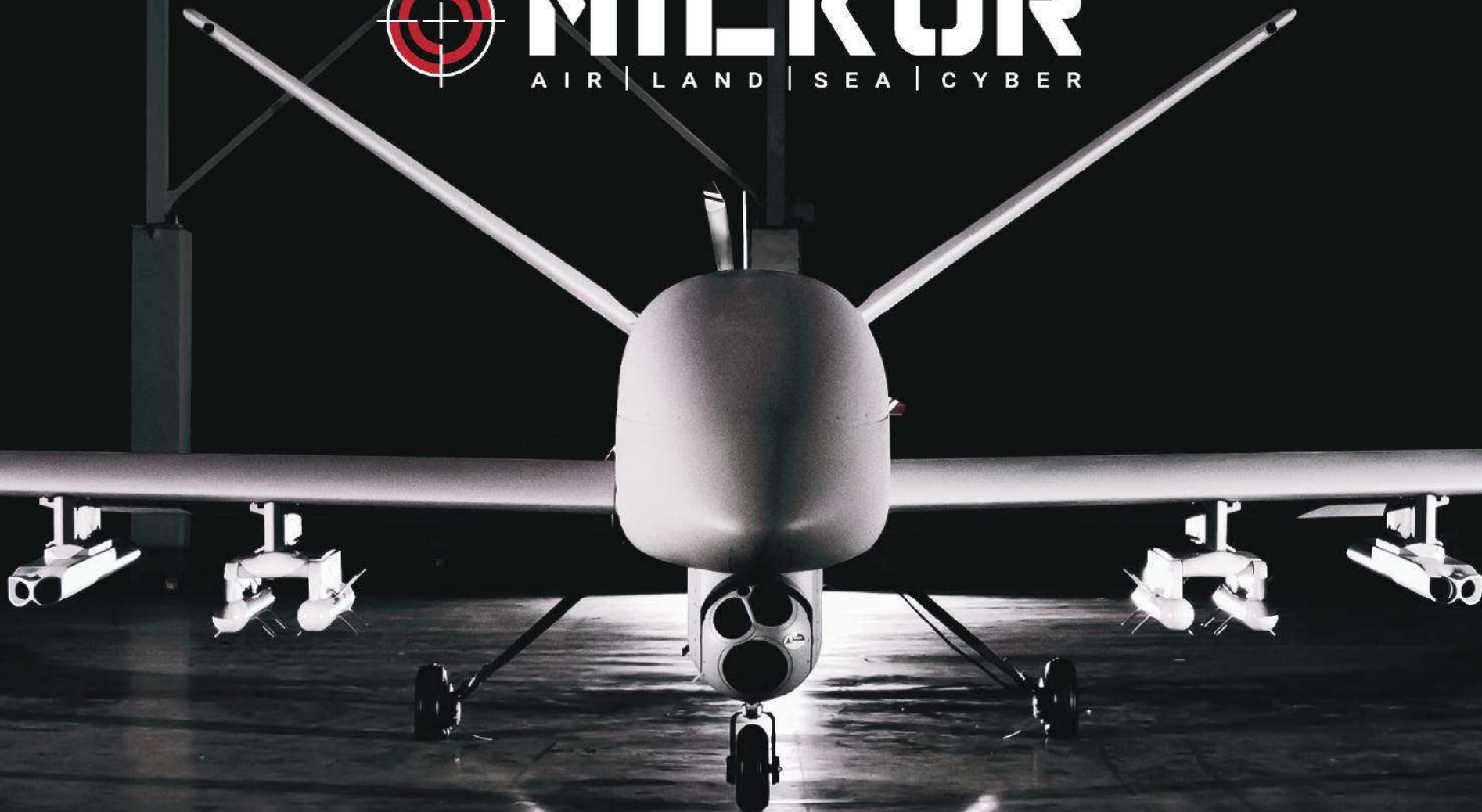


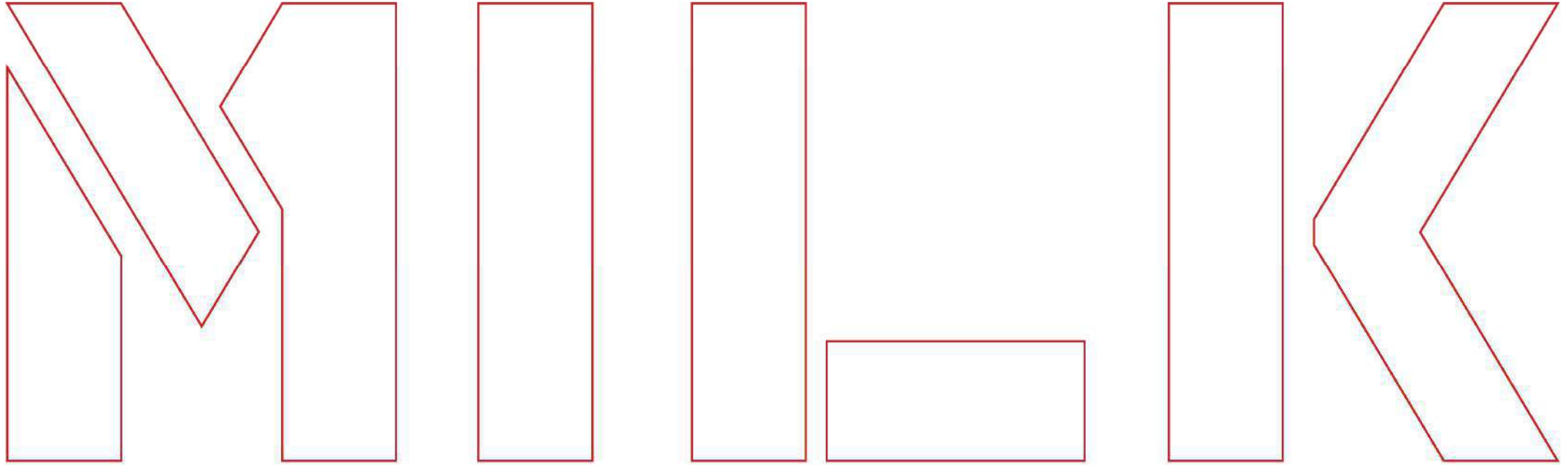


# MILKOR

AIR | LAND | SEA | CYBER



**MILKOR** INTEGRATED SYSTEMS



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MILKOR INTEGRATED  
SYSTEMS SERVICES

# MILOR

## INTRODUCTION

Milkor Integrated Systems (MIS) is a constituent of the Milkor Group, dedicated exclusively to aerospace and air system technologies. Within its operations, the company encompasses a specialized division that focuses on the comprehensive development, manufacturing, and provision of UAV solutions, alongside critical flight components and military-grade capabilities. Notably, Milkor undertakes the internal design and development of these solutions, incorporating the most advanced and dependable technology available. This approach allows for tailored customisation according to user requirements, accompanied by direct support for all systems.





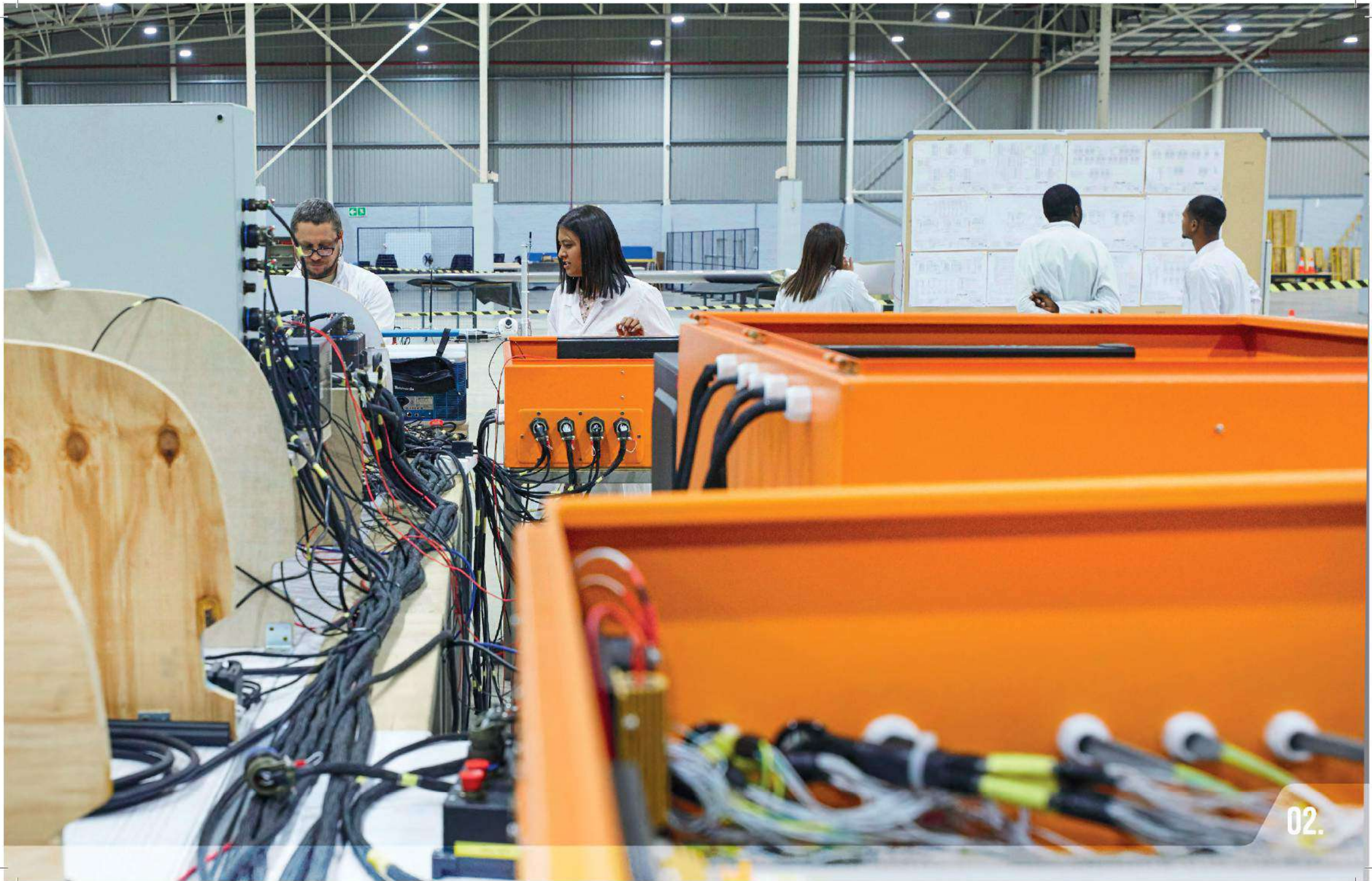


## WE TAKE PRIDE IN OUR ENGINEERING CAPABILITIES THAT SPAN ACROSS THE FOLLOWING PRIMARY DISCIPLINES:

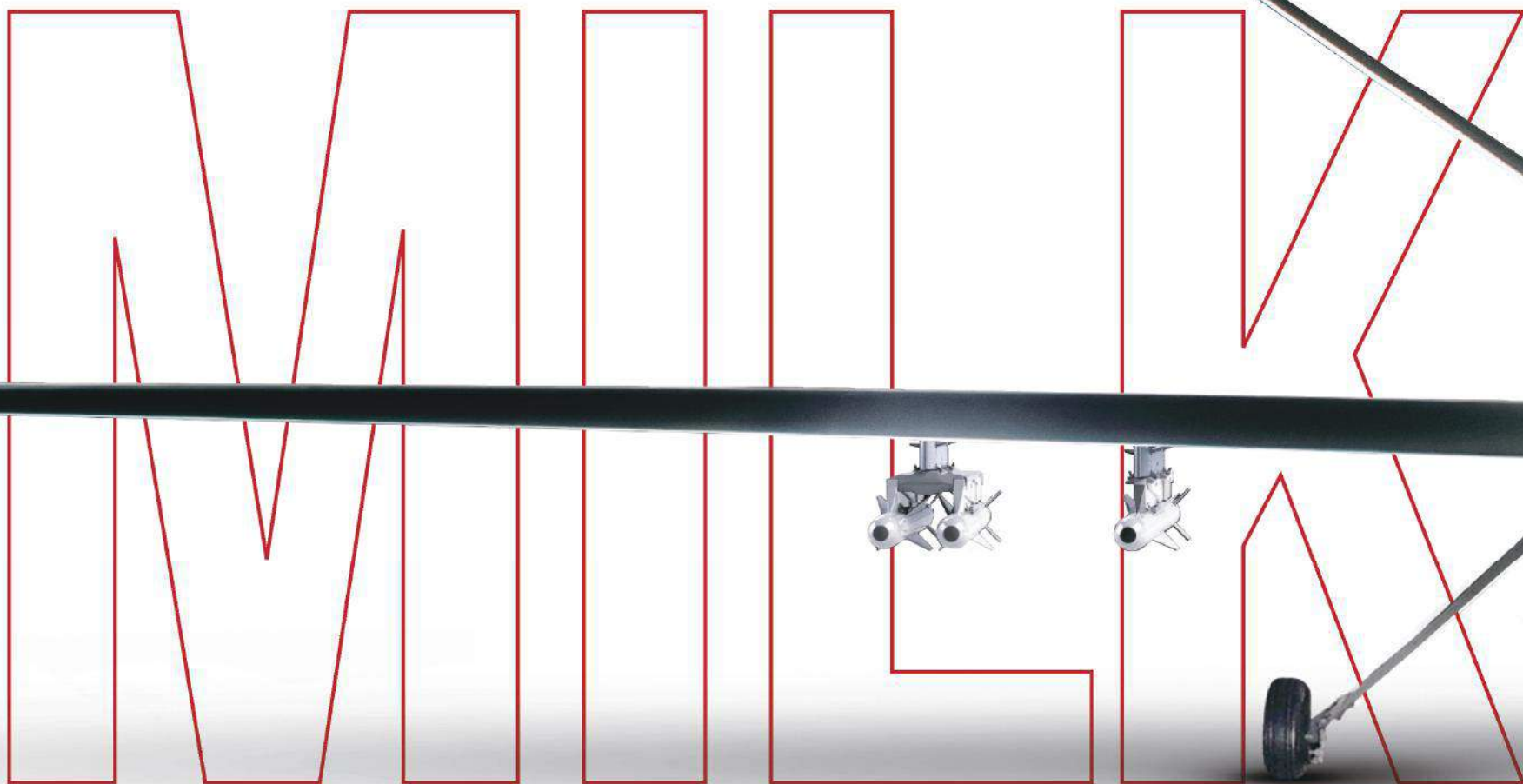
- Aircraft design and structural integrity engineering
- Materials
- Fabrication and prototyping
- Hardware architecture, design and implementation (includes high-speed digital electronics, power electronics and radio frequency)
- Software architecting, design, implementation, integration, and testing (includes firmware, embedded software, PC applications and operating systems)
- Mechanical architecture, design and implementation
- Simulation and modelling (including RF and microwave systems, control systems, fluid dynamics, aerodynamics, structural analysis, thermal analysis)
- Product disciplines: communications, missions systems, control systems, networking, guidance and navigation
- Systems integration
- Flight testing
- Systems engineering
- Program management





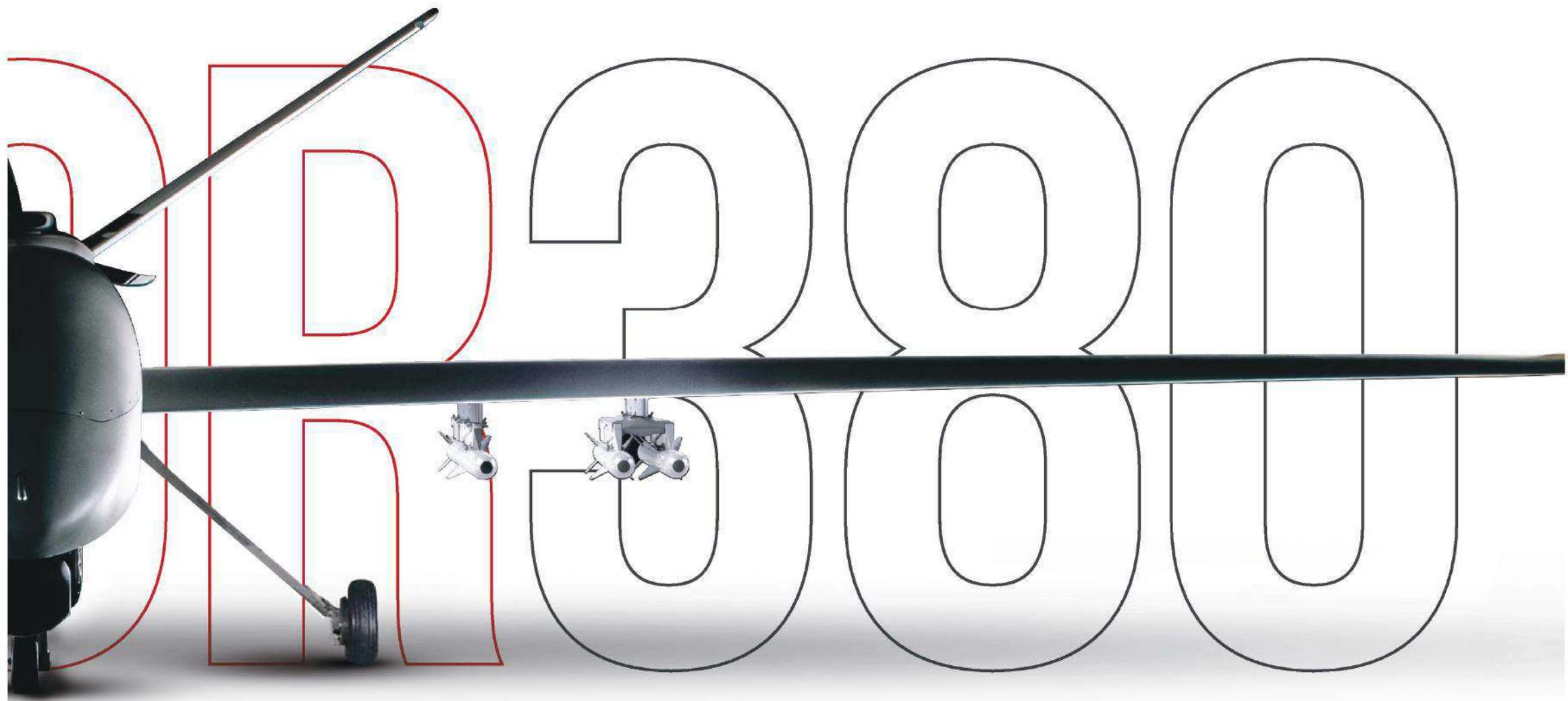






## MILKOR 380

The Milkor 380 is a versatile aerial platform designed for multiple purposes such as surveillance, reconnaissance, and opportunistic engagement operations. It offers a wide range of payload options, making it a reliable guardian in the sky capable of carrying out extended range missions with long endurance.





05.





## TECHNICAL SPECIFICATIONS

<b>Maximum Range</b>	2 000+ km
<b>Maximum Endurance</b>	35 h
<b>Service Ceiling</b>	30 000 ft
<b>Max Operational Altitude</b>	23 000 ft
<b>Length</b>	9 m
<b>Wingspan</b>	18.6 m
<b>MTOW (Max Take-off weight)</b>	1 300 kg
<b>Max Payload</b>	210 kg (515 kg including fuel)
<b>Fuel Capacity</b>	305 kg
<b>Maximum Speed</b>	250 km/h
<b>Cruise Speed</b>	110 – 150 km/h
<b>Fuel Type</b>	110 LL Avgas/93 UL Mogas



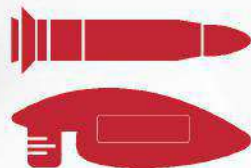
## SYSTEM FEATURES

- Fully Autonomous Flight
- Modular Design Layout
- Dual Redundant Communication Systems
- Direct Line of Sight Communications
- Satcom Capable on Enquiry
- Optronic Payload
- Optional Laser Designator and/or Laser Illuminator
- Optional Integration of Custom Intelligence Payloads
- Countermeasure Capability
- Ground Support Suite
- Fully Containerised for Deployment
- ITAR (International Traffic in Arms Regulations) Free

The Milkor 380 platform integrates world-leading optical equipment for real-time high-definition, infrared multispectral video and data acquisition. It includes Synthetic Aperture Radar (SAR) and Inverse Synthetic Aperture Radar (iSAR) for maritime monitoring. The Milkor 380 is operationally versatile with autonomous flight, take-off, and landing achieved through its onboard control system. It features pathway placement and loiter patterns for complex mission success. The design incorporates five hardpoints for interchangeable electronic warfare solutions, weapon systems, and containers. The Milkor 380 is adaptable to customer requirements, with an engineered airframe ensuring long endurance at medium altitudes for optimal performance in all conditions.

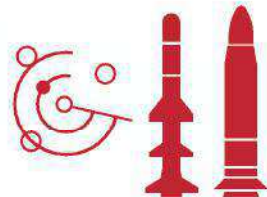
# MILKOR

## EXTERNAL PAYLOADS

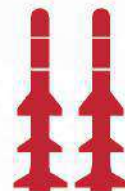


The underbelly store of the aircraft is designed to accommodate the largest payload with a total weight of 400 kg. The underbelly hardpoint of the aircraft can carry larger and heavier payloads such as sensor pods and a variety of armaments including rockets, glide bombs and missiles.





The inner wing hardpoints are designed to accommodate a payload of 150 kg per wing, enabling the installation of either additional radar and Electronic Warfare (EW) equipment or the mounting of munitions to further improve the aircraft's reconnaissance and combat capability.

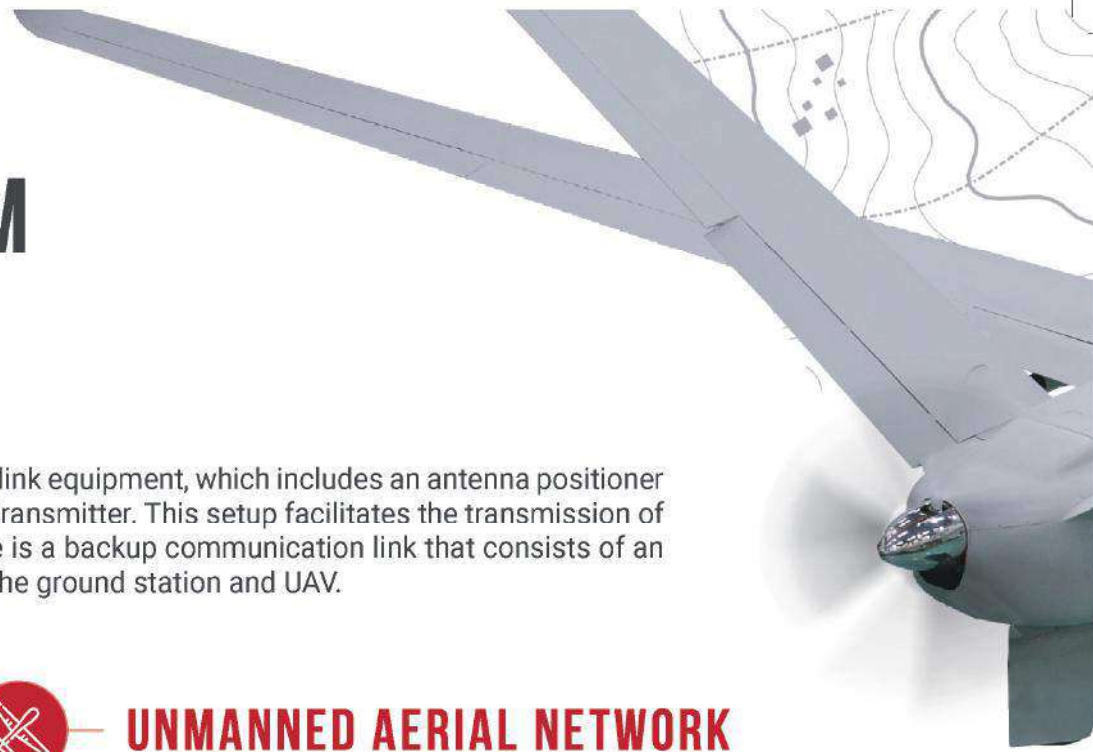


The outer wing hardpoints are designed to accommodate a payload of 80 kg per wing, allowing the carrying of additional munitions.



The aircraft's nose is capable of housing several different Electro-Optical/Infrared (EO/IR) and radar imaging equipment and is customisable to the client's requirements.

# UNMANNED AERIAL SYSTEM



## THE GROUND DATA TERMINAL

The Ground Data Terminal (GDT) comprises of primary communication link equipment, which includes an antenna positioner equipped with both a parabolic and omni antenna, as well as a C-band transmitter. This setup facilitates the transmission of video and data between the ground station and UAV. Additionally, there is a backup communication link that consists of an omni antenna and UHF transmitter, enabling a data interface between the ground station and UAV.



## POWER MODULE

The functionality of the TGCS and GDT relies on external electrical power. Therefore, they need to be deployed in close proximity to a Power Module or a suitable power source. The Power Module (PM) is a container that contains the Generator, Cables, Power Distribution Panel, and Levelling Jacks, providing the necessary infrastructure for power supply.



## UNMANNED AERIAL NETWORK

When the advanced system is activated, it allows for the creation of a network comprising 4 UAVs. These UAVs can be linked to one another through a specifically designed relay link. This connectivity enables the capability to conduct simultaneous reconnaissance operations or execute multiple technical mission requirements more effectively.

## STANDARD SYSTEM INCLUDES

### SUPPORT/TRAINING

- Spares and maintenance
- Logistics Equipment
- Pilot/Operator/Commander training
- Field Service Support training

### COMPLETE SYSTEM

- 2 x Milkor 380 Aircraft
- Each with EO/IR Payload
- 1 x Ground Control Station (GCS)

### OPTIONAL PAYLOADS

- EO/IR
- Argos II HDT (Hensoldt)
- SAR
- I-master (Thales)

### RANGE EXTENDER STATIONS

Ground Data Terminal (GDT)





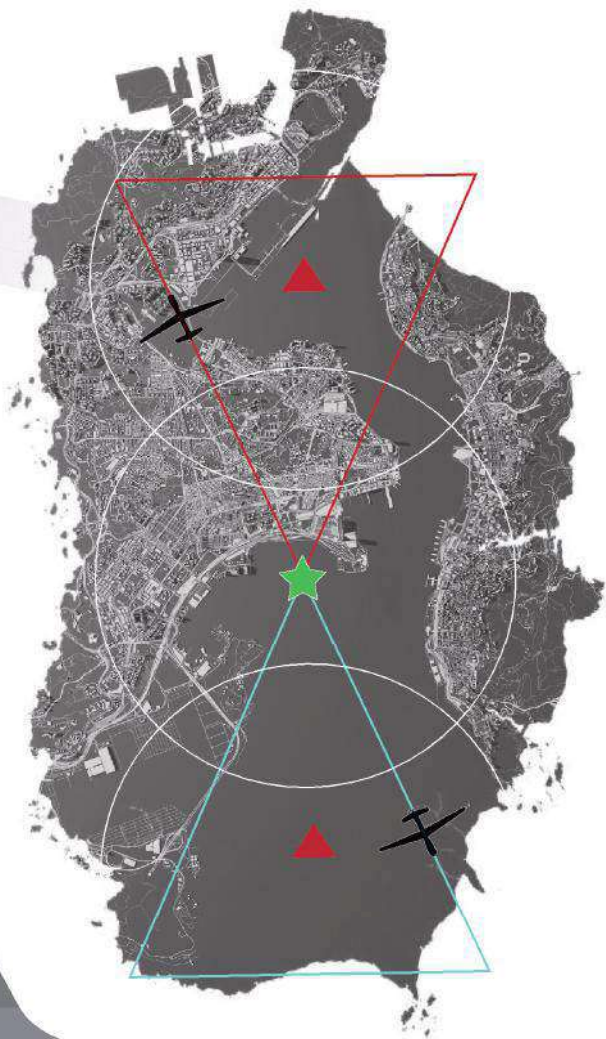
## BEYOND LINE OF SIGHT SATELLITE

By employing a satellite system, the operational range can be expanded beyond the typical Line of Sight limitations using a GDT. The signal range, which surpasses the line-of-sight distance, encompasses a span of 3 000 kilometers.



## THE GROUND CONTROL STATION

The Ground Control Station (GCS) is composed of multiple identical workstations that serve as control interfaces for the UAV, controlling the installed payload(s) and displaying relevant information. The ground control station (GCS) incorporates a modular design approach, enabling customisation for individual customers to ensure the unmanned vehicle operates optimally and functions according to their specific requirements.



Ground Control Station (GCS)  
Ground Data Terminal (GDT)

Proposed Flight Path - UAV 01  
Proposed Flight Path - UAV 02

## GROUND CONTROL STATION CAPABILITIES

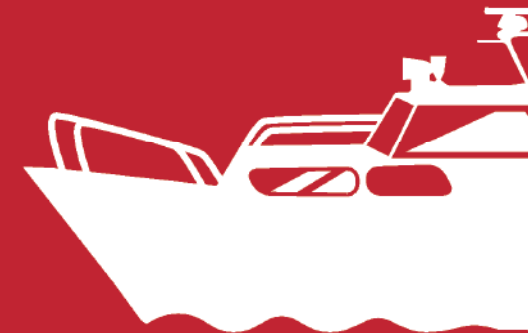
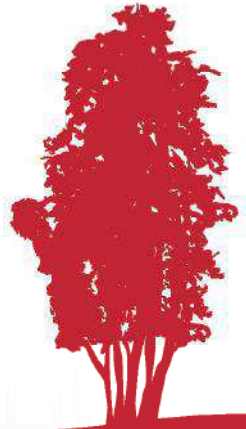
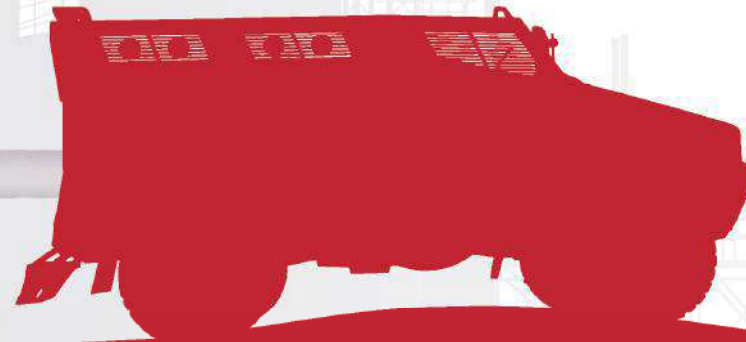
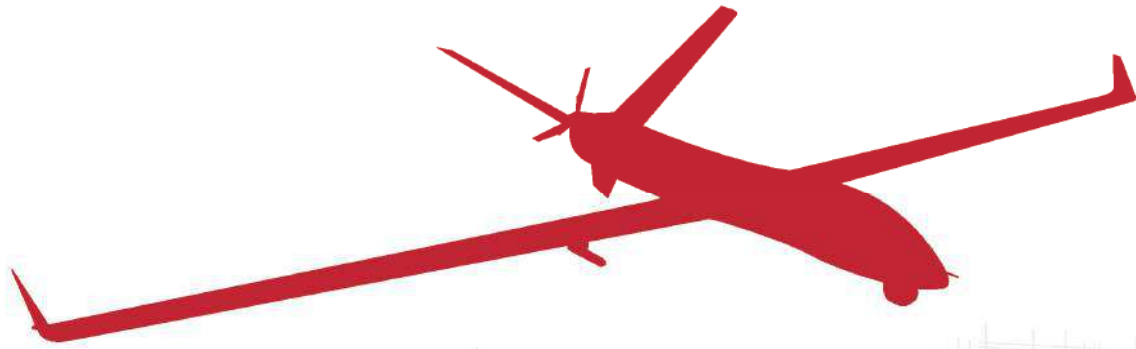
- It facilitates the command and control of the system through telemetry.
- Enables low-latency audio transmission.
- Supports low-latency HD video streaming.
- Displays the necessary payload data.
- Has a speed of  $2 \times 10$  MBps per link.



## MULTIPLE PLATFORM COMMUNICATION

Milkor is able to integrate with existing C2 & C4ISR systems that allow communication with multiple platforms through a built-in relay link on the Milkor UAV. The Milkor 380 allows for dual redundant data links with up to 3 different platforms simultaneously, enabling communications between respective forces including Land, Sea, Infantry and other Air platforms.





## COMPLETE INTEGRATION SOLUTION FOR COMMUNICATION WITH MULTIPLE PLATFORMS WHICH CAN INCLUDE:

- Real-time video streaming
- Audio communication
- Radio communication
- Geolocation
- High speed data transfer
- Network centric communication

# SYSTEM AUTOMATION AND INTEGRATION

## PAYLOAD AND WEAPONS INTERFACE SYSTEMS

- Design, Develop and Manufacture of flexible HW/SW platform for Payload and Weapons Systems Integration (PIU).
- Integrate selected commercial payloads and weapons using PIU on the SITB.
- Full payload and weapons integration qualification on advanced model aircraft.

## CONTROL AND INTERFACE SYSTEMS

- Design and Manufacture HW platform for Sensor/Actuator integration and A/C Control and Navigation
- Development of Systems Integration Test Bench
- Software and Hardware integration using System Integration Test Bench (SITB)

## UCAV SYSTEM

- Integration Planning
- Systems Integration
- Payload and Weapons Integration
- Communication Systems Integration
- Sensor integration





# WIDE AREA NETWORK

## SAFETY CRITICAL REMOTE CONTROL



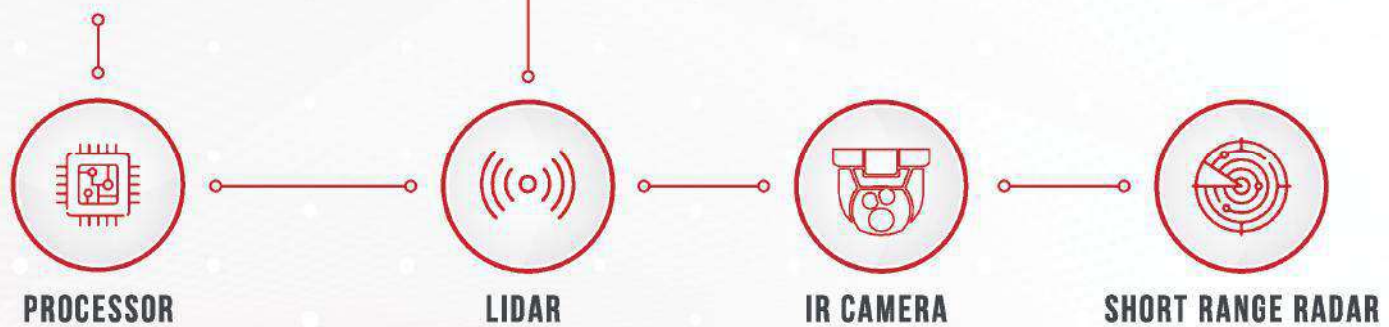
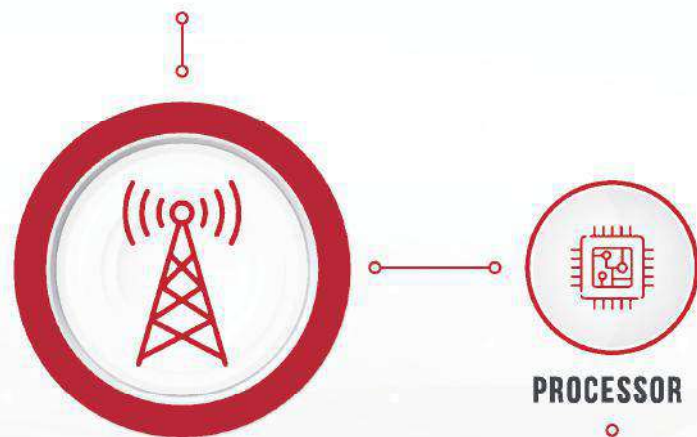
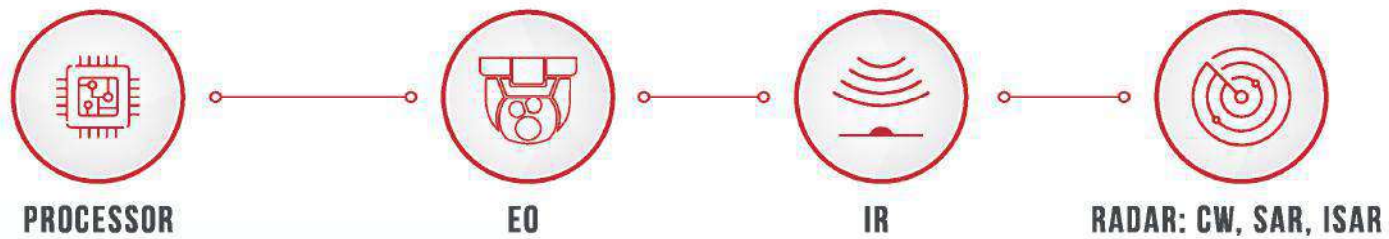


# PAYLOAD PROCESSING

## PAYLOAD PROCESSING TECHNICAL CAPABILITIES

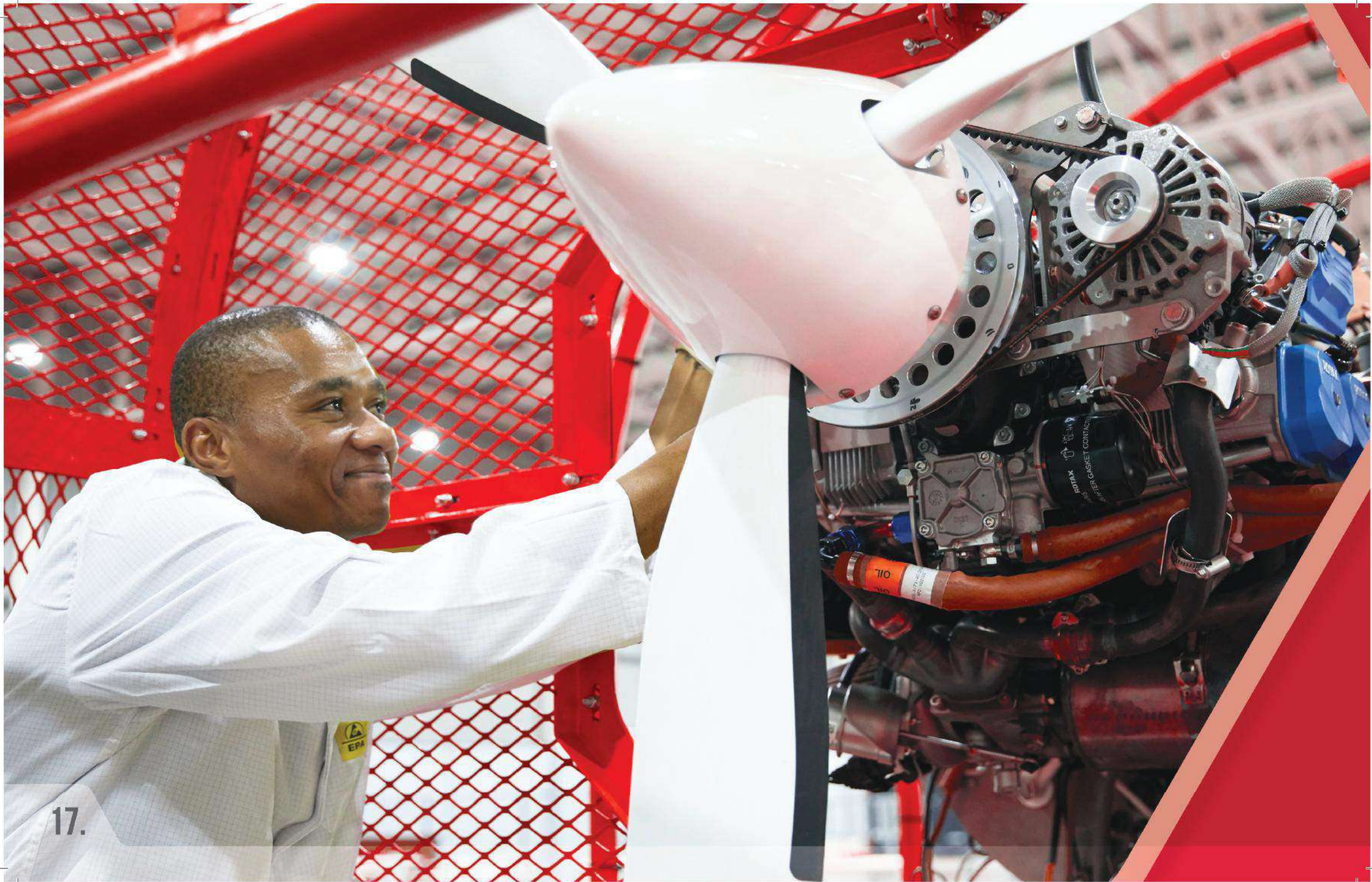
- Encode and Decode data (H.264/HEVC)
- Object Detection
- Stream: RTSP
- Object Identification
- Vision Processing
- Tracking





# PLATFORM







# UPGRADES & MODERNISATION



## AVIONICS MODERNISATION

Modern aircraft, spacecraft, and satellites rely on diverse electronic systems to fulfill their functions and missions. Complexity and mission requirements determine the extent of electronic system utilisation. Examples include engine controls, flight controls, navigation, communications, flight recorders, lighting, threat detection, fuel systems, electro-optic (EO/IR) systems, weather radar, performance monitors, and other systems for various mission and flight management tasks.



## VIDEO PROCESSING UNIT (VPU)

The VPU processes, encrypts, and compresses video/audio data for transmission to the Ground Control Station (GCS). It manages camera video data, providing Situational Awareness System streaming to inform groundcrew. The VPU encodes and processes Electro-Optical/Infra-Red (EO/IR) data, extracting target identification and tracking information. It supports overlaying multiple video streams (e.g., IR and Radar) for enhanced processing and capabilities. The VPU encrypts and compresses the data prior to radio transmission.



## COMMON INTERFACE UNIT (CIU)

The Common Interface Unit (CIU) serves as the interface and control system for avionics, auto-pilot, and internal communication busses. It functions as a control and automation unit, capable of being utilized in various automation applications like unmanned land and sea vehicles, as well as weapon systems, through sensor inputs and programming. The CIU also supports multiple discrete channels.



## RADIO UNIT (RU)

The Core (C-Band) Radio Unit is the primary datalink connecting the Unmanned Vehicle to the GCS/Satellite systems. It plays a vital role in locating the Unmanned Vehicle during GNSS spoofing/jamming or failure. The Radio Unit supports up to 4 Unmanned Vehicle connections and enables bi-directional tactical communication within the illuminated area. Optional satellite communications (SatCom) can be added.

# DEVICE INTERFACE AND NETWORKING

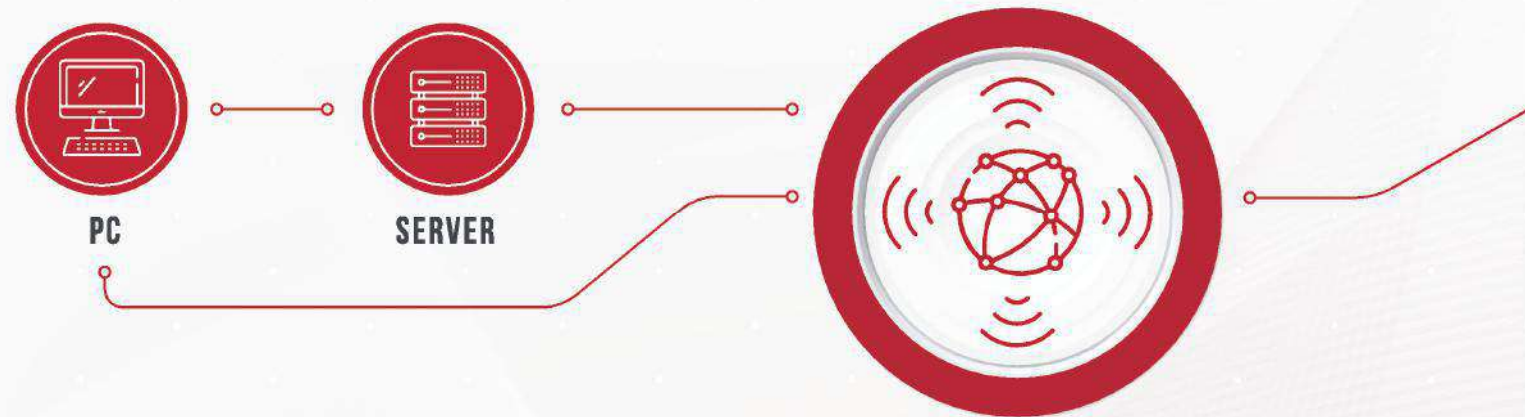
## APPLICATIONS AND TECHNICAL CAPABILITIES:

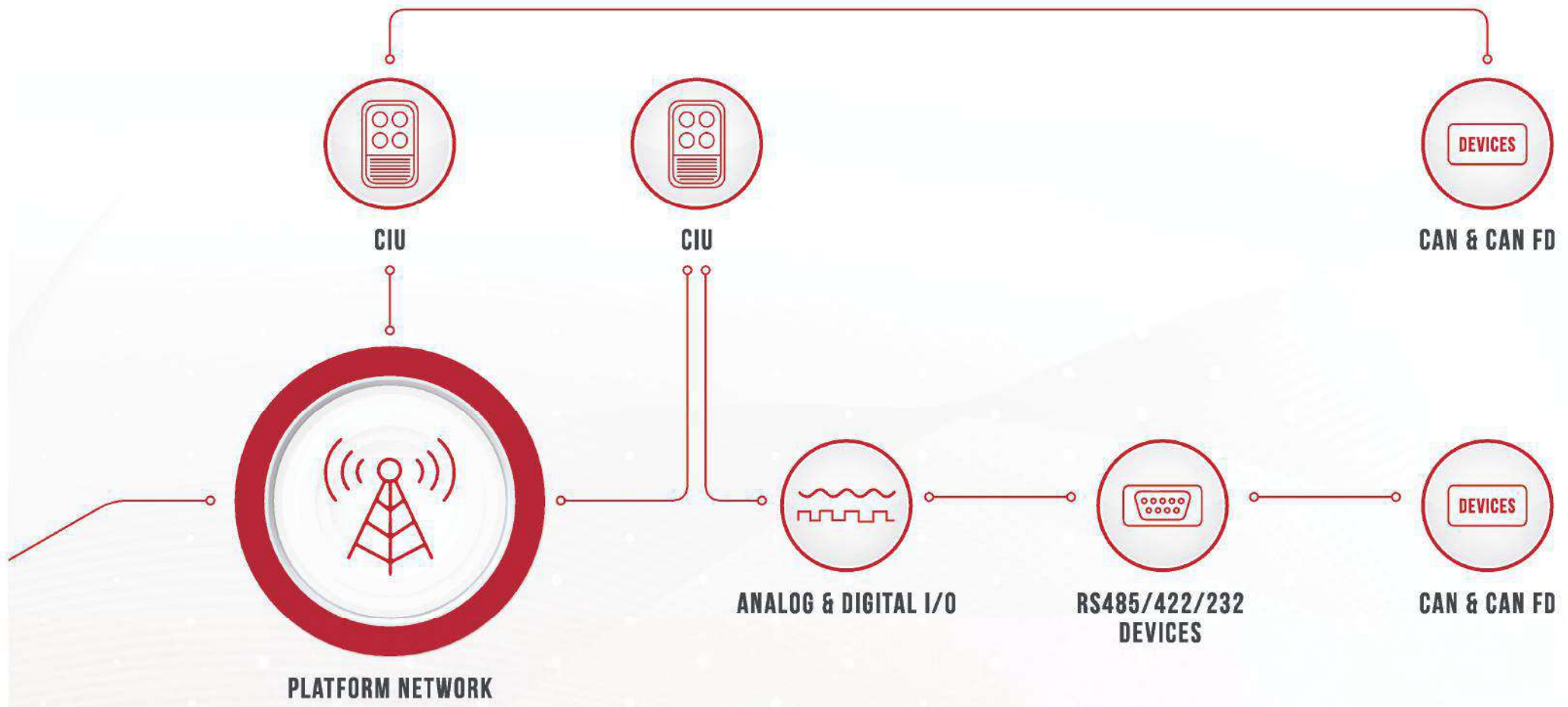
- On platform device networking
- Remote monitoring and control
- Power management of devices
- Edge Processing
- Data Fusion and filtering
- Control Loops

## DESIGN PRINCIPLES AND STANDARDS

Rugged hardware and software design principles capable of performing in harsh environments with a key focus on reliability and safety-critical operations. Designed in accordance with the following standards:

## WIDE AREA NETWORK







# MIS SERVICES

## DESIGN AND MANUFACTURING

### AIRCRAFT DESIGN AND FABRICATION

Our experienced team of designers is dedicated to achieving a comprehensive aircraft design that meets all requirements with utmost precision. They meticulously address key aspects such as aerodynamics, propulsion, performance, structural systems, control systems, and more. By carefully considering factors like fuselage shape, engine size, and numerous other parameters, our designers aim to optimise every aspect of the aircraft's design. Their expertise and attention to detail ensure that the final product is finely tuned for optimal performance, efficiency, and safety.

## FLIGHT TESTING

### FLIGHT TESTING IS PERFORMED IN DISTINCT PHASES:

- Pre-deployment ground testing.
- Taxi testing.
- Flight testing.
- Automatic Take-off and Landing (ATOL) and Pilot Assisted Take-off and Landing (PATOL) testing.
- During each of these phases, the TGCS, GDT, and Support group will also undergo testing to ensure functionality and acceptability.

### COMPOSITE MANUFACTURING

Composite parts offer a combination of strength, stiffness, and lightweight properties, allowing for the creation of complex shapes. They are well-suited for applications like fibreglass shells and covers that require large, intricate structures. Composites find extensive use in aerospace, vehicular, naval, and industrial applications where high performance and excellent mechanical properties are crucial. The availability of various glass and resin combinations makes composites an ideal choice for meeting specific performance requirements.

# MIS SERVICES

## TRAINING

MIS offers cutting-edge tactical UCAV training, consisting of 6 months of training in South Africa and 6 months in the end user's country. The training in the end user's country covers air traffic laws specific to that country. It equips operators with a comprehensive understanding of UAV systems, theoretical knowledge of the acquired system, and practical skills for operation and deployment. The training is divided into operator training, focusing on GCS operation, and technician training, providing maintenance skills for various system components like the UCAV, GDT, GCS, and PDU.

## HARDWARE & SOFTWARE DEVELOPMENT

MIS offers a range of hardware and software components along with various services in different environments. Hardware development encompasses different sectors and phases, such as architecting, design, and implementation. Within these phases, a variety of components are developed and implemented, including:

- High speed digital electronics
- Power electronics
- RF (radio frequency)

### OPERATIONAL TRAINING

All elements involved in preparing the UCAV for flight and setting up the Ground Control Station, this includes safety checks.

### FLIGHT TRAINING

All elements involved with flying the UCAV using the Ground Control Station as well as emergency scenario handling.

### MAINTENANCE TRAINING

All elements involving in servicing the UCAV after and before flight to ensure safe operation and reliability. Will include repair training for composite structure.

In the realm of software development, the process involves sectors and phases including architecting, design, implementation, integration, and testing. Throughout these phases, a diverse range of components are developed and implemented, including:

- Firmware,
- Embedded software
- PC applications and operating systems






**MILKOR** INTEGRATED SYSTEMS

Cape Town, South Africa





A dark, atmospheric photograph of a modern building interior. A prominent horizontal light fixture, possibly a long, thin tube light, is illuminated and runs across the middle of the frame. The background is mostly in shadow, with some faint architectural details and a person's silhouette visible on the right side. The overall mood is mysterious and contemporary.

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