

# SEPTENTRIO SATELLITE NAVIGATION

## From GPS to GNSS

These are exciting times in satellite navigation. Selective availability for GPS switch-off has fuelled use of satellite navigation technology in professional and consumer applications and new signals and systems are reshaping the industry landscape. Septentrio has from its inception embraced new possibilities in satellite navigation. It offers receivers for professional markets, while preparing users for the GNSS of tomorrow.

There have been important technological advances over the past decade in chip technology, signal and digital processing, miniaturisation and portability, all supporting the development and use of GPS. And now there are new satellite navigation signals and systems on the way. This promises further performance enhancements and new and expanded applications. There has also been policy evolution in the official mission and management of GPS, including switching off selective availability (SA) for GPS in 2000, the European vision of a European but global satellite navigation system, and Russian announced revival of Glonass. But most of all there has been market evolution in the massive uptake of portable devices and consumer and professional reliance on communication and (positional) information. Such developments create new opportunities.

### Millennium Eve

Septentrio was founded in 2000, just before SA switch-off. The company was born in Leuven, the Netherlands, as a spin-off from IMEC, Europe's leading independent research centre in the field of micro- and nano-electronics, nano-technology, micro-electronic design methods and technologies for ICT systems. After several years work on GPS ASIC technology, a team of seven felt it was ready for commercial launch. They embarked on a venture to build and supply GPS receivers for high-precision industrial applications, while playing a pioneering role in the development of Galileo. Today Septentrio is a multidisciplinary team of over fifty GNSS engineers and professionals spanning the whole range of capabilities to conceive, design, build and support high-precision GNSS receivers. The team includes RF specialists, (digital) ASIC designers, analogue and digital electronics design engineers, signal processing and positioning-algorithm experts, inertial-system integration experts, embedded-software and graphical user-interface engineers, and GNSS-application support engineers.

### Mission and Vision

Our mission is to supply high-end GNSS receivers to a wide variety of demanding, high-precision and integrity applications in industrial markets. Users want quality positional information for their applications and are (usually) not interested from which satellite system or combination of systems such information stems, as long as they get what they need at affordable cost. We thus want to provide great GPS receiver technology today, with the evolution to GNSS receivers in mind, and provide our receivers with application engineering support. We will provide positioning technology to allow the customer to get on with the job.

### Two Families

We develop our own satellite-navigation technology, whether ASICs or other receiver hardware, receiver algorithms for a variety of uses, or fully integrated units. Next to and in support of strategic commercial goals, we play and want to continue to play a crucial role in the development of Galileo, both in realisation of the system and in supporting the early commercial availability of Galileo technology for (industrial) users. We design and sell high-performance satellite navigation receivers for all GNSS systems: GPS, Galileo, Glonass and SBAS. These receivers fall into two families. The PolaRx2 family, on the market for over five years, is a complete platform of high-end, multi-frequency, single- and multi-antenna receivers, including special models for attitude calculation and time transfer. The recently introduced AsteRx family is a platform of compact rover receivers featuring low power consumption, high update rates and easy integration into various static or kinematic products. All variants can be delivered as an OEM board or ready-to-use in a rugged enclosure. We also deliver antennas, cables and other accessory products. All receivers are provided with intuitive graphical user-interface software and software tools to facilitate instant use and easy integration.

### Wide Range

Our products are specifically designed for a wide variety of industrial applications requiring high accuracy, robustness or integrity. They are used in existing and emerging markets, such as land and marine survey, marine construction and hydrographics, reference networks, machine control in construction and precision agriculture, and precise time and frequency transfer. The single-board heading and attitude capabilities of PolaRx2 receivers are used in various machine-control applications, and also in aerial survey and on maritime platforms. As we focus on supporting integrators and solution providers, special application engineering support is provided so that we can work closely with customers and users to help configuration and integration of our receivers in the various user applications, occasionally even providing dedicated software to support special requirements or customer features.

## **Pioneering Galileo**

From its beginning Septentrio has supported and actively contributed to the Galileo programme. In summer 2004 we supplied the first Galileo receiver prototype to the European Space Agency (ESA). This receiver was used extensively to test interoperability with both Galileo Test Satellites GIOVE-A and GIOVE-B, and quickly resulted in the design of the experimental Galileo receiver (GETR) which received the first live Galileo signals ever transmitted from space on 12th January 2006. A network of these receivers was subsequently built around the world to secure the frequency filing for Galileo and provide in-depth characterisation and analysis of Galileo signals. We continue to extend the capabilities of our Galileo Test Receivers to support Galileo System Development and In-Orbit-Validation activities. But most of all we want to put Galileo technology into the hands of industrial users. To this end, Galileo upgrade capabilities are built into our new receivers, including the new AsteRx1 receiver platform which offers users high quality GPS with a simple upgrade guarantee for when the Galileo system is fully operational.

---

<https://www.gim-international.com/content/article/from-gps-to-gnss>

---