GALILEO TODAY

Space Segment: 28 Satellites in Orbit
- 23 in Service for Navigation
- 2 Auxiliary
- 24 in service for Search and Rescue

Programme Highlights
- Initial Services provision
- Remarkable performance
- Strong link with users, market and industry
- G2G Development on-going
GALILEO DELIVERS OUTSTANDING PERFORMANCE WORLDWIDE

Ranging Accuracy, 95% @ AUL - Dual-Frequency - June 2023
GALILEO SERVICES PORTFOLIO

Now, Then, & Next

Open Service (OS)
- Free and Open Positioning Navigation & Timing (3 frequencies)
- Emergency Warning Satellite Service + Timing Service + Space Service Volume

Public Regulated Service (PRS)
- Encrypted, more robust, unlimited & uninterrupted access
- PRS evolutions

Search and Rescue (SAR) - contribution
- Forward link + acknowledgement "return link"
- Remote Beacon Activation + Two Way Communication + Distress Position Sharing

High Accuracy and Authentication
- High Accuracy Service
- OSNMA + Advanced signal authentication services

Safety-of-Life (SoL) - contribution
- Advanced Receiver Autonomous Monitoring (ARAIM)
- SBAS Dual Frequency (EGNOS Version 3)
**Galileo Navigation Open Service Status**

- Navigation Performance better than the Minimum Performance Levels defined in the Galileo OS Service Definition Document
- Enhanced Service Declaration end 2023/beg 2024
- Full Operational Capability (OS FOC) Declaration expected 2025

**Search And Rescue Service Status**

- Performance better than the levels defined in the Galileo SAR Service Definition Document
- Excellent Forward Link / Return Link Availability ≥ 99.9% / 99.8%
- 4 Galileo MEOLUTs cover 20% world surface; further increase can be achieved through networking
- New Services under preparation
  - Remote Beacon Activation
  - Two-way communication (with predefined distress Q&A helping the rescue mission)
  - Distress Position Sharing: Emergency centers can contact Galileo to share the position of a beacon in distress with other nearby users. Enable quicker rescue.

Performance Reports available at the European GNSS Service Centre website [https://www.gsc-europa.eu/](https://www.gsc-europa.eu/)
High Accuracy Service Status

- Initial Service Declared in January 2023 – Service Operational
- HAS Service Definition Document available [Galileo-HAS-SDD_v1.0.pdf (gsc-europa.eu)]
- Full Service Declaration expected in 2025

Initial Service
- Targets 20/40cm horizontal/vertical accuracy (95%)
- Very good performance since start of Service

- Increasing demand after the HAS Declaration - current status: 225+ registered users including (Google Inc., Broadcom US, Furuno, Kongsberg, Fugro, Trimble, U-Blox, etc.)
Open Service **Navigation Message Authentication (NMA)**

- OS NMA - Long awaited GNSS feature
- OSNMA SIS ICD and guidelines published in 2022
- Transition to final signal broadcast in July 2023
- Public Testing Phase ongoing
- Initial Service planned by beg 2024

**Galileo Commercial Authentication Service (CAS)**

- Allows derivation of user Position, Velocity and Timing solutions authenticated
- Initial Service: Assisted CAS (ACAS)
  - Testing in 2024
  - ACAS Initial Service in 2025
Galileo Contribution to **Safety of Life**

- Galileo already recognized for Civil Aviation
  - Formal adoption by ICAO of the Aviation Standards in March 2023
- Galileo will support Advanced Receiver Autonomous Monitoring
  - Initial Service, based on ARAIM parameters commitments, will follow OS FOC Declaration
- Galileo will support Dual Frequency Multiconstellation SBAS
  - Initial Service, based on Commitments needed for EGNOS v3, will follow OS FOC Declaration

**Galileo Emergency Warning Satellite Service**

- Service offered to National Civil Protection Authorities to broadcast alerts and associated guidance to targeted areas within minutes
- Demonstration phase on-going to showcase the end-to-end concept: confirm user interfaces, functionalities, performance
- Support the adoption by the civil protection authorities: collect feedback in support of Initial Service
- Initial Service: 2025
Galileo Space Service Volume

- Galileo stand alone 3D Position and Timing up to around 4500 km
  - Higher than GPS thanks to higher MEO orbits
- Unique Galileo services fully available in LEO
- Multi-constellation for higher orbits
- Publication of the Galileo Reference Antenna Pattern

International Cooperation

- UN International Committee on GNSS defines, promotes an Interoperable GNSS SSV for the benefit of GNSS space users
R&D Actions launched to study options for LEO PNT, covering:

- **Signals of Opportunity**
  - PNT measurements derived from 3rd party signals with Ad-hoc monitoring to support PNT service

- **Fused PNT with Satcom**
  - PNT measurements derived from satcom signals, tailored for PNT

- **Purpose-built LEO-PNT**
  - PNT measurements derived from PNT signals
    - Dedicated constellation
    - Hosted payload

**LEO-PNT fully complementary & boosting Galileo**
THANK YOU

http://ec.europa.eu/galileo