

PORTAL is a European Defence Agency (EDA) research and technology project focused on advancing radar-based ISTAR capabilities through an integrated, multi-platform and polarimetric approach. The project develops a system-of-systems concept combining a system of three drone-borne SAR sensors with complementary airborne SAR and ground-based ISAR assets. By exploiting full polarimetry, multi-channel processing and cooperative sensing, PORTAL aims to improve target detectability and discrimination in challenging maritime and land environments, where sea clutter, heterogeneous terrain and complex traffic can severely degrade conventional solutions. The technical work spans scenario and user-needs definition, the review and development of state-of-the-art algorithms for polarimetric clutter mitigation, adaptive processing and detection, and the extraction of robust features for non-cooperative target recognition. These algorithmic building blocks will be integrated into demonstrators and validated through dedicated trial campaigns in representative coastal and ground scenarios, producing radar products and performance evidence relevant for defence end users. Ultimately, PORTAL targets a scalable and upgradeable radar capability that supports persistent surveillance, rapid cueing of high-resolution imaging sensors, and improved situational awareness for European maritime security, border/perimeter surveillance and protection of critical infrastructure.

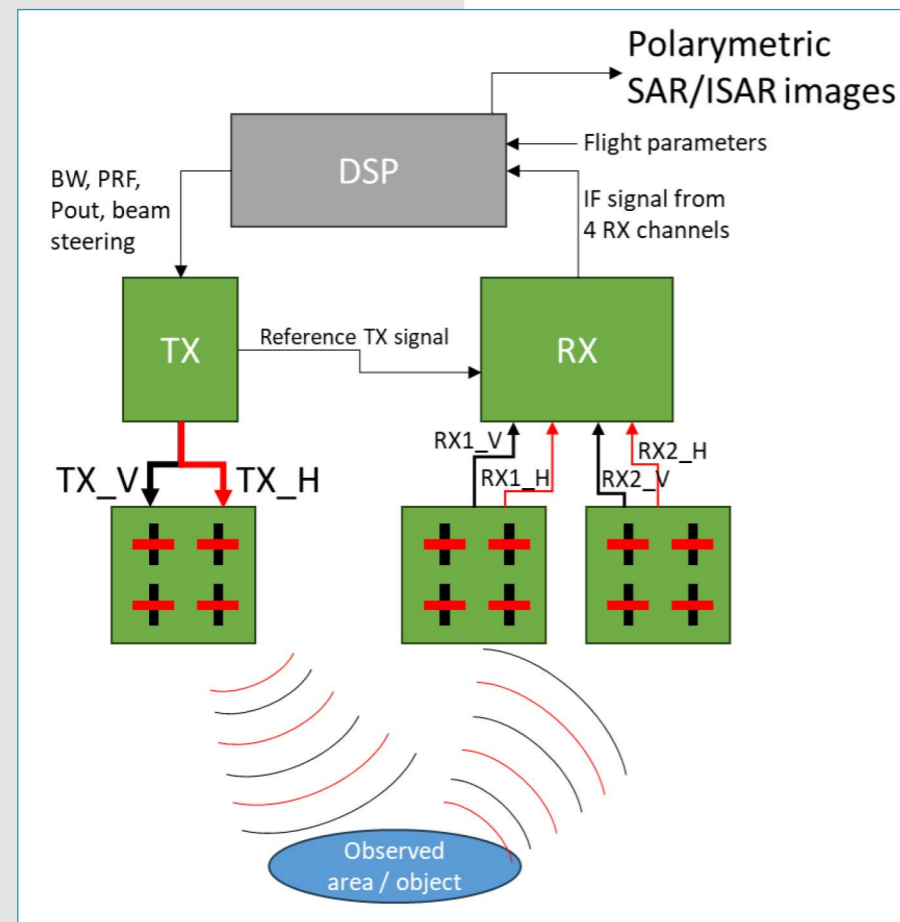
Keywords: Radar-based ISTAR, Drone-borne SAR, Polarimetric radar, Synthetic Aperture Radar (SAR), Inverse Synthetic Aperture Radar (ISAR).



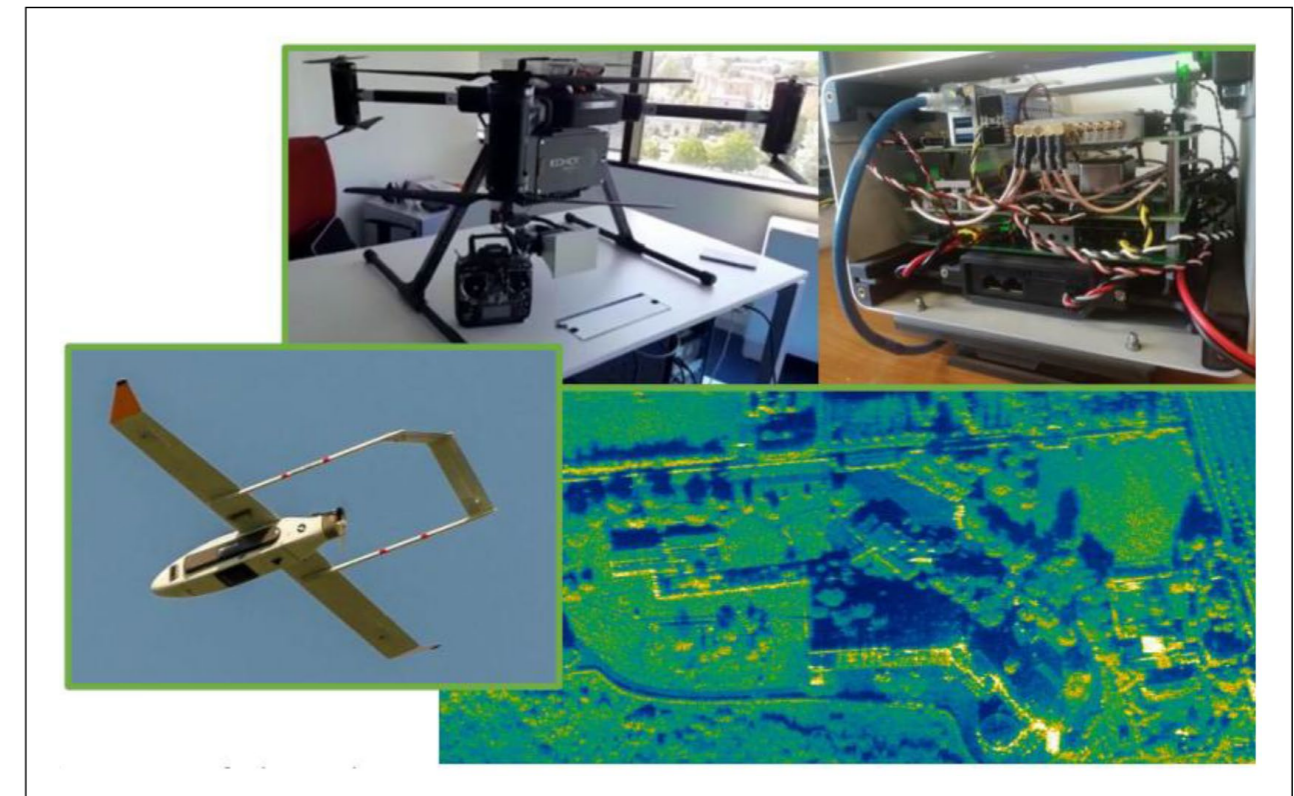
Technical Sheet	
<b>Funding institution:</b>	EDA
<b>Project partners</b>	ELDES s.r.l., Warsaw University of Technology (WUT), ECHOES Technologies s.r.l., XY Sensing, SpaceForest, WB Electronics, ITWL Air Force Institute of Technology
<b>Project duration</b>	September 2025 - ongoing
<b>Involved countries</b>	Italy, Poland



(b) Radar on swarm of drones setup



(a) Rx-Tx for polarimetric system



(c) Airborne SAR imaging from drones (courtesy of Echoes s.r.l.).