GPS Vehicle Tracker
User Guide V1.2
VT900

Contents

1. Poduct Overview

VT900 is a GPS/WCDMA based tracking device, specially developed and designed for vehicle real-time tracking and fleet management.

VT900 has an inbuilt GPS module to obtain accurate position data. This device utilizes its GSM/WCDMA capability to send position data to a specified mobile phone or server base for tracking and fleet management.

With internal memory, VT900 can store GPS coordinates when there is no GPRS/WCDMA connection, or at a specified interval requested by the user.

One optional feature of VT900 is that a RS232 port Can connect RFID card reader, magnetic card reader and other external equipment.

VT900 has the following functions and features:

- ✧ SMS and GPRS/WCDMA TCP/UDP Communication
- ✧ AGPS (with GSM/WCDMA/WCDMA Base Station ID)
- ✧ Track on Demand
- ✧ Show Location Directly on Mobile Phone
- ✧ Track by Time Interval
- ✧ Track by Distance
- ✧ Anti-Jammer (optional)
- ✧ GSM/WCDMA Blind Area Memory
- ✧ Internal Memory for Logging
- ✧ Inbuilt Motion Sensor for Power Saving
- ✧ Movement Alarm
- ✧ Geo-fencing Control
- ✧ Low Battery Alarm
- ✧ Speeding Alarm
- ✧ GPS Blind Area Alarm (in/out)
- ✧ Power-cut Alarm
- ✧ Engine Cut (Stop Engine)
- ✧ I/O: 3 digital inputs , 2 outputs and 1 analog inputs, 1 RS232
- ✧ RFID Reader Optional
- ✧ Magnetic Card Reader Optional

2. For Your Safety

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

Proper Connection Do not connect any parts of this product to other incompatible devices. When connecting with other devices, read instructions carefully to ensure proper

installation.

Qualified Accessories Use original parts, qualified batteries and peripheral equipments to avoid damage to VT900.

Safe Driving Drivers should not operate this product while driving.

Qualified Service Only qualified personnel can install or repair VT900.

Water Resistance VT900 is not water resistant. Keep it dry. Install this device inside the vehicle or use a waterproof bag for protection if necessary.

Confidential Phone Number For safety reason, do not tell other people the mobile phone number of your VT900 without taking precautions of security settings.

3. VT900 Characteristics

Items	Specifications
Power Supply	9V - 36V / 1.5A
Backup Battery	500mAh
Normal power consumption	65mA/h
Dimension	65 x 61 x 26mm
Weight	90g
Work time	30 hours in power-saving mode and 7.5 hours in normal mode
Operating temperature	-20° to 55° C
Humidity	5% to 95% Non-condensing
Frequency	VT900-T UMTS/HSDPA: 850/2100MHz GSM/WCDMA/GPRS/WCDMA: 850/900/1800/1900MHz VT900-A UMTS/HSDPA: 850/1900MHz GSM/WCDMA/GPRS/WCDMA: 850/900/1800/1900MHz VT900-E UMTS/HSDPA: 900/2100MHz GSM/WCDMA/GPRS/WCDMA: 900/1800MHz
GPS Sensitivity	-165dB
Position Accuracy	2.5 meters
LED	2 LED lights to show GPS/GSM/WCDMA status
Flash Memory	8MB
Interface	3 digital inputs (2 negative and 1 positive triggering) 1 analog inputs(0~24V) 2 outputs 1 RS232

4. Getting Started

This section will describe how to set up your VT900.

4.1 Hardware and Accessories

VT900 is supplied in a box which includes:

VT900 with battery, GPS antenna, GSM/WCDMA/WCDMA antenna, Wires

4.2 View

4.3 Functional Parts

GPS LED (Blue)	
On	One button is pressed or input is active
Flashing (every 0.1 second)	The GPS module is being initialized
Flashing (0.1 second on and 2.9 seconds off)	VT900 has a GPS fix
Flashing (1 second on and 2 seconds off)	VT900 has no GPS fix
GSM/WCDMA LED (Green)	
On	A call is coming in / a call is being made
Flashing (every 0.1 second)	The GSM/WCDMA/WCDMA module is being initialized
Flashing (0.1 second on and 2.9 seconds off)	VT900 is connected to the GSM/WCDMA/WCDMA network
Flashing (1 second on and 2 seconds off)	VT900 is not connected to the GSM/WCDMA/WCDMA network
GSM/WCDMA	Connect to GSM/WCDMA/WCDMA antenna
GPS	Connect to GPS antenna
Power Key	Press and hold for 3~5 seconds to turn on/off VT900
USB	Used for firmware update, configuration on PC and Read COM log.

PINs Connector		
PIN	**Color**	**Function**
DC	Red	DC In (power input). Input voltage: 9V~36V. 12V/24V suggested
GND	Black	Ground
IN1	White	Digital Inputs. negative triggering
IN2	White	Digital Inputs. negative triggering
IN3	White	Digital Inputs. positive triggering
OUT1	Yellow	Low voltage (0V) when effective and open drain when ineffective Output open drain sink voltage (ineffective): 45V max. Output low voltage sink current (effective): 500mA max.

OUT2	Yellow	Low voltage (0V) when effective and open drain when ineffective Output open drain sink voltage (ineffective): 45V max. Output low voltage sink current (effective): 500mA max.
AD	Blue	10 Bits Resolution Analog Inputs. Input voltage: 0~24V
RS232 Port		
PIN1		DC 5V output
PIN2		Ground
PIN3		VT900 RX
PIN4		VT900 TX

4.4 Connecting and Installation

Read this manual before using your VT900. Check to make sure all parts are included in the packaging box.

4.4.1 Ensure that your VT900 has a working SIM card installed.

- Check that the SIM card has not run out of credit
- Check that the SIM card 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 VT900, please make sure the SIM installed supports displaying caller ID.
- Before inserting SIM card, power down VT900

4.4.2 Antenna Connection

- Connect the GSM/WCDMA/WCDMA Antenna to VT900.
- Connect the GPS Antenna to VT900.
- GPS antenna should be fixed to face the sky, (It is recommended to place this device under the windshield) and should not be covered or shielded by any objects containing metal.

4.4.3 Instal VT900

- Find a suitable place inside the car for installing VT900. Wiring connections must be firm and reliable. The joints should be wrapped tightly with insulating tape. The unused electrical wire should be properly insulated.
- Check to make sure all wirings have been connected correctly. Then connect the AVL unit to the motor power.
- Make a missed phone call the VT900 using a mobile phone to check if the call can go through. The VT900 should reply with an SMS indicating longitude, latitude, speed and google link.

5 Track by Phone

Command: W******,000

Description: Send this command or make a phone call to the tracker and you will receive an SMS with an http link. Click on the link and the location will be shown directly on your mobile phone using Google maps. For example:

142161102222,Current! 20161123 15:53,V,0Km/h,http://maps.google.com/?q=22.540103,114.082329

content	explanation	remark
142161102222	Device ID	
Current	Current location	

20161123 15:53	Date and Time，YYYYMMDD hh:mm	The Event Time
V	GPS invalid	GPS status, A is valid, V is invalid
0Km/h	Speed is 0Km/h	GPS speed
http://maps.google.com/?q=22.540103,114.082329	The google link 22.540103 is latitude 114.082329 is longitude	Google link

5.1 Track by Calling

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

Latitude = 22 32 36.63N Longitude = 114 04 57.37E, Speed = 40.5Km/h, 2011-12-24, 01:50

5.2 Track by Preset Interval

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

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

Note:

1. XXX is the interval in minutes;
2. 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.

5.3 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)

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

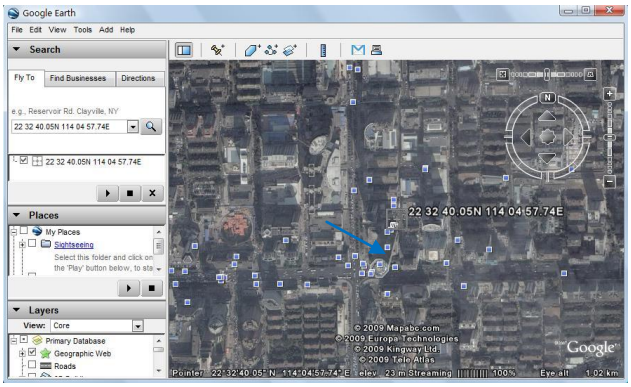
Example:

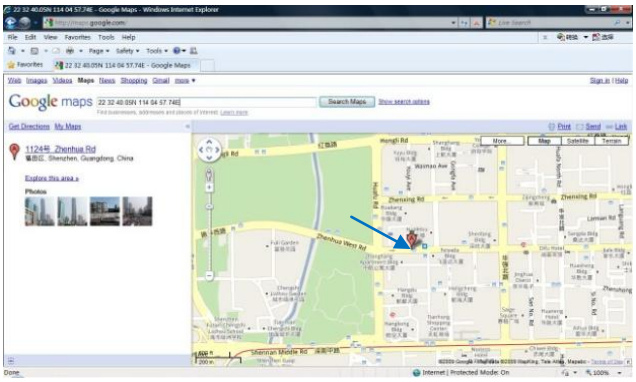
When you receive: Latitude = 22 32 40.05N Longitude = 114 04 57.74E

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:





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

5.4 Track by GPRS/WCDMA between Server and Tracker

5.4.1 Set Tracker's GPRS/WCDMA ID

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

Description: Set a digital GPRS/WCDMA ID for the tracker.

Note: GPRS/WCDMA ID must not be over 14 digits.

Example:

W000000,010,100112112222

5.4.2 Set APN

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

Description: Set APN details for the tracker

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';

Example:

W000000,011,CMNET,internet,internet

W000000,011,CMNET

5.4.3 Set IP and Port

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

Description: Set the IP and Port of tracker for GPRS/WCDMA communication.

Note:

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

Example:

W000000,012, 195.87.7.121,8500

W000000,012,www.domain.com,8500

5.4.4 Set DNS Server IP (optional)

Command: W******,009,DNS Server IP

Description: If the domain name you set by the last command (W******,012,IP, Port) doesn't work, your server IP is not properly set. You can first use this command to set DNS Server IP (please check with your DNS server provider for the DNS Server IP) and then redo the command W******,012,IP, Port.

Example: W000000,009,202.105.21.232

5.4.5 Enable GPRS/WCDMA Tracking

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

Description: Enable GPRS/WCDMA tracking function.

Note:

X=0, to turn off GPRS/WCDMA tracking (default);

X=1, to enable GPRS/WCDMA tracking via TCP;

X=2, to enable GPRS/WCDMA tracking via UDP.

Example: W000000,013,1

5.4.6 Set GPRS/WCDMA Interval

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

Description: Set time interval for sending GPRS/WCDMA 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/WCDMA packet and in unit of 10 seconds.

Example: W000000,014,00060

In this example, the tracker will send every 600 seconds (10 minutes).

5.4.7 Set ACC Off Interval

Command: W******,304,XXXXX

Description: Set ACC off interval for sending GPRS/WCDMA packets when ACC off. Input3 is used as the ACC detect input.

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/WCDMA packet and in unit of 10 seconds.

Example: W000000,304,00060

In this example, the tracker will send every 600 seconds (10 minutes) when ACC off.

5.4.8 Set ACC Off Interval Function

Command: W******,305,X

Description: Set ACC off tracking function, Input3 is used as the ACC detect input.

Note:

X=0, to turn off this function;

X=1, turn on this function.

When enable this function, it will track by ACC off interval(304) with ACC off, and track by time interval(014) with ACC on.

Example: W000000,305,1

In this example, it will turn on this function.

For more information regarding GPRS/WCDMA tracking please refer to GPRS/WCDMA Communication Protocol.

6. Authorization

Command: W******,003,F,P,T

Description: Authorize phone numbers for the SOS/inputs, receiving location reports, SMS alarms or phone calls

Note:

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

F=1, only sends SMS to the authorized phone number;

F=2, only calls the authorized phone number;

F=3, both SMS and calling.

(Note: VT900 doesn't support two-way conversation. Calling only gives ring and reminder to the authorized phone.)

P=1, set an authorized number for SOS button (Input 1);

P=2, set an authorized number for Input 2;

P=3, set an authorized number for Input 3.

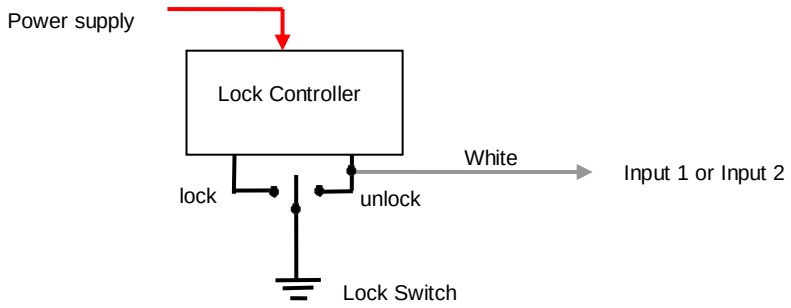
T: Preset phone number. Max.16 digits.

Example:

W000000,003,1,1,88888888

7. Application Examples for Inputs

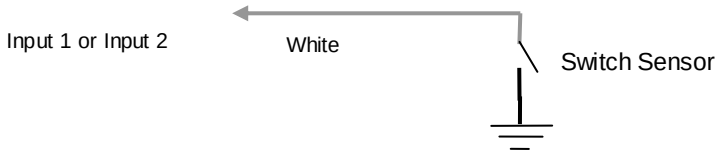
7.1 Detecting Lock Status of Car's Door or Trunk (Car Boot).



When the lock is opened, there will be a negative trigger to Input 1 or Input 2. After this, an SMS alarm will be sent to the authorized phone number, or a GPRS/WCDMA alarm will be sent to the server (please refer to the GPRS/WCDMA Command 0x9999 in **GPRS/WCDMA Communication Protocol**).

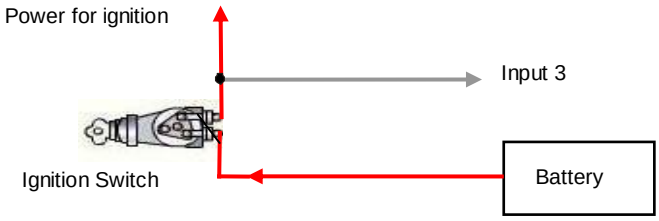
7.2 Connecting with Switch Sensors

The SMS alarm will be sent to the authorized phone number.



7.3 Ignition Detection

Input 3 (positive triggering) can be used for ignition detection. The detection alarm will be sent to the server via GPRS/WCDMA. Please refer to <GPRS/WCDMA Communication Protocol> Alarm Command 0x9999 for more information.



7.4 Analog Input (AD1)

Input voltage should be 0~24V. Please refer to **GPRS/WCDMA Communication Protocol** for more information for AD data.

For example:

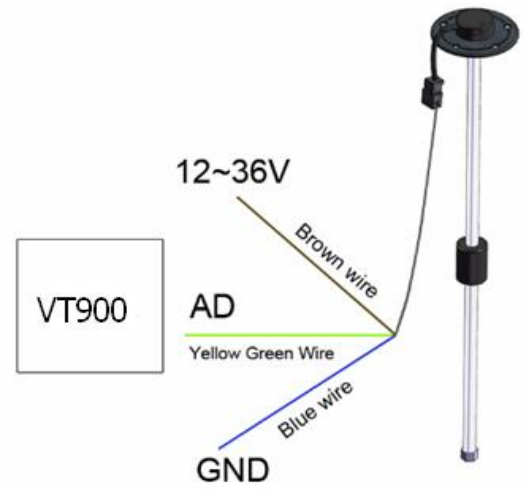
094506.000,A,2232.5412,N,11404.6919,E,0.00,,290709,,*12|1.7|110|0000|00AA,0000

AD is 0x00AA

Voltage Formula: Input Voltage=(AD*24)/1024

0x00AA=>170(decimal)=>(170*24)/1024=3.984375V

Application Example - Fuel Level Sensor



Fuel level sensors supplied by us are voltage-type sensors with output voltage: 0-24V.

The below formula is for calculating the fuel percentage left for this fuel level sensor:

$$\text{Percentage} = \frac{AD * 24}{1024 * 5} * 100\%$$

Note: The value must be converted into decimal, for example, 0x00AA is 170 in decimal.

8. Speeding Alarm

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

Description: Turn on speeding alarm. When the tracker speeds higher than the preset value, it will send an SMS alarm to the authorized 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.

9. Movement/Geo-fence

9.1 Movement Alarm

Command: W******,006,X

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

Note:

1. X is the preset radii to the tracker's original place.

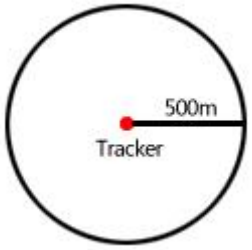
=0, to turn off this function.

=1, 30m	=2, 50m	=3, 100m	=4, 200m
=5, 300m	=6, 500m	=7, 1000m	=8, 2000m

2. Radii: [1, 4294967295] meter(s), suggest to be set above 500 meters.

3. GPRS/WCDMA command is 0x12.

Example: W000000,006,6



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

9.2 Geo-fence Alarm

Command: W******,302,X

Description: Turns on Geo-fencing alarm. When the tracker moves in/out the preset scope, it will send an SMS alarm to the authorized phone number for SOS.

Note:

1. X is the parameters which include: latitude, longitude, radii, in, out.
2. Latitude and longitude should be in ASCII format as follows:

Latitude is ddd.dddddd, '0' is needed to be stuffed if no value available. '-' should be added for south.

Longitude is dd.dddddd, '0' is needed to be stuffed if no value available. '-' should be added for west.

3. Radii: [1, 4294967295] meter(s), suggested to be set above 100 meters, if set above 8, it is corresponding radii.
4. If In and Out are 0, corresponding function is invalid. If In and Out are 1, valid.
5. Reply as Geo-Fence Alarm.
6. GPRS/WCDMA exiting command is 0x12, entering command is 0x13.
7. Send W******, 302 to turn off Geo-fence function.

Example:

W000000,302,22.000000,-114.123456,3000,1,1

Remarks:

1. Only one alarm can be set in either In or Out;

2. Only one alarm can be set in either Movement Alarm or Geo-fence Alarm.

10. Track by Distance

Command: W******,303,X

Description: Send this command to set distance interval

Note:

1. X= [1, 4294967295], suggested to be set above 300 meters;
2. X=0, turn off.

Example: W000000,303,1000

11. Set Sensitivity of Tremble Sensor

Command: W******,035,XX

Description: Send this command to set sensitivity of tremble sensor

Note:

1. XX=[1,255], it will be more sensitive if XX is smaller.
2. Default value is 30.

Example: W000000,035,30

12. Output Control

12.1 Output Control (Immediate)

Command: W******,020,P,F

Description: Send this command to control the Output of VT900

Note:

P=1, Output1;

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

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

Example: W000000,020,1,1

12.2 Output Control (Conditional)

Command: W******,120,A or W******,220,A

Description: Send this command to control the Output of VT900. This command is only workable when the speed is below 10km/h(command 120) or 20km/h(command 220) and GPS is available.

Note:

ABCDE represents Out1 respectively.

If A,

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

=1, to open the output (low voltage);

=2, to remain previous status.

Example:

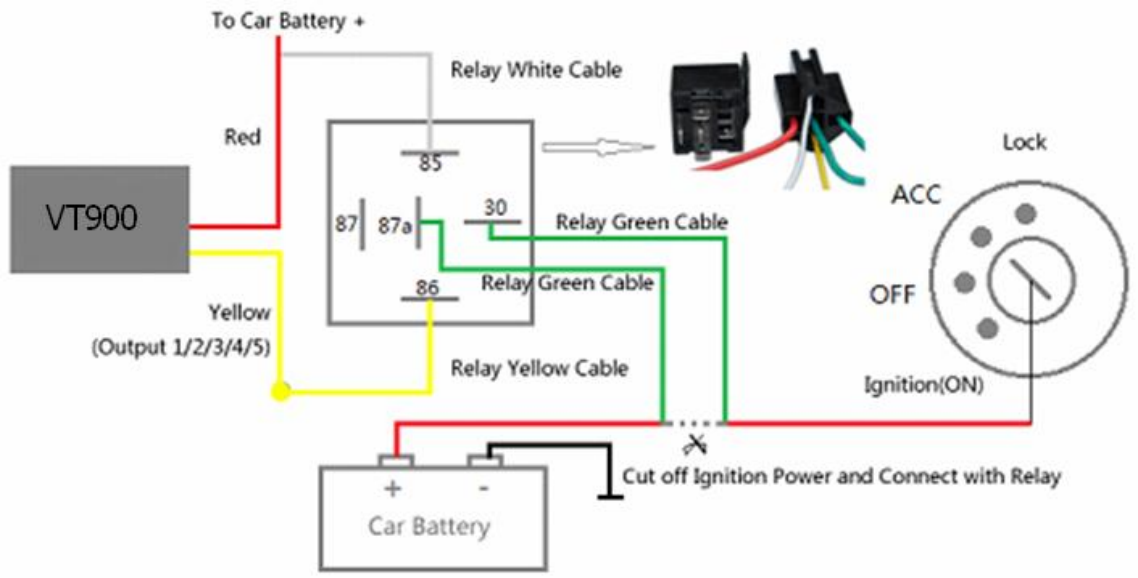
W000000,120,1

W000000,220,1

12.3 Application Examples for Outputs

12.3.1 Engine Cut

Relay Connection: Connect a relay as below picture shows:



Calculate the correct VCC value according to relay's parameter to comply with the following requirements:

Output open drain sink voltage (ineffective)	45V max
Output Low voltage sink current (effective)	500mA max

Normally two green wires are connected solidly (P1 and P2 are Normal Close[NC] in the relay), when output is open (Output be low voltage), two green wires will disconnect, the engine is then cut.

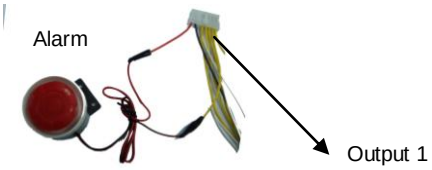
Take Output1 as an example:

W000000,020,1,1 (cut engine)

W000000,020,1,0 (cancel engine-cut)

12.3.2 Connecting with Car Alarm

When the Output that connected to the car alarm is open, the alarm will start to work.



14. Heading Change Report

Command: W******,036,degree

Description: 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/WCDMA. This enhances the accuracy when the tracker makes a direction change.

Note:

degree=0, to turn off this function;

degree=[1,180], to set degree of direction change.

Example: W000000,036,45

When the tracker turns more than 45 degree, a message will be sent back to the server.

15. Heartbeat

Command: W******,015,T

Description: Set an interval for heartbeat.

Note:

T is the interval unit of minutes.

T=0, to turn off this function;

T=1~255, set interval for heartbeat.

Example:

W000000,015,10

In this example, the tracker will send heartbeat every 10 minutes.

16. Track Log

16.1 Log by Interval

Command: W******,031,X

Description Set time interval for logging GPS information. Log information is stored within the device memory. When the memory gets full, the newest record will be overwritten on top of the oldest (FIFO - First In, First Out). In this case, only the newest information is stored.

Note:

1. X=0, to turn off this function. X=[1, 65535] to set interval in the unit of SECOND.
2. The logged message is in GPRMC format and includes:
   Date and time
   Longitude
   Latitude
   Speed
   Direction
3. All data, stored within the memory, may be exported to the PC using the USB connector. To do this, the “GPSLog” program has to be used *(please refer to **GPSLog User Guide** and **GPRS/WCDMA Communication Protocol** for more information).*
4. The device has 8MB of internal memory space for storing the track log. The Device is able to store up to 180,000 records within the memory.

Example:

W000000,031,60

The tracker will store GPS data every 60 seconds.

16.2 Auto Log when no GPRS/WCDMA

When there is no GPRS/WCDMA connection, the tracker can store all GPS information triggered by preset tracking interval, alarms, request, or button activation and send this information (FILO - First In, Last Out) to server by GPRS/WCDMA or preauthorized mobile phone by SMS when GPRS/WCDMA connection recovers.

The interval memory can store up to 1500 SMS and 4600 GPRS/WCDMA message.

16.3 Format Buffer

Command: W******, 503

Description: This command clears the data stored in the buffer.

Note: Deleted data can no longer be recovered

Example: W000000,503

17. Power Down

Command: W******,026,XX

Description: This command puts the tracker in power down mode when it is inactive or immobile for a period of time. In Power Down mode, GPS stops working, GSM/WCDMA enters sleep mode and stops sending out messages. The device remains in this mode until it is activated by message, incoming calls, movement, or triggered by the button.

Note:

XX=00, to turn off this function;

XX=01~99, to turn on Power Down after a specified period of being inactive (or stationary). It is in unit of minute.

Example: W000000,026,10

The tracker will enter power down mode after it is inactive (or stationary) for 10 minutes.

18. Get IMEI

Command: W******,601

Description: Get IMEI of the tracker. IMEI is 15 digits

Example: W000000,601

19. Initialization

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

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

Note: Send SMS “Default?” to the device. Within 120 seconds, send this SMS command to the tracker.

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

Example: W000000,990,099###

20. Password Initialization

Command: W888888,999,666

Description: This resets the password back to factory default and can be used in case you forget your password.

Note: Send SMS “Default?” to the device, and then, within 120 seconds, send this SMS command to the tracker to set the password back to factory default (000000).

If you have set an authorized telephone number, when the password has been successfully preset, the telephone will receive W888888,999,666

Example: W888888,999,666

For more details regarding SMS commands, please go to Annex 1 Command List

21. VT900 Work with RFID Reader

Hardware :

1. RS232 connect to RFID Reader
2. Output 1 connect to relay to control vehicle petrol, Input 3 connect to car ignition. When ACC On, if there is no authorized card swipe, output 1 will be auto trigger, engine will be cut.

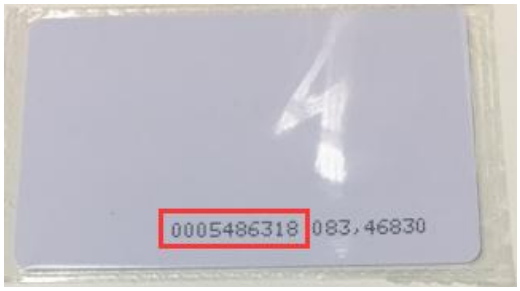
Software :

1. Support 10 authorized Card ID, configed by SMS/GPRS command
2. Authroized card swiping to control vehicle ON/OFF is optional

21.1 Set authorized Card ID:

W******,563,ID1,ID2,ID3,ID4,ID5……
Explanation : Card ID number is 8bit Decimal, need convert to HEX, maximumly could support 10 ID card.
Eg: W000000,563,0005486318
W000000,563, 0005486318,0005486319,0005486410

ID number as below picture:



21.2 Open/Close RFID Card Swiping to control Car Engine:

W******,564,Flag
Flag=1, Open
Flag=0, Close, Default set
Eg: W000000,564,1

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
Track on Demand	W******,000	W000000,000
Remarks: To get the current location of the tracker, send this command as an SMS or make a telephone call directly to the tracker.		

SMS Reply: Latitude = 22 32 36.63N Longitude = 114 04 57.37E, Speed = 40.5Km/h, 2011-12-24,01:50		
Track on Demand **-Google Link**	W******,100	W000000,100
Remarks: Send this command to the tracker and you will receive an SMS with a http link. Click on the link and the location can be shown directly on your mobile phone using Google maps. **SMS Reply:** *http://maps.google.com/?q=22.540103,114.082329* (Note: Only smart phones and PDAs support this function.)		
Change Password	W******,001,######	W000000,001,123456
Remarks: To change user's password. ###### is the new password. Password should be 6 digits. **SMS Reply:** Set Password Ok/123456		
Track by Interval	W******,002,XXX	W000000,002,030
Remarks: To set interval for automatic timed report. XXX is the interval in minutes. If XXX=000, turn off tracking by time. In this example, the tracker will send location data back to your mobile phone every 30 minutes. **SMS Reply:** Set Interval Ok/030		
Authorization	W******,003,F,P,T1 (W******,003,F,P,T1,T2)	W000000,003,3,1,88888888 W000000,003,3,1,88888888,99999999
Remarks: To authorize phone numbers for button/Inputs for receiving location reports, SMS alarms or phone calls. F=0, to turn off this function; (default) F=1, only sends SMS to the authorized phone number; F=2, only calls the authorized phone number; F=3, both SMS and calling. P=1, set an authorized number for Input 1; P=2, set an authorized number for Input 2; T1: Preset phone number. Max.16 digits. If you need to set different numbers for receiving SMS and phone call, you can use W******,003,F,P,T1,T2, In this case T1 is the phone number for receiving SMS and T2 for receiving phone calls. Note: VT900 doesn't support two-way conversation. Calling only gives ring and reminder to the authorized phone. **SMS Reply for the command**W000000,003,3,1,88888888**:**		

Set Phone Ok/3,1,88888888

Speeding Alarm	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.

SMS Reply:

Set Overspeed Ok/08

Movement Alarm	W******,006,X	W000000,006,6

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

X is the preset radii to the tracker's original place.

=0, to turn off this function

=1, 30m	=2, 50m	=3, 100m	=4, 200m
=5, 300m	=6, 500m	=7, 1000m	=8, 2000m

SMS Reply:

Set Movement Alarm Ok/6

Geo-fence Alarm	W******,302,X	W000000,302,22.000000,-114.123456,3000,1,1

Remarks: Turn on Geo-fencing alarm. When the tracker moves in/out the preset scope, it will send an SMS alarm to the authorized phone number for SOS.

Note:

1. X is the parameter that includes: latitude, longitude, radii, in, out.
2. Latitude and longitudes should be in ASCII format as follows:

Latitude is ddd.dddddd, '0' is needed to be stuffed if no value available. '-' should be added for south.

Longitude is dd.dddddd, '0' is needed to be stuffed if no value available. '-' should be added for west.

3. Radii: [1, 4294967295] meter(s), suggest to be set above 100 meters, if set above 8, it is corresponding radii.
4. If In and Out are 0, corresponding function is invalid, if are 1, valid.
5. Reply as Geo-Fence Alarm.
6. GPRS/WCDMA exiting command is 0x12, entering command is 0x13.
7. Send W******, 302 to turn off Geo-fence function.

SMS Reply:

Set Geo Ok

Track by Distance	W******,303,X	W000000,303,1000

Remarks: Send this command to set distance interval

Note:

1. X= [1, 4294967295], suggest to be set above 300 meters;
2. X=0, turn off.

SMS Reply:

Set Distance Ok/1000

Extended Functions	W******,008,ABCDEFGHIJ### #	W000000,008,1011100011###

Remarks:

A=0, turn off the function of replying with an SMS position report after a call;

A=1, turn on the function of replying with an SMS position report after a call.

B=0, SMS location data is normal mode;

For example, Latitude = 22 32 36.63N Longitude = 114 04 57.37E, Speed = 40.5Km/h, 2011-12-24,01:50

B=1, SMS location data is Google link mode.

For example**,** *http://maps.google.com/?q=22.540103,114.082329*

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.

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 when the tracker is turned on.

E, reserved and defaulted as 1.

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.

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 vehicle tracker is cut;

I=1, turn on the function of sending SMS alarm when the extra power of the vehicle tracker is cut.

J, reserved and defaulted as 1.

is the ending character.
(ABCDEFGHIJ defaulted as 1000100001)

SMS Reply:
Set Extern Flag Ok/1011100011

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

Set Tracker's GPRS/WCDMA ID	W******,010,ID	W000000,010,00001

Remarks: to set a digital GPRS/WCDMA ID for the tracker.
GPRS/WCDMA ID must not over 14 digits.

SMS Reply:
Set ID Ok/00001

Set APN	W******,011,APN,Username, Password	W000000,011,CMNET W000000,011,CMNET

Remarks: If no APN username and password are required, just input APN only.
APN defaulted as 'CMNET'.

Set IP and Port	W******,012,IP,Port	W000000,012,195.167.7.114,8500 W000000,012,www.domain.com,8500

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

Set DNS Server IP	W******,009,DNS Server IP	W000000,009,202.105.21.232

Remarks: If the domain name you set by the last command (W******,012,IP, Port) doesn't work, your server IP is not properly set. You can first use this command to set DNS Server IP (please check with your DNS server provider for the DNS Server IP) and then redo the command W******,012,IP,Port.

Enable GPRS/WCDMA Tracking	W******,013,X	W000000,013,1

Remarks:
X=0, to turn off GPRS/WCDMA tracking (default);
X=1, to enable GPRS/WCDMA tracking via TCP;
X=2, to enable GPRS/WCDMA tracking via UDP.

Set GPRS/WCDMA Interval	W******,014,XXXXX	W000000,014,00060

Remarks: to set time interval for sending GPRS/WCDMA 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/WCDMA packet and in unit of 10 seconds. In this example, the tracker will send every 600 seconds (10 minutes).		
Set Heartbeat Interval	W******,015,data	W000000,015,10
Remarks: to set interval for heartbeat. Data: in unit of minute data=0, to turn off this function; data=1~255, set interval for heartbeat. In this example, the tracker will send heartbeat every 10 minutes.		
Set Sensitivity of Tremble Sensor	W******,035,XX	W000000,035,30
Remarks: Send this command to set sensitivity of tremble sensor Note: 1. XX=[1,255], it will be more sensitive if XX is smaller. 2. Default value is 30. Example: W000000,035,30		
Heading Change Report	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/WCDMA. degree=0, to turn off this function; degree=[1,360], to set degree of direction change.		
For more information regarding GPRS/WCDMA tracking please refer to GPRS/WCDMA Communication Protocol.		
Output Control (Immediate)	W******,020,P,F	W000000,020,1,1
Remarks: P =1, Output1 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.		
Output Control (Conditional)	W******,120,A W******,220,A	W000000,120,1 W000000,220,1
Remarks: This function is achievable only when the speed is below 10km/h(command 120) or 20km/h(command 220) and meantime GPS is available. ABCDE represents Out1, Out2, Out3, Out4, and Out5 respectively. If A or B or C or D or E,		

=0, to close the output (open drain)	=1, to open the output (low voltage)	=2, to remain previous status

GPS Sleep Mode	W******,021,X	W000000,021,2

Remarks: this setting is for power saving.

X=0 turn off sleep mode	X=1 Level I	X=2 Level II

Here is some explanation for the sleep mode.

X=1, GPS module working 3 minutes and then power off 1minute…; X=2, GPS module working 2 minutes and then power off 1minute….

Power Down	W******,026,XX	W000000,026,10

Remarks: power down mode when the tracker is inactive (stationary) for a period of time.

In Power Down mode, GPS stops working and GSM/WCDMA enters sleep and stop sending out message until it is activated by message, incoming calls, movement or input changes.

XX=00, to turn off this function.

XX=01~99, to turn on Power Down after a specified period of being inactive. It is in unit of minute.

In this example, the tracker will enter power down mode after it is inactive for 10 minutes.

Set Log Interval	W******,031,X	W000000,031,60

Remarks: to set the interval for storing GPS data into tracker's flash memory.

(Note: this interval is not relevant to the interval of SMS/GPRS/WCDMA tracking)

X=0, to turn off this function.

X=[1, 65535] to set interval in second.

In this example of W000000,031,60, the tracker will store location data every 60 seconds.

Format Buffer	W******,503	W000000,503

Remarks: This command clears the data stored in the buffer.

Note: Deleted data can't recover any more.

Time Zone	W******,032,T	W000000,032,480 W000000,032,-120

Remarks: Default time of the tracker is GMT, you can use this command to correct it to your local time. This command is for SMS tracking only.

T=0, to turn off this function;

T= [-720,720] 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.

Set SMS Header	W******,033,P,String	W000000,033,1,help

Remarks: this command is to set initial characters for SOS message when SOS/IN1, Button B/IN2, Button C/IN3 is pressed.

P=1, SOS button/Input1	P=2, Input2	P=3, Input3

String is the character in SOS message and max 32 characters and defaulted as:

1 SOS Alarm!	2 Cry For Help!	3 Call The Police!

Get Version No. and Serial No.	W******,600	W000000,600
Remarks: to get the version and serial number of tracker's firmware		
Get IMEI	W******,601	W000000,601
Remarks: to get IMEI of the tracker		
Reboot GSM/WCDMA	W******,901###	W000000,901###
Remarks: to reboot the GSM/WCDMA module of the tracker		
Reboot GPS	W******,902###	W000000,902###
Remarks: to reboot the GPS module of the tracker		
Initialization	W******,990,099###	W000000,990,099###
Remarks: Send SMS "Default?" to the device, and then send (within 120 seconds) this SMS command to the tracker to make all settings (except for the password) back to factory default. ### is the ending character.		
Password Initialization	W888888,999,666	W888888,999,666
Remarks: In case you forget your password, Send SMS "Default?" to the device, and then send (within 120 seconds) this SMS command to the tracker to make the password back to factory default (000000).		

Annex 2. Troubleshooting

Problem: Unit will not turn on when pushing the power switch to On side	
Possible Cause:	**Resolution:**
Power switch was not pushed properly	Make sure the power button is pushed to On side
Battery needs charging	Recharge battery for 3 hours
Problem: Unit will not reply with SMS	
Possible Cause:	**Resolution:**
Green LED is flashing (1 second on and 2 seconds off)	Make sure VT900 is connected to GSM/WCDMA/WCDMA network
GSM/WCDMA Network is slow	Some GSM/WCDMA networks slow down during peak time or when they have equipment problems
Unit is sleeping or in power down mode	Cancel sleeping mode or power down
Wrong password in your SMS or wrong SMS format	Write correct password or SMS format

The SIM has run out of credit	Replace or top up the SIM card
Problem: Green LED is Flashing (1 second on and 2 seconds off)	
Possible Cause:	**Resolution:**
No GSM/WCDMA signal	Check with a mobile phone to see if there is a signal in the area or try to call the unit to see if you hear a ring tone
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 your 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
Battery is low	Recharge the unit and the GSM/WCDMA will start working
Problem: Blue LED is Flashing (1 second on and 2 seconds off) or the SMS received starts with 'Last…'	
Possible Cause:	**Resolution:**
Unit does not have clear view of the sky	Move the unit to a location where the sky is visible. Tall buildings, trees, and heavy rain can cause problems with the GPS reception.
Bad GPS reception	Place the front side of VT900 towards sky
Battery is low	Recharge the unit and the GPS will start working.
Problem: Unit Fails to Connect to Server via GPRS/WCDMA	
Possible Cause:	**Resolution:**
SIM card in device does not support GPRS/WCDMA function	Enable SIM card GPRS/WCDMA function
GPRS/WCDMA function of VT900 is turned off	Turn on GPRS/WCDMA function
Incorrect IP address or PORT	Get the right IP address and PORT and reset
GSM/WCDMA signal is weak	Move the unit to a location with good GSM/WCDMA reception
Problem: Unit will not turn on	
Possible Cause:	**Resolution:**
Wiring was not connected properly	Check and make sure wiring connection is in order
Battery needs charging	Recharge battery
Problem: Unit will not respond to SMS	
Possible Cause:	**Resolution:**
GSM/WCDMA antenna was not installed properly	Make VT900 connected to GSM/WCDMA network
GSM/WCDMA Network is slow	Some GSM/WCDMA 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 VT900 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 your 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/WCDMA antenna	Make sure the GSM/WCDMA antenna is connected to the GSM/WCDMA interface
Problem: SMS received starts with 'Last…'	
Possible Cause:	**Resolution:**
Unit does not have clear view of the sky	Move the antenna of the unit to a location where the sky is visible
VT900 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
Problem: Unit Fails to Connect to Server via GPRS/WCDMA	
Possible Cause:	**Resolution:**
SIM card in VT900 does not support GPRS/WCDMA function	Enable SIM card GPRS/WCDMA function
GPRS/WCDMA function of VT900 is turned off	Turn on GPRS/WCDMA function of VT900
Incorrect IP address or PORT	Get the right IP address and PORT and reset to VT900
GSM/WCDMA signal is weak	Move the unit to a location with good GSM/WCDMA reception