

ZBOP

# DEFENCE INDUSTRY OF THE SLOVAK REPUBLIC





**Security and Defence  
Industry Association  
of the Slovak Republic**

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# Security and Defence Industry Association of the Slovak Republic

## Members in Alphabetical Order

Akadémia ozbrojených síl generála Milana Rastislava Štefánika (Armed Forces Academy of General Milan Rastislav Štefánik)	<a href="http://www.aos.sk">www.aos.sk</a>
Aliter Technologies, a. s.	<a href="http://www.aliter.com">www.aliter.com</a>
BITUMEX s. r. o.	<a href="http://www.bitumex.sk">www.bitumex.sk</a>
CSBC spol. s r. o.	<a href="http://www.csbc.sk">www.csbc.sk</a>
DMD GROUP, a. s.	<a href="http://www.dmdgroup.eu">www.dmdgroup.eu</a>
EVPU a. s.	<a href="http://www.evpu.sk">www.evpu.sk</a>
CHEMICA spol. s r. o.	
Incheba, a. s.	<a href="http://www.incheba.sk">www.incheba.sk</a>
KERAMETAL, s. r. o.	<a href="http://www.kerametal.sk">www.kerametal.sk</a>
Letecké opravovne Trenčín, a. s. (Aircraft Repair Company Trenčín JSC)	<a href="http://www.lotn.sk">www.lotn.sk</a>
MANIPUL s. r. o.	<a href="http://www.manipul.sk">www.manipul.sk</a>
MONOCO a. s.	<a href="http://www.monoco.sk">www.monoco.sk</a>
MSM GROUP s. r. o.	<a href="http://www.msm.sk">www.msm.sk</a>
NEWAYS SLOVAKIA, a. s.	<a href="http://www.neways.nl">www.neways.nl</a>
SEMANČÍN POLÁČEK s. r. o.	<a href="http://www.semancinpolacek.sk">www.semancinpolacek.sk</a>
SEVOTECH spol. s r. o.	<a href="http://www.sevotech.sk">www.sevotech.sk</a>
S.G.S. - EXPO, spol. s r. o.	<a href="http://www.expo.sk">www.expo.sk</a>





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S.M.S., spol. s r. o.	<a href="http://www.smsdefence.sk">www.smsdefence.sk</a>
SPINEA, s. r. o.	<a href="http://www.spinea.sk">www.spinea.sk</a>
TANAX TRUCKS a. s.	<a href="http://www.tanaxtrucks.sk">www.tanaxtrucks.sk</a>
Technopol International, a. s.	<a href="http://www.technopol.sk">www.technopol.sk</a>
Trenčianska univerzita Alexandra Dubčeka (Alexander Dubček University of Trenčín)	<a href="http://www.tnuni.sk">www.tnuni.sk</a>
VERSOR s. r. o.	<a href="http://www.versor.sk">www.versor.sk</a>
Virtual Reality Media, a. s.	<a href="http://www.vrm.space">www.vrm.space</a>
Vojenský technický a skúšobný ústav Záhorie (Military Technical and Testing Institute Záhorie)	<a href="http://www.vtsu.sk">www.vtsu.sk</a>
Vysoká škola bezpečnostného manažérstva v Košiciach (The University of Security Management in Košice)	<a href="http://www.vsbm.sk">www.vsbm.sk</a>
WAY INDUSTRIES, a. s.	<a href="http://www.way.sk">www.way.sk</a>
ZTS VVÚ KOŠICE a. s.	<a href="http://www.ztsvvu.eu">www.ztsvvu.eu</a>
ZTS-OTS, a. s.	<a href="http://www.ztsots.sk">www.ztsots.sk</a>





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As acknowledged experts in the area of ICT and software development, Aliter Technologies delivers sophisticated and unique solutions tailored to the needs of its clients. The company operates within three divisions.

ICT Systems Division specializes in integration of secure and highly available ICT systems just like datacenters, communication systems and networks.

Software Development Division provides the clients with innovative customised solutions and develops our software product portfolio in the area of cloud automation, service orchestration and operations of contact centers.

Special Systems Division provides design, development and integration of products and solutions intended for armed forces, rescue and law enforcement agencies and use in tactical environment.



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COMTANET® Rapid Deployable Tactical ICT System of the second generation providing converged voice, data and video services at deployed, provisional field command posts locations as an alternative to previously corrupted or destroyed ICT infrastructure.

It is an open and modular designed system with services that are expandable and configurable to specific user requirements.



COMTANET® Modules

#### COMTANET® B2R Broadband Radio Router



COMTANET® B2R Broadband Radio Router, tactical MANET full IP radio system providing simultaneous, high speed transmission of data, video and voice.

The radio provides secure, dynamic routing and the ability to immediately reroute the data following changes in network topology.

COMTANET® B2R is an ideal solution to be used in static as well as in vehicular applications by rapidly deployable and highly mobile tactical units.

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MIL-STD compliant tactical ruggedized communications devices such as servers, routers, switches, power supply units, DC power distribution and UPS units, voice radio gateways, data radio gateways, broadband radios, etc. The devices are suitable to be used in deployable transport boxes as well as installed in military tracked or wheeled vehicles.

AT23701 broadband MANET IP radio and AT23801 radio router creating peer-to-peer tactical wireless data networks, allowing the simultaneous transmission of data, video and voice.



AT21201 voice communication gateway providing a voice gateway between VoIP networks, legacy telecom networks and radio networks.



AT10102 and AT10103 data radio gateways creating tactical MANET and providing dynamic routing of command and control system application data in narrow band radio networks.





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AT21301 high-performance router based on CISCO 5915 ESR providing powerful routing and security features including integrated WiFi connection.



AT21901 high-performance 10-port managed PoE switch providing switching capabilities and a variety of useful management functions.



AT22101 power distribution unit with UPS providing DC power and backup capacity to tactical communication devices.



## EVPU a.s.

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## INTELLIGENT PAN & TILT HEADS

Family of unstabilized and stabilized two-axis pan & tilt heads are assigned for the platform rotating in the azimuth and the elevation angle with a very high accuracy. Thanks to their unique features they are often used in final applications for monitoring and surveillance systems, determination of coordinates, measurement tasks and many others. EVPU pan & tilt heads are used in applications throughout the world.

## OPTOELECTRONIC SURVEILLANCE SYSTEMS

The border protection and the protection of the other important areas is the role which can be reliably performed only by using effective technical aids. The control and the protection of large areas belong to the challenging safety roles, especially at night and under conditions of bad visibility.

The optoelectronic surveillance systems are light modular systems designated for:

- Monitoring, detection and visualization of the targets
- Identification disturbers for a long distance, at day and night and even under bad weather conditions.

## FIRE CONTROL SYSTEMS AND CONTROL ELECTRONIC

Fire control system and main gun stabilization system for modernization of tank T72, infantry fighting vehicles BVP II and OT significantly increase their fighting power. Systems are fully integrated into the original tanks design, armoured personnel carriers, infantry fighting vehicles as well as to mobile and static surveillance and reconnaissance equipment.



Deployable optoelectronic surveillance system with radar



Stationary optoelectronic surveillance system



Mobile optoelectronic surveillance system integrated on Nissan Patrol



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Remote controlled weapon station GLADIUS 12  
integrated on 4x4 armoured vehicle



Remote controlled turret TURRA 30 integrated on infantry tracked vehicle

## REMOTE CONTROLLED WEAPON STATIONS & TURRETS

EVPU also designs and produces remote controlled weapon stations and turrets with optical container and gyroscopic stabilization. The system is remotely controlled and is designed for use on light wheeled/tracked armoured and fighting vehicles. Primarily the system is a part of the battle superstructure of vehicles designed for completion of fighting and special tasks within the field formation of friendly troops or in depth of the enemy field formation.

Gun carriage options for weapon systems:

- machine gun caliber 7,62  
- NATO/Russian caliber
- machine gun caliber 12,7 mm  
- NATO/Russian caliber
- heavy machine gun 14,5 mm
- automatic grenade launcher AGS-17
- 30 mm automatic canon  
- NATO/Russian caliber

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**ALIGATOR 4x4 MASTER II** is a multirole armoured vehicle for armed and special forces that features supreme properties in its class. It has optimal combat weight with massive payload properties and spacious interior for the crew plus inner equipment, surprisingly low silhouette and impressive ground clearance. Excellent track and terrain performance is achieved through independent axles, special suspension system and large wheels with run flat tyres including a central tyre inflation system. All these attributes create a vehicle that has outstanding cross country mobility, superb manoeuvrability, high speed capability, survivability and simple rapid deployment. The vehicle is amphibious

ready and upon request can be delivered as fully amphibious. Our unique monocoque hull structure provides excellent all round ballistic protection and the V – shaped underbody delivers additional protection for the crew against mines. Thanks to its unique properties this vehicle is suitable as a platform for a wide range of deployments such as command, surveillance, reconnaissance, weapons station, CBRN and police.





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## MORTAR M6 60 mm

### General:

The extremely light and safe mortar does not only meet the highest tactical and logistic demands; thanks to its high firing capacity, high accuracy and quick and easy operation it is suitable for special missions, especially on difficult terrain.

All types of 60 mm mortar bombs can be fired from this mortar.

### Model M6C with trigger and aiming device

A weapon designated for quick response and reliability. The special handgrip with trigger and the new, improved, aiming device guarantee high accuracy. The M6C can be used up to charge 3, although for easy handling, firing is recommended up to charge 2 only.

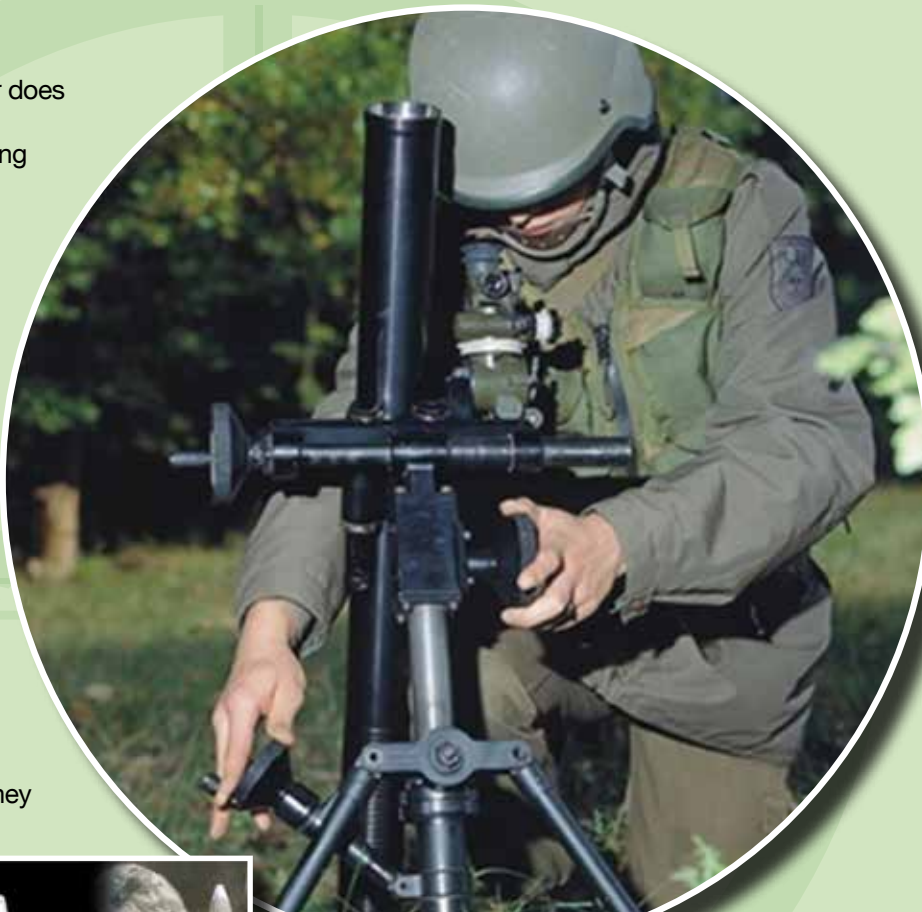
### Barrel and breech cap

The barrel and breech cap are made of high-strength special steel. They are forged, heat treated and machined to close tolerances. The barrel is provided with hand protection.

### Range scale

The division of range scale (default: charge 0, 1 and 2 for Kerametal HE Mk2, charge 1 ad

2 for Kerametal ILL Mk2 and a mils scale) can be adjusted also to other types of mortar bombs





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## MORTAR M8 81 mm

### General:

Developed for the Austrian Army, this mortar not only meets the highest tactical and logistical demands, it will also operate under extremely difficult topographical conditions. Thanks to its high firing capacity, high accuracy and quick and easy operation, it is suitable for all types of combat. Especially as indirect fire support for infantry, paratroops and armoured personnel carriers. All types of 81mm mortar bombs can be fired from this mortar. In service in the Austrian Army.

### Barrel and breech cap

The forged high-strength special steel barrel with smooth, close-tolerance bore is provided with specially designed ribs for reinforcement and improved heat dissipation. This allows of much higher firing stresses.

The breech plug, which is screwed into the barrel, has a rigidly mounted firing pin. If necessary, the latter can be easily removed from the assembled mortar.

### Base plate:

The base plate is drop-forged and made of a high-strength aluminium alloy with reinforcing ribs. The design combines low weight with high stability so that the base plate is able to withstand highest impact stresses.



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## MORTAR M12 120 mm

### General:

The mortar M12 of 120 mm calibre has been jointly developed with the Austrian Federal Army. It meets all requirements as to mobility, reliability and fire power in the modern battle field. This mortar is normally mounted on a towed carriage, but it can also be employed in tracked armoured vehicles. Almost all types of mortar bombs of 120 mm calibre can be fired with this weapon. In service at the Austrian Army.

### Base plate:

Designed for highest stability on all kinds of terrain and ground, it is made of welded steel and has six ribs and vents to ensure the desired result.

### Barrel and breech cap

The barrel is made of high-strength ESR special steel. It is forged, heat-treated and machined to close tolerances. The forged breech plug is screwed into the barrel. A specially developed sealing ring guarantees gas-tightness. The firing mechanism can be switched from fixed to triggered firing. A safety lever is provided on the breech to avoid inadvertent firing. The breech ball fits into a socket in the centre of the base plate, where it is fixed by a bayonet nut.

### Carriage

The carriage is not only used for transport of mortar. Its special design allows it to be brought, the mortar ready assembled, to the firing position, lifted from the ground after use and returned to the transport position, still assembled.





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**Virtual Portable Law Enforcement Weapon Skills and Marksmanship Training System (WS&MTS)** is a cost effective shooting training system. It provides the user with the training option with no ammunition consumption, as well as there is no wear and tear to the equipment used for training purposes. All the weapon simulators are of class 1, i.e. eye safe.

The WS&MTS is a portable training system which enables to train

- with real weapons equipped by optoelectronic weapon simulators
- shooting on different targets infantry, armoured, moving etc.
- precise shooting on electronic circular targets
- from prepared and unprepared shooting positions
- shooting while moving
- trainees individually as well as group (team, platoon) training is possible
- WS&MTS records all the events of the training and performs analysis of the trainees' effectivity.
- WS&MTS System is designated to effectively and safely train individual soldiers and small infantry groups to properly use infantry guns on various

skill levels. WS&MTS system covers all the range of infantry guns from the smallest pistol to heavy weapons, antitank guns or anti-tank missile systems. Training starts at a basic level of handling the weapon and shooting from various infantry weapons at the shooting range, marksmanship practises till collective tactical training of specialized teams. Trainees take tactical drills in extraordinary close to real virtual combat conditions.

Advantages of WS&MTS training system:

- System is modular and expandable
- System poses high resolution of aiming system which provides the system with high shooting accuracy.
- The scenario can use any of soldier, transport, APC, tank, buildings, walls ...
- WS&MTS poses effective identification of all the system components
- Effective tether-less CO<sub>2</sub> recoil system
- Modern visual system with game quality graphics
- Powerful software control system with scenario editor







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KONŠTRUKTA - Defence, a.s. is a research and development company employing project-oriented specialists focused on design, development, system integration, as well as certification regarding ground and air defence weapon systems, ammunition, fire control and command systems, electronic systems, various customized special weapon superstructures, along with wheeled and tracked chassis.

Our capabilities and qualification have been proven themselves over the decades of work in defence industry research and development segment. Products developed, upgraded, or customized by our company are used and valued by clients in Europe, Middle East and Africa.

Our R&D is mainly specialized in:

### Weapons systems

- Development of howitzers, rocket launchers and mortars, mine-laying and mine clearing systems,
- Development of support systems (ammunition supply vehicles, command vehicles),
- Hydraulic and electric drive solutions for specialized superstructures.

Recent solutions:

#### Electronic systems

- Fire control systems for howitzers, rocket launchers and mortar systems:
  - a) concerning individual weapon systems – control of traverse, elevation and loading mechanisms
  - b) concerning batteries or units connected to a superior authority within the chain of command
- Development of container systems to build in the communication equipment and information technologies.

Recent solutions:

### DELOSYS - Artillery Command and Fire Control System

Is a comprehensive artillery command and fire control system to be deployed on battalion and battery levels in conjunction with various artillery units. It is an open C4I system designed to automate battlefield command and fire control using the latest technical and software means. The system can be easily adjusted to fit any existing national fire command and control systems currently serviced.

The functions available:

- Calculating topographic information;
- Processing meteorological information;
- Computing the firing data using differential equations;
- Using digital maps;



155 mm 52 Cal. SpGH ZUZANA 2



155 mm 52 Cal. TMG EVA



155 mm 52 Cal. SpGH DIANA

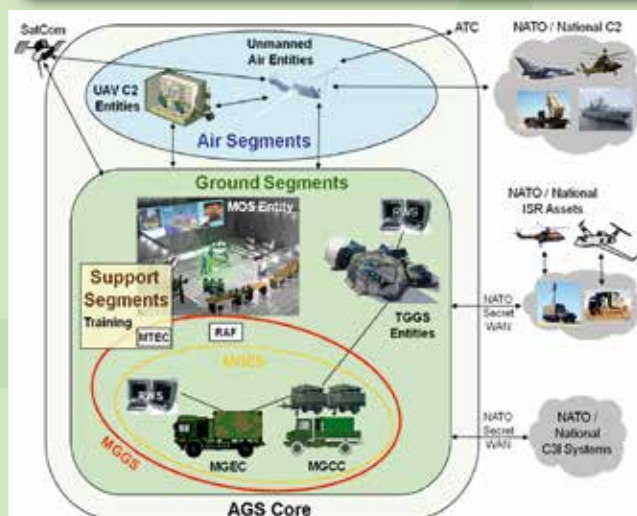
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- Fire planning;
- Fire efficiency simulation;
- Show tactical situation, planning a maneuver, fire...



on the interest area. AGS system will able to detect and monitor moving objects, evaluate movement intensity, type of weapons and next information needed to operational management activities by combining capabilities high-end unmanned air vehicles and ground sensors networks.

KONŠTRUKTA - Defence, a.s., has developed and satisfied fulfilment of technical requirements during development tests one of ground segment parts so called Mobile General Communication Component (MGCC). Its task is to receive process and distribute image, voice and data information in adequate security level.



## Project NATO Alliance Ground Surveillance (AGS)

KONŠTRUKTA - Defence, a.s., participates on solution of NATO project ground surveillance of areas of interest using common interconnection air and ground segment AGS in according to the foreign partner requirements. The Alliance ranks AGS project among the top priority. In the project are currently seventeen NATO countries involved.

This system is designed as a source of information to support of the alliance troop in peacetime operations, crisis management situations and war



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## Ammunition

Specialized project solutions:

- Development of new ammunition types (high-explosive, armour piercing, cumulative, illuminating and smoke types; ammunition warhead and charge system development – both the mortar and artillery ones).
- Modernization of the in-service-ammunition types with the objective to increase their effectiveness in target.
- Environmentally friendly disposal of unwanted or obsolete ammunition.

Our capabilities in this field include the following:

- Design and construction of artillery and rocket ammunition (30 – 155 mm), mines, demolition charges and specialized ballistic protection systems.
- Calculating the internal and external ballistics, compilation and verification of firing tables.
- Projecting solutions and design of cartridges and propellants for artillery ammunition.
- Solutions of initiating systems for artillery and rocket ammunition (fuses).



## Testing Facility

- Facility is equipped for testing of broad range of military ordnance, as well as for testing and certification of explosives for civilian use, pyrotechnic articles and various other types of special equipment, be it for military or civilian use.

- In addition to the services of maintenance and verification of service life of various ordnances and other special equipment, the facility also offers the means for safe and environmentally friendly disposal of explosive and non-explosive articles.
- Environmental testing of weapons, electric, electronic and ammunition elements (mechanical impact resistance, shipping and handling shock and vibration resistance, extreme temperature tolerance, dust and sand resistance, drop weight impact resistance testing – manipulation height of 1.5 m, 2 m and 12 m).
- Proof firing of new barrels, special superstructure configuration including equipment.
- Testing of ammunition effects (high-explosive, concussive, armour-piercing).
- Extension of the service life of ammunition – safety and functionality testing via the accelerated ageing testing procedure.
- Measuring of product conformity, testing of explosives intended for civilian use, testing of pyrotechnic articles, CE certification

## Accreditation

As an accredited Notified Body (1395), we check for product conformity and issue certificates according to following directives:

- DIRECTIVE 2014/28/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL ON THE HARMONISATION OF THE LAWS OF THE MEMBER STATES RELATING TO THE MAKING AVAILABLE ON THE MARKET AND SUPERVISION OF EXPLOSIVES FOR CIVIL USES
- DIRECTIVE 2013/29/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL ON THE HARMONISATION OF THE LAWS OF THE MEMBER STATES RELATING TO THE MAKING AVAILABLE ON THE MARKET OF PYROTECHNIC ARTICLES

Accredited testing laboratory – accredited according to the ISO/IEC 17025, SNAS č. S-077, for carrying out tests and issuing corresponding test protocols. Accredited to perform testing for:

- climatic and mechanical resistance
- technical products (phones, power generators, vents, switches, etc.)
- firearms and ammunition
- pyrotechnic articles
- protective equipment and materials
- explosives



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Authorized Body SKTC-112, Accredited  
Certification Body – accredited according to  
standard EN 45011:1998 and SNAS č. P-021 for  
issuing final protocols and certification of:

- firearms and ammunition according to C.I.P. regulations
- military explosives
- military ordnance
- categorization for transport of dangerous goods according to UN recommendations (IMDG code, ICAOTI, RD, ADN, ADR)

### Testing of:

- Small calibre ammunition
- Large calibre ammunition
- Missile ammunition
- Hand grenades
- Engineering equipment
- Shaped charges
- Explosives and primary explosives
- Smokeless powders
- Black powders
- Weapons and weapon systems
- Explosive material
- Ammunition effects (high-explosive, armour-piercing, ...)
- Personal protective equipment and materials
- Pyrotechnic articles



**ZBOP**



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**LOTN, a.s. is a traditional aircraft MRO organization which offers:**

**TRADITION**

- involved in aviation business since 1949 and transformed into a 100% government owned joint stock company in 2006
- engaged in maintenance, repair, overhaul, and modernization of fixed wing and rotary wing aircraft including avionics systems, subsystems, mechanical components, and airframes

**RELEVANT CAPABILITIES**

- extensive purpose-built facilities, workshops, equipment, and tooling to support core business activities

- dedicated in-house design and technological department which is qualified and competent to support aircraft upgrade and modernization programs
- LOTN owned and operated airfield

**COMPETENCE**

- 350 employees to include aviation engineers, technicians, mechanics, and support staff







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[www.lotn.sk](http://www.lotn.sk)



## CUSTOMER FOCUS

- renowned provider of high quality aircraft maintenance services and technical support to the Slovak Air Force and a number of Armed Forces worldwide

## PRODUCT PORTFOLIO & CAPABILITIES

- As of today, LOTN performs maintenance, repair, overhaul, and a variety of upgrades and modernization of the following aircraft and their variants:
  - Mi-8/17/171 multi role transport helicopter
  - L-39 multi role trainer aircraft
  - L-410 passenger/transport aircraft
- LOTN operates unique facilities/equipment allowing it to perform maintenance and repair of majority of the avionics systems and subsystems onboard the above aircraft down to component level





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## "Fully customised image recognition and analytics solution"

Excuber is fully customised solution for automated image recognition & analytics using its modules. Excuber will help you to optimise your business processes, increase security and reduce cost at the same time.

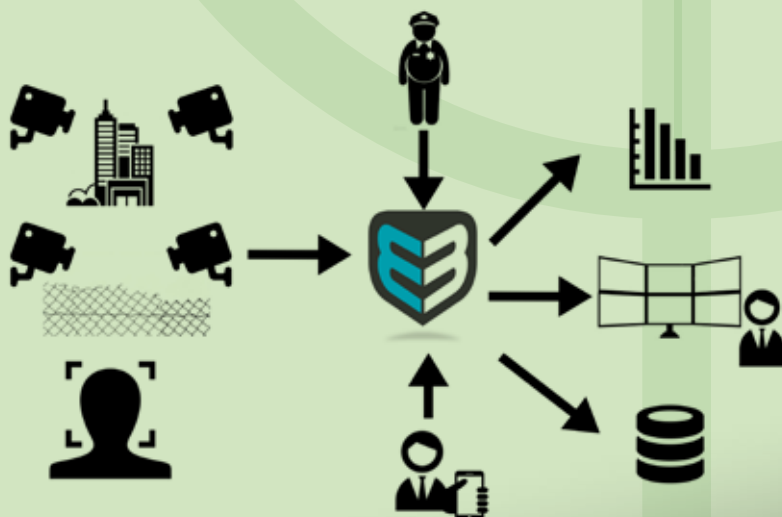


Excuber was designed to be scalable from few cameras to deployments with thousands of cameras on city or country scale. Basic principle is full customisation based on client requirements which includes custom module development, custom rules, custom reporting and other client specific services.

### Multiple industries will take advantage from Excuber including:

- Military
- City Surveillance
- Military & Police
- Intelligence
- Criminal Investigations
- Critical Infrastructure
- Law Enforcement

Excuber will take as an input data from live security cameras, archive video footage, images and other digital sources like GPS data. This information is processed by Excuber modules and provide output in form of notifications, detailed analytics, strong reporting or management of external devices.



 **EXCUBER**

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## “Fully customised image recognition and analytics solution”

Excuber is going beyond standard out-of-box software by allowing clients to specify exact requirements based on which software will be customised, new modules could be developed therefore solution will fit seamlessly into client processes.

### Excuber advantages:

- Reduces need to increase budgets on manpower
- Ability to quickly start post event analysis
- Reduce risk of missed events
- Automatic monitoring and conversion of security personnel/office from detector to event evaluator and reactor
- Dramatically decrease response time to events
- Integration of existing analog cameras is possible

### Excuber Modules:

- Face detection and Face recognition
- Object detection
- Color detection
- Movement detection
- Anomaly detection
- License plate detection [EU & US]
- Data coupling from multiple modules
- Strong analytics

### Excuber implementation approach:

- Collect business requirements
- Propose technical and process end-2-end solution
- Implement the solution
- Assist with other procurement and technical aspects beyond Excuber
- Experienced team will assist clients with every step in the process
- and support ongoing operations in years to come

### Excuber solutions:

xAnalytics	Deep analytics for retail sector
xCarGate	Car gate monitoring and analytics
xPeopleGate	People entrance total protection
xCity	City wide analytics, recognition and protection
xInsider	Monitoring and analytics of inner company premisses
xMap	Mapping solution
xOffline	Post event data analysis
xPerimeter	Outside perimeter protection
xRoad	Public roads and highways analytics



**“Don’t wait any longer and  
get in touch with us! You will  
be surprised how much value  
excuber will deliver”**







## MSM GROUP, s.r.o.

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## MAIN PORTFOLIO

R&D, DESIGN AND CONSTRUCTION,  
PRODUCTION, SERVICE, REPAIRS  
AND REVISION, MODERNISATION

### ECOLOGICAL LIQUIDATION:

Ammunition and its components  
Ammo production technology  
Military wheeled and tracked vehicles  
Weapons  
Supportive technology for aviation

## REST OF PORTFOLIO

- Authorized service and sale of TATRA vehicles
- Industry production: Metal and metal sheet processing, Welding, The hollow bodies pressing
- ISO containers production
- Surface treatment (Powder coating, Adhesives applying, Painting)
- PUR foam molding
- Molding tools, Single-purpose equipment, Complete technology lines
- Sales within the scope of whole portfolio included the spare parts

## KEY AMMUNITION PORTFOLIO

- Small caliber ammunition for sports and hunting, 7.62 x 39 mm, 9 mm LUGER, shotgun ammunition
- Medium and large caliber ammunition, 30 mm ammunition for cannon 2A42, 2A38 a 2A72
- Mortar bombs 60 mm, 81 mm, 98 mm a 120 mm,
- 125 mm ammunition for the tank
- Artillery ammunition 122 mm, 152 mm a 155 mm
- Ammunition components/ elements
- Mortars 60 mm



## AMMO SERVICES: TO COVER WHOLE LIFE CYCLE OF THE AMMUNITION

The aim of repair operations is to PROLONG THE LIFE TIME of ammunition. It provides a greater economic return than the disposal of ammunition and the subsequent production of new ammunition.

### INSPECTION:

Inspection of customer's ammo material:

- Inspection of damaged parts and initiators
- Inspection and testing of technical parameters
  1. Physical – chemical testing of all ammunition/ pyrotechnical elements (For example: Fuse, explosive, igniter, propellant, charge powder)
  2. Testing of electrical circuits
  3. Visual checking, testing of mechanical parts, checking of protecting paints,...
- Inspection of the packaging

### REPORT TO CUSTOMER WITH THE PROPOSAL FOR:

1. Repair/ Revision
2. Modernization
3. Ecological Liquidation

### THE SCOPE:

1. Revision, prolongation of life cycle or modernization of calibres from 30 to 155mm
2. Revision, prolongation of life cycle or modernization of rockets 122 JROF „Grad“
3. Revision of Mortar Bombs of calibres 60mm, 81mm, 82mm, 120mm, 160mm
4. Anti-tank and anti-aerial guided rockets: Malyutka, Konkurs, Fagot, IGIA





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### REPAIR/ REVISION:

- Replacing of damage parts
- Gun powder homogenization or its replacing
- Surface areas renovation and renewal
- Main technical parameters checking
- Cartridge case renovation including recalibration
- Inspection of ordnance from 30 up to 155 mm
- Inspection of 122 JROF RM-70 "GRAD"
- Inspection of mortar bombs from 60mm. 82mm EOM up to 160 mm EOM
- Total revision (including motors) of ATGM type "Maljutka", "Konkurz", "Fagot"
- RG-4 (hand grenade) repair
- Other activities upon the client's requirements
- The company is ready to perform the renovation of discharged shells i.e. to perform the resizing an surface treatment.



### MODERNISATION:

- The exchange (replacement) lighter - more reliable, safer, smarter (eg. which is initiated when approaching)
- More resistant material (anti-corrosion paint, paint the new generation)
- New surface protection round and cartridge
- The range extension
- The maximizing of the effect on the target - in the impact zone

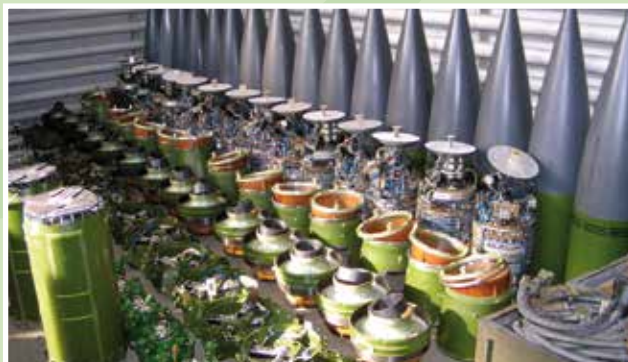
- Various missiles variants HE, Illumination, Thermobaric, Training ...
- Replacement of outdated components
- More lightweight packaging and more durable transport packaging
- Mobile technology line for ammo disposal (Made by MSM Group)
- Complete Logistics

### DELABORATION AND ECOLOGICAL DISPOSAL:

- Know-how and long term experiences with ecological disposal of infantry, artillery, aerial and anti-aerial ammunition
- Disposal of white phosphorus ammunition, solid and liquid propellants rockets, different types of pyrotechnical compounds.
- Disposal is carried out on factory own developed devices installed in stationary objects or in mobile containers
- All hazardous operations are carried out in armor protected spaces
- Ecological disposal consist of metals separation, removal and treatment of explosives and powder
- Extracted material is reused for further utilization

#### PROCEDURE:

- Dismantling of initiators
- Spreading of cartridge
- Delaboration of explosive (Jet washing, Melting, Pressing)
- Delaboration of powder charge or propellant charge.
- Disposal of pyrotechnical elements
- Recycling of raw materials





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## Capability

Manufacturing capabilities

- assembly halls with heavy cranes and handling equipment
- Certified Engines and transmissions ops department
- paintshop with two-shift operation
- Sand blasting shop
- CNC plasma, bending, laser and cutting machine
- CNC vertical milling machine
- Varnishing, Welding, Drilling
- Mechanical machining and Turning



## THE MILITARY VEHICLES

REPAIRMENT - MODERNIZATION - PRODUCTION

- TANKS: T-55, T-72
- INFANTRY VEHICLES: BMP-1, BMP-2, OT-64
- SELF-PROPELLED HOWITZERS: 2S1 GVOZDIKA, Dana (152mm)
- ROCKET „Grad“ LAUNCHERS: BM-21, RM-70



## MOBILE ISO CONTAINERS PRODUCTION

- Container ISO 1C - Mobile drinking water treatment plant and its technological solution is designed for conversion of raw groundwater and surface water to drinking water
- Water treatment means mixing in the reactor wherein the separation of the suspended solids and sludge sedimentation sand filtration and the uptake of the carbon.
- The occurrence of heavy metals leads to their elimination combination of precipitation reactions and absorbing.
- Raw water is pumped by submersible pump with flotation device and is fed by hose (1.25 m) to enter the process. Feed line is dispensed by 40% FeCl<sub>3</sub> coagulant by dosing pump.
- Water flow is guiding according to the level of the mixed water pump speed converter of raw water.
- Water-treatment of raw water is removed from the solid matter iron manganese aggressive CO<sub>2</sub> α - activity and radon.



## MOBILE ISO CONTAINERS & FIELD HOSPITALS

We produce standardized containers designed for all types of transport, fully stockable, adaptable for any kind of climate (-30 °C to +40 °C) equipped for different purposes:

- Delaboration of ammunition
- Workshops
- Medical
- Monitoring / Laboratory
- Office / Residential
- Kitchen / Sanitary
- Water treatment, Storage etc.







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## THE WEAPONS

### PRODUCTION

- **AIR RIFLES:** The PERUN 734 is the best performance model of the popular line of break-barrel performance air guns made by ZVS Ltd. This rifle is suitable not only for leisure time activities or sport shooting but also for small game hunting and pest control.
- The latest model, PERUN 734 retains all the advantages of its predecessors: An adjustable trigger pull, high safety and comfortable cocking with the muzzle velocity increased up to 220 m/s and energy to 16J.
- **9MM PISTOLS:** The P20 pistol is a semi-automatic handgun with the locked breech system.  
SA(Single Action): It is a single action function when the hammer is cocked (in rear position). After pulling the trigger the hammer is released and the pistol will fire. The trigger travel is short, and pull weight is low.  
DA(Double Action): The trigger mechanism operates in double action mode when in a first phase of pulling the trigger is hammer cocked, then release and pistol will fire. The trigger travel is longer, and trigger pull weight is higher than at SA mode.

### MODIFICATION

We are providing the modification of the weapons into the expansion and semi-automatic weapons. Expansion version is primarily intended for collection purposes, or often used in military history club.

Semi-automatic machine is adapted to firing live ammunition on individual shots. Purchasing by a valid firearms license holder only.

Supply, together with the report of depreciation.



## SUPPORTIVE TECHNOLOGY FOR AVIATION

RADIONAVIGATION | RADIOCOMMUNICATION |  
RADARS | EQUIPMENT

### THE SCOPE OF THE OFFER

Design, manufacturing and servicing of the radio navigation systems (NDB) for air traffic control (civil and military) as well as repairing and modernization of various kinds of Armed Forces equipment, especially in the segment of air defence equipment.

Another important product of the portfolio is own development and production of Ground Power Unit (GPU) for the aircraft starting. We are also providing the radar upgrades.

### THE RADARS UPGRADES

Main characteristics of the ST-68 MSK modernized radar:

- High probability of detection of small targets reflecting surface flying on small and ground heights
- Screen capture of targets with effective reflecting surface of 10 m<sup>2</sup> within 360 km incorporating a new Trigger mode of Transmitter
- High probability of fast-and slow-flying targets detection, including helicopters in hanging position
- High resistance to unintentional and intentional interference of various types, the possibility of determining the pointer targets - jammer
- Protection against anti - radar missiles
- Automatic equation of primary echo signals with signals of responses of embedded identification device /IFF/ with creating of full Radar info, info transmission in ASTERIX standard formats
- Possibility of up to 120 targets pathways automatic tracking for one turning of the antenna
- High mobility





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## TOP PRODUCT: NAVYRA 500

Air Navigation Non-Directional Beacon System (NDB)

NDB NAVYRA-500 is efficient, reliable, approach dual-radio transmitter/beacon used as an aviation navigational aid for ensuring safety landing procedure, useful for stationary sites, for civilian or military deployment. NDB Navyra-500 can be controlled manually on site or remotely via intelligent SW with selfcontrol features.

NDB NAVYRA-500 can operate with antennas of "T" type, UZA or with other antenna type with grounded counterweight system. NDB NAVYRA-500 is the part of radionavigation system NARASYS.

Operational Voltage:	230 V / 50 Hz
Frequency (Transmission Bandwidth):	190-1100 kHz variant 1B, 1100-1900 kHz variant 2B
Modulation Frequencies:	400-25 Hz, 1020-50 Hz
Identification Mark:	Combination of Morse Code characters (max. 4 characters)
Output Power:	500 W
Modulation Depth:	95±5 %
Load Impedance:	Ra = 50 Ohm, Ca = 500-1200 pF

## Mobile Air Traffic Control Tower

Control Tower is completely manufactured by MSM company in three standardized versions. Control Tower is ballistically resistant with the possibility of reducing its cross-section to be airtransportable.

MSM Group is proud to offer this innovative product as completely Made in Slovakia.

Mobile Control Towers serve for navigation and air traffic control at provisional airstripes, in cases of airstripes being frequently changed and it is not efficient to build a fixed control tower and also as an emergency solution when the main fixed control tower is broken or being repaired.

Each Control Tower can be manufactured specifically for the customer.

Navigation is possible for various aircrafts depending on the equipment installed, available radars and systems for air traffic control connectivity and interoperability.

Mobile Air Traffic Control Tower made by MSM Group is unique in its flexibility, configuration options and Price-Quality (PQ) ratio.

These systems may be deployed in peace-keeping operations, for both civil and military aviation users.



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## ARMoured VEHICLES

### TITUS

TITUS® is the ultimate armoured vehicle, designed to deal with all the constraints of modern hybrid warfare. Developed in close cooperation with TATRA TRUCKS, the prime contractor for the Czech and Slovak armed forces, Nexter's TITUS® continues a long and proud lineage including Leclerc MBT, VBCI and ARAVIS®, all combat-proven in many theatres of operation. The vehicle combines Nexter's extensive experience and state-of-the-art technology with the unique chassis supplied by TATRA EXPORT. Tactical commanders can now call upon a 6x6 vehicle that is customizable for a constantly evolving environment. TITUS® is the multirole armoured vehicle of the 21st century. From infantry transport to combat support and combat service support functions, from peacekeeping operations to counter-insurgency, TITUS® brings unrivalled technology and the Nexter touch into the heart of the action.

Main features:

- TATRA chassis design
- Mobility
- Modularity
- Protection of the crew
- High Tech equipment
- Scalable Operational Environment Kits

Technical data

Width	2,55 m	Drive	6 x 6, front axle connectable, independent air suspended half axles
Length	7,72 m	Range	700 km
Height	2,73 m	Max. speed	110 km/h
Curb weight	17 t	Slope	60 %
Combat weight	23 t	Step	700 mm
GVW	27 t	Fording capability	1200 mm
Protection	2 - 4, 2A/2B - 4A/4B, STANAG 4569	Crew	3+10 / 2+12
Gear box	Allison, 6+1	Volume	14,4m <sup>3</sup>



### IFV CORSAC 8 x 8

Wheeled Infantry Fighting Vehicle IFV CORSAC 8x8 was created by the unique cooperation of the leading Slovak companies of defence industry MSM Martin, EVPU, Konštrukta Defence and the U.S. company, General Dynamics. The original chassis was designed and adapted by our engineers to meet the needs of the Slovak Armed Forces. On the chassis, we placed the very powerful, remotely operated "TURRA 30" turret from the company EVPU. This concept ensures full compatibility with NATO standards and fully meets the needs of the Slovak Armed Forces, which allows for efficient deploying for UN / NATO missions as well as for internal territory protection.

#### Vehicle protection:

- ballistic protection Level 3 according to STANAG 4569
- mine blast protection Level 3a/b according to STANAG 4569
- observation devices
- fire protection equipment
- internal walls have a special Kevlar lining that captures cleaved fragments or pieces of armor when hit by a mine or armor piercing shots

#### C4I:

- radio compatible with NATO line control devices
- data and communication platform for soldiers from 21st century

#### Weaponry:

##### Remote controlled turret „Turra 30“

- 30 mm cannon, type: 2A42, or optional Bushmaster MK-44
- coaxial machine gun, caliber: 7.62 mm or 12.7 mm
- smoke grenade launchers, type: Galix
- anti-tank missiles, type: Konkurz or optional Spike

#### Special equipment:

- IR camera (cooled)
- laser range finder
- TV camera with zoom

Tactical and technical specifications:

Crew:	3 (commander, driver, operator) and 6 Descent	
Dimmensions:	Length:	7 430 mm
	Width:	2 670 mm
	Height:	2 950 mm
	Ground clearance:	430 mm
Maximum speed:	Combat weight:	max. 23,000 kg
	The road:	100-110 km/h
	When swimming (Optional):	11 km/h
	Range:	650 km





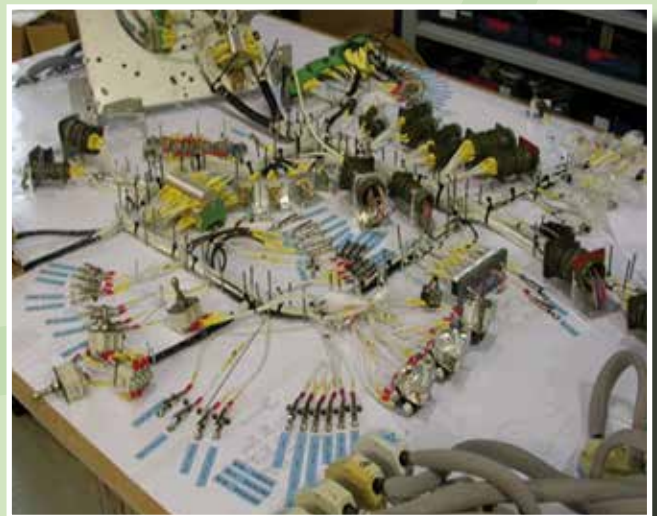
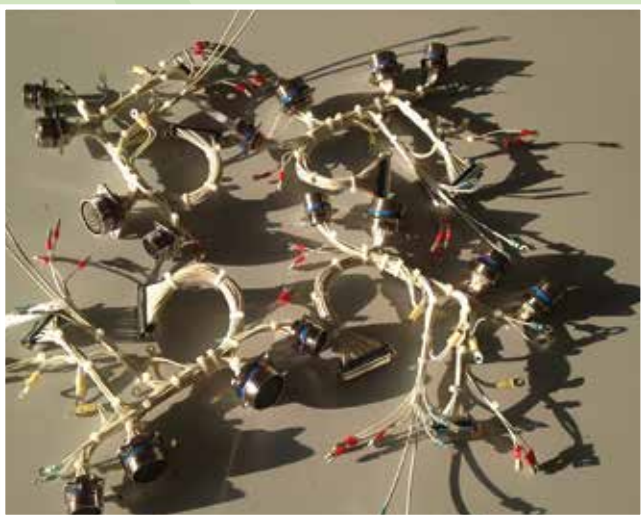
Neways Slovakia, a.s. is a member of Neways Electronics International N.V., which is a global operating EMS provider of professional electronics products and assemblies, a specialist in Development, Design and Production of:

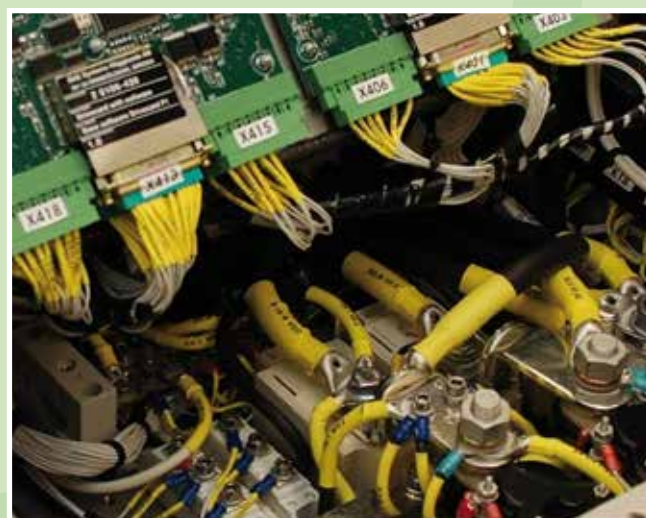
- Microelectronics,
- Printed circuit boards,
- Cable and Wiring harnesses,
- Complete Box-built products and Systems.

Quality Standards:

- ISO 9001, ISO 14001, ISO 13485,
- ESA PSS-01-20, TS16949, UL, CSA,
- AQAP 2110, DIN-VG96927.

In the field of Defence industry Neways focuses on the applications in the ground vehicles and other equipment, such as complete cable harnesses, control units, panels and other subgroups, including electrical testing.







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SPINEA is a modern manufacturing and development company. The impulse for its start was the proprietary invention of a new transmission principle of the cycloid reduction gear mechanism.

During its existence, it has successfully established itself on the global market and it has succeeded in the competition of leading suppliers in the fields such as industrial robotics, automation, manufacturing of machine tools, and navigation and medical equipment. It is currently the only European manufacturer of high-precision reduction gears and it competes with three Japanese companies in that technologically demanding segment.

In the course of the years, the E, H, M, G series were launched on the market besides the basic T series. SPINEA also manufactures other products – DriveSpin actuators and RotoSpin positioning modules with the TwinSpin reduction gears as their basic component.

**MAIN COMPETENCE IN ROBOTICS  
AND INDUSTRIAL AUTOMATION**

- Development, manufacture and sale of high-precision reduction gears – starting from the diameter of 50 mm up to 335 mm and the rated power from 18 Nm to 4200 Nm
- Proprietary design concept, protected by a number of patents
- Wide-spectrum use of the reduction gears – industrial robotics, automation, manufacture of machine tools, navigation and medical equipment
- Use in applications requiring a high reduction ratio, high kinematic precision, zero-backlash motion, high torque capacity, high rigidity, low weight, and a compact design in limited installation space
- Customer orientation – individual approach to customers' needs
- ISO certification
- Member of international associations in robotics and automation (International Federation of Robotics, EU Robotics, VDMA)





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#### KEY PROJECTS

- KUKA low and medium payload robot segment
- ABB medium payload robot segment
- COMAU low and medium payload robot segment, including the fastest robot in its class - RACER
- A number of robotic projects in China (GSK, STEP, ESTUN)
- Reduction gear applications in projects of the companies Wittmann, Trumpf, Doosan Infracore, and DMG

#### SPINEA IN DEFENCE AND SECURITY

Thanks to its unique technical solution and outstanding characteristics, products of Spinea are valued by customers from defence and security sectors and are used in applications where precision is required to the hundredths or tenths of a millimeter as well as reliable operation in harsh environment. SPINEA meets the requirements of the defense sector at a high level of quality assurance, long-term support and confidentiality.

#### PRODUCTS RECORDED SOLID PERFORMANCE IN DAILY OPERATIONS ON LAND AND SEA.

SPINEA is supplier of standard, customized and OEM products for higher integration in the defence equipment in the broad range of azimuth and elevation positioning, including:

- Devices for observation
- Military vehicles
- Weapon stations
- Radars
- Simulators

Thanks to its construction the products of SPINEA are used in harsh environment applications which includes extreme temperatures, shock and vibrations, EMC. Spinea is:

- Certified ISO-9001

Product is:

- Certified by third party test facility in compliance with MIL-STD-810G



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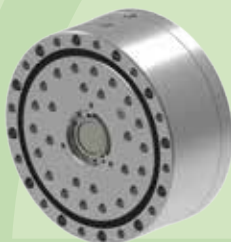
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#### MAJOR ACHIEVEMENTS

- Establishing on global markets – the sales operations of the company are strongly export-orientated (more than 97 % of the sales is exported)
- Use of SPINEA reduction gears in robotized production lines of car manufacturers (AUDI, BMW, Mercedes, Volvo, Ford)

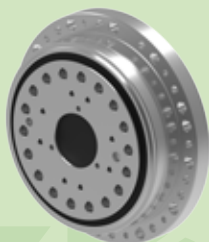
- The properties of the TwinSpin reduction gear are appreciated by Boeing and Swarovski in their production
- Deliveries for a CERN nuclear particle accelerator in Switzerland are also a proof of the precision and reliability of SPINEA products
- Since 2004, SPINEA has obtained nine Mechanical Engineering Product of the Year awards
- In 2009, the inventor, B. Janek, was nominated for a major international award, European Inventor of the Year, awarded by the European Patent Office

#### T series



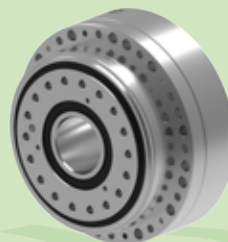
A standard version of the high precision reducer TwinSpin with through and threaded holes in the case.

#### E series



Compact unit with flange design. Suitable solution for robotics.

#### H series



Hollow shaft-reducer with possibility of sealing, where a big through hole in the shaft enables passing of cables, tubing or additional shafts to other axes.

#### M series



Mini version of high precision reduction gears TwinSpin. In its category it represents the best solution in the market.

#### Standard



The DriveSpin electric rotary actuators, as the basic type of actuators, provide rotary motion and the transfer of output torque with a high radial-axial load capacity and are the most accurate and precise solution in their category.

#### Hollowshaft



The DSH electric actuators are characterized by the possibility to use a through hole for routing cables, pipes, and drive shafts while maintaining the radial-axial and torque load capacity.

#### Modular



The DSM modular rotary positioning modules provide controlled rotary motion and transfer of torque with a high positioning accuracy and precision. The modules feature a special design of the case, which allows versatile connections, also without additional devices.





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## AKTIS 4x4.1R-08

### TECHNICAL DESCRIPTION

The vehicle has been designed for transport of materials and persons and for special superstructures operable on roads and off-roads with the possibility to couple trailers. It can be used in temperate climate zones according to STN 03 8900-2-1 within temperature range from -30 °C up to 50 °C, and in environments with a relative humidity up to 98 % at temperature +30 °C, and dustiness of surrounding air up to 1,5 g/m<sup>3</sup> (measured at the height 0,5 m above the ground), and with wind speed up to 20 m/s.

AKTIS is a double-axle vehicle with a constant drive of both axles, with a four-wheel drive 4x4, with a ladder continuous frame on which the axles with suspensions are fitted together with power steering, motor with gearbox and clutch, auxiliary clutch, winch, cab, bumper, brake elements, fuel and exhaust system, electrical parts, coach-building, front bumper, coupling devices, spare wheel, and box overpressure body.

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**Engine:** MAN D 0836 LFL 50

Diesel, 4-stroke, liquid-cooled, 6-cylinder in-line engine with forced induction, with intercooler of the compression air, with Common-Rail fuel injection, with the possibility to operate on the basis of the unified NATO fuel F-34.

Emission standard	Euro 4
Cylinder bore / stroke	108 / 125 mm
Engine displacement	6 871 cm <sup>3</sup>
Maximum rating	176 kW at 2300 rpm
Maximum axial torque	925 Nm at 1200 - 1800 rpm

**Clutch:**

Dry, single-disc clutch with diaphragm spring, with asbestos-free lining and automatic setting, hydraulically controlled with a pneumatic booster.

**Gearbox:**

ZF ECOMID 9S 1110, fully synchronized 9+1-speed gearbox, manually shifted. The gearbox forms a monobloc, together with the engine and the clutch.

**Auxiliary gearbox:**

Two-speed engine-torque distributor with a pneumatic gear shifting between the road and off-road running, with torque distributor ratio 1:1, with closure VSM management, with constant drive of the front axle.

**Steering:**

Hydraulic compact steering ZF 8039, left-handed.

**Axles:**

Rigid, with planetary gear train in the wheel hubs, with differential interlocks, drum brakes, the front axle steerable.

**Suspension:**

Front: progressively acting parabolic leaf springs and hydraulic telescopic shock absorbers.

Rear: parabolic leaf springs, hydraulic telescopic shock absorbers.

**Wheels and tyres:**

Disc wheels and self-sealing tyres with simple mounting. Profile 365/85 R20 XZL TL 164G. On request a central inflating system can be installed.

**Frame:**

Made of two longitudinal U-section members and bolted tube cross members. A shackle for emergency towing is fitted on the front cross member, apertures for the coupling device are on the rear cross member.

**Brake system:**

MAN Brake Matic with antiblock system (ABS), with automatic setting of brake-shoes. There are four mutually independent kinds of brakes in the vehicle:

**Service brake:** dual air-circuit brake, with load-sensitive regulation, acting on all wheels.

**Emergency brake:** spring-loaded, acting directly on the rear wheels with linkage to the trailer's brakes.

**Parking brake:** spring-loaded, acting directly on the rear wheels without linkage to the trailer's brakes.

**Engine brake:** exhaust brake, actuated in connection with the brake pedal.

**Driver's cab:** MAN TGM L32

A standard cab-over-engine arrangement for 3 soldiers with equipment. Furniture and accessories of the cab secure good working conditions for the driver. Standard heating depends on the engine's temperature. Automated air-conditioning with an efficient ventilation system. Adjustable inclination and height of the steering wheel. Windscreen equipped with heating of its bottom part (windscreen wipers do not freeze onto the windscreen). Preparation for auto-radio installation, based on request including the auto-radio supply. The cab's roof equipped with an observation roof door aperture. Integrated brackets for military equipment. The cab can be hydraulically tilted. High anticorrosive protection of the overall metal structure secures high endurance. Cab mounts air-suspended at rear.



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#### Electrical devices:

Voltage 24 V, negative pole grounded to frame.

2 x 12 V / 175 Ah accumulator batteries,  
alternator 28 V / 110 A, starter 24 V / 4 kW.

Halogen head lights. Fog lamps. Camouflage lighting. Sockets in accordance with the NATO requirements for trailers with ABS brakes and socket for jump-starting.

#### Winch:

With hydraulic drive, located within the frame between longitudinal members, designed as an auxiliary device for towing the vehicle when adverse terrain conditions occur, for loads skidding, or eventually for vehicle skidding. Towing force on the rope's first layer 6,350 kg, rope's diameter 12 mm, rope's length 46 m. The winch is supplied as an optional item based on request.

#### Trailer coupling:

For towing trailers up to gross weight 12,000 kg a self-operated trailer coupling is installed at the vehicle rear with the pivot diameter 40 mm. There is an auxiliary coupling mounted in the front for direct towing up to maximum vehicle weight 12,000 kg.

#### Hydraulic rear platform:

The vehicle can be equipped with a rear loadlift hydraulic platform DHOLLANDIA type DHLM 50 with loading capacity 1,500 kg.

#### Fuel Tank:

1 x 300 l. Located on the right side of the vehicle and equipped with a device indicating the amount of fuel in the tank.

#### Vehicle data

Overall length	7,378 mm
Overall width	max. 2,550 mm
Overall height	max. 3,350 mm
Clearance height	min. 389 mm
Approach angle	32°
Departure angle	33°
Wheelbase	3,900 mm
Wheeltrack	front 2,081 mm rear 2,086 mm
Curb weight	8,160 kg
Gross vehicle weight	13000 kg
Permissible gross train weight	25000 kg
Maximum speed (with speed limiter)	88 km/h
Gradeability	60 %
Fordability	750 mm
Climbing ability (vertical step)	400 mm
Crossing ability (trench width)	700 mm







TECHNOPOL INTERNATIONAL®

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## Profile

Technopol International, a.s. trade group 3(OS3), is dedicated to providing products for the defense and military industry. Business operations are managed by a highly specialized team, which includes former members of the national army and professional traders. The company's major trading partners include the Ministry of Defense of the Slovak Republic, the Ministry of Interior of the Slovak Republic, members of the North Atlantic Treaty Organization (NATO), and countries of North Africa, the Middle East, and other regions of the world. Technopol International, a.s. is a member of Security and Defense Industry Association of the Slovak Republic (ZBOP).

The company's current goals with respect to defense industry products and services include the successful implementation of domestic and export projects, the completion of innovative developmental plans, their successful introduction to the market. In addition to the commercial activities securing the latter, the company focuses on design, development and production of state of the art products on its own:

## VMS 9A – 9mm sub-machine gun

The VMS 9A sub-machine gun is a modern automatic hand-held gun with a fixed barrel and a partly locked breech system. The machine gun can be easily operated by both the left-handed and right-handed, as well as case ejection to the right or left can be selected due to its design. The sub-machine gun offers comfort and accuracy with its concept of firing with a partly locked breech bolt in the front position. Automatic function repetition is provided by gas pressure on a cartridge bottom. The VMS 9A provides fire selection mode: safe, single shot, two round burst and fully automatic.

The cocking lever of the weapon is located in the area above the barrel. The design is stationary, i.e. it is in the front position during the firing and it does not move together with the breech bolt. The cocking lever



### 9 MM SUB-MACHINE GUN VMS 9A

offers comfort and accuracy with its concept of firing with a partly locked breech bolt in the front position. The light weight due to high strength polymer used and full ambidexterity facilitate operation and control of the weapon. Further features are quick stripping and easy maintenance.

is also designed to allow easy operation by both the left-handed and right-handed. It can be set into three locked positions, to the left, to the right, or in a neutral, so called transport, position which also allows cocking of the weapon. Sights are fitted on the upper part of the upper breech bolt housing and they also provide aiming when accessories are installed. They consist of a rear sight adjustable by turning located in the rear part containing two dioptre holes and one "U" shaped open cut and a front sight fixed to the front part of the weapon and its design provides setting of the sights. The upper breech bolt housing, trigger and striking mechanism lower housing, as well as other plastic components are made of high strength polymer.

The VMS 9A can be easily dismantled into main assemblies for the purpose of maintenance and cleaning without using any tools.





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## Features of VMS 9A:

- comfort
- accuracy
- lightweight
- ambidexterity
- quick stripping
- easy maintenance



## MAIN PARTS (ASSEMBLY GROUPS)

1. UPPER BREECH BOLT HOUSING WITH BARREL AND ACCESSORIES
2. BREECH BOLT MECHANISM WITH BOLT RETURN SPRING
3. LOWER HOUSING WITH TRIGGER AND STRIKING MECHANISM, MAGAZINE SHAFT AND AN EXTENSION BUTT
4. MAGAZINE

## SPECIFICATION

Model	VMS 9A
Calibre	9 mm Luger
Weight without a magazine	1,800 g
Total weapon length	454/722 mm
Total weapon height without a magazine	198 mm
Max weapon width (in a place of a cocking lever)	55 mm
Barrel length	193 mm
Line of sight length	300 mm
Barrel rifling type	grooves
Number of grooves in the barrel	6
Magazine capacity	30 rounds





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## Company Profile:

Virtual Reality Media, a.s. (VRM) is a private company engaged in design, development, and production of state of the art simulators and training systems. VRM was established in 1992 as a computer hardware and software integrator. Since 1995 VRM provides its customers with turnkey solutions as well as comprehensive support through the life-cycle support of the synthetic training devices. Our simulation products portfolio for both Air and Land applications vary from desktop trainers all the way up to Full Flight/Full Mission Simulators in both Civil and Defense Sectors.

VRM is a renowned supplier for the Slovak MOD and customer worldwide to include USA, Africa, Middle East, Latin America and Asia.

At present, VRM employs some 60 highly skilled employees enabling the company to provide high quality products and services to its customers worldwide. The company features a wide range of in-house capabilities including software and hardware engineering, production, and system integration.

VRM is committed to design, produce, and deliver its products tailored to specific customer requirements in accordance with ISO Quality Management System. In addition, for commercial projects, the company observes all relevant FAA/EASA/ICAO standards. State of the art technologies, subsystems, and components are utilized throughout the company's development and production processes to provide customers with the most advanced and sophisticated products including qualified training, maintenance, and product life-cycle support.



Su-22 Full Mission Simulator

## Research and Development Activities:

- development of electronic and electromechanical hardware for:
  - motion platforms
  - vibrating systems
  - cockpit/vehicle cabin instrument controls
  - control loading systems
- development of software for:
  - image generators
  - hardware drivers
  - flight/drive dynamics models
  - graphical user interface (GUI) for instructor operating station (IOS)
  - computer based training (CBT) Product

## Portfolio:

### 1. Military Simulators and Training Systems:

- Fixed wing aircraft simulators
- Rotary wing aircraft simulators
- Anti-aircraft missiles systems simulators
- Ground vehicles simulators
- Multimedia Training Rooms & Computer Based Training (CBT)



Mi-171 Full Flight/Full Mission Simulator





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## 2. Civil Aircraft Simulators (built to FAA/EASA/ ICAO standards):

- Business jets: FNPT; FNPT II MCC; FTD trainers; and FFS Level A, B, C, and D
- Single engine propeller aircraft simulators

## 3. Subsystems and Software Modules:

- 6 Degree of Freedom Hydraulic Motion Platforms - payloads ranging from 1.5 to 12 tons
- Electric Control Loading Systems and Vibrating Platforms
- Power Vision Image Generator software and Immax Image Generator hardware
- Display systems ranging from single-channel flat screen to multichannel DOME-mounted



CESSNA CJ2 Level C Full Flight Simulator



Mi-17 Flight Training Device



BMP-2 IFV Full Mission Desktop Simulator



T-72 MBT Full Motion/Full Mission Simulator

## Other services provided by the company:

- 3D modeling of a variety of objects including buildings, vehicles, aircraft, ships, etc. to be implemented into various simulated scenarios;
- Terrain database modeling utilizing real digital terrain data, satellite and/or aerial photos;
- Implementation of DIS /HLA protocols to interconnect various simulators into a single network enabling joint tactical and combat training of different capabilities;
- Upgrade and relocation of existing third party simulators including Glass Cockpit conversion and Night Vision Goggles (NVG) compatibility.







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### **WAY INDUSTRIES**

Way Industries is a production company with more than 50 years experience in the field of production and assembly of civil and military vehicles and related services (maintenance, repairs, overhauls, upgrades, delivery of spare parts and after sales support).

We have got a network of representatives and agents in Europe, Asia and Africa and provide our customers with highly reliable and field proven systems and services that enjoy a very good reputation.

Our team of engineers and R&D specialists is constantly developing new solutions and move our products on the top level in terms of the quality and performance.

### **MINE CLEARENCE SYSTEM BOZENA**

Remotely controlled demining system designed for clearance of conventional land mines, UXO and IED. Its size and weight allow BOZENA to work in space limited conditions (inside forests and mountains, through plantations and various obstacles).

- BOZENA systems had been deployed and successfully used in many NATO and UN demining challenges worldwide in the past 20 years
- high resistance against anti-tank mines (9 kg TNT)
- ruggedized design
- operating capability over all terrains in extreme climatic conditions, particularly high temperatures and high humidity

We provide the machines for demining in category "mini" and "medium". Our machines have been designed and tested in order to withstand all possible demining projects all around the world. We have achieved the best solutions for mechanical demining in the category "mini" and "medium" (see BOZENA 4 in "mini" category and BOZENA 5 in "medium" category).







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### ONE-MAN TURRET

The one-man turret (OMT) has been equipped with fire control system (FCS), which is designed as a modern electronic system. Together with guns, gunners sight and stabilization of guns, it provides aiming, firing and destroying of targets in short period of time.

The OMT includes a special management system (ESVK) that provides interaction between all modules of turret control system and it controls the mode of operation of turret assemblies and weapon systems (2A42 automatic gun 30 mm; co-axial PKT machine gun 7.65 mm and ATGM launcher) and performs a complete calculations of ballistics with automatically and manually given parameters (ballistic tables, cross wind, temperature, side slope of vehicle).

The turret is equipped with control servo module for moving the weapon system in azimuth and to change it's elevation or to ensure gyroscopic stabilization of weapon systems in two axes.

Moreover, a BITE (built-in test equipment) has been incorporated for the diagnostics of the system with indication of possible failures in its parts.

The OMT with the FCS may be implemented into the BMP tracked vehicles or into any other tracked or wheeled AFV (armored fighting vehicle).

Our OMT provides level 3 protection, against AP bullets (B32) of 7,62 mm on a horizontal level, at a slope in an inclination 30° angle in whole area of azimuth angles (e.g. 360°). It also provides protection according to STANAG 4569, AEP-55 and its valid parts. Armored protection can be increased by additional armor plates.



### BOZENA RIOT SYSTEM

BOZENA RIOT SYSTEM is designed to control riots in streets and urbanized areas and to protect the law-enforcement units in action whenever peace enforcement is required. The system is intended predominantly for the special military and police units responsible for the crowd control during the violent political / social demonstrations, against football hooligans, etc.

BOZENA RIOT was designed and developed in a close cooperation with the specialists of the Slovak Police Corps. In principle, BOZENA RIOT is well protected and easy deployable barrier which can be flexibly used in favour of actual operational needs as a tool:

- (1) to direct or disperse gathered crowds into desired areas or directions;
- (2) to block entirely narrow streets and to create safe and effective access control to protected areas and buildings;
- (3) to execute direct observation and monitoring of the operational situation;
- (4) communication with rioters through the loudspeakers;
- (5) for some anti-terrorist operations, fighting against snipers, allowing a safe access to buildings and other elevated positions;
- (6) with use of the shield it can be flexibly used for removal of smaller obstacles;
- (7) with use of an easy attachable bulldozer blade it can be flexibly used for removal of bigger obstacles.

BOZENA RIOT provides high level of safety and security for the police forces on one side as well as better handling with the passive and not violent members of the crowd on the other side.



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Main ZTS – ŠPECIÁL products and services:

- 30 mm automatic gun 2A42
- Barrels production program
- DVK-30 one-man turret
- Manufacturing of 155mm SpGH ZUZANA SER 2000 self-propelled howitzers and spare components
- Manufacturing of 155mm / 52 cal. artillery systems (ZUZANA 2, EVA, DIANA) and spare components
- Service and repairs of wheeled and tracked land equipment
- SpGH DANA Overhaul

## 30 mm automatic gun 2A42

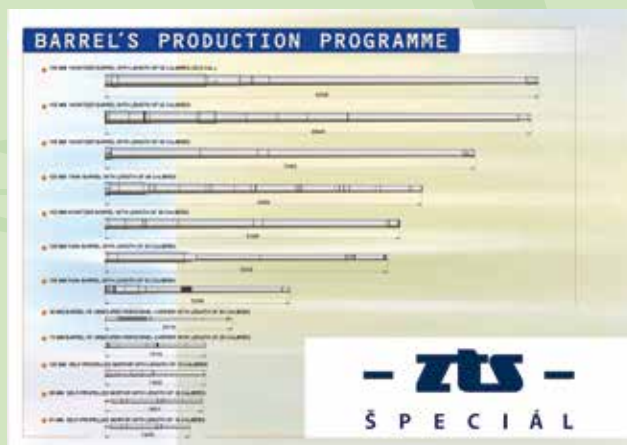
The 30 mm automatic gun is designed for firing at light armored targets within a distance up to 1500 m, non-armored targets within a distance up to 4000 m and also low-flying subsonic targets up to 2000 m within a slant distance of 2500 m. The gun can be fired in single shots or in burst (low or high rate of fire). It offers reliable functioning under sever condition such as temperature range from +50 C up to -50 C in rain, dust, frost or in a very dry environment. Serial production is ongoing in ZTS – ŠPECIÁL.

### TECHNICAL DATA OF THE GUN:

Caliber		30 mm
Number of grooves		16
Twist of grooves		715,5 mm
Rate of fire	high	min 550 rounds/min
	low	200-300 rounds/min
Weight of the gun		115 kg
Weight of the barrel		38,5 kg
Recoiling force		40-50 kN
Length of the gun		3027 mm
Feeding		Two belt type
Recocking		Pyrotechnical or manual
Number of powder cartridges		3

Barrels production program – complete production and repairs of gun barrels ranging from 30 mm up to 155 mm

- 30 mm cannon for BMP-2
- 73 mm cannon for BMP-1
- 100 mm cannon for T-54, T-55
- 81 mm, 98 mm and 120 mm mortar barrels
- 125 mm cannon for T-72
- 125 mm modernized cannon 125 MS
- 152 mm cannon for SpGH DANA
- 155 mm/45 cal. cannon for SpGH ZUZANA model 2000
- 155 mm/52cal. cannon for SpGH ZUZANA 2



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**Manufacturing of 155mm SpGH ZUZANA  
SER 2000 self-propelled howitzers and spare  
components**

**Manufacturing of 155mm / 52 cal. artillery  
systems (ZUZANA 2, EVA, DIANA) and spare  
components**

### DVK-30 one-man turret

#### DESIGNATION:

- direct fire cover for dismounted troops
- engagement of light/medium armoured targets, airborne low altitude subsonic targets, enemy surveillance means, and troops

#### MAIN FEATURES:

- light, compact, tested, easy to operate and maintain effective firing on the move at day and night
- high probability hit by first shoot
- high accuracy calculation of ballistic parameters
- turret is easily installable on a variety of wheeled and tracked vehicles
- utilization of combat proven weapons systems,
- ammunition and FCS providing for effective conduct of combat at any weather conditions, day or night

#### TECHNICAL DATA OF THE TURRET:

- |                                   |                |
|-----------------------------------|----------------|
| • Crew:                           | One-man        |
| (Gunner)                          |                |
| • Powered elevation:              | -4° ÷ +50°     |
| • Manual elevation:               | -4° ÷ +58°     |
| • Powered/ Manual traverse:       | N x 360°       |
| • Gun/ Turret stabilization:      | 2 axes         |
| • Main gun:                       | 2A42 30 mm     |
| • Coaxial machinegun:             | PKT 7.62 mm    |
| • Main gun ready rounds:          | 100 + 200 pcs. |
| (dual feed)                       |                |
| • Machinegun ready rounds:        | 1500 pcs.      |
| • Smoke grenade system:           | 6 x 81 mm      |
| • Empty turret weight (w/o ammo): | 1 050 kg       |



EVA



DIANA



ZUZANA



DANA



#### Service and repairs of wheeled and tracked land equipment

SpGH DANA Overhaul – ZTS – ŠPECIÁL performs overhauls of the complete systems DANA according to the technical conditions. For execution of service and overhaul activities of all levels ZTS – ŠPECIÁL possesses specific workplaces equipped with all necessary testing and assembly stands and tools, new technical documentation and skilled workforce.



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ZTS VVÚ KOŠICE, a. s. is a private joint-stock company operating in the field of engineering (machinery) and electro technical products. The history of the ZTS VVU KOSICE Company began in the year 1976 when a part of the drafting department of the former VSS n.p. Kosice has been set apart.



### AM 50B bridge-laying vehicle

The AM 50B bridge-laying vehicle is used mainly in the army, but it also finds application in rescue operations during natural disasters, in forestry, civil engineering and any other occasions where bridging over an obstacle is necessary.

The bridges erected over an obstacle can be used as a temporary means, however, with keeping conditions of correct treatment and maintenance, they can provide long-term (as long as several years) bridging means. The AM 50B is a wheeled self-propelled vehicle, with a superstructure consisting of a single bridge field and one detachable trestle. A single bridge field can span an obstacle with width between 10 to 12.5 m and depth from 2 m. By joining several bridge fields (max. 8 fields) it is possible to span an obstacle with width in the range of 12,5 m to 106 m, and depth from 2 to 6 m. The AM 50B can overcome fords deep 1,4 m, including the ford wave.

In present time company ZTS VVU Kosice is working in these fields:

- Military special superstructures,
- Low bad trailers for tank transportation,
- EOD robots,
- Industrial robots and manipulators,
- Transport and handling systems,
- Equipment for nuclear power plants,
- decommissioning, waste processing,
- Forming machines and lines,
- Sheet metal processing lines,
- Industrial processing automatization, controlled drives.



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#### Technical specification:

- length of opened bridge 13 500 mm
  - travel width of opened bridge 4 000 mm or 4 400 mm
  - max. load of single bridge field - vehicle with max. weight 50 000 kg
  - time of bridge erection and disassembly in favorable terrain conditions, during daytime
  - erection of single bridge field 7 min
  - disassembly of single bridge field 10 min
  - erection of bridge with four fields 30 min
  - disassembly of bridge with four fields 40 min
  - travel speed - wheeled chassis 30 - 40 km/hour
  - track laying chassis 15 - 20 km/hour
  - trestle height 1 988 - 6 052 mm
- 



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## Low loader semi trailer NLN 60-3

The low loader semi-trailer with 60 t payload is a flat semi-trailer with three-axle chassis designed primarily for transport of heavy military tracked and wheeled vehicles, ISO 1C, 1CC, 1D containers and and for the transport of broken-down vehicles over public roads and in light terrain, in moderate and hot dry climates with temperatures ranging from -32°C up to +49°C.

NLN 60 can be coupled to a road tractor with fifth wheel for 3 1/2" king-pin, with relevant engine power, ABS system and electrical equipment for military purposes.

The NLN 60 fully meets the demands of generally binding legal regulations for road transport in accordance to Act No. 725/2004 Coll., with the following exceptions:

- sharp protrusions
- gross weight
- weight proportion per axle
- dimensions - braking efficiency
- rear under-run protection
- side protection

### Technical specification:

Weights, approx. on standard roads conditions:

- Axle load capacity 3 x 18 ton – approx. 54,000 kg
- Fifth-wheel capacity of tractor unit – approx. 24,000 kg
- Max s/trailer gross weight – approx. 78,000 kg
- Empty weight of low loader – approx. 20,700 kg
- Payload capacity – approx. 57,300 kg

### Dimensions approx:

- Total s/trailer length – approx. 13,430 mm
- Length of loading platform incl. loading angle – approx. 8,500 mm
- Length of loading platform – approx. 8,000 mm
- Width of loading deck – approx. 3,500 mm

NLN 60 consists of the following main parts:

- chassis
- semi-trailer frame
- loading ramps
- electrical equipment and lighting
- accessories storage
- spare wheel holders with lifting device



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## Retriever - remotely operated vehicle

Remotely operated vehicle (hereinafter ROV) is capable of being remotely controlled over a range of 100 m line of sight both in light cross country and urban environment with a view to locate and investigate suspicious subjects. It is invaluable assets in the hands of Bomb Disposal Units of the Army, Police and other Paramilitary forces to monitor the space in transport vehicles of mass transportation, like bus, train, plane etc. With its dimensions, ROV allows to be moved in the aisles of buses, planes, trains etc. Its handling arm allows to inspect and handle subjects in the transportation means, whether located freely or in baggage compartments.

ROV can also be deployed within buildings and climb stairs for handling of hazardous material.



### A. WHEELED VERSION of ROV

ROV in basic configuration consists of the following parts:

- Wheeled chassis, wireless radio control operated
- Handling arm
- Master control station (MCS)

#### ACCESSORIES

- Charger for ROV and master control station
- Accompanying documentation in English language

### B. ARTICULATED TRACK VERSION of ROV

ROV in basic configuration consists of the following parts:

- Articulated track chassis, wireless radio control operated
- Handling arm
- Master control station (MCS)

#### ACCESSORIES

- Charger for ROV and master control station
- Accompanying documentation in English language

#### ACCESSORIES ON REQUEST:

- Four supporting arms with wheels ensuring stability in forward and backward directions (wheeled version only)
- Side supporting legs
- Front surveillance camera for travel forwards and limiting travel to backwards with integrated lighting and night vision, rotation angle  $\text{nx}360^\circ$ , tilting  $-10^\circ \div 90^\circ$
- Back surveillance camera for travel backwards and limiting travel to forwards with integrated lighting and night vision, rotation angle  $\text{nx}360^\circ$ , tilting  $-10^\circ \div 90^\circ$
- Spooler with 100 m optic cable, manually rewind
- Spooler with 100 m optic cable, automatic payout and rewind
- X-Ray device with adapter and accessories
- Transport case for ROV and handling arm
- Software for robotic control with possibility of adaptive "in - time" orientation



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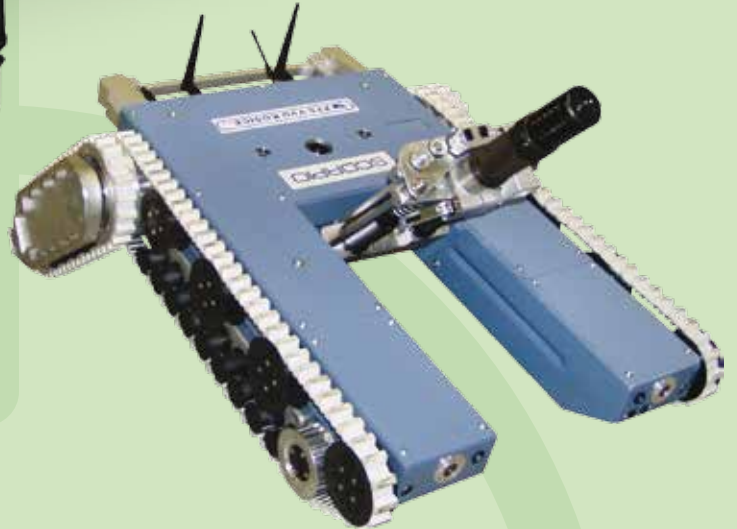
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## SCORPIO

The SCORPIO is a remotely operated vehicle (ROV) for booby-trap disposal, especially underneath vehicles.

Using a water cannon, it dislodges the firing mechanism without secondary initiation of the IED.

### MAIN FEATURES OF SCORPIO:

- Ability to pass underneath automobiles
- Ability to dispose of an IED without actually handling the IED
- Control and reconnaissance by means of camera systems
- Ability to target the IED and measure the distance of the IED from the nozzle of the water cannon and its subsequent disposal
- Ability to make a record of the whole event
- Ability to connect and use other attachments

### UNIQUE FEATURES OF SCORPIO

- A total height of only 136 mm – suitable for all kinds of automobiles
- Water cannon also included in the height of 136 mm
- Explosives can be detected and disposed of by one and the same device

### TECHNICAL PARAMETERS:

- Dimensions: 136 × 593 × 700 mm (h × w × l)
- Weight: 36 kg
- Maximum gradient: 38°
- Auxiliary tracks declination: 360°

### ELECTRO-TECHNICAL SPECIFICATION:

- Power supply: 12V DC
- Number of black & white cameras: 5 off: 2 front, 2 rear, 1 top wide angle
- Number of colour cameras: 1 off: direction finding, for cannon
- Direction finding lasers: 2 off: for cannon
- Rangefinders: 3 off: front, rear, cannon 220 to 1500 mm
- Lights: LED white 7 off: 2 front, 2 rear, 2 top, 1 direction finding (1)
- Network connectivity: Ethernet

### CONTROL PANEL

- Design: Peli briefcase
- Dimensions: 222 × 510 × 426 mm (h × w × d)
- Shielding: IP 54
- Control data transmission: wireless range approx. 100 m
- Image transmission: wireless – range approx. 100 m
- Additional antennas can be provided for enhanced control range

### ATTACHMENTS SHOTGUN

- Simple replacement of the barrel and ammunition, firing from a shotgun is possible.
- Firing procedure is similar to that of the water cannon, but for actual firing the switch in the joystick is used.
- Shotgun calibre 20 mm.

### ANALYSERS

- SCORPIO can be equipped with a variety of analysers, including ability to analyse data transfer.
- Gas analysers
- Explosives analysers
- The mounting of a particular type of analyser is governed by the customer's specification.
- Analysers are provided on an individual basis, according to customer's requirements.
- Collecting dates from Explosive analyzer MO 2 are transmitted to the control panel and are display at the control panel screen



**Security and Defence Industry Association of the Slovak Republic**

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