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Future Technologies

Vehicle protection systems provide layered defense for armored vehicles

BAE Systems unveiled its 360 Multifunction Vehicle Protection (MVP) Sensor as part of the company's integrated vehicle protection system (VPS) suite, which provides improved visibility, situational awareness, threat warning, and countermeasures to protect armored vehicles and crews.

The 360 MVP Sensor combines four high-definition, extended-view multifunction cameras that serve as the eyes of the VPS, providing crews with sharp images of the battlespace around them and quickly detecting and tracking threats – from ground troops and small arms fire to aerial systems, improvised explosive devices, and missiles. The sensors provide 360-degree visibility and threat warning capabilities during the day, at night, in adverse weather, and despite challenging natural and manmade battlefield conditions including fog, dust, and smoke.

"Our approach is different. We're using mature, integrated components to provide a modular and affordable system for protecting armored vehicles that's tailorable to the platform, mission, and budget," said Ryan Edwards, BAE Systems' business development manager for Soldier and Vehicle Electronics. "Our vehicle protection system lets crews see first and act first, helping them complete their missions."

The 360 MVP Sensor provides early threat warning that helps crews quickly detect, recognize, identify, and track potential threats. It can be integrated with and cue non-kinetic countermeasures – including BAE Systems' RAVEN – and kinetic countermeasures to defeat threats, shortening the response chain and reducing the cognitive load on crews, improving mobility, lethality, survivability, and overall mission effectiveness.

BAE Systems' VPS provides an integrated, layered defense for armored vehicles that builds on the company's extensive experience developing sensors, image-processing technology, and aircraft survivability equipment – technology that has been proven through millions of combat hours.

Development of BAE Systems' vehicle protections systems is conducted at the company's manufacturing center of excellence in Austin, Texas.

360 Multifunction Vehicle Protection Sensor

The 360 MVP Sensor improves situational awareness for ground vehicles and reduces the cognitive load on drivers. Easy integration with other vehicle protection components enhances crew response time and survivability when it matters most.

Comprised of high-definition, extended-view sensors built with BAE Systems' 1920x1200 longwave infrared camera cores, the 360 MVP Sensor system delivers low-latency imagery during the day, at night, in adverse weather, and despite challenging natural and manmade battlefield conditions.

The large field of view and our advanced algorithms improves situational awareness for ground vehicles and reduces the cognitive load on the crew. These algorithms allow the system to provide early warning of incoming threats such as unmanned aerial vehicles and ground forces, allowing crews and systems to respond before the threat can engage. The 360 MVP Sensor gives crews the "see first, act first" advantage, and improves maneuverability, lethality, and survivability in dense, urban terrain.

Key Features & Benefits:

- Four 1920 high-definition uncooled cameras provide enhanced situational awareness with 360° horizontal coverage and overlapping fields of view
- Larger format increases camera field of view from current 40° HFOV x 30° VFOV to 120° HFOV x 75° VFOV, allowing for increased look-up angle and shortened ground intercept
- Ability to integrate with other vehicle protection systems to provide passive cueing of soft-kill and hard-kill countermeasures
- Backward-compatible with existing vehicle architectures
- Slew-to-cue capable – detecting, tracking, and alerting crews to potential threats
- Increases the speed of decision-making
- Tailorable capabilities based on platform, mission, and budget

The 360 Multifunction Vehicle Protection Sensor provides 360 situational awareness, enabling the crew to rapidly detect, track, and defeat threats.

Contracts

KMW set to modernise 101 German Leopard 2 main battle

KMW has been awarded a contract to modernise 101 Leopard 2 A6 main battle tanks. The contract in question was signed on 28 March 2019 at the German Federal Office of Bundeswehr Equipment (BAAINBw). It is worth more than €300 million.

Among other things, the operating concept, targeting system and fire control computer as well as the chassis are being upgraded to the level of the Leopard 2 A7V. By this step, the diversity of different models of main battel tanks being operated in the Bundeswehr will be

reduced further and the logistical footprint of the systems will be simplified. Moreover, tank crews will no longer need additional training on the different Leopard variants to be able to operate the systems. All 101 vehicles will have been delivered by 2026.

Future Technologies

AKREP II electric armored vehicle presented in Turkey

Turkish private defense company Otokar introduced the AKREP II first Turkish electric armored vehicle. The novelty will be exhibited at IDEF'19 Turkish defense exhibition, which will be held in May.

Otokar CEO Serdar Gцrgьз organized a press conference to introduce a new generation of armored vehicles, presented by AKREP II.

Serdar Gцrgьз said that the AKREP II version is the first electric armored vehicle in Turkey, which uses companies technologies in the field of military equipment and new electrical, these are the first steps of the Turkish defense industry in hybrid and autonomous technologies.

He also announced that AKREP II will be presented for the first time at the 14th International Defense Industry Exhibition IDEF'19, which will be held in Istanbul (Turkey). Work on the vehicke continued for several months to present it in a special configuration at the exhibition.

Gцrgьз said: “Speaking about technological developments, of course, alternative fuels are on our agenda for. We developed AKREP II with alternative power source. Equipped with AKREP II electric motors and advanced batteries, Turkey’s first electric armored car will be on display at IDEF 2019.”

Combining the advantages of maneuverability, low thermal signature, high speed and silence compared to traditional armored vehicles, AKREP II is equipped with an electric motor that is able to meet the most stringent requirements of armies around the world. AKREP II provides the best combination of fuel efficiency, mobility, vitality and integrated logistic support.

“We have military equipment in 32 different countries”

Underlining that Otokar, the national defense industry company, was trying to succeed by offering a wide range of its products in various markets, Gцrgyuch said that there are goods that will meet the needs of paramilitary, special and the armed forces.

Underlining that they had developed all military products in their own R&D divisions, Gцrgyuch explained that they had spent 1 billion Turkish liras on research and development in the last 10 years and that these costs had turned into new products, solutions and innovations. Gцrgьз said the company is also trying to expand its market through technology exports. For example, the United Arab Emirates masters the production of armored vehicles, such as Rabdan and Tulpar. “We have military equipment in 32 different countries. We also provide maintenance and repair services,” said Girgyuch.

New solution for new needs

Due to the changing threats, in the last 20 years, the need for tools that can be used in armed patrols, reconnaissance and, if necessary, in resolving conflicts in the world has increased.

Gцrgьз used the following statements:

“We have been producing AKREP vehicles since 1994, and this was the first vehicle with a thermal imager among all light armored vehicles in Turkey. AKREP was first created to find solutions for our problems at the border and in the border region. The AKREP vehicle has a low silhouette, is quiet and can carry 3 people. We completed AKREP production in 2000. Taking into account the changing trends and changing needs in the world, Otokar decided to renew the AKREP platform with a very low silhouette, less but high fire capabilities, using modern technologies. The platform that we are preparing to meet the needs of intelligence and surveillance. It can be used for both electronic and direct observation. This autonomous vehicle can be integrated with drones or robots."

Both electric and diesel design

Providing information that the car was designed in two versions - electric and diesel, Gцrgyuch said that at present the electric version is fully ready, and the diesel version will be ready in one year.

The protection level of the AKREP II is similar to that of the Cobra II, but at the same time this vehicle is lighter and has a low height, which increases protection against various threats, such as anti-tank grenade launchers.

Gцrgьз argues that, both in the front of the car and in the rear, there is a place to accommodate additional batteries, which, if desired, can increase the power reserve for customers. Gцrgьз pointed out the importance of the ability of the vehicle to provide fire support to nearby ground units.

Specifications

Gцrgьз, to questions from the press, said that the batteries were enough to ensure 3 hours of work. Fast charging provides a replenishment of 20-30 percent charge within 15-20 minutes. The power reserve will be about 250 kilometers, and it can be increased with the help of new energy-intensive batteries.

Gцrgьз stressed that the car is mission ready: “We will be able to sell AKREP II in a year.” he said.

Contracts

Milrem Signs Contract for the Latvian BV206 Maintenance

Patria's subsidiary Milrem LCM has signed a framework agreement for the maintenance and repair of BV206 tracked vehicles with the Logistics Command of the Latvian National Armed Forces. The agreement is valid for eight years.

There are around a hundred BV206 vehicles with different configurations in Latvia. Most of the repairs are extensive, and Milrem will work in close cooperation with Patria's Finnish subsidiary Millog, that has a solid experience of BV206 including upgrade packages.

"We are looking forward to a close cooperation with the Latvian Armed Forces and to grow it further. We have a solid know-how of partnerships with defence forces in life-cycle support services, particularly in northern Europe. And we believe that this agreement is a good basis for us to grow further in the Baltic countries", says Ugis Romanovs, Managing Director of Milrem SIA in Latvia.

Robots

Robotic Warfare Systems Will Bring Disruption to the Battlefield, Milrem Robotics' Study Finds

An international assemble of scholars has concluded in a three-piece study that unmanned ground vehicles (UGVs) are a definite game changer that greatly enhance the capabilities of armed forces.

"The range of possibilities with military robots is immense and will very likely be one of the major changes in the art of warfare in the future," writes Gйrard de Boisboissel, a research engineer at Research Centre Schools (CREC) of Saint-Cyrone in the third book of the Digital Infantry Battlefield Solution.

The book, part of a three-piece study, was written by military and academic research experts and addresses the employment of UGVs in support of land operations.

The study was initiated by Milrem Robotics who together with partners demonstrated the capabilities and cooperation between unmanned systems during EW Live 2019 held in Tartu, Estonia.

During the event Milrem Robotics deployed their THeMIS UGV equipped with ST Engineering's ADDER DM remote weapon station to engage targets that were identified by the Titan KX-4 LE multirotor developed by Threod Systems.

"Using the integration of unmanned ground and aerial systems to identify and engage targets reduces the risk to soldiers who can stay in a safe distance," explained Kuldar Vддrsi, CEO of Milrem Robotics. "Also, it increases the efficiency and firepower of small units significantly."

James Rogers, the Director of the Global Britain Programme at the Henry Jackson Society and Robert Clark, a British Army instructor give a further example that when soldiers need to engage the enemy, UGVs would be crucial casualty evacuation tools.

"In an incident involving two casualties requiring extraction, ten personnel would normally be utilised. To mitigate against this, a THeMIS transport platform could be set remotely for pre-designated waypoints and can carry at least two casualties, and at a much higher pace of extraction than by foot. Not only does this potentially result in a casualty being extracted much quicker to receive treatment, it additionally frees up vital manpower during the battle."

The third DIBS book provides an analysis of the EU initiatives aimed at the digitalisation of the battlefield through research and innovation and offers a comprehensive assessment of the defence research and innovation ecosystem in the Baltics. The second part of the book considers the development of UGVs in Canada, France, Germany, the United Arab Emirates and the United Kingdom.

The first volume of this project, published in December 2016, provided a retrospective and prospective analysis of the development of UGVs, also addressing current tactical, technical, and legal issues and challenges. The second volume, published in August 2017, provided an analysis of ethical and legal aspects of the employment of UGVs, taking a closer view on People's Republic of China, Israel, Poland, Russia, Ukraine, and the United States.

DIBS is a result of collaboration between the Baltic Defence College, DRDC-CORA, General Tadeusz Kościuszko Military Academy of Land Forces (Poland), Latvian Institute of International Affairs, Latvian National Defence Academy, Military University of Technology (Poland), Rīga Stradiņš University and War Studies University (Poland).

Defence Industry

FNSS Reveals PARS III 8x8 Engineering Vehicle

FNSS demonstrates the modularity and adaptability of the PARS III 8x8 to different missions with the armoured engineer vehicle, developed for the Royal Army of Oman. The ongoing qualification tests for the PARS III 8x8 Engineering Vehicle are expected to be completed within the first half of this year, after which the vehicle will be delivered.

Developed by FNSS as its first 8x8 engineering vehicle clears surface laid mines and threats found within the path of the full width of the vehicle, from roads, tracks and rough terrain to produce a cleared route for the infantry and follow-on vehicles. The PARS III 8x8 Engineering Vehicle can effectively fulfil a wide range of missions owing to its ability to have equipment and hardware rapidly mounted and dismounted from its chassis. With different equipment and hardware equipped, the vehicle can execute the following types of missions, aimed at enhancing the mobility and operational capabilities of friendly forces and units:

- Removal of obstacles/barriers, clearing paths, maintenance of roads used in combat;
- Clearing paths through minefields to ensure the continued movement of friendly units;
- Construction of communication and defence posts, taking measures against surveillance (concealment), construction of mock-up facilities
- Enemy deception to increase the survivability of units

The contract signed by FNSS to meet the needs of the Royal Army of Oman covers the design, development, production and delivery of a total of 172 vehicles in 13 different configurations, as well as the integrated logistics support (ILS) services to be provided throughout the guarantee period. While 145 of these vehicles will be PARS III 8x8 vehicles delivered in eight different configurations, the remaining 27 will be the PARS III 6x6 vehicles delivered in five different configurations. The total number of PARS III 8x8 Engineering Vehicles will be six.

K. Nail Kurt, General Manager and CEO of FNSS, emphasised how the PARS III 8x8 Engineering Vehicle represents one of the best examples of FNSS' ability to develop vehicles of different configurations. "Engineering vehicles are one of the most challenging and special vehicle configurations. These vehicles require extensive engineering work beforehand, and you need to analyse in advance the different scenarios of use of the vehicle, down to the finest details. In the PARS III 8x8 Engineering Vehicle, we went a step further in these challenges and came up with a design that allows different equipment and hardware to be readily mounted and dismounted. This vehicle, which has been developed in accordance with the high standards expected by the Royal Army of Oman, is likely to have strong export potential for different countries in the near future," Kurt said.

Defence Industry

AV-8 AENBCRV Vehicle Prepares to Enter Malaysian Army Inventory

The Armoured Engineer Nuclear, Biological and Chemical Reconnaissance Vehicle (AENBCRV)version of the AV-8 Wheeled Armoured Vehicle (WAV) developed by the FNSS and DRB HICOM Defence Technologies Sdn Bhd (DEFTECH) partnership for the Malaysian Army is preparing for delivery in the first half of this year.

The AV-8 AENBCRV is fitted with CBRN detection equipment and systems to detect and classify of any type of chemical, biological, radioactive or nuclear agents. The vehicle can determine and classify the hazard zone and alert other military units and civilians of potential dangers, thus enabling them to take the necessary countermeasures.

Possessing a complex and modern system architecture and mission-specific equipment, the AENBCRV's initial vehicle development processes – comprising conceptual design, detailed design, manufacturing and assembly – was carried out entirely by FNSS. The ongoing qualification tests serve to demonstrate that the vehicle fully and comprehensively meets the requirements set by the user. The first stage of these tests, involving Land Performance Tests and CBRN System Tests, has already been completed after being carried out at FNSS' facilities in Ankara. The second stage of the tests – the Endurance Tests – were launched in Malaysia in February 2019 Following the successful completion of these tests, the

acceptance and delivery of the first vehicle to the end user will take place in Malaysia in the upcoming days.

Under the project, four AENBCRV vehicles will be delivered, the first of which will be the vehicle that completed its qualification tests. The remaining three vehicles will be manufactured and delivered by FNSS by 2020.

The AV-8 AENBCRV stands out as the first 8x8 CBRN vehicle to be developed by FNSS. The components of the CBRN system, as the main mission equipment aboard the vehicle, was procured from domestic and foreign suppliers in line with the user's preferences. FNSS has also conducted indigenisation works on some of the CBRN system's subsystems, thus aiding domestic subcontractors in acquiring new competencies.

Commenting on this latest milestone reached by the company with the AV-8 WAV project, K. Nail Kurt, General Manager and CEO of FNSS, said: "The AV-8 WAV project continues to be the single largest defence system export contract signed by Turkey in the field of land systems, and it is also one of the most complex projects in its field due to the large number of vehicle configurations involved. Integrated with a wide variety of mission equipment, the AENBCRV is the one of the AV-8's most challenging configurations to date. We have fashioned the vehicle in close contact with the user, ensuring they are supplied with the specific capabilities they need. Our vehicle is now proving itself in rigorous tests, and I believe that it will pass all of these with great success, becoming the best in its class and joining the inventory of the friendly and allied nation of Malaysia. With this vehicle, both FNSS and the Turkish defence sector have acquired very important capabilities. In the upcoming period, we are ready to meet with the best solutions any need that the Turkish Armed Forces and friendly and allied nations may have in this particular area."