INTERSOFT

E L E C T R O N I C S

ASR-M®

A modular approach to Airport
Surveillance Radar

ASR-M®
Value Proposition

Executive Summary

ASR-M® is a modular approach to Airport Surveillance Radar that embeds advanced technologies to enhance radar performance.

The modularity speeds up system integration and commissioning, and reduces costs in production, maintenance and support. The patented technologies at the core of ASR-M® offer real solutions to present and emerging challenges: wind farm mitigation, 5G interference, …

Radar manufacturers and integrators get added value from ASR-M® in the form of scalable radar solutions that are easy to integrate, at a most competitive price. ANSP's and military users enjoy outstanding performance and advanced features, in a reliable system.

ASR-M® is available in four standard configurations: single and dual channel, with or without transmitter modules. Whatever you choose, with ASR-M® you truly contribute to making the sky safe.

How would you define a successful integration of an ASR system?

Airport surveillance and ASR system operations

Is it about checking all the boxes on the customer's system requirements list? Or do you as a Radar manufacturer aim to deliver real added value? Do you want to make your customer more competitive and equipped for their future challenges? Wind farm mitigation, 5G interference, increased air traffic density, ...
No doubt that you want to provide reliable and long-lasting solutions, that require minimal maintenance, minimal spare parts and minimal obsolescence management. You want your customer to be happy and all set to perform an excellent job.
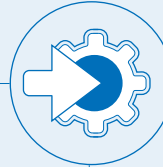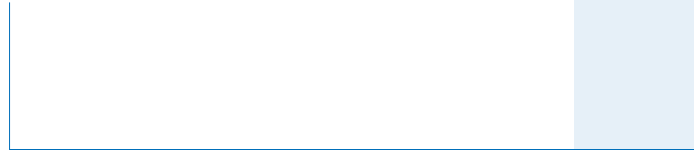
ASR system integration

And how does integrating an ASR system create value for you? When satisfying your customer, you will be respected as an integrator in the aviation industry. That's great, but it doesn't pay the bills.
You want an integration project that runs smoothly, with sub-assemblies that interface naturally. You don't want mismatches between primary and secondary sensors. For you, as a respected integrator, they are one single system that operates alike.
You want a system that can be tuned easily and trustworthily, using intuitive tools. You want to gather system performance data and monitor from remote, over secured connections.

In summary, you want the best-in-class technologies in an integration friendly format at a most competitive price.
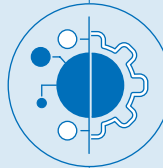
ASR-M®

The solution to your and your customer's challenges

ASR-M® has been designed to address emerging challenges in airport surveillance AND in radar system integration.

It offers added value for all stakeholders.

MODULARITY

Ease integration and save costs
Value for the ASR integrator

ADVANCED TECHNOLOGIES

Mitigate emerging challenges in airport surveillance
Value for the ASR operator

ESG CONFORM

Contribute to sustainable aviation and safer skies
Value for society

Modularity to ease integration and save costs

value for the ASR integrator

Modularity has been applied to the full ASR-M® system design. That means that the received RF-signal from the antenna is being processed all the way to the ASTERIX output, passing different processing stages in different system modules. From RF to IF, combining, extraction, etc. All the modular building blocks can easily be integrated and replaced in line. They are standard COTS units.

The modular concept of ASR-M® enables fast and easy integration and reusability of modules in multiple radar types. That reduces the need for spare parts and significantly eases obsolescence management.

The modularity also allows to optimize the production process. Consequently, costs are reduced in production, maintenance and support.

ASR integrators get higher ROI on their projects with ASR-M®.

The Next Generation Transmitter NGTX was designed according to the modular concept as well. Intersoft Electronics' highly regarded solid state NGTX offers exceptional added value thanks to its scalability and smart power combining. It operates on a peak power of 10kW and features an instrumented range of 0.3 to 80 NM.

And it doesn't stop there. The modularity even reflects in the engineering tools that were specifically designed to tune and calibrate the ASR-M®. These tools come with training modules for integration engineers and for ASR operators.

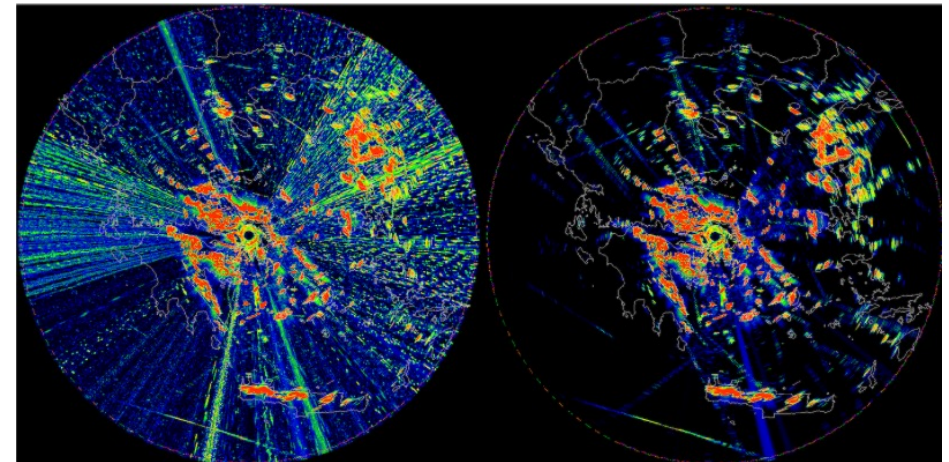value for the ASR operator
sales arguments for the ASR integrator
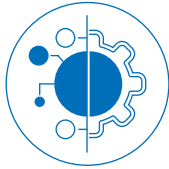
The real added value of ASR-M® is in its advanced technologies and how they help the end user to make the sky safer. Legacy radar often lack the capabilities to deal with changing environments such as wind farms and 5G interference.

ASR operators get more value
for their money with ASR–M®.

The dual beam processing of ASR-M® is the core technology that allows to deal with all these challenges. Vertical Clutter Cancellation (VCC) is a patented and respected technology that uses information of the lower beam to adapt the upper beam pattern to mitigate clutter at elevation, such as from wind turbines. The high sensitivity also makes the detection of drones easier.

Median filtering is another technology that enables several outstanding detection features. Particularly with respect to the severe suppression of RF interference, median filtering does an amazing job. 5G is an issue, as well as many other sources of high frequency interference. Median filtering deals extremely well with these. For the military, this technology enables unseen ECCM features.

Median filtering, VCC and Doppler processing all add up to an extremely clean PPI image.

Cluttermap without and with Median Filtering

value for society
sales arguments for the ASR integrator

ASR-M® was designed with our ESG ambitions in mind. Intersoft Electronics strives to deliver products and services that are developed and manufactured in an environment and social friendly manner, obeying principal business ethics. Moreover, ASR-M® renders ESG benefits for system integrators and radar operators as well.

Both, the modular design and the advanced technologies underpin the differentiating ESG benefits of ASR-M®. The modularity allows to optimize production and integration, reducing the consumption of energy, electronics components, logistics and resources.

Thanks to the overall outstanding performance, ASR-M® truly contributes to making the sky safe. ANSP's can rely on trustworthy data and eliminate a great deal of risk in decision making, facilitating airport operations in general. The incorporated advanced technologies allow different stakeholders to coexist. Telecom service providers, wind energy providers, civil and military air services and operations, …

Thanks to the overall outstanding performance, ASR-M® truly contributes to making the sky safe.

Important to mention is that ASR-M® has an infinite service lifetime. The individual modules are designed for integration in service lifetime extension programs (SLEP's) and upgrades as well. When modules deteriorate or new technologies emerge, simple upgrades or line replacements will keep ASR-M® state-of-the-art. Thanks to the closed loop integration concept (CLIC), firm- and software updates can be done from a remote location.

The core of ASR-M® is the Next Generation Signal Processor (NGSP®). It contains several modules including the RF Receiver, Signal & Data Processor and Signal & Waveform Generator.

The generated signal is amplified by the Power Amplifier (PA). That can be the legacy system PA, a third party or Intersoft Electronics supplied. The output power is distributed to the antenna system. RF on reception is input to the NGSP® for processing, combining and plot extraction. Secondary radar data can be input from any MSSR interrogator. ASTERIX is output to the ATM system. ASR-M® is available for S and L band operation.

ASR-M®
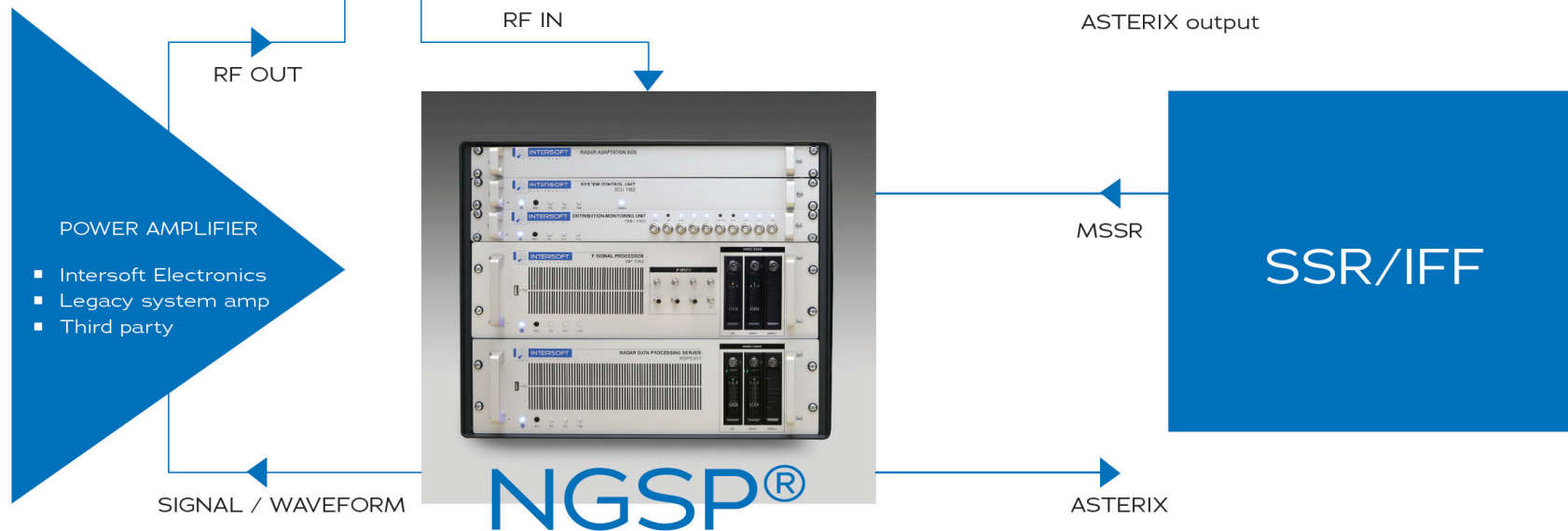
NGSP configuration includes;

- RF receiver
- Signal / Data Processor
- Signal / Waveform generator

S or L band operation

Input from any MSSR interrogator

ASTERIX output

RF IN

RF OUT

POWER AMPLIFIER

- Intersoft Electronics
- Legacy system amp
- Third party

MSSR

SSR/IFF

NGSP®

SIGNAL / WAVEFORM

ASTERIX

Key modules of ASR-M®

Triple S-band Receiver (TRX)
The TRX inputs the RF signal from the antenna, applies STC and downconverts and amplifies it.

IF Signal Processor (ISP)
The ISP inputs beam IF and outputs plots and beam video. The ISP applies Intersoft Electronics' smart processing algorithms such as VCC, Median Filtering, 16-channel MTD, CFAR, adaptive clutter maps, soft STC, ...

Radar Data Processing Server (RDPS)
The RDPS inputs plots from all beams and from the SSR/IFF sensor. After beam combining, 3D height can be calculated. The RDPS also performs sensor combining, scan-to-scan correlation, SSR reflection processing and false plots analysis.

Distribution & Monitoring Unit (DMU) and System Control Unit (SCU)
The DMU and SCU distribute control and monitoring signals to the whole NGSP® and take care of trigger and control. They output to the Control and Monitoring (CAM) interface.

Frequency Synthesizer Unit (FSU)
The FSU generates the clocks, the waveform, the oscillator and the transmission signals and outputs it to the power amplifiers.

Power Amplifiers and Power Amplifier Controller (PAC)
The Power Amplifiers amplify the RF signal. This is controlled by the PAC. The PAC controls phase shifters, multiplexers and power amplifiers.

ASR-M® is available in **4 standard configurations**:

- a single and a dual receive channel
- a single and a dual transmit/receive channel

Dual channel configurations are typically required in civil aviation, while for the military, redundancy is less of a priority.

ASR-M® integrates perfectly with any legacy transmitter amplifier technology. Transmitters are far less prone to failure and obsolescence than other sub-assemblies, and they are expensive. Those are the main reasons why Intersoft Electronics offers standard ASR-M® configurations without transmitter amplifiers.

To summarize,
ASR-M® encompasses two concepts that differentiate it from other ASR:
advanced technologies and modularity.

Particularly thanks to the former,
ASR-M® adds value for ANSP's and MoD's.
Thanks to the latter,
it can be offered at an **exceptionally competitive price**.

Together we make the sky safer