







INTRODUCTION

Recent operations have revealed that military vehicles must be modernised to improve the mobility, protection and lethality of ground forces. Combat and tactical vehicles are integral to the success of missions across a wide range of operations and must ensure a tactical advantage over current and future threats.

The company has vast experience and heritage with the digitisation and technical refresh of military vehicles for both new and existing platforms.

Our portfolio of solutions for land vehicles includes the latest digitised electronics for C4ISTAR (Command, Control, Communications, Computers, Surveillance, Target Acquisition, Reconnaissance), providing commanders and crew with enhanced situational awareness, secure and dynamic network connectivity and improved combat effectiveness. Our solutions for Command & Control support commanders on the ground, enabling assets to be adapted in a range of different configurations. This provides the ability to organise the task forces in a dynamic way based on a clear representation of the tactical environment that is shared through the chain of command.

Our network enabled architectures link platforms in the battlefield within a single communications infrastructure, providing on-the-move high speed connectivity for all mobile and dismounted units. Vehicle-borne sensors and fire control systems protect the crew against a wide range of threats and provide weapon operators with improved precision and lethality.

The company's vehicle solutions have already proven their value and durability in the most complex operational theatres and are in-service with many forces. Configurable, integrated mission systems are designed to meet a variety of mission requirements including urban, open and close-combat situations.





VEHICULAR C4I

A range of vehicular C4I systems and applications are available for both combat and non-combat land platforms. These systems provide commanders and crew with an enhanced tactical picture by gathering information provided by on-board sensors alongside data provided by friendly units across all operational levels. This picture is key to the effective, timely coordination of Command & Control operations.

These products are built upon an intuitive user interface optimised for multi-touch screens that provide the crew with automatic mechanisms for the dissemination of tactical information. Our Vehicular C4I can operate in light environments with a single radio as well as in more complex systems consisting of IP routers and tactical radios operating in different bands and supporting a wide-range of link capacities.

They are designed to interoperate with both soldiers' and command posts' C4I systems, providing a single and coherent command and control infrastructure, scalable from the tactical edge to the highest levels of command.

SICCONA

The Vehicular C4I solution for combat platforms is integrated in the SICCONA Battlefield Management System.

This application is designed to support vehicles such as Main Battle Tanks and Armoured Infantry Vehicles, and has been configured to run on combat-proven tactical computers with dedicated vehicle-ergonomic human machine interfaces.

C2N-BFSA

The Vehicular C4I solution for non-combat platforms is the C2N-BFSA (Command, Control, Navigation – Blue Force Situation Awareness). This is designed for Light Multirole Tactical Vehicles and uses a set of lighter SW modules running on rugged platforms. C2N-BFSA provides a constantly updated situational awareness to all the deployed units.

Both SICCONA and C2N-BFSA provide commanders and crew with the following key functions:

- Integrated support for digital maps, cartography and standard symbols (e.g. APP-6) with Terrain Analysis capability
- Mission planning, data preparation and definition of the tactical scenario and mission profile
- Configuration and management
 Networking and communications
 - C2 application and on-board equipment
- Status monitoring of vehicle and selected assets
- Acquisition and presentation of the operational scenario and situational awareness information
- Navigation aids (e.g. routes, waypoints)
- Integration of voice, messaging and data services
- Management of orders, messaging and reports (optimised for the land tactical scenario)
- Automatic dissemination of data and information throughout networked vehicles
- Interoperability (e.g. VMF messages formats, STANAG 5527 / NFFI, automatic data dissemination, message aggregation)
- External interface with tactical HF, VHF, UHF, as well as military/civil satellite terminals
- Fully integrated with the company's applications for dismounted soldier and deployable command posts
- Compatible with other solutions based on standard messaging and exchange protocols
- Specialised C2 applications for land commanders operating in a network-enabled architecture.

NETWORKED OPERATIONS

Digitally interconnected military vehicles increase the capacity for crew and commanders to exchange tactical information and achieve a shared situational awareness. Decision makers operating in a digitised platform can better discern where friendly elements are located and ground units operate more effectively when updated views on the local picture are available.

Commanders on the ground can be aware of friendly combat forces moving or fighting close to each other, not only for prevention of fratricides but also to make full use of all the available resources in the battlefield.

We are proud to be the prime contractor, main supplier and system integrator for the modernisation of the Italian Defence land and amphibious forces within the Forza NEC (Network Enabled Capabilities) program. Forza NEC is the largest transformation program of Italian Land Forces and requires the digitisation and C4I integration of several class of military platforms. A field-proven system-of-systems architecture has been developed to allow combat vehicles and other platforms to exist on a distributed and coherent Command & Control infrastructure.

With this system, digitalised vehicles are able to disseminate battlefield data and transfer formatted messages among units. It also provides core functionality such as database access, cartography and management of tactical overlays.

Through the strong integration of the company's C4I systems into both new and legacy vehicles we can provide the power of networking into ground operations and support the transition from partially digitised units into modern and totally digitalised land forces.





GENERIC VEHICLE ARCHITECTURE

GVA (Generic Vehicle Architecture) is an initiative established by the UK Ministry of Defence (MoD) for supporting and enabling the ongoing plans for the modernisation of the UK Army. It refers to an open, modular and scalable architectural approach applied to the design of the electronic and power architectures of military vehicles. GVA is based on a common multifunctional crew-station HMI which allows the platform to be controlled through screens and input devices.

The development of the GVA standard has been fully supported by the company from its inception and today most of our vehicle mission systems are offered with GVA infrastructure by default. Our longestablished pedigree of supply to the British Army has provided a strong understanding of the factors affecting cost and capability in the land context. Our GVA mission systems offer a configurable, scalable suite consisting of sensors, effectors, processing and data storage, communications, and HMI modules. This enables mission-appropriate applications to be installed and/or tailored to the specific operational requirement.

Our GVA common user interface is used for onboard 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.



VEHICULAR COMMUNICATIONS

A key feature of digitalised platforms is the timely receipt, processing and dissemination of battlefield information. The availability of advanced and robust tactical communications systems within each asset is a crucial consideration in realising this aspect.

The company has a world-class capability to supply communications systems for military vehicles and our solutions ensure rapid and seamless sharing of key data among all the assets in the battlespace. OUR PRODUCTS ARE FOCUSSED ON THE IMPROVEMENT OF BATTLEFIELD COMMUNICATIONS AMONG MOBILE UNITS. WE DELIVER NEXT GENERATION EQUIPMENT TO WITHSTAND THE RIGOURS OF TODAY'S COMPLEX OPERATIONAL THEATRES.

We are a renowned supplier of integrated tactical communications systems for ground platforms and our portfolio includes a family of software-defined radio systems, standard HF/VHF/UHF radios and a wide range of satellite communication products and systems. Proprietary data encryption techniques are employed in our radios to ensure full data and information security.

SOFTWARE DEFINED RADIOS

The company has been developing SDR technology since 2002, and has been part of the European Secure Software defined Radio program (ESSOR) since its beginning in 2009. Today, we offer a complete family of SWave[®] Software Defined Radios, which provide access to different frequencies and can implement multiple protocols for voice, data and command and control applications.









The **SWave**[®] **VQ1** is a four-channel vehicular radio that provides secure voice and data services for current and future tactical communications needs. The radio features a modular HW architecture that allows up to four radio channels to be configured within a common chassis with a shock mounting base.

Each channel can operate from 2MHz to 2000MHz and provides extensive support for HF/VHF/UHF narrowband and wideband waveforms. The radio has an embedded 50W peak RF output power for the 30MHz to 512MHz band.

The **SWave**[®] **VB1** is a two-channel vehicular radio which provides secure voice and data services in a package the size and weight of a conventional combat net radio. It has been specifically designed to fulfil the needs of modern light and medium/mechanised infantry units.

Each of the two channels can operate in the 30MHz to 512MHz frequency range with 20W peak RF output power with full support to VHF/UHF narrowband and wideband networks. A 50W power upgrade involves the use of an ancillary HPA device.

The **SWave**[®] **VM3** is a vehicle variant of the company's Hand Held single-channel SDR. It has been designed for those vehicular applications where a single channel radio is sufficient to cover the vehicle communications needs as well as provide the necessary link to dismounted soldiers. The radio operates in the 30MHz to 512MHz frequency range and supports both legacy and new waveforms in VHF and UHF frequency bands.

SWave® radios may be programmed to support both legacy and emerging waveforms to allow enhanced interoperability in NATO and coalition environments. Our radios are compliant with both legacy and state-of-the-art waveforms, including our proprietary waveforms SelfNET® EASY II and SelfNET® Soldier Broadband waveforms.



OTHER VEHICULAR SOLUTIONS

The **TURMA** Vehicular is the company's combat net radio for vehicular installations. With an extended frequency range from 1.6MHz to to 59.9750MHz, TURMA allows any range of tactical data and voice communications in the HF or VHF band. It offers features including radio localisation (position, speed, unit identifier, time of transmission, data quality), selective calls, broadcasting in both plain and secure mode, and e-mail on HF.

The Sentinel **Multiservice Switch Router MSR165** is a versatile and reliable dual stack IPv4/IPv6 networking solution for military tactical applications on land platforms. It is used on platforms such as Main Battle Tanks, armoured Fighting Vehicles, Personnel Carriers, Protected Tactical and Logistics platforms.

The MSR165 routers have been specifically designed to withstand the challenging mechanical, environmental and electromagnetic conditions affecting equipment inside mobile combat units.



Our portfolio of vehicular communications also includes the **TSO-102/D X**, which is an X band 'Satellite On-The-Move' terminal based on active phased array technology.

The system is designed for vehicular military use and may be installed on a range of different platforms including light multirole vehicles, trucks or vans. The system operates with a maximum vehicle speed of 90 km/h and it sustains a max track slope of 30°.



SURVEILLANCE

Commander Sight Long Range EO/IR System Ground Surveillance Radar Driver Night Vision System

RALM

Counter-IED

C4I

EX.

Colibri

Lothar

STAWS

BMS Software Rugged PC Rugged Display Vehicluar Radios SOTM System Handheld Radios Multiservice Routers Intercom

THE ROAD

SWave VM3

MSR 165

UIS 379 D



Laser Warning Receiver Counter-RCIED (Jammer)



FIRE CONTROL SYSTEMS

Aiming & Firing EO/IR Units Ballistic Computers & Ancillary Sensors Integrated Fire Control System

ARMOURED COMBAT AND RECONNAISSANCE VEHICLES

SURVEILLANCE

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DNVS

Commander Sight Long Range EO/IR System Ground Surveillance Radar Driver Night Vision System

C4I

RD104-GVA-4.

Counter-IED

BFSA Software Rugged PC Rugged Display Vehicluar Radios SOTM System Handheld Radios Multiservice Routers



LRT 350/C

SWa

TSO 102L

MSR 165

1000

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DRIVERLESS OPERATIONS

Automated Computerised Mobility Equipment (ACME)



Counter-RCIED (Jammer)

TACTICAL AND LOGISTIC VEHICLES

INTERNAL COMMUNICATIONS

The company has extensive experience in the field of vehicular intercom systems and associated equipment, primarily while supporting the Italian and UK forces. Today, our products enable effective transfer of voice and data among crew members and also provide the necessary interfaces to external communications systems.



The **UIS-379/D** allows very reliable communications, in addition to others services such as wireless connection between crews, voice and video recording and data terminal connection based on IP Network technology. UIS-379/D has a distributed and modular architecture with units connected via a digital serial bus.



Our **Platform PRR** provides communications between vehicle and mounted or dismounted troops that are equipped with the company's Personal Role Radios (PRR/EZPRR). PRR and EZPRR operate in the 2.4GHz frequency band and provide short-range communications for frontline soldiers.

TACTICAL COMPUTERS

A suite of tactical computers includes a family of Full MIL STD ultra-rugged products specifically designed to operate in extreme conditions and in harsh environments. The devices are available in various configurations for specific customer requirements. A numbers of interfaces are available on circular MIL STD connectors.



LRT-350 and **LRT-350 PC+** are high performance vehicular tactical computers. They allow system integrators to set-up a wide range of custom configurations and are the perfect candidates to support the request of computational power from the SICCONA and C2N-BFSA C4I systems. The LRT-350 PC+, in particular, is a fan-less computer with high capability of heat dissipation.

The device is equipped with a quad-core hardware platform, ensuring high performance and low power consumption.



LRT-310 is ideally suited for armored vehicles or artillery carriers. The system is optimised for 19" rack mounting and may also be shock mounted to withstand artillery vehicle stresses.



TACTICAL DISPLAYS

The company has developed a family of tactical displays which offer an ideal solution for driver vision enhancement as well as surveillance, reconnaissance and local situational awareness. Our products accommodate multifunctional crew stations in both new and legacy vehicles via an integrated suite of modern interfaces which support both internal and external interoperability. Our family of displays support the UK-led Generic Vehicle Architecture (GVA) standard, which is increasingly being adopted by other allied nations, making it easier to train users and upgrade legacy vehicle mission systems.

DRIVER'S NIGHT VISION DISPLAY UNITS

We offer a range of display screen options for driver's night vision and local situational awareness. Screens are available in a range of sizes (8.4", 10.4" and 15") and can be tailored to provide varying levels of capability and complexity.

All display screen options are designed to match the company's 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.

RD104-GVA-4x

RD104-GVA-4x is a full GVA-compliant, high brightness, high resolution rugged 10.4" LCD display. It is complemented by the latest user and digital interfaces being adopted by open-standards-based mission systems, as required by the GVA standard.

The system can be directly connected to multiple video sources without the need for any external network switch, video or graphics processing, or adapter units. This enables simple GVA-ready systems to be configured in advance of full infrastructure procurement, yet the same units may later be used in more complex GVA systems.

LRT 350/D

LRT 350-D is a 10.4" rugged display typically used in conjunction with the LRT 350 Tactical Computer in support of vehicle commander operations within wheeled and tracked platforms.

Different variants of this display are available for supporting gunner and driver.







EO/IR SURVEILLANCE SYSTEMS

We offer leading-edge capabilities in the field of Electro-Optical (EO) surveillance for both combat and non-combat vehicles. Our capabilities are based on high performance infrared detectors (manufactured in-house), thermal cameras, stabilised EO detectors, image processing algorithms, as well as field-proven expertise in system integration for land vehicles.

Our sights are installed on many platforms for day and night ground surveillance. They are designed to strengthen platform surveillance capabilities and improve the situational awareness.

Our solutions for vehicle surveillance typically contain a day camera (TV), a night camera (IR) and a laser rangefinder to calculate the distance to targets under observation.

A console allows the operator to manage various system modes and the open-architecture allows integration with the existing Command & Control systems installed in the vehicle.





JANUS

JANUS is a high performance 2 axes gyro-stabilised multi sensor for land applications. It is designed to deliver combined medium and long-range panoramic sight and day/night all-weather surveillance for combat and tactical platforms.

JANUS incorporates a rugged, self-contained and compact platform which can rotate 360 degrees in azimuth and 90 degrees in elevation. Its range and performance make it particularly suitable for detecting, tracking and engaging fast moving land targets. JANUS is provided with IR and TV cameras and an eye-safe Laser Range Finder (LRF).

JANUS RSTA

JANUS RSTA is a special mast-mounted version of the JANUS system, designed to be integrated on tactical and special surveillance vehicles to support applications such as land situation awareness, law enforcement, border and coastal surveillance.

JANUS RSTA detects both stationary and moving targets and is capable of stand-alone or integrated operation in a land networked environment.





ATTILA

ATTILA is a high performance panoramic periscope and commander sight for land platforms, integrating daylight, thermal IR and laser range finder channels.

It is designed to provide tanks and combat vehicles with day and night observation and target acquisition capabilities. The system features a two-axis primary stabilisation which allows for operation from moving platforms with no reduction in performance. The latest version of the system incorporates a 3rd generation MWIR Thermal Imager and an HD zoom camera.

NERIO LR

NERIO-LR (Long Range) is a modular Electro-Optical system for Surveillance, Reconnaissance and Target Acquisition.

NERIO-LR has been designed to satisfy a broad range of current and emerging customer requirements and can operate on both static installations as well as integrated on vehicular platforms. NERIO-LR incorporates a gyro-stabilised EO detector, a continuous optically zoomed high performance thermal imager, a continuous optically zoom TV camera, and an Eye-Safe Laser Range Finder to enable the capability for geospatial threat location.

HORIZON

HORIZON is a MWIR thermal imaging camera, which employs the latest focal plane array technology to meet long-range surveillance and target identification requirements.

Utilising a modular Integrated Detector Cooler Assembly, it is fitted with either Standard Definition (SD) or High Definition (HD) detector arrays, allowing rapid assembly and ease of maintenance. HORIZON is currently considered a key asset for Italian Army's future generation of Medium Infantry Explorer vehicles (VMB Explorer), which will carry out long-range reconnaissance tasks using the company's LYRA 10 radar and two Horus Micro-UAV launchers.

DNVS 4

The Drivers Night Vision System (DNVS) is a passive, multi-spectral, wide-angle, indirect view, observation system designed to enhance the operability of land combat and tactical vehicles.



Based on a family of products already proven with international customers on more than 14 tracked and wheeled platform types, DNVS 4 comprises a high resolution uncooled thermal imaging module and a colour day/night or low light monochrome camera contained within a single enclosure. 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 these cameras can be combined with one or more of the company's vehicle display screen units. DNVS 4 provides both traditional analogue and digital video outputs and supports the UK's Generic Vehicle Architecture (GVA) standard.







FIRE CONTROL SYSTEMS

The company is a successful provider of advanced Fire Control Systems (FCS) for land applications. Our products meet the evolving needs of today and tomorrow's battlefield and have been designed to increase the capabilities of ground forces as far as lethality, survivability, mobility and situational awareness.

In the last 40 years we have achieved a strong reputation in fielding and commissioning both stand-alone optronic solutions and integrated FCS's for tanks and infantry vehicles. Our latest range of products incorporate the ultimate technologies in the fields of electronics, processing, electro-mechanical systems and advanced algorithms.



LOTHAR

LOTHAR is a modular, high performance, compact day and night sight designed for use with large calibre guns (from 23-30mm to 120-125mm). The aiming sight can be mechanically linked to the line of fire (typically lighter and lower cost turrets), or stabilised for installations within higher performance turrets. In these instances, stabilisation is provided by a high performance gyroscopic gimbal and allows the gunner to operate with the same high performance regardless of whether the vehicle is moving or stationary.

The sight provides the gunner and the FCS with all the information necessary for effective fire control, including target position, speed and range.

LOTHAR incorporates a LWIR cooled camera (MWIR optional), a double-FOV TV camera, and a 10km Laser Range Finder (LRF).





COLIBRI and MINI COLIBRI

COLIBRI and MINI COLIBRI are modular Fire Control Systems designed for small and medium calibre guns, typically up to 30mm.

With an overall weight of less than 15kg (7kg for the smaller variant), the two systems combine high quality imaging modules and detectors to deliver full fire control capability and target engagement in all-weather conditions, day and night. COLIBRI and MINI COLIBRI may also be integrated on Remote Weapon Stations (RWS) for light armoured and reconnaissance vehicles.

STAWS

STAWS is an integrated, passive, multispectral sighting system designed for use with Remotely Controlled Weapon Systems (RCWS).

STAWS can be fully integrated with assisted-aiming fire control software which will provide the crew with a direct fire capability, 24 hours a day under all battlefield conditions.

TURMS - D

TURMS-D is a modular, fully-digital and integrated Fire Control System able to be integrated with existing capabilities on a wide variety of armoured fighting vehicles and main battle tanks.

It incorporates an observation unit (commander sight), an aiming and firing unit (gunner sight), ballistic computers and ancillary sensors to provide stabilised panoramic surveillance, fast target detection and automatic designation.

The system is able to engage a second target during the tracking of the first one by the gunner, as well as immediate firing by the commander sight in case of very close targets.





VEHICLE PROTECTION

Our capabilities for the protection of land platforms are built on a proud history of providing Armed Forces with Electronic Counter Measure (ECM) capability. The company has secured many contracts from different customers to protect a wide range of vehicles against the continued threat of RF initiated Remotely Controlled Improvised Explosive Devices (RCIED). In addition to our jamming systems, the company has fielded a range of laser warning systems which are now in service with a fleet of vehicles in the Italian Army.





COUNTER-IED SYSTEMS

The Leonardo Counter-IED system provides electronic armour to platforms against RF initiated RCIED threats. Protection is achieved by blocking the radio transmission used to detonate the explosives such as roadside bombs.

Originally conceived to meet the demanding requirements of dismounted soldiers on foot patrol, the Leonardo Counter-IED family was further developed and packaged for a range of roles including vehicles and fixed sites.

Secured onto a shock mounted tray with DC power conditioning unit, the vehicular version is supported by a range of ancillaries and its design allows for a modular and flexible approach in response to new and emerging threats. The system can be rapidly configured in small vehicles to support mounted operations.



RALM 02/V2

RALM 02/V2 is Laser Warning Receiver (LWR) specifically designed for armoured vehicles, in order to counter laser threats of present and future scenarios. The system incorporates an optical external head which detects pulsed wave laser radiation, discriminating it from the background and any other light source.

RALM 02/V2 can deal with multiple simultaneous threats, identifying the direction of arrival and type for each, and it can be directly connected with active protection systems to automatically activate, upon operator selection, the best available countermeasure.

Fibre optic technology provides protection from EMC and adverse external conditions, and an internal database can be easily updated whenever it is necessary to match different threat scenarios.



MOBILE SURVEILLANCE

LYRA® 10 is a short-range ground surveillance radar designed to provide advanced situational awareness for both security and defence applications.

Thanks to compact dimensions and low weight, it is suitable for integration on a wide range of military and civilian land platforms including light multirole tactical vehicles (LMTVs) and commercial cross-country trucks. Vehicle integration is achieved through installation of an electro-mechanical kit. Crucially, load capacity is unchanged after the installation. Mobile platforms with LYRA 10 can operate autonomously or be integrated within a larger surveillance network. Applications include border checkpoint security, convoy escort and support to Special Forces. When used in conjuction with other sensors, LYRA 10 can operate as a local gap-fillers or re-deployable observation node for border control, base protection, coastal surveillance and monitoring of large territories and critical areas (e.g. event security).

LYRA® 10 has a range of 24km for the detection, tracking and classification of objects including people, vehicles and boats. In addition, the system can detect low flying threats such as helicopters, Unmanned Aerial Vehicles (UAVs) and slow moving aircraft.

DRIVERLESS OPERATIONS

ACME (Automated Computerised Mobility Equipment) has been designed in response to the requirement for convoy protection in scenarios involving asymmetric warfare. It eliminates, or drastically reduces, the presense of humans inside vehicles thus mitigating the risk of death or injury caused by accidents or IEDs.

The system is provided as an integrated suite suite of devices and sensors that can be retro-fitted to a vehicle. These work together to allow both remote and fully autonomous operation, providing 24 hour operation via day and night systems. Vehicle installation typically takes between 40 and 120 minutes, with optical and remote systems being installed on a permanent of temprary basis.

Remote control operation is through a dedicated display configured with both visual and interface simulation of the real vehicle cockpit and dashboard. When used in autonomous mode, ACME is programmed to follow a pre-determined path, with speed and direction controlled via GPS, real-time kinematics and radar laser collision avoidance technology.





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