

## GSA releases the 3rd GNSS User Technology Report

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**With four Global Navigation Satellite Systems (GNSS) available and more than 100 satellites in operation broadcasting multiple frequencies, the GNSS industry is witnessing a shift towards the wide adoption of multifrequency receivers across market segments to meet the diverging user needs of emerging applications.**

The European GNSS Agency (GSA) has just released its latest GNSS User Technology Report, providing a comprehensive analysis of latest GNSS trends and developments. With contributions from leading GNSS receiver and chipset manufacturers, the report serves as a valuable tool to support planning and decision-making with regards to developing, purchasing and using GNSS technology. Published biennially since 2016, the User Technology Report has become a point of reference for the GNSS industry, research and policy-makers.

The third edition of the report begins with a chapter devoted to technology trends common to all segments, be it on the receiver design, position processing or signal processing side. It also discusses protection measures against GNSS jamming and spoofing, such as authentication, including what – in combination with GNSS – 5G and other technologies and sensors can do. With multi-constellation now being the norm, the industry is moving towards the wide adoption of multifrequency receivers even for usually power- and cost-constrained consumer solutions. The Galileo E5 is becoming the preferred frequency with about 20% of all receiver models in the market already using it.

The report is built around four macrosegments defined on the basis of commonalities from a technology point of view: high volume, safety- and liability-critical, high-accuracy, and, new-entry in this edition, timing devices and solutions. Each chapter starts with the macrosegment characteristics and receiver capabilities, depicts the industry landscape and typical receiver form factor, it then delves into the key current and future drivers and trends, and finishes with the added value of the EGNSS, Galileo and EGNOS, for the macrosegment at stake.

This year Editor's special "Space Data for Europe" sheds light on the role that Copernicus and Galileo play within the European Space Programme in the data management and use, now and in the future. It also provides a vision of major transformations underway within our society and our economy and the benefits expected from this digital transformation, paving the way towards the European Data Strategy and Green Deal.

"The GNSS industry is evolving at a rapid pace and is shaped by the dynamics of emerging applications and user needs as well as the upgrade of existing and new GNSS and Satellite Based Augmentation Systems (SBASs). The industry has understood the potential of Galileo's unique features," said Rodrigo da Costa, GSA Executive Director. "Today, Galileo and EGNOS already provide increased capabilities which are being used across a broad range of applications, and are already igniting the next generation of location-based applications. In the future, new services such as the Galileo High Accuracy Service (HAS), Galileo Open Service Navigation Message Authentication (OS-NMA) and Commercial Augmentation Service (CAS), will raise the accuracy and reliability bar even higher, and dramatically enhance positioning, navigation and timing solutions for businesses and citizens. By bringing insight and understanding into the evolutions of GNSS technology, we are creating opportunities for innovation," he concluded.

The full **GNSS User Technology Report 2020** is available for download [here](#).

## GNSS User Technology Report 2020 highlights

### Transversal trends

- Multi-constellation is already standard in most of the segments, GNSS receivers across all domains are now more commonly featuring multi-frequency support to deliver better performances to end users (primarily greater accuracy and robustness to interferences).
- Plenty of high-accuracy services are now available on the market to all category of users.
- Protection measures against GNSS jamming and spoofing are implemented through different combinations of technologies on both the receivers and their antennas, through the use of multiple sources of positioning information as well as the authentication of GNSS signals.
- Sensors of all types are now routinely integrated with GNSS receivers and their outputs. Largely propelled by the emerging world of 'autonomous things', this trend widely benefits other sectors, leading to ubiquitous localisation and timing, ubiquitous sensing, ubiquitous connectivity. In an environment where each subsystem contributes to the performance of the others, the seamless integration of space and ground components is paramount to achieve truly global ubiquity.

### Macrosegment specific trends

- In the world of high-volume devices for the consumer market, multi-constellation support is now standard and dual frequency capability is not only a strategic choice for high-end products but is gaining momentum in smartphone devices.
- The safety- and liability-critical device domain is traditionally constrained by regulations and standards and therefore slower in adopting new technologies. However, noticeable changes can be observed in the less regulated and low-end parts of this sector, which increasingly use high-end mass market chipsets combined with new approaches to support safety-critical applications
- In the high-accuracy domain, the devices steadily evolve towards exploiting all constellations and frequencies as they become available. Modern devices consist in compact sensor-enriched receivers, usually capable to support any type of augmentation services (RTK, NRTK, PPP and new PPP-RTK services), while offering flexible customisation to the end-user.
- In the domain of Timing devices, that deliver time and synchronisation solutions for the telecom, energy, finance or transport sectors, research and development efforts have been made at various levels of the timing processing chain; In particular, multi-constellation and multi-frequency adoption but also innovative Time-Receiver Autonomous Integrity Monitoring (T-RAIM) and interference monitoring algorithms aim to respond to the common demand for improved accuracy, increased resilience and improved availability.

## About the European GNSS Agency (GSA)

The European GNSS Agency (GSA), is the European Union Agency in charge of managing operations, security and service provision for Europe's Global Navigation Satellite Systems (GNSS), Galileo and EGNOS. By working with stakeholders, industry and user communities, the GSA ensures the highest return on European GNSS investment, multiplying the benefits of space applications for European citizens and business, boosting innovation and competitiveness, and securing sustainable economic growth. For more information, visit the [GSA website](#).

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