V521 Personal GPS Tracker

Instruction Manual V3.0

Content

Chapter One Preface

I. Overview

V521 is a perfect combination of GSM and GPS technologies. The advanced technologies of the product in GSM and GPS fields are verified by its accurate dimension and simple appearance. It represents a typical design integrating the communication product and GPS positioning.

We provide professional safety-guarding and car-positioning products and solutions.

Before you use the product, please take some time and go through this instruction manual to understand operational details and receive better services.

II. Notice

1. Please read the instruction manual carefully and operate the product properly to avoid any trouble.

2. It is recommended to install the product in a professional automobile workshop to ensure operating safety and concealment of installation.

3. The instruction manual is only for your reference. In case of any difference between the manual and the actual product, the latter shall prevail.

4. Product parameters and functions are subject to upgrade without notice. In case of any question, please contact us or your distributor.

Chapter Two Device Description

I. Brief Introduction

V521 Portable GPS tracker is a mini remote positioning tracking device based on GPS technology and GSM/GPRS technology. It receives the latitude and longitude of the user's location through cell phone messages and then locates the tracker on Google Map or other digital map software; or positioning data is uploaded by the tracker to the specified server through GPRS, and the user may search the real-time position and historical track of the tracker on the internet.

This product is widely used in the aged and the children care, property safeguard, animal tracking, etc.

II. Product characteristics

1. Built-in high-performance GPS chipset enables the product to provide accurate positioning in the event of weak signal and to work normally in urban area, valleys or other sight-limited districts.

2. Built-in GSM/GPRS model supports GSM805/900/1800/1900MHz, thus it can work throughout the world.

3. It supports SMS communications or GPRS TCP connection, and receives position information through cell phone message or used to look into movement track on internet.

4. It provides SOS function.

5. It is equipped with highly reliable electric circuit design and complies with GSM cell phone international standards.

6. It is portable, mignon and low power consumption.

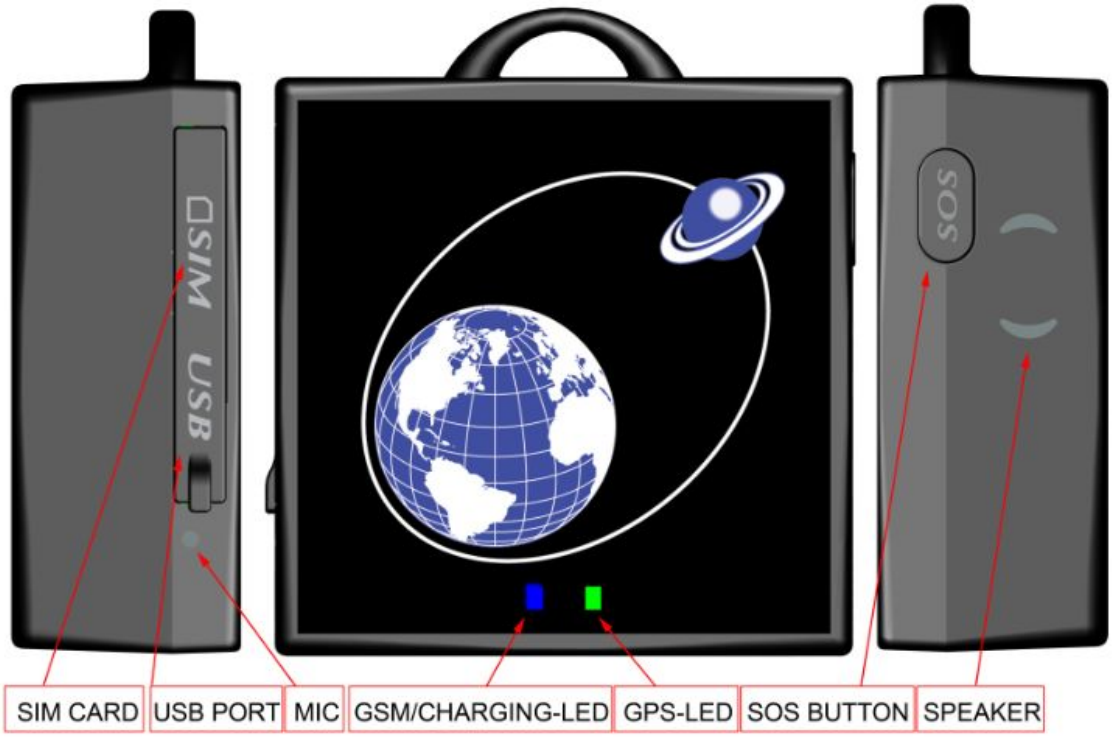
III. Usage

1. Specifications

Hardware	**Parameter**
GSM module	**GSM 850/900/1800/1900 Quad band** **Supports TCP protocol**
GPS chip	**U-blox-7**
GPS sensitivity	**-160dBm**
GPS frequency	**L1,1575.42MHz**
Code	**C/A Code**
Channel	**210-channel, omnibearing tracking**
Position accuracy	**10 meters, 2D RMS**
Speed accuracy	**0.1m/s**
Time accuracy	**1us and synchronous with GPS time**
Coordinates	**WGS-84**
Reacquisition	**0.1s on average**

Hot start	**1s on average**
Warm start	**38s on average**
Cold start	**42s on average**
Altitude Limit	**Maximum 18,000 meter (60,000 feet)**
Velocity limit	**Maximum 515m/s (1000 knot)**
Acceleration Speed limit	**Less than 4g**
Working temperature	**-25℃to 70℃**
Humidity	**5%~95% non-concretion**
Dimension	**50mm*50mm*20mm**
Voltage	**1200mAh, rechargeable battery(3.7V)**
Charger	**DC 5V**

2. Product appearance



3. LED status description

3.1 Green LED ---- GPS status indicator

Status	Description

ON	GPS unavailable
Quick flash(1s/time)	GPS available

3.2 Blue LED ---- GSM status indicator

Status	Description
ON	GSM unavailable
Slow flash (6s/time)	GSM works normally

4. Description for button's function

Button	Description
Power switch	Insert the sim card it will power on automatically, press the sim card eject to power off.
SOS key	Short press the key to accept calling-in Long press 3 seconds, V521 will vibrate and send the position information to the prestored 3 user phone numbers (or upload it to the server via the internet), meanwhile, dial the first user phone number, if failure

5. SIM card installation

a. Select SIM card

● You can use SIM card provided by local mobile operators.

● It supports SMS/GPRS function and has enough balance.

6. Switch on/off

Insert the sim card to power on , press the sim card then eject to power off.

A hint: how to obtain better GPS signal:

1. Outdoors or open area.

2. Place V521 face up.

7. Product accessories

1. V521 personal tracker

2. One USB charging line

3. One car charger or mobile charger

4. Instruction manual (CD)

Chapter Three Initial Use and Model Description

After reading the brief introduction to the product, you must know how to install the product. Then it comes to product's use after SIM card is installed.

Firstly, as the user of such product, you need to pre-store telephone number before performing instruction operation on the device. Telephone number is pre-stored as follows:

Instruction format: sos+number(1,2,3)+phone number

For example: sos113900000000

Description: If V521 receives the instruction and returns confirmation message "SET USER NUMBER (1-3) OK", then pre-stored number will be set successfully.

Clear instruction format: sos+number(1,2,3),

For example: sos1

If V521 receives the instruction it will remove the pre-store number, then reply the message "CLEAR USER NUMBER (1-3) OK",

Note: 1. Initial password for the device is 0000.

2. The device can pre-store 3 telephone numbers at most.

3. The instruction also applies to new number which covers existing number. For example, A is the first pre-stored number. If B also sends instruction to set the first pre-stored number, number of B will substitute number of A and become the first pre-stored number.

I. Working mode of device

The product has the following two working modes: SMS mode (message point to point) and GPRS online mode.

1. If the user only wants to inquire for vehicle position (longitude and latitude) with cell phone, corresponding address on Google map, please select SMS mode.

2. If the user wants to monitor vehicle real-time status and inquire for its historical track, please select GPRS real-time online mode.

II. Switchover between the two modes

The following instruction may be used to switch over between the two modes.

Message (SMS) point-to-point mode:

Instruction format: 700 (4 digits)

For example: 7000000

Description: When V521 receives the instruction, it will automatically switch to SMS mode. After success, it will return confirmation message "SET MODE OK, CURRENT MODE: SMS P2P".

GPRS online working mode:

Instruction format: 710 (4 digits)

For example: 7100000

Description: When V521 receives the instruction, it will automatically switch to GPRS mode. After success, it will return confirmation message "SET MODE OK, CURRENT MODE: GPRS".

Chapter Four Application and Operation in SMS Mode

Most instructions are operable under both SMS mode and GPRS mode unless otherwise specified.

1. Instruction to request single positioning

Instruction format: 666

Description: When V521 receives the instruction, it will return current Google link.

Note: 1. In case of cold start and GPS is not positioned, invalid message will be returned: GPS UNAVAILABLE, PLEASE TRY AGAIN LATER.

2. Instruction to return Chinese address for single positioning

Instruction format 1: 667

For example: 667

Instruction format 2: 667+MAP

For example: 667MAP

Description:

1. When the device receives instruction 1, it will immediately read GPS information and return Chinese address information to the sending number.

For example: Within 31 meters southwest of juhao east gate on Jing East Road in Shenzhen

2. Send instruction 2 and a website will be returned. Open it to view current position and screenshot:

For example: http://www.gps068.com/cngps/mapaddr.asp?lng=114.09998&lat=22.55709&z=15&w=240&h=320

3 The instruction is only valid in China mainland.

3. Instruction to return Google map screenshot link for single positioning

Instruction format 1: 668

For example: 668

Description: 1. After the device receives instruction, it will read GPS information immediately and return Google map screenshot address of local position. Open the website to view position information.

Example of screenshot website is as follows:

http://maps.google.com/maps/api/staticmap?center=22.557118,114.100010&zoom=15&size=240x320&markers=22.557118,114.100010&sensor=true

4. Instruction to return map link for single positioning

Instruction format: 669

For example: 669

Description: When the device receives the instruction, it will read GPS information immediately and return Google map link of local position to the number. User can use PDA or smart phone to view local position on Google map.

Website example:

http://maps.google.com/maps?f=q&hl=en&q=22.554765,114.104716&ie=UTF8&z=16&iwloc=addr&om=1

Note: If the server cannot be connected after the above stated 3 instructions (667/668/669) are sent or due to other cause, the following messages will be returned.

1) If the server cannot be connected, it will return: SERVER BUSY, PLEASE TRY AGAIN LATER.

2) If GPS is not available, it will return GPS UNAVAILABLE, PLEASE TRY AGAIN LATER.

3) When you use Google map in China mainland, there may be deviation between the positioned position and

the actual position in special cases.

5. Instruction to report on time everyday

Instruction format: 665+HHMM

For example: 6651022

Close timing report: 665+OFF

For example: 665OFF

Description: After receiving the instruction, the device will immediately return confirmation information: SET DAILY REPORT OK.

Note: 1. Using this instruction, the user may receive a piece of positioning information at a stated time, with its format as shown in “Single positioning request”.

2. HH stands for hour with defined range of [00, 23]. MM stands for minute with defined range of [00, 59].

6. Instruction for calling switch

1>Instruction format of calling off: 150

For example: 1500000

2>Instruction format of calling on: 150

For example: 1510000

Description: 1. After receiving instruction of calling off, V521 will turn off calling function (including SOS, power failure warning calling, fence warning calling, overspeed warning) and return confirmation message “SET VOICE CALL: OFF”.

2. After receiving instruction of calling on, V521 will turn on calling function (including SOS, power failure warning calling, fence warning calling, Overspeed warning) and return confirmation message “SET VOICE CALL: ON”.

Note: 1. In case of calling off, when SOS, power failure warning, fence warning or overspeed warning occurs, message will be returned instead of call.

2. Default setting is calling function on.

7 Monitoring function (mute switch of earphone)

Instruction format: 00X

For example: 001 or 000

Description: When receiving the instruction, the device will set status of earphone switch in accordance with X value.

X=1, earphone is switched off and the device is in monitoring mode. After setup is successful, the device will send confirmation information to the sender: SET PROFILE OK, CURRENT PROFILE: SILENT. After earphone is turned off, if prestored phone calls in, the terminal will not give prompt sound. About 10 seconds later, the phone will be answered automatically. The user can hear sound from the device side but the device side cannot hear the user.

When X=0, the earphone is turned on. After setup is successful, the device will send confirmation information to the sender: SET PROFILE OK, CURRENT PROFILE: NORMAL. After earphone is turned on, if prestored phone calls in, there will be prompt sound. About 10 seconds later, the phone will be answered automatically. Both parties can converse with each other. After conversation the device will return position information with the same format as "request for single positioning”. Information status is STATUS: ANSWER. If non-prestored phone

number calls in, it will be hung up without other response.

Note: Default setting is earphone on (non-monitoring status).

8. Instruction for incoming call restriction switch

Instruction for incoming call restriction on: 170

For example: 170

Instruction for incoming call restriction off: 171

For example: 171

Description: After success to receive the instruction for incoming call restriction on (170), V521 will return confirmation message: SET UNLIMITED MODE OFF OK. At this time, the device can only receive incoming call from 3 prestored numbers. Incoming call from non-prestored number will be hung up without other response.

After success to receive the instruction for incoming call restriction off (171), V521 will return confirmation message: SET UNLIMITED MODE ON OK. The device can answer incoming call from any cell phone.

Note: Default setting is incoming call restriction on.

9. Phone positioning function

Description: If incoming call is from one of the three prestored phone numbers and it is hung up after ringing for 2-5 times, the device will send position information with the same format as “request for single positioning” to the incoming call number. The information status is STATE: CALL. If non-prestored phone number calls in, it will be hung up without other response.

10 Emergency alarm (SOS)

Description: Press SOS key for over 3 seconds to send positioning information with information format returned from “request for single positioning” to the three prestored phone numbers. Information status is STATE: SOS. At the same time, the first prestored phone number will be called. If it fails (the phone is turned off or cannot be connected), the second and the third phone number will be called in sequence.

Note: If calling status is off, message will be sent to prestored user instead of calling him.

11. Geo-fence function

Geo-fence of the device has the following two modes: round geo-fence and square geo-fence.

Round geo-fence takes the set coordinates as center of circle and uses the set semi-diameter to determine fence scope. Square geo-fence uses 4 known latitude and longitude points to determine a square fence.

When the function is activated, once V521 steps beyond fence scope, it will send positioning information with the information format returned by above stated “request for single positioning” to the three prestored numbers. Information status is STATE: OS. At the same time, the first prestored phone number will be called. If it fails (the phone is turned off or cannot be connected), the second and the third phone number will be called in sequence.

When V521 enters fence scope again, it will send positioning information with information format returned from “request for single positioning” to the three prestored number immediately. Information status is STATE: RS. At the same time, the first prestored phone number will be called. If it fails (the phone is turned off or cannot be connected), the second and the third phone number will be called in sequence.

11.1 Setting of round geo-fence scope

The user may at his discretion select the following formats to operate according to the input different formats of coordinates.

Instruction format 1: 005Rzzz.z

For example: 005R0.1

Description: After success to receive the instruction, V521 will extract current longitude and latitude information as fence coordinate from the latest GPS data and takes R value as radius. It also turns on geo-fence and send confirmation message to the sender: GE0-FENCE ON.

Note: zzz.z is radius with definition domain of [0.1, 999.9].

1>Instruction to turn on round geo-fence

1. Turn on geo-fence: 211

After receiving the instruction, V521 will return confirmation message: GEO-FENCE ON.

2>Turn off round geo-fence instruction: 210

After receiving the instruction, V521 will return confirmation message: GEO-FENCE OFF.

Note: 1. Fence radius shall not exceed its defined domain. When decimal digit is 0, please add 0. For example, when R is 1, please enter 1.0.

2. If calling status is off, message will be sent to prestored user instead of calling him.

3. Degree and minutes is of sexagesimal system, i.e., 1d=60m.

11.2 Setting of square geo-fence scope

Instruction format: 006GX, IO/I/O, E/W longitude upper limit + N/S latitude upper limit, E/W longitude lower limit + N/S latitude lower limit.

For example: 006G1,IO,E114.10004N22.55705,E115.10006N23.55706

After receiving the instruction, V521 will return confirmation message: SET SQUARE GEO-FENCE GX (IO/I/O) OK.

Description: GX is geo-fence X, whose value range is [1, 16]. IO means warning for both outgoing and incoming fence; I means warning for incoming fence; O means outgoing fence. Longitude and latitude value take degree as unit. 5 digits after decimal point shall be reserved and 0 shall not be omitted.

IO means warning for both outgoing and incoming fence; I means warning for incoming fence; O means outgoing fence.

Note: (1) After setting is completed, fence is turned on automatically. Now, default fence type is IO, i.e., warning for both outgoing and incoming fence.

(2) If calling status is off, message will be sent to prestored user in SMS mode instead of calling him.

(3) Value set by the instruction is not subject to power off or switch on/off until change instruction or restoration operation is received again.

(4) After restoration, longitude value is indicated by 0. Fence is in shutoff status.

1>Turn on square geo-fence

Instruction format to turn on all square geo-fence: 311

For example: 311

Description: The instruction is used to turn on all square geo-fence and turn on single square geo-fence. GX stands for geo-fence X, whose value range is [1, 16]. After receiving the instruction, V521 returns confirmation message: SET ALL SQUARE GEO FENCE: ON.

2>Instruction to turn off square geo-fence

Instruction format to turn off all rectangular geo-fence: 310

For example: 310

I

Description: The instruction is used to turn on all rectangular geo-fence and turn on single rectangular geo-fence. GX stands for geo-fence X, whose value range is [1, 16]. After receiving the instruction, V521 returns confirmation message: SET ALL SQUARE GEO FENCE: OFF.

Notice: Above stated geo-fences are optional. When the device receives geo-fence setting instruction, geo-fence function will be activated automatically. When geo-fence function is activated again after turned off, previous setting remains valid.

13. Low battery alarm

In case of too low working voltage (electricity quantity), V521 will send position information with information format of returned "request for single positioning" to the prestored three numbers. Information status will be updated to STATE: LP. The information will be sent for 3 times with an interval of 1 minute.

16. Instruction to set GPS status

Message instruction may make GPS in three statuses: on/off/self adapting. GPS is switched on when delivered from the factory or reset.

1>Instruction to turn on GPS

Instruction format: opengps

Description: After receiving the instruction, V521 will return confirmation message: GPS ON OK.

2>Instruction to turn off GPS

Instruction format: closegps

Description: After receiving the instruction, V521 will return confirmation message: GPS OFF OK.

17. Instruction to change time zone setting

Instruction format: 896 + D + NN

For example: 896E08

Description: After receiving the instruction, V521 will return confirmation message: TIME ZONE SET OK,CURRENT：E8.

1. D takes E or W to indicate east or west time zone respectively. N takes a 2-digit number (1-12) to indicate time zone number.

2. After success to set 896000E08, all time-related data will be GPS time plus 8. After success to set 896000W07, all time-related data will be GPS time minus 7.

3. Default value is Greenwich time (UTC).

Note: When the instruction is set, data upload time in GPRS mode will not change. If the user wants to change data upload time, please refer to instruction 897 in GPRS mode in the next chapter.

Chapter Five Application and Operation in GPRS Mode

Send “710” to switch to GPRS mode. In the mode, V521 can also prestore three phone numbers (No.1, No.2 and No.3), a set of TCP/IP server IP address and port number, 4-digit GPRS password and an APN number at GPRS access point. Instructions in SMS mode can also be used in GPRS mode.

1. Set GPRS access point (Access Point Name)

Instruction format 1: #803#APN##

For example: #803#CMNET##

Instruction format 2: #803#APN#APN user name# APN password##

Description: After receiving the instruction, V521 will return confirmation message: SET GPRS APN OK.

Note: 1. As different GSM/GPRS service providers provide different APN, please select instruction format 1 or 2 in accordance with the APN provided by your local service provider.

2. APN is CMNET at the factory or after reset. APN is constituted by 3~35 characters which may be alpha, number, dot (.), underscore (_) or hyphen (-). APN user name and APN password are respectively constituted by 3~30 characters which may be numbers or alphas.

2. Set IP address and port

Instruction format: #804#IP address#port##

For example: #804#210.83.225.181#6998##

Description: After receiving the instruction, V521 will return confirmation message: SET SERVER IP AND PORT OK.

3 Set timing data upload

Instruction format: #805# sampling interval T# uploaded data quantity each time N##

For example: #805#10#6##

Description: After receiving the instruction and confirming that is correct, V521 will send confirmation message to the sender “SET GPS SAMPLING TIME AND QUANTITY OK”.

Note: 1. Sampling time T takes second as unit, whose defined domain is [10, 59999]. Uploaded data number N for each time has a defined domain of [1, 50].

4 Phone upload

Description: When one of the three prestored phone numbers calls in and is hung up after ringing for 2-5 times, it will operate as “immediately upload current position” . Status prompt is CALL.

5. Emergency upload

Description: Press SOS key for more than 3 seconds, and the device will operate as “instruction to immediately upload current position”; the status indicates SOS. At the same time, it will call the first prestored

number. If it fails (the phone is turned off or cannot be connected), the second and the third phone number will be called in sequence.

Note: If calling status is off, it will send position message to the server instead of calling the phone.

6. Low voltage upload

If working voltage of V521 is lower than set value, and the device will operate as “instruction to immediately upload current position” and add “LP” auxiliary attribute into data status to show current status. The information will be sent for 3 times with an interval of 1 minute.

7. Instruction to change time zone setting in GPRS mode

Instruction format: 897 + D + NN

For example: 897E08

Description: After receiving the instruction, V521 will return confirmation message: TIME ZONE SET OK,CURRENT：DN（For example: TIME ZONE SET OK,CURRENT：E8）.

Note 1. D takes E or W to indicate east or west time zone. NN takes a 2-digit number (1-12) to indicate time zone number.

2. If successes to set 897E08, GPRS data upload time will be GPS time plus 8. If successes to set 897W07, GPRS data upload time will be GPS time minus 7.

3. Default value is Greenwich time (UTC).

4. The instruction is available for data upload in GPRS mode only.

Warranty

The following after services are provided in order to serve and satisfy the customers:

Ⅰ. Warranty scope:

1. The product may be replaced free of charge within 30 days since purchase in the event that it is ineligible when normal operation (man-made sabotage excluded) and without dismantlement.

2. The product will be maintained and repaired by V-SUN free of charge within one year after purchase if it meets with trouble in normal operation due to ineligible quality and without dismantlement.

3. The product shall be repaired upon payment beyond warranty period.

4. the product shall be repaired after the authorization of Mictrack.

Ⅱ. Exemption clauses

Any damage or malfunction of fittings incurred by user's improper operation, maintenance, or storage;

2. Any damage or malfunction caused due to majeure such as rain, natural disaster, etc.

The instruction manual subjects to successive update without prior notice. Please contact our sales manager or technicians if needed.