

MundoGEOConnect Latin America
São Paulo, May 29, 2012

ir. Peter A. GROGNARD,
Founder & CEO



Septentrio Company Introduction

- Europe's leading manufacturer of professional GNSS receivers and recognized world leader for Galileo receiver development
- Privately-held company with headquarters in the heart of Europe, and offices in Los Angeles and Beijing. Majority owner of Altus Positioning Systems – www.altus-ps.com
- Representação no Brasil: Treffer Technology www.treffer.com.br



MISSION

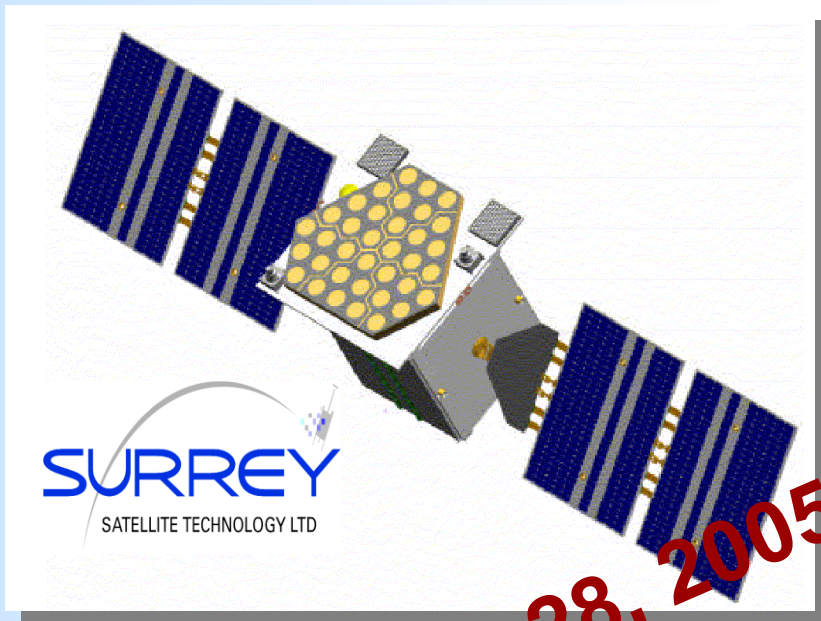
**Design, develop & commercialize
High-end OEM satellite navigation products
Based on the Company's proprietary satellite
navigation technology**



Septentrio and Galileo: A Unique Track Record since 1998

World's first Galileo signals with Septentrio

GIOVE-A



Lift-off mass 600 kg
Power demand 700 W
Stowed Dimensions:
1.3 m x 1.8 m x 1.65 m

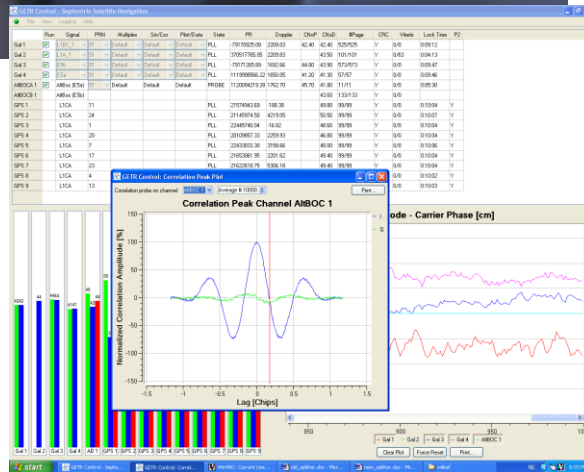
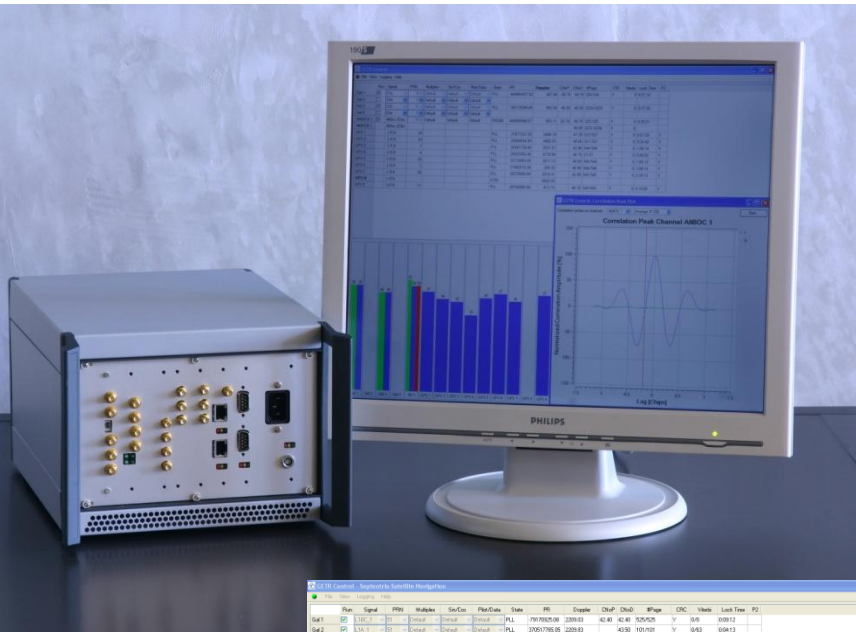
Launched Dec 28, 2005

Septentrio GETR



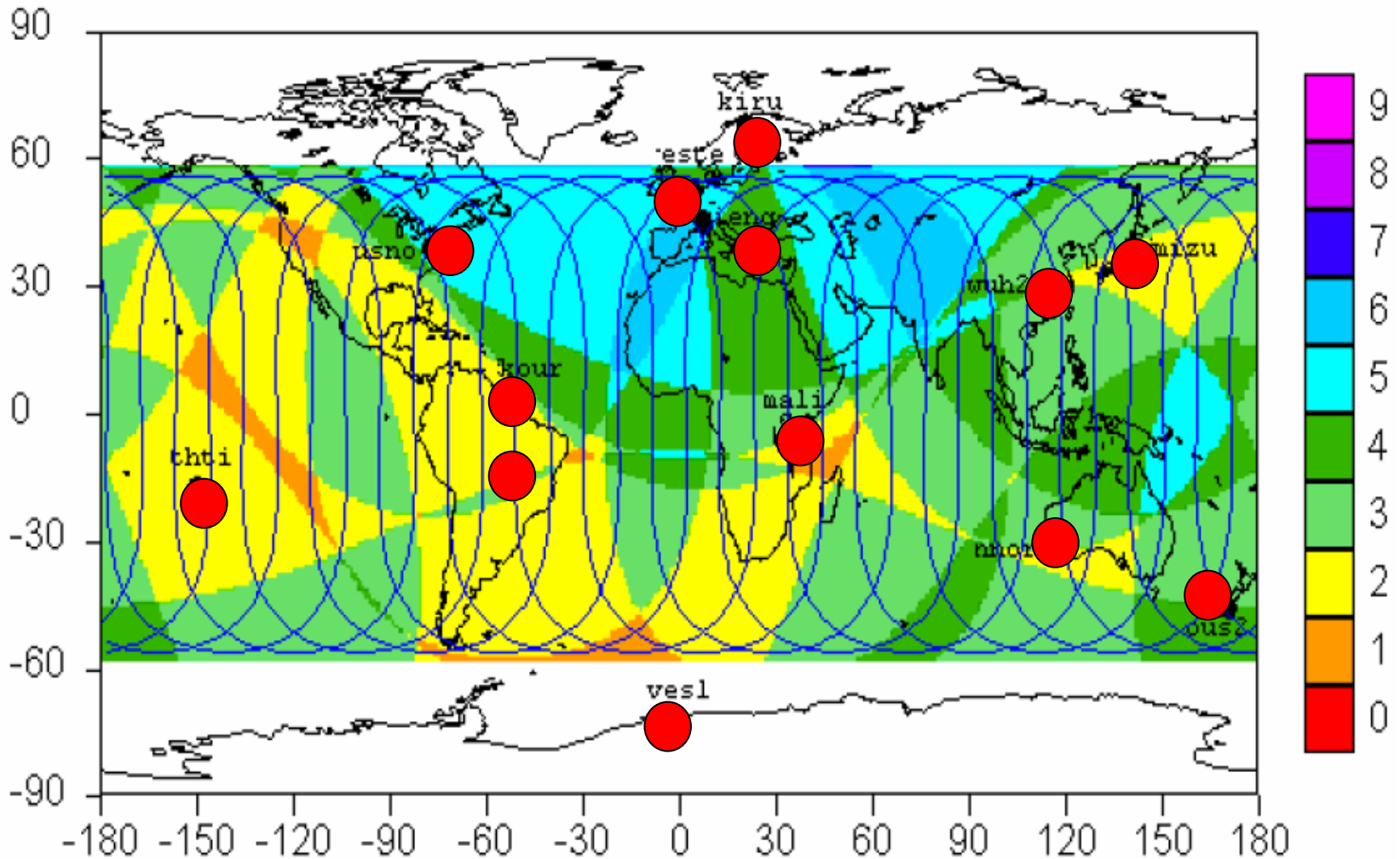
First Galileo SIS received Jan 12, 2006

GeNeRx1: Experimental Galileo Receiver



- Receive signals from first GSTB-V2 GIOVE-A (Dec-2005) and GIOVE-B (2008)
- 6 fully flexible channels + 1 AltBOC channel, supporting all Galileo signals and modulations
 - L1, E5a, E5b, E5AltBOC, E6
 - BOC, AltBOC, BPSK
- Incl. GPS all-in-view dual-frequency receiver
- Support for GPS L5
- Technology used in frequency filing campaign and GIOVE-experimentation
- Includes GUI and advanced user and development tools (incl. IF samples)
- Upgradable to IOV constellation

Septentrio Galileo Sensor Station Network



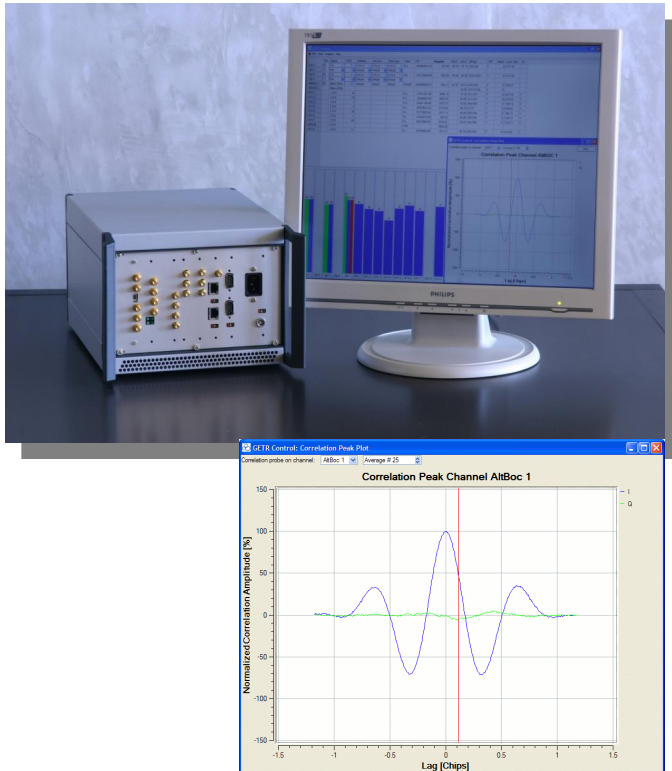
Strategic contribution to Galileo Program

- Prime Contractor to European Space Agency for Test User Segment – production of Test User Receivers
- Only receiver manufacturer that has contributed to pre-launch testing & verification of all Galileo satellites



Two Septentrio-First Historic Galileo Milestones

Tracking World's First Open Galileo Signal with Septentrio GETR Receiver



Successful Tracking of World's First Galileo Security Signal with Septentrio TUR-P Receiver on February 14, 2012



Galileo: a Real Satellite Navigation Program



Septentrio
welcomes the first
Galileo IOV launches
from Kourou,
and looks forward to
a bright GNSS future
with Galileo!

*Septentrio will continue to support
the European Space Agency and all European
stakeholders with state-of-the-art Galileo receivers,
such as the Galileo TUR-P.*

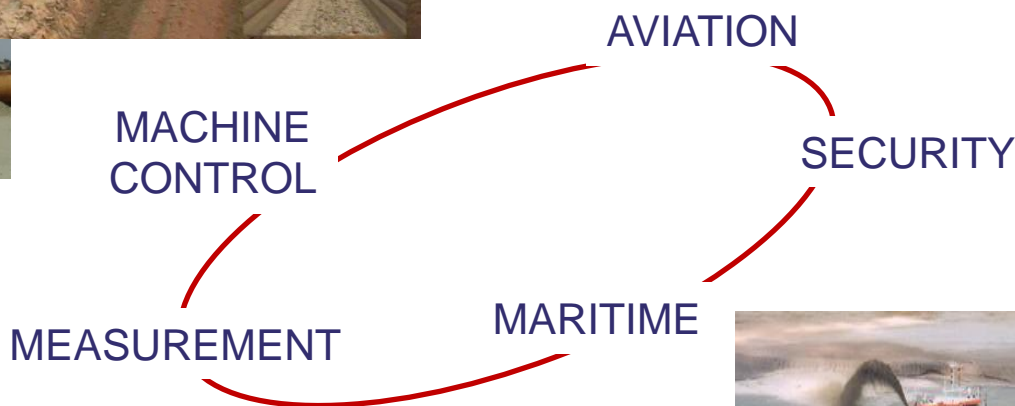
Multi-system/Multi-Frequency Essential

- **Multi-Systems: GPS + Galileo + GLONASS**
 - More satellites => (almost) always a PVT
 - With two fully deployed systems: 95% availability; only 50% with GPS alone
 - Availability critical in professional and safety-of-life applications
- **Multi-Frequency:**
 - Until May 1, 2000, Selective Availability largest error
 - Today: ionospheric errors most important - can only be compensated in real-time by receiving signals on several frequencies: L1/L2/L5
- Septentrio receivers: multi-systems & multi-frequency

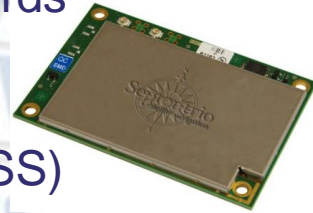


Professional GNSS Market

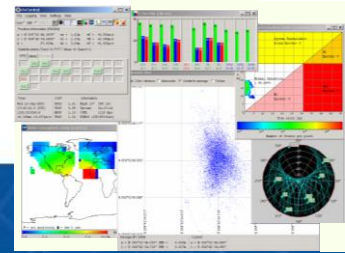
GNSS receivers and applications : high-precision professional applications



Septentrio technology



- Advanced Septentrio GNSS chipset (RF, digital)
- **AsteRx** and **PolaRx4** platforms : versatile receiver cards
 - Single/Dual/Triple frequency
 - Single or multi-antenna
 - Single/Multi constellation (GPS/Galileo/GLONASS)
 - Easy to integrate (interfaces, commands, ...)
- **GNSS+ algorithms** for high performance and flexibility
 - Tracking of GPS, Galileo, GLONASS and SBAS
 - Patented tracking algorithms for superior sensitivity
 - High precision positioning, including RTK+ and PPP+
 - Heading/Attitude calculation based on GNSS
 - Novel and ultra-precise GLONASS bias calibration
 - Patented A Posteriori Multipath Estimator (APME+)
 - Advanced Interference Monitoring and Mitigation
 - Flexible user interface and intuitive GUI, incl. field controller
- Galileo **PRS** receiver technology
- **INS** integration developments
- **Certifiable** (aviation) receiver technology



Product overview

High precision products

Certified/avionics products



Product Lines - Overview

- **AsteRx**

Compact low power high-update rate rover receivers

- AsteRx-m : Ultra low power GPS/GLO RTK receiver
- AsteRxi : GNSS/INS integrated solutions
- AsteRx2eH: Dual Antenna receiver for heading applications

- **PolaRx**

High quality multi-constellation reference station/scientific receivers

- **PPSDK**

Development kit for integration of positioning/navigation algorithms and post-processing

- **AiRx**

FAA certifiable receiver for avionics

The AsteRx family

AsteRxi

GPS/GLO

L1/L2

GNSS/INS



AsteRx-m

GPS/GLO

L1/L2

RTK

@ 0.5 W



AsteRx2e

GPS/GLO

L1/L2 RTK



AsteRx2eL

GPS/GLO

L1/L2/L-band

RTK/TerraStar



AsteRx3

GPS/GLO/GAL

L1/L2/L5/E5

RTK



AsteRx2eH

GPS/GLO

L1/L2

Dual-antenna

RTK+heading



The PolaRx family

PolaRx4

272 Channels
GPS/GLO/GAL/COMP
L1/L2/L5/E5
Webserver
Rinex Logging



PolaRx4 TR

272 channels
GPS/GLO/GAL/COMP
L1/L2/L5/E5
Webserver
Rinex Logging
FTP Push...

Precise timing applications

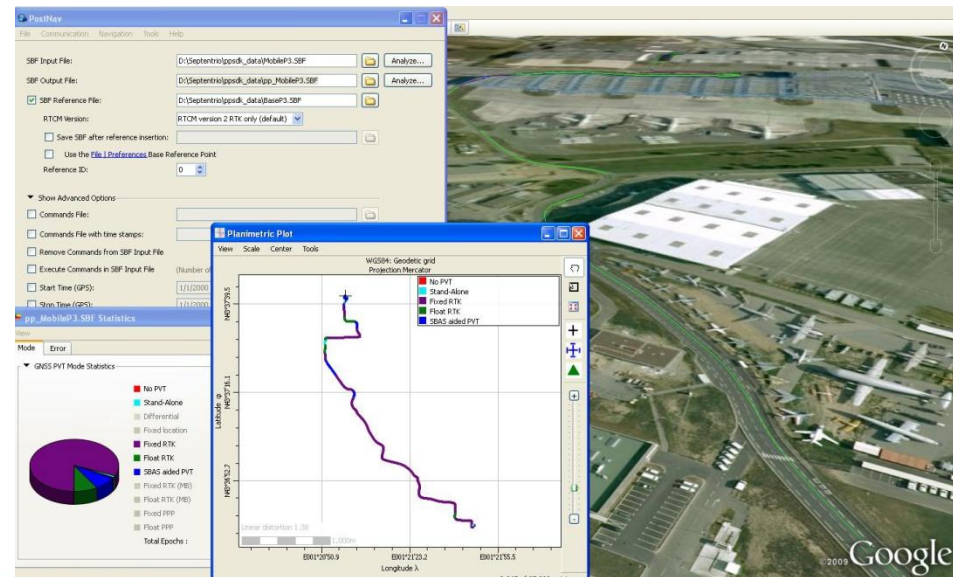
PolaRxS

136 channels
GPS/GLO/GAL/COMP
L1/L2/L5/E5
Ultra low noise OCXO
100 Hz measurements

Ionospheric monitoring

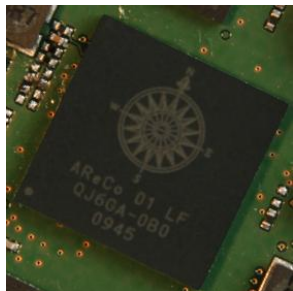


- Recalculate position solutions offline with different assumptions
- Based on receiver positioning algorithms
- Post-processing : Measure without base station, then calculate offline
- SDK for integration in 3rd party applications



The AiRx family

- AiRx2 : dual-frequency BETA-3 receiver
 - 16 channels GPS L1 C/A code/carrier
 - 4 channels L1 SBAS
 - In-the-field upgrade paths for GPS L5 and Galileo
 - DO229 / DO-160 /DO178 level B /DO254 level A
 - RAIM and pRAIM
 - Fault Detection/Exclusion



Muito obrigado!

