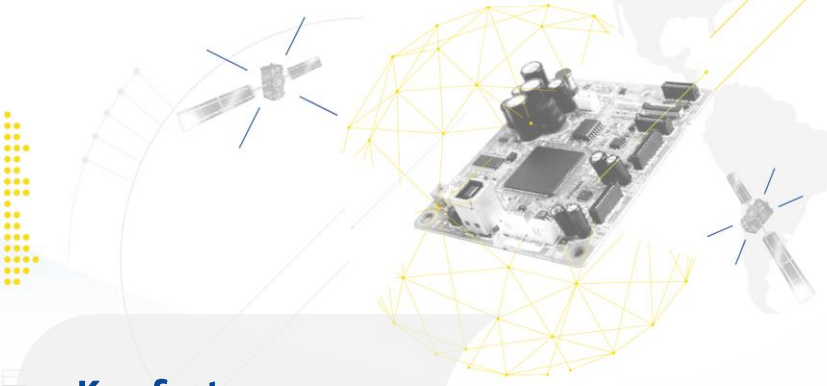
Fundamental Elements



MUGG

Multi-Mode Global Positioning System and Galileo Project

Key facts

Full name
Multi-Mode Global Positioning System and Galileo Project

Project call number
GSA/NP/37/18

Project call
Aviation DFMC SBAS Receiver Prototype (second source)

Funding
5 755 422,56 EUR

EU contribution
5 755 422,56 EUR

Topic
Civil Aviation

Market segment
Civil Aviation

Project start/end
15/12/2019 – 09/06/2024

Galileo differentiators
ARAIM, SBAS

Context and motivation

As global air traffic intensifies, the demand for more accurate, reliable, and resilient navigation systems becomes crucial. The MUGG project addresses this need by developing advanced dual frequency, multi-constellation (DFMC) satellite-based augmentation system (SBAS) receivers. By leveraging signals from both GPS and Galileo constellations, this technology aims to significantly enhance position accuracy, system availability, and resilience against signal disruptions.

The project plays a vital role in shaping future aviation standards by contributing to the development and validation of EUROCAE ED-259 Minimum Operational Performance Standards. This involvement ensures that the MUGG innovations align with international regulatory requirements. Ultimately, the project seeks to enable more efficient flight paths, reduce fuel consumption, and minimize navigation-related delays, promising both economic and environmental benefits for the aviation industry.

Targeted GNSS innovation

DFMC SBAS technology

Targeted Product

GLU-2100 - MUGG receiver prototype

Scope

At the heart of the MUGG project is the development of the GLU-2100, an advanced receiver capable of processing signals from both GPS and Galileo constellations. This innovative device incorporates cutting-edge ARAIM and DFMC SBAS software to push the boundaries of positioning accuracy. Beyond hardware development, the project's scope extends to contributing to international aviation standards, actively supporting the evolution of MOPS through the ED-259 framework. Comprehensive flight testing forms a crucial part of the project, verifying the system's performance across diverse operational scenarios.

Challenge & technical solution

Addressing the aviation industry's need for more robust navigation systems, the MUGG project tackles this challenge head-on with its GLU-2100 prototype. This receiver's innovative design harnesses the power of multiple satellite constellations and sophisticated algorithms to enable a new era of performance-based navigation. By moving beyond traditional ground-based systems, the MUGG solution paves the way for more flexible, efficient flight paths and smoother cross-border operations. Rigorous in-flight testing has confirmed the technology's ability to deliver enhanced safety and reliability, marking a significant step forward in aviation navigation capabilities.