



AIT
Asian Institute of Technology

Introduction to Septentrio

Highly Accurate, Reliable and Secure
GNSS + Inertial Positioning

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Company Overview

Septentrio's Vision

- We offer multi-frequency and multi-constellation **GNSS positioning and timing solutions** for applications requiring high accuracy, availability and reliability under the most demanding or mission critical environments.
- We deliver **integrated sensor fusion** solutions to our core markets by collaborating with leading technology partners.
- As a **reliable partner**, our mission is to make our customers successful.
- We identify strategic customers, understand their applications in depth and deliver **superior technical support** and customer service.

Septentrio Global Organization for Global Positioning



Septentrio Americas
Torrance, CA, Miami, FL,
Chicago, IL

Septentrio HQ
Leuven, Belgium

Septentrio China
Shanghai, PRC

Septentrio Japan
Yokohama, Japan

- Worldwide team of 100+
- 60+ in R&D with GNSS+inertial positioning & timing expertise



Leuven, Belgium (pop. 99K): A History of Global Leadership



Den Hoorn brewery est. 1366
(renamed by Sebastien Artois in 1708)
AB InBev annual revenue: \$56 Billion



KU – Leuven est. 1425
(current enrollment 58K)



imec est. 1984
(4,000 researchers from 90 countries)



est. 2000



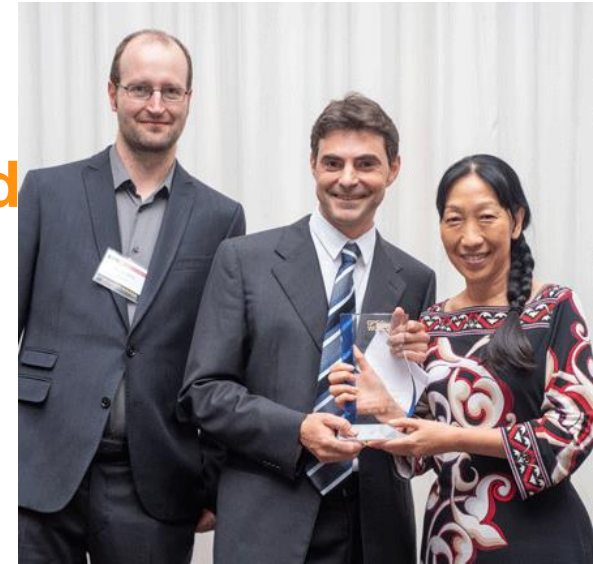
Industry Recognition - 2018

GPS World Products Leadership Award

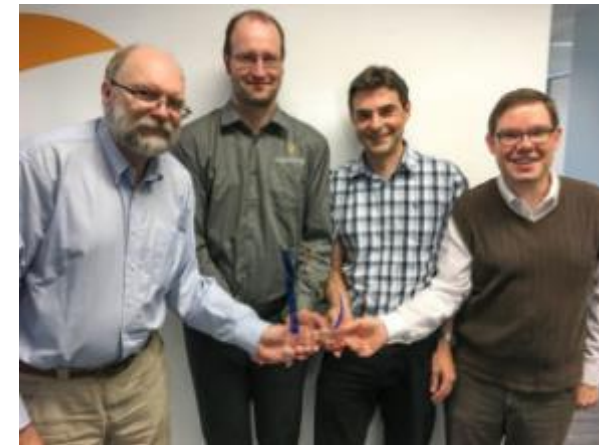


“The Septentrio team received this award for developing the versatile PolaRx5 receivers, enabling many Earth-observing applications including worldwide ionosphere monitoring.”

- Andrew Simsky - Navigation Algorithms Software Engineer
- Wim De Wilde - System Designer
- Jean-Marie Sleewaegen - System Architect
- Tom Willems - Senior Researcher



Institute of Navigation President
Dr. Jade Morton presents the
award at ION GNSS+ 2018



Septentrio Markets

Aerospace & Defense



European Space Agency
Agence spatiale européenne



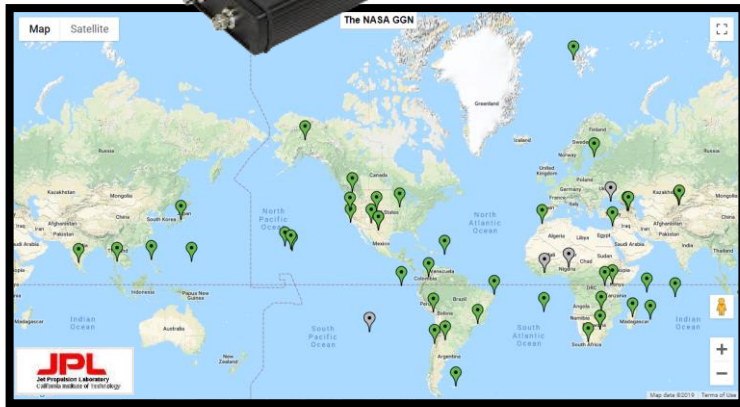
- European Space Agency - Long term strategic partner since 2002
 - All Galileo test receivers designed and built by Septentrio exclusively (IOV & FOC)
 - Participated in numerous ESA projects in military, avionics & space.
 - Provided in-depth understanding of GNSS.



GNSS Reference Stations, Precision Time Transfer & Scientific Monitoring Receivers



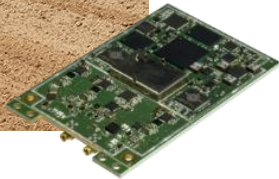
- GNSS Reference Station Networks
 - RTK, SSR, PPP Augmented Corrections
- Earthquake Early Warning & Tectonic Plate Monitoring
- Ionospheric monitoring
- High-precision GNSS Time Transfer



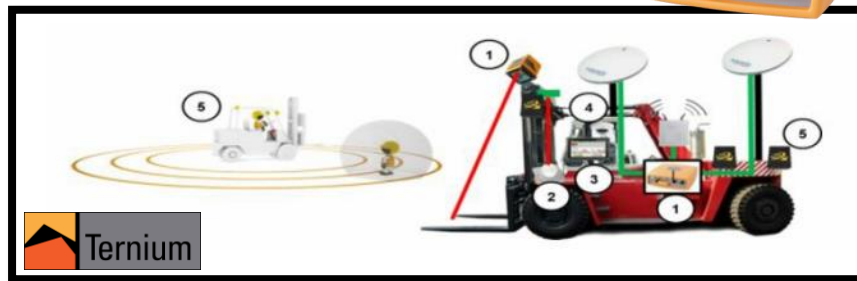
Machine Control / Machine Automation



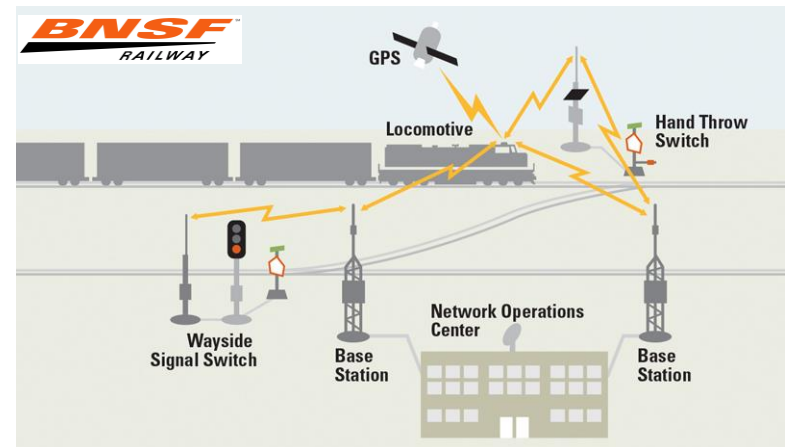
- Precision Agriculture
- Dredging
- Construction
- Mining



Transportation & Logistics



- Positive Train Control (PTC)
 - Including RTK base station networks
- RTG Cranes
- Precision Material Handling Systems



Unmanned Aerial Vehicles (UAVs)

- Aerial Mapping (PPK)
- Volumetric Survey for Mining & Aggregates (PPK)
- Precision Agriculture
- Inspection
- Construction



Why Septentrio?



Septentrio GNSS Products for Professional Markets

Altus:

- Survey & GIS

AsteRx:

- Transportation, Ag, Mining, Construction, Military & UAV

PolaRx:

- Government & Research Institutions



Smart Antennas



OEM Receiver Boards



Timing, Reference & Iono Monitoring GNSS Receivers



Integrated GNSS Receivers



OEM Platforms

Mosaic

- Small footprint (LGA)
- Available for high volume applications

AsteRx-m2/m2a

- Light and compact
- Low-power (undisputed market leader)

AsteRx4

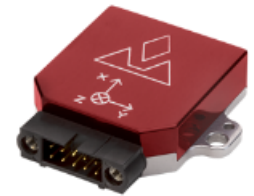
- Full featured and all signals
- Scalable and flexible



OEM Platforms

AsteRx-i

- Reliable and accurate IMU-enhanced GNSS positioning down to the cm level
- Based on AsteRx-m2 multi-frequency GNSS board
- Interated algorithm with selected MEMS sensors
 - High-update rate, low-latency positioning and attitude
 - Cm-accurate positions (RTK)
- Full attitude – heading, pitch and roll
- Compact, lightweight, low power
 - size 36 x 33 x 9 mm, weight 43 g, power draw <1.5 W



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