

ON YOUR RADAR

Executive Summary

Intersoft Electronics is a global player in the aviation and defense markets. As an established provider of specialized test equipment, services and radar technologies, it's our mission to make the sky safer, together with our valued customers and partners.

Four decades of analyzing and measuring radar and navaid systems resulted in a broad portfolio of products and services for ANSPs, airports, manufacturers, MROs, MoDs/DoDs, Air Forces and Navies. Innovation is at the core of our business, driven by the changing airspace environment, rapidly advancing technologies and the instable geopolitical situation. Those factors force radar manufacturers, ANSPs and the military to rethink the way they design, maintain and operate air surveillance systems. Test equipment such as our RES® and SkyRF®, our ASR-M® modular radar products, and our Non-Rotating Antenna systems offer profitable solutions.

Profitability and sustainability are the drivers of our design and engineering teams. Our customers should be able to perform an excellent job in a competitive way, while reducing the environmental footprint of their activities. The SkyRF® CNS drone for instance, allows to reduce test flights – and the related carbon emissions – by 50%.

In this publication, we introduce our portfolio highlights, the core activities and some corporate facts and figures. Enjoy it and get in touch with us if you too want to make the sky safer.



Luc Switten,
CEO Intersoft Electronics Group

PORTFOLIO HIGHLIGHTS

- ASR-M® Modular ASR & NGSP® Next Generation System Platform
- NORA® Non-Rotating Array antenna systems
- L-IESA® Non-Rotating IFF antenna systems for Naval Applications
- RASS® Measurement Equipment
- SkyRF® CNS Drone


NORA®
NGSP®
INTERSOFT
FSU
FREQUENCY SYNTHESIZER UNIT
INTERSOFT
SCU
SYSTEM CONTROL UNIT
INTERSOFT
ISP
IF SIGNAL PROCESSOR
INTERSOFT
RDPS
RADAR DATA PROCESSING SERVER
L-IESA®
ASR-M®
SkyRF®
RES®
INTERSOFT
RES
RADAR ENVIRONMENT SIMULATOR
RASS®



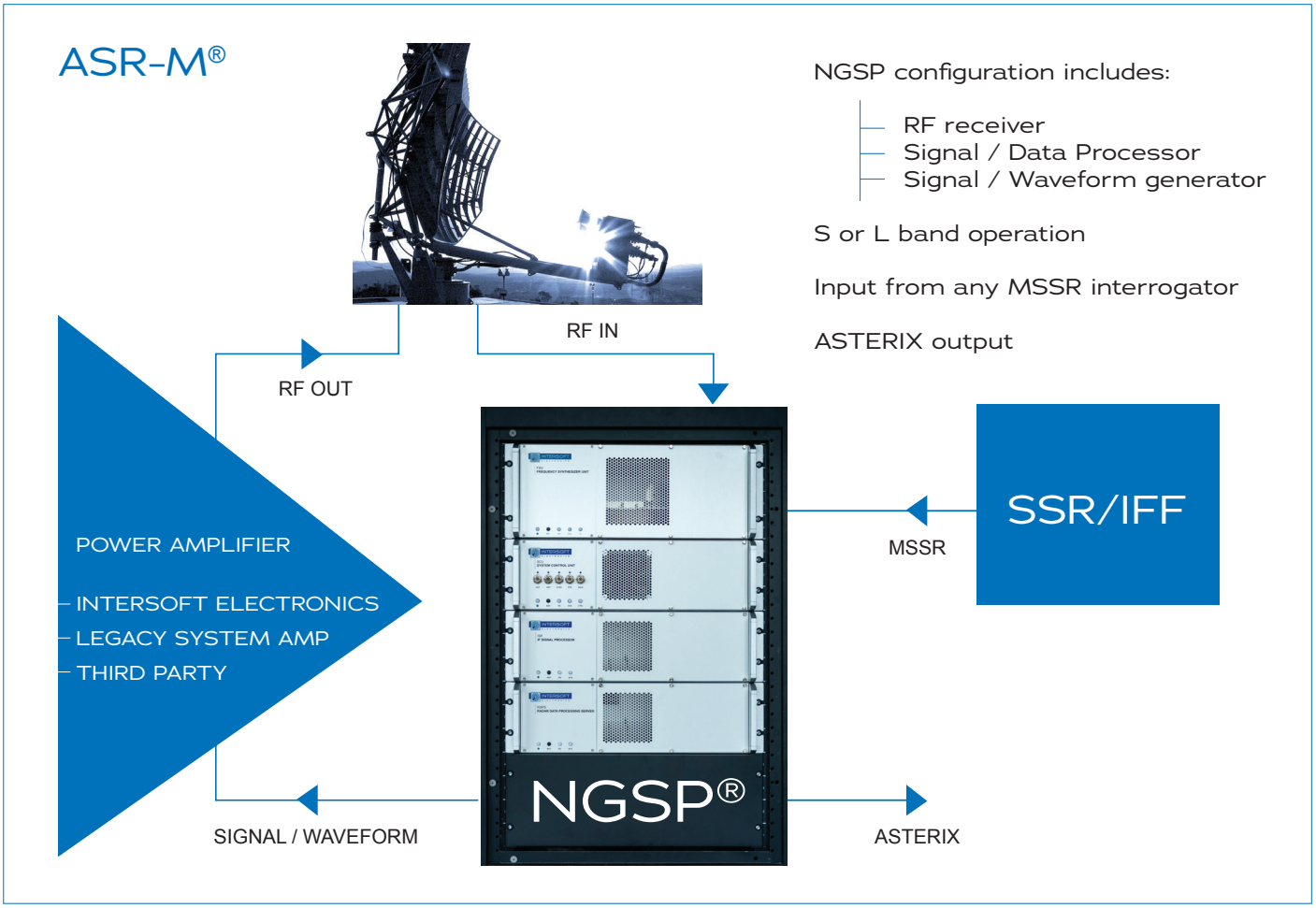
ASR-M®

A modular ASR design for infinite system lifetime

Replacing legacy radar electronics with new monolith systems doesn't work any longer in a world with rapidly changing technologies. Technological advances in radar design are driven by new challenges in Airspace environments. Windfarms and interference from 4G/5G mobile phone base stations are emerging issues that require smart signal processing algorithms to mitigate them.

While new technologies to address those challenges become available, the airspace environment keeps on changing. Signal processing technologies must continue to evolve to properly detect aircraft with different characteristics in complex environments. It's impossible to keep an ASR system up to date with the required advancing technologies by applying full system replacement programs every 20 year.

ASR-M® is a modular approach to Airport Surveillance Radar that allows manufacturers to integrate a system that is agile by design. Hardware modules can be replaced as Line Replacement Units (LRU's) and software blocks can be updated from a remote location. The modular design allows to configure and customize the hardware to the specific customer needs. ASR-M® remains state-of-the-art throughout its lifetime.



NGSP®

Next Generation System platform for Radar Upgrades & Service Life Extension

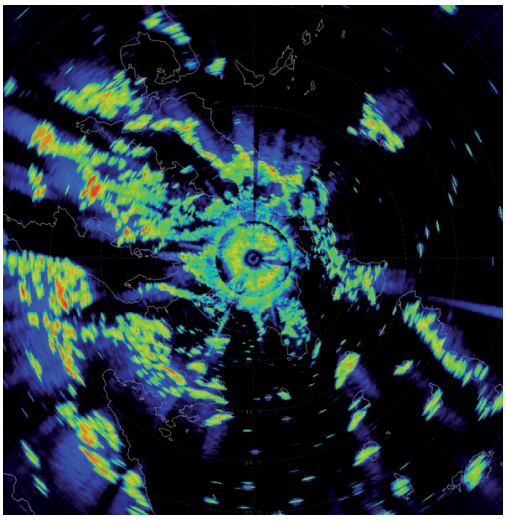
NGSP® is the system platform behind ASR-M®. It's modular in terms of hardware and in terms of software. NGSP® is also the system platform for radar upgrades and service life exensions programs.

Advanced processing algorithms

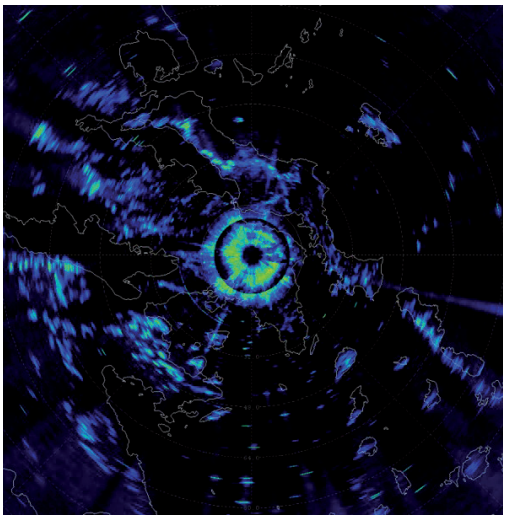
NGSP® incorporates patented algorithms that address the emerging challenges of changing environments. Ground clutter cancellation, windfarm mitigation and interference suppression are processed in an unrivalled way thanks to Intersoft Electronics' patented algorithms.

True 3D height

NGSP® also features 3D processing. Height information from PSRs increases the rejection efficiency of false targets. It provides a significant operational advantage as it is possible to report the height of targets with a malfunctioning or disabled transponder.



before Clutter Cancellation



after Clutter Cancellation



NORA®

Game changing antenna technology

Non-rotating antenna technologies have been around for some time, but mainly as the preserve of expensive military radar systems. Intersoft Electronics has developed novel non-rotating arrays, which provide some of the advanced capabilities of these military systems for the civil radar market, at a competitive cost point.

The patented Intersoft Electronics NORA® concept is based on a circular array, rather than the more common multi-faced planar (flat) arrays. This results in less beam degradation when the electronically scanned beam is pointed off the antenna boresight, maintaining near equal performance at all scan angles.

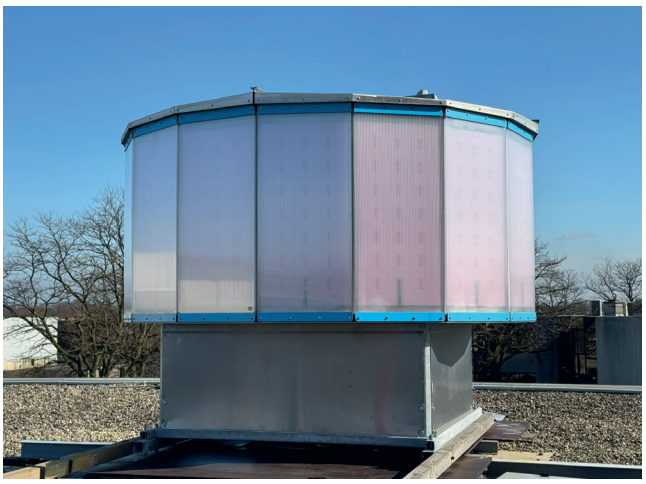
The NORA® portfolio includes non-rotating arrays for S-Band and L-Band primary radar and for L-band SSR/IFF.

NORA® - An integrated Non-Rotating Array system

NORA® is much more than just an array of antennas. Integrated with the non-rotating array is a distributed transmitter-receiver system. This integration virtually eliminates feeder losses between the normally centralized power electronics. This results in less total transmitter power being required to achieve the same performance as a conventional system.

Due to the modular construction, the arrays are scalable in diameter giving a choice in antenna aperture and total transmit power.

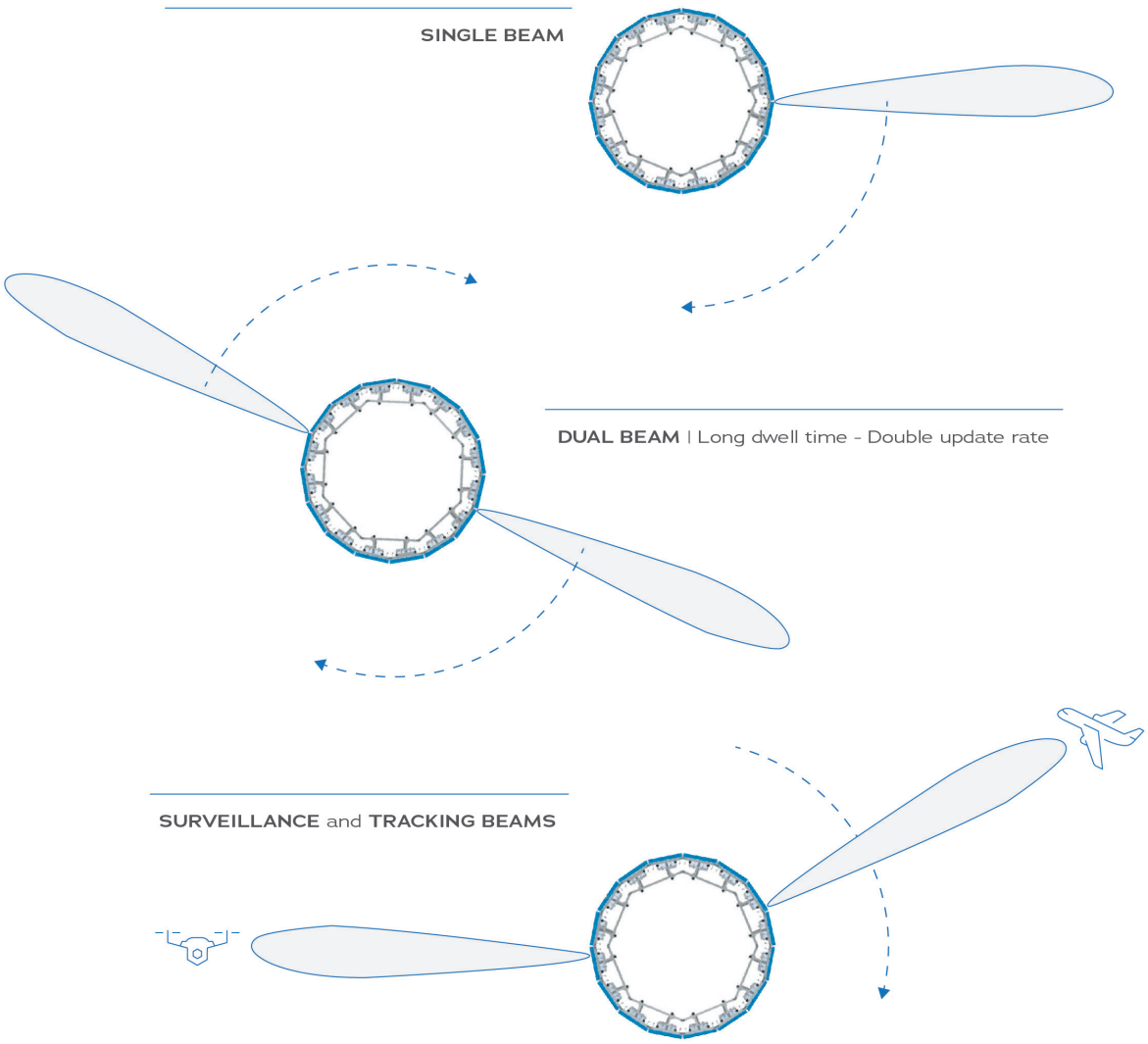
Its robust design makes NORA® extremely suitable in harsh weather conditions. As the center of the system serves as a shelter, it's very easy to maintain from the inside.



Multiple simultaneous beams

NORA® non-rotating arrays can have multiple simultaneous beams.
This allows for additional concepts of operation with specific benefits:

- Double the dwell time while maintaining the update interval for increased detection capability
- Increase the update rate with back-to-back surveillance beams
- Having a single surveillance beam and a second ‘tracking’ beam with the ability to have much more time-on-target





L-IESA®

Non-rotating IFF subsystems for naval applications

L-IESA® is the non-rotating IFF antenna system, that can be interfaced with any STANAG/AIMS certified IFF interrogator. It features unique electronic leveling capabilities that improve detection performance and volume coverage of ship-board IFF.

The circular design and the application of innovative power handling technologies allow L-IESA® to overcome long lasting challenges in antenna system design and integration. As such, L-IESA® not only brings value to the owner and operator, but also to the integrator.

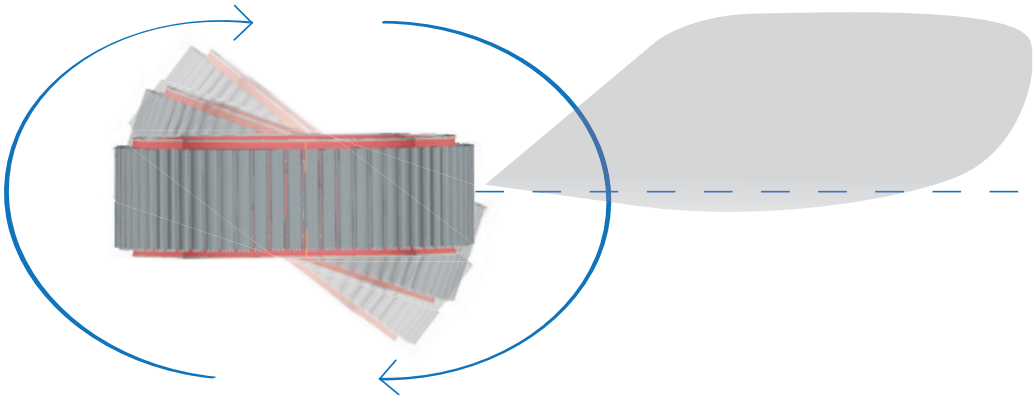
The platform space on a ship is often limited to the mast, and every Communication, Navigation and Surveillance (CNS) system claims the top position. The circular design of L-IESA® is very convenient because it can simply be wrapped around the mast, ensuring 360-degree coverage while leaving the top position vacant for other CNS systems.

L-IESA® does not contain any rotating parts, which improves its maintainability and reduces cost.



Electronic leveling

To improve its volume coverage in case of strong ship movements, L-IESA® applies its unique Vertical Antenna Pointing Diversity (VAPD), an electronic elevation beam steering and leveling algorithm.This corrects rolling ship movements in real-time and results in improved detection performance, even in case of rough sea.



The L-IESA® Non-Rotating IFF has all the technology inside that NORA® has.



RASS®

Radar Analysis Support System

The RASS® portfolio includes a set of test equipment for CNS performance analysis. Different tools are available for different levels of analysis, on-site and in-factory. RASS® can be used for daily system performance monitoring and maintenance, as well as for product development, calibration and certification.

RES®– Radar Environment Simulation for SSR

RES® presents a known reference environment to the radar on RF level. The simulated environment can include up to 2000 SSR or Mode-S targets, ADS-B, FRUIT, reflectors and antenna behavior. It allows a full data link to be tested to its extreme performance limits. RES® complies to the EUROCONTROL EMS 4.0 and is also available for Mode-5 testing.

RES® speeds up factory and site acceptance testing through generating simulated scenarios which are impossible to achieve with common signal generators. Repeatability of tests is a valuable time and cost saving advantage. RES® avoids dependency of opportunity traffic and test flights, as such increasing reliability and reducing cost and environmental impact.



RTG – Radar Target Generation for PSR

The Radar Target Generator (RTG) simulates targets on-site or in-factory at RF level. Those generated RF signals can be injected in the receiver directly or transmitted in the far field. RTG scenarios can be used on top of the real clutter background, interferences, and opportunity traffic, or they can be integrated in a lab test environment. It allows to evaluate radar KPIs and simulate complex scenarios.

RASS® ground measurement solutions



The RASS® ground measurement solutions offer a system for evaluating the different subsystems of a radar, independent of the radar manufacturer.
The scientific approach of RASS® ground measurements provides a top-down analysis of all the elements in the radar chain, verifying the performance of each element separately, from the RF signals at the antenna down to the serial data output of the radar.

Sensor Monitoring Systems

Intersoft Electronics' SMS is a scalable Sensor Monitoring System that provides real-time analysis of multiple sensors. It's the ultimate tool for maintenance personnel to gain system intelligence on the entire network with all its sensors. It enables proactive maintenance, prevents system failures and improves data accuracy and reliability.

SMS is capable to monitor PSR, SSR and Mode-S radars, MLAT systems, ADS-B, A-SMGCS and ASDE-X data, ILS LOC & GP, DME, VOR, NDB and many other types of CNS systems.

Advantages

- Centralized monitoring of CNS sensors
- Real time monitoring of sensors status and performance
- Easy integration of different formats of OEM sensor data
- Ability to implement the remote monitoring of other CNS sensors on the same network
- System and network intelligence enables proactive maintenance, improving data accuracy and reliability



SKYRF®

CNS Drone Measurements

SkyRF® is the drone platform for the measurement of Communication, Navigation and Surveillance (CNS) systems. It's offered under a cooperation agreement between Intersoft Electronics Services and Skyguide.

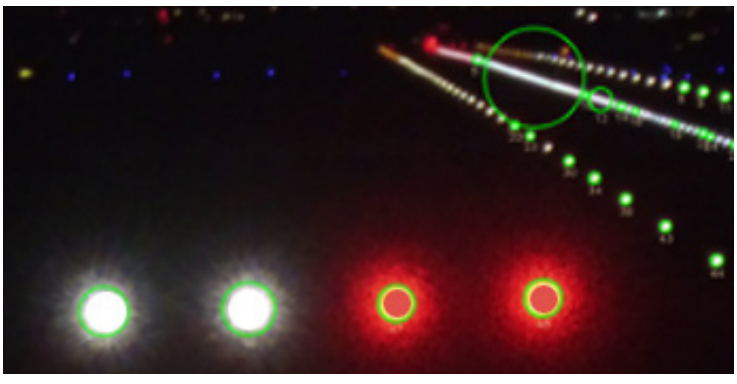
The dedicated equipment onboard SkyRF® and the software platform were specifically designed for measuring navaids and radar performance in the far field. Measuring signals at elevation avoids urban interference and obstructions. Analyzing CNS performance was never before so easy, accurate and reliable. The SkyRF® CNS drone complements ground measurements and reduces the need for flight checks by 50%.

SkyRF® supports commissioning, certification and maintenance of primary & secondary radar and navaids including ILS, DME, TACAN, VOR and many other.

- Complete radar up- and downlink measurement, no need for checking multiple subassemblies individually
- Much lower operational impact, less downtime, less support from technicians or managers required compared to conventional flight test
- Instant, reliable and repeatable measurements, no estimates, no theoretic calculations but real measurements
- Live data streaming and monitoring
- Compliant to ICAO 8071, STANAG 3374, FAA 8200.1

PAPI Calibration

Classic image processing techniques utilizing light detection are employed. Pictures are transformed into binary images, and subsequent filtering processes such as erosion and dilation are applied to easily detect light spots.



ILS – DME integrated measurements

SkyRF® assesses the performance of the ILS Localizer (LLZ) and the Glideslope (GS). To measure the LLZ, the drone flies a Mini-Orbit trajectory in the Far Field. For the GS profile, a Vertical trajectory is flown. The so called Mini-Approach test scenario flies the drone on the glidepath and allows to quickly measure both, LLZ and GS simultaneously. A Corkscrew scenario can be added and combined in a single flight to measure LLZ/GS and DME all at once.

Course, clearance, frequency and absolute power are measured through AM modulation of the 90/150 Hz signals. The difference in depth of modulation (DDM) is an indication of the exact position relative to the landing strip.



Vertical, Mini-Orbit and Mini-Approach trajectories for default maintenance procedure

VOR/TACAN – DME integrated measurements

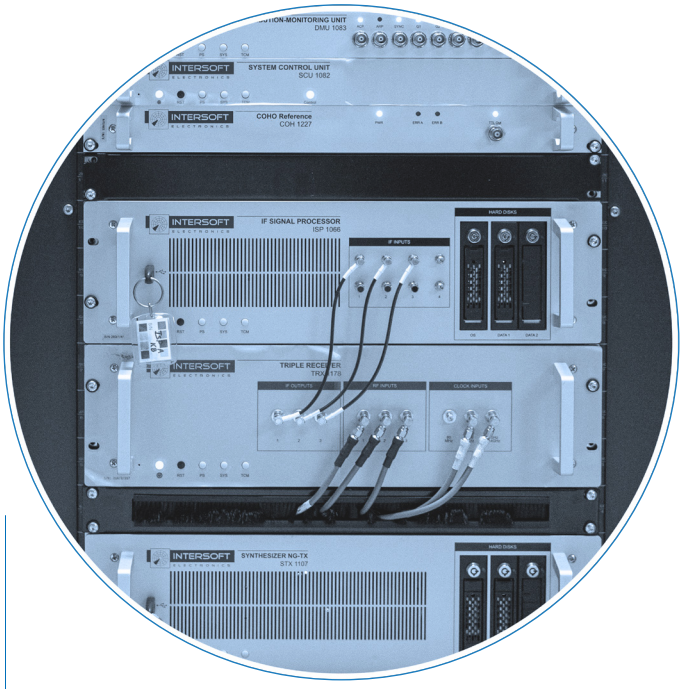
To analyse VOR performance, the same trajectories are used as for DME. This makes it possible to measure azimuth error, FM deviation, RF level and modulation depths of 30 Hz and 9960 Hz as a function of azimuth angle and distance. Trajectories are designed so that a thorough analysis of the cone of silence can be carried out. SkyRF® can serve military TACAN stations with the same range and accuracy (or better) as civilian navigation aids.

Radar VPD and HPD measurements

For radar systems using AESA (Active Electronically Scanned Array) antennas or conventional rotating antennas, it is important to perform HPD at different distances, azimuths and elevation angles. With SkyRF®, this can be achieved in a minimum of time, with great flexibility for PSR and SSR/IFF radar systems. For uplink measurements, no radar downtime is required.

VPD information can be measured flying vertically to the radar. SkyRF® compensates for slant range and terrain deviations to calculate the maximum power for each elevation angle relative to the radar system. The results are displayed live from the flight platform. VPD measurements can be performed for both PSR and SSR/IFF radar systems.

CORE ACTIVITIES





RADAR TECHNOLOGY

Modular radar subsystems, upgrades and integration projects

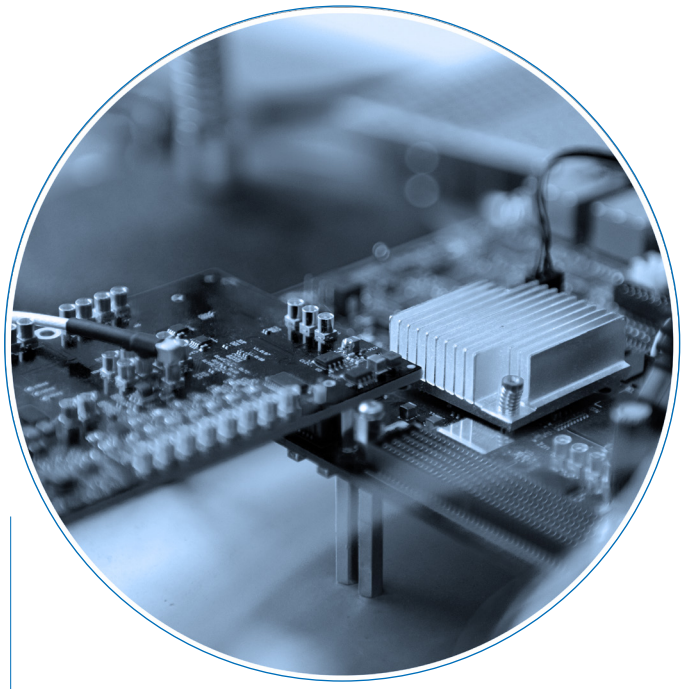
CNS TEST EQUIPMENT

Specialized tools for radar and navaids measurements



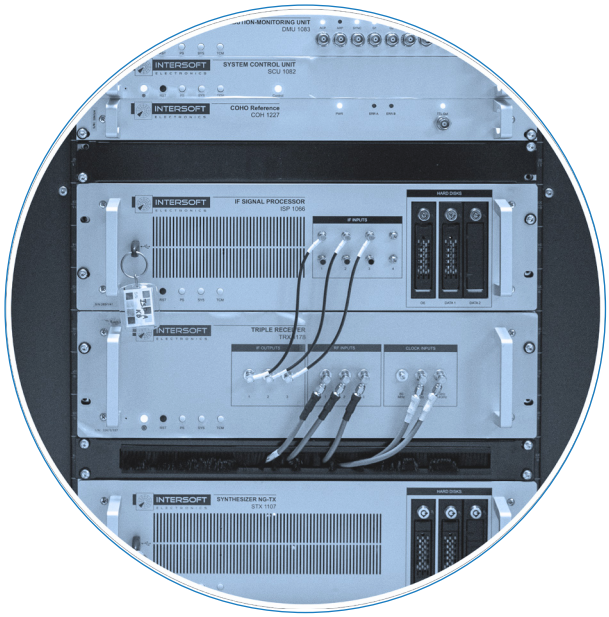
CNS SERVICES

Installation, commissioning and maintenance of CNS and Airport Infrastructures



MANUFACTURING

Vertically integrated manufacturing of complex RF electronics



RADAR TECHNOLOGY

RADAR TECHNOLOGIES

Intersoft Electronics develops innovative technologies that are used in products for OEM radar systems, such as ASR-M®. Those technologies improve sensor performance and solve emerging (as well as long lasting) challenges.

VCC and other patented processing algorithms are the core technology of ASR-M® and the Next Generation System Platform (NGSP®), addressing issues of clutter, windfarms, interference and 3D height information.

NORA® & L-IESA® are non-rotating array technologies that simplify antenna design, eliminating maintenance-intensive rotating parts.



MID-LIFE UPGRADES

The Next Generation System Platform (NGSP®) is the answer to radar electronics obsolescence. It is used in Mid-Life Upgrades and Service Life Extension Programs for ANSPs and Air Forces.

Customers benefit not only from extended operational lifetime but also from a system performance upgrade. Mid-Life Upgrades are a cost-effective way to deal with emerging challenges such as 4G/5G interference, windfarm mitigation and the increasing air traffic density.



IFF INTEGRATIONS

Naval air surveillance poses different requirements than land-based ATC. Therefore, Intersoft Electronics offers a range of Identification Friend or Foe (IFF) solutions, designed to meet the demands of modern naval operations.

Our technology supports NATO standards and enables high-precision identification, even in challenging maritime environments.





CNS TEST EQUIPMENT

ATC SENSOR MONITORING

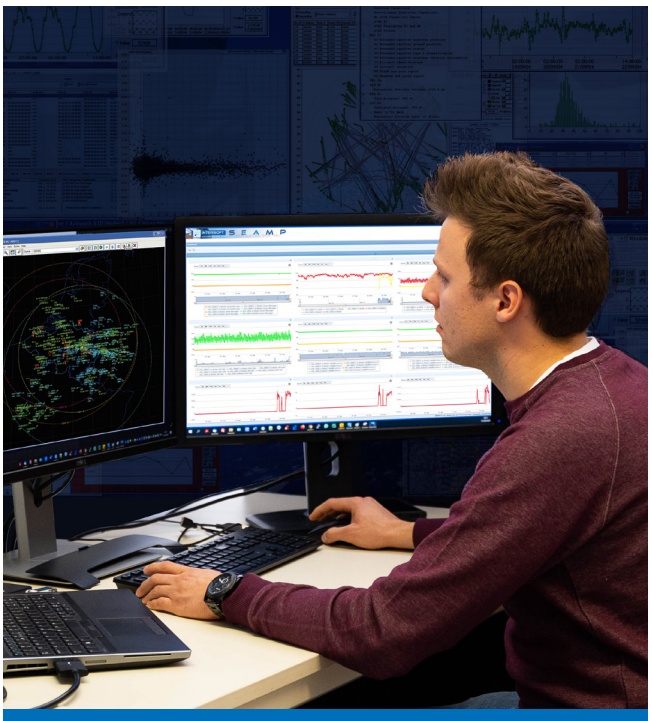
Air Navigation Service Providers (ANSPs) operate a wide range of different surveillance systems, often across multiple locations. That makes sensor management complex, requiring the integration of multiple monitoring systems and data streams.

Intersoft Electronics simplifies this with the Sensor Monitoring System (SMS), a scalable, standardized solution that centralizes data from your entire sensor network, including PSR, SSR, ADS-B, MLAT, and more.

RADAR TEST EQUIPMENT

RASS® provides a comprehensive, manufacturer-independent toolbox for evaluating all elements of primary and secondary radar (PSR and SSR) on site.

Using a top-down approach, RASS® analyzes every component in the radar chain — from RF signals at the antenna to radar data output — ensuring performance verification in real operational conditions.





NAVAIDS TEST EQUIPMENT

Accurate performance measurement of navigational aids (navaids) such as ILS, DME, VOR, TACAN, and PAPI is critical to ensuring safe and reliable airport approaches. International standards, defined by ICAO and supported by organizations like Eurocontrol and NATO (STANAG), set clear guidelines for how these systems should be tested and validated.

Traditionally, flight checks have been the cornerstone of navaids verification. Today, innovative technologies such as drone-based measurements and specialized ground equipment are enhancing and complementing these airborne inspections. Intersoft Electronics supports this evolution by providing advanced tools for precise, compliant, and efficient navaids testing.



SIMULATORS AND GENERATORS

Radar Environment Simulators (RES®) and Radar Target Generators (RTG) are highly specialized tools for extensive radar testing. This equipment allows to test systems to their absolute limits in lab and factory settings and can be used on-site for in-depth verification of system performance. They are the preferred tools for compliance and acceptance testing.

By enabling target generation and scenario simulation at altitude, the SkyRF® Generator introduces more efficient and flexible methods for IFF system certification, sensor alignment, and Combat Management System testing.





CNS SERVICES

ATC & AIRPORT SERVICES

Intersoft Services covers a wide range of planning, integration and maintenance activities on Air Traffic Control Systems and Airport Infrastructures.

We specialize in state-of-the-art CNS (Communication, Navigation and Surveillance) solutions, which are essential for ensuring the safety, reliability and efficiency of air traffic operations. Though, our expertise spans CNS technology, meteorology, airport lighting, power supply solutions and many more, ensuring seamless and reliable airport operations.

Our ATSEP technicians and personnel deliver comprehensive, high-quality service solutions for clients across Europe, the Americas and the Asia-Pacific region.

NAVAIDS SERVICES

Intersoft Electronics offers specialized CNS Services to support the certification, performance evaluation, and calibration of Navigation Aids (NavAids, including ILS, VOR, TACAN, DME, and more.

Whether you're commissioning a new system or maintaining operational compliance, our services ensure your NavAids meet all mandated standards, without the burden of downtime, logistics, or costly test flights.





RADAR SERVICES

Our engineers provide expert support to radar manufacturers, Air Navigation Service Providers, Ministries of Defense, and other service organizations during all key phases of radar system validation. This includes:

- Acceptance testing (FAT, SAT, and Flight Trials)
- Routine verification during scheduled maintenance cycles
- Time-critical diagnostics for fault finding and failure analysis

With deep technical expertise and field experience, our teams help ensure radar systems perform reliably and meet operational requirements, every time.

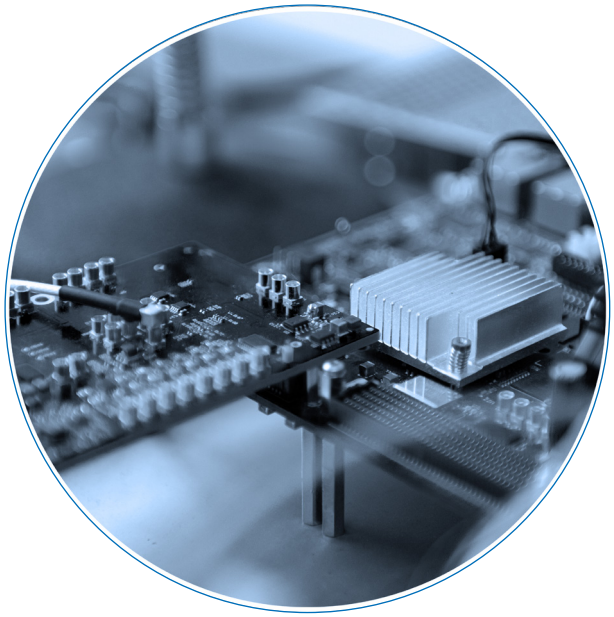


IE ACADEMY

The IE Academy helps students and aviation professionals deepen their knowledge of Communication, Navigation and Surveillance (CNS) systems and Air Traffic Management (ATM) in general. This Intersoft Electronics learning environment has evolved organically from dedicated user training to a broad portfolio of courses and customized training services.

Experienced Intersoft Services training staff compile the training material comprehensively according to the needs of trainees of different levels and functions. Training is delivered at Intersoft Electronics' Knowledge Centers in Belgium and Florida USA, at one of our local branches, or on-site at the customer's premises. We also bring together our valued customers in User Work Groups to focus on their use cases of our equipment and share knowledge.





MANUFACTURING

PRODUCT DEVELOPMENT

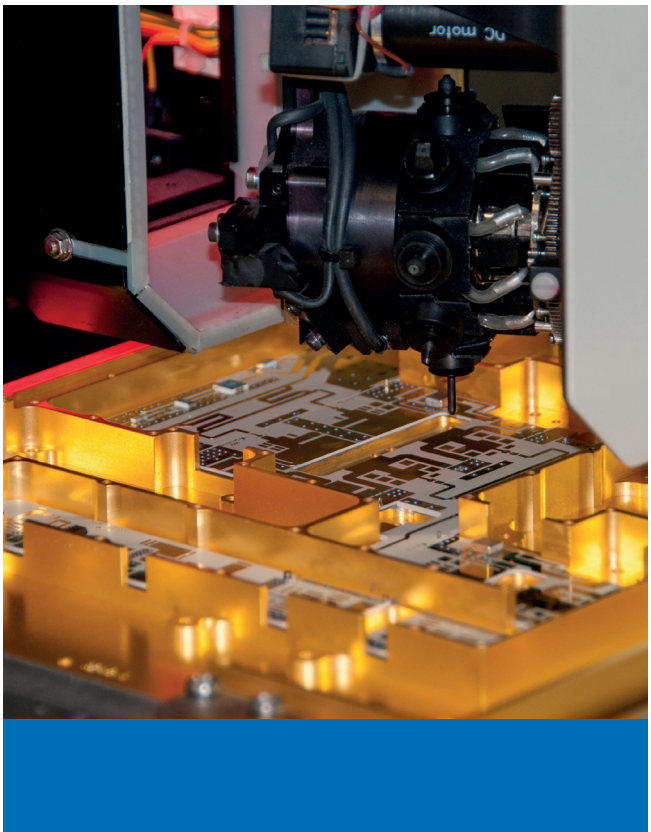
Located directly on the production site, our engineers ensure seamless integration and proactive support during the initial production phases. This close collaboration streamlines the transition from development to manufacturing, reducing time-to-market and ensuring quality.

LEAN MANUFACTURING

Our expertise spans high-speed CNC milling, advanced surface treatments for aluminum components, PCB and electronic assembly using state-of-the-art techniques, and RF electronics integration with precision tuning equipment.

We also operate a dedicated cleanroom to produce miniature hybrid modules, ensuring the highest quality standards for your most demanding applications.





Advionics

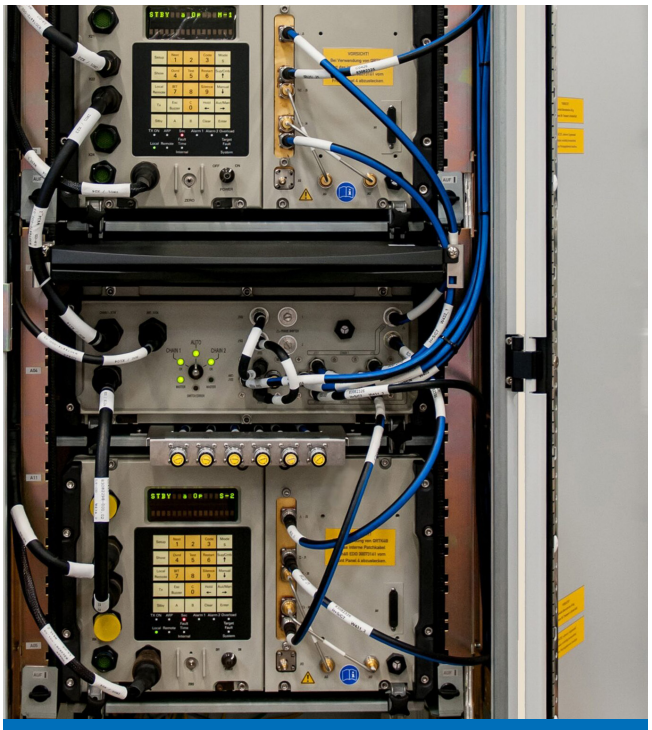
AN INTERSOFT ELECTRONICS COMPANY

Advionics, an Intersoft Electronics Manufacturing company, provides unique one-stop-shop services, based on quality, reliability and manufacturing excellence. We cover a total product life cycle from development, prototyping, industrialization, procurement, production, up to maintenance and repair, customer support and obsolescence management.

Our advanced capabilities allow us to manufacture highly intricate and mission-critical electronics with precision. With deep expertise in radio frequency (RF) technology, we deliver superior solutions for demanding applications.

SYSTEM INTEGRATION

As a true one-stop shop, we handle the complete integration of subassemblies, cables, and PCBs into fully assembled racks. These racks can be standard off-the-shelf solutions or fully customized to meet your specific requirements. We can also integrate your own modules into a complete system, ensuring flexibility and compatibility.



TESTING & QUALIFICATION

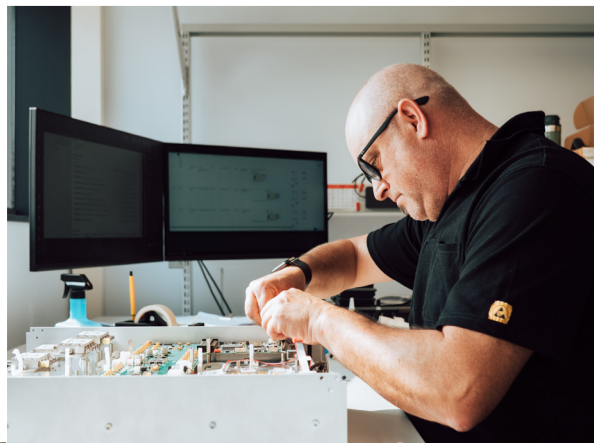
Every product undergoes rigorous testing before shipping, ensuring the highest quality standards and guaranteed fitness for purpose. We specialize in testing at all levels, boards, modules, and complete systems, using advanced equipment capable of covering frequencies from DC up to 24 GHz.



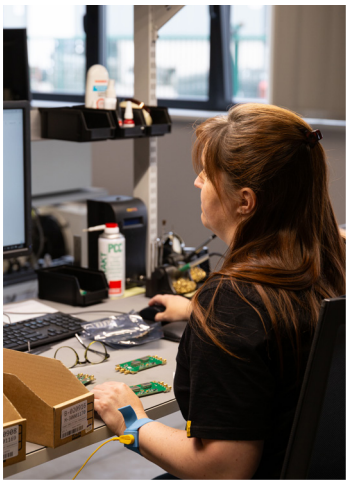
CORPORATE FACTSHEET & HISTORY









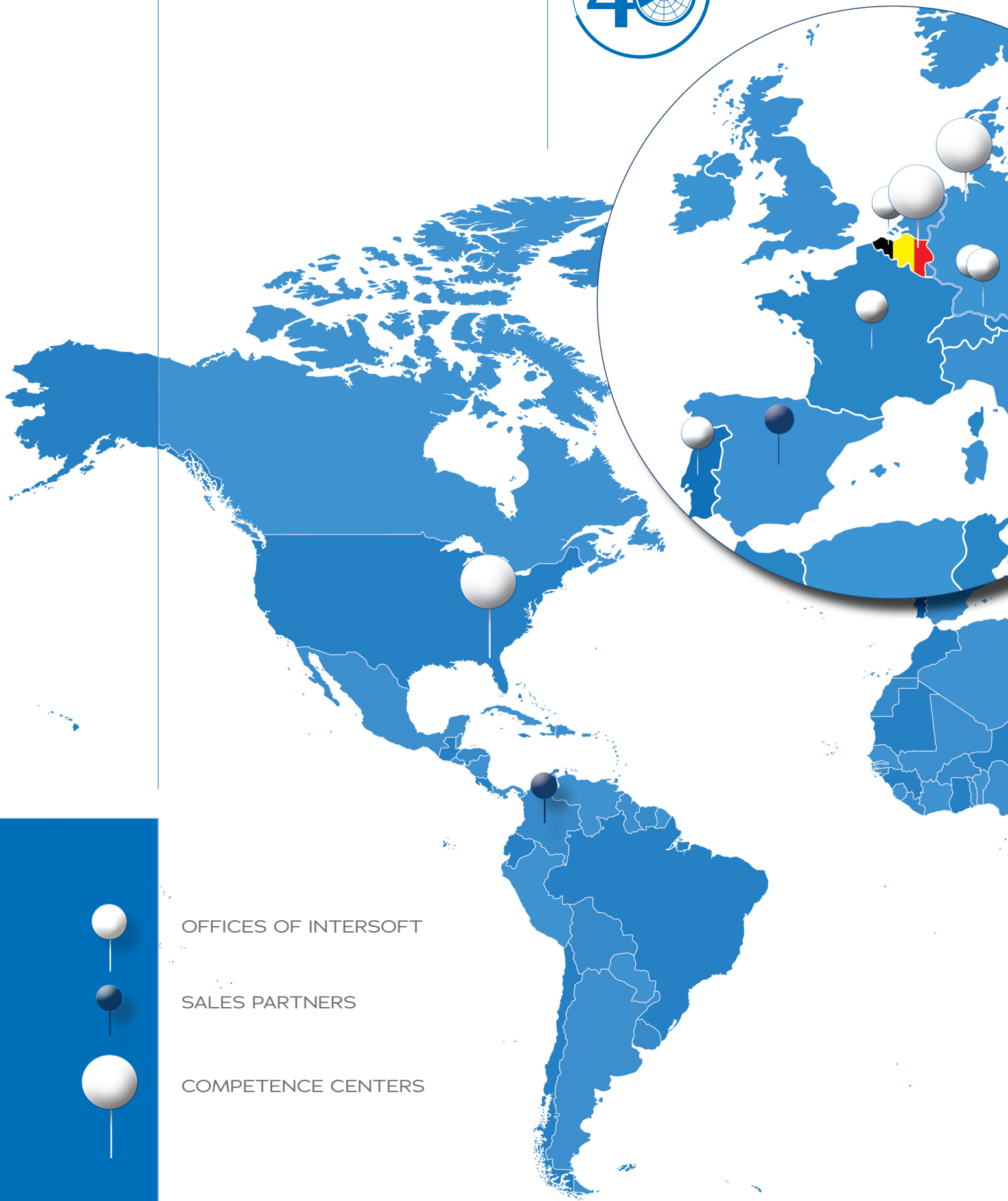



BLACK BOX



INTERSOFT
ELECTRONICS

40 YEARS



OFFICES OF INTERSOFT

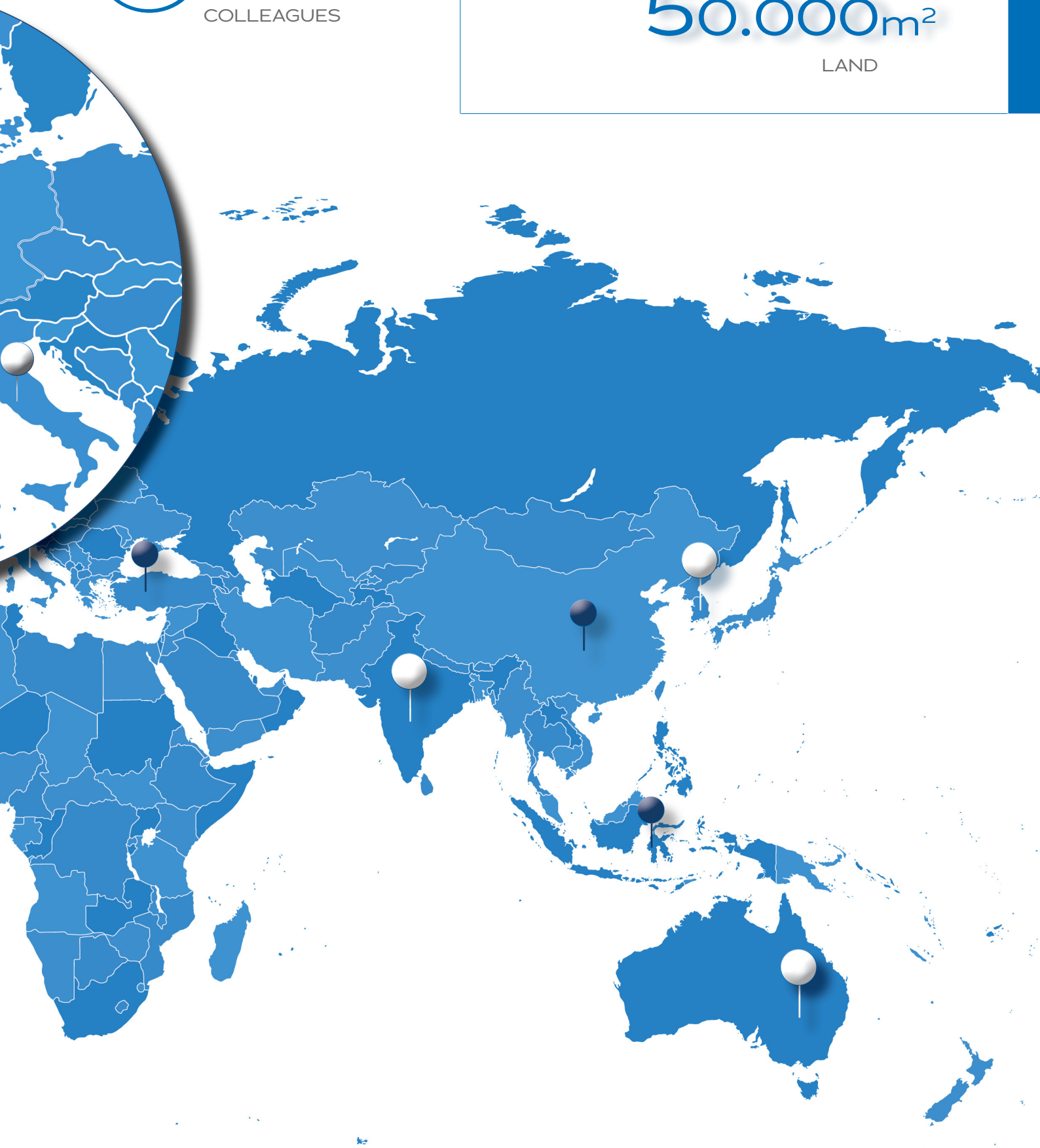
SALES PARTNERS

COMPETENCE CENTERS

400
COLLEAGUES

20.000m²
BUILDING

50.000m²
LAND



2000

USA BRANCH & WORLDWIDE REPRESENTATION

1990

RESEARCH & DEVELOPMENT

RADAR TEST EQUIPMENT

During the ninetees and early years 2000, Intersoft Electronics developed a broad portfolio of radar test equipment and monitoring tools known as RASS®. The Radar Environment Simulator (RES®) for SSR and Radar Target Generator (RTG) for PSR are two of the most successful products that are being used by ANSPs, military and manufacturers all over the world. Test equipment is still an important business for Intersoft Electronics, with SkyRF® drone measurements as the most recent addition to the services portfolio.



RADAR UPGRADES & SERVICE LIFE EXTENSION PROGRAMS

In the years 2000, Intersoft Electronics performed its first radar upgrade projects for the Belgian Air Force. More upgrades and service life extension programs on different types of radar all over the world followed soon. The Next Generation Signal Processor (NGSP®) was developed as a modular platform, incorporating advanced, patented algorithms, significantly improving detection performance.

Over its 4 decades of existence, Intersoft Electronics has adapted itself to the businesses it entered. Its pedigree as an R&D and engineering company has been strengthened consistently. Production facilities have been expanded accordingly, and a global services organization with local branches has been established. Intersoft Electronics is growing fast organically and through strategic M&A.

2020

GLOBAL SERVICES ORGANISATION WITH LOCAL BRANCHES



2010

EXPANDING PRODUCTION FACILITIES

MODULAR AIRPORT SURVEILLANCE RADAR

The NGSP® platform was the basis for ASR-M®, the modular solution for airport surveillance radar. The modular design addresses radar manufacturer's challenges of system lifetime support. By approaching system replacement in a modular manner, it becomes possible to keep a system up to date with state-of-the-art technologies that respond to the changing environments of the National Air Space.



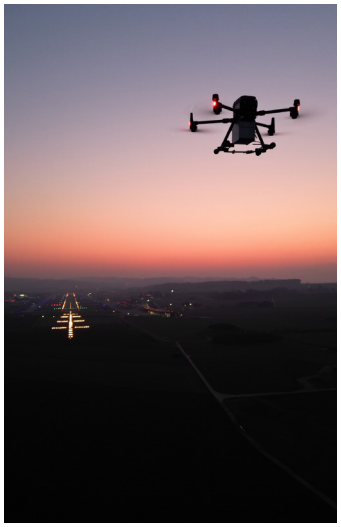
NON-ROTATING ANTENNA TECHNOLOGIES

Non-rotating antenna technologies are the most recent development of Intersoft Electronics, with patents pending. Non-rotating L-IESA® IFF systems for naval applications are being deployed and NORA® Arrays for ASR are being demonstrated.



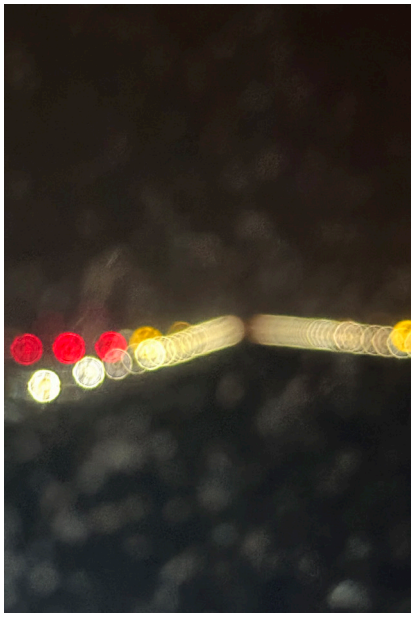







RES
DIGITAL OUT
VIDEO



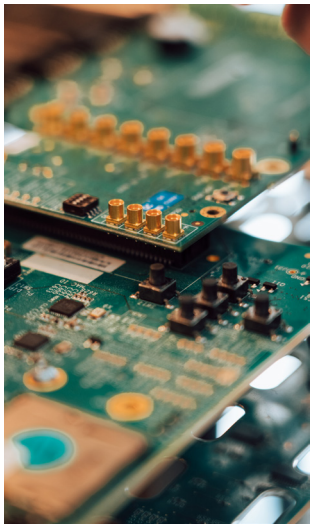












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