Selex ES

A Finmeccanica Company

Selex ES is the leader of the Italian programme SOLDATO FUTURO and supplies a wide range of soldier radios worldwide. Based on this experience and involvement in other Future Soldier projects, Selex ES provides one of the most advanced and complete C4I-soldier-oriented solution available in today's marketplace. Its portfolio enhances the capabilities of the dismounted soldier in five areas:

- Lethality or the ability to detect, recognize and attack targets
- The ability to use information and communication services to improve perception of the surrounding environment, to receive orders from the Command level, and to provide the Command level with operational information and reconnaissance data
- Survival capability: integration of bulletproof vests and Nuclear Biological Chemical (NBC) protection within the system
- Mobility in all weather conditions, indoor and outside, 24-hours-per-day, with night and assisted vision systems and equipment for autonomous navigation
- Sustainability: the ability to conduct autonomous operations for up to 24 hours, reflecting the total available quantity of power for the C4I electronic systems, ammunition, food, beverages and other consumables

Selex ES' Future Soldier System's capability is fully scalable, modular and configurable. It can be provided in many incremental configurations, covering a wide range of operational and technical requirements. Its system architecture includes the following sub-systems:

- Command & Control
- Communications
- Sensors
- Support & Autonomy

Thanks to its modular architecture, the Selex ES Future Soldier System satisfies a wide variety of end-user needs, including the effective integration of all types of GFE components and sensors.

COMMAND & CONTROL SUB-SYSTEM

The Command & Control sub-system features a wearable, flexible and distributed architecture. It includes the following key components:

- C2 software application
- Wearable computer and display
- Rugged smartphone/tablet

C2 Software Application

The C2 Software Application provides services such as Navigation and Situational Awareness using digital raster maps overlaid with all mission relevant entities - Blue and Red Positional Awareness (PA) and Infrastructures. These are enriched with navigation features (zoom, pan, routes and way-points management).

An efficient dissemination mechanism allows data exchange among soldiers in a timely and optimized way. The application helps prepare and exchange orders and reports, sends text messages, and facilitates the graphical management of orders, video and image processing, resource management and planning tools. The software's architecture is open and may be customized, modifying existing functionalities of the man-machine interface or adding new ones to meet emerging end-user needs.

Wearable computer and display

The Wearable Computer platform supports all the user's data processing activities, including sensors data collection, management and dissemination. Wired and wireless (Bluetooth) standard-interface data links connect the computer to almost any kind of electro-optic sensors forming part of the soldier's equipment suite.

A separate touch-screen Display represents the main man-machine interface for the C2 software functions. It is available in two sizes: 3.5" for the soldier and a larger 6" for the Commander. The system can also be enhanced through the introduction of head-up displays.

Rugged Smartphone/Tablets

Rugged Smartphone/Tablets are based on off-the-shelf devices sourced from the commercial mobile market. They employ Android technology and exploit the ability of mobile devices to store and process data.

This approach enables continuous use of emerging mobile technologies, allowing evolutionary capability growth during the system life-cycle; the ability to perform more advanced computational capabilities, and to embed 3G and also 4G interfaces, opens the door to law enforcement forces and other professionals to dual-use of the Future Soldier System.

These feature both traditional connectivity with soldier radios and direct connectivity with military CIS networks, and to governmental professional broadband networks, where mobile infrastructures support the use of advanced services on the move. The rising speed of broadband will be a key factor in the potential launch of new services in the context of Mobile Cloud Computing, providing computational capabilities to remote devices.

COMMUNICATIONS SUB-SYSTEM

The Communications sub-system provides the soldier with specific communication means to interconnect with the other members of the squad. It includes the following components:

- Soldier Radio
- Headset / Microphone

The Communications sub-system allows the choice of several Soldier Radios, such as the latest Selex ES offerings:

- Frontline Soldier Radio (FSR)
- Software Defined Radio (SDR) Hand-Held (HH)

Frontline Soldier Radio FSR

The Frontline Soldier Radio (FSR) is a compact Soldier Radio system that meets the most stringent military standards for electrical, mechanical and environmental conditions. It provides efficient communications at Platoon and Section level. It can be supplied with an embedded C2 Module, giving the soldier enhanced C4I capabilities. It supports Soldier System C2 applications.

The FSR has a modular architecture and can be equipped with one or two RF transceivers. The current implementation includes a Personal Role Radio (PRR)/Enhanced Encrypted PRR (EZPRR) compatible module, operating in the 2400MHz to 2483.5MHz range, and either the Soldier Broadband Waveform (SBW), operating in the 350MHz to 450MHz range, or Soldier Narrowband Waveform (SNW) modules, operating in the 350MHz to 400MHz range.

Both UHF waveforms provide the dual-net function, an essential capability for the Squad Commander who, using a single radio, can monitor both the Squad and Platoon nets simultaneously.

Software Defined Radio SDR

The SWave™ Software Defined Radio (SDR) Hand-held (HH) is an individual VHF and UHF multi-band pocket radio to provide high speed communications at Platoon and Squad level with full IP support. It also gives the soldier enhanced capability thanks to automatic data and voice relay, significantly extending the coverage over the area of the operation.
In order to increase its combat effectiveness, the radio includes an integrated GPS and, for voice communications, it can be operated via a wired press-to-talk (PTT) unit or through a wireless PTT integrated into the soldier's rifle. Operating in the 30MHz to 512MHz range, the SDR HH allows independent voice and data transmission.

The selectable waveforms include the VHF narrowband waveform for rural open environments, guaranteeing a range of up to 5km with an effective data rate of up to 50Kbps in Fixed/Fast Frequency Hopping mode to cope with spectrum constrained and hostile electromagnetic environments (Friendly or Hostile). The UHF MANET Wideband Soldier Broadband Waveform (SBW) for urban environment offers an up to 2km range with an effective data rate of up to 470Kbps.

Once delivered the SDR, thanks to standard Software Architecture (SCA 2.2.2 and ESSOR), it can be upgraded with existing or new MIL-STD, STANAG, NATO or legacy waveforms as they are made available or developed, thus protecting customer's investment. It meets the most stringent military standards for electrical, mechanical and environmental conditions.

Headset/Microphone

The Headset/Microphone audio accessory provides connectivity to radio devices. It can also be used to activate a number of computer functions by voice. A wide range of audio ancillaries are available to satisfy specific operational needs, including headsets with noise blanking capabilities and In-The-Ear devices with hearing protection.

SENSOR SUB-SYSTEM

Selex ES electro-optical equipment includes the day and night observation and pointing systems ASPIS or Minisight; the SCORPIO grenade launcher fire control system; LINX multi-functional binoculars for observation and locating objectives; and the NIMOS night mobility system fitted into the helmet.

ASPIS

ASPIS is a multi-functional thermal weapon sight. It enhances mission performance by equipping the user with the capability to observe, aim and disseminate images of a target. ASPIS combines day and night video channels, can be connected to the soldier's computer via a Bluetooth link and, in conjunction with NIMOS, enables the soldier to observe and fire around the corner and record images of the scene.

MINISIGHT

MINISIGHT is a miniaturised day/night hand-held pocket scope with weapon mount which enhances mission performance by providing the user with the capability to observe, aim and disseminate target images, and record images of the scene.

MINISIGHT combines day and night video channels and, as ASPIS, can be connected to the soldier's computer via a Bluetooth link. In conjunction with NIMOS enables soldiers to observe and fire around the corner.

SCORPIO

SCORPIO is a light and compact fire control system for 40mm grenade launchers. It supports quick and accurate pointing and firing at both static and moving targets. SCORPIO increases the probability of hitting the target and minimises the number of grenades used. The display is easy to use and features a built-in digital crosshair.

LINX

LINX is a multi-functional binocular for daytime vision (two TV video channels: one for the wide field and one for narrow field) and night vision (infrared channel in the narrow field). It also includes a laser rangefinder to measure distance to target, and a digital compass plus GPS for geo-location.

The system ensures rapid target acquisition and provides information received from the soldier's computer. LINX can be connected to the soldier's computer via Bluetooth link and is capable of sending digital images of the scene under observation, which also contains data on the target's location.

NIMOS

NIMOS is a night mobility system that allows the user to navigate through the use of light intensification technology. The system is fitted to the soldier's helmet and connected with the soldier's computer. NIMOS can replicate the wearable computer's display, capture images of the scene under observation and receive video feeds from sights such as the ASPIS, allowing the soldier to shoot round corners.

SUPPORT & AUTONOMY SUB-SYSTEM

The Support & Autonomy sub-system provides the soldier with a Centralised Power Supply system with the following main capabilities:

- Centralised power supply source for the C4I electronic equipment of the Future Soldier System that considerably extends the time duration of the soldier's mission
- The aibility to regenerate the system using an external power source

The Centralised Power Supply system is based on the following components:

- Power Distribution & Control Unit
- Rechargeable Battery
- Portable Battery Charger

The system architecture is modular in order to allow both a better ergonomics and distribution of the components on the soldier body.

The Power Distribution & Control unit distributes the energy of the battery to the Future Soldier System devices and controls the consumption and status of the connected battery through a SMBus interface. In addition, the unit cyclically sends power consumption data to the Soldier Computer through a dedicated serial line.

The Rechargeable Battery, made with rechargeable Lithium-Ion cells, is able to power the Future Soldier System and guarantees an estimated operability of up to 12 hours; Additional battery packages, carried in the rucksack, can be used for longer missions. Battery packages are hot-swappable, and the replacement does not influence the performance or stability of the system.

The Portable Battery Charger is used to connect the Future Soldier System to external power supply sources.

VEHICLE INTEGRATION CAPABILITIES

Selex ES experience in the Soldier System domain also includes the management of all aspects related to the integration of the soldier system with vehicular platforms.

Vehicular integration is supported at communication level (between Soldier Radio and intercom), C2 level (soldier C2 - vehicle BMS data exchange) and power level.

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