SELEX Communications
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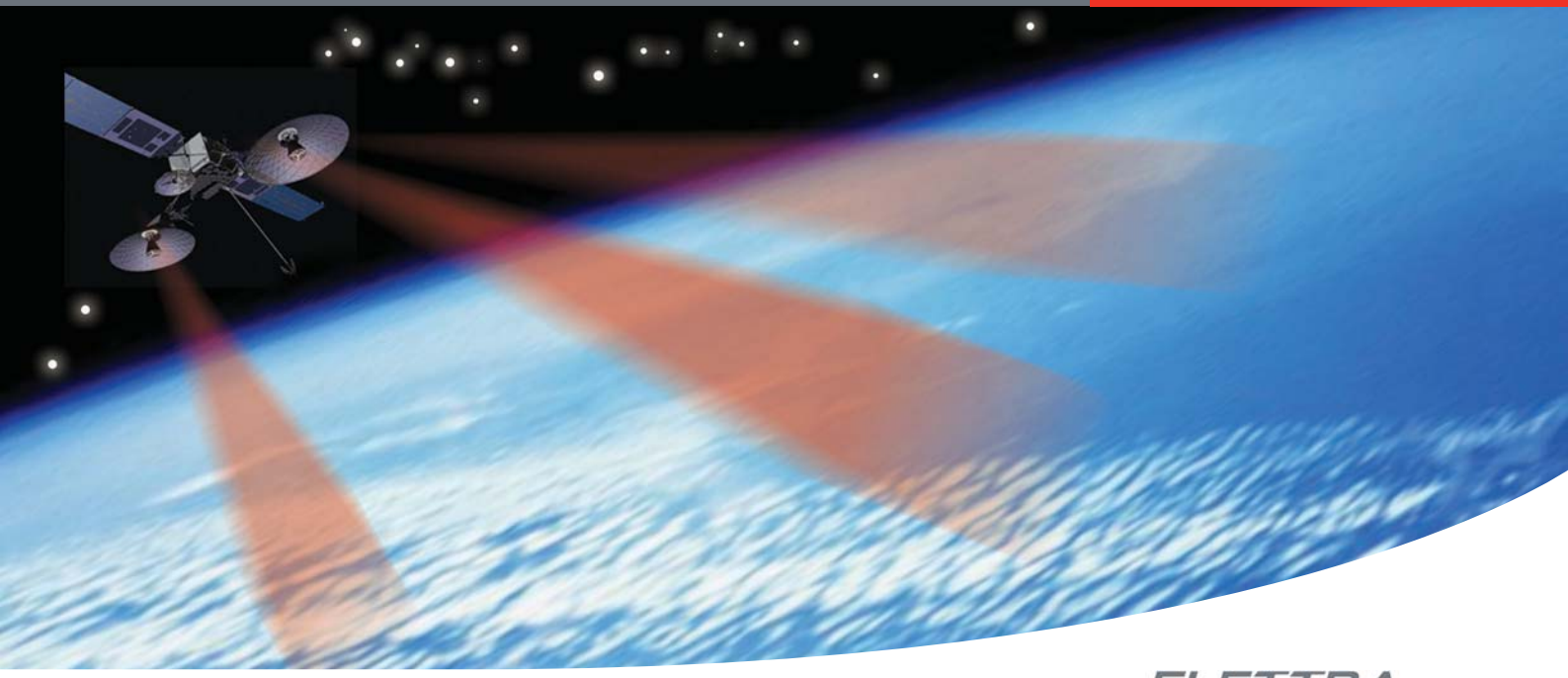
> Avionics CNI > Military & Space **> Professional Communications**



ElettraSuite ALS
Automatic Location System. An efficient LIP tracking system

SELEX Communications' Automatic Location System (ALS) solution for TETRA networks are used to track mobile assets such as security vehicles, taxis, courier vans, emergency service vehicles and people (e.g. police agents).

OVERVIEW

Location information is of the utmost importance in many activities where a fast response or fleet management are required.

SELEX Communications' **Automatic Location System (ALS) solution** for TETRA network is used to track mobile assets such as security vehicles, taxis, courier vans, emergency service vehicles and people (e.g. police officers).

Benefits include higher levels of security, greater control over fleet operations and improved efficiency. Fleets may range in size from 1 to 10,000 units (for each server).

In order to be tracked, each vehicle in a fleet must be fitted with a Global Positioning System (GPS) tracking device and a suitable TETRA radio, while each person must have a GPS-enabled TETRA radio terminal (internal or external GPS).

Our terminal products including the vehicular ElettraSuite **VS 3000-2** and the new hand held ElettraSuite **PUMA-T3 Plus** both with integrated GPS offer an effective integrated solution for this application.

The system supports the **Location Information Protocol (LIP)**, an ETSI application layer protocol designed to minimize the number of location reports sent over the air interface and avoid network congestion.

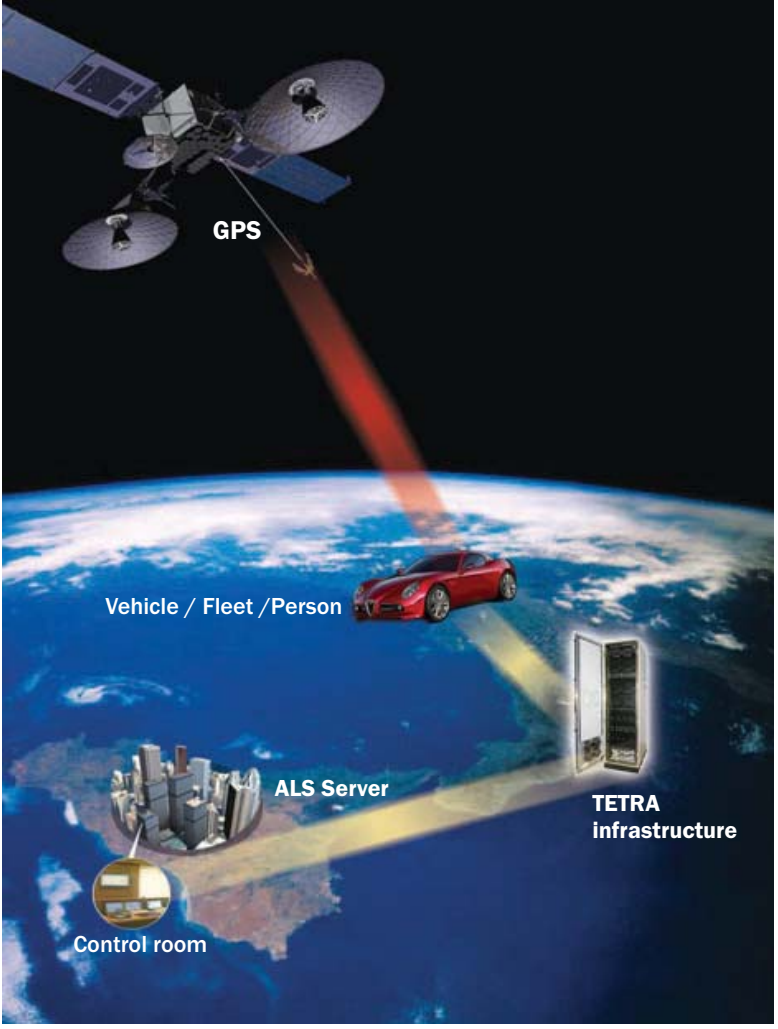
In this way it can work with most of the terminals available in the market.

The GPS position data is transmitted from vehicular radios to the TETRA network using the Short Data Service. To prevent network overload this can be performed simultaneously with voice transmissions.

For applications in which GPS coverage is restricted or limited, the tracking solution can be improved by the use of Dead Reckoning (DR) hardware on the vehicle.

This monitors the speed and direction of the vehicle so that a location can be approximated even if a GPS position fix is unavailable.

Dead reckoning allows the determination of vehicle location by measuring the distance travelled from a known location through odometer readings and the direction of travel through compass



headings, even when the GPS satellites are not visible.

For applications in which accuracy is critical, the precision of location can be augmented by a technology known as Differential GPS (DGPS) that improves accuracy to approximately ½ metre.

An ALS solution consists of standard computing hardware and specialized tracking software. This software manages the fleet of mobile units and provides a graphic display of tracks on a map background. All the most diffused map formats are supported.

A dedicated server provides Messaging and Dispatch tools analysis and acts as a bridge between mobile agents and the application, it must therefore be able to use the interfaces provided by the two sides. The server receives SDS messages sent by the Mobile Agents and sends them to the client application(s); using SDS messages it transfers messages and commands received from the clients to the TETRA network.

It applies DGPS correction by broadcasting DGPS data to the Mobile Agents and manages the SDS "transport layer" (acknowledgements and retry logic) relevant to ALS commands sent from the Control Room.

The SDS refresh rate can be dynamically configured on the server, increasing localization accuracy when required, as for a police pursuit.

DIFFERENTIAL GPS (DGPS)

SELEX Communications offers DGPS solutions to those customers who need greater precision in their vehicle location. Under DGPS, a GPS receiver is placed at a stationary site where the location has been precisely determined.

The difference between this known location and its GPS-measured location is applied as a correction to the GPS determined vehicle position to improve accuracy to about ½ a metre.

Alternative Routes

To offer the best solution in different operative scenarios, the GPS data can be routed to the ALS server through different radio bearers. Our external GPS receiver, as well as our WiNN Mobile Router, can integrate a GSM modem to transmit acquired data on GPRS when TETRA, for example, is not available.

IN VEHICLE HARDWARE

Vehicles are fitted with a GPS tracking device and with a Short Data Messaging capable TETRA radio - some radios (e.g. SELEX Communications VS 3000-2 model) have integrated GPS.

The in-vehicle TETRA radio unit also provides a messaging functionality used in dispatch applications.

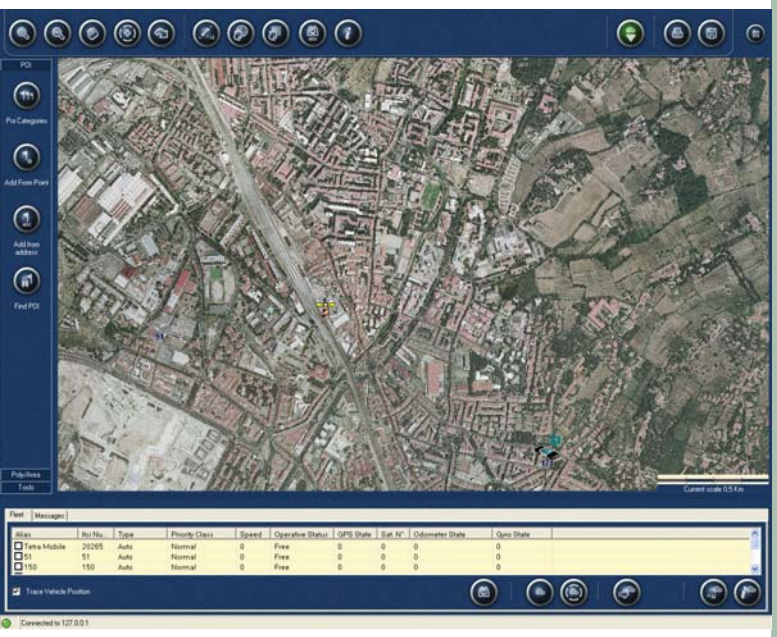
Each vehicle is fitted with a dead reckoning unit, which monitors odometer readings and the direction of travel through a Gyro.

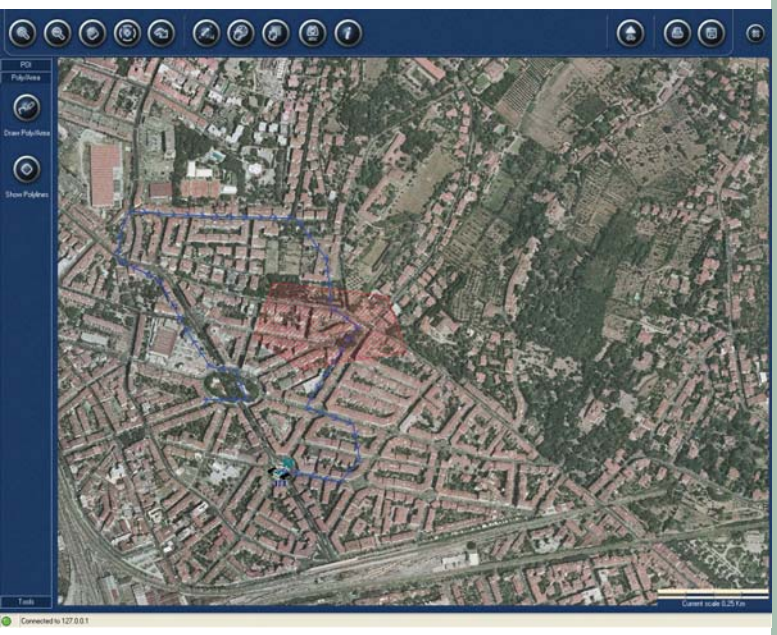
DEAD RECKONING UNIT TECHNICAL DATA

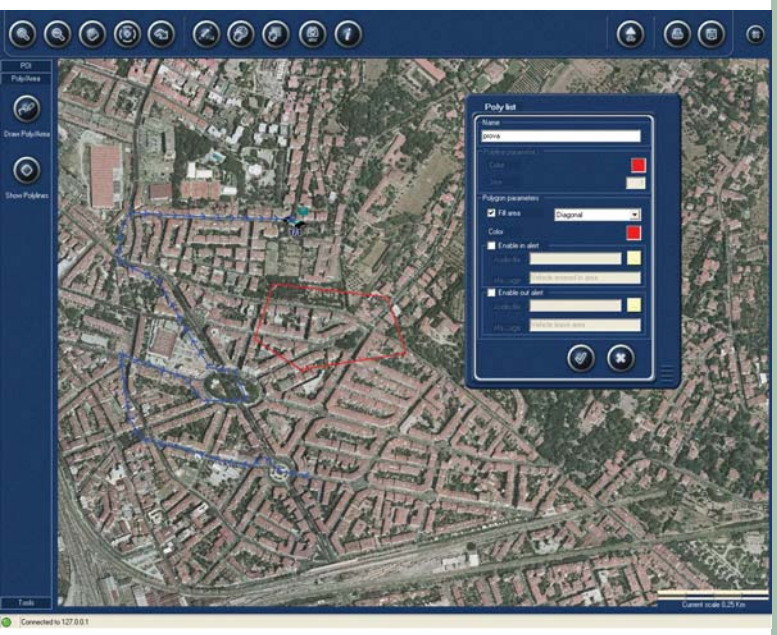
Power supply:	8 to 32Vdc - Anti-load dump feature - Does not turn off automatically with the vehicle, but turns-off after a predetermined period
Absorption:	150mA @ 12Vdc
Size (LxHxW):	195x110x30 mm
Micro controller:	Risc 32 bit, 24 MHz
1 digital relay output	
4 analogue/digital opto-isolated inputs	2 RS232 serial ports
GPS:	12 channels
Odometer Input	
Gyroscope	
Reverse Gear Input	

Environmental conditions and certification

Operating temperature:	-25 °C to +55 °C
Non-operating temperature:	-40 °C to +85 °C
Relative Humidity:	10% to 95% at 50 °C (condensing)
Cold test:	ETS 300 019-1-5 class 5.2 (within the limits of the operating temperature)
Dry hot test:	ETS 300 019-1-5 class 5.2 (within the limits of the operating temperature)
Air temperature change test:	ETS 300 019-1-5 class 5.2
Damp heat cyclic test:	ETS 300 019-1-5 class 5.2
Water and Dust Protection:	IP54
Shock and vibration certification:	ETS 300 019-1-5 IEC class 5M3
CE Certification:	(1999/5/CE regulation) and automotive.







Options

- 15/20 GPS channels expansion
- 7 opto-isolated digital/analogue input channels
- 1 relay output channel
- 2 open collector output channels
- RS485 opto-isolated serial
- Opto-isolated CAN
- GPRS Modem

ALS SERVER

- Runs on Microsoft platform
- Database support for Oracle, SQL Server, Sybase and Microsoft Access
- Compatible with a wide range of commercially available map data.
- Supports both Vector and Raster map formats
- Map Zoom In/Out
- Calculates distance between two points on a map
- Route planner
- Supports ETSI location protocol
- Integrated messaging interface
- Multi-lingual user interface - English, Italian and custom interfaces
- Smart Alarms: Automatically sends the control room alarms when mobile units approach/enter/leave pre-determined areas, speed or status
- Text messaging services
- Points of Interest Management
- Extensive tool set for real-time and historical analysis (including distance measurement)
- Multiple user capable supporting TCP/IP access
- Simple one step control of mobile unit configuration
- Fleet Management:
  - Fleet treated as a whole or split in subsets to be treated separately or to be distinguished when displayed all together
  - Attributes can be associated to the vehicles in order to select the vehicles for which a specified attribute value is true (e.g. a particular task)
  - Search for the closest vehicle to a specified location
  - Calculation of the map centring on a selected vehicle
  - Dynamic map calculation according to the movement of a selected vehicle
  - Vehicle characterization through its own identifier and other relevant information; additional information can be configured at system start-up
  - Positioning update for a selected vehicle
  - Polling list management to enable/disable positioning of vehicles and to give higher priority to a subset of the fleet
  - Sending/receiving free-text/status SDS messages to/from the vehicles

- Intelligent fleet monitoring tool to detect unit failures and tampering
- Graphical administration tools for management and configuration of large fleets.

OPTIONS ADD-ON

PowerMike Speaker/Microphone with integrated GPS for the hand-portable terminals

For hand-portable terminals not equipped with internal GPS, SELEX Communications offers the PowerMike, a Speaker / Microphone with an integrated GPS receiver and antenna to be used in analogue mode.

The high sensitivity GPS permits good positioning in urban-canyon and dense foliage environments.

Options & accessories

- GPS module to support DGPS
- Earbud

POWERMIKE TECHNICAL DATA

Operating temperature:	-25°C to +55°C
Storage temperature:	-40°C to +70°C
Casing material:	ABS
Water and Dust protection:	IP54
Clip-on clamp	
Push-To-Talk (PTT) button	

Loudspeaker characteristics

Nominal power:	1 W rms
Peak power:	1.5 W
Impedance:	25 Ohms ± 15%

Environmental conditions and certification

Operating temperature:	-25°C to + 55°C
Storage temperature:	-40°C to + 70°C
Relative humidity:	95% at 40°C (condensing)
Cold conformance:	ETS 300 019-1-7 class 7.3 E (within the limits of the operating temperature)
Dry heat conformance:	ETS 300 019-1-7 class 7.3 E (within the limits of the operating temperature)
Thermal cycle conformance:	ETS 300 019-1-7 class 7.3 E
Vibration conformance:	ETS 300 019-1-7 class 7M3
Shock conformance:	ETS 300 019-1-7 class 7M3
Free fall test conformance:	ETS 300-019-1-7 class 7M3
Certification:	CE (1999/5/CE regulation)

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e-mail: info@selex-comms.com • www.selex-comms.com

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