Patria

Patria ARIS

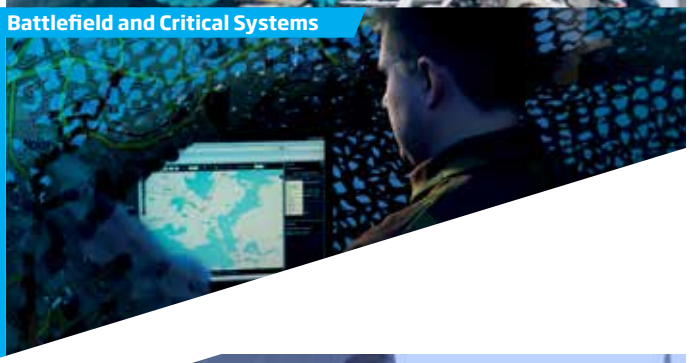
Patria ARIS-E

ELINT & ESM systems for intelligence and surveillance

Protected Mobility and Defence Systems

Through Life Capability

Battlefield and Critical Systems



EXTREME SURVIVABILITY

Finland is known for high technology and extreme resilience. The harsh nature and limited resources have pushed us to learn and innovate efficiently. Thorough preparation for the future is the backbone of our culture.

Patria has grown from its Finnish heritage to a modern and international defence and technology company with over 100 years of experience. We use resources wisely, create innovative solutions and build intelligent systems that provide extreme survivability in any condition. We work with our customers throughout the entire lifecycle to ensure maximum value. Honest and straightforward co-operation is at the core of our work.

We build exceptional partnerships that last through critical operations. That's what it takes when you stand for your sovereignty.

Trust us, we have been there.

TOTAL CONTROL

Improve your critical security with our C5ISTAR and cyber intelligence solutions.

Patria's innovative data services, with insightful visualizations and analytics, ensure that you have real-time, comprehensive situational awareness and a powerful mission control. We create a seamless defence system for those who want to have the advantage in every situation.

Stay one step ahead in your decisions with our turnkey solutions and be in total control.

Patria - Extreme conditions embedded.

ARIS and ARIS-E together deliver a complete solution for ELINT & ESM in the most modern signal environment.

ARIS is an ELINT (electronic intelligence) system for gathering information on radars, their location and their operational tactics, as well as building, updating and validating the emitter databases storing knowledge of radar waveforms.

ARIS-E is an ESM (electronic support measures) system providing real-time tactical situational picture by intercepting, recognising, geolocating and tracking radar platforms.

Patria offers these interoperable systems separately or together with customization options, to optimise solutions for various needs with superior performance, usability and unique remote operability.

The modern electronic battlespace is congested of various kinds of emitters, ranging from high power broadcast stations and legacy surveillance radars to the newest hardly detectable frequency, beam and waveform agile multifunction radars.

All simultaneously active emitters need to be intercepted, recognised and geolocated to maintain control of the electronic order of battle (EOB) and to be able to react to emerging threats. Constantly altering tactics and waveforms in the electromagnetic battlespace demand short loops from the first detection in ELINT (electronic intelligence) to the deployment of a matched emitter database to the ESM (electronic support measures) systems monitoring the battlespace and protecting life of the crew in various military platforms.

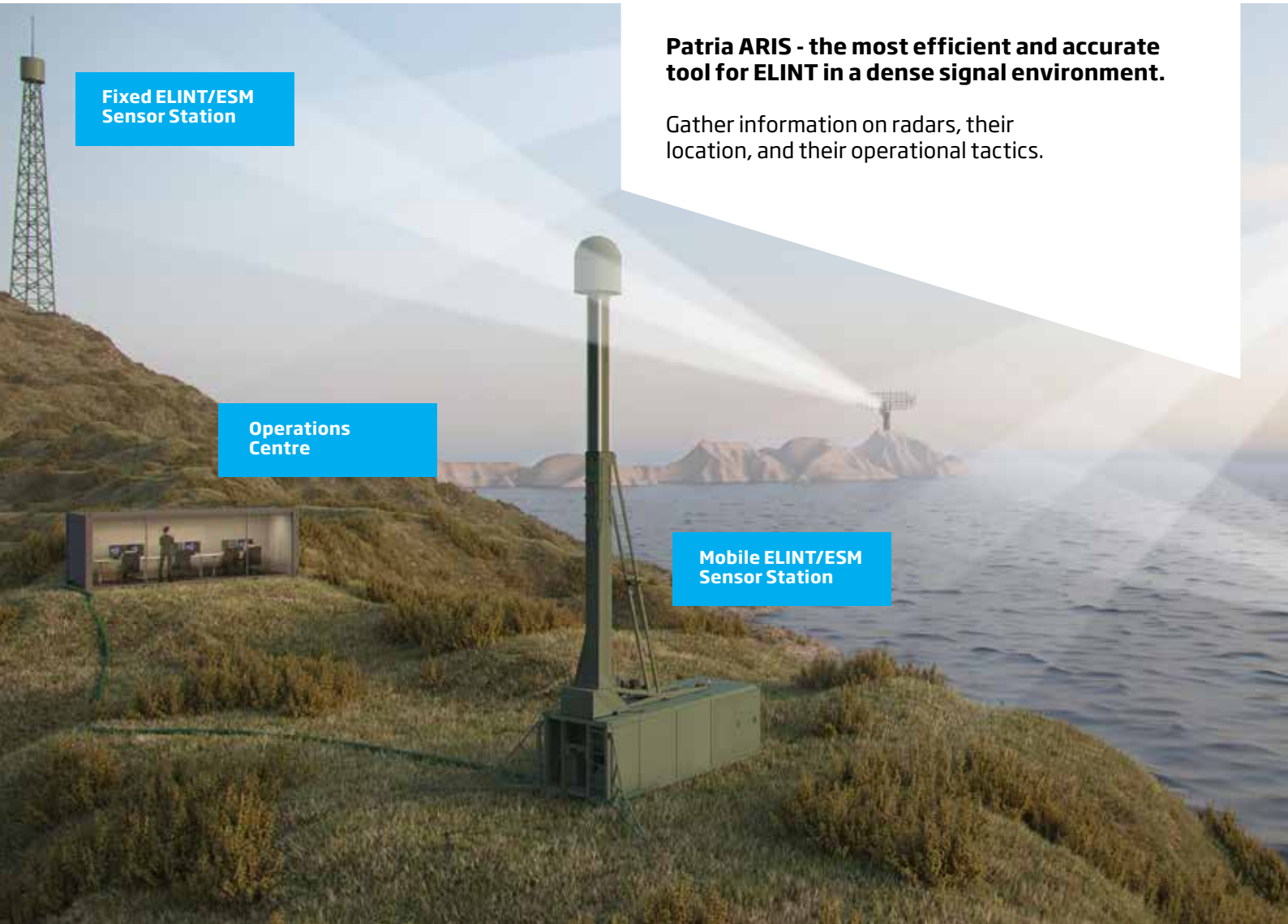
Patria ARIS is an ELINT system

ARIS is a remotely operable ELINT system for interception, recording and analysis of modern and increasingly complex signal environment. It provides an extensive set of high-performance tools for operator-driven ELINT signal analysis.

The system is used for gathering information on non-communication emitters (e.g. radars), including their location, tactics and usage. ARIS intercepts and records previously unknown emitters through spectrum surveillance. The operator can analyse signals and radar modes of operation in real time or from recordings, or the system can run autonomously to identify and record signals for later analysis.

In addition to accurate and sensitive automatic pulse measurements and PDW analysis displays, the analyst has a real-time spectrum analyser, real-time oscilloscope, modulation analyser and direction finding tools allowing, for example, intra-pulse and LPI radar waveform analysis. Signals are automatically identified against an emitter database. Both known and unknown signals can be tracked and collected either manually or automatically based on predefined surveillance tasks. The internal database can be synchronized with the external databases.

ARIS combines all ELINT functionalities in a single system offering a comfortable user experience.



Patria ARIS - the most efficient and accurate tool for ELINT in a dense signal environment.

Gather information on radars, their location, and their operational tactics.

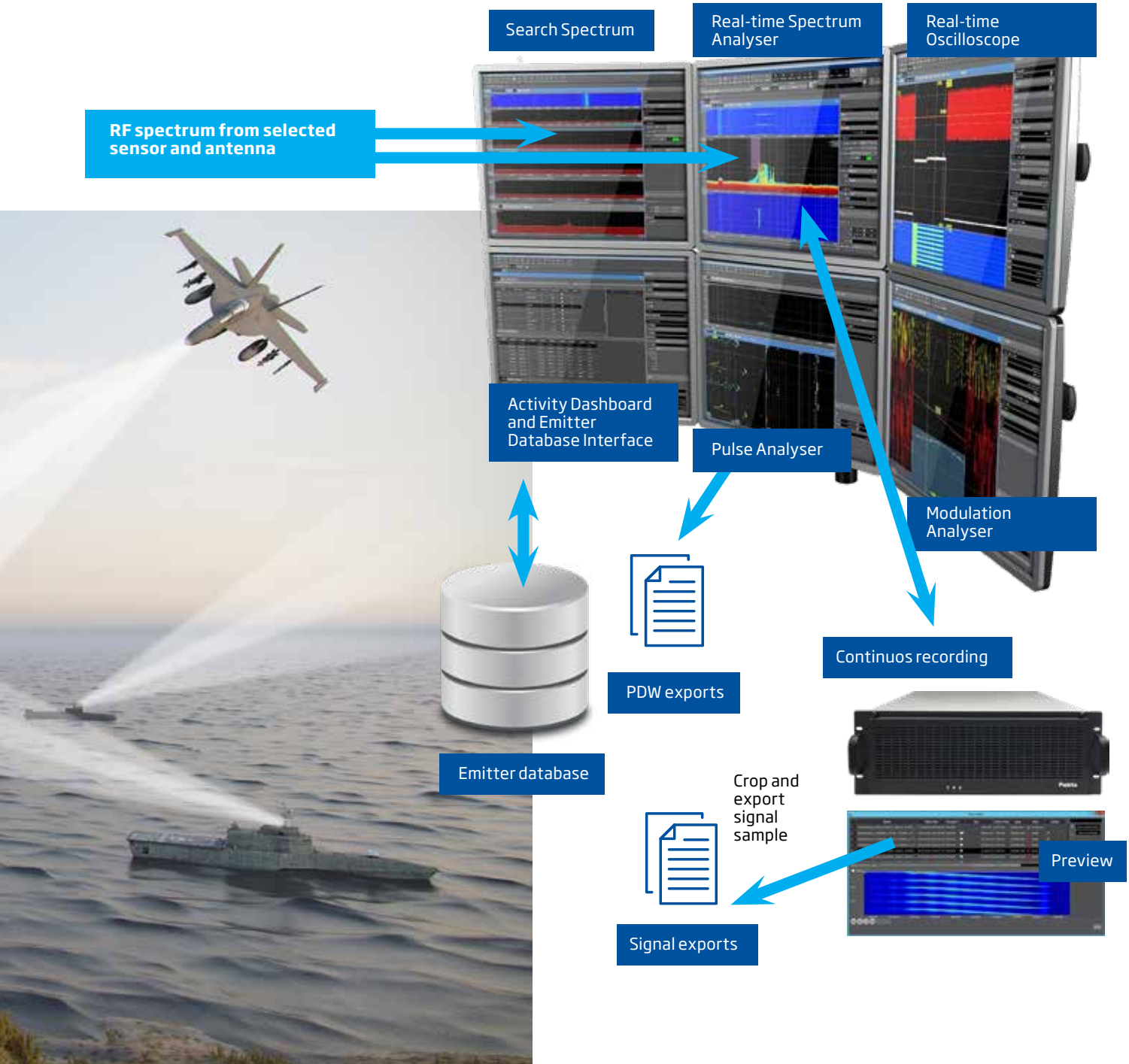
The **search spectrum** is used for spectrum surveillance. It gives a quick overview of the full spectrum with several spectrum displays available for various sub-bands. It provides enhanced probability-of-intercept combined with good sensitivity due to digital channelisation. The **real-time spectrum analyser** illustrates time-frequency information of the chosen band. A dense signal environment with very low SNR frequency chirps and frequency hopping pulse sequences can easily be analysed.

Continuous pulse processing is performed over the whole monitoring bandwidth. Pulse detection is done in channelised manner providing good sensitivity and selectivity. Detected pulses, pulse sequences and pulse parameters are revealed and analysed in the **pulse analyser** with different displays, filtering options and histograms. Intra-pulse modulations of selected pulses can be analysed with the **modulation analyser**.

To analyse a chosen waveform in more detail, signals can be detected from a chosen sub-band and illustrated with **the real-time oscilloscope.** It can be used to analyse intra-pulse and interpulse modulations or e.g. beam patterns.

Direction finding can be done using a spinning DF antenna or V/UHF monopulse antenna. Active emitters are automatically recognised based on a mission database and tracked on an **activity dashboard**.

Continuous recording enables the user to catch short-lived interesting phenomena. All of the tools available for online signal processing are also available for analysing recordings, either with fullspeed replay or by browsing manually. Recordings can be cropped in time and frequency and exported from the system. **Autonomous mode** enables the system to record triggered events automatically.



Patria ARIS-E is an ESM system

ARIS-E is a remote operable ESM/ELINT system used for intercepting, recognising, geolocating and tracking radar emitters. The system produces a situational picture of the targets and timeline of tracked objects within the operating area. The Operator can also conduct a more detailed technical analysis of the received radar signals.

Furthermore, ARIS-E classifies the active targets into identified and unidentified emitters within the operating area. Information is then further transmitted to the Operators and other connected command and control systems. ARIS-E contains flexible solutions for system integration.

ARIS-E provides all required functionality from interception of radar signals to visualisation of the situational picture. Special emphasis is given for providing the operator with (4D) situational awareness in the modern electromagnetic battlespace. ARIS-E displays not just location information of emitters, but also intuitively visualises the timeline of the activities.

ARIS and ARIS-E complete solution

All the functionalities of the ARIS and ARIS-E can be accessed and operated either locally at a sensor station or remotely from an operating center. The operation of a sensor network can be distributed to several fixed and transportable control stations or centralised to an operations center. A broad geographic coverage can be reached from a single operation position. Unmanned sensor stations reduce operational costs.

The network connection is secured with data encryption, user authentication and access control. System monitoring and maintenance is assisted with remotely usable built-in test, calibration and hardware management tools. Software upgrades can be distributed remotely. ARIS and ARIS-E combine all functionalities in a single system offering with comfortable user experience.

Patria ARIS and Patria ARIS-E are usable from a user interface that is an application run on any PC-workstation.

Patria ARIS and Patria ARIS-E together deliver a complete solution ELINT & ESM operations with high-end performance and user experience.

ARIS can be delivered in different levels of system scope and integration

The offering ranges from standalone ELINT analysis application for analysing recorded signals to fully integrated self-contained ELINT/ESM capability including antennas, masts and transportable equipment shelters.

The next generation ELINT/ESM system with undetectable surveillance and accurate identification and tracking

ARIS can also be deployed in platforms, such as various vehicle types, ships or aircraft for onboard operations.

Start with core processing and user interface applications

Add server

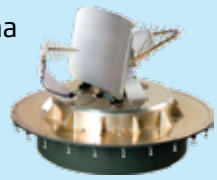
Add antenna and receiver

Add vehicle, shelter and mast or integration to any platform

Software

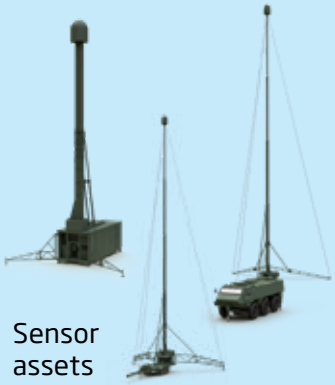
Server

Antenna



Receiver

Platform integration



Sensor assets

Core processing and operation software with the required processing board

All ELINT/ESM equipment and software to be installed/integrated in sensor station platforms and operations centres

Deployable ELINT/ESM sensor assets with integrated sensor hardware and software

Operation and lifecycle support

- Mission planning and sensor network management tools
- Technical support and training
- Remote maintenance and SW updates

Standard interfaces

- SOSA, OpenVPX, PCIe standard HW
- VITA 49, digital IF
- BLUE 1.1 and 2.0, signal recordings
- NITS, NATO ISR Tracking
- CESMO, NATO Cooperative ESM Operations
- TLS/SSL encryption, Kerberos authentication, LDAP authorisation

Patria ARIS - Technical data

Remote operable ELINT system for analysing the most challenging signal environment.

ELINT features

- Search spectrum
- Recording and replaying raw signal
- Recordings editor with crop, export and import
- Real-time spectrum analyser
- Real-time oscilloscope
- Pulse analyser
- Pulse buffer filtering and exporting
- Modulation analyser
- PRF audio
- Antenna/receiver control and direction finding
- Autonomous surveillance and recordings
- Emitter database editor and reporting tools

ESM features

- Automatic interception and identification
- Activity dashboard

Frequency range

- 270 MHz - 18 GHz
- 20 MHz - 6 GHz (high dynamic range V/UHF option)
- 18 - 40 GHz (K and Ka band options)

Instantaneous bandwidth

- Up to 500 MHz per receiver channel (100 MHz for V/UHF option)
- 1 - 3 independent receiver channels (option) and 1 synchronous omni channel (option)

Antenna options

- High gain directional antenna with positioner for ground installations
- Monopulse DF antenna for V/UHF in ground installations
- Spinning DF antenna with omni antenna option for airborne and naval installations
- Digital IF connection over 100 GbE

Patria ARIS-E - Technical data

ESM system providing superior situational awareness and analysis capability.

ESM features

- Interception of signals with a digital interferometer solution giving high sensitivity, accuracy and probability of intercept
- Interception and processing of simultaneous signals from any frequency
- Accurate pulse detection and direction finding
- Identification and tracking
- Track fusion and geolocation
- Situational awareness map display
- Activity dashboard and timeline display
- Activity recording
- DOA-Frequency display
- Polar display
- ESM mission control tools
- 3D geolocation (option)
- Tools and displays according to user roles

ELINT features

- Full band instantaneous search spectrum
- Pulse analyser
- Pulse recording
- Pulse buffer filtering and exporting
- Reporting tools

Frequency range

- 2 - 18 GHz
- 800 MHz - 2 GHz (option)
- 18 - 40 GHz (option)

Instantaneous bandwidth

- Up to 16 GHz processing and recording

Antenna options

- Interferometer antenna unit
- 360° view for a sensor station with multiple antenna units

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Patria

When if is not an option.

www.patriagroup.com