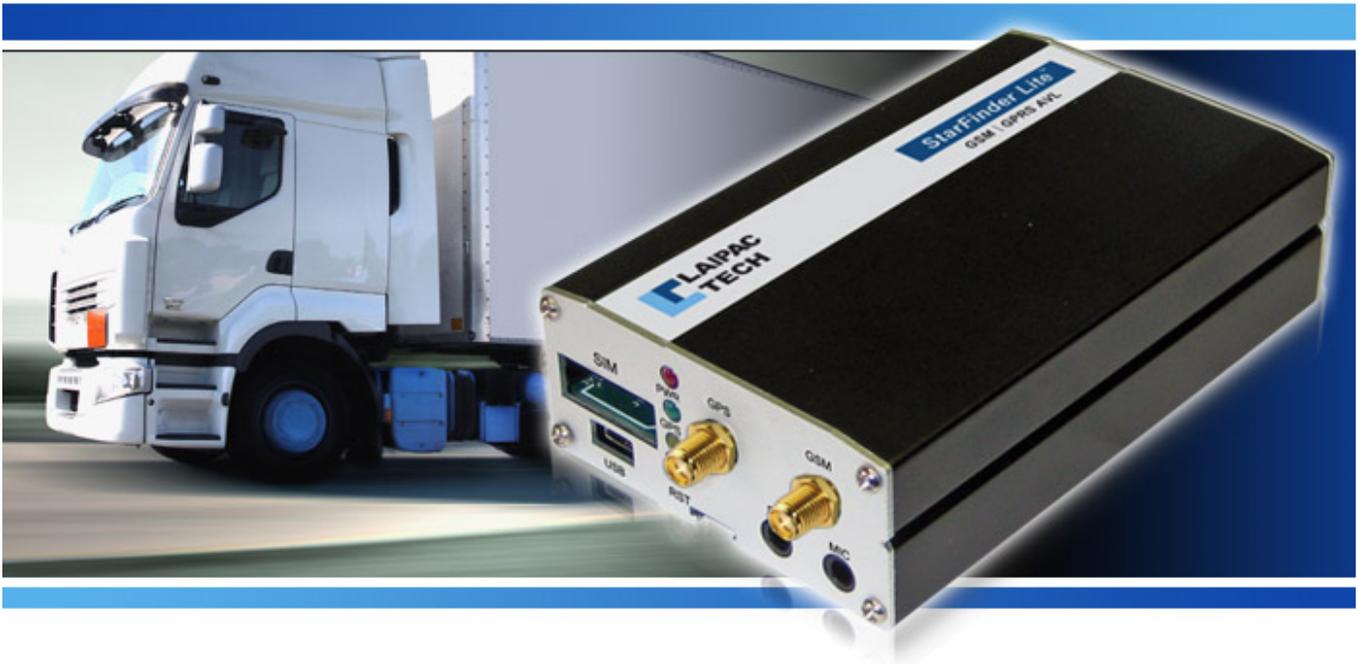


# StarFinder Lite

## User's Manual & Reference Guide

Revision 1 – 2009



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## **Federal Communications Commission (FCC) Statement**

This equipment 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.
- Consult the dealer or an experienced installer for help.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

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# 1 INTRODUCTION

The **Starfinder Lite** is a robust platform designed for remote vehicle tracking and security. The Starfinder combines both GSM/SMS and GPRS (Global System for Mobile Communications/ Short Messaging Service and General Packet Radio Service) communications with ultra-sensitive GPS technology to provide a rugged yet precise and reliable tracking platform. The Starfinder Lite can be used to report positions or events in real-time, as well as log positions for local or remote downloading. The Starfinder Lite comes standard with four optical inputs for connecting to alarm systems or other sensors, one analog inputs, and three output relays for ignition disabling and remote door unlocking. A backup battery is also included.

Each Starfinder Lite can be programmed with a unique device ID and can send data to any static or dynamic IP address or SMS base station. Configuration of the unit can be done locally, via the Starfinder Lite configuration utility in Windows™, or over the air via GPRS or SMS. We currently offer our web-based tracking application [www.LocationNow.com](http://www.LocationNow.com) for tracking and fleet management. For custom applications, we can provide our ADK kit with confidential protocol to software developers for platform integration.

## 2 FEATURES

- Worldwide GSM/GPRS Quad band 850/900/1800/1900MHz
- Multi-mode ready for SMS only, GPRS only or SMS + GPRS
- CDMA model coming by Q4/2009
- High Sensitivity GPS Receiver of 20 Ch.
- GPS Accuracy 3 – 5 m
- Dimension 9.7 x 5.9 x 2.6 cm
- Built in jacks for SPK and MIC
- Panic button and Dial button ready
- Supply voltage range: 9 to 48VDC
- Internal Li-Ion backup battery able to provide approximately 10h life from a full charge
- Low operating power consumption (less than 1W after battery is charged)
- Operation Temperature -30C to 85C
- USB Port for configuration
- Compatible with Mobile Data Terminal
- 4 Optically Isolated digital inputs
- 3 Optically Isolated digital outputs
- 1 Analog input available
- 99 Internal Geo-Fence capability with in/out of fence alert ( easily configurable through Laipac Utility SW )
- Data logger capability built in with 15,000 positions memory to record time stamp, speed, location, and event state.
- Smart logger capability built in with 600 positions memory to record time stamp, speed, location, and event state.
- 3 Axial Motion G-Sensor to report impact, accident, crash or towing event.
- Real time dynamic position report based on time interval or distance traveled
- Mileage report and over-speed alert
- 3 Emergency call numbers with fail over capability
- Firmware update through internet or through air
- WAAS / EGNOS available
- Power-saving options available
- GSM fail safes available

## • 3 INITIAL SETUP

This section will help you setup and configure your Starfinder Lite GPRS tracking device.



### 3.1 What you will need

To begin your evaluation, you will need the following:

- Starfinder Lite
- Power and I/O harness cables complete with Voice and Panic buttons
- GSM patch antenna (3 meters cable length)
- GPS magnet mount antenna (5 meters cable length)
- GPRS data enabled SIM card with known APN settings (2G and TDMA compliant)\*
- Your Identity Leaflet provided in the Evaluation Kit\*
- 7-38V DC power supply
- USB A to USB Mini B cable
- PC with Windows XP™ or later Microsoft Operating System

\*GPRS operation assumed

## 3.2 Setup Summary

The setup summary is an outline of what must be accomplished in order to operate the device. Detailed descriptions of these steps will be listed in the next sections.

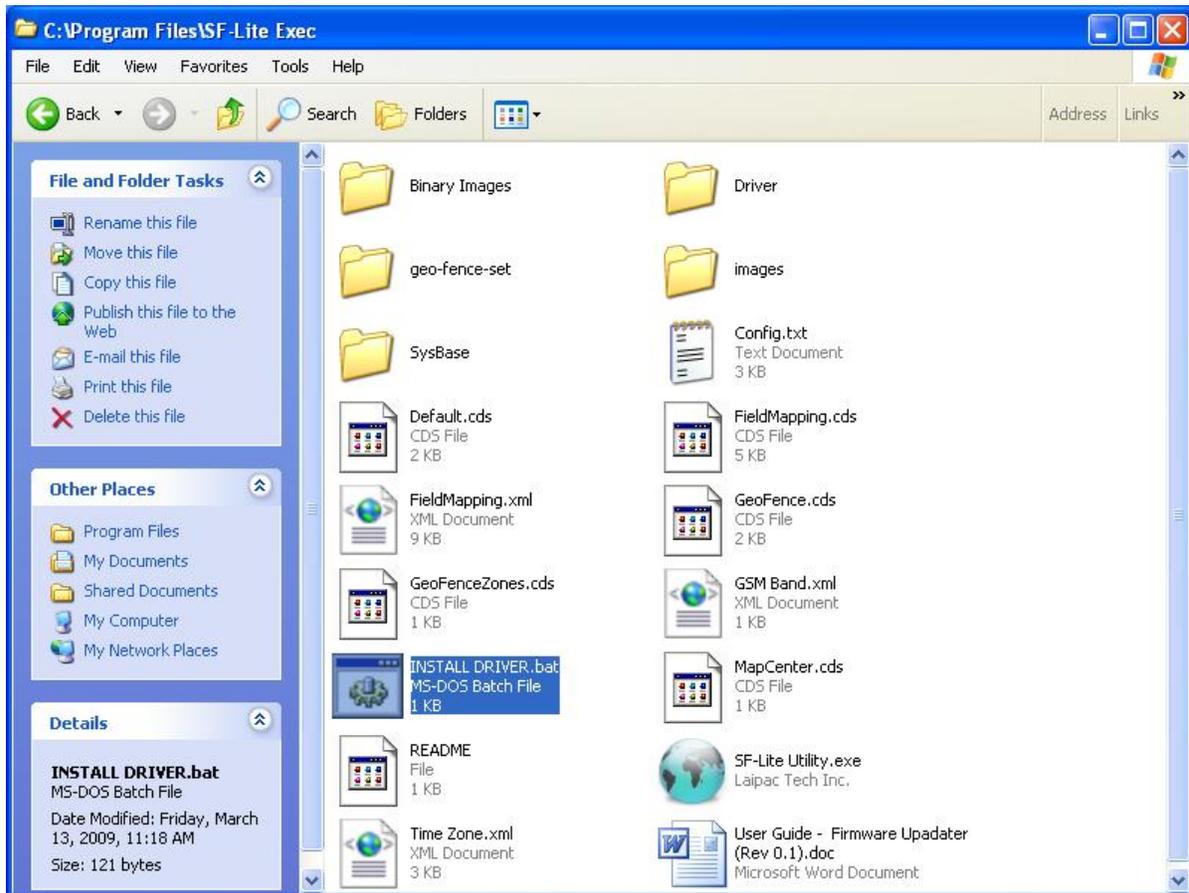
1. Insert the SIM card into the SIM Card Tray on the front of the unit
2. Connect the GPS and GSM antennas
3. Install the Starfinder Lite software and configuration utility
4. Power the Starfinder Lite
5. Connect the Starfinder Lite to the computer using the USB cable
6. Press the reset button and open the configuration utility
7. Configure the parameters and save the settings

## 3.3 Installing the Starfinder Lite Software

The first step in installing the Starfinder Lite software is to transfer the **SF-Lite Exec.zip** file onto your computer.

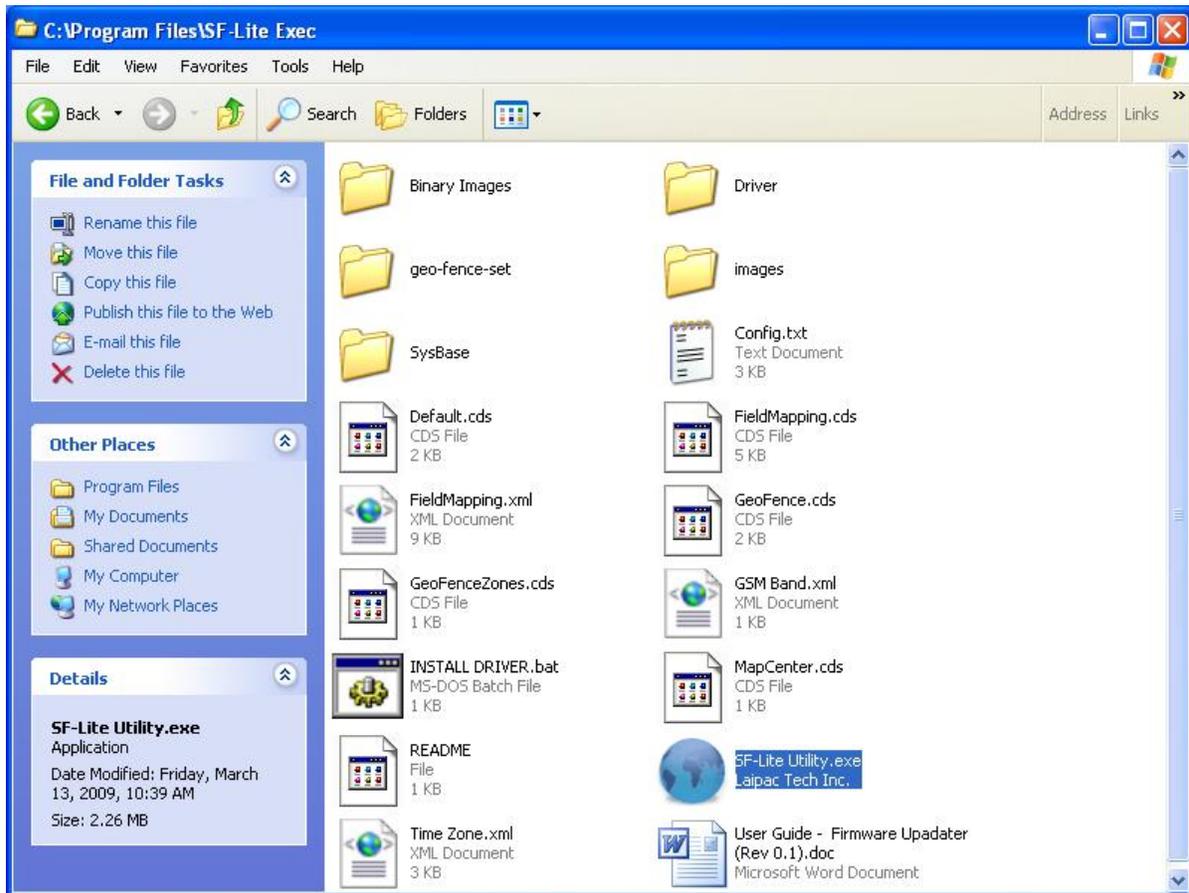


After transferring the file over to your computer, you must extract or unzip the data to any preferable location on your computer.



Once you open up the file folder named SF-Lite Exec on your computer, locate the **INSTALL DRIVER.bat** file and run it.

**Note:** This is a small program which will automatically install the virtual COM port necessary for your Starfinder Lite to interface with the configuration utility.



With the completion of the previous step, the configuration utility can be located and used. Once you are able to open the Starfinder Lite configuration utility you may move on to the next section, **Configuring Your StarFinder Lite**.

## 3.4 Using Your StarFinder Lite

### 3.4.1 For the First Time

The first time that you connect your StarFinder Lite to your PC, Windows will call the Found New Hardware Wizard. This will install the USB drivers needed to connect your StarFinder Lite with your PC.



Allow Windows find and install the driver automatically.



If the following message is displayed, click “Continue Anyway” to install the drivers. **Note: For Vista users, this message will appear differently but will have the same meaning.**

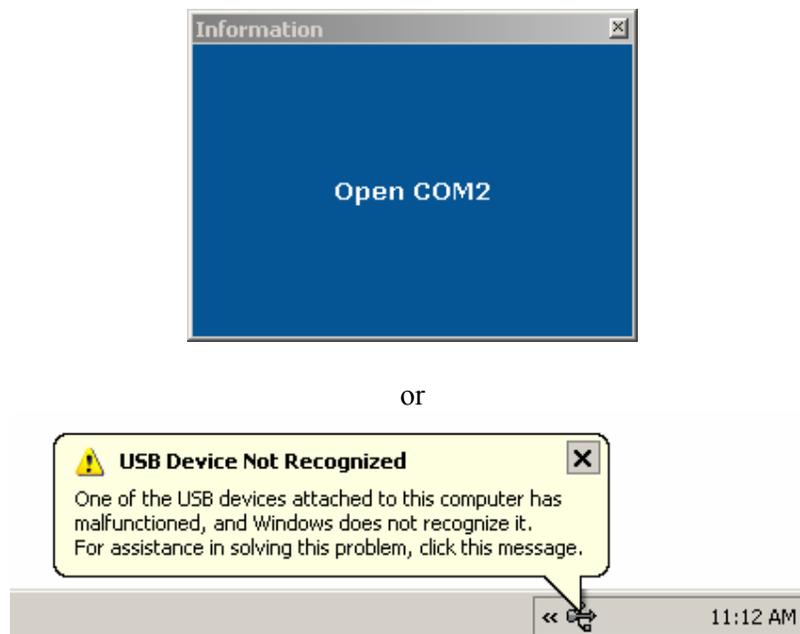


Once the automatic driver installation has completed, please press Finish and then continue to the **Basic Configuration** section to set up your StarFinder Lite.

### 3.4.2 Basic Configuration

With the necessary files installed and unpacked, you can now set up the device for use. First, open the StarFinder Lite Utility and click on Configuration. Next, supply power to the device; if it is charged, the unit will be able to run off of its internal battery. **Before you connect the device with the computer via USB you must press and release the Reset button, and within five (5) seconds of Reset then insert the USB cable.** (You may have one end of the cable connected beforehand.) You will know that the device is reset when you've pressed the button and the GPS and GSM lights have shut off.

If you do this correctly then a window will come up in the corner of your screen saying "Found a new device" followed by "Open COM#" otherwise you will get an alert from Windows saying **USB Device Not Recognized** and you must try to reset and connect again.



With the device connected to the Utility you may now configure it for your account settings and usage preferences. The first configuration page configures your device to work with your LocationNow account for tracking.

LAIPAC TECHNOLOGY INC.

StarFinder LITE Configuration Utility

FILE SETUP SYSTEM I/O APPLICATIONS

Device Info | Services | Network | NMEA

Firmware Version: xx.xx  
 Serial Number: xxxxxxxxxxxx  
 Memory Size: 512 KB  
 Hardware Configuration: xx.xx

Device ID: 99999999 (Default: 99999999)  
 Password: 00000000 (Default: 00000000)  
 GSM Band: 850/1900  
 SIM PIN Number: Disable (Default: Disable)  
 0000 (Default: 0000)  
 Time Zone: (GMT-05:00) Eastern Time (USA & Canada)  
 Automatically adjust clock for daylight saving changes

Save Setting Cancel

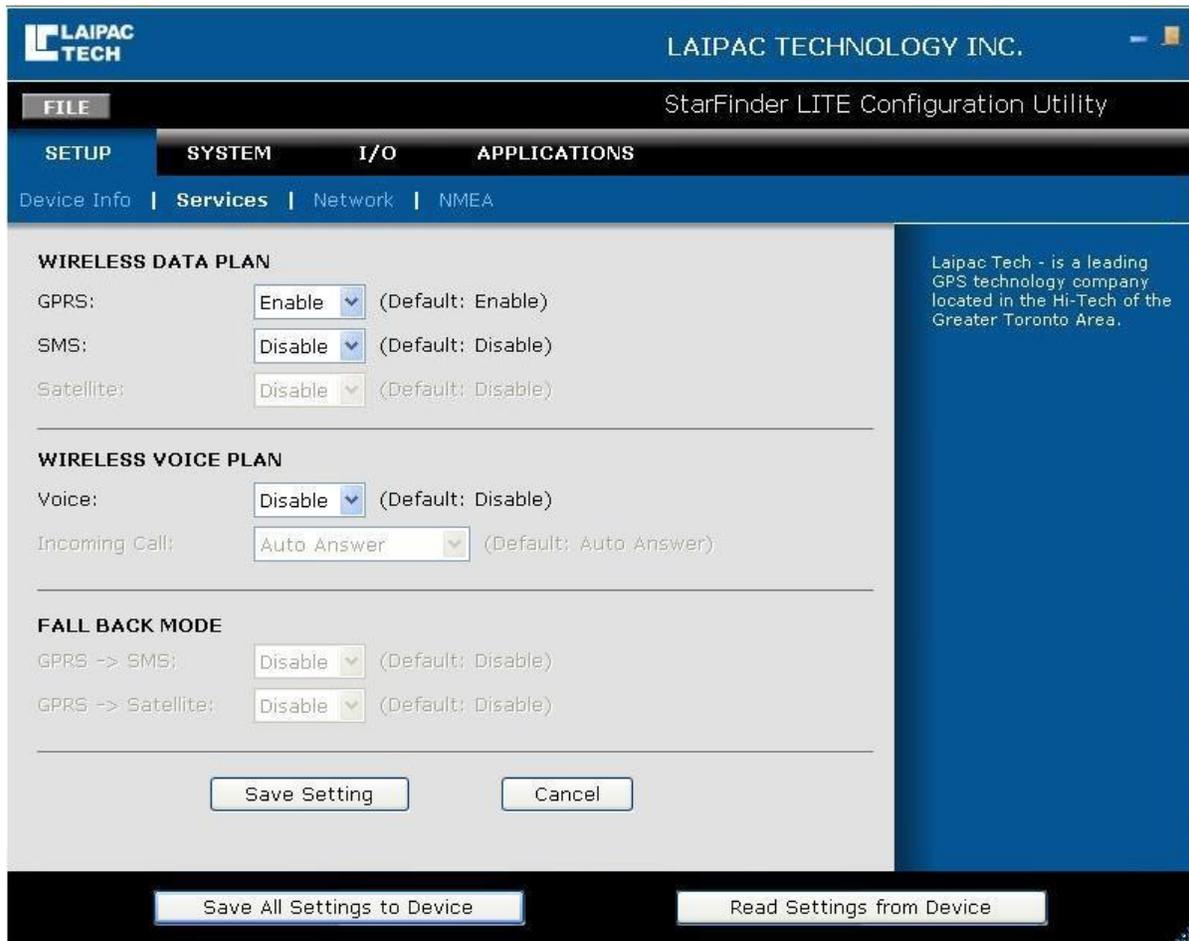
Save All Settings to Device Read Settings from Device

Laipac Tech - is a leading GPS technology company located in the Hi-Tech of the Greater Toronto Area.

- Device ID:** Specific unit identifier that identifies your device for online tracking. You can locate the Device ID on your Identity Leaflet or more accurately in your user account on the website [www.LocationNow.com](http://www.LocationNow.com).
- Password:** Is used to protect the Starfinder Lite from other people affecting its operation with SMS commands. You can locate the Password on your Identity Leaflet.
- GSM Band:** This is for setting a frequency that your GSM provider network operates at. The North American network bands are 850/1900 and the European network bands are 900/1800. If you are unsure what frequency your carrier operates at, please contact them for the correct setting.
- SIM PIN Number:** If your SIM card is password protected, Enable this option and input the PIN code. The PIN code tells the Starfinder Lite to use the user defined PIN code when communicating with GSM.
- Time Zone:** Use this to select your time zone so that the device knows your local time.

To progress to the next set of configuration options click on the word “Services”. The “Services” option list defines what services and operating mode your StarFinder Lite will be using.

## Change this page



**Note: The settings in this image are automatically set by default to use GPRS with out voice. If you are using GPRS only, you may skip this step.**

Wireless Data Plan This section governs the default modem mode connection settings or what the unit will connect to first.

**GPRS:** If you are using LocationNow tracking services, this must be enabled. GPRS mode tells the device it will be transmitting its information across the internet.

**SMS:** If you are using LocationNow but using SMS messaging instead, this should be enabled. Short Message System mode tells the device it will be transmitting its information to another SMS device.

**Satellite:** **To be determined**

Wireless Voice Plan This section initializes the voice option in the Starfinder Lite.

**Voice:** If you are using a SIM card that is voice calling enabled, you may enable this option which will allow you to use the StarFinder Lite as an emergency/car phone. **If you are not using a voice enabled SIM card, no calling or voice communication can be accomplished.**

Incoming Call: This setting requires Voice to be enabled and will determine whether or not the unit will automatically answer incoming calls.

**Note: By enabling the voice option, the unit can be used with emergency number calling, and other features that will use the emergency numbers in the event of an emergency.**

Fall Back Mode This section is a fail safe based on how the unit will react in the event there is no GSM coverage.

GPRS -> SMS: In the event GPRS communication is lost, the unit will automatically switch to SMS mode. In the event GPRS becomes reacquired, the unit will automatically switch back to GPRS mode of operation. **If you select SMS mode, Satellite mode will become disabled.**

GPRS -> Satellite: In the event GPRS communication is lost, the unit will automatically switch to Satellite mode. In the event GPRS becomes reacquired, the unit will automatically switch back to GPRS mode of operation. **If you select Satellite mode, SMS mode will become disabled.**

To progress to the next set of configuration options click on "Network". The Network option list contains the necessary wireless carrier settings needed for the device to access the internet and transmit its location and events to our LocationNow servers. **Note: If you are operating your device exclusively in SMS mode, you may skip this step.**

**Note: In the event that GPRS fails and SMS 'Fall Back Mode' has been set, the unit will first activate the smart log procedures, and will immediately try for SMS connectivity. If there is no SMS connectivity, the unit will switch between SMS and GPRS until the unit synchronizes with one of the modes. The same sequence will apply for GPRS to Satellite mode.**

**Warning: The 'Fall Back Mode' takes priority over switching between 'Alternate Servers' and alternate 'IP addresses' outlined on the next page.**

**LAIPAC TECH** LAIPAC TECHNOLOGY INC.

FILE StarFinder LITE Configuration Utility

SETUP SYSTEM I/O APPLICATIONS

Device Info | Services | Network | NMEA

**WIRELESS CARRIER**

GPRS APN:

GPRS APN User Name:

GPRS APN Password:

---

**SERVERS**

Domain Name 1a:

Port 1a:

Static IP 1:  .  .  .

Port 1:  (Default: xxxxx)

**ALTERNATIVE SERVER**

Domain Name 2a:

Port 2a:

Static IP 2:  .  .  .

Port 2:

**DNS SERVER**

DNS IP 1:  .  .  .

DNS IP 2:  .  .  .

Laipac Tech - is a leading GPS technology company located in the Hi-Tech of the Greater Toronto Area.

***Carrier Information*** This section covers the information required for the unit to access your carriers Access Point.

**GPRS APN:** The Access Point Name is used by your SIM card to connect to the GPRS network. The Access Point is the carrier's server through which the traffic becomes converted from GSM to GPRS Internet traffic.

**User Name:** The user name authorises your SIM card to access your carriers Access Point.

**Password:** The password authenticates your SIM card to access your carriers Access Point.

Server Configuration This section governs the destination end point for the GPRS traffic, a failsafe for that destination, and DNS to domain name translations.

**Domain Name 1a:** This is the domain name of the remote server. For [www.LocationNow.com](http://www.LocationNow.com) use 'laipgw1.com'.

**Static IP 1:** This is the IP address of the remote server. For [www.LocationNow.com](http://www.LocationNow.com) use '24.235.124.170'.

**Port 1 and Port 1a:** This is the Port used with the remote server. For [www.LocationNow.com](http://www.LocationNow.com) use '1688'.

**Note:** The traffic generated from our devices gets forwarded to its destination by the domain name first, IP address second and transmits the traffic through port 1688.

*The device will try to communicate through the domain name first, IP address second. This is a fail-safe so that if either the domain name or IP address are inaccessible for any reason then the other can be used without an interruption in service.*

#### ALTERNATIVE SERVER

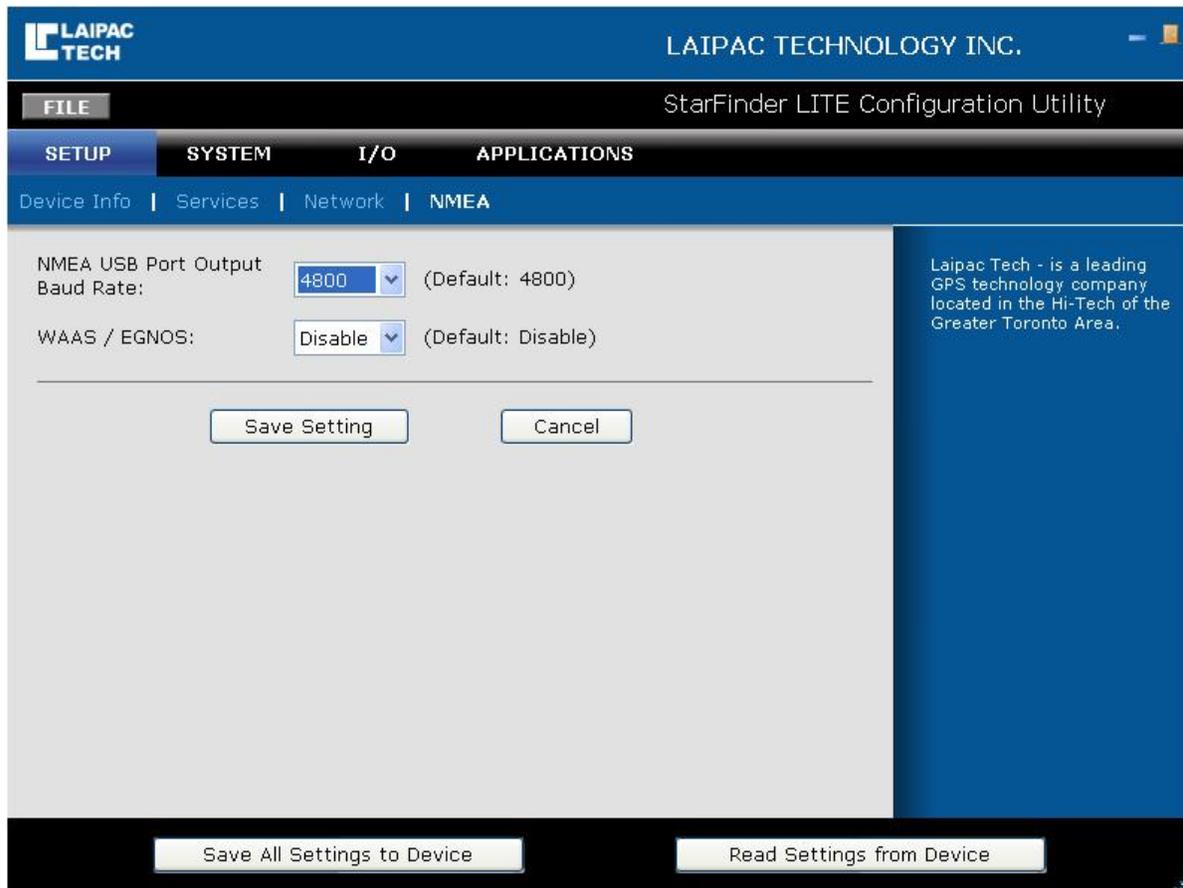
The values have the same meanings as the values under Server Configuration but are for a backup server, in case the primary server becomes completely unavailable. Configuring the alternative server is optional.

#### Under DNS SERVER

**DNS IP 1 and 2:** Allows you to select specific DNS servers by their IP address. Since the GSM module does this already, these settings are optional.

**Note:** In the event that domain name 1 fails, the unit will activate the smart logging feature and will attempt IP address 1. If IP address 1 fails, the unit will try Domain Name 2. If Domain Name 2 fails, the unit will try IP address 2. From here a loop effect will occur until it connects to one of those IP addresses. During this loop effect, the smart logging feature will remain active.

**Warning:** If you have a 'Fall Back Mode' set, along with Primary Server and Alternate Server, the unit without GPRS connectivity function as follows: First Domain Name fails, unit activates Smart Logging. Next the unit attempts to connect to SMS. From there the loop effect between SMS and GPRS Domain Name 1 will occur regardless of other IP addresses or server setup. The same applies if you have Satellite fall back mode setup.



NMEA Baud: NOT YET IMPLEMENTED

WAAS / EGNOS: This setting enables the compatibility for Wide Area Augmentation System and European Geostationary Navigation Overlay Service for added GPS accuracy. This setting is recommended but optional.

## Saving and Loading Your Configuration

Once you have finished configuring your device, click the “Save All Settings to Device” button and the settings will save.

To save the settings to a file, click on “file”, click on “save as”, specify your filename and path where you will store it. Once finished click “save” and a file will be generated with your configuration.

To load the settings, click on “Read Settings from device” and point to where you have stored your configuration file. Once you have located the file, click “Open” and the configuration will load. From there you can edit and resave it to your Starfinder Lite.

## 4 Advanced Configuration and Features

This next section covers all other configuration settings not listed under basic setup and falls under 3 major categories: one for System, one for I/O, and the last for Applications. The System settings are concerned with reporting and voice setup. The I/O settings are used for customizable I/O functionality. The Applications section is used for other types of event messages.

### 4.1 System Settings

The screenshot displays the 'StarFinder LITE Configuration Utility' window. The 'SYSTEM' tab is selected, showing the following settings:

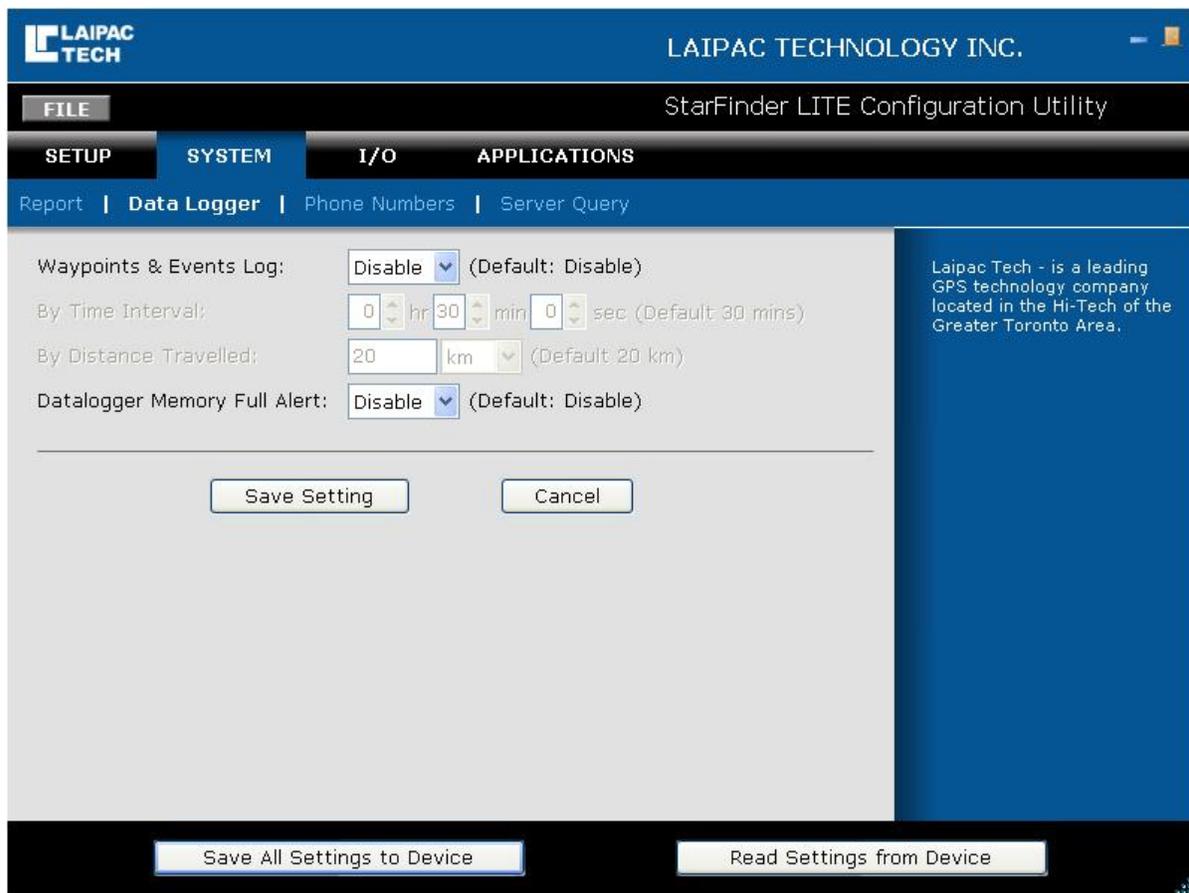
- Real Time Report by Time Interval:** 0 hr 30 min 0 sec (Default 30 mins)
- Real Time Report by Distance Travelled:** 20 km (Default 20 km)
- Smart Log Report:** Disable (Default: Disable)
- Air Time Green Mode:** Disable (Default: Disable)
- From:** (Default 7:00 pm) 7 hr 0 min pm
- To:** (Default 6:00 am) 6 hr 0 min am

Buttons at the bottom include 'Save Setting', 'Cancel', 'Save All Settings to Device', and 'Read Settings from Device'. A sidebar on the right contains the text: 'Laipac Tech - is a leading GPS technology company located in the Hi-Tech of the Greater Toronto Area.'

**Reporting Values:** This option allows you to specify how frequent the unit will send a position update. You can specify the report by time value in hours, minutes, and seconds. You can specify the report by distance value in kilometers, miles, or yards.

**Smart Log Report:** The smart log report option allows the unit to automatically log position updates into internal memory, based on the reporting values, in the event there is no GPRS connectivity. When the Starfinder Lite reconnects to GPRS, the lost messages are then transmitted back to the GPRS server automatically. The option is to Enable or Disable this feature.

**AT Green Mode:** Air Time Green Mode allows you to set the hours in which the unit can operate in. If you only require tracking during a particular time of day, the unit will go live during that specified time and will turn off. To use this feature, you must enable this feature and then specify the time the unit will be actively reporting for.



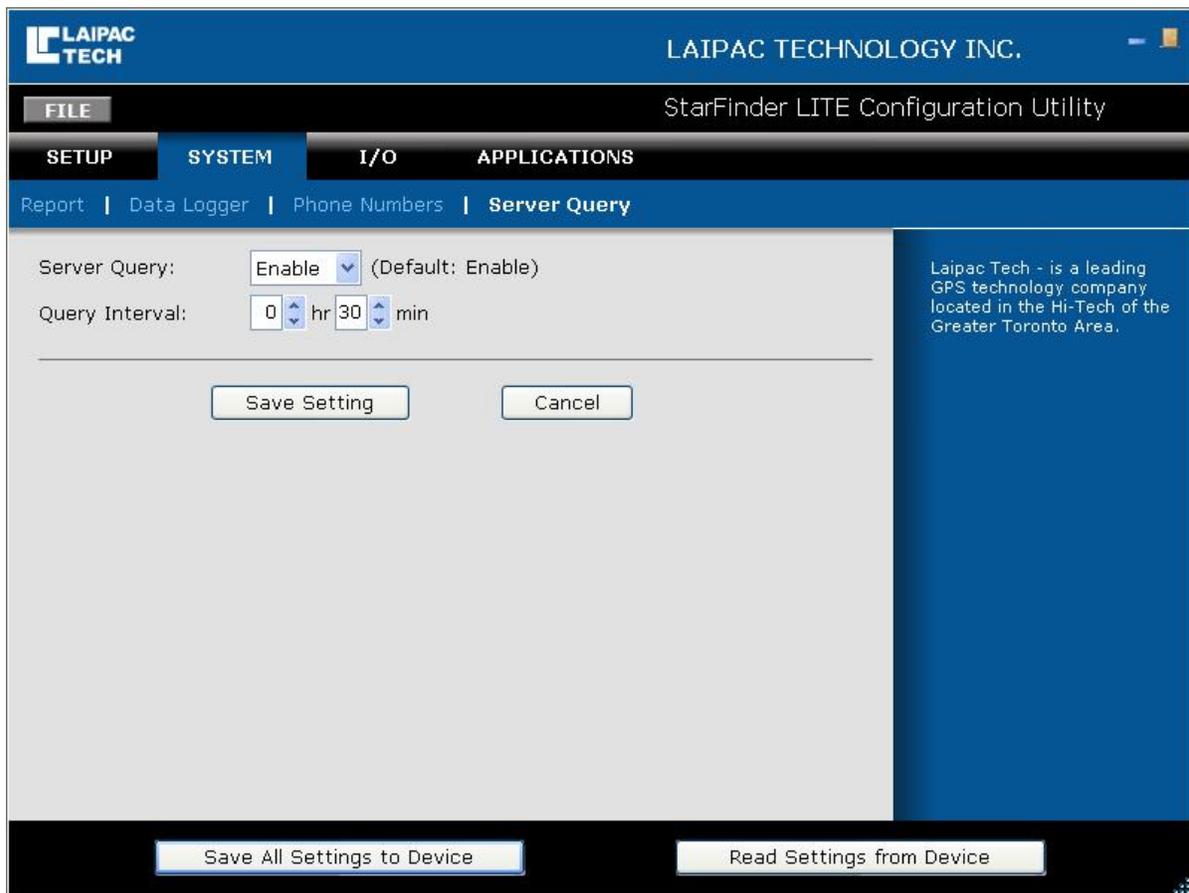
- Waypoint Log:** Waypoints & Events Log setting gives you the option to log or store waypoint and alert messages in the unit's internal memory.
- Log by Time:** Logs messages into internal memory based on the specified time interval.
- Log by Distance:** Logs messages into internal memory based on the specified distance interval.
- DL Memory Full:** Data Logger Memory Full alert will cause the unit to send an alert when the internal memory of the unit is full. This means that once the unit runs out of memory, an alert will be sent to the GPRS server.

**Assistance Number:** When you press the call button, the number programmed into the “Assistance Number” field will be dialed.

**Emergency Numbers:** If the Assistance number is not answered, the Starfinder Lite will dial Emergency Number 1. If Emergency Number 1 is unanswered, the Starfinder Lite will dial Emergency Number 2. If Emergency Number 2 is unanswered, the Starfinder Lite will redial emergency Number 1. From there, it will cycle through both numbers until one of those lines are answered.

**SMS Base Station:** The SMS Base Station Number is used when the Starfinder Lite is operating in SMS mode of operation. All of the waypoints and alert messages will be sent to the SMS Base Station Number. The number it self can belong to a cell phone, an SMS modem or any SMS device.

**Note:** In order to use the Assistance Number and Emergency Numbers, the ‘Voice’ option under ‘Setup’ ‘Services’ menus must be enabled and your SIM card must be Voice enabled.



**Server Query:** Used as a GSM keep alive and tests the connection status of the Starfinder Lite. This setting must be enabled first.

**Query Interval:** The actual interval in which the Starfinder Lite tests the connection between the GPRS server and itself. If there is no server response to the message the Starfinder Lite sends out, the unit will reset and try to resynchronize.

## Change this page

## 4.2 I/O Settings

The screenshot displays the 'I/O' configuration tab in the StarFinder LITE Configuration Utility. It features a navigation bar with 'FILE', 'SETUP', 'SYSTEM', 'I/O', and 'APPLICATIONS'. Below the navigation bar, there are sub-tabs for 'Input', 'Output', 'Buttons', 'Analog In', and 'Com'. The main area is divided into four sections, one for each input (Input 1 to Input 4). Each section contains a dropdown menu for 'Input X as' (all set to 'Disable'), a checkbox for 'Alert when X' (all set to 'Disable'), a text box for 'Counter X Starting Value' (all set to '0'), and a text box for 'Alert when Counter X reaches' (all set to '999999'). At the bottom of the window, there are buttons for 'Save Setting', 'Cancel', 'Save All Settings to Device', and 'Read Settings from Device'. A sidebar on the right contains a brief description of Laipac Tech.

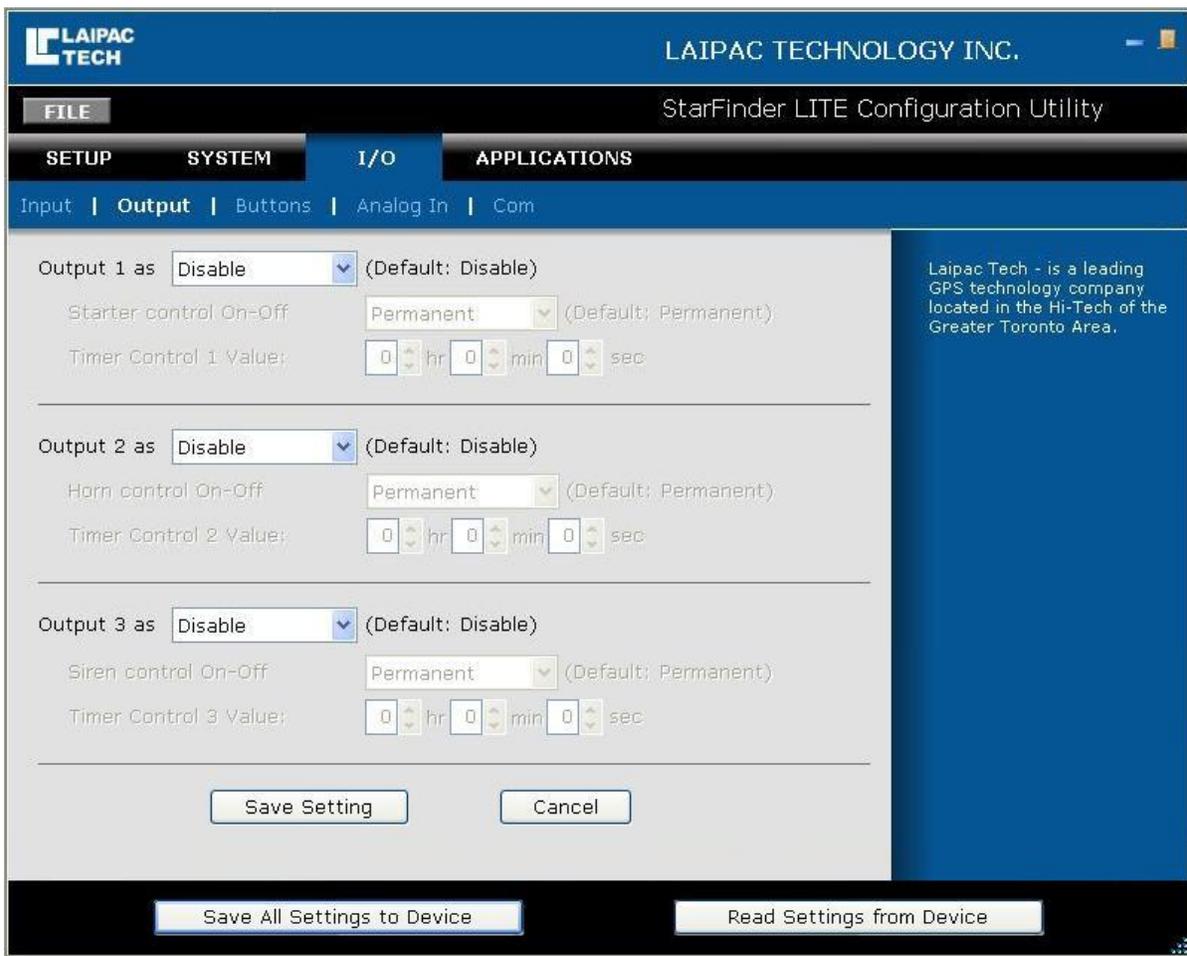
**Input 1:** Allows you to activate the functionality of the input by enabling it.

**Triggered Alerts:** This option allows you to send an alert when the alert condition is met by the input detecting a high voltage level. In the example, you have the option to receive an alert every time the ignition gets turned on.

**Counter Start Value:** This option allows the device to record how many times the alert gets triggered and accumulates from the value you set it to.

**Counter Alert Value:** This option allows you to tell the Starfinder Lite to send an alert when the counter value reaches a user defined value. If you set it to 90, it will send an alert once the counter start value reaches 90.

The same settings apply across the other inputs. The only change is the suggestive use for the application for the input. **Note: Input 1 must be reserved for the vehicle ignition as it is used in later features.**



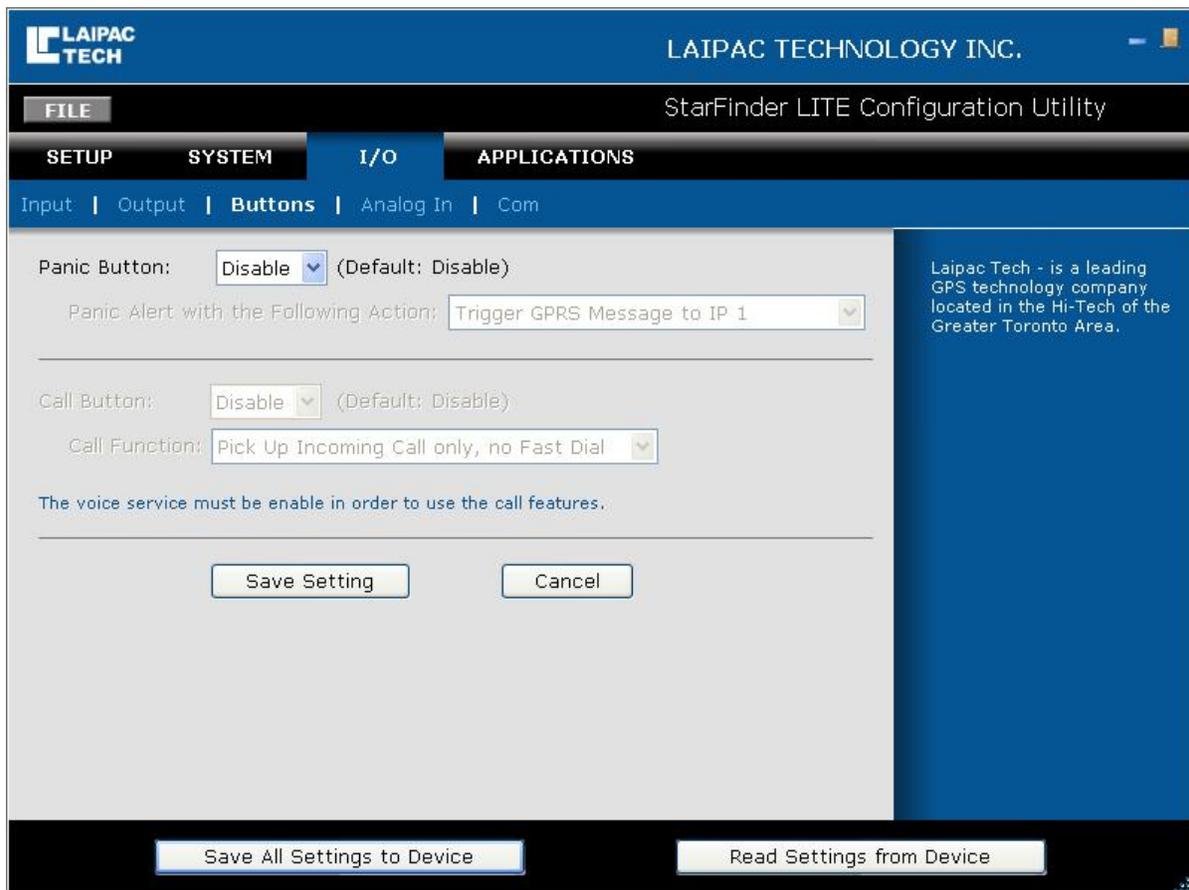
**Output 1:** Allows you to activate the functionality of the output by enabling it.

**Control Functions:** The control function of the outputs enables or disables the output as a fixed switch or a timed switch. A timed switch time is suited in situations where the voltage across a system can not remain constant such as triggering the door locks. A fixed switch is suited in situations where the voltage across a system must remain constant such as triggering the starter.

**Pulse Time Value:** This is the amount of time the timed switch will change its state. If the door locks requires a 1 second pulse to trigger, set this time for 1 second. **Note: A certified vehicle installer will be able to tell you how long of a pulse is required.**

The same settings apply across the other outputs. The only change is the suggestive use for the application of the output. The suggestion is only a recommendation and does not have to be followed completely.

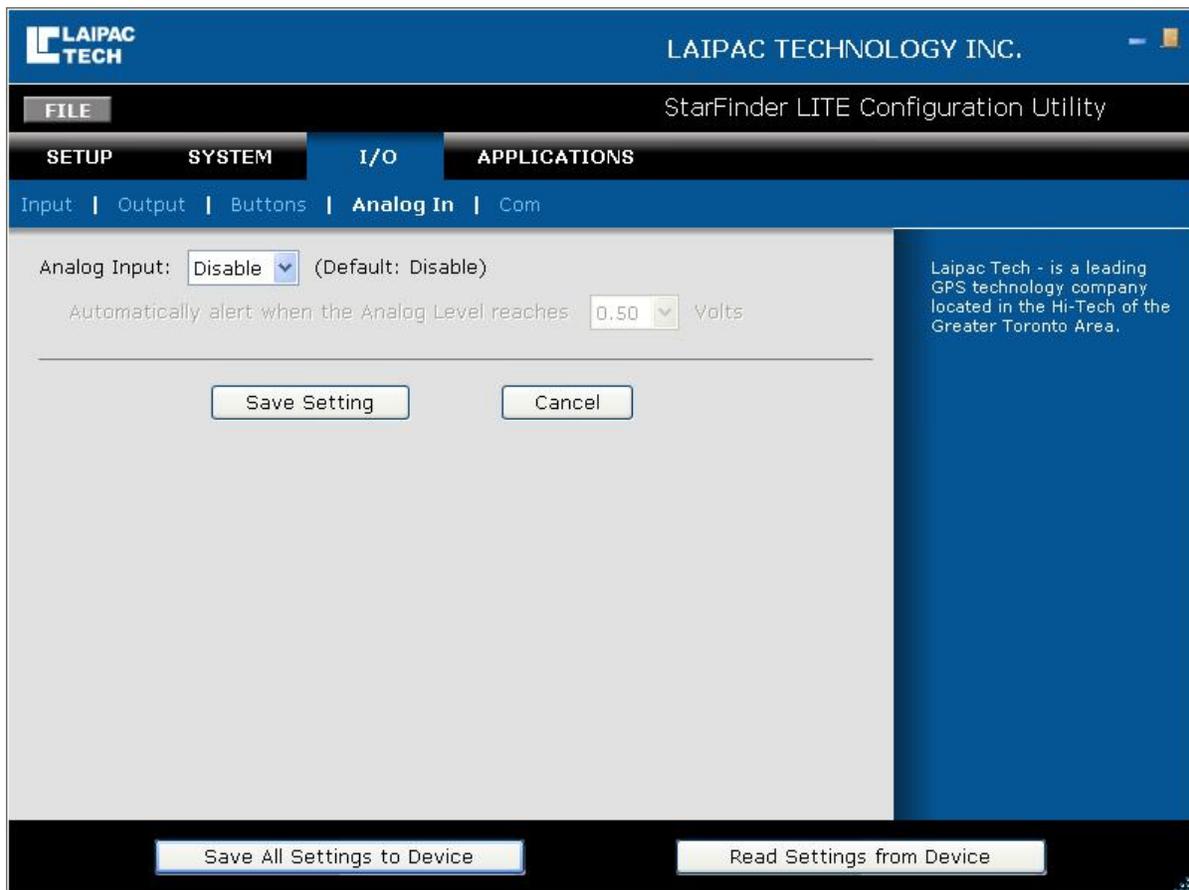
**Note: The starter should be set to normally closed (On) as you would want to start the car after installation and disable it as a test. The door locks should be set to normally open (Off) as you want to send a voltage pulse and avoid burning out the door lock system. For more electrical details and specs, refer to section 5.2.9 “Optically Isolated Outputs”.**



**Panic Button:** Allows you to activate the functionality of the panic button by enabling it. Once enabled, the panic button will send a panic alert message to the GPRS server, will call emergency number 1, or will do both by sending the alert first then calling second.

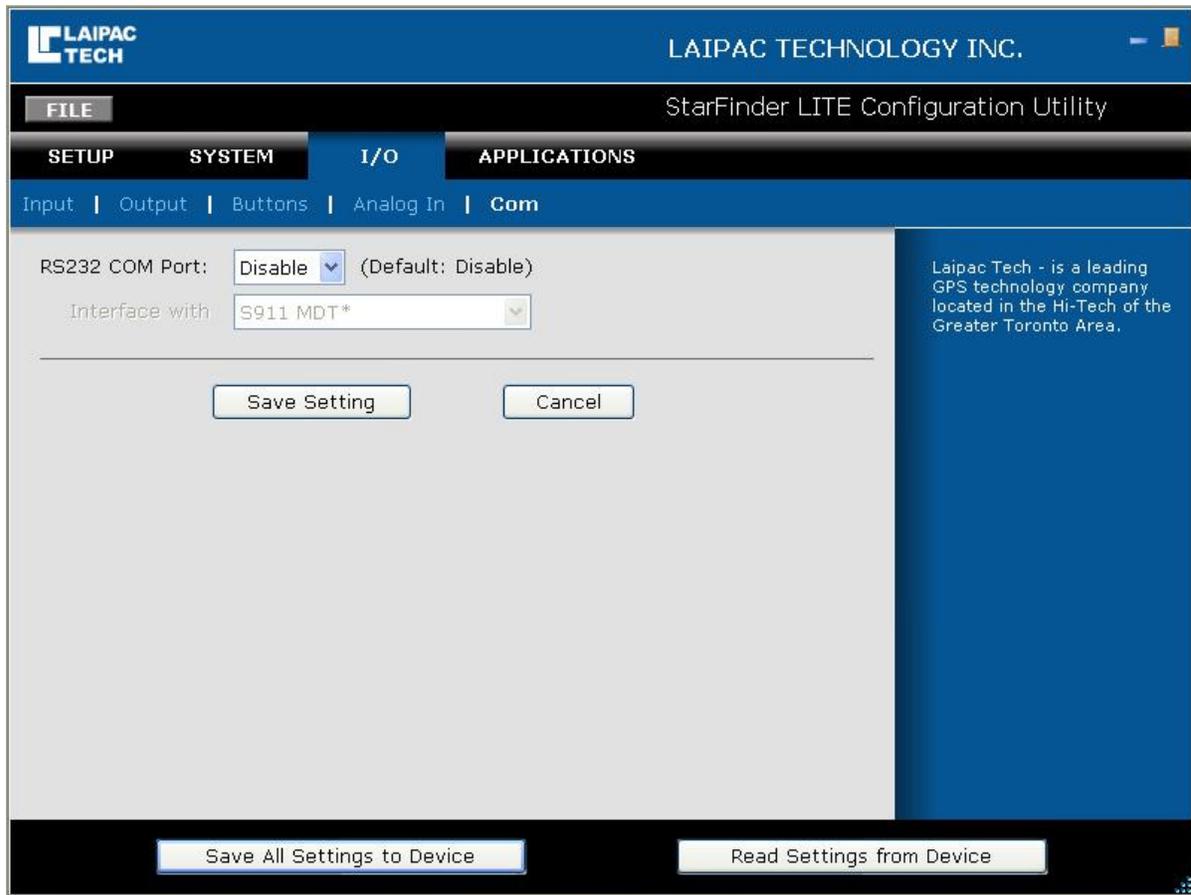
**Call Button:** Allows you to activate the functionality of the call button by enabling it. The call button has a function where it will allow the user to answer incoming calls only or has the function to answer incoming calls and speed dial the number programmed into Emergency Number 1.

**Note:** In order to use the Call Button, the 'Voice' option under 'Setup' 'Services' menus must be enabled and your SIM card must be Voice enabled and a phone number is required in the 'Assistance Number' field under 'System' 'Phone Numbers'. Also you must have a phone number programmed into 'Emergency Number 1' in order for the Panic Button to call the number or send an alert then call the number.



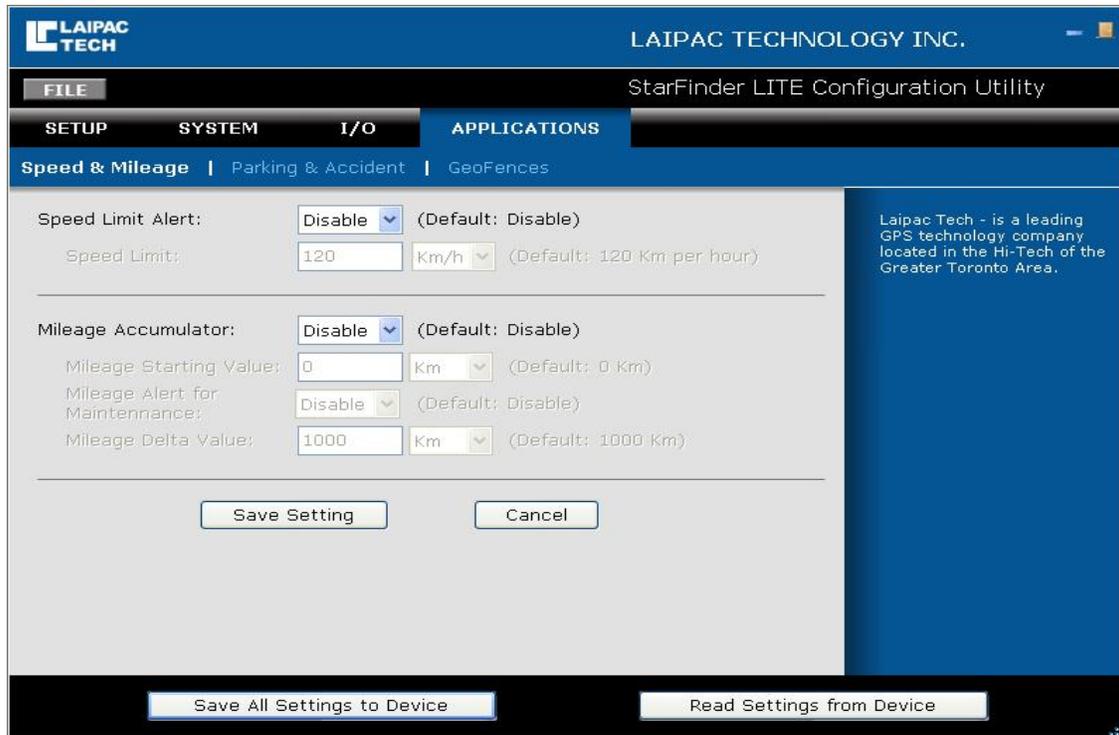
**Analog Input:** The Analog Input functionality must be enabled before using. It is designed to detect and record voltage readings between 0.00 and 3.30 volts. The reading is then transmitted back in the waypoint message. The options to have the unit generate an alert when the voltage drops below a user defined value or above a user defined value are available.

Some suggestions for setting an alert warning when a voltage drops to a certain value would be monitoring fuel or oil levels. Having an alert trigger when the voltage reading reaches a user defined value would be monitoring a temperature gauge.



RS232: **TO BE DEFINED LATER**

## 4.3 Applications



**Speed Limit Alert:** In order to use this function, it must be enabled first. The Speed Limit Alert, formerly known as over-speed, is designed to send an alert if the unit moves faster than the speed limit value.

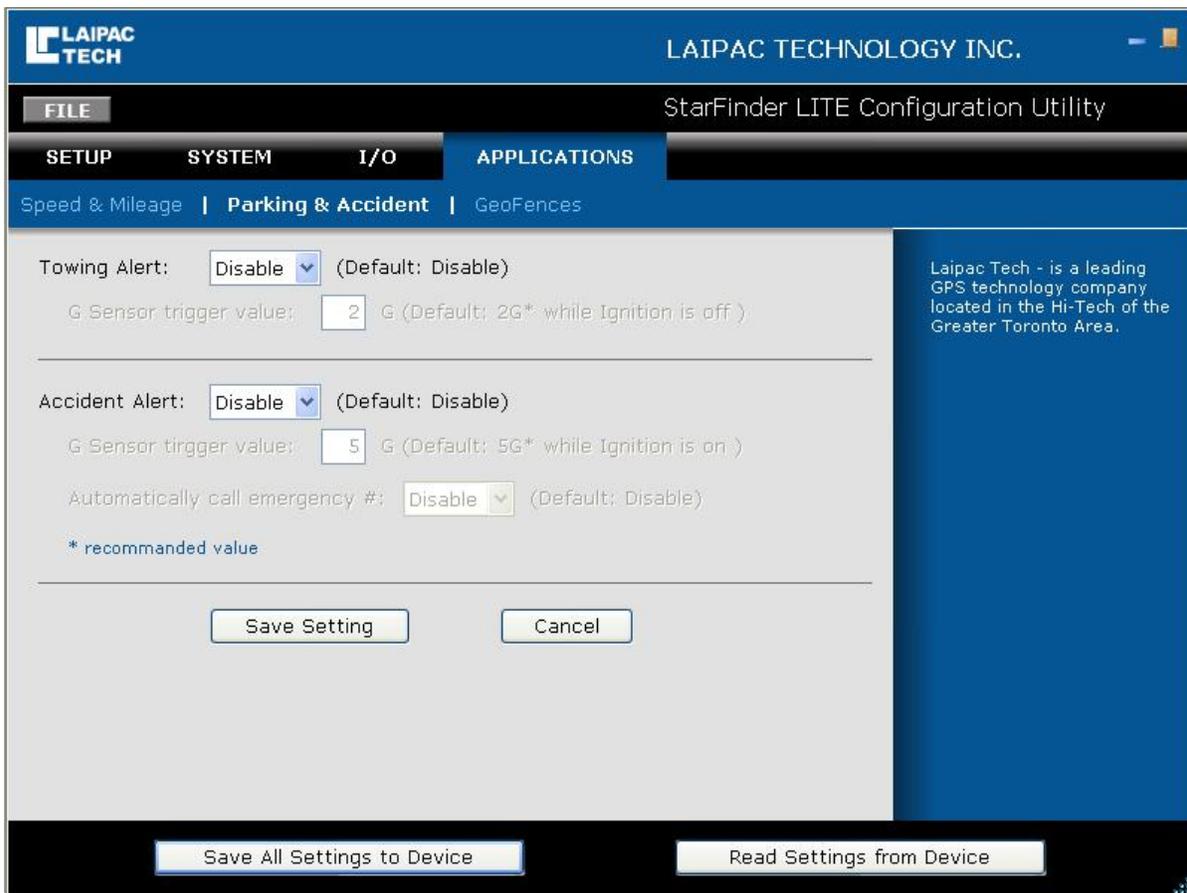
**Speed Limit:** The speed limit is user defined and can be set in kilometers or miles per hour. If the unit travels faster than this value, a speed limit alert will be sent to the GPRS server.

**Mileage:** The Mileage Accumulator option must be enabled before it can be used. It is designed to start accumulating distance based on a user defined start point and unit of distance. If the unit of distance is increased by 1, the incremented value will be added to the current mileage value.

**Starting Value:** The Mileage Start Value is user defined and is recommended to match the odometer reading in the equipped vehicle. From there you can specify the unit of distance being kilometers or miles and the mileage value will accumulate from there.

**Mileage Alert:** This alert must be enabled before it can be used. This alert will be sent to the GPRS server once the mileage accumulated value matches the alert value. It is suggested to generate a maintenance warning outlining an oil change, etc is coming due.

**Mileage Alert Value:** The alert value is a user defined value that is designed to provide a warning before a vehicle maintenance job is due. The unit of distance must be the same as the 'Mileage Starting Value'. The recommended setting for this value is 1000 km before the next oil change is due.



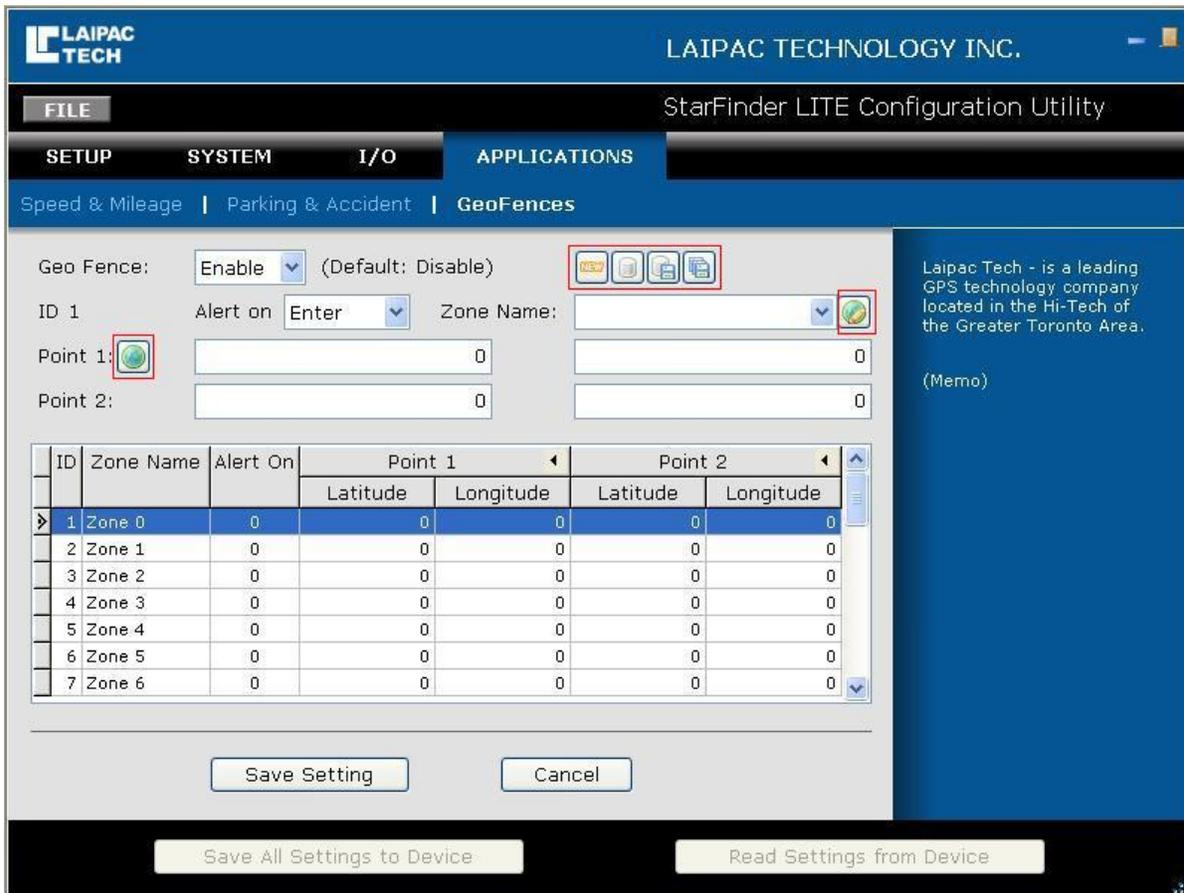
**Towing Alert:** The Towing Alert must be enabled before it can be used. This feature may be used with 'Air Time Green Mode' and must be used with 'Input 1' status. When the unit is powered off for the night and there is movement or a 2G or greater force, the unit will wake up and send an alert to the GPRS server. This is in a situation where someone tows a vehicle with out consent rather then turning it on and driving away with it.

**Trigger Value:** The G Sensor Trigger Value has a default value of 2Gs and should be kept at a low recommended value to sense movement. Note that the Ignition must be off in order for this alert to work.

**Accident Alert:** The accident alert requires enabling before it is used. It is designed to sense a high impact hit and send an alert upon receiving it similar to that of a vehicle collision.

**Trigger Value:** The G Sensor Trigger Value has a default value of 7Gs and should be kept at a high recommended value to cense a vehicle collision as opposed to a pot hole.

**Call Emergency #:** To have the Automatically Call Emergency Number function, this feature must first be enabled. **The 'Voice' option must be enabled under 'Setup' 'Services' and you must have programmed phone numbers into the 'Emergency Numbers' fields under 'System' 'Phone Numbers'.**

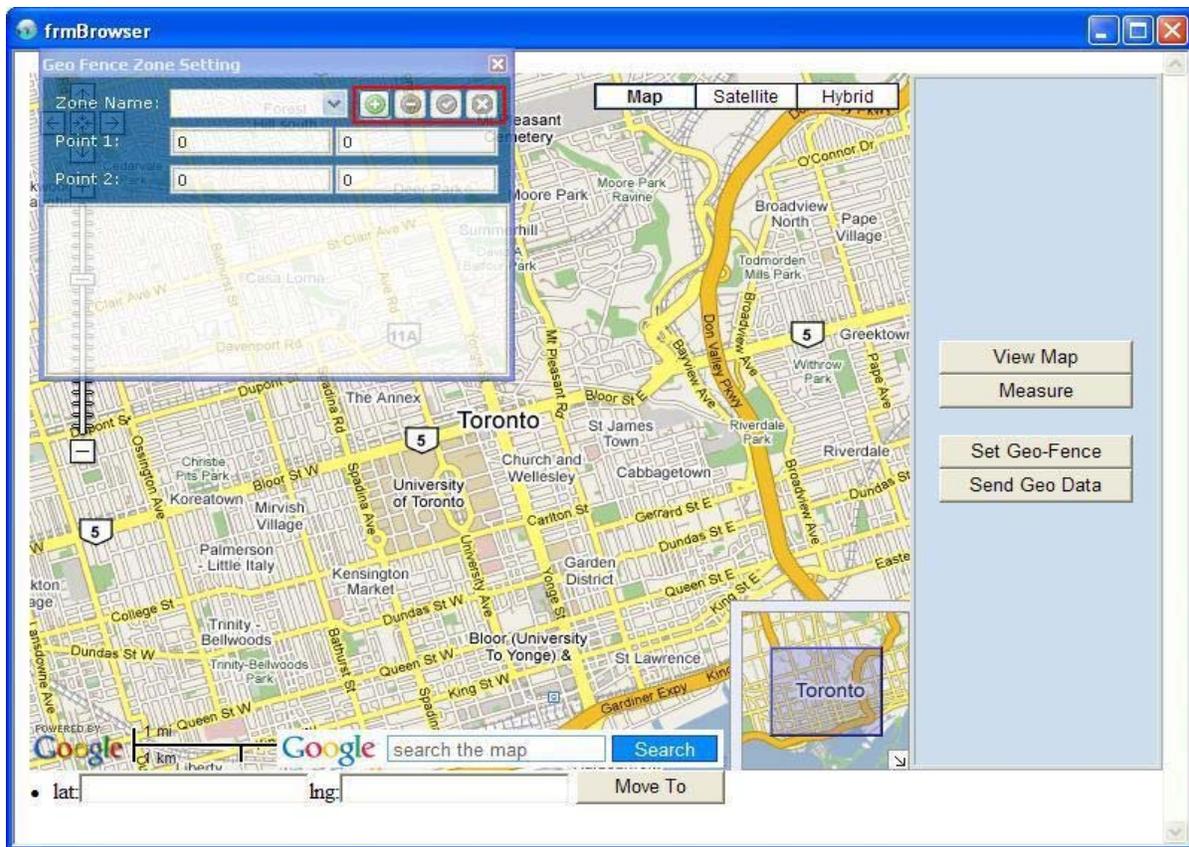


Geo Fence: The Geo-Fence settings must be enabled before using. The term Geo-Fence refers to setting up a geographical perimeter around the device that generates an alert when the unit has left that perimeter. The Geo-Fence system also provides the inverse effect meaning if the unit enters a boundary, the device will generate an alert. The geo-fencing system allows the device operator to setup a maximum of 99 different Geo-Fences though 20 are initialized by default.

The steps involved setting up a Geo-Fence include: Creating a new Geo-Fence Data Set, Setting up a geo-fence over an area, specifying the type of geo-fence, naming the geo-fence, and saving/loading data sheets.

To create a new Dataset, select the “Create New Geo Fence Dataset.” button . From this menu, you can specify the total number of Geo-Fences that can be used to a maximum of 99, and where the map will be centralized over. Once you have specified the information, click ‘OK’ to continue. **Note: You will be able to zoom out or pan over to the area you would like to setup the geo-fences.**

Now that the new data sheet is created, we can setup a Geo-Fence over an area by first selecting a zone simply by clicking on it. Next enter the map view by either, selecting the “Set Geo Fence with Google Map” button , selecting the “Edit Data of the Zone” button , or by double clicking on the zone. A similar image will appear as shown below.



The Geo Fence Zone Setting window gives the option to start editing an existing geo-fence name, adding a new record, removing the existing record, save the record to the zone, and canceling or undoing your changes. To close the window, click the x in the upper right. **Note: The Geo Fence Zone Setting window is only available by selecting the “Edit Data of the Zone” button.**

In the “frmBrosver” window the “View Map” button allows you to view the map and clears existing information. The “Measure” button allows you to select two different points and obtain the distance between the two points. If you select a third point and so on, the total distance will just keep accumulating. The “Set Geo-Fence” button allows you to set up a geo-fence over an area. The “Send Geo Data” button saves the geo-fence to the zone that was selected in the previous step.

Now that the geo-fence has been saved, close the “frmBrosver” window. On the “GeoFences” page in the utility, we can see the new entry added to the Zone list. Now the type of geo-fence can be specified by selecting the “Alert on” value option dropdown menu. The options are enter or exit. To name the geo-fence, type in the name value you want in the field right of “Zone Name”.

Now that the geo-fence has been completely setup, select the “Save current dataset as other file”  and it will create a new file to the location of your choice. The “Save current dataset” button  will save your current work to your existing filename. To verify your settings have saved properly, use the “Open a dataset” button  and select any previously saved file.

## 5 Updating the Firmware

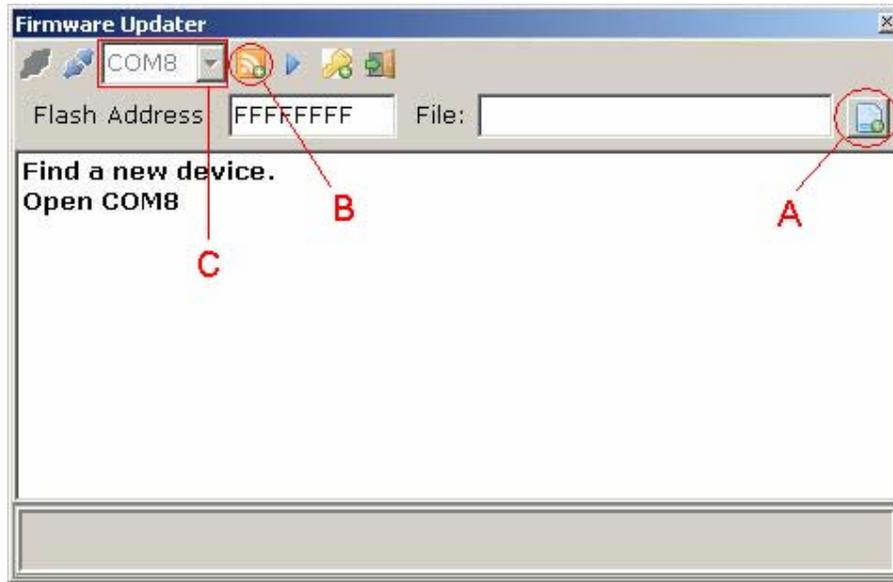


Sometimes we will release new firmware (the program inside the device) which will add new features and enhance others. These updates can be easily performed using the StarFinder Lite Utility once you have downloaded the new firmware file from the website.

To update the firmware, you must set up your StarFinder Lite device the same as if you wanted to configure it (ie: reset just before you plug in the USB) and, like configuration, it can be performed independent of the main power supply with a well-charged battery.

Open the StarFinder Lite Utility, and at the main screen, click on the 'Firmware Update' button. Also, connect your StarFinder Lite to the PC if this is not already done. If connected, the next window that appears will look similar to the following image.

To load the new firmware to your StarFinder Lite, select the firmware file using the button indicated by **A** (file select prompt) and once selected, begin the download with the button indicated by **B**. You will see a progress bar at the bottom when it begins. If there is an indication of failure, simply attempt the download again. Otherwise it will say Success and you may close this part of the Utility. The firmware update is complete.



**Note:** The COM# will vary between computers, and the actual # does not matter. As long as a COM# has been automatically selected then it should be fine (see highlighted area **C**)

## 5 HARDWARE DETAILS & INSTALLATION

The Starfinder Lite is enclosed in a robust metal case and can withstand intensive shock and temperature environments. The features on the front of the unit include a SIM card tray, a USB port, the reset button, speaker and microphone jacks, 2 female SMA connectors for the GPS and GSM antennas, and three LEDs to show the status of reporting and connectivity as shown in the below image.



The connections available on the back of the unit includes four optically isolated inputs and three optically isolated outputs in the main I/O section labeled as 12V, one analog input and the TTL I/O ports used for the call answer button labeled as 3-5V, a wide power supply input range of 7-38V, and RS232 interface as shown in the below image. **Note: Please refer to sections 5.2.5 through 5.2.9 for detailed electrical specifications.**



## 5.1 Hardware Details

### 5.1.1 GPS Engine Specifications

	<i>Value</i>	<i>Units</i>
Channels	20	Channels
RF Frequency	1575.42	MHz
Position update rate	1	Hz
Active antenna bias voltage	3	V
Position accuracy	< 10	Meters
Velocity accuracy	0.1	m/s
Time accuracy	1	uS
Cold start acquisition time	42	Seconds
Warm start acquisition time	38	Seconds
Hot start acquisition time	1	Seconds
Maximum velocity tracked	515	m/s
Maximum altitude tracked	18,000	Meters
Jerk	20	m/s <sup>3</sup>
Tracking Sensitivity	-159	dBm
Navigation Sensitivity	-159	dBm

### 5.1.2 GSM Modem Specifications

- Quad-band GSM/GPRS component (850/900/1800/1900 MHz)
- Designed for M2M and automotive applications
- Class 4 (2W @ 900 MHz)
- Class 2 (1W @ 1800 MHz)
- R&TTE, GCF-CC, EMC, Safety and Chinese approved
- Data circuit up to 14400 bits/s
- GPRS Class 10

### 5.1.3 GPS Antenna Specifications

Frequency	1575.42 +/- 3 MHz
VSWR	2.0 Max
Bandwidth	10 MHz Min
Axial Ratio	3dB Typical
Impedance	50 Ohm
Peak Gain	4 dBic Min
Gain Coverage	$\geq -4\text{dBic at } 90^\circ \leq 0 \leq 90^\circ$ (over 75% volume)
Polarization	RHCP
DC Voltage	3.3V

### 5.1.4 GSM Antenna Specifications

Bands	850/900/1800/1900 MHz
Frequency Range	824~960 MHz // 1710~1990 MHz
Impedance	50 Ohm
VSWR	<2.0 : 1
Gain	2dBi
Radiation	Omni
Polarization	Vertical
Wave	Half Wave Dipole

## 5.2 Installation

The difficulty level of installing your Starfinder Lite depends on which features you would like to use. Outlined here will be the basic installation requirements for real-time tracking. You can refer to the Optically Isolated Inputs, Optically Isolated Outputs, and Analog Port sections for more advanced hardware features which may require a more intricate installation.

### 5.2.1 Required Hardware

- Starfinder Lite
- Power, I/O harness, and call button cables
- GSM patch antenna (3 meters long )
- GPS magnet mount antenna ( 5 meters long )
- GPRS enabled SIM card with known APN settings\*

### 5.2.2 Installing your Starfinder Lite

To begin the installation, insert your activated SIM card into the SIM card tray. Connect the GSM patch antenna (long and skinny) and GPS magnet antenna (square) to the appropriate connectors. To power the unit, connect the power wiring harness and connect the red and black wires to a 9-38V DC supply. Make sure the supplied fuse is in place.

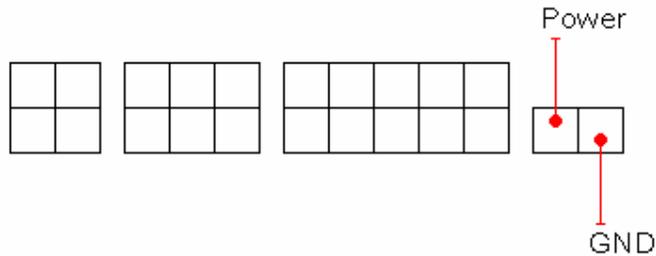
### 5.2.3 Considerations

There are a few considerations you should make when installing your Starfinder Lite. You should make sure the unit is somewhat accessible so that you can connect the unit to a laptop via USB for configuration and local NMEA 2.0 output. The GSM antenna may be mounted almost anywhere, as the GSM signal is generally very strong. The GPS antenna, however, should be mounted somewhere with a **clear line of sight to the sky** under dash board, or at least in a position not surrounded by metal. If you are having trouble receiving either signal try relocating the antenna.

### 5.2.4 Other Options

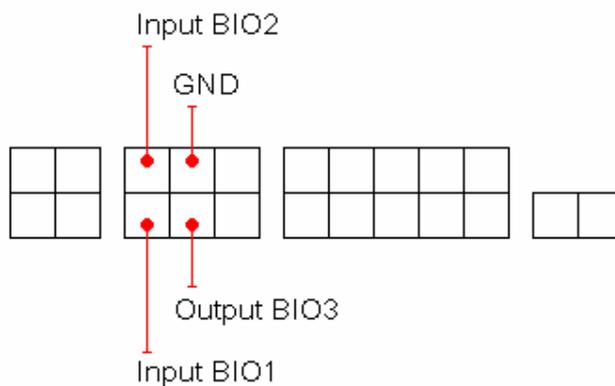
The Starfinder Lite comes with many other options which may need installation. There are 4 optically isolated inputs, 3 optically isolated outputs, and 1 analog port which may need to be connected and would rely on the specific application for installation details. A certified car audio/security installer should be familiar with connecting the relays to door locks or starter triggers. The specs and considerations for these other features can be found later in this section.

### 5.2.5 Power Connector



The main Power supply voltage can be in the range of 7-38V with recommended range of 9-38V. Typical power consumption of the Starfinder Lite is 1W with peaks up to 5.5W. *The current drawn is a result of power over voltage, thus a low voltage power supply will need to provide more current.*

### 5.2.6 Buttons Input/Output



These four connections are used by the StarFinder Lite Button/Analog cable set. If you are using these without the standard cable set, the following summarizes the use of these connections.

**Input BIO1** – Active LOW; will start, answer, or end a phone call (if enabled)

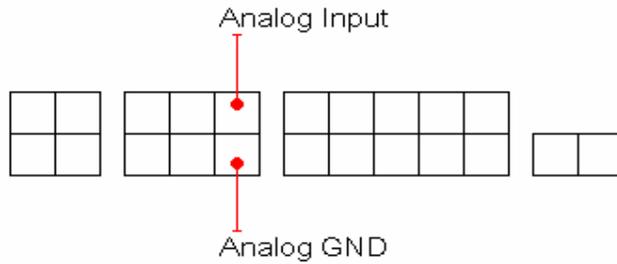
**Input BIO2** – Active LOW; will send a Panic report to LocationNow (if enabled)

**Output BIO3** – Normally LOW; indicates phone call status (used to drive LED)

**GND** – Common Ground

The inputs are standard 3.3V to signal a logical HIGH, and tolerant up to 5V; exceeding 5V can damage your StarFinder Lite.

### 5.2.7 Analog Input

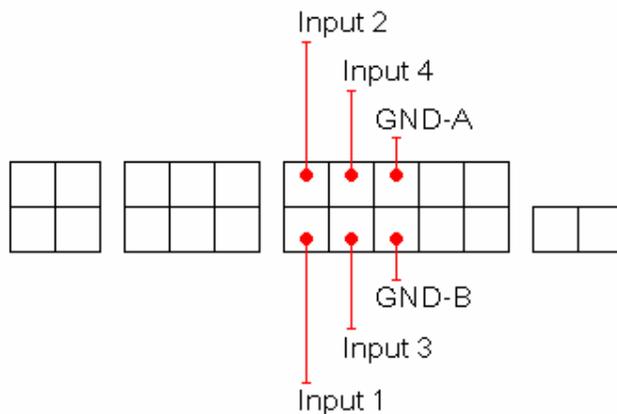


Input voltage	0-3.3V
Resolution	10 bit
Sample Time	100ms

**Analog Input** – When enabled, the analog port is used to measure input voltage from 0-3.3V and will send an alert when the voltage exceeds the level specified in your configuration. The Analog input is tolerant up to 5V; exceeding 5V can damage your StarFinder Lite.

**Analog GND** – This is the ground reference for the Analog Input signal. It is isolated from Common Ground and other grounds.

### 5.2.8 Optically Isolated Inputs



When the inputs are enabled, they will send an alert when the specified condition is met, and all have the same electrical characteristics and behavioural options.

### Electrical/Logic Levels Characteristics

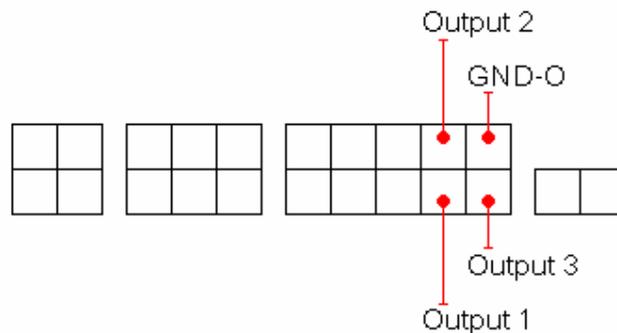
	Minimum	Maximum
Logical HIGH	3.5V , 1.3mA	18V , 6.7mA
Logical LOW	0V , 0mA	3V , 1.1mA

**GND-A:** Serves as electric ground for **Input 1** and **Input 2**, and is isolated from the Common Ground and other grounds.

**GND-B:** Serves as electric ground for **Input 3** and **Input 4**, and is isolated from the Common Ground and other grounds.

*Note: An input level exceeding 19V could damage the StarFinder Lite and should be avoided.*

### 5.2.9 Optically Isolated Outputs



The Starfinder Lite has three optical outputs which can be remotely controlled by the control center. All three outputs have the same electrical characteristics and behavioural options.

#### Electrical Characteristics

All three of these outputs are optically switch transistors. They do not source any current or voltage. Reverse current flow is prevented. Connection **GND-O** serves as electric ground for all three outputs, and is isolated from the Common Ground and other grounds.

Maximum pull-up source voltage: 300V

Maximum individual sinking current: 150mA

Maximum collective sinking current: 300mA

Maximum reverse voltage tolerance: 75V

*Note: Exceeding these values can damage the StarFinder Lite and should be avoided.*

## Behaviour Options

**Starting Closed:** The output switch is closed. A remote command will change this connection to open.

**Starting Open:** The output switch is open. A remote command will change this connection to closed.

**Normally Open:** The output switch is normally open. A remote command will close the switch for the length of time specified in configuration.

**Normally Closed:** The output switch is normally closed. A remote command will open the switch for the length of time specified in configuration.

## 6 OPERATION

The following outlines the various operating and reporting features of the Starfinder Lite.

### 6.1 LED Operation

The Starfinder Lite has three LEDs on the front of the unit. They are Power, GPS, and GSM. The following is a description of their operation.

LED	Flashing/Off	Steady
Power	No Power (off)	Power On
GPS	Searching for Position	Valid Position Acquired
GSM	Connected to Network	Not connected to Network

*Note: A flashing GSM LED does not necessarily mean the unit is connected to GPRS or [www.LocationNow.com](http://www.LocationNow.com). It only means the unit has registered with the GSM network.*

## 6.2 Position Reporting by Event

There are many events which can trigger the Starfinder to send a position report. Most are outlined below. For other possible messages, contact [sales@laipac.com](mailto:sales@laipac.com) to purchase the development protocol. The descriptions in *italics* are options and not standard features.

- **Input 1 (Opto 1)** A 'high' signal at Input 1 will send a position message to the control center with the corresponding event code.
- **Input 2 (Opto 2)** A 'high' signal at Input 2 will send a position message to the control center with the corresponding event code.
- **Geo-Fence** Once the hardware Geo-Fence is set, the Starfinder will report back to the control center when the unit has travelled outside the boundary with the corresponding event code.
- **Overspeed** When the Starfinder travels above the set speed limit it will report back to the control center with the appropriate event code.
- **Timed Reporting** When the time interval reporting is set the Starfinder will send a position message to the control center after this amount of time\*.
- **Distance Reporting** When the distance interval is set the Starfinder will send a position message to the control center after it has travelled this set distance\*.
- **Accident Alert** When detected that a high acceleration (configurable level) is achieved the Starfinder Lite will send a report to the SMS base station or control center.
- **Towing Alert** When the vehicle ignition is off and the unit senses movement, an alert message will be sent.
- **DL Memory Full** Data Logger Memory Full alert will cause the unit to send an alert when the internal memory of the unit is full or has reached max capacity.

\* *When both time and distance intervals are set they work dynamically together like an 'OR' operation. This means that whenever either condition is met, it will report.*

### **6.3 Reporting by Request**

In addition to automatically reporting the position you can manually request the current position or settings. The following are some parameters which can be requested.

- System information such as firmware version and memory size
- Current position
- Current mileage or speed limit setting
- Current Report settings
- Current Geo-Fence settings
- Current log settings
- Current input status
- Current output status

### **6.4 Serial Port**

*NOT YET DEFINED*