

Currently monitoring of railway signalling assets is based on on-demand or programmed human maintenance activities, wired solutions or active surveying using custom trains.

Each of these solutions has drawbacks. Human maintenance activities are highly demanding in terms of direct personnel costs and operational constraints. Wired solutions are very expensive, the cables used need maintenance by themselves and limited bandwidth restricts what data can be monitored. Diagnostic trains require heavy investments and run at lower speed than commercial trains, implying temporary performance limitations on the assessed lines. Diagnostic trains are technologically complex, requiring their own maintenance and very experienced personnel to operate them.

The RADIUS approach

RADIUS proposes to use Unmanned Aerial Systems (UAS) to execute a large part of the inspections and a limited range of maintenance activities like tuning, re-calibration, activation of special functions, etc.

The objective of RADIUS is to develop a UAS-based technology to monitor the physical status and electronic functionality of both non-safety-critical and safety-critical railway signalling assets and to execute specific maintenance activities to pave the road to efficient and reliable unmanned activities.



The RADIUS automation allows increased inspection frequency and constitutes a true new paradigm for railway inspection and maintenance limiting activities carried out by human teams and improving the global railway operational service in terms of availability, reliability and performance.



To get more information about the project RADIUS, please contact us at:

<https://projectradius.info>

info@projectradius.info

Follow us:  



Railway digitalisation using drones



This project has received funding from the European Union Agency for the Space Programme under the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004192.

Welcome to the future of railway signalling asset monitoring and maintenance using drones

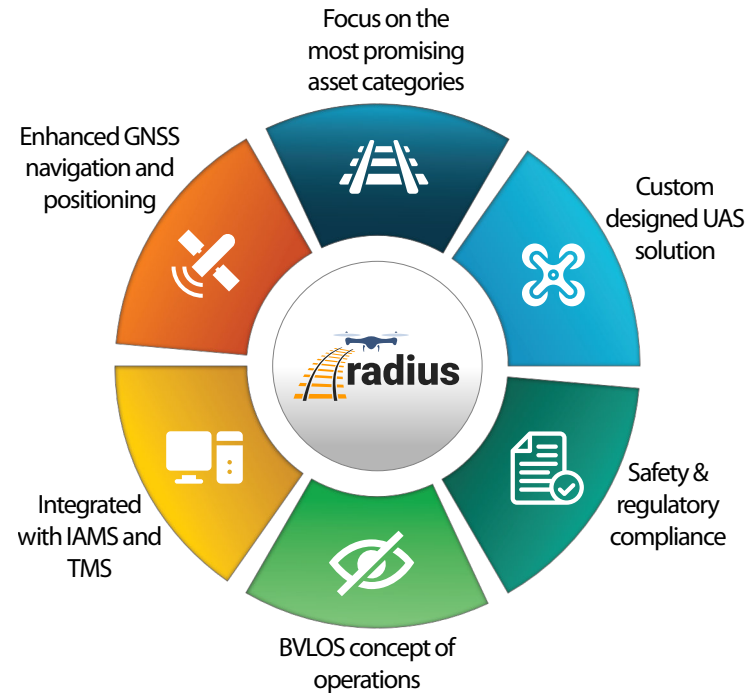
Project Scope

Design and develop the UAS solution

- Identify the UAS technologies to be used in the railway sector considering the signalling assets to be monitored, the characteristics of the lines, the distances to be covered and the maintenance actions planned
- Design and integrate the payload (sensors), wireless technology to connect the UAS with the signalling assets and the data and command links between the UAS and the remote pilot station
- Develop solutions based on EGNSS to improve navigation and positioning such as EGNOS (SBAS) and GALILEO
- Data transmission solutions to guarantee efficient, reliable and secure data exchange between drones and ground control infrastructure

Railway asset adaptation/redesign

- Focus on elements most affected by low Mean Time between failure (MTBF) or highest frequencies of maintenance, tuning, or re-calibration actions
- Design of a docking station capable to host the UA during maintenance actions and to charge its batteries



Interfaces with IAMS and TMS

- Interaction with existing Intelligent Asset Management Systems (IAMS) to guarantee a seamless integration of RADIUS in the current railway maintenance operations and to optimise the processing power of the RADIUS system taking advantage of the processing power of IAMS
- Interaction with current Traffic Management Systems (TMS) to improve the safe movements of drones within the railway and reduce, or possibly eliminate the need for railway track possession

Mission planning, safety and regulatory compliance

- Definition of a Beyond Visual Line of Sight (BVLOS) concept of operations (ConOps)
- Ensure the compliance with all aviation and railway regulations as well as with the complexity and peculiarities of the railway environment

System demonstration

RADIUS will include a practical demonstration of the solution developed into a prototype in a railway relevant environment, achieving a TRL 6.

Project Consortium

HITACHI
Inspire the Next

aeorum
EMERGING TECHNOLOGIES

EVOLEO
TECHNOLOGIES

EUROUSC
ESPAÑA

Infraestruturas
de Portugal

EUROUSC
ITALIA

ARTIFICIAL INTELLIGENCE & DATA ANALYTICS
[ZenaByte]