Providing extensive capabilities in the fields of improved situational awareness (SA), lethality and survivability, the new generation of soldier systems draws on completely new armament, improved C2 means, integrated ballistic protection, and lightweight, highly miniaturised detection sensors. Especially in light of current threats in urban terrain, operations have demonstrated the need for, e.g. shooter detection systems to protect blue forces amongst others.

Modern infantry soldier systems and their equipment will become part of a rapidly re-configurable network, in which the highly miniaturised, lightweight sensors carried relay real or near real-time data to key decision makers. They will deliver increased SA, enabling tracking and identification, thus also minimising the risk of “blue-on-blue” kills.

Increasing Demands Shape the Battlefield

For the variety of military missions commonly undertaken in complex terrain, the defence industry made significant progress in developing highly specialised detection sensors, including man-portable vision systems, thermal imagers, unattended ground sensors, radars, and sniper detection systems. All of them are optimised for use in an urban environment. For example, QinetiQ’s acoustic EARS family of wearable sniper detection and gunshot localisation systems (known to the US Army as the Soldier Wearable Acoustic Targeting System SWATS) is based on a miniature single integrated acoustic sensor. Systems like the EARS family are able to respond in less than a tenth of a second from the first gunshot being fired, without being confused by surrounding sounds, to accurately locate snipers in a 360° view, even when in use on a vehicle moving at speeds over 80 km/h. But there also are a number of completely new payloads carried by small man-pack drones. Filling in existing capability gaps, the once reconnaissance-only role of the different types of miniature drones is now shared with strike, force protection and signals collection, and, in doing so, have helped reduce the complexity and time lag in the sensor-to-shooter chain for acting on actionable intelligence.

The New Role of Battlefield Radars

Although EO has been the predominant type of sensor fielded on the battlefield to date, the nature of ISR/C4ISR/ISTAR is resulting in a greater emphasis on highly miniaturised radars.

When the protection of forward-deployed positions or field camps comes into consideration, there are lightweight ground surveillance radars (GSR) that have been developed for security reasons, e.g. Cassidian’s X-band SPXER 1000 security radar, combining Digital Beam Forming (DBF) and AESA (active electronically scanned array) technologies. With an instrumented range varying from 0.1-18km and an extremely high update rate (up to 100° within 2 seconds), the SPXER 1000 is able to detect suspicious movements on the ground, in the air, or over sea at a very early stage. Three operating modes are implemented in the radar, panorama mode (fast scan mode), beam mode, and scan mode. The latter offers a defined or arbitrary pointing of the 30° azimuth coverage pattern within the azimuth range of ±50°.

Blighter, a Plextek company, produces the B400 series of GSR, which can be used as an infantry radar on the battlefield to provide long-range area surveillance or as a security radar for the protection of bases in remote areas.

The US manufacturer SRC developed the SR HAWK radar. As a cost-effective solution, it represents a state-of-the-art design of the next generation of the military-proven AN/PPS-5D and AN/PPS-SE GSR systems that SRC developed for the US Army. The man-portable SR HAWK provides superior wide-area persistent surveillance in a lightweight, network-ready sensor.

Thales Nederland offers the SQUIRE man-portable radar that is already in use with the Royal Netherlands Army and the Royal

Stefan Nitschke

Equipping the Future Soldier - Lightweight Radar, Sonar and Detection Technology
As a multiplier of combat power, modern infantry soldier systems like the idZ-ES will become part of a rapidly re-configurable network in which sensors and C4I devices carried by the soldier relay real or near real-time messages and data to key decision makers. (Photo: Rheinmetall Defence)

Netherlands Marine Corps. SQUIRE is a medium-range GSR that can detect and classify moving targets on, or close to, the ground at ranges up to 24km, and consists of compact units to be carried in two backpacks, each weighing less than 25kg (including batteries). The radar is based on the Frequency Modulated Continuous Wave (FMCW) principle and provides very low probability of intercept (LPI) characteristics.

Adding New Punch to Light-weight EO Detection Systems

The overabundance of advanced handheld EO/IR sensors have been shown in more recent military operations to deliver persistent, accurate, and timely pictures of the dynamic battlefield. Thermal imagers can be combined with conventional camera systems to provide enhanced detection during daytime. As soldier image fusion is concerned, the defence industry has made significant progress in developing digital devices that allow the user to not only receive a fused picture, but also to transmit this picture to other units in theatre, as well as to other levels of command. Systems of this kind enable forces to quantify the opposition’s strength by locating and monitoring troop movements while minimising the risk of detection.

Inexpensive uncooled IR focal plane arrays (FPA), using very small thermally sensitive structures or bolometers, are functioning at room temperature, with almost the same sensitivities as found in liquid nitrogen-cooled semiconductor FPAs (containing detector cells responsive to IR wavelengths to form an image). With many sensors operating in complex combat environments using linear and FPA to cover both the medium-wave IR (MWIR) and long-wave IR (LWIR) frequency bands, large 2D detector arrays used in third-generation FLIR sensors enable multiband operation covering three wavebands (also including the short-wave IR (SWIR) band) to increase detection and identification ranges.

New materials have also been investigated in the IR field to include vanadium oxide (VOx) and yttrium barium copper oxide detectors. QWIP (Quantum Well Infrared Photodetector) FPA were shown to be able to offer multi-colour capability in the 3-5 MWIR and 8-12 LWIR bands.

Elbit Systems’ Elop developed the LILY-S and LILY-M devices that are based on Elop’s third-generation, uncooled microbolometer technology. Another product, the newly developed MARS thermal imager which is in service with the Israel Defense Force (IDF), combines a daylight camera and an uncooled thermal imager. The device weighs some 2kg (including batteries) and contains 384x288 pixel VOx microbolometer technology. The IDF plans to employ the MARS device (APMON in IDF parlance) at company/platoon commander levels to enable them to direct artillery and air fire support. Another product that attracts the interest of a number of international customers (e.g., Canada, Greece, Spain, and the US) is the CORAL CR thermal imager. The CR variant consists of a 640x512 pixel InSb FPA sensor and a daylight CCD sensor. The device detects a human target at 5km with recognition at 2km, while a military vehicle can be detected at a range of 11km (recognition at 4km).

Etronika, a manufacturer of a variety of thermal sights (ACRAB and VIKI) and thermal cameras (e.g., the 1.9 kg KTD-60 KUMAK daylight CCD camera), developed the smallest camera system in Poland, which is based on uncooled microbolometer technology. Named KTL-30, this thermal camera allows daylight/night observation under all severe climatic and battlefield conditions (-30°+50°), including fog, smoke, dust, and other battlefield obstructions. The camera is based on uncooled 640x480 resolution detector technology of French origin, enabling the detection of objects in the spectral wavelengths of 8 to 12 microns. The optics

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**Meprolight’s NOA NYX uncooled thermal weapon sight. Lightweight. Dependable. Precise target engagement.**

- Overall weight of < 1kg
- Versatile weapon-mounted or hand-held design
- Capture and storage of still images with PC download option
- Video-out with full overlay for Command & Control

Vectronix' STerna - the ultralight, man-portable Precision Target Location System (PTLS) - enables unrestricted, non-magnetic north finding while reducing collateral damage and ensuring a high first-round accuracy.

The STerna Systems are based on Vectronix' new and unrestricted north-finding capability providing very precise target coordinates, even in magnetically charged or GPS-denied settings meeting the requirements of multiple mission scenarios.

Depending on the mission profile, users can select today from 3 mission-ready STerna system solutions providing independent north finding, eye-safe long distance laser range finding, brilliant day view optics plus the required night view capabilities. STerna PTLS seamlessly integrates the performances of the well-known observation products VECTOR, MOKITOS and JIM LR (LRTV). All 3 system configurations are in production stage, ready for orders and deliveries.

Non-Military Applications

STerna is an ideal solution for civil applications where orientation in GPS denied environments is required or the line of sight is not available, like the construction of forestry roads.

Ultralight, Man-Portable System <4 kg

STerna's lightweight structure makes it easy to carry and deploy, with no extensive bolt-ons required to operate the unit. The man-portable capability of the STerna enables the soldier to move at the same pace as his dismounted team.

Limited Collateral Damage, High First-Round Accuracy

With the superb safety package of STerna, clearance of fires can be greatly reduced. Troops may no longer have to wait for authorization to adjust fire and will be less exposed due to STerna's first round, fire for effect capability. Soldiers can now effectively use dumb bombs as easily as laser guided bombs to reduce the amount of exposure, while saving lives, rounds, and time in the heat of battle.

Unrestricted, Non-Magnetic North Finding

Vectronix' STerna provides true north capabilities 24 hours per day, 7 days a week, in virtually any environment, and works in virtually all weather conditions. STerna operates independently and does not require the soldier to carry any support resources to directly determine true north. Vectronix' STerna does not require GPS, celestial bodies, survey, or landmarks, and can operate in a magnetically charged environment; thus, greatly reducing the cost of replacement parts. STerna's independent true north capabilities permit the soldier to operate in virtually all battle and hostile environments.

72 Hours Extended Mission Capability

STerna's operational mode summary supports missions lasting up to 72 hours. STerna's low-power consumption provides persistent and "unblinking" calibrations and missions, permitting the soldier to stay away from base for a longer period of time.

The flexibility of STerna PTLS allows for a perfect match with the requirements of today's Close Air Support, Forward Observer, Forward Air Controller, Joint Tactical Air Controller or ANGLICO. The current system portfolio is scheduled to be expanded in 2012 to include new and additional payloads fulfilling other specific mission requirements.

Vectronix is a leader in the development and manufacturing of integrated handheld, mounted, module, and precision systems for observation, detection, geo-positioning, and targeting solutions. Leveraging core competencies in electro-optics, laser range finding, and north-finding technologies, Vectronix AG supports the requirements of defense and law enforcement. Headquartered in Heerbrugg, Switzerland, Vectronix is owned by Sagem (Safran group) and maintains two subsidiaries with four branches in the US.

(made from Germanium) were completely developed in Poland. The camera is contained in a housing (40x40x70mm) made of magnesium alloy, resulting in a weight of less than 100 grams. The new camera can be also used to equip highly minimised UAVs.

EVPU Defence, which is known for the development, design and manufacturing of special fixed and mobile monitoring and surveillance systems, developed the SIRUS stationary monitoring and surveillance system. It is being employed for long-range observation of up to 20 kilometres. The company's PAVLA system also offered to several potential customers in the MENA region, is a highly mobile, computerised survey system consisting of high-precision mechanics, electronics, optics, and communication. PAVLA is equipped with a panoramic high-resolution camera, an IR sensor, and a seismic sensor able to any intruder within a guarded area.

Flir Systems produces the RECON B9 medium-range, lightweight 8-12 IR camera. It is outfitted with a continuous x4 zoom. Another product is the RECON-III medium-range binocular that is also known as the B2-M5. It includes a visible colour channel and a 640 x 480 pixel MWIR indium antimonide (InSb) sensor and a 320x240 LWIR VOx microbolometer. A monochrome low-light-level CCD camera with a 794x494 pixel resolution can be added. Flir Systems has also developed a clip-on thermal imager named VISION M32-C that is designed to augment traditional night vision goggles (NVG). Weighing 189g, the device provides long-wave thermal imaging for standard monocular NVG and a 34° field-of-view (FOV).

Among Indra's handheld thermal cameras, both the EVOL uncooled camera and the CLIP cooled camera are being operated by rechargeable lithium-ion batteries. The low consumption of each individual component
The AN/PSQ-20 thermal/intensification fusion NV system employed by the US Army since 2008 provides the soldier with both thermal and intensification vision that can be merged together. (Photo: ITT Exelis)

image fusion. A second contract, awarded in mid-2010, foresees the Spiral Enhanced NVG (SENG), also designated AN/PSQ-20, to be supplied to the US Army to ensure an optical overlay of images provided by its image intensification tube and 320x240 IR microbolometer.

Jenoptik, which recently launched a compact, yet powerful 1,550nm Laser Range finder Module for system integration, is the manufacturer of the NYXUS BIRD handheld thermal imager. In use with the German Army in Afghanistan, it is also foreseen to equip the German Army’s engineers. The company’s NYXUS-IR system has a monocular daylight channel plus a cooled 3-5 IR channel.

Meprolight manufactures uncooled thermal weapon sights, notably the MEPRO MNV NV weapon sight and the MEPRO MOR multi-purpose reflex sight developed for the IDF, and the MINIMON-I multi-functional mini-monocular. The latter utilises ANVIS-type image intensifier tubes. It offers 40 hours of continuous operation by using an AA alkaline battery. With the MINIMON-I, the user retains his full peripheral vision in the unaided eye in conjunction with the 40° FOV offered by the NV device. (Photo: Microflown AVISA)

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The low power consumption allows the VIPIR-2 thermal weapon sight to operate with only four commercially available AA batteries, greatly reducing through life costs. (Photo: Qioptiq)

Meprolight’s NOA NYX, a lightweight, un-cooled thermal weapon sight, weighing less than 1kg, was created to address the issues of precise target detection and engagement in dust, smoke, and complete darkness. The NOA NYX uses proven high-resolution microbolometer technology, to ensure clear and consistent results. The NOA NYX can be used as a hand held observation device or fitted to light machine guns, assault rifles and submachine guns, using the MIL-STD-1913 rail system. The system’s long-range capability and light weight also make it suitable for sharpshooter rifles with a x2 and x4 digital zoom, having the ability to detect man sized targets at ranges up to 900 metres. (Photo: Meprolight)

Optix is the premier designer, manufacturer and supplier of optoelectronic components and systems in Bulgaria, with products including optical sights (MK-6, PGO-7/VU, ODS-4M), NV sights (ONS-3A, ONS-4V/4M), DIANA-series of NV observation devices, thermal sights, mobile thermal vision systems (TEMRA, TERAOMA), and uncooled thermal cameras (MINION, GOLIATH, eXv2icon X2100).

PICO, part of the Bumar Group, developed the MTN-1 monocular device combining thermal and intensified images. The device is a proposal for a fused NV system for the Polish TYPAN modern soldier programme.

Photonis unveiled details of its newly improved XRS image intensifier tube in 2011. Enhancing the soldier’s tactical situational awareness, the XRS is equipped with auto-gating technology, designed to protect a soldier’s eyesight in the event of a sudden light burst. It constantly operates to improve the quality of the image, not only during day/night/day transition, but also under dynamic lighting conditions, such as MOUT.

The newly established company Rheinmetall Electro-Optics supplies a variety of dismounted soldier products. Among them are the VING- TAKS II long-range surveillance, observation and reconnaissance, the SAPHIR 9.6 uncooled thermal imaging device, the KN250 NV device, and the KN200 intensifier. The latter is a clip-on device that gives optical day sights a night time capability. Another product that will attract the interest of international customers is the VM daylight camera delivering superb reconnaissance results at extremely long distances.

In January 2011, Sagem was awarded a contract to deliver 1,175 JIM-LR2 multifunction binoculars to the French Army for use with the FELIN dismounted soldiers. The new device offers several improvements such as an image fusion mode, combining visible (daytime) and IR channels. It enables the observer to see through smoke, haze, dust, or camouflage.

SELEX Galileo is supplying its LINX multifunction day/night handheld thermal target locator to the Italian Army’s Soldato Futuro programme. The device weighs some 2.35kg (including AA batteries) and is optimised for all-weather observation, detection and recognition through battlefield obscurants. It is equipped with a 320 x 240 uncooled 8-12 sensor and a 2.5km range laser rangefinder, GPS, and a digital magnetic compass. Soldato Futuro is also receiving SELEX Galileo’s ASPIRIS sight, weighing 1.19kg and combining a daylight TV channel for high-definition observation and detection, an uncooled thermal camera, and a red dot sight for close quarters combat.

Qioptiq produces uncooled thermal imaging devices/intensifiers/sighting systems for use on small arms for most European NATO members. Besides a great variety of thermal sights, the VIPIR-2 lightweight thermal sight is designed specifically for medium-range surveillance and target engagement; and is fully ruggedised, featuring a 24 hour operational capability. VIPIR-2 is particularly suited for use on short- or medium-range 5.56, 7.62, or .50/12.7 calibre weapons. It utilises the latest in uncooled thermal imaging technology to provide a superior performance in weightsize ratio. Another product is the MERLIN-LR NV device that is being supplied under the auspices of an urgent demand of the German Army. The company is also offering its DRAGON-C multi-role thermal imager for the German Idz-ES future soldier project.

Thales developed the SOPHIE series of multifunction surveillance and target locators. Among them, the SOPHIE-UF system combines an optical day sight with a high-resolution, uncooled thermal imager operating in the long-wave 8-12" range. The SOPHIE-UF is joined by the SOPHIE-XF multifunction handheld thermal imager. It is operating in the medium wave 3-5 range, offering a x2 electronic zoom and a 7x continuous zoom. It is similar to Thales’ SOPHIE-ZS day and night handheld thermal imager.

Vectronix, a global leader in portable optoelectronics solutions owned by Sagem, manufactures the TACS-M miniature thermal acquisition clip-on system. The 150g device is a micro-sized thermal imager that clips on already fielded NV devices, and enables the user to detect thermal sources directly through the lens of such devices, significantly enhancing its overall SA. Vectronix’s MOKSITO is one of the lightest target acquisition binoculars available today, weighing less than 1.2kg, and encompassing a day/night binocular with a x5 magnification, a x3 image intensification channel, a x4 range class 1 laser rangefinder, and a digital magnetic compass within a 185x130x75mm housing. The device has been selected for the British FIST modern soldier programme. For the US Army, Vectronix developed, in a cooperation with BAE Systems, a Laser Target Locating System (LTLS) that provides a day recognition range of over 4.2 kilometres. Its uncooled IR module has a night recognition range of more than 900 metres.

Carl Zeiss Optronics supplied its TLS 40 binocular to US Special Forces, which is based on 7x42 optical binoculars in which the company has integrated a single-pulse class 1 laser rangefinder with a 20km range, a digital magnetic compass, and a 12-channel GPS receiver with an integrated antenna. The TLS 40 weighs less than 2kg (including lithium-ion batteries).

Infotron’s IT 180 helicopter-type UAS, seen here carrying Controp’s small STAMP EO/IR sensor turret, represents a man-portable UAS design capable of carrying out day/night, all-weather “over-the-hill” observation and intelligence-gathering. (Photo: Controp Precision Technologies)
Another clip-on thermal imager is available from Thermotech Systems, who developed the Clip IR thermal imager that has 4.5 hours endurance by using a single AA battery. This device was designed to function in a wide range of temperatures.

01dB-Metravib, specialising in acoustic detection systems, developed the PIVOT (Pifar Versatile Observation Turret) system, which is a rapidly deployable and man-portable surveillance system used by small infantry units, Special Forces, forward observers, and reconnaissance patrols, consisting of a high-speed, pan-and-tilt turret equipped with a daylight camera and optionally with a multifunction thermal imager. The system has been supplied to the Armed Forces of Australia, Belgium, the Czech Republic, Denmark, France, Germany, Indonesia, Italy, Norway, Poland, Singapore, Slovakia, South Africa, and the UK.

Advanced EO for Man-Portable Battlefield Unmanned Systems

When carried by man-portable unmanned systems, highly miniaturised thermal imaging sensors or IR viewers (which are also known as FLIR sensors) can be adequately deployed for data fusion from other smart sensors within a net-centric-style infrastructure. Armed at detecting targets at greater standoff ranges and closing the “sensor-to-shooter” loop, these sensors have the same design characteristics as their manned helicopter- or ground vehicle-mounted counterparts. These include the capability to be incorporated into fully automated multifunction systems to ensure better target identification and limiting “blue-on-blue” kills.

For example, the sensor payload carried by UTRI Unmanned Technologies’ DRACO micro-electrical VTOL quad-rotor system includes two day/night stabilised fixed cameras, one with optical zoom, and two IR stabilised fixed cameras. Furthermore, the 9km range, 20 minutes duration CO200 aerial reconnaissance system offered by Datron and the 2kg, 2km operating range TARKUS reconnaissance system developed by WB Electronics for “over-the-hill” reconnaissance fit into this scheme.

Controp Precision Technologies developed a range of unmanned-applicable EO/IR sensors containing InSb detector array technology to include the DSP-1 multi-sensor turret and the FOX-450Z thermal camera. The latter features a 320x256 element array operating in the MWIR band. It is fitted with the x22.5 continuous optical zoom lens. The DSP-1, encompassing a 768x494-pixel colour daylight TV camera with an x22.5 zoom lens, is said to provide sufficient resolution to detect trucks at a range of 25km and to identify them from 7.5 kilometres. The two sensors are mounted on a stabilised platform to form a turret weighing 25.8 kilograms.

Polytch, a fully owned subsidiary of Cedip Infrared Systems, has developed three gyro-stabilised EO/IR payloads for battlefield unmanned applications. These are the ARGUS 275 system, in which EO and IR sensors are interchangeable, the PIXEL 275 II payload carrying a Sony DSR-PD170 video camera with an 12x

01dB-Metravib’s military gunshot locator seen here at MILIPOL 2011 in Paris can be easily installed. (Photo: via Author)
optical zoom, and the COBOLT 350 multi-payload EO/IR airborne gimbal delivering high-resolution imagery of small moving objects at distances of up to eight kilometres.

The Bottom Line – UGV-Carried Sensors for the Future Soldier

EO/IR sensors carried by UGVs are designed to function in all likely environments. Recon Robotics developed the Recon SCOUT THROWBOT, a throwable, mobile reconnaissance device providing real-time video reconnaissance of hostile or dangerous environments. The new robot weighing 544g is constructed of aircraft aluminium and titanium. It can be thrown through a window, tossed over a wall, or driven down a stairwell. Once deployed, its movement is controlled at a distance (more than 30m indoors and 91m outdoors) by using a handheld Operator Control Unit (OCU) and it immediately begins transmitting live video of the situation. The Recon SCOUT SEARCH STICK pole enables soldiers to control any Recon SCOUT into a versatile pole camera. It can then be employed to see over walls, through windows, and into culverts. Manufactured by Zistos (a leader in pole camera technology), the SEARCH STICK is 52cm long and fits in a standard patrol pack, but it can expand to a length of 183 centimetres.

Catching the Bad Guys Equates to Saving Lives

The individual soldier is also maturing to carry other sensor payloads like advanced sniper detection devices.

01dB-Metrawi's product in this category, the LATE Acoustic Localisation System, is used in Afghanistan. The company's PILAR MkII gunshot detection device, is a situation awareness system for the automatic detection and localisation of small- and medium-calibre gunshot, rocket-propelled grenade, mortar, and anti-tank missile firing. The Picatinny rail-compatible device weighs less than 350g and displays the exact position of a gunshot in grid coordinates and in real-time allowing to pinpoint the threat. Its detection range is quoted at 1,500 metres. The system can be coupled with a remotely controlled weapon station (RWS), offering a real-time slew-to-cue capability and/or computation of target positions from any detected shot after tactical move.

Microflown Technologies developed a dismounted soldier gunshot localisation device that is named Acoustic Vector Sensor (AVS). It is in the form of a small metal tube measuring in size of a pen. A first variant of the system is already in use with the Dutch Army in Afghanistan as a counter-rocket, artillery and mortar warning sensor. A future version is shown by the company to be adapted to mini-UAVs. A rifle-mounted version will be also offered. With a target weight of 150g, it would allow the infantryman to bring to bear his weapon in the direction of the fire source in short order.

Qiqipt’s POINTER, a weapon cueing system, draws information from a network of observers, sensors and shooters and intuitively delivers the potential target information directly into the user's view via a display indicating the target for visual identification and reaction. The mapping interface at the base station means the target information can be easily assimilated by C2 staff dramatically reducing response times. POINTER can be linked to almost any target location system for proactive planning and response or shot detection system to provide real time target information to weapon operators and improve force protection. Using information provided by C4ISTAR assets, shot detection systems or a simple map, POINTER sends target location information directly to the Head Up Display mounted on the weapon station. This system also enables multiple weapon systems to be cued onto the same or several different targets silently allocating priority as and when required.

Rafael’s solution in this category is the SPOTLITE MkII small arms firing detection system. It represents an EO system designed for the precise location of small arms fire sources. The system detects multiple small arms/sniper fire sources simultaneously, day and night, at long ranges and with high precision and detection probabilities.

Raytheon’s BBN Technologies developed the BOOMERANG WARRIOR-X wearable shooter detection system. This new device weighs 900g and encompasses two sensor pads that are installed on the soldier’s shoulders. The system also includes a display providing range and azimuth of the hostile shooter. The performance of the device is quoted at over 95% for incoming supersonic projectiles. The system warns the soldier of an incoming shot either through a built-in speaker or earpiece and it provides the data of the shooting position even if the soldier is on the move, as it automatically compensates for the motion and updates the threat location. A rifle-mounted shooter detection device has been developed by the Sonar Systems Division of Ultra Electronics. Named Rifle Mounted Gunfire Locator (RMGL), its concept is based on principle on sonar technology. The sensor unit has the dimension of a golf ball and incorporates a three-axis inertial tracker that compensates for the soldier’s movement. The device detects and localises the source of incoming high-velocity rounds. The gunfire locator sensor employs frequency domain signal processing on characteristic acoustic signals to determine the range, direction and elevation to the source of hostile gunfire. An advanced algorithm isolates the fire position in the complex battlefield environment and minimises false alarms. Target data is intuitively displayed on a screen. The process culminates with the display and rifle pointing directly at the target. Ultra Electronics will further reduce the weight of the overall system from the current 450 grams. The system is currently undergoing in-theatre operational assessment with British and US troops. Several international customers have also shown interest in this innovative system.

The SPOTLITE Mk 2 system is capable of investigating the fire sources detected, verifying that it is actually enemy fire, transferring verified targets to the snipers and thereby closing the sensor-to-shooter loop quickly and efficiently.

(Photos: Rafael)