

THERMAL SENSOR TECHNOLOGIES FOR EMBEDDED SYSTEMS

OVERVIEW OF THE MARKET

SEGMENTS & APPLICATIONS

In today's world, conflicts are being fought in an increasingly high-tech battlefield, which is leading to a paradigm shift. Technology solutions represent a weapon of choice among armed forces for ensuring operational readiness. As such, they are constantly looking to upgrade their equipment with enhanced performance levels capable of meeting a wide range of needs, including protection, mobility, autonomy, stealth, communication and command.

Embedded defense systems consequently play an essential role in enabling troops to achieve the best possible outcome from their missions. They allow vehicles, aircraft, drones, boats and submersibles to **detect**, **recognize** and **identify** enemy threats. In various operational situations, they help forces **anticipate**, **react** and **respond** with the necessary level of information to take the right decisions and drastically minimize the risk of a mistake.

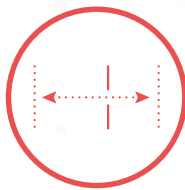
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*Infrared sensors fulfill these needs. Combined with other sensors, they are **key** to delivering the required performance during missions and protecting against new threats. They need to be **reliable**, **robust** and **compact** to guarantee access to information and meet users' needs on the battlefield.*

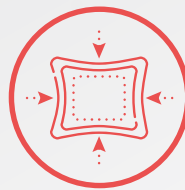
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RELIABILITY



LONGER RANGE



COMPACT



RUGGED DESIGN
FOR HARSH
ENVIRONMENTS



Use cases:

- Active Protection System
- Hostile Fire Detection
- Commander & gunner sights
- Missile Warning System
- Directional Infrared Counter Measures
- Submarine Optronic Masts
- POD, Gimbal
- Search & Track
- Remote Control Weapon Sights
- Driving Vision Enhancement
- Local Situation Awareness



CHALLENGES

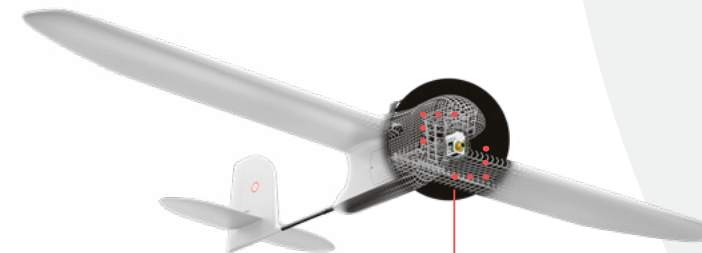
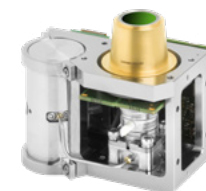
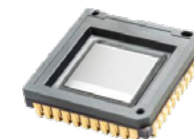
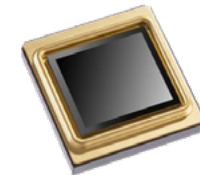
The key factors for these missions include:

- **SERVING INCREASINGLY COMPACT CARRIERS WITH HIGH-PERFORMANCE DETECTION SOLUTIONS**
- **DETECTING AND IDENTIFYING TARGETS EVEN EARLIER**
- **DETECTING AND IDENTIFYING EVER SMALLER TARGETS, INCLUDING THE NEW THREAT OF DRONES**

LYNRED: the partner you can rely on

- **High-performance infrared sensors for more than 30 years** (high sensitivity, high frame rate, etc.). Our products provide a tactical advantage through their unmatched detection, recognition and target identification capabilities, helping to protect lives
- **An extensive range of cooled and uncooled thermal sensors** covering the entire infrared spectrum to support infantry troops during their missions
- **Reliable products** approved for use in harsh environments (MIL-STD-810/833, thermal weapon sights, etc.) and guaranteed long-term availability compatible with military programs
- **A dedicated customer support team** tasked with providing assistance and technical support. We take a proactive approach to responding to your questions and needs. Our engineers have the skills to work efficiently with your people, from R&D to engineering. Our customer support team is fully integrated into our product lineup, personalized, and available to all customers. Our mission is to help boost your technical capabilities to make your infrared solution development processes more efficient while shortening the time to market
- **Independent supplier** located in Europe

LYNRED infrared sensors
bring your thermal systems to life





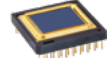





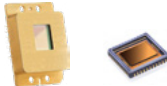




2

million detectors
delivered since 2016

MAIN LYNRED PRODUCT RANGE

Discover all our
defense products



UNCOOLED FOR SHORT TO MEDIUM RANGE	PRODUCT	FORMAT & PIXEL PITCH	SPECTRAL BAND	TYPICAL NETD*	POWER CONSUMPTION		WEIGHT	SIZE (TYPE PACKAGING)	
					DIGITAL OUTPUT MODE	ANALOG OUTPUT MODE			
 	 PICO640S™	VGA, 640 x 480, 17µm	LWIR	25mK (f/1, 300K, 30Hz)	-	< 130 mW	<6.5gr	24.4 x 24.4 x 4.7mm ³ (Ceramic)	
	 ATTO640D-02+™	VGA, 640 x 480, 12µm	LWIR	35mK (f/1, 300K, 30Hz)	<300mW @ 60Hz <285 mW @ 30Hz	<150mW @ 60Hz <140mW @ 30Hz	<3gr	17.3 x 17.3 x 4.9mm ³ (Wafer-level packaging)	
	 ATTO1024-02™	XGA, 1024 x 768, 12µm	LWIR	35mK (f/1, 300K, 30Hz)	-	≤ 470 mW @ 50Hz (2 outputs) ≤ 550 mW @ 100Hz (4 outputs)	<10gr	29.5 x 29.5 x 5.6mm ³ (Ceramic)	
	 ATTO1280-02™	SXGA, 1280 x 1024, 12µm	LWIR	35mK (f/1, 300K, 30Hz)	-	≤ 470 mW @ 30Hz (2 outputs) ≤ 550 mW @ 60Hz (4 outputs)	<10gr	29.5 x 29.5 x 5.6mm ³ (Ceramic)	
COOLED FOR HIGH PERFORMANCE & LONG RANGE	PRODUCT	FORMAT & PIXEL PITCH	SPECTRAL BAND	TYPICAL NETD*	POWER CONSUMPTION		WEIGHT	SIZE	CDT@20°C
					REGULATED INPUT POWER	COOLDOWN INPUT POWER			
 	 SNAKE SW™ / SNAKE SW Tecless™	VGA, 640 x 512, 15µm	0.9 - 1.7µm	-	-	-	25g <5g	11cm ³ 0.8cm ³	-
	 GALATEA SL™	VGA, 640 x 512, 15µm	3.6 - 4.2µm	31mK (300K, 50% well fill, 25Hz)	3.0Wdc	12.0Wdc	365g	300cm ³	210sec
	 DAPHNIS HD MW™	HD, 1280 x 720, 10µm	3.7 - 4.8µm or 3.4 - 4.2µm + 4.5 - 4.8µm	20mK (293K, 70% well fill, 2.7Me-)	4.0Wdc	13.0Wdc	670g	NA	270sec
	 SEEGNUS™	SXGA, 1280 x 1024, 7.5µm	3.6 - 4.2µm	40mK (300K, 50% well fill, 25Hz)	3.5Wdc	15.0Wdc	365g	300cm ³	240sec
	 SCORPIO LW™	640 x 512, 15µm	7.7 - 9.3µm at 80K	22mK (f/2, 210 Hz); 10 mK (f/2, 30Hz post acc. / 4 frames)	6.1Wdc	15.0Wdc	550g	NA	360sec

*Typical value with a standardized LYNRED setup



35 years

of experience

80%

exports

1,100

employees

15%

**revenue
invested in R&D**

LYNRED

**(merger between Sofradir and
ULIS) designs infrared sensors
to meet the needs in a wide range
of markets.**

Our infrared sensors lineup covers the entire infrared spectrum from SWIR through VLWIR. Our products are capable of satisfying the demanding requirements of a variety of industries.

They are reliable and rugged enough for defense applications, compact and powerful enough for surveillance applications, and stable and sensitive enough for thermography, industrial systems, firefighting and search & rescue applications.

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