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# GPS Vehicle Tracker

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User Manual

V6.1

VT320

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## 1 Product Overview

VT320 is a GPS/GSM/GPRS tracking device specially developed and designed for vehicle real-time tracking and fleet management.

With superior GPS and GPRS modules, VT320 has good sensitivity and stable performance. It can get accurate GPS fix even in remote places.

VT320 has the following functions and features:

- ↻ SMS and GPRS TCP/UDP Communication
- ↻ Track on Demand
- ↻ Show Location Directly on Mobile Phone
- ↻ Track by Time Interval
- ↻ SOS Panic Button
- ↻ Movement Alarm
- ↻ Geo-fencing Control
- ↻ Low Battery Alarm
- ↻ Speeding Alarm
- ↻ GPS Blind Area Alarm (in/out)
- ↻ Power-cut Alarm
- ↻ Engine Cut (Stop Engine)



## 2 For Your Safety

Read these simple guidelines. Not following them may be dangerous or illegal.

### Proper Connection

When connecting with other device, read carefully its manual so as to carry out correct installation. Do not connect it to other incompatible devices.

### Qualified Accessories

Use original parts, qualified batteries and peripheral equipments to avoid damage to VT320.

### Safe Driving

Drivers should not operate this product while driving.

### Qualified Service

Only qualified personnel can install or repair VT320.

### Water Resistance

VT320 is not water resistant. Keep it dry. Install it inside the vehicle

### Confidential Phone Number

For safety reason, do not tell other people the mobile phone number of your VT320 without taking precautions of security settings.

## 3 VT320 Characteristics

Items	Specification
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Power Supply	+9V - +36V / 1.5A
Backup Battery	850mAh
Normal power consumption	85mA/h
Dimension	115mm x 60mm x 21mm
Installation Dimension	115mm x 79mm x 21mm
Weight	140g
Operating temperature	-20° to 55° C
Humidity	5% to 95% Non-condensing
Frequency	GSM 900/1800/1900Mhz or GSM 850/900/1800/1900Mhz (optional)
GPS Chipset	latest GPS SIRF-Star III chipset
GPS Sensitivity	-158Db
GPS Frequency	L1, 1575.42 MHz
C/A Code	1.023 MHz chip rate
Channels	20 channel all-in-view tracking
Position Accuracy	10 meters, 2D RMS
Velocity Accuracy	0.1 m/s
Time Accuracy	1 us synchronized to GPS time
Default datum	WGS-84
Reacquisition	0.1 sec., average
Hot start	1 sec., average
Warm start	38 sec., average
Cold start	42 sec., average
Altitude Limit	18,000 meters (60,000 feet) max.
Velocity Limit	515 meters/second (1000 knots) max.
LED	1 LED light to show working status.
Button	One SOS button
Interface	One input and one output

## 4 Getting Started

This section will describe how to set up your VT320.

### 4.1 Hardware and Accessories

VT320 is supplied in a box which includes:



VT320



GPS Antenna



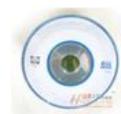
GSM Antenna



Relay



Wires with SOS Button



CD

## 4.2 Functional Parts



GSM: GSM Antenna

ON/OFF: Power key

S\_Key: SIM Card Slot key

L\_gsm: GSM Status led

GPS: GPS Antenna

USB: Serial cable

L\_gps: GPS status led

Wire Socket: Wire cables

SIM: SIM Card Slot

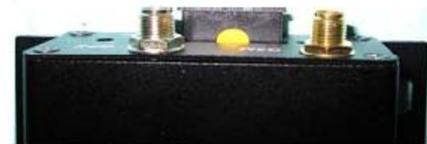
## 4.3 Hardware installation

### 4.3.1 Simcard Installation

Read this manual before using your VT320 and check if all parts are included in the packaging box. Ensure that your VT320 has a working SIM installed.

*Check that the SIM has not run out of credit (test the SIM in a phone to make sure it can send and receive SMS)*

*Check that the SIM Lock code is turned off  
If you require the function of sending an SMS location report to the authorized phone number when it makes a call to the VT305, please make sure the SIM installed supports displaying caller ID.*



Before inserting SIM card, cut off the power for the AVL unit.

### 4.3.2 Antennas Installation

Connect the GSM Antenna to the unit.

Connect the GPS Antenna to the unit.



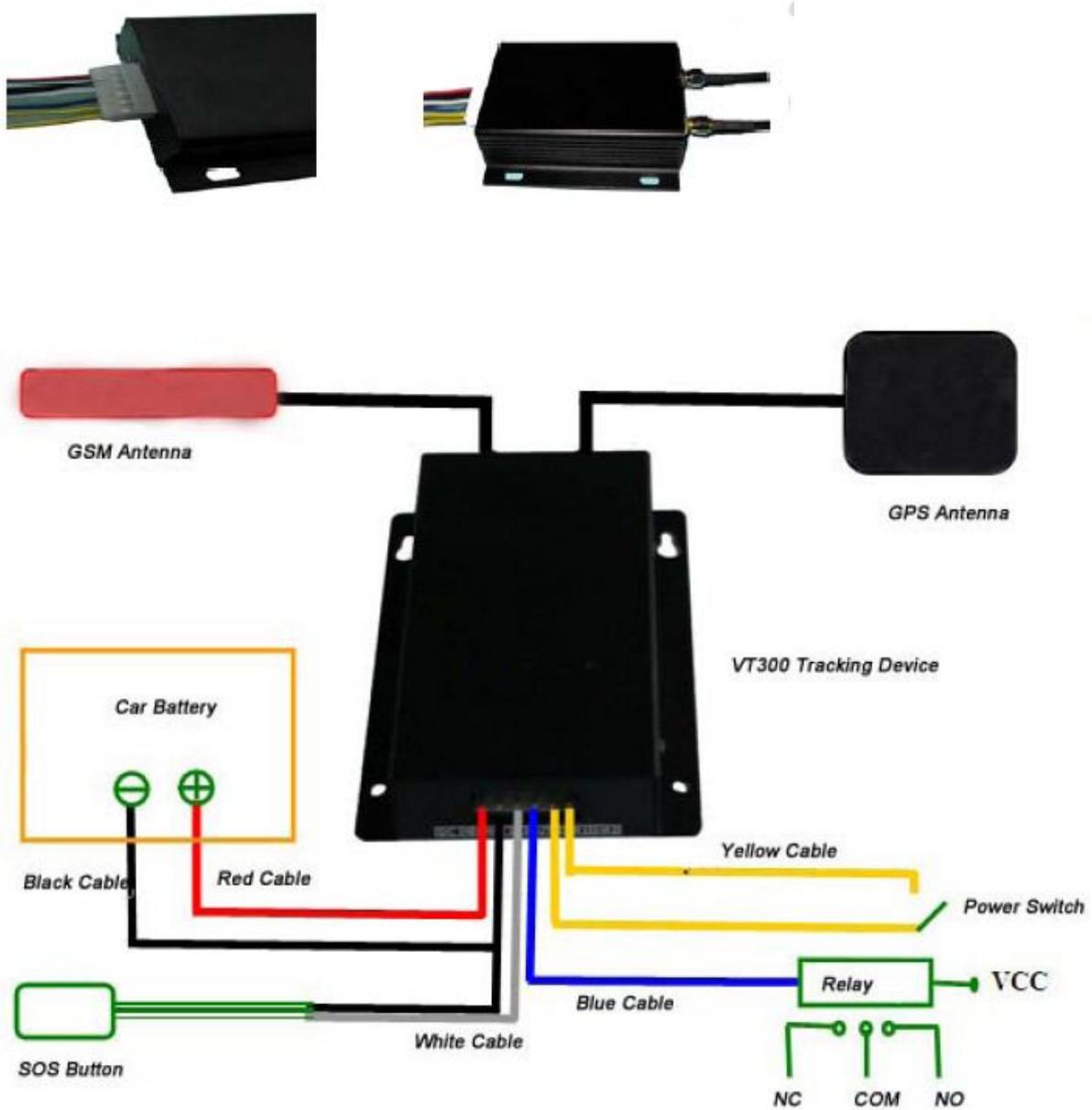
*GPS antenna is used to receive satellite signals in the sky. It should be fixed to face the sky and should not be covered or shielded by any objects containing metal, such as the metallic windshield.*

Find a suitable place inside the car for installing the unit. Wiring connections must be firm and reliable and the joints should be wrapped with insulating tape tightly. The unused electrical wire should be properly insulated.

Check if all wirings have been connected correctly and then connect the unit to

the motor power.

### 4.3.3 Wire cables Installation



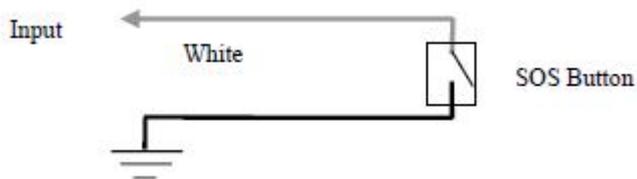
### 4.3.4 Descriptions of PINs

Pin	Color	Function
1	Red	Input voltage: 9V~35V. 12V suggested.
2	Black	GND
3	White	Digital Inputs (SOS button)
4	Blue	Output (Relay)
5	Yellow	Digital Input ,IN2
6	Yellow	Digital Input,IN3

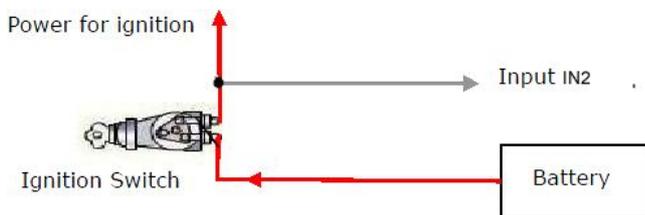
### Examples of Interfacing Application

Inputs:

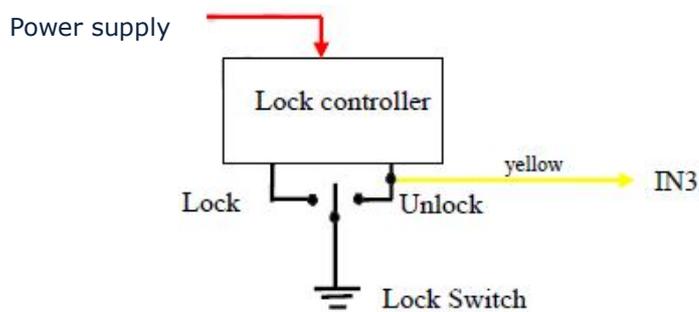
IN1:SOS button



IN2 :Detect status of engine ignition

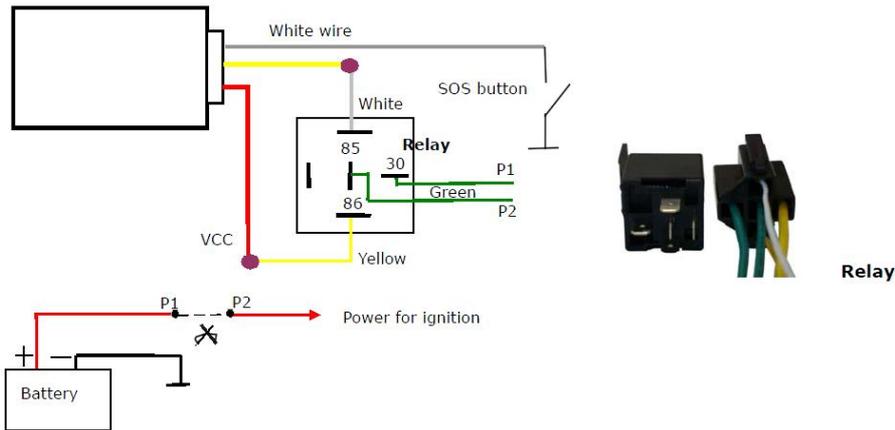


IN3 :Detect status of door



Output:

OUT:Cut off engine



#### 4.4 Led Indications

##### RED LED - indicating GPS status

On	One or more inputs are active
Flashing ( every 0.1 second)	The unit is being Initialized
Flashing (on for 0.1 second and off for 2.9 seconds)	VT320 has a GPS fix
Flashing (on for 1 second and off for 2 seconds)	VT320 has no GPS fix

##### Green LED - indicating GSM status

On	One call is coming in/ one call is being made
Flashing ( every 0.1 second)	The unit is being Initialized
Flashing (on for 0.1 second and off for 2.9 seconds)	VT320 is connected to the GSM network
Flashing (on for 1 second and off for 2 seconds)	VT320 is not connected to the GSM network

#### Track by SMS Command

VT320 will only accept commands from a user with the correct password. Commands with wrong password are ignored. The default password is 000000.

#### 5. Change Password

**Command:** W\*\*\*\*\*,001,#####

**Description:** Change user's password.

**Note:**

1. \*\*\*\*\* is user's password and the default password is 000000. The tracker will only accept commands from a user with the correct password. Commands with wrong password will be ignored.
2. ##### is the new password. Password should be 6 digits.

**Example:**

W000000,001,123456  
W123456,001,999999

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## 6. Time Zone

**Command:** W\*\*\*\*\*,032,T

**Description:** Correct time into your local time

**Note:**

T=0, to turn off this function

T=[1, 65535] to set time difference in minute to GMT. Default value is GMT

For those ahead of GMT, just input the time difference in minute directly.

For example, W000000,032,120

`-` is required for those behind GMT. For

example, W000000,032,-120.

## 7. Track

### 7.1 Track by SMS

- Track on Demand - Reply with longitude, latitude, speed and date

**Command:** W\*\*\*\*\*,000

**Description:** Get the current location of the tracker, send this SMS or make a telephone call directly to the tracker and it will report its longitude and latitude by SMS with format as follows:-

Latitude = 22 32 36.63N Longitude = 114 04 57.37E, Speed = 2.6854Km/h, 2008-12-24,01:50

**Example:**

W000000,000

### 7.2 Track by Calling

Make a missed call to the tracker and it will report its longitude and latitude by SMS with format as follows:-

Latitude = 22 32 36.63N Longitude = 114 04 57.37E, Speed = 2.6854Km/h, 2008-12-24,01:50

### 7.3 Track by Preset Interval

**Command:** W\*\*\*\*\*,002,XXX

**Description:** Set an interval for the tracker to continuously return its location by SMS

**Note:**

1. XXX is the interval in minute.
2. If XXX=000 to turn off tracking by time

**Example:**

W000000,002,030

The tracker will send location data back to your mobile phone every 30 minutes.

### Stop Track by Preset Interval

Description: Automatic timed reports will stop once VT320 receives stop command.

Command: W\*\*\*\*\*,002,000

Example:

SMS sent: W000000,002,000

SMS received: Set Timer Ok/000  
VT320 will stop automatic timed report

## 7.4 Google Earth and Google Map

Download Google Earth from <http://earth.google.com/>.

Start Google Earth (For more information about Google Earth please refer to <http://earth.google.com/>) or go to <http://maps.google.com> in your Internet Explorer

Input the latitude and longitude that you receive from the tracker by SMS and click the search button. Google Earth or Google Maps will display the location for you.

Example:

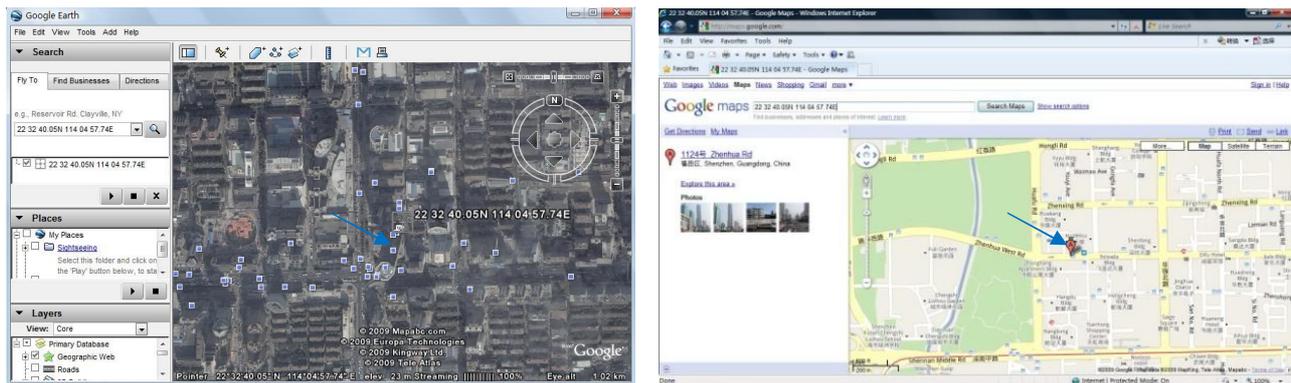
When you receive: Latitude = 22 32 40.05N Longitude = 114 04 57.74E

Type as the following picture shows:

(Note: you should input the latitude and longitude as: 22 32 40.05N 114 04 57.74E)



And then you can find the location of your tracker:



Or you can use local map software on PDA or car navigation device to input the coordinates.

## 7.5 Track by GPRS between Server and Tracker

### 7.5.1 Set Tracker's GPRS ID

**Command:** W\*\*\*\*\* ,010,ID

**Description:** Sets a digital GPRS ID for the tracker.

**Note:**

GPRS ID must not over 14 digits.

**Example:**

W000000,010,00001

### 7.5.2 Set APN

**Command:** W\*\*\*\*\* ,011,APN,Username,Password

**Description:** Set APN details for the tracker

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**Note:**

1. APN username and password are optional. If no APN username and password are required, just input APN only;
2. APN defaulted as 'CMNET';
3. APN + username + password should not over 39 characters.

**Example:**

W000000,011,CMNET,abcd,6688  
W000000,011,CMNET

**7.5.3 Set IP and Port**

**Command:** W\*\*\*\*\*,012,IP,Port

**Description:** Set IP and Port for tracker for GPRS communication.

**Note:**

1. IP is your server's IP or the domain name.
2. Port: [1,65534]

**Example:**

W000000,012, 220.121.7.89,8500  
W000000,012,www.abcd.net,8500

**7.5.4 Enable GPRS Tracking**

**Command:** W\*\*\*\*\*,013,X

**Description:** Enable GPRS tracking function.

**Note:**

- X=0, to turn off GPRS tracking (default);  
X=1, to enable GPRS tracking via TCP

**Example:** W000000,013,1

**7.5.5 Set GPRS Interval**

**Command:** W\*\*\*\*\*,014,XXXXX

**Description:** Set time interval for sending GPRS packets.

**Note:**

- XXXXX should be in five digits and in unit of 10 seconds.  
XXXXX=00000, to turn off this function;  
XXXXX=00001~65535, time interval for sending GPRS packet and in unit of 10 seconds.  
In this example, the tracker will send every 600 seconds (10 minutes).

**Example:** W000000,014,00060

The tracker will send every 600 seconds (10 minutes).

**8. Set Mobile phone number for SOS alarm**

**Command:** W\*\*\*\*\*,003,F,1,T

**Description:** Authorize phone numbers for the SOS button for receiving location reports and SMS alarms.

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**Note:**

F=0, to turn off this function (default)

F=1, to send SMS;

F=2, to call phone number;

F=3, to send message and call

T: Preset phone number. Max 16 digits

For example:

Send

W000000,003,1,1,+8613512345678

Reply: SetTel Ok/1,1, +8613512345678

## 9. Low Battery Alarm

**Command:** W\*\*\*\*\*,004,X

**Description:** When the tracker's voltage is lower than the preset value, it will send an SMS alarm to the authorized phone number for SOS.

**Note:** X is the preset value of voltage.

=0 , to turn off this function	=1, <3.3V	=2 , <3.4V
=3 , <3.5V (default)	=4 , <3.6V	=5 , <3.7V

**Example:** W000000,004,2

## 10. Speeding Alarm

**Command:** W\*\*\*\*\*,005,XX

**Description:** Turns on speeding alarm. When the tracker speeds higher than the preset value, it will send an SMS to the phone number for SOS.

**Note:** XX is the preset value of speed and in 2 digits.

=00 , to turn off this function

= [01, 20] (unit: 10Km/h)

**Example:** W000000,005,08

When the tracker's speed is over 80km/h, an SMS alarm will be sent out.

## 11 Movement Alarm

**Command:** W\*\*\*\*\*,006,XX

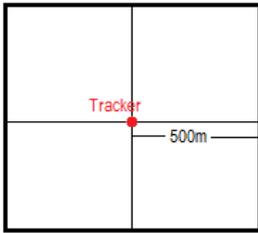
**Description:** When the tracker moves out of a preset square scope, it will send an SMS alarm to the authorized phone number for SOS.

**Note:** XX is the preset distance to the tracker's original place.

=00, to turn off this function

=01, 30m	=02, 50m	=03, 100m	=04, 200m
=05, 300m	=06, 500m	=07, 1000m	=08, 2000m

**Example:** W000000,006,06



When tracker moves out of this square scope, it will send out an SMS alarm.

**Remarks:**

- 1. Only one alarm can be set in either In or Out;**
- 2. Only one alarm can be set in either Movement Alarm**

**12 Output Control**

**Command:** W\*\*\*\*\*,020,1,F

**Description:** Send this command to control the Output of VT320

**Note:**

F=0, to close the output (open drain);

F=1, to open the output (low voltage).

**Example:** W000000,020,1,1

Once the relay is properly installed, send this command to stop the engine.

**13. Initialization**

**Command:** W\*\*\*\*\*,990,099###

**Description:** This is to make all settings (except for the password) back to factory default.

**Note:** Turn on the device, press the SOS button for five times continuously and the red LED will be on, and then send (within 120 seconds) this SMS to the tracker.

### is the ending character and is required in the text message.

**Example:** W000000,990,099###

**14. Password Initialization**

**Command:** W888888,999,666

**Description:** This is to make the password back to factory default in case you forget your password.

**Note:** Turn on the tracker, press the SOS button for five times continuously and the red LED will be on, and then send this SMS (within 120 seconds) to the tracker to make the password back to factory default (000000).

Example: W888888,999,666

## Annex 1. SMS Command List

Note: \*\*\*\*\* is user's password and the default password is 000000. The tracker will only accept commands from a user with the correct password. Commands with wrong password will be ignored.

Description	SMS Command	Example
<b>Track on Demand</b>	W*****,000	W000000,000
Remarks: To get the current location of the tracker, send this SMS or make a telephone call directly to the tracker and it will report its longitude and latitude by SMS with format as follows:- Latitude = 22 32 36.63N Longitude = 114 04 57.37E, Speed = 2.6854Km/h, 2008-12-24,01:50		
<b>Track on google link</b>	W*****,100,#####	W000000,100,123456
Remarks: Send this command to the tracker and then you receive an SMS with an http link.		
<b>Change Password</b>	W*****,001,#####	W000000,001,123456
Remarks: To change user's password. ##### is the new password. Password should be 6 digits.		
<b>Track by Interval</b>	W*****,002,XXX	W000000,002,030
Remarks: To set interval for automatic timed report. XXX is the interval in minute. If XXX=000 to turn off tracking by time. In this example, the tracker will send location data back to your mobile phone every 30 minutes.		
<b>Set Mobile phone number for SOS alarm</b>	W*****,003,F,1,T	W000000,003,1,1,88888888
F=0, to turn off this function (default) F=1, to send SMS; F=2, to call phone number; F=3, to send message and call T: Preset phone number. Max 16 digits		
<b>Low Battery Alarm</b>	W*****,004,X	W000000,004,2
Remarks: When the tracker's voltage is lower than the preset value, it will send an SMS alarm to the authorized phone number for SOS. X is the preset value of voltage.		
=0 , to turn off this function	=1, <3.3V	=2 , <3.4V
=3 , <3.5V (default)	=4 , <3.6V	=5 , <3.7V
<b>Speeding Alarm</b>	W*****,005,XX	W000000,005,08
Remarks: When the tracker speeds higher than the preset value, it will send an SMS to the authorized phone number for SOS. XX is the preset value of speed and in 2 digits. =00 , to turn off this function =[01, 20] (unit: 10Km/h) In this example, when the tracker's speed is over 80km/h, an SMS alarm will be sent out.		
<b>Movement Alarm</b>	W*****,006,XX	W000000,006,06

Remarks: When the tracker moves out of a preset square scope, it will send an SMS alarm to the authorized phone number for SOS.

XX is the preset distance to the tracker's original place

=00, to turn off this function

=01, 30m	=02, 50m	=03, 100m	=04, 200m
=05, 300m	=06, 500m	=07, 1000m	=08, 2000m

**Extended Functions**

W\*\*\*\*\*,008,ABCDEFGHIJ## # W000000,008,1011100011###

Remarks:

**A=0**, turn off the function of sending SMS location report after a phone call is made to the tracker.

**A=1**, turn on the function of sending SMS location report after a phone call is made to the tracker.

**B=0**, location data of NMEA 0183 GPRMC will be interpreted into normal text for easy reading.

For example, *Longitude = 114 degree - 04 minute -57.74 second, Latitude = 22 degree -32 minute -40.05 second*

**B=1**, location data complies with NMEA 0183 GPRMC protocol.

For example, \$GPRMC,161509.000,A,2232.5485,N,11404.6887,E,0.3,153.7,290709,,\*03

**C=0**, turn off the function to automatically hang up an incoming call.

**C=1**, turn on the function to automatically hang up an incoming call after 4 - 5 rings.

**D=0**, turn off the function of sending an SMS when the tracker is turned on.

**D=1**, turn on the function of sending an SMS to the authorized phone number for SOS when the tracker is turned on.

**E**, defaulted as 1 (the tracker shuts down automatically when the power voltage is lower than 3V).

**F=0**, turn off the SMS alarm when the tracker enters GPS blind area.

**F=1**, turn on the SMS alarm when the tracker enters GPS blind area. SMS is to be sent to the authorized phone number for SOS.

**G=0**, all LEDs work normally.

**G=1**, all LEDs stop flashing when the tracker is working.

**H**, reserved and defaulted as '0'

**I=0**, turn off the function of sending SMS alarm when the extra power of the tracker is cut.

**I=1**, turn on the function of sending an SMS alarm to the authorized phone number for SOS when the extra power of the tracker is cut.

**J**, reserved and defaulted as '1'

**###** is the ending character

(ABCDEFGHIJ defaulted as 1000100001)

**Presetting by SMS for GPRS tracking (Ensure that your SIM card supports GPRS connection prior to setting)**

**Set Tracker's GPRS ID**

W\*\*\*\*\*,010,ID W000000,010,00001

Remarks: to set a digital GPRS ID for the tracker.

GPRS ID must not over 14 digits.

**Set APN**

W\*\*\*\*\*,011,APN,Username, Password W000000,011,CMNET,abcd,6688 W000000,011,CMNET

Remarks: If no APN username and password are required, just input APN only;

APN defaulted as 'CMNET';

APN + username + password should not over 39 characters.

<b>Set IP and Port</b>	W*****,012,IP,Port	W000000,012, 220.121.7.89,8500 W000000,012,www.abcd.net,8500
Remarks: IP is your server's IP or the domain name. Port: [1,65534]		
<b>Enable GPRS Tracking</b>	W*****,013,X	W000000,013,1
Remarks: X=0, to turn off GPRS tracking (default); X=1, to enable GPRS tracking via TCP		
<b>Set GPRS Interval</b>	W*****,014,XXXXX	W000000,014,00060
Remarks: to set time interval for sending GPRS packets. XXXXX should be in five digits and in unit of 10 seconds. XXXXX=00000, to turn off this function; XXXXX=00001~65535, time interval for sending GPRS packet and in unit of 10 seconds. In this example, the tracker will send every 600 seconds (10 minutes).		
<b>Veer Report</b>	W*****,036,degree	W000000,036,90
Remarks: when the heading direction of the tracker changes over the preset degree, a message with location data will be sent back to the server by GPRS. degree=0, to turn off this function. degree=[1,360], to set degree of direction change.		
<b>Output Control</b>	W*****,020,1,F	W000000,020,1,1
Remarks: F =0, to close the output (open drain)      =1, to open the output (low voltage) For example, if you have connected Output1 with a relay, you can send W000000,020,1,1 to stop the engine.		
<b>Set time zone</b>	W*****,032,T	W000000,032,480
Remarks: Default time of the tracker is GMT, you can use this comment to correct it to your local time. This command is for SMS tracking only. T=0, to turn off this function. T=[1, 65535] to set time difference in minute to GMT. For those ahead of GMT, just input the time difference in minute directly. For example, GMT+8, W000000,032,480 '-' is required for those behind GMT. For example, W000000,032,-120.		
<b>Get Version No. and Serial No.</b>	W*****,600	W000000,600
Remarks: to get the version and serial number of tracker's firmware		
<b>Get IMEI</b>	W*****,601	W000000,601
Remarks: to get IMEI of the tracker		
<b>Initialization</b>	W*****,990,099###	W000000,990,099###
Remarks: Turn on the device, press the SOS button for five times continuously and the red LED will be on, and then send (within		

120 seconds) this SMS to the tracker to make all settings (except for the password) back to factory default. ### is the ending character.		
<b>Return to factory settings</b>	W888888,999,666	W888888,999,666
All parameters will be initialized include password.		

## Annex 2. Troubleshooting

<b>Problem: Unit will not turn on</b>	
<b>Possible Cause:</b>	<b>Resolution:</b>
Wiring was not connected properly	Check and make sure wiring connection is in order.
Battery needs charging	Recharge battery
<b>Problem: Unit will not respond to SMS</b>	
<b>Possible Cause:</b>	<b>Resolution:</b>
GSM antenna was not installed properly	Make VT320 connected to GSM network.
GSM Network is slow	Some GSM networks slow down during peak time or when they have equipment problems.
Unit is sleeping	Cancel sleeping mode
Wrong password in your SMS or wrong SMS format	Write correct password or SMS format
The SIM in VT320 has run out of credit	Replace or top up the SIM card
No SIM card	Insert a working SIM card. Check in phone that the SIM can send SMS message.
SIM card has expired	Check in phone that the SIM can send SMS message. Replace SIM card if needed.
SIM has PIN code set	Remove PIN code by inserting SIM in you phone and deleting the code.
SIM is warped or damaged	Inspect SIM, clean the contacts. If re-inserting does not help try another to see if it will work.
Roaming not enabled	If you are in a different country your SIM account must have roaming enabled.
Error connecting GSM antenna	Make sure the GSM antenna is connected to the GSM interface.
<b>Problem: SMS received starts with 'Last...'</b>	
<b>Possible Cause:</b>	<b>Resolution:</b>
Unit does not have clear view of the sky	Move the antenna of the unit to a location where the sky is visible.
VT320 is in an inner place	Wait for the target to come out
Battery is low	Recharge the unit and the GPS will start working.
Error connecting GPS antenna	Make sure the GPS antenna is connected to the GPS interface.
<b>Problem: Unit Fails to Connect to Server via GPRS</b>	
<b>Possible Cause:</b>	<b>Resolution:</b>

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SIM card in VT320 does not support GPRS function	Enable SIM card GPRS function.
GPRS function of VT320 is turned off	Turn on GPRS function of VT320.
Incorrect IP address or PORT	Get the right IP address and PORT and reset to VT320.
GSM signal is weak	Move the unit to a location with good GSM reception.