COMMUNICATION PROTOCOL

1. GPRS setting

For GPRS function, we need to do following settings first.

1.1 APN

APN (Access Point Name), it's decided by the provider of communication network.

Set APN	
Command	apn+password+space+ APN content
Example	apn123456 internet

If there're APN username and APN password, use following commands

Set APN Username	
Command	apnuser+password+space+content
Example	apn123456 internet
Set APN Password	
Command	apnpasswd+password+space+content
Example	apn123456 internet

1.2 IP and Port

Under GPRS function, all information from tracker will be sent to a certain platform, such as an URL. Every platform or server would has its own IP address and Port number.

Set IP and Port	
Command	adminip+password+space+IP ADDRES+space+PORT
Example	adminip123456 192.168.1.14 1111

The old APN, IP, Port will be removed automatically if you set the new one.

2. GPRMC format

Our format is based on GPRMC format, the GPRMC format should be like:

$GPRMC,053740.000,A,2503.6319,N,12136.0099,E,2.69,79.65,100106,,,A*53

Following table contains the values for the example:

Name	***Example***	***Units***	***Description***
Message ID	$GPRMC		RMC protocol header
UTC Time	053740.000		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	2503.6319		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12136.0099		dddmm.mmmm

E/W Indicator	E		E=east or W=west
Speed over ground	2.69	knots	True
Course over ground	79.65	degrees	
Date	100106		ddmmyy
Magnetic variation		degrees	
Variation sense			E=east or W=west (Not shown)
Mode	A		A=autonomous, D=DGPS, E=DR
Checksum	*53		
<CR> <LF>			End of message termination

3. Our format for STC solution (default).

Our default format is like following:

S/N + Authorized Number + GPRMC + UTC Time + Status+ Latitude + N/S Indicator + Longtitude + W/E Indicator + Speed + Bearing + Date + Magnetic variation + Variation sense + Mode + Checksum + Signal + Command + IMEI number + CRC16 checksum.

For example:

0711011831,+8613145826126,GPRMC,103148.000,A,2234.0239,N,11403.0765,E,0.00,,011107,,,A*75,F,imei:352022008228783,101\x8D

0711011831,+8613145826126,GPRMC,103148.000,A,2234.0239,N,11403.0765,E,0.00,,011107,,,A*75,F,help me, imei:352022008228783,101\x8D

Following table contains the values for the example:

Name	***Example***	***Units***	***Description***
Serial Number	0711011831		ID of a certain message
Authorized Number	+8613145826126		
Signal (GPS)	F		F=normal, L=low
Command	help me		
IMEI Number	352022008228783		ID of the tracker
CRC16 checksum	101\x8D		

4. Our format for ARM solution (advanced).

Our default format is like following:

S/N + Authorized Number + GPRMC + UTC Time + Status+ Latitude + N/S Indicator + Longtitude + W/E Indicator + Speed + Bearing + Date + Magnetic variation + Variation sense + Mode + Checksum + Signal + Command + IMEI number + Satellite + Altitude + Battery status + Battery voltage + Length + CRC16 checksum.

For example:

0711011831,+8613145826126,GPRMC,103148.000,A,2234.0239,N,11403.0765,E,0.00,1,011107,,,A*75,F,imei:352022008228783,05,8.3,F:3.8V, 122,101\x8D

Following table contains the values for the example:

Name	***Example***	***Units***	***Description***
Bearing	1	degree	Course over ground
Satellite	05		Receive valid signal from 5 satellites
Altitude	8.3	m	
Battery status	F		F=normal, L=low
Battery voltage	3.8V		
Length	122		Length of the whole GPRS string

Attachment: GPS Receiver Spec

Chip	SiRF Star III GSC3f 7879	
Frequency	L1 1575.42MHz, C/A code	
Channels	20	
Update rate	1Hz	
Sensitivity	Tracking	-159dBm
	Cold start	-144dBm
Acquisition Time	Hot start (Open Sky)	< 1s
	Hot start (Indoor)	< 15s
	Cold Start (Open Sky)	< 35s
Position Accuracy	Autonomous	< 10m (2D RMS)
	SBAS	< 5m (2D RMS)
Max. Altitude	< 60,000 ft	
Max. Velocity	< 1,000 knots	
Protocol Support	NMEA 0183 ver 3.0	4800 bps, 8 data bits, no parity, 1 stop bits (default) 1Hz: GGA, GLL, GSA, RMC, VTG 0.2Hz: GSV[1]
	SiRF Binary	38400 bps, 8 data bits, no parity, 1 stop bits

Ps: For more detailed command, please see the《Instruction List》