

# **SP900**

## **User Manual**



**V0.1\_091012**

## Federal Communications Commission (FCC) Statement

### 15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

### 15.105(b)

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.

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 of the device.

### FCC RF Radiation Exposure Statement:

For body worn operation, this phone has been tested and meets FCC RF exposure guidelines when used with an accessory that contains no metal and that positions the handset a minimum of 1.5 cm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines."

## **Features :**

- GSM/SMS/GPRS communication.
- Dual-band GSM (900/1800/MHz or 850/1900MHz) and GPRS class10.
- Support quickly GPS fix function.
- Located information via GPS position or GSM cell ID.
- Emergency button for immediate rescue/action & located exact location
- Voice Monitor function.
- Low Battery alarm
- Vibrating function
- GeoFence areas
- Real time tracking function: located with preset time interval, distance interval or smart mode.
- Remote command via SMS or GPRS.
- Configuration via USB, SMS or GPRS.
- The capability of data logger is able to record up 50,000 data positions.
- Built-in buffer storage, the capability to record up to 5,000 data positions.

## Specification :

<b>GSM Frequency</b>	<b>GSM 850/900/1800/1900 system</b>
<b>GPS Channels</b>	<b>51-channel acquisition 14-channel tracking</b>
<b>GPS Start Time</b>	<b>Hot Start: 1 sec, Warm Start: 25 sec, Cold Start: 29 sec</b>
<b>Position Accuracy</b>	<b>Position 2.5m CEP</b>
<b>Default Datum</b>	<b>WGS84</b>
<b>Operating Temperature</b>	<b>-20℃~ 55℃</b>
<b>Humidity</b>	<b>5%~ 95% Non-condensing</b>
<b>Dimension</b>	<b>89.5 x 48.5 x 19 mm</b>
<b>Battery</b>	<b>Rechargeable 950mAh Li-ion battery (3.7V)</b>
<b>Battery Life</b>	<b>Standby(GSM ON, GPS OFF): 150 hrs Sleep(GSM OFF, GPS OFF): 180 days Full function(GSM ON, GPS ON): 10 hrs Real time tracking every 30 minutes(GSM ON, GPS ON at preset time interval): 40 hrs</b>
<b>Charging</b>	<b>DC 5V</b>
<b>LCD Screen</b>	<b>1.44" CSTN</b>
<b>Key</b>	<b>11 keys: Quick dial key x4 Answer key, Hang up key Volume key x2 Power key, SOS key, Reset key</b>
<b>USB Port</b>	<b>Mini USB port for charging</b>
<b>Waterproof</b>	<b>IPX4</b>
<b>Certification</b>	<b>CE, FCC, PTCRB</b>
<b>Accessories</b>	<b>AC charger, Carry bag</b>

## **1.Active the device for first time use**

<b>Step</b>	<b>Server</b>	<b>Device</b>
1.		Setting IMEI、Phone Number of GPRS in device user interfaces, and send “request for active” to server. <b><u>Example:</u></b> <b>@RP0,IMEI,Phone_number*Checksum</b>
2.	Get the device IP and Active status.	
3.	Send “Has been activated” to device. <b><u>Example:</u></b> <b>\$AK0,IMEI*checksum</b>	
4.		Received “activation” status and than respond ACK. <b><u>Example:</u></b> <b>@AK0,IMEI*checksum</b>
5.		Disconnect GPRS, and enter standby state.
6.	<b>Make a phone call to device via VOIP</b>	
7.		<b>@AKVO,IMEI*checksum</b>
8.	<b>\$AKVO,IMEI*checksum</b>	

## 2. Send “Tracking” command to the device

Step	Server	Device
1.	Make a phone call to device via VOIP	
2.		When the phone comes in hangs up directly, and connects the server (Without numbers of phonebook). <u>Example:</u> @AKVO,IMEI*checksum
3.	Receive the device IP/Port and then exchange “Tracking” command to device. <u>Example:</u> \$CM,IMEI,code1,Aa2,Ac1,Ja1,Jb20,Jc0,Jd5,Je3,Ka4,Kg10,Kh40,Lc4 *checksum \$CM,IMEI,code2,..... *checksum	
4.		Receive “Tracking” command and then respond “ACK” to server. <u>Example:</u> @AKCM,IMEI,code1*checksum @AKCM,IMEI,code2*checksum
5.		Disconnect GPRS, and enter Tracking state.

Codeword	Parameter	Description
\$CM		Command head
IMEI		
code	1~65535	1~65535
Aa	2	Select Working Mode
Ac	1	Operation Mode Set Tracking
Ja	1	Report Sentence Set RP1
Jb	20(10~86400)	Report Message Period Time: 20sec
Jc	5	Report Message Of Number: 5times
Jd	5	Time Out For Receive ACK: 5sec
Je	3	Retry Report Of Number: 3times
Ka	4	GPS ON For Report Mode
Kg	7	GPS Report On Ahead Time: 10sec
Kh	40	GPS Report On Fix Time: 40sec
Lc	4	Tracking Report Type Set UDP
*xx	Ending of report messages	*Checksum

### 3. Send “Standby” command to the device

1.	Make a phone call to device via VOIP	
2.		When the phone comes in hangs up directly, and connects the server (Without numbers of phonebook). <b>Example:</b> @AKVO,IMEI*checksum
3.	Receive the device IP/Port and then exchange “Standby” command to device. <b>Example:</b> \$CM,IMEI,code1,Ac0*checksum \$CM,IMEI,code2,...*checksum	
4.		Receive “Standby” command and then respond “ACK” to server. <b>Example:</b> @AKCM,IMEI,code1*checksum @AKCM,IMEI,code2*checksum
5.		Disconnect GPRS, and enter Tracking state.

Codeword	Parameter	Description
\$CM		Command head
IMEI		
code	GRT define	1~65535
Ac	0	Operation Mode Set Normal
*xx	Ending of report messages	*Checksum

#### 4. The format of device tracking report messages

Step	Server	Device
1.		Position report to server via UDP in tracking state. <u>Example:</u> @RP1,IMEI,GPS_Status,UTC_Date,UTC_Time,Latitude,Longitude,Altitude,Speed,Azimuth,Number_of_satellites,HDOP,Battery_capacity,Alarm_status*checksum
2.		If has not received the "ACK" in 5 seconds, will report one time again.
3.	Receive position and then respond "ACK" to device. <u>Example:</u> \$AK1,IMEI*checksum	
4.		Receive "ACK", and disconnect GPRS.

Codeword	Parameter	Description
	Head of report messages	@RP0=Active report @RP1=Position report
	IMEI Code	
	GPS status	1=not fix 2=2D fixed 3=3D fixed 4=DGPS fixed
	UTC Date, Time	ddmmyy,hhmmss
	Coordinate for D+M units (Latitude, Longitude)	ddmm.mmmm(N or S), dddmm.mmmm(E or W)
	Altitude	xxxx.x Unit: meters
	Azimuth	xxx unit: degree 0~360
	Number of satellites being tracked	xx 0~12
	HDOP	x.x
	Battery capacity	xx



		unit: percent capacity
	Alarm status	1=SOS alarm 2=Low battery alarm
	Ending of report messages	*Checksum

## 5. Send “GeoFence” Alarm to the device

Step	Server	Device
1.	<p>Receive the device IP/Port/Position and then exchange “GeoFence” Alarm to device.</p> <p><b>geo-fence in(1)</b></p> <p><u>Example:</u></p> <p><b>\$GF,IMEI,1,code1,tracker_name,geofence_name,time_yyyymmdd_hhmmss,tel_number*checksum</b></p> <p><b>\$GF,011412000076319,1,1,car,myhome,2009081320:30:15,0933222333*checksum</b></p> <p><b>geo-fence out(0)</b></p> <p><u>Example:</u></p> <p><b>\$GF,IMEI,0,code2,tracker_name,geofence_name,time_yyyymmdd_hhmmss,tel_number*checksum</b></p> <p><b>\$GF,011412000076319,0,2,car,myhome,2009081320:30:15,0933222333*checksum</b></p>	
2		<p>Receive “GeoFence” Alarm and then respond “ACK” to server.</p> <p><u>Example:</u></p> <p><b>@AKGF,IMEI,1,code1*checksum</b></p> <p><b>@AKGF,011412000076319,1,1*checksum</b></p> <p><b>@AKGF,IMEI,0,code2*checksum</b></p> <p><b>@AKGF,011412000076319,0,2*checksum</b></p>

Codeword	Parameter	Description
<b>\$GF</b>		<b>Command head</b>
<b>IMEI</b>		
<b>IN/OUT</b>		<b>1 = IN, 0 = OUT</b>
<b>code</b>	<b>1~65535</b>	<b>1~65535</b>
<b>geofence_name</b>		<b>User define</b>

tel_number		User define
*xx	Ending of report messages	*Checksum

## 6. Send “POI” Alarm to the device

Step	Server	Device
1.	<p>Receive the device IP/Port/Position and then exchange “POI” Alarm to device.</p> <p><u>Example:</u></p> <p>\$PO,IMEI,code1,tracker_name,POI_name,time_yyyymmdd_hhmmss,tel_number*checksum</p> <p>\$PO,011412000076319,1,car,my home,20090813 20:30:15,0933222333*checksum</p> <p>\$PO,IMEI,code2,tracker_name,POI_name,time_yyyymmdd_hhmmss,tel_number*checksum</p> <p>\$PO,011412000076319,2,car,my home,20090813 20:30:15,0933222333*checksum</p>	
2		<p>Receive “POI” Alarm and then respond “ACK” to server.</p> <p><u>Example:</u></p> <p>@AKPO,IMEI,code1*checksum</p> <p>@AKPO,011412000076319,1*checksum</p> <p>@AKPO,IMEI,code2*checksum</p> <p>@AKPO,011412000076319,2*checksum</p>

Codeword	Parameter	Description
\$PO		Command head
IMEI		
code	1~65535	1~65535
POI_name		User define
tel_number		User define

<b>*xx</b>	<b>Ending of report messages</b>	<b>*Checksum</b>

## 7. The format of device tracking report(Data buffer form device) messages

Step	Server	Device
1.		<p>Position report to server via UDP in tracking state.</p> <p><u>Example:</u></p> <p>@RP2,IMEI,GPS_Status, UTC_Date1,UTC_Time1,Latitude,Longitude,Altitude,Speed,Azimuth,Number_of_satellites,HDOP,Battery_capacity,Alarm_status*checksum</p> <p>@RP2,IMEI,GPS_Status, UTC_Date2,UTC_Time2,Latitude,Longitude,Altitude,Speed,Azimuth,Number_of_satellites,HDOP,Battery_capacity,Alarm_status*checksum</p>
2.		If has not received the "ACK" in 5 seconds, will report one time again.
3.	<p>Receive position and then respond "ACK" to device.</p> <p><u>Example:</u></p> <p>\$AK2,IMEI, UTC_Date1,UTC_Time1*checksum</p> <p>\$AK2,IMEI, UTC_Date2,UTC_Time2*checksum</p>	
4.		Receive "ACK", and disconnect GPRS.

Codeword	Parameter	Description
	Head of report messages	@RP0=Active report @RP1=Position report @RP2=Position report(Data buffer from device)
	IMEI Code	
	GPS status	1=not fix 2=2D fixed 3=3D fixed 4=DGPS fixed
	UTC Date, Time	ddmmyy,hhmmss
	Coordinate for D+M units (Latitude, Longitude)	ddmm.mmmm(N or S), dddmm.mmmm(E or W)
	Altitude	xxxx.x Unit: meters
	Azimuth	xxx unit: degree 0~360
	Number of satellites being tracked	xx 0~12
	HDOP	x.x
	Battery capacity	xx unit: percent capacity
	Alarm status	1=SOS alarm 2=Low battery alarm
	Ending of report messages	*Checksum

## 8. Send “Set up phone number” command to the device

Step	Server	Device
1.	Make a phone call to device via VOIP	
2.		When the phone comes in hangs up directly, and connects the server (Without numbers of phonebook).  <b>Example:</b> <b>@AKVO,IMEI*checksum</b>
3.	Receive the device IP/Port and then exchange “Set up phone number” command to device.  <b>Example:</b> <b>\$CM,IMEI,code1,Exxxxxxxxxxx*checksum</b> <b>\$CM,IMEI,code2,Exxxxxxxxxxx,Ebxxxxxxxxxx</b> <b>xx,Ecxxxxxxxxxxx,Edxxxxxxxx*checksum</b> <b>\$CM,IMEI,code3,Hxxxxxxxxxxx,Hbxxxxxxxxxx</b> <b>xxx,Hcxxxxxxxxxxx,Hdxxxxxxxx*checksum</b> <b>\$CM,IMEI,code4,Gxxxxxxxxxxx,Gbxxxxxxxxxx</b> <b>xxx,Gcxxxxxxxxxxx,Gdxxxxxxxx*checksum</b>	
4.		Receive “Tracking” command and then respond “ACK” to server.  <b>Example:</b> <b>@AKCM,IMEI,code1*checksum</b> <b>@AKCM,IMEI,code2*checksum</b> <b>@AKCM,IMEI,code3*checksum</b> <b>@AKCM,IMEI,code4*checksum</b>
5.		Disconnect GPRS, and enter Tracking state.

Codeword	Parameter	Description
	Ee	Phone number for SOS
	Ea, Eb, Ec, Ed	Phone number for quick dial
	Ha, Hb, Hc, Hd	Phone number for monitoring
	Ga, Gb, Gc, Gd	Phone number for call in()

## 9. The format of device Add 、Delete 、Edit PhoneBook

### (Via Binary)

Step	Server	Device
1	Make a phone call to device via VOIP	
2		When the phone comes in hangs up directly, and connects the server (Without numbers of phonebook). <b>Example:</b> <b>@AKVO,IMEI*checksum</b>
3	Send phonebook message to device via UDP. <b>Example:</b> <b>\$PBA PhoneBook_Index IMEI</b> <b>PN_LenPhoneNumbeName_LenName TypeHotDial_IndexSOS_Index\r\n</b> <b>(For Binary)</b>	
5		Receive message and then respond "ACK" to server. <b>@AKPBA,IMEI, PhoneBook_Index *checksum</b> <b>@AKPBD,IMEI,</b> <b>PhoneBook_Index ,MoveIndex*checksum</b> <b>@AKPBE,IMEI, PhoneBook_Index *checksum</b>
6		Disconnect GPRS, and enter Tracking state.

Lenth	Parameter	Description
4	Head of report messages	\$PBA = Add Phonebook \$PBD = Delete Phonebook \$PBE = Edit Phonebook
15	IMEI Code	
1	PhoneBook_Index	
1	PN_Len	Phone Number length
36	PhoneNumber	Phone Number
1	Name_Len	Name length
36	Name	Name
1	Type(1 bytes)	0x01 = Dial 0x02 = Call IN 0x04 = Voice Monitor 0x08 = SOS ※ 2,3 互斥;1 (2,3) 4 可複選
1	HotDial_Index	1~4
1	SOS_Index	1~4
1	Ending of report messages	Checksum