



**Astrata's Geo-Location System (GLS)** is a complete Client/Server-based Fleet Management System (FMS), which has been designed for managing large fleets in a high security control centre environment supporting multiple clients seamlessly from a single central installation. The User Interface, which hosts numerous functions appropriate to Vehicle Tracking and Fleet Management is practical and simple to use and gives customers complete confidence in a comprehensive package. GLS has been designed to accommodate millions of assets by scaling to utilize multiple servers or can be implemented on a single server for turnkey applications.

## System Overview

The GLS has a highly scalable architecture that allows the entire system to be installed onto a single PC for small fleets or across numerous server class computers in order to achieve the high throughput required by very large fleets. The architecture can support one million assets based on event processing or can be zoomed in to support manual and intense supervision of a select group of assets. The system supports multiple independent fleets on the same hardware and introduces the following innovative technology features for scalable telematics systems that handle up to a million assets:

- Scalability to allow the system to scale from one to any number of servers
- High throughput SMSC connectivity to interface the GLS directly to the Telco backbone
- Zone Management to allow the creation, modification and deletion of zones for millions of assets
- Zone Sets to allow the application of multiple zones to multiple assets
- Asset Groups to provide for the logical grouping of assets and their properties
- Settings Management to provide the application of telematics device setting to groups of assets

- Database Replication to prevent report generation from impacting transactional performance
- Reliable UDP messaging for low cost Telco services
- Event Management allowing operators to subscribe/unsubscribe to asset events

Astrata's GLS implements data encryption and authentication at all interfaces to provide the most secure telematics end to end system available today.

## Maps

- Selected vehicles are displayed on map in the form of an icon that indicates mode, direction, ignition status etc
- Vehicle locations are displayed as actual street and area names

## Events

- The system can identify a multitude of event conditions and alert the user appropriately
- The system has fully customizable severity levels based on the conditions the Fleet Operator sets
- All events can be selected/deselected for notification to the operator
- All operator actions are logged

- Some device events supported:
  - Excessive idling
  - Speeding
  - Device tamper
  - Ignition changes
  - Geofence entry
  - Geofence exit
  - Device errors
  - Digital input changes
  - Harsh acceleration/braking
  - External power level
  - Unauthorized movement
  - Device commands accepted
  - External power disconnect/connect
  - Zone speed limit exceeded

## Replay

- The asset movement and event occurrences are replayed using maps
- Users are able to select a record on screen and view the details of that particular event or move to next or previous record

## Driver & Trailer Management

- The system allows for virtually an unlimited number of drivers and trailers to be added
- Additional information can be stored against each driver and trailer
- Drivers can be manually assigned to a vehicle or dynamically by tagging before being allowed to start a vehicle
- A vehicle can have one or more drivers or trailers assigned to it
- All violations are logged against driver name
- Drivers are ranked according to the number of violations and cost of violations

## Reports

- The system is able to generate reports for selected vehicles and time periods
- Reports can be exported to PDF, Excel, RTF and HTML
- Current reports available:
  - Full Movement
  - Zone Visitation
  - Diagnostic
  - User Audit
  - Fleet Health
  - Daily Speed Profile
  - Asset Violation

## Commands to Devices

- The vehicle's latest position can be requested by polling the device and the device responding with the latest position and status
- It is able to change the mode of the device over the air
- The device odometer can be set to that of the vehicle and updated on a regular basis
- The state of the 2 digital outputs can be changed to switch external devices on or off
- The system is able to send a reset command to the device restarting the embedded operating system

## Security

- Pre-defined user-groups with different access levels exist
- User activity such as Assets created/edited/deleted, Zones created/edited/deleted, Synchronization etc. are recorded in the audit trail
- All device communications are encrypted

## Device configurability

- All device settings are configurable Over-the-air
- The position gathering frequency in all modes can be adjusted
- Geofence radius and zone behaviors

## Zones

- Zone entry and exit events can be monitored by the system
- Supported shapes: Rectangle, Circular, Route, Polygon (free form)
- The user can set the speed limit per zone
- Various types of zones used:

Type	Description
Authorized	Vehicle must stay inside this area else vehicle will enter alert mode
No-Go	Vehicle will go into alert mode if it enters this area
Safe Unit	will go into safe mode when entering this zone
No-transmit	Once a vehicle enters this zone the GSM modem will be switched off

## Application Programming Interface (API)

- The GLS platform support 3rd party developers that wish to connect to the server and extract information to display on 3rd party applications

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