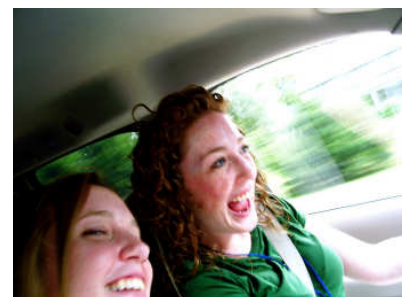


itrac Gold

**GPS Tracking for Fleet & Security
Command Protocol & User Manual**



itrac Gold

Your Professional Tracking System

Rising fuel costs and car theft are major concerns of every driver or business who owns a fleet of vehicles, so being able to protect your assets and streamlining operating costs in a business are two of the top functional features when it comes to choosing an AVL tracking system. Whether it is for personal or commercial use, the itrac Gold provides such a solution and so much more. Like being able to actively immobilize your vehicle if you have found it to be stolen or cutting down on fuel costs by reducing engine idling.



itrac is a professional tracking system that has integrated powerful chips like the SiRFstarIII for GPS positioning - providing high sensitivity of up to -186 dBW and SIEMENS tri-band wireless module that provides global coverage and the needed reliability. itrac is a highly flexible AVL tracking system with the ability to provide realtime reports via GPRS or SMS and for people who are looking for passive tracking capabilities, itrac can also be used as a datalogger for manual download or the logs can be sent over GPRS and email at the end of each working day.

SIEMENS



Versatile Tracking Applications

Vehicle Tracking – track and locate your valued assets in realtime with high accuracy in some of the most difficult environments, including urban canyons and under dense foliage. itrac utilizes the pinpoint accuracy of the SiRFstarIII chipset to acquire GPS positioning and one of the most reliable modems on the market based on a SIEMENS solution.

Fleet Management – manage your fleet of any size by increasing efficiency and reliability you provide to customers with some basic features like a virtual odometer and reporting of alarms in realtime for engine idling and the entry/exit of geofences. itrac Gold is also able to “store and forward” GPS data in the event there is a loss of GPRS coverage, this feature is especially useful if your carrier is not able to roam onto another carrier’s network.

Stolen Vehicle Recovery (SVR) – whether it is for the SVR or the Buy Here Pay Here market, track and immobilize your vehicle via GPRS or SMS in realtime, a panic alarm feature is part of the itrac system with the ability to set its own tracking interval once a panic button has been triggered.

Teenage Tracking – locate your teenager and receive alarms for overspeeding and set up to 10 geofences where you will be notified upon the entry/exit of the preset virtual fences you have configured. Forgotten keys can be recovered with a simple command to unlock the car door via a SMS command from a mobile phone.

DIY – we have also taken into consideration for those do-it-yourself users who want to take tracking into their own hands and don’t want to pay for the convenience of a monitoring center. Users can still configure itrac to report alarms to their mobile phone as well as on demand location where they can input waypoints in their favorite map provider like Google Maps™.

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1. itrac Gold Server Settings

itrac Gold is an Automatic Vehicle Location device designed to track and locate an asset remotely via the GPRS/GSM wireless network by acquiring positions from the Global Positioning System.

Unit Configuration Modes – you can communicate with the itrac in 3 modes to input commands.

USB

By connecting the unit to a PC, some basic settings must be first made via the Hyperterminal or SMS if you are planning to use GPRS to configure itrac. In this mode you are able to monitor the response of the GSM module and of course configure the device. You are also able to manually download history tracking logs from the unit without having to go through GPRS. If you would like to monitor the GSM activity of the device on a PC via Hyperterminal, use the command **&MONITOR** afterwards press **Esc** to exit the monitoring mode.

Connecting the iTrac to the Hyperterminal requires the below settings:

Bits Per Second: 4800
Data Bits: 8
Parity: None
Stop Bits: 1
Flow Control: None

SMS

First you must have a SIM card present in the device and only then will you be able to send SMS commands to configure the basic settings for it to connect to the server whether the tracking is done via GPRS or SMS. The device is able to recognize pre-defined commands with a password for security purposes in case a non-authorized user attempts to change any settings. Sending incorrect commands or SPAM messages will be ignored and deleted.

GPRS (Service must be enabled by local carrier on SIM card.)

If you choose not to make configurations via Hyperterminal and if a SIM is present in the device and is able to receive SMS, configuring **&GPRS** as well as **&SERVER** commands via SMS will then enable you to send OTA commands from your server. itrac is able to support both TCP and UDP protocols.

Getting and Setting Parameters

One of the strengths of the itrac device is its flexibility in programming. Most of the commands can be used for both GPRS and SMS communications. Not only is a system integrator able to make setting changes to the device but this power can also be given to a user to set their own configurations as well.

NOTE: At the end of each command must follow a ' #' in order for the command to be successful. The commands are not case sensitive but lower and upper case letters should never be mixed. In order for the device commands to work properly, the commands must never have spaces inside or shall there be an enter sign.

GET

Retrieving settings from the device requires only a simple command with the unit password following it, the only exception is the **&PASSWORD** setting for security measures. An example would be if you wanted to see what settings were made for the realtime reporting intervals, depending on which communications mode you are using – say via GPRS – you would input the command **+CMD:REALTIME,1234#** and '1234' would be the default password of the device. The device would then send the command string of the settings that were made to the server. For security purposes, the password portion of the command will not be shown.

000126,&REALTIME,0,60,10,0

NOTE: No password will be shown when retrieving settings from the device. The first 6 digits are the Unit ID.

SET

When making a setting, again depending on what communication mode you are using in the device, you would simply follow the format for each of the commands listed in the manual. The device will disregard commands that do not follow the correct format, once a setting is made to the device, it will send back a confirmation of the same exact setting with the Unit ID in the front and again without the password placed in the string.

itrac Complete Command List

The following is a reference table to all of the commands allowed by the itrac device, all the commands are for GPRS or Over-the-Air commands. Many of the commands can also be used for SMS or USB communication by simply replacing the '+CMD:' with '&'. The following commands are mainly used to 'get' or retrieve setting parameters in the device, look further in the manual for reference to configuring the device.

Seq.	GPRS Control Commands	Description
1	+CMD:GPRS,1234#	Device parameter to connect to APN, User ID and password.
2	+CMD:SERVER,1234#	Parameters for Unit ID, SMS Gateway number, IP, Port, GPRS protocol, GMT time.
3	+CMD:SERVERDN,1234#	Domain name server instead of IP address
4	+CMD:PASSWORD,1234#	This allows only setting a password and has no retrieval properties.
5	+CMD:PIN,1234#	Security setting for PIN of SIM card.
6	+CMD:REALTIME,1234#	Set tracking intervals for Ignition OFF, Ignition ON, PANIC, and Idle.
7	+CMD:NOGSM,1234#	Enable or disable device to store reports when GPRS/GSM is lost.
8	+CMD:SMS CONVERT,1234#	Enable or disable to switch to SMS reporting mode when GPRS is lost.
9	+CMD:KEEPALIVE,1234#	Set Keep Alive interval to maintain GPRS connection.
10	+CMD:ODOMETER,1234#	Set odometer value from vehicle, the value must be converted to meters.
11	+CMD:JOURNEY,1234#	Enable or disable logging, set start speed, speed limit, and idle limit.
12	+CMD:JOURNEYALARM,1234#	Enable or disable alerts for start and end of a journey.
13	+CMD:IDLEALARM,1234#	Enable or disable reporting to server or personal mobile number.
14	+CMD:SPEEDALARM,1234#	Enable or disable reporting to server or personal mobile number.
15	+CMD:PANICALARM,1234#	Set up to personal mobile number to receive alerts during emergency.
16	+CMD:IN2ALARM,1234#	Enable or disable reporting and set personal mobile number.
17	+CMD:IN3ALARM,1234#	Enable or disable reporting and set personal mobile number.
18	+CMD:POWERALARM,1234#	Enable or disable reporting, set SMS alert, and vehicle voltage limit for low power.
19	+CMD:POWERMGMT,1234#	Choose power saving mode when the vehicle's ignition is off. (View manual for details)
20	+CMD:POWERSLEEP,1234#	Shuts down GPS and GSM functions after the vehicle's ignition has been turned off.
21	+CMD:LOGGING,1234#	Set logging interval, this is not related to the parameters made in the normal reporting.
22	+CMD:HISTORY,1234#	Enable or disable auto reporting, email reporting, IP, and Port.
23	+CMD:HIST,1234#	Email settings for history logs sent over GPRS.
24	+CMD:GEOSET,1234#	Enable or disable reporting for geofence and towing, SMS number.
25	+CMD:GEOFENCE,1234#	Set values of up to 10 geofences.
26	+CMD:LASTPOS,1234#	Enable or disable last GPS position show when no GPS signal
27	+CMD:SATNUM,1234#	Enable or disable GPS satellite number show at the end of &GPS format
28	+CMD:LOCALTIME,1234#	Enable or disable localtime report

Control Commands for Data Retrieval and Actions

Seq.	GPRS Control Commands	Description
1	+CMD:LOCATION,1234#	Request current location and status, will generate &GPS string.
2	+CMD:LOCNOW,1234#	Request current location with conversion to 'DD.ddddd/DDD.ddddd'.
3	+CMD:REBOOT,1234#	Reboots device.
4	+CMD:HISTORYCOUNT,1234#	Get logged history data count.
5	+CMD:HISTORYREPORT,1234#	Execute history report (via E-Mail or GPRS)
6	+CMD:HISTORYDELETE,1234#	Delete logged history data.
7	&MONITOR,1234#	Monitor GSM communication with network. (Hyperterminal only)
8	ESC	Return to command mode from monitoring mode. (Hyperterminal only)
9	+CMD:VERSION,1234#	Retrieve current device firmware version.
10	+CMD:OUTPUT,1234#	Control digital output of device.
11	+CMD:PANICOFF,1234#	Release emergency status reporting.

GPRS Settings

In order to use GPRS for communication, first a SIM card with a GPRS data plan must be present and APN settings must be made. Before actually making any settings, one should check with your telecom provider for the correct APN settings in order for a successful connection.

&GPRS	
PASSWORD	String (Max 10 characters)
	Security Code Factory Key '1234'
APN	String (Max 30 characters)
	GPRS Access Point Name
User ID	String (Max 30 characters)
	APN User ID
APN Password	String (Max 30 characters)
	APN password
FORMAT	&GPRS,PASSWORD,APN,User ID,Password#
EXAMPLE	&GPRS,1234,ORANGEINTERNET,USER,PASS#

Server Settings

Settings made here are for the device to connect to a server, SMS Gateway, and history reporting at the local time.

&SERVER	
PASSWORD	String (Max 10 characters)
	Security Code Factory Key '1234'
iTrac ID	XXXXXX (6 Digits)
	Identification Code for the Monitoring Control Center or the Backend Office
iTrac Nick Name	Max 8 Characters
	itrac Nick Name – this is a personal user setting when the user receives alerts via SMS
SMS Number	+XXXXXXXXXXXXXXXXXXXX (Max 20 Digits - Include '+')
	Control Center Modem SMS Gateway Number
IP Address	XXX.XXX.XXX.XXX
	Control Center IP Address ('0.0.0.0' means no IP address or leave blank but there must be a comma)
Port Number	XXXX (4 Digits)
	Control Center Port Number ('0000' means no Port Number or leave blank)
GPRS Protocol	Max 3 Characters
	"TCP" or "UDP"
Time Difference	XXXX (4 Digits – exclude '+' or '-')
	Local time difference from GMT, used for report of history logging at local time.
FORMAT	&SERVER,PASSWORD,iTrac ID,Nick Name,SMS Number,IP,Port,GPRS Protocol,Time Difference#
EXAMPLE	&SERVER,1234,760753,John,+447793177560,81.138.201.195,6060,TCP,+0830#

Domain Name Server

Domain name instead of IP address. This setting is designed as first priority than IP address set in &server parameter. Unit would ignore the IP address set in &server parameter once you had set this parameter with any value, wrong Domain Name would cause unit never connect success and keeping trying to connect. If you don't have Domain Name, just leave it null, don't set with any value

Control Center Domain Name Port Number using the same port number set in &server parameter

&SERVERDN	
PASSWORD	String (Max 10 characters)
	Security Code Factory Key '1234'
Domain Name	X (Max 30 characters)
	Control Center Domain Name. Leave it null if don't use Domain name.
FORMAT	&SERVERDN,PASSWORD,Domain_Name#
EXAMPLE	&SERVERDN,1234,#
	&SERVERDN,1234,chengholin.com.tw#



Alerts report in a different manner in comparison to the &REALTIME intervals, the device will report first to the set IP and port then to the SMS Gateway Number if GPRS is unsuccessful. Regardless if &SMS CONVERT has been disabled, the device will send the alerts based on GPRS as a priority and then SMS if the setting has been made to &SERVER.

In order to control costs, a system integrator can choose to configure the personal alerts and leave the SMS Gateway Number value blank in the &SERVER setting.

Password Settings to Device

The default password is '1234' but you are able to change it to protect others from making any changes to the device. The itrac device is password protected and so when making changes to the settings in the device, it will not make the changes if the password is incorrect.

&PASSWORD	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
New PASSWORD	String (Max 10 characters) New password for device
New PASSWORD	String (Max 10 characters) Input new password again to prevent typing errors
FORMAT	&PASSWORD,PASSWORD,New PASSWORD,New PASSWORD#
EXAMPLE	&PASSWORD,1234,6789,6789#

PIN Setting for SIM Card

Set SIM card pin number, leave empty if no PIN number needed. If a PIN is needed for the SIM, make sure you set it in the device before inserting the SIM card. Otherwise if the PIN is not properly configured in the device first, it will keep on trying the default which will in turn lock the SIM and thus requesting the PUK. Usually a PIN is not required on the SIM card you receive from your carrier as it most likely comes without a PIN. If you are using a personal SIM for testing purposes, first unlock the PIN request from your mobile phone before inserting into device.

The PIN code on the device is set at a default value of "0000".

&PIN	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
PIN Number	XXXXXX (Max 6 Digits) Some mobile networks need a PIN number on SIM
FORMAT	&PIN,PASSWORD,PIN Number#
EXAMPLE	&PIN,1234,6688#

2. Realtime Reporting Modes and Settings

Unit Communication Modes

The itrac device is able to do both passive and realtime tracking but configuration of the device must be performed first before moving on. Below are several tracking modes explained in greater detail:

USB

If the itrac is connected to a PC through the mini USB, the unit will not produce GPS data due to hardware constraints. If only datalogging is required, simply configure the unit and place it inside the asset you would like to track. At the end of the day, you can download the history logs of the tracks manually by connecting the unit to a PC.

SMS

If you are tracking your assets via SMS, perhaps due to the fact SMS is cheaper than GPRS in your country, you will first need a SMS gateway setup with your monitoring center and of course a set plan with your local telecom carrier. In SMS mode, the unit will not be able to send history logs – instead it will have to be manually downloaded.

You are also able to configure the alarms with a separate mobile number that is able to send a SMS alert to the user or any other mobile phone you would like to report to. These alerts are only sent once when the event is triggered. Depending on how you would like to use the unit, remember how each setting can be made to tailor your tracking needs.

GPRS

itrac is able to use both TCP and UDP protocols, all of the commands that are used for SMS can also be used for GPRS tracking mode. When a command is sent from the server, the unit will echo the command back as a way of confirming it has received the command. Users can also send commands to the unit via their mobile phone to change any configurations, the server will receive a log of the command as well as a SMS confirmation will be sent to the user.

History logs can be sent over GPRS or email, instead of having to manually download the logs to a PC.

SMS and GPRS

If tracking is done over GPRS and a SMS gateway is supported, the itrac device is able to switch over to SMS once GPRS connection is lost. Settings in the **&SMS CONVERT** can be configured for this option where GPRS reporting will be primary and SMS acts as a secondary form of reporting back to the server.

If any of the settings are changed in the device via a SMS mobile number, the device will echo a confirmation via SMS to the originating mobile number and also send a notification of what settings have been modified to the server over GPRS with the mobile number attached to the end. Any commands that are sent to the unit via a mobile phone, the unit will send back the configuration without the password as confirmation to the mobile phone user over SMS but without the password in the data string. **If a command was sent from +447793177560, with setting changes made to &ODOMETER,1234,45000# – the server would receive the following notification:**

000001,&ODOMETER,45000,+447793177560

In the **&GPS** or **&LOG** reports, an **Event ID 99** will show a device setting has been changed via SMS other than the number that has already been set in **&SERVER**. In the end, the device will send one SMS to the user and to the server one **&GPS** string with the Event ID 99 and the setting that has been changed via SMS.

Data Syntax

Any responses sent by the itrac Gold will be preceded with a six-digit Unit ID number followed by the data format and ended with a carriage return or **<CR><LF>**. The ASCII display of these characters is suppressed with only the response from the device as you see below from an example of where an **&GPS** string would be received by the server.

Unit ID	&GPS	Unit ID	Date	Time	Latitude	N/S	Longitude	E/W	Speed	Heading	Odometer	Idle Time	Event ID	Input Status
927001	&GPS	927001	051106	183040	1234.5678	N	12345.6789	E	120	78	456248	306	14	1000

Normal GPS Message String

&GPS		
Unit ID	XXXXXX(6 Digits)	
	Unit ID value from &SERVER parameter.	
Date	XXXXXX(6 Digits) – XX(Day) XX(Month) XX(Year)	
	Date value from GPS information Greenwich Mean Time	
Time	XXXXXX(6 Digits) – XX(Hour) XX(Minute) XX(Second)	
	Time value from GPS information in Greenwich Mean Time	
Latitude	DDMM.MMMM	
	Latitude value from GPS information	
N/S	1 Character	
	N	North
	S	South
Longitude	DDDMM.MMMM	
	Longitude value from GPS information	
E/W	1 Character	
	E	East
	W	West
Speed	Numeric	
	Speed value from GPS information (Kilometer)	
Heading	Numeric	
	Heading value from GPS information (°)	
Odometer	Numeric	
	Current odometer value. (Meter)	
Idle Time	Numeric	
	Idle Time accumulated value appears in each reporting interval, upon movement counter will go back to 0. (Seconds)	
Event ID	XX	
	Predefined Event ID	
Input status	ABCD(4 digits)	
	A	A=0 → Ignition OFF (yellow cable) A=1 → Ignition ON (yellow cable)
	B	B=0 → Panic OFF (blue cable) B=1 → Panic ON (blue cable)
	C	C=0 → Input 2 OFF (white cable) C=1 → Input 2 ON (white cable)
	D	D=0 → Input 3 OFF (gray cable) D=1 → Input 3 ON (gray cable)
FORMAT	&GPS,Unit ID,Date,Time,Latitude,N/S,Longitude,E/W,Speed,Heading,Odometer,Idle Time,Event ID,Input Status	
EXAMPLE	&GPS,927001,051106,183040,1234.5678,N,12345.6789,E,120,78,456248,369,14,1000	



You can also acquire on-demand location or status of the device by executing an **&LOCATION,1234#** command which will send back an **&GPS** string. For mobile users, a more friendly command **&LOCNOW,1234#** can also be used to acquire a fix where the GPS coordinates can be input in your favorite online map provider.

Event ID List

When an event occurs, it gets logged as part of the **&GPS** or **&LOG** data strings.

Seq.	Event Name	Event ID	Remarks
1	Normal	00	Not an actual event, normal reporting or logging is currently active.
2	Journey Start	11	Vehicle is moving faster than set speed in &JOURNEY parameter.
3	Journey End	12	Vehicle ignition has been turned off, SMS alert will be sent via &JOURNEYALARM settings
4	Over Speed	13	Device has exceeded set speed limit, SMS alert will be sent via &SPEEDALARM settings
5	Vehicle Idle	14	Vehicle has been idling longer than set idle time, SMS alert will be sent via &IDLEALARM
6	History 80% Logged	20	80% LOGGED DATA from History Logs
7	History 90% Logged	21	90% LOGGED DATA – when the data reaches 100% it will overwrite oldest data based on FIFO
8	Towing Alert	30	Vehicle is traveling faster than 15km per hour when ACC OFF – possible errors from GPS
9	Geofence In	40~49	Entry of geofence – parameters set in &GEOFENCE , reporting set in &GEOSET command.
10	Geofence Out	50~59	Exit of geofence – parameters set in &GEOFENCE , reporting set in &GEOSET command.
11	Output1 OFF (0)	60	Depends on installation of device, requires 12V or 24V relay for immobilization or door unlock.
12	Output1ON (1)	61	Depends on installation of device, requires 12V or 24V relay for immobilization or door unlock.
13	Output2 OFF (0)	70	Depends on installation of device, requires 12V or 24V relay for immobilization or door unlock.
14	Output2 ON (1)	71	Depends on installation of device, requires 12V or 24V relay for immobilization or door unlock.
15	Panic Activated	80	Panic button has been triggered. MUST USE MOMENTARY BUTTON FOR INSTALLATION
16	Panic Distress	81	Continued emergency status from panic alarm.
17	Input2 OFF (HIGH)	82	Depends on installation of device, for example door sensor.
18	Input2 ON (LOW)	83	Depends on installation of device, for example door sensor.
19	Input3 OFF (HIGH)	84	Depends on installation of device, for example door sensor.
20	Input3 ON (LOW)	85	Depends on installation of device, for example door sensor.
21	Vehicle Battery Low	91	Power of vehicle battery has reached below setting of 9 – 24 volts.
22	POWERSLEEP On	93	Device has entered into &POWERSLEEP mode after ignition has been turned off
23	SMS Setting Change	99	Device settings have been changed by SMS via mobile number.



Alerts report in a different manner in comparison to the **&REALTIME intervals, the device will report first to the set IP and port then to the SMS Gateway Number if GPRS is unsuccessful. Regardless if **&SMS CONVERT** has been disabled, the device will send the alerts based on GPRS as a priority and then SMS if the setting has been made to **&SERVER**.**

In order to control costs, a system integrator can choose to configure the personal alerts and leave the SMS Gateway Number value blank in the **&SERVER setting.**

Any of the above Event ID's are treated in the same manner as an alert, whereby the device will first attempt to send to the IP and port and then the SMS Gateway Number as a secondary option.

Realtime Report Settings

Currently there are four individual tracking intervals that can be configured, there are two exclusive intervals that have been reserved for emergency reporting and an advanced reporting feature for engine idling.

Ignition OFF

You can configure the device to still report even when the ignition has been turned off. The tracking interval can be set to report up to every 30 days, which is highly suitable for a SVR application where you don't need the device reporting frequently. A suggested setting to complement this feature set would be to enable the **&POWERMGMT** command to have the device in power saving mode. Read further in the manual to understand the **&POWERMGMT** feature.

Ignition ON

Regular tracking interval when you are driving.

Emergency (PANIC) **Panic button must be a momentary button for installation with device.**

When INPUT 1 has been triggered, resulting in some sort of panic button being pushed, the device will report continuously for one hour until it releases this tracking interval or until the device receives an **&PANICOFF** command.

Idle



Setting this at a longer interval than your regular tracking interval can help you save on data costs as well as receiving too many waypoints in one particular position. This interval is independent from the **&JOURNEY** command, the settings from there will not influence the Idle Interval settings. The device considers the vehicle idle when data received from the GPS is at 0 KM/h.

Realtime Tracking Interval Settings

&REALTIME	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Ignition OFF Interval	0,10~2592000 (Seconds) Reporting Interval during ignition off – 0 means device will not report
Ignition ON Interval	0,10~86400 (Seconds) Reporting Interval during ignition on – 0 means device will not report
Emergency PANIC Interval	0,10~86400 (Seconds) Reporting Interval during emergency status. – Input1 has been triggered
Idle Interval	0,10~86400 (Seconds) Reporting Interval during idle – 0 means device will not report
FORMAT	&REALTIME,PASSWORD,Ignition Off,Ignition On,Emergency,Idle#
EXAMPLE	&REALTIME,1234,0,60,10,0#

On-demand Location - &LOCATION / &LOCNOW

There are two ways a user can receive an on-demand location of the device, one is by executing the command **&LOCATION,1234#** where in turn it sends back a **&GPS** string. The command can be executed via both GPRS and SMS, a second option is a command that is more user-friendly **&LOCNOW,PASSWORD#**. This particular command is aimed at personal mobile users who would like to acquire the position of the vehicle. The 'DD.ddddd/DDD.ddddd' waypoints can then be inputted into your favorite map provider like Google Maps™ to view the vehicle's position.

'Unit ID : Unit Nick Name' IS AT 'DD.ddddd(N/S) DDD.ddddd (E/W)' TRAVELING 'Heading' AT 'Speed' KM/h	
Unit ID	XXXXXX(6 Digits) Unit ID value from &SERVER parameter.
Unit Nick Name	String Nick Name value from &SERVER parameter
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM
Heading	Direction of device from SiRFstarIII GPS module, eg. NE = Northeast
Speed	Speed of device from SiRFstarIII GPS module

Keep Alive GPRS Connection

Time interval depends on when the last time a packet was sent, the factory default is set at 0 interval. This feature can be used for both TCP and UDP protocols but it will prove more advantageous when used with TCP protocol reporting. The interval **&KEEPAIVE** transmits at is based on the last time data was sent from the device, thus in order for this setting to work you must set this interval shorter than your reporting interval.

&KEEPAIVE	
PASSWORD	String (Max 10 characters)
	Security Code Factory Key '1234'
Keep Alive Interval (sec)	0,10 ~ 86400 (seconds)
	Keep Alive GPRS connection – 0 not send, 10 seconds, 1 day via last.
FORMAT	&KEEPAIVE,PASSWORD,Keep Alive Interval#
EXAMPLE	&KEEPAIVE,1234,1800#

No GPRS or No GSM signal

When there is no GPRS/GSM coverage, data will be saved in the memory of the device until connection is recovered. If the device is tracking in SMS mode, it will do the same and send out the **&GPS** reports one SMS at a time. As a backup, **&SMS CONVERT** can be used in conjunction with GPRS – in other words if GPRS fails and GSM is still present, the unit will send the reports via SMS.

&NOGSM	
PASSWORD	String (Max 10 characters)
	Security Code Factory Key '1234'
Record Enable	X (1 Digit)
	0 Disable record realtime data when no GPRS/GSM signal
	1 Enable record realtime data when no GPRS/GSM signal
FORMAT	&NOGSM,PASSWORD,Record Enable#
EXAMPLE	&NOGSM,1234,1#

Automatic SMS Convert

If set true, realtime tracking report will be sent via SMS when GPRS connection is lost.

&SMS CONVERT	
PASSWORD	String (Max 10 characters)
	Security Code Factory Key '1234'
Auto Convert	X (1 Digit)
	0 Disable Automatic Convert
	1 Enable Automatic Convert
FORMAT	&SMS CONVERT,PASSWORD,Auto Convert#
EXAMPLE	&SMS CONVERT,1234,1#

Virtual Odometer Setting

Input odometer reading from vehicle, after this setting has been configured – itrac will automatically start to accumulate virtual odometer value using GPS data. If you are reading off your odometer in kilometers with an accumulated value of 151517, to make the conversion to kilometers you need to multiply 1000 with 151517.

151517km x 1000 = 151517000 meters

Odometer value in kilometers x 1000 = meters

Odometer value in miles x 1609.344 = meters

The user should be aware there will be a variance between the virtual odometer reading accumulated from GPS data and the actual odometer reading from the vehicle itself.

&ODOMETER	
PASSWORD	String (Max 10 characters)
	Security Code Factory Key '1234'
Odometer Value	0~999999999
	Odometer value. (Meter)
FORMAT	&ODOMETER,PASSWORD,Odometer Value#
EXAMPLE	&ODOMETER,1234,45000#

3. Setting Speed Limits and Idling

Knowing More About a Journey

These particular set of settings offer greater flexibility whether it be a system integrator or someone who purchased itrac off the shelf and just wants to utilize SMS for tracking.

Journey Start

Know when a journey has begun by setting the start speed in the **&JOURNEY** command, once the vehicle is traveling faster than the set speed, an alert will be sent to a personal SMS number that was preset in the **&JOURNEYALARM**. If settings have been made to the server side, both the server and personal number will receive an alert.

Journey End

Know when the journey has ended once the ignition has been turned off.

Over Speed

Set the speed limit in the **&JOURNEY** command and receive an alert from the **&SPEEDALARM** to your personal mobile number. In order to avoid constant alerts, set the speed limit at a value above your local highway speed limit. Alarms will be sent every time the speed from the GPS falls below the set speed limit, if the speed falls below the limit and then exceeds it; the device will send the alert in the same logic.

Idle Hold Time

The Idle time event will be triggered when the vehicle has stopped for longer than the set idle hold time. This event only occurs during the journey and the accumulated idle time is reported in the **&GPS** idle time in each interval, the total accumulated idle time will be shown with Event ID 14. This alert works in the same logic as the speed alarm.

Journey Start - EVENT ID 11

Journey End - EVENT ID 12

Journey Settings for Speed and Idle

In the event that you have set the **Start Speed** to 0, the device will report **Event ID 11** and **Event ID 12** immediately each time the ignition is in the ON/OFF status. In other words, if the Start Speed is set to 0, the device will not check the speed and just report to the server each time it detects the vehicle is in the ignition ON/OFF status.

&JOURNEY		
PASSWORD	String (Max 10 characters)	
	Security Code Factory Key '1234'	
Enable Alarms	X (1 Digit)	
	0	Disable Journey Alarms
	1	Enable Journey Alarms
Start Speed	Max 3 Digits	
	Journey start speed. (Kilometer Per Hour)	
Over Speed Limit	Max 3 Digits	
	Over speed limit. (Kilometer Per Hour)	
Idle Hold Time	Max 3 Digits	
	Idle Hold Time. (Seconds) Exceeded value is accumulated and shown in &GPS string.	
FORMAT	&JOURNEY,PASSWORD,Enable Alarms,Start Speed,Over Speed Limit,Idle Hold Time#	
EXAMPLE	&JOURNEY,1234,1,5,120,120#	



Make sure the limits you set are not below the normal boundaries of the driver's behavior. A common mistake is setting a low Over Speed Limit which results in the device constantly reporting. One should set a boundary that is above the average local speed limit to avoid the device from constantly reporting back to the backend server.

Each of the boundaries are triggered once it detects the limit has been exceeded, hence if the limit falls below the limit and then exceeds it again, the device will immediately send an alert.

Journey Alarm

Enable reporting of journey alarms to both the server and SMS mobile number for the personal user.

&JOURNEYALARM	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Enable Alarm To Server	X (1 Digit) 0 Disable Journey Alarm report to server 1 Enable Journey Alarm report to server
Enable Alarm To User SMS	X (1 Digit) 0 Disable Journey Alarm report to personal SMS number 1 Enable Journey Alarm report to personal SMS number
Report SMS Number	+XXXXXXXXXXXXXXXXXXXX (Max 20 Digits - Including '+') Report to personal SMS Number (must start with '+')
FORMAT	&JOURNEYALARM,PASSWORD,Server,SMS,Report SMS Number#
EXAMPLE	&JOURNEYALARM,1234,1,1,+447793177560#

Journey Start Message via SMS to Mobile

'Unit ID : Unit Nick Name' STARTED JOURNEY AT 'DD.ddddd(N/S) DDD.ddddd (E/W)'	
Unit ID	XXXXXX(6 Digits) Unit ID value from &SERVER parameter.
Unit Nick Name	String Nick Name value from &SERVER parameter
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM

Journey End Message via SMS to Mobile

'Unit ID : Unit Nick Name' HAS ENDED JOURNEY AT 'DD.ddddd(N/S) DDD.ddddd (E/W)'	
Unit ID	XXXXXX(6 Digits) Unit ID value from &SERVER parameter.
Unit Nick Name	String Nick Name value from &SERVER parameter
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM

Idle Hold Time Alarm Setting - **EVENT ID 14**

Enable idle alarms to both the server and SMS mobile number for personal user.

&IDLEALARM	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Enable Alarm To Server	X (1 Digit) 0 Disable Idle Alarm report to server 1 Enable Idle Alarm report to server
Enable Alarm To User SMS	X (1 Digit) 0 Disable Idle Alarm report to personal SMS number 1 Enable Idle Alarm report to personal SMS number
Report SMS Number	+XXXXXXXXXXXXXXXXXXXX (Max 20 Digits - Including '+') Report to personal SMS Number (must start with '+')
FORMAT	&IDLEALARM,PASSWORD,Server,SMS,Report SMS Number#
EXAMPLE	&IDLEALARM,1234,1,1,+447793177560#

Idle Duration Message via SMS to Mobile

'Unit ID : Unit Nick Name' IDLED FOR 'X' SECONDS AT 'DD.ddddd(N/S) DDD.ddddd (E/W)'	
Unit ID	XXXXXX(6 Digits) Unit ID value from &SERVER parameter.
Unit Nick Name	String Nick Name value from &SERVER parameter
X	Total idle time since under X km per hour
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM

Over Speed Alarm Setting - **EVENT ID 13**

Enable idle alarms to both the server and SMS mobile number for personal user.

&SPEEDALARM	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Enable Alarm To Server	X (1 Digit) 0 Disable Speed Alarm report to server 1 Enable Speed Alarm report to server
Enable Alarm To User SMS	X (1 Digit) 0 Disable Speed Alarm report to personal SMS number 1 Enable Speed Alarm report to personal SMS number
Report SMS Number	+XXXXXXXXXXXXXXXXXXXX (Max 20 Digits - Including '+') Report to personal SMS Number (must start with '+')
FORMAT	&SPEEDALARM,PASSWORD,Server,SMS,Report SMS Number#
EXAMPLE	&SPEEDALARM,1234,1,1,+447793177560#

Over Speed Limit Message via SMS to Mobile

'Unit ID : Unit Nick Name' EXCEEDS OVER SPEED LIMIT 'Numeric' AT ' DD.ddddd(N/S) DDD.ddddd (E/W)'	
Unit ID	XXXXXX(6 Digits) Unit ID value from &SERVER parameter.
Unit Nick Name	String Nick Name value from &SERVER parameter
Over Speed Limit	Numeric Over speed limit value from &JOURNEY parameter
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM

4. Security and Safety Features

Adding an Extra Layer of Security

Securing your asset is one of the top priorities for any person or business that would not only like to keep track of their investments – but make sure it stays safe and secure. **itrac Gold** helps in providing that extra layer of security with features such as being able to actively immobilize your vehicle by cutting off the power or flow of petrol to the fuel pump through a 12V/24V relay. An immobilization command can be sent via GPRS or even from a personal mobile phone via SMS.

Both the 12V and 24V relay are optional accessories that complement the **itrac Gold** AVL tracking system. **We do not guarantee your vehicle will be 100% theft-proof but rather as a means of adding another layer of security.** Some insurance companies offer discounts to both personal and commercial vehicles with such a system installed. Inquire with your local auto insurer to see if any discounts are offered, full comprehensive auto insurance may be a prerequisite to receive any discounts.

Output Status Change

There are two Digital Outputs in the **itrac** where one would be used for **immobilization** to the vehicle using a 12V or 24V relay. Another DO can be used to suit whatever application you see fit, for example connecting another relay to the emergency lights that could signal the police in case of a car pursuit and leading to an unhappy ending for the car thief. For the forgetful, being able to unlock the car doors may just make your day and save you a call to the locksmith.

The Digital Outputs can be controlled remotely via GPRS or SMS from a mobile phone, these actions are logged in both the **&GPS** and **&LOG** reports. There are no alarms sent out to the user or server when controlling the outputs, rather you will only see them as EVENT ID's.

Output1 OFF (0) EVENT ID 60
Output1 ON (1) EVENT ID 61

Output2 OFF (0) EVENT ID 70
Output2 ON (1) EVENT ID 71

Controlling the Output Ports

&OUTPUT	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Output Number	Numeric Output Port Number. (1, 2)
Immediate Apply	X (1 Digit) 0 Apply after Ignition Off 1 Apply Immediately
Value	X (1 Digit) 0 OFF (Set High) 1 ON (Set Low)
FORMAT	&OUTPUT,PASSWORD,1,Apply,Value# &OUTPUT,PASSWORD,2,Apply,Value#
EXAMPLE	&OUTPUT,1234,1,1,1#

Panic Alarm Settings

Input 1 is exclusively reserved for the installation of a panic button, a separate reporting interval has been reserved in the **&REALTIME** command. **itrac** will start tracking at the set interval in the **Emergency** interval while also a sending alerts to a mobile number via SMS that have been configured in the **&PANICALARM** settings.

The tracking interval set in **&REALTIME** will keep on reporting for an hour or until an **&PANICOFF,PASSWORD#** command is sent to the device and releases the **Emergency** tracking interval. This can be used in several applications where it serves as an added value service to the consumer market, commercial fleets, or even taxi cabs where two panic buttons can be connected together with one for the driver and one in the back for the passenger.

Panic alarm has been triggered **EVENT ID 80**
 Panic interval reporting is in progress **EVENT ID 81**
 Panic Alarm Settings for Personal Mobile Number

&PANICALARM	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Report	+XXXXXXXXXXXXXXXXXXXX (Max 20 Digits - Including '+')
SMS Number	Report to personal SMS Number (Must start with '+')
FORMAT	&PANICALARM,PASSWORD,SMS Number#
EXAMPLE	&PANICALARM,1234,+447793177560#

Panic Triggered Message via SMS to Mobile

'Unit ID : Unit Nick Name' HAS TRIGGERED PANIC AT 'DD.ddddd(N/S) DDD.ddddd (E/W)' TRAVELING 'Heading' AT 'Speed' KM/h	
Unit ID	XXXXXX(6 Digits) Unit ID value from &SERVER parameter.
Unit Nick Name	String Nick Name value from &SERVER parameter
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM
Heading	Direction of device from SiRFstarIII GPS module
Speed	Speed of device from SiRFstarIII GPS module

WARNING – USE WITH DISCRETION

When installing a panic button, a momentary button **MUST** be used for the installation.

The interval the device transmits is dependent on the time interval setting in &REALTIME. As this alert is seen as an emergency, the device will report accordingly with the exception of the time interval set to 0.

When the PANIC interval is set to 0, with a momentary button, the device will not send Event ID 81 but will send Event ID 80 depending on how long or how many times the driver presses on the button.

In the case a regular ON/OFF switch is used for your application and the PANIC interval is again set at 0, if the state of the button remains ON – again the device will not send Event ID 81 but Event ID 80 will transmit continuously which may be less than 1 second per poll.

Hence installers are highly advised to use a momentary button. The manufacturer is not held liable for any data charges resulting from the use of the PANIC feature.

Input 2 and Input 3 Settings

There are a number of sensors you can connect to the two free remaining inputs, as long as it has a digital signal. An example would be connecting it to a door sensor in a delivery truck or if something like a taximeter that has a digital signal, a taxi fleet owner would be able to know when the meter was turned on and off for each journey – thus clocking each fare.

Input 2 Alarm Setting

Input2 OFF/CLOSE (HIGH) - EVENT ID 82 / Input2 ON/OPEN (LOW) - EVENT ID 83

&IN2ALARM	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Enable Alarm To Server	X (1 Digit) 0 Disable INPUT2 Alarm report to server 1 Enable INPUT2 Alarm report to server
Enable Alarm To User SMS	X (1 Digit) 0 Disable INPUT2 Alarm report to personal SMS number 1 Enable INPUT2 Alarm report to personal SMS number
Report SMS Number	+XXXXXXXXXXXXXXXXXXXX (Max 20 Digits - Including '+') Report to personal SMS Number (must start with '+')
FORMAT	&IN2ALARM,PASSWORD,Server,SMS,Report SMS Number#
EXAMPLE	&IN2ALARM,1234,1,1,+447793177560#

Input 2 HIGH Message via SMS to Mobile

'Unit ID : Unit Nick Name' INPUT 2 HIGH AT 'DD.ddddd(N/S) DDD.ddddd (E/W)'	
Unit ID	XXXXXX(6 Digits) Unit ID value from &SERVER parameter.
Unit Nick Name	String Nick Name value from &SERVER parameter
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM

Input 2 LOW Message via SMS to Mobile

'Unit ID : Unit Nick Name' INPUT 2 LOW AT 'DD.ddddd(N/S) DDD.ddddd (E/W)'	
Unit ID	XXXXXX(6 Digits) Unit ID value from &SERVER parameter.
Unit Nick Name	String Nick Name value from &SERVER parameter
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM

Input 3 Alarm Setting

Input3 OFF/CLOSE (HIGH) - **EVENT ID 84** / Input3 ON/OPEN (LOW) - **EVENT ID 85**

&IN3ALARM		
PASSWORD	String (Max 10 characters)	
	Security Code Factory Key '1234'	
Enable Alarm To Server	X (1 Digit)	
	0	Disable INPUT3 Alarm report to server
	1	Enable INPUT3 Alarm report to server
Enable Alarm To User SMS	X (1 Digit)	
	0	Disable INPUT3 Alarm report to personal SMS number
	1	Enable INPUT3 Alarm report to personal SMS number
Report SMS Number	+XXXXXXXXXXXXXXXXXXXX (Max 20 Digits - Including '+')	
	Report to personal SMS Number (must start with '+')	
FORMAT	&IN3ALARM,PASSWORD,Server,SMS,Report SMS Number#	
EXAMPLE	&IN3ALARM,1234,1,1,+447793177560#	

Input 3 HIGH Message via SMS to Mobile

'Unit ID : Unit Nick Name' INPUT 3 HIGH AT 'DD.ddddd(N/S) DDD.ddddd (E/W)'		
Unit ID	XXXXXX(6 Digits)	
	Unit ID value from &SERVER parameter.	
Unit Nick Name	String	
	Nick Name value from &SERVER parameter	
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM	

Input 3 LOW Message via SMS to Mobile

'Unit ID : Unit Nick Name' INPUT 3 LOW AT 'DD.ddddd(N/S) DDD.ddddd (E/W)'		
Unit ID	XXXXXX(6 Digits)	
	Unit ID value from &SERVER parameter.	
Unit Nick Name	String	
	Nick Name value from &SERVER parameter	
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM	

5. Geofences and Towing Alerts

Geofences are very much like a virtual fence where they can serve a wide variety of uses, you can set them to know when a particular employee has gone back home to take a nap and how long he was there. And with the geofences built into the hardware, it takes off some of the workload for system integrators on their servers. Towing is also a great feature that has been built into the **itrac** device where you can receive an alert if your vehicle is being towed.

Geofence Entry/Exit

You can setup to ten Geofences, entry and exit of a geofence will trigger an event and an alarm will be sent according to the settings made to **&SERVER** and a personal mobile number pre-configured in the **&GEOSET** parameters.

Towing

This feature sets up a geofence perimeter when the vehicle is in a parked status, some also refer to this as a parkfence. The conditions for towing are when the vehicle's ignition is turned off and the vehicle is traveling faster than 15km per hour without the ignition turned on. If the event is triggered, it will be seen as either your vehicle is being towed or even in the process of being stolen. Settings to enable or disable this feature is done in the **&GEOSET** command.

Geofence Entry

EVENT ID 40 - 49

Geofence Exit

EVENT ID 50 - 59

Towing

EVENT ID 30

Geographical Settings for Towing and Geofences

&GEOSET	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Towing Alarm Enable to Server	X (1 Digit) 0 Disable Towing Alarm report to server 1 Enable Towing Alarm report to server
Geofence Alarm Enable to Server	X (1 Digit) 0 Disable Geofence Alarm report to server 1 Enable Geofence Alarm report to server
Towing Alarm Enable to User SMS	X (1 Digit) 0 Disable Towing Alarm report to personal SMS number 1 Enable Towing Alarm report to personal SMS number
Geofence Alarm Enable to User SMS	X (1 Digit) 0 Disable Towing Alarm report to personal SMS number 1 Enable Towing Alarm report to personal SMS number
Report SMS Number	+XXXXXXXXXXXXXXXXXXXX (Max 20 Digits - Including '+') Report to personal SMS Number (must start with '+')
FORMAT	&GEOSET,PASSWORD,Towing Server,Geofence Server,Towing SMS, Geofence SMS, Report SMS Number#
EXAMPLE	&GEOSET,1234,0,1,1,1,+447793177560#

Towing Message via SMS to Mobile

'Unit ID : Unit Nick Name' IS TOWING AT 'DD.ddddd(N/S) DDD.ddddd (E/W)' TRAVELING 'Heading' AT 'Speed' KM/h	
Unit ID	XXXXXX(6 Digits) Unit ID value from &SERVER parameter.
Unit Nick Name	String Nick Name value from &SERVER parameter
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM
Heading	Direction of device from SiRFstarIII GPS module
Speed	Speed of device from SiRFstarIII GPS module

Geofence Settings – Up to 10

&GEOFENCE		
PASSWORD	String (Max 10 characters)	
	Security Code Factory Key '1234'	
Sequence	0~9 (1 Digits)	
	Geo-Fence Sequence	
Latitude	DDMM.MMMM	
	Center Point Latitude	
N/S	1 Character	
	N	North
	S	South
Longitude	DDDMM.MMMM	
	Center Point Longitude	
E/W	1 Character	
	E	East
	W	West
Radius	0~999999999	
	Radius – Meter (0 means no check)	
FORMAT	&GEOFENCE,PASSWORD,Sequence,Latitude,N/S,Longitude,E/W,Radius#	
EXAMPLE	&GEOFENCE,1234,1,1234.5678,N,12345.6789,E,1000#	

Geofence Entry Message via SMS to Mobile

'Unit ID : Unit Nick Name' COMES IN GEOFENCE 'X' AT 'DD.ddddd(N/S) DDD.ddddd (E/W)'	
Unit ID	XXXXXX(6 Digits)
	Unit ID value from &SERVER parameter.
Unit Nick Name	String
	Nick Name value from &SERVER parameter
X	Geofence Sequence
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM

Geofence Exit Message via SMS to Mobile

'Unit ID : Unit Nick Name' GOES OUT GEOFENCE 'X' AT 'DD.ddddd(N/S) DDD.ddddd (E/W)'	
Unit ID	XXXXXX(6 Digits)
	Unit ID value from &SERVER parameter.
Unit Nick Name	String
	Nick Name value from &SERVER parameter
X	Geofence Sequence
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM

6. Passive Tracking and History Logging

There are two options when approaching passive tracking with the itrac Gold, you can download the history logs directly via a data line or receive the logs over GPRS. Depending on what mode of communications you are using, all you have to do is remember to use either '&' or '+CMD:' in front of the commands. If you are using GPRS, the commands are as follows:

```
+CMD:HISTORYCOUNT,1234#
+CMD:HISTORYREPORT,1234
+CMD:HISTORYDELETE,1234#
```

&HISTORYCOUNT

The **&HISTORYCOUNT** command only retrieves the count for the number of history logs, it is not a setting command.

&HISTORYCOUNT	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Current History Count	Numeric Current logged history log count.
REQUEST FORMAT	&HISTORYCOUNT,PASSWORD#
REQUEST EXAMPLE	&HISTORYCOUNT,1234#
RETURN FORMAT	&HISTORYCOUNT,Current History Count
RETURN EXAMPLE	&HISTORYCOUNT,4521

&HISTORYREPORT

This particular command requests the device to report its history once the command has been executed – it will immediately implement the pre-defined reporting method. There's also a choice to have the device report automatically once a day through the **&HISTORY** parameters.

If you do so happen to be disconnected while downloading the history reports, you can resume download by sending a command of where you last left off. The history report count is counted down to 0, so if you wanted to report from log number 200, the command would be **&HISTORYREPORT,1234,199#**.

&HISTORYDELETE

This command will clear all data that is stored on the onboard FLASH memory in the device. When the data reaches 100%, the oldest data will be overwritten based on a First In, First Out principle. Remember to add the **#** after the command, **&HISTORYDELETE,1234#**

History 80% Logged - EVENT ID 20

History 90% Logged - EVENT ID 21

History Log Message String

History logging parameters can be made in the **&LOGGING** command.

&LOG		
Unit ID	XXXXXX(6 Digits)	
	Unit ID value from &SERVER parameter.	
Date	XXXXXX(6 Digits) – XX(Day) XX(Month) XX(Year)	
	Date value from GPS information Greenwich Mean Time	
Time	XXXXXX(6 Digits) – XX(Hour) XX(Minute) XX(Second)	
	Time value from GPS information Greenwich Mean Time	
Latitude	DDMM.MMMM	
	Latitude value from GPS information	
N/S	1 Character	
	N	North
	S	South
Longitude	DDDMM.MMMM	
	Longitude value from GPS information	
E/W	1 Character	
	E	East
	W	West
Speed	Numeric	
	Speed value from GPS information (Kilometer)	
Heading	Numeric	
	Heading value from GPS information (°)	
Odometer	Numeric	
	Current odometer value. (Meter)	
Idle Time	Numeric	
	Idle Time accumulated value appears in each reporting interval, upon movement counter will revert back to 0.	
Event ID	XX	
	Predefined Event ID	
Input Status	ABCD(4 digits)	
	A	A=0 → Ignition OFF (yellow cable) A=1 → Ignition ON (yellow cable)
	B	B=0 → Panic OFF (blue cable) B=1 → Panic ON (blue cable)
	C	C=0 → Input 2 OFF (white cable) C=1 → input 2 ON (white cable)
	D	D=0 → Input 3 OFF (gray cable) D=1 → Input 3 ON (gray cable)
Log Data Counter	XXXXXXXXX(9 digits)	
	Log data saved sequence number	
FORMAT	&LOG,Unit ID,Date,Time,Latitude,N/S,Longitude,E/W,Speed,Heading,Odometer,Idle Time,Event ID,Input Status,Log Data Counter	
EXAMPLE	&LOG,927001,051106,183040,1234.5678,N,12345.6789,E,120,78,456248,369,14,1000,000000170	

History Logging Interval Setting

&LOGGING	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Logging Interval	0,10~86400 (Numeric) Logging Interval – Second (0 means No Logging, Min 10 sec, Max 1 day)
FORMAT	&LOGGING,PASSWORD,Logging Interval#
EXAMPLE	&LOGGING,1234,60#

History Setting

History report settings for auto reporting once a day via email or over GPRS.

&HISTORY	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Report Type	X (1 Character) E Email Reporting G GPRS Reporting
Auto Reporting	X (1 Digit) 0 Disable Auto Reporting 1 Enable Auto Reporting
SMTP IP Address	XXX.XXX.XXX.XXX SMTP Server IP Address ('0.0.0.0' means no IP address) or it can be left blank
GPRS IP Address	XXX.XXX.XXX.XXX GPRS Server IP Address ('0.0.0.0' means no IP address) or it can be left blank
GPRS Port Number	XXXX (4 Digits) GPRS Server Port Number ('0000' means no Port Number) or it can be left blank
FORMAT	&HISTORY,PASSWORD,Report Type,Auto Reporting,SMTP IP Address,GPRS IP Address,GPRS Port Number#
EXAMPLE	&HISTORY,1234,E,1,81.138.201.195,81.138.201.190,8080#

History Email ID Setting

When using this feature, it is advised that you not use an unauthenticated email address, after setup you will see that you have received email with the same web address but in the place of the sender you will see the Unit ID. For example if your SMTP user ID is avl@abc.com and your Unit ID is 123456, when receiving 123456HistoryReport – you will see the sender is from 123456@avl.com.

&HIST	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
To E-Mail ID	Max 30 Characters E-Mail Report Recipient E-Mail ID
User ID	Max 30 Characters User ID for SMTP Authentication.
Password	Max 30 Characters Password for SMTP Authentication.
FORMAT	&HIST,PASSWORD,To E-Mail ID,User ID>Password#
EXAMPLE	&HIST,1234,iTrac@control.com,iTrac@control.com,iTracpass#



If you set 'Auto Reporting' to '1', itrac will report history logs once a day at the calculated local time. The last digit of the Unit ID of the device is used to determine its reporting time.

[Calculated Local Time]

(Last Digit of itrac ID * 15 Minutes) + (Local Time 00:00:00)

Local time can be calculated by time difference value in &SERVER parameter.

If itrac ID is '001545', it will report history at 01:15:00

7. Power Management & Installation Diagrams

Vehicle Battery Alarm Settings

Vehicle Battery Low **EVENT ID 91**

The **itrac Gold** device is usually connected to the vehicle's battery as a power source, this is a value added feature and one should take full advantage of such a feature. If you do receive an alarm that your car battery has reached the level you have set it at, you should attend to your vehicle in a timely fashion. If power levels have not returned above the set limit, the device will send an alarm every 15 minutes - both to the server and personal SMS number if reporting has been enabled.

&POWERALARM	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Enable Alarm To Server	X (1 Digit) 0 Disable Power Alarm report to server 1 Enable Power Alarm report to server
Enable Alarm To User SMS	X (1 Digit) 0 Disable Power Alarm report to personal SMS number 1 Enable Power Alarm report to personal SMS number
Power Voltage Limit	X – XX (voltage) Low vehicle power limit range 9 – 24 (voltage)
Report SMS Number	+XXXXXXXXXXXXXXXXXXXX (Max 20 Digits - Including '+') Report to personal SMS Number (must start with '+')
FORMAT	&POWERALARM,PASSWORD,Server Report,SMS Report,Voltage Limit,SMS Number#
EXAMPLE	&POWERALARM,1234,1,1,11,+447793177560#

Vehicle Low Power Message via SMS to Mobile

'Unit ID : Unit Nick Name' VEHICLE BATTERY IS UNDER '9V – 24V' AT 'DD.ddddd(N/S) DDD.ddddd (E/W)'	
Unit ID	XXXXXX(6 Digits) Unit ID value from &SERVER parameter.
Unit Nick Name	String Nick Name value from &SERVER parameter
Power Voltage	Low vehicle battery setting made in &POWERALARM
DD.ddddd/DDD.ddddd	Conversion from DDDMM.MMMM

Device Power Management

The **itrac Gold** also has a power management feature that is able to save power when the ignition is turned OFF by switching the GPS off – communication with the device will still be present as the GSM will NOT be switched off. This feature is quite useful when complementing the **&POWERALARM** command which is able to detect the power levels of the vehicle's battery. If you would like to wakeup the device under this feature, you can set a tracking interval in the **&REALTIME** Ignition OFF interval which will send data accordingly to the set interval.

In this mode, to save power - GPS will not be turned on - if an event occurs, the GPS will turn on and attempt to acquire a GPS fix and follow the normal tracking interval. If the device is underground and the GPS is not open to the sky, the device will timeout after 5 minutes of trying to acquire a fix and if unsuccessful – an **&GPS** string will be sent without coordinates with invalid data due to the GPS not being able to acquire a fix.

Reporting intervals for when the ignition is off will still work, as the alerts for the panic button, the two other digital inputs and even the towing alert to a certain degree. The towing alert will have a delayed response as GPS is turned off and will only be available to the device when a reporting interval or event is triggered.

THERE IS NO EVENT ID FOR &POWERMGMT.

POWERMGMT On / GSM On Only

&POWERMGMT	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Enable	X (1 Digit) 0 Disable Power Management 1 Enable Power Management
FORMAT	&POWERMGMT,PASSWORD,Enable#
EXAMPLE	&POWERMGMT,1234,1#

Deep Sleep Mode

POWERSLEEP On / GPS and GSM OFF - **EVENT ID 93**

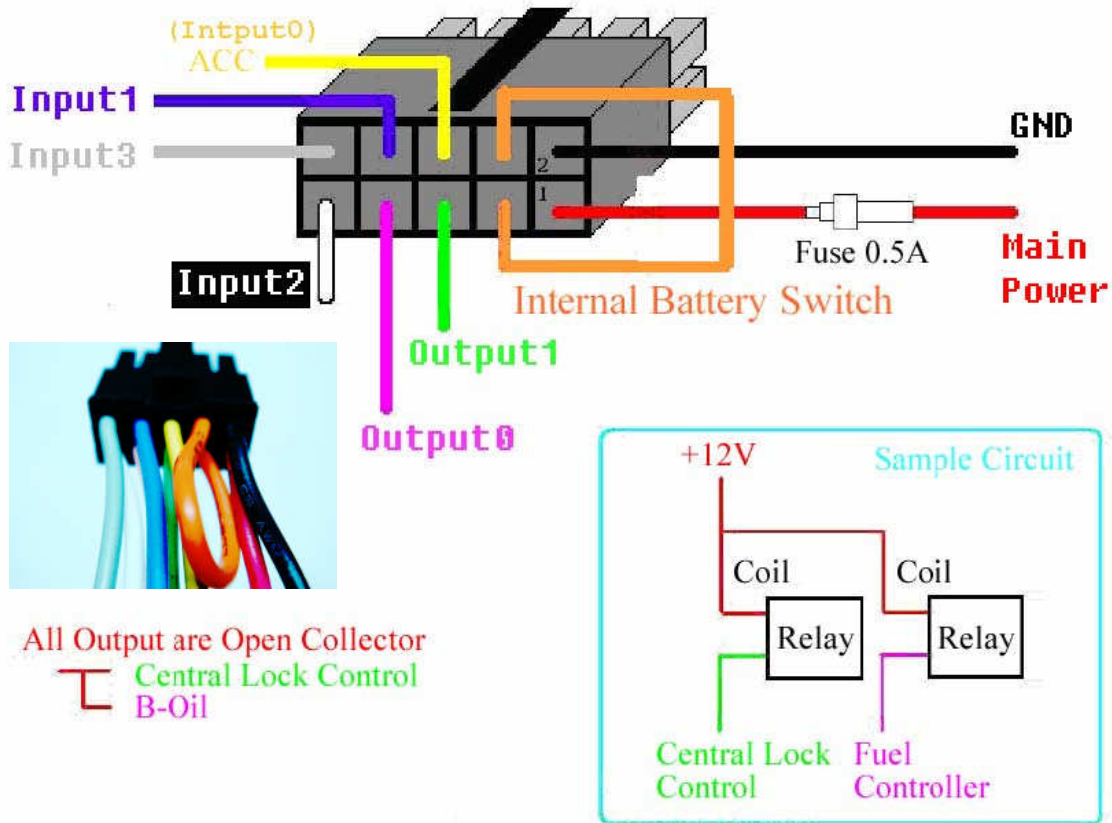
If this feature is enabled and when the car ignition is turned off, the device will go into deep sleep mode whereby both GPS and GSM are disabled. **The only means to wake up the device is if the vehicle's ignition is turned on, in this mode there will be no possible means to communicate with the device as the GSM has been disabled.**

When enabled, a GPS poll with Event ID 93 will be sent back to the backend server each time the ignition is turned off. This feature is useful for SVR applications when a last position can be used as a means of providing roadside assistance when needed. For programming purposes, the device will turn on when it detects a mini USB connector is connected. **External power consumption from the vehicle in this mode is under 2 mA.**

&POWERSLEEP	
PASSWORD	String (Max 10 characters) Security Code Factory Key '1234'
Enable	X (1 Digit) 0 Disable Power Sleep Mode 1 Enable Power Sleep Mode
FORMAT	&POWERSLEEP,PASSWORD,Enable#
EXAMPLE	&POWERSLEEP,1234,0#

Installation of itrac

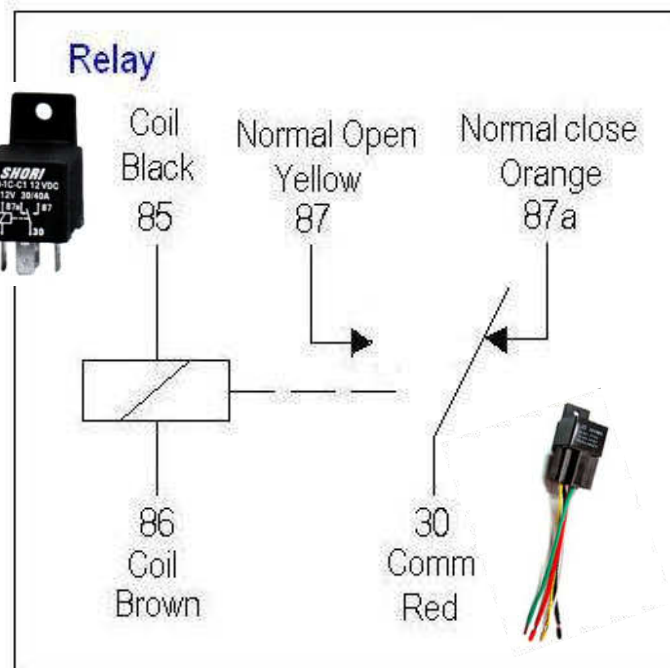
In order for itrac to work properly, the device must be connected to a power source of no less than 12V.



Color	Purpose	Description
RED	Main Power (+12V ~ +24V)	Input power must be at a minimum of 12 volts for unit to operate properly, direct connection to the vehicle's fuse box is preferred. The itrac possesses a fuse internally where it is able to protect it from up to 30 volts of input to the unit.
BLACK	Ground	Wire to car chassis for ground.
ORANGE	Battery Switch	Internal battery switch.
YELLOW	Input 0 ACC	Wire to vehicle ignition. Ignition ON (Positive / High) / Ignition OFF (Negative / Low)
BLUE	Input 1	Panic Button MUST BE A MOMENTARY BUTTON (Should be supplied with more than 500mAmp)
WHITE	Input 2	Wire to 3 rd party product like Door Open/Close OFF (High / Close) / ON (Low / Open)
GRAY	Input 3	Wire to 3 rd party product like Door Open/Close OFF (High / Close) / ON (Low / Open)
PINK	Output 1	Wire to 3 rd party product like Fuel Controller OFF (High / Close) / ON (Low / Open)
GREEN	Output 2	Wire to 3 rd party product like Central Locking device OFF (High / Close) / ON (Low / Open)



Installation of the device requires it be connected to the vehicle's battery for it to work properly, &POWERALARM may be useful in being alerted if your car battery falls below a certain power level. Using &POWERMGMT is also very useful when there is a need to save power if the installed vehicle is not in constant use. Before enabling any of the aforementioned commands, please refer to their descriptions in the manual.



Black(85) --> iTrac I/O cable, Pink wire(output1, neg)
 Brown(86)-->connect to car battery
 Orange(87a)-->connect to one side of fuel pump
 Red(30) --> connect to other side of fuel pump disable wire
 Yellow(87)-->Do not use

12V or 24V relay controls OUTPUT 1 and OUTPUT 2

The above wiring diagram is an example to connect the 12V/24V relay to the fuel pump for immobilization of the vehicle which can be controlled remotely via OUTPUT 1 and OUTPUT 2.

The 12V/24V relay is an optional accessory for the iTrac Gold.



Rear connectors of iTrac Gold

A BASIC ONE YEAR WARRANTY IS COVERED ON THE DEVICE UNDER NORMAL USE. INSTALLATION OF THE DEVICE MUST BE IN A DRY AREA WITHOUT CONTACT OF WATER OR MOISTURE. THE WARRANTY DOES NOT COVER NATURAL DISASTERS RESULTING IN THE LOSS OR DESTRUCTION OF THE DEVICE.

MANUFACTURER IS NOT RESPONSIBLE FOR ANY DATA CHARGES INCURRED BY THE CUSTOMER; CLIENT IS ADVISED TO TEST THE LOCAL CARRIER'S NETWORK BEFORE LAUNCHING DEVICE IN THE MARKET.

8. GPS Additional Feature

Last Valid GPS Position

Report with last valid GPS position when no GPS signal. Enable this feature would add another value to the &GPS string format with A or V sign.

A means current GPS data is valid GPS data

V means have no GPS signal and current GPS data was last valid GPS position saved before unit lost GPS signal.

Note: Although no GPS signal the date and time showing in &GPS string data is realtime data(need at least one time GPS fix after unit ON)

&LASTPOSI		
PASSWORD	String (Max 10 characters)	
	Security Code Factory Key '1234'	
Last Valid GPS	X (1 Digit)	
	0	Disable Last Valid GPS data show
	1	Enable Last Valid GPS data show
FORMAT	&LASTPOSI,PASSWORD,LatValidGPS#	
EXAMPLE	&LASTPOSI,1234,1#	

GPS Satellite Available Number

Enable this feature would add another value to the &GPS string format with a total number of GPS satellite available when receive the GPS data

&SATNUM		
PASSWORD	String (Max 10 characters)	
	Security Code Factory Key '1234'	
Satellite Number	X (1 Digit)	
	0	Disable GPS satellite available number show
	1	Enable GPS satellite available number show
FORMAT	&SATNUM,PASSWORD,SatelliteNumber#	
EXAMPLE	&SATNUM,1234,1#	

Local Time

Enable this feature would make unit report &GPS string data with localtime(UTC time + time difference set in &server parameter)

&LOCALTIME		
PASSWORD	String (Max 10 characters)	
	Security Code Factory Key '1234'	
Enable	X (1 Digit)	
	0	&GPS string data report with UTC time
	1	&GPS string data report with localtime
FORMAT	&LOCALTIME,PASSWORD,Enable#	
EXAMPLE	&SATNUM,1234,1#	

9. itrac Gold Specifications

GSM LED Status	
OFF	No operation
600ms ON / 600ms OFF	No SIM card present / No PIN entered / Network login processing
75ms ON / 3s OFF	The mobile is registered to the GSM network
75ms ON / 75ms OFF / 75ms ON / 3 s OFF	GPRS PDP context activated
500ms ON / 25 ms OFF	Packet switched data transfer is in progress
ON	Data call
GPS LED Status	
500ms ON / 500ms OFF	No GPS signal received
ON	GPS ready
OFF	No GPS data from hardware
GPRS LED Status	
200ms ON / 200ms OFF	GPRS transmission in process
OFF	GPRS disconnected
ON	GPRS connected
USB LED Status	
ON	USB cable connected
OFF	USB cable disconnected
Physical Characteristics	
Unit Size	95L * 89W * 35H (mm)
Weight	300g
Cover	High Grade PC + ABS
Interface	4 DI, 2 DO, 1 Mini USB port, 4 LED lights for GSM, GPS, GPRS and USB
Case Environmental Characteristics	
Operational Temperature	-10°C to +70°C (board temperature)
Storage Temperature	-25°C to +85°C
Electrical Characteristics	
SIEMENS GSM module	900/1800/1900(SIEMENS MC55) or 850/1800/1900(SIEMENS MC56)
Input Voltage	+12V ~ +24V DC
Power Consumption	Transmitting: 12 Volt – 100mAh ; 12 Volt – 130mAh (Peak) Power Saving Mode: 12 Volt – 30mAh ~ 40mAh Power Sleep Mode: Under 2 mAh
Backup Battery	Rechargeable Li Battery at 1600mAh
Backup Battery Life	Approx. 6 to 8 hours with GPS and Communication ONLINE Depends on set tracking interval, the estimated battery age, and time last charged
Memory Backup	Flash Memory 2MB
Outputs	2 negative outputs (500mA max per output)
Inputs	1 Ignition Input, 1 Panic Input 2 General Inputs
SiRFstarIII GPS Specifications	
Frequency	L1, 1575.42 MHz
Tracking Sensitivity	-159 dBm or -186 dBW
Protocol	NMEA0183 Ver3.0
Channels	Up to 20
Position	10 meters
Hot Start	< 1 sec average
Warm Start	< 35 sec average
Cold Start	< 42 sec average

● This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

● This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

► **RF Exposure Information**

This model phone meets the government's requirements for exposure to radio waves.

This phone is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

● This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.