"UNION project aims at democratizing precise navigation for mass-market applications with a platform-agnostic, accurate, and scalable navigation solution that overcomes the constraints of traditional precise GNSS technologies."

Xavier Banqué, CEO of Rokubun

UNION is a satellite positioning engine for accurate and real-time navigation for mass-market devices such as smartphones and vehicles.

This technology is developed in the framework of a collaborative R&D European project funded by the European Union Agency for the Space Programme (EUSPA).

www.rokubun.cat
www.icgc.cat

Contact

Email: info@rokubun.cat
Website: union-navigation.eu
Twitter: @GsaUnion
LinkedIn: www.linkedin.com/groups/12484229/

Key info

2 years (2021-2022)
432.000 €
2 partners: Rokubun (prime), ICGC
UNION leverage the strengths of Real Time Kinematics (RTK) and Precise Point Positioning (PPP) techniques, plus the future Galileo High Accuracy Service (HAS). UNION aims at palliating some main limitations of those techniques, such as the poor scalability of RTK and the slow convergence time of PPP.

UNION technology has being validated and demonstrated for two relevant applications:

- **automotive**
- **Location Based Services, LBS** (smartphones), although it can be used in other applications such as Aerial Unmanned Vehicles, AUV (drones).

UNION, as a precise positioning solution, improves:

- **Continuity**, especially in navigation sessions spanning hundreds of kilometres.
- **Accuracy.** UNION represents a major breakthrough in mass-market-oriented navigation solutions, reaching meter-level accuracy in smartphones, and lane-level navigation in road applications.
- **Availability** of precise navigation any time in broad geographical areas.

UNION generates the following new set of GNSS receiver technologies:

- **A Location Stack:** UNION is based on a new navigation filter for mass-market GNSS exploiting the concept of undifferentiated and uncombined processing of GNSS measurements and data sources, which allows going beyond a smart combination of PPP-RTK techniques.

- **Permanent VRS Network:** A new concept based on the creation and operation of a permanent network of Virtual Reference Stations (VRS) enables proper area coverage and one-way operation of GNSS CORS networks, thus ensuring service scalability

- **Galileo HAS corrections:** Rebroadcast the HAS messages found in Galileo E6 so that non-E6 receivers can benefit from it.

UNION generates the following new set of GNSS receiver technologies:

- **UNION SDK** (Software Development Kit) libraries
- **Smartphone app** (that integrates UNION SDK), for the validation and demo of LBS use case.

UNION as a precise positioning solution also provides an extra security layer against spoofing thanks to the Galileo Open Service Navigation Message Authentication (OS-NMA).

UNION is platform-independent and easily integrated into the user navigation device. Its implementation as a low-level SW library fosters portability, integration, and scalability. UNION is especially suited for mass-market navigation equipment, optimizing the performance and providing accurate navigation at an affordable cost.

**Project outcomes:**

- **UNION SDK** (Software Development Kit) libraries
- **Smartphone app** (that integrates UNION SDK), for the validation and demo of LBS use case.