

G-RESCUE

Key facts

Full name

Galileo-Enhanced Emergency Beacons for Next-Generation Search and Rescue

Project call number

EUSPA/GRANT/04/2024

Project call

406MHz Emergency Distress Beacons with Extended Galileo Return Link Features

EU contribution

€ 749,749.00

Market segment

Transversal – Search and Rescue

Project start/end

01/09/2025 – 31/08/2027

Context and motivation

Cospas-Sarsat 406 MHz distress beacons have provided reliable alerting for decades, but they remain one-way devices: they cannot confirm receipt of a signal, relay instructions from rescue authorities, or be triggered if the person in danger is incapacitated. This leads to delayed rescue decisions, unnecessary deployments and added stress for those in distress. Galileo's Return Link Service and emerging authentication capabilities (OSNMA, HAS) offer a European infrastructure still untapped by beacon manufacturers, most of whom rely on proprietary, subscription-based satellite links outside the Cospas-Sarsat framework. This makes bringing Galileo-enabled, interactive functionality into next-generation European beacons both a clear opportunity and a strategic need.

Scope

The aim of the G-RESCUE Consortium is to design, prototype and validate an interoperable family of next-generation 406 MHz distress beacons — ELT-S (aviation), EPIRB (maritime) and PLB (land) — built on a shared modular architecture. Two core innovations are introduced across all three classes: Two-way Communication (TwC), for confirmation and instructional messaging with rescue authorities, and Remote Beacon Activation (RBA), allowing authorised operators to trigger a beacon when the user cannot. Starting at TRL 3–4, the project targets a TRL 6–7 platform validated in real SAR scenarios, ready for certification and market uptake.

Targeted GNSS innovation

G-RESCUE's GNSS Core is a dual-frequency, multi-constellation receiver with native Galileo support, OSNMA-capable and designed with a clear evolution path toward Galileo HAS.



Targeted Product

Next-generation Cospas-Sarsat beacons — ELT-S for aviation, EPIRB for maritime and PLB for land and civil-protection use.



Challenge & technical solution

Current 406 MHz beacons offer no return channel and no remote-trigger capability, leaving rescue authorities blind to the status of a distress event and unable to act when the user is unresponsive. G-RESCUE addresses this by integrating the Galileo Return Link Service into the beacon architecture for secure, low-latency two-way messaging, combined with a Remote Beacon Activation module protected by command authentication and fail-safe logic. Both functions run on a common platform with a dual-frequency, OSNMA-ready GNSS engine and a Bluetooth-connected, glove-compatible user interface, adaptable across aviation, maritime and land domains while meeting each sector's certification standards.