



intecs Solutions

GNSS Robustness solutions

SYSTEM ENGINEERING
SOFTWARE DEVELOPMENT
PROCESS & RAMS CONSULTING
VALIDATION & VERIFICATION
EMBEDDED SOFTWARE

INTECS Group, founded in 1974, is an Italian private Company at the forefront in the design and implementation of high-tech electronic systems for the AeroSpace, Defence, Transportation and Telecommunication markets, where safety, reliability, innovation and quality are the key ingredients for success.

Intecs designs and develops applications, tools and software components for complex electronic systems in cooperation with major European and Italian Industries, Organizations, Universities and Research Centers. In 1994 Intecs was one of the first software companies in Italy to be awarded the ISO-9001 certification. Space is one of the domain where Intecs has been involved since it was founded. We have been involved in several projects for the main Space Agencies both for ground as well as for on-board software development.

Nowadays GNSS technology is used for daily activities in the mass market domain as well as in specific sectors such as aviation, maritime, rail, road, energy, telecommunications and financial. In this evolving scenario we provide solutions that can mitigate problems due to vulnerabilities such as interference, malicious jamming, meaconing, intrusion or spoofing.

Interface Detection System

The risk of intentional and unintentional emissions and interactions has increased rapidly in the last year. Our solution is ideal for tracing intentional or unintentional interference as well as potentially dangerous signal sources.

- 1

DETECT

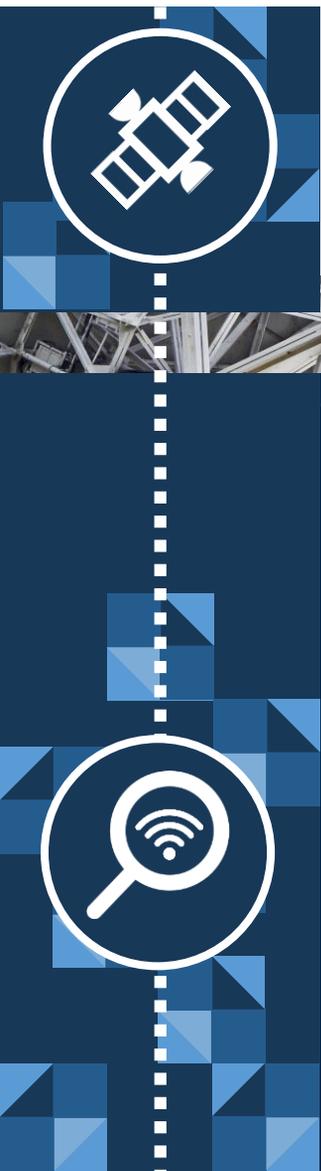
The main feature is the ability to detect those signals that are emanating from illegal sources or potential interferences sources. A spectrum analysis is the basis of the solution.
- 2

IDENTIFY

The detected signals are then analyzed and classified. Known signals are discarded and only the real potential interference are tracked.
- 3

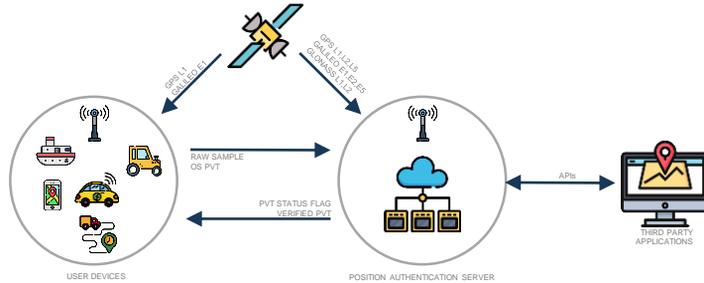
LOCALIZE

The identified suspect signals location is then calculated via sophisticated triangulation algorithms. Location of each signal is then displayed on a map.



GNSS cloud-based position authentication service

Our approach is an innovative and competitive system in the Satellite Navigation and in the wider Positioning Navigation and Timing (PNT) domain. It represents a disruptive solution that meets the increasing needs of no-institutional professional actors and civil users, offering GNSS cloud server-based position authentication service using the full spectrum of the Galileo E1 signal (E1A, E1B and E1C). It provides benefits towards vulnerabilities such as interference, malicious jamming, meaconing, intrusion or spoofing. The authentication is realized through the watermark noise recognition, a technique at physical signal level that does not need the usage of any interpretation of the upper level protocols.



The system consists of a user device and a server component. At the user side a small device provides the authentication server with the data and the position and timing information to be authenticated. The server component is **the core** of the system and is composed by a scalable cloud based architecture in charge of perform the processing and to provide the authentication information.

KEY FEATURES

- Low complexity and ultra-compact user device
- Reduced costs of the user device
- Reduced power consumption of the user device
- Cost-effective authenticated position system deployment
- Approach based on digital techniques performed on physical level of the Galileo E1 signal
- Cross-Correlation based algorithm for watermark identification
- Secure authenticated channel between user location and service server
- Verification and authentication of all GNSS (GPS, GLONASS, BEIDOU, GALILEO, SBAS) PVT solutions.

STRENGTHS

- Innovation: disruptive technology compared to approaches of only-PRS receivers, PRS server-based authentication position systems with keys hosted in the secure server or other signal authentication schemes
- Re-configurability and Upgradability: SDR approach
- Flexibility: core elements resides in the Remote Server; it is possible to support third party client.
- Low impact on pre-existing systems: the user device is in charge of communicating with existing systems by supporting a wide variety of interfaces (e.g. Wi-Fi, Bluetooth, USB, Serials) and protocols (NMEA, RTCM or proprietary)
- Low cost solution: HW components are limited to a SDR board with Front-End submodule, minimal logic unit and communication capabilities
- Traceability: for finance applications, knowledge of the traceability of the time signal to UTC is essential to ensure regulatory compliance at the time-stamp (MIFID II Directive took effect from the 3rd of January 2018)

CONTACTS

- Rome** Via Giacomo Peroni 130, I-00131 Roma
- Pisa** Via Umberto Forti, 5, I-56121 Ospedaletto – Pisa
- Milan** Corso XXII Marzo 19, I- 20129 Milano
- Turin** Strada del Drosso n. 33/8, 10135 Torino
- Naples** Via Ferrante Imparato, 198 - Isola F, 80146 Napoli
- Genoa** Via Federico Avio, 4, 16151 Genova



Tel. +39 06 20 39 28 00
Fax. +39 06 20 39 28 59



aerospace.sales@intecs.it



www.intecs.it



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