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INTRODUCTION

The company offers leading-edge capabilities in the field of electro-optical (EO) technologies and systems. It has a proven track record of providing high performance EO products to meet the demanding requirements of both domestic and international customers.

Its capabilities are based on extensive experience in core elements, including the manufacture of high performance cooled infrared detectors, camera and imaging system design, gimbal design, development of stabilised electro-optical directors, image processing algorithms and platform and mission system integration expertise, covering land, naval and avionic platforms.

Building on these core capabilities, we offer a comprehensive portfolio of world class EO products and solutions for applications including dismounted or mobile users, land vehicles, maritime and naval platforms ranging from offshore patrol vessels up to major warships or on helicopters, unmanned aerial vehicles or fixed wing aircraft. Platform integration capabilities and Systems Integration Laboratories (SIL) allow the company to work closely with customers to model specific operational scenarios and local platform environments to ensure optimum performance of the installed product or system for customers.

The portfolio of solutions offered includes those for soldier or dismounted enhanced situational awareness (SA), mobile and fixed surveillance and SA systems for asset protection or border surveillance, open architecture land vehicle mission systems with modular SA, surveillance and force protection capabilities, commanders and gunners' sights and fire control systems for tanks and armoured fighting vehicles and solutions for maritime SA and naval gun fire control systems. Using proprietary cooled infrared sensors, the company delivers 24/7 imaging capability to the individual soldier or platform in combat-proven products and systems.

The company possesses excellence in proprietary key enabling technologies, from core elements, such as infrared detectors and modules, through to complete integrated systems. This high degree of IP ownership enables the company to offer licensed manufacture to industrial partners to meet the needs of domestic markets. We can supply standalone equipment as well as turn-key optronics solutions to end users, taking advantage of its highly vertical integrated technology base and expertise in optronics, and systems.

Key technologies in optronics are modular, scalable and based on common core elements. They allow future systems growth and tailored levels of capability, whilst maintaining commonality of parts and a reduced logistics footprint. The company offers customised support packages that are tailored to the specific needs and requirements of customers and their platforms.

For more detailed information on any of the products shown in this brochure, please visit our website at www.leonardocompany.com

AIRBORNE AND SURVEILLANCE SYSTEMS

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EOST-46

High Performance Passive Electro-Optical Surveillance And Tracking System.

LEONARDO is a leading supplier of stabilised airborne Electro-Optical (EO) sensor systems and has delivered turrets for fixed wing, rotary wing and unmanned aircraft platforms. EOST-46 is the latest multi-sensor turret system designed for the demanding airborne environment. It combines high performance sensors with a high performance turret to meet the operational needs of today's airborne observation, surveillance and reconnaissance. EOST-46 is based on a modular payload, containing up to four EO sensors.

It uses the proprietary Erica Plus thermal imager, operating in the medium wavelength spectrum (3-5 μ), based on the company Focal Plane Array (FPA) Hawk detector. For day operations, including low light conditions, EOST-46 utilises a 20x zoom TV colour and B/W camera for target acquisition. A colour and B/W high magnification, long range TV camera spotter is available for target identification at longer distances. As an alternative, a Laser Range Finder can also be installed. An NVG compatible laser illuminator is also available: in cooperation with a TVCC or TV very long rang, to provide an enhanced low light search capability.





TITAN 385ES-HD

Multi-Sensor Turret System.

The Titan 385ES-HD Multi-Sensor Turret System combines high performance sensors into a single Line Replaceable Unit (LRU) solution, to meet the operational demands of today's airborne observation, surveillance and reconnaissance requirements.

The Medium Wave infrared camera is supplemented as standard with an Uncooled Long-wave IR camera for instant availability, a solid state low light level television (L3TV) camera. Optional sensor configurations include an eye-safe laser rangefinder, colour/ low light monochrome spotterscope and laser illuminator/ pointer. Titan 385ES-HD may also be configured with a subset of the standard sensor fit should the requirement demand. Titan 385ES-HD incorporates an embedded Video autotracker capable of operating on any of the imaging sensor channels. Graphics processing and aircraft interfaces are also integrated into the single LRU design of Titan 385ES-HD.

EOST381M

High Performance Stabilised Targeting Turret.

EOST381M is the LEONARDO's latest multi-sensor 4 axis gyro-stabilized turret system designed for multirole (airborne, land and naval) environment. Designed to be compliant with demanding vibration profile and to be integrated hard mounted in up and down ward position, it combines high performance sensors with a high performance turret to meet the operational needs of today's Airborne, Land and Naval observation, surveillance, reconnaissance and targeting missions.

EOST381M is based on a modular payload, containing up to six EO sensors. It is a Single LRU and ITAR free system and uses the proprietary ERICA Plus thermal imager, operating in the medium wavelength spectrum (3-5µm), based on the company's Focal Plane Array (FPA) Hawk (Standard Definition) or Falcon (High Definition) detector. For Targeting operations EOST381M utilizes a Laser Designator (compliance with STANAG3733) for bomb/missile precision laser guidance. For range measurement a Laser Range Finder is installed, if required, and a NVG compatible Laser Pointer is also available in cooperation with a Full HD TVC SPOTTER to provide an enhanced low light target marking capability. If required, as option, a SWIR Camera is available to provide see spot laser for visual target confirmation.





EOST380HD

High Performance Stabilised Multirole Turret.

EOST380HD is the LEONARDO's latest multi-sensor 4 axis gyro-stabilized turret system designed for multirole (airborne, land and naval) environment. Designed to be compliant with demanding vibration profile and to be integrated hard mounted in up and down ward position, it combines high performance sensors with a high performance turret to meet the operational needs of today's Airborne, Land and Naval observation, surveillance, reconnaissance and targeting missions.

EOST380HD is based on a modular payload, containing up to seven EO sensors. It is a Single LRU and ITAR free system. For Surveillance operations EOST380HD utilizes a MWIR Thermal Camera, a 40x zoom Full HD TV color and a 10X HD LLLTV camera for low light conditions. For range measurement a Laser Range Finder is installed and a NVG compatible Laser Illuminator/ Laser Pointer is also available in cooperation with a Full HD TV and/or LLLTV cameras to provide an enhanced low light search capability for covert operation.

FLIR 111 - HELICOPTER NAVIGATION FLIR

Forward Looking Infrared

The FLIR 111 is a field-proven, high performance, compact, lightweight navigation Forward Looking InfraRed (FLIR) for utility and attack helicopters. From a solid background in Electro-Optics (EO) and InfraRed (IR) applications and exploiting the new technologies.

The FLIR 111 makes use of a second generation thermal camera mounted onto a two-axis steering platform. The video image, generated by the thermal camera, presented on the pilot's Helmet Mounted Display (HMD), allows the crew to navigate a 'map of the earth' at night and in adverse weather conditions.

The FLIR 111 has been qualified for NH90 / TTH and Tiger helicopters. It is jointly produced by LEONARDO (Prime Contractor), Hensoldt Systemtechnik GmbH (Zeiss Group) and AEG-Infrarot-Module.





SPHYDER

Smart Processing Hyperspectral Detection And Reconnaissance System

SPHYDER is a hyperspectral system which has been conceived for remote sensing applications. Designed and manufactured entirely in-house, SPHYDER works in PAN, NIR and SWIR range, processing and displaying real-time data acquired during the flight.

A user-friendly GUI (for both the aircraft system and the ground station) enables the organisation of training across a range of disciplines ranging from Operator to Mission Planner to Mission Analyst.

SOLDIER SYSTEMS

ALICE HH

Hand Held Uncooled Thermal Imager

ALICE HH is an uncooled thermal imager based on a state-of-the-art, high resolution focal plane. The advantages of uncooled IR technology mean that there is no need for cryo-cooling devices. This results in a significant reduction in weight, size and power consumption, together with an overall improvement in reliability, operational readiness and portability.

ALICE HH is the ideal solution for applications where small size and low weight are required (reconnaissance forces and special units; security and perimeter defense forces, etc). ALICE HH can also be fitted with a laser range finder by means of a Picatinny rail (optional) to be mounted on the upper part of the equipment's body. ALICE HH can wirelessly integrate into an existing network.





LINX

Hand Held All-Weather Target Acquisition System

A multi-functional day/night handheld target locator which includes an uncooled thermal imager for all-weather observation and detection, two Field of View (FOV) colour TV channels for high definition observation and detection during daylight conditions, an eye-safe Laser Range Finder, a digital compass and Global Positioning System (GPS) provision housed in a compact lightweight unit used by dismounted soldiers and special forces.

LINX performs target acquisition through a target data record that provides target marker, azimuth, elevation, distance, global positioning and a target snapshot of the scene both in InfraRed (IR) and TV modes.

The target data record is transmitted to the C2 by wireless or wired technology. LINX is self-powered using Li-ion military rechargeable battery, AA lithium battery (+1.5V) or an auxiliary power connector for an external DC source is also available.

Integration

LINX integrates all of the necessary functions required for a real "Commander's Target Locator": TV and IR cameras, GPS, digital compass, Laser Range Finder. It is designed to be "NET-centric", i.e. integrated in a network via a wireless (but also wired) connection allowing the "Soldier System" to be in his centre with the possibility to exchange information (images and data) with the rest of the system.

COOLED LINX

Hand Held Target Acquisition System

Cooled Linx is a multi-functional hand-held target acquisition system which includes a zoom cooled thermal imager for all-weather observation and detection, an eye-safe Laser Range Finder, a Digital Magnetic Compass, a Global Positioning System (GPS) receiver, BT and Wi-Fi housed in a compact lightweight unit used by dismounted soldiers and special forces.

It is designed to be "NET-centric", i.e. integrated in a network via a wireless (but also wired) connection allowing the user to be in his center with the possibility to exchange information (images and data) with the rest of the system.

Linx is a fully integrated device for a real "Target Locator" and performs target acquisition through a target data record that provides target marker, azimuth, elevation, distance, global positioning and a target snapshot of the scene in InfraRed (IR).





MINI SIGHT 640 AC

Miniature Thermal Weapon Sight with Situational Awareness Capability and C4I Interface

Mini Sight 640 AC is an advanced new generation Miniature Thermal Weapon Sight with Situational Awarness Capability and C41 Interface.

Mini Sight can be integrated with NIMOS system or with other C2/C4i systems to provide snapshots or videostream.

The Mini Sight 640 AC is designed to be used by the "Future/Digital Dismounted Soldier" as a Hand-Held or Helmet mounted Mono-Scope or light TWS on rifles' standard Picatinny" rails.

Mini Sight 640 AC provides an outstanding image quality within a small Size, Weight And low Power (SWAP), with special features and extended operating time and performance system.

The Mini Sight 640 AC has an optional accessories, (e.g. Hard & Soft carrying Cases, Helmet/Head Mount gear, etc.).

SCORPIO

Grenade Launcher Fire Control System

Scorpio is a lightweight, compact, high hitprobability, Fire Control System (FCS) for grenade launcher tubes that provides fast and accurate aiming and firing (LOS/ LOF) capabilities.

A ballistic computer reconfigurable by means of uploaded firing tables for selected ammunition (HE frag, HEDP, Smoke, etc) provides enhanced hit probability against standing and moving ground targets. Scorpio is a unique solution for the Fire Control of a Grenade Launcher:

- It is integrated with the weapon and directly measures the quantities that are necessary for a ballistic solution (line of fire attitude, target distance and movement). On this basis and considering the projectile firing tables, it autonomously calculates the ballistic lead angles.
- Scorpio then guides the soldier to position the weapon line of sight in order to hit the target, taking into account the dynamic conditions.





NIMOS

Night Mobility System With Situational Awareness Capability And C4i Interface

NIMOS is a Helmet Mounted system composed by an electronic unit and a tactical mobile night vision goggle (TM-NVG).

NIMOS can receive and display the Rifle Sight IR by wired and wireless data link. NIMOS can also be integrated with the C2/C4I systems to directly display maps, coded messages and alarms, providing snapshots shared with C2/C4I.

Main features

- Full integrated with all helmet sizes
- Possibility to receive images and video form external devices. Typically it's connected to LEONARDO sight IR to deliver «shoot around the corner» capability
- Designed to be «NET-centric», integrated in a network via full standard protocol (Bluetooth 4.0, Wi-Fi 802.11) with the possibility to exchange information (images, videos and data) with other devices
- Inertial navigation capability.

FAOD

Forward Artillery Observation Device

FAOD is designed to be "NET-Centric" i.e. integrated in a network via a wireless / wired connection allowing the Italian "Future Soldier System" to be in communication and exchange information (image and data) with the rest of the systems on the same grid.

FAOD is a fully integrated device for a real "Commander's Target Locator" and performs target acquisition through a target data record that provides target marker, azimuth, elevation, distance, global positioning and a target snapshot of the scene both in infrared (IR) and any other modes.

The Electro-Optical Payload integrate thermal camera, laser range finder, GPS and DMC for target geo-localization.

FAOD has different operative configurations:

- Hand -held
- On tripod with LRF remote trigger
- Light configuration: Tripod + LRF trigger + Direct
 Optic + PC + Radio cable
- Full Configuration: Tripod + Goniometer + Direct
 Optic + PC + Radio cable
- Possible also integration with Lightweight Laser Designator.

Optional components like:

- Direct Optical Sight
- Goniometer
 - Equipped with optical encoders for precise angle measurement
 - Orientation is acquired from geodetic routines or DMC or celestial bodies / ASTRO or North finding Gyroscope
- PC/Tablet with Maps Management/Artillery Fire Control System /Battle Management System/JTAC
- Tactical Military radio Interface
- Military GPS (DAGR, PLGR or SASSM)
- Laser Designator
- C-spot camera.

Position is acquired from manual input or geodetic routines or internal C/A code GPS or external GPS (optional).





Light Configuration

Full Configuration

VEHICLE SYSTEMS & TACTICAL ISTAR

ATTILA D

High Performance Panoramicmultispectral Observation And Aiming System

ATTILA D is a Multispectral Optronic System designed for day/night panoramic observation, detection, identification and firing at both stationary and moving surface and aerial targets. Two-axis primary stabilisation allows operation from moving platforms with no reduction in performance. A high performance infrared focal plane array sensor provides world-class night vision.

The system also includes a high definition colour CCD TV and eye-safe Laser Range Finder (LRF). When integrated within a Fire Control System (FCS), ATILLA D delivers a full hunter-killer capability. The use of standard digital interfaces simplifies integration and configuration within an Observation and Fire Control System. ATTILA D works on Open Digital Ethernet interfaces to GVA standards.





JANUS RSTA

High Performance Stabilised Multi Sensor For Land Applications

Designed to deliver combined medium and long range panoramic sight, day/night , all weather in rugged, sealed, self contained, compact package. The JANUS RSTA is a field-proven, high performance stabilised multi sensor selected by the Italian Army to equip the Freccia multirole Armoured Vehicle (VBM).

JANUS RSTA incorporates LEONARDO's high performance infrared staring focal plane array sensor technology for high resolution night vision, a high performance colour CCD TV, and to deliver hunter-killer capability, an eye-safe Laser Range Finder. JANUS RSTA works on Open Digital Ethernet interfaces to GVA standards.

LOTHAR

Day/Night Gunner Sight

LOTHAR (Land Optronic Thermal Aiming Resource) is a modular and compact sight designed to deliver identification, recognition and pin-point targeting capabilities to the gunner, day or night. In operation/ deployed on the Italian Army, LOTHAR can be linked to the gun or independently stabilised. As a key component of a Fire Control System, LOTHAR can be integrated into turrets controlling guns from 25 -30mm to 120 - 125mm.

LOTHAR incorporates the company's latest thermal imaging modules, either LWIR or MWIR proprietary detectors, a high performance colour CCD TV, an eye-safe Laser Range Finder, a daylight elbow and all the facilities needed for a perfect control of fire. LOTHAR works on Open Digital Ethernet interfaces to GVA standards.





THETIS

Thermal Tank Infrared System

Today's battlefield requires armoured vehicles to provide effective fire and combat capability whatever the visibility conditions. THETIS is designed to provide tanks and combat vehicles with infrared (IR) observation and firing capabilities at night, in the presence of smoke or in other low visibility conditions.

THETIS comprises modular self-contained functional units, giving the system high flexibility in performance and installation armour modifications.

THETIS can be configured as a main autonomous night Fire Control System (FCS) as well as a night sighting unit for the upgrade of an existing FCS. It incorporates the company's high performance IR focal plane array sensor technology, either LWIR or MWIR, for high resolution night vision. Taking into account the integration needs, THETIS may be installed either under armour with a mirror head linked to the LOF or above armour.

MINI COLIBRI

Day - Night Fire Control System

Mini Colibrì is an indirect view electro-optical FCS for use in short to medium range applications. It is capable of target engagement under all weather conditions during both day and night. Target engagement is carried out remotely from within the turret.

It can be used as Aiming and/or Fire Control System for both short and medium-range applications (e.g. small to medium size weapon systems, operations in an urban environment, in reconnaissance vehicles operating in direct fire mode).

The Mini Colibrì offers the following functionality:

- Daylight observation and firing, by means TV camera withzoom and optionally by a TV camera with Narrow Field of View
- Night-time observation and firing, by use of the Uncooled IR sensor
- Range measurement, by means of LRF
- Ballistic reticule control, and emergency reticules
- Indirect observation of the outside scenario via the System Control Unit located inside the turret.





COLIBRI

Day/Night Fire Control System

COLIBRI Fire Control System, with accurate targeting capabilities, has been developed for vehicle and weapon systems featuring modular and scalable solutions that are easy to integrate on to any platform.

COLIBRI incorporates LEONARDO's high performance infrared staring focal plane array sensor technology for high resolution night vision. In addition to the thermal image from the COLIBRI sensor, both gunner and commander are also provided with a high resolution image from a Colour Charged Coupled Device (CCD) sensor. The CCD sensor has a continuous zoom facility which can be used to enhance target recognition and identification ranges. An eye-safe Laser Rangefinder (LRF) has been integrated into the sight to provide accurate target ranging and improved accuracy. A FCS management computer, a console in a rugged, very compact enclosure, complete the configuration with an overall weight of less than 15Kg.

STAWS

Surveillance Target Acquisition And Weapon Sight

The Surveillance Target Acquisition and Weapon Sight (STAWS), is an integrated, passive, multispectral sighting system designed for use with the latest generation of Remote Controlled Weapon Systems (RCWS). The STAWS sight utilises advanced uncooled thermal imaging technology.

Combined with a high-resolution daylight sensor, STAWS provides a 24-hour all weather surveillance and target acquisition capability. To maintain its competitive advantage, STAWS has been designed with a growth path to accept technology insertion. This includes larger format 640 x 480 uncooled detectors for extended range performance. In its basic form, STAWS uses a stadiametric non-laser based range finding method to determine the distance to a target. For more accurate ranging an optional eyesafe Laser Range Finder (LRF) can be fitted. Data provided by the LRF, Digital Magnetic Compass (DMC) and Global Positioning System (GPS) is processed by a micro controller built into STAWS. The target position is calculated and displayed on a screen.





STAWS DF

Surveillance Target Acquisition And Weapon Sight Direct Fire System

The STAWS Direct Fire System provides a flexible and cost effective day/night sighting solution for a wide variety of armoured fighting vehicles ranging from light tanks up to and including self propelled howitzers. The Direct Fire Sight system is an enhanced version of the proven in-service Surveillance, Target Acquisition and Weapon aiming Sight (STAWS) and uses the latest thermal imaging technology being supplied into the British Army and other international forces.

The ballistic computer embedded in the system can be programmed with the data for up to six different ammunition types and for a range of different weapon calibres. In addition to the thermal image from the STAWS sensor, both gunner and commander are also provided with a high resolution image from a Colour Charged Coupled Device (CCD) sensor. The CCD sensor has a continuous zoom facility which can be used to enhance target recognition and identification ranges. An eye-safe Laser Rangefinder (LRF) has been integrated into the sight to provide accurate target ranging and improved accuracy.

ENFORCER

Remote controlled weapon system

Enforcer is a state of the art Remote Controlled Weapon System (RCWS) designed to be fitted to a wide range of combat vehicle platforms, including light wheeled and tracked armoured fighting vehicles.

A modular design allows optimised solutions to be generated for a variety of operational requirements. Enforcer accepts a range of weapons that can be interchanged in the field including 7.62mm General Purpose Machine Gun (GPMG), 12.7mm Heavy Machine Gun (HMG) and 40mm Automatic Grenade Launcher (AGL).

Selected for the British Army's Panther Command and Liaison Vehicle (CLV), Enforcer is currently undergoing trials both in the UK and abroad for other vehicle platforms.

Enforcer is fitted with the company's Surveillance Target Acquisition and Weapon Sight (STAWS), providing a full 24-hour, all weather surveillance and target engagement capability.





ENFORCER II

Remote controlled weapon system

Enforcer II is a state-of-the-art stabilised Remote Controlled Weapon System (RCWS). Enforcer II is based on the combat proven Enforcer RCWS with approx 500 systems in service with the British Army on wheeled/tracked vehicles and fixed installations. The digital control architecture provides a stabilised weapons platform for 'fire on the move' capability supported by a video autotracker in both daylight and TI modes. Enforcer II can also be interfaced with a Battle Management System to enable 'slew to cue' functions.

The modular design allows optimised solutions to be generated for a variety of operational requirements. Enforcer II accepts a range of weapons that can be interchanged in the field including 7.62mm General Purpose Machine Gun (GPMG), 12.7mm Heavy Machine Gun (HMG) and 40mm Automatic Grenade Launcher (AGL). Enforcer II has many parts common to Enforcer and can be fitted as an upgrade. Enforcer II is fitted with the company's Surveillance Target Acquisition and Weapon Sight (STAWS), providing a full 24-hour, all-weather surveillance and target engagement capability.

EOST381M

High Performance Stabilised Targeting Turret

EOST381M is the LEONARDO's latest multi-sensor 4 axis gyro-stabilized turret system designed for multirole (airborne, land and naval) environment. Designed to be compliant with demanding vibration profile and to be integrated hard mounted in up and down ward position, it combines high performance sensors with a high performance turret to meet the operational needs of today's Airborne, Land and Naval observation, surveillance, reconnaissance and targeting missions.

EOST381M is based on a modular payload, containing up to six EO sensors. It is a Single LRU and ITAR free system and uses the proprietary ERICA_Plus thermal imager, operating in the medium wavelength spectrum ($3-5\mu m$), based on the the company's Focal Plane Array (FPA) Hawk (Standard Definition) or Falcon (High Definition) detector. For Targeting operations EOST381M utilizes a Laser Designator (compliance with STANAG3733) for bomb/missile precision laser guidance. For range measurement a Laser Range Finder is installed and a NVG compatible Laser Pointer is also available in cooperation with a Full HD TVC SPOTTER to provide an enhanced low light target marking capability. If required, as option, a SWIR Camera is available to provide see spot laser for visual target confirmation.



TURMS - D

Tank Universal Reconfigurable Modular System

The company has extensive experience and a broad range of technologies to enhance battlespace capability. In the land sector, the company draws on its unique experience to develop tailored vehicle architectures, and a complete range of system solutions and services. TURMS-D is a fully digital, up-to-date system, designed on the basis of the experience gained with the previous TURMS and TURMS-T family.

Tank Universal Reconfigurable Modular System (TURMS) design is fully modular, able to match and fulfill customer requirements, and to integrate with existing capabilities on a wide variety of AFVs and MBTs. However, fire power remains the prime factor for BTs and AFVs. The TURMS family FCS is the best answer to this requirement, giving the best results in:

- Firing-on-the-move capability
- Operations by day and night
- Short reaction time.

With more than 40 years' experience in design, development and manufacturing of tank FCS, the company integrated TURMS systems on Centauro, Ariete and Freccia of Italian and other armies, and T-72. We are also a worldwide experienced company in MBT modernisation.





SYSTEM FEATURES

Modular, Scalable and Open Architecture/ Configuration

- Flexible to specific requirements
- Oriented to future sensor technology
- Open to future needs: sensor fusion and advanced sensors
- Fully digital system.
- Full digital system compliant to
 - Nato GVA standardisation requirements
 - NATO platform level digital video standard.

Very Short Reaction Time

- Primary stabilised panoramic commander sight allows the COMMANDER fast target detection and automatic designation
- Ability to engage a second target with the commander sight during the tracking of the first one by the gunner
- Immediate firing by the commander sight in case of very close target.

Fully Automatic Computation

Laser range finding, automatic sensor and a stateof-the-art ballistic computer allow very accurate calculation of the ballistic solution. Special algorithms enable the fire when the probability to hit the target is maximum, taking into account the movement of the own vehicle and the target, and compensating the effects due to the time delays and online arities in the artille.

Easy System Operation

 Fully automatic computation and high performance stabilisation reduce training difficulties.

Networking

- Integrated system thanks to the internal digital data bus and digital video bus
- All the devices are networked
- Full information sharing within the vehicleIntegration in the external C4I battlespace
- environment
- Easy to fit and simplified maintenance due to the bus structure
- Reduced weight, lower power consumption, smaller size.

System Composition

- Observation unit (COMMANDER SIGHT)
- Aiming and firing unit (GUNNER SIGHT)
- Ballistic computer
- Ancillary sensors.

VMS

Vehicle mission systems

The company offers a Mission System that following the GVA (Generic Vehicle Architecture) approach offers a configurable, scalable suite consisting of:

- SensorsEffectors
- Processing and data storage
- Communications
- HMI modules.

These are interconnected via one or more local Ethernet networks, while power requirements are managed through standard military connection points.

The software is modular and decoupled from the hardware by a middleware layer. This enables mission-appropriate applications to be installed and/or tailored to the specific operational need. The GVA common user interface is used for on-board operation of all subsystems, from any crew station. It reduces the clutter inherent with multiple dedicated devices in a typically cramped workspace and helps towards more economic cross-fleet user training. Working in collaboration with the base vehicle provider, the company offers a whole-life Mission System solution - from concept through to acquisition, training and support.

The configurable modular re-use concept behind GVA demands more than just an 'installer'. A Mission System Integrator must be appointed, capable of applying specialist and inter-disciplinary system engineering, management and support skills.

The company's Vehicle Mission Systems benefit from a long-established pedigree of supply to the British Army including Challenger 2, Panther, Terrier, Mastiff, Ridgback, Wolfhound, Viking and Warrior.

This provides a proven understanding of the factors affecting capability and affordability, which can be balanced in a land context.

An in-house team of Mission System experts proactively supports the development and maintenance of the GVA defence standards. 'Interoperability' is a frequently used term, reflecting a reasonable user expectation. The multi-layered aspects of delivering interoperability in complex military systems are embedded in the company's core business.





	Crew		GVA Ready	eras	ion	ure			pe		sor
GVA Display	GVA Hard Control Panel	Headset	Equipment GVA Functional Group (Software)	Local SA Cameras	Sniper Detection	Countermeasure Effector	RWS	Navigation	Mast Mounted Sight	MOTS Radios	MOTS Processor
			Situational Awareness (SA)	•	•			•			
			Weapon (WPN)				•				
			Defensive Aids (DEF)								
			System (SYS) (BIT, HUMS. Pwr Mgt, User Config)								
			Driving Aids (DRV)	•				•			
			Communications (COM)							•	
			Battle Management (BMS)								
			Special To Role (STR)								

DNVS

Driver's Night Vision And Vehicle Situational Awareness Systems

The company offers modular solutions addressing the need for Driver's Night Vision and Vehicle Situational Awareness, up to full 360° coverage around the vehicle and with independent operation from multiple crew stations in the vehicle. Closein Situational Awareness provides the commander and crew with vital intelligence about the area immediately in front of and all around the vehicle before dismounting, which is essential for today's military operations with the threat from IEDs, EFPs and RPGs.

The system uses any combination of the latest uncooled Thermal Imaging technology, colour CCD daylight or Low Light TV sensors with optional Infrared illumination to provide the optimum vehicle solution.

The sensors are all interchangeable and allow individual vehicles to be tailored to meet specific operational requirements. Sensors may be swapped to meet different mission demands. A range of displays/crew stations are available to suit the individual needs of the driver, commander and crew, ranging from 8.4" to 15" screens. Capabilities include a "picture in picture" facility in the 10.4" and 15" displays and a 10.4" intelligent unit with additional

PC module. Rear or side connectivity is available to provide greater installation options. The systems are fully qualified for both wheeled and tracked military fighting vehicles and are combat proven.









System Configuration

Our team of system and installation engineers are available to discuss and understand your operational requirements and propose solutions which best fit your operational needs and budget requirements.

- 1. Front camera
- 2. Rear camera
- 3. Side camera
- 4. Driver display unit
- 5. Commander display unit
- 6. Crew display unit.

Cameras

Our camera technology is combat proven and is in service with the UK and other armed forces on more than 14 different vehicle types, both wheeled and tracked.

- DNVS 4 Digital Dual Channel Thermal/Colour camera
- DNVS 4C single channel colour day/night camera
- DNVS 4M single channel low light monochrome camera.

Display Units

The company offers a range of display screen options for the driver's night vision and local situational awareness systems. The display screens are available in a range of sizes, and can be tailored to provide varying levels of capability and complexity.

- 8.4" Driver Display Unit
- 10.4" Multifunction Display Unit
- 15" Specialist Display Unit.

Optional System Capabilities

The versatile design of the system elements allows a number of additional system capabilities to be offered.

- Near IR Illuminators
- Integrated Inclinometer
- Integrated GPS / Navigation
- Battlefield Management System (BMS) display and Digital Mapping
- Surveillance Mode with x2/x4 Zoom.

DNVS 4

Situational Awareness Cameras

Our driver and local situational awareness cameras provide a complete range of cameras for installation on to military vehicles to provide passive, wideangle indirect view observation.

Designed to enhance the operability of armoured vehicles, these cameras provide optimum vision and improved situational awareness for today's 24-hour all-weather battlefield environment.

DNVS 4 is the latest generation of the company's DNVS family.

This addition is based on the successful DNVS 3 camera, which is combat proven and in-service with the UK and other armed forces on more than 14 different vehicle types, both wheeled and tracked. Cameras can be used for the driver's forward or rear vision, or in a number of positions around the vehicle to facilitate safe navigation and transit in areas of danger.

One or more of the cameras can be combined with one or more of the company's vehicle display screen units.

Cameras can be fitted as an independent system to provide enhanced vision, or as part of an indirect vision system to provide the vehicle with a full 360 degree field of regard. All versions of the cameras are fully interchangeable, so that thermal imaging night vision, low light monochrome cameras, and colour day/light cameras can be chosen as required to meet operational requirements.

Key Benefits

- Affordable driver's and local situational awareness vision sensor
- 24-hour operating capability
- Directly interchangeable with other cameras in the company's product range
- Modular construction fits most vehicles
- Near instantaneous operation
- Optional wash/wipe and soft cover
- Low whole life costs.



DNVS 4 Digital Dual Channel Thermal/Colour Camera

The DNVS 4 camera contains both a 640x480 high resolution thermal imaging camera and a colour day/night camera to provide optimum vision and situational awareness 24-hours a day, and in conditions of smoke and battlefield obscurants.

DNVS 4C Single Channel Colour Day/Night Situational Awareness Camera

The DNVS 4C colour day/night camera version provides the best full colour video performance at higher light levels, switching to monochrome operation once light levels fall below a threshold, providing an improved lowlight picture. The monochrome night mode maintains excellent performance at scene illumination levels down to 0.1 lux.

DNVS 4M Single Channel Low Light Monochrome Situational Awareness Camera

The DNVS 4M monochrome low light camera provides the best performance at/in near darkness levels, maintaining excellent performance at scene illumination levels down to 0.01 lux. If operation is required at very low light levels or total darkness, then a high performance IR illuminator option is available.

Configuration Options

- Default Camera DNVS 4 Dual Channel Thermal/ Colour Camera (Canvas Cover - Optional)
- Wash/Wipe Module with or without Grille (Optional) (Canvas Cover - Optional)
- IR Illuminator (Optional)



Wash/Wipe Module with or without Grille (Optional) (*Canvas Cover - Optional*)



DNVS 4M Single Channel Low Light Monochrome Situational Awareness Camera



DNVS 4 Digital Dual Channel Thermal/Colour Camera



IR Illuminator (Optional)



DNVS DISPLAY UNITS

Driver's Night Vision And Local Situational Awareness Display Screen Units

LEONARDO offers a range of display screen options for the driver's night vision and local situational awareness systems. The display screens are available in a range of sizes, and can be tailored to provide varying levels of capability and complexity. All of the display screen options are specifically designed to match the LEONARDO range of cameras, and have a very high level of integrated capability fully contained within the display units, reducing the need for any additional LRUs.

8.4" Driver's Display Units (DDU)

The 8.4" Driver's Display Unit (DDU) is designed for applications where a smaller size screen is necessary, providing an optimum balance between capability, size and eye relief, for vehicles with a more restricted internal space.

The DDU interfaces with multiple cameras, additional video sources, and a VGA video source. The user can select to display any of the available video sources (e.g. front camera, rear camera, and an external Battlefield Management System).

10.4" Multifunction Display Unit (MDU)

The MDU is a 10.4 inch colour LCD flat panel display with illuminated controls and indicators arranged around the screen. The controls utilise soft keys to allow easy adaptation to suit a multitude of different sensor interfaces.

10.4" Intelligent Multifunction Display Unit (IMDU)

The 10.4" intelligent Multifunction Display Unit (iMDU) is similar to the standard MDU screen in terms of functionality, size and weight, but has an additional integral processor module (including ultra low power integrated graphics) which is capable of running other PC based applications, either LEONARDO or customer supplied, with the soft-keys interfacing with the application. This is in addition to all of the functions of the 10.4" MDU.

15" Specialist Display Unit (SDU)

The 15" Specialist Display Unit has identical functionality and interfacing to the 10.4" Situational Awareness Display Unit, but has a larger display screen format. This unit would typically be suitable for a specialist operator who is using systems with high performance / high resolution output (e.g. a high resolution sensor display or detailed map display).







RD104-GVA-4X

Flat Panel Display

The RD104-GVA-4x is a full GVA-compliant yet cost effective, rugged 10.4" flat panel display. Its compact dimensions, Ethernet and Middleware interfaces mean that a multifunction GVA crew station can now be accommodated in the most confined spaces, even in legacy vehicles lacking a video network infrastructure.

The proven, high brightness, high resolution LCD, is complemented by the latest user and digital interfaces being adopted by open-standards-based mission systems, as required by Def Stan 23-09 Generic Vehicle Architecture (GVA).

The bezel keys follow the GVA Human Machine Interface layout requirements and conform to Def Stan 00-250 for gloved operation in a mobile vehicle. A touch screen, and combinations of either internal or external graphics generation, give the flexibility for an intuitive common user interface across dissimilar mission systems, with the associated potential for through life training benefits.



NERIO-LR

Long Range Surveillance And Threat Acquisition System

NERIO-LR is a state of the art modular Electro-Optical (EO) Surveillance, Threat Acquisition (STA) and Reconnaissance system designed to satisfy a broad range of current and emerging customer requirements.

These include:

- Border security and Critical National Infrastructure protection
- Vehicle based STA and Reconnaissance operational from both wheeled and tracked vehicle platforms
- Coastal surveillance
- Ship borne STA and Situation Awareness.

NERIO-LR integrates world-class EO sensors as part of a fully flexible payload configuration together with a gyro-stabilised director mechanism enabling capability, cost and performance to be optimised according to specific customer needs. Utilising the SLX-Hawk Thermal Imaging (TI) camera for provision of a 24/7 operational capability, NERIO-LR combines a 24° to 1.8° TI zoom field of view with a $360^\circ \times \pm 60^\circ$ system field of regard. Additionally to the SLX-Hawk TI camera, the standard NERIO-LR sensor payload configuration includes a high-definition colour day TV camera and optional, eye-safe Laser Rangefinder (LRF) to supplement the surveillance capability and enable the capability for geospatial threat location.

The modular payload and communication architecture of NERIO-LR enables the Day TV Camera and LRF solutions to tailored to meet specific customer performance, cost and capability needs. Additional special to role modules, e.g. illuminators and dazzle sources, can also be readily integrated to meet specific operational needs.

NERIO-LR is designed to facilitate use in direct mounting to platforms, masts or static tower mounted applications.

The SLX-Hawk and Horizon TI cameras incorporates a long-life cooling engine enabling extended maintenance free operation whilst the design of NERIO-LR/ULR enables ready access to the cameras for ease of maintenance when required.





NERIO-ULR

Ultra-Long Range Surveillance And Threat Acquisition System

NERIO-ULR is a state of the art modular Electro-Optical (EO) Surveillance, Threat Acquisition (STA) and Reconnaissance system designed to satisfy a broad range of current and emerging customer requirements.

These include:

- Border security and Critical National Infrastructure protection
- Vehicle based STA and Reconnaissance operational from both wheeled and tracked vehicle platforms
- Coastal surveillance
- Ship borne STA and Situation Awareness.

NERIO-LR integrates world-class EO sensors as part of a fully flexible payload configuration together with a gyro-stabilised director mechanism enabling capability, cost and performance to be optimised according to specific customer needs. Utilising the Horizon Thermal Imaging (TI) camera for provision of a 24hr operational capability, NERIO-ULR combines an 11° to 0.9° zoom field-of-view high definition (HD) TI with a 360° x \pm 50° system field of regard.

In additional to the Horizon camera, the standard NERIO-ULR sensor payload configuration includes a high-definition colour day TV camera with a compatible zoom field of view and optional, eyesafe Laser Rangefinder (LRF) to supplement the surveillance capability and enable threat identification and geospatial location. The combination of high definition imaging performance, sightline stability and field coverage enables customers to conduct surveillance acquisition operations from short to very long-range with a single EO system asset.

The modular payload and communication architecture of NERIO-ULR enables the Day TV Camera and LRF solutions to tailored to meet specific customer performance, cost and capability needs. Additional special to role modules, e.g. illuminators, dazzle sources and GPS receiver, can also be offered to meet specific operational needs. Performance of the Horizon TI camera enables the identification of threats at ranges typically beyond the effective range of the threat, enabling early counteraction to be initiated.

NERIO-ULR is designed to facilitate use in direct mounting to platforms, masts or static tower mounted applications. The SLX-Hawk and Horizon TI cameras incorporates a long-life cooling engine enabling extended maintenance free operation whilst the design of NERIO-LR/ULR enables ready access to the cameras for ease of maintenance when required.

OBSERVER 100

Ground-Based Situational Awareness System

Demonstrating a broad range of technologies within operationally deployed systems and the capability to integrate sensors to deliver persistent situational awareness.

OBSERVER 100 is a trailer-borne situational awareness system delivering 360 degree day and night surveillance. It is quick to deploy and recover and can provide surveillance to mobile patrols as well as fixed installations.

OBSERVER 100 is military off-the-shelf and ITAR free, comprising of an integrated radar and electrooptic sensor head, a 10 meters mast, processor unit, power management unit and batteries mounted in a sub-frame with an integrated generator. Accepting power from a range of external sources, it is self sufficient for over 60 days and has a plug and play sensor suite to meet a range of user needs and tasks.

The control suite provides two displays, a map with the radar targets and tracks overlaid and a video feed from the thermal or colour camera. A joystick provides intuitive control of the EO sensors and an intuitive GUI manages all other functions.

Key Applications

- Border management
- Critical National Infrastructure
- Forward operating/patrol bases
- Major/high profile events
- Oil and gas exploration.

A range of EO and ground surveillance radar sensors can be fitted on to the OBSERVER 100 system to meet the individual needs of the Customer. Please see the relevant datasheet for their Technical Specifications.



NERIO LR - long range surveillance and threat acquisition system



NERIO ULR - ultra long range surveillance and threat acquisition system



OBSERVER 250

Heavy Ground Based Istar System

The company has a broad range of technologies within operationally deployed systems and the capability to integrate sensors to deliver persistent situational awareness.

Utilising its experience and expertise, the company has developed OBSERVER 250, delivering a 360°, day, night and all weather 25m tower mounted surveillance platform which can be brought into action in less than 30 minutes, providing persistent surveillance to mobile patrols as well as fixed installations.

OBSERVER 250 is Military Off-The-Shelf and ITAR free, comprising of a flexible and modular platform that is capable of hosting a range of sensors to meet the customer's requirements.

The base specification comprises of an integrated ground surveillance radar, high performance Electro-Optic sensor head, 25 meters tower, power management system and a rugged control console. Accepting power from a wide range of external sources, it is self sufficient for over 30 days.

OBSERVER 250's control suite can be remoted from the sensor system by up to 100 meters via cable, up to 15km via a single IP bearer or further via Non-Line-Of-Sight communications. All of the platform layers have been designed to the relevant open and MIL standards for data and information layers, electrical and physical interfaces e.g. STANAG 4559 (metadata tagging), 4609 (video exploitability).



Key Applications

- Security and surveillance of Forward Operating Bases/Patrol Bases and key military installations
- Border management and surveillance
- Critical National Infrastructure
- Disaster management
- Surveillance for major and high profile events.



NAVAL ISTAR & MARITIME SYSTEMS ~

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DSS-IRST

Distributed Static Staring Infrared Search & Track

DSS-IRST is a automatic Search & Track full wide covered distribution system. THE DSS-IRST system uses in its configuration many sensors/ components installed along a perimeter of vessel platform that allow an activity of full 360 ° coverage.

DSS-IRST incorporates LEONARDO's latest high performance MWIR infrared staring focal plane array sensor technology that allow an automatic detection of traces, calculating distance actively or passively through triangulation and the possibility of video tracking of the tracks revealed.

KEY CAPABILITY

Functional requirements:

- Distributed system for eliminating blind areas
- Search & Auto Track at 50 Hz of 360 ° in the infrared band MWIR
- Automatic confirmation of the tracks to reduce probability of false trail
- Calculation target distance actively or by passive triangulation
- Video tracking IR panoramic video production
- IR and video production sector TV
- Use as a line of sight to the on-board weapons systems.

Architectural requirements:

- No. 4 Search Head for panoramic vision and IRST
- No. 3 Detection Head for track confirmation and distance measurement or passive triangulation
- No. 1 Cabinet processing and data and video interface
- No. 1 Local Console.

Performance requirements:

- FOV panoramic: 360°X >30°
- FOR: from -20° a +85°
- Search & Track: frequency 50 Hz
- Search & Track capability: 100 track
- FAR: 1/h blue water, 4/h littoral/harbour.







Search Head

Detection Head
SASS

Silent Acquisition And Surveillance System

SASS is a long range, passive IRST for naval applications, operating simultaneously in MWIR (3- 5μ m) and LWIR (8- 12μ m) spectral bands. It is able to detect and track air and surface targets with full 360° horizontal coverage and to provide InfraRed (IR) maps of the scene around the ship. It supports threat evaluation providing a statistical classification of tracks.

SASS has a modular architecture based on a stabilised panoramic head equipped with IR sensors and an electronic cabinet hosting the processing and control units. Special design care has been devoted to facilitate on-board maintenance.

SASS is a system developed for the Italian flag ship: the aircraft carrier CAVOUR. SASS has been validated at sea by the Italian Navy and has been selected for the Italian Future European Multi Role Frigates (FREMM).





JANUS-N

Multi Sensor Naval Suite

Designed to deliver combined medium and long range panoramic sight, day/night, all weather in rugged, sealed, self contained, compact package.

The JANUS-N is a field proven, high performance stabilised multi sensor naval suite selected by the Italian Navy as surveillance sensor for sea patrolling.

Janus incorporates the company's high performance infrared staring focal plane array sensor technology for high resolution night vision and a high performance colour CCD TV, with optional Laser range finder. JANUS-N suite include a console, a video tracker and a video recorder.

MEDUSA MK4/B

Eoir Gun Fire Control System

MEDUSA MK4/B is a lightweight Electro-Optical and Infra Red Gun Fire Control System (EOIR GFCS). Medusa can be used as stand alone GFCS for remote control of small/medium calibre guns, as well as an additional line of sight and, in general, for maritime operations where a passive capability is required.

Medusa Mk4/B belongs to the last generation of Gun Fire Control Systems and is based upon stateof-the-art processing unit and last generation EO/ IR sensors. The GFCS is designed for maritime operations during day and night, and to minimize outdoor and indoor space and weight.

Medusa is controlled by an operator at the Control Desk (provided with HD display, keyboard and joystick), which can be located in a sheltered area.

The man machine interface can be integrated within any combat management system. The system also provides a panoramic view to improve situational awareness at sea. Open to get target designations from external sources as Target Designation Sights, radars and combat management system. The high reliability of the system promotes low maintenance costs.



EOST380HD

High Performance Stabilised Multirole Turret

EOST381HD is the LEONARDO's latest multi-sensor 4 axis gyro-stabilized turret system designed for multirole (airborne, land and naval) environment. Designed to be compliant with demanding vibration profile and to be integrated hard mounted in up and down ward position, it combines high performance sensors with a high performance turret to meet the operational needs of today's Airborne, Land and Naval observation, surveillance, reconnaissance and targeting missions.

EOST380HD is based on a modular payload, containing up to seven EO sensors. It is a Single LRU and ITAR free system.

For Surveillance operations EOST380DH utilizes a MWIR Thermal Camera, a 40x zoom Full HD TV color and a 10X HD LLLTV camera for low light conditions. For range measurement a Laser Range Finder is installed and a NVG compatible Laser Illuminator/Laser Pointer is also available in cooperation with a Full HD TV and/or LLLTV cameras to provide an enhanced low light search capability for covert operation.



EOST381M

High Performance Stabilised Targeting Turret

EOST381M is the LEONARDO's latest multi-sensor 4 axis gyro-stabilized turret system designed for multirole (airborne, land and naval) environment. Designed to be compliant with demanding vibration profile and to be integrated hard mounted in up and down ward position, it combines high performance sensors with a high performance turret to meet the operational needs of today's Airborne, Land and Naval observation, surveillance, reconnaissance and targeting missions. EOST381M is based on a modular payload, containing up to six EO sensors.

It is a Single LRU and ITAR free system and uses the proprietary ERICA Plus thermal imager, operating in the medium wavelength spectrum ($3-5\mu m$), based on the Leonardo Focal Plane Array (FPA) Hawk (Standard Definition) or Falcon (High Definition) detector.

For Targeting operations EOST381M utilizes a Laser Designator (compliance with STANAG3733) for bomb/missile precision laser guidance. For range measurement a Laser Range Finder can be installed, if required, and a NVG compatible Laser Pointer is also available in cooperation with a Full HD TVC SPOTTER to provide an enhanced low light target marking capability. If required, as option, a SWIR Camera is available to provide see spot laser for visual target confirmation.

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ERICA FF

High Performance Full Format Thermal Imager

Delivering high resolution and high sensitivity image clarity at all times and whatever the conditions is at the heart of the company's Electro-Optics (EO) systems.

ERICA FF is a lightweight and compact cooled Staring Focal Plane Array step zoom thermal imaging core providing high resolution passive infrared imaging for day and night scenarios, in low visibility conditions for land, air and sea operations.

The imager uses an infrared HAWK MWIR detector coupled with our latest generation advanced processing electronics and 2 FOV step zoom objectives.





ERICA PLUS

High Performance Long Range Thermal Imager

Delivering high resolution and high sensitivity image clarity at all times, whatever the conditions, is at the heart of the company's Electro-Optics (EO) systems.

ERICA Plus is a lightweight and compact advanced thermal imager providing high resolution passive infrared imaging for day and night scenarios, in low visibility conditions for land, air and sea operations.

The imager uses a MWIR Mercury Cadmium Telluride HAWK detector with a 16 μ m pitch coupled with our latest generation of advanced processing electronics and very narrow FOV step zoom objective.

SLX CONDOR II

High Performance Dwir Thermal Imaging Camera

LEONARDO's new SLX-Condor II thermal imaging camera uses the latest Dual Waveband Infra-Red (DWIR) "3rd Generation" detector technology to provide the optimum passive thermal images irrespective of environmental conditions in land, sea and airborne operations.

The DWIR camera uses the standard TV resolution "Condor-II" MCT detector array developed by LEONARDO under UK MOD funding.

The detector is manufactured using LEONARDO's proprietary MOVPE on GaAs process and operates in two different spectral wavebands, at 3-5µm and 8-10µm. Coupled with LEONARDO's latest generation of advanced image processing electronics, the resulting camera produces near simultaneous images in both bands.

The SLX-Condor II camera enables the user to select the optimum thermal imaging waveband for the prevailing conditions at the time of operation. For the first time in a single camera, the natural resolution advantage of the MWIR waveband can be fully exploited without sacrificing any of the traditional advantages of the LWIR waveband.

Both wavebands can be displayed side-by-side on the video output for direct comparison of the images.

The camera also enables both wavebands to be fused in real time to create a unique true two-colour thermal image of the scene, clearly showing spectral anomalies in the scene.

An integrated microscan module is optional, to provide 1.3-megapixel resolution in each waveband and enhanced range performance using digital zoom technology. The SLX-Condor II DWIR camera has been designed as a compact, high performance unit which can be applied to a wide range of thermal imaging applications by system integrators and OEMs.





SLX HARRIER

High Performance Lwir Thermal Imaging Camera

The "3rd Generation" thermal imaging camera uses the latest staring focal plane technology to provide high performance, high resolution, passive Long Waveband Infra-Red (LWIR) imaging in day, night and poor visibility for land, sea and airborne operations.

The thermal imaging camera uses the high resolution "Harrier" LWIR MCT detector array developed under UK MOD funding on the Albion 3rd Generation development programme. The detector is manufactured using a proprietary MOVPE on GaAs process to achieve outstanding performance, image uniformity and pixel operability with very short stare times.

This leading edge detector is coupled with the latest generation of advanced image processing electronics to achieve superior image quality with minimum motion smearing, e.g. compared to QWIP-based imagers, even when mounted on highly dynamic platforms or viewing rapidly changing scenes. An integrated microscan module is optional, to provide 1.3 Megapixel resolution and enhanced range performance using digital zoom technology. The SLX-Harrier camera has been designed as a compact, high performance unit which can be applied to a wide range of thermal imaging applications by system integrators and OEMs.

SLX HAWK

High Performance Mwir Thermal Imaging Camera With Continuous Zoom Lens

The company's latest thermal imaging camera uses the latest staring focal plane technology to provide high performance passive Mid Waveband Infra-Red (MWIR) imaging in day, night and poor visibility for land, sea and airborne operations.

The camera uses the standard definition television (SDTV) resolution Hawk MCT detector array, manufactured using a proprietary MOVPE on GaAs process. This high performance detector is coupled with our latest generation of advanced image processing electronics to achieve superior image quality.

The continuous zoom lens has been specifically developed for the system and offers very wide fields of view for rapid surveillance while enabling very long identification ranges by rapidly zooming into a narrower field of view. An optional integrated microscan module provides 1.3 Megapixel resolution and enhanced range performance using full resolution digital zoom technology. An optional integrated microscan module provides 1.3 Megapixel resolution and enhanced range performance using full resolution digital zoom technology. The SLX-Hawk 2:24cz camera has been designed as a compact, high performance unit which can be applied to a wide range of thermal imaging applications by system integrators and OEMs.



SLX HAWK-S

High Performance Mwir Thermal Imaging Camera With Continuous Zoom Lens

The SLX Hawk-S has been developed as a smaller form factor to be a direct drop-in replacement for the heritage naval thermal imager market. It dramatically upgrades and improves the range performance and image quality of traditional naval thermal imagers.

The camera uses the standard definition television (SDTV) resolution Hawk MCT detector array, manufactured using a proprietary MOVPE on GaAs process. This high performance detector is coupled with our latest generation of advanced image processing electronics to achieve superior image quality. The continuous zoom lens has been specifically developed for the system and offers very wide fields of view for rapid surveillance while enabling very long identification ranges by rapidly zooming in to a narrower field of view. An integrated microscan module is optional, to provide 1.3 Megapixel resolution and enhanced range performance using full resolution digital zoom technology.

An integrated microscan module is optional, to provide 1.3 Megapixel resolution and enhanced range performance using full resolution digital zoom technology.

The SLX-Hawk-S camera has been designed as a compact, high performance unit which can be applied to a wide range of thermal imaging applications by system integrators and OEMs.





SLX MERLIN

High Performance MWIR Thermal Imaging Camera

The "3rd Generation" thermal imaging camera uses the latest staring focal plane technology to provide high performance, high resolution, passive Mid Waveband Infra- Red (MWIR) imaging in day, night and poor visibility for land, sea and airborne operations.

The thermal imaging camera uses the high resolution "Merlin" MCT detector array developed under UK MOD funding on the Albion 3rd Generation development programme. The detector is manufactured using a proprietary MOVPE on GaAs process to achieve outstanding performance, image uniformity and pixel operability. This leading edge detector is coupled with the latest generation of advanced image processing electronics to achieve superior image quality.

An integrated microscan module is optional, to provide 3 Megapixel resolution and enhanced range performance using digital zoom technology. The SLX Merlin camera has been designed as a compact, high performance unit which can be applied to a wide range of thermal imaging applications by system integrators and OEMs.

TILDE

Thermal Imager For Long Range Detection And Engagement

Delivering the best resolution and clarity at all times, whatever the conditions, is at the heart of the company's electro-optics systems. TILDE is the company's highly successful response to high sensitivity, long-range detection requirements.

Based on improved thermal imaging modules, TILDE is a thermal imager operating in the 8-12 micron spectral band (LWIR) with a FPA 288x4 TDI detector. TILDE has been designed and qualified to work in the harshest environments (temperature and vibration), and is self contained in a rugged, sealed enclosure.

Typically equipped with a double FOV objective, optical surfaces are coated with a high quality antireflective coating to maximise transmission.

The company has produced well over 2000 TILDE currently in operations supporting a wide range of systems.



TILDE S

Thermal Imager For Long Range Detection & Engagement

Delivering the best resolution and clarity at all times and whatever the conditions is at the heart of the company's electro-optics systems. TILDE S is the highly successful response to high sensitivity longrange detection requirements. Based on improved thermal imaging modules, TILDE S is a thermal imager operating in the LWIR spectral band with a staring FPA 640 x 512 detector.

TILDE S has been designed and qualified to work in the harshest environments (temperature, vibration) and is self contained in a rugged, sealed enclosure. A wide selection of optical objectives customises detection ranges.

Typically equipped with a double FOV objective, the optical surfaces are coated with a high quality antireflective coating to maximise transmission. The reliable and low-consumption design permits to operate in hard environment. A set of advanced image processing algorithms, providing a high quality video output where no detail is lost.



HORIZON

Thermal Imaging Camera

The Horizon Medium Wave Infra-Red (MWIR) thermal imaging camera employs the latest focal plane array technology to meet long-range surveillance and target identification for early warning of threats and detection of illegal activities to satisfy border control, coastal security and surveillance requirements.

The camera is fitted with a high definition detector array and is qualified to operate in the most stringent land and maritime environments. The system is able to detect vehicles at up to 50km and personnel at ranges of up to 30km. One camera can therefore monitor hundreds of square kilometers of terrain. The crisp imagery allows rapid identification and detailed investigation of suspicious movements and activity.

The latest generation of algorithms provide additional image enhancements for harsh environments, these include turbulence mitigation, Local Area Contrast enhancement (LACE), edge enhancement and image stabilisation. Horizon provides a wider Field of View (FoV) for greater Situational Awareness, whilst delivering a narrower IFoV for longer range target identification and engagement. Horizon cameras have been specifically designed with very long life cooling engines of 50,000 hours. This increases reliability and reduces through-life costs.



FIREFLY CAMERA CORE

Hot MWIR With Android™

The Firefly Camera Core uses a high operating temperature (HOT) Mercury Cadmium Telluride (MCT) array with a resolution of 640 x 512 pixels on a 16µm pitch. Firefly provides all of the processing and interface requirements to drive a multi-functional hand held thermal imager, including additional camera channels, combined into an infrared camera core.

HOT technology enables cooled medium wave imagers to offer far superior performance in a more compact solution than uncooled imagers for long range, hand held and weapon mounted applications.

Firefly based systems will provide greater Detection, Recognition and Identification (DRI) ranges in a package with lower Size, Weight and Power (SWaP). The unique power saving features ensure an image is available instantly throughout the mission. The revolutionary electronic architecture of Firefly brings a wealth of features adding new capabilities for the system integrator and end user. Firefly is a native Android[™] device and all image processing is performed in software with GPU acceleration. Firefly's software can be customised to meet the requirements of specific applications, for example; customised image processing, machine vision algorithms, or integration of pre-existing Android software libraries for capabilities such as augmented reality.

The software based architecture allows additional functionality to be developed quickly and rolled out to units in the field. Firefly has all of the functionality expected in an Android device, including integrated 3-axis accelerometer and gyroscope, GPS, Wi-Fi, Bluetooth and USB 3.0.

These interfaces allow real-time streaming of video between Firefly units or other suitable systems. In addition a large number of GPIO's which can be configured as button inputs, digital control lines or configured as a number of standard interfaces including; I2C, SPI and RS232. These interfaces allow Firefly to control a wide range of peripheral devices such as laser rangefinders.



SPRINT MODULE™

High Speed Broadband Infrared Sensor Module

The company designs, develops and manufactures infrared detectors at its dedicated facility in Southampton UK.

With a reputation for providing customers with the best in high performance and cost-effective technology for IR camera systems, we offer a unique level of expertise, covering Mercury Cadmium Telluride (MCT) material growth, Read-Out Integrated Circuit (ROIC) design, volume detector manufacture, electro-optic and environmental test.

Using technology developed for high-performance thermal imaging systems, the company has introduced a unique IR sensor module for scientific instrument applications. The Sprint Module[™] uses a 2-Dimensional 384 x 384 pixel Mercury Cadmium Telluride (MCT) Focal Plane Array detector which offers a broad band spectral response from 2.0µm to 12.0µm and beyond, achieved through an unrivalled MCT material growth capability.

The Sprint ModuleTM is based on a high-speed digital readout circuit ideally suited for fast framing spectral analysing systems.

It incorporates a split cycle Stirling Cooling Engine with built in balancer for low vibration, and state of the art Dewar assembly and proximity electronics assembled into a simple to integrate module.

It is a high-performance, lightweight, low-power sensor module designed for fast frame-rate scientific applications.



DETECTORS

CONDOR II

Dual Waveband Infrared Detector

The Condor II Dual Waveband Infrared (DWIR) detector is a 640 x 512 Mercury Cadmium Telluride (MCT), Integrated Detector Cooler Assembly (IDCA), designed for high performance imaging in the 3 - 5µm Medium Wave Infrared (MWIR) and 8 -10µm Long Wave Infrared (LWIR) wavebands.





HARRIER LW

Long Wave Infrared Detector

The Harrier Long Wave Infrared (LWIR) detector is a 640 x 512 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Harrier LWIR detector is designed for very high performance imaging in the 8 - 10µm waveband.

EAGLE MW

Medium Wave Infrared Detector

The Eagle Medium Wave Infrared (MWIR) detector is a 640 x 512 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Eagle MWIR detector is designed for very high performance imaging in the 3 – 5 μ m waveband.





EAGLE LW

Long Wave Infrared Detector

The Eagle Long Wave Infrared (LWIR) detector is a 640 x 512 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Eagle LWIR detector is designed for very high performance imaging in the 8 - 10µm waveband.

MERLIN LW

Long Wave Infrared Detector

The Merlin Long Wave Infrared (LWIR) detector is a 1024 x 768 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Merlin LWIR detector is designed for very high performance imaging in the 8 - 10µm waveband.





MERLIN MW

Medium Wave Infrared Detector

The Merlin Medium Wave InfraRed (MWIR) detector is a 1024 x 768 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Merlin MWIR detector is designed for very high performance imaging in the 3 - 5µm waveband.

HAWK LW

Long Wave Infrared Detector

The Hawk Long Wave Infrared (LWIR) detector is a compact and lightweight 640 x 512 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Hawk LWIR detector is designed for high performance, low cost imaging in the 8-10µm waveband.





HAWK MW

Medium Wave Infrared Detector

The Hawk Medium Wave Infrared (MWIR) detector is a compact and lightweight 640 x 512 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Hawk MWIR detector is designed for high performance, low cost imaging in the 3 - 5µm waveband.

SUPERHAWK

Medium Wave Infrared Detector

The SuperHawk infrared detector is a 1280 x 1024 array of pixels on an 8µm pitch, manufactured using a Metal Organic Vapour Phase Epitaxy (MOVPE) process with Mercury Cadmium Telluride (MCT) detector material grown on low cost substrates.

The SuperHawk detector offers four times as many pixels in the same active image area as conventional $640 \times 512 \ 16 \mu m$ pitch products. In addition, the SuperHawk offers a 1280×720 mode of operation, providing an easy High Definition upgrade in a smaller optical footprint than alternative $15 \mu m$ Standard Definition products.





HOT HAWK

High Operating Temperature (Hot) Hawk Medium Wave Infrared Detector

The HOT Hawk Medium Wave Infrared (MWIR) detector is a compact and lightweight 640 x 512 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA).

The Hawk MWIR detector is designed for high performance, low cost imaging in the 3 - 5 μ m waveband. The company's MWIR MCT, grown by the MOVPE process, provides excellent imagery up to 175K and higher operating temperatures, for applications requiring lower input power and faster time to operation.

L-20 LW

Long Wave Infrared Detector

The L-20 Long Wave Infrared (LWIR) detector is a 640 x 512 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The L-20 LWIR detector is designed for very high performance imaging in the 8 - 10µm waveband.





M-20 MW

Medium Wave Infrared Detector

The M-20 Medium Wave Infrared (MWIR) detector is a 640 x 512 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The M-20 MWIR detector is designed for very high performance imaging in the 3 - 5μ m waveband.

OSPREY-C LW

Long Wave Infrared Detector

The Osprey-C Long Wave InfraRed (LWIR) detector is a compact, lightweight 384 x 288 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Osprey-C LWIR detector is designed for high performance, low cost imaging in the 8 - 10µm waveband.





OSPREY-C MW

Medium Wave Infrared Detector

The Osprey-C Medium Wave InfraRed (MWIR) detector is a compact lightweight 384 x 288 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Osprey-C MWIR detector is designed for high performance, low cost imaging in the 3 - 5µm waveband.

OSPREY-S LW

Long Wave Infrared Detector

The Osprey-S Long Wave Infrared (LWIR) detector is a compact, lightweight 384 x 288 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Osprey-S LWIR detector is designed for high performance, low costimaging in the 8 - 10µm waveband.





OSPREY-S MW

Medium Wave Infrared Detector

The Osprey-S Medium Wave Infrared (MWIR) detector is a compact lightweight 384 x 288 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Osprey-S MWIR detector is designed for high performance, low cost imaging in the 3 - 5µm waveband.

FALCON 720

Medium Wave Infrared Detector

The Falcon 720 infrared detector uses the latest focal plane technology to provide high definition infrared images compatible with commercial 720p HDTV signal formats. The 12 μ m-pitch focal plane array enables this high definition detector to be offered in a compact, low-cost,low-power format.

The Falcon Medium Wave Infrared (MWIR) detector is a compact and lightweight 1280 x 720 Mercury Cadmium Telluride (MCT) Integrated Detector Cooler Assembly (IDCA). The Falcon MWIR detector is designed for high performance, low cost imaging in the 3 - 5μ m waveband.



SAPHIRA

Avalanche Photodiode Array

The Saphira detector is designed for high speed infrared applications and is the result of a three year research and development programme alongside the European Southern Observatory on sensors for astronomical instruments. It delivers world leading photon sensitivity of <1 photon rms with Fowler sampling and high speed non-destructive readout (>10K frame/s).

Saphira is an HgCdTe avalanche photodiode (APD) array incorporating a full custom ROIC for applications in the 1 to 2.5µm range. A key aspect of the array is the ability to perform multiple non-destructive readouts which can allow Fowler sampling or "down the slope" sampling to significantly reduce the noise and increase the sensitivity.

The architecture allows multiple, independently resettable windows and a selectable number of parallel outputs up to 32.

DLATGS

Pyroelectric Dlatgs Infrared Detectors For Nstrumentation

We are a leading manufacturer of DLATGS detectors for Infrared (IR) spectrometers. This position has been achieved by supplying high performance detectors at competitive prices to major IR spectrometer manufacturers all over the world. The crystal growth process for DLATGS (deuterated L-alanine doped triglycene sulphate) detectors was developed by the company, and unrivalled production skills have enabled the business to continue to expand.

DLATGS detectors are pyroelectric and can be operated uncooled or with temperature stabilisation. They are supplied in a range of element sizes with options of hermetic sealing, parylene coating, filter material, pin configuration and performance characteristics.

We are the leading supplier of high performance DLATGS detectors for use in FT-IR instruments. All of the standard build pyroelectric detectors are EU RoHS compliant.





SEEKER

-2

SAL

GenIII Semi-Active Laser Seeker

The GEN III Semi-Active Laser (SAL) seeker provides high accuracy laser spot acquisition and tracking capability in a very compact sensor package for precision weapon terminal guidance. It is compatible with multiple guided weapon types including missiles, bombs and rockets. With laser spot tracking and SAL seeking products currently in-service worldwide, this product has been developed due to the increasing demand for SAL guided weapons.

The complexity and dynamics of modern battlefield scenarios places challenging demands on guidance systems for precision attack weapons. The need for highly target selective and accurate terminal guidance across a broad range of scenarios cannot be achieved by GPS/INS systems alone.

The GEN III SAL seeker product uses a unique configuration silicon detector providing continuous high resolution angular reporting over a wide field of view. Configuration of this technology is the subject of patents both granted and under application.

It utilises mature signal processing read across from other laser sensor products currently in-service on a number of high performance platforms. The algorithms have a proven capability to acquire and maintain target track in the presence of false targets and clutter.

The GEN III SAL product provides a highly integrated complete sensor solution providing minimal risk of compatibility issues for ease of integration in customers' systems. In order to facilitate integration with alternative weapon types, the seeker also accommodates a wide input voltage range. It has been qualified for weapon operations from fixed/rotary wing and UAS carriage platforms. Multi-kilometer seeker acquisition and sub-metric terminal accuracy have been repeatedly demonstrated.





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