



**PROVEN SOLUTIONS
FOR MODERN ARMED FORCES**
PRODUCT CATALOG



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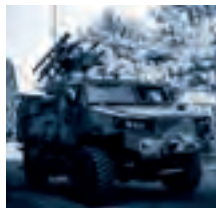
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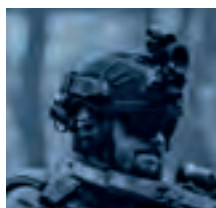
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NEW, AMPHIBIOUS INFANTRY FIGHTING VEHICLE

New, Amphibious Infantry Fighting Vehicle codename „Borsuk“ („Badger“) is able to cross wide water obstacles, has high manoeuvrability and can be used in various terrain and weather conditions. Constructed to address the challenges of the contemporary battlefield. Designed in close cooperation with users, which resulted in highly ergonomic vehicle providing comfort and safety to the soldiers.

The amphibious IFV „Borsuk“ is a development stage under the contract with the National Research and Development Centre for execution and financing of the project for security and defense of the State.





REMOTE CONTROL TURRET SYSTEM

Designed to combat light and heavy armoured vehicles structures and other enemy assets, providing support for the infantry units in combat in various climatic conditions. The ability to utilize programmable rounds enables to combat low-level airborne threats and targets behind a cover. RCTS is integrated with the APC ROSOMAK and IFV BORSUK. RCTS is an unmanned, fully automatic turret.



GOD-1 STABILIZED COMMANDER OPTRONIC SYSTEM GOC-1 IRIS STABILIZED COMMANDER OPTRONIC SYSTEM

- High-resolution cooled thermal imaging sensor
- Long-range of observation
- Set of TV cameras coupled with a light meter sensor
- Monopulse eye-safe laser rangefinder



GOC-1



GOD-1

ROSOMAK APC





8x8 APC

ROSOMAK wheeled Armored Personnel Carrier is a vehicle based on the modular design, making it possible to tailor the vehicle, as a platform, to the requirements of the contemporary battlespace. The high power output provides the APC with high top speed and good levels of maneuverability - also in rough terrain. The design allows for rapid replacement of individual systems and components.

- New, modular construction multiple applications
- Designated to transport and protect the crew and infantry soldiers against small arms fire, AT grenade launchers and IEDs
- IFV version armed with 30 mm automatic cannon, dual ATGM launcher, 7,62 machine gun
- Powerpack driving system
- High level of modular ballistic and mine protection ensuring the safety of the crew and inventory
- Auxiliary power unit (APU)
- CBRN filtration system
- Fire fighting and suppression system
- Omnidirectional observation system
- Breakwater



Dimensions of the base variant

Length	7,880 mm
Width	2,830 mm
Height (including the turret)	3,275 mm
Wheelbase	2,450 mm
Ground clearance	430 mm
Vehicle weight	22,500 kg
Top speed	100 kph
Amphibious speed: forward	10 kph, reverse - 3.3 kph
Operational range	500 - 700 km
Offroad capabilities	Crossing 60% slopes
	Crossing 2.1 m ditches
	Negotiating 50 cm vertical obstacles
Maximum side roll	35%
Wading depth	1,5 m



IFV Rosomak intergrated with ZSSW-30 turret



120mm self-propelled mortar RAK



Medical Evacuation Vehicle - Medevac



Reconnaissance Vehicle



Armored Recovery Vehicle



Fire Command Vehicle

4x4 MULTI-PURPOSE TACTICAL VEHICLE

This multi-purpose tactical vehicle is a medium-class armored wheeled vehicle for a wide range of applications that allows taking 8 (2+6) crew members aboard. The design and technical parameters of the 4x4 vehicle meet the requirements of all STANAG standards applicable to this type of equipment. At the same time, the vehicle complies with valid road traffic regulations, therefore it can be operated on public roads for emergency management or training purposes.





WEAPON STATIONS



ZSMU is a remote controlled weapon station family providing the vehicle/infrastructure crews/personnel with 360-degrees observation to protect against direct engagements, with minimized threat for the operator, in any terrain conditions, regardless of weather conditions, season, and time of the day.

- One-person control
- Modular design
- Easy maintenance/replacement/reloading of the weapons

ZSMU A5

Dual weapon system:	12,7 mm Machine gun or 40 mm automatic grenade launcher 7.62 mm UKM 2000C
Weight	303 kg
Elevation range	from -15° to +70°



ZSMU A3

- Single 7.62 mm machine gun UKM 2000C

Primary armament:	7.62 mm UKM 2000C
Weight	165 kg ±5%
Elevation range:	from -5° to +50°



ZMO

- Integrated optoelectronic module can be used for detection, recognition, identification and range finding
- Daytime camera, thermal imaging camera, range finder
- High resolution of uncooled thermal sensor
- Portable, long-range observation device
- controlled via multi-function panels used in the given weapons system

Daytime camera sensor	
WFOV NFOV	14° x 10.3° 4° x 3°
Wavelength	8 - 12 μm
Thermal imaging camera	
Resolution	640 x 480 px
FOV / NFOV	14.3° x 10.7° / 4.5° x 3.5°
Zoom	2x 4x digital
Laser rangefinder	
Safety Class - 1	1
wavelength	1.55 μm
Rangefinder range:	10 ÷ 5.000 m



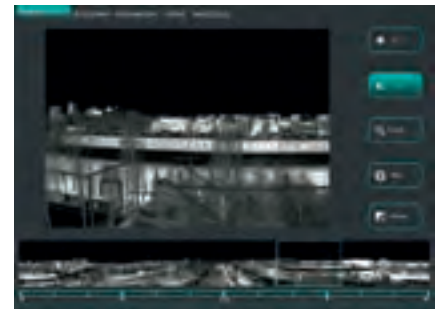
OMNIDIRECTIONAL OBSERVATION SYSTEM SOD-1

The 360 Degrees Observation System is designed for wide-angle observation of the vicinity of vehicles and movement detection around the carrier platform.

- The system provides the user with the ability to observe the surrounding environment at night and during the day, as well as in low visibility conditions
- It is possible to observe all of the vehicle's surroundings nearby, using TV and thermal imaging sensors
- Single TV/thermal imaging module features 2 TV and 2 thermal imaging optical tracts
- Module data is displayed on a touch screen display



Total module's FOV	110° x 40° (±10%)
TV Section	
Sensor resolution	1280 x 960 px
Thermal Imaging Section	
Sensor type:	non-cooled microbolometer sensor
Minimum resolution	640 x 480 FPA
Spectral range	8 - 14 μm
Pixel size	17 x 17 μm
Thermal resolution	80 mK
Image polarization	Yes



VEHICLE PROTECTION SYSTEM SSP-OBRA-3

- SSP-1 vehicle self-protection system has been developed to detect laser target designators and rangefinder beams hitting military vehicles and objects
- OBRA-3 identifies signals sent by own laser rangefinder systems
- It provides the user with automatic smoke grenade launching capability
- Broad range of detected laser radiation 0.6 μm - 11 μm
- System also acts as an optical and acoustic laser warning asset, indicating the direction at which the beam is detected, along with the type of the beam and time elapsed from detection

Number of sensors	from 4 to 8
Angular detection range in the vertical plane	-6° +30°
Angular detection range in the horizontal plane	0 ÷ 360°
Number of laser radiation bearings, possible to detect	twenty 18° sectors
Operating temperature	-30° C to +55° C



VEHICLE RADIOSTATION



RKP 8100

Radio transceiver RKP-8100 narrowband tactical radio transceiver is designed to work from 1.5MHz to 512 MHz frequency range. It provides voice communication and data transmission via standard protocols and interfaces (IP, SMTP, POP3, Ethernet, RS232). The radio transceiver is the SDR (Software Defined Radio) system type. The waveforms implemented in RKP-8100 are specified by NATO standards, required for operation in HF and VHF bands and narrowband waveforms for UHF band operation.

The design of the radio is strong optimized for EPM capability. The RKP-8100 is a universal radio transceiver which can be used as an element of mobile radio communication systems, installed on vehicular and caterpillar chassis or as a manpack radio transceiver.



Basic parameters for RKP-8100AM-B:

Frequency range	1,5 do 512MHz
Sensitivity	< 0,5 μ V all over the band
Harmonic suppression	higher than 50dB
Output power	HF 150W/500W/1KW, VHF/UHF 50W
EPM Hop rate	up to 2000 hops per second
MANET	STANAG 4691
ALE	STANAG 4538 (ALE 3G)
Frequency stability	$\pm 0,5 \times 10^{-6}$
Environmental parameters:	N.7-O-II-A, N.10-O-II-A, NO-06-A103:2005
Working temperatures/ perimeter / storage	-40°C do +55°C / -40°C do +70°C / -40°C do +70°C
Electromagnetic compatibility	NO-06-A200:2012 KCS-01, KCS-02, KCS-03, KCS-06, KCS-07, KCS-08, KRE-02, KRS-02, KCE-02
Mass	20 kg
Voltage	28 VDC (22 do 32 VDC)

FIRE EXTINGUISHING AND EXPLOSION SUPPRESSION SYSTEM

- Reacts to the puncture of a combat vehicle by a cumulative jet and to a fire or explosion of fuel, preventing the spread of fire and destruction of the vehicle
- Highly selective in detecting and identifying threats
- Can be used in tanks, combat vehicles and transporters as well as various types of service vehicles (army, police, fire brigade)
- Intend to protect the crew, engine compartments and external surfaces of vehicles
- Tailored to the vehicle type, size and space availability





ARTILLERY

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155 MM SELF PROPELLED HOWITZER

Advanced fully equipped turret and combat-proven base platform, made it possible to develop a highly lethal and reliable system, that also remains highly ergonomic and meets the toughest crew-safety standards. The KRAB howitzer has been fitted with a range of the latest hardware and software systems, providing the platform with fully autonomous capabilities. The systems include an integrated TOPAZ C2/Fire Control System, control terminal, targeting and ballistic computers, along with the Ballistic radar, land navigation and topographical positioning system TALIN 5000, GPS and odometer, internal communication system.



155 mm ROUND

155 mm extended range HE shells have been designed for use with 155 mm howitzers, with a 52-calibers long barrel.

Extended range 155 mm HE shells with base bleed designed for use with 155 mm howitzers, with a 52-calibers long barrel. Round meets JBMoU norms. The round is fitted with an (it may be detonated on impact, or with a short delay), meeting NATO STANAG 4187 requirements. The maximum range of the projectile exceeds 40 kilometers.

The round includes modular propelling charges, meaning that it is a caseless solution.



	155 mm EOFdMKM DV	155 mm EOFdMKM
Type	HE, extended range, with base bleed	HE, extended range
Projectile weight	43.55 kg	40.30 kg
Projectile length	914.00 kg	904.70 kg
Explosive payload	TNT (trinitrotoluene)	TNT (trinitrotoluene)
Weight of the explosives [kg]	10.00	10.00
Fuse	impact immediate/delayed	mechanical impact fuse
Propelling charges	BMCS bi-modular charges system	BMCS bi-modular charges system

KRAB





AUTOMATIC 120 MM MORTAR TURRET

120 mm mortar turret can be integrated on any platform - wheeled, tracked provided that the said platform meets the performance requirements within the scope of payload. Auto-targeting system and autoloader that can load rounds into the mortar throughout the turret movement range. The solutions in question minimize the reaction/engagement times. The mortar is fully autonomous.



120 MM MORTAR ROUNDS



	Modernized OF-843B round	RAK-HE-1
Type	HE	HE
Round weight	18.2 kg	19.5 kg
Projectile weight	16.1 kg	16.0 kg
Explosive payload	TNT (trinitrotoluene) - kg	TNT (trinitrotoluene) - kg
Weight of the explosives	1.75 kg	2.9 kg
Maximum range	6,873 m	10,400 m
Quantity of propelling charges	6	7



MULTIPLE LAUNCH ROCKET SYSTEM

Multiple Launch Rocket System LANGUSTA is designed to destroy and suppress enemy's manpower and combat equipment in its concentration areas, destroy enemy's firing means and command posts, disrupt and disorganize enemy's actions, lay scattered mines and to suppress enemy's command system and logistic support.



122 MM ROCKET FENIKS



Warhead type	HE
Weight of the rocket, with payload	64.9 ± 0.7 kg
Length, fuse included	MRW-U/T 2,797 mm
Maximum range	≥ 41 km
Minimum range	≥ 10 km
Top speed	≤ 1,150 m/s

ARTILLERY HSW

COMMAND VEHICLES

Thanks to all the comprehensive ICT suite integrated onboard, Command Vehicles act as a mobile command station - gathering and processing intel, carrying out fire control tasks, and establishing command and logistical outposts. They provide the commander with the ability to develop the firing solutions in an automated manner.



AMMUNITION VEHICLES

Their designation is to supply ammunition for the artillery armament unit (battalion, support company). Its' main function is both transportation as well as mechanized loading and unloading of pallets containing ammunition.



REPAIR VEHICLES

The vehicles are designed for field repair of armament and electronics, support in technical servicing and supply of subcomponents and spare parts for an artillery armament unit (battalion, support company).





ENGINEERING EQUIPMENT

BAOBAB-K SCATTERED MINE LAYING SYSTEM

BAOBAB-K Scattered Mine Laying System on 8x8 truck enables deployment of minefields of various sizes, density and self-destruction time. The minefield laying process has been fully automated: both rotation and movement of platforms with launchers (mine throwers) is carried out automatically by using a control station, which allows quick transition from transport to combat mode (and vice versa). In automatic mode, the computer calculates the speed of the vehicle, launcher settings and adjusts the frequency of launching mines while driving to ensure the correct parameters of the minefield. Manual mode, if desired, is also possible.



SCATTERING SYSTEM MINE MN-123

- Designed for BAOBAB-K Mine Scattering System



Weight	3,7 kg
Dimensions (diameter/height)	167 x 90 mm
Charge type	Shaped charge (EFP) Two-directional
RHA penetration	60 mm
Fuze type	Magnetic, delayed or instantaneous
Safety	Self-neutralization system Programmable self-destruction





ENGINEERING EQUIPMENT



MS-20 DAGLEZJA WHEELED PLATFORM BRIDGE SYSTEM

- Enables quick and safe overcoming by all types of vehicles and pedestrians - natural and artificial terrain obstacles up to 20 m wide
- Only bridge of this type equipped with a modular bridge span with automatically extending inter-track fillings
- Excellent offroad capabilities, thanks to the extra hydraulic drives



Bridge-crossing parameters

Maximum width of the crossing	20 meters
Maximum permissible wheel pressure, on the bridge's surface	90.7 kN
Lane width	4 m
Length of the bridge, with the bridge folded on the trailer	16.5 m
Length of the bridge, when deployed	ca. 42 meters

Platform

Crew	2 troops
Weight	47.9 tonnes
Weight, with armored cabin	49.5 tonnes

JELCZ P882.53

Drive	8x8
Protection, cabin crew	Armored, two persons
Dry weight (depending on the equipment package)	18,500 kg
Maximum gross weight	32,000 kg
Engine: Manufacturer/Type/Model	FPT CURSOR 13 EURO III



JELCZ S662D.43

Drive	6x6
Protection, cabin crew	Non-armored, two persons
Dry weight (depending on the equipment package)	14,000 kg
Maximum payload	11,000 kg
Maximum gross weight	25,000 kg
Engine: Manufacturer/Type/Model	FPT CURSOR 13 EURO III



JELCZ 442.32

Drive	4x4
Protection, cabin crew	Non-armored, two persons
Dry weight (depending on the equipment package)	18,500 kg
Maximum payload	6,000 kg or 12 euro pallets or 24 troops
Maximum gross weight	15,750 kg
Engine: Manufacturer/Type/Model	MTU 6R106TD21, EURO III





AIR DEFENCE

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PIORUN



MANPADS

Man Portable Air Defence System (MANPADS) Missile set PIORUN is designed to combat observed air targets, including aircrafts, helicopters and other platforms emitting infrared radiation. It is highly mobile, safe and combat proven solution with high shock resistance. Thanks to employing high sensitivity thermal homing seeker, the missile has nearly 100% effectiveness rate.

- Proximity and impact fuze
- Two-band IR homing head
- Effective against self-protection systems
- Extensively battle-proven against jets and helicopters
- Very effective against low-flying objects and UAVs



Danger zone: altitude of target	10 - 4000 m
Danger zone: distance of target	400 - 6500 m
Missile set weight	19,5 kg
Missile weight	10,5 kg
Missile caliber	72 mm
Average flight speed	580 m/s
Target max speed	Approaching 400 m/s / Pursuit 360 m/s

POPRAD



ANTI-AIRCRAFT MISSILE SYSTEM

Self-propelled Surface-to-Air Missile System POPRAD is designed to detect, recognize and destroy airborne targets at close distances and low altitudes, with the use of short-range anti-aircraft missiles. It has very short into-action time as well as evacuation time below 30 sec.

- 4 PIORUN missiles
- Highly mobile solution, with short deployment and evacuation time
- Integrable onto a various platforms wheeled and tracked, naval units
- Highly precise optoelectronic integrated tracking/targeting sensor
- Effective combat against fast, maneuvering targets
- Allowing operation at night, and during the day



35 MM ANTI-AIRCRAFT GUN

35 mm Anti-Aircraft Gun System is a remotely controlled, stabilized weapon system equipped with a 35 mm automatic gun with an independent optoelectronic target tracking system. Designed both to integrate with C2 system as well as for autonomous operation, independent of the C2.

Structure is made of carbon fiber resulting in light weight of the system, together with its modularity and scalability allows full integration on platforms of various types.

- High fire efficiency
- Air burst munition allows to effectively combat small objects
- Sub-caliber ammunition effectively combats high velocity aircraft
- Rapid change of munition type (two-sided feeding system)
- Automatic and precise aiming thanks to observation and tracking head equipped with IR camera, TV camera, hi-repetition laser rangefinder and video tracker
- Early threat detection
- Air picture acquisition from C2 systems or directly from radars
- High mobility and short deployment time



Effective fire	Maneuvering targets up to 500 m/s
Max. target Distance (range) – conventional targets – small, e.g. UAVs – ground and sea Surface targets	5500 m (FAPDS-T) 3000 m (ABM) 4000/5500 m (depending on munition)
Max altitude of target	Up to 3500 m (depending on munition)
Elevation angles	-3° to +85°
Rate of fire	550 rds./min
Ammo rack capacity	2 x 100 rds.

35 MM AMMUNITION



35 x 228

Air Burst Munition (ABM) detonates in midair, causing air burst effect with cluster of tungsten subprojectiles. The fuse is programmed in a way so the projectile's separation occurs at the predefined distance from the target.



TP-T

FAPDS-T

ABM

	Target Practice - Tracer	Frangible Armor Piercing Discarding Sabot - Tracer	Air Burst Ammunition
Muzzle velocity	1175 m/s	1440 m/s	1050 m/s
Effective range	3500 m	5500 m	4000 m
Maximum range	13000 m	27000 m	11000 m
Tracer burning time	> 5 s	> 2,5 s	-
Projectile weight	550 g	380 g	750 g
Time to 4000 m	6,1 s	3,5 s	6,2 s

PILICA

AIR DEFENCE SYSTEM

Pilica is an anti-aircraft solution based on trusted ZU-23-2 twin cannon coupled with two Piorun missiles, ensuring effective protection in the radius of 6 km. This highly mobile system includes autonomous fire control system with capability to serve as part of integrated C2 system.

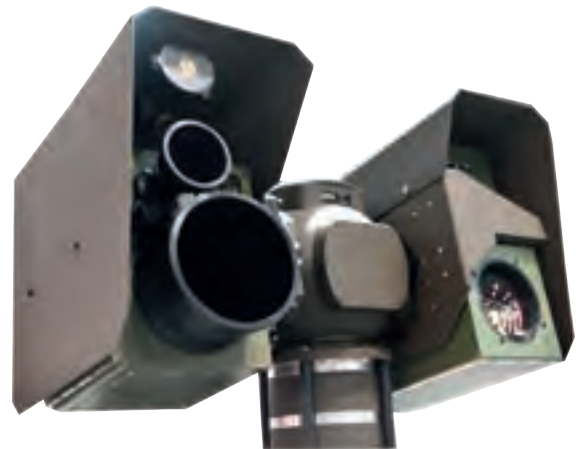
- Effectively neutralizes targets in radius of 6 km up to 4,5 km altitude
- Dual armament system: ZU-23-2 23 mm twin cannon, 2 thermal homing PIORUN missiles
- Fully digital operation with emergency manual operation possibility
- Fire control system integrated with Observation-Tracking Head coupled with electric drives ensure precise aiming
- Capability to operate the Unit from remote control panel
- Ability to work within an external C2 system



Armament	Two 23 mm 2A14 cannons 2 PIORUN launchers	
Elevation angles	-3° to +85°	
Missiles		
Maximum altitude engagement	4 500 m	
Maximum distance engagement	6 000 m	
23 mm cannon		
Practical rate of fire for the cannons	Up to 400 rounds per minute, per cannon	
Maximum altitude engagement	API / HEI	1 500 m
	APDS / FAPDS	2 000 m
Maximum effective range against the land targets	API / HEI	2 000 m
	APDS / FAPDS	2 500 m

STABILIZED OBSERVATION-TRACKING HEAD

- Compact design - all control systems in one unit
- Composed of cooled thermal imaging system (3-5 μm range), TV camera, High frequency L-GM20 laser rangefinder
- A broad range of tracking/guidance speeds (from the minimum of less than 100 rad/s to top speed of more than 2 rad/s)
- Compact size and low weight make the system suitable for a broad variety of combat platforms
- Possible integration various sensors (thermal imagers, TV cameras, laser rangefinders, etc.) per the individual customer requirements



Daytime TV camera sensor

NFOV	1.8° x 1.5° ($\pm 10\%$)
WFOV	7.8° x 5.8° ($\pm 10\%$)

Standard CCIR PAL video output

Thermal imaging camera

Spectral range	3.7 μm \div 4.8 μm
Sensor resolution	640 x 512 pixels
Field of view	NFOV 1.8° x 1.5° ($\pm 10\%$) WFOV 7.8° x 5.8° ($\pm 10\%$)

ZU-23-2



ZM Tarnów has capacity to provide entire portfolio of new spare parts for ZU-23-2



Maximum altitude engagement	API / HEI	1 500 m
	APDS / FAPDS	2 000 m
Maximum effective range against the land targets	API / HEI	2 000 m
	APDS / FAPDS	2 500 m

MOBILE 3D SHORT RANGE RADAR

3D Mobile radar is a multi-functional and multi-purpose radar for the SHORAD systems used to protect tactical combat units from airborne threats with versatile capabilities and various applications. It detects and tracks typical airborne targets, such as combat aircraft and helicopters (also hovering), missiles and UAVs, as well as mortar projectiles. High accuracy of tracked objects position.

- Instrumental range: 80 km
- Ability to detect threats with low-RCS
- Autonomous operation or as a sensor within a air defense C2 network
- Features spoofing and decoy systems, diminishing the risk of being detected by the enemy
- Resistance to passive countermeasures, or active jamming, enhancing the resilience to ARMs
- Detection of active mortar sites, defining their position and point of impact for the fired mortar bombs



Frequency of operation	C-band
Antenna	AESA
Instrumental range	80 km
Elevation coverage	up to 70°
Azimuthal coverage	360°
Refresh rate	2 s
Communications system and datalink	radio/wired
IFF	Mode 1, 2, 3/A, C (SIF), Mode 4 (SM), and Mode S, readied for Mode 5 operation

MOBILE 3D MEDIUM RANGE RADAR

Mobile radar covering in the gaps in the existing radar coverage. Once maritime channel functionality is added, the radar may also work as a sensor for coastal missile systems.

- Instrumental range 240 km
- Capability to detect low-flying threats
- Highly mobile solution, with short deployment times
- High resilience to passive and active jamming
- Capability to work with a remote control panel
- Capability to process confidential data, up to high-security levels
- Deployment time in less than 20 minutes by a 3-man crew



Range parameters	Coverage	Accuracy (RMS)	Discrimination
Instrumental range	240 km		
Target detection range	200 km	<50 m	120 m

Technical Specification	
Frequency of operation	S-band (NATO F)
Antenna rotation speed	6/12 RPM
Antenna characteristics, when receiving	7 beams in elevation
Width of the antenna beam (azimuth)	1.8° AZ
Maximum number of tracks	255
Output data	3D, IFF, extra data in the ASTERIX and/or national format

INTERROGATORS AND TRANSPONDERS

IDZ-50

Long-range interrogator designed to work with airspace monitoring systems and LRAD solutions. High power output and high efficiency make this device an optimal solution for primary long-range radars. It can provide identification in modes 1, 2, 3/A, C, and S, as well as the encrypted modes 4 and 5 (up to level 2).



ISZ-50

Universal medium-range interrogator. The compact design makes the system portable. It can be integrated on many platforms, ranging from stationary MRAD sites to highly mobile SHORAD radars. It can provide identification in modes 1, 2, 3/A, C, and S, as well as the encrypted modes 4 and 5 (up to level 2).



IKZ-50P

Designed specifically for use within SHORAD/VSHORAD systems. Low power requirements and compact size make it perfectly suitable for integration on mobile platforms. It is also a good solution for coupling with MANPADS.



TRL-50

TRL-50 is an aviation IFF Mark XIIA transponder, also acting as RIFF (Reverse IFF) interrogator, designed for identifying the objects in an air-to-surface setting. RIFF makes it possible to identify own surface assets that use relevant RIFF responders. The transponder can handle the full range of military and civil IFF modes (1, 2, 3A, C, S, and 4 and 5). Its interface makes it possible to easily integrate TRL-50 on air and naval platforms.



TRN-50

TRN-50 - ground RIFF responder designed for use on land and naval platforms. Working with TRL-50 transponder, or other RIFF-compatible hardware, the system provides the user with the ability to identify their own platforms on the battlefield, decreasing the risk of the emergence of a blue-on-blue scenario.



COMMAND SYSTEM

- Command and control system, including Fire Control System, with safety features (e.g. system check, missile malfunction notification, creating restricted fire zones for the missiles)
- Receiving and providing air picture from the radar
- Automatic control of up to 6 weapon systems
- Automatic target assignment for the engagement
- Wire and wireless data transmission and voice communication





NAVAL SYSTEMS

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OSU-35K



NAVAL ARMAMENT SYSTEM

Precision and effectiveness OSU-35K is a remotely controlled, stabilized naval weapon system equipped with a 35 mm automatic gun with an independent optoelectronic target tracking system. Structure made in carbon fiber technology allowed to significantly reduce the size and weight, as well as to achieve a high level of ergonomics in operation. OSU-35K provides engaging air targets maneuvering with course, speed and altitude in the fire zone as well as surface targets. Designed both to integrate with CMS (Combat Management System) as well as for autonomous operation, independently of the CMS. Integrated Observation and Tracking Head ZGS-35K includes thermal imaging camera, daylight camera, high-repetition laser rangefinder, video tracker and short-range interrogator.

Main elements:

- Automatic gun system (AM-35K)
- Integrated observation and tracking head (ZGS-35K)
- Fire control system unit (BSKO-35K) and a backup fire control station (RSKO-35K)

The open architecture of the system, its modularity and scalability allow full integration on ships of various types.



Main elements:

- Capability of precise target engaging
- Simultaneous engaging of various types of threats (double-sided feeding system for various types of ammunition, programmable air-burst ammunition system)
- High level of ergonomics in operation thanks to structure made in carbon fiber technology
- Possibility of integration on ships of various types



Technical Specification

Calibre	35 mm
Rate of fire	max. 550 r/min
Weight without ammunition	3300 kg
Ammunition feeding system	two-sided, belted
Capacity of magazines	2 x 100 rounds
Operation range in Elevation	From -10° to +85°
Camera	1920 x 1080 / 3,2 Mp

NAVAL SYSTEMS

COMBAT MANAGEMENT SYSTEM SCOT

Integration of the subsystems revolves around the vessel's data bus. The system supports the combat effort undertaken by the crew, within the scope of effective use of all of the vessel's effectors and sensors. It is also used for mission planning purposes. It supports the decision-making chain and monitors the mission's progress. The scope of integration for the subsystems shall be defined by expectations tied to the set of hardware and vessel systems (armament, CCTV, sensors, etc.), and technologies used to organize virtualized networks (sub-networks) for information exchange (data, imagery, audio).

SCOT is a modern combat management system that integrates:

- Air, surface, and underwater combat systems
- Asymmetric threat neutralization systems
- CCTV, radars, communications suite
- Services rendered by the integrated navigation suite, within the scope of the vessel's safety
- Monitoring of the current position and movement parameters

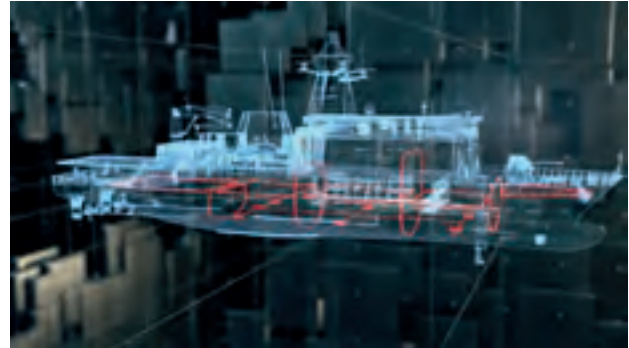


PASSIVE DEFENCE SYSTEM

Increases safety of the ship in waters, where underwater weapon system with non-contact incendiary device was placed and also increases the level of passive defense against the attack of missiles with noses homing infrared sources. System consists of the physical fields monitoring subsystems:

magnetic, electric, thermal.

- Magnetic Field Monitoring Subsystem control the operation of Ship's Demagnetizing Device, which minimizes the magnetic field of the ship
- Electric Field Monitoring Subsystem is connected to the Electric Field Measurement Module (MPE) and Multisector Cathodic Protection Station (MSOK)
- Thermal Subsystem allows to control the thermal fields of any selected areas of the ship, delivers data on temperature of those areas and generates the thermal picture of the ship on passive protection console
- Vibration Monitoring Subsystem is designed to measure devices and ship mechanisms vibration parameters and selected construction points of the ship's hull in real time. The results of measurement are pictured on Passive Protection Console, where the analysis of amplitude-frequency of measured vibrations can be done



CATHODIC PROTECTION SYSTEM

The Cathodic Protection System (SOK) is designated to protect the hulls of vessels and power units against electrochemical corrosion in the sea water. The basic tenet of cathodic protection is to reduce polarize metal surface adjoined with electrolyte to the value, which allows the corrosion processes to stop. The system may be controlled via the embedded console. It may also be subordinated to the higher level vessel's systems.

The components of the Vessel Cathodic Protection system include:

- Multi-sector Vessel Cathodic Protection Station
- A set of polarizing anodes
- A set of control electrodes



NAVAL SYSTEMS - MINE COUNTER MEASURES CTM

MODULAR LIGHTWEIGHT MINESWEEP MLM

The minesweep is designed to counter sea mines with influence fuses, whose operation is dependent on the identification of a specific type of vessel, based on the characteristic signature of physical fields of this vessel.

The minesweep precisely simulates physical fields of the vessel as regards:

- Magnetostatic field (MS)
- Alternating magnetic field (AM): 40 Hz to 300 Hz
- Electric potential (UEP)
- Extremely low-frequency alternating electric field (ELF): 1 Hz to 5 Hz
- Sound field: 5 Hz to 30 kHz

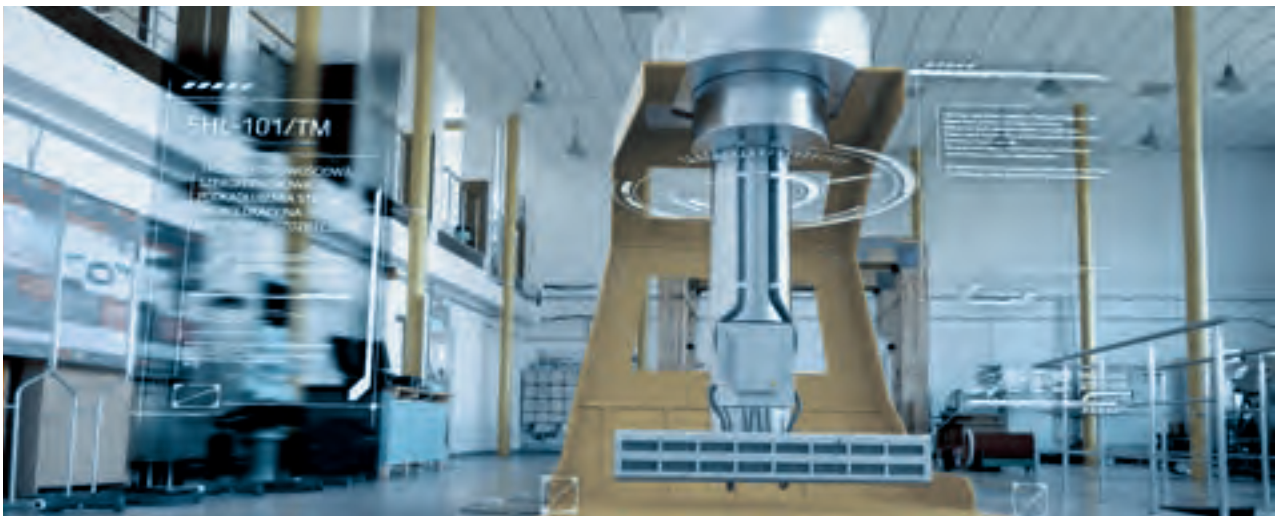
The minesweep is designed for naval operations, in particular such as:

- Escorting vessels or a convoy through an endangered water area
- Performing approaches to the shore for seaborne force
- Recognizing mines at harbour approaches and planned routes of passage



SHL-101/T SONAR

SHL-101/T device a triple frequency, broadband, high resolution hull mounted MCM sonar. It performs detection and classification of bottom and anchor mines, including less detectable mines. It can be used in shallow and deep waters in areas of strong layering as well as in the presence of interferences. The SHL-101/TM sonar has outstanding detection and classification performance due to its state-of-the-art processing hardware and software technology. It is equipped with modern hydroacoustic transducers manufactured by Thales Underwater Systems based in France. The application of FM signals enables pulse compression providing a considerable increase in the signal-to-noise ratio and several centimetres of depth resolution. This feature significantly improves detection and classification performance against stealthy mines in waters with a high noise level. With its modular design, it can be easily supplied for various types of ships.



REMOTELY CONTROLLED EXPLOSIVE CHARGES TOCZEK

The system of remotely and wirelessly explosive charges was developed to counter sea mines. Charges type A and B are transported and positioned by remotely operated vehicles – ASW or AUV. Charge type C is transported and positioned by divers. All types of charges are equipped with universal acoustic fuses. The fuse is equipped with multi-level safety features. The system itself is provided with a device used to test all fuse parameters.



ANTI-LANDING MINE MPD

MPD mines can be effectively used to neutralize landing vessels and vehicles as well as amphibious fighting vehicles. It detects targets above the mine within 5 m radius. It eliminates vessels with demagnetized hulls from the battlefield as well. It has two independent safety systems that prevent the fuze from automatically switching to combat-ready mode.

Weight	69 kg
Diameter / height	60/27 cm
Fuze	Influence / magnetic
Maximum laying depth:	5 m
Self-destruction:	Yes
Anti-removal device:	Yes





MUNITIONS AND EXPLOSIVES

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AMMUNITION



SMALL ARMS AMUNITIONS



9x18 mm



9x19 mm



5.56x45 mm



7.62x39 mm



7.62x51 mm



7.62x54R mm

Caliber	Type
9x18 mm	Lead core bullet, Makarov
	Blank round - Makarov
9x19 mm	Lead core ball, Parabellum
	Blank round, Parabellum
5.56x45 mm	Lead core ball round
	Steel core ball round
	Tracer round
	AP6 armor piercing ammunition
	Non-tox ball round
7.62x39 mm	Blank round
	Type 1943 steel-core round, and brass casing
	Type 1943 tracer round, and brass casing
7.62x51 mm	Type 1943 blank round, with brass casing
	Lead core bullet round (BALL)
	Tracer round (T)
	Armor-piercing round (AP)
	Enhanced armor-piercing round (AP2)
7.62x54R mm	Armor-piercing incendiary round (API)
	Armor-piercing round (AP4)
	Blank round
7.62x54R mm	Steel core round, brass casing
	T-46 tracer round, brass casing
	Blank round, brass casing

.50 BMG



Caliber

Type

.50 BMG

- | | |
|---|---|
| 1 | M33 BALL round |
| 2 | M33 BALL sniper round |
| 3 | MP NM 140 multi-purpose projectile sniper round |
| 4 | MP NM 140 multi-purpose projectile round |
| 5 | MP-T NM 160 multi-purpose projectile tracer round |
| 6 | AP-S NM 173 armor-piercing round |
| 7 | SG-T special-purpose projectile tracer round |
| 8 | RR-T reduced range tracer round |

AMMUNITION



MEDIUM CALIBER AMMUNITION



TP-T	FAPDS-T	ABM
Caliber 20 x 102 mm	Caliber 23 x 152 mm	Caliber 30 x 173 mm
Type	Type	Type
Target Practice - Tracer	Frangible Armor Piercing Discarding Sabot - Tracer	Air Burst Ammunition
MP LD M70 A1 round	BZT armor-piercing incendiary tracer round	Fragmenting armor-piercing discarding sabot spin-stabilized kinetic energy projectile with armor-piercing, fragmenting core and tracer (FAPDS-T)
TP RRR LD M2 training round	Armor-piercing discarding sabot (APDS) spin-stabilized kinetic energy projectile with armor-piercing core and tracer	MP-T/SD multi-purpose tracer self-destructing round
	Fragmenting armor-piercing discarding sabot (FAPDS) spin-stabilized kinetic energy projectile with armor-piercing, fragmenting core, and tracer	APFSDS-T armor-piercing fin-stabilized discarding sabot tracer round, with a tungsten core
	Blank round	TP-T training tracer round

35 x 228



	TP-T	FAPDS-T	ABM
	Target Practice - Tracer	Frangible Armor Piercing Discarding Sabot - Tracer	Air Burst Ammunition
Muzzle velocity	1175 m/s	1440 m/s	1050 m/s
Effective range	3500 m	5500 m	4000 m
Maximum range	13000 m	27000 m	11000 m
Tracer burning time	> 5 s	> 2,5 s	-
Projectile weight	550 g	380 g	750 g
Time to 4000 m	6,1 s	3,5 s	6,2 s

TANK MUNITIONS



Caliber	Type
120 mm	1 APFSDS-T round for the Rh 120 L44 gun
	2 APFSDS-T-TP round for the Rh 120 L44 gun
	3 HE round for the Rh 120 L44 gun
	4 HE-TP round for the Rh 120 L44 gun
125 mm	5 HE round for the 125 mm 2A46 gun
	6 ISA-125 cannon shot imitator round
	7 APFSDS-T round for the 125 mm 2A46 tank gun

EXPLOSIVES



TNT

Form factor: flakes or hemispheres (1.55 g per cubic centimeter with 24 mm diameter).

Compositions:

- TNT+HNS: 99.5% - 99.8%, HNS: 0.2% - 0.5%



HMX OCTOGEN

Grade B according to MIL-DTL-4544C
Form factor: Crystalline white powder.

Compositions:

- HMX: 95.5% - 97%, WAX: 3% - 4.5%
- HMX: 95% - 97%, VITON: 3% - 5%
- HMX: 90% - 40%, % TNT: 10% - 60%
- HMX: 90% - 40%, % TNT: 10% - 60%, GRAPHITE: 0.3 - 0.6%



K-43

Insensitive explosive composition loaded into a high caliber projectiles at Nitro-Chem filling plant.

Compositions:

- NTO 44-48%, TNT 30-34%, Aluminum 13-15%, Waxes 7-9%



RDX

Type I, compliant with MIL-DTL-398D
Form factor: Crystalline white powder.

Compositions:

- Composition B: TNT 40%, RDX 60%
- A4 RDX: 95.5% - 97%, WAX: 3% - 4.5%
- A3 RDX: 89% - 91%, WAX: 9% - 11%
- A5 RDX: 98.5% - 99%, STEARIC ACID: 1% - 1.5% + AIX-1
- RDX: 95% - 98.5%, WAX: 1.5% - 5%
- RDX: 95% - 97%, VITON: 3% - 6%
- RDX: 90% - 40%, TNT: 10% - 60%
- RDX: 95.4% - 96.7%, VITON: 3% - 4%, GRAPHITE: 0.3% - 0.6%
- RDX: 98.2% - 96.7%, WAX: 1%, GRAPHITE: 0.8%





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MANPACK RADIO

RKP-8100

Radio transceiver RKP-8100 narrowband tactical radio transceiver is designed to work from 1.5MHz to 512MHz frequency range. It provides voice communication and data transmission via standard protocols and interfaces (IP, SMTP, POP3, Ethernet, RS232). The radio transceiver is the SDR (Software Defined Radio) system type. The waveforms implemented in RKP-8100 are specified by NATO standards, required for operation in HF and VHF bands and narrowband waveforms for UHF band operation.

The design of the radio is strong optimized for EPM capability. The RKP-8100 is a universal radio transceiver which can be used as an element of mobile radio communication systems, installed on vehicular and caterpillar chassis or as a manpack radio transceiver.



Basic parameters for RKP-8100AM-B:

Frequency range	1,5 do 512MHz
Sensitivity	< 0,5 μ V all over the band
Harmonic suppression	higher than 50dB
Output power	HF 20W, VHF/UHF 10W
EPM Hop rate	up to 2000 hops per second
MANET	STANAG 4691
ALE	STANAG 4538 (ALE 3G)
Frequency stability	$\pm 0,5 \times 10^{-6}$
Environmental parameters:	N.7-O-II-A, N.10-O-II-A, NO-06-A103:2005
Working temperatures/ perimeter / storage	-40°C do +55°C / -40°C do +70°C / -40°C do +70°C
Electromagnetic compatibility	NO-06-A200:2012 KCS-01, KCS-02, KCS-03, KCS-06, KCS-07, KCS-08, KRE-02, KRS-02, KCE-02
Mass	20 kg
Voltage	28 VDC (22 do 32 VDC)



HELMETS MASKPOL

- Aramid shell
- Two accessory side rails
- Nape pad with BOA® adjustable retention system
- The internals of the helmet feature a system of size adjustment/shock absorbing cushion pads, 4-point harness system
- Side rails for mounting accessories, along with a front shroud for cameras or night vision goggles
- Fragmentation protection - V50 above 600 m/s for 1.1 g FSP fragment
- Bullet resistance - 9x19 mm FMJ 8.0 g (360±15) m/s, 357 Magnum JSP 10.2 g (425±15) m/s

HP-05 ballistic helmet

Helmet shell made in HIGH-CUT standard. Thanks to deep undercuts, the helmet is compatible with various hearing protection products.

Additional equipment is a masking cover with sewn tapes for attaching cables, and a pocket for a counterweight.



HB-04 ballistic helmet

MICH/ACH standard, made of high-tech ballistic materials ensuring optimal protection of the user. The helmet is equipped with the BOA® Fit System that ensures a smooth fit for various head shapes.



Combat helmet Model 2005

A standard PASGT made of high-tech ballistic materials - KEVLAR® aramid fabric, equipped with a size adjustable shock absorption cushions made of foam absorbing the impact energy, allowing for proper adjustment to the circumference of the user's head, as well as with a harness with a 4-point fastening system with BOA® Fit System.



KPO-04 protective helmet

Aramid protective helmet designed to protect the head, face and neck against injuries caused by impacts with dangerous objects and the effects of liquid chemicals. The protective helmet is compatible with the gas mask.



VESTS



ROCK one bullet-proof vest

Integrated vest for carrying soft and hard ballistic inserts. Made in laser cut technology using Cordura® laminate. The weight of the vest - from 2 to 5 kg, depending on the ballistic package used. Depending on the user's needs, the vest can be additionally equipped with shoulders, abdomen and lower spine covers, as well as with a ballistic collar.



KKZ SG-01 bullet-proof vest

Standard plate carrier used to carry STAND ALONE hard ballistic plates and other necessary equipment. The ballistic package consists of four hard bulletproof plates providing user protection at the K3 AB level according to the PN-V-87000: 2011 standard, i.e. bullet puncture resistance: 7.62x39 mm, bullet type: PS; 5.56x45 mm, bullet type: SS109.



TMP-02 bullet-proof vest

TMP-02 Vest - has the ability to carry hard SAPI ballistic plates in sizes S, M and L.

Thanks to the lift inside the vest, the plates with dimensions of 250x300 mm fit steady inside.

The entire cover is covered with tapes in the MAPA camouflage, allowing for any configuration.



KKP-01-B bullet-proof vest

Lightweight camouflage vest ensuring optimal fit to the user's body and full freedom of movement while performing official duties.

Thanks to its weight and undercuts, the vest is virtually invisible under the outer clothing.



GAS MASKS MASKPOL

MP-6

- Gas mask protects the respiratory system, face, eyes, and skin, from dust, smoke, fumes, aerosols, and gases
- Protective for face, easy use
- Physiological/hygiene comfort when used in temperatures ranging from -30° C to +70° C
- Three sizes, ensuring a tight seal
- Voice chamber
- Integrated water tube system to externally attached water bottle
- Complies with the NATO standards, and with the EU EN-136 standard



MCP-01

MCP-01 panoramic mask is equipped with a polycarbonate visor with unique impact and chemical resistance properties. The PC visor is characterised by high transparency. The filtering element is mounted in the mask through a bayonet fitting arranged symmetrically on both sides of the mask.



MCP-02

MCP-02 panoramic mask is equipped with a polycarbonate visor with unique impact and chemical resistance properties. The PC visor is characterised by high transparency. The filtering element is mounted in the central part of the mask with a threaded connector Rd 40x1.7”.



PROTECTIVE GARMENTS

CBRN-E protective suit

The CBRN-E protective suit is dedicated for officers of various uniformed formations. The product is characterized by a high level of protection, ensuring the user safe functioning and performance of tasks during operations in the environment polluted with chemical warfare agents/CWAs (tests conducted with SOMAN, VX, SULPHUR MUSTARD/YPERITE) and toxic industrial agents/TICs (tests conducted with sulfuric acid and sodium hydroxide 30%). CBRN-E protective suit, a one-piece set, covers the wearer's body from head to wrists and feet (except the face). The product has a two-layer structure: the outer layer is a barrier fabric with a flame-retardant, waterproof and oleophobic finish, and the inner layer is a filter material with activated carbon. The elements to complete the protective suit are protective gloves, as well as shoe covers, made in the same layered arrangement as the suit. The set can be additionally supplemented with protective underwear (sweatshirt, trousers, socks, balaclava), designed as a single-layer product made of filter-sorptive fabric, with an antibacterial finish.



Overboots with non-slip soles



Touchscreen-friendly protective gloves.



INDIVIDUAL OPTOELECTRONICS





INDIVIDUAL OPTOELECTRONICS

MODULAR NVG SYSTEM

MZN-1 night vision system is a product designed for individual soldier. MZN-1 consists of two monoculars, a universal bridge to use them as goggles, and a helmet-mounted flip-up system. Each of the monoculars may be rotated up individually, without hitting the helmet. It may also be stowed on the helmet to minimize the profile of user. Stand-alone monocular, via mount with an integrated power supply, can be installed on weapons behind the red dot sight. The goggles' weight is low - they weigh less than 600 grams. Dedicated weapons mount is just 90 grams.

- Simple configuration with 18 mm and 16 mm image intensifies, or thermal imaging sensor, in a monocular or goggle setup
- Impact-resistant plastics, aluminum alloys, and titanium
- Common power supply and control transferred from monocular or goggles to the bridge
- Unique auto shut-off for monoculars
- The open architecture for possible integration new accessories and applications in the future (such as data display)



Magnification	1x
FOV	40°
Diopter/focus adjustment range	-5 ÷ +2
Focusing range	25 cm ÷ ∞
Power source	1 AA or CR123 battery

MT-1 THERMAL IMAGING MONOCULAR

MT-1 is one of the lightest, and smallest, thermal imaging devices in the world. Despite the compact design, it provides excellent image quality. MT-1 might be deployed as a standalone, hand-held observation system or as a module attached to the MZN-1 NVG. MT-1 is also compatible with all of the MU-3M monocular accessories for increased functionality.



Zoom/Magnification	1x
Horizontal FOV	31°
Power source	1 x 3V, or CR1123
Weight, battery included	220 g
Dimensions (length, width, height)	90 42 / 66 mm

INDIVIDUAL OPTOELECTRONICS

MU3 NIGHT VISION MONOCULAR

Versatile night vision device built with use of a state-of-the-art 16 mm 4G image intensifier, supplied by the European industry. High resilience, reliability, and highest quality. Tested both in desert conditions, as well as in a tropical jungles.

- The MU-3M monocular is 10-meter submersible
- The system features a 16 mm, 4G image intensifier, with high FOM performance
- Available with green phosphor (P45), or white phosphor (P45 - ONYX)
- Fast Auto Gating
- Automatic Gain Control
- Compatible with a broad variety of popular combat helmets
- Automatic shut-off, when the monocular is stowed upwards
- Onboard 2-stage IR illuminator
- IR on/off switch, low battery indicator
- More than 40 hours of continuous operation, on a single battery
- Optional adapter for thermal clip-on, for night vision/thermal fusion



	Standard lens	With 3x lens	With 5x lens
Zoom/Magnification	1x	3x	5x
FOV	> 40°	≤ 11,5°	≤ 6,5°
Focus range	from 0.25 m to ∞	from 2.5 m to ∞	from 7 m to ∞
Image intensifier	XR5™/4G Intens™ 16mm	1 AA or CR123 battery	1 AA or CR123 battery
Diopter adjustment	from -6 to +2 dpt	40°	40°
Pupillary distance adjustment range	58 mm ÷ 72 mm	-5 ÷ +2	-5 ÷ +2
Time of operation, normal temperature	ca. 40 h (1x3.6V lithium battery)		
Operating temperatures range	-35°C ÷ +50°C		
Weight of the monocular	256 g		

MU-3ADM MODULAR NIGHT VISION GOGGLE SYSTEM

- System consists of two, reliable MU-3M monoculars of perfect quality, compact size, and high image resolution
- The user may rotate each of the monoculars individually, or simultaneously as goggles, stowing them on helmet
- Automatic shut-off, for each monocular, when stowed upwards
- Weight: goggles + bridge 630 g





INDIVIDUAL OPTOELECTRONICS

NPL-1T THERMAL IMAGING BINOCULARS

- Portable, easy-to-use device that can be used for daytime and night observation, regardless of the lighting conditions Target detection at 6 kilometers
- 2x and 4x digital zoom, image polarization, sharpening of the details, and rough distance measurement
- Range finder for objects taller than 175 cm
- Spectacular image clarity displayed on two OLED displays
- Low weight
- military grade GPS module to display coordinates and time on the display
- Image recording system and transmission via a digital output
- 4 configurations available: fixed-focal-length x2 zoom lens; fixed x2 zoom, and optional x4 lens; fixed focal length 3x zoom lens; fixed focal length 4x zoom lens



Sensor type	Microbolometer
Sensor resolution	640 x 480 px
Pixel size	17 μm
Wavelength	8 μm ÷ 14 μm
Gain	< 50 mK
FOV	12° x 9°
FOV, with zoom lens	6° x 4.5°
Working temperatures range:	-30°C ÷ +60°C
Dimensions (length, width, height)	190 / 150 / 100 mm
Weight	800 g

SCT Shooter Thermal Sight

- Designed for use on firearms or for hand-held observation. Detection and identification of the targets are possible regardless of the lighting and weather conditions
- Helmet mounted display may be integrated with the SCT for shooting "from behind a corner"
- More than 8 hours of continuous operation, on a single set of batteries
- The face illumination effect has been eliminated
- 2x digital zoom
- B/W polarity switch
- Video and image recording



Spectral range	8 - 14 μm
NETD	≤ -50 mK
FOV	≤ 12 x 9°
Lens focusing range	from 3 m to ∞
Diopter movement	from -4 to +4 dpt
Power Supply	4 x AA batteries / CR1123
Time of operation, normal temperature	> 8 h
Operating temperatures range	-30°C ÷ +60°C
Weight	< 1 kg

PNL-3M Aviation Night Vision Goggles

PNL-3M aviation NVG system is a dual-use, aviation night vision system, designed for helicopter crews and pilots for night flights, and flights in low-light conditions. PNL-3M goggles design uses the latest 16 mm 4G image intensifiers. Thanks to the modern design, the goggles are lightweight, providing the user with comfortable, stereoscopic vision. The user can still enjoy unchanged natural depth, shape, and size perception.

- Proven in desert, tropical, and mountain conditions
- Two high performance 16 mm, 4G image intensifiers, with high FOM, low halo presence, and fast auto-gating
- Wide bandwidth (from 400 nm to 1,100 nm)
- P43, or P45 phosphor option (black-green, or black-white imagery)
- Embedded minus blue filters available (A, or B, or C Class)
- RTCA/DO275 compliance emergency break away
- Low weight
- Two-battery power supply unit, velcro-mounted on the rear of the helmet
- EASA-certified, RTCA/DO275 compliance
- ITAR-FREE



Zoom/Magnification	1x
FOV	>/= 40°
Focusing range	from 0.25 m to ∞
Image intensifier type	4G 16 mm
Diopter movement	from -6 to +2 dpt
Pupillary distance adjustment range	51 mm ÷ 72 mm
Power source	1x AA 1.5 V or 1x rechargeable cell, AA 1.2 V or 1x3.6 V, or optional onboard power supply
Time of operation, normal temperature	> 20 h (1x Lithium Battery, AA 1.5 V)
Operating temperatures range	-35°C ÷ +50°C
Weight	525 g

SUPPORT WEAPONS - MACHINE GUNS

WLKM

- WLKM Multi-barrel externally driven electric-powered Gatling-system .50 BMG belt-fed machine gun
- May be used as aircraft, naval or ground weapon, on fixed and portable gun mounts
- M19 links
- Four revolving barrels
- The rate of fire can be adjusted, from 2,500 to 3,600 rounds per minute
- Range of 2,000 meters
- Possible integration on many platforms



Technical Specification

Ammunition	12.7 x 99 mm NATO
Range	2,000 meters
Length	1,300 mm
Barrel length	900 mm
Weight	50 kg

WKM-Bm / NSW-UTIOS HEAVY MACHINE GUN

- Light weight and modern construction in comparison with competitive hmgs
- Reliability against influence of humidity and sea water
- User -friendly weapon



Technical Specification	WKM-Bm	NSW-UTIOS
Ammunition	12.7 x 99 mm NATO	12.7 x 108 mm
Range	2,000 meters	2,000 meters
Length	1,560 mm	1,560 mm
Barrel length	1,200 mm	1,200 mm
Weight	25 kg	25 kg
Rate of fire	700-800 rounds per minute	700-800 rounds per minute

UKM-2000PE general purpose machine gun

- High reliability
- Picattiny rail in accordance with MIL STD-1913

Technical Specification	
Ammunition	7.62 x 51 mm NATO / M13 link
Range	1,500 m
Length	944 mm, stock folded
Barrel length (without the muzzle device)	440 mm
Weight	10 kilograms, depending on configuration
Capacity	50/100/200
Rate of fire	700-900 rounds per minute



7.62 mm UKM-2000C

- Tank version of the 7,62 mm GPMG UKM 2000

Ammunition	7.62 x 51 mm NATO / M13 belt
Range	1,500 m
Length	1,058 mm
Barrel length (without the muzzle device)	521 mm
Weight	11 kg
Capacity	250
Rate of fire	700-900 rounds per minute



SUPPORT WEAPONS - MACHINE GUNS



UKM 2020 GENERAL PURPOSE MACHUNE GUN

The latest version of the UKM has been developed to reduce the size and weight of the rifle while maintaining its reliability and durability. The rifle uses a shortened 440 mm barrel, a plastic stock folded inside out and a commercial bipod. The bipod used can be adjusted in height and folded forward and backward. The rifle is equipped with a mounting rail integrated with the cover of the receiver and a minimalist mechanical sight with one setting. In addition, there are 3 mounting rails on the gas tube cover for attaching a bipod and accessories.



Ammunition	7,62 x 51 mm NATO
Range	1,200 m
Length	824 mm with folded butt stock 1035:1123 mm with unfolded butt stock
Barrel length (without the muzzle device)	440/540 mm
Weight	9,2 kg
Capacity	250
Rate of fire	600-900 rounds per minute



SUPPORT WEAPONS - GRENADE LAUNCHERS

RGP-40

- Six rounds cylinder capacity
- Compatible with 40 x 46 mm and 40 x 51 mm NATO grenades
- Fully ambidextrous
- Adjustable stock



Ammunition	40 x 46 mm NATO 40 x 51 mm NATO
Range (depending on the grenade type)	400 - 800 m
Length	850 mm
Weight	6.5 kg
Drum capacity	6 grenades
Operation cycle	Semi-auto

40 mm GSBO-40 SINGLE-SHOT STAND-ALONE GRENADE LAUNCHER



Ammunition	40 x 46 mm LV
Launcher length, with stock folded/extended	498/564 mm
Launcher height, with sight folded/deployed	209/317 mm
Barrel length	250 mm
Weight of the launcher, with the front grip	~ 2,365g (this includes the sight weight - 150g)



40 mm GSBO-40 SINGLE-SHOT UNDERBARREL GRENADE LAUNCHER - compatible with Beryl M762



Ammunition	40 x 46 mm LV
Launcher length, with stock folded/extended	220/328 mm
Barrel length	250 mm
Weight of the launcher, with the front grip	~ 1,915 g



GRENADES 40 MM



40 x 53 mm HV

Round Type	NGA-0 HE SD	NGKO HEDP	NGKO-RF HEDP Air- Burst round with Radio Frquenced fuze	NGAC BALL-TP	NGAC-T BALL-TP-T	NGA-M practice marker	NGA-MT practice marker with tracer
Weight [g]	353	363	363	363	363	363	363
Length [mm]	max 112	max 112	max 112	max 112	max 112	max 112	max 112
Muzzle velocity [m/s]	237 ± 8	237 ± 8	237 ± 8	237 ± 8	237 ± 8	237 ± 8	237 ± 8
Range [m]	min 370	min 370	min 370	min 370	min 370	min 370	min 370
Operating temperature range [°C]	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50



40 x 46 mm LV

Round Type	NGO-N1 HE with self-destruct mechanism	NGC-N target practice	NGC1-40 practice round	NGC2-40 practice with tracer	NGM1-40 practice -marker	NGM2-40 practice -marker with tracer
Weight [g]	277	255	277	277	277	277
Length [mm]	99	101,9	99	99	99	99
Muzzle velocity [m/s]	82 ± 2	78	82 ± 2	76 ± 2	76 ± 2	76 ± 2
Range [m]	min 370	min 370	min 370	min 370	min 370	min 370
Operating temperature range [°C]	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50

Round Type	NGOS-N illuminating	NGHB-N flash-bang	NGD-N	NGDR-N	NGZ-N	NGK-N
Weight [g]	225	240	300	300	300	180
Length [mm]	123,5	105	123,5	123,5	123,5	123,5
Muzzle velocity [m/s]	76	76 ± 2	82	82	82 ± 2	-
Range [m]	>180	-	min 370	min 100	min 370	-
Operating temperature range [°C]	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50

SUPPORT WEAPONS - MORTAR



60 MM LIGHT MORTAR COMBAT LMC

- Only mortar on the market that allows to fire projectiles up to 2.2 kg while ensuring the guaranteed durability of the barrel at the level of 2000 shots
- Equipped with a built-in programmable digital sight with the display of the distance to the target and display of angular values
- The high range and high fragmentation of the projectile, the mortar fire provides effective support to the fighting units under optical visibility in all weather conditions, day and night
- Designed to fire 60 mm MAPAM (Mortar Anti-Personal Anti-Material) ammunition with a propellant charge I (Charge 1) by SAAB Bofors Dynamics or 60 mm rounds with a caliber compliant with the STANAG 4425 ed. 2 of any manufacturer

Barrel caliber	60,7 mm
Maximum pressure of gunpowder gases in the barrel	28±2 MPa
Min range	100 m
Max range	1300 m
Shot angle range for the scope	45 ÷ 85
Maximum number of rounds fired by continuous fire	30 rds
Rate of fire without correcting the aiming	25 rds./min
Rate of fire with improved aiming rounds	10 rds./min
Minimum service	1 operator
Weight	≤ 7,5 kg
Length / Height	850 / 230 mm





SUPPORT WEAPONS - LOITERING MUNITION



DRAGONFLY UAV

- Designed for combat engagements in open, and urbanized areas. High mobility: low weight, compact design
- Rapid activation of the system
- The whole system is carried by a single soldier, in a backpack
- Sensors, control panel, external antenna
- Installation of IR sensor possible
- HE, HEAT, FAE/HIT, and TP warheads are available

The operator has 4 warhead types at his disposal. Fragmentation, shaped-charge, thermobaric, and training one. The warheads may be fitted with a TV or thermal vision camera. To ensure safety, DRAGONFLY has been fitted with a three-degree system for remote arming and disarming of the warhead. After locking onto the target and enabling the video-tracking mode, the UAV may also continue mission even if communication is lost.

Wingspan, after deployment -	ca. 700 mm
Length, warhead included	ca. 900 mm
Weight	5 kg
Range (LOS) -	maximum 10 km
Operational ceiling	500 m
Speed	0 ÷ 120 kph
Flight endurance (hover)	ca. 25 minutes



UAV WARHEADS





GX-1 DG WARHEADS

Parameter	High Explosive GO-1 DG HE	High Explosive Anti-Tank GK-1 DG HEAT	Thermobaric GTB-1 DG FAE	Training GO-1 DG HE-TR
Mass	1,2 kg	1,2 kg	1,2 kg	1,2 kg
Type of explosive	Hexogen	Octogen	TBX	INERT
Lethal radius/penetration	30 m	200 mm RHA	10 m	---



GX-1 WARHEADS

Parameter	High Explosive GO-1 HE	High Explosive Anti-Tank GK-1 HEAT	Thermobaric GTB-1 FAE	Traininh GO-1 HE-TR
Mass	1,5 kg	1,5 kg	1,5 kg	1,5 kg
Type of explosive	Hexogen	Octogen	TBX	INERT
Lethal radius/penetration	12 m (30 m)	180 (200) mm RHA	10 m	--



GX-2 WARHEADS

Parameter	High Explosive GO-2 HE	High Explosive Anti-Tank GK-2 HEAT	Thermobaric GTB-2 FAE	Training GO-2 HE-TR
Mass	4,8 kg	4,8 kg	4,8 kg	4,8 kg
Type of explosive	Comp B	Octogen	TBX	INERT
Lethal radius/penetration	50 m	700-800 mm RHA	50 m	--



GX-4 WARHEADS

Parameter	High Explosive GO-4 HE	High Explosive Anti-Tank GK-4 HEAT	Thermobaric GTB-4 FAE	Training GO-4 HE-TR
Mass	1,6 kg	1,6 kg	1,6 kg	1,6 kg
Type of explosive	Hexogen	Octogen	TBX	--
Lethal radius/penetration	30 m	400 mm RHA	20 m	--



SIDE MINE TULIPAN

- Designed to eliminate infantry vehicles, armored personnel carriers, and off-road trucks from the battlefield
- Equipped with a thermoacoustic influence fuze able to detect presence of military vehicles within the effective range of the mine
- Effectively combats targets across a few dozen meters
- Ability to attack consecutive targets in a column of vehicles

Weight	7 kg
Length/height/width	30/18/15 cm
RHA penetration	60 mm – at a distance of up to 50 meters
Sensors	acoustic, thermal
Mode of operation	automatic/controlled (MITL)
Safety features	Anti-handling device Programmable self-destruction Programmable selectivity



MR-123

MR-123 combat antitank mines are designated to eliminate from combat any fighting and transport vehicles by attacking the bottom of vehicle's hull. Operation of the mines is preceded by release of the safety units in two-stages. The vehicle which is passing above the mine is the cause of disturbance of magnetic field. This in turn activates the mine and causes the explosion. Cumulative action of the mine is possible in both directions – regardless of mine's two possible orientations.

If the mine has not been activated by a vehicle in the time of use, after the self-destruction time, the mine is going to self-detonate. If, after the longest programmed time there was no self-destruction detonation, the mine is going to the self-neutralization and it is losing detonation abilities. Once the mine is armed and ready, any attempts to remove it or change its position will cause the mine's detonation.



Weight	3,7 kg
Dimensions (diameter/height)	167x90 mm
Charge type	Shaped charge (EFP) Two-directional
RHA penetration	60 mm
Fuze type	Magnetic, delayed or instantaneous
Safety	Self-neutralization system Programmable self-destruction

VIS-100 PISTOL

- Design based on Browning system
- Ergonomic grip
- lightweight, compact, well balanced, fully ambidextrous
- Low weight - 710 grams
- Picatinny rail

VIS 100 pistol is a duty handgun designed for military, law enforcement, and security detail. It is effective at a range of up to 50 meters. The pistol features an ergonomic grip that can be customized by the user with removable backstraps. It is an ambidextrous weapon. The pistol frame features the Picatinny accommodating laser sight or a flashlight.

Caliber/ammunition	9 x 19 Parabellum
Muzzle velocity	360 m/s
Muzzle energy	518 J
Operating principle	Short recoil
Effective range	50 meters
Trigger mechanism	Single action/Double action trigger mechanism
Safety	Automatic
Sight	Open sights, zeroed for 25 meters, contrast enhancements/tritium illuminated
Length	193 mm
Height	137 mm
Barrel length	110 mm
Weight (excluding the mag)	710 g
Magazine capacity	15 rounds





GROT RIFLE

- Modular design
- Rapidly replaceable elements: barrel, stock
- Fully ambidextrous design
- MSBS system is currently deployed

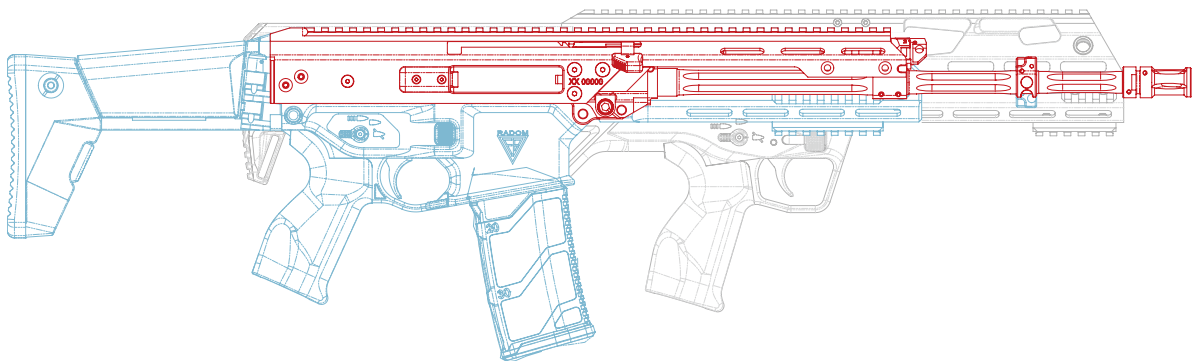
MSBS Grot is a modular rifle system allowing for rapid reconfiguration, within the scope of replacing the barrel, type of stock, and changing the side of the ejector port. The modular nature of the design makes it possible to adjust the weapon to meet the individual needs of the user. The rifle has been fitted with an integrated Picatinny rail (STANAG 2334) on top of the upper receiver, making it possible to use a variety of electrooptics, such as scopes, thermal imaging sights, holographic sights, night vision systems, or back-up iron sights.

All controls, including the safety switch, single-shot/burst/full auto switch, magazine release, and bolt catch are ambidextrous and located near to the trigger finger for increased ergonomics and speed.

The modular handguard features the M-LOK system for additional accessories.

The MSBS rifle is comfortable to shoot in any stance.

The rifle is currently deployed with the Polish Armed Forces.



GROT BASIC

Caliber/ammunition	5,56 x 45
Muzzle velocity	890 m/s
Muzzle energy	1600 J
Weight (excluding the mag)	3,700 g



GROT SUBCARABINE

Caliber/ammunition	5,56 x 45
Muzzle velocity	780 m/s
Muzzle energy	1210 J
Weight (excluding the mag)	3,400 g



GROT WITH UBGL

Caliber/ammunition	5,56 x 45
Muzzle velocity	890 m/s
Muzzle energy	1600 J
Weight (excluding the mag)	4,600 g



GROT BULLPUP

Caliber/ammunition	5,56 x 45
Muzzle velocity	890 m/s
Muzzle energy	1600 J
Weight (excluding the mag)	3,650 g



GROT CEREMONIAL RIFLE

GROT R 20 FB M-1 Ceremonial Rifle is a weapon that uses solely blank cartridges. The rifle's long stock enhances the weapon's ergonomics in a ceremonial setting. The modular nature of the MSBS system makes it possible to transform the ceremonial variant into a standard, combat rifle.



GROT ASSAULT RIFLE 7,62

Caliber/ammunition	7,62 x 39
Muzzle velocity	715 m/s
Muzzle energy	1900 J
Weight (excluding the mag)	3,800 g



GROT 762N 20 FB-N1

Caliber/ammunition	7,62 x 51
Muzzle velocity	742 m/s
Muzzle energy	3303 J
Weight (excluding the mag)	5,100 g



GROT 762N 16 FB-N1

Caliber/ammunition	7,62 x 51
Muzzle velocity	725 m/s
Muzzle energy	3153 J
Weight (excluding the mag)	4,500 g



BERYL

Beryl assault rifle is a combat-proven rifle that is used by the Polish soldiers. Beryl is reliable, accurate, and highly resilient when exposed to the difficult conditions. Accessories such as iron and optronic sights, flashlights, or laser sights may be attached to Picatinny rails on the handguard and receiver. Features a non-folded adjustable-length stock. The rifle can fire rifle grenades with the use of live ammunition. For increased firepower, GP-40 and GPBO-40 underbarrel grenade launchers can be mounted on the rifles.

BERYL 5,56 NATO

Caliber/ammunition	5.56 x 45 mm NATO
Muzzle velocity	920 m/s
Muzzle energy	1690 J
Effective range	600 m
Weight (excluding the mag)	3,650 g



MINI BERYL 5,56

Caliber/ammunition	5.56 x 45 mm NATO
Muzzle velocity	770 m/s
Muzzle energy	1189 J
Effective range	400 m
Weight (excluding the mag)	3,400 g



BERYL M762

Caliber/ammunition	7.62 x 39 mm
Muzzle velocity	715 m/s
Muzzle energy	1991 J
Effective range	600 m
Weight (excluding the mag)	3,550 g





MODULAR WEAPON SYSTEM

MWS (Modular Weapons System) family of rifles is designed to operate in any terrain, weather and day conditions. marksman platforms. Gas-operated rifle features a short-stroke piston and four-position gas block.

MWS rifles family is fully ambidextrous – safety switch, bolt catch, and magazine releases are doubled. Modular construction allows the customization of the rifle according to user preferences. Barrels are quick-changeable. The rifle comes in a variant with fixed, or folding stock.

MWS 15



Barrel length	20"	18"	16"	14,5"	10,5"	8"
Caliber	5,56 x 45 mm (NATO)				5,56 x 45 mm (NATO)/,300 BLK	
Weight (net)	4,2 kg	4,15 kg	3,85 kg	3,8 kg	3,65 kg	3,45 kg
Overall length, stock extended	980 mm	929 mm	863 mm	825 mm	724 mm	660 mm
Overall length, stock folded	767 mm	716 mm	665 mm	627 mm	526 mm	462 mm
Magazine capacity	10/20/30 rounds					

MWS 25



Barrel length	20"	16,5"	16"	13"
Caliber	.308 WIN (7.62 x 51) or 6.5 Creedmoor		.308 WIN (7.62 x 51)	
Weight (net)	980 mm	929 mm	863 mm	825 mm
Overall length, stock extended	767 mm	716 mm	665 mm	627 mm
Overall length, stock folded	767 mm	716 mm	665 mm	627 mm
Magazine capacity	20 rounds			

MWS 38



BOLT-ACTION SNIPER RIFLES



Zakłady Mechaniczne Tarnów is a manufacturer of modern sniper rifles – specialized design created after the year 2000, used for precision shooting for large distances. The rifles produced in Tarnow are adopted by the Polish Armed Forces and proven during the mission by snipers in the toughest conditions.

Zakłady Mechaniczne Tarnów offers a wide range of bolt-action sniper rifles of the following calibers: 7.62 mm (.308 Winchester), 8.6 mm (.338 Lapua Magnum) and 12.7 mm (.50 BMG). The weapons are mainly used by military and uniformed services.

All produced in Tarnow sniper rifles are designed in bull-pup design and equipped with free-floating barrels, which distinguishes them among other classic rifle designs.

A characteristic feature of the bull-pup design is the location of the magazine and the trigger unit behind the grip. This results in a high compactness of the rifle and a better balance. The weapon is equipped with much longer barrel with the same overall length. The bull-pup allows for reducing the muzzle rise during action which is to achieve a higher accuracy. The center of the weapon gravity is located within the pistol grip, which makes the rifle easier to maneuver.

ZMT WKW-50 LARGE-CALIBER SNIPER RIFLE

12.7 ZMT WKW 50 large-caliber Sniper Rifle is a result of development works on previous version of the weapon - WKW TOR 12.7. Verified construction of WKW 50 allowed lowering the weight, significantly improved the overall functionality and ergonomics as well as safety of the usage. WKW ZMT 50 is designated for precision shooting to point targets up to 1700 m and for destruction of the technical equipment from a distance up to 2000 m (lightly armored offroad vehicles, shielded targets, aircraft and helicopters at the airport, radar stations, technical devices, optoelectronic devices). The operating temperature range of the weapon is -40° to +55°.

Bull-pup Rifle Features:

- Higher compactness
- Shorter length
- Longer barrel
- Higher accuracy
- Better balance
- Lower weight



ALEX-338 SNIPER RIFLE

The Alex-338 semi-automatic sniper rifle is fed by a 8.6 x 70 mm (.338 Lapua Magnum) ammunition and used for precision shooting to point targets at a distance of 2000 meters and to lightly armored targets at a distance of 1000 meters. High energy-caliber 8.6 mm cartridge provides a very long effective range of fire, accuracy and power of destruction, while keeping the minimum weight of a rifle.



BOR-7.62 SNIPER RIFLE

The BOR-7.62 bolt-action sniper rifle is fed by a 7.62x51 mm NATO (.308 Winchester) cartridge and is used to engage living and lightly armored targets up to 1200 meters. The rifle is equipped with an integral Picatinny rail for optical sight, an forend rail system for night vision device and other accessories. The BOR-7.62 standard accessories are an effective muzzle brake, a folding bipod and a rear support.



TECHNICAL DATA	BOR-7.62	Alex-338	WKW-50
Caliber	.308 Winchester (7.62 x 51 mm NATO)	.338 Lapua Magnum (8.6 x 70 mm)	.50 BMG (12.7 x 99 mm NATO)
Range	1000 - 1600 m	1500 - 2000 m	~1600 / 1700 m
Length	980 mm	985 mm	1125/1201/1268 mm
Overall length	660 mm	660 mm	737/813/880 mm
Weight	5.7 kg	6.1 kg	~14,1/14,14,3 kg
Magazine	10 rounds	5 rounds	7 rounds
Action	Bolt-action	Bolt-action	Bolt-action

SIMULATORS



MOS NG

NEXT GENERATION MULTIMEDIA SHOOTING AND SIMULATION CENTER

Fixed or adjustable fire opening line with virtually generated firing distance, allowing the use of not only direct fire weapons but also high trajectory weapons, e.g. light mortars. Shooting from the firing positions provided in the shooting program with weapons and ammunition to fixed and appearing targets.

Options available to simulators:

- Live ammunition, including personal weapons
- Various visual platforms (images, animations, videos, VBS - Virtual Battle Space and others)
- Blue-Box technology, enabling real-time exchanges of fire in direct encounters against an opponent
- Static, dynamic, individual and team training
- Combination of several trainer devices into a single virtual operation area
- Application of virtual flashlight, CS gas spray or to shoot on hearing the enemy
- Many types of support weapons

MOS NG enables to arrange individual training programmes addressing the needs of various users, including uniformed services, e.g. the Police, Border Guard, Customs and Fiscal Service, Special Services, SWAT teams, NGOs, etc., including:

- Combat shooting - police, anti-terrorist, security, other resulting from the nature of duty
- Military training of the military schools)
- Sport shooting - according to relevant regulations
- Selected examination shooting training
- Candidates for weapons possession
- Educational shooting lessons

MOS NG allows to to conduct simulated shooting at virtual targets, displayed on a panoramic screen or using HMDs, built-in displays. Reaisitcally reproduced scenarios, high quality trainer devices (replicas of weapons) combined with virtual reality, allow the user to experience a real combat situation.



OBRTrain

Innovative tool developed to set up interactive applications/systems to teach design principles and operation rules for battlefield equipment and to present technical parameters. Spatial geometry of models that are used in applications is an imitation on such a level of detailing that these models enable getting familiar with the design of equipment and its key functionalities. Users are able to carry out complex interactions (e.g. maintenance operations) on a virtual device or machine.

- Improving efficiency of trainings decreasing its cost
- Enabling conducting initial or periodical trainings without access to real equipment
- Increase equipment reliability owing to correct maintenance and repair procedures
- Virtual training simulators - for trainings on technical maintenance and troubleshooting
- Systems for teaching operation of human-machine interfaces (HMI) components (e.g. control panels, power supply switchgears, etc.)



LEOPARD 2A4 SIMULATOR

Developed for methodical training for the Leopard 2A4 tank driver. Allows to conduct exercises with various simulation parameters such as traffic conditions, off-road terrain, climatic zones and weather conditions, different seasons and day time. Simulator enables training of tank drivers in accordance with the requirements of the modern battlefield and improvement of soldiers skills to maintain high level of combat readiness.

- High fidelity control & diagnostic panels and observation devices
- Instructor/operator station
- 6 degrees of freedom motion platform (6DOF) allowing for mapping the displacements, tilts and accelerations of the simulated tank. Reproduce of realistic driving conditions is possible thanks to the simulation of overloads/accelerations and forces acting on the tank during movement, and interaction with the virtual environment
- Implementation of tactical tasks that could be assigned by the instructor, in the form of repetitive exercise scenarios, with use of databases: built-in objects, maps and simulation events
- Simulation of predefined tank failures and damage, learning maintenance procedures performed by tank drivers
- Equipped with HLA / DIS communication modules (compliant with NATO standards) allowing integration with other simulation systems



