Arrow-QG Arrow-VI

4-6340-17-12V

4-6340-10

4-6341-17

4-6341-10

Vehicle Tracking Device

Contents

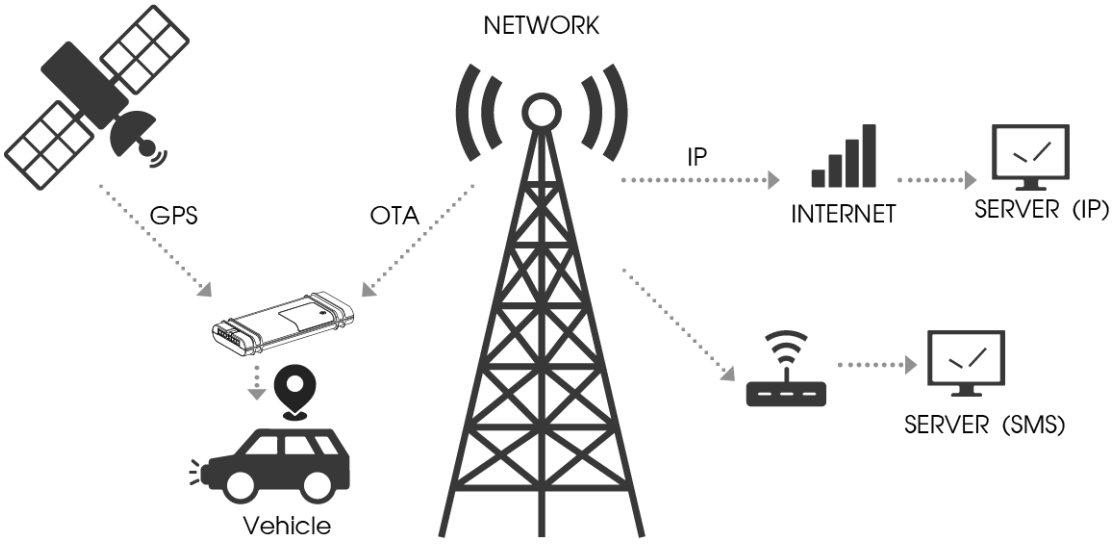
1 Introduction

The Arrow-QG (Arrow-VI) is a self-Contained vehicle tracking device that combines GPS location with LTE and BLE connectivity.

The Arrow-QG (Arrow-VI) appears to a user or a server application as a single endpoint device. It can be queried, updated and configured either through a serial connection, or an over the air LTE IP connection. The Arrow-QG (Arrow-VI) presents itself over these connections as an enhanced cellular modem with attached functional elements. These elements include:

- GPS location engine
- General Purpose Bidirectional I/O (GPIO) pins
- Relay drive pin output
- Serial UART port
- CAN Communication (optional)
- BLE5.0

Application scene:



2 Design

2.1 Basic Hardware

Items	Requirement
Baseband Chipset	Qualcomm Cat.M1
RF Transceiver	Qualcomm SDR
Memory	Internal
Air Interface	Support for LTE Cat.M1
Frequency	4G band support : Band2/4/5/12/13/25/26 BLE5.0 : 2.4GHz
Antenna	Internal Antenna / Chip Antenna
GPS Antenna	Dedicated high performance ceramic antenna
Interface	UART TX
	UART RX
	12V DC Input（1A current）
	Relay Drive
	GPIO
	CAN(Option)
Voltage Monitor	Supported
Watchdog	Supported
Motion Detect	Supported
LED	2 LED Supported
Battery	Built in battery for backup（< 90mAH）
Power Cable connector type	8 pin
Power Consumption	< 5Watts

The Arrow-QG (Arrow-VI) provides support for specialized hardware features through extended AT commands. The features supported include the following.

GPS

The major functionality of the GPS system is to compute the correlation results between the incoming signal and the selected PRN code based on certain Carrier Doppler Frequency, Code Doppler Frequency, code phase, carrier phase, and the particular satellite the system is tracking or acquiring.

GPIO

The GPIO pins are presented to the external environment on the main connector. They are general purpose bidirectional lines capable of providing system interrupts to generate a report or drive logic levels to external devices. These lines are 2.8V logic level and are 16V tolerant.

LED's

Two LED status indicators are provided to verify correct installation and operation.

UART
A UART port is provided for AT command and data interaction and optionally for application specific control.

Relay Driver
A 500mA sink capable output pin is provided. This pin is meant to drive a relay coil intended to interrupt the starter solenoid relay for the ignition circuit to a car.

Voltage Monitor
The battery monitor is internal analog input scaled such that the DC value of the power input pin to the Arrow-QG (Arrow-VI) system is measured.

Watchdog
MDM9207-1 chipset provide internal software and hardware Watchdog.

Motion Detect
This function will work with firmware power down options to keep the Arrow-QG (Arrow-VI) in a very low power down state until motion is detected. Upon wakening, a report can then be generated.

CAN
This function is an option for watching the information of vehicle.

2.2 Basic RF Performance

Items	Requirements	Remark
TRP free space	CTIA	TRP free space
TIS free space	CTIA	TIS free space

Board RF Specification	
4G LTE Cat.1	
Band	Band 2/4/5/12/13/25/26
Rx Spec	Follow TS 36.521 Ch.7
Tx Spec	Follow TS 36.521 Ch.6
BLE5.0	
ISM Band	2.4GHz
Rx Spec	Follow chipset
Tx Spec	Follow chipset
GPS	
Frequency Support	L1-band (1.57542GHz)

2.3 Certification and Safety

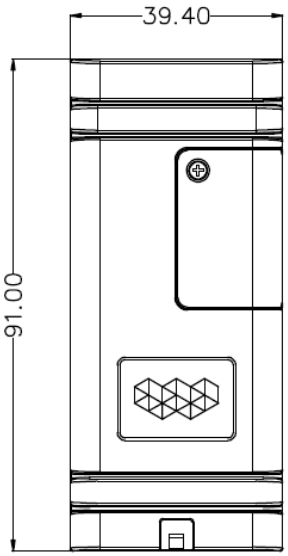
Items	Requirement
Drop Design	0.8meter 6 direction standard drop test
Temperature Range	0 to +60°C Operation -40 to +85°C Storage
Humidity:	20% to 90% Operation 10% to 95% Storage
Altitude:	-500 to +18,000m
FCC Certification	FCC Part 15/22/24/27/90
IC Certification	RSS-130/132/133/139/247
ESD Requirement	8KV non-Conductive

3 Testing

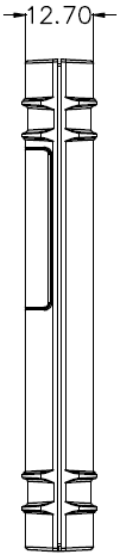
Test Item	Description
Baseband Function Test	• Power Input Test • Power Consumption and Current Test • Heat Dissipation Test • UART Stability Test • GPIO Level Test • Drop Down Test • ESD Test • High/Low Temperature Test
RF Test	• LTE Performance Test • GPS Performance Test • BLE Performance Test • Antenna Performance Test

Mechanical Structure(mm)

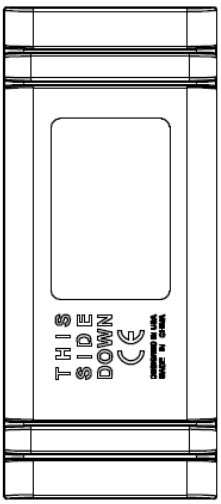
TOP View



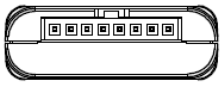
RIGHT View



BOTTOM View



FRONT View



Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential 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 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.

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.

IMPORTANT NOTE:
FCC 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 minimum distance
20cm between the radiator & your body.

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

Industry Canada statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference
(2) This device must accept any interference, including interference that may cause undesired operation of the device

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) L'appareil ne doit pas produire de brouillage;
(2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement:
This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:
Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps