

Webinar

Connectivity Solutions for Public Transport ITS

Secure, Powerful, Compliant



InVehicle G810 Gateway



Speakers



Bessie Wu

Marketing Communications Manager



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Business Development Manager for
Transportation

Contents

Applications for Transport

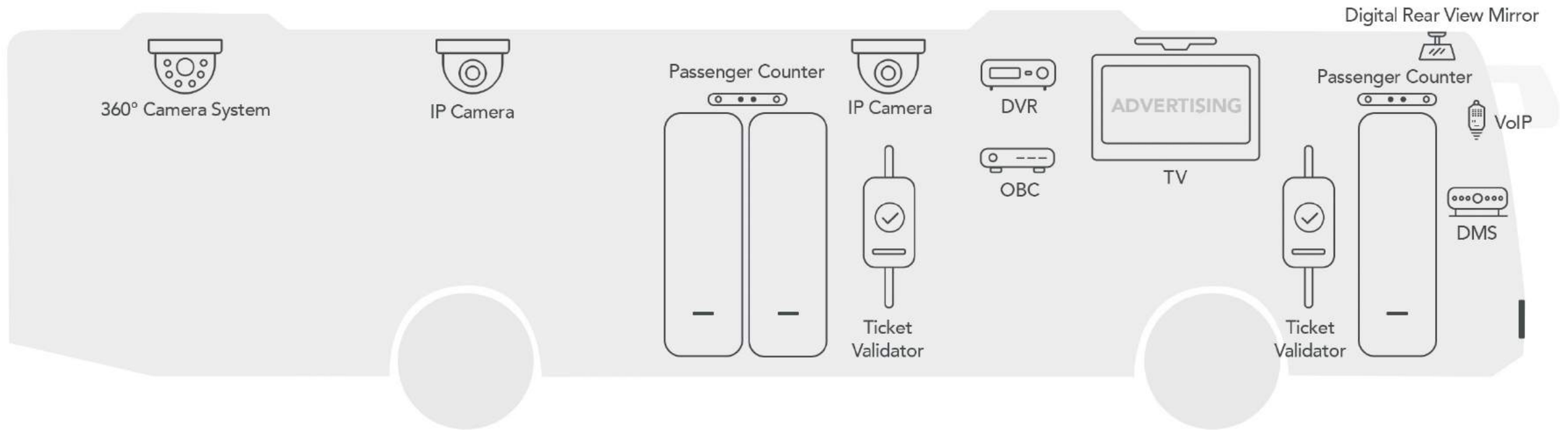
Why InHand Networks?

Success Stories

Q & A

Applications for Transport

Devices on Board



Ticketing

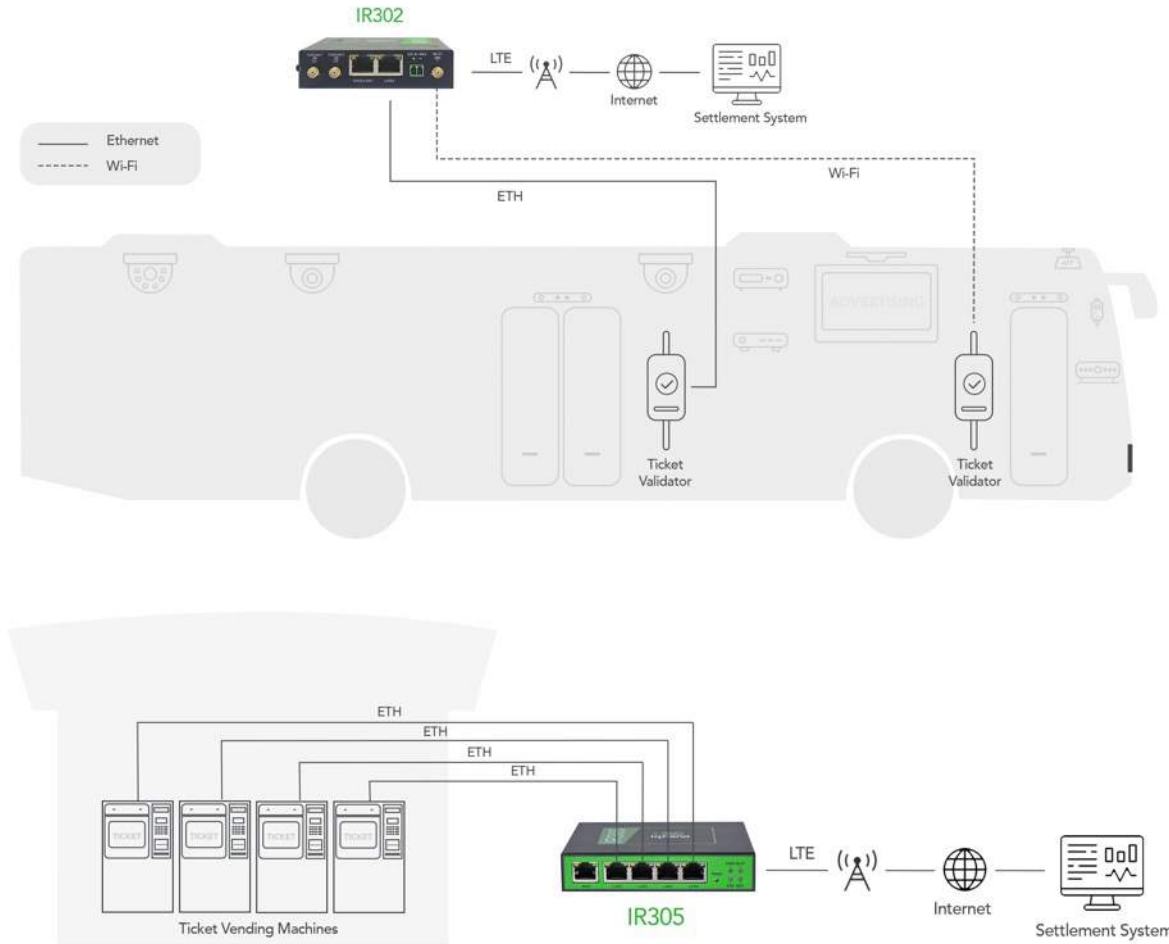
Ticket vending machines have been widely installed on buses, trams, as well as in metro/railway stations. Ticketing is expected to be fast and simple, and downtime means losing money – not only for now but worse still, in the future.

Meanwhile, security counts when it comes to money. Transactions should be well protected to keep the customers' accounts safe.

- Fast and reliable connectivity between the ticket vending machine and the ticketing system
- Comprehensive security mechanisms such as VPNs be applied to protect passengers' financial security



Ticketing - Solution



1

Fast and Reliable Connectivity

Available with wired, Wi-Fi and 4G cellular connectivity, mutual failover
Dual SIM, multiple backup mechanisms

2

Comprehensive Security Mechanisms

Multiple VPN technologies and firewall functions
Tiered authority management; virtual private dial network (VPDN) access

3

Centralized Management

Centrally managed by the Device Manager for remote batch operation

4

Built for Vehicles

IP30, E-Marked, the IR300 withstands harsh environments on vehicles

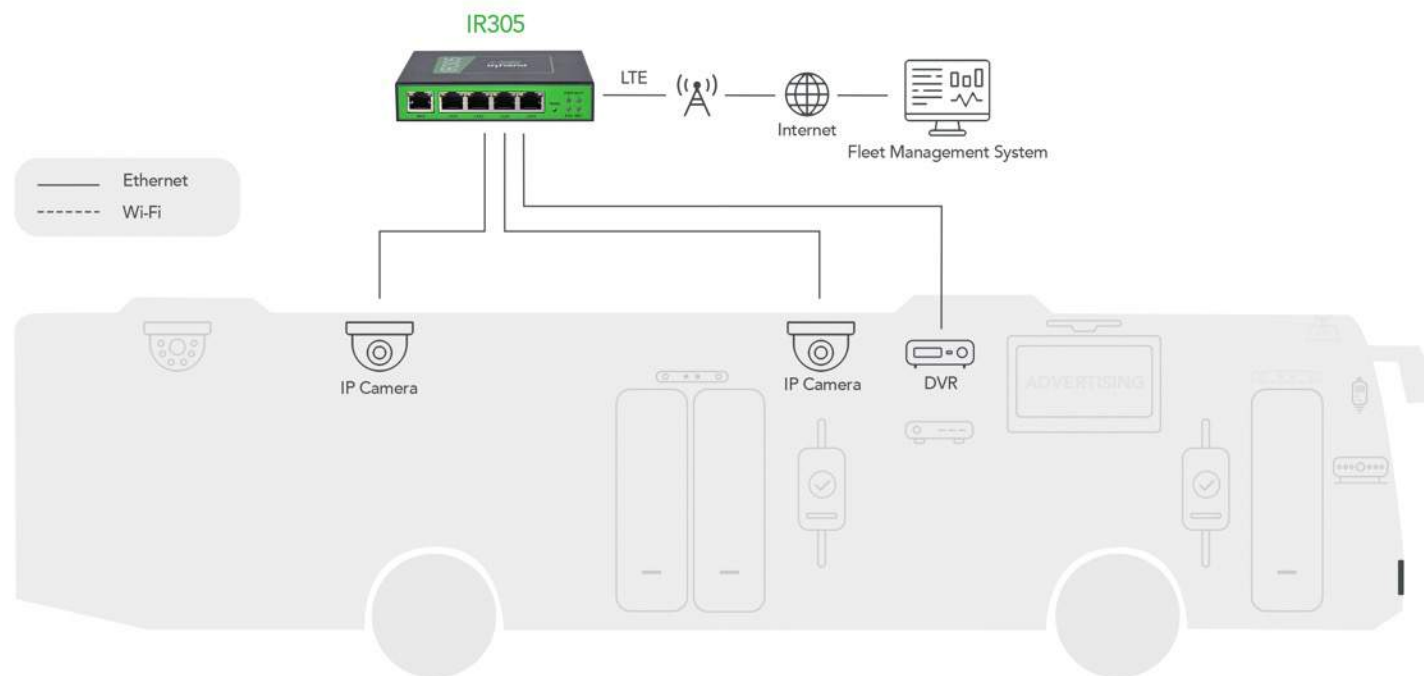
Video surveillance is a must-have feature for today's public transport. It helps monitor what's happening on board, solve and prevent misconduct and crimes.

- **Fast and reliable connectivity** for video data uploading
- Cost-effective, easy for deployment

CCTV



InHand Networks

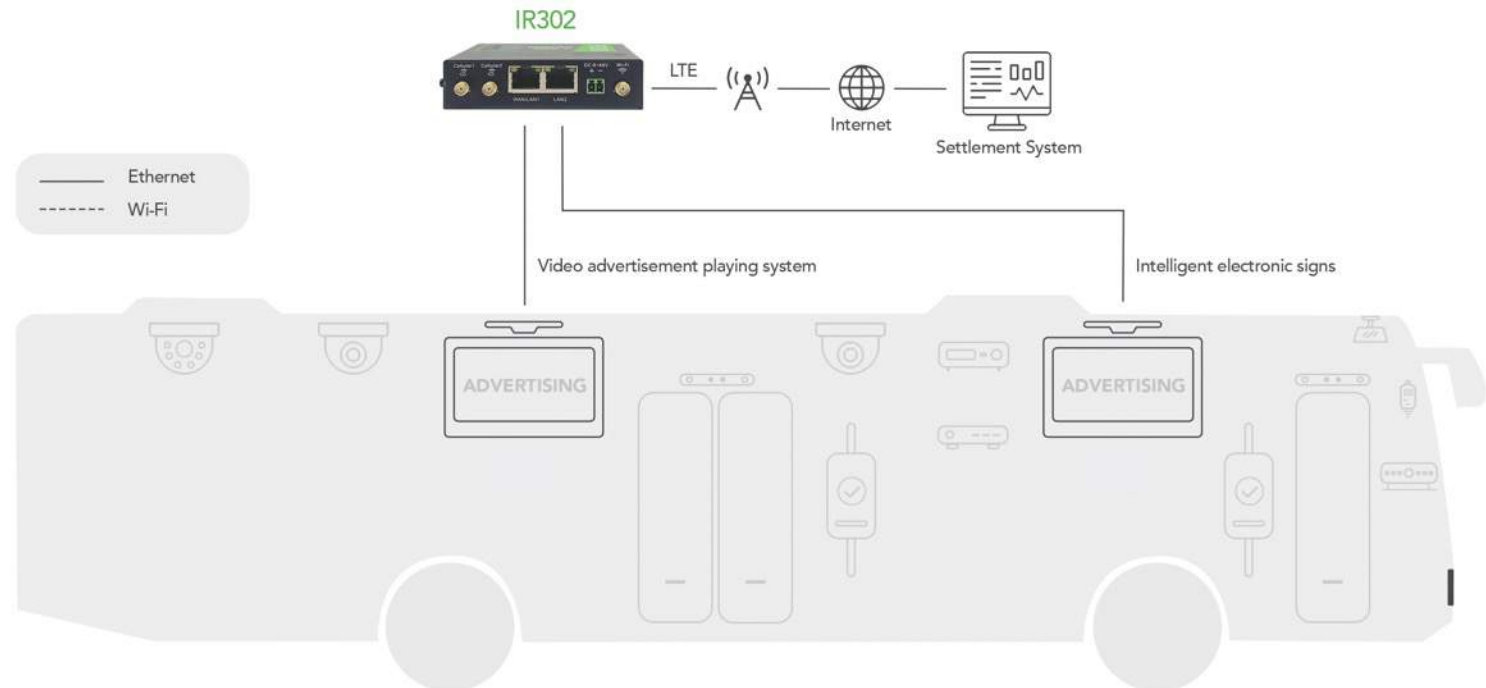


- Data from IP cameras stored locally in DVR
- DVR uploads video data to the surveillance center

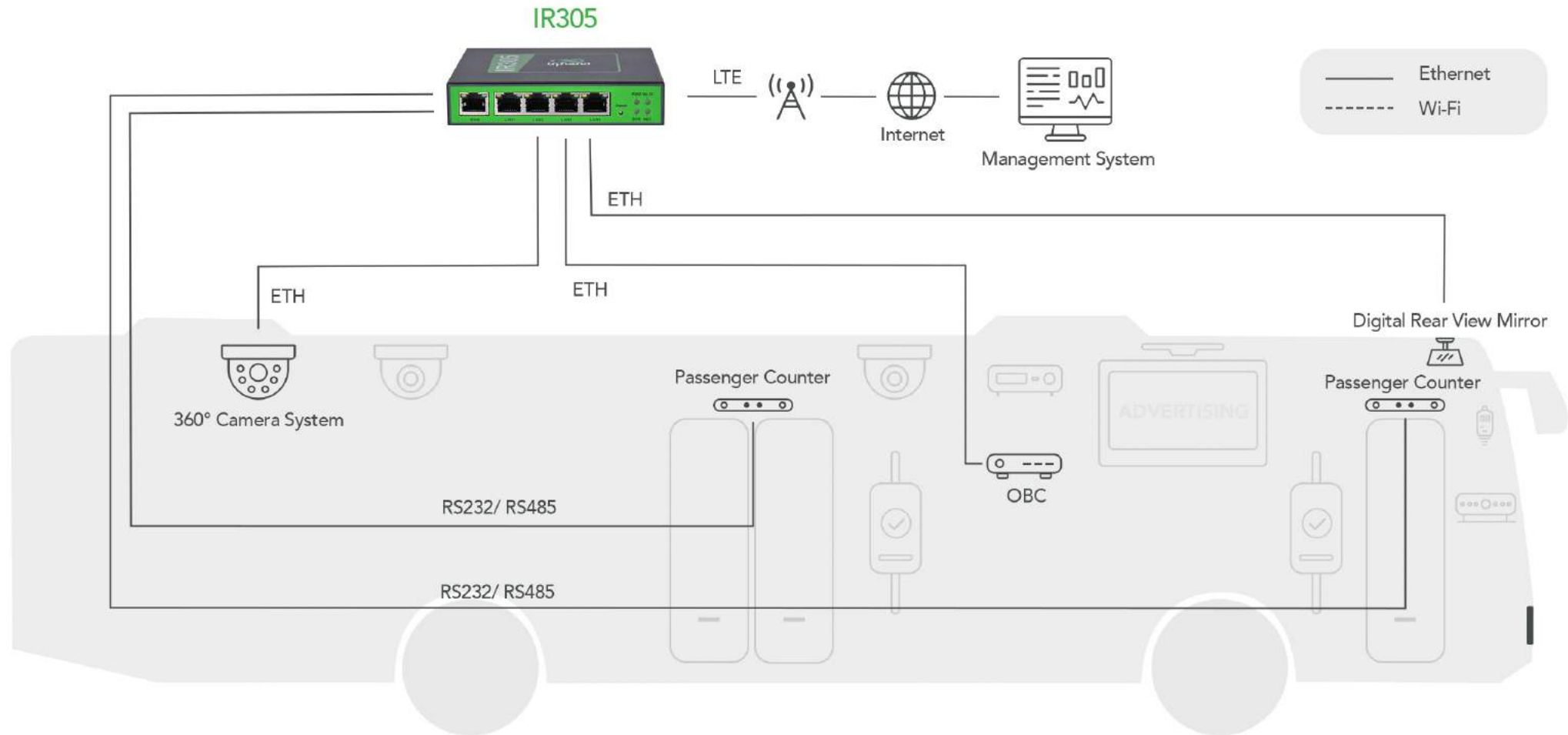
Passenger Infotainment

Passengers expect to receive real-time information, timetable updates and important announcements. Advertising and entertainment also play an important role in making on-board time enjoyable.

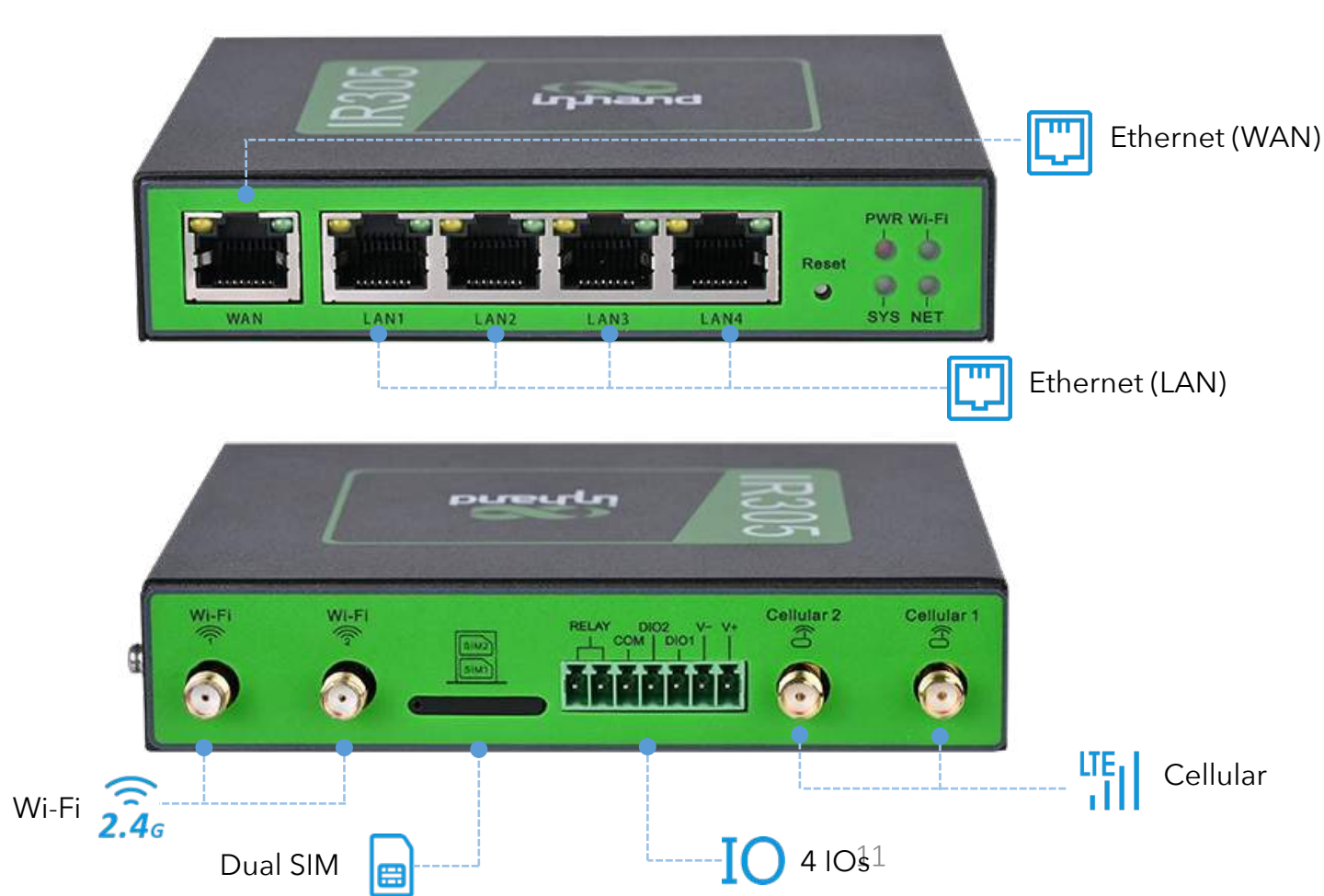
- **Reliable on-board real-time connectivity** of the passenger infotainment system
- **Ruggedized design** for long-time functionality on board
- Batch management & remote control
- Cost-effective



Other Onboard Devices



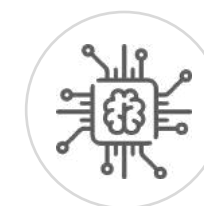
IR305 *E-Marked* Industrial LTE Router



4G/3G



2.4G
2*2MIMO



Protect
function

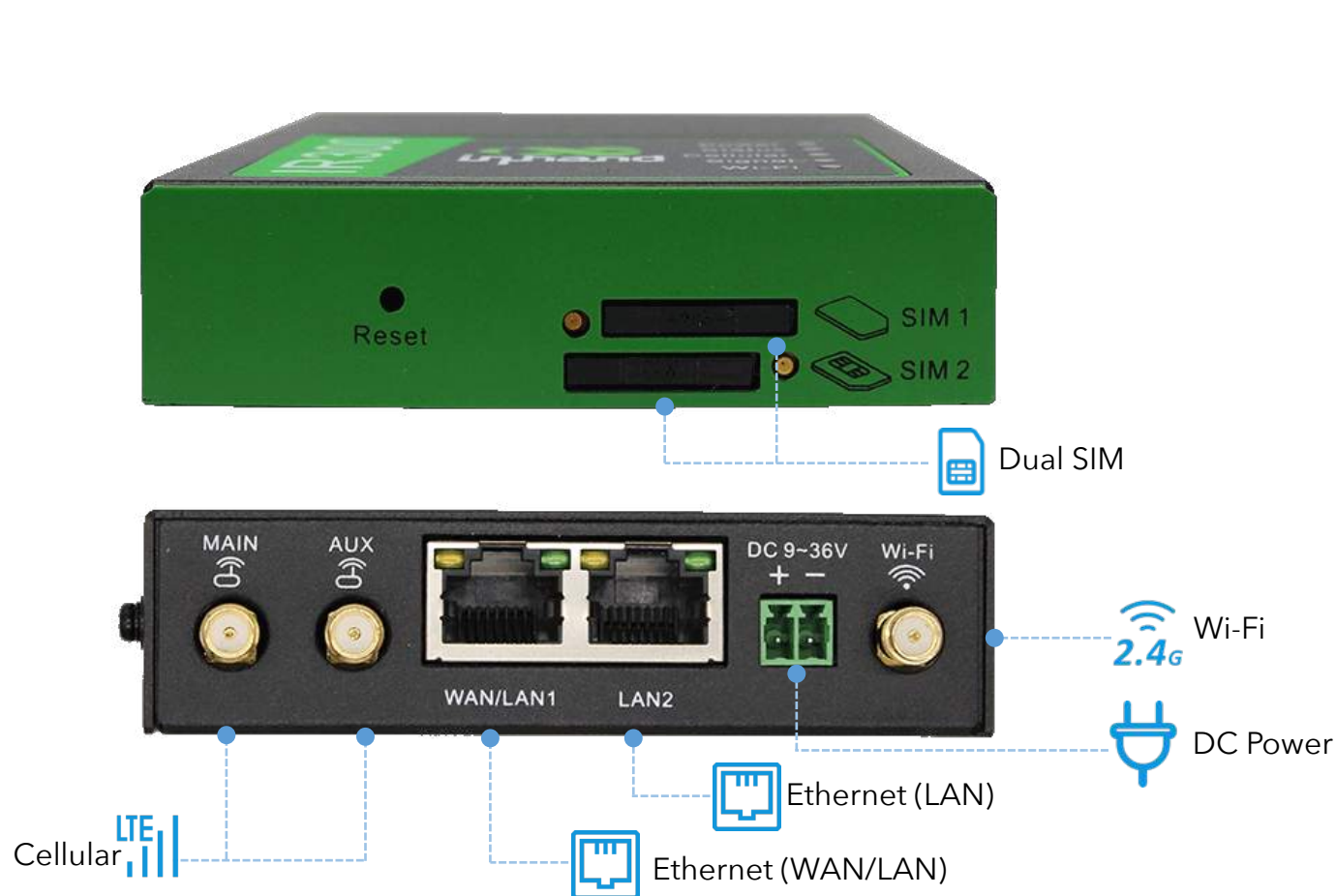


Highly secure
protection



Clouds for easy
Deployment &
management

IR302 *E-Marked* Industrial LTE Router



Versatile



LTE CAT 4/1, CAT M1
ETH, Wi-Fi
Dual-SIM Failover



Highly secure



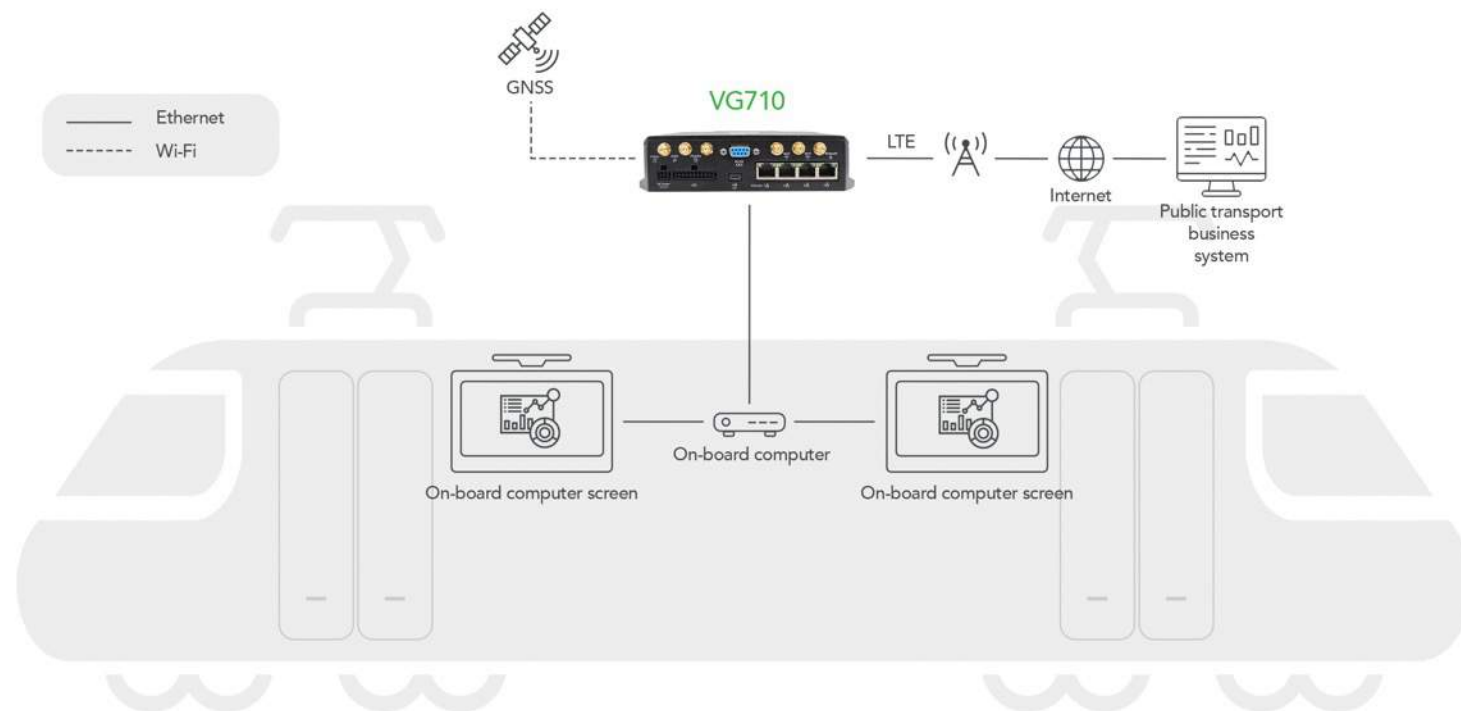
Easy to deploy
and manage



Passenger Information Display

Passengers expect to receive updates of vehicle location, local environment data so as to better plan their trips.

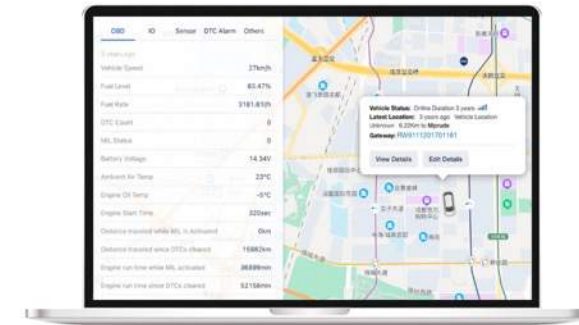
- **Reliable on-board real-time connectivity** of the passenger infotainment system
- Precise and real time location tracking
- Interfaces for on-board computer
- **Ruggedized design** for long-time functionality on board
- Programmable for custom function definition



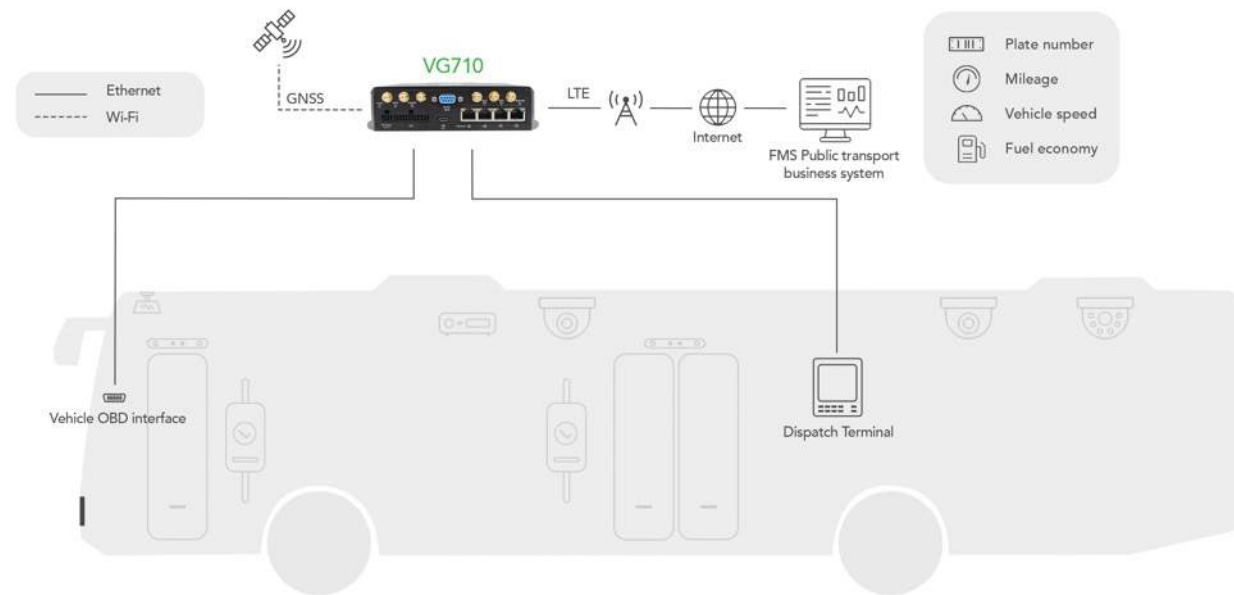
- Real-time location constantly captured by VG710
- Location data sent to on-board computer, where display information is updated accordingly

Fleet Management

Owning a large number of vehicles, public transport operators seek ways to batch manage their vehicles, track their location in real time and remotely dispatch them.



- **Reliable on-board real-time connectivity** between vehicles and the command center
- Real-time vehicle location tracking
- Real-time monitoring of vehicle operation status
- Asset tracking
- **Ruggedized design** for long-time functionality on board

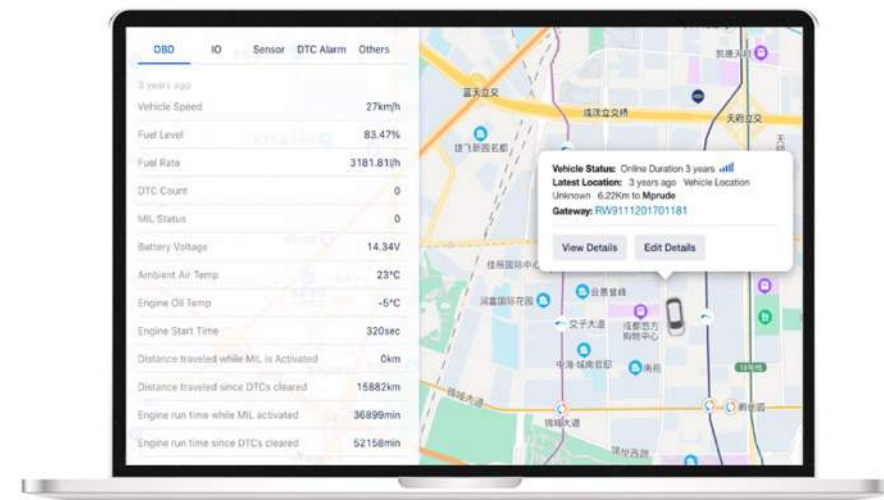
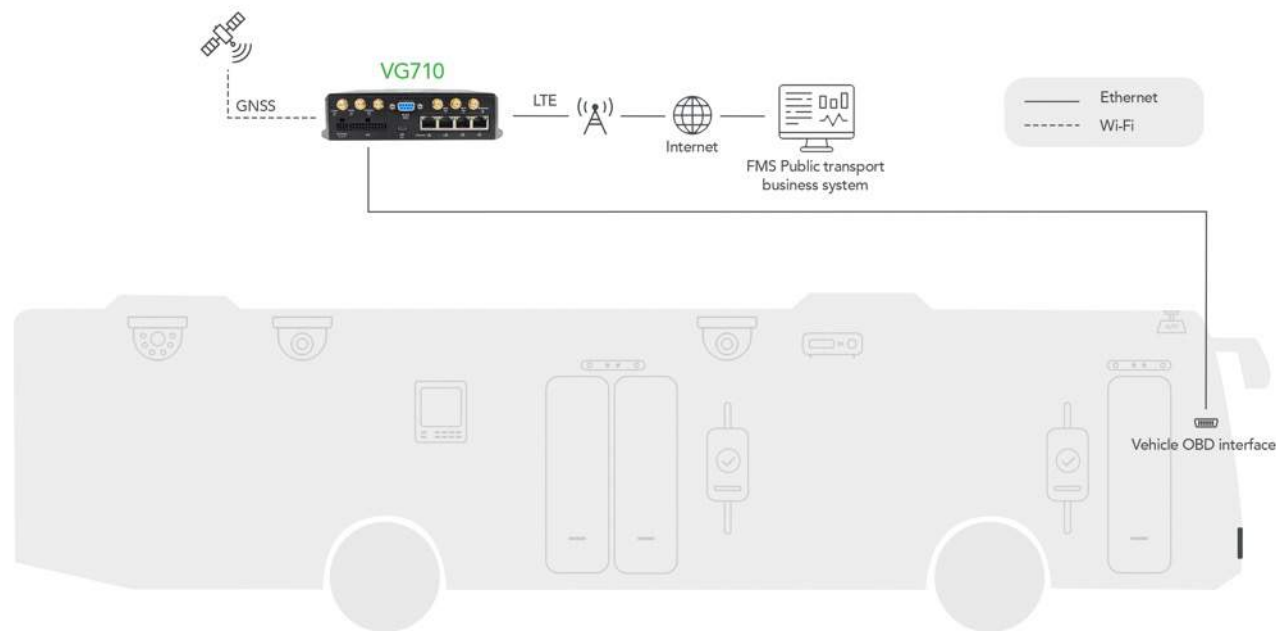


Vehicle Diagnostics

Running long hours on the road, vehicles require constant monitoring of their status in case of accidents, especially for long trips outside the city where technical assistance is not always available.

- **Reliable real-time connectivity** of the vehicle and the command center
- Interfaces for connection to different parts of the vehicle
- Prompt response and notification of security hazards
- **Ruggedized design** for long-time functionality on board

Vehicle Diagnostics

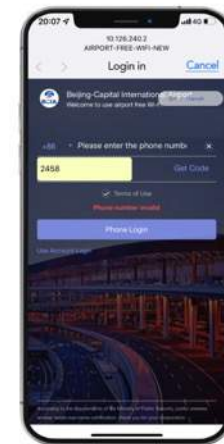
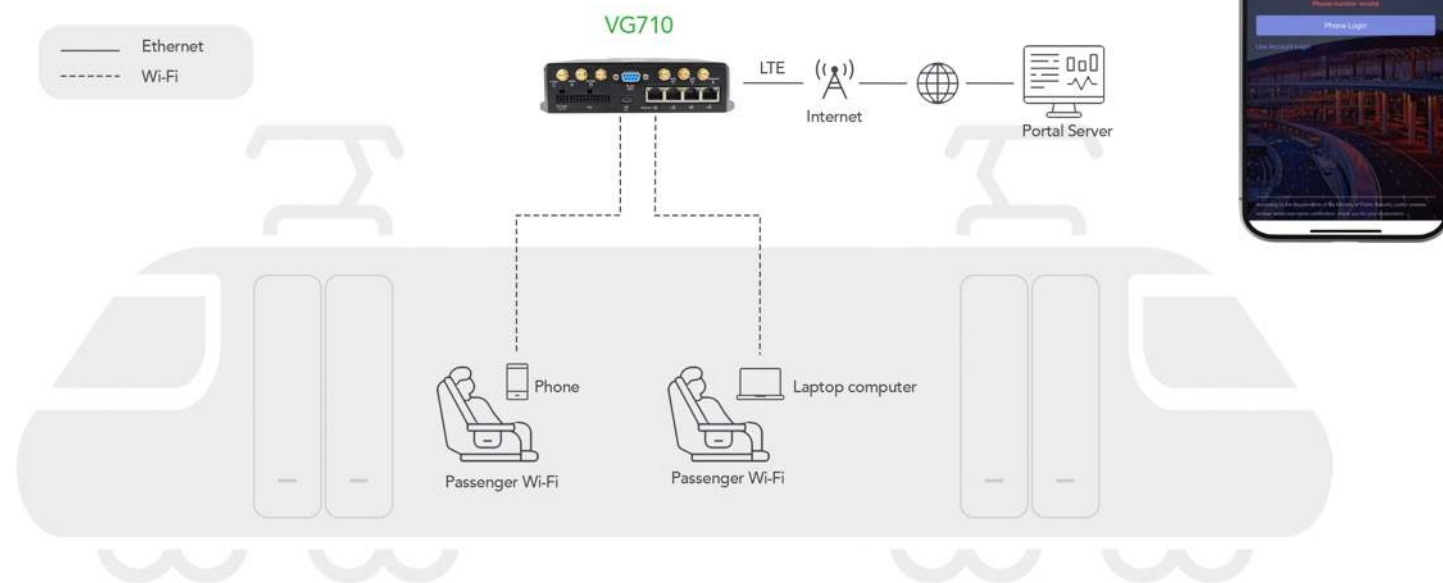


- Real-time parameters: RPM, speed, pedal position, spark advance, airflow rate, coolant temperature, etc.
- Status of "Check Engine" light, emission readiness,
- Diagnostic trouble codes (DTCs)
- Vehicle ID, No. of ignition cycles, mileage, etc.

Passenger Wi-Fi

Travel takes up quite some time in our daily life and work. Given long hours locked in the carriage, Internet access becomes a necessity for today's passengers. Fast and stable Internet connectivity means greater ride experience.

- **Fast and reliable Wi-Fi connectivity** of smart devices on board (smart phones, tablets, PCs, etc.)
- **Rugged** for long-time operation in harsh environments, e.g. vibration, electromagnetic disturbance
- Large coverage for more devices to access



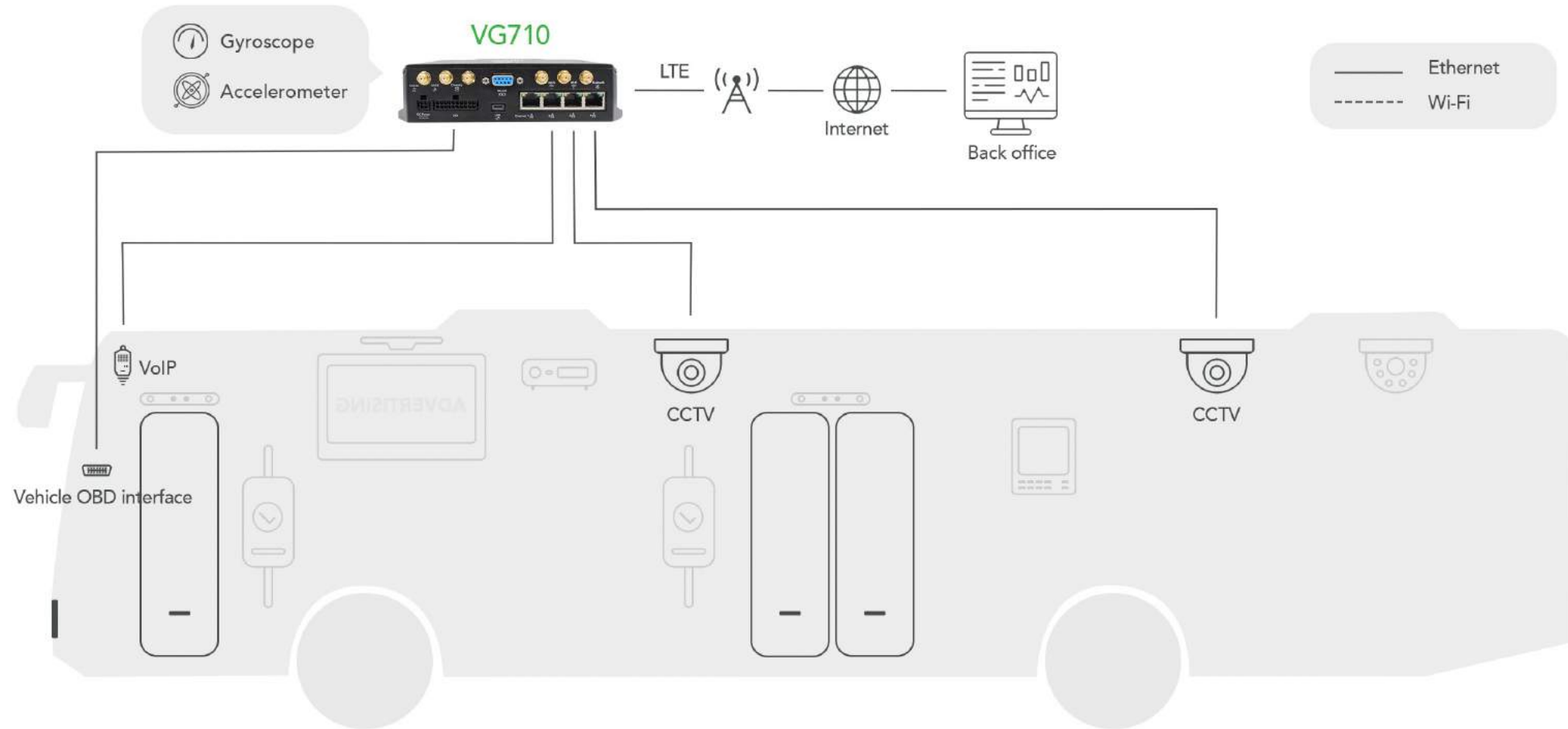
Safety

Safety is among the top priorities of public transport operation. Engines, doors, fire control, different switches and control units, etc. everything requires close inspection, especially for rail transport where vehicles run in separate and closed tracks.

- Connectivity to a wide range of sensors that collect real-time data of those parts
- Reliable and real-time communications to the management platform
- Quick response to security hazards, timely notification to technical staff for immediate troubleshooting



Safety



Designed for Public Transport



- EN50155: Temperature, humidity, shock, vibration
- EN45545: Flame retardant test
- EN61373: Sustainability for vibration & shock
- ECE R10: Electromagnetic compatibility
- ECE R118: Fire protection
-

Designed for IP64 for resistance to dust and water ingress, the VG710 survives water splash, dust, shock, vibration, humidity and extreme temperatures.

InVehicle Gateway710

CE FCC E

PTCRB

ECE-R118



4G 5G
High speed
LTE

2.4G 5G
Gigabit Wi-Fi

ARM
Cortex A7
(quadcore)

Inertial
Navigation

CAN bus/IO/
1-Wire

Edge
computing

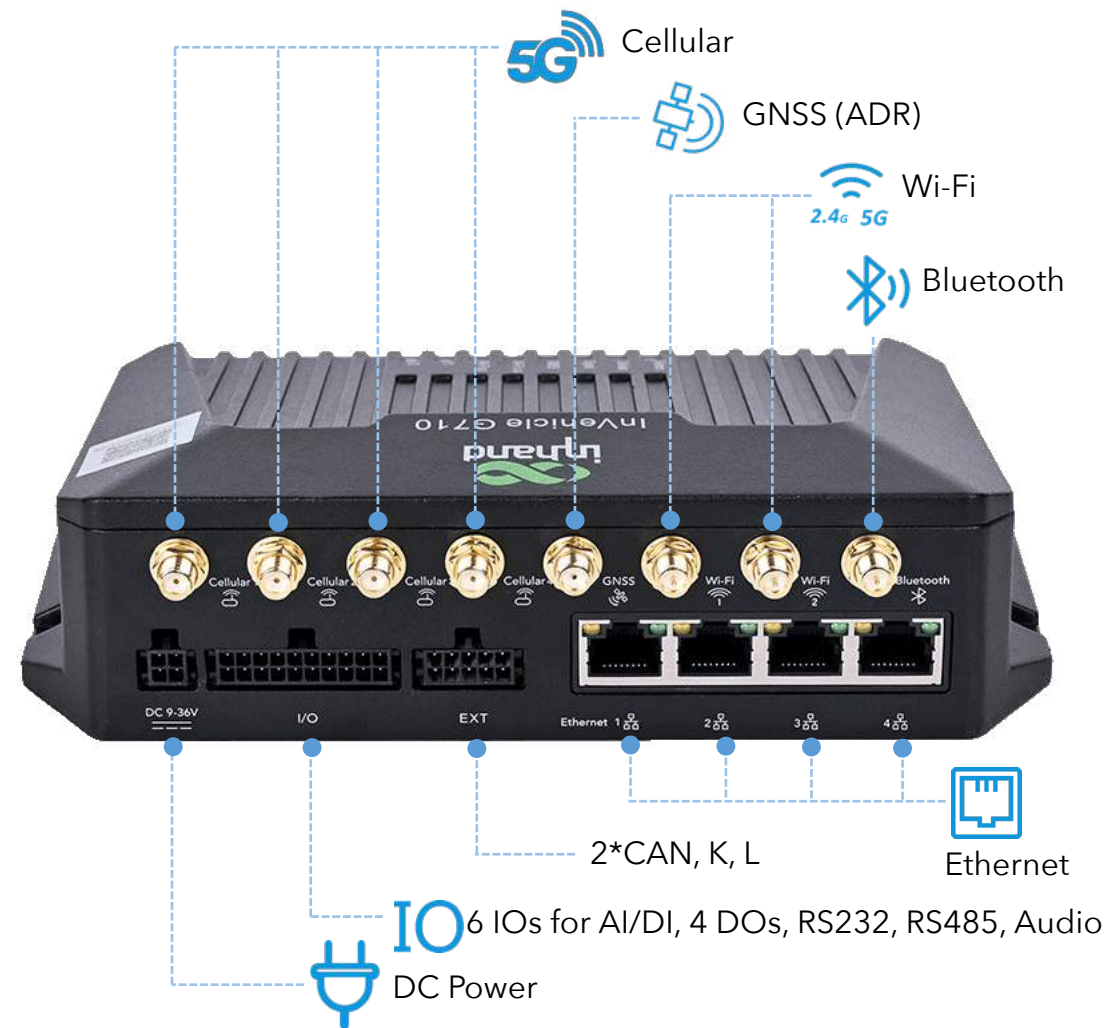
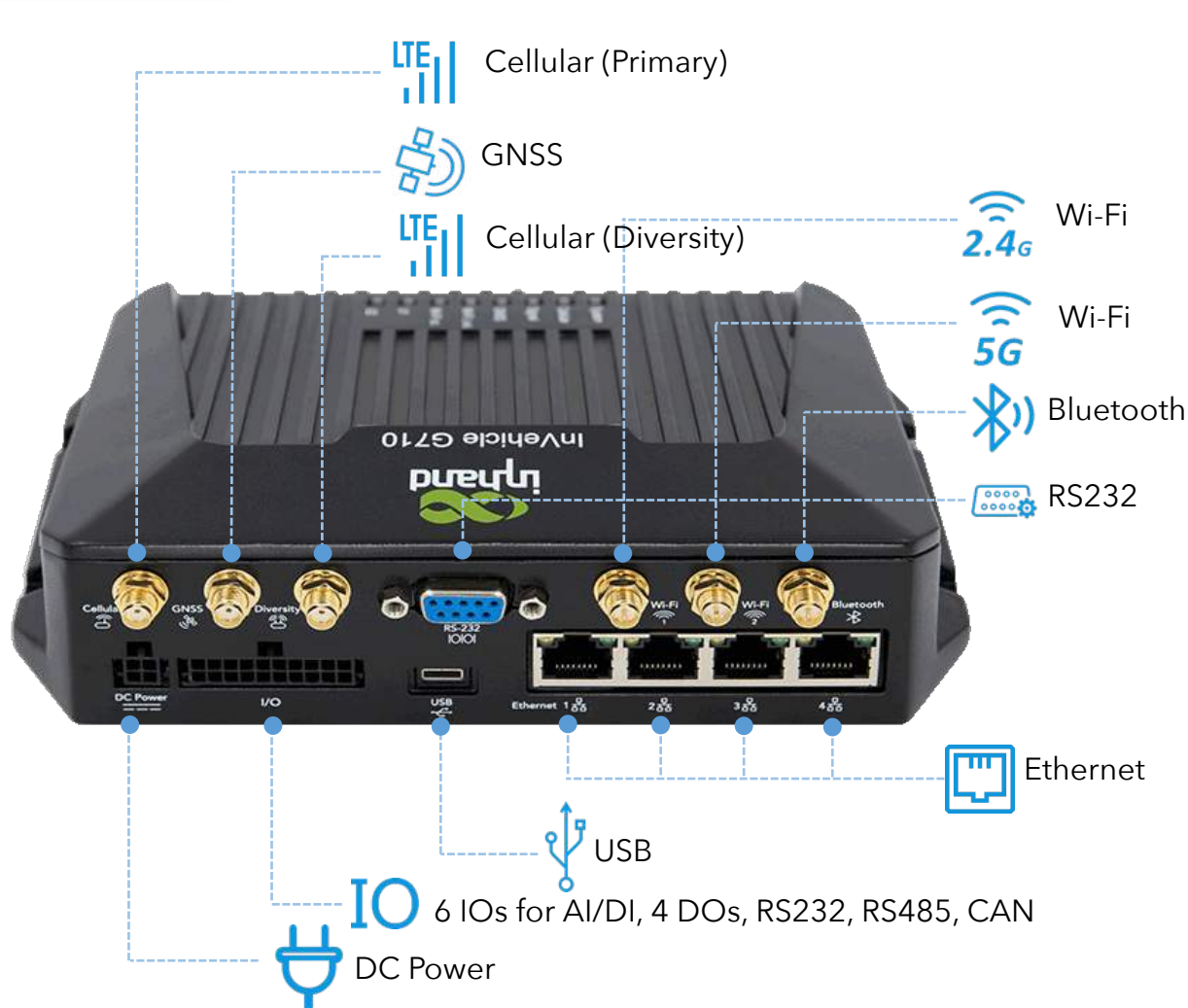
Development
Platform

Azure IoT

IP64
Protection
Rating

VG710

Interfaces



ITxPT Compliance

Hardware









Interface	Implementation Level	VG710	VG810
Power Supply	Permanent, Ignition, Main switch, Full power, SLEEP management	✓	✓
Ethernet	Native or cable end, number and type of port (M12 X)	Cable end	✓
FMS	Optional ground	Cable end	✓
Wireless Communications	Cellular, GNSS, WLAN	✓	✓
Audio	Stereo, mono, Driver, Passenger, External	✓	✓
Auxiliary	Low battery, Odometer, Doors, AnyDoorOpen, Awake request, Stop request, Full power	✓	✓

Software

Service	Provided Type	VG710	VG810
Module	ITxPT_socket or		
Inventory	ITxPT_http	✓	✓
Time	sntp		
GNSS	ITxPT_multicast	✓	✓
Location	ITxPT_multicast /		
FMS to IP	ITxPT_http	✓	✓
MQTT	MQTT	✓	✓
Module	ITxPT_socket or		
Inventory	ITxPT_http	✓	✓

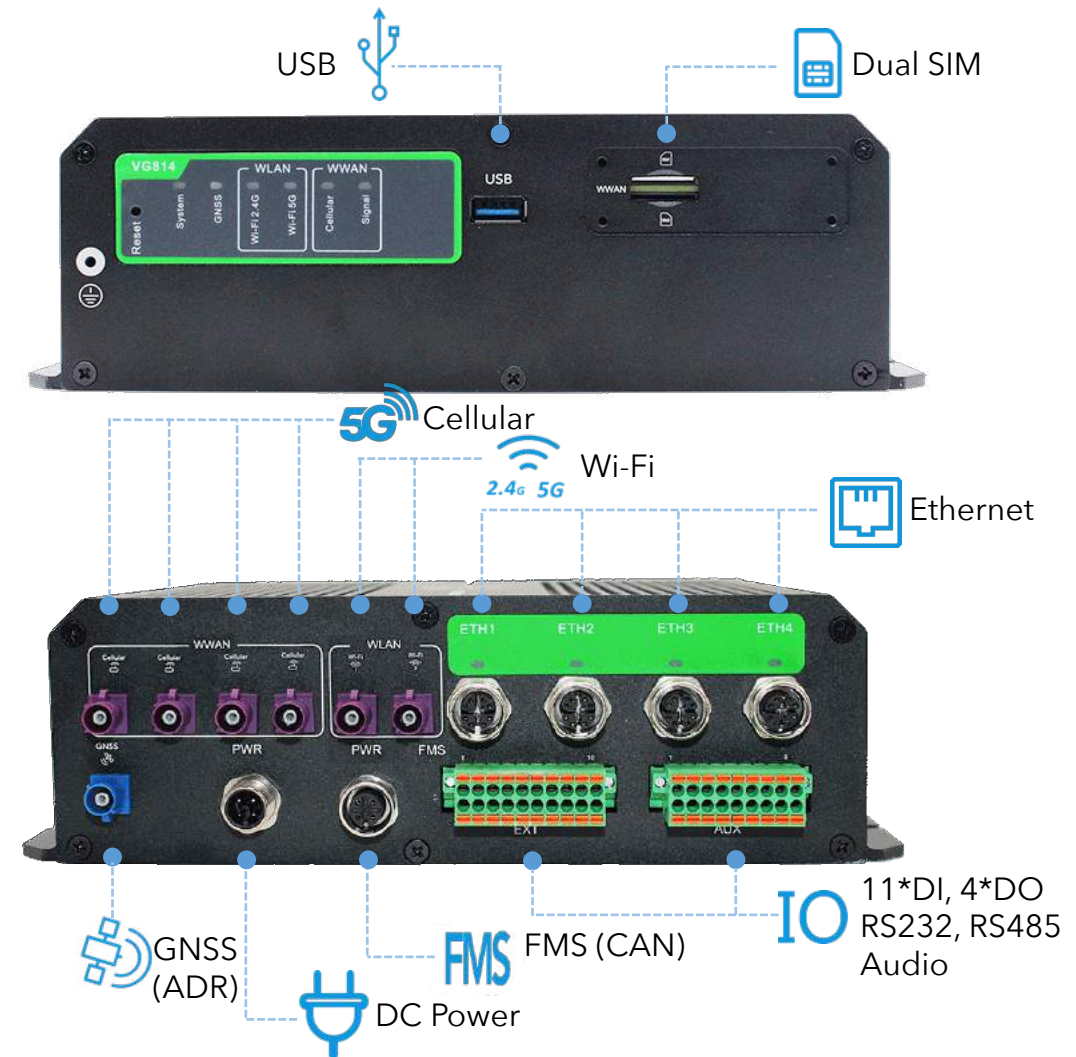
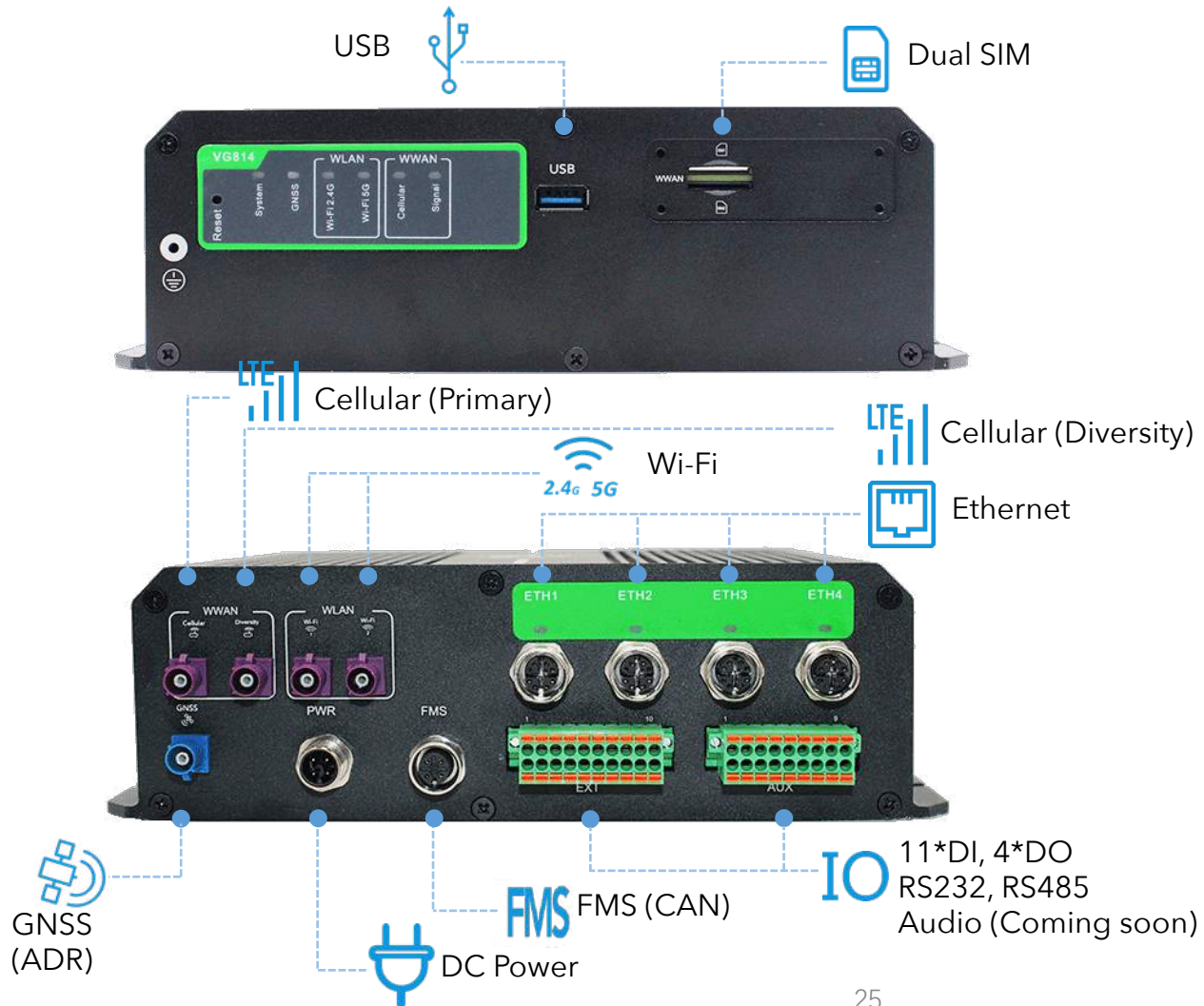
InVehicle Gateway810



 5G / LTE CAT6	 Gigabit Wi-Fi	 Cortex A7 (quadcore)
 Inertial Navigation	 CAN bus/IO	 Edge computing
 Development Platform	 AWS Azure IoT/AWS	 IP40->IP53 Protection Rating

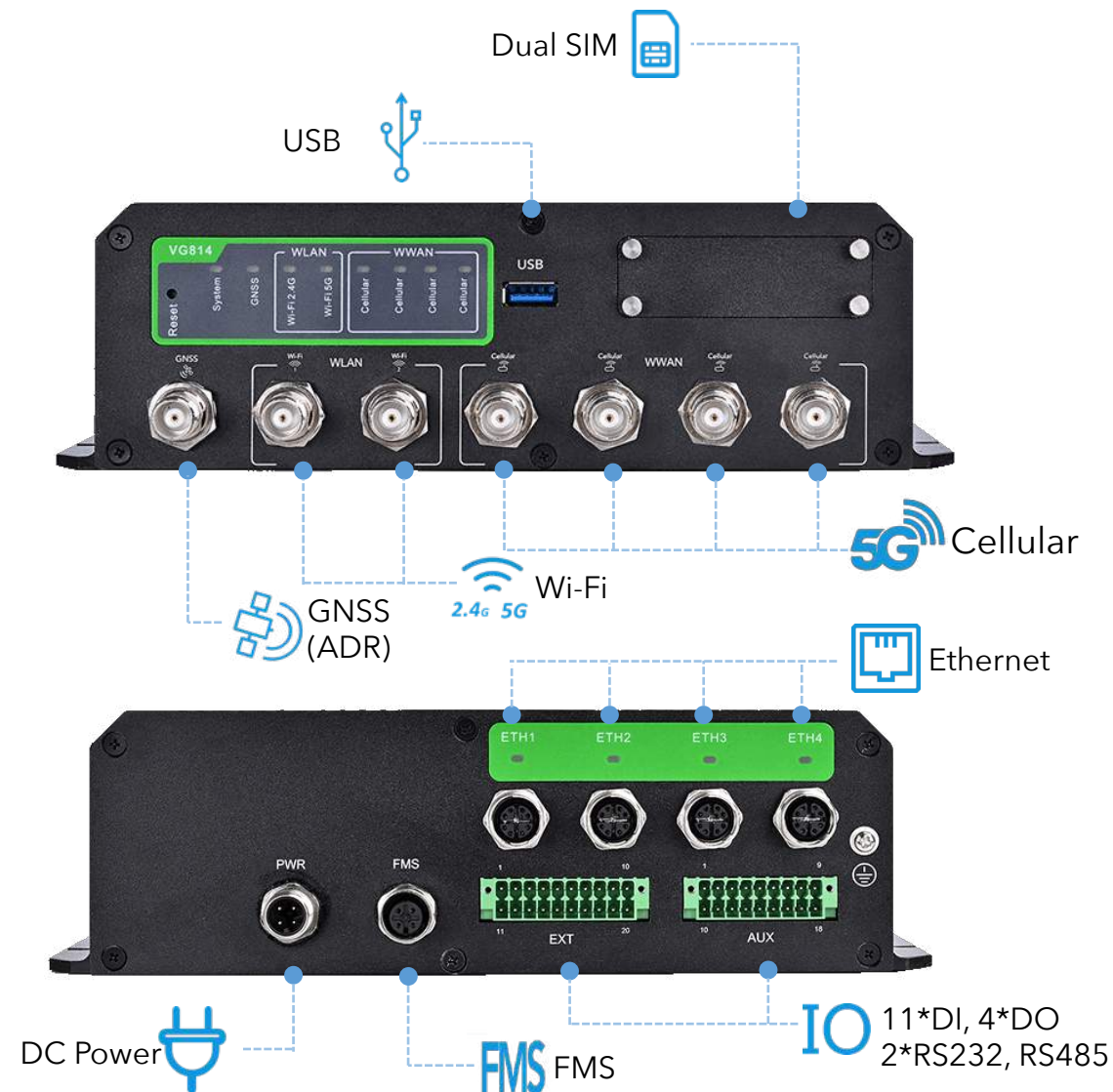
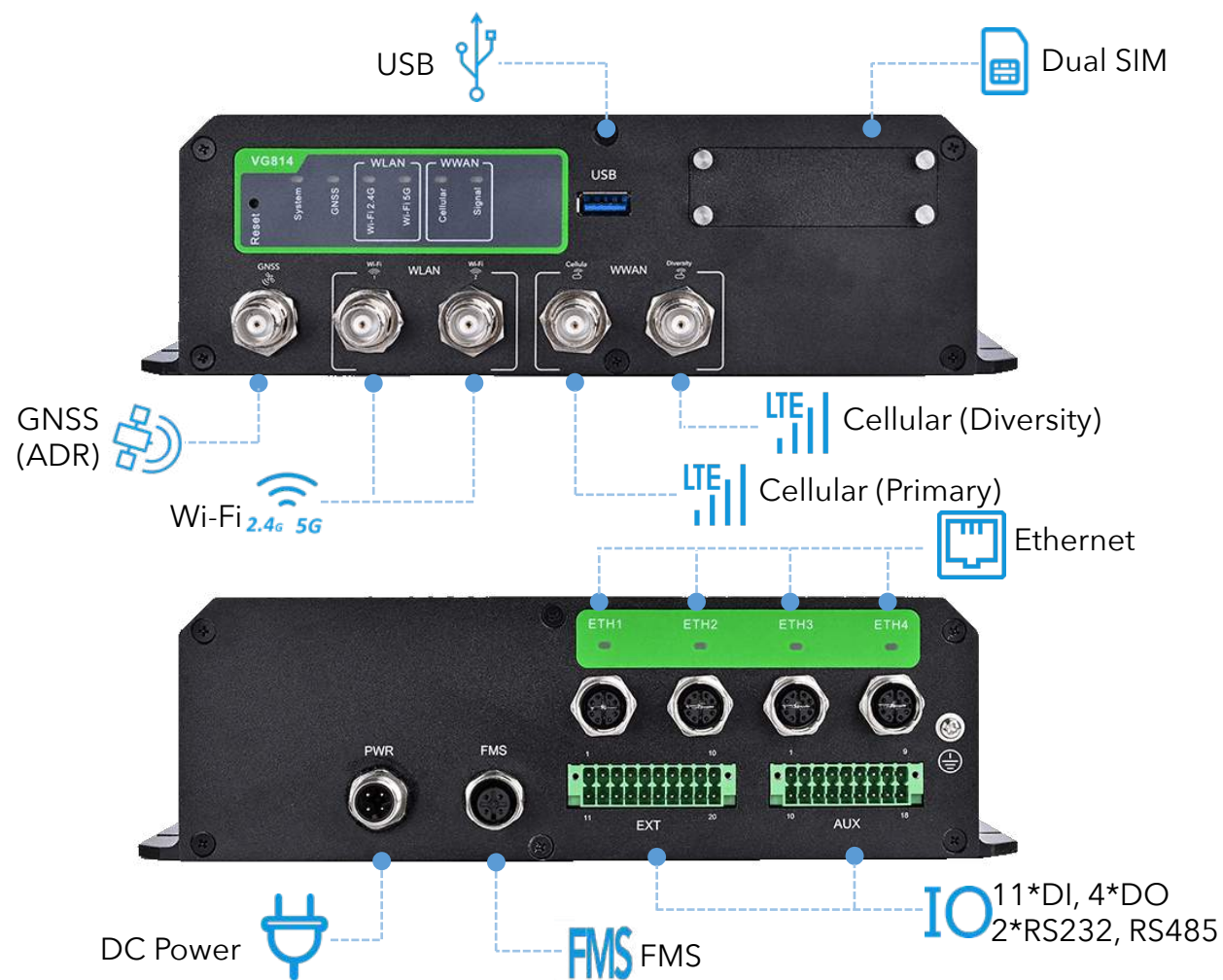
VG810

Interfaces (Road)

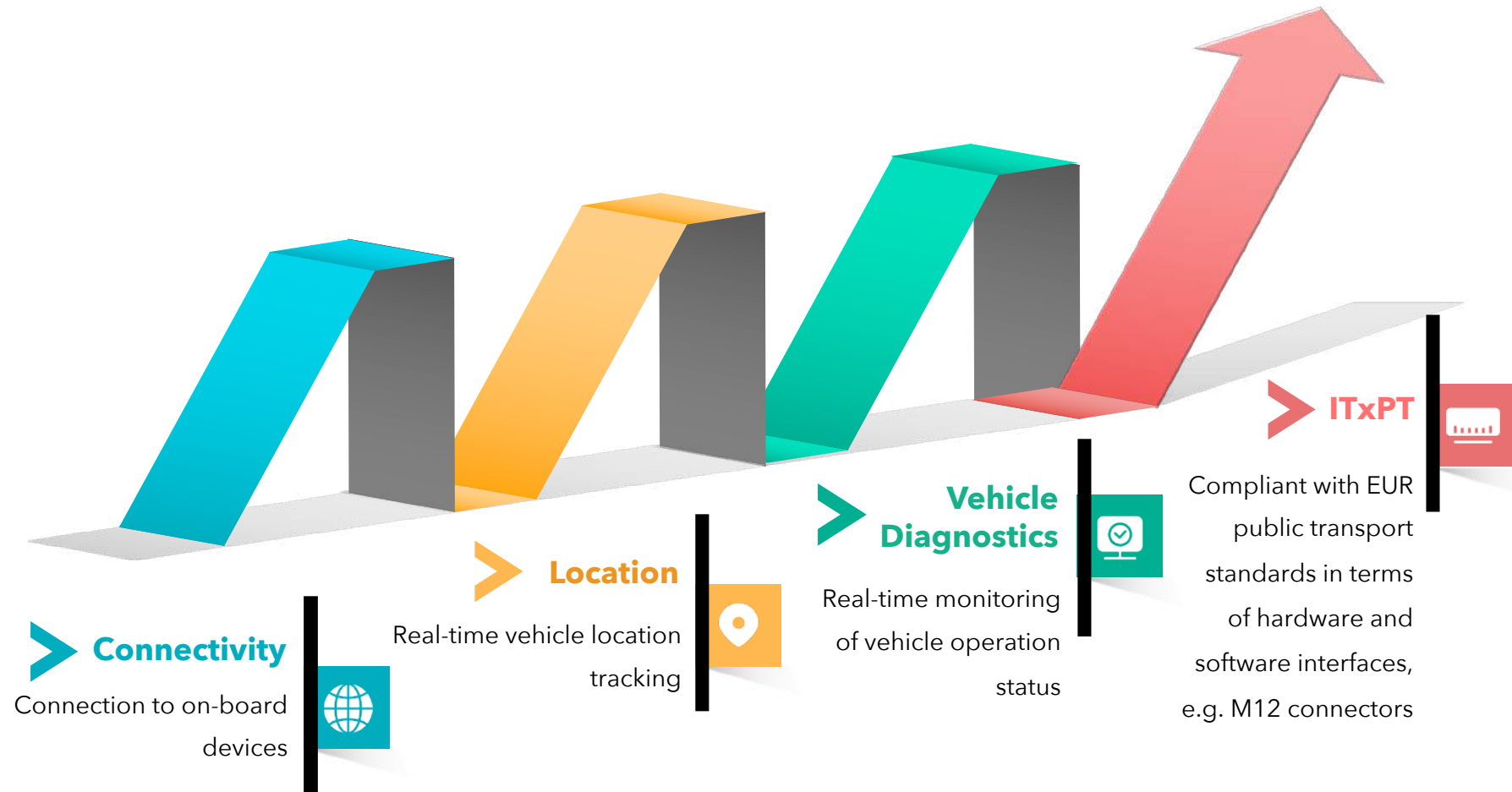


VG810

Interfaces (Railway)

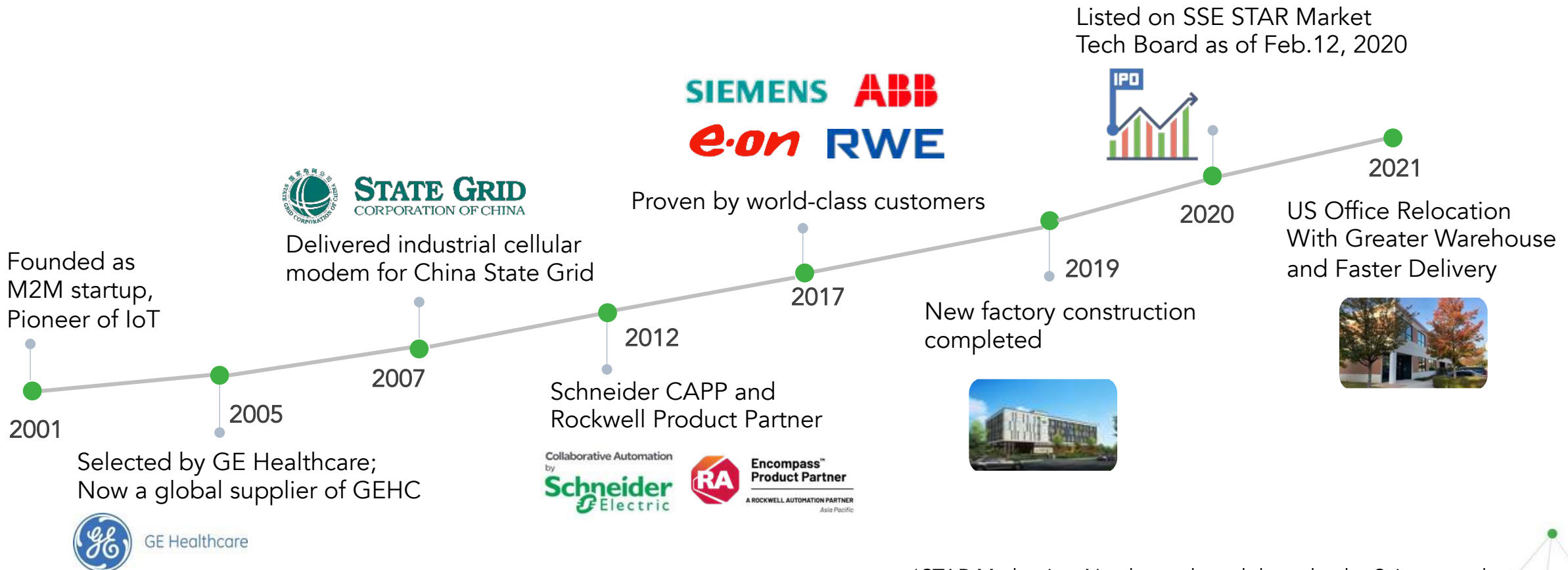


To Sum up



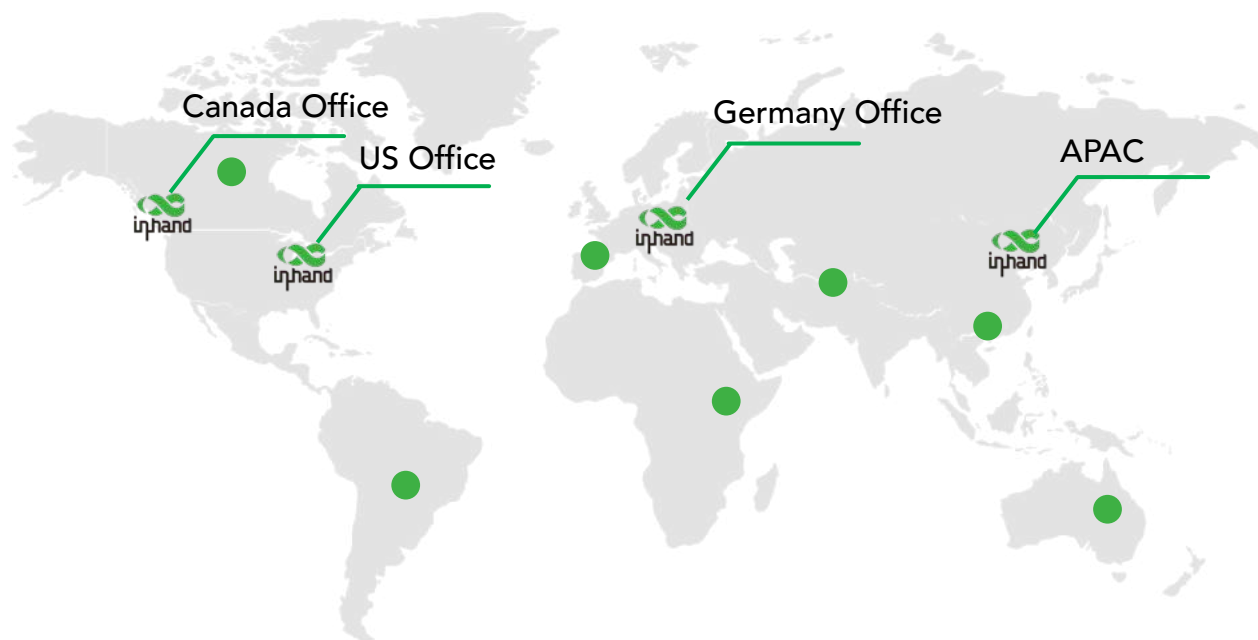
Why InHand Networks?

Pioneering IoT for 21 Years



*STAR Market is a Nasdaq-style tech board – the Science and Technology Innovation Board at Shanghai Stock Exchange.

Global Coverage



Employees 400+
R&D Team 140+



2021 Total Sales \$70 Million+
550K+ IoT products shipped
worldwide



New factory plant in Jiaxing,
China, open since July 2020

Quality Commitment & Support



High Quality with
ISO 9001: 2015, RoHS
and CE certifications

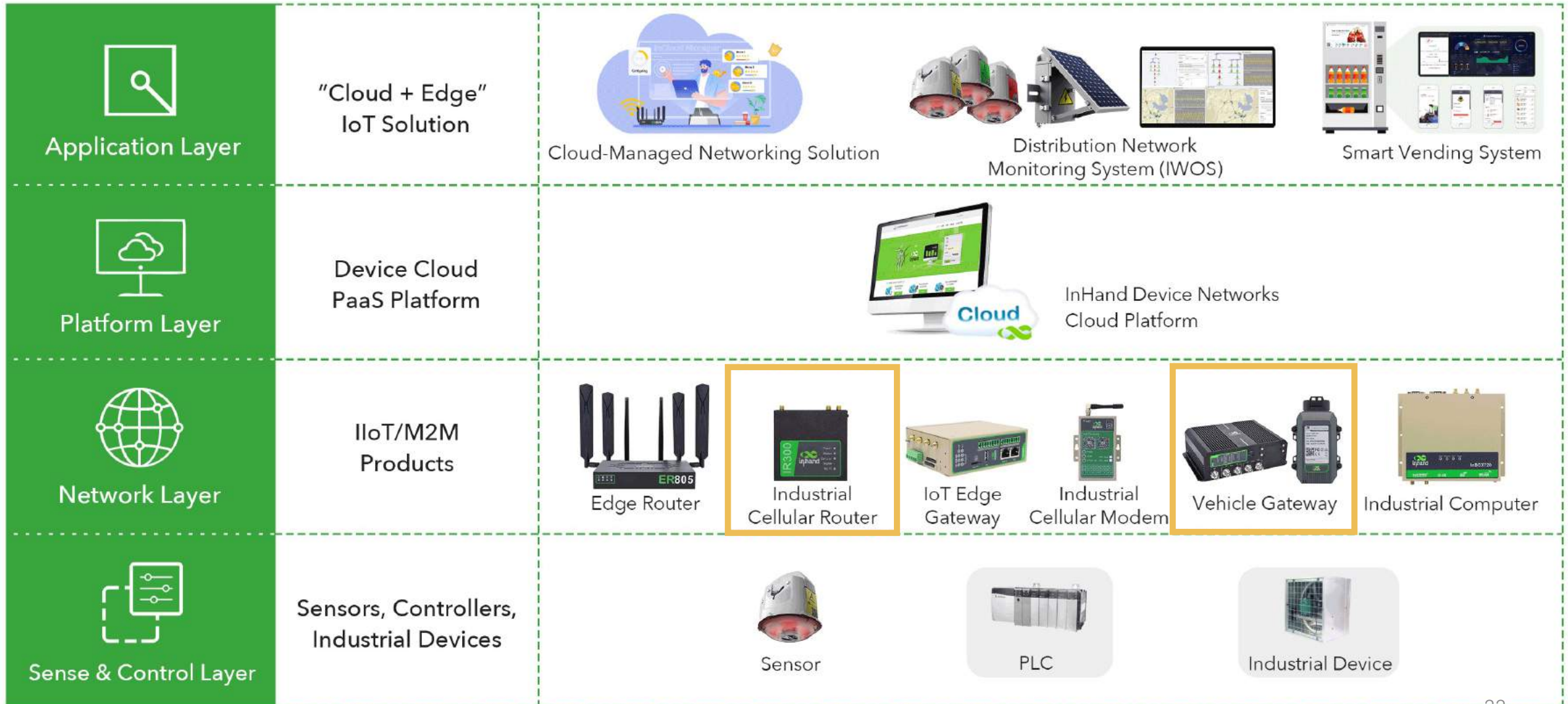


3-year
Warranty



Free Technical Support
16 Hrs per Day
5 Days per Week

IoT/M2M Products & Solutions



Success Stories



InHand Networks

SUCCESS STORY

INTERNET OF VEHICLES

Multi-channel Communications &
Remote Management

InHand Networks x TriNorth

CUSTOMER REQUIREMENTS

- Eco driving data, alcolock data
- Remote control and monitoring of heating system
- Connectivity to the central platform
- Passenger information





| InHand Networks

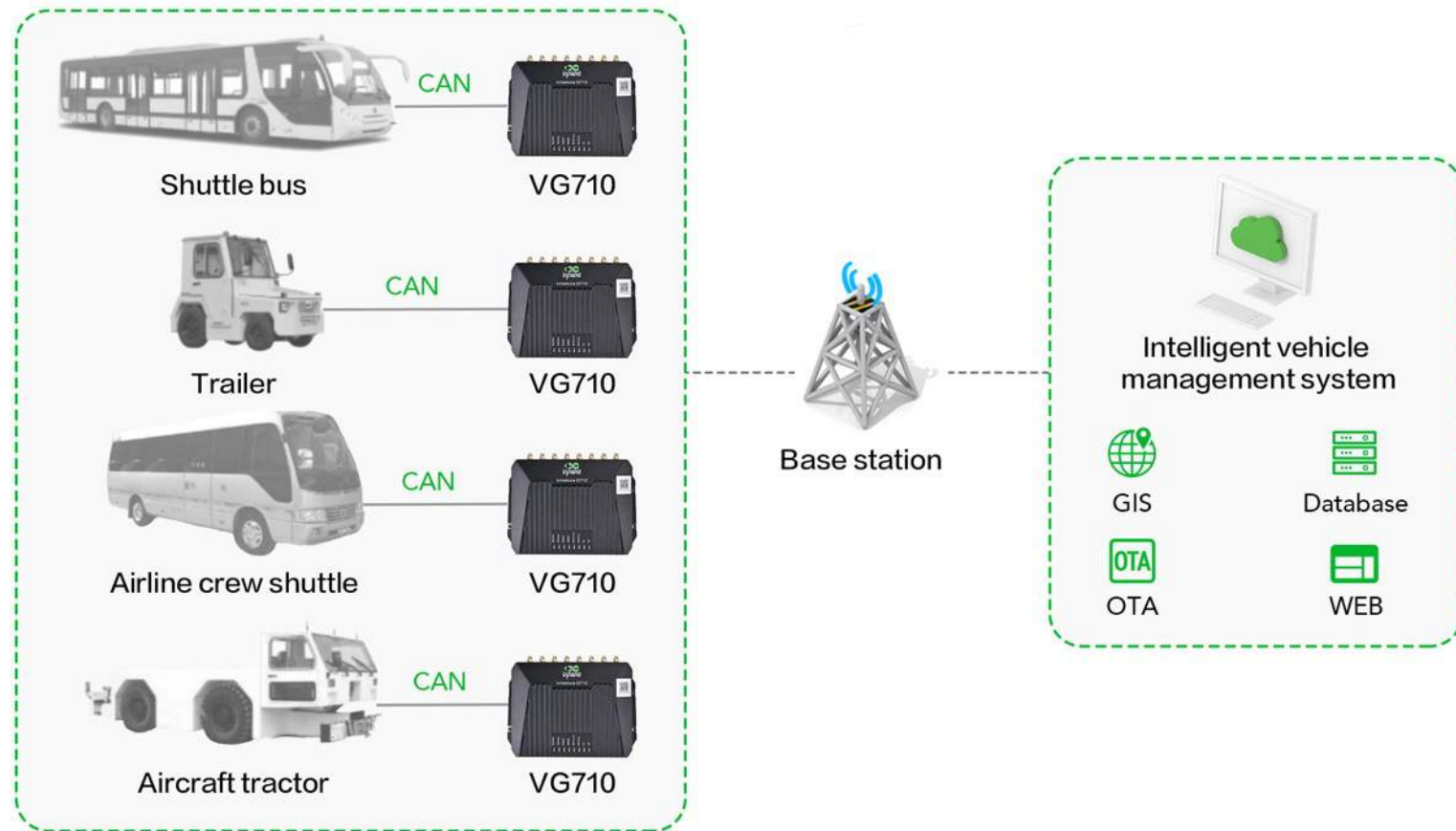
SUCCESS STORY

AIRPORT GROUND SERVICE

Reliable & Efficient Remote Management
of Ground Vehicles

CUSTOMER REQUIREMENTS

- Monitoring of all vehicles on the apron, including shuttle buses, aircraft tractors, trailers, etc.
- Management of vehicle maintenance records, dispatch queries, vehicle usage, etc.
- OBD data collection and analysis
- OTA upgrade and cloud management





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SUCCESS STORY

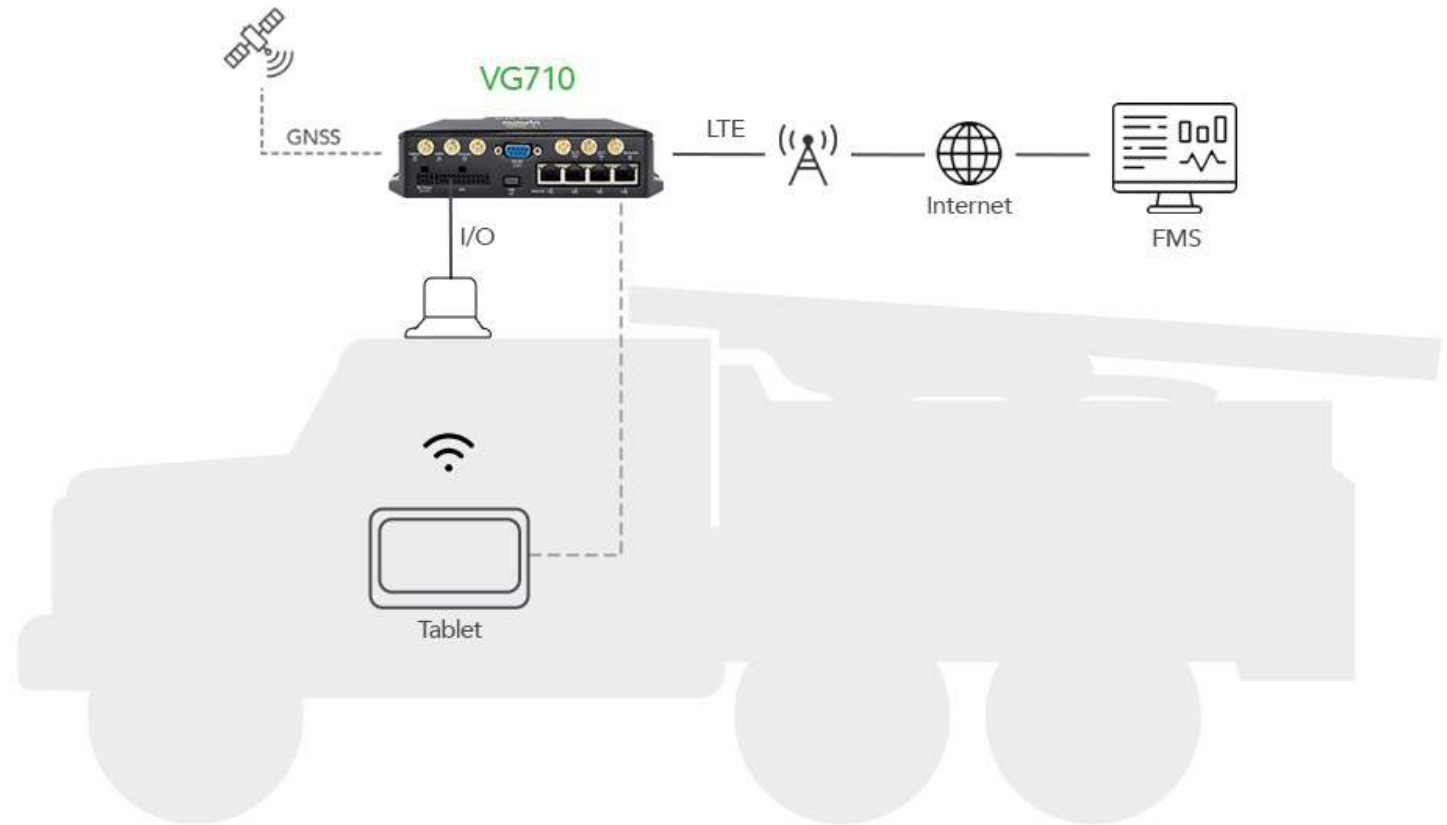
FIRETRUCKS MANAGEMENT

In-vehicle Connectivity & Fleet Management

InHand Networks x MRF

CUSTOMER REQUIREMENTS

- Management of 50 fire trucks in a government project in Alberta, Canada
- Two status inputs on each truck: emergency lights, siren
- Wi-Fi connection to a navigation tablet that works 24/7, to receive dispatch routes
- GNSS for location tracking and uploading



Product Portfolio

Product Portfolio



Category	Specifications	VG810	VG710	IR300
Robust Networking	Cellular	5G/ LTE CAT6/CAT4	5G/ LTE CAT6/CAT4	LTE CAT 6/4/1
	Dual SIM	2	2	1
	Wi-Fi	2.4G / 5GHz dual-band, Wi-Fi 5	2.4G / 5GHz dual-band, Wi-Fi 5	2.4GHz (802.11b/g/n)
	Ethernet Ports	4 *Gigabit Ethernet, M12	4*10/100/1000Mbps, RJ45	5*100M Ethernet port: WAN/LAN/VLAN
Extensive Interfaces	Bluetooth	/	Bluetooth 4.1	/
	USB	USB 3.0	USB 2.0	/
	Diagnostic Interfaces	2 *CANbus (FMS Interface M12 A-Coded female	2*CANbus, 1*J1708, 1*LINBus	/
	Serial Ports	2 * RS232, 1 * RS485	1*RS232, 2*RS485	1*RS232+1*RS485
	I/O Ports	11 * DI, 4 * AI, 3 * DO(or 7*DO)	4*DI/AI and 4*DO	4*DI or DO
	GNSS Receiver	GPS, GLONASS,Galileo,Beidou	GPS, GLONASS,Galileo,Beidou	/
Development Platform	Python Programs	√	√	/
	Docker	√	√	/
	Cloud Platforms	AWS, Azure, Aliyun, 3rd Patry	AWS, Azure, Aliyun, 3rd Patry	/
	Management Platform	DeviceManager, InConnect	DeviceManager, InConnect	DeviceManager, InConnect
Compliance Standards	Protection Rating	IP40->IP53	IP64	IP30
	Compliance	CE, RoHS*, E-Mark*, ITxPT*, EN50155, EN45545	CE, -Mark, RoHS,EN50155, EN45545...	CE, FCC, CB, E-MARK, PTCRB, IC, VZW, RCM, AT&T
	Application Case	Railway, Bus (Factory-Installed Vehicle)	Railway, Bus,First Responders (Aftermarket installed Vehicle)	Smart Parking, EV Charging, Smart City

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