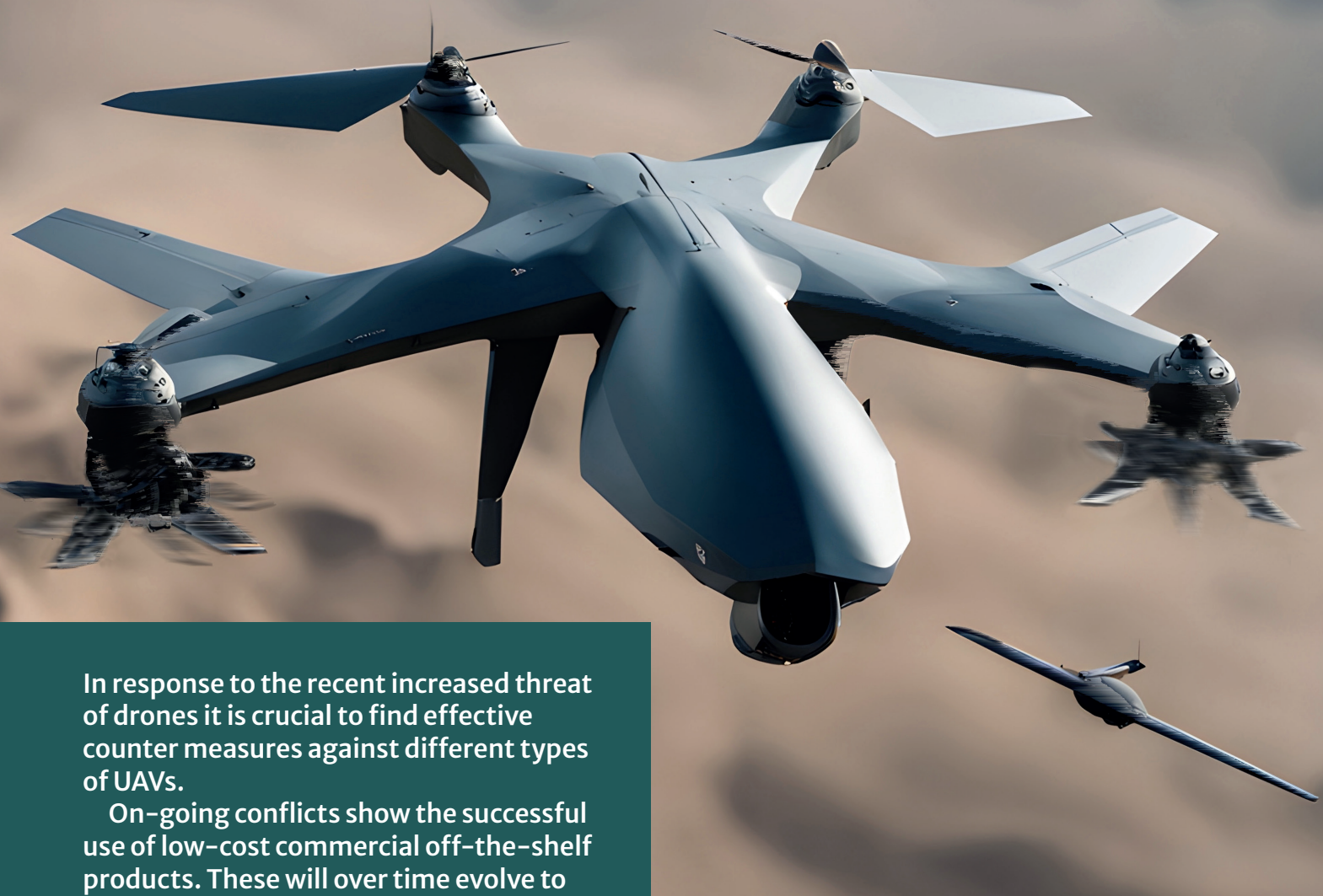


# Modules for Counter Unmanned Aerial Systems (C-UAS)



# Detect, track and engage



In response to the recent increased threat of drones it is crucial to find effective counter measures against different types of UAVs.

On-going conflicts show the successful use of low-cost commercial off-the-shelf products. These will over time evolve to be more capable, C-UAS must be able to handle different types of threats.

The Counter Unmanned Aerial System (C-UAS) can be installed on a vehicle or at a command post. The system includes products for detecting, tracking, engaging and interface to command-and-control components and different effectors.

This brochure lists several different modules that can be used to build a C-UAS system of own choice in response to the market needs.

Lasers can be used for range measurement, optic detection, 3D detection/tracking, dazzling, designating and as high energy effector.

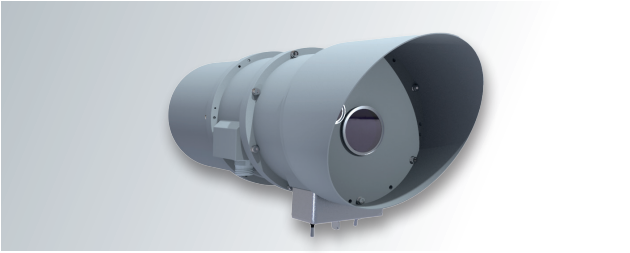
## Laser Rangefinders (LRF)



Lumibird brings a very long experience of providing laser rangefinders for Land, Air and Naval applications. The range performance is from a few thousand meters up to 20 km+.

Many different variants utilizing different technologies i.e. solid state, fiber and diode lasers. The laser rangefinders are ideal for C-UAS central unit or to be mounted to a UAV.

## Optic scanner



Optoscan, device to scan, detect and classify reflecting optics. Can be used to verify if the approaching objects contain threatening sensors before activation of counter measures.

## Sensor destroyer



High energy laser used to permanently destroy the optical sensors of the UAV. A blind UAV can no longer be controlled from the ground station due to loss of visual data. Available in several different variants and wave lengths in the visual range or IR and can be adapted as the threat evolves.

## Detection



Detection and tracking of small objects in 3D, up to 2000 m or more. LIDAR gives a more precise measurement than radar and with no detectable radio emissions. Several different variants are available.

## High Energy Laser (HEL)



Lumibird has a long tradition of making high energy lasers for industrial applications. These are available in the different variants such as: < 2 kW and scalable from 2 kW to 10 kW. These products can be adapted to efficiently destroy UAV's.

## Designator

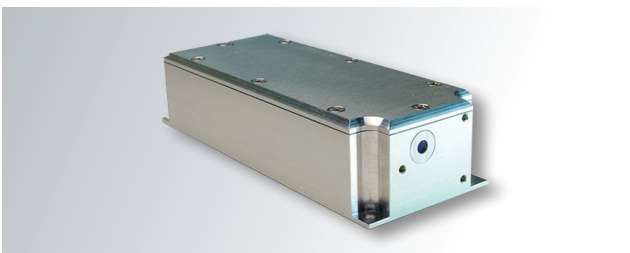


Laser target designator for guided weapons. Lumibird brings long experience of providing laser designators to both Airborne and Land applications. These are available in a huge variety of different modules and performance.

## Effectors (3<sup>rd</sup> party)

- High Energy Laser (HEL)
- Kinetic energy
- Missiles
- RF-Jammers

## Dazzler



The Dazzler is used to temporary blind the sensors of the UAV. It may also be used to jam anti-collision sensors. They are available in several different variants and wave lengths.

## Interfaces (3<sup>rd</sup> party)



- Command and control systems
- Other sensors (radar, acoustic)
- Other effectors

# State-of-the-art products for C-UAS

Lumibird offers several off-the-shelf modules that can be used to build a C-UAS system. It is up to the system integrator to pick the specific modules and to integrate them into a complete system.

The Technical Readiness Level (TRL) is listed for each module in the table below. More modules in each category is available on request. Lumibird is well familiar with the requirements for C-UAS.

## TECHNICAL DATA AND SPECIFICATIONS

Module	Laser class	Wave length	Size (l x w x h mm)	Weight	Power	Other information	TRL
LRF-Vidar	1 M	1532 nm	328 x 145 x 141	5,6 kg	24 VDC	Solid state	9
LRF-Hildur	1	1532 nm	140 x 120 x 80	1,5 kg	24 VDC	Solid state	6
LRF-1550 MR	1 M	1550 nm	112 x 80 x 81	600 gr	24 VDC	Fiber-laser	9
LRF-Diode	1 M	1550 nm	45 x 34 x 20	26 gr	24 VDC	Diode-laser	5
LRF LP/TLP	1 M	1550 nm	87 x 58 x 47	140 gr	24 VDC	Fiber-laser	7
Optic scanner-Scout	3B DNRO 20 m	NIR	300 x 200 x 150	5 kg	24 VDC	Solid state	4
Lidar-Atlas 3D	3B DNRO 100 m	1550 nm	230 x 310 x 155	10 kg	24 VDC	Fiber laser 40μ 50 kHz	5
Designator-SparrowHawk	4	1064 nm	150 x 120 x 86	1,3 kg	24 VDC	YAG-laser	4
Dazzler	4	***	100 x 40 x 30	0,5 kg	24 VDC	Fiber laser	9
Sensor destroyer	4	*1	226 x 227 x 71	4-4,5 kg	24 VDC	Nd:YAG	9
HEL 2 kW	Ple	1080 nm	1000 x 600 x 900	200 kg	24 VDC	Ytterbium Fiber Laser	9**
HEL 10 kW	Ple	1080 nm	1400 x 910 x 1230	470 kg	24 VDC	Ytterbium Fiber Laser	9**

\* 1064, 532, 355 or 266 nm  
 \*\* Industry laser  
 \*\*\* 520, 532, 546 or 577 nm

Technical data and product configuration might be subject to changes.

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Lumibird has been a leading manufacturer of military lasers since the early 1960s, with naval, land and airborne applications worldwide. Over the years, Lumibird has delivered more than 5000 long range laser rangefinders for military applications to more than 30 countries.

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**LUMIBIRD**

MORE THAN LASERS

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