



# **ETrack User Manual**

**Product Code : 442**

**Version : 0.0**



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## 1. INTRODUCTION

### 1.1. *Attention*



All wireless data transferring devices produce interference that may affect other devices which are placed nearby.



Do not disassemble the device. If the device is damaged, the power supply cables are not isolated or the isolation is damaged, before unplugging the power supply, do not touch the device.



Any installation and/or handling during a lightning Storm are prohibited.



The Device must be connected only by installation Engineer/ Qualified candidate.



The Device must be firmly fastened in the predefined location.



The device is susceptible to dust and water with IP class IP65.

### 1.2. *Instructions of safety*

This chapter contains information on how to operate this device safely. By following these requirements and recommendations, you will avoid dangerous situations. You must read these instructions carefully and follow them strictly before operating the device.

The nominal voltage is 12 V DC. The allowed minimum voltage is 7 V DC and maximum voltage is 40 V DC.

To avoid mechanical damage, it is advised to transport the device in an impact proof package. Before usage, the device should be placed so that its LED indicators are visible, which show the status of operation the device is in.

When installing, the connection cables to the vehicle, the appropriate jumpers of the power supply of the vehicle should be disconnected.

Before dismounting the device from the vehicle, the connection cables must be disconnected.



### **1.3. Legal Notice**

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## **2. BASIC DESCRIPTION**

ETRACK-442 is a terminal with GNSS (GPS + GLONASS) and GSM connectivity, which is able to determine the object's coordinates and transfer them via the GSM network. This device is perfectly suitable for applications, which need location acquirement of remote objects. It is important to mention that ETRACK 442 has additional inputs and outputs, which let you control and monitor other devices on remote objects. ETRACK 442 has a SERIAL interface also.

### **2.1 Package Contents**

The ETRACK 442 device is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The package contains:

ETrack 442 Device,

3.7V/3000mAh Li-Ion Multi Cell Battery (Already fitted)

### **2.2 Basic Characteristics**

#### **GSM/GPRS Features:**

- Quectel M95 Quad Band 850/900/1800/1900 MHz
- GPRS Multi-slot Class 12, GPRS Mobile station Class B
- SMS (Text)

#### **GNSS Module Features:**

- GPS - L1 1575.42MHz C/A Code
- GLONASS – L1 1598.0625~1605.275MHz
- Protocol NMEA-0183: GGA, GGL, GSA, GSV, RMC, VTG



### **Hardware Features:**

- ARM Cortex®-M3 processor
- Up to 20 Kbytes of SRAM CPU memory
- 8 MB external Flash memory
- 3.7V/3000mAh Li-Ion Multi Cell Battery

### **Interface Features:**

- Power Supply: 8 to 36V DC
- Serial Interface
- 3 Digital Inputs + 1 (Ignition)
- 2 Open collector digital outputs
- 4 Analog input
- Audio (two way calling)
- LED indication for Status, GNSS & GPRS

### **Special Features:**

- Any element event triggers (External Sensor, Input, Speed, etc.)
- Highly configurable data acquisition and sending
- 5 Circular Geofence areas
- Sleep Mode
- Deep Sleep Mode
- Configurable scenarios available
- Real-Time Process monitoring
- Authorized number for remote access
- Firmware update over the Air(GPRS)
- Configuration update via SMS and Server
- TCP/IP or UDP/IP protocol support
- 30000 records storing capacity
- Auto Power-Cut from main Battery
- Text message based tracking and Driver behaviour alerts
- Audio - Two way (Optional)
- Auto Upgradation (Optional)
- Internal GSM and Dual GPS/GLONASS antenna
- GPS Dark zone / multi path elimination using LBS & Cell Tower Triangulation
- Virtual trip meter with automatic Trip start and end detection
- SMS and Email Alarms from device on Tampering, Over speeding or vehicle Towing
- Configurable External & Internal Battery Cut-off
- Device can be configured to hit multiple servers for a single event
- Reverse Geo-Address (Optional)
- SMS Tracking



### 2.3 Technical Feature

External Power	8VDC to 36VDC
Operating Current	< 60mA; Peak 2.5A
Sleep Mode Current (Deep Sleep)	< 4mA
Internal Battery	3000 / 3200 mAh
Charging Time / Battery Backup	300 Minutes/ 360 Minutes
Operating Temp (Storage Temp)	0°C to +85°C (30°F to +185°F)
CPU	ARM Cortex-M3 @72Mhz
CPU Internal Flash + Memory	512 KB Flash + 20 KB of SRAM
External Memory	8 MB Flash
Wired Communication	1 RS-232 Port, 1 USB Device (Optional)
GSM /GPRS MODEM	850/900/1800/1900 MHz Quad Band, Multi Slot (12/10/8), Class B GPRS Module
Navigation – GPS+GLONASS Receiver	GPS - L1 1575.42MHz C/A Code GLONASS – L1 1598.0625~1605.275MHz
Serial Interface	CCTV Camera/RFID/Biometrics Sensors
Device Input (Digital + Analog)	3+1
Device Output	2
FOTA	Firmware over Air, Configuration Over Air
Power/SIM/Battery removal alert	Yes
Low Battery alert	Yes
Device Auto Disconnection	When Vehicle Battery is low.
Geo-address	Yes (Optional)
GPS antenna	Inbuilt
GPRS antenna	Inbuilt
GPS dark zone	LBS & GSM Triangulation
Smart Polling	Time, Distance ,Angle & IO Events
Audio	Two way(optional)
SMS Tracking	Yes
Dual Server	Optional

**ETrack 442 Specification**

### 2.4 Technical Information about internal battery

3.7V/3000 Li-Ion Multi Cell Battery.

ETRACK 442 operating time with internal battery depends on external supply voltage.  
It helps device to implement auto-cut feature.



## 2.5 Electrical Characteristics

Description	Value	Min	Typ	Max	Unit
Supply Voltage		8		36	V
Operating Current		<0.004	<0.06	2.5 Peak Current	A
Analog Input		0		30	V

## 3. Connection, Pinouts & Accessories

### 3.1. How to insert sim card and how to connect battery into ETrack 442



Hold the device



Select Allen Key Metric 2'



Insert SIM carefully & reconnect

Internal Battery



Uncover the Unit & look for SIM Holder





### **3.2. Installing ETrack 442 drivers**

#### **Software requirements:**

Operating system 32-bit or 64-bit: Windows XP with SP3 or later, Windows Vista, Windows 7, Window 8 or Window 10.

MS .NET Framework V3.5 or later (<http://www.microsoft.com>)

#### **Driver:**

Please download virtual comport driver.

#### **Installing Driver:**

Extract and run Setup file. This driver is used to detect ETRACK 442 device connected to the computer. This will launch device driver installation wizard. In the following window click 'Next' button:



**Driver Installation window**

Setup will continue installing drivers and will display a window about successful process at the end. Click 'Finish' to complete setup:



**Driver Installation Window**

You have now installed drivers for serial communication successfully.

### 3.3. GPRS (Blue) LED

Behaviour	Meaning
Permanently Off	GPRS Module is not running / Module OFF
64ms On/800ms Off	The Module is not synchronized with network
64ms On/2000ms Off	The Module is synchronized with network

### 3.4. Status (Red) LED

Behaviour	Meaning
Permanently Off	No Power Supply / Sleep Mode/Deep Sleep Mode
LED toggle per second	Ignition Off
Permanent On	Ignition On
Blinking rapidly	During Firmware upgradation mode

### 3.5. GPS/GLONASS (Green) LED

Behaviour	Meaning
Permanently Off	Not receiving valid signal / Module OFF
Blink 1 Pulse Per Second	Receiving valid signal

### 3.6. Main Cable wiring/Wiring Diagram

S.N.	Wire Name	Description	Wire Colour
1.	Power Supply	Battery Voltage (8 to 36)VDC	Red
2.	Ignition	Default Digital Input to sense Ignition status	Brown
3.	Digital Output 1	Digital Output 1 to control On/Off	Orange
4.	Digital Input 1	Digital Input 1 to sense input state H/L	Yellow
5.	Digital Input 2	Digital Input 2 to sense input state H/L	Green
6.	Analog Input 1	Analog Input 1 to sense Voltage (0-30V)	Blue
7.	Analog Input 2	Analog Input 1 to sense Voltage (0-30V)	White
8.	Ground	Vehicle Body or '-' terminal of Battery	Black

**The Main cable wire Description**

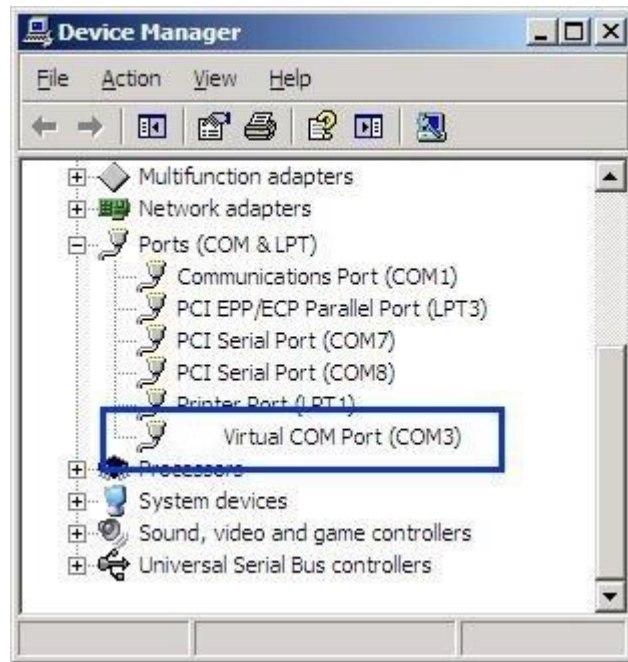
### 3.7. Serial Connection

For connecting ETRACK 442 device to PC, 232 cable is used. On one side of the cable there is usual DB9, which should be connected to PC. Other side of the cable has connector to connect with ETRACK 442. Cable can be connected after removing cover of ETRACK 442.

For connecting the device with USB port, a SERIAL to USB cable is required along with virtual comport driver that is explained earlier.

**Please note that ETrack 442 device must be connected to the power supply before connecting with PC via serial.**

When ETRACK 442 is connected to PC, it creates an SERIAL COM Port, which can be used as a system port (to configure the device):



**Com-Ports**

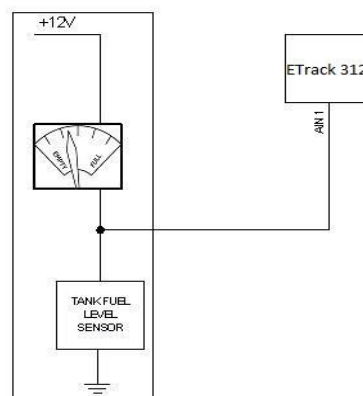
### 3.8. Accessories

**NOTE:** EDS does not provide any additional equipment like button or sensors etc.

Some of accessories are used as follows:

- **Fuel Tank Sensor**

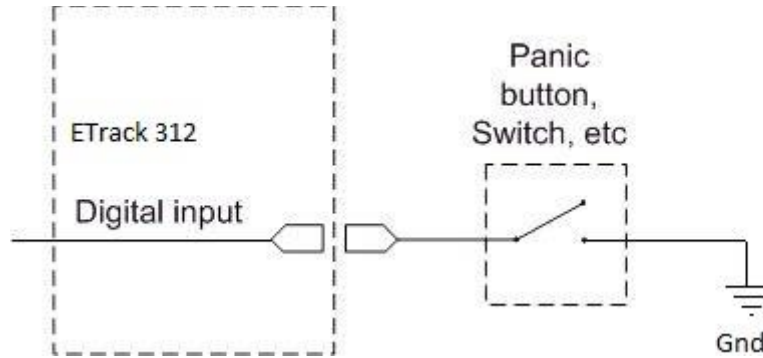
A fuel tank level sensor exists in most cars, which shows the approximate fuel level in the driver's indicator panel. It is possible to connect ETRACK 442 Analog input to it (if sensor returns analogue signal proportional to fuel level). Following figure shows the connection scheme to the ETRACK 442 and fuel tank sensor. After the connection to the tank fuel level sensor, calibration is needed. Calibration is needed because most fuel tank sensors are not linear. Calibration is performed by measuring voltage dependence on volume of fuel in tank.



**Fuel Sensor Connection**

- **Alarm Button, door sensors etc.**

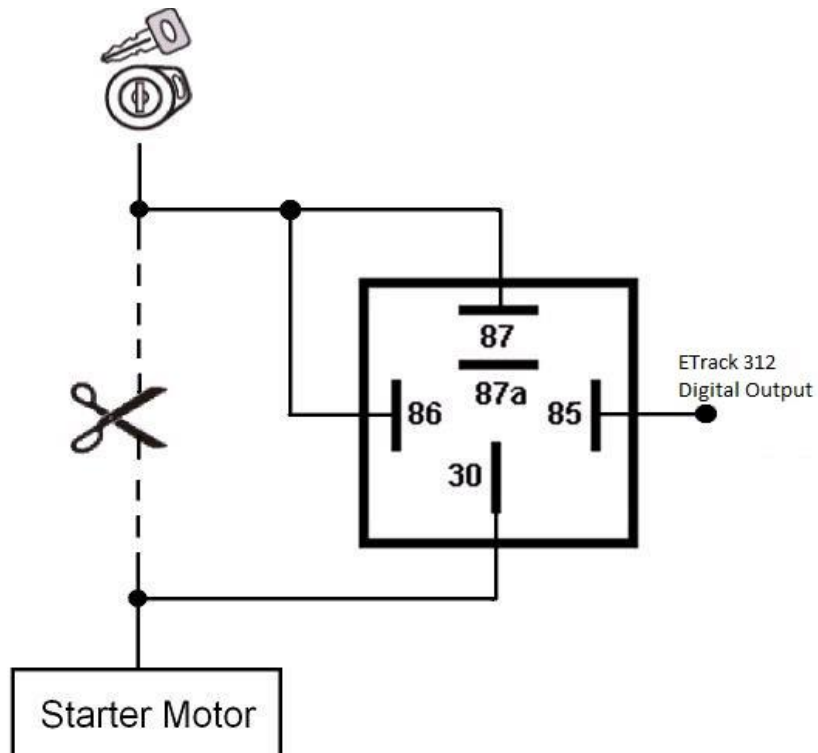
Alarm buttons, door sensors, etc. return two states: high or low voltage. Digital inputs are used to read this information. Figure below shows how to connect alarm button, door sensor, etc.



**Digital Input Connection**

- **Immobilizer Relay**

When connected as shown below, ETRACK 442 disables engine starter when output is ON. More details about relays can be found below.



**Immobilizer Relay Connection**

- **Relays**

An ordinary automotive relay is used to invert input signal or to immobilize engine starter. Note, that they are available as 12 V or 24 V.

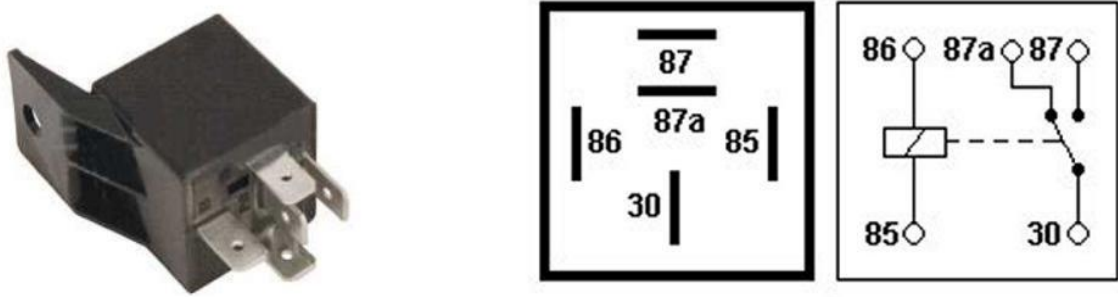


Figure 10. Automotive relay pinouts

## 4. FIRMWARE

ETrack 442 functionality is always improving, new firmware versions are developed. Firmware can be updated via following.

- **Updating Firmware via serial : (Optional)**
- **Updating Firmware via GPRS :**

Firmware can be updated via GPRS. To update firmware, GPRS module establishes a connection with FTP server after receiving a fixed pattern text message. This message has following fields

- I. IP Address of FTP server
- II. Port number of FTP server
- III. Username
- IV. Password
- V. Software Version

While device in FTP mode to update its firmware version its red LED blinks rapidly until it revert back to normal(regular) working state. Device has maximum five attempts for updating its firmware. If it fails to update its firmware it reverts back to previous existing version. Before jumping to next version or revert back to existing version device left a record file of its operation and its result on server.



## 5. OPERATIONAL BASICS

### 5.1. Operational Principals:

ETRACK 442 device is designed to acquire records and send them to the server. Records contain GPS/GLONASS data and I/O information. The device uses GPS/GLONASS receiver to acquire GPS/GLONASS data and is powered with four data acquire methods: **time-based, distance-based, angle-based and event-based** method.

Note that if ETRACK 442 loses connection to GPS/GLONASS satellites, it continues to make records based on GPRS cell tower Triangulation. Failed data packets are stored in flash memory and later can be sent via GPRS. GPRS mode is the most preferred data sending mode.

ETRACK 442 communicates with server using special data protocol. Data protocol is described in a separate protocol document.

ETRACK 442 can be managed by SMS commands or by Server. SMS Command list is described in SMS COMMAND LIST section. Module configuration can be performed over TCP or via SMS. Configuration parameters and modes are described in a separate Protocol document.

### 5.2. Sleep Modes

#### I. Sleep Mode

ETrack 442 enters into sleep mode when its external power is removed and only internal battery remains as power source. In this mode device saves internally battery's power and hit configured server once in 15 minutes and after sending packet/packets it again enters into sleep mode. This Hitting time interval is configurable and can be changed as per used need.

As soon as ignition is turned on ETrack 442 exits from sleep mode and behave normally. During sleep mode no LED indication can be seen.

#### II. Deep Sleep Mode

ETrack 442 enters into "Deep Sleep Mode" when its internal battery's voltage level drops specified lowest level, in this mode ETrack 442 is just waiting to be supplied via external battery.

### 5.3. Virtual Trip Meter

Virtual trip-meter is used to calculate travelled distance between Vehicle's Ignition On state & Vehicle's Ignition Off state in ETRACK 442 as a separate I/O element.





When ETRACK 442 detects ignition on event, it starts counting distance using GPS/GLONASS signal. It checks current location and calculates distance between current and previous point. It keeps adding these intervals until vehicle's ignition is off, which is equal to the sum of all distances, measured every time. When Vehicle's Ignition is turned on again, trip-meter resets to zero and distance calculation starts all over again.

Virtual Odometer can be also be handled in the same way at server site.

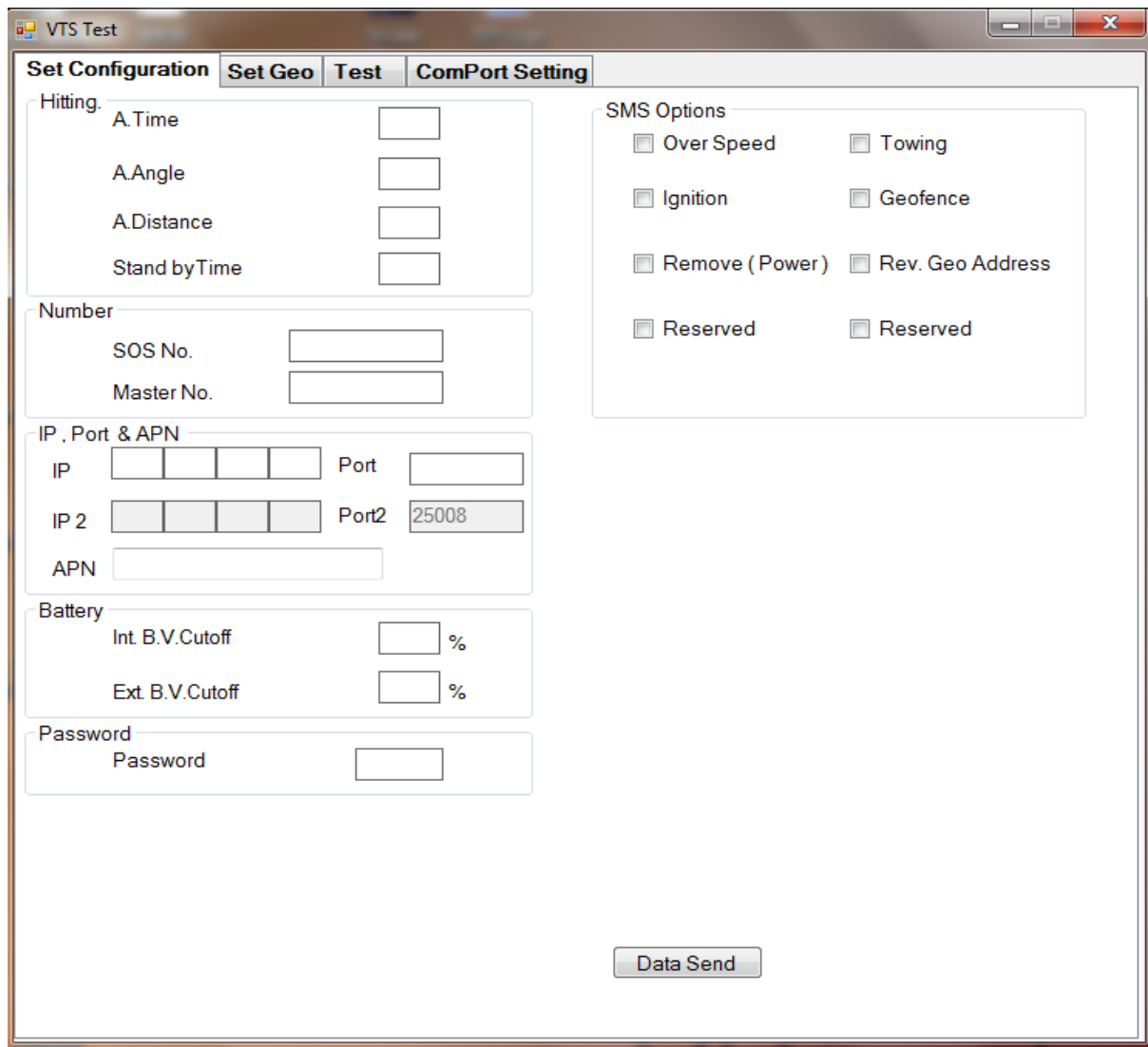
#### **5.4. Features**

Using available features can greatly increase ETrack 442 usability options.

As Features has been highlighted under section 2.2. Some of them like Over Speed, Tow, etc. can be used with digital outputs to manage buzzer, LED etc. So that current driver can have indication using these digital outputs.

#### **5.5. Configuration & Testing**

EDS provides an executable setup to configure ETrack 442 via RS232 Serial communication. As shown in following figure, it has all configurable parameters fields.



**Figure 11. Configurator & Tester**

This application has 4 tabs:

- i. Configuration - This tab contains all configurable parameters.
- ii. Geofence - This tab contains 5 geofence areas details.
- iii. Device Test - This tab is used to test the Device.
- iv. Comport - All these can take only via serial-RS232 communication, for which user need to set comport number at starting time.

## 5.6. Geofencing

Geofencing is another feature which is highly customizable and can detect wherever car enters or leaves customized areas. ETrack-442 internally supports 5 circular geofence zones at a time. These can be added or deleted via both ways either using text message or server.



To add a geofence zone user need to fill 4 fields, those are as follows:

1. **Zone number** – Device supports 5 circular geofence zones so index would be from 1 to 5.
2. **Zone Co-ordinates** – User need to provide respected **latitude** and **longitude**.
3. **Zone Radius** – As these zones are circular in shape in that case user need to provide a virtual radius for respected geofence zone
4. **Zone name** – User need to write a name for a particular zone to recognise easily.

### 5.7. Master Number

ETrack-442 currently has 2 numbers facility one is SOS number and other one is Master number. SOS number is used when any alarm/event occurs, in this case device sends a text message to a dedicated (SOS) number.

Anyone can change/alter configuration parameters via send SMS that fulfil the predefined criteria until master number is not set.

If master number is configured, no-one can alter parameters via SMS because in this case password will be discarded and only Master number can change/alter parameters without password.

Only master number and server can reset the master number.

\* How to Enable Master and other SMS Commands are described under point 7

## 6. Alarm/Events

ETrack-442 device generates alarm and send TCP Packets according to alarm/events. These events has unique header to differentiate with each-other  
Device has following type of alarms/events:

Events		Header
External Battery Removed	-----	\$rmv
External Battery Reconnected	-----	\$rnc
External Battery Low	-----	\$ebl
Internal Battery Low	-----	\$ibl
Box tamper	-----	\$tmp
Sim Tamper	-----	\$smt
Internal Battery Tamper	-----	\$btt
Ignition On	-----	\$ion
Ignition Off	-----	\$iof
Geofence Entrance	-----	\$gen
Geofence Exit	-----	\$gex
Configuration Update	-----	\$cfg
Geofence Zone/Zones update	-----	\$geo



## 7. SMS COMMAND

ETrack-442 supports a number of SMS commands, user needs to send SMS in proper manner otherwise it may not be worthy for him. All SMS commands are case insensitive.

### 7.1 @SETCONF# (Configuration update)

This command plays a very important role. This command is used with password if sender number is not master number to change/alter parameters. This command is used as follows:

If Sender is not Master number –

@setconf#<password>,<parameters>,<parameter>,<parameter>,,,,,,,,,

Let password is “EDS” and we need to change “Active Time” as 60, “Standby Time” as 300, and “IP Address” as 38.69.192.101 and “Port” as 5900.

See the example –

Command would be:-

@setconf#eds,at-60,st-300,ip-38.69.192.101,port-5900,

NOTE: It is advised to end the message with comma ','

Similarly other configuration can also be set.

If Sender is not Master number –

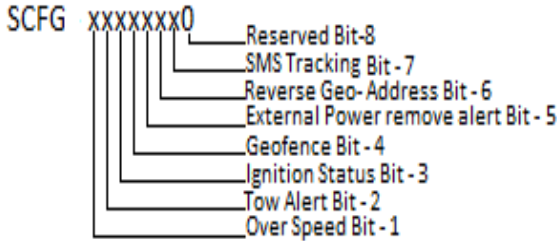
@setconf#,<parameters>,<parameter>,<parameter>,,,,,,,,,

In this case password is not required.

Configuration parameters are as follows (Let Master Number is not set)

@SETCONF#<PASSWORD>,	Description	
SOS-xxxxxxxxxx,	'x' refers to digit of SOS number	SOS number
IP-xxx.xxx.xx.xx,	'x' refers to digit of an TCP IP Address	TCP Server IP Address
PORT-xxxxxx,	'x' refers to digit of TCP Port Address	TCP Server Port number
AT-xxx,	'x' refers to digit of time in seconds(0-999)	Active Time ( Hitting time interval when ignition is on)
AD-xxx,	'x' refers to digit of distance in meter(10-999)	Active Distance (Distance covered from last location)
AA-xxx,	'x' refers to digit of angle in degree(10-360)	Active angle (Angle of Device)
ST-xxx,	'x' refers to digit of time in seconds (10-999)	Standby time (Hitting Time interval when ignition is off)
IBL-xx,	'x' refers to digit of % value for battery low Level alarm (5% - 50%)	Internal Battery low level



EBL-xx,	'x' refers to digit of % value for battery low level alarm (5% - 50%)	External Battery low level
PWD-xxxx,	'x' refers to alpha-numeric digits	Password
MNO-xxxxxxxxxx,	'x' refers to digit of Master number	Master Number
SL-xxx,	'x' refers to digit of speed in KM (5-250)KM/Hr	Speed Limit
TT-xxx,	'x' refers to digit of SMS track time in seconds (60-999)	SMS Based Tracking
SMT-xxxx,	'x' refers to digit of Sleep time interval in seconds (300-2000)	Sleep Mode Time interval
SCFG-xxxxxxx0,	'x' refers to Bit of SMS configuration  	SMS alert configuration bits. To receive SMS alerts of an event, user needs to enable that respective bit of this field. ⇒ Reserved Bit remains as 0 ⇒ SOS number must be set before applying SMS configuration command
APN-<apn name>,	Access point name of respective SIM Operator	Access Point Name

Example: @setconf#<password>,<sos-xxxxxxxxxx>,<ip-xxx.xx.xxx.xx>,<port-xxxxx>,<AT-xx>,  
 @setconf#EDS, sos-9876543210,ip-122.160.162.38,port-12345,at-60,

These SMS Commands are case insensitive

**NOTE : In case of Master Number Password is not required.**

**In case of Dual Server:**

@setconf#<Password>,	Description	
IP1-xxx.xxx.xx.xx,	'x' refers to digit of 1 <sup>st</sup> TCP server IP Address	1 <sup>st</sup> TCP Server IP Address
PORT1-xxxxx,	'x' refers to digit of 1 <sup>st</sup> TCP server Port	1 <sup>st</sup> TCP Server Port number
IP2-xxx.xxx.xx.xx,	'x' refers to digit of 2 <sup>nd</sup> TCP server IP Address	2 <sup>nd</sup> TCP Server IP Address
PORT2-xxxxx,	'x' refers to digit of 2 <sup>nd</sup> TCP server Port	2 <sup>nd</sup> TCP Server Port number
DS-'x'	'x' refers to Main server or Secondary server	Disable server-M/S
ES-'x'	'x' refers to Main server or Secondary server	Enable Server –M/S

**Example :**

To Disable Main server-

@setconf#<password>,<DS-x>,

@setconf#EDS,DS-M,



## 7.2 @OPn Start/Stop# (Output Control)

ETrack-442 Device supports 2 digital outputs those can be controlled via server as well SMS. Output is a sensitive part of device so to start any output password is required if sander number is not master number, While to stop these output authentication is not required command from any number would be accepted.

Syntax is same as in explained above.

### Example :

To start output 1 if sander is not master number

@op1 start#<password>

To stop output 1 if sander is not master number

@op1 stop#

Similarly output 2 can also be operated.

**NOTE: Password is not required if sander is master number.**

⇒ After receiving one of these commands device will take action accordingly and respond back to sender like “Output ‘n’ Started/Stopped”

## 7.3 @SETGEO# (Set geofence zone)

ETrack-442 Device supports 5 circular geofence zones. These zones can be set/reset via SMS as well as server. At a time only one zone is accepted. Command would be as follows:

@setgeo#<Password>,<geo-x>,<latitude>,<longitude>,<radius>,<Zone name>,

@setgeo#EDS,geo-1, 28.4040, 77.1742,100,manesar,

password  
Zone number  
Latitude  
(degree)  
Longitude  
(degree)  
Radius  
(Meter)  
Zone name

**NOTE:** Custome zone name has only 15 character field limit and must be terminated by comma ‘,’

## 7.4 @CLRGEO# (Clear geofence Zone/Zones )

ETrack-442 Device supports up to 5 geofence zones as explained above. These zones can be cleared in single command.

**Example:** To clear only one zone

@CLRGEO#<password>,<geo-x>,

@clrgeo#EDS,geo-3,

⇒ It will clear only zone number 3, rest will remain same.

To clear all zones:

@clrgeo#EDS,geo-1,2,3,4,5,



**NOTE:** Password is required only if sender number is not master number.

### 7.5 **@GETGEO#** (Information of Geofence Zones)

As it is explained already this device supports up to 5 circular geofence zones. To know about all existing zones of a particular device, user need to send a text message command as following example.

**Example:** To know about geofence zones:

@GETGEO#

⇒ Sender will receive a message about information of geofence zones. That message contains following fields:

**Example:** GF-1,Lat-28.7874,Long-77.7845,Radi-100,Name-office,

**GF-** Geofence zone number

**Lat-** Zone latitude

**Long-** Zone longitude

**Radi-** Zone radius

**Name-** Zone name

⇒ Sender will receive the information of all 5 zones.

⇒ This kind of messages does not require any authentication/password.

### 7.6 **@GET#**

This message provides following fields:

- Latitude (Lt)
- Longitude (Ln)
- Ignition status
- Speed (KM/hr or Miles/Hr)
- TripMeter
- Outputs status

### 7.7 **@SMSDATA#**

This command provides the information about GPRS and GPS/GNSS Data.

It starts with '#'.  
Syntax:

#<IMEI\_Number>,< Source >,<Latitude>,<Longitude>,<Speed>,<Direction>,<Altitude>,<HDOP>,<Used Satellite>,<Visible Satellite>,<Date>,<Time>,<Ignition Status>

- **IMEI Number** – IMEI number of Device
- **Source** – Source of data (GPRS-1, GPS-2, GNSS-3, GNSS/GPS 3D – 4)
- **Latitude** – Latitude of current location of device





- **Longitude** – Latitude of current location of device
- **Speed** – Speed of Device in KM/hr or in Miles/hr depends on location
- **Direction** – Direction of device
- **Altitude** – Altitude of Device
- **HDOP** – HDOP value of Device
- **Used Satellite** – Number of satellites used to get location information
- **Visible Satellite** – Number of satellites visible to device
- **Date** – Current Date
- **Time** - Current UTC Time
- **Ignition Status** – Ignition status of device

### 7.8 **@GETCONF#**

This SMS command is used to get current configuration parameters' value of device. It has the following fields:

- **Master Number** – Master number of device
- **SOS Number** – SOS number of device
- **IP & Port/\*IPs & \*Ports** – TCP Server IP address and respective Port number
- **\*Server Status** – It is applicable for dual server or multi server enabled devices only, it provides info about server Enable/Disable status.
- **Active Time(AT)** – Hitting time interval when ignition is on
- **StandBy Time(ST)** – Hitting time interval when ignition is off.
- **Sleep Mode Time(SMT)** – Device wake up time interval from sleep mode
- **Active Distance (AD)** – Distance travelled by device from last server hitting location
- **Active Angle (AA)** – Angle of device measured from last server hitting location
- **Speed Limit(SL)** – Speed limit of device
- **Internal Battery Alarm** - Internal battery low voltage level to generate an alarm
- **External Battery Alarm** – External Battery low voltage level trigger an alarm
- **SMS Enabled for** – It provides the info about enabled event messages.

NOTE : here \* used for dual server/Multi server only

### 7.9 **@POLL#**

This SMS Command is used to instruct the device to hit TCP server instantly.

### 7.10 **@RESET#**

This SMS Command is used as soft restart key of device.



### 7.11 @DEBUG#

This SMS Command is widely used in testing. As its name indicates it is used for debugging purpose. Its Respond message has following fields:

- **GPS/GNSS Status** – Status of GPS/GNSS fix or not
- **GPRS Status** – Status of GPRS fix or not
- **Used Satellite & Visible Satellite** – Used satellite out total visible satellite
- **HDOP** – HDOP value
- **Signal Strength** – Signal Strength of SIM
- **Operator** – Name of service provider
- **Current Hitting Time** - Current Server Hitting time interval
- **Server/Servers Connection** – Server/Servers connected/Disconnected
- **Last Hit Time** – UTC time of last time hitting the server
- **Backup** – Number of TCP packets remaining to shoot
- **APN Status** – Access Point Status set or not set
- **Flash memory status** – Flash memory chip status Fail or OK
- **Digital Input Status** – On or OFF
- **Digital Output Status** – On or OFF
- **Power Source** – External or Internal
- **Internal Battery Status** – Internal Battery Voltage & its cut-off voltage
- **External Battery Status** – External Battery Voltage & its cut-off voltage
- **Analog Input** – Analog input voltage
- **Software Version**

### 7.12 @BKPRST#

This SMS Command is used to clear old backup data.

## 8. SERVER

Every device needs at least a server to shoot its packets. As explained in earlier section device can be controlled, monitored and operated via SMS similarly server can also capable to do these things.

Server is capable to handle a lots of devices as well as particular one in same manner.

For Server, Password is not required to execute these commands what have been described in under SMS Commands (section 7).

If Server operator wants to handle only a particular device he need to insert its IMEI number at starting otherwise all connected devices will receive the same command and will behave accordingly.



**For Example:**

+RECEIVE:<CR><LF><IMEI Number>@setconf#,<parameter>,.....,@@

In this example only one device will change its parameter values, rest will discard this message as their IMEI Number does not match with received IMEI Number.

But this Same Message is sent by server without inserting any IMEI number.

**For Example:**

+RECEIVE:<CR><LF>@setconf#,<parameter>,.....,@@

In this case every device accepts this command and change its configuration parameter value.

The command what is sent via Server always starts with “+RECEIVE: <CR><LF>” and ends with “@@”(double ‘@’ sign).

## **8.1 Set Configuration Parameters**

Every Configuration parameter value can also be updated or modified from server, Even master number can be changed by it. Server is able to update all connected devices’ parameter simultaneously.

Command Syntax:

**To Update parameters of all connected devices:**

+RECEIVE:<CR><LF>@setconf#,<parameter>,.....,@@

Here in this command no IMEI number is mentioned hence it is applicable to all devices and parameter values will update automatically.

**To Update parameters of a particular devices:**

+RECEIVE:<CR><LF><IMEI Number>@setconf#,<parameter>,.....,@@

Here in this command user need to insert IMEI number of particular device (before “@SETCONF#” command ) that is targeted to update its parameter.

All parameters have been explained under section 7.1

In the case of server, operator need to take care about header and footer.

Header: +RECEIVE:<CR><LF>

Footer: @@

**Example: ( for all devices )**

+RECEIVE:<CR><LF>@setconf#,AT-60,ST-300,SOS-9876543210,@@

This command is applicable to all devices because no particular IMEI number is inserted. This command will update Active Time, Standby time and SOS number of all devices.



After updating its configuration parameter device shoots a TCP packet to server as an acknowledge packet of updating configuration. This packet starts with “\$CFG” header. This packet send last saved all configurable parameter to server.

**Syntax:**

\$cfg,<IMEI Number>,<Master Number>,<SOS Number>,<Server IP>,<Server Port Number>,<Active Time>,<Active Distance>,<Active Angle>,<StandBy Time>,<Sleep Mode Time>,<Speed Limit>,<Internal Battery Low Voltage level>,< External Battery Low Voltage level >,<Password>,<Enabled SOS SMS>,<Sender>

## 8.2 Set Geofence

Similar to configuration parameters geofence can also be added by server. Server can only add a geofence zone at a time.

Geofence fields remain same what we have already seen under section 7.3

**Syntax ( for a single device ):**

+RECEIVE:<CR><LF><IMEI Number>,  
@SETGEO#,GEO-<Zone Number>,<Latitude>,<Longitude>,<Radius>,<Zone Name>,

The above command is valid only for particular Device that has same IMEI number what server sent But geofence can also be set in all devices for this purpose operator needs to remove this IMEI number field only.

## 8.3 Digital Output Control

Same as controlling output via SMS, These output can be controlled from server side also. As outputs are sensitive in nature hence these cannot be set/reset (in bulk) to all device simultaneously. Operator must insert One IMEI Number in this case otherwise message will take no effect.

**Syntax:**

<+RECEIVE:><CR><LF><IMEI Number><@OPn Start#>,@@  
<+RECEIVE:><CR><LF><IMEI Number><@OPn Stop#>,@@

Here ‘n’ refers to output number like @OP1 Start# or @OP2 Start# or @OP1 Stop#

# 9. Mounting Recommendations

## 9.1 Connecting Wires

- Wires should be connected while module is not plugged in.
- Wires should be fastened to the other wires or non-moving parts. Try to avoid heat emitting and moving objects near the wires.



- The connections should not be seen very clearly. If factory isolation was removed while connecting wires, it should be applied again.
- If the wires are placed in the exterior or in places where they can be damaged or exposed to heat, humidity, dirt, etc., additional isolation should be applied.
- Wires cannot be connected to the board computers or control units.

## 9.2 Connecting Power Source

- Be sure that after the car computer falls asleep, power is still available on chosen wire. Depending on car, this may happen in 5 to 30 minutes period.
- When module is connected, be sure to measure voltage again if it did not decrease.
- It is recommended to connect to the main power cable in the fuse box.

## 9.3 Connecting Ignition Wire

- Be sure to check if it is a real ignition wire.
- Check if this is not an ACC wire.

## 9.4 Connecting Ground Wire

- Ground wire is connected to the vehicle frame or metal parts that are fixed to the frame.
- If the wire is fixed with the bolt, the loop must be connected to the end of the wire.
- For better contact scrub paint from the place where loop is connected.

**NOTE :** Connecting the power supply must be carried out in a very low impedance point on-board vehicle network. These points in the car are the battery terminals.

## 9.5 Module Installation

- Do not place the unit under the metal surfaces.
- Do not install near: radio, speakers or alarm system.
- The unit should be located as far as possible in a horizontal position (if the slope of more than 30 degrees, it is installed incorrectly.)
- It must be rigidly mounted on the surface.
- The unit should not be placed on the heating or moving parts.
- SIM-card must be inserted in only when the unit is off (Power Off).
- The device can be placed in any other area of the vehicle (internally or externally in car, truck, motorcycle), wherever there is visibility to the satellites.