

SAFER AIRSPACE FOR ALL

COMPANY PROFILE

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A WORD FROM THE CEO

The rapid evolution of aviation creates a challenging environment. Current state-of-the-art technologies open doors to new opportunities, and yet the regulations often fall behind. Nevertheless, we at R-SYS, do our best to respond flexibly to all specific requirements of our customers by developing customizable solutions that meet both the customer needs and the latest safety and regulatory standards.

Moreover, we are closely following the fast-paced evolution of UTM services, and the need for safe integration of manned and unmanned aerial operations. This would not be possible without reliable and secure information exchange between the stakeholders.

Thanks to the expertise of our employees, and our more than 20-year experience in a development and production of air traffic control systems, we are able to meet demands of our customers and deliver solutions significantly contributing to the safe and secure airspace for all.

Ing. Marek Náhlik
CEO R-SYS, s.r.o



COMPANY PROFILE

History and ownership

1997

R-SYS, s.r.o. (Ltd.) was founded by a group of experts involved in Command & Control systems and radar technology.

2007



The General Assembly of the company made the decision to change the company branding, corporate structure, and business strategy to follow new trends and flexibly respond to market requirements by delivering competitive software & hardware solutions, and system integration services.

2016



R-SYS, s.r.o. was acquired by ERA a.s., Czech Republic, making ERA a majority owner of R-SYS. By entering the strategic alliance with ERA, R-SYS refocused its business primarily on the development of SW solutions as a support of ERA product portfolio, and other in-house innovations for the customers worldwide.

2023

Today, R-SYS represents a middle-sized project-oriented IT company employing 50 highly skilled IT engineers and ATC/ATM specialists. The company is organized as a distributed team spreading across multiple locations in Slovak Republic.



A full member of Global UTM Association since 2017



A full member of EUROCAE since 2022

Our mission

Our company is committed to the development of innovative software solutions aimed at mission-critical applications and real-time systems of dual use. Our production covers a broad spectrum of SW solutions that can be delivered as on-site solutions together with the installation of a related infrastructure, or as cloud-based service (up to SaaS level). Our solutions include web applications, applications for mobile devices, and native applications designed for fast and reliable data presentation. Moreover, we deal with signal processing, and map data preparation technologies and services.

Our global reach



Our production is certified to the Quality Management System of EN ISO 9001 and Environmental Management System of EN ISO 14001 (since 2013), and Information Security Management System of EN ISO 27001 (since 2022).

We use a unified methodology covering all standard SW development processes in compliance with ISO/IEC 12207, and apply SW safety assurance standard ED-109A and ED-153.

All these standards together are basic pillars of security environment in which our products are designed, built, deployed and maintained.

R-SYS, s.r.o. holds the prestigious AAA Rating Certificate awarded by Dun & Bradstreet, ranking the company among the top 0.09% most credible economic operators of Slovakia.



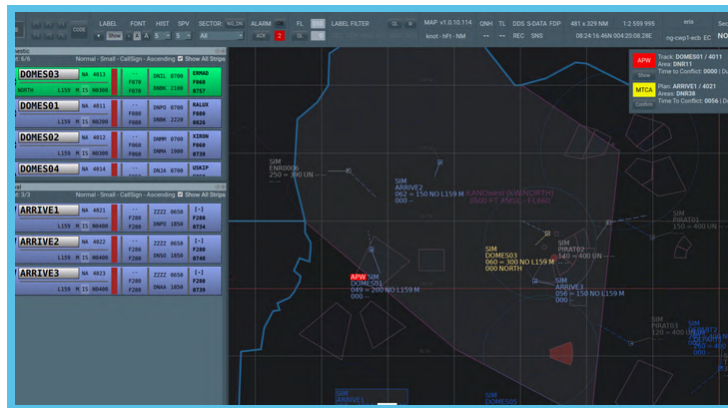
PRODUCT PORTFOLIO

Information systems for safe flight management

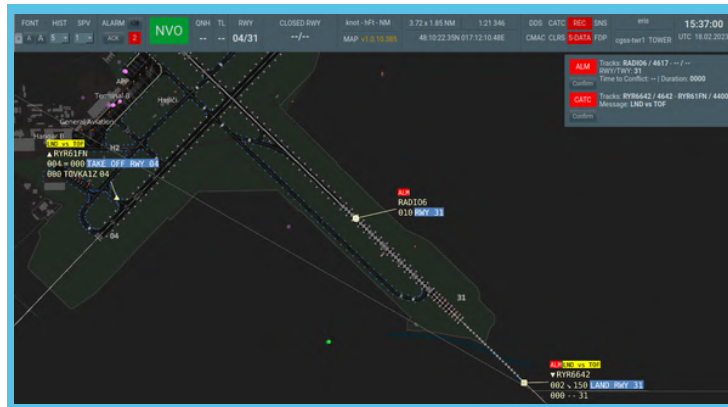
Our effort is mainly spent on the development of software products for our parent company, ERA a.s., including, but not limited to, delivering applications for data processing of passive surveillance systems in real time and data visualization, determination of measurement accuracy of data provided by surveillance systems (MLAT WAM, LAN, PCL, etc.) and planning of sensor deployment, simulation of passive sensor operation as well as applications for ATC/ATM systems. Our key products are intended for the safe management of flights.

ATC/ATM

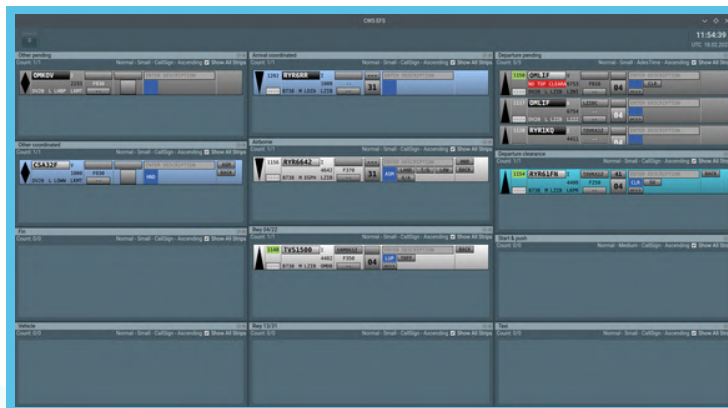
ERIS
APP/ACC ATC SYSTEM



ERIS - A
ASMGCs



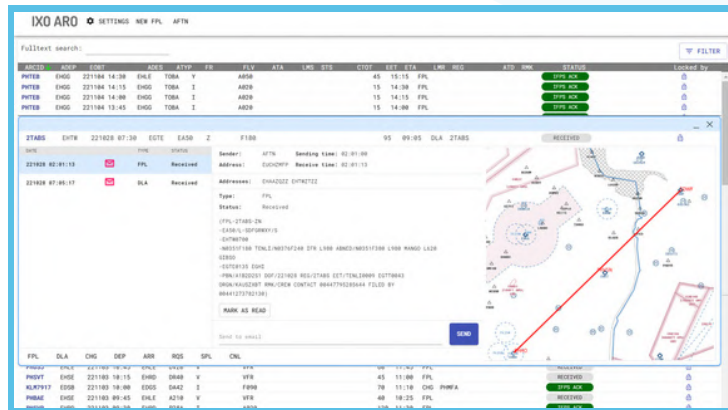
ERIS - A
EFS



ATM/UTM

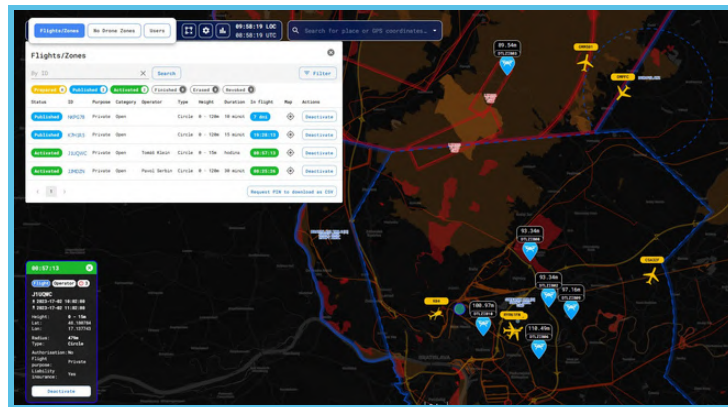
IXO SYSTEM

IXO ATM



IXO SYSTEM

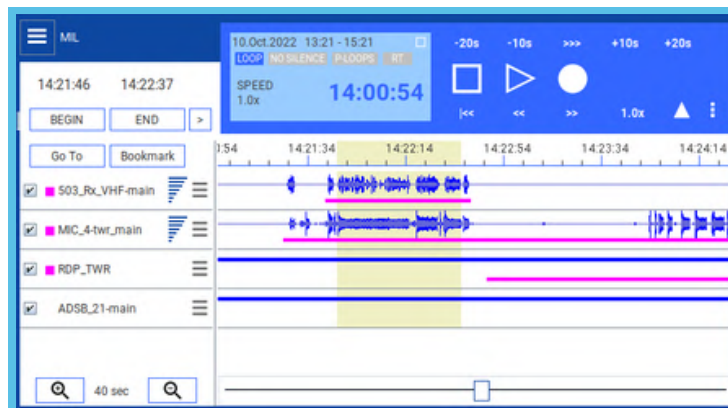
IXO UTM



RECORDING AND REPLAY

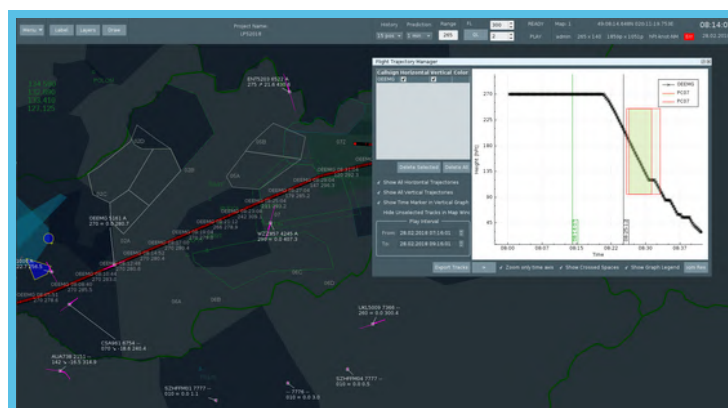
3R SYSTEM

Recording Replay and Investigation System



3R SYSTEM

Investigator Radar Data Display



IXO SYSTEM

Manned and unmanned air traffic management

IXO SYSTEM is an information system and a platform for gathering, processing and distributing aeronautical data received from a variety of data sources. It is developed in close collaboration with aviation authorities, ANSP experts, and domain specialists.

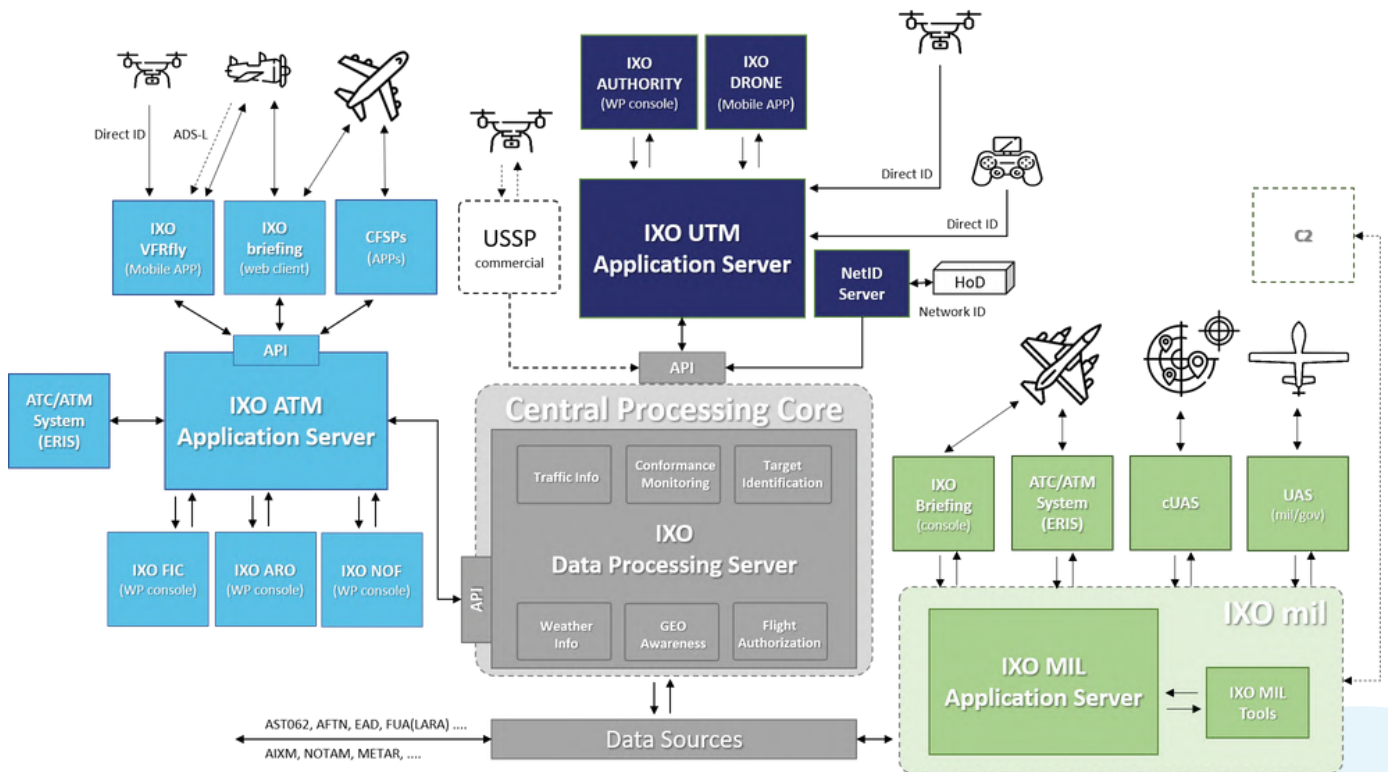
IXO consists of multiple web and mobile applications that allow working with specific data in a customizable environment. Our applications allow pilots and ANSP personnel to manage flights and carry out pre-flight briefings according to ICAO standards and regulations.

Moreover, IXO being the backbone of UTM systems, offers CIS and USSP solutions that allow the UAS operators to plan, authorize and perform flights in compliance with the latest EASA and EUROCONTROL Rules on Unmanned Aircraft Systems.

IXO can be delivered both on premises and as a cloud-based system, either as a client-operated or an SaaS solution in accordance with the latest IT standards.



IXO Integrated ATM/UTM System



IXO ATM

Advanced integrated ATM solution

IXO ATM is a web-based application designed for both ANSP operators and Commercial and General Aviation that facilitates overall flight plan management and comprehensive pre-flight planning via state-of-the-art technologies.

This product, designed for manned aviation, has been successfully deployed and is currently being operated by several European ANSPs, including HungaroControl, PANSO, LVNL, Albcontrol, and LPS SR. To comply not only with global, but local regulations, all IXO ATM modules are customized after deployment at each of our clients individually.



IXO PILOT

The IXO Pilot application offers interactive flight planning and pre-flight briefing based on valid ANSP and EAD data. IXO Pilot is paperless and accessible from anywhere. Its ability to manage flight plans, and create detailed Pre-flight Information Bulletins in real time provides a significant added value to all its users.

Main Features

- Interactive flight planning and pre-flight briefing based on valid ANSPs and EAD data
- Submission of FPL proposals and FPL-related messages, and their instantaneous updates via dedicated modules
- Alerts on potential conflicts of the flight route with terrain, obstacles, static (TRA, TSA, etc.) and dynamic (FUA/LARA) airspace in the flight planning phase
- Information on current weather conditions (METAR, satellite and radar images), weather forecast (TAF) and significant weather (SIGMET, lightning, etc.)
- 2D/3D route visualization

IXO ARO

The IXO ARO application is designed specifically for ATS Reporting Office (ARO/CARO) to enable flight plans management in relation with the IXO SYSTEM and its interfaces, and to provide all information and data required for seamless ANSP operations. IXO ARO is fully compliant with ICAO DOC-4444 (PANS - ATM), ICAO Annex 15 (Aeronautical Information Services), ICAO Annex 3 (Meteorological Service for International Air Navigation), and EUROCONTROL IFPS User Manual, and was developed in close cooperation with several European ANSPs.

Main Features

- Flight plan management
- Access to NOTAM database and other EAD data
- Weather information visualization
- Aeronautical data display
- Interfaces to other AIM tools (e.g. EUROCONTROL Network Manager, AIMSL)
- Interfaces to CFSP flight planning tools
- Compliance with the highest cybersecurity requirements according to industry standards

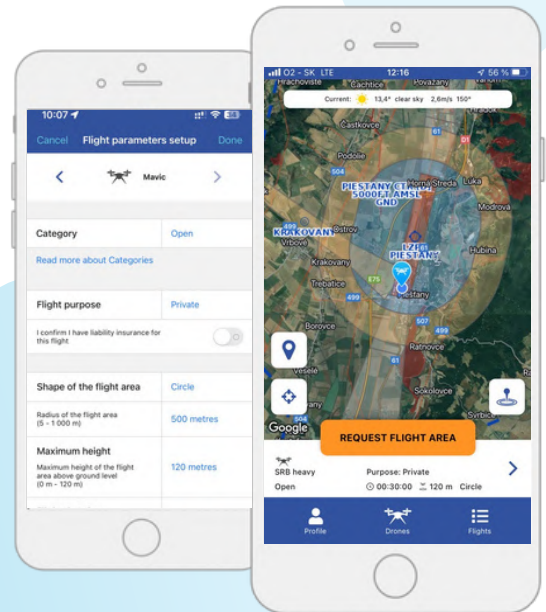
IXO UTM

Unmanned Traffic Management and U-Space

Our most recently deployed solution, IXO UTM, built upon the IXO ATM core, is designed for unmanned aircraft operations management. This tool, as a powerful platform for all UTM stakeholders, integrates all information on manned and unmanned aircraft operations, and provides real-time aeronautical data for all airspace users in a common digital environment.

Albeit complex and fully automated tool, IXO UTM with its simple and intuitive user interface decreases the users' workload thus greatly contributing to overall airspace safety. The original IXO UTM tool was developed as an initiative of HungaroControl, and put into operation in January 2020. Since then, this product underwent further extensive in-house development, and its latest version covers the latest CIS and USSP solution requirements to full extent.

IXO UTM complies with the latest regulations on UAS flight planning, airspace conflict calculation, UAS flight validation and authorization processing, unmanned aircraft management, and aeronautical data provision in compliance with ICAO, EASA and EUROCONTROL standards. Moreover, the IXO UTM system provides U-Space services up to level U2, and shall the national UTM legislation and infrastructure permit, these services can be upgraded up to level U4.



IXO CONSOLE

The IXO Console module, designed for ANSPs, aviation authorities, state institutions, municipalities, and airport operators, allows to manage all UAS operations with a high level of automation thus creating a safe environment for both manned and unmanned traffic and a solid foundation for urban air mobility development.

Main Features

- Management of all levels of UAS operations
- Manned and unmanned traffic information and separation
- Conformance monitoring service
- Remote Network ID and Direct ID service
- UAS flight authorization service
- Geo-awareness
- Information on meteorological conditions
- Statistical analysis of operational usage data and generation of reports

IXO APP

IXO APP is a mobile application developed for iOS and Android devices intended for drone pilots and UAS operators to facilitate their flight planning.

Main Features

- Real-time flight monitoring
- Fully automated flight authorization and management
- Mid-air collision prevention and calculations of potential conflicts
- Display of other UAS traffic equipped by Direct ID technology
- Easy-to-use interface

IXO CORE

The core of IXO System is a virtual platform that provides services covering all requirements of the SWIM-based modular CIS/FIMS platforms, and serves as a digitally centralized single point of truth for all users.

Main Features

- Real-time flight management and traffic data sharing between ATM and UTM stakeholders
- Cross-platform, multi-source data interface (SDO, SDD, AFTN, FUA, AIMSL, NMB2B, XTAM linkage, MET etc.)
- Common situational awareness – data for cross-authority and -agency collaborative decision making
- Safety Nets – airspace authorization, deconfliction and conflict management
- API for provision of valid real-time data for all users (USSPs, C-UAS C2 systems, Security Systems, etc.)
- Central airspace management

3R SYSTEM

Voice-Video-Data Recording & Replay System

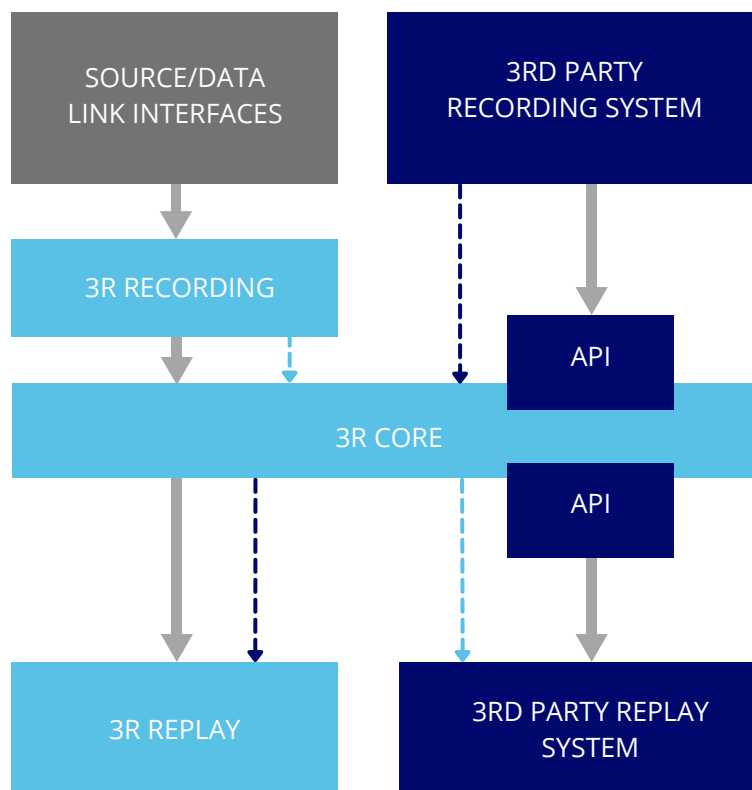
The 3R System provides a high level of modularity, which allows us to deliver to our customers a variety of 3R configurations according to their requirements for performance, and operational and safety parameters of the proposed solution. The 3R SW is built on Service-Oriented Architecture (SOA) integrating distributed, separately maintained, and deployed software components, thus allowing 3R processes and applications to run on one or multiple devices connected to one network as required.

Key capabilities

- 365/24/7 operation
- Retention period of at least 30 days
- Multi-source/multi-channel design
- Secure communication within 3R environment
- ATC/ATM-specific Monitoring and Diagnostics (status, notification, alert) and SNMP support
- Incident Management tools
- User Management
- Centralized System Configuration
- Centralized Monitoring and Log System

Benefits

- Shorter time of investigation files sharing across the team
- Based on COTS HW components
- Easy export of given sequence
- Independent Data Display for surveillance data
- Selectable channels for on-line monitoring



MODULAR and OPEN architecture

Modular Design

3R modules

- 3R Recorder – Audio/Video/VoIP/Data – Recording Module
- CSS and CS – Central Storage and Central Server
- CMS – Monitoring & Diagnostics and System Configuration Module
- 3R Player – Replay and Investigation Module
- 3R RDD – Radar Data Replay and Investigation Module
- New module DART – Data Analysis and Replay Tool provides an interactive and advanced multi-level surveillance data analysis, from packets to decoded ASTERIX message inspector, to trajectories.

3R modules can be operated on one computer, one or more servers, and one or multiple workstations, and configured in compliance with required performance, operational, and safety specifications.

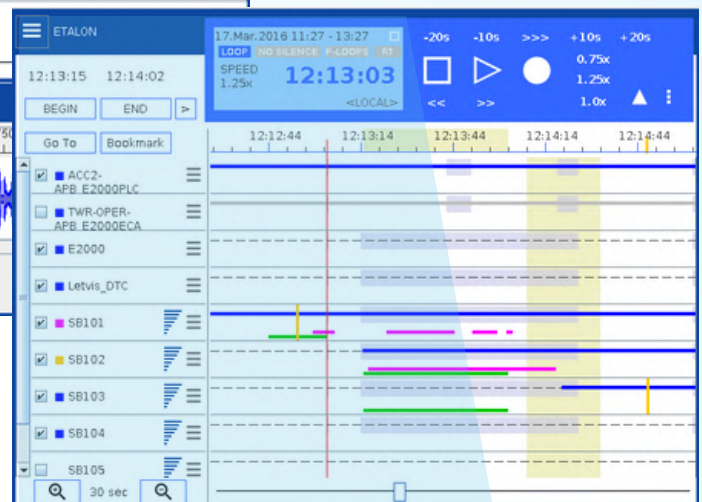
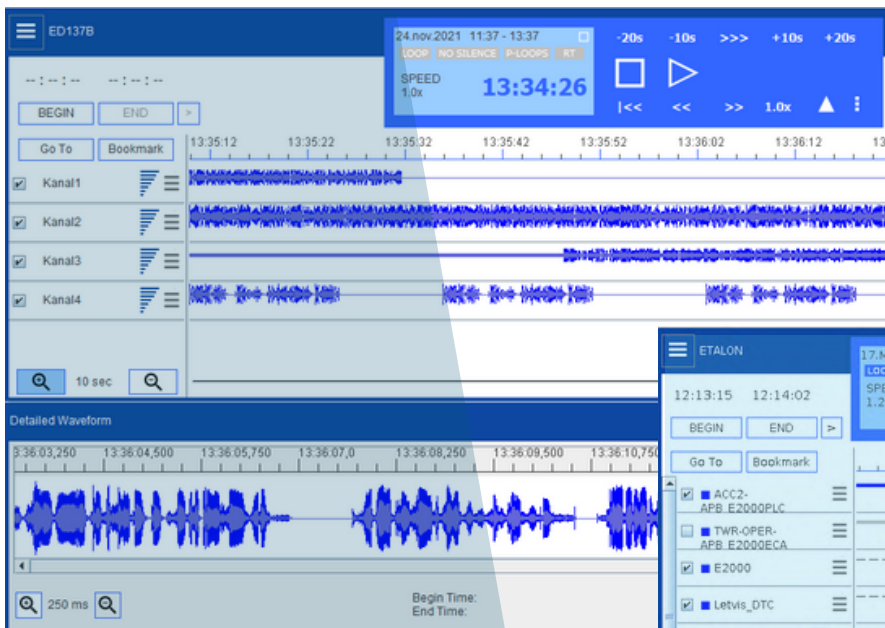


3R system modules can run as:

- Autonomous recording and replay system integrated into a third party' system
- System fully integrated within the monitored system environment (e.g. software video grabbing)
- System modules integrated into third party' recording and replay environment via API

3R modules can be deployed as:

- A stand-alone computer
- One or more servers, and one or multiple workstations
- Configured to required performance, operational, and safety specifications



ERIS-A

A-SMGCS SYSTEM

ERIS-A belongs to a family of advanced airport surveillance data processing and display systems designed for air traffic control and flight planning operations in a TMA and an airport, and is developed in compliance with ICAO 9830-AN/452 and EUROCAE ED -87, -153.

Key capabilities

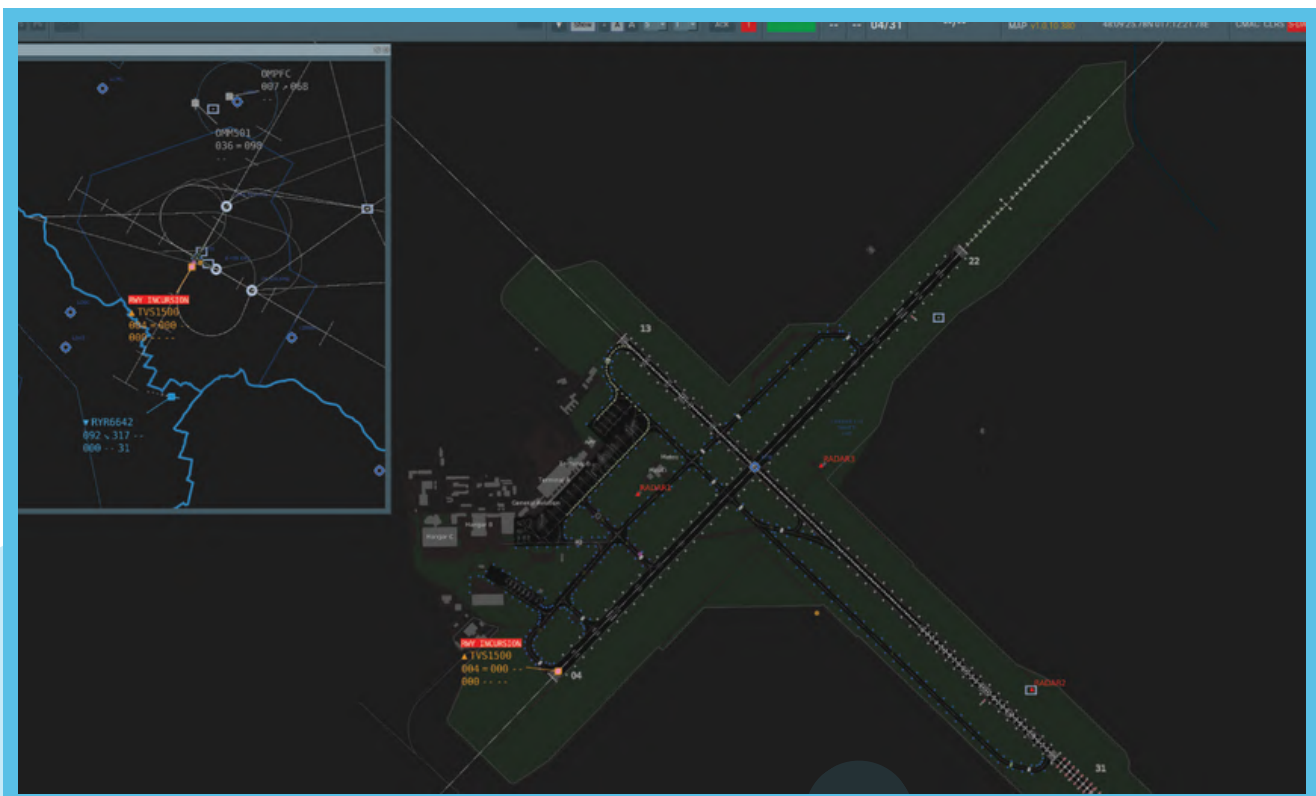
- Open and modular architecture
- Surveillance Data Fusion from various data sources (ADS-B, MLAT, SMR, TAR)
- Provision of Surveillance Monitoring Service and Airport Safety Support Service (RMCA, CATC, CMAC)
- Integrated Electronic Flight Progress Strip (EFS) module for a control and presentation of flight progress
- Comprehensive supervision and monitoring system
- Continuous operational data recording, archiving and replay system
- Configurable HMI at ATCO working positions
- Supporting data for airside security awareness and Airport Management
- Airport Map Layout Editor as a part of delivery

Key components

The Controller Working Position (Collaborative Workstation, CWS)

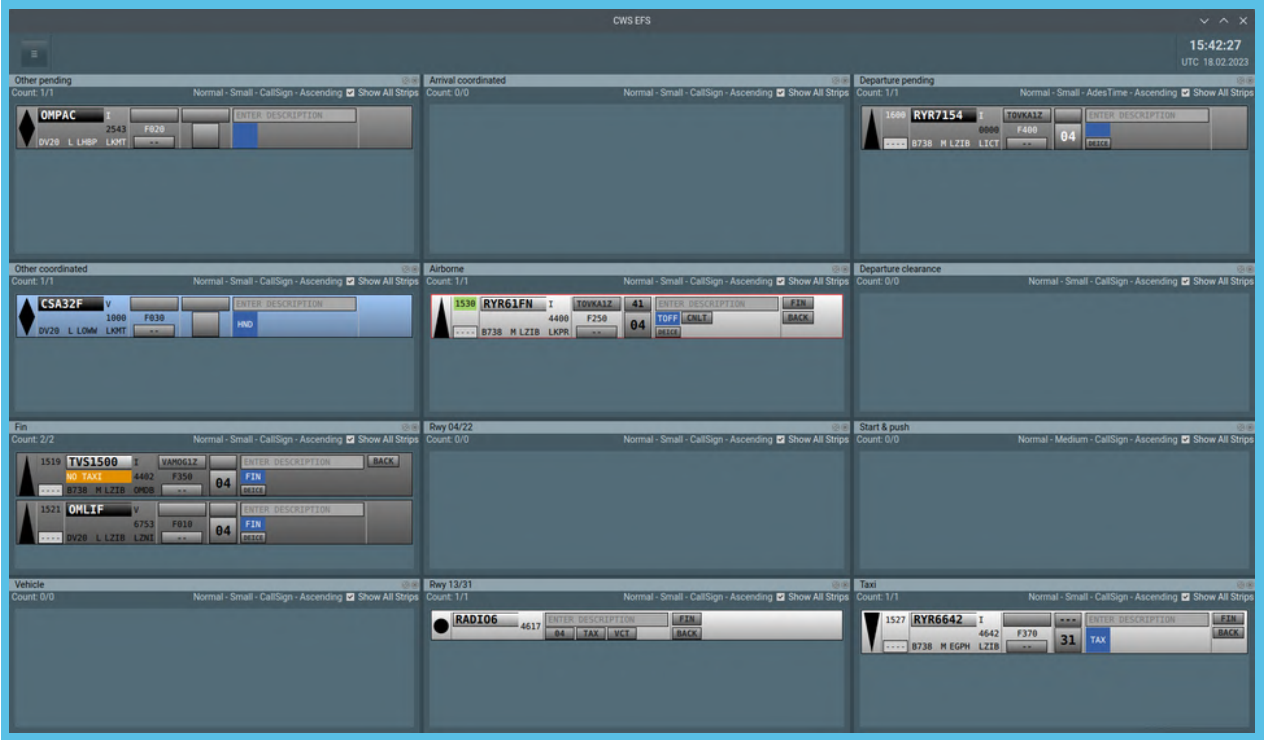
CWS application can run in a single- or dual-monitor configuration while providing the same functions. In a dual-monitor configuration, the main screen is used to display surveillance and SafetyNet information while providing the controller with a clear picture of movements on approach and on the airport surface and the second screen serves for a display of EFS assisting users in managing traffic workflows safely and efficiently on the ground and on approach.

In a single-monitor configuration, both the surveillance functions and EFS system are manipulated via one screen whereby specific groups of strips are managed through windows laying on top of the main primary CWS window.



EFS module provides the user with a set of customized predictive clearances to be issued with respect to operational and safety aspects, local rules, and applied to a specific phase/type of flight or flight operation.

User profile management provides access control based on rules specified by the user. Map view profile management allows to apply user-specific settings to create customized configurations of map content which the user needs when accomplishing his specific tasks.



Safety Net Service

RMCA, CATC and CMAC are an integral part of Airport Safety Nets contributing to a safety of airside operation through a prevention of hazardous situations and/or accidents resulting from operational errors or deviations of a controller, flight crew or vehicle driver. Calculation of conflict events is performed by a centralized service ensuring that identical conflicts and alerts are presented on all CWS screens. Conflicts/alerts are distributed to CWS workstations by ASTERIX Cat. 04 protocol.

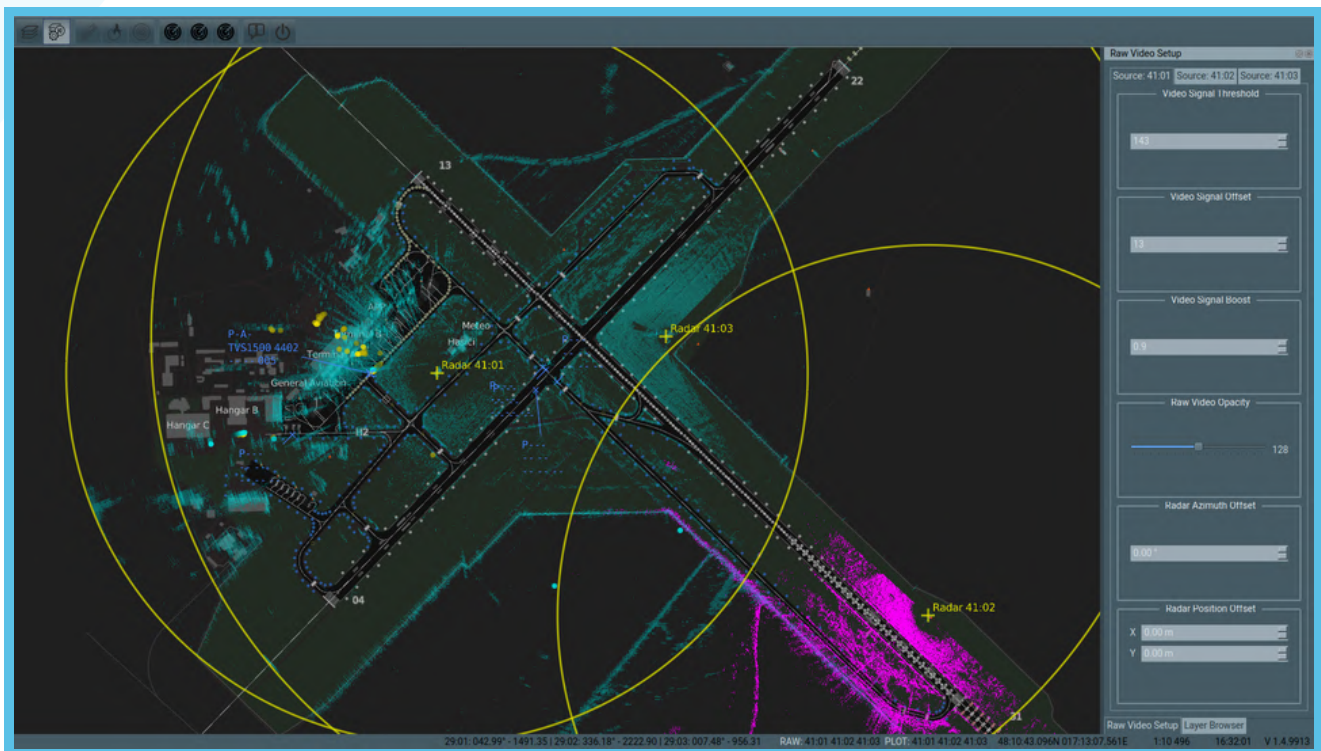


Surveillance Subsystem

Surveillance subsystem is an integral part of ERIS-A solution. ERIS can be integrated with standard SMR radar via ASTERIX CAT 10 output, however R-SYS introduced an optional cost-effective solution in accordance with upcoming A-SMGCS Light concept which is designed for middle-sized and regional airports. This solution uses reasonably priced EHF radar combined with ERA ADS-B or MLAT system for a detection of non-cooperative targets.

EHF is a short-range radar providing high-precision measurement of a target position. It can be used as a principal source of non-cooperative target data or as a gap filler radar ensuring a coverage of blind zones. EHF radars are sources of sufficient data needed for a calculation of potential collisions caused by runway incursion.

EHF radar frequency range	FMCW - 76-77.5 GHz
Scalable detection range	Scalable range 800-3000 m Vehicle detection up to 2000 m Human detection up to 900 m
Resolution	25cm
Radar pattern	Azimuth 1°, Elevation 3°
Data update	360° up to 1 sec
Consumption	18 W
Weight	17 Kg



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