G connectivity for continuous communication with the management center
The VG710 delivers continuous access to high speed LTE CAT6 networks. With multi-layer auto link detection and recovery, the VG710 ensures that all the firetrucks remain online 24/7.

Constant status tracking gives customer peace of mind
Built with extensive interfaces like I/O, the VG710 keeps collecting the status of the firetruck; high-precision 72-channel GNSS keeps tracking the position of each truck so that fleet managers can always locate their vehicles and dispatch them with ease and efficiency.

Easy integration to clouds, "cloud + edge" smart management
With simple configuration, the VG710 can be connected to the customer's own platform through MQTT and HTTP standard protocol, so that users can custom their applications for enhanced performance.
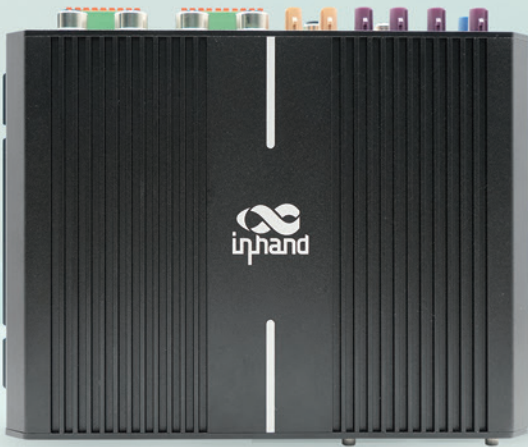
Vehicle Gateways

VG814 / VG710

The VG series is a 5G/4G cellular vehicle gateway specially for the Internet of Vehicles (IoV). It provides high-speed and secure connectivity for a wide range of scenarios in the mobility industry, such as public transport, heavy equipment, logistics, municipal and public safety. With extensive interfaces, cloud integration and developer features, it enables connectivity to various on-board devices and remote monitoring of vehicle status, improving operation and management efficiency.

Hardware

CPU	4-Core ARM Cortex-A7
RAM	1GB DDR3L
Cellular	5G or 4G
GNSS	GPS, GLONASS, Galileo, Beidou
Wi-Fi	IEEE802.11 a/b/g/n/ac
Ethernet	4*Gigabit Ethernet M12 X-coded
Other Interfaces	1*RS485, 1*RS232, 1*CAN 2.0B dual wire, 11*DI, 4*DO, Audio, Voice
SIM Card	2*Mini SIM 2FF
Indicator	System, Cellular, Signal, GNSS, Wi-Fi 2.4G, Wi-Fi 5G
Operating Temperature	-30℃ ~ +70℃
IP Rating	IP53
Ingress Protection	EN61373, ISO16750, EN50155, EN45545
Vehicle Standard Dimension	223*148.8*60 mm

Software

Network Access	APN, VPDN
IP Application	Ping, Traceroute, DHCP server/relay/client, DNS relay, DDNS, Telnet, SSH, HTTP, HTTPS, MQTT
IP Routing	Static routing, RIP, OSPF, BGP
VPN	IPsec VPN, OpenVPN, L2TP, GRE
Cyber Security	Firewall, SPI, Attack, AAA
Reliability	VRRP Link Backup, Watchdog, Link Detection
Configuration	HTPP, HTTPS, Telnet, SSH, Device Manager
Cloud Platforms	Azure, AWS, third-party platform
Edge Computing	Programmable environment Python3.0, C/C++, Docker environment
IoT Transmit Protocol	Supports MQTT, DDS, AMQP, XMPP, JMS, REST, CoAP
Certification	CE, E-Mark, ITxPT, RoHS, ECE-R118, EN50155, EN45545-2

VG814

5G Vehicle Gateway

High Performance Vehicle Network

Brand new network experience with 5G, high bandwidth, low latency and massive connectivity

All-in-one Design

More devices accessible with M12 GbE, Wi-Fi 5, serial port and I/O

Highly Accurate Vehicle Positioning

72-channel high precision and high sensitivity Global Navigation Satellite System(GNSS) inertial navigation with ADR or UDR support

ITxPT Standards

Guarantee reliable operation in harsh environments with ITxTP and E-mark certification

The InVehicle G810 is a high-performance vehicle gateway that integrates 5G/4G WAN, Wi-Fi 5, Gigabit Ethernet and CAN bus. It provides fast, reliable and secure network access for the vehicle area.

Hardware

CPU	4-Core ARM Cortex-A7		Indicators	System, Cellular, Signal, GNSS, Wi-Fi 2.4G, Wi-Fi 5G, U1, U2
RAM	5G: 1GB DDR3L, 4G: 1GB/512M DDR3			
Cellular	5G or 4G CAT6		Operating Temperature	-30℃~70℃, -22F~158F
GNSS	GPS, GLONASS, Galileo, Beidou		IP Rating	IP64
Wi-Fi	IEEE802.11 a/b/g/n/ac		Vehicle Standard	ECE-R118, IEC60068-2-31, EN50155, EN50121, EN61373, EN45554, EMC Level3
Ethernet	4*10/100/1000Mbps RJ45			
MicroSD/ Bluetooth	Micro SD Card			
Other Interfaces	RS232, RS485, Micro USB, I/O, Audio, Voice		Dimensions	186*128.5*48 mm
SIM Card	2FF			
Antenna	4*Cellular, GNSS, 2*Wi-Fi, Bluetooth			

Software

Network Access	APN, VPDN
IP Application	Support IPv6, Ping, Traceroute, DHCP server / relay / client, DNS relay, dynamic domain DDNS, Telnet, SSH, HTTP, HTTPS, TFTP, FTP, SFTP
IP Routing	Support static route, RIP, OSPF, BGP, IGMP Proxy
VPN	IPsec VPN, OpenVPN, L2TP, GRE
Cyber Security	Firewall, SPI, anti-DoS attack, AAA
Reliability	VRRP Link Backup, Watchdog, Link Detection
Configuration	HTPP, HTTPS, Telnet, SSH, Device Manager
Cloud Platforms	Azure, AWS, third-party platform
Edge Computing	Programmable environment Python 3.0, C/C++, Docker runtime environment
IoT Transmit Protocol	Support MQTT, DDS, AMOP, XMPP, JMS, REST, CoAP
Certification	CE, E-Mark, lTxPT, FCC, IC, PTCRB, AT&T, T-Mobile, Verizon, RoHS, ECE-R118, EN50155

VG710

5G Vehicle Gateway

High Performance Vehicle Network

Brand new network experience with 5G, high bandwidth, low latency and massive connectivity

Powerful Data Processing

4-Core ARM Cortex-A7 CPU and 8GB ROM

Flexible Application Development

Support secondary development, C/C++, Python, Docker

Designed for Vehicles

IP64 IP rating, compliant with vehicle standard EN50155, EN50121, EMC, EN61373

The InVehicle G710 is a 5G cellular network vehicle gateway specially for the Internet of Vehicles (IoV). It provides high-speed and secure connectivity for mission critical applications in a wide range of scenarios, such as police cars, heavy equipment, ambulances, and logistics.

Vehicle Telematics Gateways

VT320 / VT310 / VT200

The VT series is a rugged and functionally capable vehicle telematics gateway. Integrating extensive interfaces, multiple diagnostic protocols and major IoT clouds, it delivers reliable vehicle data in some of the most challenging environments that involve severe cold or scorching heat, and/or water immersion, while remaining budget friendly.

Hardware

Cellular	LTE, CATM
Antennas	LTE FPC built-in antenna, GNSS ceramic built-in antenna
GNSS	GPS, GLONASS, Galileo, Beidou
Inertial Sensors	Built-in six-axis 3D gyroscope
Bluetooth	Bluetooth 4.1
Vehicle Features	2*CAN Bus, 1*J1708
I/O	1*RS485, 4*DI, 3*DO, 1*AI
Operating Voltage	9~48VDC
Power Consumption	0.55W
Battery	Ni-MH battery 1200mA
Operating Environment	-40°C~85°C
Dimensions	158*100*40mm
IP Rating	IP66

Software

Network Access	APN, VPDN
Cloud Platforms	AWS IoT, Azure IoT, Wialon, Traccar, GPSWox, WhiteLable Tracking, Thingsboard, Customer Private Cloud
Transport protocol	TCP, UDP, HTTP, MQTT, JT/T 808
Encrypted Communications	SSL/TLS
Vehicle Diagnostic Protocol	OBD-II, J1939, J1708, CAN bus and ELD data transparent transmission
Serial Port Protocol	Transparent, Modbus RTU
Event Alarm	Collision detection, Motion detection, Overspeed, IO change, ignition signal detection, etc.
Configuration	RS232 or Bluetooth
Certification	FCC, IC, PTCRB, AT&T, Verizon

VT320

Vehicle Telematics Gateway

Multiple Carrier Options

Access to multiple cellular networks and carriers, available with LTE CAT1, CAT M1, CAT4

Accurate Positioning

Accurate positioning of vehicle location with GNSS and LBS dual positioning

Major IoT Cloud Platforms

AWS, Azure, Wialon ThingsBoard

Designed for Vehicles

Compliant with ISO 16750-3 random vibration, IP66 design, EMC level 3

The InVehicle T320 is a cost-effective, interface-rich, and powerful asset tracking product for logistics, engineering vehicles and other applications. With high-accuracy GNSS positioning, it helps track vehicles, monitor vehicle and driver status, and performs functions of historical track, electronic fence, abnormal alarms, etc.

VT310

Vehicle Telematics Gateway

Multiple Carrier Options

Access to multiple cellular networks and carriers, available with LTE CAT1 and CAT4

Accurate Positioning

Accurate positioning of vehicle location with GNSS and LBS dual positioning

Major IoT Cloud Platforms

AWS, Azure, Wialon ThingsBoard

Designed for Vehicles

Compliant with ISO 16750-3 random vibration, IP66 design, EMC level 3

The InVehicle T310 is a cost-effective, interface-rich, and powerful asset tracking product for logistics, engineering vehicles and other applications. With high-accuracy GNSS positioning, it helps track vehicles, monitor vehicle and driver status, and performs functions of historical track, electronic fence, abnormal alarms, etc.

Hardware

Cellular	LTE CAT1, CAT4
Antennas	LTE FPC built-in antenna, GNSS ceramic built-in antenna
GNSS	GPS/A-GNSS
Inertial Sensors	Built-in six-axis 3D gyroscope
Bluetooth	Bluetooth 4.1
Vehicle Features	2*CAN Bus, 1*J1708
I/O	1*RS232, 4*DI, 3*DO, 1*AI
Operating Voltage	9~48VDC
Power Consumption	0.55W
Battery	Lithium-ion battery 1200mA
Operating Environment	-40°C~85°C (mains powered), -20°C ~ 60°C (battery powered)
Dimensions	141*82*35mm
IP Rating	IP66

Software

Network Access	APN, VPDN
Cloud Platforms	AWS IoT, Azure IoT, Wialon, Traccar, GPSWox, WhiteLable Tracking, Thingsboard, Customer Private Cloud
Transport Protocol	TCP, UDP, HTTP, MQTT, JT/T 808
Encrypted Communications	SSL/TLS
Vehicle Diagnostic Protocol	OBD-II, J1939, J1708, CAN bus and ELD data transparent transmission
Serial Port Protocol	Transparent, Modbus RTU
Event Alarm	Collision detection, Motion detection, Overspeed, IO change, ignition signal detection, etc.
Configuration	Serial Port or Bluetooth
Certification	CE, FCC, IC, PTCRB, E-Mark

Hardware

Cellular	LTE CAT1, CATM, CAT4
Antennas	LTE FPC built-in antenna, GNSS ceramic built-in antenna or external SMA interface antenna
GNSS	GPS, GLONASS, Galileo, Beidou
Inertial Sensors	Built-in six-axis 3D gyroscope
Vehicle Features	1*CAN Bus
I/O	1*RS232, 1*RS485, 4 *DO/AI
Operating Voltage	9~36VDC
Battery	Lithium-ion battery 1200mA
Operating Environment	-40°C~85°C (mains powered), -20°C~ 60°C (battery powered)
Dimensions	98.6*62*23.5mm
IP Rating	IP40

Software

Network Access	APN, VPDN
Cloud Platforms	AWS loT, Azure loT, Wialon, Traccar, GPSWox, WhiteLable Tracking, Thingsboard, Customer Private Cloud
Transport protocol	TCP, UDP, HTTP, MQTT, JT/T 808
Encrypted Communications	SSL/TLS
Vehicle Diagnostic Protocol	OBD-II, J1939, CAN bus and ELD data transparent transmission
Serial Port Protocol	Transparent, Modbus RTU
Event Alarm	Collision detection, Motion detection, Overspeed, IO change, ignition signal detection, etc.
Configuration	USB Type-C
Certification	CE, FCC, IC, PTCRB, E-Mark

VT200

Vehicle Telematics Gateway

Accurate Positioning

Supports all satellite augmentation systems: GPS, Galileo, GLONASS, BeiDou

Multiple Interfaces

RS232, RS485, CAN, I/O

Major IoT Cloud Platforms

AWS, Azure, Wialon, ThingsBoard

Various Application Scenarios

Fleet management, asset location, and telematics

The InVehicle T200 integrates LTE, GNSS, gyroscope and inertial sensors with a multi-tasking system to precisely locate vehicle position in real time, record mileage, monitor accidents such as emergency braking, acceleration and collision, maintain transportation safety, locally record and analyze driving behavior.

Selection Guide

	Model	VG814-V (Road)	VG814-R (Rail)	VG710	VG710-H	VT320	VT310	VT200
Hardware	CPU	ARM® Cortex®-A7 quad-core		ARM® Cortex®-A7 quad-core		ARM® Cortex®-M4	ARM® Cortex®-M4	ARM® Cortex®-M4
	RAM	1GB DDR3		512MB/1GB DDR3	1GB DDR3	320KB SRAM	320KB SRAM	512KB SRAM
	ROM	8GB eMMC		8GB eMMC		4MB/32MB NOR Flash	4MB/32MB NOR Flash	4MB NOR Flash
Interfaces	Ethernet	4*10/100/1000 Mbps, M12 X-coded female — Network status indicator — NO PoE, 1.5KV network isolation transformer protection		4*10/100/1000 Mbps, RJ45 — Network status indicator, NO PoE — 1.5KV network isolation transformer protection		-	-	-
	Serial	3PIN 1*RS232, 2PIN 1*RS485	3PIN 2*RS232, 2PIN 1*RS485	DB9 1*RS232,2PIN 1*RS485	3PIN 1*RS232,2PIN 1*RS485	3PIN 1*RS232, 2PIN 1*RS485	3PIN 1*RS232, 2PIN 1*RS485/J7108	3PIN 1*RS232, 2PIN 1*RS485
	4G	LTE CAT4/6, China: CAT4 — APAC/EMEA/NAMC CAT6 — Antennas: 2*FAKRA	LTE CAT4/6, China: CAT4 — APAC/EMEA/NAMC CAT6 — Antennas: 2*TNC	LTE CAT4/6,China: CAT4 — APAC/EMEA/NAMC: CAT6 — Antennas: 2*SMA	LTE CAT6 — APAC/EMEA/NAMC: CAT6 — Antennas: 2*SMA	NAMC: CAT1/CAT M1 — Built-in antenna	China: CAT1/CAT4 — APAC/EMEA/NAMC: CAT1/CAT M1 — Built-in antenna	China: CAT1 — APAC/EMEA/NAMC: CAT1/CAT M1 — Built-in antenna / external SMA
	5G	Global: SA/NSA, Antennas: 4*FAKRA	Global: SA/NSA , Antennas: 4*TNC	-	Global: SA/NSA, Antennas: 4*SMA	-		
	GNSS	Beidou, GPS, GLONASS, Galileo — Inertial navigation — Antenna: 1*FAKRA	Beidou, GPS, GLONASS, Galileo — Inertial navigation — Antenna: 1*TNC	Beidou, GPS, GLONASS, Galileo — Inertial navigation — Antenna: 1*SMA		Beidou, GPS, GLONASS, Galileo — Inertial navigation — Built-in antenna / external 1*SMA	GPS/A-GNSS or Beidou, GPS, GLONASS, Galileo, Inertial navigation — Built-in antenna / external 1*SMA	Beidou, GPS, GLONASS, Galileo — Inertial navigation — Built-in antenna / external 1*SMA
	Wi-Fi	Wi-Fi 4/5, FAKRA antennas, 2*2 MIMO, AP/STA	Wi-Fi 4/5, TNC antennas, 2*2 MIMO, AP/STA	Wi-Fi 4/5,SMA antennas, 2*2 MIMO,AP/STA		-	-	
	Bluetooth	-	-	Bluetooth 4.1, Antenna: 1*SMA		Bluetooth 4.1 Built-in antenna	Bluetooth 4.1, Built-in antenna	-
	SIM Card	2*SIM (push-push type)		2*SIM (push-push type)		1*SIM 2FF (push-push type)	1*SIM (push-push type)	1*SIM 4FF (push-push type)
	IO	4*DO+11*DI	4*DO+11*DI	4*DO+6*AI/DI	2*DO+4*AI/DI, 2*DO+2*A/DI+FWD+WHEEL TICK (GNSS ADR version)	1*AI+3*DO+4*DI	1*AI+3*DO+4*DI	2*DO+4*AI/DI
	Audio and Mic	3PIN left channel, right channel, microphone	-	-	3PIN left channel, right channel, microphone	-	-	-
	1-Wire	-	-	1*2PIN 1-Wire	1*2PIN 1-Wire	2PIN 1*1-Wire	2PIN 1*1-Wire	2PIN 1*1-Wire
	CAN/LINE/J1708	1*M12 CAN 2.0B A-code female — 1*2PIN CAN 2.0B	1*M12 CAN 2.0B A-code female — 1*2PIN CAN 2.0B	1*2PIN CAN 2.0B	2*2PIN CAN 2.0B, 1*2PIN J1708, 1*2PIN LINE bus	2*2PIN CAN 2.0B — 1*2PIN J1708	2*2PIN CAN 2.0B — 1*2PIN J1708	1*2PIN CAN 2.0B
	IGT/ACC	1*IGT/ACC	1*IGT/ACC	1*IGT/ACC	1*IGT/ACC	1*IGT/ACC	1*IGT/ACC	1*IGT/ACC
	USB	USB Type A	USB Type A	USB Type Mirco-B	-	-	-	USB Type-C
	Reset	YES		YES		YES	YES	YES
	Grounding	YES		YES		YES	YES	YES
Operating Environment	Ambient Humidity	5 ~ 95% (non-condensing)		5 ~ 95% (non-condensing)		5 ~ 95% (non-condensing)	5 ~ 95% (non-condensing)	5 ~ 95% (non-condensing)
	Storage Temp	-40°C~+85°C		-40°C~+85°C		-40°C~+85°C	-40°C~+85°C	-40°C~+85°C
	Operating Temp	-30°C~+70°C		-30°C~+70°C		-20°C~+60°C (with 1000mAh Ni-H battery) — -30°C~+70°C (without battery)	-20°C~+60°C (with 1200mAh lithium battery) — -30°C~+70°C (without battery)	-20°C~+60°C (with 1000mAh lithium battery) — -30°C~+70°C (without battery)
Power Supply	Power Input	9-48VDC		9-36VDC		9-48VDC	9-48VDC	9-36VDC
	Power Connector	M12 A-code male		4PIN terminal block		20PIN terminal block	26PIN automative connector	20PIN terminal block
Mechanical	Installation	Wall mounting		Wall mounting		Wall mounting	Wall mounting	Tie bundle
	Dimensions (L*D*H mm)	223*181.36*66.2	223*1178*66.2	186*128.5*48		158*100*44	141*82*35	108.3*62*23.5
	Housing	Aluminum extrusion		Die-cast aluminum		PC+ABS	PC+ABS	PC+ABS
	Protection Rating	IP40/IP53		IP64		IP66	IP66	IP40
	Weight	1340g	1438g	775g		120g	152g	120g
	Vibration	ISO16750-3, EN61373, IEC61373	EN61373, IEC61373	EN61373, IEC61373		ISO16750-3	ISO16750-3	ISO16750-3
EMC	EMC Level	Level 3		Level 3		Level 2	Level 3	Level 2
Vehicle Standard	Road	ECE R10, ISO16750, GB/T28046	-	ECE R10		-	-	-
	Rail	-	EN50155, EN50121-3-2, EN61373, EN45545-2	EN50155, EN50121-3-2		-	-	-
Certification		CE, E-Mark, ITxPT, RoHS, ECE-R118		CE, E-Mark, ITxPT, FCC, IC, PTCRB, AT&T, T-Mobile, Verizon, RoHS, ECE-R118		FCC, IC, PTCRB, AT&T, Verizon	CE, E-Mark, FCC, IC, PTCRB, RoHS	CE, E-Mark, FCC, IC, PTCRB, RoHS

Applied in a Wide Range of Scenarios

Smart Manufacturing

Smart Retail

Smart Grid

Smart Cities

Smart Transportation

Renewables

Utilities

Smart Healthcare

Business Internet

Used worldwide. Proven worldwide.
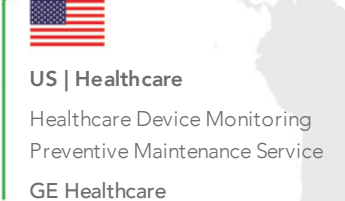
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Bicycle Sharing System
Vélib'

UK | Transportation
Traffic Signal Control
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Germany | Power Grid
DER Monitoring
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China | Power Grid
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Overhead-lines Monitoring
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US | Healthcare
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