NIGHT VISION AT A GLANCE

EXOSENS

Exosens is a European leader in advanced electro-optical technologies, specializing in high-performance solutions for defense and industrial applications. With a strong focus on innovation and technical excellence, the company designs, manufactures, and delivers cutting-edge amplification, detection and imaging systems tailored to the most demanding environments.

Its comprehensive product range includes advanced imaging cameras, detectors for electrons, ions, neutrons, and gamma rays, microwave amplifiers, and image intensifier tubes. Covering the entire spectrum from UltraViolet (UV) to Long-Wave Infrared (LWIR), Exosens solutions are renowned for their high sensitivity, speed, and ability to solve complex challenges with precision and reliability.

EXOSENS
REVEAL THE INVISIBLE

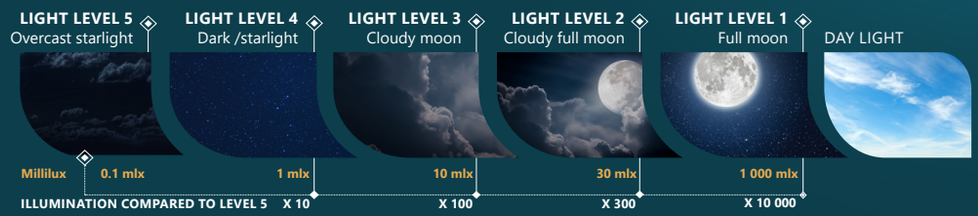
30%
NON-DEFENSE
- Industrial Control
- Lifescience
- Nuclear

70%
DEFENSE
- Portable sights (Night Vision Goggles)
- Armored vehicles & platform sights
- Electronic warfare

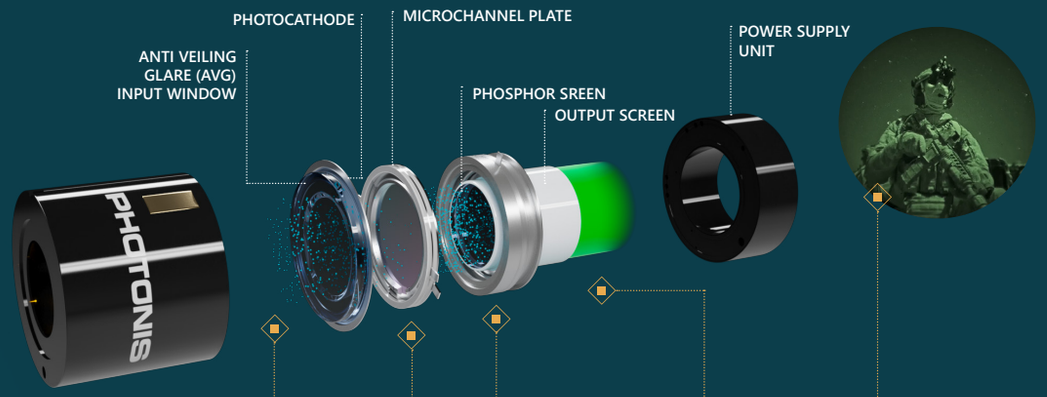
PHOTONIS
EXOSENS GROUP

PHOTONIS NIGHT VISION

Photonis is the world leader in the design and manufacturing of state-of-the-art Image Intensifier Tubes (IIT) for defense applications. Over the years, night vision has become a key opto-electronic technology in modern warfare as more and more operations take place by night.



An image intensifier tube (IIT) amplifies low light level images into levels that can be seen by the human eye. IIT collects the existing ambient light from natural or artifical sources, such as starlight, moonlight, street lights or infrared illuminators. The light passes through different internal components to be multiplied several thousand times, producing a much brighter image that can be seen by the soldier through the Night Vision Device (NVD).



01
Photons (light) are converted into electrons by the photocathode

02
Electrons are accelerated through an electrical field and hit the MCP walls to generate secondary electrons that in turn will generate more electrons into an « electron avalanche »

03
Multiplied secondary electrons are accelerated through an electrical field and hit the phosphor screen layer

04
Electrons are converted back into light

05
The image is projected through the eye-piece of the NVD

PERFORMANCE CRITERIA AND FEATURES

The performance of an Image Intensifier Tube (IIT) is the sum of several parameters:

Figure Of Merit
FOM = Resolution x Signal to Noise Ratio (SNR)

Modulation Transfer Function (MTF) : the MTF illustrates how well this device can reproduce the contrast of the observed scene

Resolution : the limiting resolution measured in line pairs per millimeter (lp/mm), that the viewer can distinguish

Auto-Gating : tactical feature that provides soldiers with clear visuals in frequent and sudden changing light conditions by switching the photocathode voltage on/off to maintain optimal IIT performance

Signal to Noise Ratio (SNR) : at a given light level, the SNR quantifies how much the signal is corrupted by the noise introduced by the IIT

Halo : bright circle of light that surrounds a concentrated bright light source. The smaller the halo, the more precise the image

Spectral Range : 4G & 4G+ bandwidth is twice larger than Gen III IIT, collecting more photons and improving Detection, Recognition, Identification (DRI)

Black spots : common cosmetic blemishes that may originate from fixed particles inside the IIT or in the fiber optic of the screen

Laser visibility : enlarged spectrum providing soldiers with the crucial tactical advantage of seeing 1064nm lasers target designator

Fixed Pattern Noise (FPN) : it's caused when the MCP is saturated after a high-light exposure on the IIT

Gain : improve the ability to detect and recognize targets at a greater distance or in extreme low light conditions

Phosphor screen : converts the electron avalanche from the microchannel plate back into photons, resulting in the green or white image

Photonis was the 1st manufacturer in the world to develop and sell white phosphor image intensifier tubes and is also the sole company to offer a 16mm format tube. This new standard has enabled the design of modern, lighter and smaller night vision devices.

Green phosphor (P43)

White phosphor (P45)

PHOTONIS
EXOSENS GROUP

PHOTONIS, THE NIGHT VISION EXPERT FOR TACTICAL DEFENSE OPERATIONS

NEW 2025

5G

Thanks to the major technological advances made by Photonis over recent years, the 5G Image Intensifier Tube (IIT) is the ultimate cutting-edge technology on the night vision market.
The 5G is the highest-performing Photonis IIT that enables end-users to benefit from very high performance and high gain while improving DRI ranges in the darkest nights and maintaining stable performance over lifetime.

4G+

The 4G+ image intensifier tube meets the stringent requirements of modern warfare at night to deliver end-users a very high performance in all field conditions. This technology offers extended bandwidth for high image quality on all theatres of operations (desert, snow, forest, urban), very high Figure Of Merit (FOM) performance and a small halo providing more details around light sources. This is an undeniable advantage on the darkest nights.

4G

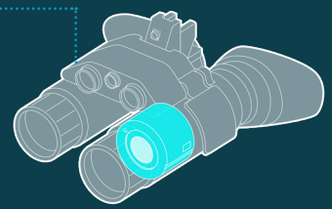
The 4G technology has become the standard in all major European Land Forces programs. The 4G image intensifier tube is a more affordable version than 4G+ while maintaining a high level of performance. 4G IIT provides operators high image quality and long detection ranges in the most challenging light conditions: brightness of equipment, longevity of tubes, ability to see farther in increasingly low levels of darkness and very fast auto-gating.

ECHO+, ECHO, ECHO14

The ECHO series is the commercial grade image intensifier tube by Photonis, offering three high performance levels: the ECHO+, the ECHO and the ECHO14.
Ideal for use in activities such as sport shooting, hunting, airsoft, and other night vision applications, the ECHO series combines reliability with advanced optics to perform seamlessly in low-light conditions.

ONE SOLDIER, ONE GOGGLE

- **STATE-OF-THE-ART NIGH VISION**
- **THE BENCHMARK IN ALL MAJOR EUROPEAN ARMY PROGRAMS**
- **MADE IN EU - ITAR FREE**



Photonis_One pager_May 2025

exosens.com
nightvision@exosens.com

EXOSENS
REVEAL THE INVISIBLE