



AOT-120G User Manual

GSM\SMS\GPRS\GPS

(Version 1.0)

Product overview

AOT120G is a GPS/GPRS based tracking device specially developed and designed for vehicle real-time tracking and fleet management.

AOT120G has inbuilt GPS module to obtain accurate position data and utilizes its GSM capability to send the position data to a specified server base for tracking and fleet management. With internal memory, AOT120G can store data when there is no GPRS connection or non-GSM area at a specified interval requested by the user.

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Specification

GSM	SIMCOM		
GSM Band	Quad Band 850/900/1800/1900		
Transmit Power	Class4(2W) at GSM850 and EGSM900 Class1(1W) at DCS1800 and PCS1900		
Spurious emission frequencies / harmonics	Max 33±2dBm Min 5±5dbm at GSM850 and EGSM900 Max 30±2dBm Min 0±5dbm at GSM850 and EGSM900		
Type of Modulation / De-modulation	GMSK(GPRS/GSM)		
Operating standards	GSM 07.07 ,07.05,11.14,11.11,03.38,11.10,07.10		
Transmission Technique	TDMA/FDMA/FDD		
GPS	U-Blox (NEO-7)		
GPS sensitivity	-160dBm		
GPS frequency	L1,1575.42MHz		
Code	C/A Code		
Channel	50 channels		
GPS Positioning	<2.5m, CEP		
Speed accuracy	0.1 m/s		
Time accuracy	1us and synchronous with GPS time		
Coordinates	WGS-84		
Reacquisition	0.1s on average		
GPS Start	Cold start: 32s, Warm start: 30s, Hot start: 1s (Open Sky)		
Altitude Limit	Maximum 18,000 meter (60,000 feet)		
Velocity limit	Maximum 515m/s (1000 knot)		
Acceleration Speed limit	Less than 4g		
Voltage Input Rang	9-90 VDC		
Current Consumption	25mA@12V (ACC ON) and <2mA@12V (ACC OFF)		
GSM Antenna	Built-in GSM Antenna (Commercial Stander)		
GPS Antenna	Built-in GPS Antenna (-148dBm to -162dBm)		
Memory	6000+ Locations		
I/O Ports	Inputs	Digital Input (+) for ACC	1
		Digital Input (-) Optional SOS	1
	Outputs	Digital Output (-)	1
Voice	MIC	Built-in (Optional)	1
Internal Battery	Polymer Lithium Battery, 100mA, 85 °C		
Temperature	-10 to +70 °C		
Humidity	20% - 80% RH		
Dimension	48(L)mm*25(W)mm*23(H)mm		
Weight	32g		
Test Reports	CE, EMC, EMI, RoHS, Safety Test Report.		

Basic Hardware Features

- GPS satellite & LBS dual model positioning
- Number of available GPS satellite
- GSM Signal Straight
- Very low current consumption for saving main Battery power (only 10mA Working Mode at 12V)
- Sleep Mode function for low current consumption
- Auto wake up from sleep mode (on ACC ON or Vibration detection)
- Built-in auto Backup battery charging controller (PWM)
- Hardware Over Speed Alert
- Hardware Vibration sensor
- Hardware watch dog timer
- Hardware ODO-meter
- Main and backup battery Voltage measuring
- Internal memory Storage (more than 10,000 location save when device is in non-GSM area)
- Auto reboot on malfunctions
- Stop, moving, Heart beat and sleep mode adjustable timing separately
- Time base alarm send to remote server
- Angle alarm send to remote server (20 degree by default)
- Vibration alarm
- ACC detection (+ve)
- SOS Alarm (-ve)
- Output 1 use for intelligent immobilization function (for save main battery power)
- Built-in MIC (Optional) for voice listener function
- Battery Tempering Alerts
- SMS forwarding from Server request (use for SMS Alerts)
- Hardware security (Add Center number)
- Additional information (IMSI number, LBS and Network information)
- All certification (CE, RoHS, EMC, EMI and Safety Test reports)
- Device have own TAC (Type allocation code 86696803 by GSMA)
- PTA Approved

Indication of LEDs

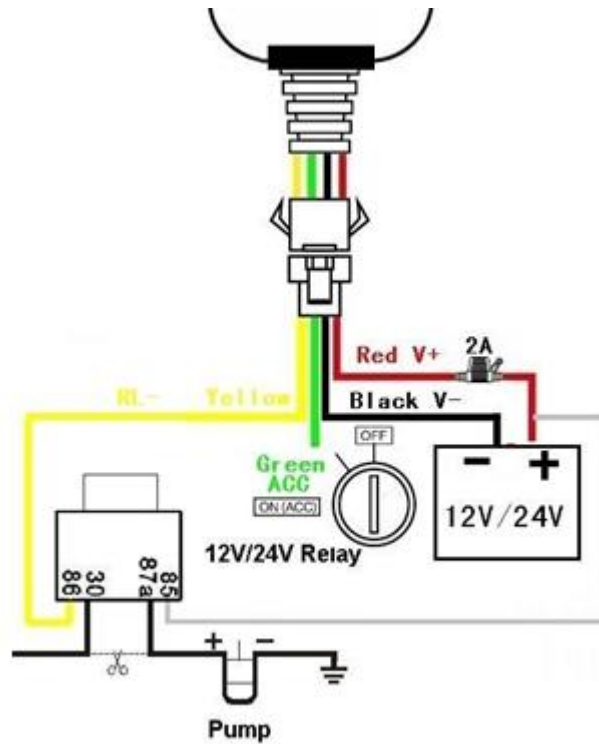
BLUE LED *(GSM status indicator)*





GSM LED Status	Description
Dark	Module did not power ON (or in Sleep/Deep Sleep mode)
Light 0.5s, Dark 0.5s	Finding GSM signal
Light 0.2s, Dark 0.8s	GSM register and ready to communication

GREEN LED *(GPS status indicator)*

GPS LED Status	Description
Dark	Module did not power on (or in Deep Sleep mode)
Light ON	Initializing GPS
Light 0.5s, Dark 0.5s	Finding GPS Signal
Light 0.2s, Dark 0.8s	GPS fixed location

I/O Ports Connections



Label Indicator	Color	Inactive	Active	Max.	Description
+VCC		< 9 VDC	< 9 VDC	90 VDC	Connect with vehicle battery positive
GND		GND			Connect with vehicle battery GND
ACC +		> 9 VDC	< 9 VDC	36 VDC	Connect with Ignition
DO-1		> 9 VDC	12 VDC		Relay coil (As battery voltage)

Installation

Notice of Installation:

To prevent theft of the Device, the device should be installed as covertly as possible.

Notice as following:

- Ideally must be installed in open area (Sky view)
- Device has built-in GSM antenna and GPS antenna. During installation, please make sure the receiving side face is up, with no metal object above the device to interfere with GPS reception.
- Avoid placing the Device close to higher power electrical devices, such as reversing radar, anti-theft device or other vehicle communication equipment.
- The Device should be fixed into position with cable ties or wide double-side tape.
- For safety, do NOT remove the fuse of device cable.
- Avoid installing near heat generation parts.
- Do not connect wires with the car control wiring

Steps of installation

- Open the cover, insert a SIM card to SIM card slot
- Switch backup battery power button up (power on)
- Connect the power code with the interface of device
- Now two LED lights will lighting
- Make sure the receiving side faces up, without any metal object shelter
- The LED lights will flash after 1 to 5mins. It shows working normally
- Close the back cover
- Please ask professional technical to connect wires and install to the vehicle.

SMS Commands

Set APN	SL APN <code>apn name,user name,password#</code>	APN	[1,30]
		User Name	[1,20]
		Password	[1,20]
Example	SL APN <code>connect.mobilinkworld.com,,#</code>	Change APN as Mobilink Don't require user name and password	

Set Domain or IP	SL IP/Domain#Port#	IP or Domain	[1,30] (domain length less than 30 byte)
		Port	[1,5]
Example 1	SL DP111.222.333.444#6000#	Change the IP and Port	
Example 2	SL DPtrack.AOT.com#6000#	Change the target domain name as track.aot.com, Port is: 6000	

Set Time Interval	SL INTV30,600	Moving Time	30 sec Interval time when vehicle is moving
		Stop Time	600 sec Interval time when vehicle is OFF or not moving

Read Parameter	SL CX	Read Device parameters by sending command
Example 1	Send SMS "SL CX"	IMEI number, IP/Domain, Port, APN, GSM Signal in percentage, Number of satellite and Back Battery voltage in percentage
	Reply: 68034012345,track.aot.com6000, connect.mobilinkworld.comATORAPN,31,11,94	

Server Number	SL CP+923001234567#	Server Number must be add with +92...
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Note: once add CP number than security will ON, no can change IP, APN and setting of the device, only CP number can.

Add and Delete Voice / SOS Numbers	101#03001234567#	Add voice monitoring or SOS number 1
	102#03001234567#	Add voice monitoring or SOS number 2
	103#03001234567#	Add voice monitoring or SOS number 3
	D101#	Delete voice monitoring or SOS number 1
	D102#	Delete voice monitoring or SOS number 2
	D103#	Delete voice monitoring or SOS number 3
To Check	C10#	Reply all set numbers

Location Request	SL LC	Lat/Long or LBS Location
Google Link	SL URL	Location with google link
IMSI Number	SL LCCID	SIM IMSI number
Version	SL VR	Hardware Version Number
IMEI number	SL IE	IMEI number last 10 Digit
Restart	SL RT	Device restart
Reset	SL FT	Factory Reset

Digital Outputs	SL YD?	Output	0	Kill
			1	Release
Example	SL YD0	Kill Engine		
	SL YD1	Release Engine		

Sleeping Mode with Power Saving Specifications:

The sleeping mode had been activated and defaulted inside the AOT120G. After the car has switched off more than 3 minutes, the device will shut off all the LEDs, there are two sleep mode one is normal sleep mode and 2nd is deep sleep mode

Normal Sleep mode:

Only Heart beat send to server, no location data send to server during sleep mode. In this mode GSM and GPS are ON. When device wake up from sleep mode after 20 sec settlement of device send normal data to server and goes to sleep mode again for saving Main battery power

Deep Sleep mode:

Only heart beat sends to server, no location data send to server during deep sleep mode. In this mode GSM is ON and GPS is OFF. When device wake up from sleep mode after 60 sec settlement of device send normal data to server and goes to deep sleep mode again for saving Main battery power

There are 2 methods to exit the normal or deep sleep mode:

- 1) Switch ON the ACC, this will lead device exit sleeping mode. If ACC is always on high level up, (means ACC is always on) the device will not goes to sleeping mode.
- 2) Shake the device to make it exit from sleeping mode.

During the first time testing, it is better to connect the ACC wire to high level up to locate the GPS signal fast in the opening area as well as to avoid the device goes to sleeping mode and could not locate the GPS after 5 minutes.

USAGE OF DEVICE

AOT120G is used for following auto mobile:

		
 <small>© Can Stock Photo - csp14619749</small>		
		
 <small>© Can Stock Photo</small>	 <small>#119889692</small>	 <small>#120457267</small>

Trouble Shooting

- After installing it in the first time, if device cannot get connected with server, please check the following steps:
 - 1) Check whether the connection of power-line is correct,
 - 2) Check whether SIM card is installed correctly please refers to the installation manual;
 - 3) Check whether the power switch is toggled to “ON”, the switch is in the left of the SIM card’s slot.
 - 4) Whether ACC ignition cable is connected, please turn on the ACC with key after it is connected.
 - 5) Check the LEDs’ status. In normal working status
 - 6) Check whether GPS is located, if not, please drive to the open areas for positioning.

- If AOT120G is “offline” status in Server, first of all check the 2 LED’s and check the SIM card status:
 - 1) Call the SIM card number of the device to check whether you can get through
 - 2) Check whether the vehicle is in no GSM area, such as basement
 - 3) Check whether the Jamming area of GSM/GPS
 - 4) Check whether your SIM card balance
 - 5) Check whether the SIM card supports GPRS
 - 6) Check the parameter setup, whether the device IMEI number, GPRS sending interval is correct;

- If the device’ GPS function is normal, but cannot locate for a long time, please check whether the installation setup of device is correct:
 - 1) Please make sure the AOT120G logo side face is up;
 - 2) Please make sure there is no electromagnetic wave- absorbent object (metal) above the device, especially the thermal-protective coating on the windshield, it may affect the GPS reception of the device;

- If GPS cannot receive the signals normally (there is high building around to interfere with GPS reception), please drive to the open areas for positioning. Generally, it needs 1-2 minutes to receive the first coordinates.

- If GSM cannot receive the signals normally, please check whether SIM card is installed correctly or there is no GSM signal at the location you are, such as basement parking, please drive to a place covered by GSM signal reception