

SHERPA

EXTREMELY COMPACT NON-LETHAL ASYMMETRIC
THREAT DETECTION AND COUNTERMEASURE FOR
MILITARY ASSETS PROTECTION



VocCom[®]
audio

PASS[®]
PROFESSIONAL Medientechnik
Pro-Audio-Service & Support

headsets.at
Intradex Communications

SHERPA OVERVIEW

Navies, terrestrial, and security forces often deploy their ships and vehicles through hostile and dangerous environments or need to protect critical infrastructures both at sea and on land. To carry out such missions, it is often necessary to engage threats, such as small boats or ground vehicles, using non-lethal techniques like clear and intelligible voice messages over medium to long distances.

Loud and clear communication can be crucial in determining the intentions of incoming targets and initiating an escalated response.

Sherpa provides these capabilities in an outstanding, lightweight, MIL-grade, and compact-sized equipment



SHERPA OVERVIEW

SHERPA enables medium to long-range communication between a ship (or other craft) and a human target for various missions:

Search & Rescue: Ensuring that people can hear from a long distance during rescue operations.

Anti-piracy: Warning approaching vessels or terrestrial vehicles to maintain distance or retreat from the ship, vehicle, or infrastructure.

Self-defense: Disrupting targets with extremely loud sounds, high-power glaring laser light, or high-power light.



APPLICATIONS

Control and non-lethal defense against asymmetrical threats
in critical environment



NAVAL



Navy medium and large sized warships

Coast guard vessels

Cruise ships

Merchant ships

LAND



Armoured vehicles

Special forces vehicles

Tanks

Police vehicles

CRITICAL INFRASTRUCTURES



Ports and harbours critical sites

Critical infrastructures perimeter

Offshore platforms

National borders

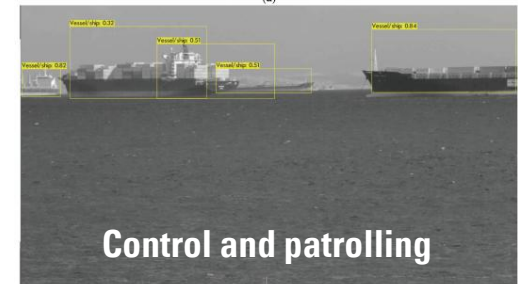


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(a)



(b)

Search and rescue missions

Platforms self-defense

Control and patrolling

**Control and non-lethal defense against asymmetrical threats
in critical environment**

SHERPA USE



Long range communications

Target Engagement
and tracking

Visual Target
Identification using AI

**COMMUNICATION AND
SURVEILLANCE**



Sherpa System

LASER AND LIGHT Dazzling
deterrence

ACOUSTIC
DISSUASION
using high pitch tones

COUNTERMEASURE

ASSET

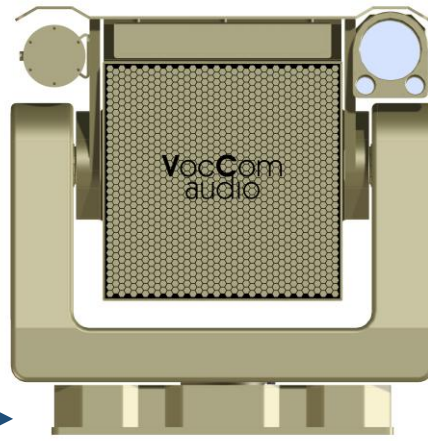


CONFIGURATION

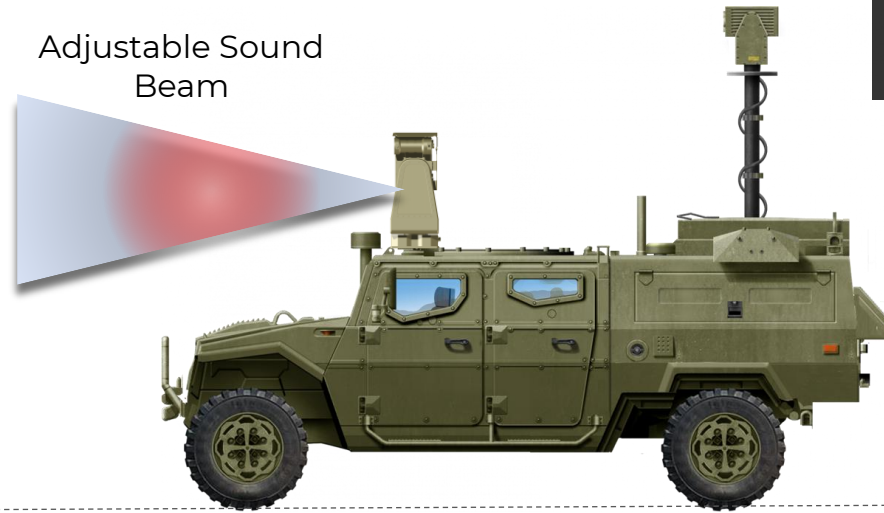
SHERPA LAND DOMAIN



Sherpa external unit



Adjustable Sound Beam



Platform

Control station

Gbit ethernet

User interface



Sherpa control unit

CONFIGURATION

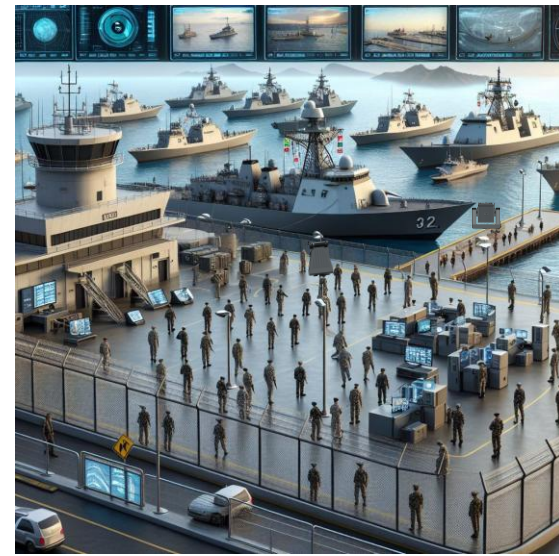
SHERPA LAND DOMAIN



115/220 Vac

Platform

Control station



Gbit ethernet

User interface

Sherpa control unit



CONFIGURATION

SHERPA NAVAL DOMAIN

Sherpa external unit



115/220 Vac

Platform

Control station



Gbit ethernet

User interface



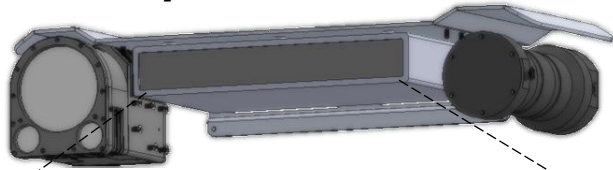
Sherpa control unit



SHERPA COMPONENTS AND FEATURES

E/O UNIT

Powerful
Search
Light



Green Laser Dazzler

SENSOR PAYLOAD

Thermal
camera



Laser Range
Finder



HD Video
camera



CONTROL UNIT

Gbit ethernet
interface



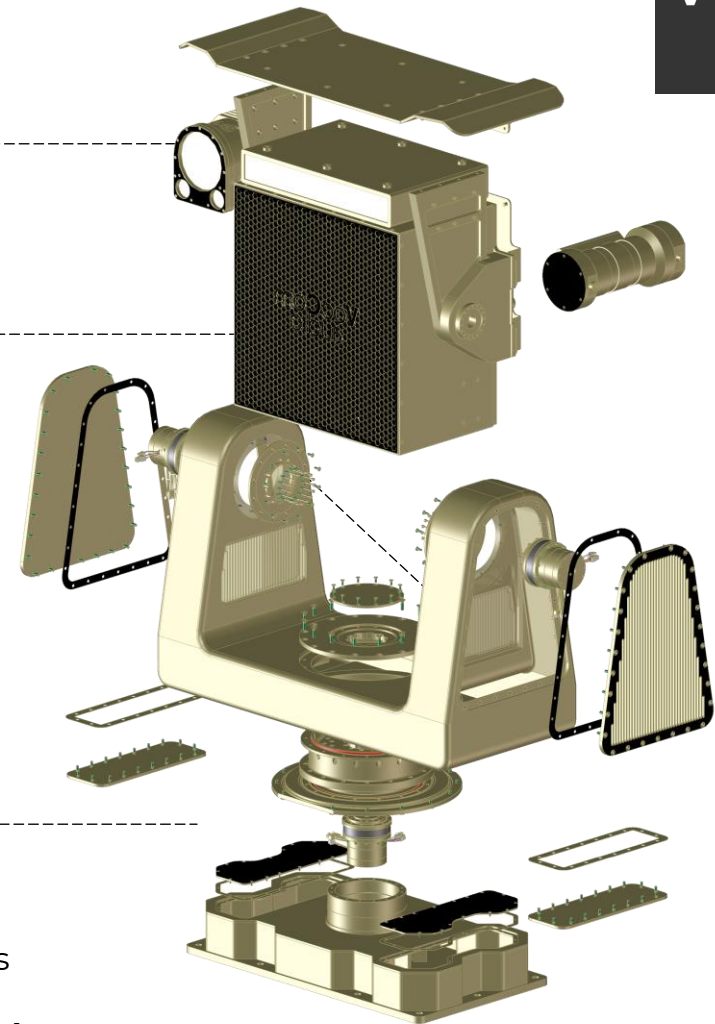
LOC

ACOUSTIC HAILER

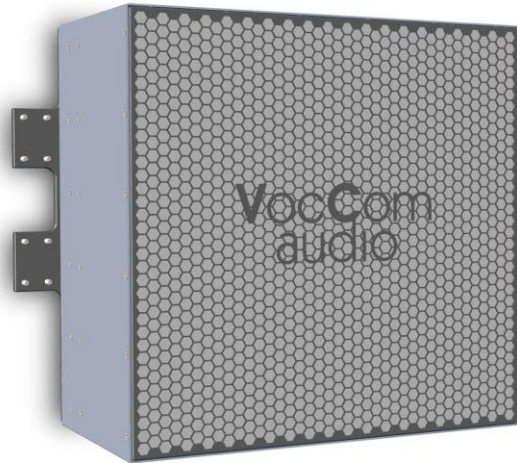
SPL max: **151 dB @ 1m**
SPL peak: **156 dB @ 1m**
Usable range **up to 2 km**

STABILIZED PAN-TILT

HxWxD: **855 x 800 x 600 [mm]**
Weight: **120 Kg FULL PAYLOAD**
Carbon fiber structure
IMU stabilization
360° continuous rotation on pan axis
+/-80° on tilt axis
Rotational speed up to **60°/s full load**
Double TILT motor



ADJUSTABLE BEAM POWERFUL ACOUSTIC HAILER



SPL max: 151 dB @ 1m

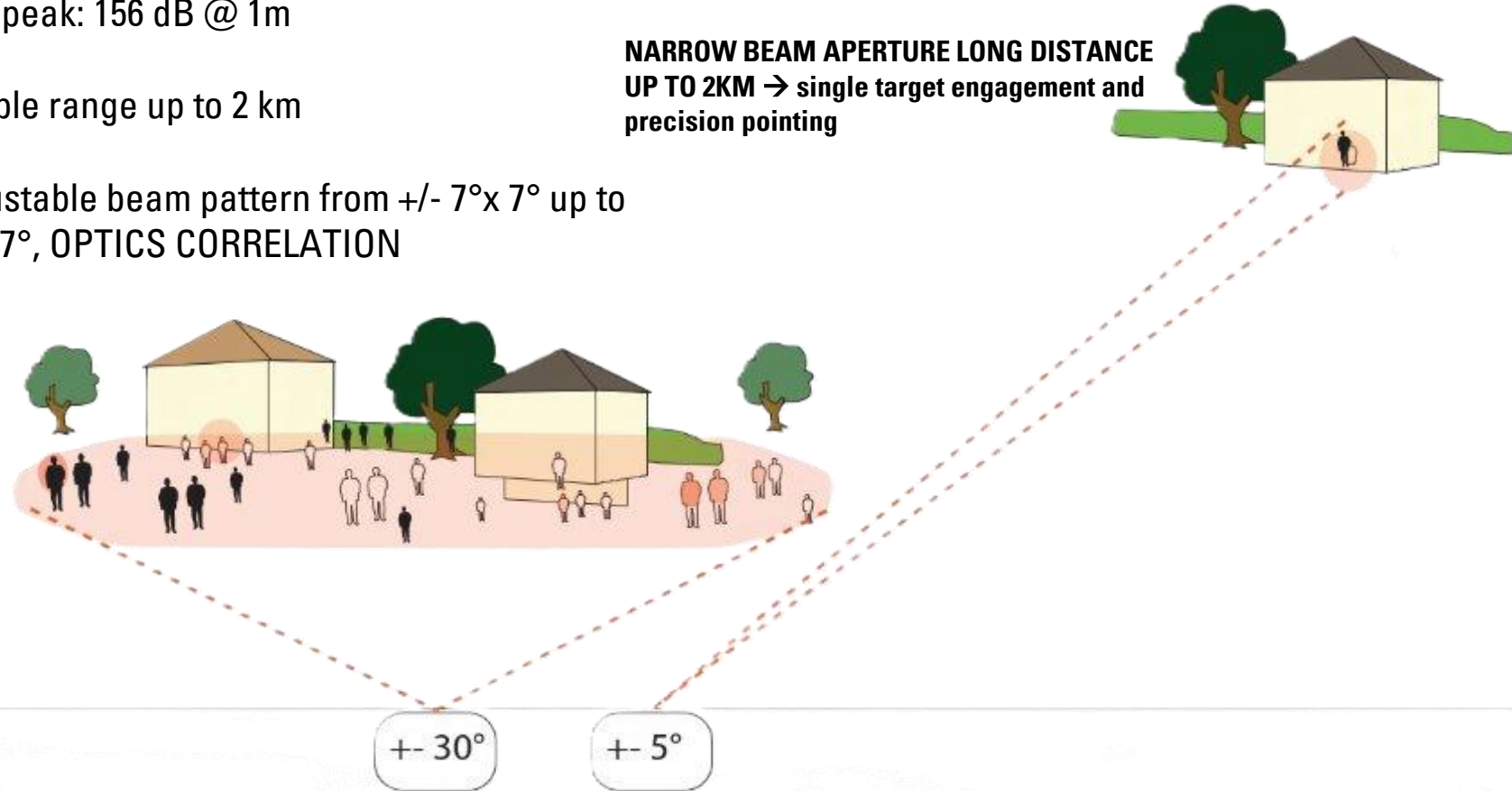
SPL peak: 156 dB @ 1m

Usable range up to 2 km

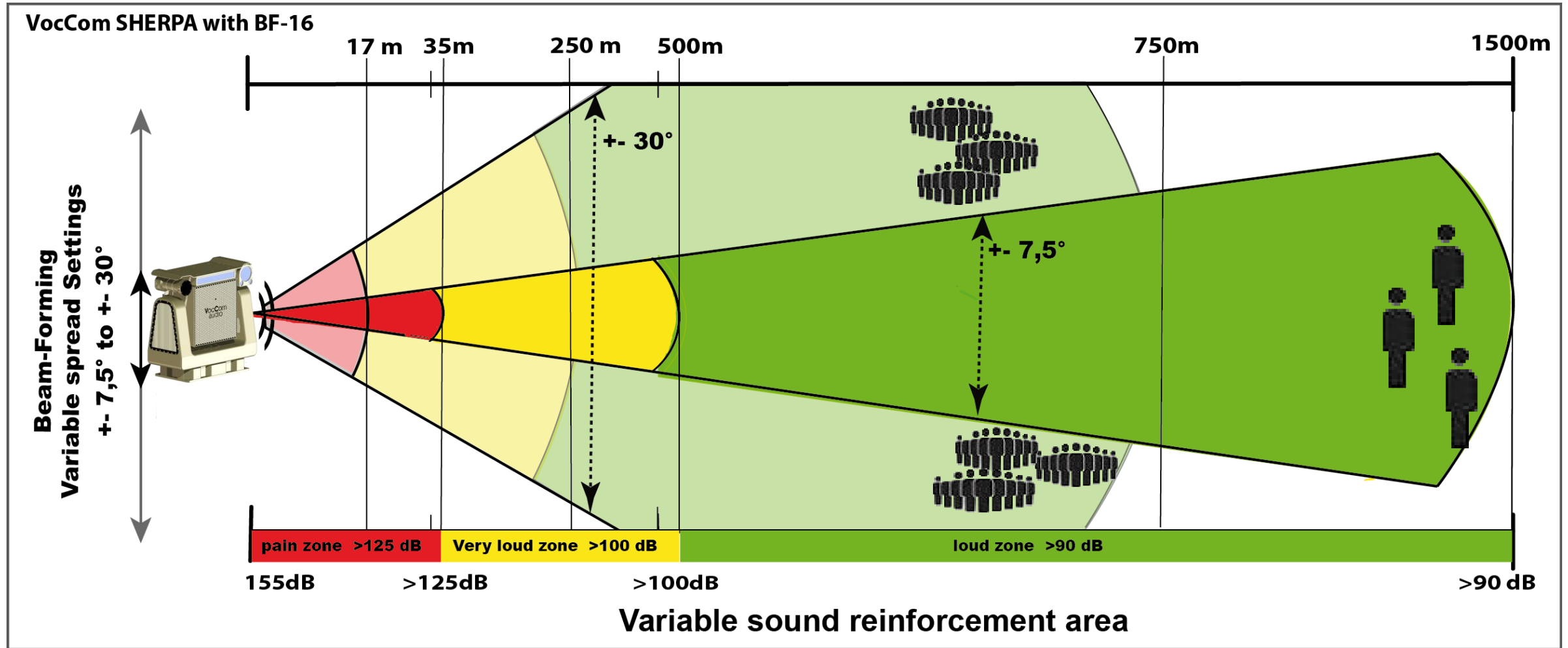
Adjustable beam pattern from +/- 7°x 7° up to 70°x7°, OPTICS CORRELATION

NARROW BEAM APERTURE LONG DISTANCE
UP TO 2KM → single target engagement and precision pointing

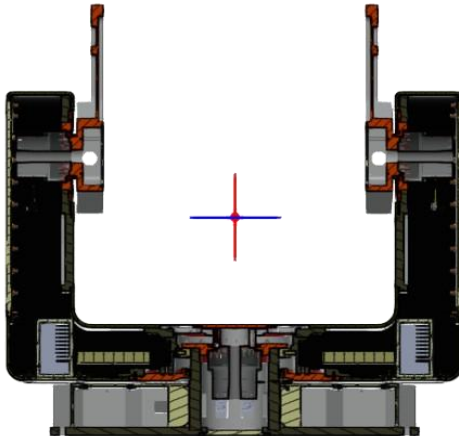
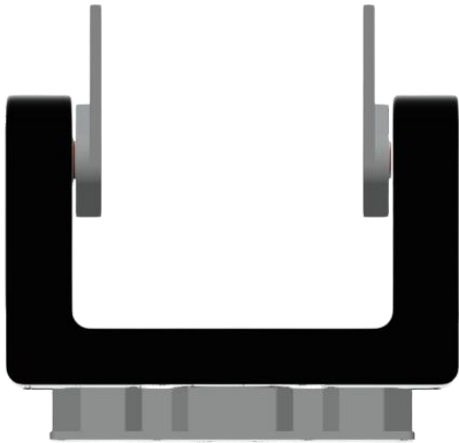
WIDE BEAM APERTURE IN PROXIMITY 250-500M
→ multiple targets at once



ADJUSTABLE-BEAM-POWERFUL ACOUSTIC HAILER



PAN TILT U-SHAPE PLATFORM



Dual axis movement on pan and tilt:

- **360°** continuous rotation on the pan axis
- **+/- 80°** rotation on the tilt axis

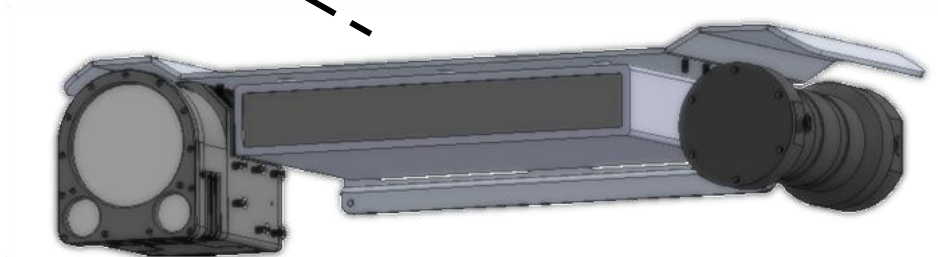
Positioning accuracy: 0.002°

Maximum speed: 60°/s on both axis FULL PAYLOAD (200 °/s no load conditions)

Stabilization against roll and pitch motion embedding a stand alone Inertial Motion Unit

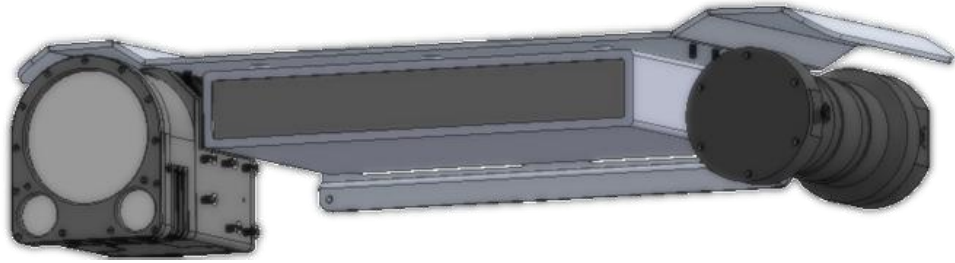
External interface with Ship's Gyro or Vehicle GPS synchronization

EO UNIT



Modular electro-optical system designed to meet "remove and replace" principles and "plug and play" concepts, with customizable composition of the following components:

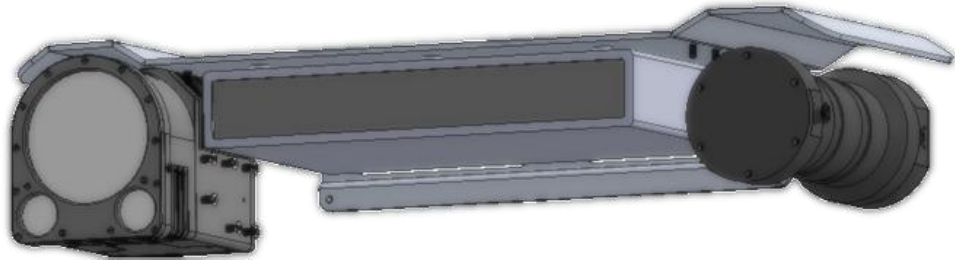
- Green laser dazzler**
- Searchlight**
- HD camera**
- IR camera**
- Laser range finder**



LASER RANGE FINDER

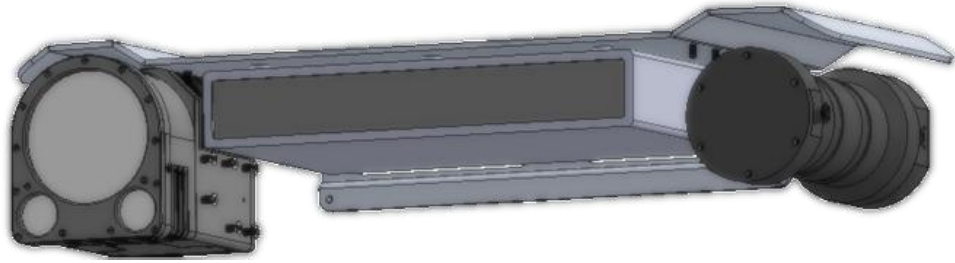


- Eye-safe type laser, class 3b iaw IEC 60825-1 for target distance measurements
- Maximum range $\geq 3500\text{m}$
- Range performance on $2.3\text{ m} \times 2.3\text{ m}$ NATO target size $\geq 3\ 000\text{ m}$
- Measurement accuracy $\geq \pm 3\text{ m}$



HD CAMERA

- full HD type (1080p) CMOS base with stabilized image
- 1920x1080 resolution with motorized zoom
- 30x enhanced optical motorized zoom



SHUTTERLESS THERMAL CAMERA



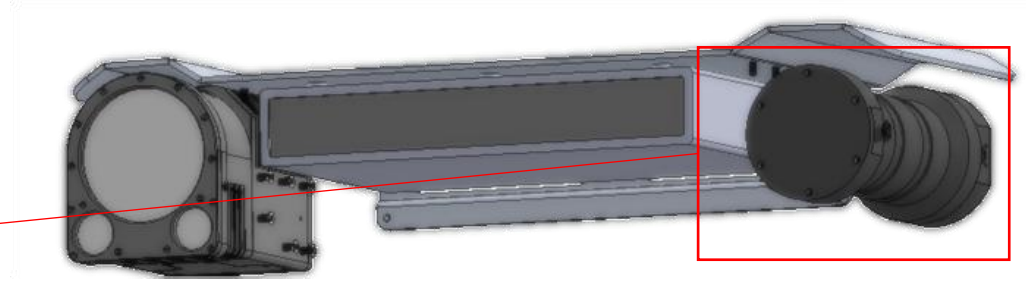
LWIR options

- Minimum frame rate 30fps
- Spectral range from 8 μ m to 14 μ m
- Sensitivity (NETD) <50 mK (normalized at f/1.0)
 - Minimum resolution of 640x480
- **Shutterless** with on-board Non-Uniformity Correlation (NUC)
- Array operability > 99% with on-board bad-pixel replacement

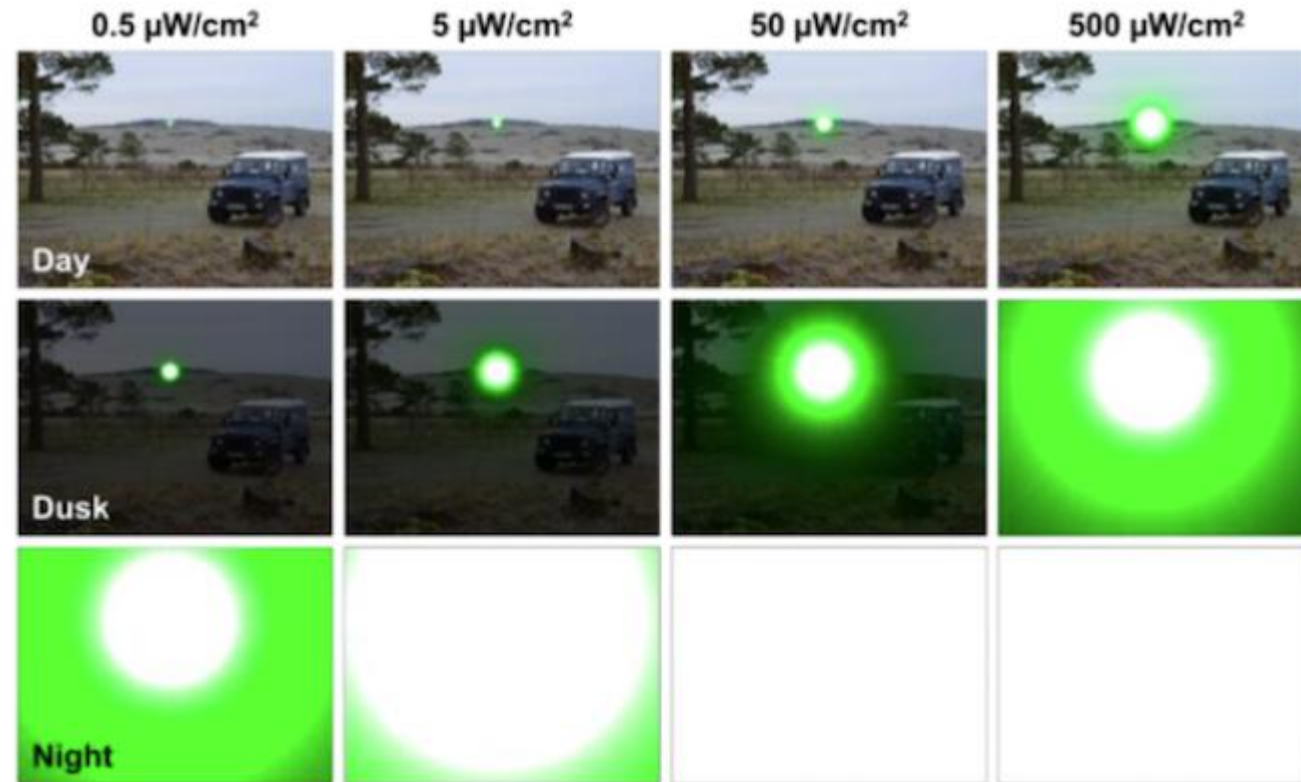
SWIR options

- Minimum frame rate 30fps
- Integration type snapshot
- Spectral range from 900nm to 1700nm
- Array operability > 99% with on-board bad-pixel replacement
- On-board Non-Uniformity Correlation (NUC)
 - Integrated cooling system
 - Minimum resolution of 640x512

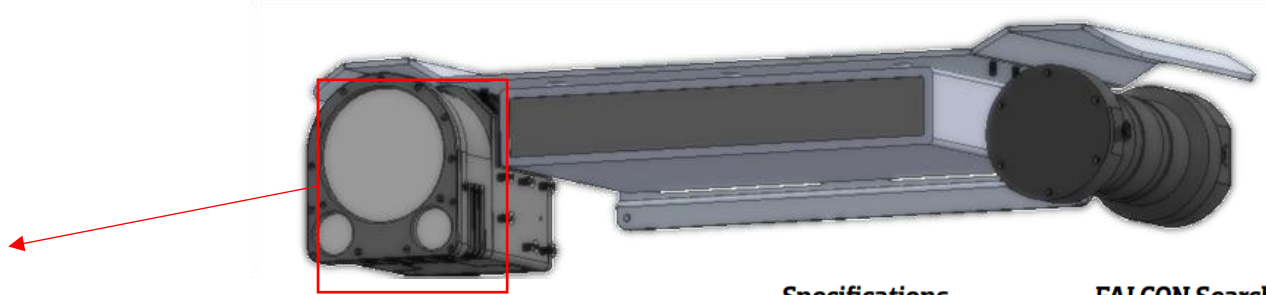
LASER DAZZLER



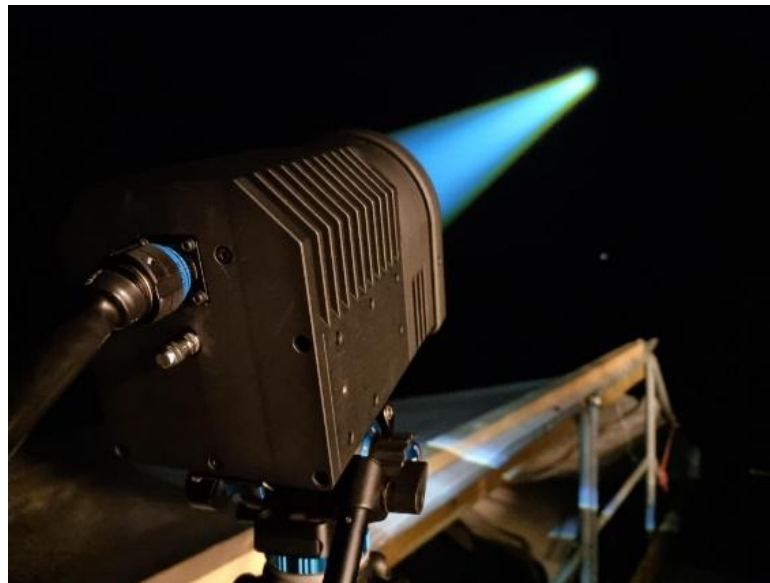
- Laser, class IV iaw IEC 60825-1 for target visual deterrence
- Power up to 5W (lower power versions available on request)
- Wavelength: 520nm - 532nm of the visible spectrum
- Divergence $\leq 6\text{mrad}$



SEARCH LIGHT



Based on Light
Excited Phosphor
state of the art
Technology



Specifications	FALCON Searchlight/Dual laser illuminator	
Bezel diameter	140 mm	
Length	230 mm	
Weight	6 000gr / 6,0 kg	
Input range (DC)	18-32V	
Power consumption	Max 130W, depending on configuration	*6000 lumen Led FLOOD option -> 100W
Surface treatment	MIL DTL 5541 51 Type II Class 1A, Class 3 on request	
Luminous intensity	15.000.000 cd	0,25 Lux @ 7746 m
Divergence	1° - 40°+	Adjustable FOV (Flood light > 30°)
IR Laser illuminator	3° Degrees / 52,4 mrad	860nm , Class 3B 499 mW, NOHD TBD
Green laser module	12 mrad laser dazzler	520nm , Class 3B 499mW, NOHD TBD
Range	0,25 Lux @ 7746 m	Pr ANSI/PLATO FL1 2016)
Output modes	Constant/strobe	Programmable
Working temperature	From -33°C to 60°C	MILSTD-810G
Interface	RS232/RS422/Ethernet	
Water resistance	IP67	
Color temperature	6000 Kelvin	

SHERPA CONTROL UNIT

- Custom control console
- Integration in vehicle control via API
- Integration in CMS (Combat Management System)
- Audio-, video- and control over 1x Gbit-Ethernet





The **SHERPA control console** embeds a custom in-house developed software for the bridging of the camera sensors with the control console allowing:

- Real time hardware video coding/decoding
- State of the Art technology based objects tracking system (generally coupled with product dedicated mechanical axis)
- Multiple video feed managing capability
- High performances allowed by a dedicated Neural Network

The **Sherpa software console** is the product of years of research on technologies based on artificial intelligence applied to image processing.



The **SHERPA control console** embeds a custom software for the bridging the camera sensors with the control console allowing:

- Performing **tracking functionalities** through the video stream from day and thermal camera, it shall be possible to select, engage and keep tracked the target selected by the operator locally or in integrated mode (CMS) of operation allowing the laser and acoustic emitter a correct aiming
- **AI-based target classification**, recognizing ships, people, and small boats (e.g., RHIBs) - (optional)
- **Multispectral images registration** (Visible, LWIR, SWIR) - (optional)
- **Simultaneously and correspondingly adjusting both the day vision camera FOV and the acoustic emitter beam aperture range based on the zoom functionality**
- Managing and modifying a **database of predefined phrases** for transmission via the acoustic emitter
- **Autofocus/Autozoom while tracking** over daylight camera - (optional)



(a)



(b)

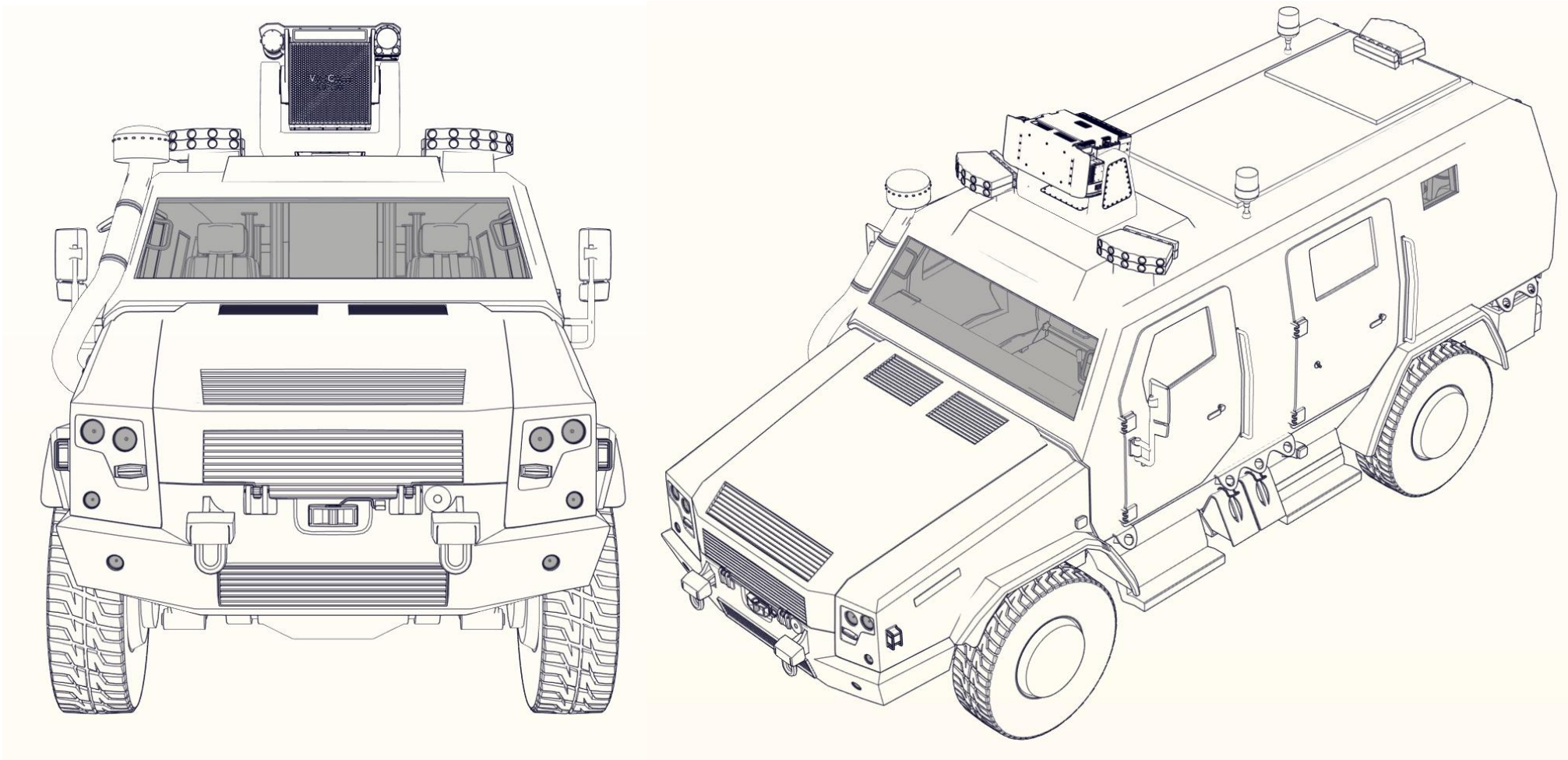
REMOTE CONTROL THROUGH PRIVATE 5G TACTICAL CELL COMMUNICATION



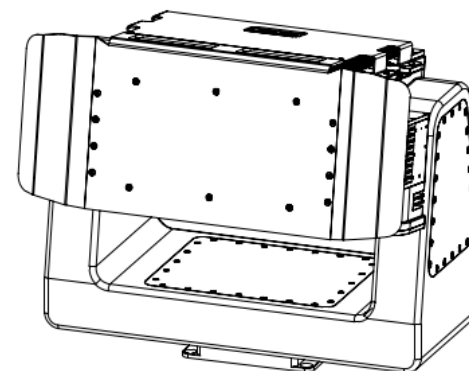
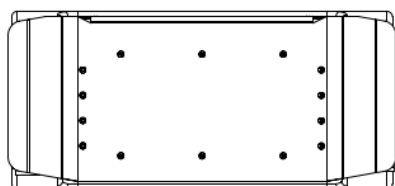
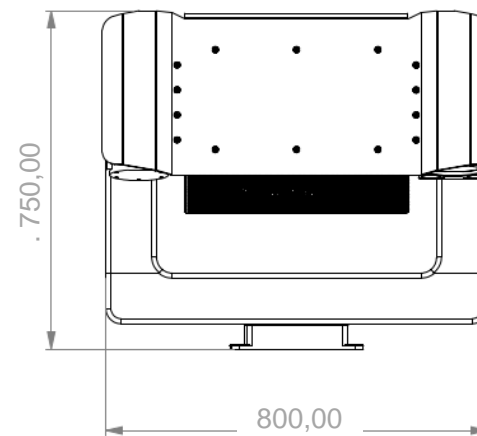
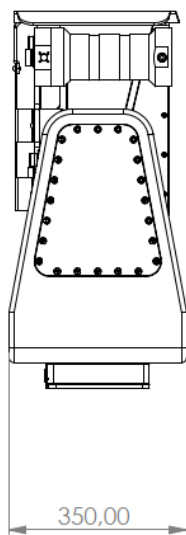
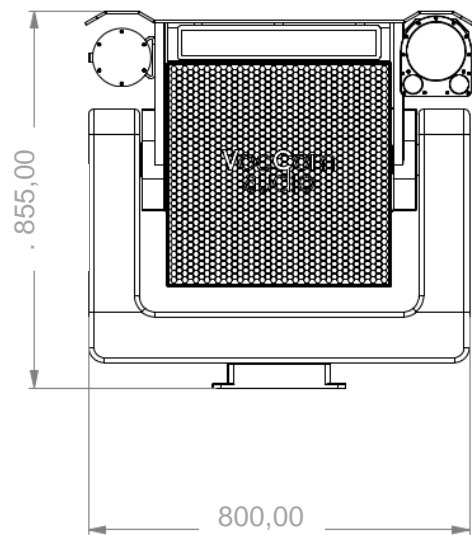
Tactical 5G module for communication through private network within 3Km depending on the line of sight with anti-spoofing and anti-jamming equipment, also allowing interactions with other user equipment.



TYPICAL VEHICLE INSTALLATION



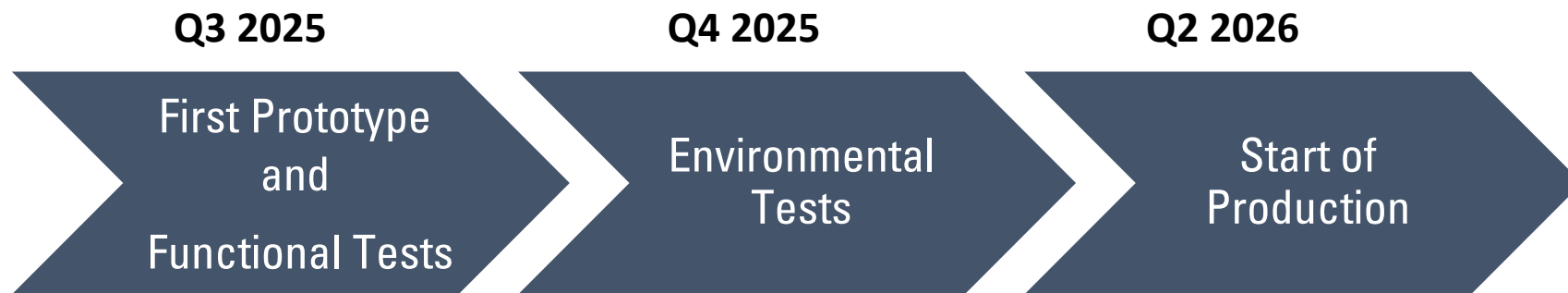
MECHANICAL DIMENSIONS



VERIFICATION AND QUALIFICATION TESTS

- AHD acoustic tests
- EMI laboratory tests (MIL-STD-461G, Class A4)
- Magnetic susceptibility (MIL-STD-461G)
- Humidity (MIL-STD-810G CHG1, Method 507.6 Proc.II Aggravated Cycle)
- Rain (MIL-STD-810G CH1, Method 506.6 Proc. I)
- Salt Fog laboratory test (MIL-STD-810Gw/CHANGE Method 509.6)
- Shock tests (MIL-S-901D)
- Humidity (MIL-STD-810G CHG1)
- Wind stress conditions tests
- Vibration tests (MIL-STD-167-1A)
- Air and structural noise (MIL-STD-740-1, Grade A3)
- Watertightness tests (IP67 ingress protection grade)

TIMELINE





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