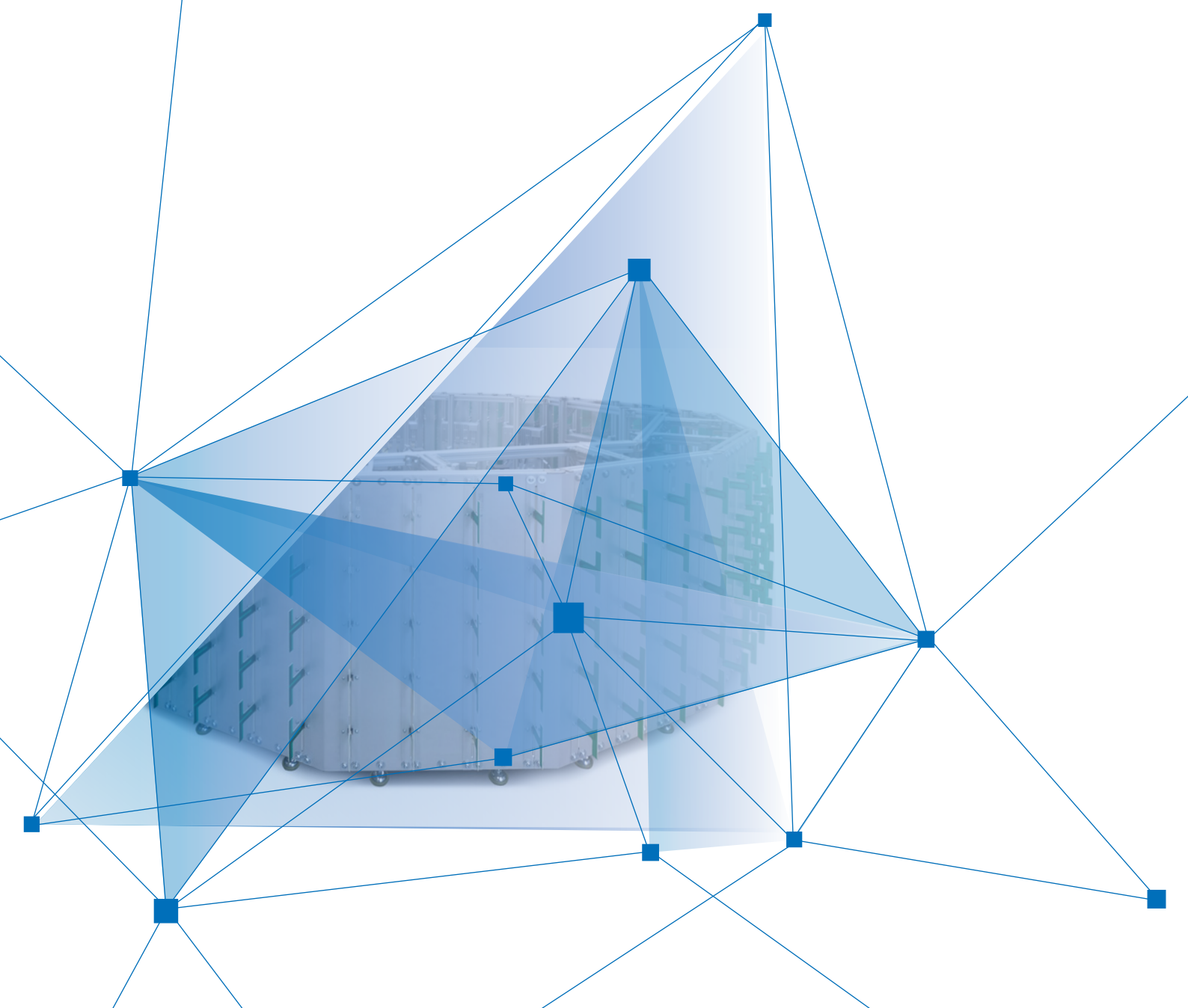
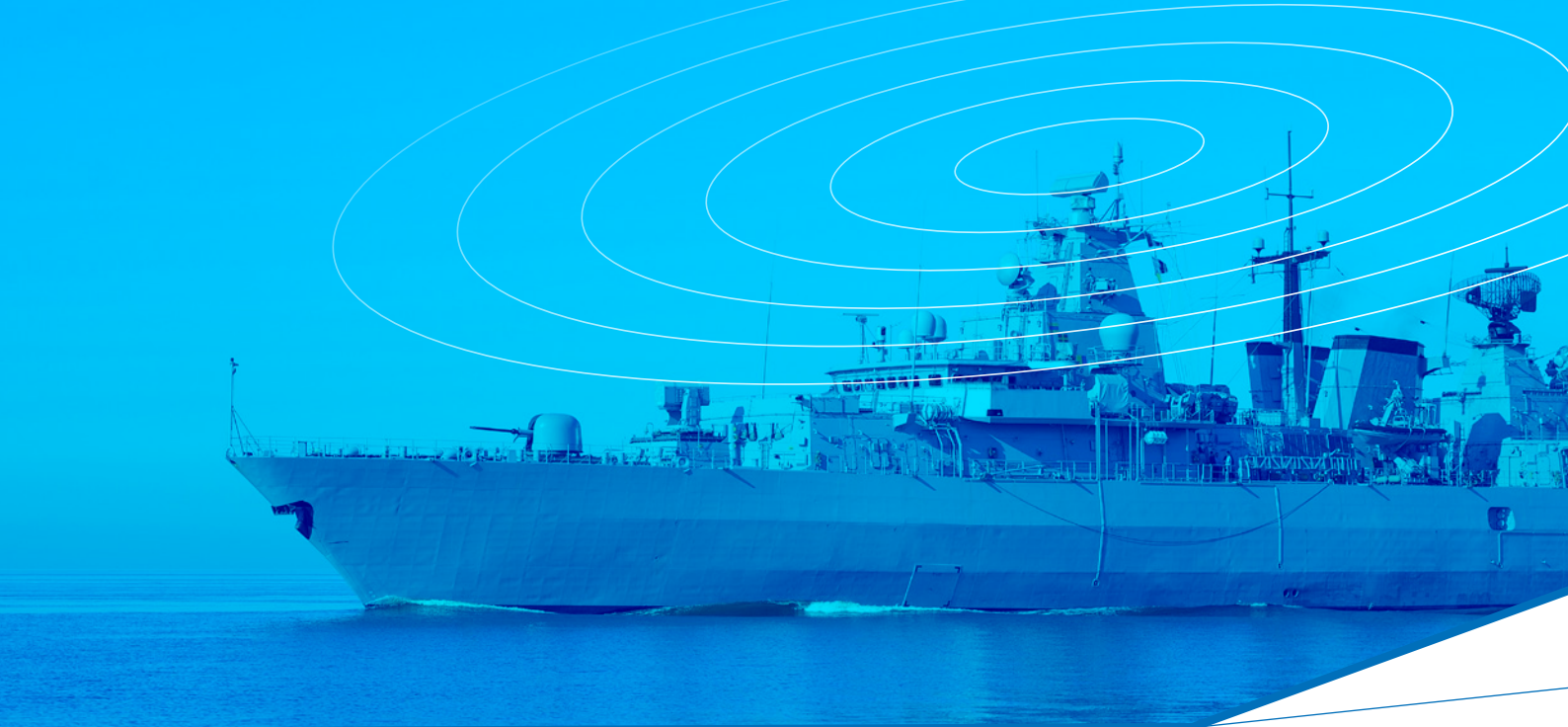




■ L-IESA® NR-IFF

| Non-Rotating Identification Friend/Foe Solution |





□ OPERATIONAL BENEFITS

L-IESA®, the **L-Band Intelligent Electronic Scanning Array** product family is the next generation of circular AESA radars, for many applications, ranging from Identification Friend/Foe, via Data Link to Primary Surveillance Radar.

■ Volume Coverage

The L-IESA Non-Rotating IFF Product enables the use of an 360° long range surveillance without the need to be at the top mast position of a ship, which is normally contested by the ESM systems. The L-IESA NR-IFF does not contain any rotating parts, which at the same time improves its maintainability and therefore life cycle cost. The Antenna System is a fully active, solid state design, which overcomes the attenuation issues of previous generations of IFF antennas. With an output power up to 2.400W directly at the antenna radiating columns, it easily reaches more than 200NM range coverage, even with medium or low power IFF interrogators.

■ Active Antenna

Using the active antenna elements for uplink and downlink, secures at the same time, that the received signals are low noise amplified and phase correctly combined already at the earliest moment possible, directly in the antenna. This allows to not only secure the range coverage in the downlink, it also improves significantly the extractor performance of any connected IFF medium/long range interrogator by increasing the detectable signal level. This results into improved air picture quality and accuracy for the operator.

■ Vertical Antenna Pointing Diversity

To improve its volume coverage in case of strong ship movements, the L-IESA NR-IFF is using its unique "Vertical Antenna Pointing Diversity" (VAPD), an electronic elevation beam switching. For the operator this benefits into improved detection performance even in case of rough sea states.

■ Mode 5 / Mode S / ADS-B

The L-IESA NR-IFF Antenna System has been verified to assure an ICAO Annex 10 Vol III/IV, STANAG 4193 Ed. 3 and AIMS 03-1000A/B compliance of the complete IFF system, in case the used IFF interrogator is already certified to be STANAG 4193 Ed. 3 / AIMS 03-1000A/B compliant. Even as active antenna system, the L-IESA NR-IFF is not jeopardizing or even measurably impacting this compliance. Any NR-IFF system built from L-IESA NR-IFF will therefore be capable of IFF Mode 1, 2, 3/A, C, S (Elementary and Enhanced Surveillance), ADS-B, Mode 5 Level 1 and 2.

■ Availability

Compared with other AESA antenna designs, the number of active Transmit/Receive modules is minimized so that the actual system MTBF is still sufficiently high to support NATO missions without huge burden of large amount of spare parts.

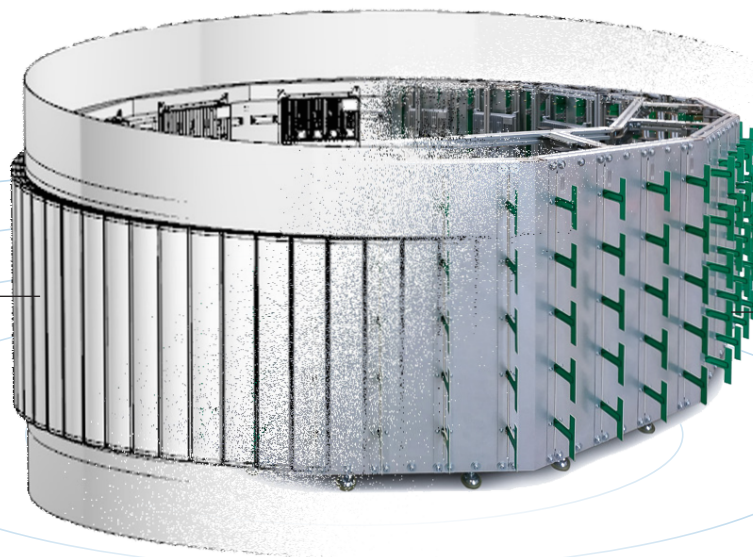
UNIQUE CHARACTERISTICS

Multi-Path

Previous shipborne IFF applications suffer in its detection performance severely from over sea multipath propagation issues, resulting in large blind spots/areas especially during plain sea states. These multipath losses are caused by electromagnetic wave self-elimination while arriving at the recipient directly and through a second reflection on sea. The L-IESA NR-IFF implements a unique "Vertical Antenna Pointing Diversity" (VAPD) architecture that solves this major performance degradation by implementing in parallel several different switchable elevation antenna diagrams, which are continuously altered. In case of multipath losses through one diagram, it is statistically almost impossible that other elevation pattern(s) also suffer the multipath elimination at the same time. This way a detection probability is significantly increased, in the presence of multipath, using VAPD.

Antenna Gain

Using newly designed radiating elements the L-IESA achieves despite only $<3.500\text{mm}$ diameter a directivity gain of about $>22\text{ dBi}$. This is significantly outperforming other circular antennas of the same vertical aperture and securing a superior performance in terms of range coverage.





TECHNOLOGY USED

- L-IESA® NR-IFF implements highly sustainable and reliable transmit output power technology, robust over wide temperature ranges and long term reliable beyond any other previously used technology.
- L-IESA® NR-IFF also enables smooth electronic beam azimuth transition despite digitally switched antenna elements using Vector Modulator technology, mimicking a completely analogue rotation.
- The completely Solid State design of the minimized TR-Modules secures a long life cycle at almost none life cycle costs.
- L-IESA® NR-IFF implements a highly sophisticated online built-in-test operation, that allows an online Monopulse calibration verification. This again secures, that deviations, any drifts or external impact disturbances of the target measurement accuracy of the antenna are self-observed and monitored during operation, without even entering into maintenance or calibration mode of the antenna system. The comprehensive PBIT/IBIT and CBIT allow in addition a fault isolation down to LRU level.

RADIO FREQUENCY CHARACTERISTICS		
Antenna Gain	> 22dBi	
3dB Antenna beamwidth	adjustable 6° to 8°	
Azimuth accuracy	<0.1° RMS (stationary)	
Sum - Delta notch	>30dB	
SLS side lobe coverage	>6dB	
SLS	>9dB below SUM peak	
Output power	1.600W...2.400W	
VOLUME COVERAGE		
Azimuth	360°	
Max. Range	>200NM	
Elevation	>50° (cumulative)	
Elevation beams	Vertical Antenna Pointing Diversity	
Multipath suppression	dynamic elevation beam switching	
PLATFORM MOVEMENT COMPENSATION		
Roll	up to 30°	
Pitch	up to 15°	
Yaw	up to 15°	
SECONDARY RADAR / IFF STANDARDS		
ICAO Annex 10 Vol III/IV	compliant	
STANAG 4193 Edition 3	compliant	
AIMS 03-1000A/B	compliant	
MECHANICAL DIMENSIONS		
Outer diameter	< 3.500mm	
Inner diameter	> 2.800mm	
Height	< 900mm	
Weight	<700kg	
Cooling	passive convection cooling, no liquids	
ENVIRONMENTAL QUALIFICATION		
MIL-STD-810H	Method 501.7 High Temperature	Method 509.7 Salt Fog
	Method 502.7 Low Temperature	Method 505.7 Solar Radiation
	Method 524.1 Freeze/Thaw	Method 508.8 Fungus
	Method 507.6 Humidity	Method 516.8 Shock
	Method 506.6 Rain	Method 528.1 Vibration
	Method 521.4 Icing	
MIL-STD-461G		
AECTP230	Zones M1, M2, M3, B1, B2, B3, A2, A3, C0, C1	
AECTP500		
MATERIAL ENVIRONMENTAL SAFETY		
European Directive 765/2008 CE Mark	compliant	
European Radio Equipment Directive 2014/53/EU	compliant	
European Directive 2011/65/EU Restriction of Hazardous Substances (RoHS)	compliant	
Regulation (EC) No 1907/2006 Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)	compliant	
LOGISTIC SUPPORT ANALYSIS DATA		
System MTBF	> 4.500h (MIL-HDBK-217F NU/NS 20°C)	
Documentation	IETD ASD 1000D, 2000M	

■ GLOBAL PRESENCE



**Intersoft Electronics NV
Belgium Head Office**

www.intersoft-electronics.com
support@intersoft-electronics.com



**Advionics NV
Belgium**

www.advionics.be
info@advionics.be



**Inventive Electronics Inc.
US Office, Florida**

www.intersoft-electronics.com
support@inventiveelectronics.com



**Intersoft Radar UK Ltd
UK Office**

www.intersoft-radar.co.uk
support@intersoft-radar.co.uk