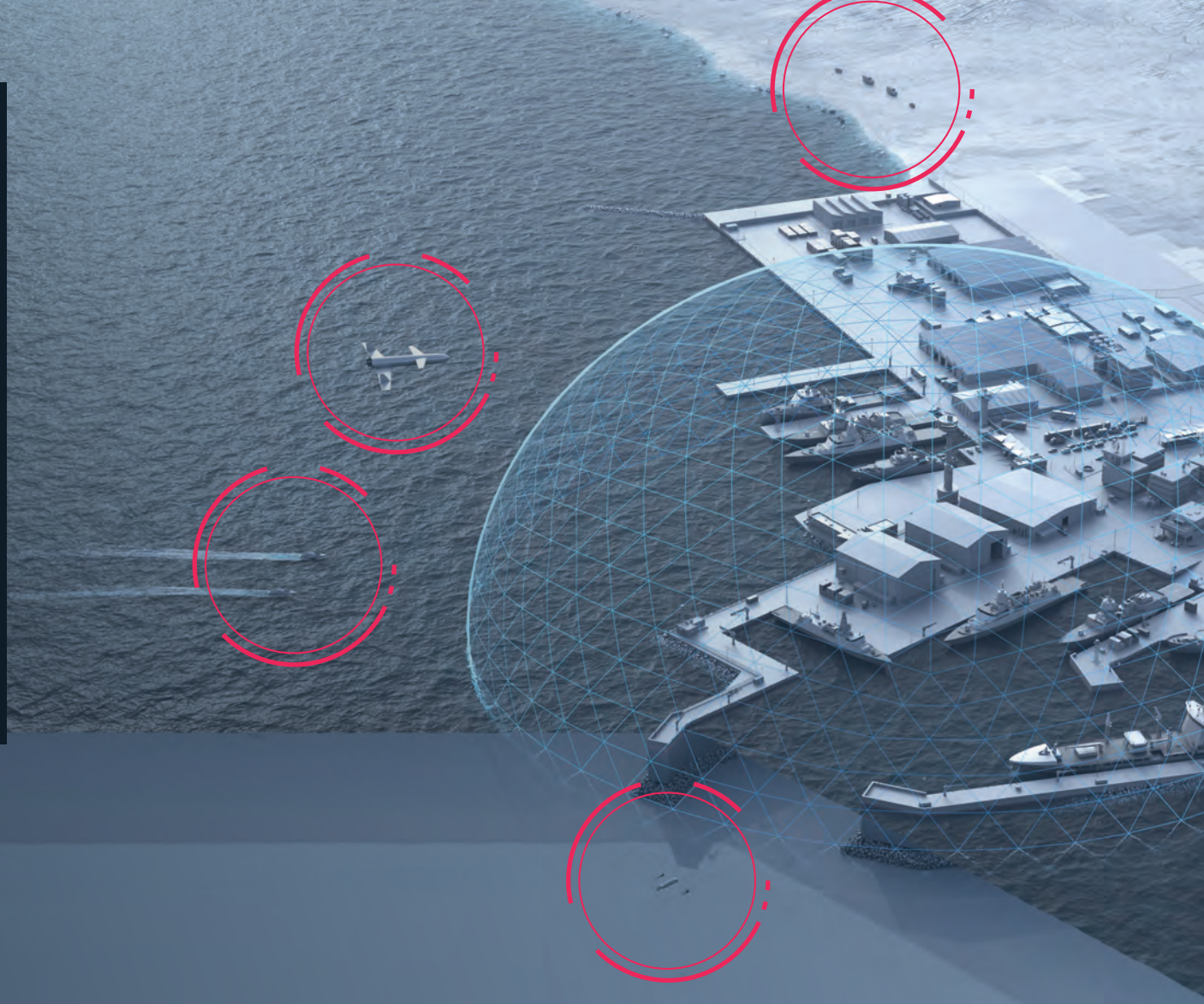
NiDAR™ 4D

MULTI-DOMAIN SURVEILLANCE
& PROTECTION

marss.com

MARSS

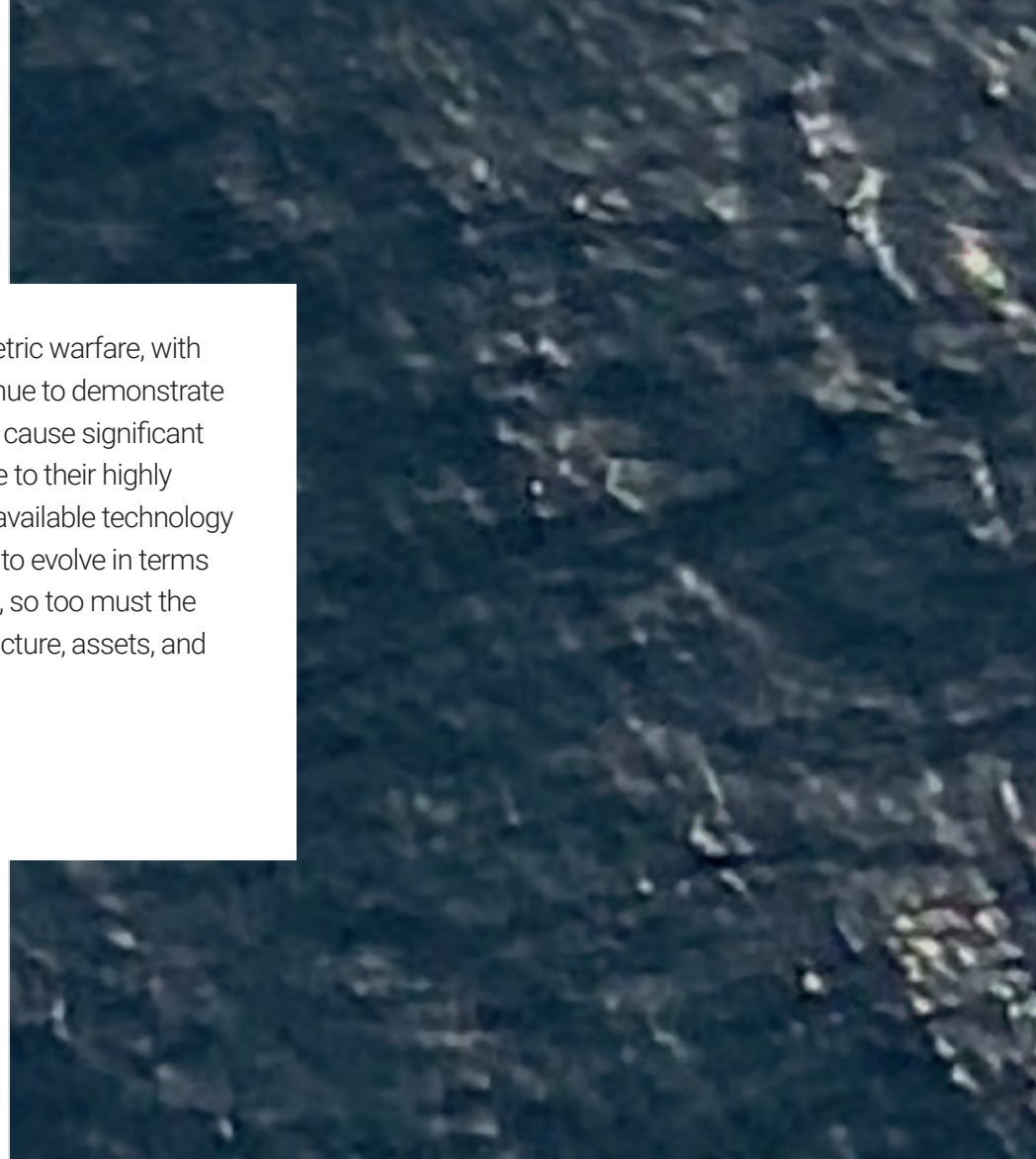


NiDAR™ 4D


MARSS

THE WORLD'S FASTEST EVOLVING THREAT...

Unmanned Systems (UxS) represent an operational step-change in asymmetric warfare, with the ability to strike in any domain - air, land, sea, and underwater. They continue to demonstrate an ability to exploit gaps in conventional defenses' intel and surveillance and cause significant damage to national infrastructure and strategic resources. This is largely due to their highly effective autonomous hunt and attack capability. Constructed from readily available technology and easily accessible by hostile forces due to low cost, this threat continues to evolve in terms of autonomy, range, and destructive payload. As offensive measures evolve, so too must the defense of the those tasked with protecting critical civil and military infrastructure, assets, and people.



UAS THREAT CATEGORIES

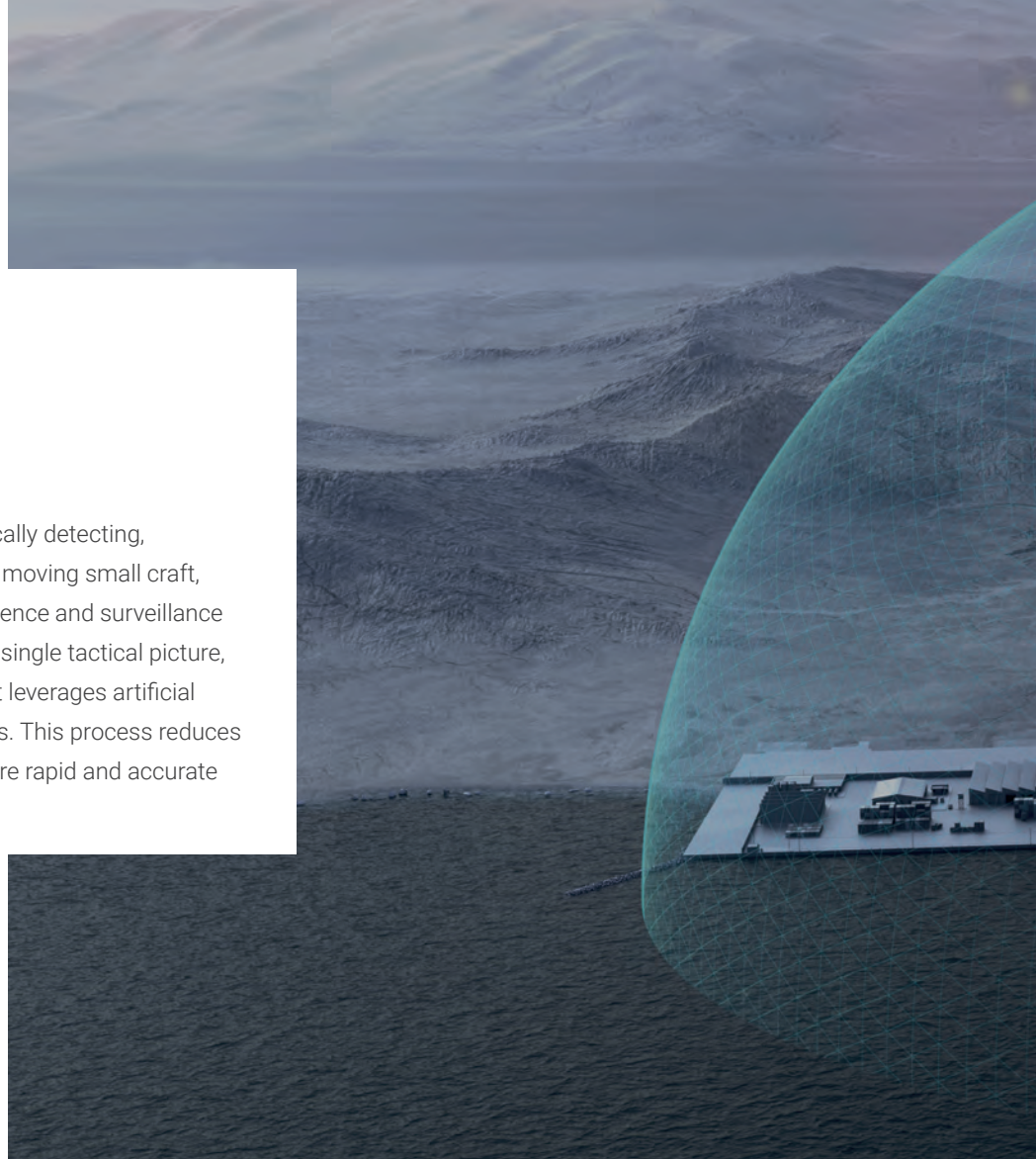
								
Category	Micro	CAT I	CAT II	CAT III 150kg - 600kg	CAT IV >600kg	UGV	USV	Subsurface
Altitude	200ft AGL	3,000ft AGL	5,000ft AGL	18,000ft AGL	65,000 ft MSL	N/A	N/A	100ft
Payload	200 g - 2 kg	2 kg - 20 kg	20 kg - 150 kg	>150 kg	>600 kg	N/A	N/A	N/A
Radius	5 km LOS	>25 km LOS	>25 km LOS	<200 km LOS	Unlimited BLOS	>100KM	>200KM	>200KM
Deployment	Hand deployed, ISR mission	Hand deployed, loitering munition	Hand deployed, loitering munition	Tactical formation	Operational theater	Operational Theatre	Operational Theatre	Operational Theatre

The fastest growing threats to national security

INTRODUCING NiDAR 4D

MULTI-DOMAIN PROTECTION, ACROSS AIR, LAND, SEA AND UNDERWATER

NiDAR 4D is a turnkey solution for surveillance and infrastructure protection, automatically detecting, classifying, and responding to multi-domain asymmetrical threats – aerial drones, fast moving small craft, divers and mini-submarines. MARSS core technology, NiDAR integrates several intelligence and surveillance streams (sensor fusion) to create operator situational awareness. Consolidated into a single tactical picture, multi-domain information is viewed and controlled via an easy-to-use C4i interface that leverages artificial intelligent's (AI) superior threat recognition, alerting users to only mission-critical events. This process reduces operator burden and human factors and increases decision-support that leads to a more rapid and accurate response.



NiDAR 4D FEATURES/BENEFITS

INTEGRATES STATE-OF-THE-ART SENSORS

Several surveillance and intelligence streams work together in unison for real-time operator situational awareness

FULLY MODULAR AND SENSOR AGNOSTIC

Integrates with existing systems or latest sensor solutions. Highly scalable with growth capability based on requirements

24/7, 360-DEGREE PROTECTION

NiDAR is always on alert, monitoring for UAS threats day and night, protecting from all approaches, reducing human factors or errors

UTILIZES NIDAR AI ENABLED TRACKING

NiDAR AI optimizes radar detection and camera positioning to track fast moving UAS, ensuring operators alway have a prime view of the threat

HARNESSES AI THREAT RECOGNITION

Analyses object pattern behaviour (over 1000 objects known), ensuring operators are only alerted to critical events

INTUITIVE USER INTERFACE

Complex information is made simple, controlling multiple data sources with AI enabled decision-support. Includes blue force tracking

ACQUIRES DATA FROM PAST EVENTS

Utilizing machine learning, system becomes even more efficient with use, logging UAS speed, approach and manoeuvrability

FULLY INTEGRATED COUNTERMEASURES

Fixed or mobile systems in both kinetic and non-kinetic solutions, capable of defeating fast, high manoeuvring targets with speed and accuracy.

NATIONAL AND MOBILE C2 UNITS

Enables communication centrally with remote and local operators. System available in 2 fully integrated mobile platforms

INSTALLATION, INTEGRATION & SUPPORT

All software, sensors and effectors installed and integrated by qualified engineers. Operator familiarization training available

LAYERED DEFENCE

MULTI-DOMAIN SURVEILLANCE AND SITUATION ANALYSIS: FROM DETECTION TO DENIAL, NIDAR C2 SHOWS YOU EVERYTHING AND GIVES YOU CONTROL.

DETECT

NiDAR C2 equipped with Radar and RF monitoring for detection of objects across land, surface and air. Live view of objects and accurate sensor diagnostics enables users to observe, monitor and protect assets.

AI IDENTIFICATION

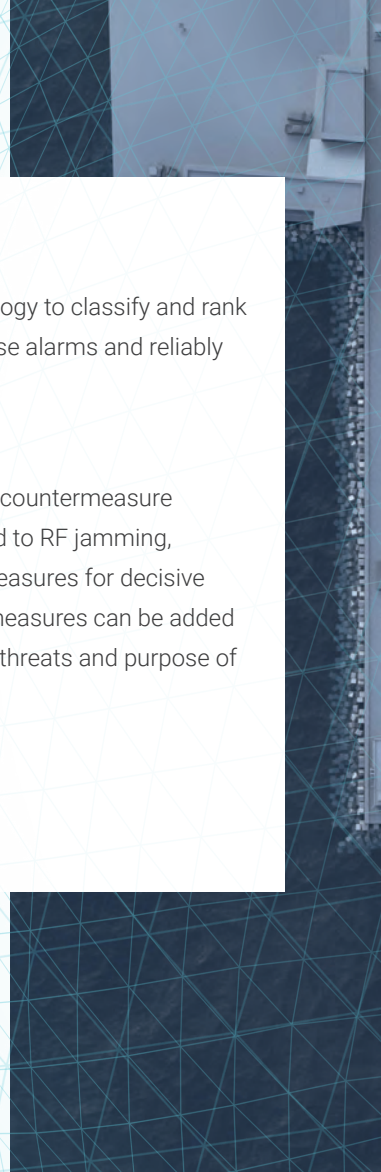
NiDAR's proprietary AI uses advanced algorithms, video and behaviour pattern recognition, object data points, event history analysis, RF signal monitoring and environment reports such as weather, location, and flight schedules to identify objects.

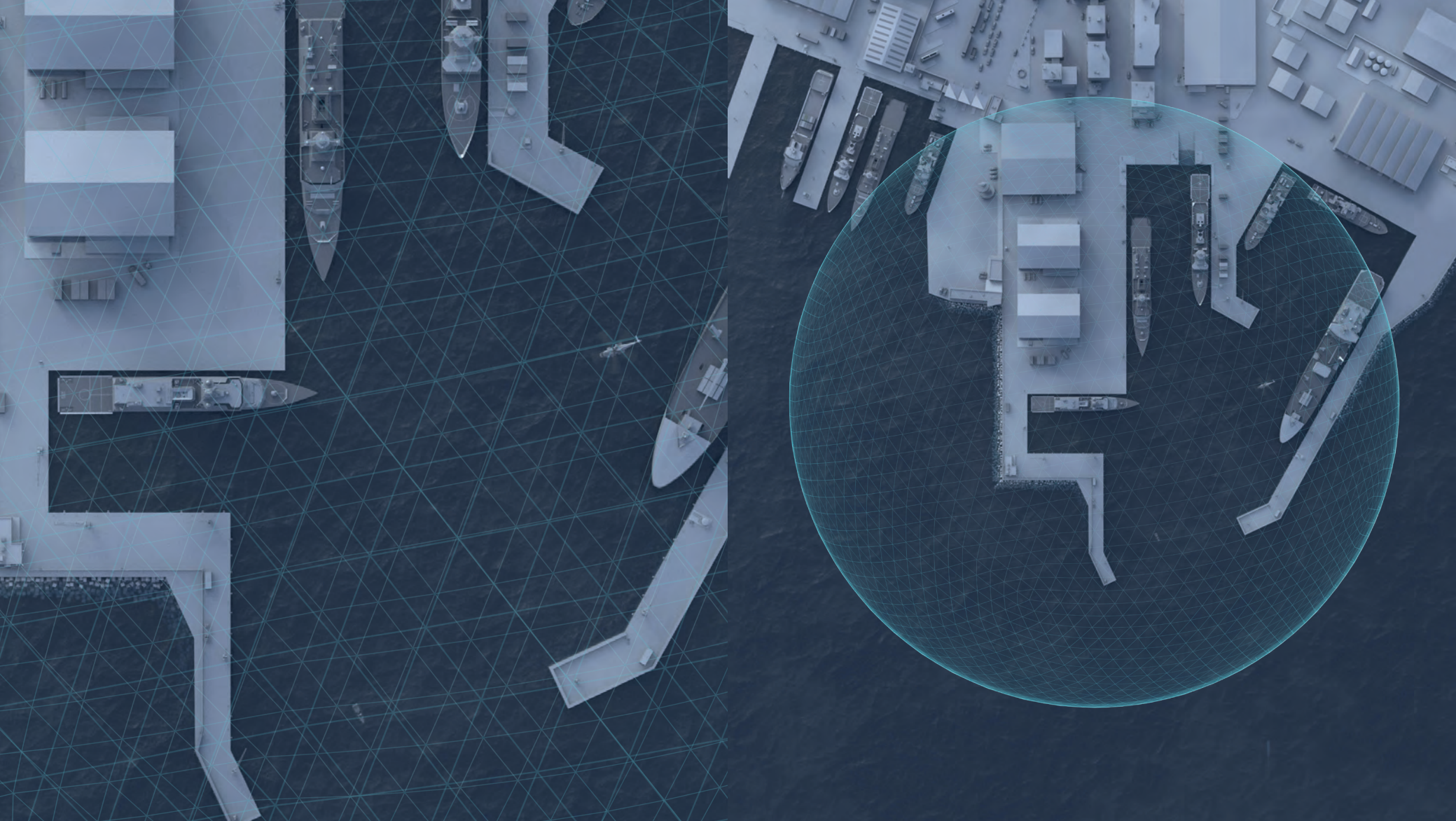
ALERT & MONITOR

Continuous surveillance technology to classify and rank potential threats, minimising false alarms and reliably projecting outcomes.

RESPOND

NiDAR's intuitive UI connects to countermeasure options including and not limited to RF jamming, GPS jamming, kinetic countermeasures for decisive elimination of threats. Countermeasures can be added to the system and expanded as threats and purpose of operations evolve.





CUAS RADAR

FEATURES / BENEFITS

Omnidirectional

4 fixed arrays 90˚ Az, 90˚ El

Modular design

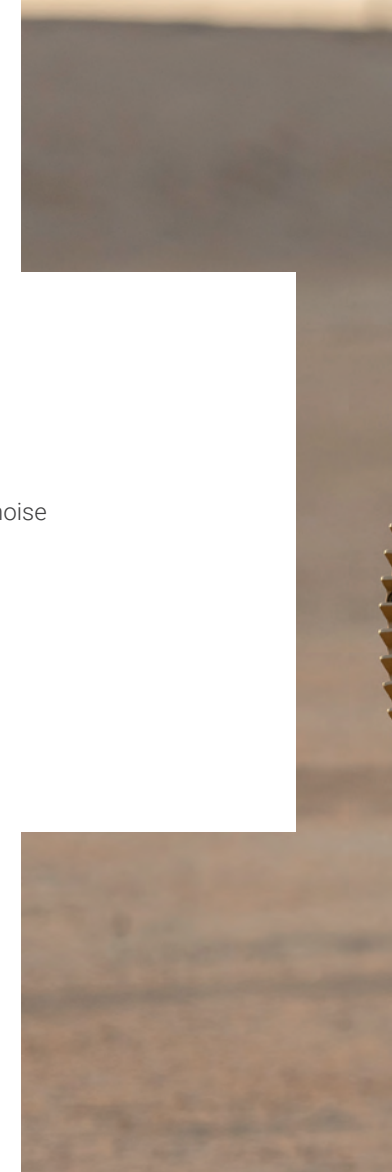
Various models, covering distances of up to 30km

Small contacts

High resolution, low doppler

Target classification

AI auto classification of birds/noise



TECHNICAL SPECIFICATIONS

Coverage	360˚, 4 fixed arrays each 90˚ Az, 90˚ El
Frequency	S-Band
Operating Temp	-40˚ to +55˚ (passive cooling only)
Model S Ranges	CAT2=15km; Transport Aircraf
Model M Ranges	CAT2=25km; Transport Aircraft=100km
Model L Ranges	CAT2=80km; Transport Aircraft=200km (c.2020)


MARSS

4D
MARITIME RADAR

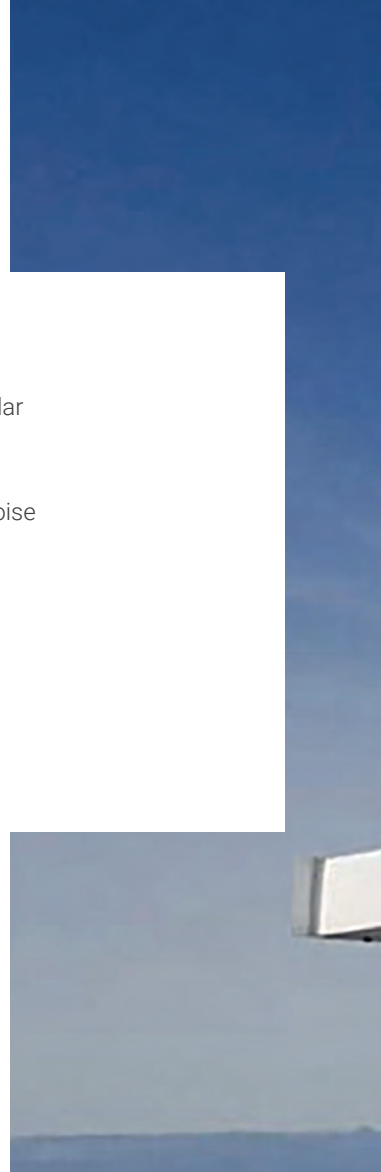
FEATURES / BENEFITS

Omnidirectional
360˚ fixed array

Small contacts
High resolution low doppler capability

Auto tuning
No need for operator to tune radar

Target classification
AI auto classification of birds/noise



TECHNICAL SPECIFICATIONS

Antenna	5.5 m, horizontalG: ≥ 36.0 dBi; H: ≤ 0.40° ± 0.02°; V:<16°6 to 25 RPM
Frequency	9.25 to 9.55 GHz
Operating temperature	-15 to +55 °C (can be extended to -25° to +55 °C
Size	330kg

CUAS ADSB, DJI, IFF DETECTION

FEATURES / BENEFITS

C2 Integration

Auto verification of radar contact

ADSB database check

Auto verification of ADSB history

DJI pilot finder

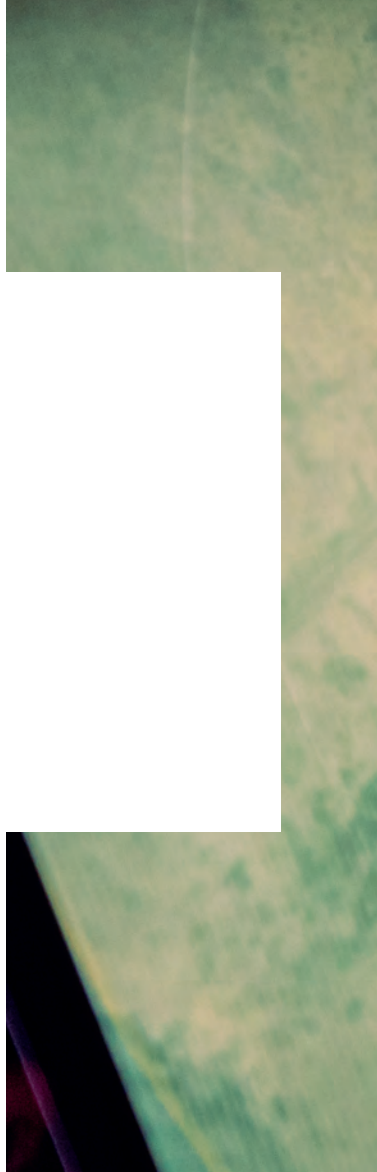
Location of DJI UAV pilot

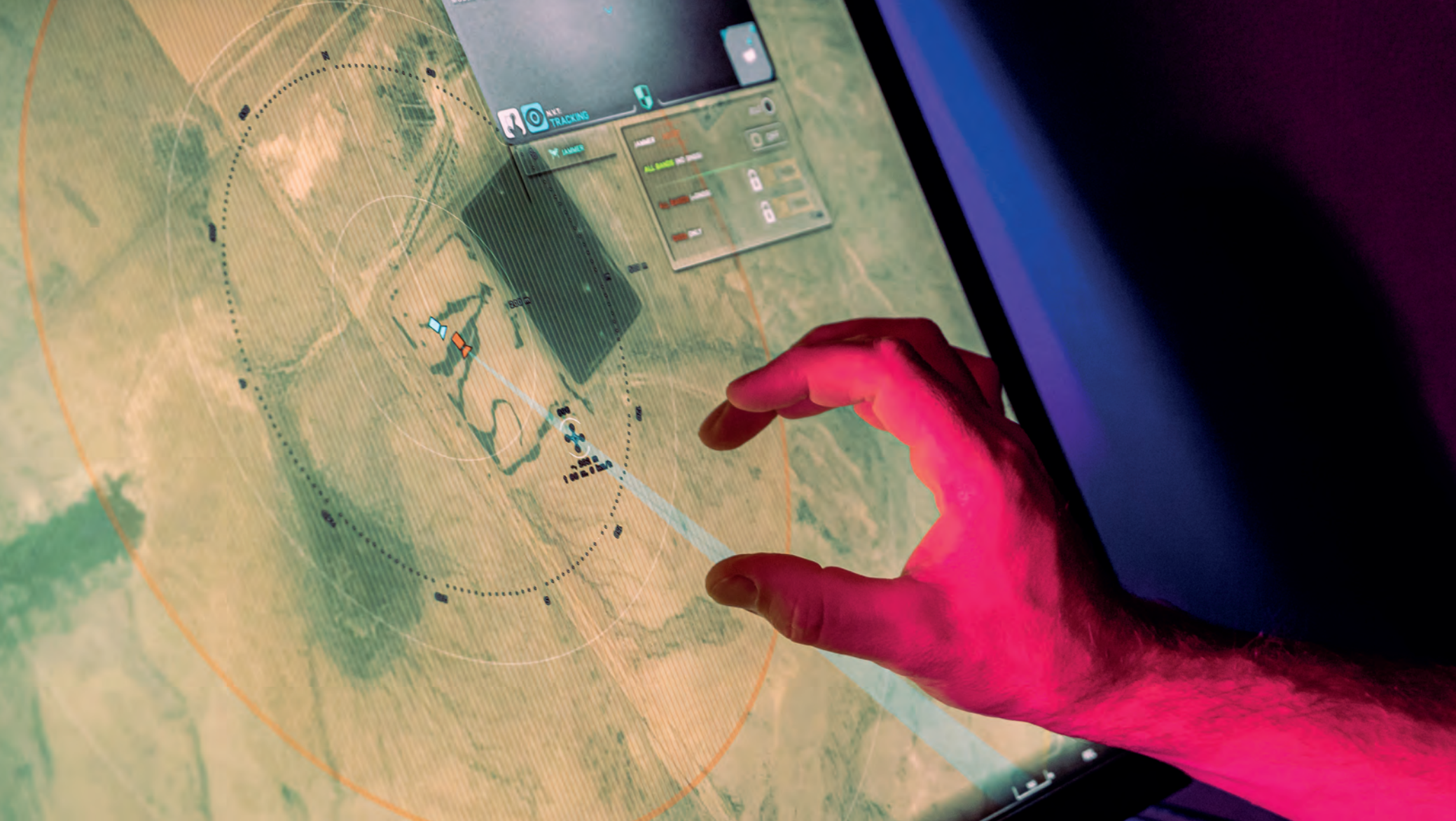
85% of COTS UAV

Standard drones covered

TECHNICAL SPECIFICATIONS

Working frequencies	978 MHz, 1030MHz, 1090 MHz, 2.4-2.5 GHz, 5.7-5.8 GHz
Detection range	ADSB = >50km/DJI = 8 or 16km




TRACKING
JAMMER

CUAS
RF DETECTION

FEATURES / BENEFITS

Detection/classification

Full 24/7 protection

Low Burden

No calibration, signal expertize or training required

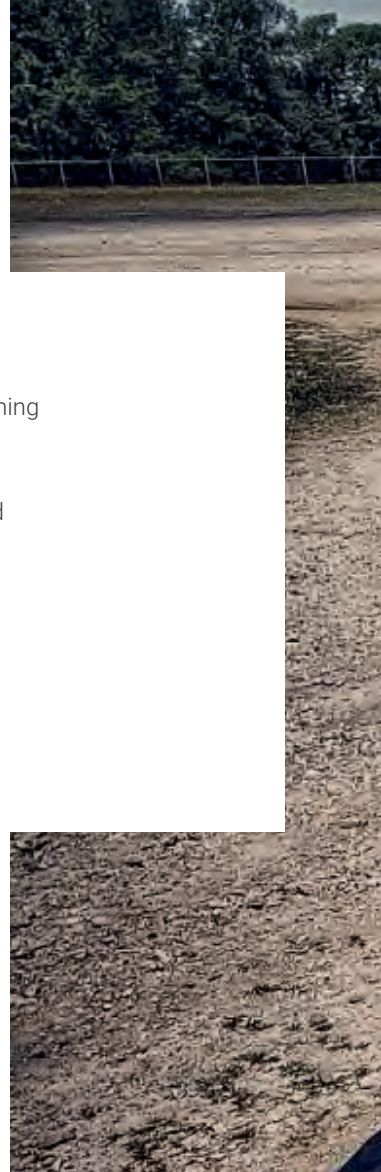
Smart jamming

Uses RF input for targeted jamming

Technically proven

98% of standard drones covered

TECHNICAL SPECIFICATIONS	
Control frequencies	Standard Kit: 2.4 GHz / 5.8 GHz / Wi-FiExtended Frequency Kit: 433 / 868 / 915 MHz / 1.2 GHz / Wi-Fi
Detection range	Up to 3km horizontal; 1,500 ft vertical (variable with noise floor & environment)
Antennas	Omni Bifilar & Quadrafilar (RX), Dual Band (TX), Wi-Fi (Dual TX/RX), GPS (RX)



CUAS AI
EO VERIFICATION

FEATURES / BENEFITS

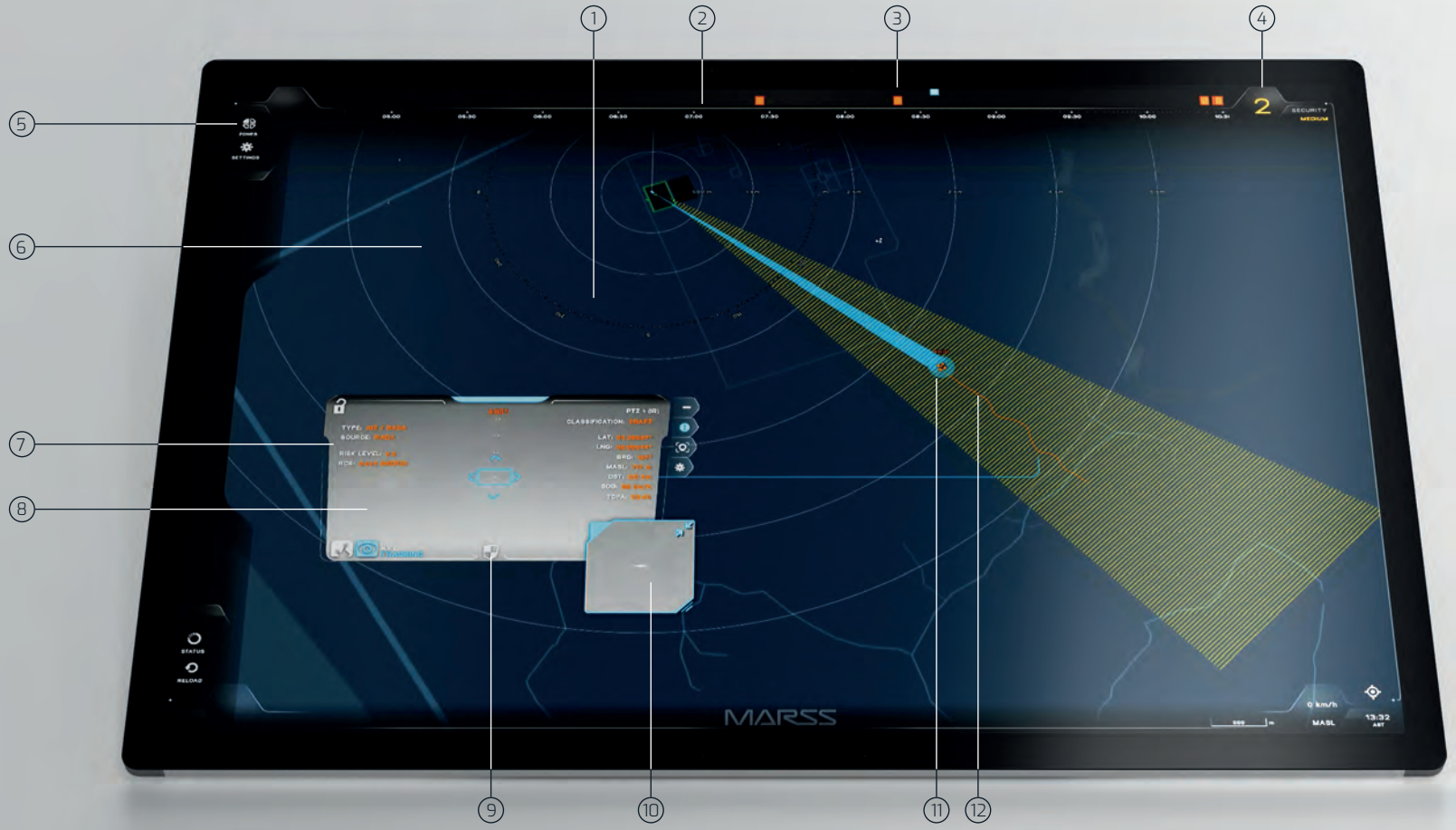
Auto slew to cue
C2 integration, no operator control needed

NiDAR AI image classification
Classes each object into 17 categories - bird, UAV, helicopter, airliner, tank, truck

Day & night
Cooled high-definition IR for 24/7 operation

Gyro stabilized
Operational in high wind or instable platforms

TECHNICAL SPECIFICATIONS	
Daylight camera	High definition daylight imager (1920x1080 5mp continuous zoom)
Infrared core	Cooled mid-wave infrared (MWIR) 3-5 µm Thermal Imager (1280 x 1024 pixel)
MX10 range	CAT2 detection ~14km
MX15 range	CAT2 detection ~20km


1
2
3
4
5
6
7
8
9
10
11
12
MARSS

NiDAR CUAS OPERATOR ALERT

1 MULTI-TOUCH CONTROL
Intuitive operation of sensors/effectors

2 EVENT TIME-LINES
Navigate documented events

3 ALERT RECORDS
Geo-located / time stamped data

4 SECURITY LEVELS
User defined based on threat scenario

5 ZONES & SETTINGS
Manage settings and protection zones

6 DETAILED MAP
Satellite image and electronic map

7 OBJECT IDENTIFICATION
Object/threat details including risk level

8 OBJECT MONITORING & INTEL
Critical data on object bearing

9 INTERACTIONS
Options to secure, monitor or engage

10 LIVE VIDEO FEEDS
Automated tracking/camera handover

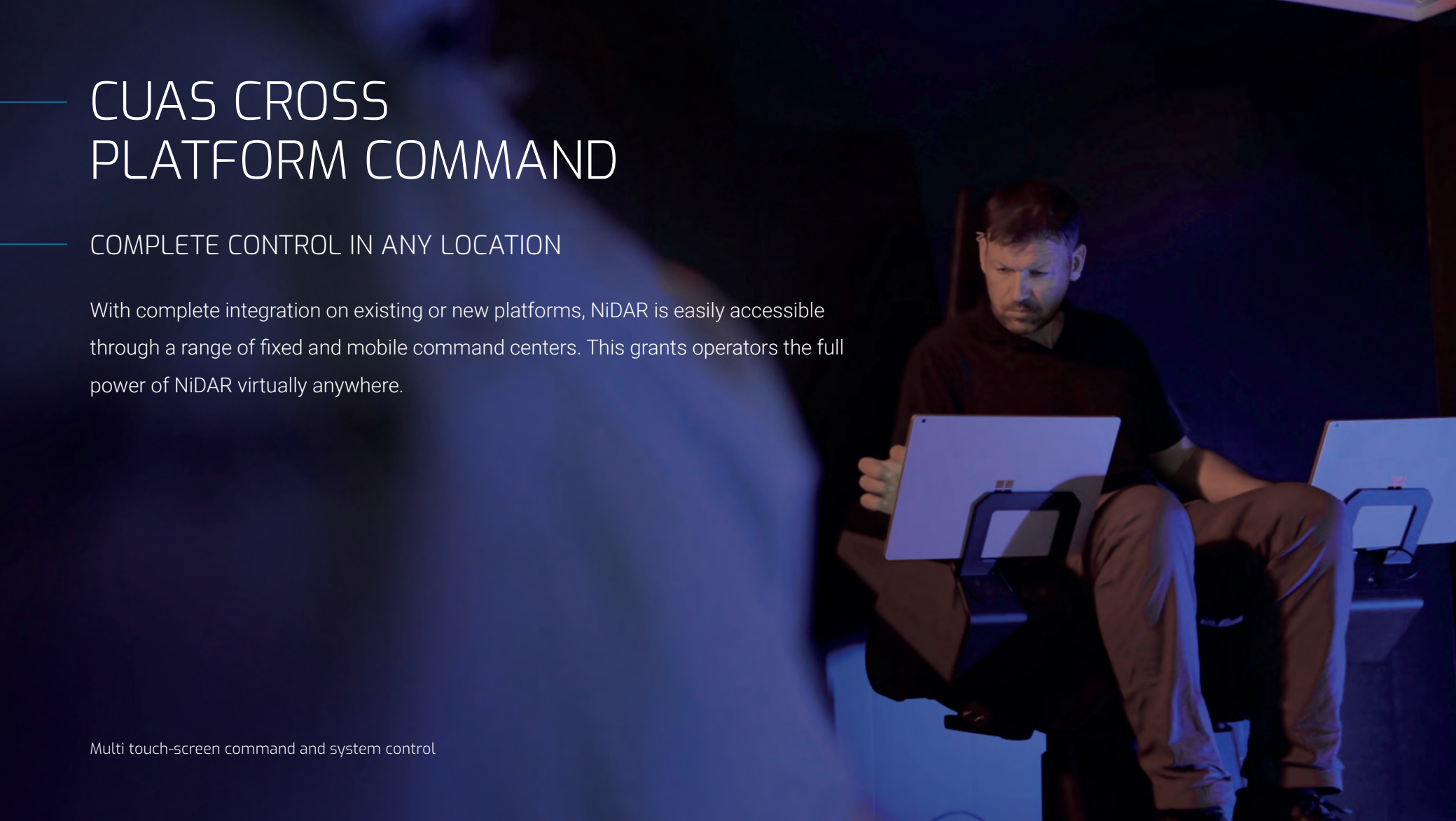
11 OBJECT LOCATION
Colour and icon coded object detection

12 PROTECTION ZONES
User defined warning and alarm zones

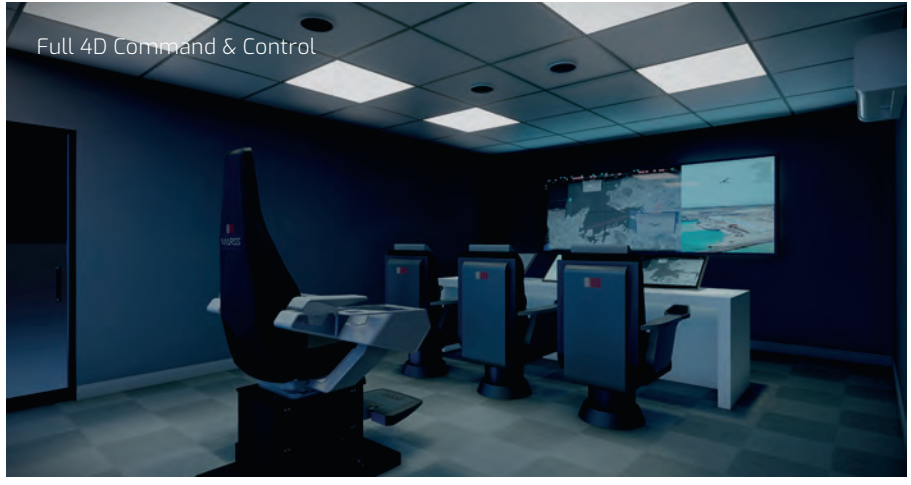
CUAS CROSS PLATFORM COMMAND

COMPLETE CONTROL IN ANY LOCATION

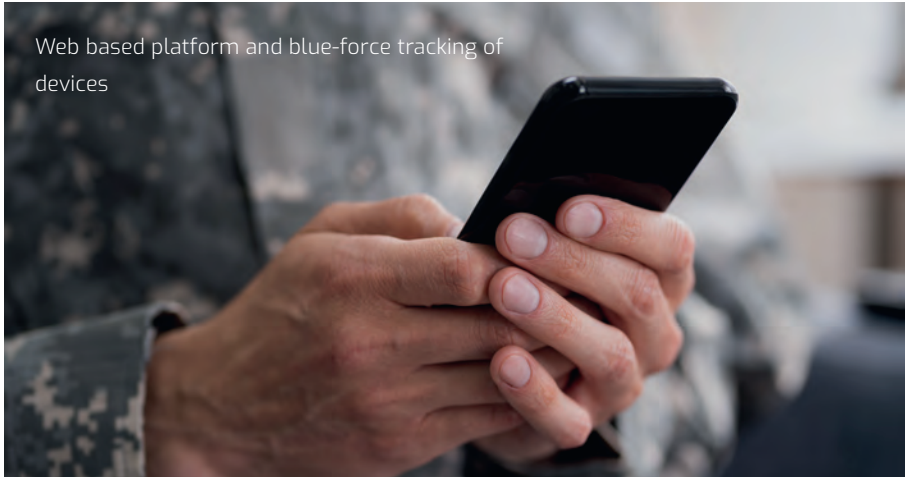
With complete integration on existing or new platforms, NiDAR is easily accessible through a range of fixed and mobile command centers. This grants operators the full power of NiDAR virtually anywhere.



Multi touch-screen command and system control



Full 4D Command & Control



Web based platform and blue-force tracking of devices

Complete 360° Command & Control

Modified vehicle, equipped with CUAS capabilities

CUAS RADIO FREQUENCY DENIAL

FEATURES / BENEFITS

Omnidirectional

360° protection, high to low frequencies

GPS jamming

Effective positioning system denial

UXV control jamming

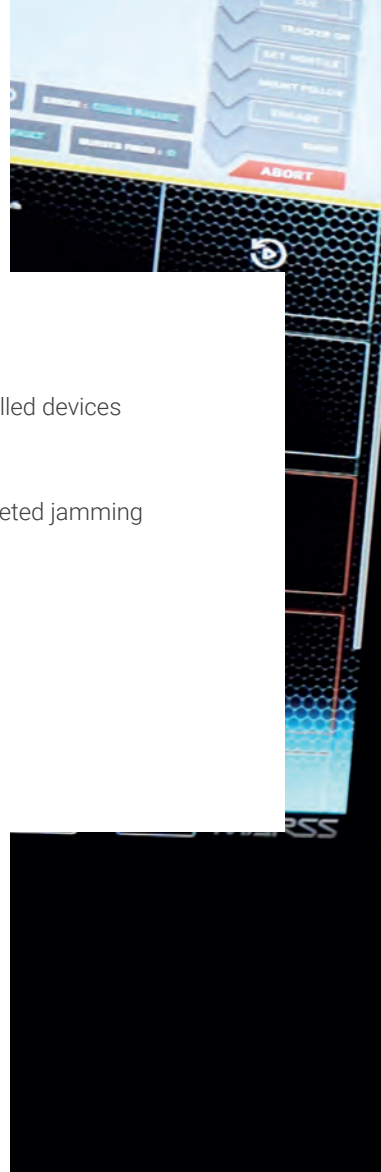
Denial of air/land remote controlled devices

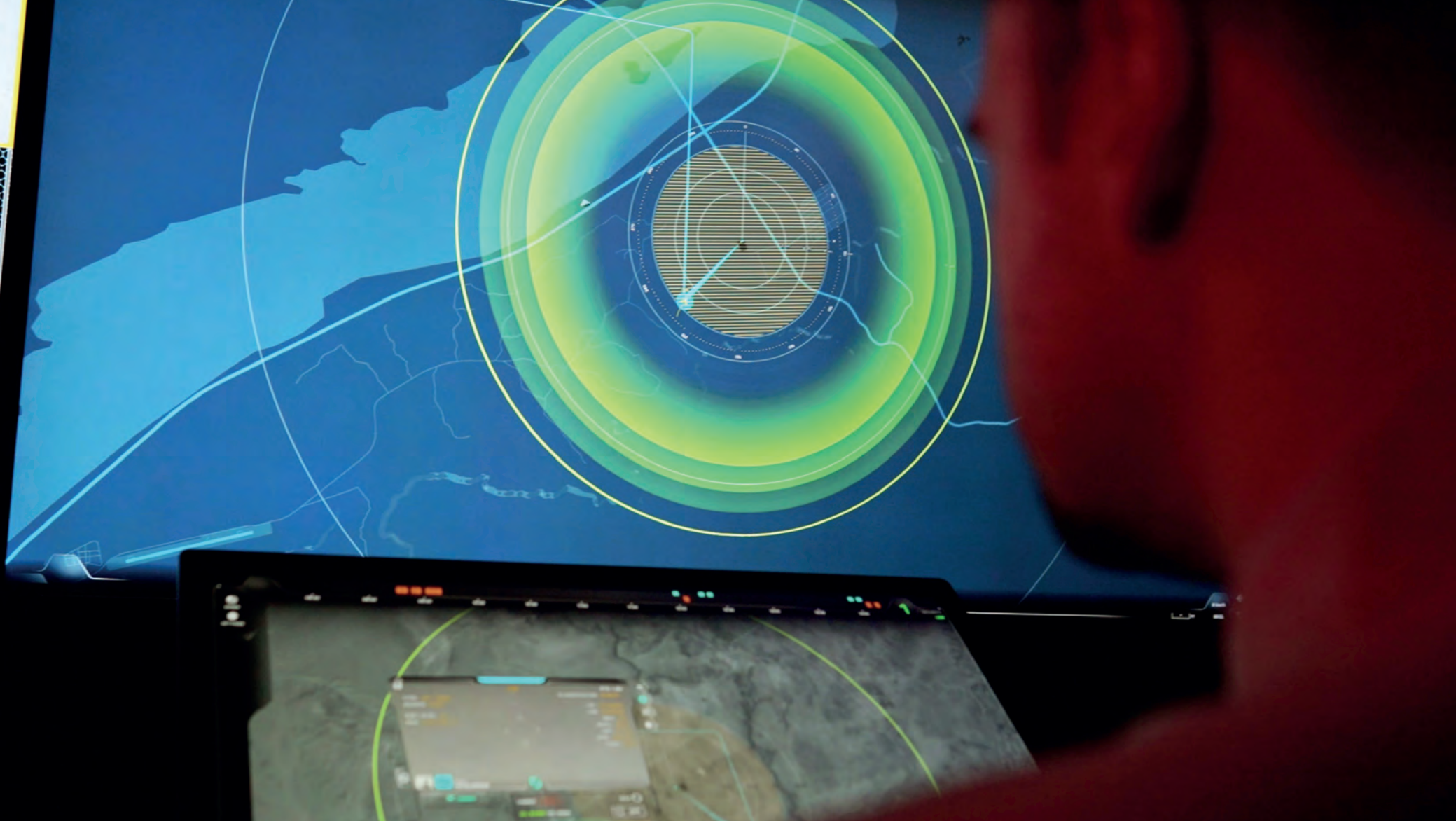
Smart jamming

Uses RF detection input for targeted jamming

TECHNICAL SPECIFICATIONS

Frequency range	20 MHz – 6 GHz including GPS jamming
RF Power outpup	Up to 500W
Voltage in	20–35V
Operating temp	-20C to +55C





4D SONAR

FEATURES / BENEFITS

Long range

600 diver and 1,200 m UUV detection ran

Wide bandwidth

Default 70 kHz with an in excess of 20 kHz

Low burden

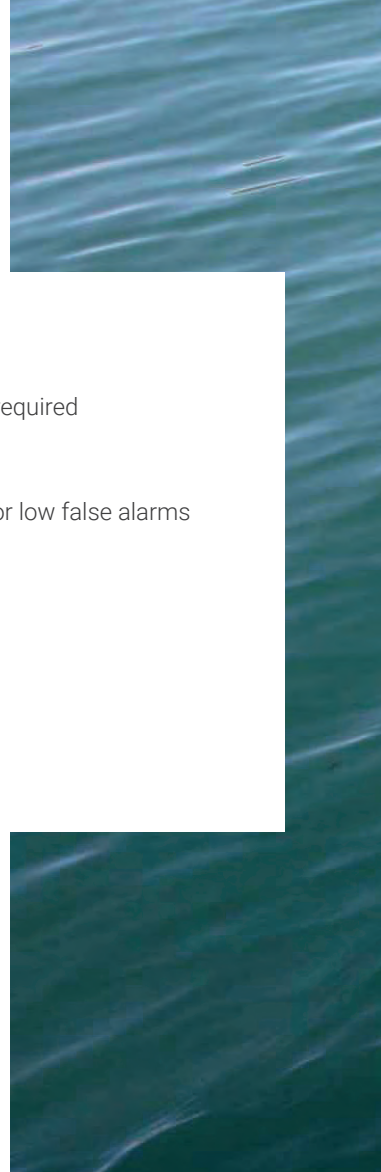
No specialist sonar experience required

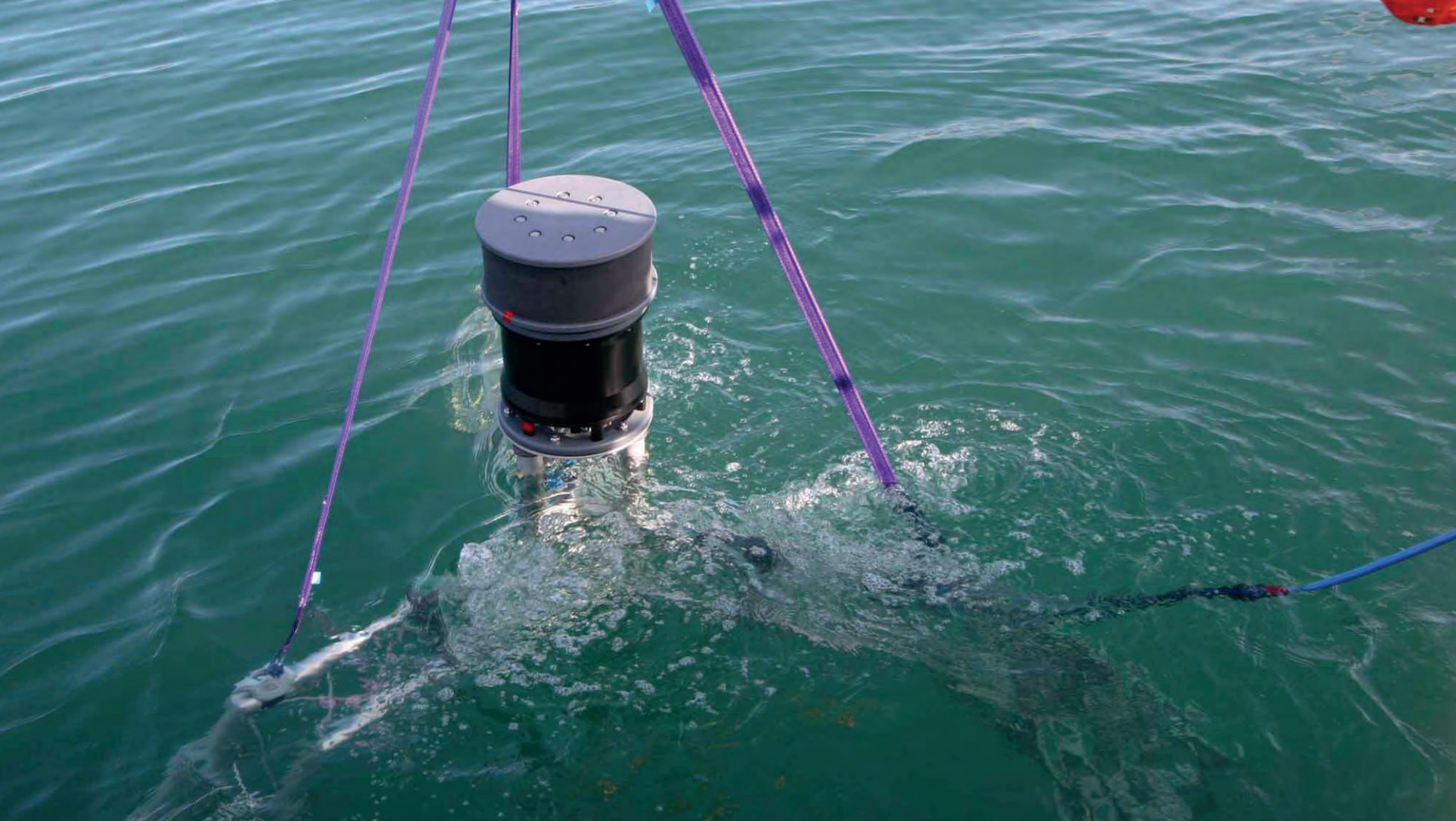
Target classification

Verification of divers and UUV for low false alarms

TECHNICAL SPECIFICATIONS

Accuracy	<1 m at 150m range
Frequencies	2.4 GHz, 5.8 GHz, 433 MHz, 915 MHz, 1.2 GHz (RMILEC, Draglonlink, Crossfire, Pixhawk, SiK Video)
Operating temperature	-20 to +50 °C
Size	35kg (air), 6kg (water)





4D LOUDHAILER

FEATURES / BENEFITS

Omnidirectional defense

Offers 360 deg. protection

Long range

Hailing ranges of up to 600 m

Programmable

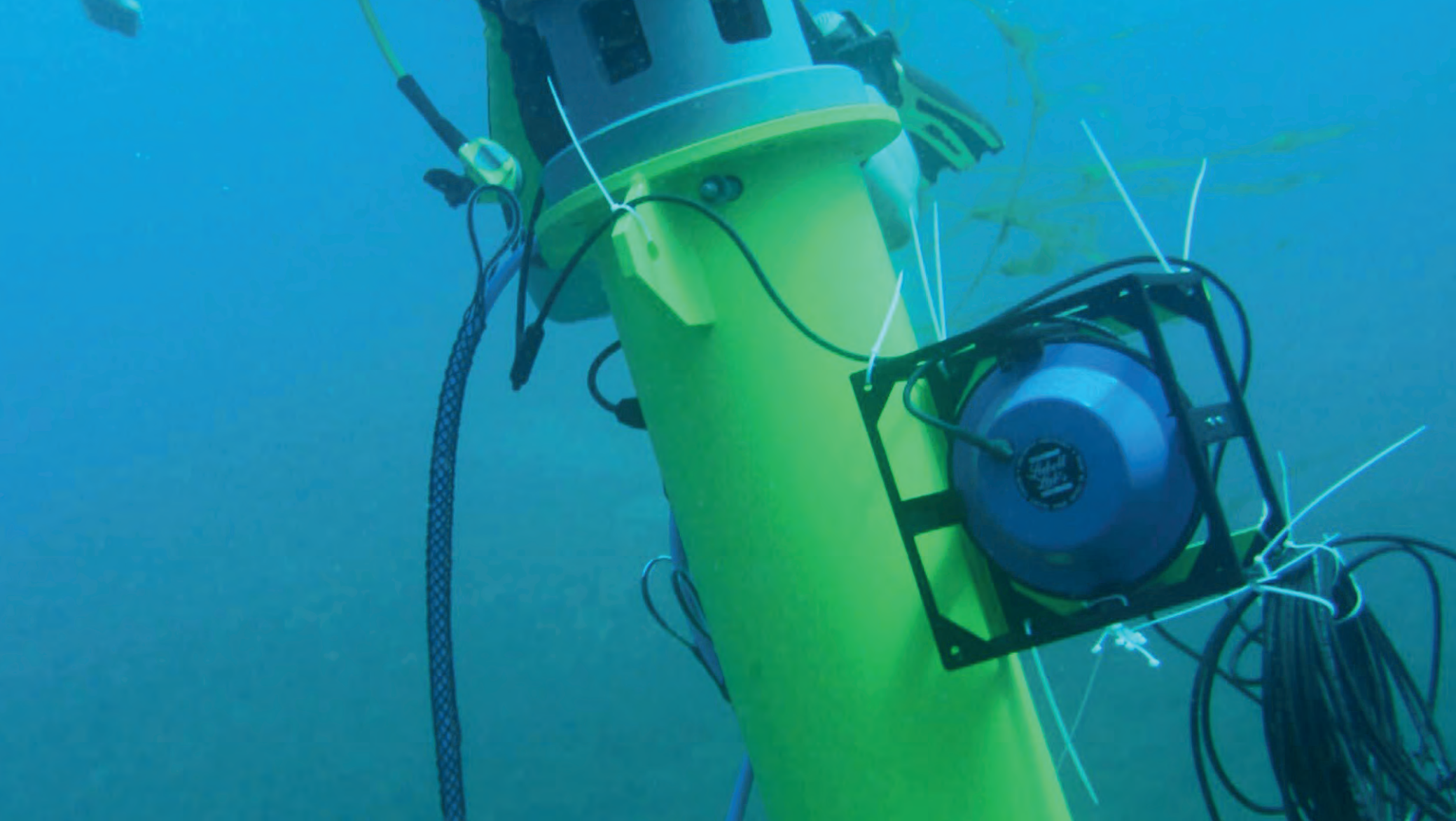
Automatic/manual warnings and instructions

Low collateral

Disorientating but not dangerous to humans

TECHNICAL SPECIFICATIONS

Power output	110 V DC
Voltage In	20–35V
Operating depth	Omni Bifilar & Quadrafilar (RX), Dual Band (TX), Maximum 15m
Weight	5.4kg



4D SUPPORT

.LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT, SED DO EIUSMOD TEMPOR INCIDIDUNT UT LABORE ET DOLORE MAGNA ALIQUA

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

1. SITE
CLIENT INFRASTRUCTURE ASSESSMENT

- Threat and/or vulnerabilities evaluation
- Optimal location of sensors/effectors
- Network communication requirements

2. DESIGN
SYSTEM DESIGN AND VALIDATION

- Functional and performance requirements
- Hardware and software specifications
- Individual and system level testing

3. INSTALLATION
MARSS ON-SITE COMMISSIONING

- Setup and calibration of all systems
- Full sensor configuration
- Functional verification tests

4. TRAINING
OPERATOR AND MAINTAINER TRAINING

- Training needs analysis
- Sensor maintenance training

NiDAR operator and administrator training

5. OPTIMIZATION
NiDAR SYSTEM OPTIMIZATION

- 14-45 day post install diagnostics
- Modifications based on operator input
- Discussion of potential design expansion

6. MAINTENANCE
SUPPORT AND MAINTENANCE SERVICES

- Bi-annual health-checks visits
- Software updates, and enhancements
- Back to base hardware warranty

LEADING DEFENCE TECHNOLOGY

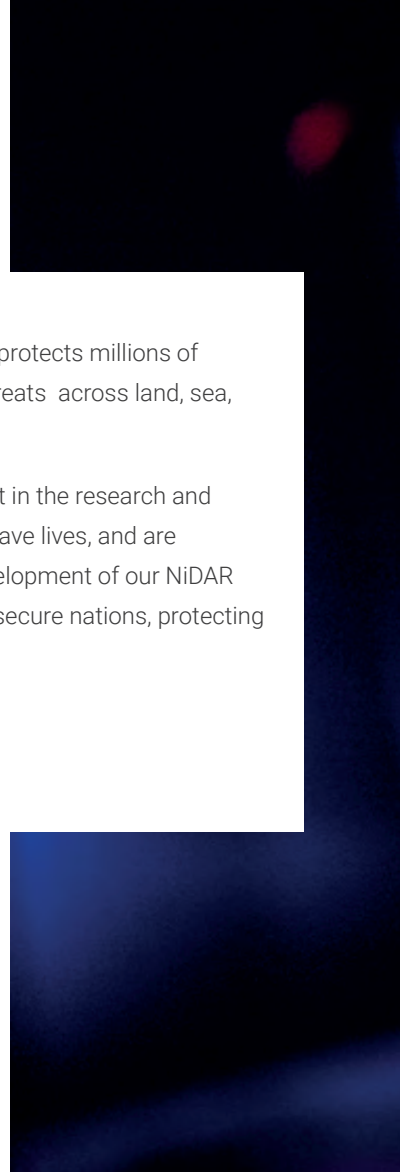
HELPING NATIONS AROUND THE GLOBE PROTECT WHAT THEY VALUE MOST.

At MARSS, we help our customers strengthen their defence & security and modernize their cities. Our AI powered IoT platform, NiDAR provides a turnkey solution by fusing intelligence and surveillance to grant full situational awareness and control.

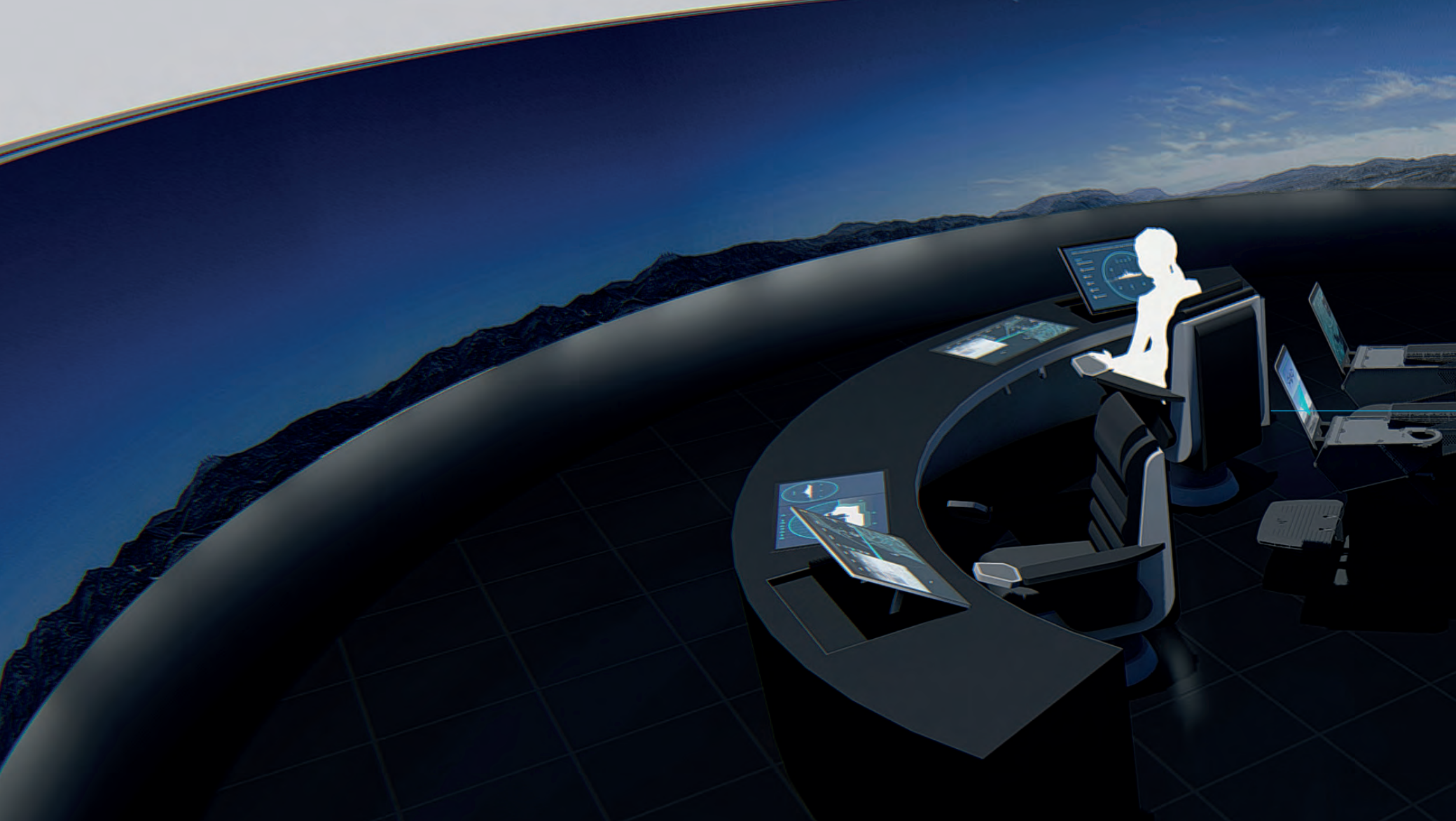
Threats are evolving and operation demand is ever changing. Working alongside hardware partners, we developed NiDAR to enhance command and control capabilities, fusing technology, sensors and countermeasures into a single tactical picture.

Trusted globally, our systems protects millions of lives against a multitude of threats across land, sea, underwater and air.

Driven by innovation, we invest in the research and design of new technology to save lives, and are committed to continuous development of our NiDAR platform to create smart and secure nations, protecting against future threats, today.




MARSS



MARSS is committed to making a difference and creating efficient and intuitive solutions to make the world a safer, and more intelligent, place to live.

MARSS

LONDON
14 Curzon Street
W1J 5HN
London, UK

MONACO
Villa C Olympea
6-8 Rue Augustin Vento
98000, Monaco

KSA
King Khalid Int. Rd.
Riyadh
Saudi Arabia

BRISTOL
40 Berkeley Square
BS8 1HP
Bristol, UK

info@marss.com / marss.com