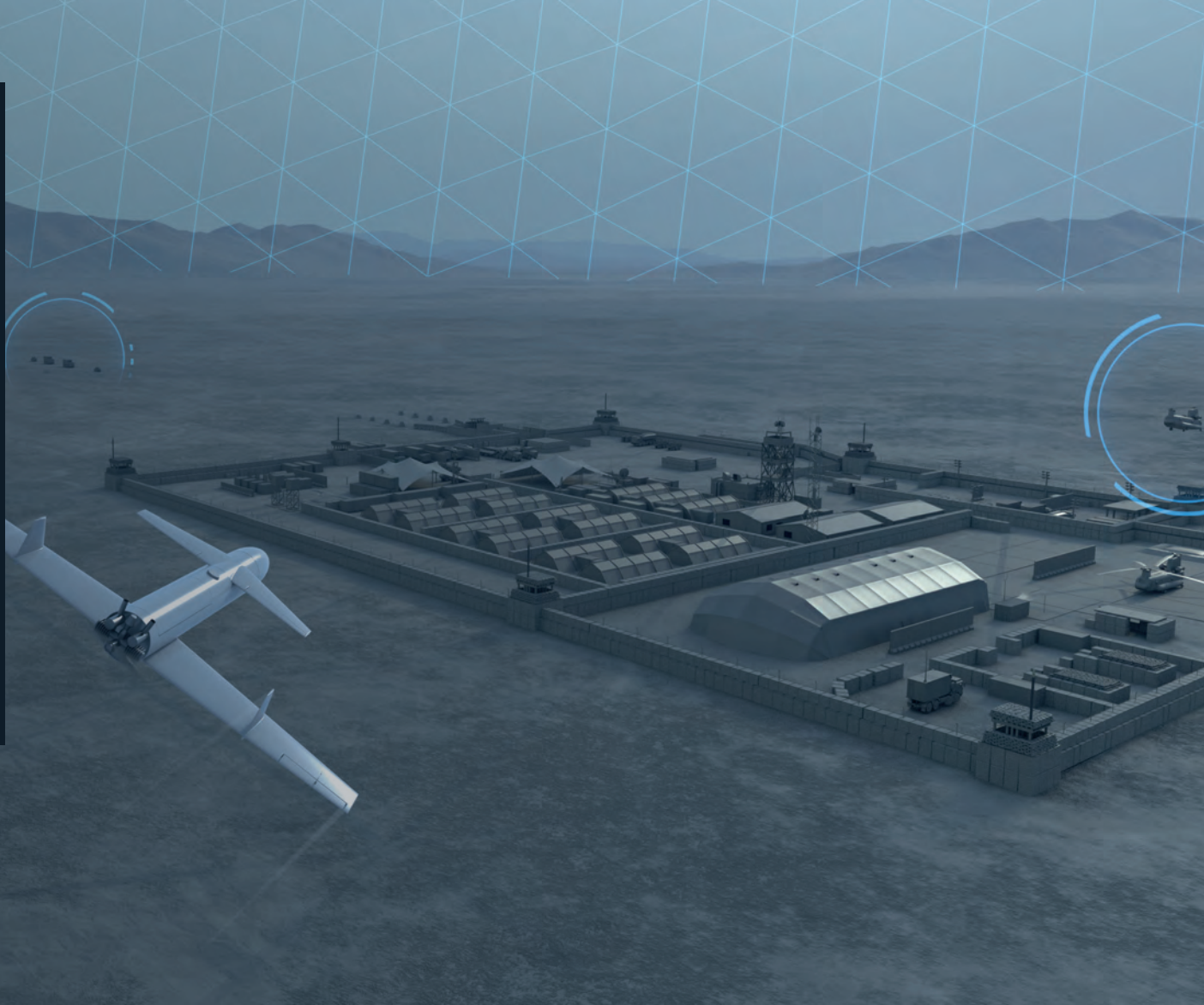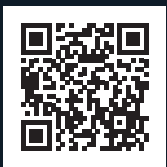# NiDAR™ CUAS

COUNTER UNMANNED
AERIAL SYSTEMS

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# NiDAR™ CUAS

# THE WORLD'S FASTEST EVOLVING THREAT...

Unmanned Aerial Systems (UAS) represent an operational step-change in asymmetric warfare. 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 strike 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 |
|---|---|---|---|---|---|
| Altitude | 200ft AGL | 3,000ft AGL | 5,000ft AGL | 18,000ft AGL | 65,000 ft MSL |
| Payload | 200 g - 2 kg | 2 kg - 20 kg | 20 kg - 150 kg | >150 kg | >600 kg |
| Radius | 5 km LOS | >25 km LOS | >25 km LOS | <200 km LOS | Unlimited BLOS |
| Deployment | Hand deployed, ISR mission | Hand deployed, loitering munition | Hand deployed, loitering munition | Tactical formation | Operational theater |

The fastest growing threats
to national security

# INTRODUCING NiDAR CUAS

## A PURPOSE-BUILT SYSTEM CAPABLE OF FINDING AND DEFEATING UAS FROM UPWARDS OF 25KM+

NiDAR CUAS significantly increases the speed and efficiency in which military and security operators can detect, verify, track, and counter UAS threats. MARSS core technology, NiDAR is a turnkey solution that 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 C2 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. Both kinetic and non-kinetic countermeasures are available, with effectors able to address a target up to 6km.
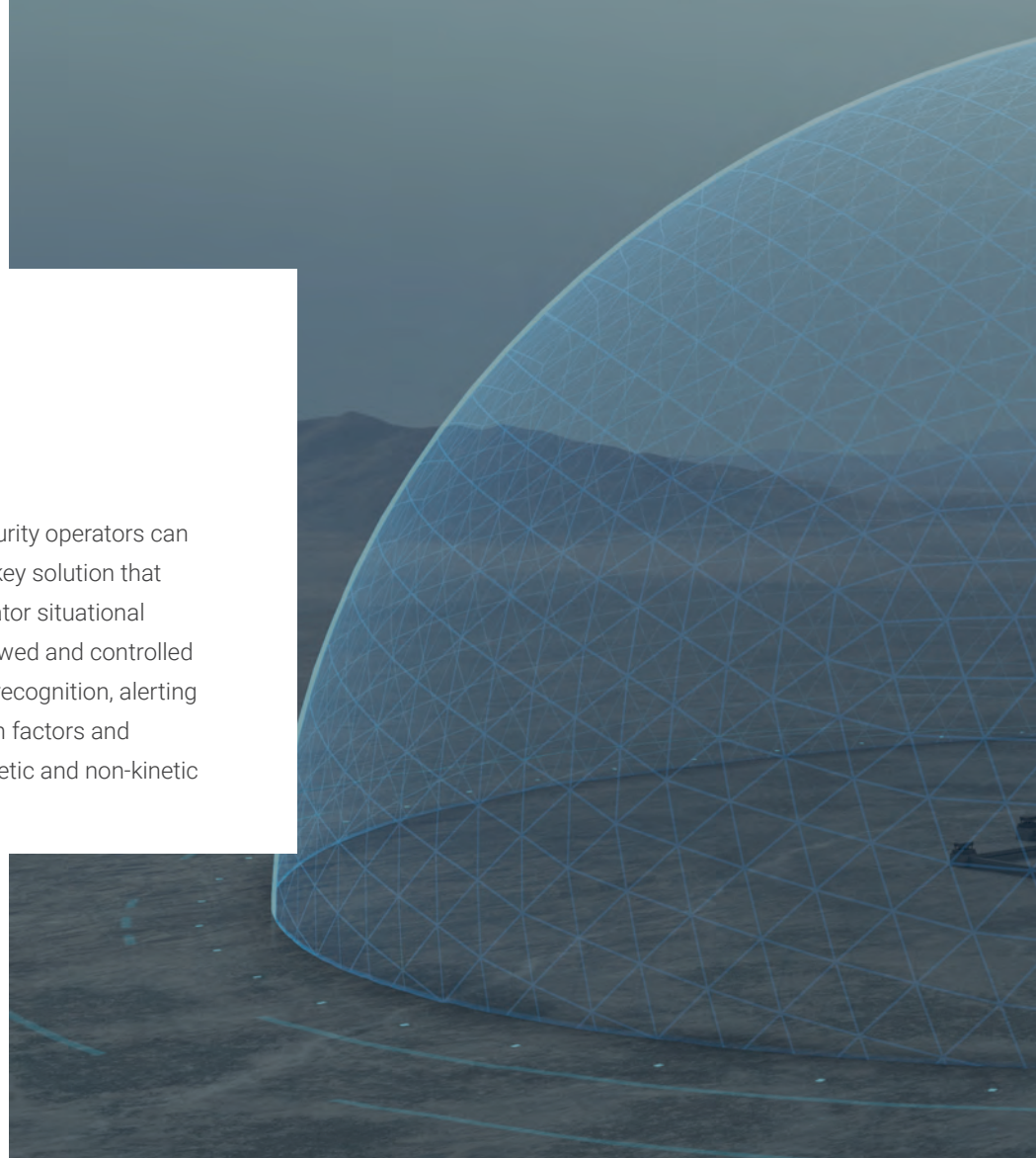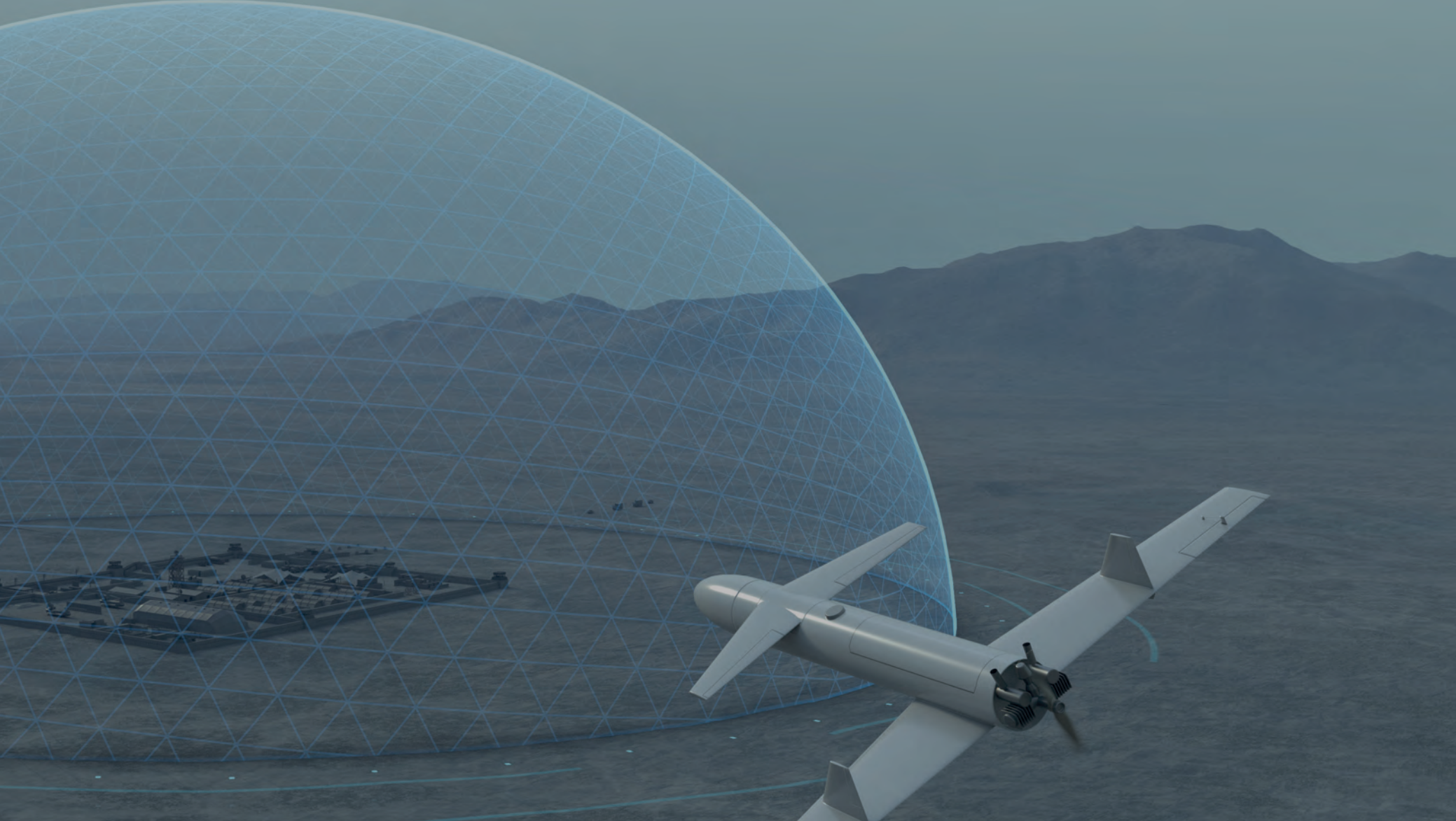
# NiDAR CUAS FEATURES/BENEFITS

### 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.
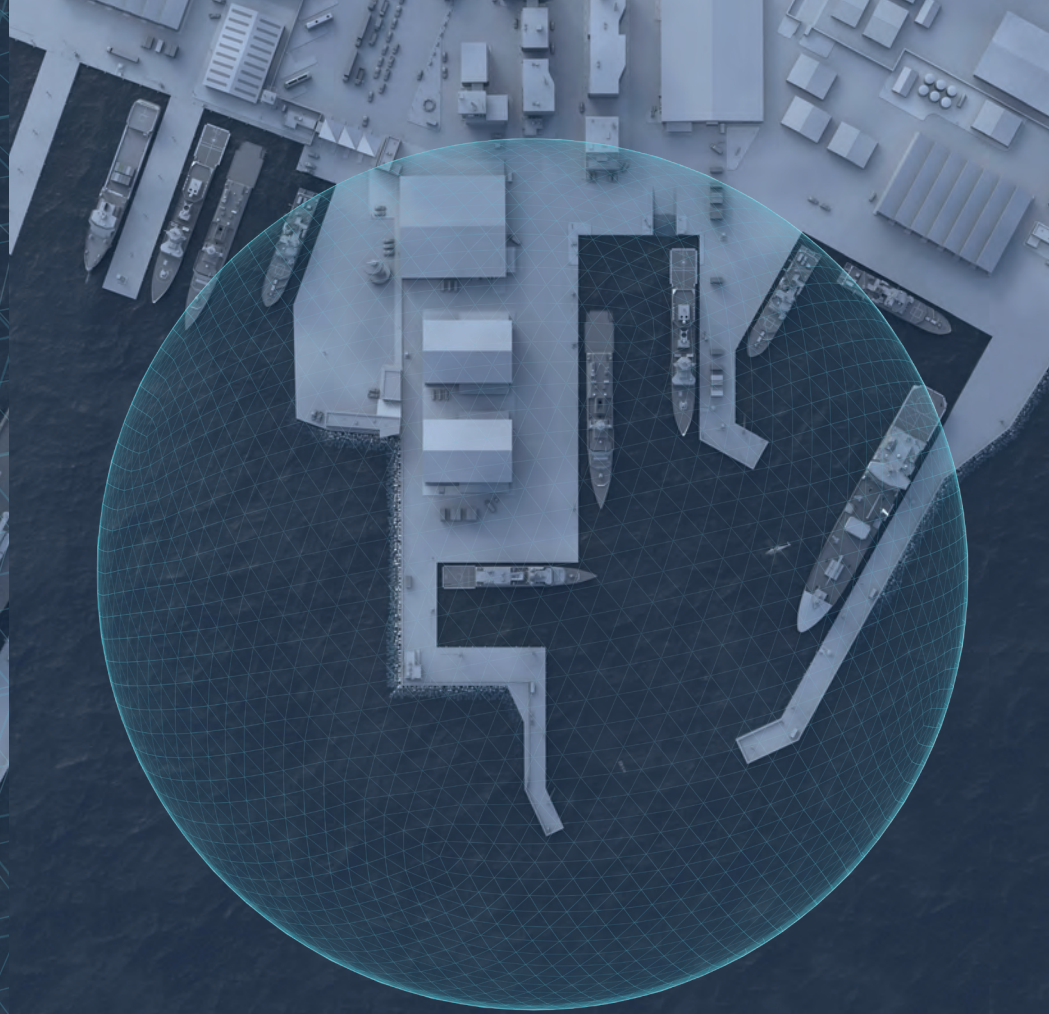
# CUAS RADAR DETECTION

## 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) |
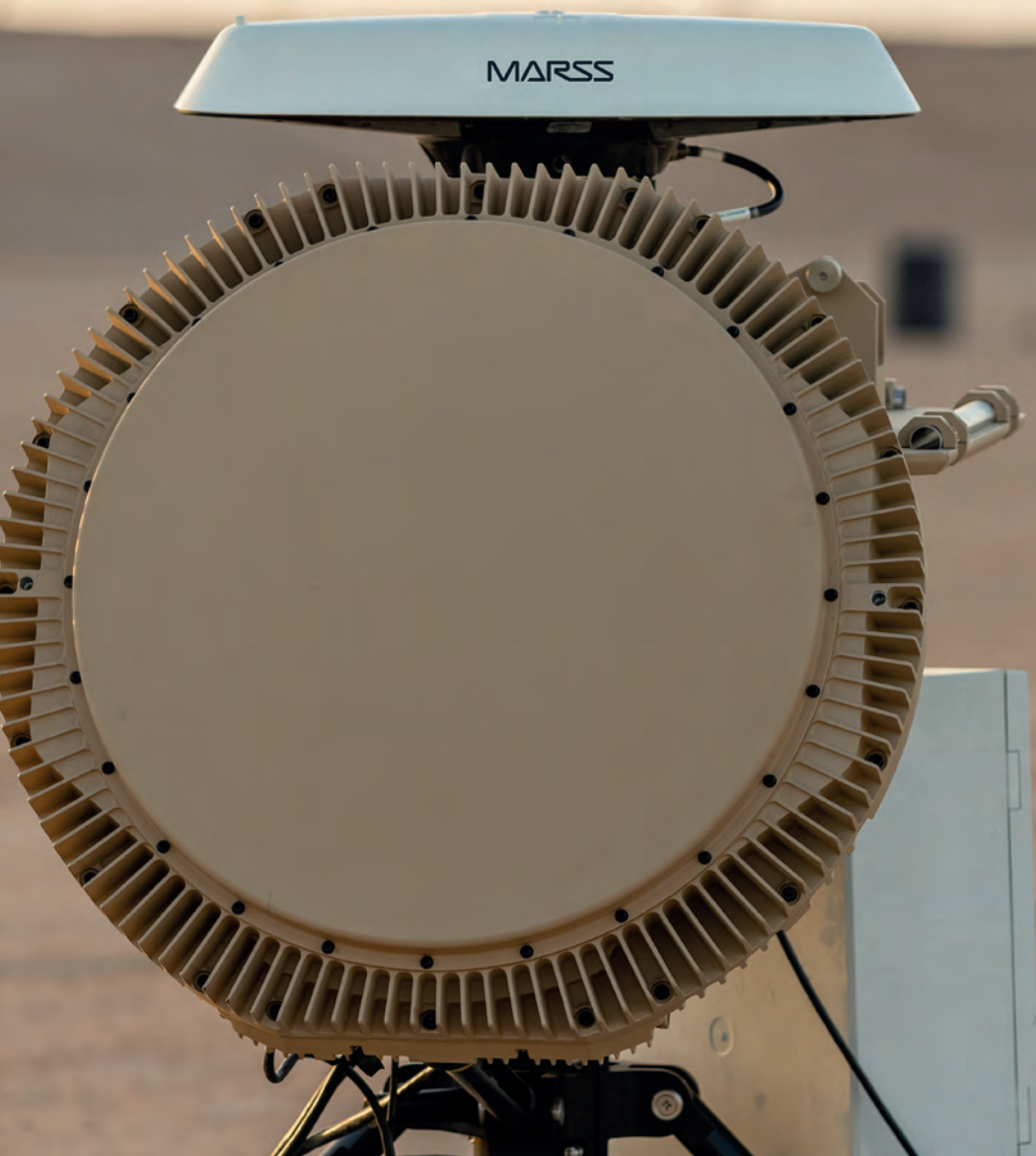
# CUAS ADSB,
# DJI, IFF DETECTION

## FEATURES / BENEFITS

### C2 Integration
Auto verification of radar contact

### DJI pilot finder
Location of DJI UAV pilot

### ADSB database check
Auto verification of ADSB history

### 85% of COTS UAV
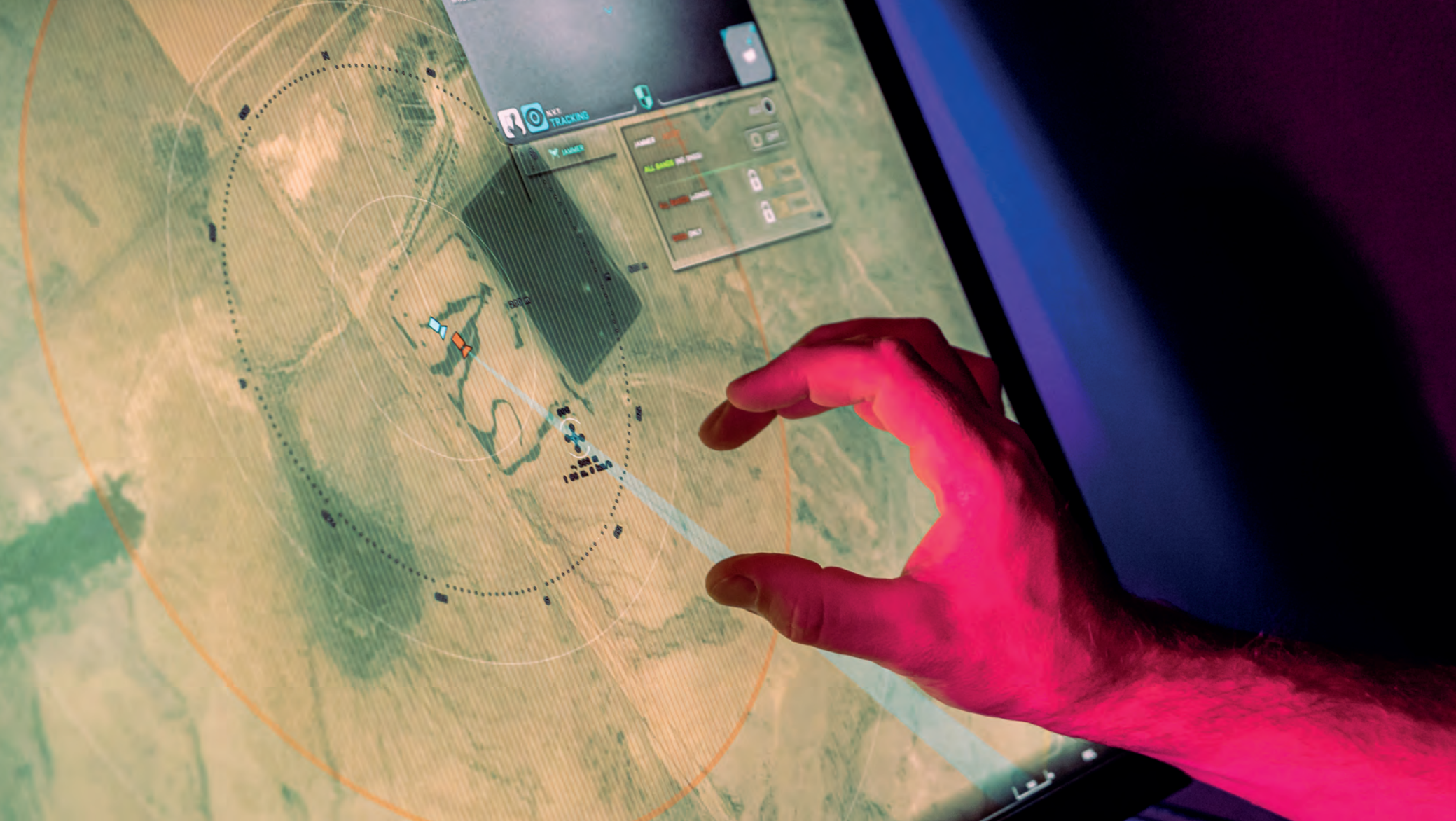Standard drones covered

### 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 |

# 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) |
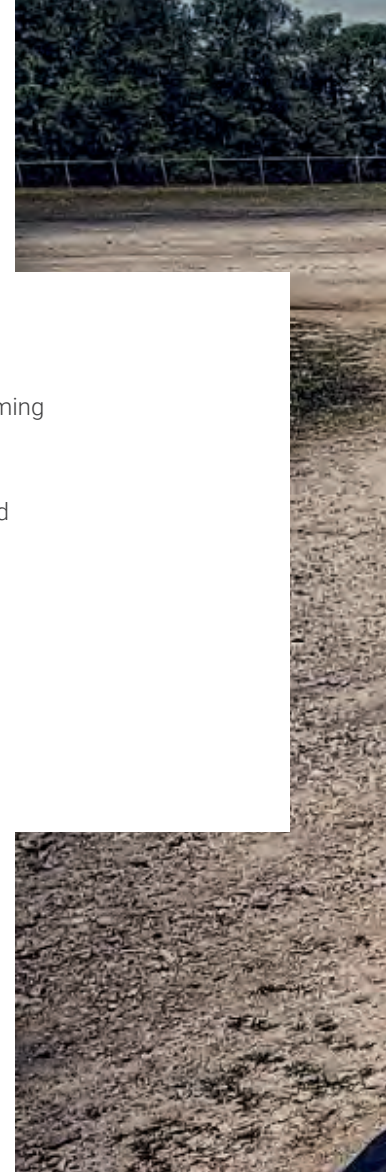
# CUAS AI
# EO VERIFICATION

## 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 |
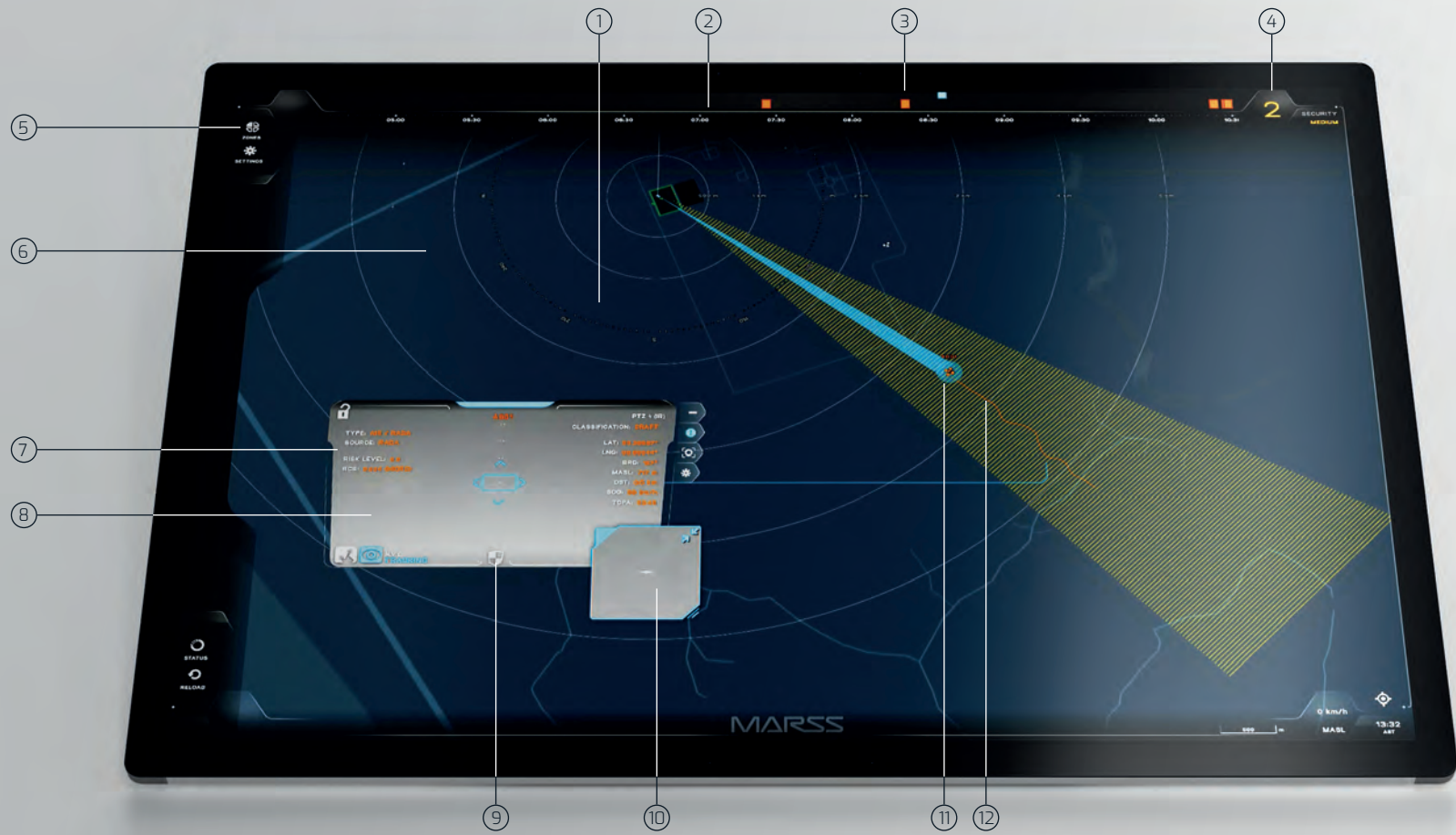
# NiDAR CUAS
# OPERATOR ALERT

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.

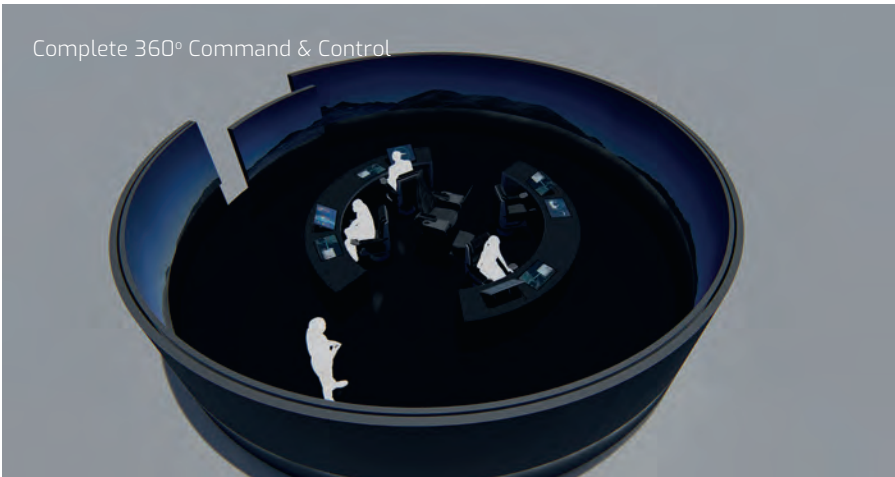Multi touch-screen command and system control

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
360º protection, high to low frequencies

### GPS jamming
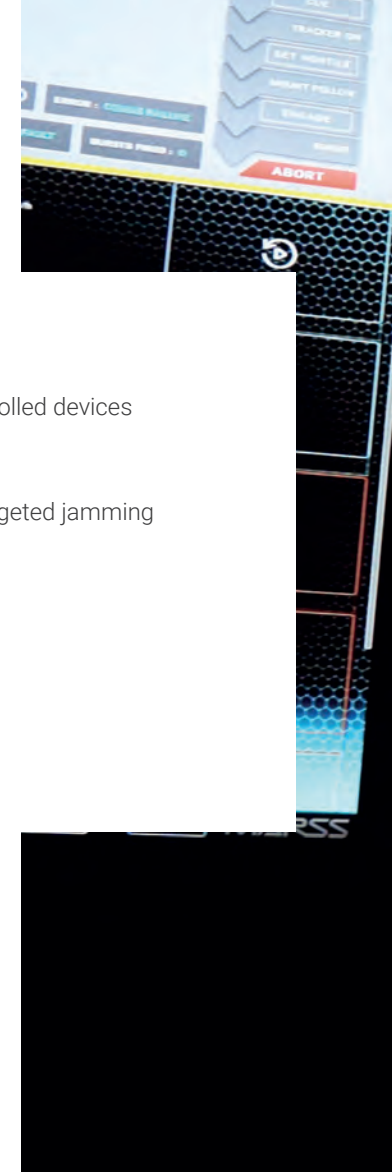Effective positioning system denial

### UXV control jamming
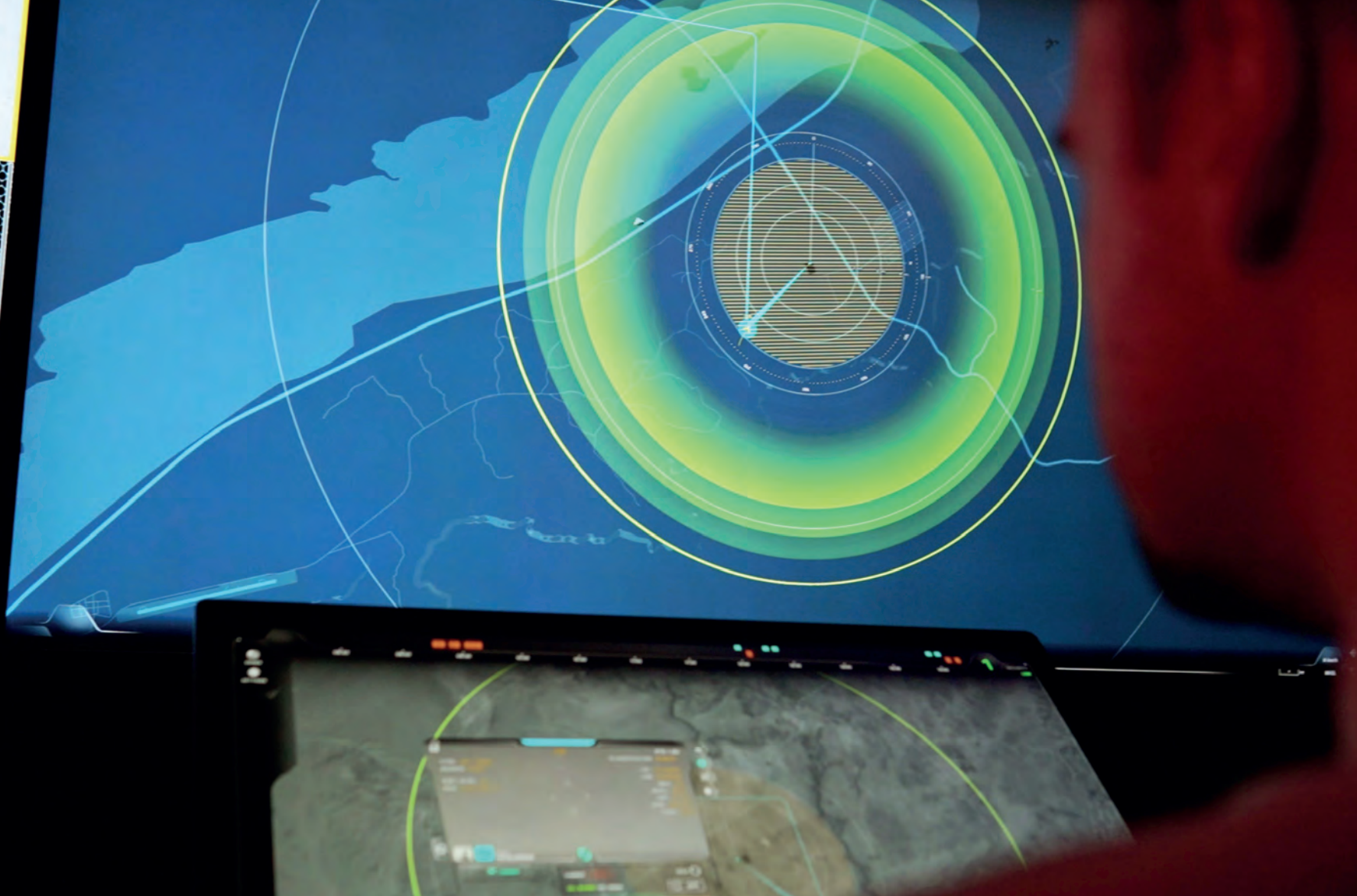Denial of air/land remote controlled devices

### 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 |

# LEADING DEFENCE TECHNOLOGY

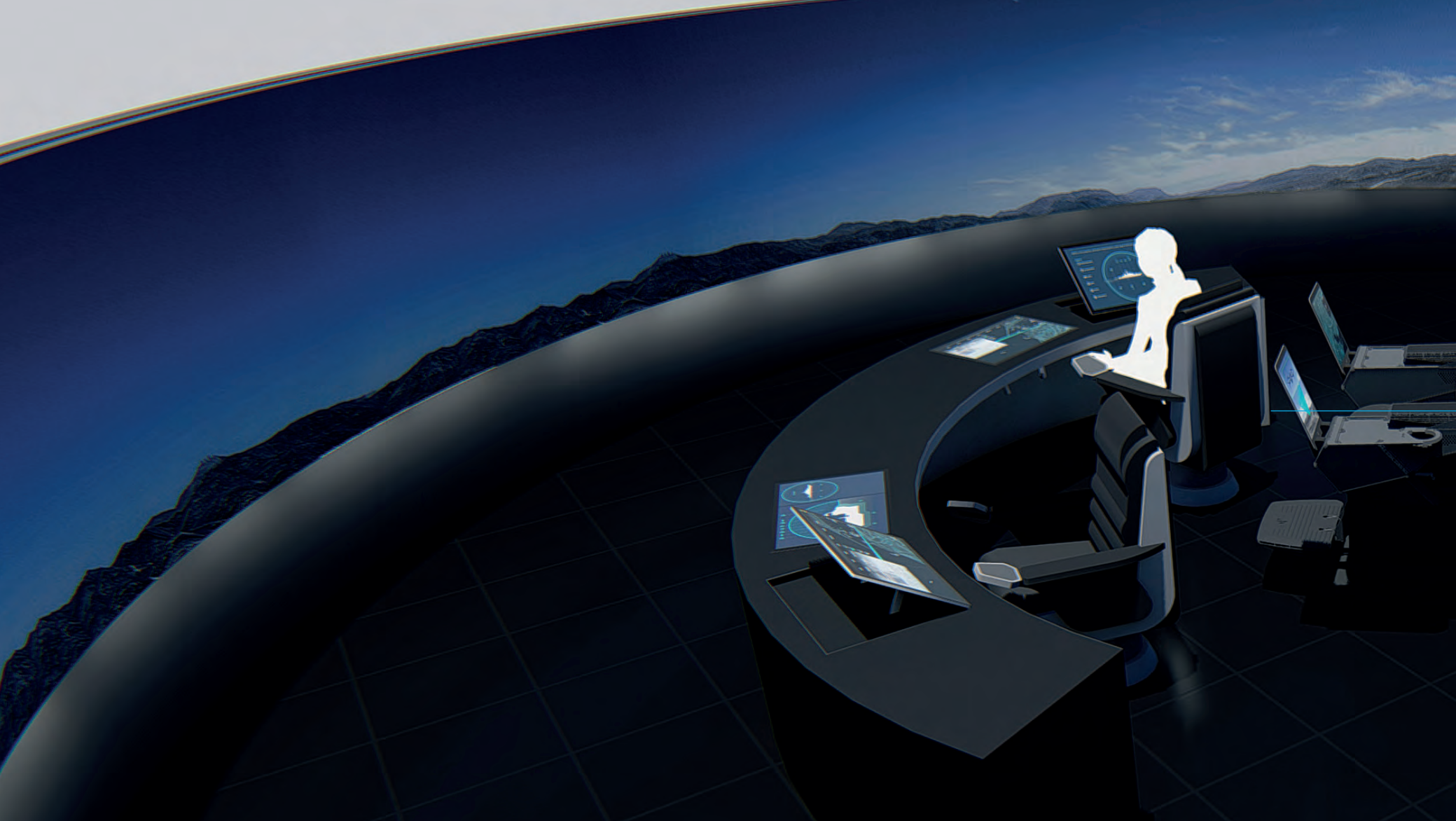## HELPING NATIONS AROUND THE GLOBE PROTECT WHAT THEY VALUE MOST.

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 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