深圳市龙桥科技发展有限公司
SHENZHEN DRAGON BRIDGE TECHNOLOGYLIDE COMPANY

Application :Rental cars, insurance cars, trucks, buses

Wireless Fleet management Solution Innovator

GSM/GPRS/GPS Tracker

G-M402

4G OBD T-BOX

ROADRAGON
路特龙

Content

1. Product Introduction

G-M402 is an on-board intelligent terminal which integrates TBOX function and adopts 4G all-network hardware architecture.

It integrates advanced wireless all-network data 4G communication module, high-precision Beidou dual-mode GPS module, low-power Bluetooth 5.0 module, high-performance three-axis or six-axis gravity and gyroscope sensors and on-board ECU computer communication module, optional voice speaker and microphone, optional data encryption chip, optional SOS button, ACC signal input, 2-way CAN and K/L line circuit for vehicle communication, and external equipment including the 485 camera and 232 camera, temperature sensor, fuel sensor and card punch, etc. It is compatible with 12V/24V power supply system for cars and commercial vehicles. The vehicle running status, vehicle condition data, vehicle fuel consumption data, driver control data, etc. can be uploaded through the wireless module to the IoV management cloud platform which can realize the remote fleet management through terminal data, vehicle trajectory statistics, driving behavior, fuel consumption statistics, anti-theft tracking, remote control, etc.

It is a multi-function, low-power, remote monitoring terminal system specially designed for vehicle applications.

Standard configuration of hardware
- Wireless network: Support 4G all-network frequency band;
- Support ECALL, BCALL, ICALL, car locating, anti-theft alarm, remote query business, etc.;
- Support: anti-theft alarm, remote query business, etc.;
- GPS: Support Beidou dual-mode system;
- Voltage: Support 12V/24V vehicle systems, support voltage range between 9-36V;
- CAN: Support 2-way high-speed CAN channels and meet CAN 2.0 specification;
- K/L: Support various protocol buses such as KWP2000;
- OBD: Support 9 protocols for passenger car OBD, vehicle private protocol, J1939 protocol;
- External interface: Support 2-way 232/485 external interface, compatible with RS232 external interface;
- Backup battery: Support lithium battery and NI-MH battery, and support business operation in case of external power supply failure;
- Input/output: High input, high output and low output, 6-way output and 2-way input;
- Support 24V/12V direct power output of vehicles;
- Support 5V power output;
- Support ultra-low-power 1MA design;
- SIM card; Support to choose SIM-Plus or external card.

Optional configuration of hardware:
- Bluetooth: Support low-power BLE5.0;
- EMMC: Optional configuration of 8G/16G/32G
- Voice broadcasting: Equipped with audio decoding chip, voice speaker and microphone;
- SOS button: Support external SOS button

- Buzzer: Support data encryption for external buzzer:
- Support encryption chip for data encryption and various security encryption algorithms, DES/3DES AES, RSA, ECC, SM1, SM2, SM3, SM4, SHA-n;
- Support 4G USB output;
- Three-axis/six-axis gyroscope: Calculate rapid acceleration/deceleration/turning, trailing, collision, wake alarm, body attitude and driving behavior, etc.;

2. Product Specification

2.1. Appearance and structure

Attribute	Description
Product appearance	
Waterproof level	IP54

Notes: Subject to the final product appearance.

2.2. Whole machine parameter

Attribute	Description
Working voltage	9V-36V DC
Average current	<120mA@1V
Sleep current	<7mA@12V
Operating temperature	-30℃~+70℃
Storage temperature	-40℃~+85℃
Battery capacity	Choose Ni-MH battery or lithium battery (optional battery)
Encryption chip	Support (optional encryption chip)
GPS antenna	Built-out
GSM antenna	Built-out
Bluetooth antenna	Built-in/built-out (optional)
SIM card	SIM-Plus /external card

2.3.   GPS parameters

Attribute	Description
Positioning mode	GPS/BD
Working mode	Single GPSL1, single BD2 B1, GPSL1/BD2 B1 dual mode

Cold start time	≤ 30s (average)
Hot start time	≤ 5s (average)
Positioning accuracy	Level < 2m | elevation < 10m
Speed measurement accuracy	<0.1m/s
Sensitivity	Capture <-145dBm | tacking <-161dBm
Antenna format	Built-out/built-in

2.4.　Encryption chip

Attribute	Description
Encrypt type	DES/3DES/AES/ECC(512bit)/RSA(4096bit)/SHA-1/SM1/SM2/SM3/SM4/SSF33
Security mechanism	✧　Key register protection ✧　Core/user status program/data access control mechanism ✧　Encryption and decryption of internal memory of the chip ✧　SPA/DPA anti-attack design ✧　Safety detector ✧　True random number generator ✧　Power-on resetting circuit of chip ✧　Active/passive physical protection of chip

2.5. External interface

Attribute	Description
Common IO port	Support 6-way output and 2-way input
Communication serial port	1-way 232 or 485, optional as required
GSM antenna	2G/3G/4G external antenna
GPS antenna	GPS/BD dual-mode external antenna
Main connector	Power supply, CAN1, CAN2, ACC, K/L line
Auxiliary connector	IO input/output, SOS, buzzer, 4G module USB, serial port, speaker and microphone, etc.

2.6.　Bluetooth module (optional)

Attribute	Description
Bluetooth mode	Support Bluetooth 5.0 and BLE
Bluetooth	Choose built-in or built-out

antenna	
Operating temperature	-40℃~ +85℃;

2.7. 4G module

Attribute	Description				
Chip model					
Network type	4G/3G/2G	4G/3G/2G	4G/3G/2G	4G/3G/2G	4G/3G/2G
Region	China/India/Thailand	North America	North America	Europe/Middle East/Africa/ Korea/Thailand/Singapore	Australia/ New Zealand/Taiwan(China) /Brazil
Support FDD LTE	B1/B3/B8	B2/B4/	B4/B13	B1/B3/B5/	B1/B2/B3/B4/B5/B7
Frequency band	B12	B12	B12	B7/B8/B20	B8/B28
Country TDD LTE	B38/B39/B40/B41	/	/	B38/B40/B41	B40
Regional frequency band TDSCDMA	B34/B39	/	/	/	/
Replaceable mode WCDMA	B1/B8	B2/B4/B5	/	B1/B5/B8	B1/B2/B5/
Module type CDMA	BC0	/	/	/	/
GSM	900/1800MHz	/	/	B3/B8	B2/B3/B5/B8
Receiving sensitivity	LTE B1: -97dBm(20M)				
	LTE B3: -96dBm(20M)				
	LTE B5: -99dBm(10M)				
	LTE B7: -97dBm(20M)				
	LTE B8: -98dBm(10M)				
	LTE B20: -96dBm(20M)				
	UMTS B1: -110dBm				
	UMTS B5: -112dBm				
	UMTS B8: -111dBm				
	GSM 850: -111dBm				
	GSM 900: -110dBm				
	GSM 1800: -109dBm				
	GSM 1900: -109dBm				

2.8 CAT1 module

Properties

• LTE FDD: Band 1/3/5/8
• LTE TDD: Band 34/38/39/40/41
• GSM: 900/1800MHz
• LCC 31x28x2.4mm
• Operating Temperature: -40℃~+85℃
• Storage Temperature: -40℃~+85℃
• Operating Voltage: 3.3V~4.3V typical 3.8V

• **AT Command Set:** 3GPP TS 27.007 and 27.005, and proprietary FIBOCOM AT commands
• **TX Power**
  GSM900: 32.5 dBm±1dB
  DCS1800: 29.5dBm±1dB
  LTE FDD: 23.0dBm±1dB
  LTE TDD: 23.0dBm±1dB

Data

• LTE FDD: 10Mbps DL/5Mbps UL
• LTE TDD: 10Mbps DL/5Mbps UL
• GPRS: 107Kbps DL/85.6Kbps UL

Function

• MUX: Basic Mode
• SMS: MO/MT Text and PDU modes
• HTTP(S)/FTP(S)/TCP(S)/UDP/IPV4/IPV6/MQTT
• ECM/RNDIS/PPP
• DFOTA/FOAT
• VoLTE/TTS/Recording/FFS/BIP/NITZ/NTP/SSL

3. Product Features

## 3.1. Basic functions of vehicle

Communication management function	
Sleep	The vehicle enters sleep state after flameout for 5 minutes.
2G/3G/4G reconnection	It can automatically reconnect after losing connection with GPRS.
Communication protocol	TCP protocol is adopted for interaction between data information and platform
Standby IP	Reserve 2 standby IPs, a total of 3 IP gateway addresses and ports, and if the gateway is busy, automatically switch to standby IP
Parameter setting	Directly set IP address, port number, APN of the terminal through the platform, and adopt password protection
ECALL/ICALL/BCALL	Support SRS signal triggered or CAN signal triggered ECALL function, Support ICALL/BCALL function of 2-way voice dialing call
Positioning function	
Positioning data	Including latitude and longitude, time, number of satellites, speed, direction, ACC status, battery voltage, OBD speed
Positioning function of the base station	Including LAC and CellID information, operator code of LBS base station
Intelligent trajectory	The terminal automatically judges the trajectory route, realizes intelligent reporting of GPS point, and realizes the butterfly-shaped effect of the trajectory
Query of vehicle position	Query current position of the vehicle in real time
Reporting at a fixed interval	The monitoring platform sets the method of sending terminal and returning positioning information and the frequency parameters
Alarm reminder function	
Ignition reminder	After vehicle ignition, report ignition alarm, including alarm time and GPS information
Flameout reminder	After vehicle flameout, report flameout alarm, including alarm time and GPS information
Vehicle low-voltage alarm	If the vehicle voltage is lower than the set voltage threshold, report the low-voltage alarm, including alarm time and GPS information
Overspeed alarm	If the driving speed of the vehicle exceeds the set speed threshold, report the overspeed alarm, including the alarm time and GPS information.
Collision alarm	If, during the driving of the vehicle, the generated acceleration exceeds the set threshold, filter the front and rear speeds,
	Define it as the serious collision scenario, and report collision alarm, including collision time, GPS information and collision acceleration
Fatigue driving	If the vehicle runs for a long term, automatically identify and report the fatigue driving

reminder	reminder
Equipment plugging alarm	After terminal equipment plugging, report plugging alarm
Equipment unplugging alarm	After terminal equipment unplugging, report unplugging alarm
Long positioning time	In the case of vehicle ignition and the positioning time exceeding the set time threshold, report long positioning time alarm, including the alarm time and GPS information
Driving behaviors	
Driving behaviors	Including the start and terminal time of driving cycle, total mileage of driving cycle, average speed, maximum speed, overspeed time,
	Times of overspeed, idling time, rapid acceleration, rapid deceleration and rapid turning.
Vehicle bus function	
Vehicle faults reading	The terminal identifies the vehicle fault information, and reports to the platform in case of change of vehicle fault state.
Vehicle faults clearing	Issue instructions through the platform to clear vehicle faults.
Bus control	Control window lifting, car locating, locking and unlocking, blast, folding of rearview mirror, remote start-up and flameout, remote car locking, etc. through CAN or K/L line bus.
Remote management function	
Remote upgrade	Remotely upgrade the terminal software through GPRS network and FTP server
Remote restart	Issue an instruction to restart the equipment through the data channel
Remote query	The platform remotely queries the terminal information, vehicle type, GPRS communication parameters, heartbeat parameters, GPS/CAN return parameters, SIM card information, GPS information, CAN data flow, various alarm parameters of current faults, and parameters of rapid acceleration/deceleration/turning through GPRS.
Remote setting	The platform remotely sets the terminal information, vehicle type, GPRS communication parameters, heartbeat parameters, GPS/CAN return parameters, clearing of vehicle faults, control restart, factory data resetting, clearing of blind area data, various alarm parameters, and parameters of rapid acceleration/deceleration/turning through GPRS.
Version report	Report version information during each ACC ON. The platform checks the vehicle version information through instructions
SIM card information report	Report SIM card IMEI number, etc. during each ACC ON
	The platform checks the SIM card IMEI number, etc. through instructions.
Module self-check	Terminal status self-check: Detect each functional module (including positioning module, bus module, FLASH, 3D module)
	Check whether it runs normally and report alarm in case of fault (fault not related to wireless communication)
Bluetooth	
Bluetooth connection control	After Bluetooth connection with the nearby vehicle, control the vehicle locking and unlocking, car locating, blast, etc.
Data encryption	
Data encryption	Optionally equipped with built-in encryption chip, or encrypt equipment data by three

	methods such as TFC card and gateway data encryption, and support various security encryption algorithms and ensure data security and stability, DES/3DES, AES, RSA, ECC, SM1, SM2, SM3, SM4 and SHA-n.
Voice broadcasting:	
Voice broadcasting:	Connect 4G audio channel to speaker and microphone, to realize TTS voice broadcasting, remote call and voice intercom networking
Backup power	
Backup power tracking and alarm	After the terminal unplugging, the internal battery provides the power, and reports the unplugging alarm and trajectory position information. (Optional)
External	
External interface:	Externally equipped with 485 and 232 cameras, temperature sensors, card punches, fuel sensors, tire pressure device, etc.

3.4. TBOX frame diagram

The specific hardware architecture diagram is shown below:
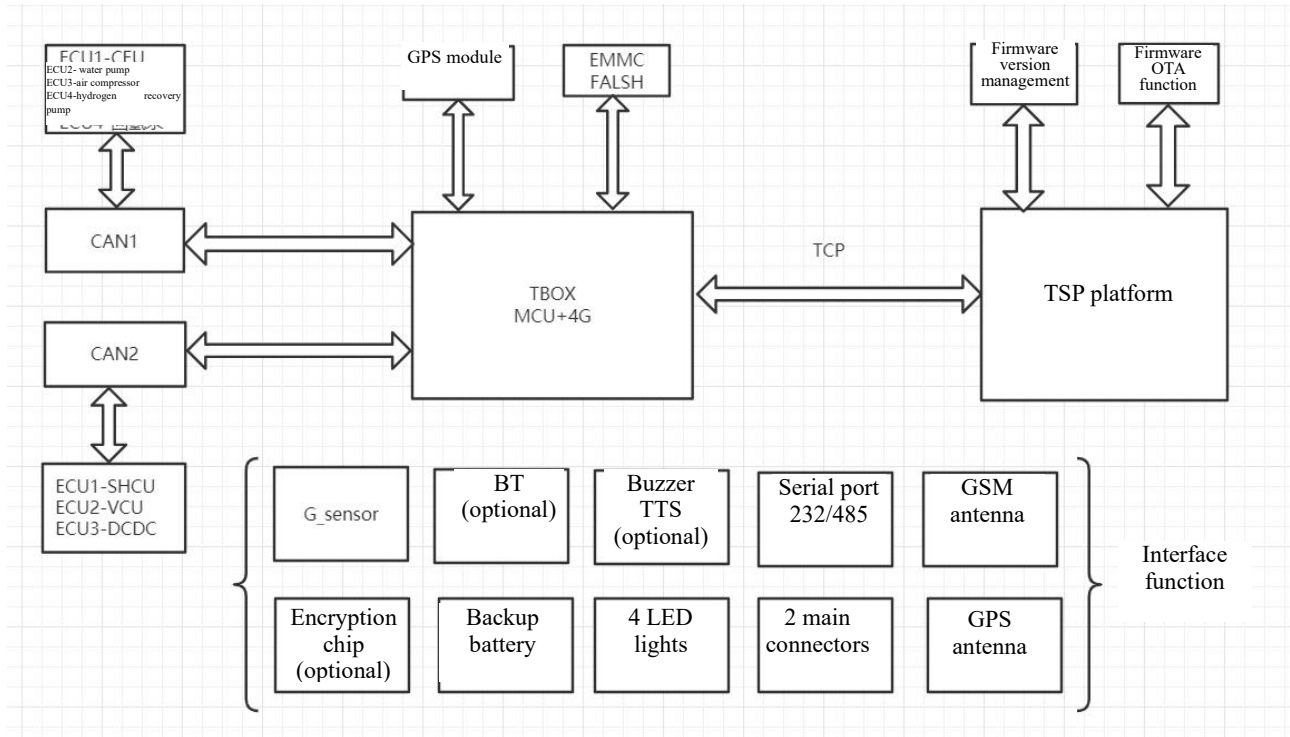
4. Protocol Support

Attribute	Description
Air protocol standard	Extension of 32960 national standard protocol
Bus communication protocol	ISO-15765 500K ST ISO-15765 500K EX ISO-15765 250K ST ISO-15765 250K EX ISO-14230 FAST ISO-14230 SLOW ISO-9141-2 ISO-27145 ISO-15031 SAE J1939 SAE J1708
Network communication protocol	TCP protocol

5. Interface Definition

5.1. Host interface

· Specify the definitions of specific host interface and harness interface before the completion of final mold opening.

5.2. Indicator
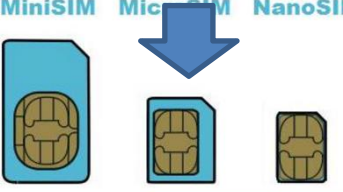
| Attribute	Description
Type of indicator	① **Green - GPS;** ② **Blue - bus communication 1;** ③ **Blue - bus communication 2;** ④ **Orange - GPRS**
GPRS light	· GSM closed: Light off · SIM not plugged: Quick flashing at an interval of 60MS · Signal searching: Medium-speed flashing at an interval of 500ms · Logging in platform: Slow flashing at an interval of 1S · Launched: Normally on
GPS light	· GPS closed: Light off · Not positioned: Medium-speed flashing at an interval of 500ms · Positioned: Normally on · Hardware failure: Quick flashing at an interval of 60MS
Bus communication light 1/2	· Diagnostics closed: Light off · Scanning the protocol: Medium-speed flashing at an interval of 500ms · Normal bus communication: Normally on · Repair mode: Quick flashing at an interval of 60MS

6 Getting Started

6.1 Installing a SIM Card

6.2 Tracking Platform

6.2.1 web platform

http://www.18gps.cc
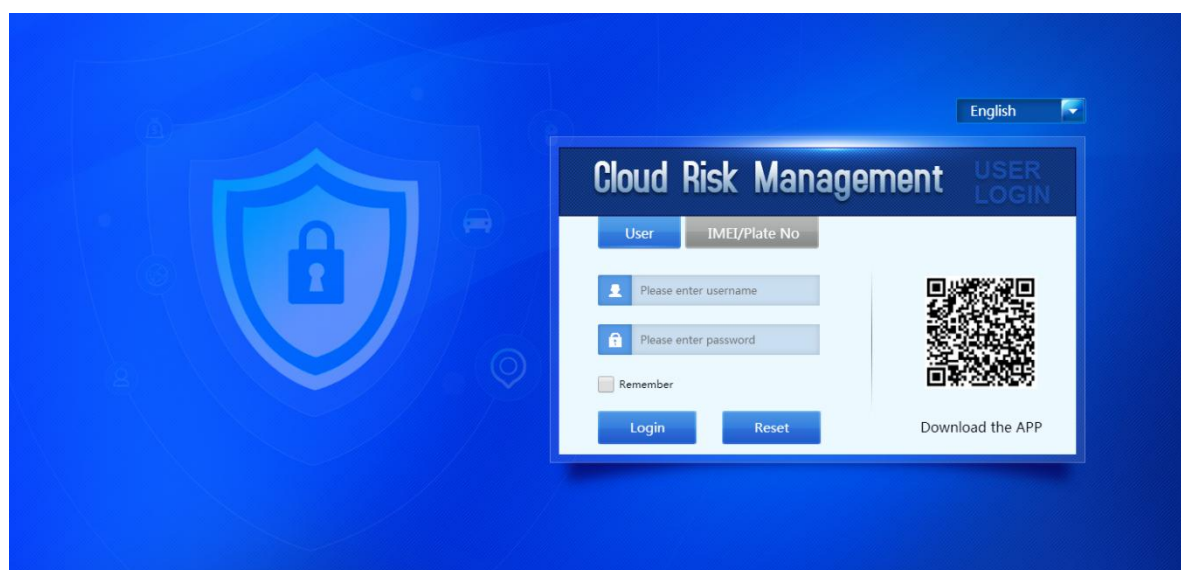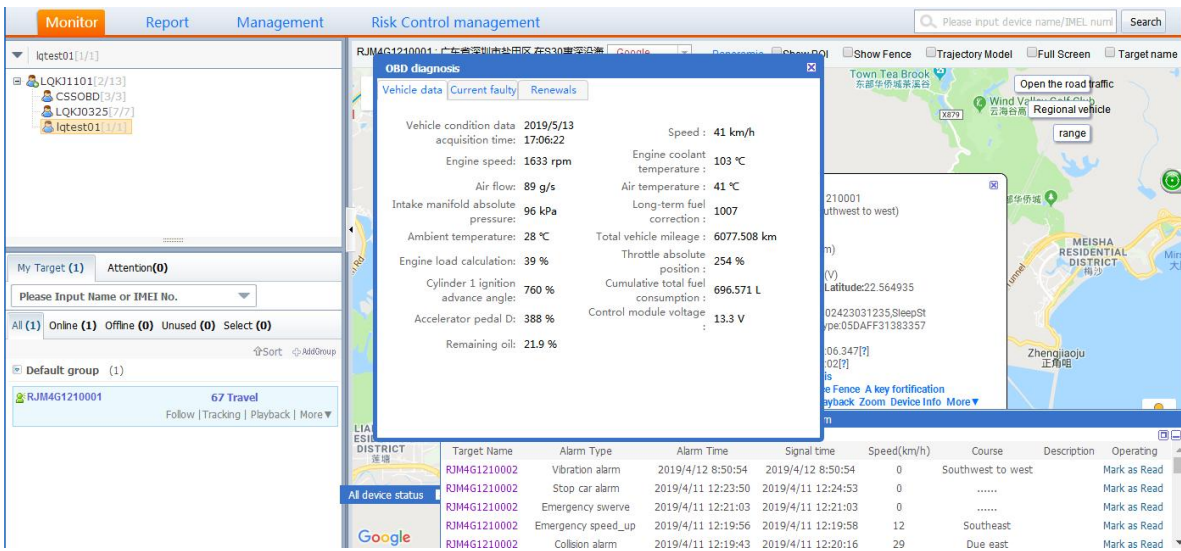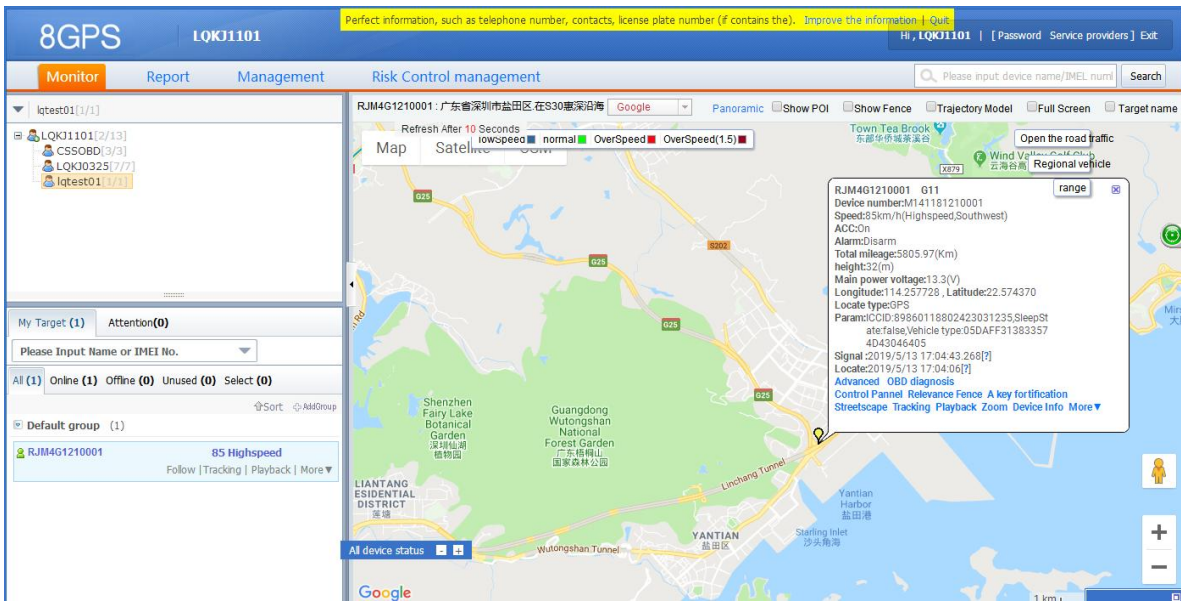
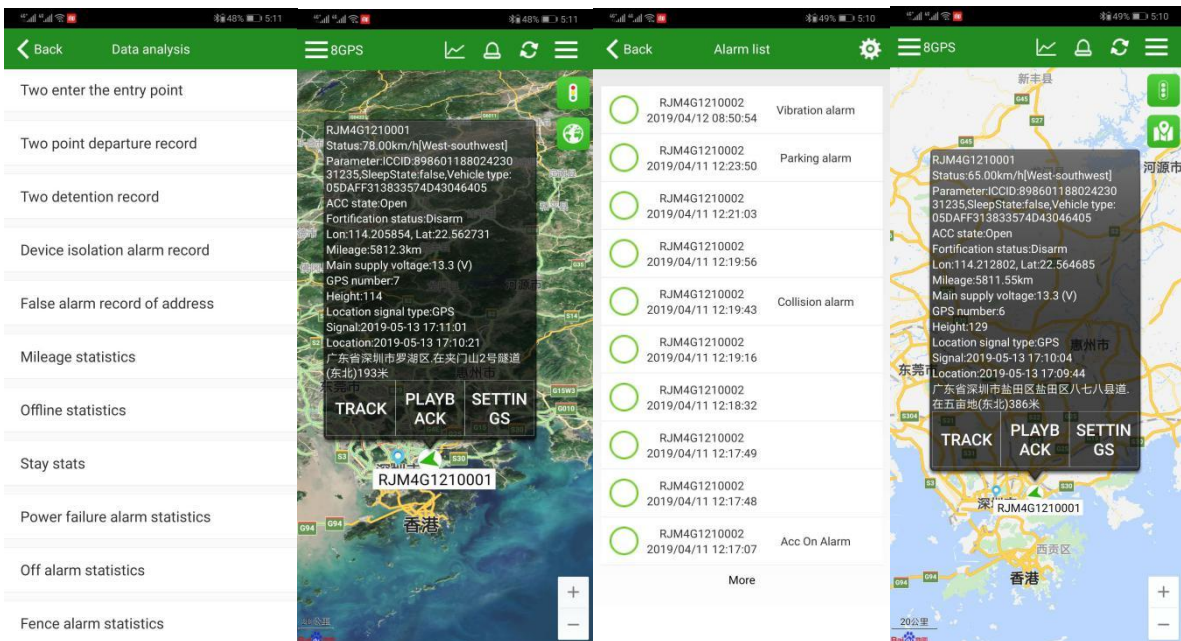## 6.2.2 Phone APP

6.3 Precautions

1 Find the vehicle OBD diagnostic seat, refer to the common interface position;

2 Open the side strip of the device and insert the MICRO-SIM card (3FF medium card) according to the direction of the label;

3 Connect the terminal directly to the OBD diagnostic interface of the vehicle to power on. The indicator light is on and observe whether the indicator blinks normally. Until the device is online and positioned normally, the time for first online and positioning will be slightly longer.

4 When the vehicle is started, the device will automatically communicate with the vehicle to obtain the data it supports;

5 Equipment with battery is generally recommended to start the engine to charge the battery for more than 2 hours, to ensure that the alarm and other data are released.

Note: Parameters such as gateways are pre-set as needed before leaving the factory.

6.4 Scenario

Fleet management

Home vehicle management

The equipment can realize the fleet management of a family, a unit or even a large fleet, and the fleet management is very flexible.

Large vehicle management

Office vehicle management

Real-time trajectory

Record your vehicle's real-time trajectory at any time, and the vehicle is well-known for remote monitoring.

Vehicle service

Car consultation Emergency help Problem report Maintenance

Through the presence of auto technicians, owners have various service problems in the process of using the car, such as car consultation, emergency help, maintenance, etc., to make the owner more worry-free and save money.