

MPIP-619 User Manual



V1.0.0

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1. Product Introduction

MPIP-619 GPS tracker integrates internationally leading technologies of GPS, GSM, intelligent automatic control and anti-theft alarming. It is able to monitor position, safety, operation and technical status of moving target 24 hours a day, and it provides real-time tracking, fleet management ,anti-theft of vehicle, asking for help in case of accident, fault repair, data checking, fuel consumption statistics, mileage statistics, maintenance reminder, driving behavior analyzer, SMS alarm, Geo-fence alarm, easy installation, total fuel consumption read, fault alarm read, engine speed alarm read and temperature alarm read, etc.

2. Disclaimer

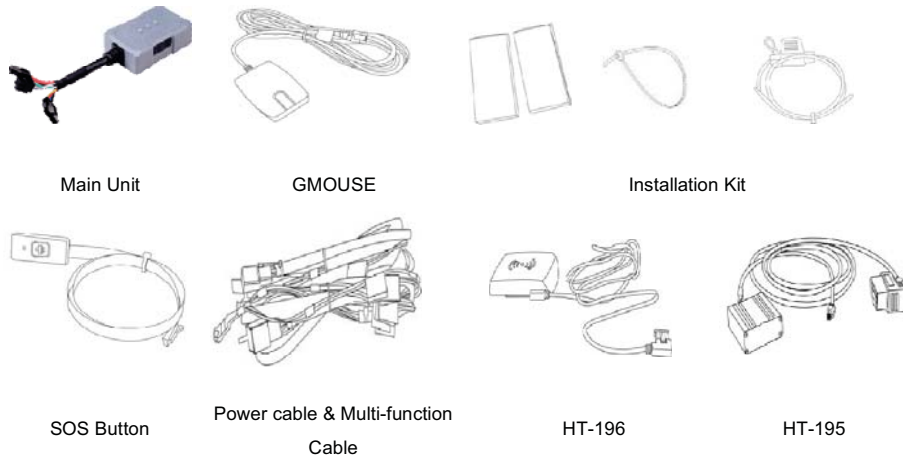
MPIP-619 mobile terminal is developed on GPS applied technology of United States. Since its GPS receiver must always keep directly communicating with satellite in the course of operation, the equipment may be affected when it operates in electromagnetic shielded areas or when the carrier (such as a vehicle) is under some shelters like indoor area, underground parking lot or footbridge;

MPIP-619 mobile terminal is a radio communication device. The product shall be as far away as possible from areas that might cause explosion like fuel warehouses, chemical plants, and so on. The product may be affected in places sensitive to external radio-frequency signals, such as gas stations, hospitals, schools, etc, where radio frequency suppressors may be installed;

Because data communication is conducted between system adopting GSM technology and monitoring center, user must use SIM cards of public communication network operators whose GPRS signal cover the area where car runs. Besides, the SIM card shall always contain sufficient value. Please do not use SIM cards subject to limitation of regions;

Please use accessories provided by original manufacturer to guarantee normal operation of the product.

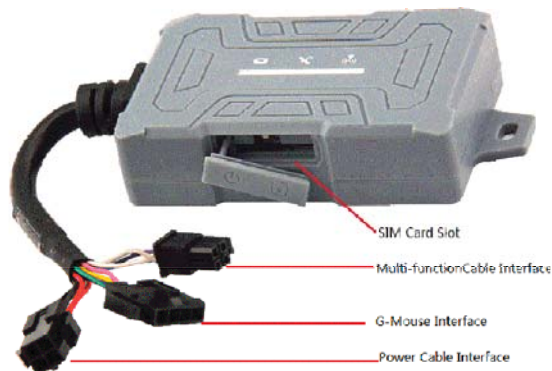
3. Product Overview



4. Interface

4.1 Interface Introduction

MPIP-619 main unit has 4 interfaces totally, including power cable interface, multi-function cable, G-mouse interface (RS-232) and SIM Card slot. As below picture:



4.2 Interface Pin Definition

4.2.1 2*2PIN Multi-function Cable Interface

Overview	Pin	Function	Color	Remark
	1	AWG26,ACC monitor	Grey	
	2	AWG26,Power and Oil monitor	Purple	
	3	AWG26, Ground (-)	Light blue	
	4	AWG26,Alarms sign input monitor /LED Status output (Multifunction)	white	

4.2.2 1*4PIN Power Cable Definition

Overview	Pin	Function	Color	Remark
	1	AWG26, TXD	Brown	
	2	AWG26, Power(-)	Black	POWER (-)
	3	AWG26, Power(+)	Red	POWER (+)
	4	AWG26, RXD	Orange	

4.2.3 G-Mouse Interface Definition

Overview	Pin	Function	Color	Remark
	1	AWG26, TXD	Green	Standard RS232 interface, connect G-mouse or HT-196R, Default Model connects to G-Mouse with 4800bps. Serial Model when connects to Castelecom PCTool Via USB cable. Exit serial Model and then return to G-Mouse Model.
	2	AWG26, DC Power +5V output (1A max.)	Blue	
	3	AWG26, Ground	Pink	
	4	AWG26, RXD	Yellow	

5. Function

5.1 Highlights

5.1.1 Easy Installation

Power supplied by OBD port, device doesn't need external power cable OBD unit supports plug and play and to adapt 12VDC and 24VDC automatically.

5.1.2 GPS Module Integrated

The terminal can get locations globally with GPS technology.

5.1.3 GPS Locating & Tracking

5.1.3.1 Phone Call Locating

Dial the SIM card number by cell phone, and then cut it off before it is received. The initiator will receive a feedback SMS with location information, click map link to check device's location on the map directly.

If the call is received, the user will not get feedback SMS. Location message format is below:

"Car license number, xx, yy, A/V! Map link? Language& latitude& longitude"

(xx means CSQ value, yy means number of valid locating satellite, A/V means the location result is positive/negative)

Example:

K576N,26,9,A!http://maps.google.com/maps?hl=en&q=22.7643750,114.3974383 (Map link English: hl=en)

5.1.3.2 SMS GPS Locating

Send "SMS Encryption key, LBG (Location Based GPS) " to device's SIM card number by any cell phone, device will feedback a locating SMS to initiator. User click map link to check device's location on the map directly.

Feedback SMS format:

"Car license number, xx, yy, A/V! Map link? Language& latitude& longitude"

(xx means CSQ value, yy means number of valid locating satellite, A/V means the location result is positive/negative)

5.1.3.3 SMS Base Station Locating

Send "SMS Encryption key, LBS (Location Based Services) " to device's SIM card number by any cell phone, device will feedback a locating SMS to initiator. User click map link to check device's location on the map directly.

Feedback SMS format:

"Car license number, xx! Map link? Language& latitude& longitude"

(xx means CSQ value)

5.1.4 Platform management & E-mail Forwarder of Reports

After device connects with platform successfully, platform can check and store real-time data, and then send the reports to referred email address by interval.

5.1.5 Intelligent Power Save

Device supports none power-save mode and half power-save mode.

Half power-saving mode

After ACC is OFF for 5 minutes, GPS will be turned off, GPRS will be disconnected, and GSM will go sleep. On this condition, device can only get call and SMS, upload last location data. ALL external device will be turned off.

When device goes into half power-saving mode, it will be woke up when: ACC on, Door open, Cut off power supply, SOS alarm, Abnormal Temperature, Abnormal Fuel, called, unplug of OBD. Then GPS & GPRS will be powered on, terminal will upload alarm data immediately (whatever it is located or not, if can't be located, device will upload last valid location), meanwhile it will keep online working state and upload data (whatever it is located or not) until next ACC off.

5.1.6 Car Locating

User can locate a car by internet platform or PC client.

5.1.7 Command from Platform

Platform can send text message to device via GPRS, the text message will be showed on LCD screen& handset.

5.1.8 Maintenance Reminder

User can set maintenance reminder on platform according to time period or mileage, to remind user to maintain the car once the time/mileage exceeds the number pre-set.

5.1.9 OBD Function

5.1.9.1 Fuel Consumption

When connected with HT-195, main unit will update the fuel consumption binding with GPS data, which will be showed on the platform. Margin of error: +/-5%.

5.1.9.2 Remaining Oil

When HT-195 is connected, it will read remaining oil data from OBD.

5.1.9.3 Fault Warn

When HT-195 is connected, it will read car's fault data from OBD and send it to platform.

5.1.9.4 Mileage Consumption

When HT-195 is connected, it will read car's mileage consumption from OBD. It was calculated by GPS data.

Margin of error: +/-5%.

5.1.10 Driving Behavior Monitor

Device can detect over speed, parking without engine off and fatigue driving, etc;

When HT-196 is connected, it can detect over speed, acceleration, deceleration, lane change, crash, parking without engine off and fatigue driving, etc. HT-196 will get alarm of illegal behavior.

5.2 Locating and Tracking

5.2.1 Locating Query

User can check vehicle's current location on any computer with network.

5.2.2 Tracking by interval

After receiving command from center, device will upload GPS information by interval.

5.2.3 Fixed Upload

Terminal can upload GPS data, OBD data to platform by time interval without times limited, default OBD data includes total fuel consumption, remaining oil volume and total mileage.

5.2.4 Compressed Upload by Interval

Device uploads GPS information to platform by interval, after it gathered 8 GPS & OBD data

5.2.5 Blind Area Store/Report after Event

In GSM blind area, GPS data & OBD data can be stored and resend to server when GPRS service is woke up.

Stock capacity is 3000pcs.

5.3 State Detection & Control

5.3.1 State Detection

5.3.1.1 Vehicle Status

Main unit can check ignition on/off status, OBD connection status, external accessory connection detection, etc.

5.3.1.2 External Device

Connection status of G-MOUSE, HT-196R, HT-195 will be uploaded.

5.3.2 Battery Voltage

Battery voltage data is contained in GPS data, if the value is lower than the number pre-set, it will warn with alarm.

5.3.3 Remote Engine On/Off

When the car is confirmed to be stolen, user can send command to cut off/wake up the engine remotely by 2 ways:

- a) Platform GPRS
- b) SMS
 - Cut Off: Send "SMS Encryption Key, engine off" by any cell phone to device;
 - Wake Up: Send "SMS Encryption Key, engine on" by any cell phone to device;

5.4 Alarm

5.4.1 SMS Alarm

Device sends important alarm (SOS, low voltage, power cable cut off) to preset cell phone via SMS.

5.4.2 SOS Emergency Alarm

In case of emergency in car, terminal will send emergency alarm to center after user press SOS button for more than 3 seconds.

5.4.3 Other Alarm

Power cable cut off, low voltage, engine on/off, GPS Failure, over speed, crash, accelerate, decelerate, lane change, park with engine on, high RPM, high water temperature, fatigue driving.

5.5 Terminal Maintenance

5.5.1 CASTELECOM PC Tool

User can read and modify all parameters, and update the firmware by CASTELECOM PC Tool. See details on chapter 6: Configuration Guidance.

5.5.2 Remote Maintenance

User can modify parameters through online platform client. See details on chapter 6: Configuration Guidance.

5.5.3 SMS Maintenance

User can modify part of parameters via SMS. See details on chapter 6: Configuration Guidance.

6. Configuration Guidance

6.1 CASTELECOM PC Tool

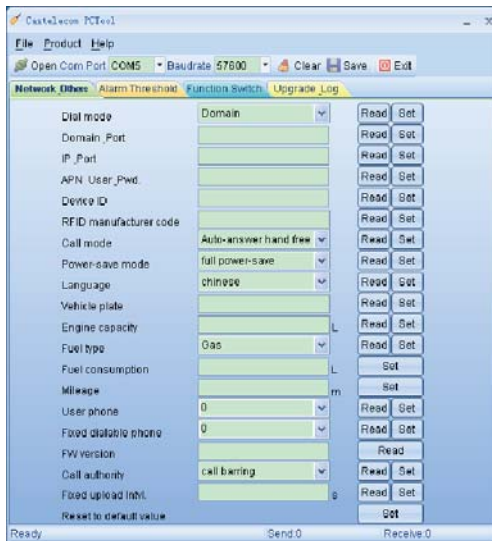
- 1) Install CASTELECOM PC Tool on PC, click CATELECOM PC Tool.msi to start installation.



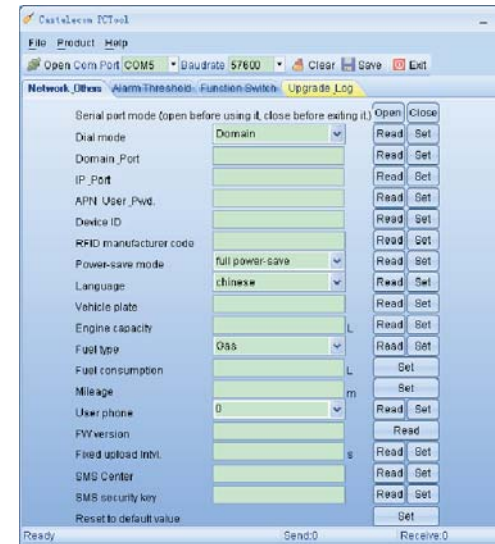
- 2) PCTool Icon.



- 3) Double click icon to run the software.



- 4) Choose "Product---->MPIP-619".



- 5) Connect MPIP-619 with PC by data cable via G-Mouse interface.
- 6) Prepare power supply, and then power on terminal.
- 7) Open Com Port. Please notice below items:
 - A) Before modify and update, please open serial port mode. Operate as below: on "Network_Others" bar, the first order is "Serial port mode (open before using it, close before exiting it.)", then click "Open";
 - B) Before disconnect device, please close serial port mode. Operate as below: on "Network_Others" bar, the first order is "Serial port mode (open before using it, close before exiting it.)", then click "Close";

To see detail CASTELECOM PC TOOL guidance, open its user manual on CASTELECOM PC Tool "Help->User Manual".

6.2 Platform

After inserted SIM Card, device will register on platform. User can set parameters on platform, including upload time interval, GPRS parameters, alarm, etc.

6.3 SMS

MPIP-619 support SMS setting several parameters as below:

1) Terminal Language

User can change device's language between English and Chinese by sending "SMS encryption Key, EN", "SMS encryption Key, CN" to terminal by any cell phone.

Feedback: "EN, ok", "CN, ok" means success, no feedback if fails.

2) Authorized Phone Number

Send SMS "SMS encryption Key, SP, no1, no2, no3" by any cell phone.

If there's no need for any number, user can keep blank in SMS.

To delete all number, send "SMS encryption Key, SP".

For example: Set first authorized number with SMS "123884,SP, 123456,,"

Feedback "SP, 123456,,ok" if success.

3) Fixed upload time interval

Send SMS "SMS encryption Key,,SI, fixed upload time interval" by any cell phone.

The units of "fixed upload time interval" is "s". "fixed upload time interval=0" means stop fixed upload.

For example: "123884,SI,60" is to set the time interval as 60s.

Feedback "SI,ok" if success. No feedback if fail.

4) GPRS

Send SMS "SMS encryption Key,,SG,DialMode,IP/domain,Port,APN,user,password" by any cell phone.

DialMode

=0, means domain dial

=1, means IP dial

For example: 123884,SG,0,www.163.com,7888,cmnet,,

Feedback "SG,ok" if success. No feedback if fails.

7. Installation Guidance

!WARNING: The operations below are for reference only. We recommend that the product shall be installed by technicians specialized in vehicle circuit installation. We are not liable for damage to the vehicle circuit caused by improper operation of the client.

7.1 SIM Card

Before installing device to car, user should insert SIM Card at first:

- 1) Open the cover board



- 2) Keep SIM card upwards and gap in by, then insert it to SIM card slot;
- 3) Switch the power toggle to "ON";
- 4) Turn off cover.

7.2 Cable Connection

7.2.1 Simple Installation (HT-195)

HT-195 provides power supply and ACC signal for main unit.

OBD Cable Connection:

Plug OBD cable's male terminal into OBD diagnostic port in car, then connect the cathode/anode to main unit



7.2.2 Installation without HT-195

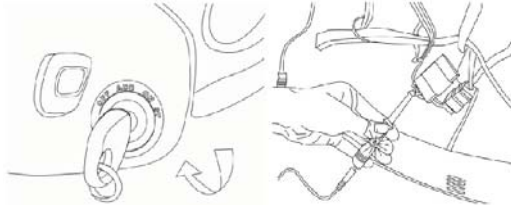
1) Cable Check

Please refer to the following instructions to locate the connection positions of functional cables in vehicle.

(1) Power Cord

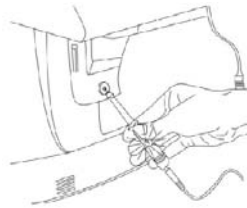
Power cord position: It is generally located in wiring harness inside the lower baffle plate of the steering wheel, or inside the door wiring harness of the driver's seat, or inside the fuse box. It can also be directly connected with the positive pole of the vehicle battery.

Method of locating: ground one end of the test probe and put the other end on the power cord. The key is respectively in the position of OFF, ON or ACC, and the LED indicator of the test probe always lights constantly.



(2) Ground Cord

The ground cord of vehicle generally adopts the mode of grounding.



(3) ACC detection cord (IGN+)

ACC detection cord (IGN+) is the basis to judge whether the vehicle's engine is on, and it is located in wiring harness inside the lower baffle plate of steering wheel, or inside the fuse box.

Method of locating: ground one end of the test probe and put the other end on the wire. When the vehicle key is respectively in the position of ACC, ON or START, the LED indicator of the test probe illuminates. When the key returns to the position of OFF, the LED indicator of the test probe goes off.



(4) Fuel Pump Cord

Characteristics of fuel pump cord: When the engine is off, the cord has no voltage signal. When the engine is started, the wire has voltage signal.

Location of fuel pump wire: It is generally located inside the wiring harness of the left or right front door side, or inside the fuse box, or under the back seat, near the fuel tank.

2) Connection between Multi-function Cord and Power Cable

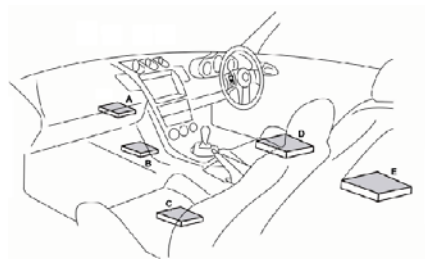
- (1) Refer to the explanation of functional ports as shown in the "MPIP-619 Port Connection Diagram". Connect the ports with vehicle circuit;
- (2) Please take out the fuse wire in the fuse base before installation to avoid blowout.



- (3) All wire's connection and the part out in air must make insulation protection, to avoid short circuit.
- (4) Connection of power cord requires installing the fuse seat in standard accessories within 0.3m length from joint. Principle of local grounding for the MPIP-619 main unit is adopted by the ground wire, and the grounding wire must not exceed 1m long.

7.3 Main Unit Installation

- 7.3.1 Location for installing MPIP-619 should be determined in advance. The location should allow secure installation, concealment, anti-humidity, avoidance of high-temperature area, and be far away from magnetic field, air bag, sound system, ABS system and there sensitive electronic equipment. In addition, it should be installed to conceal.
- 7.3.2 Recommended installation location for MPIP-619: concealed position inside the decorated board under the dashboard or under the seat. Refer to the following diagram for the specific installation location:

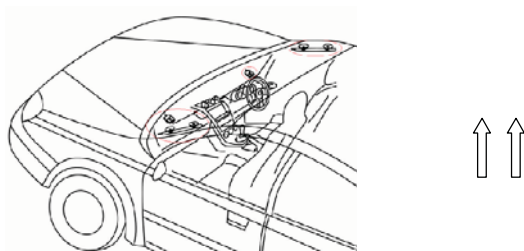


Magic tape can be used to fix the main unit to the vehicle body.

7.4 G-Mouse Installation

G-mouse cannot be installed under metal baffle plate because it will hinder receipt of GPS signals, thus affecting the normal monitoring and positioning of MPIP-6189 main unit.

G-mouse is generally placed inside the decorated plate under the front or rear windshield or on the dashboard. Refer to the following diagram for the specific installation location:



7.5 Installation of SOS button

The SOS button should be placed between dashboard and steering wheel to facilitate operation of the driver. The SOS button has adhesive tape stuck to its back. When installing, please remove the adhesive tape and attach it to the intended position. Refer to the following diagram for the specific installation location:



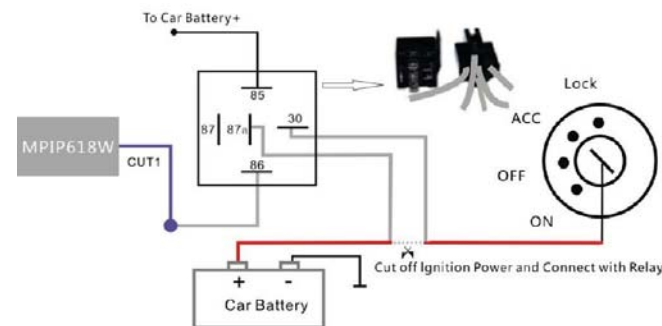
7.6 Installation HT-196 Driving Behavior Analyzer

When installing, please don't put it under any metal or explosion prevention metal. We advise to absorb it on the windshield or fix it under the windshield by double faced adhesive tape.

Please keep driving behavior analyzer horizontal, and the angle with ground shall not exceed 15°.

7.7 Relay Installation

- 1) Connect the CUT1 control line of the multi-function cable with relay 86 pin.
- 2) Connect the relay 85 with car battery anode, 87a.30 connect with two side of the ACC line as below:



7.8 Installation Finish

- 1) After all equipments are installed, insert fuse into fuse base to power port on main unit
- 2) Meanwhile start vehicle to check if device works well.
- 3) Once notice any abnormality, power off main unit. Recheck all installation wires or send it to a professional vehicle service agent.
- 4) Log on "Client software of monitoring center" or the "Internet-based WEB vehicle tracking system" to check if the vehicle is online and locating service is normal. If there are problems, refer to Section X of the User Manual for trouble shooting. Contact local dealer if the problems cannot be solved.

7.9 Indication of Operation Status

7.9.1 LED Indicator

Type	Color	Status	Remark
POWER	Red	Constantly On: Regular Work Extinguish: Power off	LED indicator on SOS button or main unit's board
GSM	Blue	Extinguish: Slumbering or power off; Flickering: Log on network successfully Constant on: log on failed	LED indicator on main unit's board

GPS	Green	Extinguish: Slumbering or power off; Flickering: Locate successfully Constant on: Searching for signal	LED indicator on main unit's board
GPS	Green	Extinguish: Slumbering or power off; Flickering: Locate successfully	LED indicator on G-Mouse
Driving behavior	Yellow & Red	Yellow on 3s:normal illegal driving behavior Red on 3s:serious illegal driving behavior Extinguished: no illegal driving behavior	LED indicator on HT-196

7.9.2 Buzzer

Tone	Remark
Di (last 500ms):power on Di- Di (last 100ms, every 100ms):illegal card Di- Di (last 100ms, every 100ms, 1s ring 1 time): no card read Di- Di -Di(last 100ms, every 100ms):normal illegal driving behavior Di- Di -Di -Di (last 100ms, every 100ms):serious illegal driving behavior	Buzzer indicator on HT-196

8. Packing List

8.1 Standard

Standard	Quantity
MPIP-619 Main Unit	1
Power Cable	1
G-mouse	1
CD User Manual (including warranty card)	1
Installation Accessories(including fuse, sticker, cable tie)	1

8.2 Optional

Optional	Remark	Quantity
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USB Data Cable		1
Multi-function cable		1
SOS button		1
Relay		1
HT-195(16P/9P/6P Optional)		1

9. Technical Specification

Item	Description
Dimension	75mm(L)*48mm(W)*20mm(H)
Weight	80g
Protection Level	IP54
Working Voltage	9V - 36V DC
Battery	3.7V/300mAH Lithium battery
Stand by current	40mA
Max working current	<250mA@13.8V(not including accessory)
TX/RX Current	<150 mA@13.8V(not including accessory)
ACC OFF current	<90mA@12V/24V(not including accessory)
Extinguish Current	<20mA@12V/24V(not including accessory)
Working Temperature	-30°C ~ + 70°C
Stock Temperature	-40°C ~ + 85°C

Humidity	5% ~ 95%(No frost)
Frequency	GPRS 850: 824.20MHz-848.80MHz GPRS1900: 1850.20MHz-1909.80MHz
Data transmission	GPRS
Locate	GPS
GPS Chip	SIRF 3
Locate Speed Accuracy	≤0.1m/s
GPS Sensitivity	-159dB
Locate Accuracy	≤15m
SOS Button/LED Indicator	LED Indicator/SOS Button function reuse
Certificate	FCC : CE : E-Mark
HT-195	<p>OBD passenger car protocol:</p> <p>SAE J1850 PWM (10.4 k baud) ; SAE J1850 VPW (41.6 k baud)</p> <p>ISO 9141-2 (5 baud init) ; ISO 14230-4 (5 buad init)</p> <p>ISO 14230-4 (fast init) ; ISO 15765-4 CAN (11 bit ID, 500 k baud),</p> <p>ISO 15765-4 CAN (29 bit ID, 500 k baud) ;</p> <p>ISO 15765-4 CAN (11 bit ID, 250 k baud)</p> <p>OBD commercial car protocol:</p> <p>SAE J1939 CAN (29 bit ID, 250 kbaud)</p> <p>SAE J1587/J1708 (9.6 kbaud)</p>
I/O port	1 digital/analog input

	1 digital output(engine cut)
	1 SOS input

Note: above current is read under 12V power circumstance, actual data would be a little different under local circumstance.

10. Care and Maintenance

To ensure proper use and extend service life of device, following items should be paid attention to in the course of installation, use, care and maintenance:

- 1) The voltage range of normal power supply for mobile terminal is DC 9V—36V, and recommended operating voltage is 12V or 24V. Prior to installation, user shall make sure the power supply is in the range aforesaid.
- 2) When the in-Vehicle terminal is powered on, do not plug in or pullout the antenna or remove SIM card to avoid damage to the in-Vehicle terminal and SIM card.
- 3) The connection socket of the in-Vehicle terminal shall avoid direct contact with conductive body, otherwise it may result in short circuit and danger.
- 4) Do not use mobile terminal in a dusty environment. When washing the vehicle, try to prevent the terminal from being soaked or showered which will damage the terminal.
- 5) Keep using the mobile terminal in required temperature. The equipment may be damaged when user operate too long in the environment where the temperature is above 85°C or lower than -40°C.
- 6) When vehicle is inside building, tunnel or within a shielded area, receiving of GPS and GSM signals will be affected. After vehicle moves out of the area mentioned above, it will automatically resume
- 7) Main unit has built-in spare battery which will not be activated and begin working until the equipment is used for first time with external power. After the battery is activated, the power supply will automatically switch to built-in battery, which can last for about 10 hours (calculated based on that the terminal data transmits 5 minutes per time).
- 8) Terminal can only use accessories designated or recognized by CASTEL. Unauthorized accessories may damage the device.
- 9) If abnormality occurs to the terminal equipment or its accessories, which leads to failure of normal operation, please contact the manufacturer or local dealer.

11. General Trouble Shooting

Trouble	Possible Cause and Solution
---------	-----------------------------

Terminal can't log online	<p>1. Fuse of power cord is burned so that there is no power supply. Solution: change fuses.</p> <p>2. Improper setup of parameters Solution: check APN parameters and reset.</p> <p>3. Insufficient value of SIM card or non-support of GPRS function. Solution: reconfirm the SIM card function.</p> <p>4. Improper connection of GSM antenna and weak signal. Solution: check GSM antenna.</p> <p>5. Failure of MPIP-619 main unit Solution: send it to designated maintenance center for repair.</p>
Terminal can't be located	<p>1. GPS antenna is shielded by metal shielding object. Solution: remove the metal shielding object or reinstall G-mouse at another place.</p> <p>2. G-mouse failure. Solution: return it to the designated maintenance center for repair.</p> <p>3. Failure of the MPIP-619 main unit. Solution: send it to the designated maintenance center for repair.</p>
Power cut-off alarm	<p>1. Fuse of the power source is burned. Solution: change fuses.</p> <p>2. The power cord is improperly connected with the ACC end. Solution: check the connection and reconnect it to the common power cord.</p>
Can't upload emergency alarm	<p>1. The SOS button has not been connected. Solution: check the SOS button.</p> <p>2. MPIP-619 main unit won't come online, and the alarm information fails to be</p>

	<p>reported.</p> <p>Solution: analyze why the MPIP-619 main unit won't come online.</p> <p>3. Failure of the MPIP-619 main unit Solution: send it to the designated maintenance center for repair.</p>
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Warranty Card

User Name _____

Phone No. _____

Address _____

Post Code _____

Purchase date _____

Device serial No. _____

Agency and phone No. _____

Remark _____

Remark: Please keep this card properly for better service. Please see service details as below.

Agency (Stamp):

Repair Record

Device Model:

Date	Troubles and repair record		Sign(Maintainer)	Sign(User)
	Trouble	Record		

Note: Agency should fill this card completely before repair.

12. Claim

Without written authorization of CHINA AEROSPACE TELECOMMUNICATIONS LTD., any kind of copy, transmission, dispatching or saving of this file is prohibited.

CHINA AEROSPACE TELECOMMUNICATIONS LTD. keeps the rights of reservation and modification without any notification in advance. Receiving and operation time would be affected by SIM card, network and using circumstance of different device. And we don't take responsibility of data losing and income wastage, or any special, occasion, and indirection reason.

This file is based on "local" situation. In spite of relative law, explicit or hinting data including (but no limited in) hinting selling data, is no connection with accuracy and reliability.

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13.FCC Statement:

1. 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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE:

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 or more 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.

The distance between user and this device include its antenna should be no less than 20 cm.

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