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# Parker Vehicle System Gateway for Mobile IoT

## VA MOBILE-IOT-GEN3-GATEWAY-4G-GLOBAL-WIFI

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User Guide



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# Publication History

The following table provides an overview of the changes made to this document throughout its publication history.

Rev	Release Date	Description of Change
1	6-13-2024	First release of this document

# Safety

Do not perform the procedures in this manual unless you are experienced in handling electronic equipment. Contact the manufacturer if there is anything you are not sure about or if you have any questions regarding the product and its handling or maintenance. The term "manufacturer" refers to Parker Hannifin Corporation.

## Safety symbols

The following symbols are used in this document to indicate potentially hazardous situations:

**▲ DANGER** *Danger! Risk of death or injury.*

**Notice** *Notice: Risk of damage to equipment or degradation of signal*

When you see these symbols, follow the instructions carefully and proceed with caution.

## General safety regulations

Work on the hydraulics control electronics may only be carried out by trained personnel who are well-acquainted with the control system, the machine, and its safety regulations.

**Notice** Follow the manufacturer's regulations when mounting, modifying, repairing, and maintaining equipment. The manufacturer assumes no responsibility for any accidents caused by incorrectly mounted or incorrectly maintained equipment. The manufacturer assumes no responsibility for the system being incorrectly applied, or the system being programmed in a manner that jeopardizes safety.

**Notice** Do not use the product if electronic modules, cabling, or connectors are damaged or if the control system shows error functions.

**Notice** Electronic control systems in an inappropriate installation and in combination with strong electromagnetic interference fields can, in extreme cases, cause an unintentional change of speed of the output function.

## Welding after installation

Complete as much as possible of the welding work on the chassis before the installation of the system. If welding must be done afterward, proceed as follows:

**Notice** Do not place the welding unit cables near the electrical wires of the control system.

- Disconnect the electrical connections between the system and external equipment.
- Disconnect the negative cable from the battery.
- Disconnect the positive cable from the battery.
- Connect the welder's ground wire as close as possible to the place of the welding.

## Construction regulations

The vehicle must be equipped with an emergency stop that disconnects the supply voltage to the control system's electrical units. The emergency stop must be easily accessible to the operator. If possible, the machine must be built so that the supply voltage to the control system's electrical units is disconnected when the operator leaves the operator's station.

## Safety during installation

**Notice** Incorrectly positioned or mounted cabling can be influenced by radio signals, which can interfere with the system's functions.

## Safety during start-up

**▲ DANGER** Danger! Risk of death or injury. Do not start the machine's engine before the control system is mounted and its electrical functions have been verified. Do not start the machine if anyone is near the machine.

## Safety during maintenance and fault diagnosis

Before performing any work on the hydraulics control electronics, ensure that:

- The machine cannot start moving
- Functions are positioned safely
- The machine is turned off
- The hydraulic system is relieved from any pressure.
- Supply voltage to the control electronics is disconnected.

# 1. GEN3 Gateway Service and Plan Offerings

## 1.1 Plug & Play Hardware

The main hardware features of the VA MOBILE-IOT-GEN3-GATEWAY-4G-GLOBAL-WIFI, also known as the GEN3 Gateway, are listed in the following table:

Specifications		
<b>Main Connector</b>	DT13- 12PA	
<b>Mating Connector</b>	DT06- 12SA	
<b>Ethernet Connector</b>	M12 connector (4-pin), 10Base-T / 100Base-TX	
<b>Input Voltage</b>	12V / 24VDC Minimum 6VDC – Maximum 32VDC	
<b>Input Protection</b>	SAE J1113- 11 transients and reverse voltage protection	
<b>Application Processor</b>	NXP i.MX 8M Nano UltraLite Quad Quad Core ARM Cortex A53 1.4GHz and ARM Cortex M7	
<b>RAM</b>	1GB DDR3L	
<b>Flash Memory</b>	8GB eMMC v5.1	
<b>OS</b>	Linux	
<b>IO Processor</b>	ARM Cortex M4 180MHz 512kB Flash 200kB SRAM NXP LPC54618J512ET180E	
<b>GNSS</b>	GPS, GLONASS, BeiDou, Galileo	
<b>Cellular Connectivity</b>	Global 4G with 3G fallback	
<b>THALES PLS63 W module specifications:</b>		
	FDD LTE	bands 1,2,3,4,5,7,8,12,13,18,19,20,26,28,66
	TD-LTE	bands 38, 40, 41
	UMTS (WCDMA/ FDD)	bands 1, 3, 2, 4, 5, 6, 8, 19
	Quad Band GSM	850, 900, 1800, 1900 MHz
	Regulatory Certifications	RED, GCF, FCC, PTCRB, IC, UL, CCC, IFETEL, UKCA, Anatel , JATE, TELEC
	Carrier Approvals	AT&T, Verizon, Telstra, NTT Docomo, KDDI
<b>Wi-Fi</b>		802.11 a/b/g/n/ac 2.4GHz and 5GHz

Specifications	
<b>CAN</b>	Support for CAN FD available x2 , configurable speeds of 250 kbps or 500 kbps
<b>CAN Protocol</b>	J1939 and Generic CAN. Supports 11 bit and 29 bit extended identifiers
<b>Ethernet</b>	10Base-T / 100Base-TX
<b>Input Protection</b>	SAE J1113-11 transients and reverse voltage protection
<b>Reverse Voltage Protection</b>	Up to -36VDC
<b>IMU</b> Used for Wake Up Only	3-axis accelerometer and 3-axis gyroscope IMU ±125 to 2,000 dps gyroscope ±2g to 16g accelerometer
<b>Digital Inputs</b>	1 x Digital input (0 – 32V) pull down with option to enable 20kΩ pull up resistor to power supply input voltage through software. Vin, low(max) = 1.40VDC Vin, high(min) = 3.48VDC  1x Chassis detect with 47kΩ pull up to 3.3VDC internal voltage supply.
<b>Digital Output</b>	1 x Low-side drive up to 1A
<b>Sleep Current</b>	≤ 100uA @ 12VDC input
<b>IP Rating</b>	IP67
<b>Backup Battery Supply</b>	1000mAh Lithium-Ion
	<b>Discharge Temperature</b> -20°C to +60°C
	<b>Charging Temperature</b> 10°C to 45°C
	<b>Estimated Holdup Time</b> 3.33 hours for continuous operation. Actual consumption may vary based on application. Holdup time will increase by implementing periodic wakeup algorithm.
<b>Wake up Sources</b>	CAN, Ignition, IMU, RTC, SMS
<b>Load Dump</b>	ISO 16750 Test Pulse 5a, up to 202VDC



## 1.2 Part Numbers & Accessories

The GEN3 Gateway can be activated with one of three available service plans. The service plans are sold separate, and it is recommended to purchase at the time-of-service activation. Each part number includes specific cellular service, web portal access and OTA capabilities for the duration defined in the description. Service levels are explained in the table below. Customers can order the service level part numbers any time or after service expiration.

1 Send PO for Hardware

2 Send PO for Service Plan when ready to commission the gateway

- Service plans can be used for new gateways or to renew expired contracts on field units
- Renewal service plans may be assigned by user from inside their portal or by Parker Hannifin if gateway master tag is specified on the PO



	Hardware Lite, Standard, Premium
VA MOBILE-IOT-GEN3-GATEWAY-4G-GLOBAL-WIFI	173074

3 Activate Service Contract

- Assign SP to whitelisted gateway\*
- Activate asset by assigning a template (onboarding/production)\*\*
- Service contract starts

1. For onboarding template: Starts after 5 months or after assigning production template - whichever is earlier
2. For production template: Contract starts right away



	Lite - 5 Signals including GPS Signals every 2 hours IQAN connections "pay as you go"	Standard - 50MB Flexible signal rates IQAN connections "pay as you go"	Premium - 200MB Flexible signal rates IQAN connections included
1 YR Service Plan	IOT10680121YRLT	IOT10680121YRST	IOT10680121YRPR
2 YR Service Plan	IOT10680132YRLT	IOT10680132YRST	IOT10680132YRPR
3 YR Service Plan	IOT10680143YRLT	IOT10680143YRST	IOT10680143YRPR
5 YR Service Plan		IOT10680165YRST	IOT10680165YRPR
7YR Service Plan			IOT10680167YRPR

\*If Gateway is left in Whitelisted status after being assigned a service plan, contract starts automatically after 6 months.

\*\*On Boarding template delays service plan activation for up to 6 months. Service contract will start when a production template is assigned during the 6 month grace period or after 6 months with an On Boarding Template.

NOTE: On Boarding template does not stop contract clock if assigned after a production template has already been applied to the Gateway.

## 1.2.1 Service Plan – Feature Content

### Service Plans

Description	Lite	Standard	Premium
Service Data Plan	10MB*	50MB*	200MB*
Data MB Pooling	Included**		
Data Contracts	1YR, 2YR, 3YR	1YR, 2YR, 3YR, 5YR	1YR, 2YR, 3YR, 5YR, 7YR
Impact Detection Data	N/A	Included with purchase of hardware	

### Fleet Operation

Description	Lite	Standard	Premium
Fleet Administration		Included	
Users Management		Included	
Fleet List		Included	
Fleet Dashboard Statistics		Included	
Global Notes		Included	

### Locate Your Machine

Description	Lite	Standard	Premium
Map Overview		Included	
Geofencing		Included	
Search Assets		Included	

### Machine Status

Description	Lite	Standard	Premium
Map Overview		Included	
Geofencing		Included	
Search Assets		Included	

### Machine Diagnostics

Description	Lite	Standard	Premium
Event Logs (Faults and Alerts)		90 days	
Machine Insights (Widgets Visualization)		Included	
DM1 Remote Diagnostics		Included	
Cummins OTA		Included	
Cummins Advanced Diagnostics	N/A		Included
IQAN-Open OTA		Included	
Real Time Advanced Diagnostics (IQAN Software)		Included	
Controller Over the Air Updates (IQAN Software)		Included	
SMS notifications		Included	
Email notifications		Included	

\*Overages may apply

\*\*Available for more than 100 assets

## Reports

Description	Lite	Standard	Premium
Gateway Status		Included	
Level I - Fleet Summary, Fuel, Hours, ePTO, SOC		Included***	
Level II - Operations, Health		Included	
Custom Table Summary Report		Included	

## Condition Monitoring

Description	Lite	Standard	Premium
Custom Signals	Any Up to 10MB/ Month	Any Up to 50MB/ Month	Any Up to 200MB/ Month
Example Captured Interval	5 configurable signals + GPS / 2 hr	20 configurable signals + GPS / 1 minute	80 configurable signals + GPS / 1 minute
Machine Signals Alerts		Included	
Service Alerts		Included	
Data Auto Refresh		Included	

## Customization\*\*\*

Description	Lite	Standard	Premium
Custom Reports		Included	
White Labeling		Included	
Mobile Apps		Included	
Custom Third-Party Integrations		Included	

## Messaging

Description	Lite	Standard	Premium
Cloud to Device and Device to Cloud (D2C / C2D)	N/A	Included	

## APIs

Description	Lite	Standard	Premium
Fleet Snapshot AEMP2.0	Optional	Included	
DM1 Diagnostics AEMP2.0	Optional	Included	
Machine AEMP+	Optional	Included	
Custom APIs	Contact for Quotation		

\*\*\*All customizations require quotation. Contact Parker Mobile IoT for more information.

## 1.3 Service Notes

- 4G modem support Globally Bands in 4G. See section 6.2 Modem and Cellular Communications for more information, please contact your Parker Representative for more information.
- Customers who sell Parker's mobile IoT solution must have a signed SaaS (Software as a Service) agreement in place. In addition, the customer must have created a EULA (End User License Agreement) and process for flow down to end users.
- Billing period begins when customer assigns an on-boarding template to the Gateway, however, the actual billing starts after 6 months of applying on-boarding template. However, if a production template is assigned, the billing starts right away.
- Service level can be renewed upwards or downwards after the period expires. For example, Lite can be restored to Standard. Standard can be restored to Premium once the current service plan expires.
- Overages and OTA usage fees will be billed to the customer at the end of each quarter.
- Gateway replacement part is defined as hardware only part number and can be ordered as separate. Master tag marrying for Gateway and service plan is completed in the IoT portal by end user.

Once the system confirms connection, the user can use any diagnostic tools as if they were plugged directly into the back of the module.

## 2. Mounting the GEN3 Gateway to a Machine

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The original equipment manufacturer (OEM) or integrator must ensure the product is securely mounted to the vehicle.

### 2.1 Safety, Reliability, and Accessibility

- Use eye protection when using a drill/performing work that may be hazardous to the eyes
- Use ear protection in noisy work areas.
- Wear appropriate clothing/uniforms and safety shoes.
- Maintain three points of contact when climbing in and out of cab.
- Make sure you know what is behind the area before you drill.
- Install equipment so it will not cause damage to the vehicle or work loose over time.
- Make sure there are no loose components/cables and no unsecured components.
- Use solid mounting surfaces.
- Route all cables away from hot or abrasive areas.
- Choose installation locations where components can be easily serviced.
- Choose installation locations where components are safe from tampering and damage

**Notice**

- Do not locate the product where it obstructs the driver's field of vision, distracts the driver from the driving task, interferes with the driver's operation of controls or displays, or creates a safety hazard. Follow all laws and regulations governing the placement of equipment and mounts.

## 2.2 Installation Guidelines

- Gateway can be safely installed on a secured bracket that is robust enough to minimize any vibration and sustain the weight of the product.
- The mounting surface is strong enough to support the mounting hardware.
- The mounting surface is flat.
- It does not block the view of the road or mirrors.
- The surrounding area is clear of dash controls and gauges.
- It does not limit a passenger's leg room or block access to any other compartments.
- It does not interfere with anyone entering or exiting the vehicle cab.
- It is not likely to impact the driver or passenger in case of an accident or collision.
- Obstructs the driver's field of vision.
- Distracts the driver from the driving task.
- Interferes with the driver's operation of controls or shifting.
- Obstructs moving parts of the vehicle, if any.
- Blocks the deployment of an airbag.

## 2.3 Additional information for selecting an installation location:

- Installations should not obstruct the driver's field of vision while operating the vehicle, and should comply with all applicable federal and state laws and regulations regarding
- Appropriate installation locations (including restrictions against mounting objects on a vehicle's windshield) and driver distraction.
- Consider the owner's preference in selecting the installation location and whether there is a team or a single driver.
- Once a suitable location is selected, verify that there is nothing behind the mounting surface that might be damaged by drilling holes.

**Notice** Excess cable can be a tripping hazard. Ensure cable is not draped where it will interfere with either the driver or passenger as they move within the cabin.

The following guidelines are related to physically attaching the GEN3 Gateway to a vehicle:

- Mounting Screw Locations. There are a total of 4 mounting screw holes, one at each corner, as pointed by the red arrows below. Two of the holes are slightly elongated for tolerance purposes.
- Secure the GEN3 Gateway with bolts in all bolt holes using Hex Head #10 or equivalent metric size (M5) bolts.
- Torque recommendation of 14-15 in-lbf (1.58 – 1.69 N-m).

## 2.4 Mounting and Dimensions

The GEN3 Gateway dimensions are shown in Figure 12 below. (Units in mm)

There are a total of four mounting screw holes, one at each corner, as pointed by the red arrows below. Two of the holes are slightly elongated for tolerance purpose.

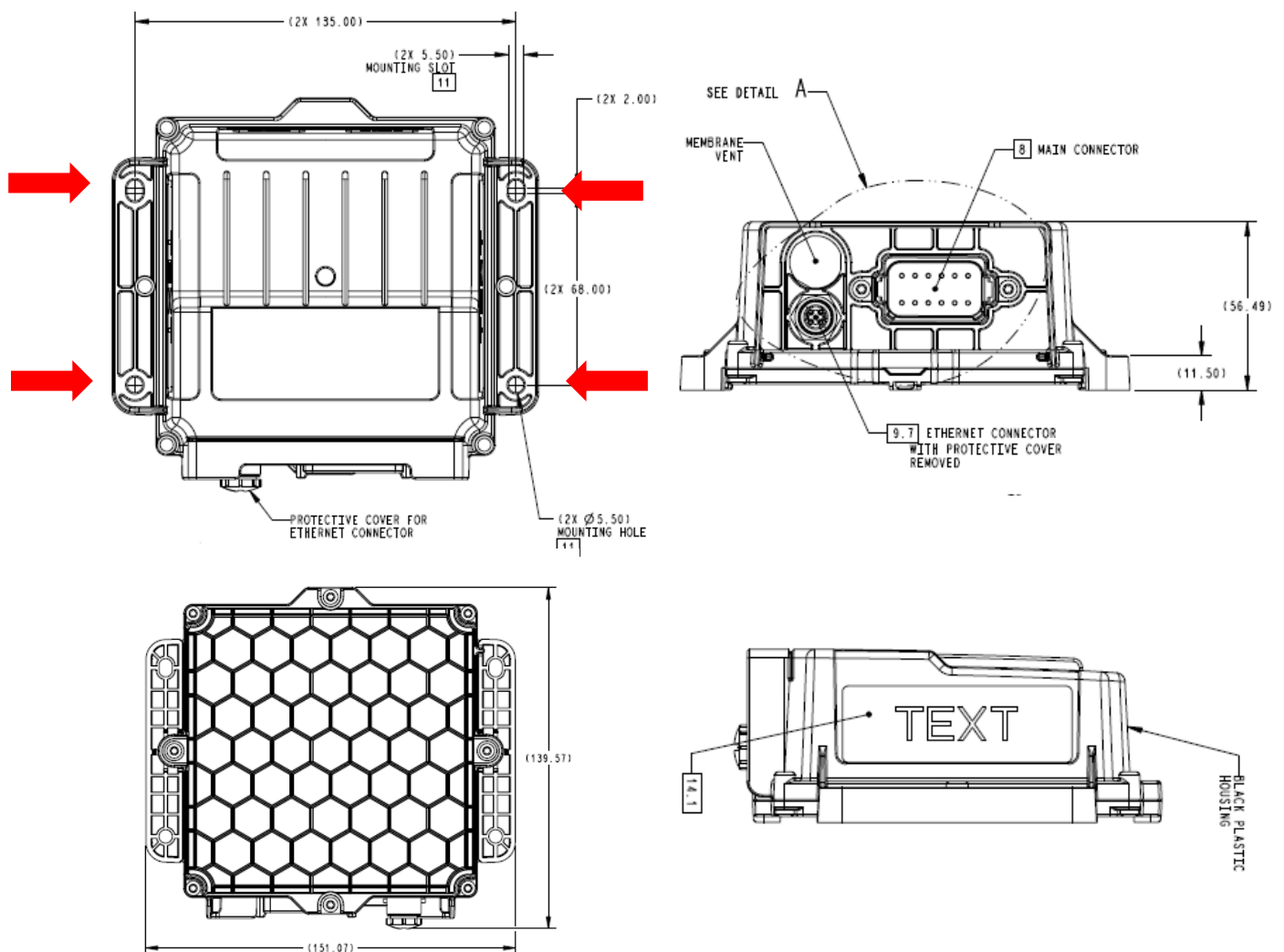
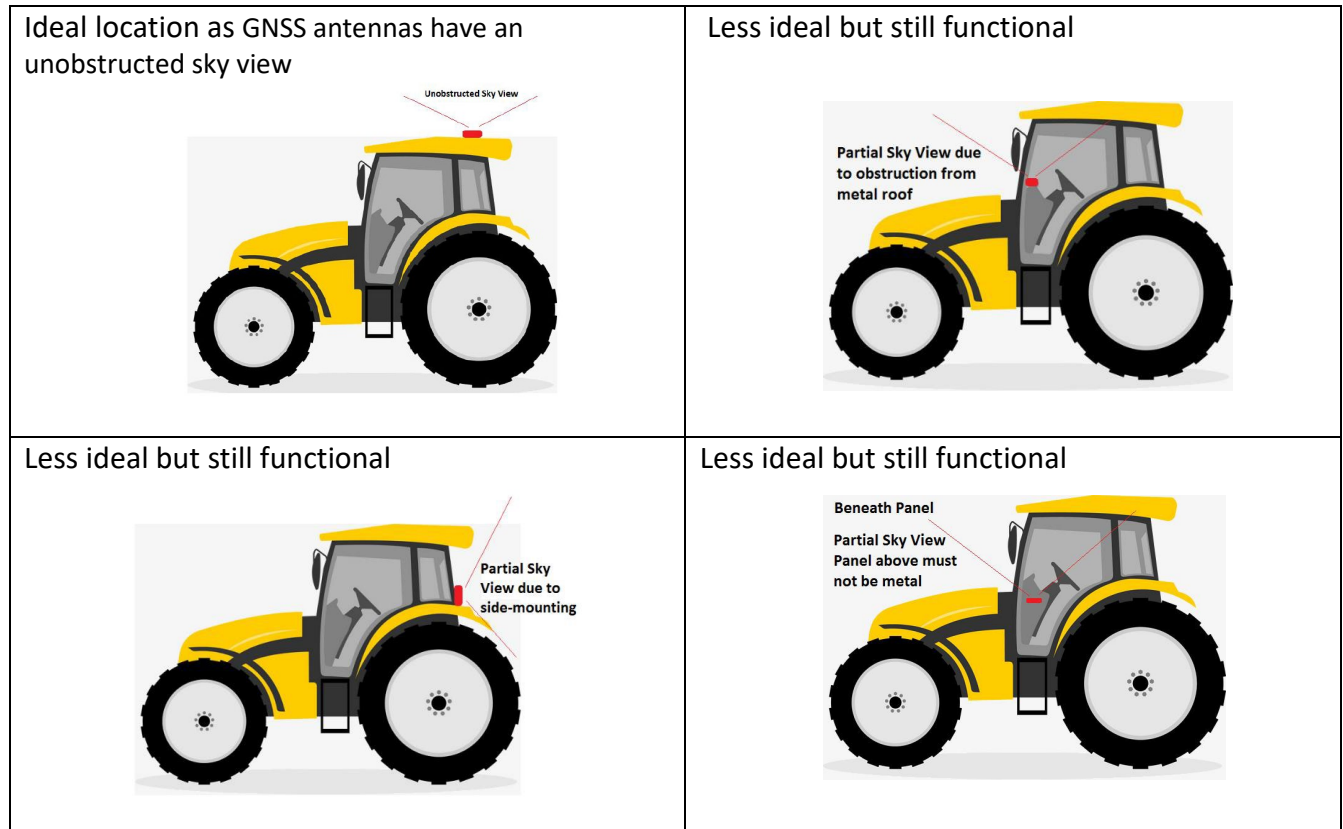


Figure 1: GEN3 Gateway dimensions (units in mm)

## 2.5 Suggested Installation Locations

To achieve the best performance on the GEN3 Hardware product, the following installation considerations are recommended.



- 1.) GNSS antenna to have unobstructed sky view.
- 2.) Product is preferred to be mounted on a non-metallic base and should be placed inside a metallic enclosure. Cellular antenna efficiency may be affected if the product is mounted on a metal base.
- 3.) Product should not be placed near heat generating components for example, heater of the engine.
- 4.) Consider using tamper-resistant seals to ensure product is not tampered by unauthorized personnel.
- 5.) Install product more than 20 cm away from the user to meet SAR minimum safe distance requirement.

## 2.6 Designing and Connecting the Vehicle Harness

The vehicle manufacturer or integrator is responsible for designing a vehicle harness that mates with the GEN3 Gateway connector(s).



The vehicle harness design depends on the following:

- How the user's inputs, outputs, communication, and power pins are configured.
- Other components on the vehicle and their physical locations.
- The routing of the harness.

Details on recommended wire diameters for use with the product connector are covered in the connector manufacturer's datasheet. The wire diameters used should be enough for the expected module current.

To use the remote diagnostic features of the GEN3 Gateway, the CAN 1 diagnostic bus of the Gateway must be properly connected to the diagnostic bus of the IQAN control system.

Once the vehicle harness is designed, it can be connected to the GEN3 Gateway simply by clicking the mating connectors into the connector ports on the GEN3 Gateway.

**Notice**

***Damage to Equipment!*** The technician installing the connector should take special care that the connector is inserted in the correct orientation as power applied to unprotected pins can cause permanent damage to the Gateway.

# 3. Gateway Connections (Pinout)

## 3.1 Power and Vehicle Communication

### 3.1.1 Mating Connector

The mating connector for the GEN3 Gateway is a Deutsch DT16, 12 contact connectors key A.

(DT06-12SA or AT06-12SA)



Figure 2: Mating connector

The socket type contacts in the Deutsch DT16 connector are used for power, power control (ignition sense), and CAN communication channels.

**Notice** *Damage to Equipment!* The technician installing the connector should ensure that the connector is inserted in the correct orientation as power applied to unprotected pins can cause permanent damage to the Gateway.

### 3.1.2 Pinout

The following tables show the pinouts for the connectors:

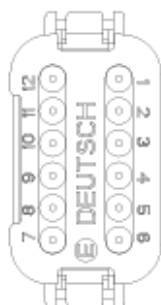


Figure 3: GEN3 Gateway connector

Main Connector Pin-out	
Pin	Function
1	+12V OR +24V VBATT
2	DIGITAL_IN
3	CAN1_H (IQAN)
4	CAN1_L (IQAN)
5	CHASSIS GROUND
6	IGNITION SENSE
7	CAN0_H
8	CAN0_L
9	CHASSIS GROUND
10	DIGITAL OUT
11	CHASSIS GROUND
12	GROUND

The pins with italicized descriptions are not used in the IQAN Connect solution. It is recommended to plug in the unused pins for the connector.

The pins with **bold** descriptions are required for the device to boot and CAN communication.

### 3.1.3 CANBUS Module Block Diagram

When utilizing the GEN3 Gateway with an IQAN-based control system, it is very important to connect the diagnostic bus of the Gateway to the diagnostic bus of the IQAN Master Controller.

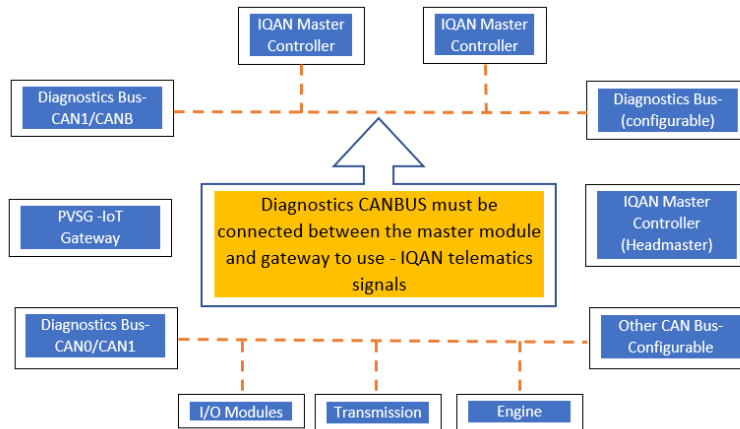


Figure 17. Block diagram of wiring GEN3 Gateway

## 4. Main Power

The GEN3 Gateway is powered by a direct battery connection to pin 1, upstream of any main power disconnect switch. The Gateway is activated by applying switched power to the ignition sense input pin 6.

The GEN3 Gateway operates in a 12 V or 24 V system and can operate from 6.5 V up to 32 V with over-voltage protection at 36 V.

Requirements	Conditions
Operating Temperature	-30° C to 70° C (-35° F to 158° F)
Operating Voltage	12- or 24-Volts DC
Operating Current	500mA max @ 12V
	250mA max @ 24V
Sleep current	0.6mA max @ 12V

Direct Battery Input (+VBATT)				
Parameter	Min	Nom	Max	Units
Input voltage for normal operation (see note 1)	6.5	-	32	V
Maximum continuous voltage (see note 2)	-	-	36	V
Maximum peak current (see note 3)				
VBATT=6.5 V			3.17	A
VBATT=13.8 V			1.50	A
VBATT=28.0 V			0.74	A
VBATT=32.0 V			0.64	A
Recommended External Fuse	-	3	-	A

**Note 1:** It is strongly recommended that Pin 1 of the module be connected directly to the vehicle battery source and to utilize Pin 6 (Keyswitch) for activating and deactivating, as well as allowing a safe shut-down sequence of the module.

**Note 2:** Exposure to maximum voltages for extended periods may affect device reliability.

**Note 3:** Maximum peak current is a theoretical calculation assuming maximum current draw for each peripheral as specified in datasheets, 85% efficiency for step-down regulators, and peak cellular current during a 1-slot Tx burst at maximum power. Note the burst duration is typically 1 ms or less, thus not affecting recommended fuse ratings.

# 5. Power Control Input (Ignition Sense)

**Notice** *Damage to equipment!* Do not connect inputs directly to unprotected inductive loads such as solenoids or relay coils, as these can produce high voltage spikes that may damage the GEN3 Gateway. If an inductive load must be connected to an input, use protective circuitry such as a diode or transorb.

## 5.1 Power Control input connections

You must be aware of the following when connecting the power control digital input:

- The power control digital input is usually connected to the vehicle ignition, but it can be connected to any power source in a system.
- To protect the harness that connects the GEN3 Gateway to the ignition, it is recommended to place a fuse of 3A in the circuit that feeds the unit.
- If your GEN3 Gateway must always be powered, the power control digital input can be directly connected to a fused battery power input (called VBATT), which will provide constant power.
- When battery power (VBATT) is connected, and the power control digital input is inactive, the GEN3 Gateway will deactivate.

The following shows a typical power control digital input connection:

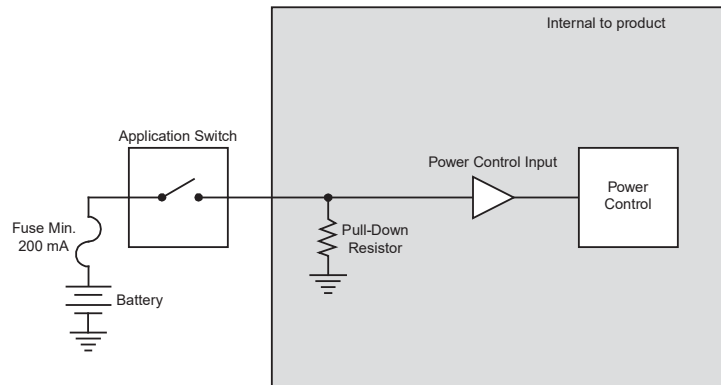


Figure 4: Power control digital input installation connections

## 5.2 Power for Sleep Mode

The GEN3 Gateway supports sleep mode functionality the wiring must comply per the below diagram to obtain direct power from the battery.

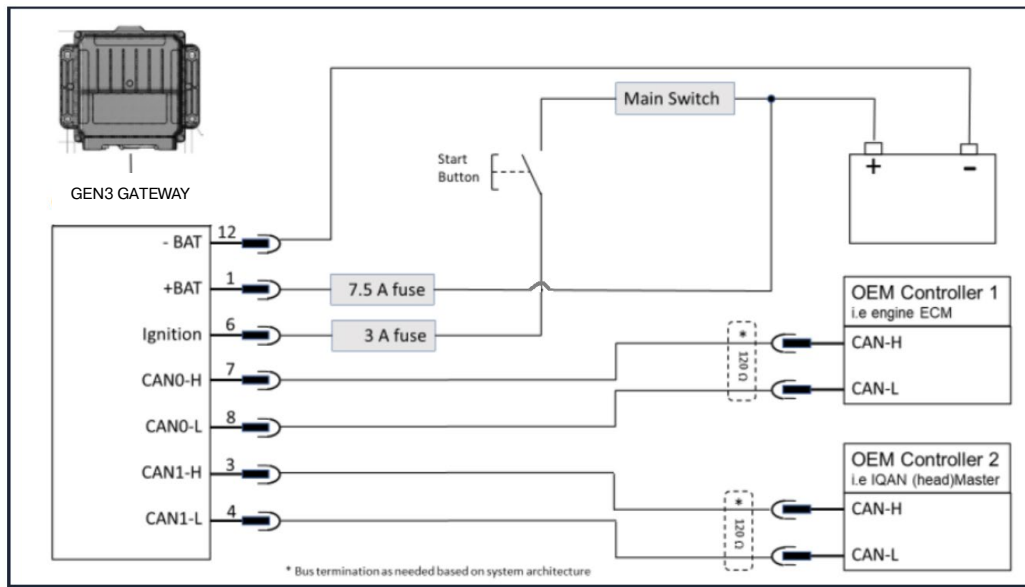


Figure 5: Power control for Sleep Mode function

## 6. Communication

The types of communication available to the GEN3 Gateway are Controller Area Network (CAN), Ethernet, Modem (GSM), Wi-Fi

### 6.1 Controller Area Network

The GEN3 Gateway has 2 CAN communication ports available.

The hardware provides controller area network (CAN) communication according to the SAE J1939 specification, making the GEN3 Gateway compatible with CAN based protocol through software.

CAN communication is used to communicate the status of multiple modules that are connected in the same network.

#### 6.1.1 CAN capabilities

CAN 0 and CAN 1 can be configured to 250 kbps (default) or 500 kbps remotely by Parker personnel.

Both CAN 0 and CAN 1 can support J1939 networks. CAN 1 also supports IQAN diagnostics and is strongly recommended when remotely connecting your IQAN controls system in the field.

## 6.1.2 J1939 CAN Installation Connections

The CAN connection for the GEN3 Gateway should conform to the J1939 standard. The SAE J1939 standard is a robust automotive specification that is a good CAN installation guideline even when the J1939 CAN protocol is not being used.

For a list of J1939 connection considerations, refer to the SAE J1939 specifications available through the Society for Automotive Engineers. SAE J1939-11 covers the CAN bus's physical aspects, including cable type, connector type, and cable lengths.

**Notice** The standard variant of the GEN3 Gateway does not have a CAN termination resistor, which assumes that the CAN bus is terminated in the harness.

The following lists the elements that are required for a J1939 CAN connection:

- **CAN Cable:** A shielded twisted-pair cable should be used when connecting multiple modules to the CAN bus. The cable for the J1939 CAN bus has three wires: CAN - High, CAN - Low, and CAN Shield (which connect to the corresponding CAN\_HIGH, CAN\_LOW, and CAN\_SHIELD pins on the connector). When a module does not have a CAN\_SHIELD pin, the CAN Shield should be connected to an available ground terminal attached to the negative battery. The CAN cable must have an impedance of 120  $\Omega$
- **CAN Connectors:** Industry-approved CAN connectors are manufactured by ITT Cannon and Deutsch and come in either T or Y configurations.
- **CAN Harness:** The CAN harness is the main backbone cable used to connect the CAN network. This cable cannot be longer than 40 meters and must have a 120  $\Omega$  terminating resistor at each end. The 120  $\Omega$  terminating resistors eliminate bus reflections and ensure proper idle-state voltage levels.
- The CAN cable is very susceptible to system noise; therefore, CAN shield must be connected as follows:
  - a) Connect CAN Shield to the point of least electrical noise on the CAN bus.
  - b) Connect CAN Shield as close to the center of the CAN bus as possible.
  - c) Use the lowest impedance connection possible.

**Notice** Ground loops can damage electronic modules. The CAN Shield can only be grounded to one point on the network. If grounded to multiple points, a ground loop may occur.

- **CAN Stubs:** The CAN stubs cannot be longer than 1 meter, and each stub should vary in length to eliminate bus reflections and ensure proper idle state voltage levels.
- **Max Number of Modules in a System:** The CAN bus can handle a maximum of 30 modules in a system at one time

The following shows a typical CAN connection using the SAE J1939 standard:

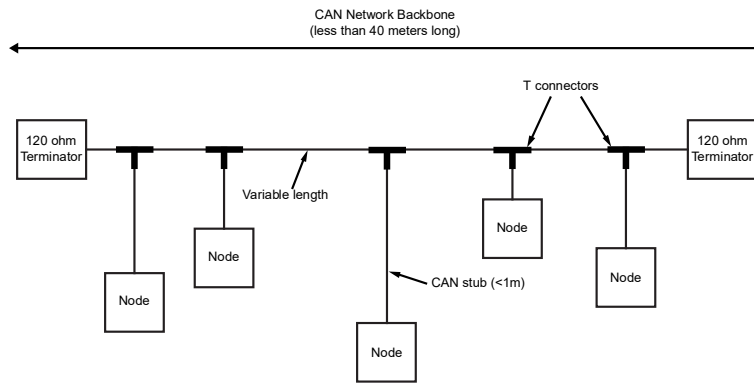


Figure 6: J1939 CAN connection

## 6.2 Modem and Cellular Communications

### 6.2.1 Modem Specifications

The main specifications of the GEN3 Gateway cellular modems interface is listed in the following table:

#### 6.2.1.1 North America/ Central/ South America

Cellular Interface America GEN3 Gateway	
Parameter	Description
4G LTE LET FDD Cat 1	Bands 2 ,4, 12
HSPA+ (3G)	Band 1, 2, 4, 5, 8
GSM (2G)	Band 2, 3, 5, 8
Supported antenna	Internal
Certifications	AT&T, US (FCC CFR 47 part 15), Canada (IC ISED RSS), Europe (CE 2014/53/EU), Australia/New Zealand (RCM), South Africa (ICASA), ZIMBAWE (POTRAZ)



## 6.2.2 SIM Carrier Information

The GEN3 Gateway comes supplied with a SIM card provisioned for AT&T and their partner's global networks. Figure 18 provides a list of countries where the GEN3 Gateway could have service available. *Note: for countries in group B, may require additional approval and country certifications. Gateway will operate if the country's telecommunication networks support any of the 3G or 4G bands stated in section 7.2.1 Modem Specifications. Local authorities and carrier providers could change service coverage and network frequency band support anytime.*



Figure 7: Gateway countries of operation

## 6.3 Wi-Fi

The GEN3 Gateway will support the following Wi-Fi Services

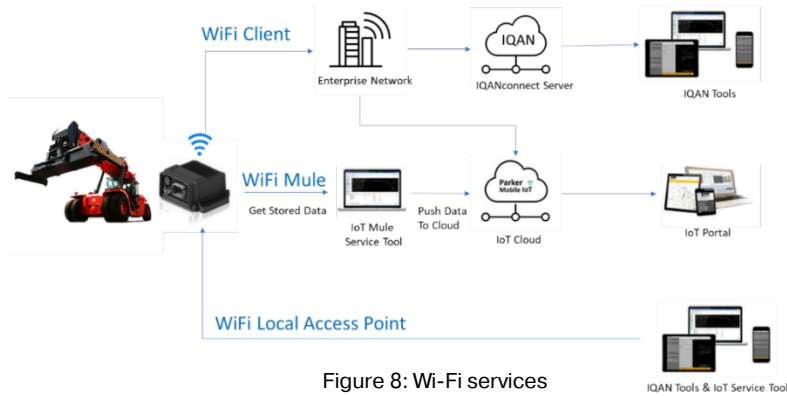


Figure 8: Wi-Fi services

- **Wi-Fi Client:** Setup Gateway as a client and connect to existing infrastructure networks
- **Wi-Fi Mule:** Connect PC to Gateway access point, extract machine logs and upload the cloud when offline
- **Wi-Fi Local Access Point:** Connect mobile devices (PC, phone, tablet) to Gateway access point, perform IQAN real time diagnostic and software OTA updates locally or use the Parker Service Tool.

The main specifications of the GEN3 Gateway Wi-Fi interface are listed in the following table: (*Note 1: Certain governments do not permit operating with all available channels.*)

Wi-Fi interface	
Parameter	Description
Standard	802.11 b/g/n (2.4GHz) 802.11 a/n (5 GHz)
Channels	See tables below
Operational modes	APN, Client
Security	WEP64/128 WPA (TKIP, AES) WPA2 (CCMP, AES) WAPI hardware support 64/128 bit AES hardware support
Supported antenna	Internal
Certifications	US (FCC CFR 47 part 15) Canada (IC RSS)

2.4 GHz – IEEE 802.11b/g/n					
20 MHz Channels			40 MHz Channels		
Channel	Frequency	Unit	Channel	Frequency	Unit
1	2 412	MHz	1-5	2 422	MHz
2	2 417	MHz	2-6	2 427	MHz
3	2 422	MHz	3-7	2 432	MHz
4	2 427	MHz	4-8	2 437	MHz
5	2 432	MHz	5-9	2 442	MHz
6	2 437	MHz	6-10	2 447	MHz
7	2 442	MHz	7-11	2 452	MHz
8	2 447	MHz			
9	2 452	MHz			
10	2 457	MHz			
11	2 462	MHz			

5 GHz – IEEE 802.11a/n					
20 MHz Channels			40 MHz Channels		
Channel	Frequency	Unit	Channel	Frequency	Unit
36	5 180	MHz	36-40	5 190	MHz
40	5 200	MHz	44-48	5 230	MHz
44	5 220	MHz	52-56	5 270	MHz
48	5 240	MHz	60-64	5 310	MHz
52	5 260	MHz			
56	5 280	MHz			
60	5 300	MHz			
64	5 320	MHz			

100	5 500	MHz	100-104	5 510	MHz
104	5 520	MHz	108-112	5 550	MHz
108	5 540	MHz	116-120	5 590	MHz
112	5 560	MHz	124-128	5 630	MHz
116	5 580	MHz	132-136	5 670	MHz
120	5 600	MHz			
124	5 620	MHz			
128	5 640	MHz			
132	5 660	MHz			
136	5 680	MHz			
140	5 700	MHz			

5 GHz – IEEE 802.11a/n					
20 MHz Channels			40 MHz Channels		
Channel	Frequency	Unit	Channel	Frequency	Unit
149	5 745	MHz	149-153	5 755	MHz
153	5 765	MHz	157-161	5 795	MHz
157	5 785	MHz			
161	5 805	MHz			
165	5 825	MHz			

## 6.4 GPS/GNSS Interface

*The GEN3 Gateway has an onboard GPS chip for calculating geolocation information to be used throughout the cloud application.*

## 7. Need Further Assistance?

### 7.1 Where to find help?

Contact the supplier of the GEN3 Gateway or open a ticket with the Parker Support Help Desk 1-888-915-4357 (help) number when looking for assistance on any of the IoT products and services. Also email [EMC.mobileiot@support.parker.com](mailto:EMC.mobileiot@support.parker.com) for further assistance.

### 7.3 Parker Mobile IoT Service App

Access mobile IoT services, assets, and Gateways through the Mobile IoT Services app. Click the link or use the QR code to download the app.



## 8. Markings/Approvals

The GEN3 Gateway meets the following regulations.

### 8.1 FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in an industrial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

#### Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 28cm between the radiator & your body.

Note: The country code selection is for non-US models only and is not available to all US models. Per FCC regulation, all Wi-Fi products marketed in US must be fixed to US operation channels only.

## 8.2 IC Compliance

This device complies with ISED's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

#### Caution :

(i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

(iv) where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the E.I.R.P. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

#### Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

(i) les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

(iv) lorsqu'il y a lieu, les types d'antennes (s'il y en a plusieurs), les numéros de modèle de l'antenne et les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la P.I.R.E. applicable au masque d'élévation, énoncée à la section 6.2.2.3, doivent être clairement indiqués

#### Radiation Exposure Statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated with greater than 28cm between the radiator & your body.

Déclaration d'exposition aux radiations: Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 28 cm entre le radiateur et votre corps.

# 9. Appendix

## 9.1 Diagram conventions

The following symbols are used in the schematic diagrams in this document:

Symbol	Meaning
	General input
	General output
	Frequency input
	Analog input
	Frequency sensor
	Pulse sensor
	Resistive sensor
	General sensor
	Application switch
	Load
	Pull-down resistor
	Pull-up resistor
	Battery
	Fuse
	Resistor
	Ground
	Chassis ground

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