

POLISH DEFENCE & SECURITY EQUIPMENT CATALOGUE 2025



PL

**Polish Defence
and Security Equipment
Catalogue
2025**

Imprint

Editors Łukasz Dryblak
 Karol Sobczak
 Paweł Wiszniewski

Copyright © by the National Security Bureau
 Warszawa 2025



ISBN 978-83-60846-36-0

Cooperation The Marshal Józef Piłsudski
 Central Military Library



FOREWORD

The beginnings of the Polish defense industry date back to November 1918. When rebuilding the country, the Poles emphasized the comprehensive use of scientific and technical knowledge as well as the creative potential of scientists, designers and technicians.

In 1936, the construction of the Central Industrial District began – a modern design and production complex located at the fork of the Vistula and San rivers. Many of the companies built there continue old traditions, e.g. the “Łucznik” Arms Factory in Radom, which produces small arms, or the “Stalowa Wola” Steelworks. In the city of Stalowa Wola, built for the needs of the steelworks, the following products are now manufactured and highly valued on the global market: the M120 Rak self-propelled mortar, the Krab 155 mm howitzer, the Borsuk amphibious infantry fighting vehicle and the ZSSW 30 30 mm turret system.

We are proud of the impact that Polish scientists have had on the intellectual and technical development of Europe and the world. However, Polish industry is not only tradition, experience and generations of talented designers. It is also innovation and flexibility in adapting to changing security conditions, methods of waging armed conflicts and the challenges of the modern battlefield. Thanks to this, the Polish industry is experiencing a renaissance - with a network of companies offering technologically advanced products from the defense and civil security industries. The Polish Armaments Group alone brings together around 60 companies that design and manufacture equipment and technologies for the purposes of national defense and security. Poland is among ten largest arms exporters, and our products are increasingly recognized and valued on international markets.

Polish industry, following the changes taking place, systematically improves the quality and technological advancement of its products, a good example of which is the development of quantum technologies, including pioneering encrypted communication using Quantum Key Distribution developed thanks to the cooperation of WAT, NASK and TELDAT. The establishment of the NATO-Ukraine Analysis, Education and Training Center, the only one within the North Atlantic Alliance, is proof that Poland is a leader in research and reception of experiences from the war in Ukraine.

The strengths of the Polish industry are high quality and technological advancement, which go hand in hand with price competitiveness. Polish equipment and armaments have proven themselves in the fights in Ukraine. The “Krab” self-propelled howitzer is unmatched among similar artillery systems. The effectiveness of the portable anti-aircraft missile systems “Piorun” (Thunderbolt), manufactured by ZM Mesko S.A. and offered by WB Electronics, WARMATE loitering munition and FLYEYE unmanned aerial vehicles, optics and anti-drone systems, has also been confirmed in real operations in the Ukrainian theater.

Polish companies offer products and services in all major sectors: land, sea, air, space and cyber. Manufacturers offer, among others, modern battlefield management systems, advanced communications, optics, electronics and individual soldier equipment. Poland is a leader in the production of UAVs, anti-drone systems and various types of radars, both in terms of technological advancement and the philosophy of using these systems on the battlefield and in the protection of critical infrastructure.

The largest company supplying radars to the Polish Armed Forces is PIT-Radwar, whose P-18PL mobile early warning radar is capable of detecting stealth airborne objects and TBMs at a distance of 900 km when operating in passive mode. The company has also recently added a Naval Weapons System with a 35 mm cannon to its portfolio, which provides unique capabilities in the fight against all types of unmanned aerial vehicles and helicopters.

In Poland, there are also a number of smaller companies with high-end capabilities in anti-drone protection, such as AP Flyer and B4Limits. In the context of anti-aircraft defence, it is also worth mentioning the co-producer of GROM / PIORUN MANPADS and KUSZA (Crossbow) - Mobile Missile System. The systems offered by the Polish company Telesystem Mesko are considered to be among the best in the world.

The leader in the sale of unmanned systems is WB Electronics, offering comprehensive solutions consisting of observation and reconnaissance systems, command, communication and battlefield management, fire control and strike systems, among which the latest products include the FT-5 Unmanned Aerial Vehicle and the X-Fronter personal UAV. It is not the only manufacturer of unmanned aerial vehicles; it is also worth mentioning other companies such as FlyFocus or Tech Robotics, whose offer is presented in the Catalog.

We are also developing capabilities in the field of ground robots, where the leader with several decades of experience is the Industrial Research Institute for Automation and Measurements PIAP, whose robots are used by armies and services all over the world, including the Polish Armed Forces, which has ordered 90 PIAP Patrol robots.

The space sector is also developing more and more dynamically, as exemplified by companies such as the entirely Polish Creotech, the Polish-Finnish company ICEYE, which is a global leader in SAR satellite operations for continuous observation, and Satim, which provides software for the analysis of teledetection data.

The offer of the Polish defense industry presented in this catalog gives the opportunity to purchase not only individual products, but also comprehensive and integrated strike systems, as well as artillery and anti-aircraft systems.

The catalogue presents an offer from 87 companies containing almost 300 selected products divided into twelve categories. On the one hand, this publication illustrates the potential of the Polish defense industry. On the other, it is an inspiration and an incentive to get to know the wide range of products offered by Polish manufacturers and to establish cooperation with Polish companies.



Polish Armed Forces go under the process of modernization with the broad engagement of the Polish defence industry. Our troops use Polish products because these meet the highest quality requirements. The experience of our professional staff, high standards of research & development as well as production capabilities are transferred into real effectiveness.

I am glad that thanks to this publication, knowledge about the Polish defence industry will reach a wide range of audience.

Troops & armaments are the fighting fist of the state.

Władysław Kosiniak-Kamysz

Deputy Prime Minister, Minister of National Defence



The offer of the Polish defence industry presented in this catalog gives the opportunity to purchase not only individual products, but also comprehensive and integrated strike systems, as well as artillery and anti-aircraft systems.

The catalogue presents an offer from 90 companies containing almost 300 selected products divided into twelve categories. On the one hand, this publication illustrates the potential of the Polish defense industry. On the other, it is an inspiration and an incentive to get to know the wide range of products offered by Polish manufacturers and to establish cooperation with Polish companies.

Lieutenant General (Ret.) Dariusz Łukowski

Secretary of State, Head of the National Security Bureau



Polish defence industry is highly competitive due to its technological capabilities and innovative solutions, which are continually updated to meet modern warfare demands. The sector benefits from strong cooperation between military, research institutions, and private companies, ensuring the highest standards of quality and efficiency. Moreover, Poland offers a strategic location within Europe, providing an attractive business environment for international partners.

Krzysztof Paszyk

Minister of Economic Development and Technology

AEROSPACE & SPACE	21
AIR AND MISSILE DEFENCE	77
ARMoured VEHICLES AND ARTILLERY SYSTEMS	95
COMMUNICATION EQUIPMENT AND C4I SYSTEMS	125
CYBER & ANALYSIS, INFORMATION PROTECTION	151
ENGINEERING, LOGISTIC AND CHEMICAL EQUIPMENT	173
FORCE PROTECTION AND MOBILITY	195
NAVAL VESSELS AND SYSTEMS	219
SENSORS AND EFFECTORS	225
SIMULATION AND TRAINING	243
SOLDIER UNIFORMS AND EQUIPMENT	263
WEAPONS SYSTEMS, AMMUNITION AND EXPLOSIVES	279

CONTENTS

FOREWORD	3
PRODUCTS	19
AEROSPACE & SPACE	21
AMSTA Digital border and critical infrastructure system	22
Aurora Satellite Terminal	23
Board Support Package (BSP)	24
Bootloader (BSW)	24
CANopen On-Board Protocol Stack	24
Civil aviation CAO	25
Design and production of aviation products	26
Blok 2E-ME on-board integrated control and warning system "EKARAN"	26
IFF System Interface type CITB-29	26
PS-COM-01 Control Panel	27
T- CITB-29 TESTER	27
Remote Control Unit for IFF System type PS-CIT-01	28
T-PS-CIT-01 TESTER	28
DRAGONFLY Loitering Ammunition System (LMS)	29
ekoSKY 2.0	30
Farada G1-B VTOL drone	32
Farada G2 VTOL drone	33
FLYEYE mini Unmanned Aerial System	34
Flyfocus Cableguard Patented Tethered UAS	35
Flyfocus Lemur Vertical takeoff landing fixed-wing aircraft	36
Flyfocus Polaris Ultimate aerial surveillance tool	37
Giez/WarbleFly Loitering Ammunition System	38
G6060 SST sCMOS camera solution for Space Situational Awareness, Surveillance and Tracking needs	39
HUSSAR – Lightweight and Portable X-Band Synthetic Aperture Radar	40
HyperSat Eagle HR EO a 1-2m GSD high resolution Earth Observation microsatellite	42
HyperSat satellite family Versatile, Reliable, and ITAR-Free Solutions	44
HyperSat Seagull SAR Microsatellite	45
ICE Cube On-board Control Unit	46
ICEYE's Latest Generation Satellite	46
Lenses	48
Liquid Rocket Fuel HTP (hydrogen peroxide)	
in concentrations ranging from 85% to 98% and DMAZ (2-dimethylaminoethylazide)	50
MADDOS Multi-sensor Automatic Dron Detection & Observation System	51
MADDOS VTOL Vertical take-off and landing UAV	52
VTOL 350e	52
VTOL 600h	53
Maintenance of C-130 Hercules	54
Maintenance of F-16	55
Maintenance, repair and overhaul (MRO), Aircraft Painting	56

PORTABLE C-UAS SYSTEMS	57
Handheld jammer (Handheld-9 Drone C-UAS)	57
Manpack jammer (Manpack-9 Drone C-UAS)	57
Vehicle protection system (MADDOS MDP)	57
PRISMS	58
Rasel – Autonomous Tracking and Telemetry Communication System	60
ReconSKY	62
Scanway Camera System (SCS)	63
Scanway Optical Payload (SOP)	63
Space Optical in-house production	64
Special-use printed circuit boards	66
SPECTRE-2	67
Synthetic Aperture Radar (SAR) Payload	68
Thorium Space Chipsets	70
UAS HAASTA	71
WARMATE Loitering Munition System	72
X-FRONTER Mini UAV	73
XY-IFTE	74
XY-SAR-X	75

AIR AND MISSILE DEFENCE **77**

ANTI-AIRCRAFT MISSILE SYSTEM POPRAD	78
Anti-aircraft Rocket-artillery System PSR-A PILICA	79
BYSTRA MOBILE 3D SHORT RANGE RADAR	80
CABLE HARNESSES	81
CKE-1T thermal target sight for anti-aircraft gun and missile system	82
Control and Measurement Station	82
DJ-25 Jammer. Unmanned Aerial Vehicle (UAV) jammer system	84
ELECTRO OPTICAL SYSTEMS	85
MSI-DS TERRAHAWK PALADIN	86
PIORUN MANPADS	87
Repairs, Modernizations, Modifications, Integration, Maintenance at the Depot Level	88
Rockets S-5KO, S-5MO	88
SKYctrl Interceptor Drone	89
SKYctrl L containerized system	90
SKYctrl Omnidirectional FPV drone neutralizer	91
SKYctrl S containerized system	91
Twin-Round Mobile Air Defence Manpads System KUSZA (Crossbow)	92
ZU-23-2CP Anti-aircraft Artillery System	93

ARMoured VEHICLES AND ARTILLERY SYSTEMS **95**

122 mm Ammunition with HE-462 Projectile and Reduced Charge for D-30/2S1	96
152 mm Ammunition with HE-540 Projectile and Full or Reduced Charge for D20/2S3	96

155 mm Artillery High-Explosive Base-Bleed Round with Extended Range	96
Authorized maintenance, repairs, overhauls, modification and modernization of the Leopard 2 tanks	97
BAOBAB-K SCATTERED MINE LAYING VEHICLE	98
BORIMEX GEARBOXES RANGE	99
BORSUK Amphibious Infantry Fighting Vehicle	100
BÓBR A modern 4x4 amphibious armoured vehicle	102
BWR-1S/1D Execution of a long-term contract for comprehensive modification of the BWR-1S/1D vehicles	103
Directional Spool Valves for Extreme Environmental Conditions	104
GAK-81	104
Heated observation devices OPO-120F, OPO-125F, OPO-130F	105
Heavy wheeled recovery vehicle	105
Hydraulic System for Anti-Aircraft Defence Vehicles	106
HYDRAULIC WINCHES	106
Hydropneumatic Suspension for Tracked Vehicles	108
IMITATOR OF A CANNON SHOT ISA – 155 TRAINING AMMUNITION	109
ISA-73 mm cannon shot imitator	109
KRAB 155 mm – Self-propelled howitzer	110
M120 RAK 120 mm mortar turret	111
M17T Thermal Imaging Periscope	112
Oil Hydraulic Systems for Tracked and Wheel Vehicles	113
OVERHAULS AND RETROFITTING OF MBT Leopard 2A4/T-72/PT-91	114
Overhauls of Armoured Recovery Vehicle (WZT-2/WZT-3)	115
Power Pack designer and manufacturer	116
ROSOMAK 8x8 APC	117
Smart & flexible ceramic materials	118
Special Transporter JELCZ brand. Type 663.45.	120
TUR VI	121
WARAN 4x4 MULTI-PURPOSE TACTICAL VEHICLE	122
ZSSW 30 REMOTE-CONTROLLED TURRET SYSTEM	123

COMMUNICATION EQUIPMENT AND C4I SYSTEMS 125

BMS JASMINE	126
COMP@N Software Defined Radio	127
CSD EP System Client	128
CyView C2	129
C3IS JASMINE	130
Digital Baltic	131
Digital radio relay R-460A	131
Digital Wideband Radio R-450C-01	132
EyeQ Land	132
FlyAway SMART Terminal	133
FONET Digital Communication Platform	134
FT-5 Digital Communication Platform	135
HMS JASMINE	136
Mobile Access Node – SIL720-MWD	137

PERAD 6010 Digital Personal Radio	138
PIK MC Communication Integration Platform – Mission Critical	139
RKP-8100	141
SatPack AutoMate	142
SatPack Cobalt Terminal	143
TacNet400	144
Tactical Terminals	145
Topaz Integrated Combat Management System	146
UAV Radio Data Link	147
BMR-10-N1 Ground Radio Module	147
Aircraft Radio Module SMR-10-S	147
VoIP gateway CV-12r-01	148
VSAT MASTER Satellite Terminal	148
White Rabbit Switch the sub-nanosecond time-synchronisation switch for large distributed systems	149
WRK-01	149

CYBER & ANALYSIS, INFORMATION PROTECTION **151**

All in 1 Zero Client Terminal SIL720-L/T	152
Borderscan for the protection of smart borders	153
Cryptomage Cyber Eye™	154
Cyber Bastion	154
Enigma Electronic Monitoring System (EMS)	155
Financial Trail	156
FTS Filter Tuning Solutions powered by AI	157
Fudo Enterprise – Intelligent Privileged Access Management and Secure Third-Party Access	158
IDENTT Biometrics Engine	158
IDENTT eWallet	159
IDENTT Vision	159
OREC AI-Based software for object detection and classification on SAR imagery	160
Plumla-NGN	161
Portable VTC System SIL788 – MVTC/WRB	162
RP-201-01 Routing Platform	162
Safety of Critical Data Electromagnetic and Ballistic Protection in a Transportable (Mobile) Container	163
SCADvance XP®	164
SecureVisio – cybersecurity management platform	165
Servers Room	166
Shielded Cabinet SIL720 – SzE19xx Series	167
SSIG - SAR Signature Simulator	168
SUS-24-02 Tactical Server	170
TEMPEST NATO SDIP-27 and EU IASG 7-03 compliant IT equipment	170

ENGINEERING, LOGISTIC AND CHEMICAL EQUIPMENT **173**

AMBULANCE	174
ARMORTOPCOAT PU 1000-10 Polyurethane camouflage enamel	175
Engineering simulations and research	176

Flatrack Load Platforms	178
Fortis M.165 Hooklift System – Advanced Logistic Solution for the Armed Forces	179
GENERAL PURPOSE TRUCK WITH CRANE	180
LUNAR – ROTARY DETONATION KILN FOR DISPOSAL OF EXPLOSIVES AND AMMUNITION	181
MS-20 DAGLEZJA A WHEELED VEHICLE-LAUNCHED SUPPORT BRIDGE	182
NS-26	184
Professional military containers for uniformed services	185
SEMI-TRAILER ST555-20W.M and ST775-20W.M	186
SEMI-TRAILER ST775-20W	188
SEMI-TRAILER ST775-24W.H-PA	189
Tent halls	190
Universal Expandable 20' Containers	192
Versatile Transport Trailers	193

FORCE PROTECTION AND MOBILITY **195**

AD-2000 Parachute System	196
ADS Safety System For use in special military equipment	197
AEDO Safety System	198
ALEXA Light Weight Gas-Tight EOD Container	199
Armored Observation Container (OKO)	200
DEDAL (AD-95s.3 AZ-95s.3) series 3 Parachute System	201
EVA Gas-Tight Explosion-Proof Container	202
Feniks Future Parachute System	203
Feniks Military G-9 Parachute System	204
Feniks S Parachute System	205
FLAME signal mine	206
Mobile camouflage	206
Mobile Data Center	207
Mobile high-capacity evacuation ferry PEP.30-01 type	208
Mobile RACK Transport Case ShMRC1904	209
PIAP FENIX Lightweight EOD & reconnaissance robot	210
PIAP GRYF EOD mobile robot	210
PIAP IBIS Heavy robot for pyrotechnic operations	211
PIAP PATROL Robot for C-IED and CBRN tasks	211
Static camouflage 2D Multispectral Winter Camouflage Net	212
Static camouflage Optical and multispectral static camouflage 2D single and double-sided versions	213
Static camouflage Optical and multispectral static camouflage 3D	214
Thermal and anti-radiation inner liners	215
UNL. Universal High Mobility Unmanned Vehicle	
with Reconnaissance and Combat Version GOBLIN	216
Vehicle Filtration & Ventilation Unit UFS.B2.02-100FW/24V, w.02A	217

NAVAL VESSELS AND SYSTEMS **219**

Dynamic testing	220
Minehunter KORMORAN II class	221

MLM – PROMIENICA	222
OSU-35K Naval Armament Ship Weapons System	223

SENSORS AND EFFECTORS 225

ARGUS PSIM the physical security information management class platform, integrating technical security systems	226
Defender Wideband RF Jamming Product Family	227
FIELDctrl 3D MIMO Radars: Advance, Range, Runway, Ultra	228
HAWK	230
Hertz GPS Terminal 4 Pollux (HGPST4 Pollux)	231
Hertz GPS Terminal UAV (HGPST UAV)	231
Hertz GPS Terminal uGram (HGPST uG)	231
Hydra – Multicolor Photometry For Orbital Object Characterization	232
IFF Mark XIIA Family Products	233
Mobile Passive Radar XY-PCL-MU	234
Passive Coherent Location Radar XY-PCL-K	235
Perseus High-End Ground-Based Observation System	236
Ship's Dynamic Positioning System	238
Small Intelligent Light Satellite Terminal SilPack Series	240
Transportable Passive Radar XY-PCL-C	240
TUGA – 4D AESA Radar	241

SIMULATION AND TRAINING 243

Advanced Hoist Simulation Training System	244
CDeX Cyber Range	244
Combat Mission Simulator for Fixed-Wing and Rotary-Wing Aircraft	245
Combat Training Support System “ŚNIEŻNIK”	245
Complex Tactical and Fire Simulators for Crews of Combat Vehicles and Tanks in the Platoon Version	246
Container Shooting Range MoST-2	247
Container Shooting Range	247
CQB House Shooting Range	248
Ejection Procedure Training Simulator	249
Flight Simulator for Fixed-Wing and Rotary-Wing Aircraft	250
Mobile Bullet Traps	251
Mobile Container Shooting Range MoST-1	252
Mobile Container Shooting Range (40 FT HC)	253
Mobile Shooting Target Robotic Target™ 2WD, Robotic Target™ 4WD	253
Modular Tactical Shooting Ranges MoST-5 and MoST-10	254
Optical Sights Simulators for Military Equipment	255
Pneumatic Decoys	256
PRACTICE AND TRAINING DEVICE UST-2 PIORUN	257
SJCL-6P Driving Simulator for Leopard 2A4 Main Battle Tank	258
SOKOL Parachute Simulator	259
Training Simulators	261
Modified Training Simulator 9F632.M1	261

Simulator of Anti-Aircraft Missile Combat Vehicle PRWB OSA (SA-8) based on VBS3 technology	261
Wireless Control System WSB-04M for Battlefield Areas	261

SOLDIER UNIFORMS AND EQUIPMENT **263**

CBRN-E protective suit	264
DAYTIME MODULAR SIGHT DCM-1	265
HB-04 ballistic helmet	265
HP-05 ballistic helmet	265
Individual Anti-drone Systems The Antidrone Poncho	266
Individual Anti-drone Systems Individual Winter Camouflage Suit	266
KKT-01 Bullet Proof Vest	267
KKZ SG-01 bullet-proof vest	267
Laser Target Designators	268
LASER WARNING SYSTEM SSP-1 OBRA-3	268
Lightweight Flame-retardant Fragment-proof Suit	269
Modular Bulletproof Vest MKO 2.0	270
MP-6 gas mask	271
MT-1 THERMAL IMAGING MONOCULAR	271
MU-3ADM MODULAR NIGHT VISION GOGGLE SYSTEM	271
MUP-RESCUE PACK MARINE PILOT SUIT	272
NIGHT VISION GOGGLES PNL-2ADM	273
NIGHT VISION GOGGLES PNL-3X	273
NIGHT VISION MONOCULAR/GOGGLES MU-3M/MU-3ADM	274
OMNIDIRECTIONAL OBSERVATION SYSTEM SOD-1	274
ROCK 2.0 Vest	275
ROCK one Vest	275
STABILIZED COMMANDER'S OPTOELECTRONIC HEAD GOD-1	276
STABILIZED GUNNER'S OPTOELECTRONIC HEAD GOC-1	276
STABILIZED OBSERVATION AND TRACKING OPTOELECTRONIC HEAD FOR ANTIAIRCRAFT SYSTEMS GOS-1	277
THERMAL IMAGING BINOCULARS NPL-1T	277
THERMAL IMAGING MONOCULAR MT-1	277

WEAPONS SYSTEMS, AMMUNITION AND EXPLOSIVES **279**

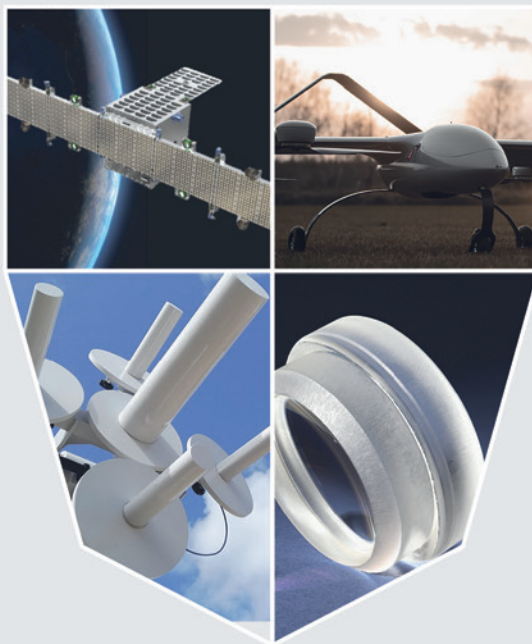
122 mm M-21 FHD "FENIKS" rocket	280
40 MM GRENADE LAUNCHERS	280
ALEX-338 Sniper Rifle	281
AMMUNITION (MESKO)	281
AMMUNITION (DEZAMET)	282
40 x 46 mm LV AMMUNITION	282
40 x 53 mm HV AMMUNITION	283
60 mm MORTAR AMMUNITION	283
120 mm MORTAR AMMUNITION	284
155 mm ARTILERY AMMUNITION	284
Combat Modules for Tactical Warheads	285

CONTROLLED ANTI-TANK ANTI-VEHICLE MINES SPPLW	286
Explosive Device for Armament Neutralization "PULS"	286
Filling of Ammunition Ammo Filling Lines / Special Chemical Installations	287
FILLING SERVICES	287
GNOM GROUND LOITERING MUNITION	288
GOMANDER TACTINOX QD LOCK SILENCER	289
GX WARHEADS FOR UNMANNED VEHICLES	290
HEAT MINE FOR MANUAL LAYING MR-123	291
HEXOGEN (RDX)	291
LMC 2021 Light Infantry Mortar	291
LMP-2017 60 mm Light Infantry Mortar	292
M107 155 mm Artillery Ammunition	292
Modular Weapon System ZMT MWS-25	293
"Moskit" anti-tank guided missile	293
MSBS Grenade Launcher cal. 40x46 mm	294
MSBS Grot Grot Modular Firearm System	295
MWS Modular Weapon System	297
OCTOGEN (HMX)	298
Pangolin – family of explosive reactive armours	298
Recoilless Anti-tank Missile Launcher RPG-75-M	299
Recoilless Launcher for Thermobaric-cumulative Missiles RPG-75-MP	299
Recoilless thermobaric missile Launcher	299
RGP 40 Multi-shot Grenade Launcher	300
SA-35 – Self-Propelled Gun System	301
SHAPE CHARGE	302
Sniper Rifle MSBS 762N cal. 7.62 x 51 mm (.308 Win)	303
Tactical Heads for Unmanned Aerial Vehicles	304
TECHNOLOGICAL LINE FOR HTPB (hydroxyl-terminated polybutadiene) PRODUCTION	305
UKM 2020S General-purpose Machine Gun	306
TNT	306
UŁK Universal Shaped Charge	308
VIS 100 Cal. 9x19 mm The Semi-Automatic Pistol	308
WKM-Bm/NSW-UTIOS Heavy Machine Gun	309
WLKM 12.7 Multi-barrel Machine Gun	309
ZMT WKW-50 Large Caliber Sniper Rifle	310
ZSMU A3/A3B/A5 Remotely Controlled Weapon Station	311

COMPANIES	313
Advanced Protection Systems S.A.	314
Air Force Institute of Technology	315
AIR-POL Sp. z o.o.	315
AMZ-KUTNO S.A.	316
AP-FLYER	316
ARMPOL Research and Development Company	317
Asseco Poland S.A.	318
AUTOCOMP MANAGEMENT Sp. z o.o.	318
B4Limits	319
Borimex	320
Bydgoskie Zakłady Elektromechaniczne BELMA S.A. PGZ	321
BZB UAS Sp. z o.o.	322
Centrum Rozwojowo-Wdrożeniowe Telesystem Mesko	322
Centrum Techniki Morskiej PGZ	323
Centrum Techniki Okrętowej S.A.	323
Creotech Instruments S.A.	324
Cryptomage	325
Cybersecurity Foundation	325
DEMARKO S.A.	326
Enamor International	326
Enigma Systemy Ochrony Informacji Sp. z o.o.	327
Enigma Information Security Systems – ELFO Consortium	328
ETC-PZL Aerospace Industries	328
EUROTECH Sp. z o.o.	329
Eycore Sp. z o.o.	329
Fabryka Broni „Łucznik” – Radom Sp. z o.o. PGZ	330
FARADA GROUP	331
Flyfocus Sp. z o.o.	332
Fudo Security Sp. z o.o.	332
GISS Sp. z o.o.	333
Hertz Systems	334
Huta Stalowa Wola S.A. PGZ	334
ICEYE Polska Sp. z o.o.	335
ICsec S.A.	336
IDENTT	336
Jakusz Sp z o.o.	337
Jelcz Sp. z o.o. PGZ	338
KLIMAWENT S.A.	338
Komes Sp. z o.o.	339
Lubawa S.A.	339
Łukasiewicz Research Network – Industrial Research Institute for Automation and Measurements PIAP	340
Łukasiewicz Research Network – Tele and Radio Research Institute	341
Macro-System Sp. z o.o.	341

Maskpol S.A. PGZ	342
Matic S.A.	342
Mesko S.A. PGZ	343
Military Aviation Works No. 2 PGZ	344
Military Institute of Armament Technology	345
Miranda Sp. z o.o.	346
Modular System Sp. z o.o.	346
N7 Space Sp. z o.o.	347
NOVOL Sp. z o. o.	348
Nowak Innovations Sp. z o.o.	348
Obrum Sp. z o.o. PGZ	349
PCO S.A. PGZ	350
PIT-RADWAR S.A. PGZ	351
PONAR Wadowice S.A.	351
Przedsiębiorstwo PREXER Sp. z o.o.	352
Rekord Hale Namiotowe Sp. z o.o.	352
Remontowa Shipbuilding S.A.	353
Rosomak S.A. PGZ	353
Satim Satellite Monitoring	354
Scanway S.A.	355
SecureVisio	356
SILTEC Sp. z o.o.	356
Smart Fluid S.A.	357
Solaris Optics S.A.	357
SpaceForest Sp. z o.o.	358
Spectre Solutions Sp. z o.o.	359
Sybilla Technologies Sp. z o.o.	359
SZCZĘŚNIAK Pojazdy Specjalne Sp. z o.o.	360
Tech Robotics S.A.	361
TELBUD SA	361
TELDAT	362
Thorium Space S.A.	363
Transbit	363
Vector Synergy	364
WB Group	365
WOJSKOWE ZAKŁADY MOTORYZACYJNE S.A. PGZ	366
Wojskowe Zakłady Uzbrojenia S.A. (WZU S.A.) PGZ	366
XY-Sensing Sp. z o.o.	367
Zakłady Chemiczne „Nitro-Chem” PGZ	368
Zakłady Mechaniczne „BUMAR-ŁABĘDY” S.A. PGZ	369
Zakłady Mechaniczne „Tarnów” S.A. PGZ	369
Zakłady Metalowe DEZAMET S.A. PGZ	370
Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o.	371
ZAMET-GŁOWNO 2 sp. z o.o sp. k.	371

CATALOGUE



AEROSPACE & SPACE

AMSTA

Digital border and critical infrastructure system

WB ELECTRONICS S.A. ► p. 365



The AMSTA system is a modern perimeter protection system designed to safeguard critical infrastructure and state borders. With a network of intelligent sensors, this system ensures the security of facilities such as power plants, ports, refineries, warehouses, pipelines, and flood embankments against unauthorized intrusion by individuals and vehicles. The AMSTA system is a solution based on artificial intelligence algorithms for the protection of facilities and areas crucial to the safe operating of the state, using neural networks implemented in seismic sensors and advanced image analysis algorithms from video sensors.

The system can be supplemented with 2D and 3D radar equipment and a fleet of FlyEye and FT-5 unmanned aerial vehicles (UAVs). UAV systems are capable of long-endurance airborne capability and are equipped with advanced object observation and reconnaissance sensors.

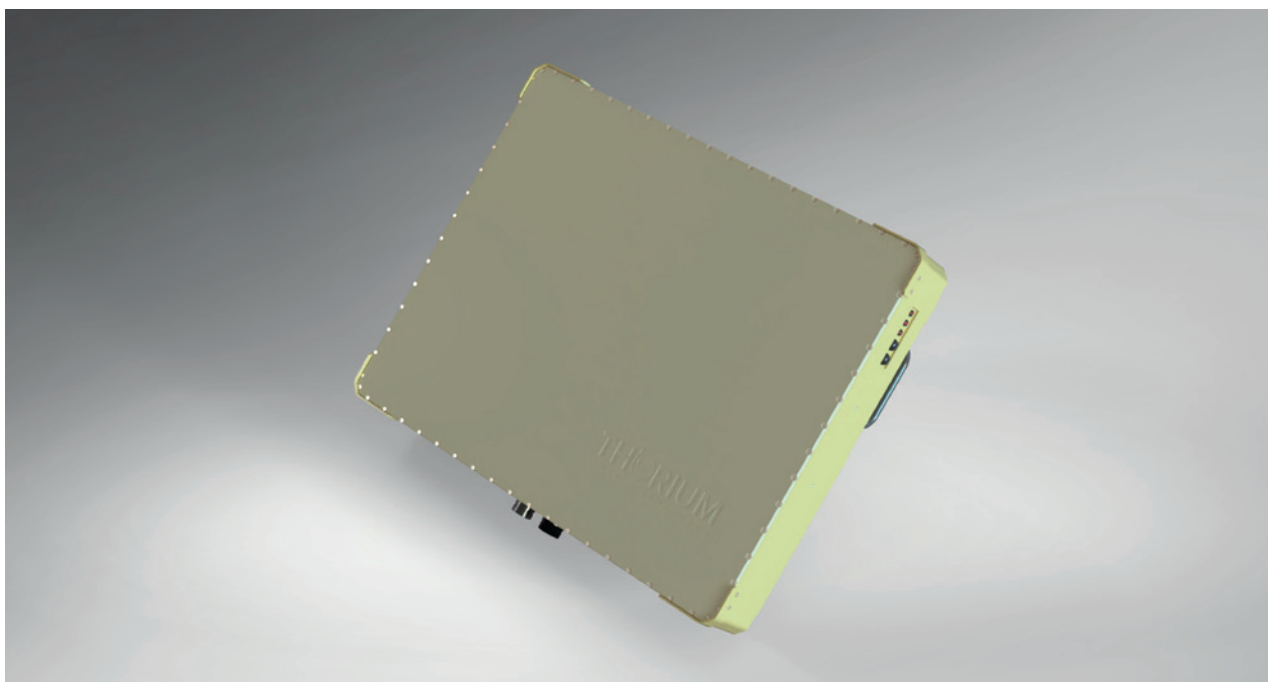
The AMSTA system, is available in two variants: cable (fixed) and wireless (mobile). Each can be adapted to the specific needs of the user taking into account local field conditions. In the cable variant, all sensors in the system are connected to each other via a fibre-optic network and are powered from a fixed power source. The radio communication system allows the dispatcher to share images

from fixed cameras or directly from the UAV monitoring the selected area with foot and vehicle patrols in the field. Seismic sensors using algorithms based on artificial intelligence are able to filter out animal signatures from humans with very high efficiency, and therefore reduce false alarms and support image analytics. The system architecture is resilient to the effects of single failures.

All data from seismic sensors, radars and images from cameras and unmanned systems are transmitted directly to the management centre. A specialised application, running on a ruggedised laptop or tablet, consists of functional modules designed to configure the system, modify the settings of individual system components and analyse data received from seismic sensors, radar and cameras and unmanned systems. The application continuously receives data from the server (from all system components) and visualises it in the form of messages, warnings, videos, photos and other necessary data, and archives the current operation of the system. The AMSTA system in the wired version is based on digital fibre-optic solutions ensuring secure data transmission and a fixed 230V/24V cable power supply. In the wireless version, the data transmission takes place in a ttier network: the LCS and DCS.

Aurora Satellite Terminal

Thorium Space S.A. ► p. 363



The Aurora Satellite Terminal redefines satellite communication with its state-of-the-art technology and unparalleled versatility. Engineered for both stationary and mobile use, it seamlessly adapts to diverse environments — whether on land, at sea, or in the air. This flexibility positions Aurora as a robust solution for industries and operations demanding reliable connectivity in remote or challenging conditions.

A standout feature is its advanced phased array antenna technology, enabling dynamic independent dual-beam steering for uninterrupted, high-quality connections. Coupled with its compatibility with geostationary (GEO) and low Earth orbit (LEO) satellites, the terminal ensures global coverage and reliable performance across multiple networks. While its high throughput supports data-intensive applications, Aurora is particularly well-suited for transmitting critical information, such as HD video streams and essential operational data.



Aurora simplifies deployment with its automatic satellite tracking, providing continuous, stable connections without manual adjustments. Its design also emphasizes security, integrating advanced encryption for secure data transmission. Despite its advanced capabilities, the terminal offers intuitive installation and operation, minimizing the need for extensive training.

Ideal for humanitarian missions, military operations, and industries like oil and gas or maritime navigation, Aurora guarantees connectivity where traditional methods fall short. Whether for emergency communications or commercial ventures, the Aurora Satellite Terminal combines innovation, reliability, and performance to deliver a cutting-edge communication solution for the modern world.



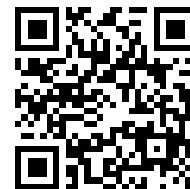
Board Support Package (BSP)

N7 SPACE ► p. 347

Ready to deploy, cost effective driver library for ARM and LEON-based space systems

Key features:

- SAMV71Q21(RT), SAMRH71F20, SAMRH707F18
- ECSS criticality category B pre-qualified
- Static memory allocation
- Object-oriented design
- No dependency on any external library
- Used as a base for BSW – tested in flight software
- RTEMS integration layer
- ESA ECSS qualification test suite and data pack included



More details at
<https://bootloader.space/#bsp>

Bootloader (BSW)

N7 SPACE ► p. 347

Ready to deploy, cost effective boot software for ARM and LEON-based space systems.

Key features:

- SAMV71Q21(RT), SAMRH71F20, SAMRH707F18, Leon3 based systems
 - Demonstration version working on SAMV71 Xplained Ultra and SAMRH71F20-EK available
 - ECSS criticality category B pre-qualified
 - Based on ESA SAVOIR (Flight Computer Initialization Sequence Generic Specification)
 - High code and decision coverage
 - Self test of the critical CPU modules
 - Failure reporting through boot and death reports
 - Bare metal design (no RTOS used)
 - Execution from internal or external non-volatile memory
 - ESA ECSS qualification test suite and data pack included
- <https://www.armadadigital.com>



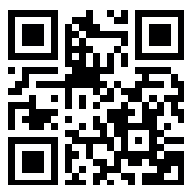
More details at
<https://bootloader.space/#bsw>

CANopen On-Board Protocol Stack

N7 SPACE ► p. 347

Highly customizable and configurable open-source library targeted for critical embedded systems

- ECSS criticality level B validation test suite and documentation:
 - Qualification data pack compliant with ECSS-E-ST-40C and ECSS-Q-ST-80C standards
 - ECSS-E-ST-50-15C validation tests
 - 100% line, branch and MD/DC coverage by unit-tests



See more at:
<https://canopen.space>

- C language API of the library provides:
 - Pure C99/C11 interface
 - Object-oriented design
 - Static memory allocation
 - No external libraries dependencies
 - C++ wrappers (for non-critical software)
- Full compliance with CiA 301 and ECSS-E-ST-50-15C:
 - PDO, SDO, SYNC, EMCY, NMT
 - Support for ECSS-based bus redundancy in NMT service and 'time objects'

Civil aviation CAO

Military Aviation Works No. 2 (WZL2) ► p. 344



Capabilities:

- Authorized Service Centre for Cirrus and Diamond aircraft types:
 - lanned 50 hours and 100 hours maintenance, annual maintenance and special maintenance;
 - repairs of composite structures;
 - Garmin and Avidyne avionics system maintenance;
 - CAPS system component maintenance.
- renovation of paint coating /painting of aircraft;
- Non-Destructive Testing (NDT);
- professional aircraft cleaning;
- filling of oxygen system;
- filling of defrosting agent.

Scope of the approval:

- Cirrus SR20, SR22, SR22T,
- Diamond DA20 (engine Continental or Rotax),
- Diamond DA40 (engine Austro Engine, Technify or Lycoming),
- Diamond DA42 (engine Austro Engine lub Technify),
- Diamond DA62,
- Diamond DV20 (engine Rotax).
- Sonex LL (Special Category),
- Vans RV-8, RV-10,
- Cessna 150, 152, 172, 182

For the above mentioned types, CAO may either extend the validity of the ARC or issue a new ARC.

CAO

Continuing airworthiness management is based on a certificate (PART M/G) issued by the Civil Aviation Authority (PART M/G) on the basis of relevant maintenance programs and contracts with aircraft operators.

The Authorized Service Centres for Cirrus and Diamond

Wojskowe Zakłady Lotnicze Nr 2 S.A. (WZL2) is the Authorized Service Centre for Cirrus and Diamond aircraft types. ASC employees have been trained at the company's U. S. headquarters in Duluth and have received relevant certificates of competence: Certificate of Completion Caps Technician, Maintenance Excellence, Composites, Certificate of Training Garmin & Avidyne. WZL2 Service Centre has been equipped with a number of diagnostic devices for Cirrus aircraft, thanks to which it is possible to perform many specialist services and tests. The service is carried out after: 50 hours, 100 hours, one year, while other repairs are carried out in accordance with the approval or after consultation with the manufacturer and Civil Aviation Authority. It is also possible to buy parts and accessories at the Service Center.



Certificates:

- CAO is a certified Comprehensive Airworthiness Organization, certificate No. PL.CAO.0016
- approval of the national organization NCAO, certificate PL.NCAO.0003



Blok 2E-ME on-board integrated control and warning system "EKARAN"

Advantages of the 2E ME block use:

- full compatibility with the block 2E-01;
- the possibility of recording up to 500 messages in the internal memory of the block 2E-ME (twice as much as on LM-35P tape of the block 2E-01);
- the possibility of viewing recorded messages on the 2E ME block display; ergonomics and operating comfort;
- safe data archiving and documentation on a computer or printout; quick playback of check results on a computer and printout;
- elimination of an expensive LM-35P tape use;
- lack of necessity of periodical works performance (e.g. cleaning of print head needle, cleaning of a roller pressing a tape, adjustment of a supply spool clutch, etc. in the block 2E-01).

The 2E-ME unit is used for presentation of messages from the block 1E on a LED display and for recording them in the operational memory. There are three luminous guides on the block 2E (FAIL, TURN, MEMORY), two buttons for block menu operation and connection (DATA) which enables data readout from the internal memory.



IFF System Interface type CITB-29



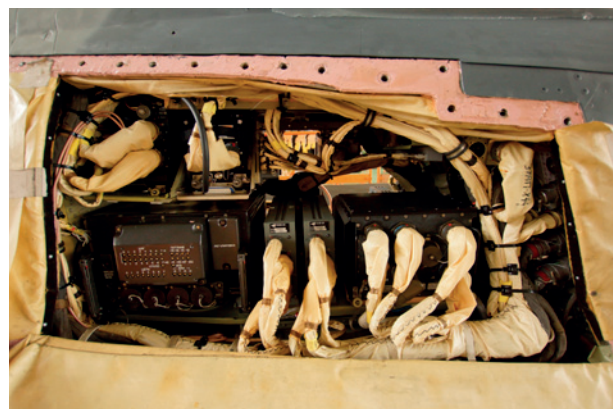
Technical parameters:

- power supply DC: nominal +27V;
- consumed power: max. 50W;
- transmission type: Mil-Bus 1553B, ARINC 429, RS232;
- discreet inputs/outputs;
- device readiness to start operation: < 2s;
- weight: < 2,5kg.

Interface CITB-29 serves for integrating the IFF system of type e.g. AN/APX 125, DPX 7 with the existing systems on aircraft like: C-130, C-295, or MiG 29. It may also be applied on other kinds of aircraft equipped with a transponder or interrogator of the IFF system.

The interface enables to process and select data for modes: M1, M2, M3, M4, M5 Level 2, MC, and MS EHS of the IFF system. Interface CITB-29 for external communication utilizes interface MIL-Bus 1553B, ARINC429.

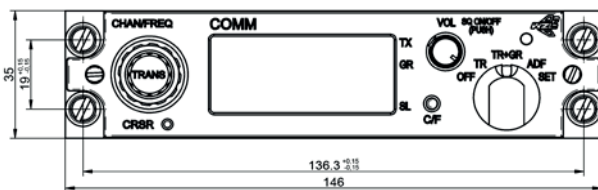
Interface CITB-29 complies with environmental conditions according to NO-06-A103, NO-06-A105 and NO-06-A107.



PS-COM-01 Control Panel

The PS-COM-01 control panel is used for R-862 radio station control. The unit enables memorization of up to 100 frequency channels with ascribed names, operation with two frequencies (awaiting-edited and working), direct choice of frequency, frequency monitoring via the superior panel (slave mode), as well as cooperation of the radio station and MDP mission computer (ARINC 429).

The PS-COM-01 can be also used for control of a different type of a radio station equipped with the ARINC 429 interface. Interface CITB-29 complies with environmental conditions according to NO-06-A103, NO-06-A105 and NO-06-A107.



Technical data:

- DC power supply: nominal +27V;
- absorbed power: max. 10W;
- display: alphanumeric LED [two-rowed, 8 characters in each row];
- number of symbols/characters simultaneously displayed on the screen: 16;
- frequency range: 100,000÷149,975MHz with a step 25kHz; 220÷399,975MHz with a step 25kHz;
- transmission type: 2D3A, ARINC-429, RS-485;
- readiness to work: does not exceed 2s;
- weight: does not exceed 1kg.

T- CITB-29 TESTER

TESTER T-CITB-29 serves for complex checks, periodic maintenance and troubleshooting of interface CITB-29 failures. The device has been located in a suitcase-shaped transport container Explorer Cases providing for its high portability.



The Tester is designed for MROs and aviation military units operating aircraft equipped with interface CITB-29.

TESTER T-CITB-29 provides for checking the following parameters:

- co-operation with PS-CIT-01;
- co-operation with CIT AN/APX-125;
- co-operation with the navigation-targeting complex;
- inputs/outputs ARINC 429;
- data bus MIL-BUS-1553;
- configuration inputs.

The TESTER T-CITB-29 device set involves the following:

- device TESTER T-CITB-29;
- operating manual;
- power supply set;
- harnesses for connection to interface CITB-29.

Remote Control Unit for IFF System type PS-CIT-01

Remote Control Unit (RCU) PS-CIT-01 is used for control of IFF system type e.g AN/APX 125 on MiG 29M aircraft, DPX 7 on MiG 29UBM aircraft. It can also be used on other aircraft equipped with a transponder, interrogator of IFF system. The PS-CIT-01 enables control and selection of data for the following modes: M1, M2, M3, M4, M5 Level 2, MC and MS EHS of IFF system and displaying settings for an interrogator operation mode for AN/APX 125 unit.



Technical parameters:

- DC power supply: nominal +27V;
- power input: max. 27W;
- communication type: ARINC 429 2xOUT/1xIN RS485;
- readiness to work: < 2s;
- weight: < 1kg.

For external communication, the PS-CIT-01 uses interface ARINC429 or RS485. Information is displayed on the 3ATI display with the resolution of 480x480 pixels. The PS-CIT-01 is adapted for operation on the NVIS mode. The remote control unit satisfies environmental conditions in accordance with NO-06-A103, NO-06-A105, NO-06-A107.



T-PS-CIT-01 TESTER

T-PS-CIT-01 tester is used for comprehensive checking, periodical maintenance and fault location of PS-CIT-01 remote control unit. The tester is placed in the Explorer Cases which provides high mobility.



The T-PS-CIT-01 tester set consists of:

- T-PS-CIT-01 tester;
- operation manual;
- wireless keyboard;
- connection harnesses.

The T-PS-CIT-01 tester provides checking of:

- RS485 communication between PS-CIT-01 remote control unit and peripheral devices;
- ARINC 429 communication between PS-CIT-01 remote control unit and peripheral devices;
- discrete input and output signals of PS-CIT-01 remote control unit;
- keyboard and the remaining manual elements of PS-CIT-01 remote control unit;
- backlight control systems of the PS-CIT-01 remote control unit display;
- PS-CIT-01 remote control unit power supply.



DRAGONFLY Loitering Ammunition System (LMS)

Military Aviation Works No. 2 (WZL2) ► p. 344

DragonFly opens up a new line of loitering munitions based on the unmanned aerial vehicle platform for military purposes, more and more willingly and increasingly often used by armies worldwide on modern battlefields. The system can be used independently or carried/transported by land units or special troops. DragonFly is an alternative to anti-tank ATGMs thanks to the ability to operate within a much larger radius, allowing the detection and observation of a potential target in a relatively high time comfort. The core of the DragonFly is the carrier of vertical take-off and landing warheads in the quadrocopter system, constituting a unique solution on a global scale. The use of small size loitering munitions, allowing for vertical take-off, landing and hovering in the air, opens up a new direction in conducting operations on the modern battlefield. The system's functionality makes it possible to be applied satisfactorily in combat missions carried out by Territorial Defense Forces or Special Forces.

System can be used by one soldier/operator. After starting the system, operator searches for a target, indicates it and gives the command to attack. In ATTACK mode, LMS flies straight to the indicated target, continuing the mission even in case of losing communication with the GCP. Cancelling the attack procedure, changing the target or disarming the warhead is possible only if radio communication is maintained. Neutralization of the target can also be executed manually in any time using the explosion button on the GCP. This function can be useful for example, when LMS is located over or close to the target (in the field of destruction). This system does not rely on GPS and can be operated fully without GPS signal, which makes it resistant to jamming.

TECHNICAL DATA

Dimensions

Rotor span	700 mm
Length with warhead	900 mm
Weight	5 kg
Range	10 km
Ceiling	500 m
Hovering flight time	20 minutes
Speed	0 ÷ 120 km/h
Service	1 soldier
Temperature range from	-10 to 40°C



ADVANTAGES

- The greatest advantage of the system is its mobility, which is achieved by its low weight, small dimensions and a very short time of system start-up.
- The entire system is carried by one soldier in a specially designed backpack.
- Remote system of warhead arming and disarming;
- Resistance to interference during the attack phase;
- Resistance to constant rainfall and dust;
- Stand-alone system or carried or transported by subunit of land or special forces;
- An alternative to anti-tank guided missiles providing a much larger radius of action;
- Allows to detect and observe a potential target in relatively high time comfort;
- The system was designed to carry out combat operations, both in open and urban areas.



POSSIBLE WARHEADS: cumulative GK-1 HEAT, thermobaric GTB-1 FAE, fragmentation GO-1 HE, training GO-1 HE-TP / GO-1 HE-TR



Flight modes:

- ALT HOLD (NONGPS)
- POS HOLD (GPS)
- PATROL (GPS)
- PATROL (NONGPS)
- GRID (GPS)
- ATTACK (GPS)
- ATTACK (NONGPS)
- RTL (GPS)

The original vertical take-off plane of Polish production. One of the first Polish vertical take-off and landing (VTOL) aircraft. It is made of advanced composite materials and equipped with the latest electronic components. Powered by electric motors, which allow it to fly for up to 150 minutes. The Plug&Play system, vertical take-off, and landing make flight preparation and operation surprisingly simple and convenient.



- FLIGHT TIME – up to 150 min
- MAXIMUM PAYLOAD MASS – 1,5 kg
- CRUISING SPEED – 20 m/s (72km/h)
- MASS (MTOM) – 16 kg
- ASSEMBLY TIME – 10 min
- TAKEOFF/LANDING – Vertical
- RANGE – 180 km



Developed with passion - built with experience

We care about safety and quality of our machines, which is why we tested individual parts of the unmanned aerial vehicle in laboratory conditions. Thanks to durability tests, we checked in practice what maximum loads our structure can carry and whether it corresponds to our calculations.

Appropriate arrangement of fibers, proper annealing of our components and many other parameters increase load resistance by more than 200%.



FARADA G1-B VTOL drone

Farada Group Sp. z o.o. ► p. 331

The VTOL (Vertical Take-Off and Landing) drone is designed to redefine aerial surveillance and operational efficiency. Its clever design ensures a maximum take-off mass (MTOM) of under 25 kg and a wingspan of up to 3,6 m. Additionally, the drone generates 40 kg of thrust during vertical take-off and landing, enabling operations in challenging weather conditions. Despite its lightweight structure, it can carry a payload of up to 5 kg.

The drone is equipped with redundant systems that meet the highest aviation standards. With a built-in GSM module, it offers unlimited communication range. Throughout the entire flight, the UAV is protected from interception by third parties, thanks to specially encrypted codes. We can provide communication with the drone by a radio link, which is crucial in areas where there is none cellular network or it is disrupted.

The package consists of three items: Ground control station where you can operate the drone, Antenna which automatically follows the UAV for the best connection and radio communication module which is located in the plane. This solution allows us to provide connection range of up to 200 km.

Our UAVs align with zero-emission policies, as all motors are powered electrically, ensuring no emissions are produced during the flight. Operating at altitudes of 1,000 m above sea level, with a ceiling of 3,000 m, this drone is suitable for versatile deployments across various terrains. It boasts a flight endurance of 2.5 hours, flying autonomously from takeoff to landing, making it a reliable asset for a wide range of missions.

If requested the UAV can be equipped with camera systems, from our partners with the following specification:

- Thermal Imager (640x512, 15x zoom MWIR with 1,5o nFOV)
- Color Zoom Camera (2160p QFHD, video at 30 fps, max zoom x90)
- Laser Pointer
- Laser Range Finder
- Automatic object tracking
- Artillery Fire Adjustment Software
- Efficient Stabilization
- Moving Target Indicator
- Onboard video recording (32Gd)
- High precision Geo-Location



FARADA G2 VTOL drone

Farada Group Sp. z o.o. ► p. 331



With an impressive wingspan of 4,4 meters, the UAV weighs 40 kg, complemented by an additional 7 kg battery weight and 14 kg fuel weight, housed within an 18-liter fuel tank. This configuration supports a Maximum Take-Off Mass (MTOM) of 65 kg. Powered by an 125cc internal combustion engine.

Operating efficiently at altitudes of 1000 meters and capable of reaching a ceiling of 3000 meters above sea level, this drone is built for demanding missions across diverse environments.

Engineered for versatility, the drone features a gimbal camera and a payload capacity of up to 12 kg. It excels in various flight parameters, with a minimal speed of 24 m/s, a cruise speed of 26-29 m/s, and a top speed of 35 m/s. Thanks to a hybrid propulsion system, the plane is able to reach a range from 300 to 600 km.

The Farada G2 is a UAV with a wide range of applications, for example for the surveillance of state borders, national parks, military bases. To ensure best possible efficiency in that kind of application it is possible to integrate a camera with specifications to the following :

- Thermal imager (Sensor type: 640x512, LWIR (uncooled), Wavelength: 7.5- 13.5 μm staring array, Sensitivity: <30 mK, Zoom ratio: 5x optical (+4xdigital))
- Color zoom camera (Resolution 1920x1080px, Optical zoom 30x (1080p) / 67x (480p))
- Laser Range Finder (Power: 50mW, Wavelength: 830nm, Classification: Class IIb)
- Automatic object tracking (onboard)
- Moving Target Indicator (onboard)
- High precision Geo-Location
- Artillery Fire Adjustment Software
- Onboard video recording (32Gb)
- Electronic video enhancement



FLYEYE mini Unmanned Aerial System

WB Electronics ► p. 365



FlyEye is a mini Unmanned Air System (UAS), that is used for intelligence, reconnaissance, and surveillance of the battlefield, sensitive areas, national borders, natural disasters, or large public events. The reliability and usability of the FlyEye System, have been tested and proven during many field evaluations around the world, as well as during active service in combat zones with the Polish Armed Forces. The system has been subject to field evaluations during both day and night and in extreme environmental conditions such as high wind, high and low temperatures, increased humidity and altitude changes.

The FlyEye UAV is hand-launched, which allows it to be operated in tight spaces, such as urban areas or forest clearings and maximally simplifies logistics. Before the UAV lands, it rejects its battery and payload container. Then the UAV glides towards the operator-specified landing location. Not only this ensures effective protection of the most expensive part of the system, i.e. the observation head, but it also facilitates control over the UAV in the last stage of the flight, helping to minimize its speed.

The observation head with two cameras (visible light and IR) attached under the fuselage provides significantly better observation options and a function for rapid switching between the two video feeds. The whole system is operated by only two operators and can be securely stowed in two backpacks.

This UAV's ease of assembly and disassembly, modular design and launch readiness, which can be achieved in 15 minutes, makes it usable in almost any terrain conditions, even for small squads.



Flyfocus Cableguard Patented Tethered UAS

Flyfocus Sp. z o.o. ► p. 332



Key Features:

- Long Range Transmission:
Tracking antenna with digital, encrypted video, and data link allows for up to 10 km of range on EU standards (CE) and 15 km on US standards (FCC).
- Configurability:
Thanks to the universal payload mount, attaching both our modules and those requested by the customer is not a problem.
- Tethered Power:
High voltage supply system allows power transmission to the drone by a lightweight and durable cable. This solution enables the UAV to stay in the air 24/7.



Technical Specification:

- Materials: carbon fibre, fiberglass
- Tether endurance: up to 30 days
- Max tether altitude: 100 m Max takeoff weight: 16 kg
- Max payload: 5 kg
- Flight endurance: up to 30 min
- Max speed: 60 km/h
- Temperature range: from -20 to +50 °C
- Flying range: up to 15 km
- Preparation time: 10 min
- Wind resistance: 13 m/s
- Autopilot: certified or non-certified open-source
- Data transmission: Fiber-Optic (RF silent), P2P, LTE, or Satellite Radio Communication
- Takeoff/landing type: vertical, possible from moving platform with 1 m landing accuracy
- IP rating: IP55
- Remote controller: Flyfocus GCS
- Vision systems: EO/IR with optional Laser Rangefinder and Target Designator
- Safety systems: ADSB transponder, emergency parachute
- Optional payloads: upon request



Flyfocus Lemur

Vertical takeoff landing fixed-wing aircraft

Flyfocus Sp. z o.o. ► p. 332



Overview:

Lemur is capable of long-endurance missions with heavy payloads.

Versatile:

Surveils during day and night with an optoelectronic surveillance gimbal equipped with advanced machine vision and A.I. algorithms capable of high-accuracy target pointing, moving object detection, and classification.

Long Range:

Capable of transporting loads over long distances. Cargo bay designed to carry up to 5 kg.

- Wings: 4 segments
- Data transmission: P2P, LTE, or Satellite Radio Communication
- Takeoff/landing type: vertical or classic with 2 m landing accuracy
- Remote controller: Flyfocus GCS
- Vision systems: EO/IR with optional Laser Rangefinder and Target Designator
- Safety systems: ADSB transponder, emergency parachute
- Optional payloads: upon request

Technical Specifications:

- Materials: carbon fibre, fiberglass
- Wingspan: 4.7 m Max takeoff weight: 30 kg
- Weight with fuel: 20 kg
- Flight time: up to 8 hours with internal combustion (IC) motor or 3 hours with electric motor
- Operational cruise speed: 100 km/h
- Wind resistance: 14 m/s
- Max altitude: 4000 m AMSL
- Temperature range: from -20 to +50 °C
- Flying range: up to 800 km
- Preparation time: 10 min
- Engine: electric or internal combustion
- Autopilot: certified DO-178B, DO-254, DO-160





Flyfocus Polaris

Ultimate aerial surveillance tool

Flyfocus Sp. z o.o. ► p. 332

Overview:

UAV Polaris is a unique aircraft designed from scratch in Poland with long-term, quiet operations in mind. It is smaller, lighter, and, above all, more cost-effective than the currently used solutions. It fits in a small backpack and carries various payloads like EO/IR, mapping cameras, communication relays, or radio-electronic warfare (SIGINT). It's hand-launched and climbs at a 45° angle, eliminating the need for ground infrastructure. The aircraft approaches the landing on its back (to protect the payload) at a 45° angle using flaps and reverse thrust. It's equipped with the proprietary "Thermal AI" algorithm, which allows it to find and use the thermal updrafts to increase engine-free flight time.

Technical Specifications:

- Materials: carbon-glass composite
- Propulsion: silent electric motor with a folding propeller
- Wingspan: 2.2 m Max takeoff weight: 4.5 kg
- Backpack weight: 8-14 kg
- Flight time: up to 4 hours with Thermal AI algorithm
- Speed range: 45-110 km/h
- Max altitude: 4000 m ASL
- Temperature range: from -20 to +50 °C
- Preparation time: 5 min
- Navigation: GPS + INS, additional anti-jamming systems or missions without GPS
- EO/IR payload: daytime camera 40X zoom, thermal camera 640x480
- Payload features: object tracking, recognition, target geolocation, "fly by camera"
- Takeoff: hand launch up to 45°
- Landing: inverted belly landing with 10-50° glideslope (flaps and reverse thrust)
- Backpack dimensions: 63x40x30 cm



Giez/WarbleFly Loitering Ammunition System

Military Institute of Armament Technology ► p. 345

Airframe loitering ammunition system for precision target strike. The system consists of a transport tray - a UAV launcher, an aerial platform with a warhead, a ground C2 station and a tracking antenna. The system is characterized by ease of operation, short time to prepare the platform for launch, and the ability to operate the system by one soldier.



The system is equipped with GX-4 warheads specially designed for this purpose by WITU /mass of about 1.6 kg/. The GX-4 warheads family consists of:

- GO-4 HE /high explosive/ warhead – used to strike personnel, unarmored vehicles and machine gun nests. The lethal radius – 30 m GK-4 HEAT shaped charge warhead – a warhead used to destroy medium and lightly armored vehicles and MBT. Armor penetration capability – min. 350 mm RHA
- GTB-4 FAE thermobaric warhead – a warhead used to destroy unarmored vehicles, anti-personnel (including hidden) and bunkers and shelters. Range of effective striking – 20 m GO-1 HE-TR training warhead – a non-explosive training warhead used for operator training



Technical data:

→ Dimensions of the shipping container [mm]	200×200×1350
→ Aircraft length [mm]	1075
→ Aircraft span [mm]	1660
→ Aircraft mass with launch tray - launcher [kg]	<12
→ Aircraft mass in flight with warhead [kg]	5.8
→ Flight duration [min]	30
→ Flight range (limited by data link) [km]	>10
→ Flight altitude during patrolling and search targets above ground level [m]	120÷200
→ Maximum altitude (above sea level) [m]	2000
→ Flight time to a target 10 km away [min]	8
→ Patrolling time in the area of the potential target [min]	20
→ Velocity during patrolling [km/h]	80÷105
→ Velocity during attack [km/h]	150

Creotech Instruments S.A. – CTI ► p. 324

The solution allows for stand-alone camera operations and enables user algorithms to be run on the built-in computing resources, enabling to tailor the solution to specific

- Sensor: Gpixel Gsense 6060 (FSI/BSI)
- Resolution: 6144 x 6144, 10 μ m pixel size
- Quantum Efficiency: Up to 95%@580nm (BSI)
- Dynamic Range: Max 90 dB (BSI, HDR mode)
- Readout Speed: 22fps at 12-bit full frame
- Cooling: TEC with air (customizable options)
- Interfaces: 10GbE, USB 3.0, and more

Mass: ~5kg (without external shutter).

Ideal for scientific instrumentation, quantum applications, and space systems.



HUSSAR

SpaceForest Sp. z o.o. ► p. 358

HUSSAR radar from SpaceForest is a portable X-band system that uses SAR technology to provide high-resolution terrain scanning and motion detection with a resolution of up to 15 cm, regardless of time of day or weather conditions. It can be mounted on unmanned aircraft / UAV, planes or helicopters with a range of up to 15 km.

Equipped with a mechanically stabilized antenna, an integrated real-time SAR processor, and an FMCW radar with low probability of interception, HUSSAR operates in Stripmap and Spotlight modes, delivering exceptional image quality. Its GMTI capability enables the detection and tracking of moving ground targets, making it an essential tool for border and security monitoring, supporting border guards, military forces and police. Additionally, it is useful in surveying, mapping and monitoring land changes, including for instance natural disasters.

Radar solution developed and offered in partnership with XY-Sensing.

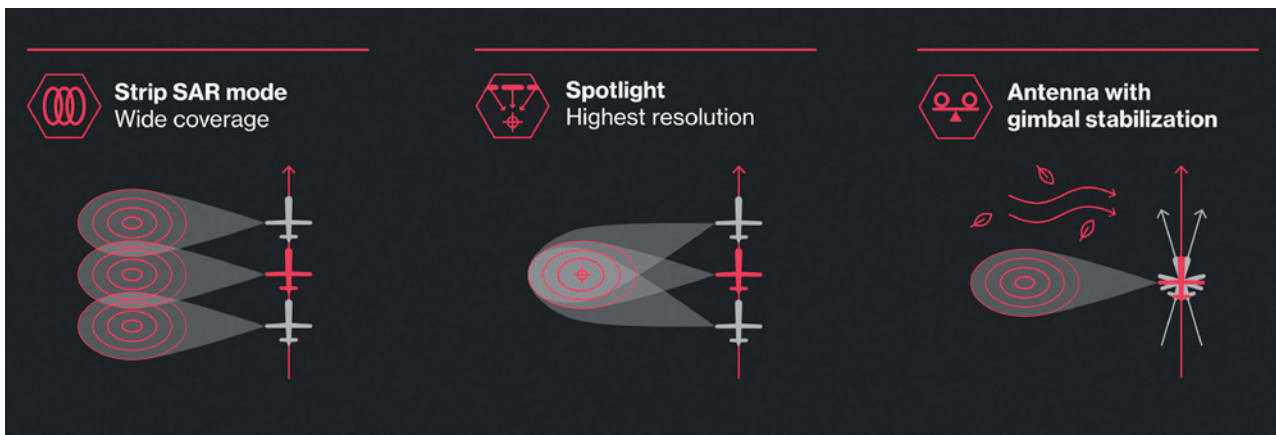
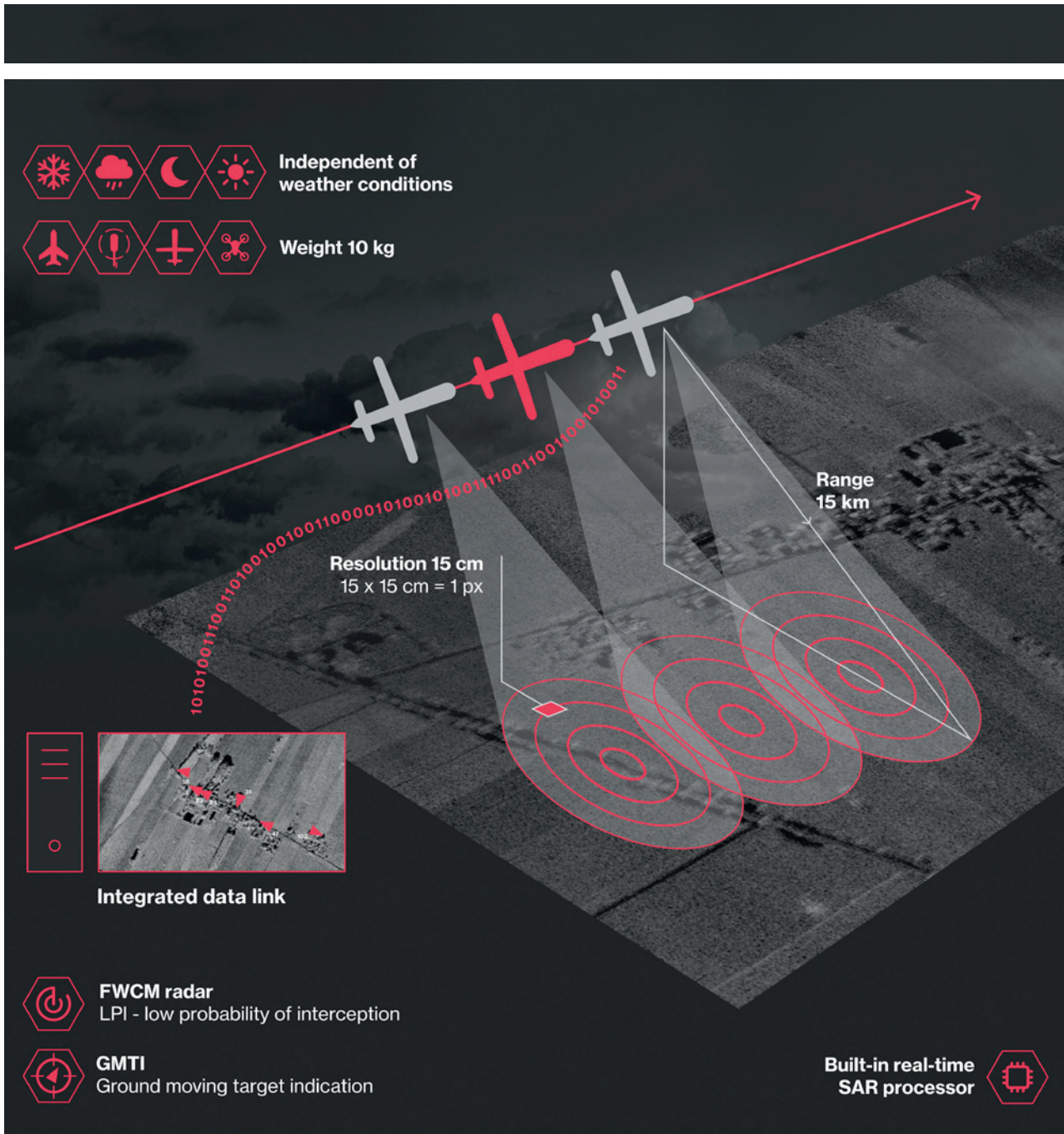


Key Features

- 15 cm resolution for precise imaging
- 15 km+ range for extensive coverage
- Real-time processing with onboard SAR
- GMTI capability for detecting and tracking ground movement
- Gimbal-stabilized antenna for enhanced precision
- Seamless UAV and aircraft integration
- Low Probability of Interception (LPI) FMCW technology



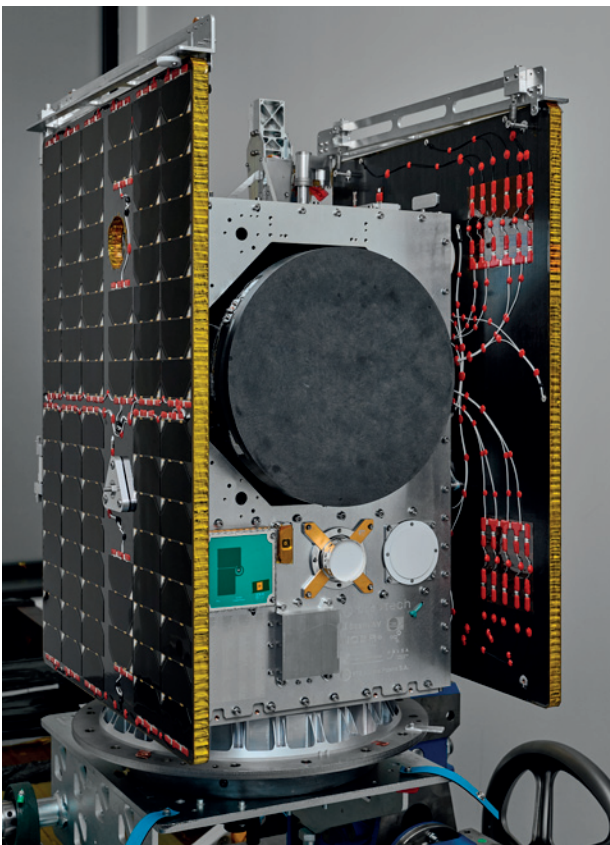
Parameter	Minimal	Maximal	Unit
Frequency range	9	11	GHz
Range (radar to target)	150	15000	m
Finest range resolution	30	15	cm
Elevation angle of the beam	25	65	°
Supply (voltage & power)	36	52 / 180	V / W
Weight (with and without housing)		10	kg
Temperature range	-10	50	°C
Dimensions (including aircraft integration)	120x20x20 (84x45x15)		cm
Interfaces (Control & Data Storage)	Ethernet / USB		
Operation modes	Stripmap, Spotlight, GMTI		



HyperSat Eagle HR EO

a 1-2m GSD high resolution Earth Observation microsatellite

Creotech Instruments S.A. ► p. 324



HyperSat Eagle HR EO enables high-resolution (<1.5m GSD) Earth Observation in the visible and near infrared parts of the spectrum. Eagle HR EO is constructed and manufactured to the highest quality standards, adhering to tailored ECSS requirements. The first satellite has been successfully launched and operated by Creotech Instruments in August 2024.

HyperSat Eagle HR EO is a verified satellite with space heritage offering high-resolution Earth Observation at <1.5m GSD in PAN, RGB, NIR, advanced pointing accuracy, and secure data communication. With an ITAR-free design, 5-year lifespan, and compatibility with major launch systems, it ensures reliable and flexible performance.

Key specs include:

- Compact size (~400 x 400 x 640 mm) and ~80kg mass
- Customizable payload tailored to mission needs
- Swath 7km x 5km minimum
- Propulsion options (chemical or electrical)
- Advanced AOCS for precise maneuvering and pointing
- Redundancy offered as a standard
- Offers secure data transmission with AES-256 encryption, supporting up to 400 Mbps X-band downlink and CCSDS/PUS compliance



HyperSat Eagle HR EO simplifies mission success with optional propulsion and comprehensive support services.



HyperSat satellite family

Versatile, Reliable, and ITAR-Free Solutions

Creotech Instruments S.A. ► p. 324

HyperSat is offered in three main configurations, optimized for the current rideshare options:

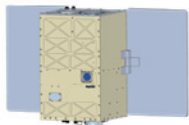
- HyperSat Kestrel,
- HyperSat Eagle
- HyperSat Seagull.

Examples of HyperSat missions include:

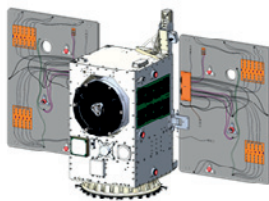
- MIKROGLOB Earth Observation constellation composed of 4 microsattellites for Polish MoD to be launched by 2027
- CAMILA Earth Observation constellation composed of at least 4 optical and SAR satellites for ESA to be launched by 2027
- PIAST Constellation composed of 3 formation-flying spacecrafts to be launched in 2025
- EagleEye - in-orbit-demonstration mission of HyperSat Eagle variant, successfully launched in 2024”

All use the same common-core modular avionics, designed from the ground up to cover the entire 10 – 200 kg range of buses. All satellites utilize the same encrypted TM/TC stack, interoperable with most ground segments in Europe, allowing flexibility in expanding and replenishing constellation over time, adding new payloads and orbits as required. Possible payloads include: Optical EO, SAR, SIGINT, PNT, COMM, and more. All platforms are delivered with optional secure ground segment as a service or as a deployable system set up at customer’s chosen site.

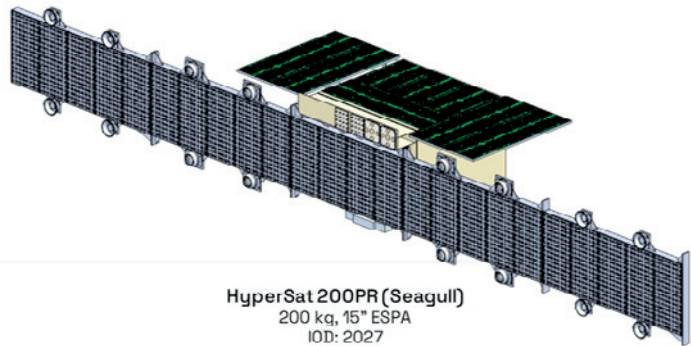
Full ownership of the spacecraft can be transferred to the end-user. Support from Creotech Instruments is available throughout the entire delivery timeline: from requirements specification to ongoing support during nominal mission operations.



HyperSat 25P (Kestrel)
30 kg, 8” ESPA
IOD: 2025



HyperSat 80PR (Eagle)
80 kg, 15” ESPA
IOD: 2024



HyperSat 200PR (Seagull)
200 kg, 15” ESPA
IOD: 2027





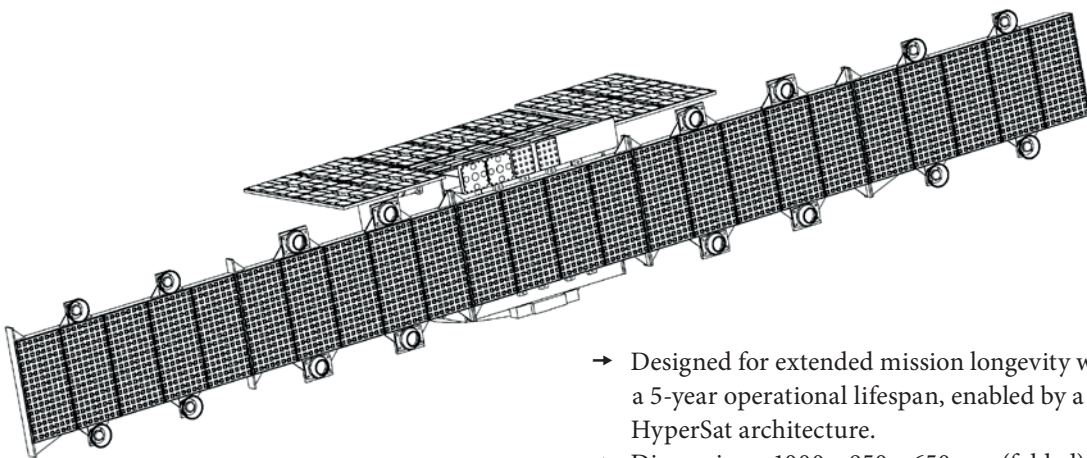
HyperSat Seagull SAR Microsatellite

Creotech Instruments S.A. ► p. 324

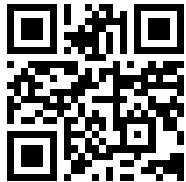
Creotech Instruments S.A. presents the HyperSat Seagull platform, a state-of-the-art ITAR-free microsatellite for high-resolution Synthetic Aperture Radar Earth observation. This spacecraft is designed for a cost-effective and sovereign access to 24/7 global monitoring and includes a Polish SAR payload developed by Eycore Sp. z o. o.

Key specs include:

- High-resolution imaging with GSD of ~1m (Spot), 5 m (Strip), and 15 m (ScanSAR) at 500 km altitude. Swath widths extend beyond 5 km in Spot mode, 40 km in Strip mode, and 100 km in Scan mode.
- Offers secure data transmission with AES-256 encryption, supporting up to 400 Mbps X-band downlink and CCSDS/PUS compliance.



- Designed for extended mission longevity with a 5-year operational lifespan, enabled by a redundant HyperSat architecture.
- Dimensions: 1000 x 950 x 650mm (folded)
- Mass: ~200 kg, ensuring compatibility with a wide range of launch vehicles.



See more at: <https://obc.n7space.com>

ICE Cube On-board Control Unit

N7 SPACE ► p. 347

The complete, ready-to-use OBC module for CubeSats and ISS in-orbit experiments

- Fully compatible with ISS ICE Cube Facility
- Based on Microchip radiation tolerant SAMV71Q21RT
- 2x64 MiB SDRAM, 2 GiB NAND Flash
- TC/TM over Ethernet with PUS-C protocol
- OBCU-payload interfaces: UART, GPIO, I2C, SPI, ADC
- Power protection for payloads OVP, OCP
- Created following the ECSS standards for software development and quality
- Power consumption <~1 W Independent power control and data lanes
- Integrates a TC/TM link protocol based on ESA's Packet Utilization Standard ver. C (PUS-C)
- Developed in collaboration with Space Research Centre of the Polish Academy of Sciences (CBK PAN)

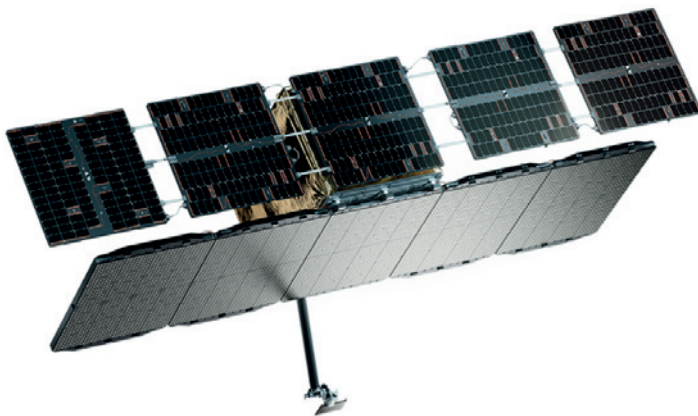
ICEYE's Latest Generation Satellite

ICEYE POLSKA Sp. z o.o. ► p. 335

For governments and commercial clients, ICEYE has really changed what is possible from Synthetic Aperture Radar (SAR) Earth observation. Our New Space approach has allowed clients to purchase one or more latest generation ICEYE SAR satellites. We are the only organization in the world to offer high-precision SAR satellites for direct purchase. We also offer full launch procurement services, training and support, plus access to additional data from our own constellation.

Designed for flexibility

The design of our unique satellite and antenna lets you take a wide range of operational approaches. By mechanically maneuvering the satellite and electronically steering the radar beam, you can quickly and easily scan large areas in low resolution and zoom in at high resolution when needed. This enables unprecedented operational capability.



GROUND RESOLUTION	Up to 0.16 m
BANDWIDTH	1200 MHz
CARRIER FREQUENCY	9.8 GHz
PEAK RADIATION	7.0 kW
SAR ANTENNA	2.6 m ²
POLARIZATION	VV
LOOK DIRECTION	Left and right
NOMINAL INCIDENCE	20-50 degr.
COMMUNICATION	S-/X-band
X-BAND DOWNLINK	Up to 700 Mbps
PROPULSION	Electrical Ion
BATTERY	1.4 kWh
ONBOARD STORAGE	1 TB
MASS	200-220 kg

Powerful and Affordable

Until now, SAR satellite missions have used large and expensive platforms carrying massive payloads. Our novel SAR system is a miniaturized, active phased array sensor mounted on a small satellite platform, enabling frequent imaging of any AOI and making our SAR satellites powerful and affordable by design.

Operational, proven, trusted

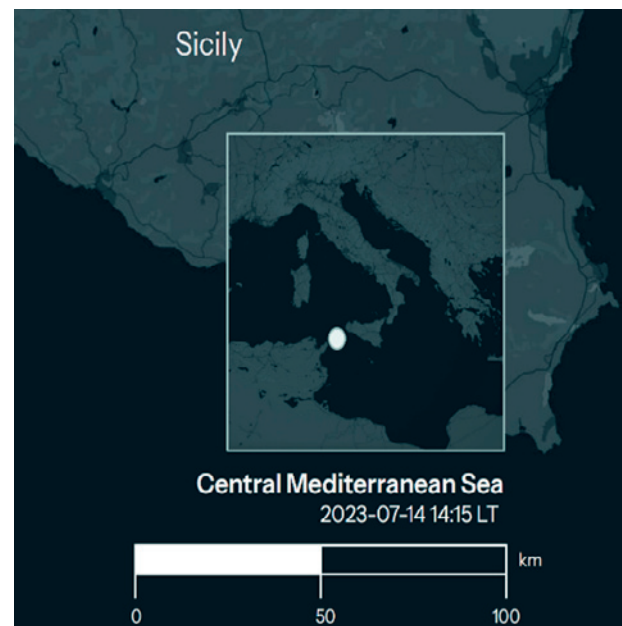
We've launched over 40 satellites since 2018 with 20+ more planned for 2025 and beyond. As the only New Space company with the proven ability to design, build and supply new-era SAR Earth observation satellites, we are already trusted by governments and organizations across the globe. If you are interested in procuring ICEYE satellites, please get in contact and we would be happy to provide a tailored solution to meet your requirements.



Accurate, near real-time Earth monitoring with SAR data. Dwell Mode CSI (Colorized Subaperture Image) emphasizing man-made objects using various colors

A typical ICEYE satellite mission solution:

- Example: launch of 4-10 of ICEYE's latest SAR satellites
- Delivered launch-ready in approximately 18-24 months
- Arrangement of launch services on client's behalf to low earth sun-synchronous orbit (LEO SSO)
- Provision of a mission ground segment in client's country for sovereign satellite control and data receipt
- Support for operations and maintenance throughout the satellite's service life
- Training by world experts for constellation operations, data acquisition and processing



Scan Mode enables large-area monitoring, even up to 84,000 sq. km per acquisition

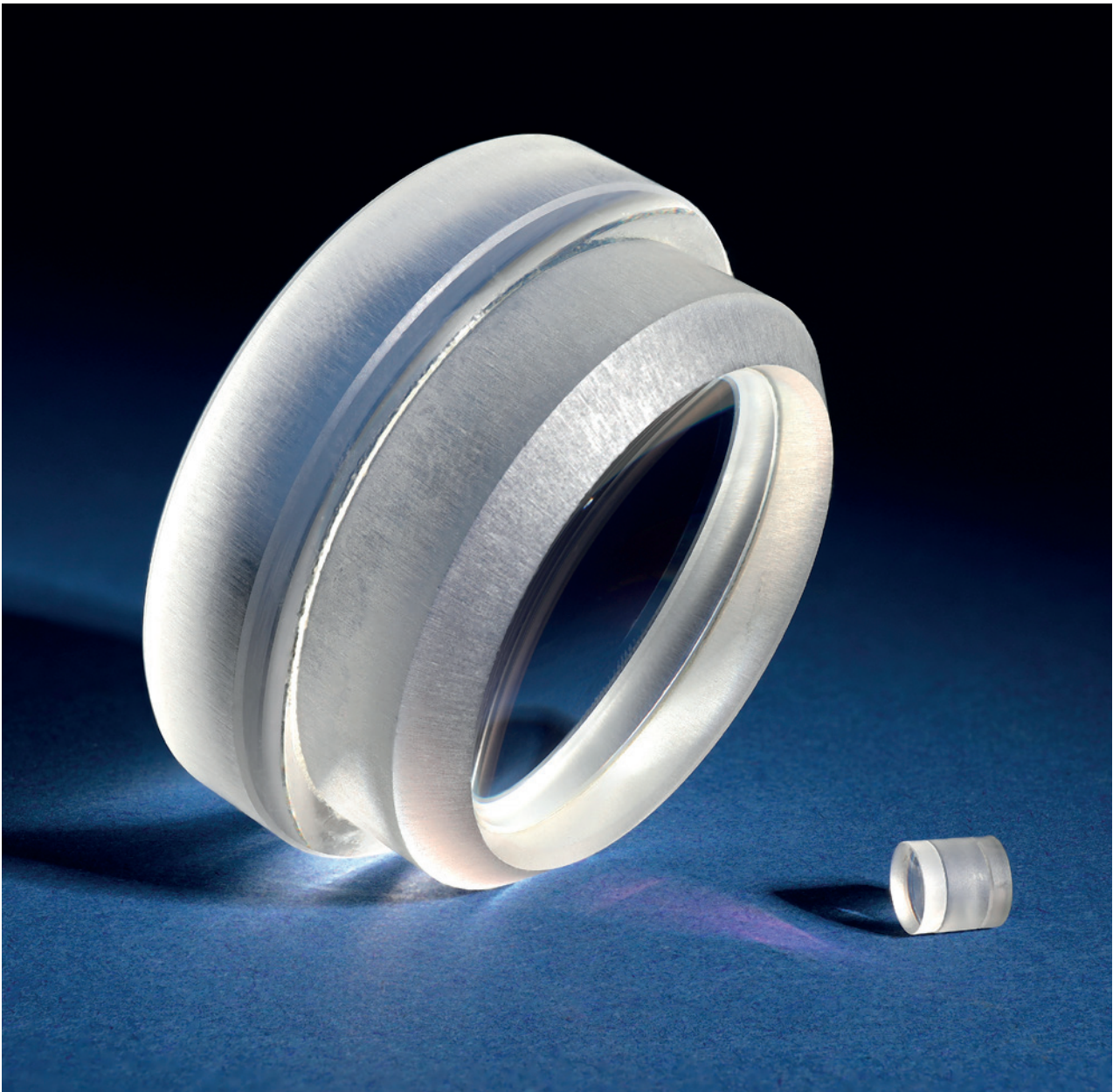


LENSES

SOLARIS OPTICS S.A. ► p. 357

Lenses are fundamental refractive elements used to control light in optical systems. They are commonly used in imaging systems, such as space applications. Our in-house resources provide reliable solutions for producing customized, high-performance lenses of all types, including spherical, cylindrical (milled or produced from semi-finished products), and achromatic (doublets), as well as lenses optimized from UV to IR ranges.

All production steps, from raw material processing to thin-film coatings, take place on Solaris premises. Most elements are circular in shape, but since our production is customized, we can also provide lenses with cut edges. We work with a variety of optical materials, including glass, glass ceramics, quartz, and crystals.



LIQUID ROCKET FUEL

HTP (hydrogen peroxide) in concentrations ranging from 85% to 98% and DMAZ (2-dimethylaminoethylazide)

Jakusz Sp. z o.o. ► p. 337

Jakusz produces and offers a continuous supply of:

- HTP (hydrogen peroxide) up to 98% – clean and cost-effective rocket fuel
 - **Simple Storage and Handling:** HTP (98% H_2O_2) is easy to store at room temperature without special equipment, minimizing operational costs and simplifying procedures.
 - **Environmentally Safe:** Decomposing into water and oxygen, HTP is both environmentally friendly and safe for personnel.
 - **Dual Role - Propellant and Oxidizer:** HTP serves both as a powerful oxidizer for satellite engines and as a propellant for gas generators in auxiliary power units (APUs), making it highly versatile in the rocket industry.



- DMAZ (2-dimethylaminoethylazide) - a safer alternative for rocket propulsion
 - **Non-toxic Substitute:** DMAZ offers similar properties to monomethylhydrazine (MMH) but is much safer and non-carcinogenic.
 - **Versatile Usage:** Suitable for both bipropellant systems (as fuel with an oxidizer) and monopropellant applications, DMAZ ignites spontaneously with certain oxidizers, eliminating the need for additional ignition systems.



- **Stable and Reliable:** Unlike other organic azides, DMAZ is stable, impact-resistant, and non-explosive – an ideal choice for green propulsion in the space industry.

Jakusz cooperates in propulsion development projects with the European Space Agency (ESA) since 2015.

MADDOS

Multi-sensor Automatic Dron Detection & Observation System

AP-FLYER ► p. 316

MADDOS is a comprehensive, multi-sensor C-UAS designed for medium-range operations up to 15 km. With a multi-layered sensor fusion approach and precision countermeasures, it ensures rapid and unmatched threat detection, identification, and neutralization capabilities. Whether securing military bases, government facilities, or commercial assets, MADDOS is the most reliable solution to choose.

Features of the MADDOS system:

- Effective range up to 15 km
- Multi-layered solution
- Combat-proven system
- Effective against NATO class I and II drones/UAVs
- 360° x 90° protection coverage
- Highly reliable in all weather conditions
- Detection of all UAV types
- Location of drone swarms and operators
- Scalable for large areas and borders
- Operational On the Move

Software

- Data fusion and correlation
- Compliant with MIL-STD 2525 common NATO symbology
- Sensor management from single place
- Unified air picture
- Automatic operation with AI support

System configurations:

- stationary
- man-portable
- mobile mounted on vehicles

Detection systems:

- **Passive RF sensor** – detection of the radio communication signal between the drone and the operator
- **Radar** – 3D detection of flying objects with automatic classification and distinction of UAVs from other flying targets.
- **EOIR camera** – dual-sensor optoelectronic system on P&T platform for target confirmation and visual tracking.

Neutralization systems:

- **Multi-band jammers** – interference with the drones communication and navigation signal
- **GNSS Spoofing** – manipulation of the drone's GNSS receiver forcing it into uncontrollable movement
- **ToC (Take over Control)** – a system for detecting and taking control of drones and forcing them to land in a predefined point
- **Assassin drone** – autonomous hunter drone kinetically engaging enemy drones
- **FCS Orion** – integrated detection and hard-kill solution based on 23 mm anti-aircraft cannon



MADDOS VTOL

Vertical take-off and landing UAV

AP-FLYER ► p. 316

Designed and built to deliver unparalleled performance matched with onboard cutting-edge technology. Combining real-time intelligence gathering capabilities with robust construction, it's an ultimate tool for strategic advantage in challenging environments.



VTOL 350e is a fully electric unmanned aircraft system in VTOL configuration, designed for rapid, short range ISR missions. Its endurance of up to 3h and silent operation makes it a perfect tool for law enforcement and military users.

- VTOL – vertical take-off and landing
- High endurance – up to 10 h of flight
- Suitable for every mission scenario
- Modular design – fast field assembly
- Multi-payload capable
- Fully automatic operation
- Day and night operative
- Long range data link – up to 150 km
- Operational in EW environment
- MIL-STD and DO certified avionics

VTOL 350e

- Propulsion: Electric
- Wingspan: 3.5 m
- MTOW: 22.5 kg
- Payload: 2 kg
- Flight time – up to 3h
- Cruise speed: 72 km/h
- Ready to fly in 15 min
- Used for rapid, mid-range ISR missions
- Silent operation
- Communication range – up to 40 km



VTOL 600h

VTOL 600h is a long-endurance, long-range unmanned aircraft system in VTOL configuration, designed for demanding operations. Its endurance of up to 10h with a line-of-sight range of 150 km makes it a competent unmanned platform that meets various mission needs.

- Propulsion: Hybrid
- Wingspan: 6m
- MTOW: 110kg
- Payload: 20kg
- Flight time – up to 10h+
- Cruise speed: 115 km/h
- Ready to fly in less than 60min
- Dual payload capable
- Payload options – EOIR cameras, SAR radar, NADIR cameras, integration of users payload
- Communication range – up to 150km (LoS)
- Redundant flight controller meeting Aviation and MIL-STD standards
- Anti-jamming capabilities – operational under EW conditions



Maintenance of C-130 Hercules

Military Aviation Works No. 2 (WZL2) ► p. 344

Capabilities:

- Programmed Depot Maintenance (PDM);
- HSC and ISO periodic maintenance;
- Development of technical bulletins and preparation of ordered bulletins;
- Upgrade of aircraft systems on site: replacement of airframe elements, replacement of aircraft system elements;
- Removal of paint coating and painting of aircraft;
- Checks and adjustments;
- NDI (non-destructive inspections) of airframe structures and elements;
- Components repair;
- Design, production and operation of airport and hangar equipment;
- Supply of spare parts and materials;
- Implementation of other tasks required and stipulated by the contract.

Experience

We provide Polish and international customers with comprehensive and affordable versatile aviation solutions based on the highest qualifications and the commitment of employees. Credibility, responsibility, security and awareness of the importance of services for national defense are the company's main aspirations.

We have the necessary personnel, equipment and infrastructure to perform repairs, periodic and depot maintenance of C-130E and C-130H aircraft. Since 2010 our company has been executing C-130 maintenance contracts.

Contracts for the PDM (Programmed Depot Maintenance) have been implemented since 2015 as ongoing support in the field of maintenance, through repairs, improvements, delivery of technical material resources as well as development and implementation of technical bulletins.

In January 2016, a new hangar was commissioned for use. It consists of two parts: an aircraft hangar that can accommodate two C-130 aircraft and a paint shop.



Maintenance of F-16

Military Aviation Works No. 2 (WZL2) ► p. 344



Capabilities:

- Overhaul of landing gear LRUs (undercarriage struts, angle struts, shock absorbers, wheel axles);
- Overhaul of hydraulics (tanks, actuators, valves);
- Overhaul of electrical equipment (converters, control blocks, voltage regulators);
- Overhaul of avionics (displays, armament control blocks, radio stations);
- Paint coat removal using Plastic Media Blasting (PMB);
- Ground Support Equipment (GSE) design and production;
- Airframe painting;
- Alternate Mission Equipment (AME) painting;
- NDI (non-destructive inspections) of airframe structure

Experience

We provide Polish and international customers with comprehensive and affordable versatile aviation solutions based on the highest qualifications and the commitment of employees. Credibility, responsibility, security and awareness of the importance of services for national defense are the company's main aspirations.

We have the necessary personnel, equipment and infrastructure to perform repairs, periodic and depot maintenance of F-16 aircraft. Within the scope of F-16 maintenance, we perform selective removal of paint coating by the PMB (Plastic Media Blasting) method. Additionally, we repaint aircraft in the Have Glass II system. It is a special coating enabling reduction of effective reflecting surface (Radar Cross Section).



Maintenance, repair and overhaul (MRO), Aircraft Painting

Military Aviation Works No. 2 (WZL2) ► p.344

Capabilities:

- line maintenance approval for Embraer ERJ 170/190, Base;
- base maintenance approval for ERJ 170/190;
- components repair and overhaul (brakes, wheels, batteries, composites, sheet metal);
- line/base maintenance (Part 145) including: paintshop, engineering, workshops, demo flight assistance, aircraft weighting, engine/APU removal & installation;
- comprehensive aircraft parking and storage services for approx. 20 aircraft;
- maintenance of components (oxygen and fire protection systems; overhaul and repair of wheels, batteries)
- aircraft painting;
- mechanical or chemical paint stripping;
- surface preparation, paint and anti-corrosive coat spreading;
- application of all types of painting systems High Solid / Base Coat Clear Coat/ VIP Finishes;
- Application of decorative films.



Modern hangars

Wojskowe Zakłady Lotnicze Nr 2 S.A. (WZL2) possesses a hangar with two halls with areas of 3,600 m² and 3,700 m², where two planes ICAO code C (f.e. A320 or B737) or ICAO code D (f.e. Boeing 767 or Airbus A310) can be accommodated. One hall is dedicated to the maintenance services for civilian passenger and transport aircraft and second hall is a modern paint shop. After completing maintenance service, we can offer paint the aircraft. The paint shop is equipped with state-of-the-art heating, humidification, ventilation, and lighting systems and much more. The second is separate hangar with 2 slots for maintenance type C for Embraer 170/190 aircraft.



Certificates

In accordance with the EASA PART-145 WZL2 offers line, base and workshop aircraft maintenance. The company assists in the preparation of documentation, analyzing defects, and solving technical problems. WZL2 provides maintenance for aircraft ERJ 170/190.



The most modern painting shop in Europe:

- All types of painting system application (high solid, base coat, clear coat, etc.);
- Environmental protection (waste water cleaning, air filters);
- Electrostatic painting system (extremely reduced amount of dust and waste of paint);
- LED lighting system providing neutral temperature of light (day light).

WZL2 paints whole aircraft or their parts such as fuselages, wings, cabin interior and some aircraft components. The process starts with status verification (incoming inspection). The highly skilled technicians use the latest industrial tools, equipment and consumables. The paint shop allows removing aircraft-paint by surface sanding or chemical stripping and application of a new layer. Logo design and aircraft sticker application can be carried out at the paint.

Painting processes are top and environment friendly. The paint shop uses the latest technology dedicated to repainting process – for example BaseCoat/ClearCoat and chromate free materials that comply with REACH EU regulations. However, the painting of an aircraft is more than just colour and first impressions. It also protects and preserves the aircraft's value.

PORTABLE C-UAS SYSTEMS

AP-FLYER ► p. 316

Designed for today's modern battlefield, soldier-carried and vehicle-based anti-drone system provides a powerful defense against aerial surveillance and attack. Engineered with the latest technology, it offers unmatched reliability and performance in neutralizing drone threats at range.



Handheld jammer (Handheld-9 Drone C-UAS)

- Range: up to 2 km
- Covers 9 frequency bands
- Weight: <7.5 kg
- Operating time on a single battery: up to 60 min
- Features: digital display, inbuilt compass, optical scope, active cooling, IP65
- Safety: MIL-STD & Radiation hazard certificate

Manpack jammer (Manpack-9 Drone C-UAS)

- Range: over 2.5 km
- Covers 9 frequency bands
- Weight: <18 kg
- Operating time on a single battery: up to 60 min
- Operating time from AC source: unlimited
- Features: digital display, optical scope, active cooling, IP55, hot-swap battery



Vehicle protection system (MADDOS MDP)

- Automatic operation – Detect & Defeat
- Protection of vehicles and convoys
- Detection range up to 3 km
- Neutralization range up to 1 km
- Designed to neutralize FPV drones
- Swarm drone detection and neutralization
- Operational On the Move (OTM)
- Ruggedized and shock resistance compliant with MIL-STD 810H

PRISMS

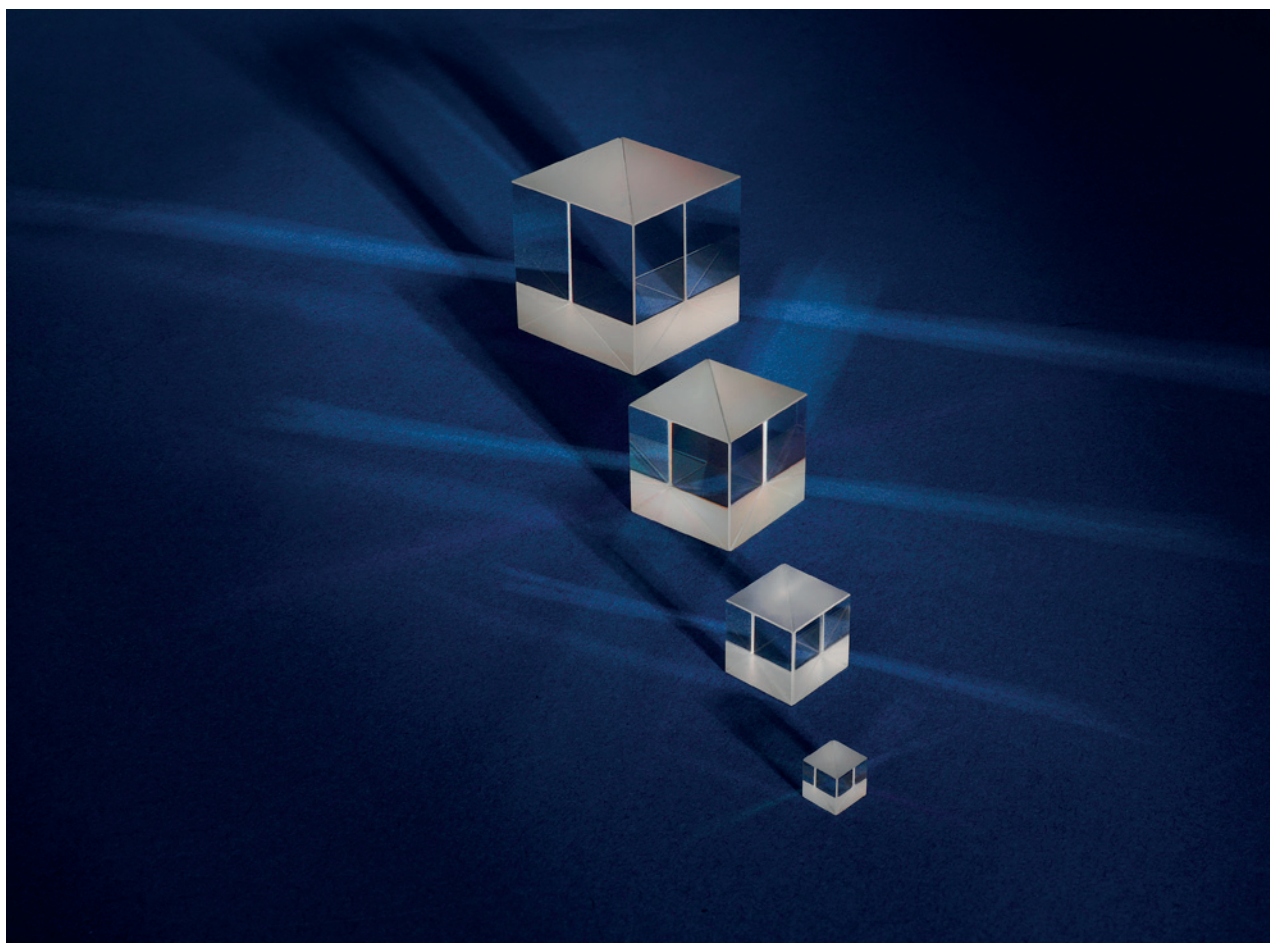
SOLARIS OPTICS S.A. ► p. 357

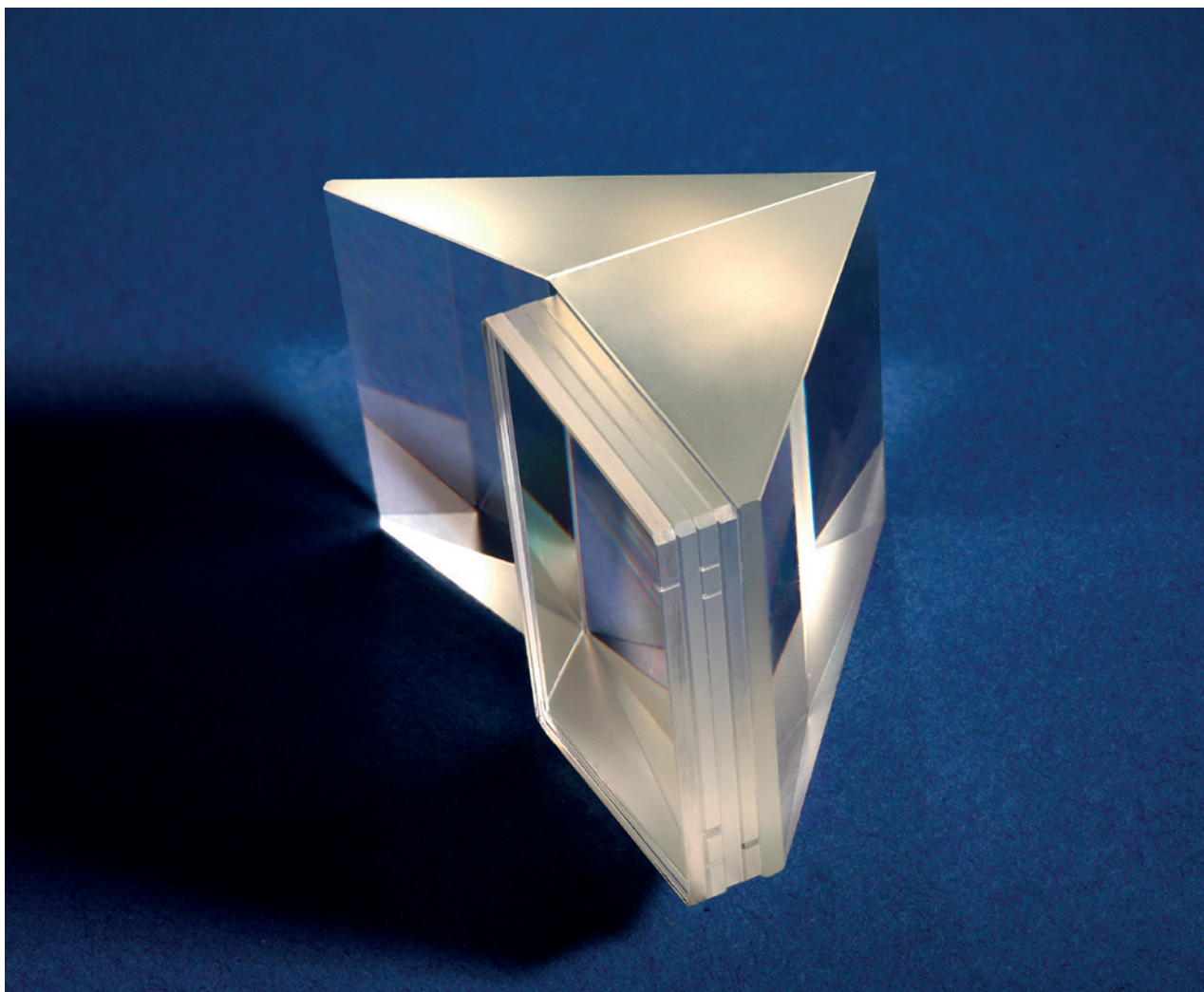


Prisms are optical elements typically used for directing light rays or changing the image orientation relative to the subject (rotation, inversion). Solaris Optics offers a wide range of reflective prisms, such as right-angle prisms, Dove prisms, and penta prisms.

Prisms are categorized into: dispersion and reflection prisms. Dispersion prisms split light into its spectral components due to the material's dispersive properties. When polychromatic light refracts twice at the prism's surfaces, it exits at an angle of deflection, which varies by wavelength. A common example is the equilateral prism (60° refraction angle), made from high-dispersion materials like SF10.

Reflection prisms function like plane mirrors, used to redirect light or alter image orientation (rotation, inversion). Their surfaces are flat, with mirrors for reflection, though total internal reflection can also be utilized with finely polished surfaces.





Technical specification – priswms

	Standard	Non-standard*
Material		on request
Range of sizes		4 –100 mm
Size tolerance	±0.1 mm	±0.01 mm or better
Clear aperture	90%	>95%
Thickness tolerance	±0.1 mm	±0.05 mm or better
Angle accuracy	2'	on request
Pyramidal error	2'	on request
Surface form error at 633 nm	$\lambda/4$	$\lambda/20$
Surface finish (Scratch-Dig)	60-40	10-5 or better
Microroughness	<2 nm RMS	0.25 nm RMS
Coatings		on request

Measurement capabilities:

- Dimensions
- Thickness
- Surface parameters:
 - surface finish,
 - surface accuracy,
 - microroughness
- Angular tolerances
- Spectral characteristics
- Transmitted wavefront error

* Individually analyzed upon request

RASEL

Autonomous Tracking and Telemetry Communication System

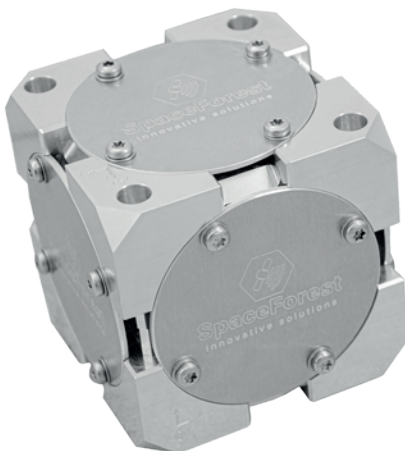
SpaceForest Sp. z o.o. ► p. 358



RASEL is an autonomous tracking and telemetry system designed for monitoring rocket flights and other flying objects in supersonic and subsonic conditions. It ensures reliable communication between the rocket and ground station, enabling real-time data collection and analysis.

RASEL Advantages

- Tracks objects across the entire celestial hemisphere
- Long-range receivers and transmitters for maximum communication range
- Compact, rigid, and durable for easy transport and deployment
- Modular and adaptable for various applications



Core Functions

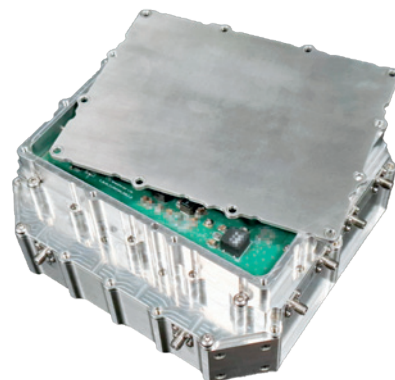
- Autonomous object tracking – Precise object location based on telemetry
- Telemetry transmission/reception (TM/TC) – Data reception and command transmission to the rocket
- Navigation system integration – Inertial Navigation System (INS) for precise position and orientation
- Telemetry data recording – Supports data storage for post-flight analysis
- Communication in various conditions – Optional drone integration to eliminate line-of-sight limitations
- Flight Termination System (FTS) support – Ensures mission safety
- IMU module – Provides real-time acceleration and orientation measurements
- Telemetry visualization – Real-time flight parameter analysis

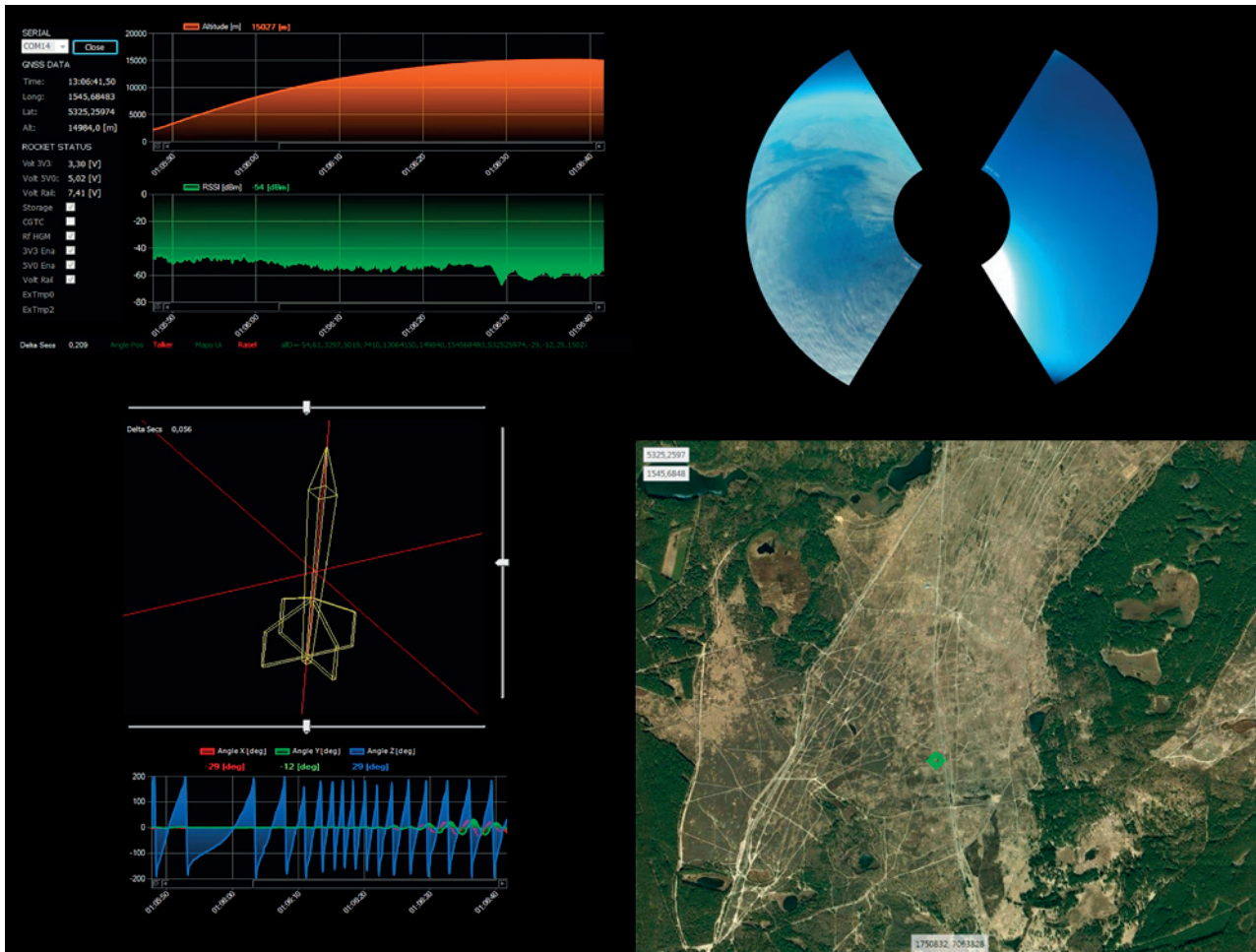


System Structure

The system includes a ground station and onboard modules. The ground station features:

- Motorized tracking platform (360° horizontal, 180° vertical)
- Four active antennas for TM signal reception
- Directional TC antenna for communication





Parameter	Value
Tracking antenna gain	13 dBi
Operating frequencies	TM: 1.8 GHz, TC: 869 MHz (others available on request)
Maximum communication distance	Up to 125 km
Power consumption	2kW@220VAC
Communication interface	Ethernet
Scanning range	Horizontal: 360°, Vertical: 180°
Maximum angular velocity	180°/s

The RASEL system can be customized to meet specific user needs, including integration with other telemetry systems and adaptation of operating frequencies.





The ReconSKY UAV is a fully autonomous unmanned aerial system (UAS) in a flying-wing configuration. It is a modern Polish solution designed for a wide range of missions.

The ReconSKY system can be used for terrain observation, signal relay, border patrol, and critical infrastructure monitoring. Thanks to its modular design, it is easy to assemble and disassemble, allowing for quick mission readiness. Operations can be conducted autonomously, and the system can be integrated with other solutions.



Technical Specification

- Wingspan: 163 cm
- Flight time: 120 min +
- Communication system: ISM bands
- Cruising speed: 54 km/h
- Maximum speed: 140 km/h
- Flight altitude: 3,500 m Launch type: Assisted launch using a rubber-powered catapult
- Landing type: Automatic, at a designated point
- Maximum takeoff weight: 3 kg
- Communication and control range: 30 km (with line-of-sight to antennas)
- Structure: Composite
- Propulsion: Low-noise, brushless, electric motor
- Power supply: Lithium-ion battery
- Maximum wind resistance: 12 m/s
- Operating temperature: -15°C to 40°C
- Humidity resistance: Resistant to light rain
- Transport dimensions: 170 x 30 x 60 cm

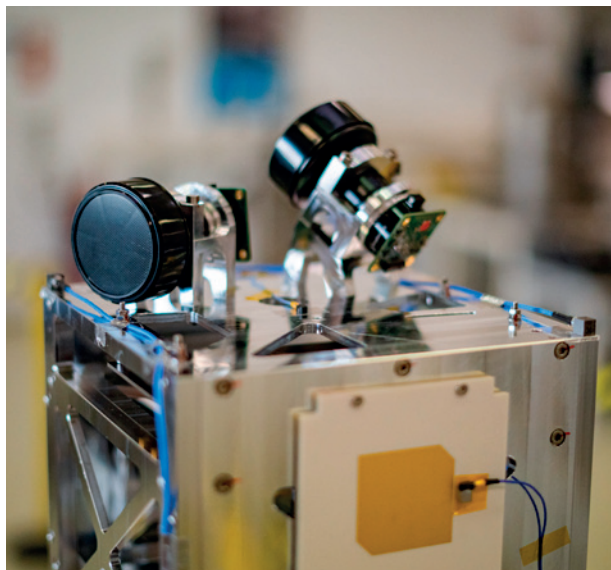


Scanway Camera System (SCS)

Scanway S.A. ► p. 355

The Scanway Camera System is a product line of camera systems dedicated for a wide range of space applications. The SCS was developed as a combination of Scanway's experience in developing proprietary vision systems for quality control in the manufacturing industry on Earth and familiarity with designing components dedicated to space. It is a relatively simple camera system that relies on cameras and other sensors for its operation and has the ability to analyze changes or processes using machine learning and DL-based vision algorithms. Applications of vision systems in space: self-diagnosis of space vehicle modules and objects approaching the vehicles, observation of space vehicle processes while operating in space, control of production and service processes in space, possible applications to SSA. When the SCS is applied to space infrastructure, it allows for conducting self-diagnosis of the satellite based on the acquired images.

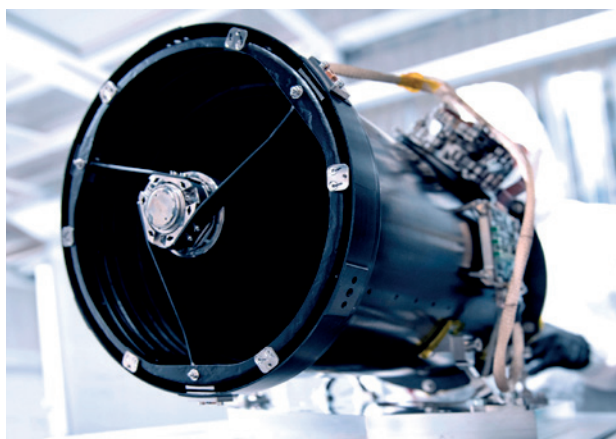
The cameras can collect data from both the exterior and interior of the vehicle, and their range of applications includes, for example, assessment of the degradation of photovoltaic panels, verification of the operation of mechanisms, verification of the operation of the AOCS



systems, or thermographic analysis of electronic components. Analysis of images captured by the cameras is carried out in specially designed electronics using FPGAs and artificial intelligence algorithms.

Scanway Optical Payload (SOP)

Scanway S.A. ► p. 355



Scanway Optical Payload is a product line of cameras for Earth Observation and other remote sensing applications, mainly designed for small satellites (nano- and microsatellites). The instruments have different apertures, depending on the mission objectives, altitude and platform size, resulting in imaging capabilities tailored to the specific

mission (imaging at different spectra and resolution). The company's past projects and activities have resulted in telescopes dedicated to working with 3U, 6U platforms and microsatellites of up to about 70 kg.

The company is currently developing optical solutions also dedicated to Earth observation constellations or for Moon surface observation. Thanks to the use of modern materials and an innovative approach to design, the telescopes of the SOP line have athermal properties that maintain high imaging quality parameters during on-orbit operation. The scalability and modularity of the structure exemplify the optimum price combined with the best technical performance. Scanway offers support at every stage of optical payload delivery: design, manufacturing, testing, integration and operation of the telescope in orbit. Imaging obtained with the SOP telescopes has many applications such as monitoring natural disasters, studying climate change, supporting agriculture and urban development, object classification, and military applications. The instrument can also be used for other remote sensing applications, such as SSA on orbit.

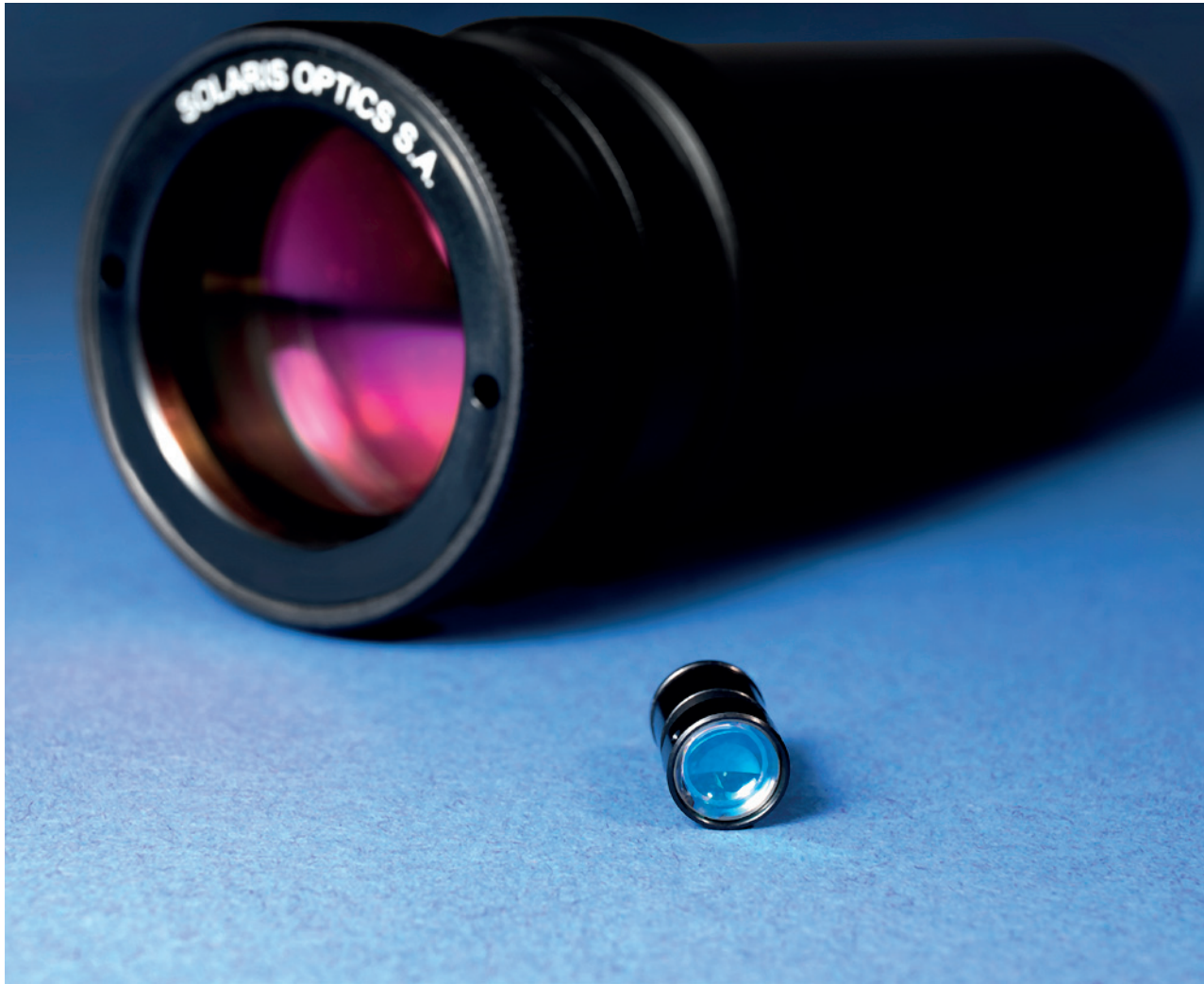
Space Optical in-house production

SOLARIS OPTICS S.A. ► p. 357

Solaris Optics manufactures not only single components but also optical systems. We can manufacture these systems according to our customers' requirements, and we are also able to support them throughout the entire design process, starting from the initial feasibility study, optical design, and tolerancing to the optomechanical design. We source the mechanical parts from our trusted suppliers and assemble the systems in-house. After the assembly, we characterize the systems in our laboratory.

Solaris Optics has extensive experience in manufacturing a wide range of precise optical systems, from simple mounted doublets to complex objectives. Our team can manage the entire design process, including the optomechanical design and the tolerance analysis. We can also work based on our customers' designs. The optical elements of the system are fully manufactured in-house, while the mechanical parts are sourced from trusted mechanical workshops.





The assembly of systems is carried out by our experienced personnel. In most cases, we use the drop-in assembly method; however, when tight positioning requirements must be met, we perform precision assembly using designed adjustment movements. Mounted systems are characterized with the use of OptiCentric and OptiSurf devices, which enables the measurement of air gaps, tilt, and decentration of elements within the assembly.

Our capabilities

Parameter	Standard	Precision
Air gaps tolerance	± 0.05 mm	± 0.02 mm
Decentration of the elements	± 0.04 mm	± 0.015 mm
Tilt of the elements	4'	<1'

Our metrological capabilities:

- Diameter/dimensions
- Air gaps
- Decentration
- Spectral characteristics
- Focal length
- Transmitted wavefront error
- Magnification

Types of our systems:

- Objectives for different spectral ranges, from NUV to NIR
- Zoom systems
- Beam expanders

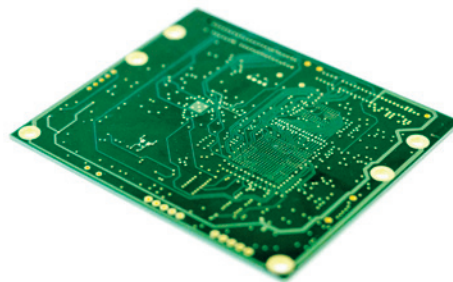
Special-use printed circuit boards

Łukasiewicz Research Network – Tele and Radio Research Institute ► p. 341

The Institute is the only one in Poland to conduct R&D work on special-use printed circuits, including for military and aerospace applications. The designs concern multi-layered, flexible and flex-rigid circuits, aluminium base circuits and circuits using PTFE materials. The structure of the boards can be symmetrical, asymmetrical or hybrid. One of the Institute's latest designs was the construction of specialised printed circuits for the microwave antenna of the ESEO S-50 satellite telecommunications system, which was launched into space in 2018.

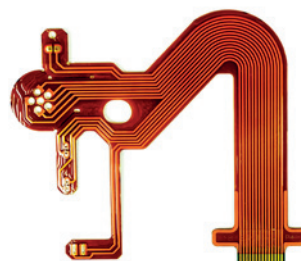


For nearly three years, we have held the AQAP certification. This demonstrates that we meet NATO's stringent requirements for quality and reliability, which are crucial in the defense sector. Implementing these standards helps ensure high-quality deliveries and minimizes risks associated with the use of military equipment.



We also offer:

- tests of components for assembly and disassembly of electronic units,
- developing new applications integrating various technologies,
- conducting tests in terms of validation of electronic units and products,
- testing accredited printed circuit boards, electronic components, electronic units (packages), soldered connections – Accreditation AB045,
- Assembly of electronic components,
- electron beam welding in a vacuum for prototype series,
- services related to the development of technology for vacuum components and actuating elements for special applications.



SPECTRE-2

Spectre Solutions Sp. z o.o. ► p. 359

SPECTRE-2 is a flexible VTOL drone that can handle any challenge. It can serve various functions, such as infrastructure monitoring, medical supplies delivery, or other missions. SPECTRE-2 is a perfect solution for these activities.

SPECTRE-2 is a hybrid drone that benefits from fixed-wing and rotary-wing features: it can take off, land vertically without needing a runway, and fly at high speed and long distances. It can also hover in the air and switch between three flight modes: automatic, semi-automatic, and manual. It can be controlled remotely or fly autonomously, using cutting-edge communication standards: RC/GSM/LTE/5G/SAT.



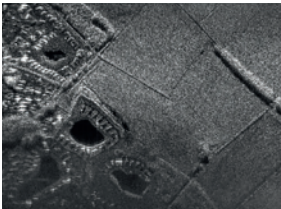
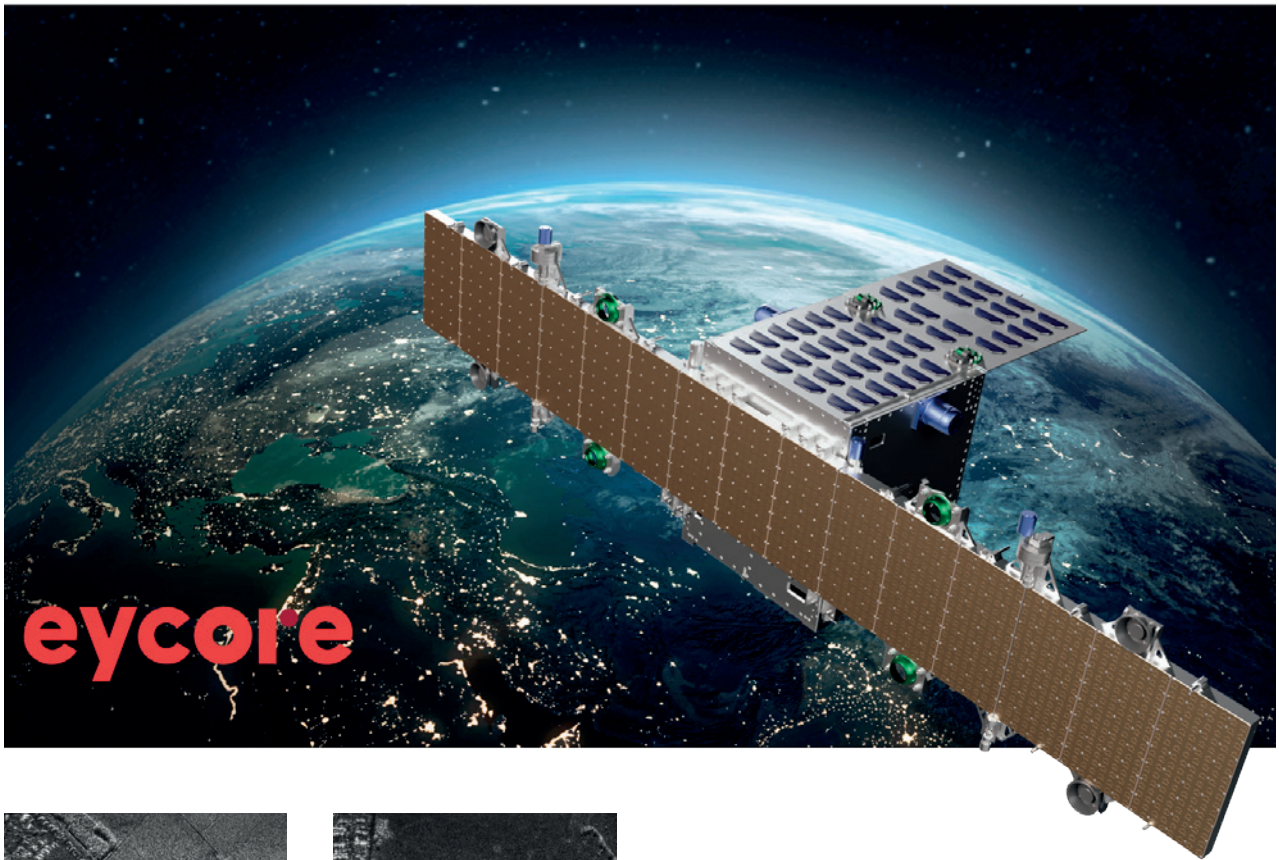
SPECTRE-2 is developed by the most experienced aviation experts, using the highest technology and standards. It is equipped with multi-level security systems, ensuring its operations' safety and payload. It can carry a customizable payload of up to 6 kg, and the drop system can deliver it safely on a parachute. The drone has an ample cargo space of 45 litres and can transport various medical supplies.

SPECTRE-2 is the best possible option for the most demanding needs. It has a maximum take-off weight of 32 kg and can reach a speed of up to 140 km/h. Depending on the order specifications, it can have a range of up to 700 km and a flight time of up to 6.5 hours. It can operate at a maximum ceiling of 1000m and adjust to terrain and weather conditions.



Synthetic Aperture Radar (SAR) Payload

Eycore Sp. z o.o ► p. 329



Eycore's synthetic aperture radar (SAR) sensor is built with a modular design in mind to meet the various operational needs of our customers. The SAR sensor consists of two key components:

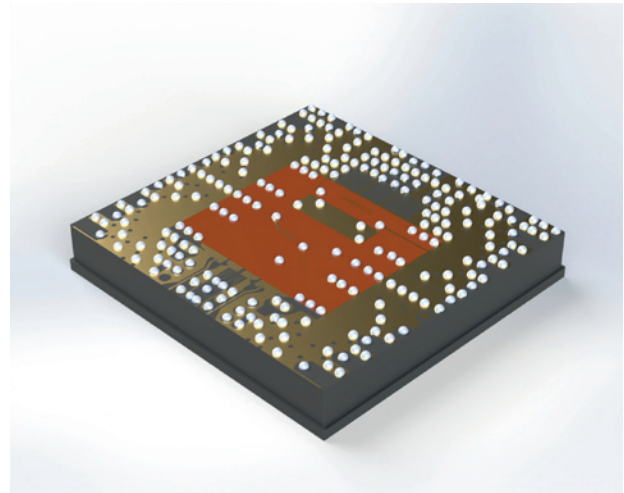
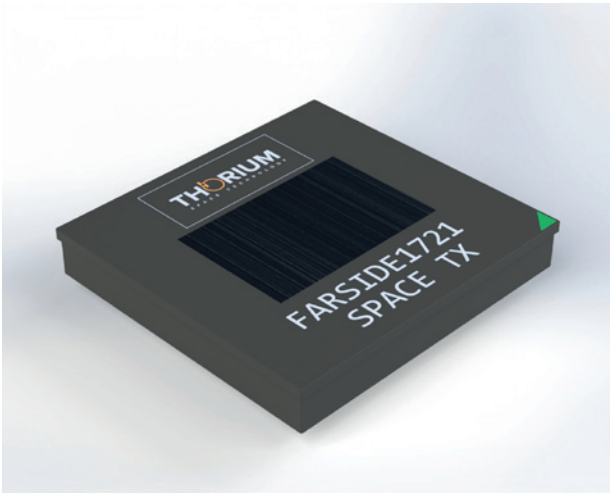
- Internal Payload Assembly (IPA)
- SAR Antenna Assembly (SAA)

Both of these components are satellite platform-agnostic and can readily be scaled up and seamlessly integrated with a wide variety of third-party satellite platforms. This versatility gives our customers the freedom to select a satellite platform of their choice and customise the design to meet their very own specific mission needs and applications.

Through long-standing and trusted partnerships between Eycore and reputable satellite integration and launch providers, we are also able to offer a complete end-to-end solution by delivering to our customers a flight-ready satellite integrated with our SAR. This removes any unnecessary overheads on our customers and minimise their technical risks so that their mission objectives remain on track for success.

Thorium Space Chipsets

Thorium Space S.A. ► p. 363

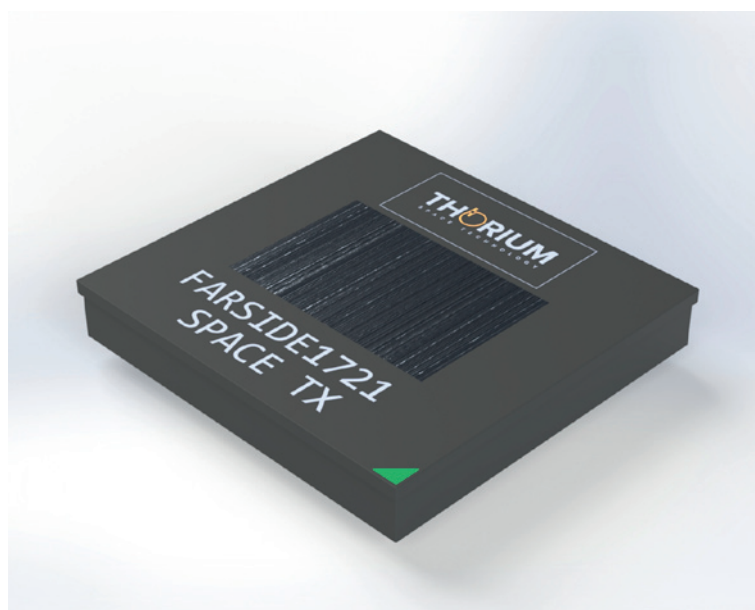


Thorium Space chipsets (beamformers) are cutting-edge integrated circuits designed to elevate satellite communication and space system performance. Operating across an exceptionally wide frequency range, they enable high-speed data transmission, supporting applications like broadband connectivity, video streaming, and large-scale data transfer, providing flexibility for different satellite communication systems.

Engineered for the rigors of space, these chipsets withstand extreme temperatures and radiation, ensuring reliable performance throughout missions. Their advanced architecture and miniaturized design integrate multiple communication system components into a single chip, reducing payload complexity and weight—critical advantages for optimizing satellite real estate.

Equipped with robust security features, the chipsets resist signal interference and jamming by suppressing unwanted signals, guaranteeing dependable communication even in contested environments. Their scalability allows seamless integration into satellite systems of any size and complexity, from compact CubeSats to large geostationary platforms.

Thorium Space chipsets are characterized by high performance, compact design, advanced communication capabilities, and robust security features, providing reliable and efficient solutions for various space missions and applications and making them a cornerstone for modern satellite communication and space exploration missions.



UAS HAASTA

EUROTECH Sp. z o.o ► p. 329



The HAASTA Unmanned Aircraft System was designed to be completely independent of the airport infrastructure, performs automatic take-off from the launcher and landing on a gliding parachute. All system elements are prepared for easy transport and quick assembly in the field. The HAASTA platform is prepared to perform flights in difficult weather conditions.



UAS HAASTA is an ideal product for everyday operation of various tasks. The platform has a unique construction prepared for transporting a payload of up to 30 kg in the central part of the fuselage, which can be dropped during flight.

The HAASTA system is prepared to carry out group missions of up to 7 platforms operating simultaneously, supervised from one GCS ground station with the participation of only 3 operators. The HAASTA system is intuitive and easy to use. For effective training and maintaining crew readiness, the HAASTA system provides a simulation module integrated with the GCS.

- Multifunction UAS HAASTA with Cargo Drop capability (up to 30 kg)
- Designed to be difficult to detect and destroy thanks to small RCS/IR signature and high performance.
- Designed to operate in difficult weather conditions.
- Very short preparation time for flight, small crew.
- Independent of airport infrastructure, catapult-launched, parachute landing.
- The HAASTA platform can be easily adapted to the user's operational requirements
- Redundant avionics and onboard energy solution.
- Propulsion: 20HP Hybrid (piston engine+electric motor).
- Operating range: up to 200 km - LoS link + Mesh link for multiplatform flight
- Speed: up to 280 km/h
- Altitude: up to 5.000 m Endurance: up to 10 hours
- Mobile GCS, dedicated software compatible with STANAG 4586 and 4609.



WB Electronics ► p. 365



A white model airplane with a green nose and yellow markings is resting on a field of dry grass. The background shows a line of trees under a clear blue sky.

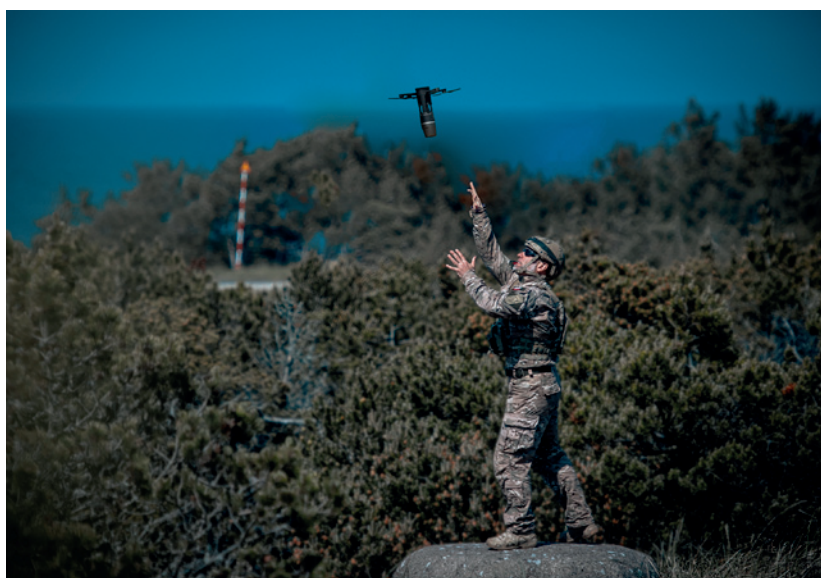


X-FRONTER Mini UAV

WB Electronics S.A. ► p. 365

The Mini UAV designed for surveillance and combat missions. Light, compact-sized and highly portable X-FRONTER system is a fully autonomous solution suited for military operations, special forces, law enforcement, public safety entities and private security.

An easily deployable X-FRONTER is designed to help the operators navigate areas in real-time for significantly improved situational awareness. Remotely controlled from a small portable tablet, the system is a personal reconnaissance device that can carry out surveillance and combat missions automatically or manually.



The XY-IFTE Intelligent False Targets Emulator is a low power generator of false targets and it interferes with the normal operation of surveillance radar stations.

The system is mounted on a small drone and might operate on different bands after its calibration. The IFTE can produce different false target scenarios causing the problem with the correct detection and identification of the real air objects.

FEATURES & BENEFITS

- UAV mountable: lightweight and compact
- 30km range between the closest and the farthest false target
- Ability to simulate Doppler effect for false targets
- Antenna placement limiting crosstalk
- Digital crosstalk cancellation
- Controlled antennas look angle
- Autonomous mode of operation
- Enhanced performance with ground-based deployment

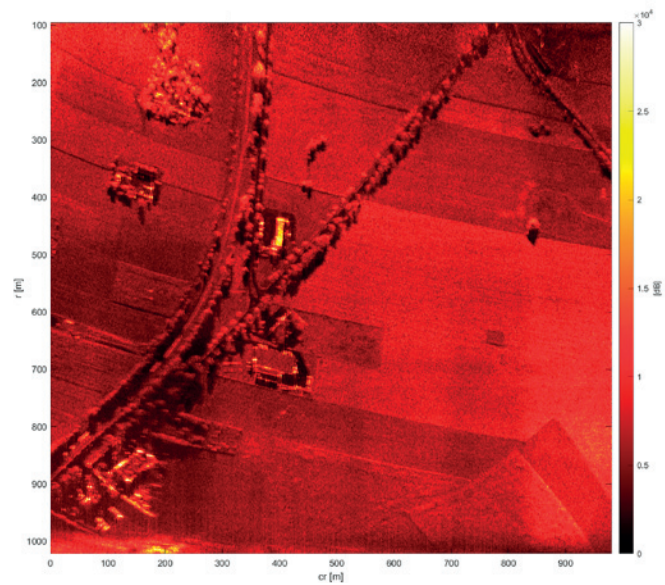


TECHNICAL SPECIFICATION

Parameter	min	typical	max	unit
Instantaneous bandwidth		40		MHz
Operating frequency	1.2		6	GHz
Transmitted power		16	20	dBm
Delay	0.2		200	µs
Number of false targets			10	
Doppler frequency		0.25	20	kHz
Antenna elevation beamwidth		20		°
Length x width x height (main unit)		19 x 16 x 6		cm
Length x width x height (antennas)		20x 45 x 8		cm
Weight (with antennas)		1.2		kg
Supply voltage		6		V
Supply power		60		W

The XY-SAR-X portable X-band radar, which can be connected to the drone, allows you to scan the terrain and manage the space within your range.

The radar can be used to monitor security areas, e.g., by border authorities, police, and fire brigades, for detection and tracking of suspicious and unauthorized drones and cars, but also for land surveying and mapping, land monitoring and surveillance, illegal clearing or trenching backwaters.



IMAGING SAMPLE

FEATURES & BENEFITS

- Range up to 15 km
- Operating on Strip SAR mode
- Antenna with gimbal stabilization
- Onboard real-time SAR processor
- Ground base post-processing station
- Linear polarization
- FMCW radar (LPI – low probability interception)
- All weather conditions
- Possible customization



Radar solution
developed and offered
in partnership with
Space Forest Ltd.

TECHNICAL SPECIFICATION

Parameter	min	typical	max	unit
Transmit bandwidth	50		1000	MHz
Pulse Repetition Frequency	0.5		10	kHz
Transmitted power		10		W
Finest range resolution		30		cm
Antenna elevation beamwidth		20		°
Antenna azimuth beamwidth		7		°
Length x width x height		120 x 20 x 20		cm
Weight		10		kg
Supply voltage		12/24		V
Supply power		180		W



AIR AND MISSILE DEFENCE

Anti-Aircraft Missile System POPRAD

PIT-RADWAR S.A. ► p. 351



The POPRAD self-propelled anti-aircraft missile system is intended for fighting low and medium altitude air targets with use of heat-seeking missiles. The basic functions of POPRAD are accomplished by a tracking-aiming head, which contains a set of electrooptical sensors (thermal camera and laser range-finder), four launchers of GROM/PIORUN missiles, IFF, two-axis drive. The system uses a fire guiding computer and a navigation and orientation system. Target acquisition is based on digital data radio-link from the automated air defense command and control system or is worked-out autonomously.

- High mobility
- Short deployment and evacuation time
- Day and night operations
- Hidden operations



Anti-aircraft Rocket-artillery System PSR-A PILICA

Consortium PGZ – Pilica:

PCO S.A. ► p. 350

PIT-RADWAR S.A. ► p. 351

Zakłady Mechaniczne Tarnów S.A. ► p. 369

The PILICA Anti-Aircraft Missile and Artillery System is a very short-range air defense system (V-SHORAD). The PSR-A PILICA Fire Unit is designed to combat low-flying air targets and lightly armored ground and surface targets. PSR-A PILICA has an integrated sub-system for detection, identification and combat management as well as combat-ing air, ground and surface objects.

Thanks to the increased precision of detecting and tracking aerial objects, the PSR-A PILICA is able to destroy combat aircraft and helicopters. The PSR-A PILICA is characterized by a full range of fire in the horizontal plane, covering 360 degrees. In the vertical plane, the firing angle reaches from -3 degrees to +75 degrees, which allows to aim at both short negative angles and high elevation angles. The practical rate of fire reaches the level of 400 rounds per minute for the firing unit, which ensures a very high intensity of fire during combat operations.

The GROM/PIORUN MANPADS and 23 mm ammunition for the 2A14 cannon with OFZT, BZT, APDS-T

and FAPDS-T rounds (domestic or foreign) can be used to fire at air targets. For firing at ground and surface targets, 23 mm rounds for the 23 mm 2A14 cannon with OFZT, BZT, APDS-T and FAPDS-T missiles (domestic or foreign production) can be used.



BYSTRA

MOBILE 3D SHORT RANGE RADAR

PIT-RADWAR S.A. ► p. 351



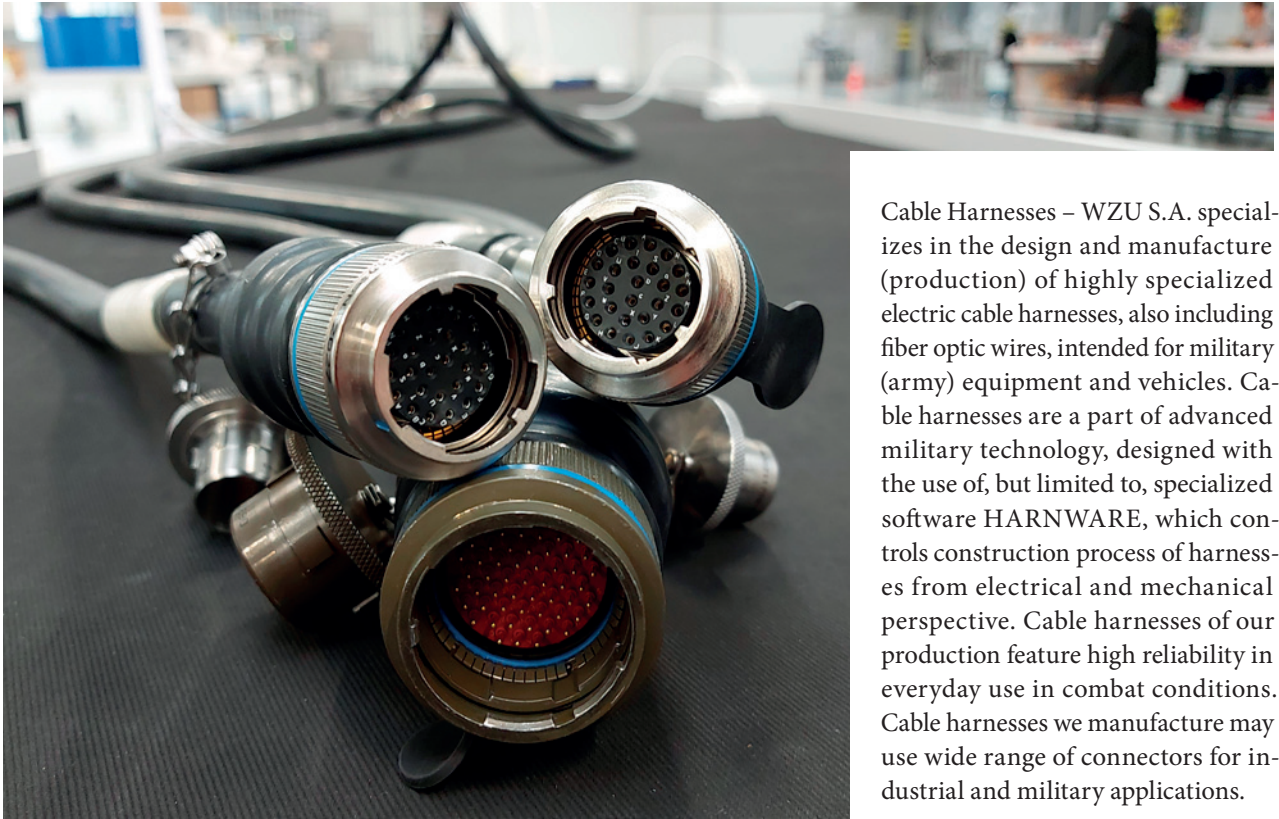
The BYSTRA Mobile 3D Short Range Radar is designed for detecting and localizing air targets at short ranges and for supporting air-defense units that cover tactical battle groups against attacks from the air. BYSTRA is a multifunction and multi-mission radar with versatile capabilities and various applications, including detection and tracking of typical air threats as combat aircrafts and helicopters (also when hovering), as well as missiles, UAVs and mortar shells.

- Instrumental range – 80km
- Features own power generator, spoofing and decoy systems
- Resistance to passive countermeasures or active jamming
- Ability to detect threats with low-RCS



CABLE HARNESSSES

Wojskowe Zakłady Uzbrojenia S.A. (WZU S.A.) ► p. 366



CKE-1T thermal target sight for anti-aircraft gun and missile system

Przedsiębiorstwo PREXER Sp. z o.o. ► p. 352



CKE-1T target sight and DJ-25 Jammer on an anti-aircraft gun ZU-23-2

The CKE-1T thermal imaging sight, working as an autonomous fire control system, is designed to conduct combat operations in day and night conditions, especially in all conditions of limited visibility. The CKE-1T has a thermal imaging module allowing for detection and engagement of the target at night.

The CKE-1T target sight can be used in modernized 23 mm anti-aircraft sets, e.g. ZU-23-2, while combating air targets. The sight is equipped with a programmable thermal imaging module adaptable to working conditions. The device can be equipped with a laser rangefinder. The CKE-1T target sight works with DJ-25 - Unmanned Aerial Vehicle (UAV) jammer system.

Target detection in limited visibility conditions:

→ Helicopter (4x6m)	5800 m
→ SUV car (2x4m)	3800 m
→ Single soldier (1,5x0,7m)	1350 m
→ Standard NATO target (2,3x2,3m)	2950 m

Thermal imaging module parameters:

→ Spectrum range	8÷14 μ m
→ Thermal sensitivity NEDT	< 50 mK
→ Digital optical zoom	2x, 4x
→ Matrix	640x480, optional 1024x768 or 1280x1024
→ Horizontal viewing angle	17°
→ Vertical viewing angle	13°

Range of entered distances:

→ by means of the manual switch	2÷30 hm
→ using the footswitch	programmable
→ automatically	2÷24 hm



Control and Measurement Station

CRW Telesystem-Mesko Sp. z o.o. ► p. 322

The Control and Measurement Station is used for the automatic execution of periodic inspections and multiple tests of missiles, launch mechanisms, authorization keys, and the MANPADS PIORUN systems. The testing includes verifying electrical and optical parameters (missile launch and pyrotechnic circuits are not tested). By utilizing the CMS, users can monitor the condition of products throughout their entire lifecycle, ensuring full operational readiness of the systems and enabling informed decision-making.

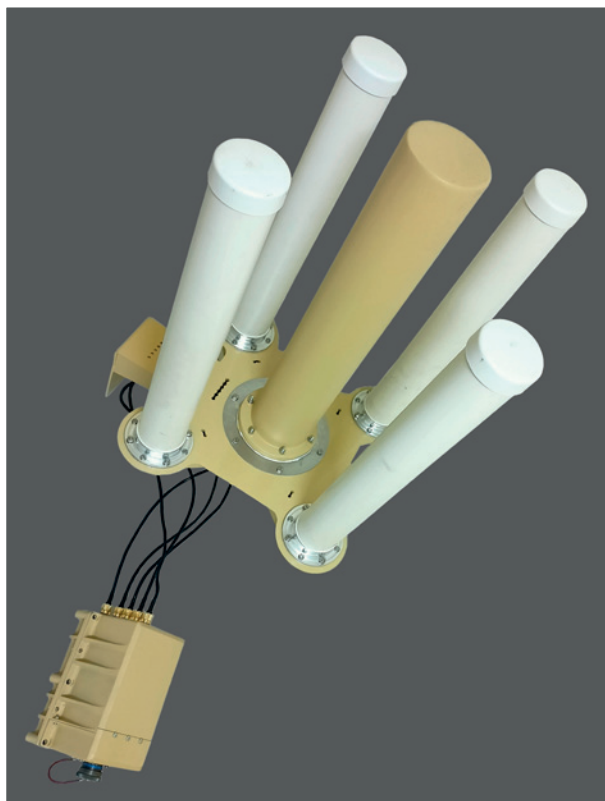
Purpose and components of the set:

- SKP-RAK (Rocket Tester): Enables the verification of missile readiness for target tracking based on the analysis and measurement of designated electrical parameters of the missile.
 - SKP-TMS (Launch Mechanism Tester): Checks the technical functionality of the Launch Mechanisms (MS), including readiness to launch the missile, selection of launch conditions, and issuing start command signals.
 - SKP-TKA (Authorization Key Tester): Verifies the technical functionality of Authorization Keys (KA).
- data from SKP-TKA and SKP-TMS testers as well as logs from ZPA.
- SKP-JC: A management and control block for the testing processes, housed in a PELI case.
 - SKP-KOL: A device generating a radiation beam simulating a target with a spectral profile similar to an actual target.
 - SKP-LAPA: A component attached to the launcher connector. The cable connection enables missile power supply and the reading of necessary measurement signals.



DJ-25 Jammer Unmanned Aerial Vehicle (UAV) jammer system

Przedsiębiorstwo PREXER Sp. z o.o. ► p. 352



The DJ-25 Jammer is a system that enables the neutralization of enemy objects, such as commercial civilian drones used for reconnaissance purposes and engaging targets using dropped Improvised Explosives or mortar shells, at a distance of up to 2,500 meters.

The DJ-25 system is equipped with precise GPS, telemetry and radio communication jammers. Operating broadband at frequencies e.g. 2.4 GHz, 5.8 GHz and the GSM 850/900 MHz band.

The DJ-25 has been adapted to the technical realities of the most popular, potential air targets.

Tactical and technical data:

- Range 2500 m
- Output power for one channel up to 100W (52 dBm)
- Operating temperature range from -30 up to +60°C
- System weight approx. 15 kg
- Power supply 12V or 24V



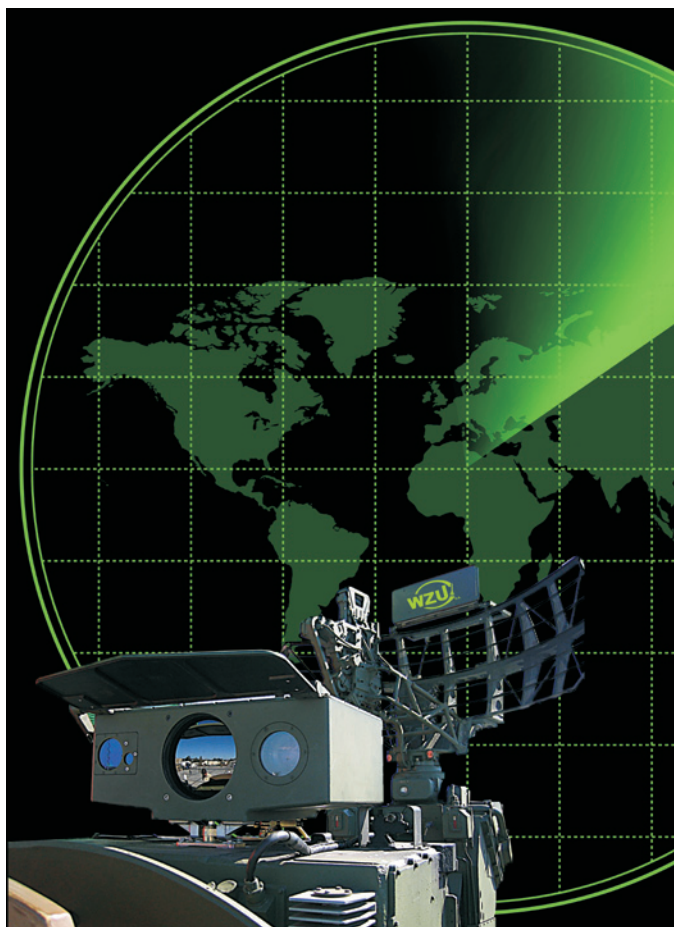
ELECTRO OPTICAL SYSTEMS

Wojskowe Zakłady Uzbrojenia S.A. (WZU S.A.) ► p. 366

Optoelectronic Head is a new generation device integrating passive optoelectronic sensors operating in the bands from visible to thermal as a means for detection, recognition, identification, and observation, and following integration onto the platform for specification of angular coordinates of remote targets in the visible spectrum and in the infrared. It may operate in various weather conditions, both during the day with sunlight or artificial lighting as well as in the conditions of limited visibility. Optoelectronic Head operates in a set of devices which enable manual and automatic guidance of the head optical axis on the target under observation. The laser range finder, as a component of the equipment, enables identification of range to the target from 100 m to 30.000 m.

Capabilities

- passive detection – identification
 - thermo-video recognition,
 - no detection of own position,
- control over the airspace,
- eye-safe laser range finding,
- data on the target range and azimuth,
- positioning, determination of co-ordinates,
- potential adjustment to any platform.



Purpose

The optoelectronic head may be adjusted to any fire control platform of anti-aircraft systems, in particular, for the following air defence systems:

- 2K12 KUB (SA-6),
- 9A33BM2 OSA (SA-8),
- 2K11 KRUG (SA-4),
- an example of a different type of platform
 - Combat Field Reconnaissance System integrated onto a HUMVEE platform.

Advantages of Application

- Replacement of the sight used so far enabling the systems to thermally detect the target and to improve detection range.
- Limited radar radiation and improved radio electronic camouflage.
- Upgrade and improvement of missile weapons which are a significant potential in use by Land Forces, Air Force, Air Defence and Navy of the Republic of Poland



MSI-DS TERRAHAWK PALADIN

Advanced Protection Systems S.A. ► p. 314

The MSI-DS TERRAHAWK PALADIN system is the result of cooperation between APS and UK-based MSI Defence Systems. Radar panels and a soft-kill effector (jammer) are designed and manufactured by APS; a hard-kill effector, the 30 mm MK44 Bushmaster chain gun, is made by Northrop Grumman Corporation. The entire set is controlled by the APS-developed CyView C2 system. The C2 system allows the MSI-DS TERRAHAWK PALADIN platforms (currently four) to be combined into one module and managed together.



The state-of-the-art 3D MIMO FIELDctrl Advance radars enable UAV detection, tracking, and classification. UAVs can be neutralised in two ways: non-kinetic (jammer) and kinetic (cannon).

The module can be controlled from any platform by assigning a MASTER or SLAVE function. This increases the system's effectiveness and survivability on the battlefield.



MESKO S.A. (PGZ) ► p. 343

A close-up photograph of a soldier in camouflage gear aiming a large, green, shoulder-mounted anti-aircraft weapon, possibly a Stinger missile launcher, in a wooded area. The soldier's head is covered in a ghillie suit, and they are wearing a helmet. The weapon has a large, cylindrical body and a long, black, telescopic sight. The soldier's hands are visible, holding the weapon. The background is a blurred forest.

- 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



Repairs, Modernizations, Modifications, Integration, Maintenance at the Depot Level

Wojskowe Zakłady Uzbrojenia S.A. (WZU S.A.) ► p. 366

Repair of military technical equipment performed by Wojskowe Zakłady Uzbrojenia S.A. guarantees full restoration of operational efficiency in compliance with the demands of operational readiness.

In the course of overhaul, not only technical efficiency of the equipment, but also all the technical and operational parameters of the new equipment will be restored, including operational reliability.

Apart from above equipment and systems Wojskowe Zakłady Uzbrojenia S.A. performs overhaul of missile systems supporting equipment such as:

- equipment for fuel distribution, oxidiser and air,
- control and measuring stations,
- training simulators,
- transporters and transporting and loading equipment,
- surface-to-air anti-aircraft missiles,
- electrical power supply sources.



Modernizations include OSA combat vehicles, WEGA, KRUG and KUB missile systems and cover all major systems and subsystems of mentioned missile sets. They have been developed based on our own design solutions and carried out in accordance with WZU S.A. documentation. Modernizations increase quality by replacing a number of unreliable units with our own solutions and removing operational inconveniences. The use of latest technical solutions improves tactical and technical parameters of the sets, which correlate with performance of devices used on the modern battlefield and have a significant impact on increasing their reliability.



Rockets S-5KO, S-5MO

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

Unguided rockets designed to be fired from aircraft launchers at armored vehicles, hides and buildings. The nose-cone, after tearing, creates an additional area of effect in the form of a large number of shrapnels.



Advanced Protection Systems S.A. ► p. 314

Beyond military applications, the Interceptor Drone offers a non-explosive alternative to jammers for protecting civilian airspace, including airports, from invasive drones.



SKYctrl L containerized system

Advanced Protection Systems S.A. ► p. 314

This large-scale system in an autonomous container – suitable for protecting forces, high-value assets, and command posts – has been designed so that only one operator is needed. It is possible to use different variants of the FIELDctrl 3D MIMO radars: Advance or Range.

The SKYctrl L is integrated into a mobile container adapted to difficult weather conditions. It is possible to link up to four SKYctrl L units, with the possibility of

communication and data synchronization between the individual systems using a fibre optic cable. The included radar, optoelectronic, and jamming systems are automatically raised according to operational requirements. All equipment is stored in the container during transport.

SKYctrl L is fully adapted to be transported by vehicles with high off-road mobility. No additional lifting equipment is required.



It is in use in the Polish Armed Forces with NSN 5865 - 430031819.

SKYctrl

SKYctrl Omnidirectional FPV drone neutralizer

Advanced Protection Systems S.A. ► p. 314

The jamming device (jammer) is an essential element of the neutralising module in the integrated counter-drone SKYctrl system.

One of its main functions is to combat FPV (first person view) drones and to protect troops. It can be both integrated with an external system or used on its own.



SKYctrl

Omnidirectional range	up to 500 m
Modular design	up to 7 RF bands
Battery operation time	6.5 hours
Operating temperature	-30° to +50°
Weight	15-28 kg
Water immersion	MIL-STD-810H
Power supply	24 VDC, 36 VDC, 230 VAC variants
Antennas compliant with	MIL-STD-810H
Easy to transport	IP66/IP67

The device can operate in a manual mode (without any external software) and in an automatic mode. The neutraliser is controlled by the company's own network-centric command and control system, CyView C2.

The output power in each jamming band is up to 10 watts. The omni-directional antennas provide up to 4 dBi gain, making the unit highly effective against UAVs with a maximum jamming range of up to 500 m, depending on the power of the drone's navigation and control signal and the distance between the drone and the operator.

SKYctrl S

Advanced Protection Systems S.A. ► p. 314

Detection, tracking, classification and neutralisation of LSS (low-slow-small) targets.

- Precise 3D multi-target tracking radar with an MHT algorithm (multiple hypothesis tracking)
- Automatic classification; distinguishes between drones and other aerial objects
- Detection and defeat of class 1-3 drones
- Automatic jammers with directional antennas covering the communication and navigation bands of drones
- Dedicated and user-friendly C2 software; the PDQ tool for mission optimisation
- Extremely fast set up: full deployment in less than 5 minutes
- Dedicated API for radar data transfer to external systems; easy integration with hard-kill effectors
- Automatic positioning and heading control



SKYctrl



This version of the SKYctrl system consists of a maximum of two radars and one jammer. It is possible to integrate hard-kill effectors.

The SKYctrl S is intended for use by light infantry units to protect borders and public events. It is already in service with the Polish Armed Forces and the Ukrainian Armed Forces. It is designed to meet the most dynamic needs of our partners. Its deployment time is below 5 minutes.

Twin-Round Mobile Air Defence Manpads System KUSZA (Crossbow)

CRW Telesystem-Mesko Sp. z o.o. ► p. 322



Highly maneuverable mobile dual missile launch platform MANPADS “KUSZA” System is designed for countering air threat, including fighter jets, helicopters, UAVs and UCAVs, and other similar aerial platforms. The system is equipped with “fire and forget” type PIORUN MANPADS missiles, with highly sensitive and accurate optoelectronic sight devices, which make easy to search, track and counter the air attacking platforms.

System configuration

PIORUN missiles are housed in standard launchers connected with autonomous Gripstock and BCU (Battery Coolant Unit). Sight and communication systems are power supplied from high capacity platform Batteries or power supply Generator, which gives independence from external power supply for many hours of operational time.

The MANPADS “KUSZA” System is mounted on the any off-road vehicle, that enables to take a battle position in almost any terrain conditions. Simple small size and rugged construction allows to relocate quickly the deployment position with use of various transport platforms. It can be integrated with Main Command Unit and with IFF Interrogation system, as well as equipped with GPS positioning system and/or electronic compass.

Air-defence missile System includes:

- 4-6 MANPADS PIORUN missiles (operational configuration, missiles not included);
- 2 Gripstocks MS-Kusza, protected against unauthorized combat use,
- main control unit PS-Kusza; a prelaunch electronics box communicated with Gripstocks and sighting systems,
- daytime optoelectronic collimator sight system CD-Kusza with magnification range from 1x to 20x at least,
- nighttime thermal sight system CN-Kusza (including bolometric array)



CRW Telesystem-Mesko Sp. z o.o. ► p. 322

can be also used against live targets uncovered or covered in lightly hidden outdoor locations. The ZU-23-2CP is designed to fight against enemy with the following types of 23 mm ammunition: Armor-piercing Incendiary with Tracer (API/BZT), High-explosive Incendiary with Tracer (HEI/OFZT), Armor-piercing Discarding Sabot with Tracer (APDS-T) and Frangible Armor-piercing Discarding Sabot with Tracer (FAPDS-T). The weapon is designated for users from countries with dry and tropical climate.





ARMoured VEHICLES AND ARTILLERY SYSTEMS

122 mm Ammunition with HE-462 Projectile and Reduced Charge for D-30/2S1

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371



The product is designed for shooting with 122 mm 2S1 and D30 howitzers in order to destroy enemy manpower in open space or field fortifications and for clearing the way through minefields and defensive fortifications, fighting artillery and destroying lightly armored vehicles and weapons.

152 mm Ammunition with HE-540 Projectile and Full or Reduced Charge for D20/2S3

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

Designed to destroy manpower in open space or shelters, demolish bunkers and field fortifications, fight artillery and destroy armored vehicles. It can also be used to clear the way in minefields and defensive fortifications.



155 mm Artillery High-Explosive Base-Bleed Round with Extended Range

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371



The 155 mm HE ER BB rounds are designed to partially or completely destroy targets or temporarily slow down the advance of enemy forces, thus limiting their combat effectiveness. The 155 mm HE ER BB rounds primarily allow for the destruction of stationary targets, places with a high concentration of troops, field shelters, lightly armored targets, weapon systems, military equipment, transport equipment, etc.

WOJSKOWE ZAKŁADY MOTORYZACYJNE S.A. ► p. 366

- sights: EMES 15 A2 gunner's sight and PERI R17 A2 commander's sight (exchange of thermal cameras for the third generation cameras of PCO S.A. production and a new laser rangefinder);
- main armament (120 mm cannons) and auxiliary weapons (machine guns – replacement for Polish production rifles – ZM Tarnów S.A. and/or ZSMU ZM Tarnów S.A.), ensuring the possibility of using programmable ammunition and increasing the Firepower;
- wheels and suspension system (resulting from increased weight, as a result of increased level of crew protection), including the final drive;
- preparation of the vehicle for the assembly of the BMS and day-night cameras for the driver used in terrain surveillance in front of and behind the tank;
- the electrical system, including the vehicle's power supply system by equipping the tank with an additional power supply source – the APU or APB;

- external and internal systems of digital communication;
- the fire protection system, for example by implementing an explosion and fire suppression system in the combat compartment;
- gun turret drive system (upgrade from an analog version to the digital one).

Moreover, the company is implementing regeneration of many components, subcomponents, like:

- the wheels' control arms,
- road and tensioning wheels,
- final drive,
- injection pumps,
- heads of MB873 engine and other components of this engine.

WZM S.A. also works on subsequent technologies that make it possible to become independent from sub-contractors in the area of key components of the Leopard 2.



BAOBAB-K SCATTERED MINE LAYING VEHICLE

Huta Stalowa Wola S.A. ► p. 334

BAOBAB – K Scattered Mine Laying Vehicle enables deployment of minefields of various sizes, laying density, and self-destruction time. The minefield laying process has been fully automated: both rotation and movement of platforms with launchers (mine throwers) are carried out automatically, using a control station, which allows for a quick transition from transport to combat mode (and vice versa). The user can choose between the automatic or manual mode of the control system.



In the automatic mode, the computer calculates the launcher's settings and retains launching frequency during vehicle's travel to ensure the correct parameters of the minefield. The BAOBAB features 6 mine throwers (20 barrels in each thrower to be loaded with mine cassettes), a single mine cassette is loaded with 5 mines, so in total one vehicle carries up to 600 mines.



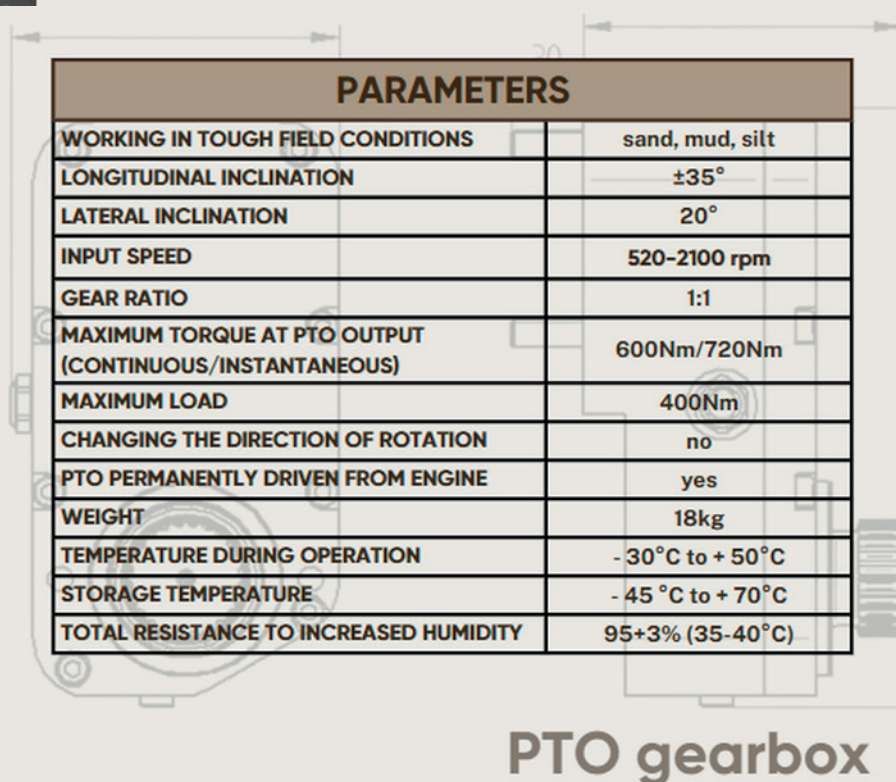
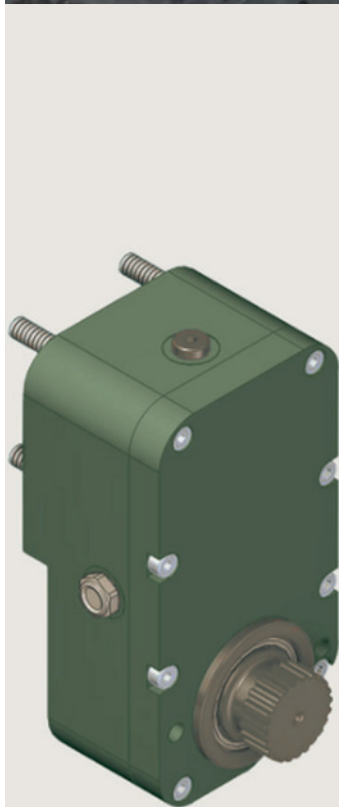
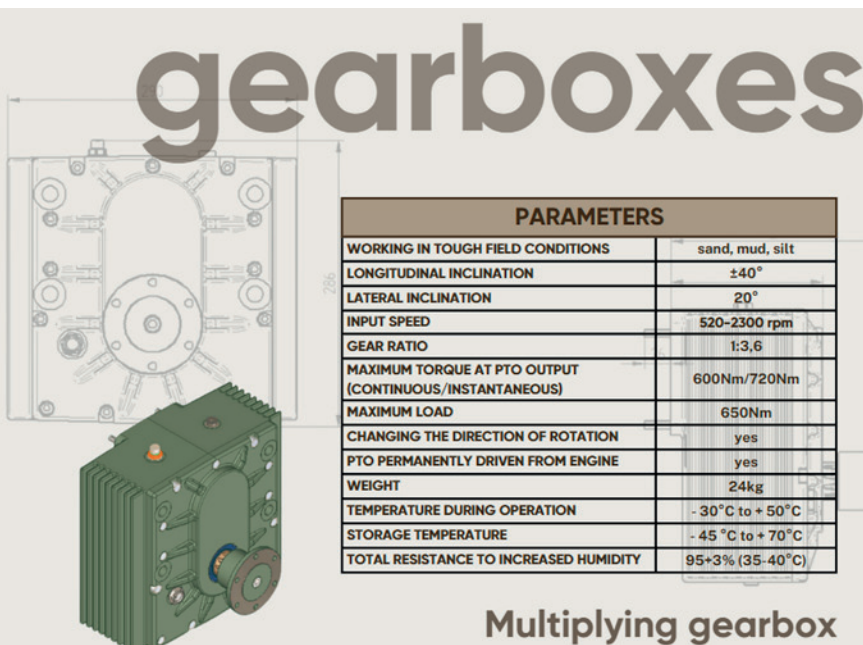
BORIMEX GEARBOXES RANGE

BORIMEX Sp. z o.o. ► p. 320

Borimex supports the design and manufacture of dedicated hydraulic transmissions with different gear ratios.

All product parameters, including its dimensions and desired functions play a crucial role in mechanical systems by

managing the transfer of power and control signals from the operator to the vehicle and all these are defined by the client and then tailored to meet their specific requirements.



BORSUK

Huta Stalowa Wola S.A. ► p. 334

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, with a high level of modular ballistic and mine protection to ensure crew safety resulting in a highly ergonomic vehicle providing comfort and safety for the troops. Modular construction allows to provide a single platform for multiple purposes.

The Borsuk IFV is integrated with the 30 mm Remote Controlled Turret System (RCTS-30 / ZSSW-30). RCTS-30 features 30 mm automatic cannon with a dual-feed system, 7.62 mm coaxial machine gun, double ATGM (SPIKE) and smoke grenade launchers. RCTS-30 / ZSSW-30 is designed to combat light and heavy armoured vehicles, and other enemy assets, providing support for the infantry units in combat. The ability to utilize programmable rounds enables combating low-level airborne threats and targets behind a cover.



BÓBR

A modern 4x4 amphibious armoured vehicle



A modern 4x4 amphibious armoured vehicle, designed and built entirely by AMZ-KUTNO S.A. It is a modular platform adapted to a variety of body and destination variants, with further upgrade potential, meeting the highest quality and safety standards.

The chassis of the BÓBR 3 vehicle under the LOTR program underwent a series of traction, environmental and functional tests, as well as was tested for bullet and mine resistance. All tests were completed with positive results.

The BÓBR 3 was designed according to the highest military standards, taking into account the maintenance of interoperability within NATO.

Advantages of the vehicle:

- The vehicle is approved for operation on public roads.
- Ballistic protection is realized in a modular way with the possibility of replacing panels with different levels of protection.
- The technical solutions used in the vehicle make it possible to overcome water obstacles without preparation.

Alternative versions::

- Artillery Reconnaissance Vehicle,
- Command Vehicle,
- Chemical Reconnaissance Vehicle,
- Tank Destroyer,
- Amphibious carrier for short-range air defense systems,
- Vehicle-carrier for strike drones / radio-electronic warfare means.

Technical Data:

- Engine: 6-cylinder 7.2 L engine and 326 horsepower
- Water propulsion: hydraulically powered thrusters
- Transmission: automatic
- Armoring: Level I and III according to STANAG 4569
- GVW: 16 tons
- V-max: 90 km/h
- V-max float: 8 km/h
- Number of seats: 5

Execution of a long-term contract for comprehensive modification of the BWR-1S/1D vehicles

WOJSKOWE ZAKŁADY MOTORYZACYJNE S.A. ► p. 366

The BWR-1D and the BWR-1S Reconnaissance Combat Vehicles are floating, armoured, tracked combat vehicles equipped with specialized reconnaissance functions. Their modification was developed and implemented by Wojskowe Zakłady Motoryzacyjne S.A.

The modified vehicles have been retrofitted with technologically advanced systems and devices including:

- external communication systems based on Harris and Radmor tactical digital radio stations,
- IT system with a digital internal communication system,
- all-round observation system based on multi-function infrared JIM LR binoculars,
- integrated optoelectronic ZIG-T-2R head,
- SR Hawk Battlefield Surveillance Radar,
- navigation systems (inertial TALIN 5000 and DAGR type GPS) and positioning systems,
- SSP-1N OBRA-3 Laser Warning System,
- AP4C automatic chemical contamination control device,
- MIMID – miniature mine detector,
- DPO portable radiometer;
- as well as:
- BERBERYS type C multi-range camouflage covering,
- 2 kW generator powered from vehicle tanks,
- parking heating
- passive surveillance and sighting equipment,
- tracks with rubber pads,
- ergonomic seats for all crew members,
- expanded fuel tanks.



Directional Spool Valves for Extreme Environmental Conditions

PONAR Wadowice S.A. ► p. 351

Our offer includes special versions of our proprietary spool valves that can be used in extreme environmental conditions, such as low/high temperatures, high humidity or dustiness, salt and sea fog.

For temperatures from -40°C to +50°C ...SO536

Products tested and compliant with defence standards:

- NO-06-A101 ÷ NO-060A108.
- IN VERSION UP TO + 90°C -TROIPIK, ...SO7

Elements of products in the TROIPIK version are galvanized or painted with phthalic enamel, tropical cyclorubber enamel, EMSGT... electromagnets are made of DNE winding wire in accordance with PN/EN-60317-0-1.

In Marine Version

Bodies and covers of products in marine versions are painted with ALBA LUX special alkyd enamel, while other elements are made of stainless steel.



GAK-81

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

The 81 mm GAK-81 smokescreen grenades are designed for firing from an OBRA, 902A, ERB-type launcher with the task of creating a smokescreen capable of preventing location and distance measurement using laser rangefinders as well as conducting reconnaissance and fire control using thermovision means. The smokescreen serves to protect individual objects, tanks, combat vehicles, artillery positions.

Heated observation devices OPO-120F, OPO-125F, OPO-130F

Przedsiębiorstwo PREXER Sp. z o.o. ► p. 352

The OPO-120F, OPO-125F, OPO-130F heated observation devices are new generation periscopes with wide angle of vision both horizontal and vertical planes, in which classic glass prisms are replaced with prisms made of organic glass.



The observation devices are equipped with heated windows with laser filters that absorb the laser light within a wavelength of 800-1200 nm.

They are designed for installation on light tanks, combat infantry cars, wheeled armored vehicles and similar.

Optical parameters of OPO-130F:

- | | |
|---|-------------|
| → Observation angle in a vertical plane | 45° |
| → Viewing angle in the horizontal plane | 160° |
| → Periscoposity [P] | 130 mm |
| → Absorbed laser light wavelength | 800÷1200 nm |
| → Optical density (1064 nm) | D≥5 |

Dimensions and weight of OPO-130F:

- | | |
|---|------------|
| → Overall height | 217 mm |
| → The dimensions of the upper part of the periscope | 365x133 mm |
| → The dimensions of the lower part of the periscope | 262x74 mm |
| → Mass | 5,5 kg |

Heavy wheeled recovery vehicle

SZCZEŚNIAK Pojazdy Specjalne Sp. z o.o. ► p. 360

Heavy wheeled recovery vehicle KWZT-3 on Tatra T 815-7M3C4.371 8x8.1R chassis was designed for quick and efficient recovery of armored vehicles in a tactical environment. The vehicle maximizes resources, minimizes and reduces recovery time. The vehicle has HMF 8520-K2 hydraulic crane with a lifting capacity of 17 320 kg

(at 4,4m) and 9 500 kg (at 8,1m), towing arm with a lifting capacity of 14 000 kg, hydraulic winches with a pulling capacity of 24 000 kg and pulling capacity of 2 000 kg and a hydraulic blade.

The vehicle will not only optimize recovery operations, but with its integrated crane, it can perform maintenance missions. It is specifically engineered to address the Army's rapid recovery needs where self-recovery and like-vehicle recovery are not feasible and was designed to recover heavy armored vehicles such as the MRAP, Pandur, etc. The vehicle enables to overturn vehicles, perform slope recovery and access vehicles mired in water, mud, sand and snow. Lift and tow operations are supported by independent Tatra suspension and a specially designed non-twisting chassis frame. The vehicle can also tow a high mobility recovery trailer for evacuation of completely immobilized vehicles.



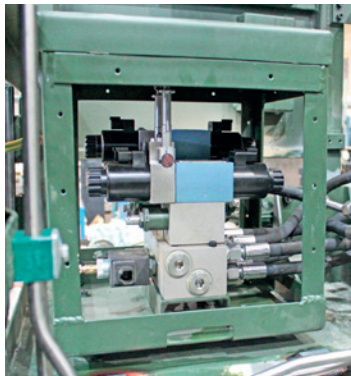
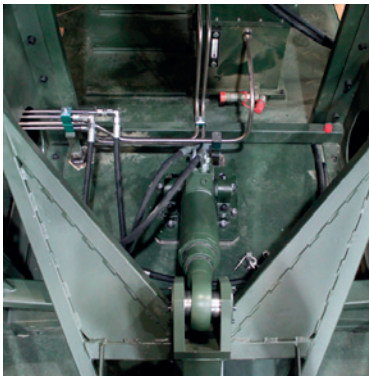
Hydraulic System for Anti-Aircraft Defence Vehicles

PONAR Wadowice S.A. ► p. 351

Within the scope of the project PONAR Wadowice manufactured a hydraulic drive for lifting and bolting of the head unit, consisting of:

- a powering unit/hydraulic power pack
- a block of hydraulic valves
- hydraulic cylinders as actuators.

The application uses electrical connections made in accordance with the DEUTSCH standard (high IP) and slide valves equipped with levers for manual override of the device.



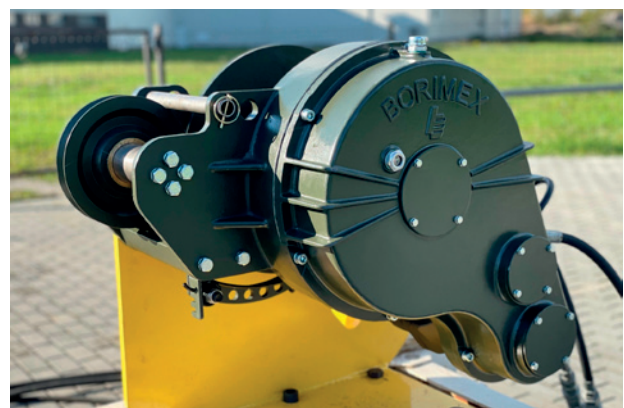
HYDRAULIC WINCHES

BORIMEX Sp. z o.o. ► p. 320

Borimex hydraulic winches are characterised by their very compact design. As a manufacturer, the company ensures that the ascender can be individually adapted to the customer's requirements, both in terms of the external construction and the parameters of the vehicle itself.

Options that the Borimex hydraulic winch fulfils:

- project adaptation to the installation within the vehicle frame
- modification and adjustment of hydraulic connections
- ability to customize control valves
- return pulleys customization (allowing the winch to pull the vehicle both forward and backward)
- system of guide rollers and mounting brackets
- Depending on the customer's needs, Borimex offers several types of hydraulic winches:
 - 70kN central winch
 - 82kN winch
 - 100kN side winch – in variants: with or without decoupling – left or right side



- 119-130kN winch (left or right side)
- 240kN winch – offered individually or as a set of two, enclosed in a frame

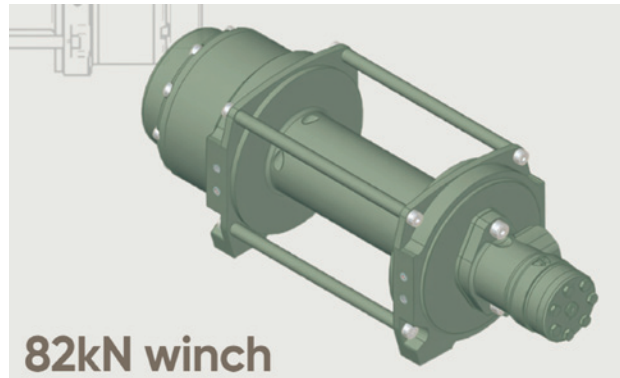
As complementary components, all of which are tailored to the winch's specifications it is possible to deliver dedicated winch accessories such as: rope presser, rope tensioner, return pulley, block, loose rope brake, rope guide with a cleaner.

PARAMETERS 70kN CENTRAL WINCH	
NOMINAL LOAD (PULLING FORCE)	70kN
NOMINAL ROPE RETRACTION SPEED	17m/min
AMBIENT TEMPERATURE DURING OPERATION	-30°C to 55°C
STORAGE TEMPERATURE	-40°C to 70°C
WEIGHT WITHOUT FRAME	104kg (± 1%)
WEIGHT WITH FRAME	141 kg (± 1%)
MAXIMUM OIL VOLUME FLOW	100l/min
MAXIMUM OIL PRESSURE	250 bar
MINIMUM BRAKE RELEASE PRESSURE	13 bar
TOTAL ROPE LENGTH	70m
EFFECTIVE ROPE LENGTH	67m
ROPE DIAMETER	14mm
MINIMUM BREAKING LOAD (MBL EN 14492-1)	≥ 140kN



winches	
PARAMETERS	
NOMINAL LOAD (PULLING FORCE)	82kN
NOMINAL ROPE RETRACTION SPEED	3,5m/min
MAXIMUM OIL PRESSURE	200bar
BRAKE TYPE	disc
MAXIMUM OIL VOLUME FLOW	80l/min
DIAMETER OF THE WINCH DRUM	102mm
DIAMETER OF (SYNTHETIC) ROPE	14mm
ROPE LENGTH	32m
MINIMUM BREAKING LOAD (MBL EN 14492-1)	≥ 200kN
WEIGHT WITHOUT ROPE	38kg
AMBIENT TEMPERATURE DURING OPERATION	-30°C to 55°C
STORAGE TEMPERATURE	-40°C to 70°C

PARAMETERS 100kN SIDE WINCH	
NOMINAL LOAD (PULLING FORCE)	100kN
NOMINAL ROPE RETRACTION SPEED	12m/min
AMBIENT TEMPERATURE DURING OPERATION	-30°C to 55°C
STORAGE TEMPERATURE	-40°C to 70°C
WEIGHT WITH FRAME	267 kg (± 1%)
MAXIMUM OIL VOLUME FLOW	100l/min
MAXIMUM OIL PRESSURE	200 bar
MINIMUM BRAKE RELEASE PRESSURE	32-35 bar
TOTAL ROPE LENGTH	67m
ROPE DIAMETER	16mm
MINIMUM BREAKING LOAD (MBL EN 14492-1)	≥ 200kN
DIAMETER OF THE WINCH DRUM	200mm



Hydropneumatic Suspension for Tracked Vehicles

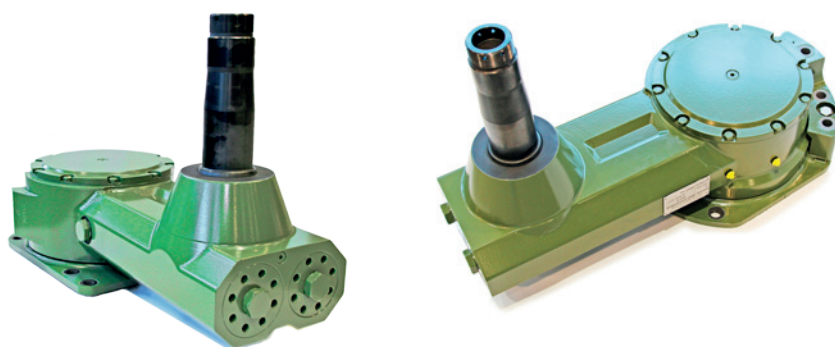
PONAR Wadowice S.A. ► p. 351

A vehicle suspension systems for heavy loads, hydropneumatic rocker arms are an element acting as a damper in the suspension of the chassis. One rocker is mounted on one wheel assembly. In the hydro-pneumatic suspension system, a gas spring is used to support the weight of the vehicle. A hydraulic and pneumatic mechanism is built into the rocker body to provide a twisting force around the axis of rotation. The air spring provides non-linear resistance to suspension deflection.

The vehicle clearance is regulated by the gas volume in the gas spring. The proper damping characteristics of the rocker arm movement are achieved through the appropriate design of the shock absorber. The design of the rocker arm allows it to be used in vehicles of various weights.

The shock absorber provides resistance to the rotational movement of the axle rocker, the amount of resistance being a function of the rotational speed of the rocker. The mechanical energy from the rotation of the driving arm is absorbed by the shock absorber and dissipated as heat to the environment.

Hydropneumatic rocker arms are tested on test rigs, where tightness tests, pressure tests of 970 bar, damping characteristics, tests at reduced temperature and resistance to vibration, humidity and salt fog are carried out.



IMITATOR OF A CANNON SHOT ISA – 155 TRAINING AMMUNITION

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

The Imitator of a Cannon Shot 155 mm round perfectly enables to train activity of loading and shooting alike the utilization of live ammunition and even practice shooting. Special plug ensures complete burning of the propellant during firing. Energy created during firing is sufficient to ensure automatic functioning of the weapon system even in extreme conditions. Considering the minimal danger area (100 meters) no firing range is demanded for training and the cost of training are just fraction of the cost needed for live ammunition firing.



ISA-73 mm cannon shot imitator

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

73 mm cannon shot imitator ISA-73 with a PG-15P charge is used for training soldiers, familiarization with the mechanisms of automatic loading and imitation of the shot-fired from the 2A28 gun.



KRAB 155 mm – Self-propelled howitzer

Huta Stalowa Wola S.A. (PGZ) ► p. 334

The Krab gun-howitzer is a 155 mm self-propelled tracked howitzer designed in Poland by the Huta Stalowa Wola.

The KRAB self-propelled howitzer is designed to destroy missile systems, artillery and anti-aircraft missile batteries, command posts, communications nodes and field fortification, mechanised and motorised sub-units located deep within the enemy formation, and other important support area facilities.

The Krab self-propelled howitzers used by the Polish Army have successfully proven their value in real-life military operations in Ukraine. Their sale to the Ukrainian side is the first export contract for this armament.

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, GPS and odometer, internal communication system.





120 mm RAK 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.



M17T Thermal Imaging Periscope

Przedsiębiorstwo PREXER Sp. z o.o. ► p. 352



M17T periscope with additional
dual camera module

The M17T periscope is a day-night observation device equipped with two cameras: a thermal imager and a day-light and fully modular display, with the possibility of adding two more cameras: daytime, or TI, e.g. as reverse cameras for the driver. The device is designed for assembly in tanks, combat cars, armoured vehicles, etc.

The M17T is dedicated to, among others, M113 tracked transporters, M1A1 Abrams tanks, M108/M109 self-propelled howitzers, M578/M88 technical support vehicles, M2Bradley/ M1126 Stryker infantry fighting vehicles. There is a possibility of adaptation to other vehicles.

The M17T is dedicated as a functional extension/replace- ment for the M17/M19/M24 day observation devices and the AN/VVS2 night periscope devices. The M17T increases the crew's situational awareness in all visibility conditions.

Examples of technical parameters:

- Thermal imaging camera:
- Resolution 640x512
 - NETD ≤50 mK
 - Operating spectrum 8~14 μm
 - Viewing angle HFOV: 61.8°

Day camera:

- Horizontal resolution 1500TVL
- Enhanced sensitivity system at low light levels: Super WDR (HDR)
- Min. Illumination [WDR] 0,00001 lx
- Viewing angle 125°

Display:

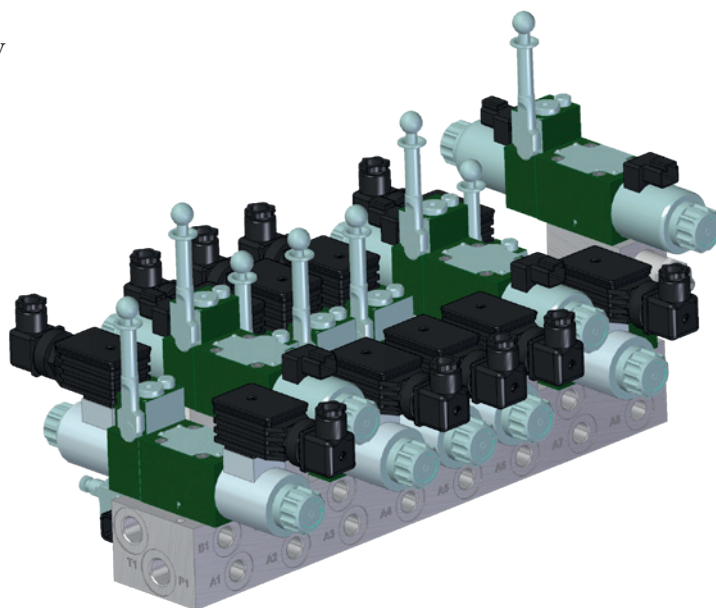
- Diagonal screen size 7 inches
- Resolution 1280 x 800 pixels

Work parameters:

- Periscope power supply: from the vehicle installation
- Operating temperature: from -30°C to +65°C,
- Impact and shock resistance and environmental conditions according to MIL-STD-810

PONAR Wadowice S.A. ► p. 351

- a pump unit
- valve block
- oil tank
- piston hydraulic cylinders with mechanical brakes
- linear hydraulic cylinders
- rotary hydraulic cylinders
- roof opening cylinders, piston/piston rod diameter 50/36mm, stroke 398 mm
- hydraulic cylinder of a bolt
- swivel joint lock cylinder

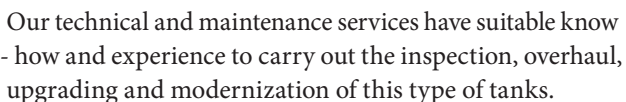


- lifting and unfolding structural elements
- opening and closing of the roof
- for leveling the vehicle
- raising and lowering the masts
- as well as locking and unlocking the mechanisms



Zakłady Mechaniczne "BUMAR-ŁABĘDY" S.A. ► p. 369

Zakłady Mechaniczne "BUMAR-ŁABĘDY" S.A. ► p. 369



Overhaul works:

- As part of the overhaul works, tanks can be retrofitted with new components in the form of additional equipment packages with varying costs of implementation.



Zakłady Mechaniczne "BUMAR-ŁABĘDY" S.A. ► p. 369

- minefield clearing vehicle - support of armored division in the scope of passing through the minefield;
- scattered mine laying vehicle - support of armored division in the scope of mining with new scattered mines;
- deactivation support vehicle - support of armored division in the scope of tanks and other vehicles deactivation from radioactive and chemical precipitation.



WOJSKOWE ZAKŁADY MOTORYZACYJNE S.A. ► p. 366

The quick-replacement power-pack for the IFV "Borsuk" is an original propulsion unit with the following basic technical parameters:

- dimensions: 2436 mm x 1949 mm x 1421 mm (length x width x height),
- time of dismantling from the vehicle: less than 1 hour,
- MTU 8V199 TE20 engine (530 kW maximum power, 2700 Nm maximum torque),
- transmission X300, additionally 3040 MX by Allison Transmission (automatic, 4 forward gears, 2 reverse gears, hydrostatic steering),
- Polish-made cooling system,
- hydraulic pumps of the hydraulic system,
- an alternator with a capacity of 320 A,
- intake air filtration system with centrifugal separator.

ROSOMAK
8x8 APC

ROSOMAK S.A. ► p. 353

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.

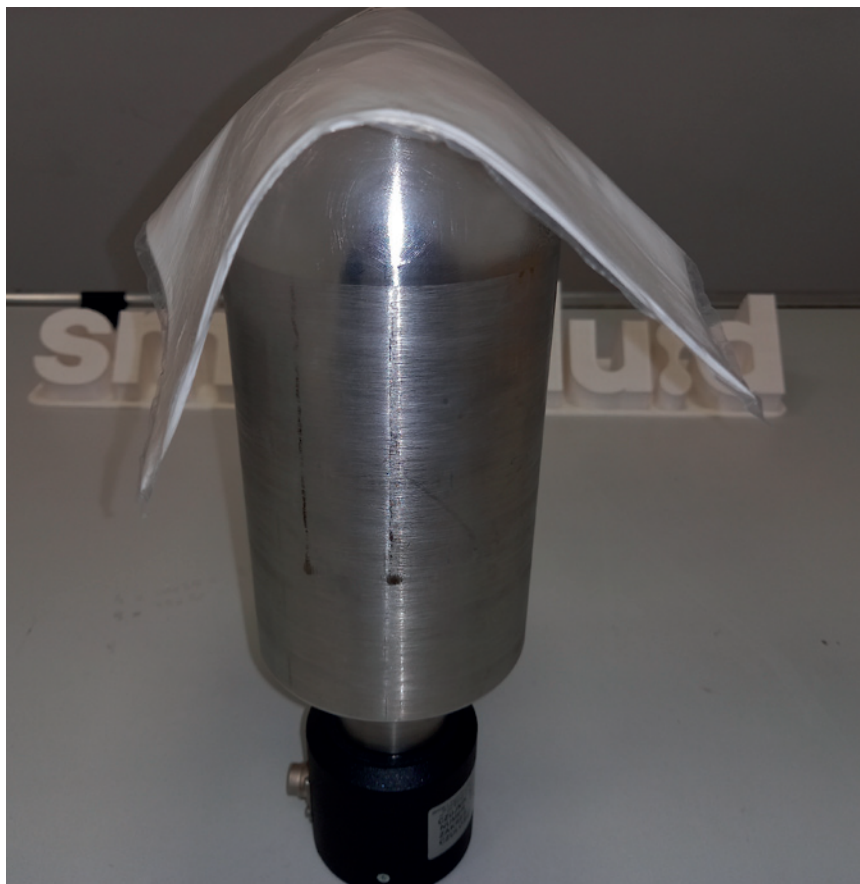


- New, modular construction multiple applications
- Designated to transport and protect the crew and infantry soldiers against small arms fire, AT grenade launchers and IEDs
- IFV version armed with 30 mm automatic cannon, dual ATGM launcher, 7,62 machine gun
- Powerpack driving system
- High level of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



Smart & flexible ceramic materials

Smart Fluid S.A. ► p. 357



liquid

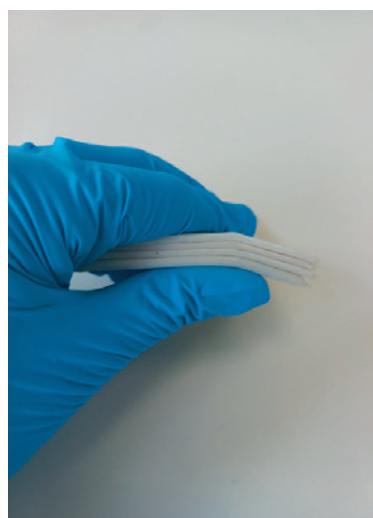


gel layer

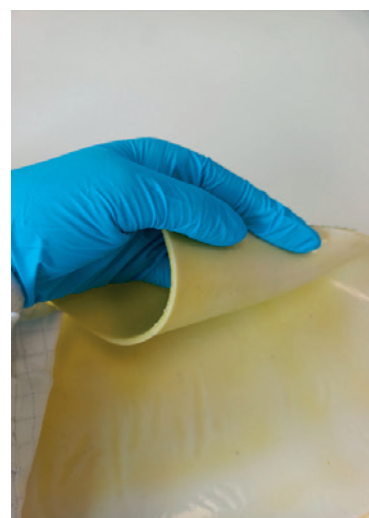
The Smart Ceramic Material is a next-generation material developed for exceptional adaptability and protection. Utilizing shear thickening concept, this group of innovative materials exhibits rapid increase in viscosity to absorb energy and vibrations.

The SCM is available in various forms: liquid, gel, multi-layer gel inserts and foams. This allows it to be tailored to specific requirements and applications such as:

- personal protection (vests, ballistic plates, footwear, helmets, EOD suits) - help to reduce back-face deformation (BFS) by 25-35%+
- equipment protection (passive armour, spall liners, blast wave protection, fuel tanks, steel structure filler, combat equipment protection) - help to reduce shock wave by ~40%+
- anti-vibration systems (logistics crates and containers, seats, aircrafts: helicopters, airplanes, drones and space applications)



multiple gel layers



foam

Special Transporter
JELCZ brand. Type 663.45.

JELCZ Sp. z o. o. ► p. 338

A special vehicle. Truck chassis. Special Transporter

The 3rd generation Jelcz with independent suspension – three-axle vehicle type 663.45, code T60 was created from scratch by Polish engineers. The 663.45 model is supposed to be, among other things, a carrier for the Homar-A missile system, i.e. the American M142 HIMARS multiple rocket launcher. The 3rd generation JELCZ vehicles will ultimately become the basic trucks of the Polish Army. The architecture of these vehicles is more modern than the previous one, and at the same time provides considerable development potential. The JELCZ chassis of the 663.45 type is a vehicle with a three-seater, armored cabin with a bed. The modules, testifying to the design difference of the premiere representatives of the third generation and being one of its basic characteristics, are the new following ones, installed for the first time in the JELCZ chassis:

- independent suspension on all axles of the vehicle
- an armoured cabin, equipped with a bed, with a flat floor enabling comfortable movement of two to four persons
- wheels equipped with Runflat inserts and the new CTI system
- fully automatic ZF transmission
- the engine retracted behind the cabin, the gearbox and the transfer case are connected directly
 - creating one module – power pack
- automatic locking system for transfer case and drive axle differentials (ADM)
- compact control panel with extended functionality for easy operation by the driver

Subject code in JELCZ Sp. z o.o.: T60 TS



TUR VI

AMZ-KUTNO S.A. ► p. 316

It is an innovative product with a modular design, designed from the beginning in compliance with the standards and requirements of military technology. One of the variants of TUR VI is the Light Armored Transporter, implemented in series production, designed for special operations carried out by the Police, Special Services and the Bureau of Anti-Terrorist Operations. Its design is based on an augmented mobility chassis with a 4x4 drivetrain, optionally 6x6. Due to its innovative lightweight design, the vehicle's payload reserve allows it to provide ballistic protection at the level expected by the user, while maintaining high vehicle dynamics. The vehicle also allows the use of additional special assault equipment, such as tactical entry and rescue system. The spacious interior provides the ability to carry eight people.

Technical parameters:

- Engine: diesel - 362 hp
- Transmission - 5-speed automatic
- Suspension:
 - Front independent, reinforced, with springs and telescopic shock absorbers
 - Rear with springs and telescopic shock absorbers
- Permanent 4x4 drive or 6x6
- Armoring - Level I and II according to STANAG 4560



- Shrapnel resistance – I and II level according to STANAG 4569
- Length – 6440 mm
- Width – 2350 mm
- Height – 2640 mm

Alternative versions:

- Vehicle – armored ambulance
- Vehicle for the transportation of specially protected persons
- Vehicle for transportation of specially protected cargoes
- Vehicle for transportation of unexploded ordnance



WARAN 4x4 Multi-Purpose Tactical Vehicle

Huta Stalowa Wola S.A. (PGZ) ► p. 334



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.



ZSSW 30 Remote-Controlled Turret System

Huta Stalowa Wola S.A. (PGZ) ► p. 334

Remote-Controlled Turret System (ZSSW-30) is designed to combat, destroy and suppress enemy light and heavy armoured targets and other objects, including the enemy's infrastructure, in different climate conditions and to provide fire support for units during combat activities, irrespective of the time of the day. Remote-Controlled Turret System features 30 mm automatic cannon with dual-feed system; 7,62 mm coaxial machine gun, 8 pcs. smoke grenade launchers, double ATGM, SPIKE. The turret system has bi-axial stabilization of the basic armament, cannon and machine gun, two-axis, independently stabilized ob-



servation devices for both the commander and the armament operator, features an additional observation device for conducting combat operations in emergency mode.

The turret system together with function stands is to be autonomous not only in tactical terms but also in terms of construction, giving the possibility of adapting it to various carriers including tracked.

The carrier of the RCST is the KTO ROSOMAK 8x8 base vehicle. The RCST is also adapted to the New Amphibious Infantry Fighting Vehicle “”.





COMMUNICATION EQUIPMENT AND C4I SYSTEMS

BMS JASMINE

TELDAT Sp. z o.o. sp.k. ► p. 362

BMS JASMINE is the latest generation, comprehensive and network centric battle management system dedicated to tactical echelon (battalion, company, platoon and section) or rescue operations. This is the first BMS in Poland and one of the few in the world. The system enhances and automates the processes of command and communications and combat operations. It is designed to develop modern and comprehensive C2 on-board systems at tactical level. The system is dedicated to all types of vehicles, vessels and flying objects in the armed forces. It can also be used by mobile troops of various types of public services, after the adjustments to their specific needs. On the base of this solution modules, the various system configurations of the same standard can be constructed using its like blocks. The solution can be also used as an autonomous system.

BMS JASMINE as an on-board ICT node provides modern, efficient, mobile, and multi-service ICT infrastructure dedicated to a tactical level, designed in IP technology; optimal selection, integration, use and monitoring of on-board equipment (including communication means, transmission media, sensors, effectors and endpoint devices); high security level by applying network devices that meet the highest level of national and NATO standards (e.g. cybersecurity) validated by penetration and vulnerability tests; interoperability with the coalition systems, among others by the implementation of NATO standards.



COMP@N Software Defined Radio

WB Electronics ► p. 365

The SDR COMP@N radio offers a wide range of features, such as voice transmissions broadcast, MANET radio functions, and the possibility to choose between different waveforms (WF) and a range of supported frequencies. The radio is offered in a handheld and mobile versions and allows to choose between different waveforms (WF) and range of supported frequencies. The radio comes with a wide range of functionalities, such as basic e.g. voice transmissions broadcast, complex e.g. MANET radio / all available functions. Current requirements of the modern battlefield, with all limitations, or even a lack of available radio resources, determine the need to use various types of radios working with many types of waveforms (WF). Fulfilling of these expectations is a challenge that can only be achieved by a radio communication system, for which

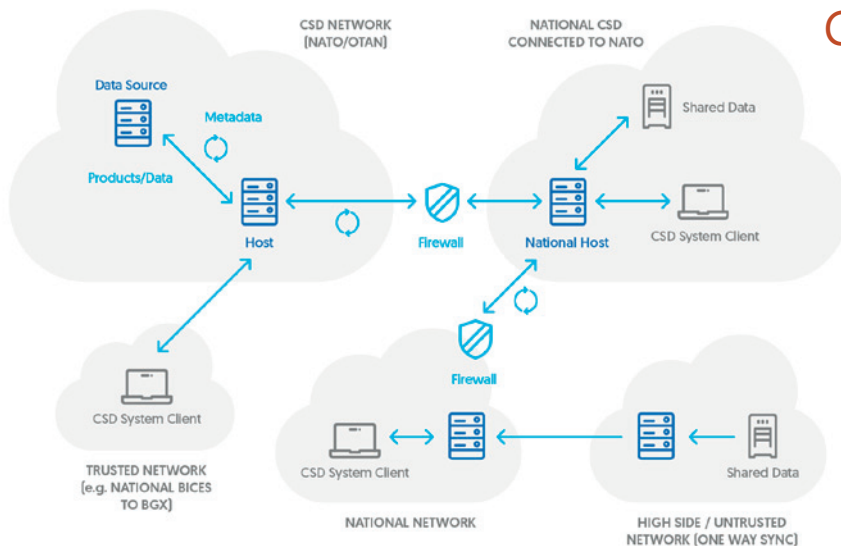
the main goal is to provide a comprehensive implementation of user's services while taking into account the limitations of the planning spectrum.

COMP@N provides a comprehensive security in the range of TRANSEC, NETSEC and COMSEC mechanisms based on AES-256 algorithms and additional usage of SCIP technology (STANAG 5068). The main services include data services: IP data, Serial Data, sensor data, as well as data for BMS systems —> Situation Awareness / GPS; analog voice and digital voice (which supports the flat and vertical structure), remote and local management services and capability to integrate with existing infrastructure elements such as other radios, terminal devices, vehicles and civilian radios.



CSD EP System Client

Asseco Poland S.A. ► p. 318



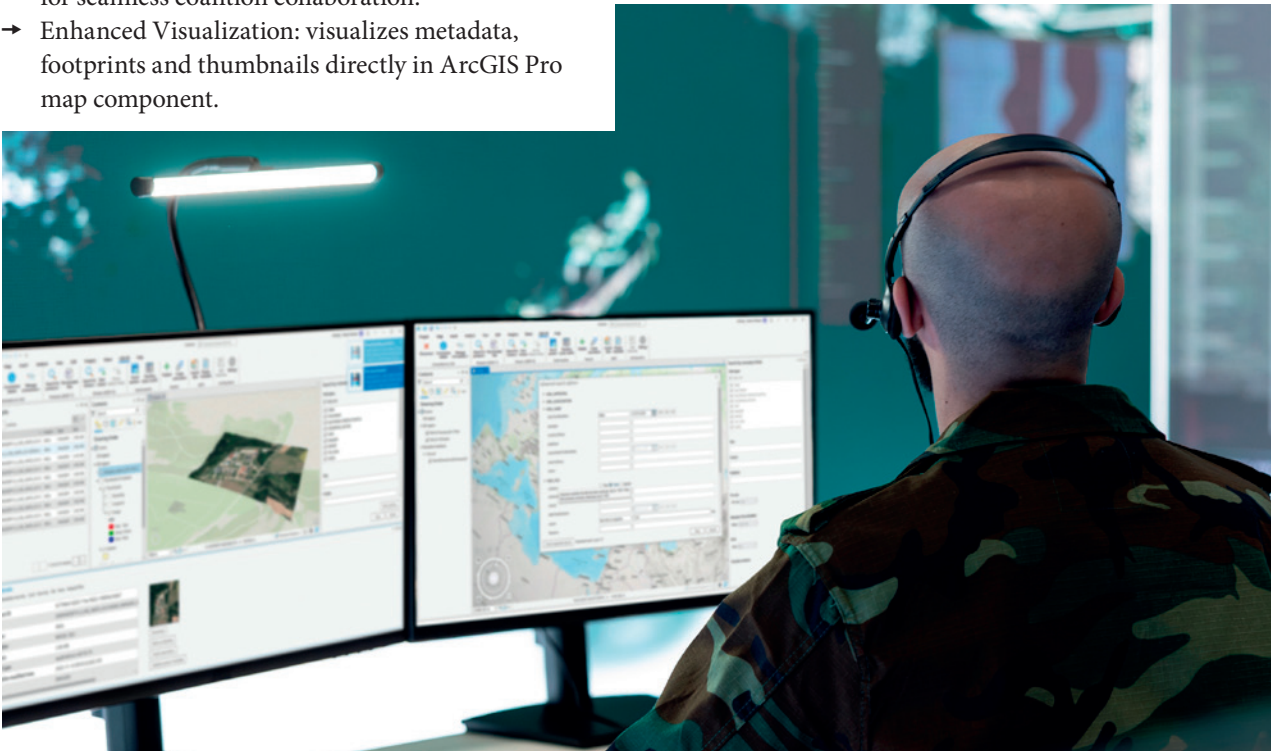
The CSD EP System Client revolutionizes intelligence sharing and efficiency within NATO coalition forces. Integrated with Esri ArcGIS Pro, it enables analysts to access reconnaissance data—satellite imagery, reports, maps, videos etc.—perform analyses, and share insights in real time. Validated at NATO CWIX, it ensures secure communication in classified networks.

Key Features

- **Advanced Metadata Search:** supports complex queries (STANAG 4559 AEDP-17/18) for rapid data discovery, including spatial queries and standing queries for monitoring.
- **Real-Time Integration:** handles FMV and GMTI streaming.
- **Seamless Workflows:** automates data discovery, analysis, and publishing in one application.
- **Connectivity:** connects to CSD servers from different manufacturers.
- **Interoperability:** fully compliant with NATO standards, integrates into the JISR process, for seamless coalition collaboration.
- **Enhanced Visualization:** visualizes metadata, footprints and thumbnails directly in ArcGIS Pro map component.

Benefits

- **Operational efficiency:** automates data workflows, reducing manual effort and speeding up analysis.
- **Enhanced decision-making:** boosts situational awareness.
- **Scalability and Compliance:** adapts to diverse operational needs while maintaining NATO interoperability.
- **User-Centric Design:** features an intuitive interface and customizable settings.
- **Support for ISR Missions:** provides tools for intelligence, surveillance, and reconnaissance missions.



CyView C2

Advanced Protection Systems S.A. ► p. 314

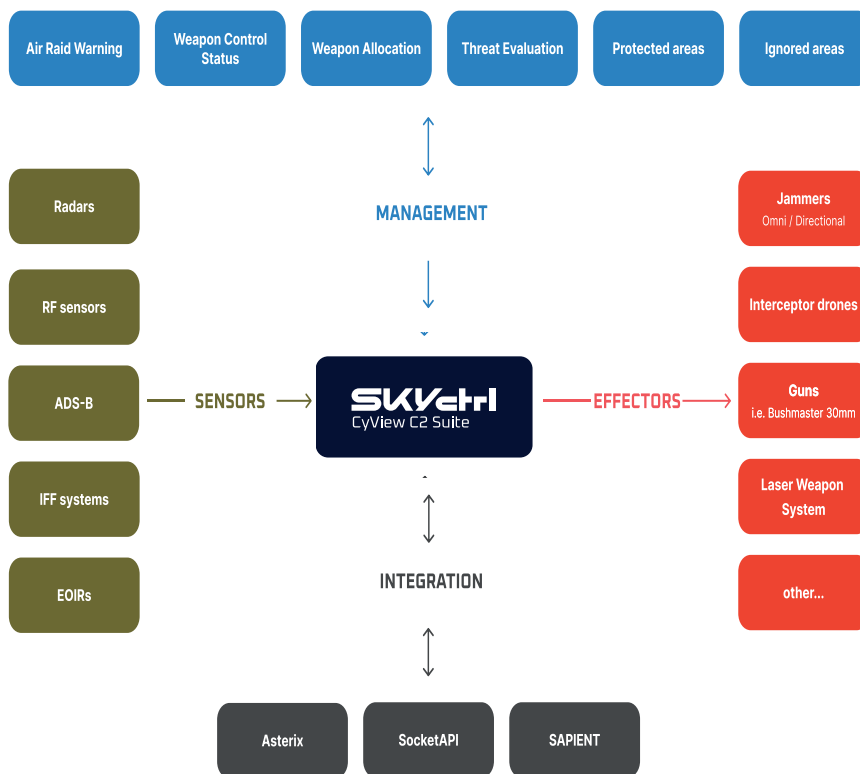
SKYctrl is an advanced system comprising specialized hardware and software. At the core of the system lies the proprietary software suite SKYctrl CyView C2 Suite, a comprehensive solution designed for detection, classification, identification, and neutralization of mini and micro-class unmanned aerial vehicles (UAVs).

CyView C2 is a fully Polish product, conceived and developed by specialists from the Gdynia-based company APS. The company listens closely to the needs of soldiers, ensuring that the system is both user-friendly and intuitive, enhancing operators' response time.

The software is fully customizable, modular, and capable of integration with a wide range of sensors and effectors (both soft-kill and hard-kill). Among the software solutions developed and continuously improved by APS are two flagship Command and Control (C2) applications: CyView C2 Suite and CyView C2 Web Suite, each designed for different operational needs.

SKYctrl CyView C2 Suite has been developed for experienced military operators trained in kinetic and non-kinetic effectors. It is modular and integrates with RF, optical, and radar sensors. Additionally, the software is network-centric, capable of Master-Slave operation, and interoperable via NATO-compliant protocols.

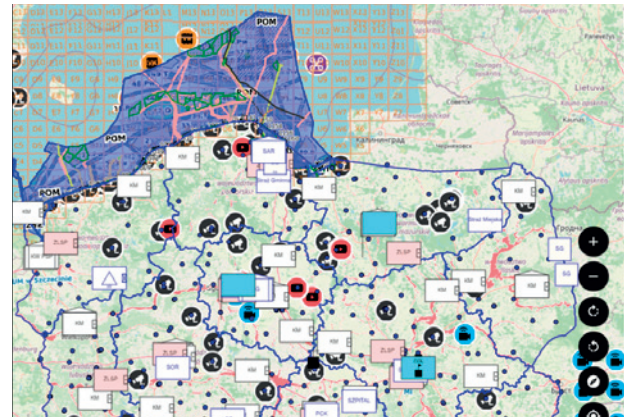
The operator interface follows User-Centered Design (UCD) principles, ensuring intuitive use, rapid training, and seamless interaction.



C3IS JASMINE

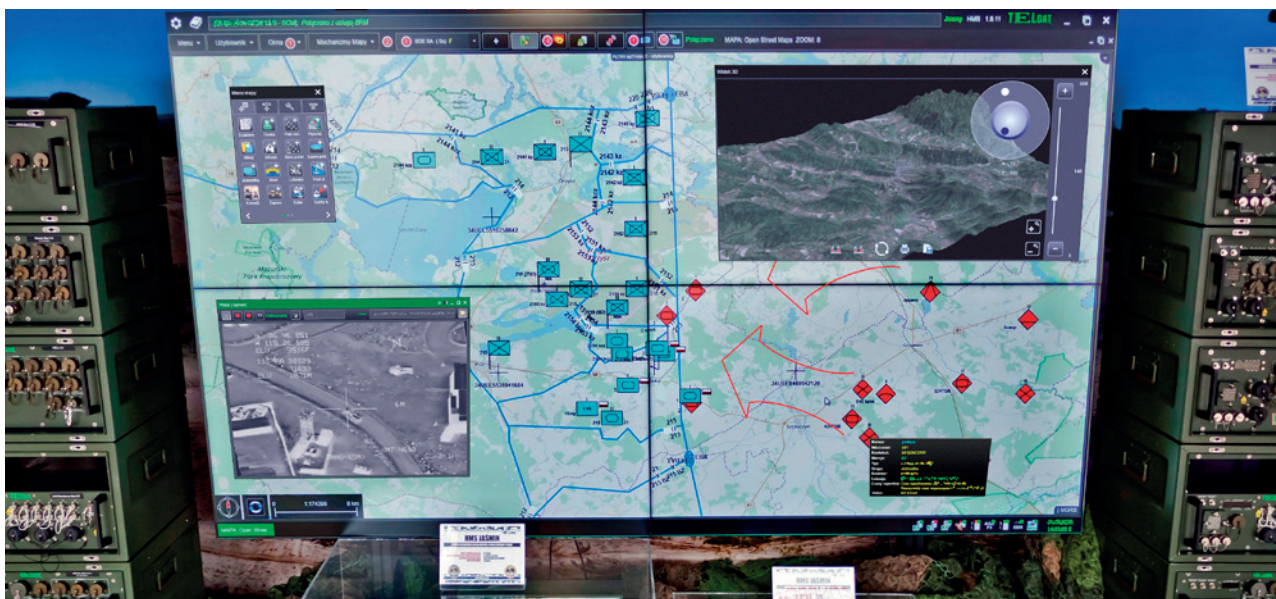
TELDAT Sp. z o.o. sp.k. ► p. 362

C3IS JASMINE is an automatic and comprehensive software solution – a C3I network centric system dedicated to all command echelons from operational down to dismounted soldier. The innovative and primary feature of this product is the fact that it consists of a wide range of ready to implement solutions based on the versatile Set of Services which directly fits to the requirements of the armed forces. This solution ranks with the C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) class systems. The development of this high specialized software has contributed to the significant progress of C2 systems also in the alliance dimension. It allowed to rank Poland at the forefront of NATO countries in this area.



C3IS JASMINE was designed according to the Service Oriented Architecture concept and has a fully unified and comprehensive set of services, which ensures its scalability and modular structure. The offered system incorporates many Software Modules including the following ones :

- HMS C3IS JASMINE - software / Multidomain Combat Management System for the Operational and Tactical Level;
- BMS C3IS JASMINE - software / Battlefield Management System for Battalion, Company, Platoon & Section;
- DSS C3IS JASMINE - software / Dismounted Soldier System;
- JFSS C3IS JASMINE - software / Joint Fires Support System, including JTAC;
- CMS C3IS JASMINE - software / Multilevel Crisis Management System.



Digital Baltic

Centrum Techniki Morskiej (PGZ) ► p. 323

Digital Baltic is a state-of-the-art technology platform that enables real-time geographic data management. It combines data from various public and private sources, supporting the analysis of the maritime situation with a GIS module and artificial intelligence algorithms. The system guarantees full information security, operating in two independent versions (unclassified and classified),

and its compliance with international standards ensures interoperability. With features such as automatic detection of anomalies, creation of alerts and recognized maritime situational awareness, the platform is an indispensable tool in protecting critical infrastructure and maintaining maritime security.



Digital Radio Relay R-460AM-2

Transbit Sp. z o.o. ► p. 363

Digital Radio Relay R-460AM-2 – designed for the construction of High Capacity Line of Sight (HCLOS) radio communications.



General parameters: operating band NATO IV (4.4 GHz ÷ 5.0 GHz) provides data transmission of over 400 Mbit/s and band NATO III+ (1.35 GHz ÷ 2.7 GHz) provides data transmission of up to 100 Mbit/s, communication at a distance of about 40 km. R-460AM-2 radio relay manufactured by Transbit play a fundamental role in ensuring a modern and reliable communication system of the Air Defense Forces in the Polish Armed Forces. The R-460A Radio Relay fits into the requirements of the IBCS (Air Defense Command and Control System). It was integrated by Northrop Grumman and Transbit in 2021. The R-460A is the first non-U.S. radio communications device integrated into the IBCS.

Digital Wideband Radio R-450C-01

Transbit Sp. z o.o. ► p. 363

Wideband Radio R-450C-01 is the first Polish programmable digital radio - Software Defined Radio (SDR). It is designed to create tactical battlefield radio communication IP networks (wireless local LAN and wide WAN), using the band I (from 225 MHz to 400 MHz). R-450C is characterized by high resistance to interference and unfavorable propagation phenomena, such as signal reflections (multipath) or fading. It is dedicated to create IP network between mobile objects e.g. Reconnaissance Vehicle, Command Staff Vehicle, or Fire Unit. R-450C-01 is designed for network-centric command systems (C4ISR) at the Brigade, Battalion and Company level.



EyeQ Land

WB Electronics ► p. 365

EyeQ Land not only provides essential, expanded situational awareness, but also serves as a key element of support for soldiers in multi-domain operational activities. The improved algorithm ensures precise tracking, identification and guidance to targets in an automated manner. EyeQ Land is a synergy between an advanced technology and engineering precision, aimed at ensuring maximum flow of combat information and optimizing the ability to respond to dynamically changing operational conditions.

Integrating advanced artificial intelligence features, the EyeQ Land system significantly improves the effectiveness of combat operations by supporting the crew. AI also assists in critical moments, allowing soldiers to focus on the most pressing, highest priority threats. The system recognizes vehicles and other military objects, automatically classifying them according to a defined hierarchy of military classes. This allows soldiers to easily identify the type of object, leading to shortened reaction times.

The system can automatically suggest which targets should be neutralized first and what type of weaponry should be used. By continuously analyzing the battlefield, the AI prioritizes threats and makes recommendations to the soldiers in real-time.

The crew has access to a holistic view of the combat situation through integrated cameras. Observation of the surroundings is highly automated and subject only to human oversight. This helps improve situational awareness, reduces mental workload, and allows for more rapid and judicious actions even in complex, high-stress combat scenarios. Operations in urban terrain become much easier. Consequently, the number of crew members can be reduced to two persons. The system can also be integrated with unmanned vehicles.

The system also provides precise tactical data for commanders and operators, enabling image analysis from single or multiple video sources. All of this leads to increased situational awareness, both at the individual vehicle level and the entire theater of operations.

EyeQ Land can be integrated with fire control and battlefield management systems, further enhancing its effectiveness in combat operations. EyeQ Land supports automatic optical distance measurements based on the recognized object class.

As a result, EyeQ Land offers not only advanced combat capabilities, but also flexibility and scalability, allowing it to be used effectively in a wide variety of operational scenarios

FlyAway SMART Terminal

GISS Sp. z o.o. ► p. 333

SMART by GISS is a complete FlyAway VSAT terminal, offering a wide range of configurations suited to each customer's requirements. It comes with motorized antenna of aperture of the customer's choice from 1,5m up to 2,4m and Antenna Control Unit with auto-pointing feature as a standard, and can be equipped with Fiber Optic module, conventional IDU section, or No-IDU Modem Module with various modems. It is possible to integrate network devices, UPS, and other required accessories according to customer requirements.

Advantages:

- Flexible configuration according to the customer's needs.
- Wide range of different antenna size.
- Bespoke IDU with Integrated Terminal Controller (ZKT) or No-IDU option.
- Fiber Optic modules with L-Band signals transmission available.
- In-field, tool-less switching of the working band by changing only RF module.
- Motorizing and dedicated ACU with automated pointing feature as a standard.
- Intuitive local GUI and WEB interface.
- Powered from AC (mains) with UPS option.
- Packed with dedicated hard-case system.



FONET Digital Communication Platform

WB Electronics ► p. 365

FONET is a set of devices and their software creating a unified data exchange base between military vehicles on the battlefield. Comprising a single scalable, modular and platform-agnostic solution, FONET hardware allows end users to select the most appropriate mission-relevant C4I configurations for tactical ground vehicles.

Digital communication platform FONET hardware, when integrated on board a tactical ground vehicle, provides end users with the ability to operate a variety of mission capabilities to enhance connectivity and situation awareness; provide accessibility to lethal and non-lethal effectors; and reduce decision-making and targeting cycles at the lowest tactical level.

This aggregation of C4ISTAR systems across the battlespace not only enhances the operational effectiveness of small unit teams but also provides redundancy levels in data pathways particular relevant to missions conducted in Command and Control Disrupted or Denied environments (C2D2Es) similar to those currently being witnessed in Eastern Europe.

Specifically designed to support the generation and management of a Collaborative Operating Picture (COP), FONET enables ground forces to operate C4ISTAR configurations across any platform agnostic tactical ground vehicle employed on the battlefield.



FT-5 Digital Communication Platform

WB Electronics ► p. 365



FT-5 is a short-range tactical category unmanned aerial system (UAV) developed by WB Group. It is designed for missions requiring high reliability and long flight duration.

FT-5 features a twin-engine design, which enhances its reliability. It can be equipped with various sensors, such as

electro-optical heads, COMINT/ELINT/SAR sensors, contamination detection sensors, and armaments. This system is capable of autonomous takeoff and landing, as well as conducting intelligence missions, battlefield observation, convoy escorting, disaster monitoring, and border patrolling.



HMS JASMINE

Headquarters Management System

TELDAT Sp. z o.o. sp.k. ► p. 362

HMS JASMINE (Headquarters Management System) in shelter and portable version is a comprehensive, network centric battle management system dedicated to the operational and tactical echelons or crisis operations structures. It is an innovative, mobile ICT infrastructure of the highest and medium command's posts echelons. This solution (also with software) is implemented and used on a large scale in the Polish Armed Forces. This highly specialized system, also the only Polish, has NATO recommendations and interoperability certificates. The system has also operational recommendations of the Polish War Studies University (ASzWoj). It's enrolled on the Approved Fielded Product List (AFPL) and it has passed the highest level tests with MIP Test Reference System (NATO - MTRS).



The system has been granted numerous awards (also by the President of the Republic of Poland and the Polish Ministry of National Defense) and has been successfully implemented and used in the Polish Armed Forces as well as in a number of largest international and Polish projects (e.g.: Multilateral Interoperability Programme and many subsequent editions of military exercises). All of this together is the primary and unique feature of this solution.



In the most cases HMS JASMINE is composed of:

- software: HMS C3IS JASMINE- Multidomain Combat Management System for Operational and Tactical Level;
- hardware: modern data communications node.



Mobile Access Node SIL720-MWD

SILTEC Sp. z o.o. ► p. 356



Mobile Access Node is made in one compact 2U high, according to the 19" RACK standard, equipped with movable rails to ensure an easy access to the device. The MWD housing is divided into 5 sections guaranteeing easy user access to the power and operation sections. It also meets the SDIP-27 Level A standard.

MWD is made on the basis of 2 CISCO ESR-6300-CON-K9 routers, one for each side: RED and BLACK.

- In the RED section of the device, 4 SFP ports with 1 Gbit speed for SFP modules compatible with the CISCO router are placed on the front panel of the device.
- In the BLACK section, 5 SFP ports with 1 Gbit speed for SFP modules compatible with CISCO router are placed on the front panel: 2 SFP ports of WAN type, 3 ports of LAN type.

In addition, ports in each section ensure an independent and easy configuration of the CISCO ESR6300 routers. In the cryptographic device section, there are LAN ports for connecting an encryption device to the RED and BLACK sections, as well as USB host type A ports (for each section).

At the top of the device there is a revision to the section that allows installation of the cryptographic device with its accessories.



PERAD 6010 Digital Personal Radio

WB Electronics ► p. 365



With low spectral density, frequency hopping, and built-in encryption algorithms the PERAD 6010 provides a highly effective LPI/LPD solution. Combined with smart power management, the PERAD 6010 sets the standard for ultra-low emission tactical radios.

The PERAD 6010 supports a wide range of interoperability standards, allowing commanders to share situational information with coalition partners. Each radio serves as a network node or a miniature base station supporting other nodes within the interactive network. When mounted on a UAV, end users can be provided with semi-satellite coverage and extended range. As a result, all system elements, including the most remote points of the network, have reliable access to the data transmitted within the system, providing the most advanced ICT

infrastructure functionalities required whenever the use of the standard networks is not an option.

Full feature multi-user conferencing, straightforward operation, superb ergonomics and reliability make PERAD an outstanding high-performance product for tactical applications. A combination of excellent sensitivity and selectivity, built-in intelligent anti-jamming algorithms and the self-configuring MANET network make PERAD a true enabler providing a full range of new interoperability capabilities.

The PERAD radio can be used in multiple configurations to adapt to diverse conditions. Compatible with WB products including the dismounted observation & command AR technology system UGATE, UAV's and Loitering Munitions.





PIK MC Communication Integration Platform – Mission Critical

WB Electronics ► p. 365

Safe, integrated dispatcher communication and crisis management system is a comprehensive device supporting integration of various communication technologies used in rescue and crisis management operations. It can also be used to perform other tasks requiring a dispatcher-based communication.

The system was designed in accordance with the international 3GPP Mission Critical Services standards and it can be used by state public safety services: police, border guard, national revenue administration, emergency services: ambulance service, fire departments, rescue services, critical infrastructure security services: refineries, power plants, ports, airports, warehouses, services responsible for security and safety during mass events e.g. concerts, football matches, etc., as well as for personal protection and property security companies.

Its key functionalities include nationwide safe dispatcher communication based on LTE and PLTE cellular networks, operation in an autonomous mode by setting up its private



network, integration of various radio communication systems (including incompatible ones), e.g.: Tetra, DMR, analogue radio, etc., organization of dispatcher communication, a safe mobile access to databases and logs, live video feeds from drone and mobile crews' cameras, broadband Internet access using LTE, PLTE and satellite networks, easily integrable with other systems, as well as situational awareness building and expanding.

The RKP-8100 narrowband tactical radio transceiver is designed to operate in the frequency range from 1.5MHz to 512 MHz. It provides tactical voice and data communications transmitted via standard protocols and interfaces (IP, SMTP, POP3, Ethernet, RS-232). The radio transceiver is an SDR (Software Defined Radio) type system. RKP-8100 has implemented waveforms specified by NATO standards, required for operation in the HF and VHF bands, and narrowband waveforms for operation in the UHF band. The RKP-8100 transceiver can be used as a manpack radio (20W HF and 10W VHF/UHF) or as a component of mobile radio communication systems installed on wheeled and tracked chassis. The design of the radio station is optimized for waveform operation with EPM capability.

As a mobile radio transceiver, the RKP-8100 is equipped with an external amplifier and an RKS-8000SA-D antenna coupler. The basic amplifier in the mobile version is the RKP-8100AM-B. It includes a 150W HF, 50W VHF/UHF amplifier. In addition, the device improves

the reliability of communications in strong collocation conditions by using additional narrowband filtering circuits. The filters cover the entire HF band, as well as the VHF (30MHz - 88MHz) and UHF (225MHz - 400MHz) band ranges, where they can operate in frequency hopping mode.

The RKP-8100 radio in the HF band can work with the 500W RKP-8100WM-D and 1000W RKP-8100WM-H amplifier. These units are also equipped with a narrowband filtering system for the HF band.

Advantages

- Frequency range from 1.5 MHz to 512MHz (full range used for narrowband operation).
- Two application options - mounted on vehicles or transported in a backpack
- Optimized for waveform operation with EPM capability





Technical Data

Frequency range	1,5 to 512MHz
Sensitivity	< 0,5 μ V
Harmonic suppression	higher than 50dB
Output power	HF 20W/150W/500W/1kW, VHF/UHF 10W/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
Working temperatures/ storage	-40°C do +55°C / -40°C to +70°C / -40°C to +70°C
Electromagnetic compatibility	NO-06-A200 KCS 01, KCS 02, KCS 03, KCS 06, KCS 07, KCS 08, KRE 02, KRS 02, KCE 02
Mass	20 kg (150W)
Voltage	28 VDC (22 to 32 VDC)



SatPack AutoMate is a multi-orbital terminal capable of operating with satellites in GEO, LEO and MEO orbits. In paired mode, the terminal ensures seamless communication handover between satellites without any interruption. When using a single terminal, handover between satellites takes only a few seconds.

The intuitive user interface and automatic satellite pointing algorithm eliminate the need for additional equipment, such as the spectrum analyzer. Thanks to the ability to utilize a high-power BUC and 1.3 m antenna dish, the AutoMate is a ten-times-lighter alternative to traditional FlyAway systems.

Advantages:

- Dedicated to be used with GEO, MEO and LEO orbits
- Automatic pointing system on a predefined satellite
- No supporting devices needed – built-in antenna pointing algorithm and intuitive GUI
- Multi band working options: X, Ku, Ka
- Multi modem options



SatPack Cobalt Terminal

GISS Sp. z o.o. ► p. 333

An innovative, portable, and fully modular VSAT system has been developed to support the most demanding applications of our customers, elevating SatCom capabilities on higher level. Its flexible design allows the terminal to be customized to meet the specific needs of end-users, ensuring timeless quality and reliability.

Power Supply Options:

- Capable of being powered by AC (mains), DC, or BB-2590 batteries.
- With BB-2590 batteries, the power supply functions as an uninterruptible power supply (UPS), ensuring continuous satellite connectivity even during power interruptions.

Key Features:

- Various modem options for both TDMA and SCPC operations.
- Multiple RF options, including X, Ku, and Ka bands with power 20W or 40W.
- Tool-less module swapping in field environments.
- Full configurability to meet customer requirements.
- Quick setup in under 5 minutes.
- Local GUI for terminal monitoring and control.

This system boasts a military-grade design, offering reliability in all conditions with an IP67 rating. It is lightweight, weighing less than 20 kg with a 1-meter dish, and comes with a dedicated backpack or hard case for easy transport.



TacNet400

GISS Sp. z o.o. ► p. 333

TacNet400 is a structurally reinforced rapid response kit designed for efficient mobility and quick deployment of tactical communication networks for small and medium-sized teams. The kit consists of a rugged case, network equipment and power system, making it suitable for use in any environmental conditions.



The TacNet400 design allows for both AC and DC power supply and contains space for up to three PacStar 400 series devices, an encryption device, the LTE modem Cradlepoint IBR 600/900 or similar, essential cabling and military-type batteries. This configuration enables teams to set up and activate the kit within minutes of arriving at the operational site.

Advantages:

- High mobility and easy to use
- Quick and tool-less set-up
- Reliability in all conditions
- Possibility of use in a moving vehicle
- Ready to install:
- Up to 3 Pacstar 400-Series devices of customer choice
- KG-250X/XS & TCE 621 M encryption module
- Mobile access point (eg. Cradlepoint IBR 600/900, Peplink BR2 Pro)
- Additional power supply & network cabling
- BB-2590 or AN/PRC 152 battery set



Tactical Terminals

TELDAT Sp. z o.o. sp.k. ► p. 362

In addition to comprehensive automated C4ISR systems TELDAT manufactures endpoint devices, that are one of a kind. They are, for example, the part of the family of the military, high-performance, resistant and constantly developed and tested tactical computers, dedicated to current and future military programs and projects. They are highly appreciated by customers and used by them in many military solutions. Tactical Terminals – due to their technical features are one of the most modern and robust in the ICT military world. They are ruggedized tactical computers dedicated to C4ISR solutions in armed forces or in different type of public emergency and special services. Terminals can be utilized on-board the vehicle or portable. Tactical Terminals are designed to operate in harsh military environments (that meet high military standards e.g. anti-shock, climatic and environmental). These solutions enable devices to operate in water and make them drop



and shock resistant. Tactical Terminals offer flexible, modular design that can be configured in any manner. Furthermore, they may be manufactured with the use of the latest, fastest, most efficient, and optimal electronics (CPUs, memory, storage space), interfaces, and communications modules, such as WiFi 2.4/5 GHz, 4G/LTE, 5G, Gigabit Ethernet, USB 3.0, Bluetooth 5.0, GPS, Galileo and BeiDou. This makes the terminals' architecture and functions expandable. The maintenance is also easy, throughout the whole lifecycle.



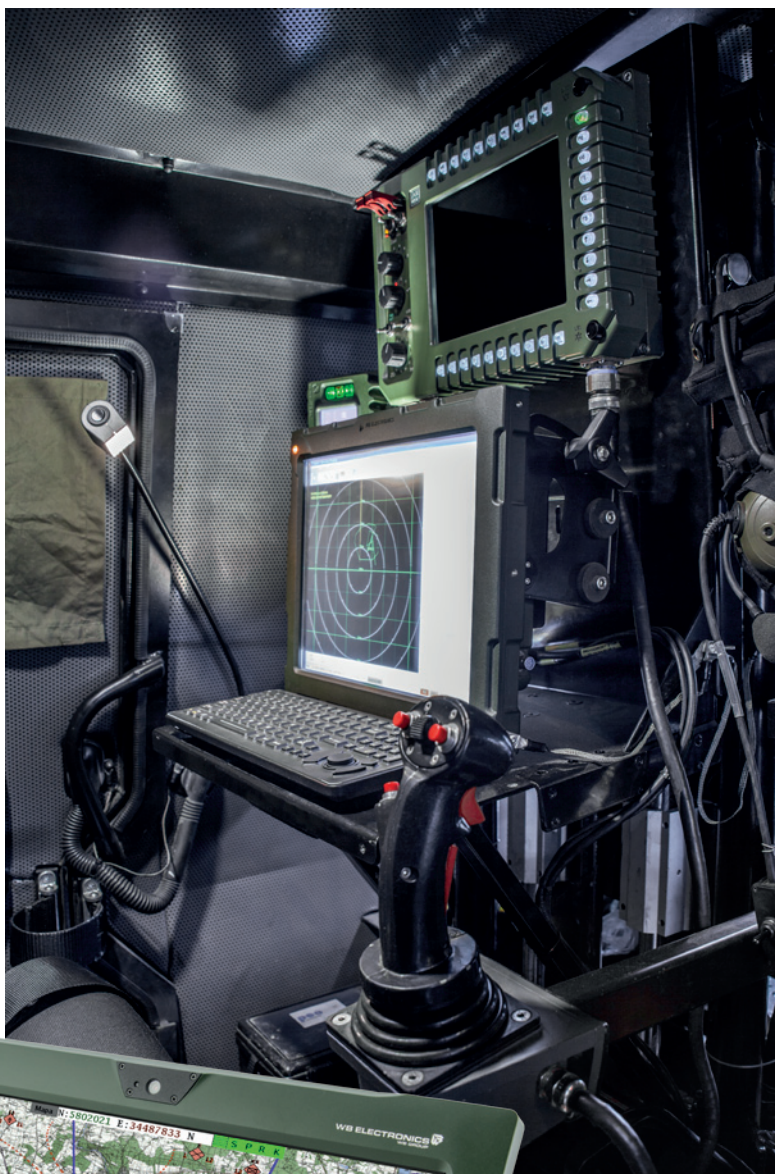
Topaz Integrated Combat Management System

WB Electronics ► p. 365

A fully integrated system enhancing situational awareness in the military and civil sectors, providing support in strategy, mission planning & preparation.

The TOPAZ system integrates the unmanned aerial systems, allowing highly accurate observation and target selection, and a rapid strike response using the loitering munitions. Data and voice communication between the different vehicles within the RSU are facilitated by the FONET - voice, and data communication system, which is incorporated with either a third-party radio or the Comp@n software defined vehicular radio. All of the system's components are manufactured by WB GROUP.

Main features include an advanced software to be integrated with various strike systems, enabling to perform precise ballistic calculations, fully integrated communications and command network, ensuring effective management and command at every operational level, integration of all artillery strike systems and loitering munitions systems to perform precise air strikes, as well as advanced surveillance systems for total situational awareness. This makes Topaz a system that ensures full control over all military assets, situational awareness and precise and quick data transmission along with security and reliability in the most extreme conditions.



BMR-10-N1 Ground Radio Module

Designed for wireless encrypted communication between the Ground Control Station and the Unmanned Aerial Vehicle (UAV). It enables reception of high bit rate data acquired by the UAV (e.g. video streams, SAR radar data) and transmission of UAV control commands. Communications are carried out in variable bit rate channels.

General parameters:

- operating band 4400 - 4820 MHz,
- bit rate up to 9.5 Mbit/s,
- communication over 150 km.

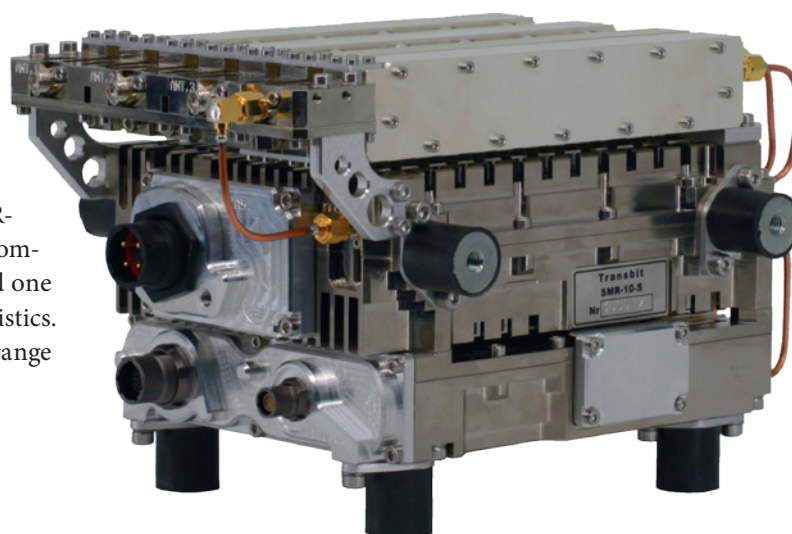


Aircraft Radio Module SMR-10-S

Designed to transmit high bit rate data (video stream, SAR radar data, etc.) acquired by UAV via radio. SMR-10-S has the ability to set up bidirectional connections with other system facilities, in channels of software-adjusted bit rate. SMR-10-S works with a set of two antennas with omnidirectional radiation characteristics and one antenna with directional radiation characteristics. With a retranslation module to extend the range of the UAV.

General parameters:

- operating band 4400 - 4990 MHz,
- bit rate up to 9.5 Mbit/s,
- communication over 150 km LOS.



VoIP gateway CV-12r-01

Transbit Sp. z o.o. ► p. 363

Tactical VoIP Gateway CV-12r-01 it is used to build telephone communications systems based on analog and digital phones working in VoIP technology, based on SIP protocol. CV-12R-01 Gateway serves as an integrator of radio stations with the LAN of the second and third layer. It provides ability to connect devices: encryption devices, radio stations, on-board communications terminals (AC-30IP) and Tactical Server SUS-24-01. The device has a built-in switch, provides a bridge for intercom connections of AC-30IP terminals.



VSAT MASTER Satellite Terminal

GISS Sp. z o.o. ► p. 333



The VSAT Master Terminal has been designed to establish secure broadband satellite connections via geostationary satellites, operating in X-band, both the standard Ku-band and the extended Ku-band and Ka-band, supporting various network topologies such as Point-to-Point (P-t-P), STAR, MESH, and HYBRID. This terminal is centred around a 3.8m Dual Offset parabolic antenna and equipment, enabling it to operate concurrently with multiple TDMA and SCPC modems.

Each of these network topologies can be easily accessed by each modem independently by adjusting its configuration. The station is primarily engineered to function as a master station within the network, but its final role depends on the configuration of the modem.

White Rabbit Switch

The sub-nanosecond time-synchronisation switch for large distributed systems

Creotech Instruments S.A. ► p. 324



The White Rabbit Switch (WRS) by Creotech provides sub-nanosecond accuracy and picoseconds precision of synchronization for large distributed systems, allowing for deterministic and reliable data delivery.

Based on the technology created at CERN and fully tested under the most demanding conditions of the Large Hadron Collider, WRS allows for reliable and precise

time-stamping of measurement data and makes it possible to run data acquisition in large installations while using the same network for data transmission.

White Rabbit Switch works on a distance range over 10km using optic fiber and allows to connect thousands of nodes in an Ethernet-based network.



WRK-01

Enamor International ► p. 326

The WRK-01 military router is dedicated to mobile, field military core networks for high-capacity traffic handling and radio links integration. It enables the service flexibility and delivery of Layer 2, Layer 3, IP and MPLS transport. The router is capable of handling up to 400Gbps data flow through a variety of interfaces (serial, Ethernet F/O and F/X). It is based on the state-of-the-art CISCO Network Convergence System platform with all services provided by the newest CISCO IOS-XE firmware. The military router is compliant with the environmental, mechanical and EMC standards.

Use cases:

- Core network military communication vehicles
- High-capacity radio links integration
- Satellite links integration
- Troposcatter radio links integration
- Multiprotocol Label Switching (MPLS)

Key parameters and features:

- Operates from -40 to +50 C Deployable on mobile and field military vehicles (N7 according to NO-06-A103 / MIL-STD 810)
- EMC according to MIL-STD 461 and NO-06-A200
- Broad variety of network interfaces
 - Ethernet F/O and serial
- High data throughput – up to 400Gb/s
- Network services L2, L3, IP, MPLS

The devices automatically change their modulation due to quality of propagation of radio waves. Quality of Service is defined by the user depending on the situation or size of sent/received data. Considering that, the device can be used to deliver multiple services, such as Voice over IP, video conferences, Internet, email or other network services. In given frequency band R-450C has 176 channel frequencies, and each one can be 1 MHz to 4 MHz wide. In its work, radio uses OFDM (BPSK, QPSK, 16QAM, 64QAM) modulation. The creation of MANET- Mobile Ad-Hoc Network with Multi-Hop function.



CYBER & ANALYSIS, INFORMATION PROTECTION

Cyber &
information protection
Cyber & analysis, info
analysis, information protection

All in 1 Zero Client Terminal SIL720-L/T

SILTEC Sp. z o.o. ► p. 356

Because zero client is a computer with no local storage it is perfectly fitted to military field applications like mobile C2 Centre. Zero client uses firmware to boot off of the network and connect to the server. It downloads what it needed directly into memory rather than onto a hard drive. Such solution prevents data from being intercepted by the enemy in the event of a takeover of a C2 position.



- Based on ClearCube CD1024
- Teradici TERA2321 processor (PCoIP protocol)
- No HDD/SSD/eMMC (only 256Mbit NVRAM for configuration data, diagnostic logs)
- No OS
- 15,6 FHD screen
- Interfaces: SFP, USB (DB9), SmartCard reader
- Aluminum housing with dedicated pendrive section (revision)
- Keyboard and touchpad made of silicon
- Meeting SDIP-27 Level A standard



Borderscan for the protection of smart borders

Enigma Information Security Systems – ELFO Consortium ► p. 328

Borderscan is an innovative biometric enrolment solution developed to meet the needs of the EES. Following the successful implementation of the EES Directive, the EU's

IT agency has begun work on implementing a central entry/exit system to automatise the registration of travellers from non-Schengen countries. The system is expected to be operational throughout the Schengen area by the end of 2024.

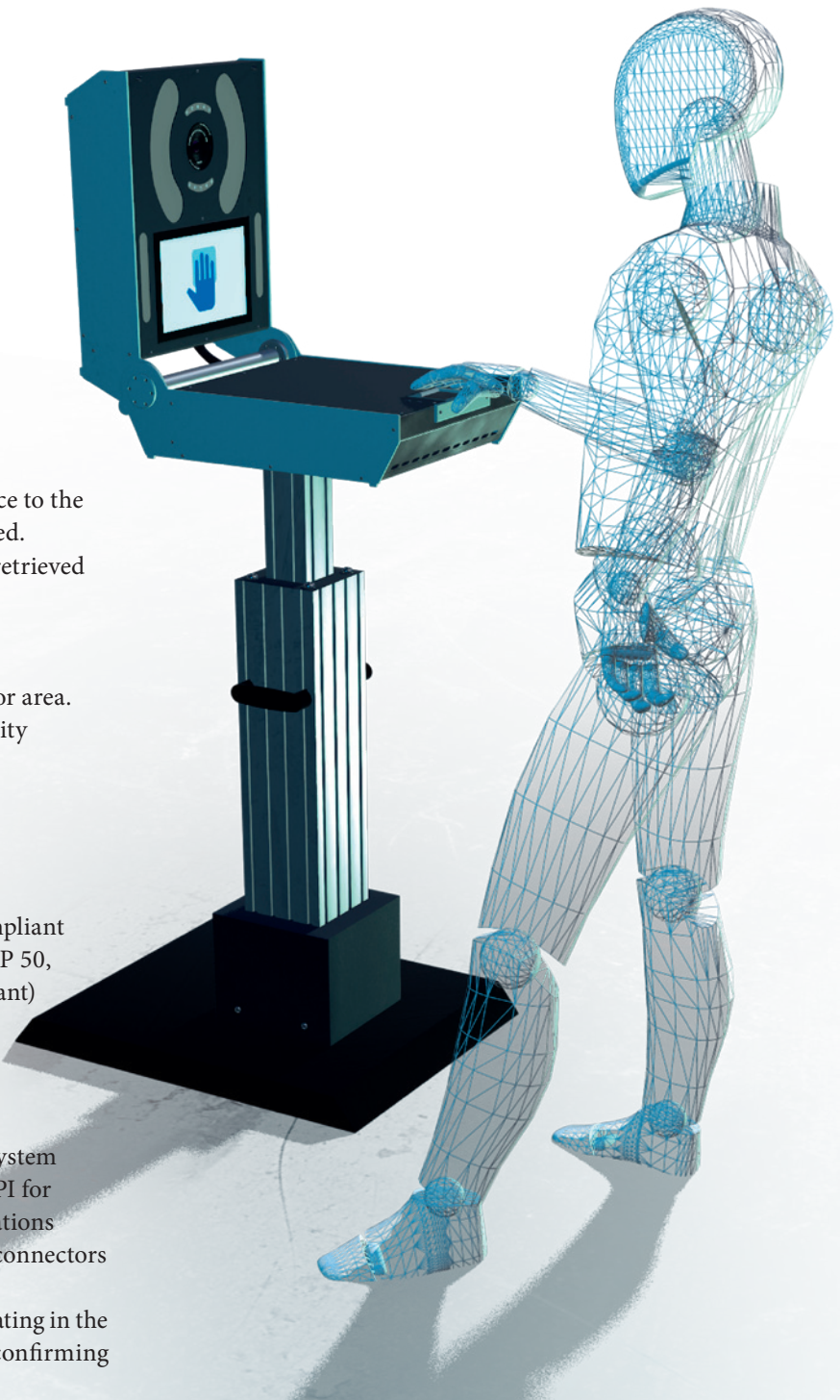
Key features of the solution:

- Implementation of automatic enrolment of biometric data such as facial image and fingerprints.
- Enabling self-scanning of data by persons crossing the EU border.
- Automatic adaptation of the device to the height of the person being enrolled.
- Verification of the quality of the retrieved data according to set criteria.
- Automatic data transmission to a central system.
- Designed for operation in a indoor area.
- Easy installation and transferability between workstations thanks to support for so-called transport and operational positions.

BorderSCAN - technical data:

- 24 Megapixel camera, ICAO-compliant
- 10-fingerprint reader (4-4-2), FAP 50, FBI-certified (Appendix F compliant)
- Reader with automatic fraud detection function
- Built-in speakers to play voice announcements for travellers
- Specially customised operating system and proprietary software with API for integration into customer applications
- Rj45, USB 3.0, Kensington Lock connectors

The device has been successfully operating in the Polish Border Guard for two years, confirming its effectiveness and reliability.





CyberBastion is a simulation game focused on building the most resilient

ICT security system and effectively responding to various threats from cyberspace. Each team is provided with a predetermined budget, which can be increased during the game. The available security measures are divided into eight categories: Organization, Physical Infrastructure, Whole Network, Network Edge, Internal Network, End Devices, Applications, and Data.

Security measures are scored based on their effectiveness in prevention (identification and protection) and response (detection, response, and recovery). The team that best prepares its organization to handle cyber events wins the game.

CyberBastion uses gamified learning, leveraging game design mechanisms in a purposeful way to activate, motivate, and engage participants. The game is structured as a closed

workshop, with a clear beginning, progression, and conclusion. Participants are fully focused on achieving victory.

The game scenarios are based on real and current events, providing a realistic and up-to-date training experience.



Cyber Bastion

Cybersecurity Foundation. ► p. 325

Cryptomage Cyber Eye™

Cryptomage Inc. ► p. 325

Cryptomage Cyber Eye™ is a Network Detection and Response class cybersecurity probe that goes beyond traffic flow analytics, offering real-time anomaly detection and prediction based on network behavior. By analyzing



protocol behavior, packet analysis, and host communications behavior, powered by ML and AI algorithms, it provides a unique approach to network traffic analysis.

Unlike many security solutions that focus solely on user and host behavior, Cryptomage Cyber Eye™ also incorporates unusual low-level network behavior. This comprehensive analysis enables organizations to identify, monitor, and triage traffic flows, connections, and potential malicious events, empowering security teams to enhance security and automate threat discovery and prevention. The probe evolves and integrates with other security solutions, augmenting threat detection capabilities. It continuously adapts to emerging threats, ensuring robust protection. Key features of solution include real-time network monitoring, event management, real-time threat detection, a forensic module, and a GDPR module. These functionalities equip organizations with the tools to detect and predict hidden network traffic, botnet C2 communication, malware activity, 0-day attacks, and DDoS attacks as well as other cyberthreats.

Cryptomage Cyber Eye™ addresses challenges across industries such as financial services, telecommunications, utilities, government, military and uniformed services, manufacturing, and healthcare.

Enigma Electronic Monitoring System (EMS)

Enigma Systemy Ochrony Informacji Sp. z o.o. ► p. 327

Enigma offers many solutions that improve the operation of state institutions and introduce the latest technologies into a public service in key areas for the state. One of them is a solution for electronic monitoring of convicted persons - Enigma Electronic Monitoring System (EMS).

This system enables the technical implementation of several very important functions:

- serving house arrest or imprisonment at home;
- supervision over compliance with the ban on approaching specific places or areas (restraining order, e.g. stadium ban);
- supervision over compliance with the order for people to remain in a specific area (e.g. ban on leaving the city);
- supervision over compliance with the prohibition on approaching defined people or protecting victims against violence.

These are key issues from the point of view of institutions caring for the safety of citizens and the justice system. The Enigma Electronic Monitoring System can be used for the needs of police forces, probation and prison services in order to carry out their vital tasks.

The system consists of several components, delivered depending on the customer's needs:

- a central software system ensuring supervision of persons subject to EMS operations:
 - for 24-hour supervision of convicts
 - the ability to designate prohibited zones for the convict on the map and mandatory zones, leaving which within a defined time will result in an alarm
 - automation of the institution's basic processes (including monitoring center, alarm handling schemes, device logistics, handling formal documentation, reporting)
 - dozens of alarms generated when convicted persons perform prohibited activities
 - full accountability of the actions of users and convicts
 - possibility of installation in an on-premise environment, in a public or private cloud, and delivery in the SaaS model
- transmitters installed on the limbs of convicted persons
 - only radio transmitters or radio transmitters with the ability to determine the convict's position based on GPS, A-GPS and LBS;
- stationary receivers intended for installation in place indicated as the place where the sentence is served
- portable receivers with GPS, A-GPS and LBS, with which people using the system are equipped - including victims of violence - that detect transmitters in their surroundings and generates alarms in the event of contact with them
- A set of specialized installation and control tools designed to operate the system

Enigma is the only recognized supplier of such a solution from a territory of the European Union, ensuring a high standard of both the system, devices and related services. The system works in many countries, both in the EU and beyond, enabling customers using it to save time and money, as well as contributing to citizen satisfaction.

HOME UNIT
(HU)



RADIO FREQUENCY
TAG (RFT)



ONE PART
TRACKER
(OPT)



TWO PART
TRACKER
(TPT)

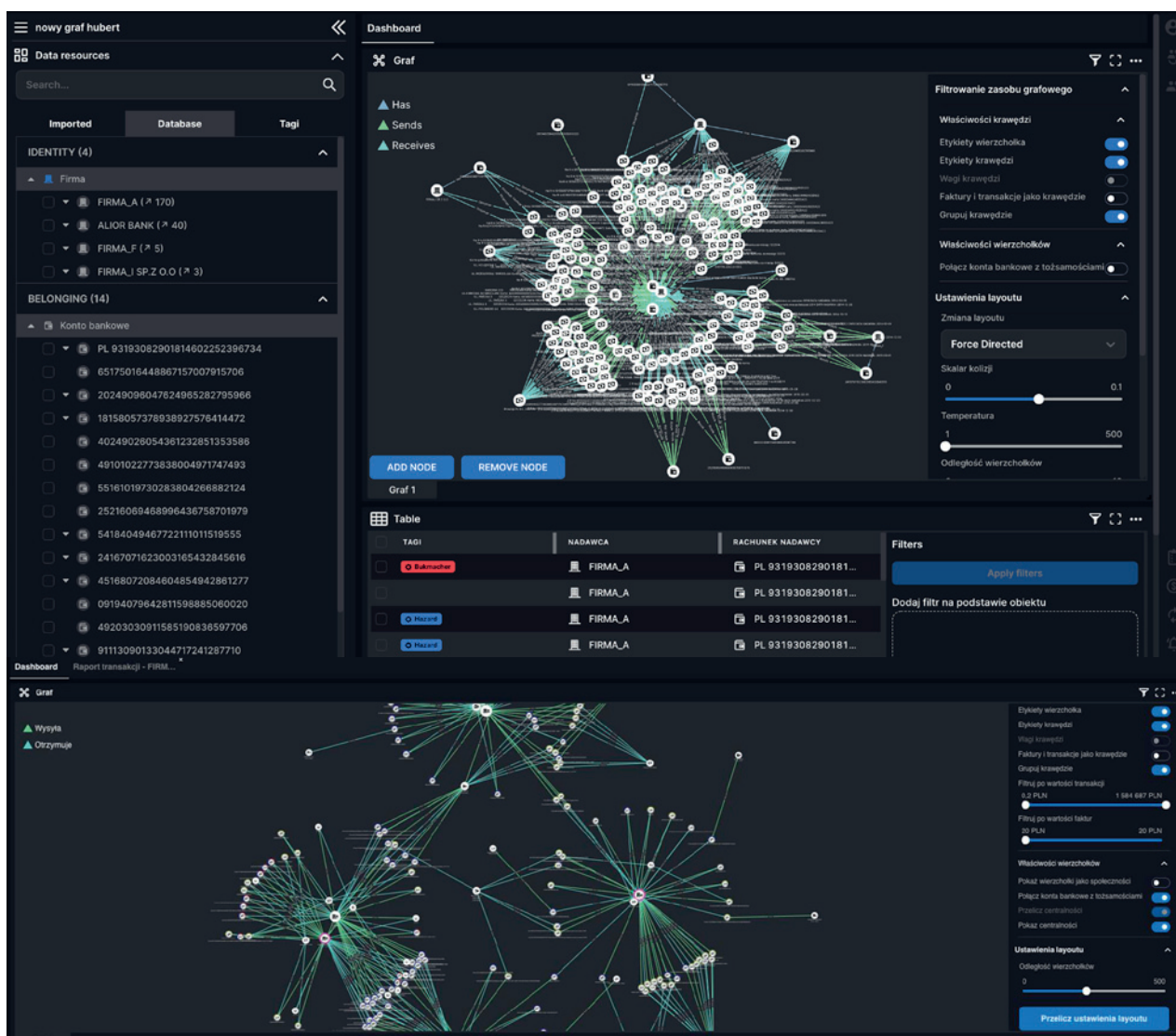
Best in class software for combating economic crimes for criminal analysts. The use of Financial Trail will radically shorten the analysis time, improve quality and shift the burden of work from importing and standardizing information to their proper analysis. Financial Trail has built-in import engines for hundreds of financial transaction formats that will allow you to semi-automatically import them into the database, eliminate duplicate transactions and harmonize transaction types. If a format is not yet supported by us, we will add it to the software as part of standard support.

A joint analysis of all data in a case from many financial institutions based on graphs and flexible dashboards allows you to quickly verify many analytical theses. Display your information resource in tables, graphs, charts;

mark, filter, tag create reports and export data in an easy and fast way. In addition, we have automated some of your difficult work so that you can focus on your analysis and not on tedious data combing. Take advantage of the expert scenarios built into the software, analyze data quickly and efficiently, at a massive pace.

And many more:

- Currency module,
- Dedicated report module,
- Built-in modus operandi,
- Duplicate search algorithms and merging objects,
- i2 Analyst's Notebook integration,
- Easy exports,
- Efficiently import multiple files.



FTS

SpaceForest Sp. z o.o. ► p. 358



Precision Tuning. Maximum Efficiency. Total Control. FTS (Filter Tuning Solutions) by SpaceForest is an advanced system for precise and automated tuning of RF and microwave filters. Designed for high-performance applications in telecommunications, aerospace and defense, it ensures superior accuracy, repeatability and efficiency. The system is powered by artificial intelligence, which enhances the tuning process by optimizing parameters for maximum precision and reducing human error. This AI-driven approach significantly improves both speed and consistency, making FTS an invaluable tool for complex filtering applications.

Faster, More Precise Filter Tuning

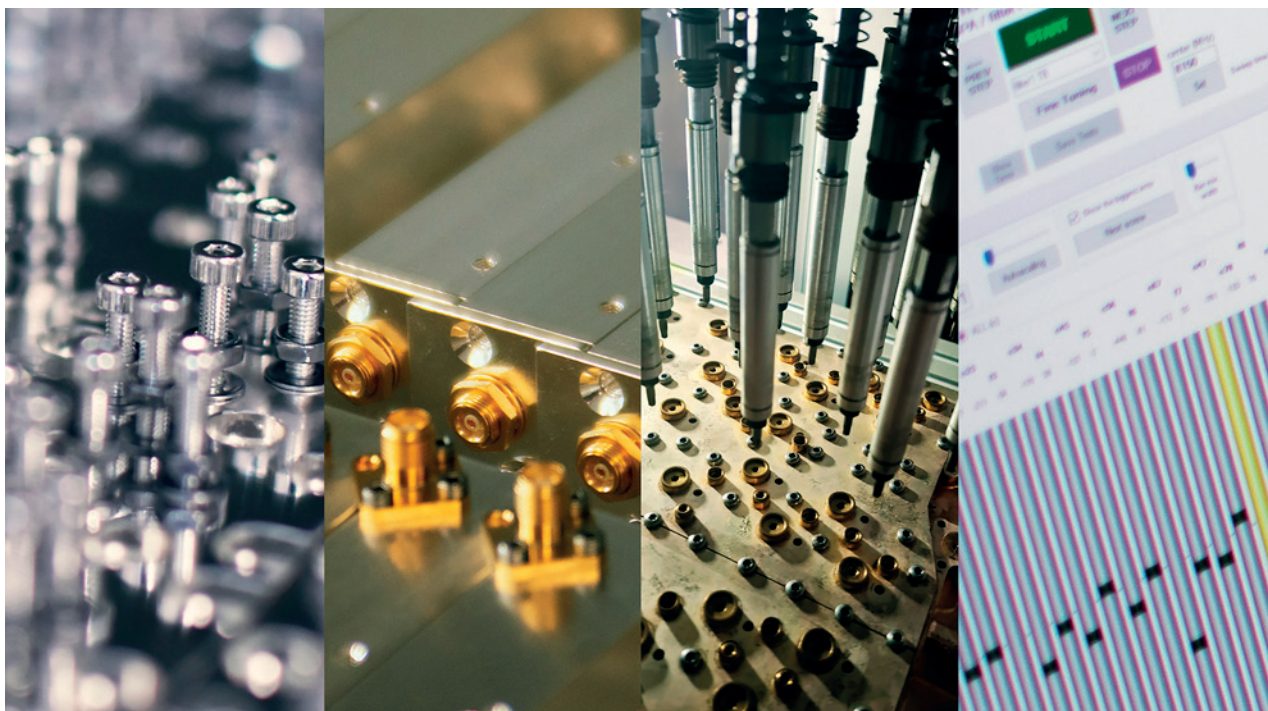
FTS minimizes manual effort and tuning time while maintaining sub-micron precision. It supports cavity, waveguide, and dielectric resonator filters, offering seamless integration into both R&D and production environments.



Key Features

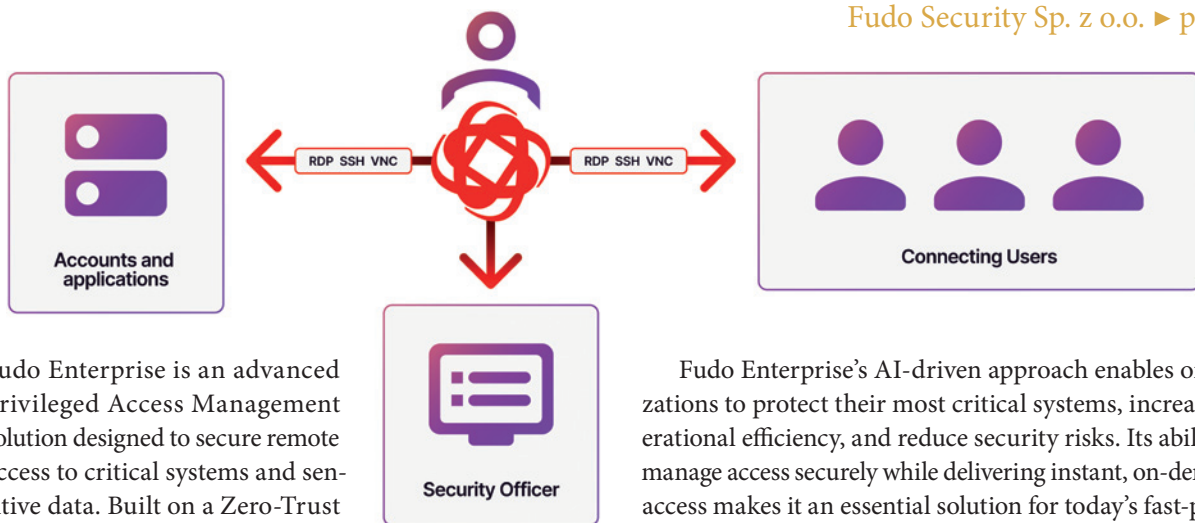
- Sub-micron accuracy for reliable tuning
- Automated & manual modes for flexible operation
- Supports cavity, waveguide, and dielectric filters
- Reduces tuning time and human error
- Seamless integration into production workflows
- Customizable to meet specific requirements

Learn more at www.spaceforest.pl and discover how FTS can optimize your RF filter tuning process.



Fudo Enterprise

Fudo Security Sp. z o.o. ► p. 332



Fudo Enterprise is an advanced Privileged Access Management solution designed to secure remote access to critical systems and sensitive data. Built on a Zero-Trust framework, it ensures access is granted only when needed and for the necessary duration, minimizing the risk of unauthorized access.

Fudo Enterprise provides real-time monitoring of user activity, powered by AI-driven behavioral and biometric analysis, to detect and prevent suspicious behavior. In case of anomalies, the system immediately terminates the session and notifies administrators, ensuring a rapid response to potential security threats.

The solution supports a wide range of access protocols, including RDP, SSH, VNC, HTTP/S, MSSQL, and Telnet. Fudo Enterprise's big advantage is seamless, agentless deployment that makes it easy to integrate into existing IT environments. With Fudo Enterprise, organizations can manage privileged access, monitor third-party access, and ensure compliance with key regulations like NIS2, ISO/IEC 27001, and GDPR.

Fudo Enterprise's AI-driven approach enables organizations to protect their most critical systems, increase operational efficiency, and reduce security risks. Its ability to manage access securely while delivering instant, on-demand access makes it an essential solution for today's fast-paced, security-conscious business environment.

Fudo Solves the Modern Defense Access Challenge

→ Complete Control Over Third-Party Access

Fudo enforces strict, time-bound access for vendors and integrators — no agent, no hassle, no blind spots.

→ Insider Threat Protection

Real-time AI-powered risk analysis and full session recording detect and prevent suspicious behavior — even from trusted insiders.

→ Privileged Access Secured

Admins, contractors, remote teams — all access is visible, auditable, and compliant with Zero Trust.

→ Agentless & Isolated Deployment

Rapid rollout in air-gapped environments. Fudo requires no agents, no data access, and ensures full platform isolation.

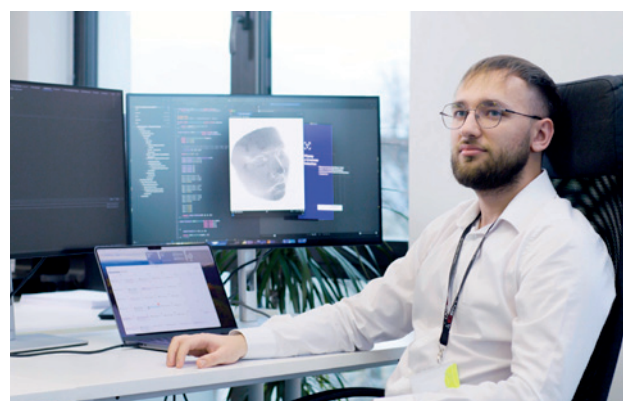


Person Recognition AI Enabling Safe Identification

Leveraging data from already deployed cameras and sensors, Biometrics Engine assures the identity and detects fraud attempts instantaneously with unique, secure deployments available not only in the cloud, but also under an on-premise regime. Biometrics Engine is not only able to recognize artificially or age-augmented face characteristics of the same person, but also notify of multiple fake identities presence (for the same biometrics), presentation attack (PA) or injection attack (PA), such as DeepFake, under variable operating conditions: for both remote, end user-device deployments, and in-person-based security protocols.

IDENTT Biometrics Engine

IDENTT ► p. 336





IDENTT eWallet

IDENTT ► p. 336



Virtual Identity Assurance

Complaint with EU Digital

Identity (EUDI) Wallet Regulation

Combining robust cryptographic security, ease and speed of use, IDENTT eWallet allows companies and governments to implement interoperational virtual identity document processing compliant with latest EUDI Wallet requirements. With Biometrics Engine verification of face biometrics built in, IDENTT eWallet protects against virtual identity theft through user device-level malware or other third party actions, assuring that no stolen virtual identity can be used in the process.



IDENTT Vision

IDENTT ► p. 336



Automated eKYC/Onboarding Compliance with AI-Based Identity Verification

Enabling customer acquisition automation in banking, finance, telecom, or entertainment, IDENTT Vision offers a complete, eKYC-compliant identity verification solution. With easy-to-use end user interface and an extensive set of SDKs, IDENTT Vision empowers creation of new, digital services, such as online bank account creation, new phone

number registration, and more. Based on the proprietary, world's largest structured identity document knowledge database, IDENTT Vision performs automated analysis and verification of 300+ identity document versions (passports, identity cards, residence permits, drivers licenses, virtual (eWallet) and eID chip-equipped documents issued by over 200 countries around the world, aiding in expat or non-ordinary document-based identity verification.

OREC is a cutting-edge, AI-driven Automatic Target Recognition (ATR) software designed for the detection and classification of vessels, aircraft, and ground vehicles. It is specifically calibrated to work seamlessly with widely used SAR sensor constellations, including UMBRA, ICEYE, Capella Space, AIRBUS, Synspec and more.

What makes SATIM's solution unique is its use of synthetic SAR data, generated through the highly effective SSIG simulator, developed by SATIM's SAR specialists. By training AI models with simulated SAR signatures, SATIM ensures near real-time, highly accurate object detection and classification—whether on the open sea, in port, or on land. OREC is built to support strategic, operational, and tactical planning across both defense and commercial applications.

SATIM's OREC AI offers the following noteworthy features and capabilities:

→ **High Accuracy**

- Achieves high precision and recall rates for detecting and classifying vessels, aircraft and vehicles.

- Vessels (110 classes): 95% accuracy in detection, 90% accuracy in classification
- Aircraft (18 classes): 90% accuracy in detection, 90% in classification
- Vehicles (7 classes): 83% in classification accuracy

→ **Real-time Processing**

Provides real-time results for rapid decision-making and response. Processing time per SAR imagery is up to several minutes.

→ **Scalability**

Scales effortlessly to process large volumes of SAR data from multiple sources.

→ **Adaptability**

Adapts to different SAR sensor types, imagery parameters – including resolution or acquisition modes and new object types using synthetic SAR datasets to expand the object catalog.

→ **Multi-Platform Compatibility**

Compatible with various satellite platforms, making it versatile for a range of applications.

satim PROVEN LEADER IN OBJECT DETECTION AND CLASSIFICATION IN SAR

VESSELS
110 CLASSES
UMBRA

AIRCRAFT
18 CLASSES
Capella Space

VEHICLES
7 CLASSES
ICEYE

RESILIENT | ADAPTABLE | PRECISE

AI-Based Automatic Target Recognition (ATR)

Plumla-NGN is an FPGA based packet processor compatible with SDN OpenFlow architecture with full speed packet processing up to 160 Gbps with extremely low latency < 8µs. Ready to support high throughput network interconnections in core and access networks, 5G networks and industrial control systems infrastructure (ICS/OT).

Unique functionalities of the new Plumla-NGN appliance:

- Helps optimize the implementation cost of network services IPSec, IDS/IPS, packet analysis, SSL decryption, MPLS processing.
- Applicable in your core and access networks or ICS infrastructure.
- Enhances your Security Operation Center (SOC) and Network Operation Center (NOC) capabilities.

Key parameters and features:

Compliant with SDN OpenFlow 1.3 specification and ready to be integrated with SDN controllers.

Network interfaces:

- 4 x 40 Gbps (QSFP+)
- 4 x 10 Gbps (SFP+)

Best in class network performance:

- packet processing 160 Gbps, 240M pps
- low latency - only <8µs
- 0 packet loss proved by RFC 2544 tests

Use cases:

- Network traffic redirections to cybersecurity analysis (IDS/IPS/FPC)
- Load balancing for IPSec and network services
- IP traffic tunneling
- IP filtering
- MPLS service

PLUMLA



Portable VTC System - MVTC/WRB

SILTEC Sp. z o.o. ► p. 356

Portable VTC terminal, designed and manufactured by Siltec on the basis of Cisco Webex Room Bar. MVTC/WRB is a videoconferencing system in a suitcase, enabling

the conduct of video-meetings in field military conditions. Resistant to demanding climate conditions such as sand, impacts, corrosion or vibrations.



- Case with internal aluminum frame equipped with vibro-isolators
- Based on Cisco Webex Room Bar (commercial version CS-BAR-T-K9, TEMPEST version CS-BAR-NR-K9)
- 17,3 FHD hardened screen with a UV filter
- 1080p camera, integrated mic and audio
- Interfaces: RJ45/SFP, HDMI, USB A/C
- Battery power system with a battery level indicator, 230V AC, DC 12V
- Available in commercial or TEMPEST versions
 - meeting the SDIP-27 level B standard requirements
- Equipped with an additional case with accessories

RP-201-01 Routing Platform

Transbit Sp. z o.o. ► p. 363

Tactical Routing Platform RP-201-01 allows to perform several network functions simultaneously, i.e., Router, Firewall, Session Border Controller. It enables to build military IP networks both wide area and locally. The RP-201-01 is designed

for mobile use in armed vehicles or stationary, to build IP military networks. The RP-201-01 is based on CISCO software platform and may be delivered with IOS system. Device is designed as an access point to Military Network.



Safety of Critical Data Electromagnetic and Ballistic Protection in a Transportable (Mobile) Container

Jakusz Sp. z o.o. ► p. 337

Safety of critical data electromagnetic and ballistic protection in a transportable (mobile) container

- separated and fully secured server room, data warehouse, command or communication center with high efficiency and resistance to changeable external factors
- supplied with an adapted vehicle, forming a complete transportable server room set
- transfer of data and reaching stationary databases and data centers both home and abroad
- multiple and safe transportation - archives of replacement data, critical information

Container in the basic version:

- structure adjusted to repeated transportation,
- resistant to external factors, including fire protection,
- resistant to heat penetration from the outside,
- equipped with dedicated anti-vibration systems and vibration monitoring systems,
- at least 3 racks for the needs of IT 42U 800 x 100 (it is possible to install 4 racks),
- power supply system, switchroom, PDUs,

UPS back-up system in redundancy of n+1,

- precise air conditioning in order to ensure correct environmental parameters for IT devices in redundancy n+1,
- fire extinguishing and early detection system, environmental monitoring system, structured cabling system,
- safety systems, power supply and IT service lines,
- electromagnetic protection with increased attenuation parameters,
- protection from HEMP (High-Altitude Electromagnetic Pulse),
- self-unloading system (time of preparation for transport - 15 minutes) without any additional loading devices.

Container with additional equipment:

- protection from acoustic eavesdropping,
- ballistic protection, according to STANAG 4569,
- chemical and biological filters,
- automatic, extendable antennas,
- IT equipment.



SCADVance XP is a comprehensive security platform for real-time monitoring of industrial networks, consisting of both software and hardware components.

What distinguishes SCADVance XP® is its utilization of specialized predictive and analytical models, powered by machine learning algorithms (ML/AI), that adapt to each OT network configuration. This enables the system to accurately detect anomalies and threats within the industrial network, thus enhancing the security and resilience of critical infrastructure.

SCADVance XP® enables a complete inventory of OT networks, including device identification, network mapping, and the generation of detailed connection reports across all OT networks.

SCADVance XP® conducts automatic, real-time audits of the OT network, enabling the detection of the network's weakest links, including unwanted communication and potential attack vectors. The system immediately identifies events that deviate from normal behavior in the industrial network. This includes automatic anomaly detection, cyberattacks (such as zero-day attacks), and system crashes.

Supporting specialized protocols, SCADVance XP® operates independently of ICS control systems' manufacturers and suppliers and can be easily integrated with external systems (SIEM, UEBA, SOAR, data bus, API).

What makes SCADVance XP® stand out:

- Proprietary algorithm for creating dedicated ML/AI predictive and analytical models for each installation
- Behavioral methods enabling detection of previously unknown cyber attacks (zero-day)
- Passive monitoring (no interference with OT systems)
- OT network device recognition and deep analysis of industrial protocols (DPI)
- False positive alarms elimination
- Independence from automation suppliers
- Versatility of use (monitoring and connection to all types of industrial automation networks)
- Possibility of monitoring directly from the Ethernet, RS and CAN interfaces



SecureVisio ► p. 356

- Asset Discovery
- Risk management
- Vulnerability Management
- Data protection
- Threat Intelligence
- XDR (Extended Detection and Response)
- SIEM (Security Information and Event Management)
- SOAR (Security Orchestration, Automation and Response)
- UEBA (User and Entity Behavior Analytics)

Platform highlights

- **Asset Discovery:** Automates the discovery, identification and documentation of the IT environment providing essential context data to other SecureVisio components
- **SIEM Solution:** Collects event data across the organization, aligns alerts with the MITRE ATT&CK framework and enriches them with contextual information for comprehensive IT environment visibility
- **Vulnerability Detection:** Employs various scanners and CVE feeds to automatically identify vulnerabilities in both IT and OT environments
- **Business Impact Analysis:** Offers real-time prioritization of security alerts and vulnerabilities, alongside insights into potential costs related to security breaches and vulnerabilities across critical assets
- **SOAR Solution:** Automates threat investigation and response with easy-to-use playbooks targeting key security scenarios
- **Threat Modeling and Attack Simulations:** Visualizes potential attack pathways to critical assets on the Network Map, aiding in the anticipation of cybercriminal activities
- **Compliance:** Our platform follows key regulations such as NIS2, DORA and GDPR
- **Deployment Options:** Our products are available on cloud and on-premise

165



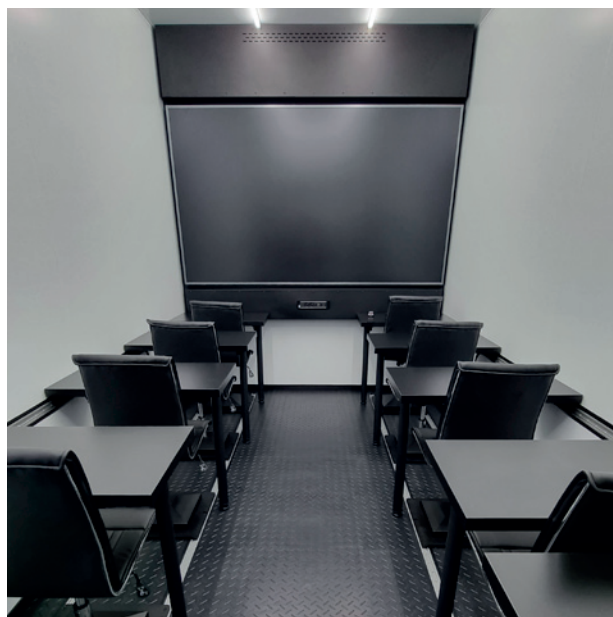
- System is based on containerized housing adapted for IT infrastructure assembly
- A container consists of three separate compartments: an operational compartment with IT infrastructure and two technical compartments for the generator set and air-con condensers
- The compartment based structure allows to equip with all of the relevant data centre system within the container dimensions. No additional devices are needed for mounting outside the container
- A containerized Data Center is connected to utility power through an electrical supply board
- In case of applications requiring transportation of a data center with IT equipment, the Rack cabinet is mounted to the container with shock absorbers that prevent the effects of vibrations and shocks during transportation



Servers Room

SILTEC Sp. z o.o. ► p. 356

Max IT power consumption:	100kW
Max No. of IT rack cabinets:	10
Max depth of rack cabinet:	1200mm
Cooling system redundancy:	N+1 or 2N
Generator Set Power:	up to 250kVA
Housing dimensions:	Length: up to 12m, Width: 3m, Height: 3m



- The cooling power of one unit depending on the model varies from 10 to 35kW. Maximum cooling power installed in the containerized data centre can be set up to 100kW in total
- None of the components of the cooling system is located outside of the outer dimension of the container
- Electrical system is equipped with UPS (Uninterruptible Power Supply) and batteries for continuous IT devices power supply even during blackouts
- Battery backup time depends on the system configuration
- Optional built-in generating set for backup power supply inside the container dimensions
- The containerized Data Center is adapted for an electrical lifting system installation for self-loading and unloading off the lorry
- The system can be built inside the profiles of the container
- Other optional systems: fire alarm, access control, CCTV, remote control of operation parameter

Shielded Cabinet SIL720 - SzE19xx Series

SILTEC Sp. z o.o. ► p. 356



Shielded Cabinet available in SDIP-27 Level A, B, C versions.

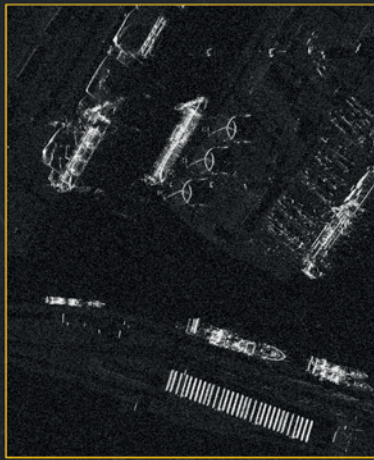
- 19" Shielded Cabinets in various heights - from 8U to 47U
- Width: 700 mm (Level A) or 600 mm (Level B, C)
- Depth: 700, 800, 1000, 1200 mm
- Cabinet power supply AC 230 V Inside the cabinet there is a power strip equipped with 9 socket with a grounding pin/Schuko with rated current of 16A
- Interface panel (USB/VIDEO/FO)
- FO channels in bottom plate
- Front and rear door (left or right-sided) with bolt lock providing 2,3,4 or 5 point pressure (depending on the height of the cabinet)
- Fans assembly with thermostat installed in the top plate of cabinet (standardly 4 fans are installed)
- Ventilation steering: thermostat (standard equipment) or microprocessor panel (optional equipment)
- Shelves (fixed or slide shelves)
- Wheels to allow movement
- Splitted rack for crypto solutions

In the case of individual projects requiring the use of devices that are not available in the TEMPEST version, we suggest alternative solutions such as Shielded Cabinets. These provide effective shielding against the radiated emissions coming from such equipment. The design of the enclosure is adapted to the type, shape and configuration of the equipment to be protected.

SSIG - an advanced and highly versatile tool developed by SATIM, designed to generate synthetic SAR signatures in of various objects such as vessels, vehicles, and aircraft. SSIG also has the capability to simulate entire scenes i.e. ports, airports, generating comprehensive datasets essential for training SATIM's AI models. The simulator pro-

duces these signatures at multiple resolutions, ensuring it can be adapted to meet diverse analytical needs. Given that access to real SAR datasets can be expensive, or restricted due to privacy and security concerns, these simulations provide a crucial alternative by producing realistic synthetic SAR imagery.

SAR SIGNATURE SIMULATOR (SSIG)



SAR SIMULATIONS | IMAGE CHIPS OF ANY SIZE | DATA LABELING

3D MODEL OF C-130 HERCULES

SAR SIMULATION



SAR SIGNATURE SIMULATOR (SSIG)



3D MODEL

TU-22M "BACKFIRE"

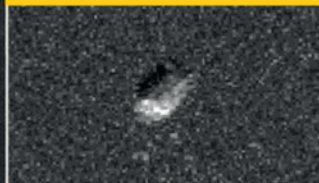


SAR SIMULATION



3D MODEL

T-72



SAR SIMULATION



3D MODEL

TYPE 23 - DUKE CLASS



SAR SIMULATION

ANY OBJECT - ANY SAR SENSOR - REAL-TIME

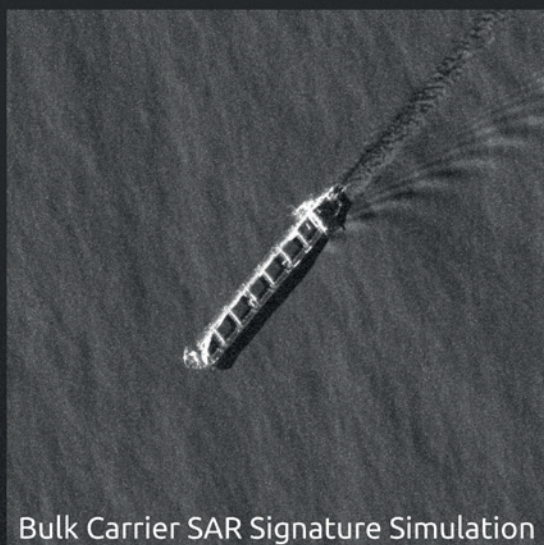
A key advantage of SSIG is its speed, enabling users to rapidly generate high-quality synthetic datasets. This efficiency translates into significant cost savings, especially in data labeling, a typically resource-heavy task. By generating fully labeled datasets, SSIG alleviates the need

for extensive manual annotation efforts. Its flexibility also allows users to adjust simulations to meet specific, on-demand requirements, making it an ideal solution for a variety of operational challenges.

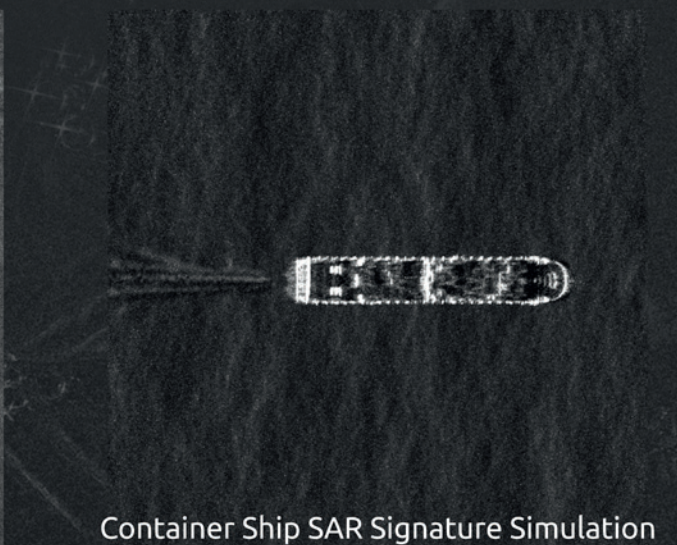


SAR SIGNATURE SIMULATOR (SSIG)

Ship Wake Simulation



Bulk Carrier SAR Signature Simulation



Container Ship SAR Signature Simulation

SUS-24-02 Tactical Server

Transbit Sp. z o.o. ► p. 363

The SUS-24-02 tactical server is intended to be used, in mobile objects, in which it is necessary to build computer networks with highly efficient servers. Servers SUS-24 may fulfil a function of a service server, constituting a central point of ICT networks providing services for functional persons.

The device comes with a high-performance Intel Xeon® D series 1500 or 1700 processor. It features a disk compartment that enables fast swapping of up to 4 drives, including 2 SATA drives in the m² format and 2 drives with a fast NVME interface.

The server also allow to virtualize both servers and workstations. SUS-24-02 has 4 built-in network cards two of which two enable it to work with SFP+ 10GBase-SR, 10GBase-LR, 10GBase-T, 1000Base-SX, 1000Base-LX models, and the other two enable it to work in the 100/100Base-T standard. SUS-24-02 enables to insert a graphics accelerator in one of two variants: Nvidia Tesla T4 or Nvidia A2 Tensor.



TEMPEST NATO SDIP-27 and EU IASG 7-03 compliant IT equipment

SILTEC Sp. z o.o. ► p. 356

Siltec is a leading manufacturer and supplier of the dedicated TEMPEST hardware. The company offers a wide range of computers, peripherals and network equipment to ensure the security of the classified information processed. We have

three Electromagnetic Shielding Laboratories, allowing us to carry out TEMPEST standard measurements. Siltec offers design of the dedicated equipment, precision engineering and manufacturing and the related service support.





All devices meet NATO SDIP-27 standards:

- Level A - SIL720 range of products
- Level B - SIL788 range of products
- Level C - SIL784 range of products

TEMPEST equipment:

- Computers
- Monitors
- Scanners
- Printers
- Notebooks
- Servers and network equipment
- Shielded cabinets
- Video teleconference systems
- Audiovisual equipment
- External adapters and connectors
- Power filters
- Other dedicated and customized solutions





ENGINEERING, LOGISTIC AND CHEMICAL EQUIPMENT

chemical
ing, logistic
chemical equipmen
Engineering, logistic
ing, logistic and chemical equi

AMBULANCE

DEMARKO S.A. ► p. 326

The ambulance is created on the base of IVECO chassis MUV 70W18EIII. Purposely selected due to extensive GVW of 7 000 kg in comparison with its compact size. The container dedicated for transport of four casualties on stretches, optimally maintains the off-road conditions providing at the same time maximum space in the medical compartment. The filter ventilation system ensures safety of the persons inside vehicle cabin and medical container. The system meets the requirements of Defence Standards. Comfortable cabin secures driver's comfort of work, comparable with modern vans. Proven, reliable diesel engine, adapted to use NATO F-34 fuel is still meeting EURO III exhaust pollution standard.



The 132 kW of power and 420 Nm of torque ensure high top speed as well as excellent dynamic during off road operations. The medical container is well equipped with medical equipment securing capability to provide first aid to the transported 4 patients on stretches or 6 persons between which two are still transported on stretches while remaining four are traveling in seating position. The modern One-Touch-Click Technology™ implemented to operate with top stretches makes patients' handling easier and faster. The electric installation fitted on the ambulance secures assembly of all kinds of lights required on military operations.



ZAMET-GŁOWNO 2 sp. z o.o. sp. k ► p. 371

- Versions: 1x20' and 2x10'
- Gross Weight: 18,500 kg
- Maximum payload Capacity: 16,500 kg



- Hooklift system - fast and safe loading
- Forklift - convenient operation on loading areas
- Crane device / HDS - possibility of loading in difficult terrain conditions
- Overhead crane - effective solution in logistics bases and warehouses



Fortis M.165 Hooklift System

Advanced Logistic Solution for the Armed Forces

ZAMET-GŁOWNO 2 sp. z o.o. sp. k ► p. 371



Versatility and Configurability

- Operation of Flatrack loading platforms and ISO 20' containers with hooklift
- Extended version - handling ISO 20' containers without a hooklift using the Container Transport Kit (ZTK)
- Adaptation for air transport - optional folding vertical hook arm, reducing the height of the system on the vehicle

Advanced Hydraulic and Control System

- BOSCH REXROTH components - ensure long and trouble-free operation
- Operation mode: manual (sequential) and automatic
- Remote control - easy operation from a portable control panel

Mounting and Mobility

- Compatibility - adapted to 3- and 4-axle truck chassis
- Loading and unloading in difficult terrain - ability to work from ground level or below

Full Compatibility and Interchangeability

- Compatibility with systems used in the Polish and NATO Armed Forces
- Easy replacement of the chassis or entire system in case of failure
- Optional emergency power supply from an alternative hydraulic source

FORTIS M.165 is a state-of-the-art Material Handling Equipment, designed for application on off-road vehicles used in special operations, mainly military. The system is fully compliant with NATO (STANAG) standards, ensuring reliability and compatibility with current logistics solutions.

Key Technical Parameters

- Nominal lifting capacity: 16,500 kg
- Net weight: approximately 2,200 kg
- Construction material: high-strength steel, resistant to extreme conditions



GENERAL PURPOSE TRUCK WITH CRANE

DEMARKO S.A. ► p. 326



The family of vehicles with different payload and superstructure developed for particular missions. All of them are successfully operated by the units of the Polish Armed Forces. Among them one of payload 6 500 kg, curb weight 25 496 kg and GVW 32 000 kg. Capable to transport among



others fourteen (14) EURO pallets, two (2) containers ISO 10' and one (1) container 20". Additionally, to ensure better performance, equipped with articulated crane with max lifting capability of 22 000 kg at arm length of 3 m and 360o angle of work. The loose or weather sensitive cargo can be transported under tarpaulin.

The vehicle is adapted to operate with a trailer, with a total of of GCW 60 000 kg. The electric system and all related elements are compliant with ADR requirements making the vehicle appropriate for transport of dangerous materials and goods.

The presented truck configuration is one of many different kinds produced by DEMARKO S.A. superstructures fitted on chassis selected by a customer. The general-purpose superstructures of various arrangements, prime movers and multi-lifts for load platforms of the type FLATRACK are also members of family. All vehicles are designed individually, following customer's specific requirement.



LUNAR – ROTARY DETONATION KILN FOR DISPOSAL OF EXPLOSIVES AND AMMUNITION

Jakusz Sp. z o.o. ► p. 337

Lunar – Rotary Detonation Kiln for Disposal of Explosives and Ammunition

- a comprehensive solution for destruction of:
 - obsolete ammunition which may pose a threat of uncontrolled detonation or environmental pollution,
 - residues from the manufacture of explosives including items associated with the production, e.g. paper, scrap metal, cleaning cloths etc.,
 - defective ammunition from the production process,
 - confiscated ammunition,
- small- and medium-calibre ammunition containing:
 - explosives, e.g. TNT, RDX, A-IX-2,
 - propellants, e.g. nitrocellulose powder, nitroglycerine powder,
- solution for military and civil sectors,
- placed in a container construction transportable by road, rail and sea,
- stationary, transportable devices,
- destruction is carried out in a way that is safe for human life and health, property and the environment,
- integrated with the Post-Detonation Gas Purification System - the gases generated during the destruction process are directed to the purification system,
- maximum single charge of the kiln: up to 0.6 kg net of explosives in TNT equivalent,
- presumed system efficiency of approximately 40 kg of explosives in TNT equivalent/hour,
- maximum dimensions of the items fed into incinerator (length x width x height): 300 x 150 x 130 mm,
- required personnel: 2-3 persons,
- implemented internationally.



A WHEELED VEHICLE-LAUNCHED SUPPORT BRIDGE

OBRUM Sp. z o.o. ► p. 349



MS-20 „DAGLEZJA” mobile bridge is capable to carry the heavies NATO vehicles including ABRAMS MBT's and infantry to cross water and terrain obstacles with a span of up to 20 m (acc. to STANAG 2021). The fillings between bridge spans provide convenience and safety for people crossing the bridge. A dedicated semitrailer is designed to transport a bridge span, to expand its width from 3 m from transport to the 4m working position, launch and retrieve the span across an obstacle. The bridge is ready for performing crossing operation in less than 30 minutes (including the complete technical preparation). The vehicle is approved for operation for traffic on public roads. MS-20 „DAGLEZJA” set consists of a Jelcz C662D.43 6×6 towing vehicle, 6×6 (hydraulic) semitrailer, bridge layer and PM-20 span.

Main features:

- Allows to transport all types of vehicles (tracked on or wheeled) and the infantry to cross terrain obstacles of up to 20 m The only mobile bridge equipped with fillings between bridge spans
- For use in rough terrain conditions

Advantages:

- High mobility
- Rapid launch and retrieval across an obstacle
 - up to 10 minutes (excluding the time required technical preparation)
- Ballistic protection of the crew available in the armored version
- Operation in a wide range of environmental and terrain conditions
- Approved for public roads traffic



The NS-26 is a universal structure designed to perform various tasks, from command posts, through field hospitals, warehouses, etc. The tent is composed of a rigid frame made of unified aluminum profiles with a quick deployment system, which minimizes the time required to put up the tent. The sheathing is made of fire-resistant polyester fabric, with special finishing ensuring thermal and light reflex (thus improving the efficiency of lighting and air conditioning systems). It meets the requirements for accommodation of 6 people with the equipment.

The NS-26 tent is suitable for all terrain conditions (mountains, uplands, lowlands, deserts, forests and lakes, etc.) and climatic zones (polar, moderate and inter-tropical), including conditions of high air and ground humidity, intensive sunlight, as well as low temperatures, intensive rain and snow. The operating temperature range is from -30°C to $+60^{\circ}\text{C}$. Inside the tent there is a possibility of maintaining comfortable temperature from $+18^{\circ}\text{C}$ to $+21^{\circ}\text{C}$, regardless of climatic zones, thanks to the use of additional equipment, e.g. air conditioners, heaters, power generators.

Technical parameters

Length	5,20 m	Width	4,80 m	Height at the center	
	2,50 m	Usable area			25,00 m ²



Professional military containers for uniformed services

Modular System Sp. z o.o. ► p. 346



The functionality of container and modular construction, fast implementation time according to individual needs, cost optimization, mobility and the possibility of introducing changes over time, contribute to the growing interest in container products as an alternative to traditional construction.

Our painstakingly created military containers are designed to withstand even the most extreme environments, crafted in response to detailed assessments and suggestions, meeting the unique needs of the military infrastructure around the globe.

Securing the required licenses and certifications allows us to reliably provide customized solutions as promised, strengthening our capacity to safeguard and cater to a variety of markets.



Our modular systems make it possible to build multifunctional facilities:

- military modules
- office modules
- sanitary modules
- modular residential buildings
- medical modules
- rest and refreshment space,
- catering outlets,

NATO standards

The solutions we employ are meticulously designed to align with the rigorous standards and specifications necessary to secure military infrastructure essential for NATO unit operations spanning decades.

These standards encompass a comprehensive range of security measures tailored to meet the exacting demands of modern defence strategies and protocols, ensuring the long-term viability and resilience of our equipment.

Our modular systems represent the pinnacle of adaptability and versatility, serving as the cornerstone of military preparedness across a spectrum of operational environments worldwide.

Whether deployed in arctic climates, arid deserts, or dense urban landscapes, our solutions are engineered to excel under diverse conditions, ensuring seamless integration and functionality for uniformed services over extended periods.



- shops, kiosks, pharmacies,
- hotels, motels, leisure facilities,
- sports facilities at playgrounds and recreational areas,
- schools, kindergartens, nurseries,
- outpatient clinics and other medical facilities,
- background during fairs, concerts and open-air events,
- car showrooms and many other spaces in various branches of the economy and public utilities.

SEMI-TRAILER ST555-20W.M and ST775-20W.M

DEMARKO S.A. ► p. 326

Modular concept. The system of two semi-trailers consists of two trailer platforms adapted to be connected to the one universal goose neck. Hydraulic cylinders, in addition to the height adjustment system, allow adjustment of the load effecting a fifth wheel of a tractor. The proposed arrangement of these three elements, two kinds of load platforms along with universal goose, make transport organization more efficient, faster and flexible. This way, the multirole arrangement was made, dedicated for the transport of cargo, vehicles but also heavy and high combat equipment like howitzers or mobile air defence systems up to 50 000 kg weight the first configuration.

A heavy, armour vehicles or cargo in many different arrangements up to 70 000 kg total weight, the second configuration. To secure all required functions related to loading and unloading processes the goose neck is equipped with power generator in One-Hydra-Neck Technology™ as well as two winches of 24 000 kg each. The arrangement of winches and the guiding rope wheels allows for loading and unloading of damaged vehicles but also facilitates self-recovery. Electric 24 V waterproof system is built in such an arrangement as to ensure that the multirole transport system can be used not only in military operations but also civil ones.



SEMI-TRAILER ST775-20W

DEMARKO S.A. ► p. 326



The effectively proven during many years of operation semi-trailer of the Heavy Equipment Transport (HET) family with a payload of 70 000kg, is dedicated and respectively equipped for transportation of heavy and armoured vehicles of both wheeled and tracklaying kinds. Having cargo deck of 10 550 mm length at total semi-trailer length of 15 530 mm, it is capable to perform efficiently and effectively transportation of all heavy vehicles available and deployed currently by any army worldwide. The standard cargo deck of 3 450 mm width and 960 mm height supported with hydraulically operated ramps, is equipped with a system of rope wheels dedicated for loading

and unloading damaged vehicles using winches mounted on a tractor. A simple, running gear consisting of seven extra wide axles with twin wheels provides exceptional stability. The five axles with hydraulic steering secure excellent manoeuvrability, extending tires' life. Wheels equipped with Run-Flat inserts allow the trailer to run even after a tire puncture. The goose neck with adjustable coupling with height ranging from 1 250 mm up to 1 650 mm allows for marriage and operation with many different prime movers. The 24V waterproof electric installation is configured to be equipped with military as well as civil lights systems.



SEMI-TRAILER ST775-24W.H-PA

DEMARKO S.A. ► p. 326



The already successfully, practically proven semi-trailer of the Heavy Equipment Transport (HET) family with a payload of 70 000kg, is dedicated and respectively equipped for transportation of heavy and armoured vehicles of both wheeled and tracklaying kinds. Having cargo deck of 11 400 mm length at total length of 16 380 mm, it is capable to perform efficiently and effectively transportation of all heavy vehicles available and deployed currently by any army worldwide. The standard cargo deck width of 3 000 mm can be extended smoothly up to 3 500 mm, using a dedicated hydraulic system, which considerably improves the comfort of loading and transport of wide combat vehicles. The unique, independent, hydraulic suspension secures tactical mobility at the highest level. Supported by inclinometers,

accelerometers, encoders, it has an extraordinary rotating and swinging capability. The suspension stroke of up to 650 mm secures the semi-trailer's capability to perform successful missions almost in every terrain, thanks to the possibility of lifting up respectively the entire cargo deck. Originally of 1 100 mm height. The articulated goose neck, which is also hydraulically powered and electronically controlled, secures the semi-trailer's capability to be married with every prime mover with the fifth wheel height from 1 250 mm up to 1 650 mm. A dedicated arrangement of the rope guiding wheels increases the deployment range as also damaged vehicles can be efficiently loaded and unloaded. The hydraulically operated and electronically controlled rear ramps effectively support the process.



Tent halls

REKORD Hale Namiotowe ► p. 352

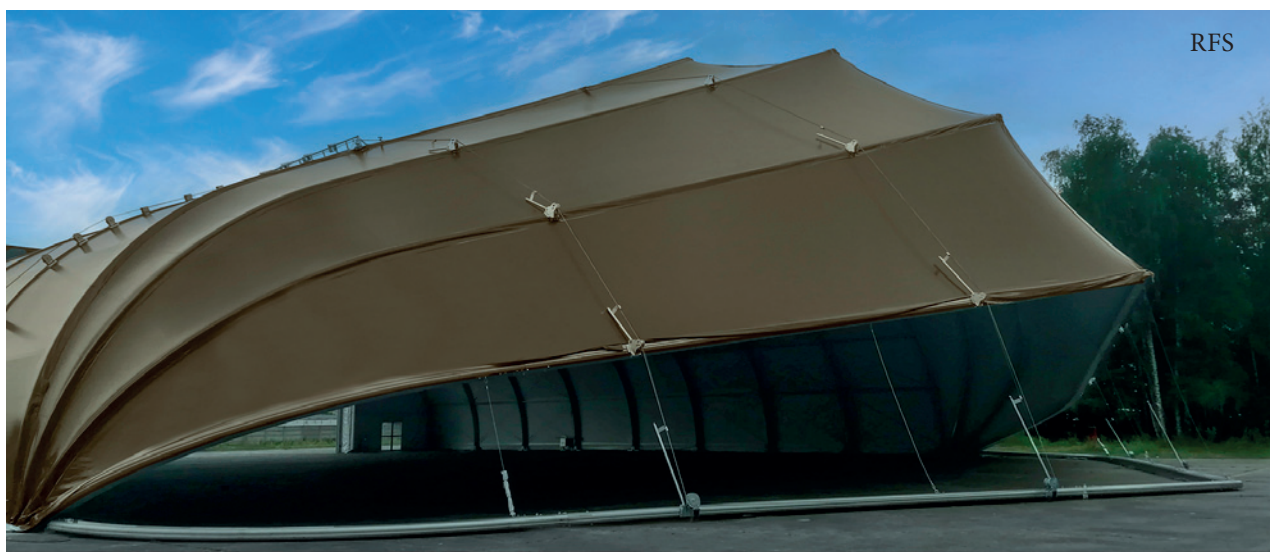


RFS halls are some of the more spectacular tent halls. Their lightweight and unique construction does not require permanent bonding to the ground and allows the construction of an RFS tent hall with a span of 15 to 75 meters and any length in modules every 5 meters. Each module has a system that allows bi-directional tensioning of the sheathing, which definitely increases the strength parameters of the hall and the comfort of use. Rekord Group is a leader in the construction of lightweight tented aircraft hangars, such as service hangars for C-class aircraft, mobile hangars for helicopters, and we build TV studios as well.

HAN-type halls are designed to allow rapid relocation of halls for use as military and civilian hangars. The use of modular construction makes it possible to adjust the area

of the facility by expanding it. HAN-type hangars perform well in extreme climatic conditions, including Arctic, desert, temperate and tropical climates. Advantages: minimization of operating costs, ability to adjust the size depending on the purpose, quick opening of entire gable walls.

ALU tent halls provide unlimited possibilities for interior design, making them ideal for military bases or events. They are also erected as temporary exhibition facilities, trading halls, trade pavilions, conference and wedding halls. The range of additional equipment of the proposed halls (heaters, air conditioners, dividing walls, lighting, etc.), the variety of finishes (walls made of safety glass or PVC panels, soffit, dividing walls, etc.) make the proposed halls provide optimal flexibility for the organization of





events not only as regards of the season of their use, but also the size and type of event. Tent halls are equipped with modular floor systems, which are characterized by high strength, quick assembly, aesthetics and relatively small dimensions for easy transportation. Rekord Hale Namiotowe sp. z o.o. provides services related to the organization of accommodation bases, canteens in the form of equipped tent halls: with bunk beds, mattresses, tables and Bavarian benches, dining facility areas and the possibility of ordering additional accessories and equipment.

We are a strategic supplier of comprehensive services for the Polish military and allied forces. We design, build and equip military camps comprehensively: from site preparation to support social and living infrastructure.

MNT is a military technical tent based on a frame structure, providing the ability to perform maintenance and repair work on weapons and military equipment in field conditions. Tested in various climatic zones, it is characterized by high resistance to changing weather conditions.

The construction of the tent provides a short time of assembly and disassembly, and the materials used in the production of the cover are resistant to corrosive aggressive environmental factors, chemicals for disinfection, decontamination, detergents used for cleaning or petroleum based mps products. It is possible to connect several tents in series and parallel, thereby increasing the usable area.

VACU's innovative and environmentally friendly products, based on vacuum technology used in aviation, are smart and sustainable sanitation solutions. The group includes toilets, urinals, washrooms and showers, which can function independently or combine into modules of any configuration. Our VACU toilet is an innovation on the market – the first vacuum toilet system in Poland, based on state of the art sanitary solutions taken from aviation. It saves water (only 0.8l per use) and is chemical-free (no chemicals required).



ZAMET-GŁOWNO 2 sp. z o.o. sp. k ► p. 371

A large, green, rectangular outdoor storage container or shed, likely for agricultural equipment, situated on a paved area next to a building. The container has a flat roof with a small vent pipe, a door on the side, and a small box on the front. It is supported by metal legs.

- Field kitchens - fully equipped, ready to prepare meals under any conditions
- Mobile hospitals and medical posts - providing immediate assistance in operational areas
- Bathhouses and sanitary facilities - with full hygienic facilities, adapted to extreme conditions
- Command center - modern operational space for management personnel
- Mobile workshops - with equipment adapted to the customer's requirements
- Mobile warehouses - adapted for storage of equipment and supplies

- Certificate of obtaining the type of construction
- Container metrics
- CSC (KBK) certificate
- Marking in accordance with PN-EN ISO 6346:1999
- International identification numbers
- CSC-type approval certificates from recognized certifying bodies

- Working area: $\sim 23 \text{ m}^2$ when the side walls are extended
- One-person operation - ready for use in ~ 15 minutes
- Workshop equipment - configurable according to user needs (air conditioning, generator, dynamic drying, filtration and ventilation systems, etc.).
- Loading Options
- Crane systems
- Multi Lift system with H-frame
- Forklift truck
- Self-loading - hydraulic support legs integrated into the container structure



Versatile Transport Trailers

ZAMET-GŁOWNO 2 sp. z o.o. sp. k ► p. 371

Transport trailers are sturdy and durable structures designed for transporting flatracks, container systems with special equipment and boats. We offer both light-weight universal trailers and specialized truck trailers for maximum functionality in military, rescue and civilian transportation.

Application

- Transportation of ISO containers (1x20', 2x10')
- Carriage of cargo platforms
- Compatible with specialized containers built to DIN 30722 standards



Key Parameters

- For 3-axle trailers
- Gross vehicle Weight: up to 24,000 kg
- Maximum payload: up to 19,400 kg
- For 2-axle trailers
- Hookloader System - loading with the back of the trailer

Key Advantages

- Durable and robust design - built for heavy-duty use
- Compatible with container systems - easy integration with various transportation standards
- Customization options - adaptable to individual transport needs





FORCE PROTECTION AND MOBILITY

Force protection and mobility
Force protection and mobility
Force protection and mobility
Force protection and mobility

AD-2000 Parachute System

Air-Pol Sp. z o.o. ► p. 315

Thanks to its two-stage main parachute deployment and stabilization system, the AD-2000 parachute system allows delayed deployment jumps by jumpers who are not proficient in the free-fall technique. Thus, AD-2000 minimizes the training time of soldiers for ram-air parachute jumping. The excellent lift-to-drag ratio of the canopy used in AD-2000 makes possible flights of up to 30 km whilst also very good manoeuvrability allows the jumper to freely choose the landing spot.

AD-2000 is equipped with:

- a special version of the CYPRES-2 automatic device with the reserve canopy,
- a three-ring, single-grip main canopy release system,
- wide size adjustment of harness with cushions,
- harness for cargo container which allow both lowering of the container and its emergency release during the flight,
- RSL.



Specification of AD-2000 Parachute System

- | | |
|--|---|
| → NSN number: | 1670-43-000-0615. |
| → Certificate number (in accordance with ETSO C23d): | 64.086.010. |
| → Canopy area [m ² / ft ²]: | 27,87 m ² / 300 ft ² . |
| → Main canopy - number of jumps / service life: | 1,500 jumps / 12 years. |
| → Reserve canopy - number of jumps / service life: | 20 jumps / 12 years
or 40 documented packings. |
| → Assembly weight [kg / lbs]: | 17.5 kg / 38.58 lbs. |
| → Suspended load [kg / lbs]: | Min 78 kg / 171 lbs, Max 140 kg / 308.64 lbs. |
| → Min jump altitude [m / ft]: | 200 m / 650 ft. |
| → Descent speed with the stabilizing parachute [m/s / ft/s]: | 30-35 m/s / 98.5-115 ft/s. |
| → Deployment systems: | |
| • static line, | |
| • two-stage deployment system | |
| • stabilisation / manual deployment with KAP-3P1 automatic device, | |
| • RSL, | |
| • manual deployment of reserve parachute with CYPRES automatic device. | |

ADS Safety System

Nowak Innovations Sp. z o.o. ► p. 348

The ADS System is designed for use in special military equipment. The System protects the crew and the vehicle from the effects of being hit by an anti-tank missile or other type of munitions.

The ADS System consists of:

- Independent Electronic Control System ADS,
- high-power pyrotechnic actuators,
- opening and closing mechanism.

How does the system work?

When an ATGM (or other type of munitions) hits and penetrates the armor of the vehicle the ADS System is activated and the vehicle's doors, hatches or boards are opened to release the accumulated pressure inside the vehicle.

The response time from the moment the explosion is detected to the moment the System is activated is about 100 milliseconds.

The ADS System protects the vehicle crew, the turret system and the vehicle, from being blown apart (e.g. effect Jack-In-The-Box). After activation of the ADS System, it is possible, to close again the hatches, doors of the vehicle and withdraw from the threatened area.

ADS system, can be used, also in industrial plants, for example those producing explosives.

Possible applications:

Main Battle Tanks, Ammunition Vehicles, Turret Systems of IFVs and APCs, Industrial plants, Ammunition depots, Ammunition magazines in the vehicle.



AEDO Safety System

Nowak Innovations Sp. z o.o. ► p. 348

AEDO Safety System is designed for emergency opening of doors on military and civilian vehicles. The system enables the emergency opening of jammed or blocked doors and hatches, it also provides the rapid evacuation of the crew, increases the safety of soldiers during combat tasks. The AEDO System can be activated by vehicle crews, as well as from the outside by emergency services.



The System operates after accidents:

- collision of the vehicle with another vehicle or with an obstacle,
- tilting of the vehicle beyond a certain angle or rollover,
- door blockage,
- fire or sinking of the vehicle,
- a mine or IED explosion,
- hit by anti-tank missiles and other types of ATGM.

The AEDO System consists of:

- Independent Electronic Control Unit NEUS 1,
- pyrotechnic telescopic actuators,
- impact, position, fire, smoke and water sensors,
- panel for manual control from the vehicle cabin,
- an external electronic key, to activate the AEDO System.



Power for the System is independent, via a small 12V/24V battery. IMPORTANT: the System does not damage doors and hatches, which can be closed again. The AEDO System, can be easily installed in new, as well as military and civilian vehicles which are already in service.



How does the system work?

First, the locks and deadbolts of the door/hatch are opened, and then the door/hatch is opened (pushed out).

Possible applications:

All types of military vehicles, as well as helicopters, aircraft, ships and submarines.

ALEXA

Jakusz Sp. z o.o. ► p. 337

Gas-tight EOD container design provides:

- maximum level of protection against shock wave, fire and fragmentation,
- strengthening CBRNE security,
- rapid isolation and transport of hazardous materials with a maximum weight of 1,5 kg TNT equivalent,
- isolating hazards and moving them away from populated areas.

A cost-effective, mobile, easy-to-use solution for:
special forces / border guards / police / bomb dis-
posal units / public facility security services.

The ALEXA container is suitable for mounting on a robotic drive unit and on a pick-up chassis enabling:

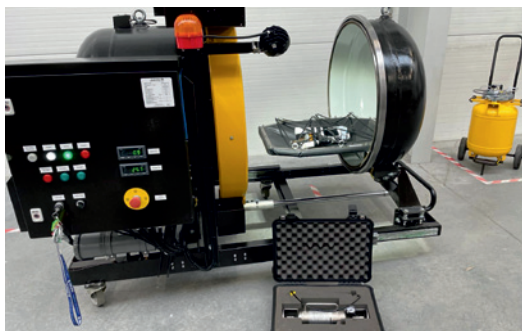
- placing close to the hazard and fast isolation of hazardous materials,
- rapid movement to the place of danger, in crisis and war situations,
- operating in confined spaces and heavy traffic areas.

Additionally the design of the ALEXA container allows sampling of post-detonation gases from a closed container and:

- checking pressure inside the container body,
- venting of gases after detonation,
- sampling of gases from inside the container into special containers for further analysis.

Parameters:

- wired or radio remote control,
- fully automatic container opening/
closing system,
- possibility to work with a EOD robot,
- wide range of carriers/vehicles to use in terms
of permissible gross weight of the vehicle.



Technical parameters

Maximum explosive	1,5 kg (TNT)
Type of container	gas-tight
Maximum weight of transported object	50 kg
Maximum size of transported object	600 mm x 450 mm x 400 mm (LxWxH)
Maximum size of the container	1200 mm x 1500 mm x 1300 mm (LxWxH)

Armored Observation Container (OKO)

Siltec Sp. z o.o. ► p. 356

Armored Observation Container (OKO) allows you to view and record the image around the container from six cameras, including two mounted on the mast, while ensuring the protection and safety of the container operators thanks to the armored structure that meets the requirements of the KE2 level according to STANAG 4569 edition 3.

Manufactured in accordance with ICC load and hook container standard, which enables its loading and transport with the use of vehicles adapted for this purpose. Dedicated hook lift truck can be delivered together with the container.

The defence solutions of the Armored Observation Container, which increase the level of protection of operators and their safety, include: a structure that meets the requirements of the KE2 level according to

STANAG 4569 edition 3, shooting positions, an evacuation hatch, windows with tilting louvers and a filter-ventilation system.

For observation activities, the container is equipped with two high-speed cameras mounted on an 8-meter retractable pneumatic mast, four stationary cameras located with remotely controlled external floodlights at the corners of the container, a simultaneous viewing and recording system, an operator's desk and a communication system. The container has the option of connecting an external mains supply or operating from a power generator installed in the technical space, equipped with the function of automatic in case of the power loss. In the event of a temporary power failure, the UPS device will enable data recording and proper system termination.

In addition, the Armored Observation Container is equipped with an air-conditioning system and air heaters, two beds, weapon racks, a refrigerator, LED lighting, external lighting with motion sensors, as well as a sanitary and hygienic room.



DEDAL (AD-95s.3 AZ-95s.3) series 3 Parachute System

Air-Pol Sp. z o.o. ► p. 315

DEDAL series 3 troop parachute (AD-95s3+AZ-95s3) is designed for basic and advanced training jumps, combat-training jumps and combat jumps. The AD-95s. parachute system can be equipped with a steerable or non-steerable main canopy. The purpose of the DEDAL series 3 parachutes are airborne troop landing operations with combat equipment from high and low altitudes. Parachute harness supports standard containers with equipment and weapons. The AD-95s.3 canopy has a unique ability to change the functionality of the parachute by the jumper when airborne. After deployment, the parachute falls vertically (no forward speed). The forward speed appears only if the jumper decides to open the drive slots that give the canopy horizontal speed and allow the parachute to manoeuvre.



The AZ-95s.3 reserve parachute is designed to rescue a jumper in case of partial or total failure of the main canopy. Deployment of the canopy is accelerated by a spring mechanism. AZ-95s.3 can be deployed with either hand. In addition, the parachute can be equipped with an AAD.

Specification of DEDAL series 3 Parachute System

- NSN number: 1670-43-002-2634 + 1670-43-002-2635.
- Certificate number: 64.086.006a + 64.086.005a.
- Canopy type: conical, steerable (optionally non-steerable).
- Canopy area [m² / ft²]: 110 m² / 118 ft² + 63 m² / 538.21 ft².
- Canopy diameter [m / ft]: 13.2 m / 43.31 ft + 9.8 m / 26.24 ft.
- Rotation time [s]: ~12 s (main canopy).
- Main canopy [number of jumps / service life]: 150 jumps / 12 years (max 20 years).
- Reserve canopy [number of jumps / service life]:
 - 1 jump at 350 km/h,
 - 12 jumps at up to 225 km/h,
 - 20 deployments in auxiliary mode, / 12 years (max 20 years).
- Assembly weight [kg / lbs]: 18.5 kg / 40.8 lbs + 8 kg / 18 lbs.
- Max suspended load [kg / lbs]: 185 kg / 408 lbs.
- Deployment speed of the main parachute:
 - Min 120 km/h / 65 KTS,
 - Max 400km/h / 216 KTS with min. 3-second delay.
- Deployment speed of the reserve parachute:
 - Min 110 km/h / 60 KTS;
 - Max 277.8 km/h / 150 KTS;
 - Max 400km/h / 216 KTS with min. 5-second delay.
- Min jump altitude (main canopy) [m / ft]: 150 m / 492 ft.
- Min jump altitude (reserve canopy) [m / ft]: 100 m / 328 ft.
- Descent speed [m/s / ft/s] (main canopy): 5.4 m/s / 17.7 ft/s (at 185 kg).
- Descent speed [m/s / ft/s] (reserve canopy): 7.9 m/s / 26 ft/s (at 185 kg).
- Forward speed [m/s / ft/s]: 0 ÷ 4.5 m/s / 0 ÷ 14.76 ft/s.
- Descent speed with a stabilizing drogue parachute [m/s / ft/s]: 35 m/s / 115 ft/sec.



- Deployment systems:
 - static line,
 - static line with spring-loaded pilot chute,
 - two-stage stabilized deployment system backed with KAP-3P1
 - automatic device,
 - manual deployment by ripcord backed with KAP-3P1 automatic device.

EVA Gas-Tight Explosion-Proof Container

Jakusz Sp. z o.o. ► p. 337

EVA mobile EXPLOSION-PROOF CONTAINER for the isolation and transport of hazardous and explosive materials:

- gas-tight, providing a maximum degree of protection against shock wave, fire and fragments,
- resistant to detonation of:
 - 8 kg in TNT equivalent - gas-tight,
 - 10 kg in TNT equivalent - non-gas-tight,
- protection against CBRN agents,
- decontamination system that enables neutralisation of products generated during explosion, ensuring complete protection of the surrounding,
- a system allowing the collection of gas samples from a closed container,
- self-propelled / with own drive,
- radio-controlled with option of manual emergency opening,



- steering axle allowing close approach to the load pick-up point,
- tested and certified by research institutes,
- operating in various climate and environmental conditions, at temperatures of -20°C + 40°C, on sand, in dust, high humidity and rain,
- comprehensive solution for border guard / military / police / EOD services / public facility security services,
- operation compatible with EOD robot.

EXPLOSION-PROOF CONTAINER can be installed on trailers, mobile platforms or adapted for installation on vehicles.

Maximum load dimensions	width 670 / height 500 / length 1,170 mm
Maximum dimensions of closed container (ready for transport)	width 2,000 / height 2,300 / length 3,500 mm
Maximum weight of transported material	80 kg
Set weight - container and mobile platform	6000 kg

Feniks Future Parachute System

Air-Pol Sp. z o.o. ► p. 315

The Feniks Future Parachute System is dedicated to parachute training of soldiers who have previously mastered jumps with a free-fall opening system. It is perfectly suited for parachute sport and as a parachute for instructors conducting AFF training. The container is available in different sizes depending on the user's requirements regarding the main and reserve canopy assembly. Depending on the order, the harness is custom-manufactured to size or with the possibility of adjustment to ensure maximum comfort for jumpers who remain on stand-by for a long period of time.



Specification of Feniks Future Parachute System

- Certificate number
(in accordance with ETSO C23d): 64086002.
- Canopy area [m^2 / ft^2]:
- 10.87 m^2 / 117 ft^2 ,
 - 11.51 m^2 / 124 ft^2 ,
 - 12.26 m^2 / 132 ft^2 ,
 - 13.00 m^2 / 140 ft^2 ,
 - 14.86 m^2 / 160 ft^2 ,
 - 15.79 m^2 / 170 ft^2 ,
 - 16.25 m^2 / 175 ft^2 ,
 - 18.58 m^2 / 200 ft^2 ,
 - 19.97 m^2 / 215 ft^2 ,
 - 20.44 m^2 / 220 ft^2 .
- 



- Reserve canopy area [m^2 / ft^2]:
- 13.28 m^2 / 143 ft^2 ,
 - 13,74 m^2 / 148 ft^2 ,
 - 13,74 m^2 / 148 ft^2 ,
 - 13.93 m^2 / 150 ft^2 ,
 - 16.25 m^2 / 175 ft^2 ,
 - 17.46 m^2 / 188 ft^2 ,
 - 19.32 m^2 / 208 ft^2 ,
 - 19.97 m^2 / 215 ft^2 ,
 - 21.18 m^2 / 228 ft^2 .



- Assembly weight [kg / lbs]: ~11.5 kg / ~25.35 lbs.
- Min/Max suspended load [kg / lbs]: 165 kg / 264.55 lbs.
- Max deployment speed [km/h / KTS]: 277.8 km/h / 150 KTS.
- Deployment system: soft BOC pilot chute.
- Backup:
 - AAD – dedicated CYPRES II,
 - RSL.

Feniks Military G-9 Parachute System

Air-Pol Sp. z o.o. ► p. 315

Fenix G-9 Military is a parachute system designed for HAHO jumps. The G-9 canopy is a cross-over of a parafoil and a parachute which makes it an ideal solution for long distance gliding flights.

Due to its parameters, the G-9 canopy is very demanding which makes it suitable primarily for very experienced soldiers. A wide range of applications is possible thanks

to a variety of available deployment systems, regardless of the equipment and its size. The harness has been designed to provide maximum comfort and convenience for the jumper during long flights.

The parachute can be adjusted to the height and dimensions of the jumper.



Specification of Feniks Military G-9 Parachute System

→ Certificate number (in accordance with ETSO C23d):	64086004.
→ Main and reserve canopy area [m ² / ft ²]:	34.83 m ² / 375 ft ² .
→ Number of cells:	11.
→ Lift-to-drag:	6+.
→ Assembly weight [kg / lbs]:	23 kg / 50.70 lbs.
→ Min/Max suspended load [kg / lbs]:	181.43 kg / 400 lbs.
→ Max deployment speed [km/h / KTS]:	277.8 km/h / 150 KTS.
→ Descent speed of deployed canopy [m/s / ft/s]:	2.5 m/s / 8.20 ft/s.

- Descent speed with the drogue parachute [m/s / ft/s]: 45 m/s / 147.63 ft/s.
- Deployment systems:
 - soft BOC pilot chute,
 - grip/spring-loaded chute,
 - static line,
 - static line to deploy drogue,
 - two-stage/drogue.
- Backup:
 - AAD - dedicated CYPRES II,
 - RSL.

Feniks S Parachute System

Air-Pol Sp. z o.o. ► p. 315

The Feniks S parachute system is the foundation of the entire Feniks parachute series. It is designed for parachute training both for beginners and for advanced jumpers as well as for skill-honing trainings. It is a perfect set for basic trainings, sport and leisure, as well as advanced parachute training. With correctly selected sizes of the main canopy and reserve, it perfectly plays its role as a parachute for students and AFF instructors. Its container is designed to provide maximum comfort for jumpers also during long standby periods. The technical solutions applied in the system make it perfectly support safe movement on board the aircraft (jump masters) without the risk of accidental deployment of the parachute. Feniks is designed for all parachute trainers. In the “back-to-back” system, Feniks has containers for the reserve and main parachutes and an integrated harness for a single jumper.

It is perfectly suited for parachute sport and as a parachute for instructors conducting AFF training. The container is available in different sizes depending on the user's requirements regarding the main and reserve canopy assembly. Depending on the order, the harness is custom-manufactured to size or with the possibility of adjustment to ensure maximum comfort for jumpers who remain on stand-by for a long period of time.

Specification of Feniks S Parachute System

- Certificate number (in accordance with ETSO C23d):
64086003.

- Canopy area [m²]:
 - 21.36 m² / 230 ft².
 - 23.22 m² / 250 ft².
 - 24.15 m² / 260 ft²,
 - 25.08 m² / 270 ft².
 - 26.01 m² / 280 ft².



- Reserve canopy area [m^2 / ft^2]:
- 21.18 $\text{m}^2 / 228 \text{ ft}^2$,
 - 21.83 $\text{m}^2 / 235 \text{ ft}^2$,
 - 23.04 $\text{m}^2 / 248 \text{ ft}^2$,
 - 23.22 $\text{m}^2 / 250 \text{ ft}^2$,
 - 24.61 $\text{m}^2 / 265 \text{ ft}^2$,
 - 25.08 $\text{m}^2 / 270 \text{ ft}^2$,
 - 26.75 $\text{m}^2 / 288 \text{ ft}^2$,
 - 26.94 $\text{m}^2 / 290 \text{ ft}^2$,
 - 27.87 $\text{m}^2 / 300 \text{ ft}^2$.



- Assembly weight [kg / lbs]: ~15.5 kg / ~33 lbs.
- Min/Max suspended load [kg / lbs]: 181.4 kg / 400 lbs.
- Max deployment speed [km/h / KTS]: 277.8 km/h / 150 KTS.



- Deployment system:
 - soft BOC pilot chute,
 - grip/spring-loaded chute,
 - static line.
- Backup:
 - AAD – dedicated CYPRES II,
 - RSL.





FLAME signal mine

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

The signaling mine is intended for the protection of military facilities, storage areas, border crossings, etc.

Description of the operation:

After pulling the tripwire, the cotter is pulled out and pin released, which, hitting the primer, causes it to detonate and firing the powder charge and to eject the signal cartridge from the body of the mine.

The burning time of the cartridge is $4,5 \pm 1,5$ sec.

Mobile camouflage

SILTEC Sp. z o.o. ► p. _

Mobile camouflage designed for camouflaging vehicles both on the move and at a standstill. It is made of custom-made panels for each vehicle. It provides multi-band UV, VIS, NIR, TIR, RADAR protection. It effectively changes the thermal and radar signatures of vehicles, making them impossible to detect. This results in a significant increase in survivability and a reduction in the loss of resources on the modern battlefield.

Mobile camouflage imitates the texture of the natural environment, leaves, and terrain, providing a sense of space and enhanced protection in forest, desert or mountain environments. The modular design of the mobile camouflage allows the camouflage panels to be adapted to a specific vehicle and quick installation on vehicles. The use of a panelled design also allows for easy replacement of damaged camouflage components.



SILTEC Sp. z o.o. ► p. 356



- ## Container compartments

- ### Generator set

Mobile high-capacity evacuation ferry PEP.30-01 type

ARMPOL Research and Development Company ► p. 317

The ferry is designed for:

- evacuation from flooded areas of civilians and all kinds of property,
- securing ad hoc crossings of water obstacles in cases of damage to bridges,
- securing unusual rescue operations, such as extinguishing a burning bridge,
- water transport of high-volume and high-tonnage objects in the national economy.

Technical and Operating Parameters

General Data:

- Total weight of the shuttle 31 100 kg
- Dimensions of the shuttle as a trailer (L x W x H) 14030 x 3400 x 4000 mm
- Shuttle dimensions when unfolded (L x W x H) 19850 x 6360 x 3620 mm

- The displacement 108 t Unladen immersion approx. 700 mm
 - Dipping with a load of 30 t approx. 1200 mm
- Swimming speed with no load approx. 13 km/h
 - Cruising speed with a load of 30 t approx. 9 km/h
- Tractive force 25 kN
- Rated power of ferry drive motors 2x313 kW
- Fuel tank volume 1 600 l



- Supply voltage of on-board installation 27,6±1,0 V

Performance parameters:

- Temperature range from -10 do +50°C
- Temperature range of storage from -45 do +65°C (after computer hardware was debunked)



Mobile RACK Transport Case

ShMRC1904

SILTEC Sp. z o.o. ► p. 356



Mobile RACK transport case guarantees the security of the commercial equipment not only against difficult environmental conditions but also against electromagnetic leakage of processed information while meeting the SDIP-27 Level A Standard.

The case is made on the basis of SHOCK RACK series 3RR (4U) transport case. This series is: lightweight, shock-proof, waterproof, dustproof, heat and chemical resistant, ideal for protecting and transporting sensitive electronic equipment. The internal chassis is constructed of extruded high-strength/lightweight aluminum sections with gear rails made of 11 gauge carbon steel to meet EIA-310 standards. Shock and vibration braking is provided by eight elastomeric isolators with a nominal load capacity of 40 lbs. to 150 lbs. in standard configuration.

SHOCK Series 3RS static racks are available in 24 "or 30" rail-to-rail depths with standard 19 "cabinet widths per ANSI / EIA-310-C specifications. The contoured ribs and stacking brackets are designed to stack with a competitive manufacturer. An automatic pressure relief valve is another standard feature, along with sealed lids that include convenient lid hangers for storing lids when the unit is operating.

Equipping the enclosure with appropriate ports, power outlets along with signaling and switches, as well as ventilation, guarantees the correct operation of the equipment installed in it.

The fabricated electromagnetic shell on a static rack, combined with a transport box, is an advanced solution for transporting and protecting electronic equipment, designed to provide maximum security, both physical and electromagnetic. It is particularly useful in military, industrial and research environments, and wherever protection from electromagnetic interference and electromagnetic fugacity is needed.





PIAP FENIX

Lightweight EOD & reconnaissance robot

Łukasiewicz – PIAP ► p. 340

PIAP FENIX® is a light, backpack-deployed EOD & reconnaissance robot. It has been created to conduct reconnaissance in the immediate vicinity of military operations, including places inaccessible to humans. Excellent field properties of PIAP FENIX® robot (track-wheels chassis with moveable front flippers) ensure easy movement on hardened road surface, dirt roads, pathless tracts and in urban areas.

The robot's gripper can be equipped with a cable cutter, window shredder, 40mm or less-sized water disruptor, shotgun, X-RAY system, etc for required situation when operating.

PIAP GRYF

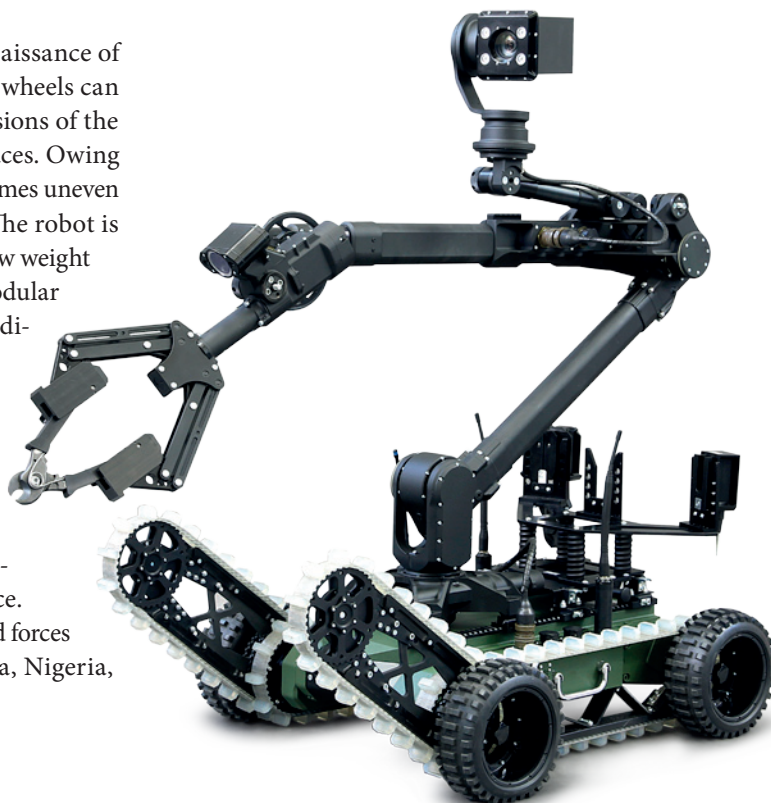
EOD mobile robot

Łukasiewicz – PIAP ► p. 340

PIAP GRYF® is mobile robot used for reconnaissance of terrain and hard to reach places. The Robot's wheels can easily be removed, which reduces the dimensions of the robot and thus facilitates missions in tight spaces. Owing to the applied drives, the robot smoothly overcomes uneven terrain and obstacles up to an angle of 45°. The robot is characterized by excellent maneuverability. Low weight makes it easy to transport and carry and its modular design allows for quick and easy change of additional equipment.

The robot is controlled via a modern, light control panel that, thanks to a brand-new design, allows for intuitive joystick operation in all degrees of freedom of the manipulator's arm. The large touchscreen makes it possible to inspect suspicious cargo, luggage, or IEDs, at a safe distance.

The Robot is already being operated by armed forces around the world, in South Korea, Indonesia, Nigeria, Senegal, Romania, Italy, France and Finland.



PIAP IBIS

Heavy robot for pyrotechnic operations

Łukasiewicz – PIAP ► p. 340

PIAP IBIS® is a robot designed for pyrotechnic operations and reconnaissance. Upon installation of additional devices, it can be used, among others, for disposal of dangerous objects, chemical detection, and rescue operations.

The six-wheeled chassis with independent drive of each wheel allows to operate in challenging and varied terrain. PIAP IBIS® is a fast robot (10 km/h). Special design of mobile base suspension ensures optimum wheel contact with the ground. The manipulator with extendable arm ensures a large reach (over three meters) and a high range of motion in each plane. It is the main pyrotechnic robot at the largest airports in Poland and in the service of the border guard, police and military police.



PIAP PATROL

Robot for C-IED and CBRN tasks

Łukasiewicz – PIAP ► p. 340



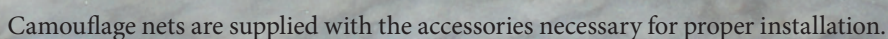
PIAP PATROL® is a medium EOD tracked robot used for detection and neutralization, which can support operators in the most dangerous tasks. The robot design ensures the use of several accessories at the same time. The lightweight robot control panel is integrated with mobile x-ray systems and CBRN sensors. Robot's dimensions and applied drive system allow to carry out activities both inside buildings and in difficult terrain and its compact and modular design allows it to be transported even in a passenger car.

Manipulator with 6 degrees of freedom and a gripping function enables to lift and dispose loads up to 30 kg with maximum reach of 2 m.

Miranda Sp. z o.o. ► p. 346

The camouflage pattern and color parameters are designed for the environment in which the camouflage will be used. They perfectly blend in with the natural surroundings and provide effective protection against optical recognition systems and the aided and unaided eye.

The latest solutions are made of lightweight high-strength textiles with very good performance parameters. The design of the net fabric provides excellent situational awareness. The external environment is perfectly visible to the observer from under the camouflage net. In the winter version it is possible to make additional openings.



Miranda Sp. z o.o. ► p. 346

The latest solutions are made of lightweight high-strength textiles with very good performance parameters. The design of the net fabric provides excellent situational awareness. The external environment is perfectly visible to the observer from under the camouflage net.

The camouflage nets are supplied with the accessories necessary for proper installation.



Static camouflage

Optical and multispectral static camouflage 3D

Miranda Sp. z o.o. ► p. 346

3D multispectral camouflage nets are designed to protect people and equipment. They are made of durable materials, have a unique spatial structure, and provide protection across the entire spectrum of UV, VIS, NIR, SWIR, TIR, RADAR electromagnetic radiation.

The 3D version imitates the texture of the natural environment, foliage and terrain, giving the impression of spatiality and providing increased protection in forest environments. A special dedicated camouflage pattern blends in perfectly with the natural surroundings and provides

effective protection against optical recognition systems and the aided and unaided eye.

The design of the net fabric provides excellent situational awareness. The external environment is perfectly visible to the observer from under the camouflage net. The load-bearing and filling layer is created from materials with higher tensile and tear strength, which ensures greater longevity of the camouflage in harsh conditions.

Camouflage nets are supplied with the accessories necessary for proper installation.



Thermal and anti-radiation inner liners

Miranda Sp. z o.o. ► p. 346

Thermal and anti-radiation inner liners are used as internal hangar linings. Depending on the type, they provide protection against external temperature changes and against thermal infrared and microwave recognition. Technological solutions used in the lining, prevent the detection of equipment and people inside the hangar using radar waves. The effect of hiding from radar is achieved by absorbing

and scattering the energy of microwave radiation. The fabrics used in the anti-radar inner liner have flame-retardant and self-extinguishing properties.

Each layer of the composite performs its own function, giving the whole its unique properties while maintaining a relatively low mass per unit. This translates into the possibility of using a lighter support structure for the hangar.



UNL

Universal High Mobility Unmanned Vehicle with Reconnaissance and Combat Version GOBLIN

MACRO-SYSTEM Sp. z o.o. ► p. 341

The UNL is an advanced, remotely controlled, unmanned electric vehicle. It fills the gap between large UGVs with dimensions similar to manned vehicles and small explosive ordnance disposal robots (EOD). Its design and functionalities translate into multitasking and a wide range of missions – from reconnaissance and combat operations, through transporting wounded soldiers evacuated from the battlefield or delivering ammunition, to accompanying smaller units in difficult terrain (transporting additional cargo with equipment).

The vehicle's size makes it extremely compact and easy to transport. It can be carried by standard delivery vehicles, as well as helicopters and airplanes, allowing for airdrop and quick movement even to hard-to-reach areas. It also has a high load capacity increased by the ability to tow the trailer.

Its reconnaissance and combat version GOBLIN is equipped with a remote-controlled weapon station ZMU-07, developed by AREX Sp. z o.o. (a WB GROUP company), with a 7.62 mm caliber machine gun. It can be used to detect and combat infantry and lightly armored targets over distances of up to 800 m, day and night. The system is operated remotely by two soldiers – the first operator controls the vehicle in order to achieve the best fire position, the second one controls the armament module and conducts fire.

UNL technical data:

External dimensions:	2,0 x 1,2 x 1,0 m (length x width x height)
Curb weight:	830 kg
Payload:	300 kg
Battery capacity:	27 kwh
Maximum speed:	30 km/h
Trailer option with a payload of up to 5 tons	

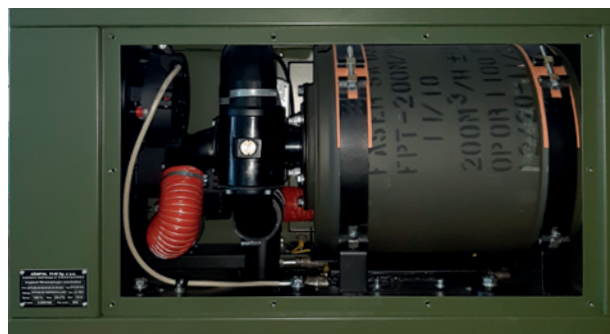


UFS.B2.02-100FW/24V, w.02A

ARMPOL Research and Development Company ► p. 317

The device protects the usable space against the effects of natural pollution from the atmosphere, use of weapons of mass destruction (BMR) and contamination with selected toxic industrial substances. It provides a comprehensive solution for the protection of people and equipment in utility spaces of buildings with an average cubature of up to 20 m³, stationary and intended for transport, including: vehicle cabins, vehicle box bodies and containers.

The device is available in various versions – depending on the structurally required method of installation on the facility and the scope of operation, including additionally: air efficiency measurement and automatic activation of the filtering and ventilation regime in cooperation with the contamination alarm.



Technical and Operating Parameters

ZFW.B2-02 (L x W x H)	740 x 400 x 400 mm
Total mass (without packaging)	up to 75 kg
Filter used	FPT-200M/P lub FPT-200B
Nominal supply voltage	24 VDC/27,6 ±0,5 VDC
Nominal power	110 W
Nominal power	4 A
Recommended overpressure in the protected space	min. 200 Pa +50 Pa
External static pressure of fans	min. 1 000 Pa
Nominal output in case of filtration and ventilation	min. 100 m3/h – 10%
Nominal output in case of ventilation	min. 120 m3/h – 10%
Tightness	≤ 0,1 %
Protection factor	≥ 10 000
Acceptable noise level	less than 80 dB/A
Range of operating temperatures	from –30 to +50oC
Range of storage temperatures	From –50 to +70oC
Device classification	NO-06-A101, NO-06-A103, NO-42-A213



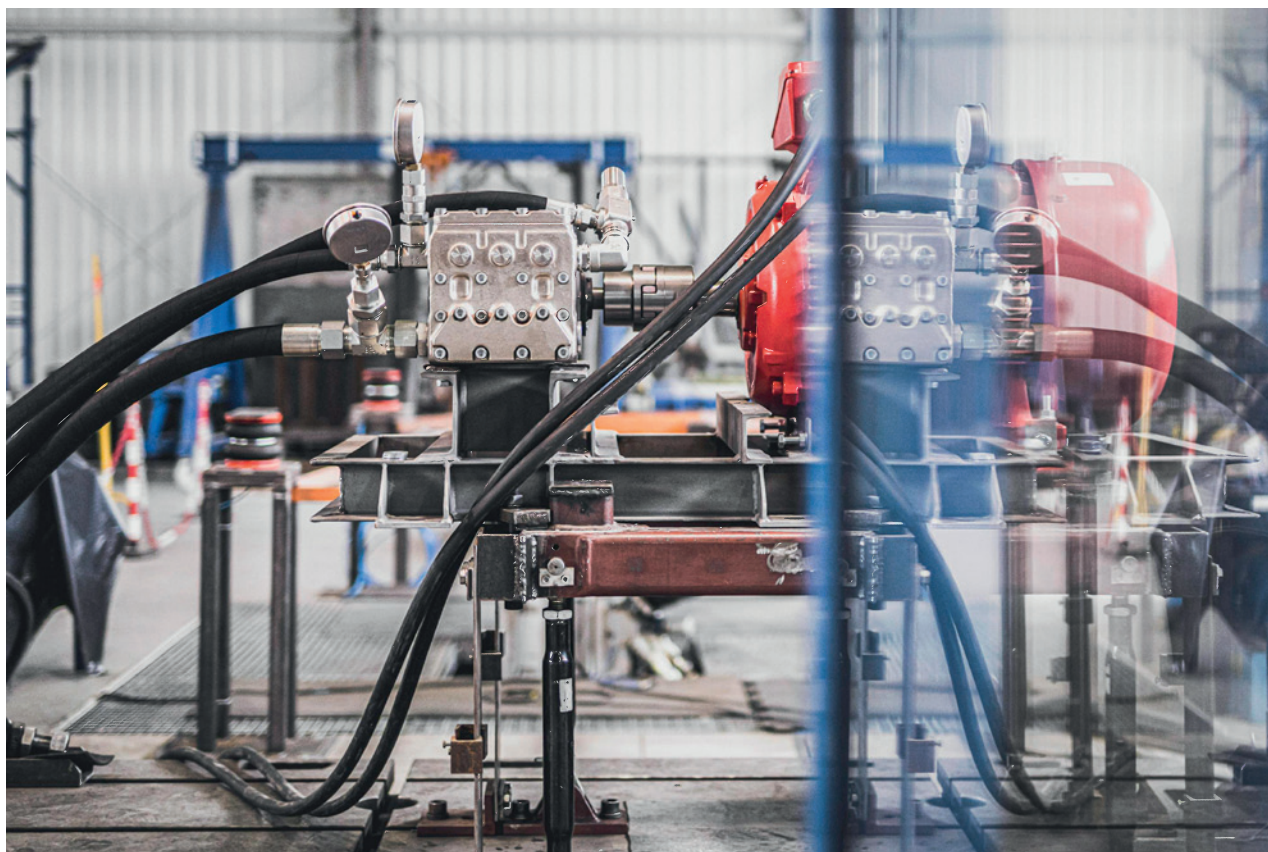
NAVAL VESSELS AND SYSTEMS

Dynamic testing

Centrum Techniki Okrętowej S.A. ► p. 323

CTO conducts tests to assess the resistance of devices to vibrations and single, multiple, or seismic shocks. We provide testing services for all types of electrical, electronic, and mechanical equipment that must withstand shocks and vibrations throughout its operational lifespan. This includes weapons, electronic systems, and infrastructure

designed for warships or seismically active regions, as well as installations with heightened security and reliability requirements, such as voltage converters, transformers, control cabinets and panels, servers, hydraulic and pneumatic fittings, industrial monitoring systems, portholes, hatches, doors, and small electronic devices.



One of our key strengths is testing large objects, with capacities of up to 3,000 kg.

Laboratory Equipment

Our laboratory is equipped with:

- A test stand for vibration, multiple, and seismic shock resistance testing – up to 3,000 kg
- A test stand for single shock resistance tests, compliant with the military standard NO-20-A500-5, with acceleration up to $2,700 \text{ m/s}^2$
- An acoustic vibration chamber for testing resistance to noise levels up to 140 dB in the frequency range of 50 Hz – 10,000 Hz
- Equipment for measuring the efficiency of suppressors, capturing the pressure-time history of suppressed and unsuppressed small arms, in accordance with NATO AEP-4785

Minehunter KORMORAN II class

Remontowa Shipbuilding S.A. ► p. 353

Minehunters Kormoran II class are built by a consortium consisting of the Remontowa Shipbuilding S.A. (leader), the OBR CTM S.A. and the PGZ Stocznia Wojenna from Gdynia.

The first 3 vessels: ORP “Kormoran”, ORP “Albatros” and ORP “Mewa” are already in service. The next 3 will be handed over in the years 2026–2027.

Minehunters Kormoran II class are in fact multi-purpose mine defense platforms.

They are dedicated to perform minehunting activities in Polish Exclusive Economic Zone autonomously, as well as a Task Unit duties performed as part of the tactical task groups. They also are intended for cooperation with allied naval forces in the Baltic and the North Sea, and designated to be a part of the Standing NATO Mine Countermeasures Groups.



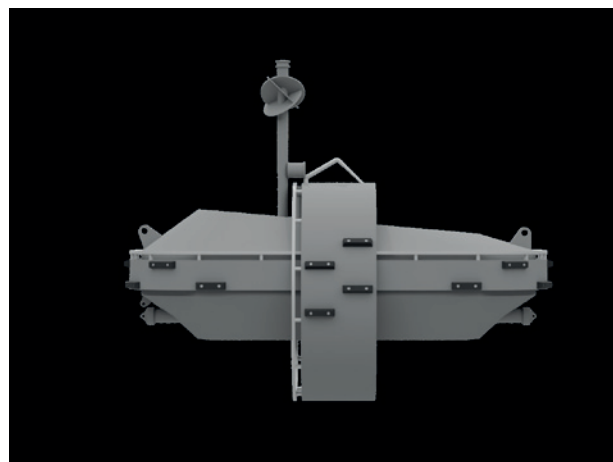
Their main tasks include:

- detect to engage – full mine countermeasure chain capability with multiple techniques,
- stand – off mine countermeasure operations with autonomous underwater vehicles,
- lead through operations within mine threat areas,
- mine laying operations,
- rapid environment assessment (REA) in the underwater domain,
- securing the sea lines of communications (SLOC),
- building the robust recognized maritime picture (RMP) based on the tactical data link system (TDLS).

Additional tasks can consist in securing the critical marine infrastructure like ports, terminals, underwater pipelines and cables, offshore wind farms etc.

Minehunters KORMORAN II class are also capable of hoisting transfer and fuel replenishment at sea (RAS), which makes KORMORAN II ready for set of long-distance missions. These ships already participate in many exercises, support NATO allies and gain their recognition.

MLM-PROMIENICA plays a key role in combating naval mines that are equipped with non-contact fuses. The effectiveness of a minesweeper is based on the identification of a specific type of vessel by analyzing its characteristic physical field signatures. The complex structure of a minesweeper includes a set of elementary magnetic and electric field inducers, connected by cables both to each other and to onboard power and control equipment.



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

ADVANTAGES

- Preventing damage to the ship
- Supporting vessels safety in an endangered water area
- Performing approaches to the shore for seaborne force

TECHNICAL DATA

LENGTH OF CABLES BETWEEN INDUCERS	55 ÷ 20,5 m
LENGTH OF MAIN CABLE	Depends on the impact resistance of the towing unit (in the range of 100÷200 m)
MAXIMUM LENGTH OF SET	34,5 – 94,5 m
DEPTH IN THE SWEEPING AREA	5 ÷ 40 m
MINESWEEPING SPEED	Up to 8 kN
TOLLING RESISTANCE (5 inductors, v=8w)	40kN
NUMBER OF INDUCTORS IN A SET	Up to 5
SUPPLY VOLTAGE	3x400V @50/60 Hz
MAXIMUM POWER (5 inductors)	80kVA
LENGTH OF A SINGLE INDUCTOR	2,95 m
DIAMETER OF A SINGLE INDUCTOR	1,6 m
WEIGHT OF A SINGLE INDUCTOR	1350 kg

OSU-35K Ship Weapons System

PIT-RADWAR S.A. (PGZ) ► p. 351

The OSU-35K Ship Weapons System is a modern, effective, remote, multi-task anti-aircraft artillery direct defense system equipped with the 35 mm automatic gun having its own optoelectronic fire control system. It is intended for combat operations during the day and at night, in all weather conditions in which naval vessel with OSU-35K thereon is operating. An innovative construction of the entire system and its components with the use of carbon fibre technology ensures an optimum weight (slightly above 3 tonnes) dimensions and high level of ergonomy. The system has a capability to detect, track and combat airborne targets such as aircraft, helicopters, unmanned aerial vehicles or missiles of unarmoured or lightly armoured surface targets and targets in asymmetric operations.

Main elements:

- Automatic Gun System – AM-35K
- Integrated observation and tracking head – ZGS-35K
- Fire control system (BSKO-35K) unit and a backup fire control station (RSKO-35K)
- Double-sided feeding system for various types of ammunition





SENSORS AND EFFECTORS

ARGUS PSIM

the physical security information management class platform, integrating technical security systems

TELBUD SA ► p. 361

ARGUS is a PSIM class (physical security information management) integrating software for facility security management. It is entirely manufactured in Poland. ARGUS Joins all new and existing systems into a single supervisory and control platform. It integrates systems of single and distributed objects, regardless of the type of system and device manufacturer. ARGUS collects, processes and presents data coming from many devices belonging to the following example systems: fire alarm systems, access control, CCTV, alarm systems, BMS and SCADA. The ARGUS software has an integrated anti-drone system module. The system includes a radar, a radio wave jamming device, RF detectors and a complex of long-range cameras. The ARGUS system operator can simultaneously use one system integrating all security

systems operating on the premises, including the anti-drone system. All data is presented on synoptic maps and in the event log. The states of each element are stored in the database along with the history. The ARGUS system can be used for the integration of security systems installed in different facilities. This includes small facilities such as storage facilities, office and other building complexes, industrial and power facilities and extensive military complexes and crisis management centres. ARGUS is a suitable system to be applied in large and distributed facilities of particular importance for the national economy and defence. Argus PSIM can be used to integrate electronic technical security systems in the perimeter protection of the area.



Defender Wideband RF Jamming Product Family

B4 Limits Sp. z o.o. ► p. 319



The Defender Wideband family is an advanced fully scalable Jamming platform designed for CUAS electronic warfare application, telecoms and prison applications, capable of jamming RF signals in the 20 MHz – 8000 MHz bands. Defenders come in manpack or mobile versions and are based on FPGA technology which is responsible for fast jamming signal processing, both in RX and TX paths. Utilization of FPGAs especially in the reactive mode gives it a significant advantage over simple (e.g., VCO) jammers by enabling fast generation of jamming signals precisely in the frequency bands where the RF signal transmission is visible (higher RF power density). The use of FPGA is efficient in implementation of various jamming algorithms such as Active, Semi-Reactive, Reactive, Sweep, Barrage, CW, AM, FM, PM or user-supplied modulated signal. Defender Wideband is rapidly re-configurable to cover additional frequencies as new frequencies become usable in the field. Each Defender Wideband jammer is made to suit client needs by optimising bandwidth, antennas, antenna sectors with battery life (where applicable) to deliver secure skies from all commercial, C1 military and FPV UAVs. Defender line of products was introduced as a Wideband solution for telecommunication jamming in 2021 offering an excellent blend of accuracy, flexibility, reliability, power and bandwidth breadth.

Flagship Product: Defender Wideband WB6500 Jammer (configuration for CUAV)

- Designed to jam the radio signal between the UAV and the operator in Full Frequency range: 20 MHz – 6 GHz
- Simultaneous jamming bandwidth: 1800 MHz;
- Performance target: 1:1 ratio between UAV and operator to UAV and jammer, up to 7 km distance;
- Maximum output power: 650W (RF);
- Max Beam azimuth per sector angle: 60°;
- Max Beam elevation per sector angle: 60°;
- Jamming modes: Reactive, Semi-Reactive, Active (permanent);
- Automatic jamming configuration;
- Full synchronization between Defender Family Jammers;
- Dedicated software for system monitoring, configuration and control;
- Dedicated API for integration;
- Dedicated e-learning platform for operators;
- 7 RX/TX dedicated antennas;
- batteries and communications that remove operator from harm's way.

FIELDctrl 3D MIMO Radars: Advance, Range, Runway, Ultra

Advanced Protection Systems S.A. ► p. 314

FIELDctrl

Advanced Protection Systems designs, manufactures and supplies top-of-the-range MIMO 3D radars for LSS (Low-Slow-Small) target monitoring.

Precise target detection information provides an advantage over competing radars. Distance, angle and height are provided in real time. Innovative technology allows other sensors – cameras as well as effectors – jammers – to automatically target the drone.

Artificial intelligence and machine learning algorithms enable automatic classification – the FIELDctrl 3D MIMO

radars accurately distinguish drones from birds. What's more, they are able to track multiple objects of different classes simultaneously.

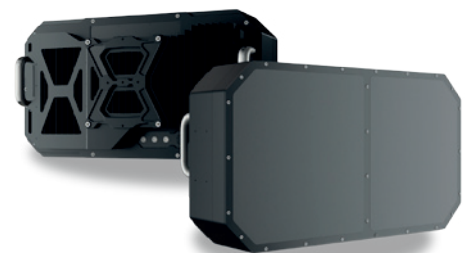
FIELDctrl 3D MIMO radars can accurately detect all types of drones: rotary and fixed-wing, radio-controlled and non-radio-controlled, fully autonomous, and class 1–3. They even detect microdrones at distances up to 6 km.

Swarms, hovering drones and drones moving across the radar beam, i.e. having a zero Doppler velocity, are also effectively detected, tracked and classified.



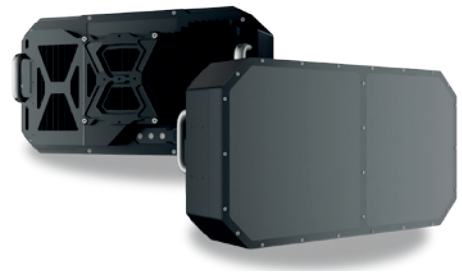
FIELDctrl Advance 3D MIMO Radar

Field of view (azimuth/elevation)	90°/60°
Radar type	FMCW
Output power	80 W, 19 dBW
Frequency of operation / frequency tuning range	from 9.7 to 10 GHz
Class of emission	300 MFXN
Bandwidth	300 MHz
Supply voltage	24 VDC and 230 VAC variants
Ingress protection	IP66/IP67
Dimensions (LxWxH) excl. mounting brackets	645 x 360 x 180 mm
Weight (panel only)	31.4 kg
Effective detection and classification range for micro UAVs – RCS 0.01 m ²	3 km
Minimum target altitude (AGL)	1 m
Minimum UAV detection speed	0 m/s (hovering drone)
Colour version available	military green desert sand



FIELDctrl Range 3D MIMO Radar

Field of view (azimuth/elevation)	90°/30°
Radar type	FMCW
Output power	80 W, 19 dBW
Frequency of operation/frequency tuning range	from 9.7 to 10 GHz
Class of emission	300 MFXN
Bandwidth	300 MHz
Supply voltage	24 VDC and 230 VAC variants
Ingress protection code	IP66/IP67
Dimensions (LxWxH) excl. mounting brackets	645 x 360 x 180 mm
Weight (panel only)	31.4 kg
Effective detection and classification range for micro UAVs – RCS 0.01 m ²	5 km
Minimum target altitude (AGL)	1 m
Minimum UAV detection speed	0 m/s (hovering drone)
Colour version available	military green desert sand



FIELDctrl Runway 3D MIMO Radar

Field of view (azimuth/elevation)	45°/20°
Radar type	FMCW
Output power	80 W, 19 dBW
Frequency of operation/frequency tuning range	from 9.7 to 10 GHz
Class of emission	300 MFXN
Bandwidth	300 MHz
Supply voltage	24 VDC and 230 VAC variants
Ingress protection code	IP66/IP67
Dimensions (LxWxH) excl. mounting brackets	850 x 567 x 190 mm
Weight (panel only)	40,6 kg
Effective detection and classification range for micro UAVs – RCS 0.01 m ²	8 km
Minimum target altitude (AGL)	1 m
Minimum UAV detection speed	0 m/s (hovering drone)
Colour version available	military green desert sand



FIELDctrl Ultra 3D MIMO Radar

Field of view (azimuth/elevation)	90°/90°
Radar type	FMCW
Output power	200 W, 23 dBW
Frequency of operation/frequency tuning range	from 9.7 to 10 GHz
Class of emission	300 MFXN
Bandwidth	300 MHz
Supply voltage	230 VAC
Ingress protection code	IP66/IP67
Dimensions (LxWxH) excl. mounting brackets	840 x 680 x 320 mm
Weight (panel only)	81 kg
Effective detection and classification range for micro UAVs – RCS 0.01 m ²	6 km
Minimum target altitude (AGL)	1 m
Minimum UAV detection speed	0 m/s (hovering drone)
Colour version available	military green desert sand



The HAWK system is a multi-layered counter-drone solution designed to detect, track, and neutralize unauthorized drones. HAWK employs a combination of sensors, including radars, RF Scanners, acoustic and optical devices. Such approach ensures the detection of various types of drones regardless of their construction (rotary-wing, fixed-wing, improvised (DIY), FPV, or loitering munitions) or flight mode (manual or autonomous). Neutralization is carried out using a range of non-kinetic and kinetic effectors. System management is handled by in house developed HAWK C2 software, which provides real-time airspace monitoring, operational control, definition of protection zones, and automatic alerts.

Key features:

- Detection range up to 15 km
- Neutralization range up to 10 km
- Ability to work on the move
- Advanced classifier with applied AI
- Detection of the UAV
- Detection of the operator
- Multi-layer neutralization:
 - Wideband jamming (20MHz – 6GHz)
 - Dual-band GNSS spoofing
 - Hacking
 - Interception by the drone with net launcher
 - Laser
 - Directed energy
 - Kinetic methods
- Intelligent neutralization resource allocation



- Hand-held jammers
- Supported communication via ASTERIX and JREAP-C
- Data archiving
- Open architecture
- Scalability



Hertz GPS Terminal 4 Pollux (HGPST4 Pollux)

HERTZ SYSTEMS Sp. z o.o. ► p. 334



HGPST4 Pollux – Military-Grade GPS Navigation for Land Platforms

The HGPST4 Pollux is a high-performance, military-grade GPS receiver with a SAASM cryptographic module, designed for secure and reliable navigation in demanding environments. It supports M-Code and operates in Precise Positioning Service (PPS) mode, ensuring precise positioning even in jamming or spoofing conditions.

The HGPST4 Pollux is a reliable, versatile solution for land-based military platforms, ensuring secure and accurate navigation in challenging environments. It is a vital tool for modern military operations, including battlefield management, reconnaissance, and secure communications.

Hertz GPS Terminal UAV (HGPST UAV)

HERTZ SYSTEMS Sp. z o.o. ► p. 334

The HGPST-UAV is a high-performance, military-grade GPS receiver with SAASM (Selective Availability Anti-Spoofing Module), specifically designed for integration into unmanned aerial vehicles (UAVs). It provides secure, precise GPS navigation, ensuring reliable operation in environments where jamming or spoofing is a risk.

Operating in Precise Positioning Service (PPS) mode, the receiver can decode P(Y) signals on L1/L2 frequencies, delivering accurate positioning and timing even in GPS-denied areas. It ensures continuous operation in hostile environments while preventing cryptographic data interception, ensuring secure communication.



Hertz GPS Terminal uGram (HGPST uG)

HERTZ SYSTEMS Sp. z o.o. ► p. 334



The HGPST uG is an advanced military-grade cryptographic GPS receiver designed for integration with mini and micro UAV platforms. Using the SAASM or M-Code uGram module, it delivers unmatched accuracy and security for applications requiring precise location data in demanding conditions.

The HGPST uG is a reliable solution for UAV missions demanding precision, security, and reliability. Trusted by defense forces, it ensures consistent performance even in GPS-denied environments, making it ideal for border monitoring, intelligence, and search and rescue missions.

Hydra

– Multicolor Photometry For Orbital Object Characterization

Sybilla Technologies Sp. z o.o. ► p. 359

Cutting-Edge Space Object Identification

Hydra is a powerful telescope system designed for multicolor photometry. It allows for a detailed analysis of satellites and orbital objects. By measuring the way different materials reflect light, Hydra can determine what a satellite is made of, what kind of platform it uses, and whether it carries additional components like solar panels or antennas. This information is invaluable for intelligence, strategic planning, and space security.

Precise Tracking and Detailed Observations

Hydra isn't just another telescope—it's built for accuracy. With up to six optical tubes mounted together, it can capture synchronized multicolor observations and help analysts to recognize key features like shape, size, external equipment, and even surface wear and degradation. This ability to collect multiple data points at once makes Hydra a highly efficient tool for object classification in the space.

The HGPST uG is a reliable solution for UAV missions demanding precision, security, and reliability. Trusted by defense forces, it ensures consistent performance even in GPS-denied environments, making it ideal for border monitoring, intelligence, and search and rescue missions.

Versatile Coverage Across Different Orbits

Hydra is perfect for tracking objects across vast distances, from Low Earth Orbit (LEO) to Geostationary Orbit (GEO). It can monitor satellites as close as 200 km above the Earth and as far as 35,786 km in GEO. Hydra ensures continuous monitoring across all key orbital regimes by keeping an eye on fast-moving low-orbit satellites or geostationary assets.

Real-Time Data Processing for Immediate Insights

Speed matters when tracking objects in space. Hydra features industrial-grade computing systems, GPS modules, and specialized cooling, ensuring stable and real-time data processing. It works seamlessly with Sybilla Technologies' software tools, such as ABOT and Astrometry24Net, handling everything from scheduling observations to processing the results.

Military Applications – A Strategic Asset

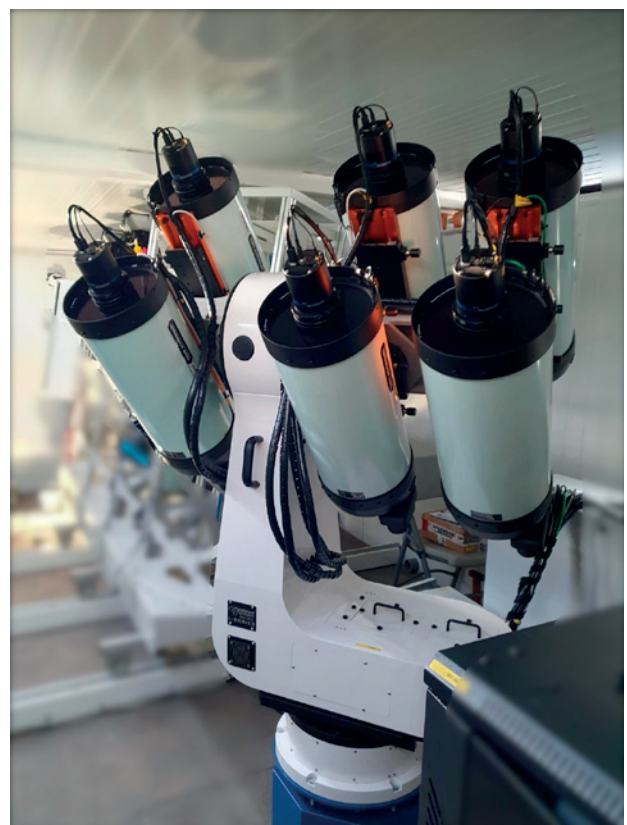
Hydra isn't just about observation; it plays a critical role in space defense. Working alongside Perseus, Hydra enhances surveillance missions by adding another layer of intelligence.

Key benefits include:

- Joint Operations: Complements Perseus for a more complete picture of space activity
- Risk Assessment: Helps identify a satellite's manufacturer, purpose, and condition, allowing decision-makers to assess potential threats
- Strategic Insight: Provides critical data for military planning and security operations

Proven Deployment in European Defense Projects

Hydra has actively contributed to key European defense initiatives, including the SAURON project under the European Defence Industrial Development Programme (EDIDP), aimed at strengthening the EU's defense capabilities. Additionally, Hydra plays a significant role in the EON project, supporting cutting-edge research and development in space surveillance and threat assessment. Active systems operate in Spain, Poland and soon in Hungary.



Hydra with 6 optical tubes is a reliable tool for characterizing objects in orbits.

IFF Mark XIIA Family Products

PIT-RADWAR S.A (PGZ) ► p. 351

PIT-RADWAR S.A. offers a full range of IFF Mark XIIA devices which include a family of ground/vehicle-based interrogators. PIT-RADWAR's interrogator family consists of: IDZ-50, ISZ-50, IKZ-50P and IKZ-M, dedicated for long-, medium-, short range- and for MANPADS, respectively.

- Mark XIIA's Mode 5 ready
- IDZ-50 long range IFF Mark XIIA interrogator, supports identification in Mode 1,2,3/A,C,S (up to Level 2) and 5 (up to Level 2). Range up to 470 km.
- ISZ-50 medium range IFF Mark XIIA interrogator, supports identification in Mode 1,2,3/A,C,S (up to Level 2) and 5 (up to Level 2) and ATC interrogation formats 3/A,C,S. Range up to 240 km.
- IKZ-50P short range IFF Mark XIIA interrogator, supports identification in Mode 5 Level 1 (can be software upgradeable to Level 2). Range up to 25 km.
- IKZ-M MANPADS IFF Mark XIIA interrogator, supports Mode 5 Level , range up to 25 km.



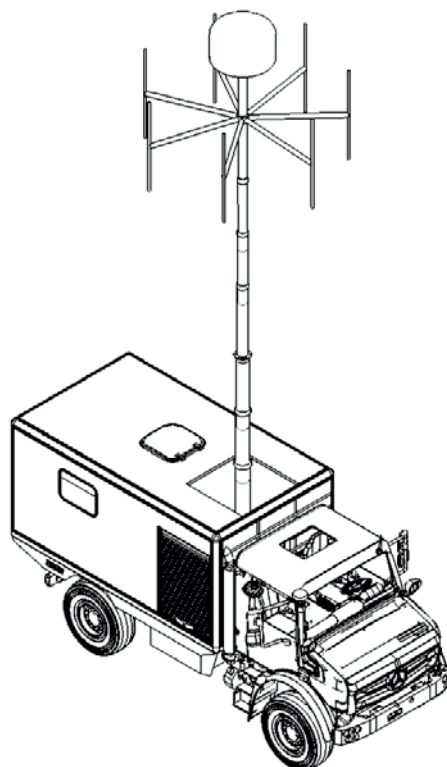
Mobile Passive Radar XY-PCL-MU

XY-Sensing Sp. z o.o. ► p. 367

The XY Passive Coherent Location Radar (XY-PCL-MU) is a novel product capable to detect and identify all kinds of airborne objects / targets including helicopters and drones. The XY-PCL-MU Radar, due to its nature and utilized radar techniques, does not contaminate electromagnetic spectrum and it is safe for the environment and life species. Since no electromagnetic energy is emitted by the radar, it cannot be detected and eliminated by an anti-radiation missile as in the case of an active radar. The XY-PCL-C is an ideal, low cost-solution delivering the valid and credible air surveillance information which can be exploited by military and civilian airspace users.

The AirSurveillance-PCL Radar is fully autonomous, but it can also be supervised/controlled by the operator onsite or from a remote location if necessary (Command Post, Higher HQ etc.). The proposed AS-PCL Radar is integrated with the 4x4 Mercedes-Benz Unimog vehicle. The proposed version is a militarized version with the operator cabin and an additional trailer carrying the power unit, spare parts and cables.

Radar solution developed and offered in partnership with Pex-Pool Plus Agregaty Ltd



TECHNICAL SPECIFICATION

Parameter	unit		
Illuminators of Opportunity (IOs):	DBV-T	470-862	MHz
	FM	88-108	MHz
Coverage	360°		
Instrumented range	0,05	300	km
Height/elevation	0	15	km
Target speed	5	1 000	m/s
Processing and display capacity:			
• Bistatic plots		10 000	
• Bistatic tracks:		1 000	
• IOs		10 000	
Update rate / information refresh rate	1		s
Operation temperature	-30	+50	°C
Weight		5 000	kg

Specifications subject to change without notice.

Passive Coherent Location Radar XY-PCL-K

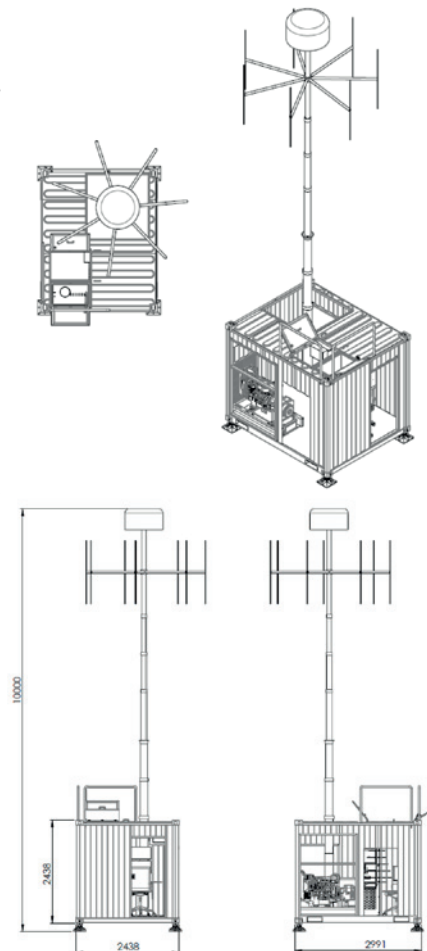
XY-Sensing Sp. z o.o. ► p. 367

The XY Passive Coherent Location Radar (XY-PCL-K) is a novel product capable of detecting and identifying all kinds of airborne objects / targets including helicopters and drones. The XY-PCL-K Radar, because of its nature and utilized radar techniques, does not contaminate electromagnetic spectrum and it is safe for environment and life species. Since no electromagnetic energy is emitted by the radar, it cannot be detected and eliminated by an anti-radiation missile as in the case of active radar. The XY-PCL-K is an ideal and low cost solution delivering the valid and credible air surveillance information which can be exploited by military and civilian airspace users. The AS-PCL Radar is fully autonomous, but it can also be supervised/controlled by the operator onsite or from a remote location if necessary (Command Post, Higher HQ etc.). The proposed AS-PCL Radar is based on the 10 ft inter-modal container (cargo) shelter with a fully independent, self-load/unload system, equipped with HVAC (heating, ventilation, air conditioning) system, own power generator, telescopic antenna mast, additional 1 km fibre-optic cables to connect other stations and able to host one operator.

XY-PCL-K Technical Parameters

- a) Illuminators of Opportunity – the PCL radar uses FM (88-108 MHz) radio and DVB-T television transmitter (470-862 MHz). Both DVB-T and DVB-T2 standards are supported.
- b) The system provides 360° coverage, by using circular antenna arrays.
- c) The system can operate 24/7 in any environmental conditions.
- d) Detection and tracking coverage volume that supports every type of mission:
 - Maximum instrumented range: 300 km
 - Minimum instrumented range: 50 m
 - Maximum height/elevation: 15 km
 - Minimum height/elevation: 0 km
 - Maximum elevation angle: 45°
 - Minimum elevation angle: 0°
 - Target minimum speed: 5 m/s
 - Target maximum speed: 1000 m/s
- e) Accuracy of target coordinates determination:
 - Horizontal: 200-700 m
 - Vertical: 500-1500 m
 - Speed: 5-15 m/s
 - Direction: 0.5-5.0°
- f) The antenna system automatically rises itself to a height above ground that will assure detection of targets moving at low and very low heights

- g) Multiple ECCM/EP capabilities
- h) Target information update rate / information refresh rate – 1 s
- i) Processing and display capacity:
 - Bistatic plots: 10 000
 - Bistatic tracks: 1000
 - Cartesian tracks: 1000
 - Illuminators of Opportunity: 10 000
- j) The system can be operated entirely remotely.
- k) The system has open architecture and can cooperate with external systems. It can accept inputs from other systems, e.g., detections from active radars can be used to initialize tracks. It can send data to other systems.
- l) The system can be integrated with external systems, including proprietary/non-standard systems.
- m) The whole system can operate within –30 +500 C
- n) There is a 12 kW power source guarantying the power (230/400 V AC, 50 Hz) for all equipment (radar station, HVAC, lighting system, self-load/unload system, etc.) augmented by the battery system ensuring the uninterrupted operation.



Perseus High-End Ground-Based Observation System

Sybilla Technologies Sp. z o.o. ► p. 359



Perseus system in Utah, USA – completed as part of the development of the POLON network for POLSA.

Performance Details:

FOV: 7.89 x 5.93 deg (46.79 deg²) per telescope, 187.15 deg² combined

PX scale: 1.986 arcsec/px

Slew speed: 50deg/s

Time tagging: 1ms

Precision: less than 2 arcsec RMS (subpixel)

Comprehensive Space Monitoring

Perseus is an advanced space surveillance system that delivers precise tracking and monitoring of objects in Earth's orbit. Perseus provides crucial situational awareness, early threat detection, and comprehensive analysis

for military and governmental agencies. These capabilities are crucial, especially now, when the defense and security sector increasingly depend on space assets.

High-Precision Object Detection and Tracking

Perseus uses a network of ground-based optical sensors to identify and track space objects with exceptional accuracy. A field of view (FOV) of 7.89° × 5.93° per telescope and a combined 187.15°² coverage makes the system highly effective in wide-area monitoring and reducing blind spots in surveillance. With precision of less than 2 arcseconds RMS (subpixel level) Perseus provides reliable detection of even the smallest and fastest-moving objects in orbit.

Rapid Response to Emerging Threat

Perseus can quickly reorient to track new threats with a slew speed of 50°/s. It ensures immediate response to potential hostile activities or space debris threats. The system's time tagging accuracy of 1 millisecond guarantees precise event recording, critical for military and intelligence applications.

Data Fusion and Automated Intelligence

Perseus processes high-resolution imagery. This makes it provide effectively real-time assessment of space activities. The system generates up to 3 million measurements per month, so it provides unparalleled data density for improved decision-making.



Tracking of ESA Aeolus S/C right before its re-entry in July 2023, at 260 km height (low LEO).

Aeolus (4,6 m x 1,9 m x 2 m) appears as a bright dot, while stars leave trails, |caused by the object tracking mode.

Enhancing National Security Through Space Awareness

The space-based threats evolve. This is why maintaining robust surveillance capabilities is crucial. Perseus strengthens defense operations with reliable monitoring, early detection, and threat mitigation. Its main focus is to ensure the protection of national space assets and maintain strategic advantage.



NORAD 40699 (COSMOS 2506) – Russian military digital reconnaissance satellite
(7 m long and 2,7 m in diameter).



Elements of the Perseus observation module.

Tested in all conditions

PERSEUS has demonstrated its reliability and performance in some of the most challenging environments around the world. The system has been successfully deployed in Australia, South Africa, the USA, and Chile, where it operates under diverse atmospheric and observation conditions. It also plays a critical role in POLSA's POLON network, contributing to Poland's space surveillance capabilities and strengthening international space security efforts.



Perseus system implemented by Sybilla Technologies as part of the POLON network.

Ship's Dynamic Positioning System

AUTOCOMP MANAGEMENT Sp. z o.o. ► p. 318

The Dynamic Positioning System (DP) is a computer-aided system designed for ship manoeuvring. The DP system's task is to maintain a set position of the ship or to control the movement of the ship according to a set trajectory. The Dynamic Positioning System can operate in automatic, semi-automatic and manual modes and interfaces with the Command Post (SD).

The DP system performs the following functions:

- maintenance of a preset position or movement along a preset trajectory,
- maintenance of a pre-set position or motion along a pre-set trajectory with minimum energy requirements,
- control of the ship's propulsion systems so as to ensure compensation of disturbing forces and moments.

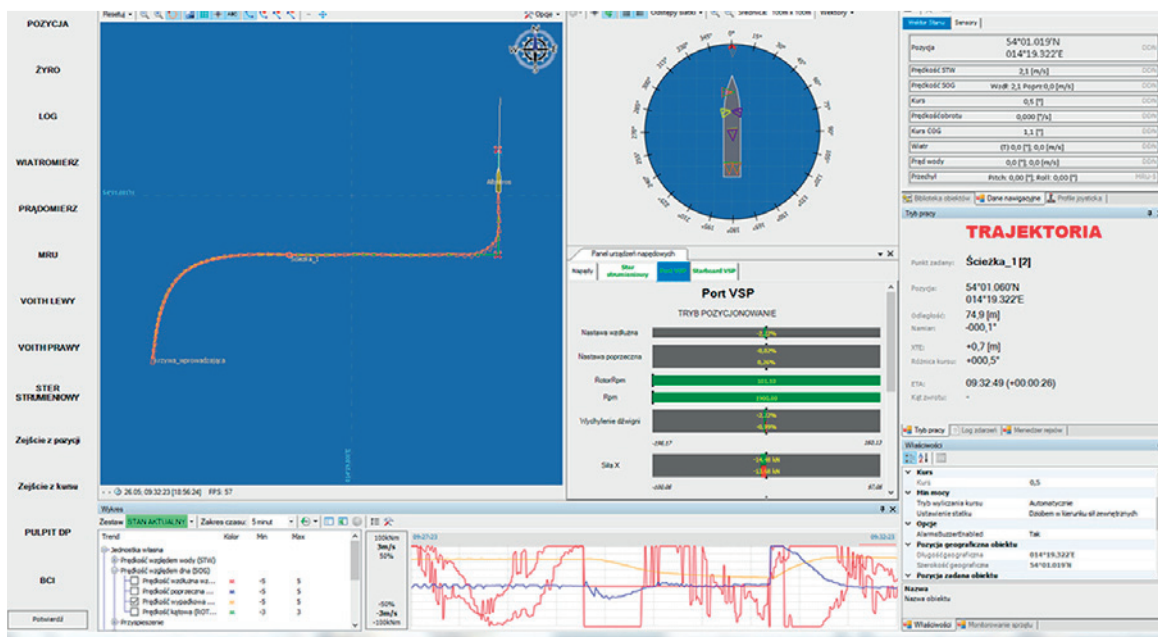


Quantities measured in the dynamic stabilisation process:

- ship's position – DGPS-RTK system, GPS SAAM,
- wind speed and direction – anemometer
- compass heading – gyrocompass,
- speed of ship's movement – DLOG
- speed of sea currents – sea current meter
- heeling and acceleration – MRU gyroscope plumb-bob.

Measurement data for the DP system is supplied from the Navigation Data Distributor (DDN) and directly from the gyroscope plumb-bob. The DP system is delivered as a set of functional components, the completion of which depends on the vessel's specificity.

The system software runs on a Windows runtime platform and is structured on the so-called plug-in architecture. System operation is fully supported by the operator's graphical interface or, to a selected extent, supported/replaced by hardware console modules.



Small Intelligent Light Satellite Terminal SilPack Series

SILTEC Sp. z o.o. ► p. 356



Silpack is a manpack class SATCOM terminal. Equipped with two replaceable antennas (60 and 100 cm) operating in X, Ku and Ka Bands. With its capability of replacing modems, the terminal assures a flexible solution for different communication topologies.

The terminal is delivered with a positioner which allows pointing of the antenna to the proper satellite. Equipped with a software package a tool for monitoring and control purposes of the embedded devices.

Technical specification

Antenna

Frequency bands – X, Ku, Ka
Dish diameters – 60, 80, 100 cm

Ku Band

TX frequency [GHz] – 13,75–14,50
RX frequency [GHz] – 10,70–12,75
Polarization – Linear
BUC – 8 W (Other options available)
PLL LNB

X Band

TX frequency [GHz] 7,90–8,40
RX frequency [GHz] 7,25–7,75
Polarization – Circular
BUC – 10
W PLL LNB

Modems

ND Satcom Skywan 5G mini
Comtech UHP-210
Teledyne Qlite
Other options on request

Functionalities

Ethernet LAN (1 Gb/s) x 2
GPS receiver
Compass
Satellites and locations database
Angles calculation
Pointing support
M&C software
AZ/EL/POL – adjustable in wide range
Levelling

Power supply advanced

- AC 100–240V, 45–60Hz, DC 12–36V
- Batteries BB2590/U, BB-390B/U
- Car lighter, car battery

Environmental conditions

- Operating temperature $-30^{\circ} \div +50^{\circ}$
- Storage temperature $-40^{\circ} \div +60^{\circ}$
- Humidity 100 %
- Weight (backpack not included) < 20 kg

Transportable Passive Radar XY-PCL-C

XY-Sensing Sp. z o.o. ► p. 367

The XY Passive Coherent Location Radar (XY-PCL-C) is a novel product capable of detecting and identifying all kinds of airborne objects/targets including helicopters and drones. The XY-PCL-C Radar, due to its nature and utilized radar techniques, does not contaminate the electromagnetic spectrum and it is safe for the environment and life species. Since no electromagnetic energy is emitted

by the radar, it cannot be detected and eliminated by an anti-radiation missile as in the case of an active radar. The XY-PCL-C is an ideal, low-cost solution delivering valid and credible air surveillance information which can be exploited by military and civilian airspace users.

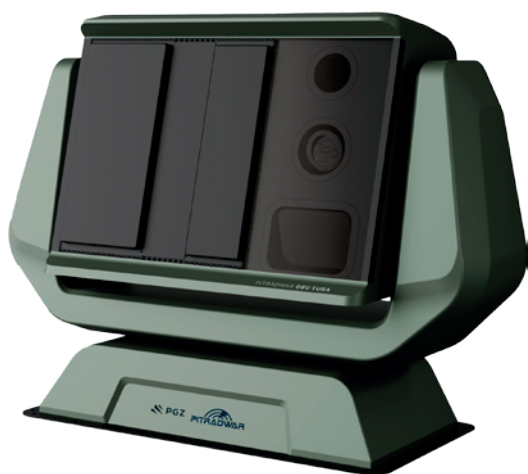
The AS-PCL Radar is fully autonomous, but it can also be supervised/controlled by the operator onsite or

A tall, green, mobile radar system. The base is a large green metal cabinet with multiple compartments. The top compartment is open, revealing internal electronic components and a circular fan. The middle section is a tall, narrow green column. The top section is a large, circular, multi-lobed antenna array mounted on a rotating platform. The entire system is mounted on a mobile chassis with wheels.

TECHNICAL SPECIFICATION

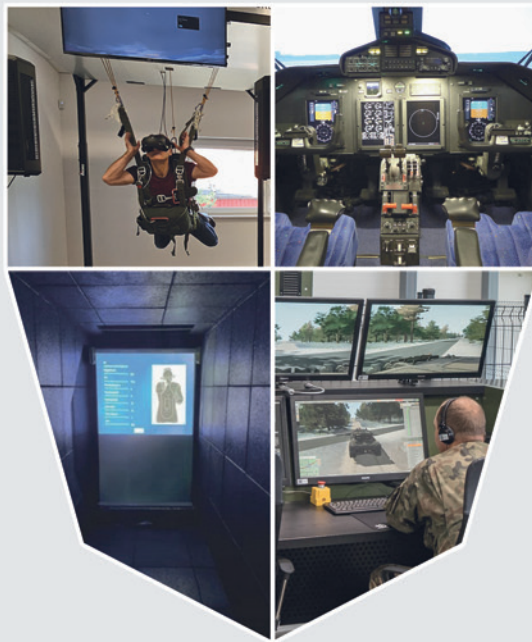
Parameter	unit		
Illuminators of Opportunity (IOs):	DBV-T	470-862	MHz
	FM	88-108	MHz
Coverage	360°		
Instrumented range	0,05	300	km
Height/elevation	0	15	km
Target speed	5	1 000	m/s
Processing and display capacity:			
• Bistatic plots	10 000		
• Bistatic tracks:	1 000		
• IOs	10 000		
Update rate / information refresh rate	1		s
Operation temperature	-30	+50	°C
Weight		5 000	kg

Specifications subject to change without notice.



PIT-RADWAR S.A (PGZ) ► p. 351

- Range up to 50 km
- AESA antenna
- Single rotary radar or multiple radar panels that cover 360° simultaneously



SIMULATION AND TRAINING

Advanced Hoist Simulation Training System

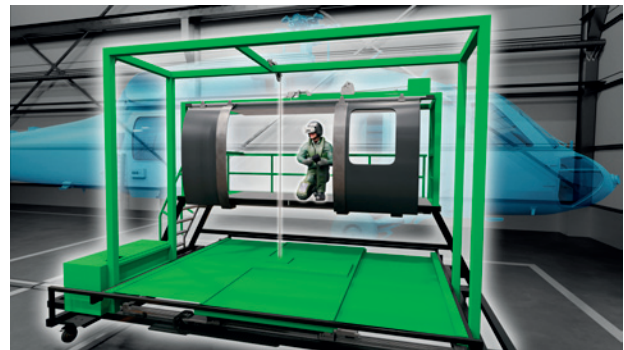
ETC-PZL Aerospace Industries Sp. z o.o. ► p. 328

The Advanced Hoist Simulation Training System provides a comprehensive, immersive training experience, leveraging real-world scenarios by extended reality (XR). Traditional hoist operator training, while fundamental, inherently carries substantial risk and is significantly constrained by rigorous safety protocols.

This system features an ultra-realistic cable that dynamically responds to simulated flight physics, mirroring the intricate behaviors of an actual hoist rope under operational stresses. This high-fidelity simulation environment replicates mission conditions with exceptional accuracy and enhances the coordination and communication between crew members. Hoist Simulator can be employed as a standalone training solution or seamlessly integrated with full-flight training simulators. This flexibility enables hoist operators and crews to train anytime and anywhere, at a fraction of the operational cost of live training.

Advanced Hoist Simulation Training System Overview

- Comprehensive, fully immersive virtual training for hoist operators and entire crews' readiness at both basic and advanced levels

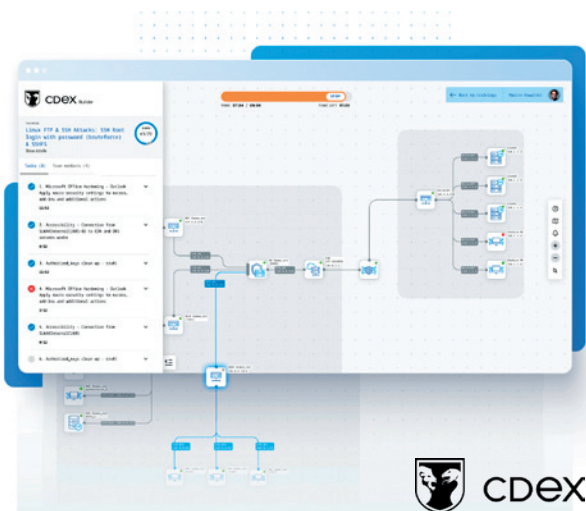


- Risk-free environment to prepare for high-risk, complex missions
- Advanced live cable management
- Immediately reviewable, real-world scenarios
- Exceptional agility in training – deployable anywhere and anytime
- Designed with extended reality (XR)
- Open architecture for a variety of configurations – from standalone solutions to systems integrated with full-flight training simulators

CDeX Cyber Range

VECTOR SYNERGY ► p. 364

CDeX is an advanced cyber range platform that delivers a fully scalable, automated, and hyperrealistic training environment. This innovative platform is designed to enable organisations to build robust cyber defence competences and acquire hands-on skills by simulating live-fire cyberattack scenarios.



One of the standout features of our platform is its ability to simulate cyberattacks using a dedicated agent. This agent executes automated attack actions, eliminating the need for a physical red team to stage threats. This unique capability streamlines training processes, allowing organisations to simulate complex attack scenarios efficiently, cost-effectively, and with unprecedented realism.

Our platform serves four key sectors:

- National Defence and Military
- Critical Infrastructure
- Business and Corporate
- Education

Innovation and Impact: CDeX's hyperrealistic simulation capabilities represent a breakthrough in cybersecurity training. By offering automated attack scenarios and comprehensive training environments, our platform bridges the gap between theoretical knowledge and practical expertise. This innovation plays a pivotal role in strengthening global cyber defences, particularly in critical areas such as education and national security.

Our platform not only prepares professionals to face current cyber threats but also anticipates the challenges of tomorrow, making it an indispensable tool in the fight against cybercrime and digital warfare.

Combat Mission Simulator for Fixed-Wing and Rotary-Wing Aircraft

ETC-PZL Aerospace Industries Sp. z o.o. ► p. 328

Real-world training limitations – restricted resources, participant availability, safety concerns, equipment preservation, terrain access, and operational secrecy – fundamentally constrain tactical preparation. Combat mission simulator enables comprehensive joint training, starting with individual soldiers mastering the use of basic battlefield weapons and equipment, including sniper rifles, anti-tank missile launchers, drones for reconnaissance and strikes (as well as drone swarms), MANPADS, binoculars, laser pointers, communication devices, and radar. It also enhances coordination between supporting forces and frontline troops, such as Forward Artillery Observers (FAO), Forward Air Controllers (FAC), and Joint Tactical Air Controllers (JTAC). Additionally, the system facilitates cooperation between ground forces and supporting units through Call for Fire and Close Air Support (CAS) scenarios, as well as training for helicopter external loads operations like cargo transport, hoist operations, medical evacuations (MEDEVAC), and marshaling.

Combat Mission Simulator for Fixed-Wing and Rotary-Wing Aircraft Overview

- Doctrine to execution – transforms theoretical military doctrines into executable tactical skills through immersive simulation.
- Critical operational domain training – supports individual and joint force training in communication, command, reconnaissance, and intelligence gathering, delivering unparalleled fidelity at a fraction of real-world training costs.
- Modular training stations – interconnected identical or diverse modules linked through advanced communication technologies, operating in a unified synthetic environment for cohesive battlefield simulation.
- Dynamic battlefield perspectives, engaging participants from realistic perspectives.
- Comprehensive post-mission analysis – detailed session recording.

Combat Training Support System “ŚNIEŻNIK”

AUTOCOMP MANAGEMENT Sp. z o.o. ► p. 318

The ŚNIEŻNIK combat training support system is an advanced project for complex training of soldiers in garrison conditions on a virtual battlefield. The system provides a comprehensive solution for conducting fire training for soldiers of mechanized, motorized, anti-aircraft, artillery or sharpshooter units at shooting ranges, battlefield or in facilities.

The high resolution of the screens and emitting characteristic sounds of the environment reflect the sounds of the battlefield. The trainees use real types of combat weapons, adapted to shooting in the Śnieżnik, equipped with laser modules, pneumatic reloading systems and simulators of optical sights. The system also reflects the ballistics of the bullets, corresponding to the types of ammunition.

In addition, environmental and atmospheric factors, types of propellant charges and fuse settings were also provided. The Śnieżnik enables significant savings in the training process due to the lack of costs of ammunition,



fuel, other material resources, no need to move to training grounds and no use of weapons and military equipment.

The Śnieżnik system allows for training commanders in fire control, with the simultaneous participation of subunits of various types of troops, training in combined operations, training in events impossible to be carried out on barracks exercise yards, training in conditions specific for potential mission/operation areas, unlimited training and no weather restrictions.

Complex Tactical and Fire Simulators for Crews of Combat Vehicles and Tanks in the Platoon Version

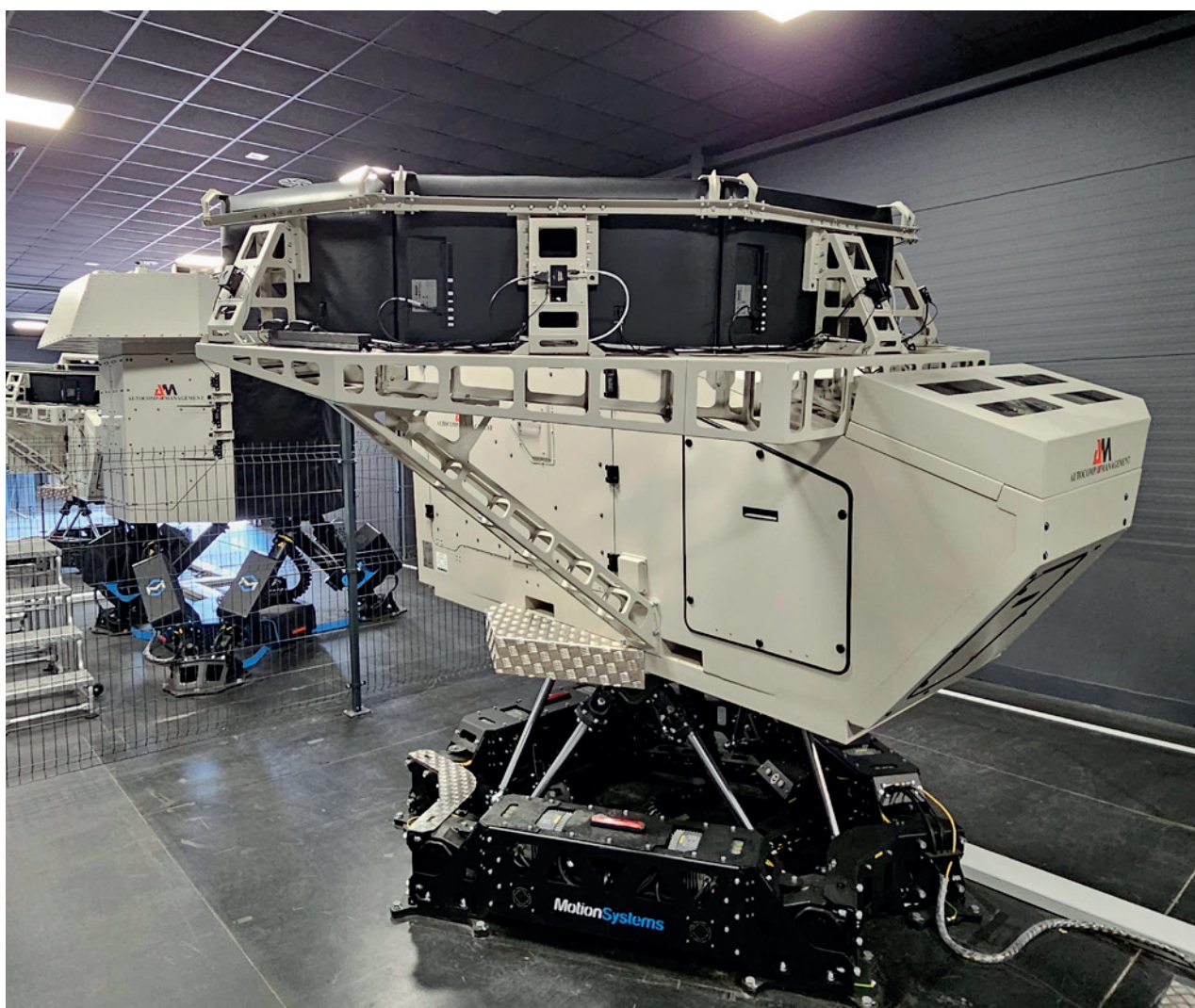
AUTOCOMP MANAGEMENT Sp. z o.o. ► p 318.

Autocomp Management Ltd. is a manufacturer and supplier of comprehensive cabin tactical-fire simulators designed for training crews and subunits equipped with armored personnel carriers, tanks and other military vehicles. The simulators enable realistic projection of tactical and fire capabilities of armament and military equipment during the implementation of combat tasks. The simulation enables the implementation of a full spectrum of tactical and fire tasks by both crews and platoon soldiers, and at the same time provides the necessary data to assess the effects of their training.

The simulators provide various types of tactical operations such as defence, assault, delaying operations, marching, and fire control operations of combat vehicles using computer simulations.

The simulators of the platoon version are equipped with a Class Manager position and an After Action Review module. They consist of Crew Simulation Stations placed on motion platforms, where each station contains: a combat module that reflects the turret with the commander's and gunner's stations, a driver's module which reflects his compartment and the operator's station.

The software uses artificial intelligence algorithms to simulate actions on the battlefield and computer-generated behavior using virtual objects. Cabin tactical and fire simulators allow for effective training of crews, ensuring maximum training effects while maintaining appropriate economy of this process (principle of cost-effect).



Container Shooting Range

GISS Sp. z o.o. ► p. 333

The GISS container shooting ranges are specially designed systems consisting of mobile ballistic modules. They allow for the construction of highly specialized training facilities anywhere, catering to the shooting and tactical training needs of uniformed services and civilians alike. These facilities are capable of hosting a variety of training sessions, offering shooting distances ranging from 5 to 200 meters with both fixed and adjustable firing lines. They feature between two to eight shooting positions, accommodating individual, paired, or group training scenarios.

By utilizing standard equipment and live ammunition during training, these ranges elevate the level of practical

training, enhancing concentration and building confidence in acquired skills. The internal training support systems enable comprehensive analysis of training sessions, facilitating identification of individual and group errors, thereby aiding in their prevention during future training and operational missions. In addition to the ballistic modules, the facility can also be equipped with various modules to support the overall functioning of the center. These modules may include space for training, office, social, logistics, and communication units, housing amenities such as a shooting control station, weapon cleaning room, restroom, training area, waiting room, locker room, or a medical facility.



Container Shooting Range MoST-2

KLIMAWENT S.A. ► p. 338

MoST-2 container shooting range:

- can be used as training facility for uniformed services and as commercial facility
- is fully covered shooting range
- has 25m shooting line
- has two shooting stalls
- is equipped with tactical lighting system, target retrieval system and CCTV
- is equipped with long life granular bullet trap
- provides possibility of using ammunition of 3600 J maximum initial energy of the bullet, including weapons listed below:
 - pneumatic weapons, 4.5 mm (shot)
 - rimfire pistols and rifles, e.g. 5.6 mm
 - centerfire pistols and rifles, e.g. 7.62 mm, 9.65 mm, 11.43 mm
 - smoothbore shotguns, e.g. 12 gauge,
 - rifles and carbines, e.g. 7.62 mm NATO (not supported: armour-piercing, tracer and incendiary rounds)
- allows trainings from fixed or moving firing lines
- consists of four modules than can be placed on a flat surface in any location
- guarantees the highest air quality due to perfect ventilation system



CQB House Shooting Range

GISS Sp. z o.o. ► p. 333

The armoured CQB House manufactured by GISS is a specially designed system of portable ballistic panels allowing life-sized training facility to be built. This allows for tactical trainings to be organized in conditions most similar to those prevailing on a modern battlefield.

It is also possible to carry out a wide spectrum of live fire trainings undertaken in preparation for the following types of operation:

- Military Operations in Urban Terrain – MOUT.
- Close Quarters Battle – CQB.
- Hostage Rescue Operation – HR.
- Counterterrorism – CT.
- Special Reconnaissance – SR.
- Direct Action – DA.
- Personal Security Detachment – PSD.

In addition to comprehensive preparation for the implementation of the above-mentioned operations, by using the appropriate elements the CQB House also allows basic skills to be improved, such as situational shooting or even breaching, without exposing trainees to the danger of loss of health or life.

Internally installed training support systems enable comprehensive analysis of training and identification of

individual and group mistakes, helping to avoid them in the future during training and combat operations.

Systems that can be used to make training more attractive:

- Artificial smoke system to allow for training in conditions of limited visibility
- Audio system – generating sounds of the battlefield
- Monitoring system for training participants
- Specialised simulation lighting system
- System of mobile targets
- System of integrated bullet-traps



Ejection Procedure Training Simulator

ETC-PZL Aerospace Industries Sp. z o.o. ► p. 328

Our advanced Ejection Procedure Training Simulator offers life-saving, risk-free training for military pilots, ensuring they are fully prepared for emergencies. It develops critical decision-making skills and reflexive actions, guiding pilots through the entire ejection process—from the decision to eject accordingly to the actual procedure. Tailored to specific aircraft and seat types, the system delivers unmatched realism and reliability, simulating various malfunctions, damage scenarios, and flight conditions.

The system has been developed and refined over the past twenty years in cooperation with aviation medicine specialists and the Polish Air Force's flight safety experts. Delivered worldwide – Poland, Korea, UAE, Qatar, India, Turkey, Malaysia, Algeria, USA.



Ejection Procedure Training Simulator Overview

- Training replicates the entire sequence of events from an aircraft emergency handling and ejection decision to the final seat ejection.
- The simulator facilitates acoustic and visual recognition of emergencies related to aircraft operation; and provides radio communication between the pilot and instructor.
- G-load can be set between 3,5 G to 10 G and up to 100G/sec onset.
- Multi-layered physical and software safety interlocks, catapult brakes, and safety barriers.
- The simulator's configurations depend on each customer's unique set of specifications (aircraft type, seat type, scope of situations requiring an eject decision, including malfunctions, damage, flight phases, and spatial and geographical situations).
- Multiple cockpits option – can be delivered in a variety of interchangeable cockpits to replicate training for multiple aircraft types.

Flight Simulator for Fixed-Wing and Rotary-Wing Aircraft

ETC-PZL Aerospace Industries Sp. z o.o. ► p. 328

Flight simulators and training systems designed for clients in the demanding and specialized aviation sector represent a key priority in our portfolio. As part of our portfolio, we offer simulators across all training classes and operational configurations, ensuring comprehensive coverage for diverse aviation training needs.

1. Basic Instrument Training Device (BITD)
2. Flight and Navigation Procedures Trainer (FNTP)
3. Flight Training Device (FTD)
4. Full Flight Simulator (FFS)



Flight Simulators General Overview

- High-fidelity cockpit systems with 6 DOF motion.
- Sustained G acceleration motion systems, providing physiological training experiences crucial for handling high-performance aircraft.
- Continuous 3-axis rotational motion platforms for spatial disorientation training for fixed and rotary wing aircraft.
- Expansive visual databases covering large terrain zones, including mission-critical, high-resolution areas of interest to support comprehensive scenario generation.
- Continuous-view visual systems, simulating diverse weather conditions with extraordinary atmospheric authenticity.
- Integrated navigational databases, enabling full instrument navigation training and sophisticated tactical multi-ship flying scenarios.
- Emergency procedure training modules, allowing aircrew to master critical failure response protocols in safe, controlled environments.
- Customizable mission training scenarios for specific aircraft types, operational theaters, and mission profiles, including combat and search-and-rescue scenarios.
- Advanced communications and team coordination tools, simulating multi-crew and multi-aircraft mission environments.



- Support for mixed reality (MR) to overlay virtual environments on physical cockpit hardware, blending real-world tactile feedback with virtual training scenarios.
- A psychophysiological monitoring module.

Mobile Bullet Traps

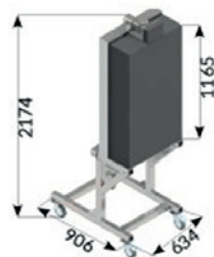
KLIMAWENT S.A. ► p. 338

The mobile bullet traps are intended for live-fire tactical training in sheltered and outdoor shooting ranges. The mobile bullet traps can be deployed in linear series or as standalone units. They facilitate any deployment configuration for building “shoot houses”. The mobile bullet traps withstand live round fire with a maximum bullet energy of 3600 J, including the following calibres: 9 mm, 5.62 mm, and 7.62 mm (and 7.62 NATO) (exclud-

ing: armour-piercing, tracer and incendiary rounds). The KMB-600 bullet traps withstand live round fire with a maximum bullet energy of 6600 J, e.g. 338 LM.

The offer of Mobile Bullet Traps consists of:

- KMR-600 mobile bullet trap (ballistic resistance to 3600J, weight: 150kg)
- KMB-600 mobile bullet trap (ballistic resistance to 6600J, weight: 345kg)



KMR-600 mobile bullet trap

Mobile bullet trap on a wheeled dolly and a backstop. 50 mm anti-ricochet panels installed on one backstop side.

KMB-600 mobile bullet trap

Mobile bullet trap on a wheeled dolly and a backstop. 50 mm anti-ricochet panels and 300 mm solid blocks installed on one backstop side.

Mobile Container Shooting Range MoST-1

KLIMAWENT S.A. ► p. 338

MoST-1 mobile container shooting range:

- can be used as a personalized shooting range, commercial facility as well as training facility for uniformed services,
- has one shooting stall,
- has 7 m shooting line,
- is equipped with multifunctional firearms simulator designed to address both basic and advanced firearms training and simulate different distances,
- is equipped with long life granular bullet trap,

- provides possibility of using ammunition of 3600 J maximum initial energy of the bullet, including weapons listed below:
 - pneumatic weapons, 4.5 mm (shot),
 - rimfire pistols and rifles, e.g. 5.6 mm,
 - centerfire pistols and rifles, e.g. 7.62 mm, 9.65 mm, 11.43 mm,
 - smoothbore shotguns, e.g. 12 gauge,
 - rifles and carbines, e.g. 7.62 mm NATO (not supported: armour-piercing, tracer and incendiary rounds),
- guarantees the highest air quality due to a perfect ventilation system.



Mobile Container Shooting Range (40 FT HC)

Zakłady Mechaniczne "Tarnów" S.A. ► p. 369



The Mobile Container Shooting Range 40FT HC is designed to conduct secure training and shooting practice with application of live ammunition, using standard-issue and combat weapons. The complete shooting range consists of two or more connected containers where training can be conducted within 5 m to 50 m distance in steady position or in motion from various standpoints and firing lines. Installed interactive training simulator – multimedia

trainer, allows application of various training programs/methods (using stationary shooting targets, speed shooting, shooting to moving targets, precision shooting training and training with active and neutral targets) and to program own tactical scenarios and combat situations developed according to the user's needs. Interactive multimedia training simulator allows to shoot with live ammunition, laser pointers and to extend the line of fire up to 200m. The advantage of the shooting range is that it can be set and ready in any area within a very short time. It allows

to use ammunition of maximal muzzle energy of 3600 J, including:

- Rimfire pistols and rifles, for example, 5.6 mm
- Centerfire pistols, revolvers of caliber up to 11.43 mm
- Rifles and carbines of caliber: 5.6 mm, 5.56 mm, 7.62 mm (excluding armor-piercing, tracer and incendiary rounds)

Mobile Shooting Target Robotic Target™ 2WD, Robotic Target™ 4WD

Tech Robotics S.A. ► p. 361



This is a lightweight and mobile remotely controlled platform. Two drive wheels on a flat surface allow for highly dynamic maneuverability. ROBOTIC TARGET™ is capable of operating on existing shooting range objects without modifying the shooting range infrastructure.

Our targets can work with various attachments mounted on our platform, such as the 3D TECHFLEX™ Shooting Range Dummy Target. Our mobile shooting targets enhance the skills of every shooter. Each of the wheels is powered by a separate motor.

With control over direction and speed, an instructor can simulate an unlimited number of scenarios. In a fraction of a second, a simulated target without any warning can become a threat. The purpose of the mobile shooting target is to conduct dynamic training with non-linear scenarios.

Training with the robotic shooting targets can assist soldiers or officers in improving various skills: accuracy, tactical and situational awareness, decision-making, speed and reaction time, safety, scenario-based force-on-force training.

Modular Tactical Shooting Ranges

MoST-5 and MoST-10

KLIMAWENT S.A. ► p. 338

MoST-5 and MoST-10 are indoor shooting ranges for all kinds of shooting trainings. They are made of steel modules which can be transported to any location which has a flat surface. MoST systems are not fix to the ground. The time of building the shooting range is between 180 and 360 days depending on the MoST size.

MoST systems are available in eight sizes:

- MoST-5 – 5 m lane width, either 25, 50, 100 or 200 m shooting line
- MoST-10 – 10 m lane width, either 25, 50, 100 or 200 m shooting line



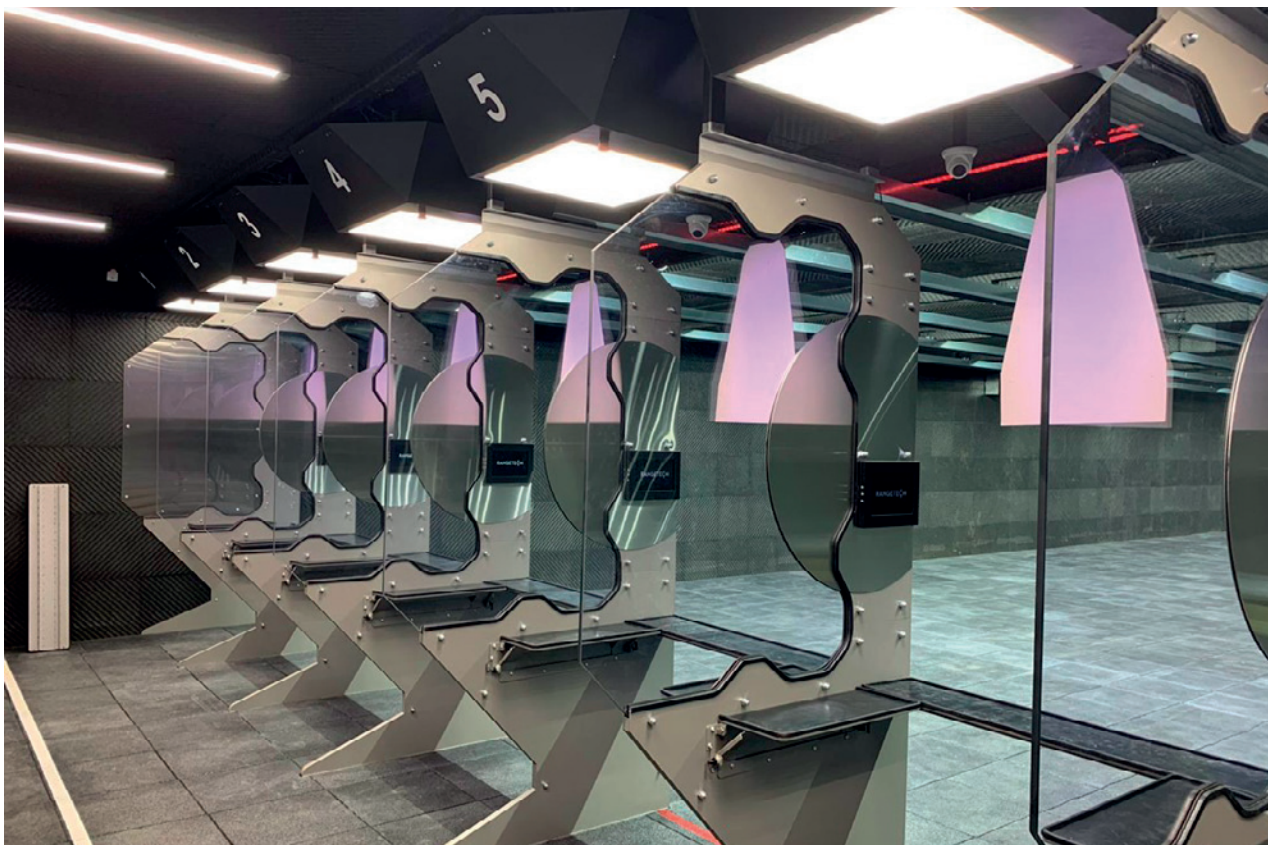
The modular design of the MoST systems allow the range length to be modified by the adding or removing modules. Each MoST range can also be disassembled and relocated at any time.

MoST-5 and MoST-10 provide possibility of using ammunition of 3600 J maximum initial energy of the bullet, including weapons listed below:

- pneumatic weapons, 4.5 mm (shot)
- rimfire pistols and rifles, e.g. 5.6 mm
- centerfire pistols and rifles, e.g. 7.62 mm, 9.65 mm, 11.43 mm
- smoothbore shotguns, e.g. 12 gauge
- rifles and carbines, e.g. 7.62 mm NATO (not supported: armour-piercing, tracer and incendiary rounds)

The ballistic equipment consists of:

- long life granular bullet trap
- anti-ricochet panels
- target retrieval system
- tactical and emergency lamps
- audio system
- CCTV system



Optical Sights Simulators for Military Equipment

AUTOCOMP MANAGEMENT Sp. z o.o. ► p. 318

The company's first optical projects were the EMES, PERI, FERRO fire control system simulators of the Leopard 2A5 tank commissioned by Krauss Maffei Wegmann GmbH. These simulators precisely reflect the parameters of the original optical devices, including emulation of form and function of the original ones. The optical device simulators are high-fidelity replicas designed for advanced simulator systems which enables the mapping of the shape, its operating elements and output elements.

Autocomp Management specializes in the production of three types of optical devices as below:

- periscope simulators,
- target simulators for small arms and sharpshooters,
- simulators of fire control system sights,
- night vision simulators of combat vehicle drivers.

The Optics Production Section has its own grinding, polishing and clean production facilities. The section manufactures optical instruments from the design phase to final production of optical parts. The process includes gluing optical assemblies, applying anti-reflective layers and so-called "white" assembly, i.e. integration of optical and mechanical parts.

Other flagship products in the optics department are simulators of small arms sights, including types such as CKW, CWKW, PCS-5M and PCS-5M/1, the Leupold Mark44, Shmidt RH.450 and Shmidt RH.451, and binocular simulators used in the ŠNIEŽNIK combat training support system.



Pneumatic Decoys

Lubawa S.A. ► p. 339

Decoys are designed to mislead an observer from actual targets and to misrepresent the information about the actual number of deployed forces. Decoys also function as targets for training operations and live fire exercises. The product presented shows the technological and construction possibilities available. Lubawa SA provides variety of options for decoys such as JELCZ 442.32, T-72, KTO ROSOMAK, BWP-1.

Various other forms may also be designed:

- Pneumatic decoys are used for simulation of actual equipment in the real battlefield environment as well as in a group consisting of decoys only.
- The vehicle is based on a pneumatic frame.
- The outer sheathing is made of masking fabric and the elements shaping the outline and details specific to the equipment of the vehicle are made of textiles, plywood and polyurethane foam.
- The inflatable decoy imitates the signature of the real object in the spectra of detection for visible, thermal, and radar.



PRACTICE AND TRAINING DEVICE UST-2 PIORUN

MESKO S.A. (PGZ) ► p. 343

The UST-2 trainer is designed for practical learning and improving the firing skills of PIORUN missiles as part of the PIORUN training activities for operators of PIORUN MANPADS in the scope of pre-firing activities, aiming and tracking targets, solving and carrying out firing missions when facing changing tactical conditions. UST-2 PIORUN allows for evaluation of the training of operators in the given range.

ALLOWS FOR:

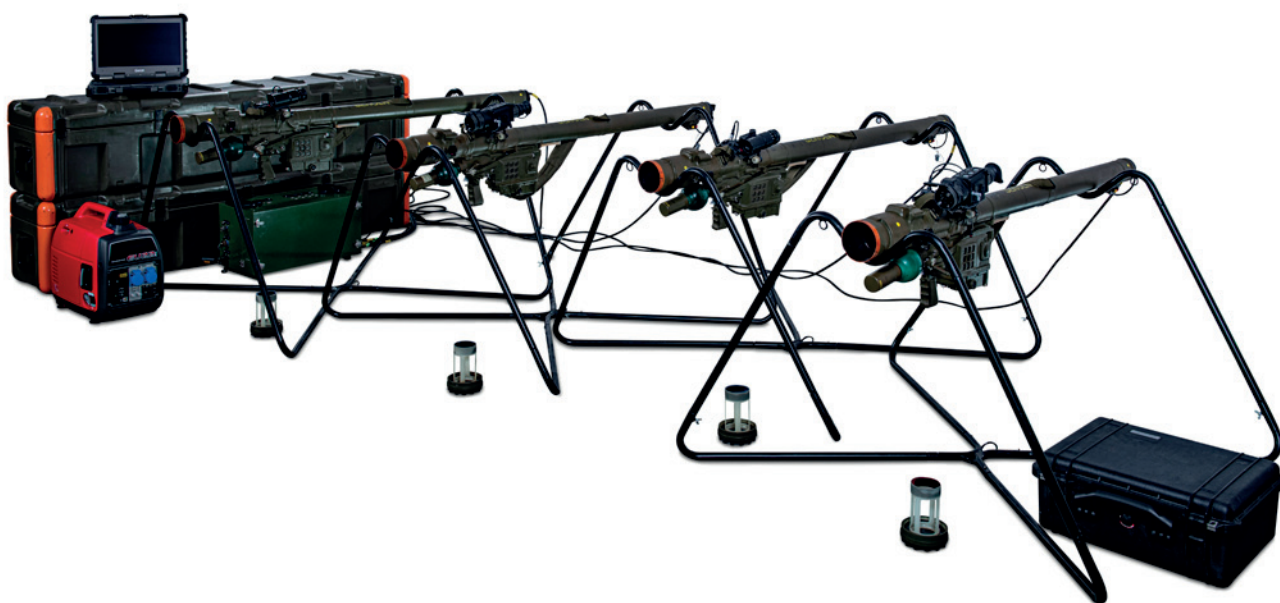
Training of operators as well as the crews of mobile anti-air sets equipped with PIORUN MANPADS:

- up to four operators at a time under the direct supervision of the instructor;
- in all terrain conditions with the use of real air targets (airplanes, helicopters, UAVs - also while thermal disturbances are present) or air target imitators that emit heat radiation at both low and high temperatures;
- indoors using a VR simulator

DESIGN SOLUTION:

UST-2 has four essential elements:

- Central Unit JC-2 (instructor station) – computer system equipped with a package of interfaces and software that enables the following:
 - current view of the work of up to 4 operators at the same time,
 - inputting the parameters of the firing task,
 - automatic calculation of each firing attempt,
 - creating and maintaining a database containing the results of individual operators,
 - video recording of “firing” attempts in the form of measurement data files and video clips.
- RST- 2 Training Missile PIORUN with a built-in Observation System (UO), which is a training equivalent of PIORUN missile in the launcher, it recreates the dimensions and mass parameters of the product as well as mechanical and electronic interfaces.
- The Training Missile Mechanism, which is a training equivalent of the PIORUN's combat Starting Set, recreates the dimensions and weight parameters of the combat Starting Set as well as mechanical and electronic interfaces.
- Power Block BZ-2, which is a part of a set of power supplies to power the Central Unit JC-2 and RST- 2 Training Missile PIORUN.



SJCL-6P Driving Simulator for Leopard 2A4 Main Battle Tank

OBRUM Sp. z o.o. ► p. 349

SJCL-6P is a modern simulator developed by OBRUM for drivers of the LEOPARD 2A4 tank. Dedicated software allows to conduct exercises with various simulation parameters (e.g. traffic conditions, off-road terrain driving & ground driving, various climate zones and weather conditions, different seasons and day / night time). The simulator enables training of tank drivers in accordance with the requirements of the modern battlefield. The driver's compartment of the simulator has been reproduced with high fidelity, especially in aspects of control and diagnostic panels and observation / optical devices.

Base components of SJCL-6P include: the driver's cabin with visual system, instructor/operator station, motion platform (6DOF) to increase the level of immersion, hardware set with dedicated simulation software.

The platform with 6 degrees of freedom (6DOF) allows to reflect the displacements, tilts and accelerations of the simulated tank. Reproducing of realistic driving conditions is possible thanks to the simulation of overloads/accelerations and forces impacting the tank during movement.

In addition, dedicated software responsible for evaluation of simulation events and generation of virtual environment, is supplemented with spatial sound effects, ensuring a high level of training realism. The simulator enables training of operation of the driver's compartment mechanisms while driving in various terrain conditions (built-in database of several terrain maps). It allows training in the environment of asymmetric conflicts, recognizing potential threats and reacting in combat situations. The systems includes simulation objects, implemented tactical tasks that could be assigned by the instructor in the form of repetitive exercise scenarios with use of databases that include built-in objects, maps and simulation events. It also includes simulation of predefined tank failures and damage, learning maintenance procedures performed by tank drivers.

The SJCL-6P simulator is equipped with HLA / DIS communication modules (compliant with NATO standards) that allow integration with other simulation systems.



SOKOL Parachute Simulator

AIR-POL Sp. z o.o. ► p. 315

The Parachute Simulator SOKOL™ is a high-performance e.sigma product for the entire spectrum of parachute operations training. SOKOL™ is a holistic solution, which encompasses all functionalities of a jump, including HALO and HAHO jumps and all types of canopies, including reserves and troop parachutes as well as pilot chutes.

SOKOL™ was specifically developed for the multistage and comprehensive training of all parachute jumpers, from beginners right up to paratroopers and Special Forces. All the functionalities were developed in cooperation with instructors and professional jumpers.

Benefits

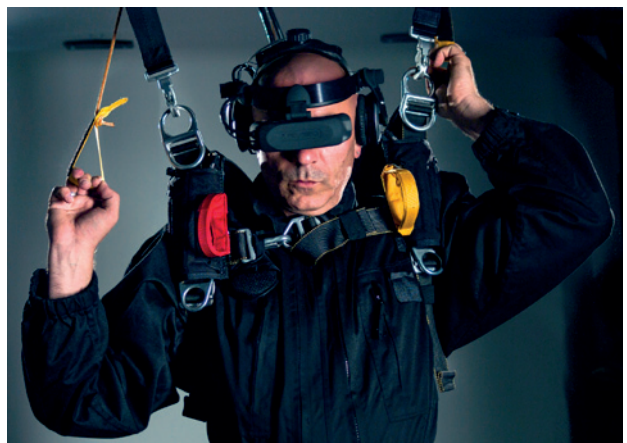
- **Modular.** SOKOL™'s modular design and robust steel superstructure enables jumpers to train anywhere, as a single jumper or with a group of other trainees or virtual jumpers. It is also possible to integrate new regions or training locations at any time. Additionally, SOKOL™ is capable of cross-location networking and interfacing with third-party simulators.
- **Realistic.** All SOKOL™ simulators feature realistic representations of environments, horizons and descent movements. SOKOL™'s extensive 3D geo-specific visual databases offer a variety of different terrain options, serving as the basis for all types of exercise and mission planning.
- **User-centric.** Due to the advanced customization capabilities, it is possible not only to train in numerous terrains, different times of day and weather conditions, but also in realistic environments and mission specific locations, both alone as well as in a group jumping scenario.
- **Secure.** SOKOL™ helps you acquire safe and accurate chute control, for a variety of chute and line related malfunctions. You can also practice evasive manoeuvres and collision avoidance, as well as training under stressful situation to help build confidence and calm during jumps.

Specification of SOKOL Parachute Training System

- Free Fall & Static Simulation:
 - Realistic suspension of the parachutist in an original sensor armed harness.
 - HALO/ HAHO training.
 - Fast calibration-free setup.
 - Wireless sensors for free fall steering.
 - 3D body movement simulation during free fall and static line.

→ Exercise Creation & De-Briefing:

- Recording and playback of the simulation for briefing/de-briefing.
- Instructor station with interactive control over training scenario creation and running drill exercises.
- Real-time observation and monitoring tool for instructor.
- Communication system for the instructor and multiple trainees to communicate with each other during a jump simulation.



- Realistic Flight Experience:
 - Accurate parachute dynamics for various parachute types.
 - High resolution head-mounted display with high precision head sensor.
 - Ripcord/ hand/ static line or AAD activated deployment.
 - Realistic suspension during canopy ride.
 - Realistic canopy opening simulation with comprehensive malfunction simulation.
 - Steering with Risers.
 - Sound simulation for a realistic and immersive jumping experience.
 - Visual simulation of altimeter, compass and GPS.
 - Motorized force feedback system for all suspension and steering lines.
- High Fidelity 3D Databases & Models:

- Different photo-realistic terrains and drop zones, and accurate 3D models.
- Option to integrate additional terrains / models.
- Realistic depiction of weather conditions and day /night setting for more holistic trainings.



Training Simulators

Wojskowe Zakłady Uzbrojenia S.A. (PGZ) ► p. 366

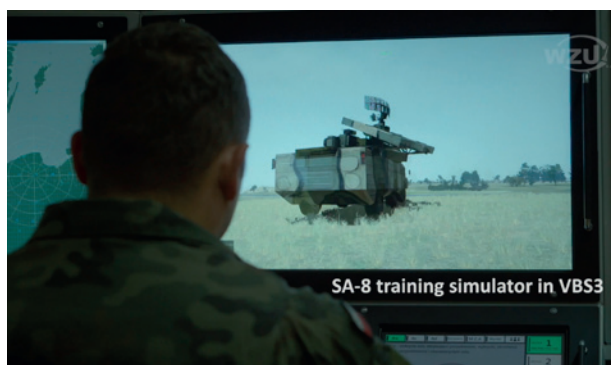
Modified Training Simulator 9F632.M1

Modified Training Simulator 9F632.M1 enables simultaneous training of 6 crews of anti-aircraft missile combat systems in a single virtual battlefield. The use of innovative electronic equipment provides top level training capabilities – the crew is trained with real equipment. The key element of the Modified Training Simulator 9F632.M1 is a new digital air situation imitator whose features include: generating air situation, managing flight parameters of flying objects, managing EW measures of flying objects, instructor supervision over crews in training and continuous communication with crews in training. The crews in training may also use targets generated by real data received from an external source e.g. radar.



Simulator of Anti-Aircraft Missile Combat Vehicle PRWB OSA (SA-8) based on VBS3 technology

PRWB OSA (SA-8) operating crew training to develop habits enabling effective air target engagement in various combat zone scenarios generated in virtual space.



Wireless Control System WSB-04M for Battlefield Areas

AUTOCOMP MANAGEMENT Sp. z o.o. ► p. 318

Wireless control system WSB-04M with feedback is a part of the equipment of training facilities of the Land Forces Field Training Centres.

The system allows for radio control of executive devices in the simulation of a battlefield (battlefield figure lifts, moving targets, fire line crossing signals, short stop recorders, warning signals, shot imitators, etc.), providing control of 32 000 objects at the same time, which offers practically unlimited possibilities in controlling even the most complex systems operating on Tactical Exercise Belts, allowing WSB-04M systems to operate on adjoining objects.

The WSB-04/M is the only system in Poland used at the training facilities of the Polish Armed Forces, which enables complex control of executive equipment, including conducting exercises in Directing Fire in an Attack, in an automatic mode. The system carries out real-time control of the distance between combat vehicles and targets and automatically raises or lowers combat figures as well as

activates moving targets, in accordance with the conditions programmed in the exercise by system operator and, most importantly, in accordance with the safety rules contained in the fifth chapter of the shooting training programme. This functionality is unique in its implementation exclusively due to the use of the WSB-04/M system.





SOLDIER UNIFORMS AND EQUIPMENT

CBRN-E protective suit

MASKPOL S.A. (PGZ) ► p. 342

The CBRN-E protective suit is dedicated for officers of various uniformed formations. The product is characterized by a high level of protection, ensuring user's 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, and 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.

- FABRIC: Two-layer layout of barrier fabric and filter-sorptive fabric.
- RESISTANT TO: Sulphur Mustard/Yprite droplets- 24h, Sulphur Mustard/Yprite vapours- 24h, Soman droplets- 24h, VX droplets- 18h, TSP- does not soak.
- BALLISTIC RESISTANCE: Depending on the applied ballistic package up to level 4NIJ Standard.
- Buckle system allowing for quick attachment of the front panel.



DAYTIME MODULAR SIGHT DCM-1

PCO S.A. (PGZ) ► p. 350

The DCM-1 includes an LDK-4 aiming scope with an attached small open-type MK-1 collimator. The LDK-4 sight can be used for ballistics of a specific weapon type by preparing an appropriate aiming rectile. The LDK-4 aiming scope is intended for operation with thermal vision and night vision devices (PCO's NT-2 and NN-1 clip-ons) attached in front of the sight, and allowing its use during nighttime or in limited visibility conditions.

The DCM-1 sight increases firing efficiency at small distances, it is equipped with a mesh screen which makes it harder for the enemy to detect the shooter, has an option to adjust the illumination of aiming crosshairs in the LDK-4 and the MK-1 sight offers a wide range of brightness adjustment for the reticle.



HB-04 ballistic helmet

MASKPOL S.A. (PGZ) ► p. 342



Helmet shell in 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.

- MATERIAL: REGULAR-CUT standard aramid shell secured with an edge band.
- BALISTIC RESISTANCE: Bullet-proof 9x19 mm FMJ, 357 MAGNUM JSP shrapnel-proof V50 > 600 m/s.
- WEBBING: System of impact absorbing cushioning pads in three thickness versions.
- WEIGHT: 1450 g for a complete helmet in size 1.

HP-05 ballistic helmet

MASKPOL S.A. (PGZ) ► p. 342



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.

- MATERIAL: HIGH-CUT standard aramid shell secured with an edge band.
- BALISTIC RESISTANCE: Bullet-proof 9x19 mm FMJ, 357 MAGNUM JSP shrapnel-proof V50 > 600 m/s.
- BOA® SYSTEM: Equipped with a smooth head circumference adjustment system on the nape pad.
- WEBBING: System impact absorbing cushioning pads in three thickness versions.

Individual Anti-drone Systems The Antidrone Poncho

Miranda Sp. z o.o. ► p. 346

The Antidrone Poncho “Invisibility cloak” is an individual suit for a single soldier, in woodland variant, that provides perfect concealment in forest and steppe conditions. The use of modern material combinations enabled the creation of concealment in the most important detection ranges: VIS, NIR, and TIR, while maintaining user comfort. The outfit was designed as a direct response to increased activity of drones carrying thermal cameras. It effectively reduces thermal signature, thereby increasing the chances of survival on the battlefield.

The individual anti-drone systems are designed for individual protection of soldiers. They provide effective protection for soldiers in the visible near-infrared (night vision) and thermal range and effectively reduce thermal radiation.

Low weight and small dimensions do not burden the soldier’s equipment. The camouflage suit is worn over the standard uniform and provides additional protection against environmental conditions. The elements used, such as reinforcements, pockets or zips, provide the necessary comfort.



Individual Anti-drone Systems Individual Winter Camouflage Suit

Miranda Sp. z o.o. ► p. 346

The individual camouflage suit in the winter variant provides excellent protection against detection in snowy conditions. The selection of specialised materials for the construction of the outer layer of the camouflage suit and the applied camouflage print significantly affects the parameters of concealment among snow-covered vegetation. Innovative material solutions enable protection from detection in all major detection wavelengths, UV, VIS, NIR and TIR, while guaranteeing user comfort.

Individual anti-drone systems are designed for individual protection of soldiers. They provide effective protection for soldiers in the visible near-infrared (night vision) and thermal range and effectively reduce thermal radiation.

Low weight and small dimensions do not burden the soldier’s equipment. The camouflage suit is worn over the standard uniform and provides additional protection against environmental conditions. The elements used, such as reinforcements, pockets or zips, provide the necessary comfort.



KKT-01 Bullet Proof Vest

MASKPOL S.A. (PGZ) ► p. 342

The KKT-01 bulletproof vest is made of a high strength laminate. The design of the vest allows for individual selection of a ballistic package. The vest can be used by police officers as a bulletproof vest as well as a tactical vest for carrying personal equipment. After applying the knife/spike protection package, the vest can be successfully used by paramedics. Thanks to the solutions used, the front ballistic panel of the vest comes as one-piece, increasing the user's safety.

- FABRIC: The shell made entirely of CORDURA® laminate
- PALS SYSTEM: The entire shell is made in laser cut technology.
- COMFORT: Increased air circulation from the inside ensuring high comfort of use.
- MOLLE/PALS system: The entire shell is covered with laser cut MOLLE/PALS webbing.



KKZ SG-01 bullet-proof vest

MASKPOL S.A. (PGZ) ► p. 342

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.

Laser Target Designators

Centrum Rozwojowo-Wdrożeniowe Telesystem-Mesko Sp. z o.o. ► p. 322



The Development and Implementation Center TELESYS-TEM-MESKO, alongside the development of 155mm and 120mm Precision-Guided Munitions (PGM) and the PIRAT ATGM, has designed Laser Target Designators (LTD) compliant with STANAG 3733. These devices are used to designate targets for all NATO laser-guided munitions utilizing reflected laser radiation. Implementing its proprietary Laser Target Designator allows the company to offer a complete system to clients—strike munitions along with target designation systems.

Significantly, the LTD can operate both day and night due to interchangeable, optional sighting modules: an optical sighting scope, a daytime camera, or a nighttime camera

(night vision or thermal). The built-in OLED display enables device status, measurement data display, and information on remote or manual control, while the integrated range-finder ensures precise distance measurements to the target. With in-house technologies, we can design and manufacture custom designators tailored to client needs.

LASER DIODE DESIGNATOR (LDD):

KEY PARAMETERS OF THE DESIGNATOR:

- **Laser Type:** Nd:YAG
- **Wavelength:** 1.064 μm for the illuminator
- **Programmable Pulse Repetition Time (PRT):** Compliant with STANAG 3733 and others
- **Laser Beam Divergence:** < 0.35 mrad
- **Pulse Energy:** > 80 mJ
- **Pulse Duration:** 15 $\pm$ 5 ns
- **Rangefinder Range:** Up to 20 km
- **Typical Operating Temperature:** -35°C to +55°C
- **Storage Temperature:** -40°C to +70°C

Shot Synchronization Module:

- Remote setting of programmable pulse sequences
- Data transmission from GPS, goniometer, and rangefinder
- Remote laser activation
- Remote readiness and device status reading
- Programming shot delay
- Programming laser operation time

LASER WARNING SYSTEM SSP-1 OBRA-3

PCO S.A. (PGZ) ► p. 350

The SSP-1 OBRA-3 is a vehicle self-shielding system designed to detect when vehicles or military objects are being targeted by pulsed laser rangefinders or laser illuminators. It can be integrated with a smoke grenade launcher to automatically deploy a smoke screen in the direction of the detected laser radiation.

System components:

- 4 to 8 identical detection heads (depending on vehicle or object size),
- reading and control dashboard,
- electronics block with direction update unit,
- connecting cables,
- smoke grenade launcher unit (not included in the standard kit from PCO S.A.).

Distinguishing features:

- **safety interlock:** prevents smoke grenades from firing when the tank hatch is open,

- **reflected signal identification:** the 'OBRA-3' system recognises signals from its own laser rangefinder to avoid confusion,
- **broad spectral detection:** detects radiation within the 0.6 μm to 11 μm range.



Lightweight Flame-retardant Fragment-proof Suit

Lubawa S.A. ► p. 339

A light version of an EOD Suit designed for reconnaissance tasks and various specialized missions (e.g. working in environments with high risk of explosions). The Lightweight Flame-retardant Fragment-proof Suit, resistance class acc. to PN-V-87000:2011, is worn on overgarment and/or TYPE-3 chemical protective suit

Features:

- The suit is composed of a vest with attached adjustable sleeves and trousers,
- Front, shoulders, and back of the vest have MOLLE/PALS bands sewed in,
- The vest has a rescue grip on the back at shoulder level,
- The bottom of the back has in-built 'comfort pads' to protect the spine and the back,
- Additional reinforcing pads on elbows,
- Velcro pads in front, back, and shoulders for attaching badges,
- The trousers are equipped with a system of suspenders with buckles, adjustable length,
- Additional reinforcement on knees,
- Two-stage adjustment of legs with horizontal zipper bands,
- MOLLE/PALS bands sewed in at the front and on the back,
- Suit leg bottoms have a system of 5 cm wide fluorescent and reflective bands,
- Ballistic inserts in trousers are protected against shifting with sewed-in velcro bands.



Modular Bulletproof Vest MKO 2.0

Lubawa S.A. ► p. 339

The exact ballistic resistance depends on the configuration of the vest and can correspond to international standard NIJ IV, NIJ IIIA etc. The full assault configuration provides a maximum protection level. The key benefit



of the MKO 2.0 bulletproof vest is state-of-the-art design that allows for a very wide scope of customization, based on mission requirements. The individual components of the vest ensure the maximum freedom of configuration without the unnecessary hustle of extra equipment.

FEATURES:

- A sleek, comfortable design ensures the maximum freedom of movement and customization to mission-specific requirements
- Rapid donning on/off and easy adjustment to the shape and size of the user's torso
- A wide range of circumference and length adjustment
- Modular design
- Manufactured of a polyamide fabric and a high-strength polyamide laminate, Panther Khaki camouflage pattern ver. 93

SET CONFIGURATION OPTIONS

- Lightweight Plate Carrier – designed for the ultimate mobility, up to 4 hard ballistic plates (front and rear plates + two side plates),
- Modular Overt Vest – designed to carry two soft ballistic inserts (front and rear) and two side hard ballistic plates,
- Covert Vest – two soft ballistic inserts (front and rear),
- Chest Rig with Braces – designed for high mobility tasks, which require the user to carry additional equipment,
- Waist Belt with Braces – designed for high mobility tasks, which require the user to carry additional equipment,
- Full Assault Setup – this configuration is designed for operations requiring the maximum ballistic protection.

MODULAR BULLETPROOF VEST MKO 2.0 – BALLISTIC RESISTANCE

Class K4 SA* according to PN-V-87000:2011 – 7.62x39 mm BZ (armor-piercing incendiary bullet with a 62+/-2 HRC steel core, weight 7.7 +/-0.1g and impact velocity 735 +/-15 m/s)

FRONT / REAR plate resistance: 3 shots

SIDE plate resistance: 1 shot

*SA (STAND ALONE) – The plate provides the declared ballistic resistance WITHOUT the need of applying a soft ballistic insert or a trauma pad

Class K2 according to PN-V-87000:2011 – (7.62x25 TT bullet; weight 5.5 g; impact velocity 420 +/-15 m/s)

Class 02 according to PN-V-87000:2011 – (1.1 g fragment; 525 <= V50 < 600 m/s)

Resistance to combat knife, e.g. design ver. 92 with impact energy 25 J and allowed penetration of 7 mm

Hard Ballistic Plate
(FRONT/REAR/SIDES)

Soft ballistics rear
Soft ballistics front
Soft ballistics – arm guard
Soft ballistics – groin cover
Soft ballistics – loins cover
Soft ballistics – collar

MP-6 gas mask

MASKPOL S.A. (PGZ) ► p. 342



MP-6 gas mask with a combined filter is designed to protect against harmful effects of chemical warfare (CW) agents, toxic industrial and radioactive substances and biological agents. The mask meets the requirements of the civil standard PN-EN 136:2001 and the defence standards NO-06-A107 and NO-A2014:2005.

- FACIAL PART: Made of anti-allergic rubber in 3 sizes for a better fit.
- VISIOR: Two polymer glasses with impact-resistant properties ($V=215$ m/s) with the possibility of mounting additional adapters for corrective lenses.
- SOUND CHAMBER: A sound system with a diaphragm enabling conversation.
- HYDRATION SYSTEM: Allows for the intake of fluids in a contaminated area.

MT-1 THERMAL IMAGING MONOCULAR

PCO S.A. (PGZ) ► p. 350



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.

MU-3ADM MODULAR NIGHT VISION GOGGLE SYSTEM

PCO S.A. (PGZ) ► p. 350

- 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



MUP-RESCUE PACK MARINE PILOT SUIT

Air Force Institute of Technology ► p. 315

MUP-Rescue pack is dedicated to the staff of military aircraft.

It is available in the following versions:

- MUP-Rescue Pack 'P'
 - Survival kit in the version for the pilot,
- MUP-Rescue Pack 'N/T'
 - Survival kit for navigator and flight engineer,
- MUP-Rescue Pack 'R'
 - Survival kit in the version for the rescuer.

MUP-Rescue Pack is dedicated to staff flying above water areas. It protects against hypothermia in case of water landing after an aircraft emergency evacuation.

MUP-Rescue Pack includes the following elements:

- MUP-1 ver. m (drysuit, underwear and warming items),
- two-function vest,
- specialist footwear intended for MUP-Rescue Pack,
- optional elements.



NIGHT VISION GOGGLES PNL-2ADM

PCO S.A. (PGZ) ► p. 350

The PNL-2ADM Night Vision Goggles is a stereoscopic image intensification device designed for observing terrain, detecting targets, reading maps, and driving under natural night conditions. It is adapted for mounting on a ballistic helmet and on the head-harness. PNL-2ADM utilises the latest PHOTONIS 18mm image intensification tubes, which, combined with the use of a new generation gradient optics, provide excellent detection, recognition, and identification (DRI) parameters and an extended bandwidth (compared to Gen 3), ranging from 400 nm to over 1,100 nm. Goggles weigh less than 520g (incl. CR123A battery)

Additionally, thanks to the built-in infrared illuminator, the goggles enable the illumination of targets with infrared light in total darkness (tunnels, basements, densely forested areas, etc.). The goggles are compatible with Wilcox helmet

mounting equipment and the PCO S.A.'s newest external battery power supply from PCO S.A.



NIGHT VISION GOGGLES PNL-3X

PCO S.A. (PGZ) ► p. 350

The PNL-3X are the latest aviation goggles produced by PCO S.A. They are a completely new design based on many years of experience in the design and operation of the PNL-3 and PNL-3M goggles. They are intended for use in flight by helicopter pilots and other crew members under low light and in night conditions, without the need for any artificial light sources. This makes them more effective for border patrol, law enforcement support, search and rescue missions, HEMS, and aerial firefighting.

Key Functional Features of the PNL-3X Goggles:

- Designed in accordance with civil and military aviation standards to withstand specific operational conditions in aviation.



- New, reliable emergency release mechanism for goggles from the mount and helmet, ensuring full pilot safety.
- Equipped with an automatic on/off system when raised/lowered.
- Utilise the latest 4G image intensifiers.
- Thanks to the use of a new generation gradient optics, they provide excellent detection, recognition, and identification (DRI) parameters and an extended bandwidth (compared to Gen 3), ranging from 400 nm to over 1,100 nm.
- Visibility of the laser beam (including 1064 nm laser markers) for military and public safety purposes (e.g., police, border protection, fire service).
- Can be turned on/off and operated with one hand (right or left).
- Compatible with cockpit night lighting and displays thanks to the built-in internal Minus Blue filter (class A, B, or C).
- Thanks to the new four-battery power supply, they can operate for over 40 hours in continuous mode without the need to replace batteries.
- The goggle-power supply system is perfectly balanced, not causing strain and neck muscle fatigue.
- One of the lightest goggles on the market – their weight is 475g (total weight of the complete goggles is 871g).

Currently, PCO S.A. is in the final stages of obtaining ETSO certification for the PNL-3X Goggles.

NIGHT VISION MONOCULAR/GOGGLES MU-3M/MU-3ADM

PCO S.A. (PGZ) ► p. 350

The MU-3M night vision monocular is a standalone, versatile observation device utilising the most advanced and unique 16 mm 4G image intensifier. It can be used handheld, mounted on a head harness or a ballistic helmet, or installed on a MILSTD-1913 rail alongside an optical sight, such as the DCM-1 Modular Day Sight.

What sets the MU-3M apart from many of its competitors is its exceptional durability and the highest quality workmanship, confirmed by an individual testing procedure for each manufactured device.

The MU-3ADM night vision goggles are a modular stereoscopic device consisting of two reliable MU-3M monoculars offering excellent craftsmanship, compact size and high image quality.



OMNIDIRECTIONAL OBSERVATION SYSTEM SOD-1

PCO S.A. (PGZ) ► p. 350

The Day/Night Omnidirectional Observation System is designed for wide-angle observation of the immediate surroundings of vehicles, enabling monitoring of the area and motion detection. It functions effectively during the day, at night, and in conditions of limited visibility. The system features independent operation of thermal imaging and TV channels, or they can work together to observe the same area, with the option to superimpose thermal images onto television images in a selected pair of cameras.

This omnidirectional observation system equips the commander and crew of armoured vehicles with a comprehensive view of their surroundings in both TV and thermal imaging modes. Information from the SOD modules is displayed on a touchscreen monitor. Each TV and thermal imaging module contains 2 TV and 2 thermal imaging channels. The system offers different display modes: panoramic view (image from four modules), modular view (selected one of four modules), or directional view (selected two modules from four: front, back, right, left).



ROCK 2.0 Vest

MASKPOL S.A. (PGZ) ► p. 342



Modular tactical vest for soft and hard ballistic plates made of Cordura® fabric and laminate in laser cut technology. The entire surface is covered with a laser-cut MOLLE system which allows for attaching the equipment according to the individual preferences and needs of the user. It consists of a basic low-profile vest with soft ballistic inserts and a Plate Carrier vest with hard ballistic inserts. The front and rear panels of the vest are connected with cummerbunds in a full or slim version and a quick release system. The vest has an innovative Duraflex Quad Release system, enabling quick and easy donning and doffing of the vest, which is important during medical operations on the battlefield. When equipped with ballistic plates, the vest provides protection against bullets and shrapnel. Additional elements of the vest are: shoulder protectors, lower abdomen protector, throat and neck protector, front assault panel, patrol backpack and additional soft ballistic protection in the form of a separate vest.

- FABRIC: Cover made entirely of COR-DURA® laminate in laser cut technology.
- Duraflex Quad Release buckle system allows for quick donning and doffing of the vest.
- Possibility of attaching additional protection: neck, throat, shoulder, lower abdomen/ groin protectors.
- The full set includes: a low-profile vest for carrying soft ballistic inserts, a main vest for carrying hard ballistic plates, neck, throat, shoulder, lower abdomen protectors and a dedicated tactical backpack.

ROCK ONE Vest

MASKPOL S.A. (PGZ) ► p. 342



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 shoulder, abdomen and lower spine covers, or with a ballistic collar.

- FABRIC: The shell made entirely of CORDURA® laminate
- ROC SYSTEM ®: The buckle release system allows for quick donning and doffing of the vest.
- PALS SYSTEM: The entire shell is made in laser cut technology.
- COMFORT: Increased air circulation from the inside ensuring high comfort of use.

STABILIZED COMMANDER'S OPTOELECTRONIC HEAD GOD-1

PCO S.A. (PGZ) ► p. 350

The GOD-1 optoelectronic head is designed for use in detection, observation, tracking, and targeting systems against ground and airborne targets under both day and night lighting conditions. It features an integrated optoelectronic module mounted on a biaxially stabilised carrier platform.

Distinguishing features:

- Enables terrain observation through TV and thermal imaging channels and measures the distance to the target
- Facilitates tracking of targets
- Compatible with a multifunctional onboard dashboard
- Features a high-resolution array in the thermal imaging channel
- Compact design
- Extended observation range
- Operating temperature range: -30°C to +50°C
- 360° observation range
- When combined, the Commander's GOD-1 head and the Targeting GOC-1 head can operate within a hunter-killer or killer-killer system configuration.

Applications:

- Fire control systems for onboard weapons.
- Observation and targeting systems.



STABILIZED GUNNER'S OPTOELECTRONIC HEAD GOC-1

PCO S.A. (PGZ) ► p. 350

The GOC-1 optoelectronic head is designed for use in detection, observation, tracking, and targeting systems against ground and airborne targets under both day and night lighting conditions. It features an integrated optoelectronic module mounted on a biaxially stabilised carrier platform.

Distinguishing features:

- Enables terrain observation through TV and thermal imaging channels and measures the distance to the target
- Facilitates tracking of targets
- Compatible with a multifunctional onboard dashboard
- Features a high-resolution array in the thermal imaging channel
- Compact design
- Extended observation range
- Operating temperature range: -30°C to +50°C
- 360° observation range
- When combined, the Commander's GOD-1 head and the Targeting GOC-1 head can operate within a hunter-killer or killer-killer system configuration.

Applications:

- Fire control systems for onboard weapons.
- Observation and targeting systems.



STABILIZED OBSERVATION AND TRACKING OPTOELECTRONIC HEAD FOR ANTI-AIRCRAFT SYSTEMS GOS-1

PCO S.A. (PGZ) ► p. 350



The GOS-1 is a technologically advanced device featuring numerous utility functions that facilitate its integration with various systems, such as anti-aircraft weapon modules. It serves as a crucial component of the 23 mm anti-aircraft missile and artillery set ZU-23-2SP, part of the 'PILICA' system, with the videotracker being a key element.

Distinguishing features:

- Precise target tracking: operates in conjunction with the videotracker
- Wide tracking speed range: capable of homing and tracking speeds ranging from less than 100 rad/sec to over 2 rad/sec
- Compact design: combines all controls into one unit for a streamlined, integrated solution
- Small size and weight: facilitates easy integration into combat platforms (including vehicles, weapons modules, and anti-aircraft sets)
- Customisable sensor configuration: allows the integration of thermal imaging cameras, TV cameras, and laser rangefinders according to individual user requirements

Applications:

- Fire control systems for onboard weapons
- Observation and targeting systems

THERMAL IMAGING BINOCULARS NPL-1T

PCO S.A. (PGZ) ► p. 350



The NPL-1T thermal binoculars are an easy-to-use and portable thermal imaging device designed for both day and night observation in all lighting conditions. The design solutions and advanced thermal image processing methods used in the binoculars have resulted in excep-

tional thermal image quality while reducing weight and power consumption. The thermal image is displayed on two OLED screens or can be transmitted via digital video output to an external head-mounted display or monitor. The binoculars capture images to internal memory, with the option of transferring images to a computer. The primary power source is four AA batteries, but the binoculars can also be powered by an external source within a wide voltage range. The NPL-1T is compatible with a military GPS receiver, enabling the display of geographic coordinates and time on the screen.

THERMAL IMAGING MONOCULAR MT-1

PCO S.A. (PGZ) ► p. 350



The MT-1 thermal imaging monocular is the smallest thermal imaging device PCO S.A. offers for individual users. Despite its light weight, it provides excellent image performance. This innovative technical solution allows it to be used as a handheld observation tool or as part of a head-mounted system, either alongside night vision devices or on its own. The MT-1 can also be used with all accessories of the MU-3M monocular, expanding its operational capabilities.



WEAPONS SYSTEMS, AMMUNITION AND EXPLOSIVES

on a
explosives
Weapons system
s systems, ammunition
ammunition and explosives

122 mm M-21 FHD "FENIKS" rocket

MESKO S.A. (PGZ) ► p. 343

The 122 mm M-21 FHD "FENIKS" rocket is destined for firing high-explosive warheads up to 41 km. Its main task is to destroy fortifications, military equipment and personnel. It is mainly used in MLRS like BM-21, RM-70 or WR-40 Langusta.



40 MM GRENADE LAUNCHERS

Zakłady Metalowe "DEZAMET" S.A. (PGZ) ► p. 370

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

The 40 mm stand-alone grenade launcher GSBO-40 is a modern, manually operated, single-shot weapon intended for fighting manpower, fire positions and light armored vehicles, destroying structural targets, generating smoke screen, lighting the nearby area etc. depending on the type of ammunition fired. The 40 mm stand-alone launcher is made up of the prime components: a barrel module, a firing device module, a mounting gear module, a mechanical sight module and a folding stock module. The barrel module includes a grooved barrel and housing.



The firing module includes: a sear mechanism, a safety mechanism and a lock mechanism. There is a possibility of configuration for both the left and the right handed. The launcher's barrel can be tilted to the side to enable the use of different length of 40 x 46 ammunition. Thanks to GSBO-40 modular built the launcher can be modified into an under barrel version (GPBO-40).

40 MM GPBO-40 SINGLE-SHOT UNDER-BARREL GRENADE LAUNCHER

The 40 mm under-barrel grenade launcher GPBO-40 is an additional unit of firepower for a soldier already armed with the 5,56 mm assault rifle BERYL or the 7,62 mm AKM. The 40 mm under-barrel grenade launcher GPBO-40 is a modern, manually operated, single-shot weapon intended for fighting manpower, fire positions and light armoured vehicles, destroying structural targets, generating smoke screen, lighting the nearby area etc.



ALEX-338 Sniper Rifle

Zakłady Mechaniczne "Tarnów" S.A. (PGZ) ► p. 369



ALEX-338 sniper rifle was designed for precision shooting to point targets over long distances (up to 2000m), lightly-armored targets (up to 1000m) and to carry out other specialized combat tasks. ALEX-338 combines modern material solutions with ergonomics providing high accuracy and effectiveness of fire while keeping a compact construction.

- High-precision and stopping power – powerful cartridge 8.6mm (.338 Lapua Magnum) guarantees high effectiveness over long distances
- Lowered recoil – mounted muzzle brake reduces recoil by 50%, what improves comfort of shooting
- Self-supporting barrel – provides better rigidity of the whole construction and higher precision of shots

- Compact construction (bullpup) – shortening the rifle's length while maintaining full length of the barrel allows for greater maneuverability
- Optimal weight balance – the center of balance is set above the pistol grip what makes operating the rifle easier
- Reliable trigger – characterized by small inertia of firing mechanism elements what ensures fast reaction
- Reinforced bolt – resistant to dry firing, what increases durability of the weapon



AMMUNITION (MESKO)

MESKO S.A. (PGZ) ► p. 343

World-class ammunition for a wide range of weaponry and in various types and calibers, from small caliber pistol ammunition through rifle, machine gun and heavy machine gun ammunition to medium caliber used in M61 Vulcan rotary cannons, Mk 44 Bushmaster II chain guns or AA twin autocannons. The company also produces large caliber tank and artillery ammunition. All calibers listed below.

Small caliber ammunition:	Medium caliber ammunition:	Tank ammunition:	Artillery ammunition:
→ 5,56x45 mm	→ 20x102 mm	→ 120 mm	→ 122 mm
→ 7,62x39 mm	→ 23x152 mm	→ 125 mm	→ 152 mm
→ 7,62x51 mm	→ 30x173 mm		
→ 762x54R mm	→ 35x228 mm		
→ 9x18 mm			
→ 9x19 mm			
→ 12,7x99 mm			

AMMUNITION (DEZAMET)

Zakłady Metalowe "Dezamet" S.A. (PGZ) ► p. 370

40 x 46 mm LV AMMUNITION

40x46 mm LV ammunition is designed to be fired from the 40 mm grenade launchers GSBO-40 and GPBO-40 also produced by Dezamet, or alternatively from other 40 mm grenade launchers with the same design parameters, eg. M79, M203, etc.

Available types of 40 x 46 mm LV ammunition:
 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), NGOS-N (illuminating), NGH-N (flash – bang), NGD-N (smoke), NGDR-N (multi – smoke), NGZ-N (incendiary), NGK-N (multi – rubber balls).

ADVANTAGES

- NATO standard 40x46 ammunition
- Ammunition can be used in grenade launchers of various manufacturers
- Combat and tactical ammunition
- Excellent smoke screen effect of NGD-N and NGDR-N ammunition



40 x 53 mm HV AMMUNITION

40x 53 mm HV ammunition is designed to be fired from 40 mm automatic grenade launcher Mk.19 mod. 3, H&K GMG and other automatic grenade launchers compatible with NATO standards.

Available types of 40 x 53 mm HV ammunition:

- NGKO-2 – HEDP Round
- NGA-O – HE Round
- NGKO-RF – HEDP Air-Burst Round with Radio Frequenced Fuze
- NGAC – Practice Round
- NGAC-T – Practice Round with Tracer
- NGA-M – Practice Round with marker
- NGA-MT – Practice Round with marker and tracer

ADVANTAGES

- Ammunition meets the requirements of STANAG 4403, STANAG 4187, AOP-2
- Ammunition equipped with a self-extinction function
- NGKO-2 and NGKO-RF ammunition is a double-action ammunition, it has both fragmentation and cumulative action function
- NGKO-2 cumulative-shrapnel ammunition pierces armor plate with a thickness of at least 50mm
- NGKO-RF programmable cumulative-shrapnel ammunition can be programmed to operate on a flight path neutralizing objects hidden behind cover
- Ammunition can be used with Mk.19 mod 3, H&K GMG, CIS 40 AGL grenade launchers



60 mm MORTAR AMMUNITION

There are three types of 60 mm mortar ammunition: HE mortar bomb O-LM60, Smoke mortar bomb D-LM60 and Illuminating mortar bomb S-LM60.

60 mm HE mortar bomb O-LM60 is designed to defeat live force, firing position, tactical headquarters, not armoured military equipment and light field fortifications. The bomb is launched from a 60 mm mortar LM-60D or 60 mm commando mostar LM-60K.

D-LM60 – Smoke mortar bomb is designed to generate smoke screen with single or several rounds to camouflage own military operations, firing sources, points of resistance, centre of command as well as to blind the opponent's points of observation. The emitted smoke camouflages both in visible and infrared radiation. A 60 mm smoke mortar bomb is launched from a 60 mm mortar LM-60D or a 60 mm commando mortar LM-60K.

S-LM60 – Illuminating mortar bomb is designed to light the near target area, enemy objects and operation forces at night. A 60 mm illuminating mortar bomb is launched from a 60 mm light mortar LM-60D or a 60 mm commando mortar LM-60K.

120 mm MORTAR AMMUNITION



The 120 mm RAK-HE mortar round is a fragmentation and demolition cartridge and is designed for firing the 120 mm M120 RAK self-propelled mortar. The cartridge is elaborated with K-43 low-sensitivity material and counts as low-sensitivity ammunition according to the requirements of STANAG 4439 Policy for Introduction and Assessment of Insensitive Munitions. The cartridge is equipped with a UMZ-12 dual-mode fuze, i.e., instantaneous action SQ (Super Quick) and with a short delay D (Delay). The RAK-HE cartridge is used for the purpose of hitting enemy live force, destroying fire means, military equipment and field fortifications. The cartridge consists of the following assemblies: a 120 mm mortar fragmentation and demolition projectile, a UMZ-12 impact fuze, a ferrule assembly and a set of propelling charges.

The Illuminating round can be used for: lighting the near target area at night, indicating targets, indicating surveillance and light axes, blinding enemy observation systems. The illuminating mortar bomb consists of the basic components: a 120 mm illuminating projectile, a STANAG compatible and very modern programmable mortar fuze PMZ-10, a stub case and a set of propelling charges.

The smoke mortar round is designed to be launched from the RAK mortar in both chassis variants – the wheel based (M120K) and the tracked one (M120G). Single or several rounds generate a smoke screen to camouflage own military operations (firing sources, points of resistance, centre of command) as well as to blind the opponent's points of observation. The emitted smoke masks in visible light and infrared. The smoke mortar bomb consists of the basic components: a 120 mm smoke projectile, a STANAG compatible and very modern programmable mortar fuze PMZ-10 and a set of propelling charges.

155 mm ARTILERY AMMUNITION

The 155 mm HE extended range ammunition is designed to be fired from the 155 mm self-propelled howitzer (Krab). The ammunition meets standard requirements as specified in the JB MoU agreement. The round is armed with a KZ984 dual purpose impact fuse (immediate action or delayed action). The fuze meets all safety standards requirements by NATO (STANAG 4187). Apart from a projectile the round also consists of a set of combustible modular charges.

AVAILABLE VERSIONS:

- 155 mm HE round – EOFdMKM – hollow base
- 155 mm HE round – EOFdMKM DV – with base bleed

The Basebleed meets the safety standards requirements by NATO (STANAG 4519). Thanks to basebleed the round's maximum range exceeds a 40 km-long distance.

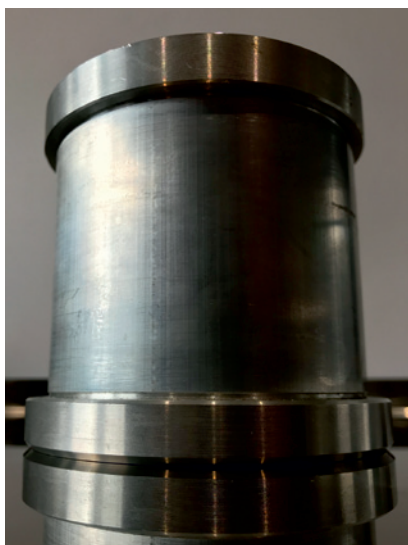


Combat Modules for Tactical Warheads

Jakusz Sp. z o.o. ► p. 337

Combat Modules for Tactical Warheads

- combat modules for tactical warheads adapted for drones and combat UAVs
- high explosive modules TERRA
- thermobaric modules IGNIS



IGNIS

Purpose

Combat modules can be part of warheads integrated with virtually any carrier, provided the mechanical, electrical and IT integration requirements are met.

Type of warhead, type of target, effective blast radius, type of explosive, type of agent of destruction, weight of module are selected according to individual needs of the Purchaser.

Impact force

The design of the modules allows to flare lightly armored targets, live force and fortified points.



TERRA

Field tests to confirm the impact force of combat modules

Technical parameters of modules – in accordance with Client's individual requirements.

Example of Modules Parameters

PARAMETERS	HIGH EXPLOSIVE MODULES	THERMOBARIC MODULES
Type of explosive	Configuration I 40% ± 5% TNT/ 60% ± 5% RDX	Configuration I – TGAF
Weight of module	930 g	900 g
Weight of explosive	235 g	650 g
Weight variation	± 1,1 %	± 2,5 %
Maximum length of module	100,5 mm	100,5 mm
Maximum diameter of module	90,0 mm	90,0 mm

CONTROLLED ANTI-TANK ANTI-VEHICLE MINES SPŁŁW

Bydgoskie Zakłady Elektromechaniczne BELMA S.A. ► p. 321

The SPŁŁW mines are designed to combat vehicles, armoured transporters and truck/off-road vehicles.

The off-route mine SPŁŁW is equipped with an acoustic-thermal non-contact fuze capable of detecting the presence of military vehicles in the mine blast zone. The EFP combat head used is capable of effectively hitting targets at a distance of several tens of metres (2-50 m), and stopping vehicles travelling in the mine blast axis.

The mine may be used for protecting national borders, defence, delaying operations, covering the withdrawal of own troops, shielding objects, such as command stations in troop deployment areas and diversification activities.

Due to its small size and weight (7 kg) two mines may be carried in a backpack and laid in the battlefield by one person in less than 5-6 minutes.

The mine can operate automatically or under operator's supervision. The automatic mode is provided by the version without the authorisation key.

Specifications:

Weight	7 kg
Dimensions (length/height/width)	30/18/15 cm
RHA Penetration	60 mm – at a distance of 2 to 50 metres
Power supply	Battery
MW type	Composition B
Type of fuze	Non-contact
Irremovability	YES
Self-destruction	Programmable
Self-neutralization	YES
Mode of operation	Automatic/supervised (MITL)
Sensors	Acoustic; thermal
Target selection	YES, the possibility of attacking consecutive or selected targets in column, from 1 to 9 objects,



Explosive Device for Armament Neutralization "PULS"

Military Institute of Armament Technology ► p. 345



Explosive Device for Armament Neutralization "PULS" is a device designed for neutralizing combat capability of armored vehicles. It is used in contact with enemy vehicles, for example, in diversion operations or to destroy own armament when withdrawing from the battlefield. The device can also be used to neutralize vehicles in an urban area, where a stealthy approach is possible.

The characteristics of use allow sensitive areas of the vehicle armour to be penetrated for efficiency of deployment. Using the device is effortless – attaching it to the vehicle and setting the triggering time. Possible use in two modes – removable (timed trigger only) or non-removable (device removal protection).

Parameters:	Armor penetration	200 mm RHA
	Trigger time	up to 24h
	Safety pin for transport safety	

Filling of Ammunition Ammo Filling Lines / Special Chemical Installations

Jakusz Sp. z o.o. ► p. 337

Jakusz provides high quality filling with explosive materials of the following types ammunition:

- mortar ammunition, e.g. 82 mm, 120 mm;
- artillery ammunition, e.g. 122 mm, 152 mm, 155 mm;
- tank ammunition, e.g. 120 mm;
- engineer ammunition;
- tactical warheads for drones: HE and thermobaric modules.

Cast charges performed in various sizes and weights (from several hundred grammes to several kilograms). We can design a dedicated charge as per customer's requirements.

The shell / warhead can be filled with such explosives as: TNT, Composition B, thermobaric mixtures.

Jakusz also designs and performs technological lines for production of:

- ammunition (artillery, tank, mortar, engineer), warheads for drones, aerial bombs and mines;
- ammunition components such as explosives (TNT, RDX, HMX), propellants (HTP, DMAZ), binders (HTPB, CTPB), plasticizers and others.

We have a wide experience in application of cast method by performance of various types of cast charges. Our technology ensures the highest homogeneity of the final product and repetitive ammo production.

The above turn-key production lines can be offered in stationary or transportable (containerized) versions.

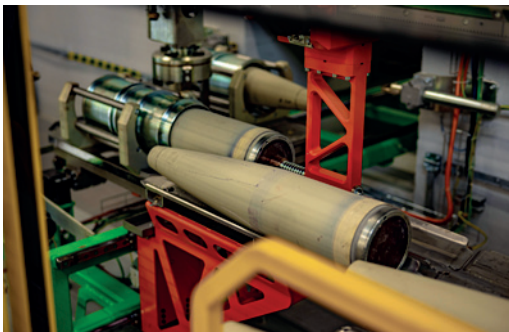
Line capacity is adapted to the customer's needs (from laboratory up to technical scale).

JAKUSZ offers universal set of equipment manufactured according to the EU standards, meeting the highest safety requirements (remote control, safety zones).



FILLING SERVICES

Zakłady Chemiczne "Nitro-Chem" S.A. (PGZ) ► p. 368



"NITRO-CHEM" offers a wide range of filling services.

Owined lines for filling services:

- Line for casting of TNT, RDX, HMX, NTO or their compositions
- Line for screw filling of projectiles with TNT in calibers from 80 mm to 155 mm
- Line for making pressed charges for military and commercial use

GNOM GROUND LOITERING MUNITION

MACRO-SYSTEM Sp. z o.o. ► p. 341

GNOM is a remote-controlled electric vehicle with compact dimensions of 550 x 400 mm and weight of 7 kg, designed to transport GX-1 DG warheads. As an advanced combat tool, it combines mobility, reliability, and an innovative approach to modern military operations.

The non-standard combination of combat and reconnaissance functions, low detectability, and the ability to quickly change camouflage make it a true innovation on the market. Representing a new standard in the field of unmanned combat systems, it offers the armed forces exceptional versatility and effectiveness in performing the most demanding missions.

One of the key advantages of the vehicle is its top speed of 80 km/h and a control range of 500 meters. This allows to quickly reach its target or to rapidly withdraw from the operation site, which is invaluable in the dynamically changing conditions of the battlefield.

GNOM can precisely destruct targets located in the open field, inside buildings, behind terrain obstacles, in urban areas or hidden among trees – places inaccessible to flying loitering munitions and traditional weapons. It also has an ability to hit armored vehicles from below.

Depending on a type of GX-1 DG warhead used, the system is designed to perform various combat tasks, for example: destroying armored vehicles, combat vehicle crews, machine gun nests, manpower, shelters, bunkers and critical infrastructure, training of drone operators in foreground observation, guidance and fire drill tasks.

LENGTH:	550 mm
WIDTH:	400 mm
WEIGHT WITH WARHEAD:	7 kg
TOP SPEED:	80 km/h
CONTROL RANGE:	500 m
VIDEO CONTROL:	using a camera mounted on the vehicle



GOMANDER TACTINOX QD LOCK SILENCER

BORIMEX Sp. z o.o. ► p. 320

GOMANDER Silencers for the uniformed services are designed to:

- Reduce noise: Less noise allows for a more discreet operation, reduces the risk of detection by the enemy and provides greater control of the situation.
- Reduce the risk of hearing loss: Shooters are regularly exposed to high levels of noise especially in confined spaces. Reducing recoil affects the accuracy of shots. This is extremely important where precision and speed of response are key.
- Backpressure System reduces a large amount of carcinogenic gases to be directed into the shooter's face.
- Gomander silencers are equipped with the QD-LOCK system that allows quick locking with a single finger swipe, without the use of any tools. It ensures the stability of the silencers mounting, which means that the silencer will not unscrew during intense shooting.

The Gomander QD-LOCK with Reduced Backpressure System optimises gas flow and reduces the BLOWBACK effect.

The silencers baffles allow some of the gases to be routed towards the outlet. As a result, less gas escapes through the ejection window. The Military Institute of Technology of Armament (WITU) carried out a study of Gomander silencers. The test was carried out in accordance with MIL-STD 1474-E for the measurement of sound intensity and using a ballistic kit with the measurement of the initial velocity of the projectile V0 by the radar method.



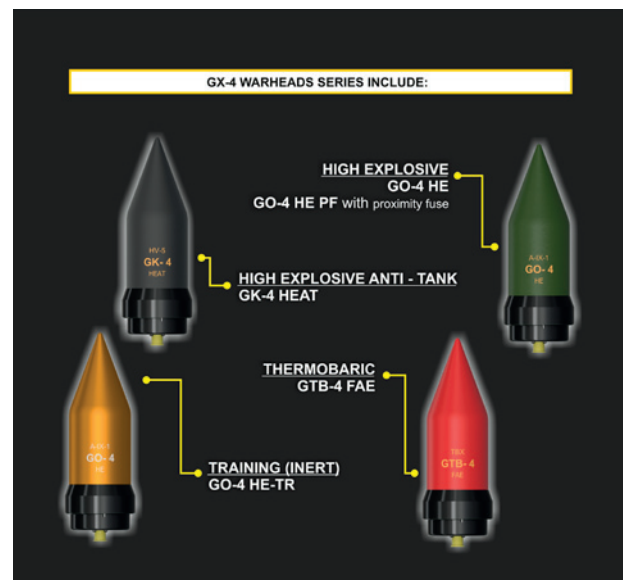
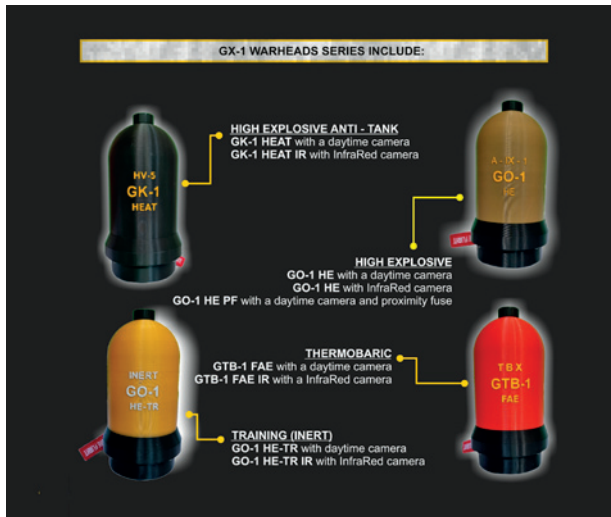
GX WARHEADS FOR UNMANNED VEHICLES

Military Institute of Armament Technology ► p. 345

The GX series warheads are offered in a variety of sizes, mass, functionalities and capabilities. They are designed to be carried by all types of Unmanned Vehicles with or without their own vision system. The warheads are mainly used for the kamikaze-type loitering munition systems, but there is also a possibility to adapt them for dropping to avoid destruction of the carrier.

All warheads are equipped with a three stage safety system, ensuring full operational safety and the the ability to reuse the warhead after an aborted combat task. The system consists of:

- Mechanical interlock – the launch bolt with a pin, which is removed by the operator before launching;
- Authorisation code – a 4-character hexagonal code, unique for each warhead, entered from the operator's desktop;
- SA (Save-Arm) type protection system – the system has the ability to repeatedly arm and disarm the warhead from the operator's desktop



		High Explosive (HE)	High Explosive Anti Tank (HEAT)	Thermobaric
GX-1 (with camera)	1,4 kg	30 m	180 mm RHA	10-12 m
GX-1 DG	1 kg	30 m	200 mm RHA	10-12 m
GX-2	4,8 kg	50 m	700 mm RHA	50 m
GX-4	1,6 kg	30 m	300 mm RHA	20 m

LMP-2017 60 mm Light Infantry Mortar

Zakłady Mechaniczne "Tarnów" S.A. (PGZ) ► p. 369

The LMP-2017 60 mm light infantry mortar, a direct support weapon, is designed to have a destructive kinetic impact on enemy combat systems. Thanks to its significant range and high fragmentation of the missile, mortar fire provides effective support to fighting sub-units in conditions of optical visibility in all weather conditions, both day and night. The steep trajectory of the missile and the small size of the mortar in the firing position make it possible to hit targets with semi-indirect fire, i.e., observed from the firing position.

The LMP-2017 is suitable for temperate, cold, and dry and humid tropical climates and meets the requirements of group N.14-O-II-A according to NO-06-A101÷103:2005. LMP-2017 operating temperature ranges from -40°C to +55°C. Storage temperature from -60°C to +70°C.



The minimum durability of the LMP-2017 is 1,500 shots which gives it an advantage over other designs. An additional distinguishing feature of the mortar is the number of rounds fired with uninterrupted fire – 30.

The following projectile types are used for the LMP-2017 light infantry mortar:

- O-LM60 60 mm mortar projectile with fragmentation shell
- S-LM60 60 mm mortar projectile with illuminating shell
- O-LM60N (M60-HE) 60 mm mortar projectile with fragmentation shell.



M107 155 mm Artillery Ammunition

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

The 155 mm ammunition is intended for destroying targets or temporarily slowing down the movement of enemy forces, destroying stationary targets, places with a large concentration of infantry, field covers, lightly armored targets, weapon systems, military and transport

equipment, etc. The impact of the projectile on the target is carried out by the kinetic energy of fragments of the metal parts of the shell and the shock wave of the explosive charge.

Modular Weapon System ZMT MWS-25

Zakłady Mechaniczne “Tarnów” S.A. (PGZ) ► p. 369



The ZMT MWS-25 (SKW .308) is a modular semi-automatic sniper rifle fed with ammunition caliber .308 WIN or 6.5 mm Creedmoor. It can be equipped with barrels measuring from 13” to 20”. The construction uses short stroke gas piston system. Gas block is equipped with adjustable four-stage gas regulator, which ensures that the weapon cooperates firmly with suppressors. The semi-automatic sniper rifle is equipped with ambidextrous safety switch, magazine button and bolt release lever. Rifle’s barrel is easily interchangeable, which enables the user to change it for different length or caliber. Handguard can be offered in two mounting systems: M-LOK or KeyMod. Depending on the set the rifle may be equipped with a back plate with a hinge allowing to fold the butt stock to the right side of the upper receiver. The rifle can be quickly adjusted to a select fire variant for semi-automatic and automatic modes through changing the barrel assembly and lower receiver.

“Moskit” anti-tank guided missile

Military Institute of Armament Technology ► p. 345

The “Moskit” anti-tank guided missile is a response to the need to break up armored columns while defending against an attack. The concept of the Military Institute of Armament Technology is to provide the Armed Forces with a high-end, precision means of destruction. It will excel in combat at ranges of up to 4,500 m against light- and heavily-armored targets thanks to its 700 mm RHA tandem penetrating warhead, behind reactive armor. Thanks to the implemented aerodynamic system and the functionality of the navigation system, it attacks from the upper half-sphere hitting the most sensitive points of armor. Direction of fire is carried out through a fiber-optic module, which determines uninterrupted communication with the missile, detection and which guarantees precise impact. The propulsion technology uses smokeless fuels, and the missile moves silently thanks to its aerodynamic shape due to which detection of the launch area is made difficult, thus protecting the operators. The system consists of a transport container with a missile and an observation and targeting instrument i.e. a launcher. The system is carried by two operators. Once the system is set up, it is possible to observe targets through the optics of the instrument, followed by launch, target selection and fully passive guidance with the support of the tracking system.

It is also possible to attack out-of-sight targets indicated by ISR (Intelligence, Surveillance & Reconnaissance). It is a local product, immune to supply chain disruptions and independent in critical technologies from foreign supplies, ensuring of which can be difficult in times of escalating tensions. In its design, it meets the requirements of special forces, territorial defense and artillery. The “Moskit” complements the limited number of the Spike-LR missiles in service in the Polish Armed Forces.



MSBS Grenade Launcher cal. 40x46 mm

Fabryka Broni "ŁUCZNIK" – Radom Sp. z o.o. (PGZ) ► p. 330

The 40 mm grenade launcher is an individual, non-automatic, single-shot weapon intended, among others, for: combating and incapacitating manpower, destroying technical devices, buildings, firearms, lightly armored vehicles, placing smoke screens, lighting the area, etc. The weapon has a trigger mechanism with a striker system and a trigger mechanism only with self-cocking (DAO). An adjustable wing safety fuse, the wings of which are placed on both sides of the trigger chamber, protects against an accidental shot. The grenade launcher uses mechanical open-type sights, consisting of a front sight and rear sight, located on a rotating sight arm. 40x46 mm (LV) grenade launcher cartridges are used for firing from a grenade launcher. The grenade launcher is equipped with a front grip and a telescopic stock, thanks to which it can fire quickly and precisely. The gun is loaded by tilting the barrel sideways.

Technical Data:

Calibre:	40x46 mm (lv)
Firing mode:	single
Weight without sights:	~2,4 kg
Number of grooves:	6
Grooves Twist:	1200 mm
Barrel length:	200 mm
Length:	435-610 mm



MSBS GROT Grot Modular Firearm System

Fabryka Broni “ŁUCZNIK” – Radom Sp. z o.o. (PGZ) ► p. 330

A modern rifle manufactured to the quality standards used for military products. The GROT is an automatic assault rifle, gas operated with short-stroke gas piston system.

The GROT is equipped with a mounting rail integrated into the receiver, in accordance with STANAG 4694 (Picatinny) standard, on which different variants of sights (mechanical and optoelectronic) can be mounted. The rifle has a handguard that allows various accessories to be mounted using the M-LOK system. The rifle is supplied from AR-compatible magazines, excluding P-Mag 3rd Gen magazines.

The rifle is equipped with:

- a fluted barrel with lengths of 10.5 inches, 14.5 inches, 16 inches
- a modular handguard in the M-LOK system with detachable thermal covers
- a front grip
- a pistol grip
- a telescopic stock with 4 length adjustment positions and a cheek rest adjustable in height and angle



The rifle stands out thanks to its highly ergonomic design. It is standard maintenance kit, as all the operating controls are symmetrically located on both sides of the weapon (bolt catch, magazine release, charging handle). The user can quickly change the direction of shell ejection to the left or right, using tools from the standard maintenance kit.

The modular design allows for a variety of solutions to be created based on base elements, such as, the barrel assembly, receiver assembly, bolt carrier group. This design enables rapid modification of the weapon by the end user as needed.

The Grot rifles are sold to export markets, both to typical military users and civilian users. They are also used by special forces. The new design was successfully tested in combat during the war in Ukraine.



Basic assault rifle
GROT C16 FB-M1 5.56 mm x 45 NATO



Basic assault rifle
GROT 762 16 FB-M1 7.62 mm x 39



Basic assault rifle
with the UTM conversion set 5.56 mm x 45 NATO



Subcarbine
GROT C10 FB-M1 5.56 mm x 45 NATO



Basic assault rifle
Grenade launcher
GROT C16 G FB-M1 5.56 mm x 45 NATO



LMG
GROT C16M FB-M1 5.56 mm x 45 NATO



Marksman rifle
GROT R20 FB-M1 5.56 mm x 45 NATO



Ceremonial rifle 5.56 mm x 45 NATO



Basic assault rifle
GROT B 16 FB-M1 5.56 mm x 45 NATO



Basic assault rifle
Grenade launcher
GROT B 16G FB-M1 5.56 mm x 45 NATO



Marksman rifle
GROT B 20PS FB-M1 5.56 mm x 45 NATO



Subcarbine
GROT B 10 FB-M1 5.56 mm x 45 NATO



LMG
GROT B 16M FB-M1 5.56 mm x 45 NATO

MWS Modular Weapon System

Zakłady Mechaniczne "Tarnów" S.A. (PGZ) ► p. 369

The ZMT MWS-25 (SKW.308) is a modular semi-automatic sniper rifle manufactured by Zakłady Mechaniczne "Tarnów" S.A. It has been designed to meet the rigorous demands of the modern battlefield. The rifle has a modular design, it's ergonomic and adapted to both right- and left-handed shooters, adapted for use with a silencer and has a folding stock. The rifle comes with barrel lengths measuring from 13" to 20" in 308 WIN and 6.5 Creedmoor calibers. The rifle is dedicated to both institutions and sport shooters. The MWS-25 operates by way of gas discharge through the side opening of the barrel. Gunpowder gases act on the short-stroke gas piston. The gas system is equipped with an adjustable 4-position gas regulator, thanks to which the rifle can be used with silencers. The design features a safety lever duplicated on both sides of

the lower receiver, as well as magazine release buttons, and bolt / bolt carrier group release lever. The rifle components and parts are fully interchangeable and its ergonomics is identical to that of the AR15/HK416 rifles. The rifle's barrel can be easily changed, so the user can swap it for one with a different length or caliber. The handguard assembly can be offered with two mounting systems: M-LOK or KeyMod. Depending on their set-up, rifle can be fitted with a hinged joint that allows the stock to be folded to the right side of the receiver. The MWS family also offers the ZMT MWS-15 carbine chambered in 5.56x45 NATO (.223 Rem) ammunition. Semi-automatic and selective-fire versions are available with various barrel lengths. It is possible to make a carbine for a different ammunition, e.g. .300 Blackout.



OCTOGEN (HMX)

Zakłady Chemiczne “Nitro-Chem” S.A. (PGZ) ► p. 368



Octogen is one of the most powerful series-manufactured blasting explosives. It is applied as a military explosive both individually (in form of different charges) and as a component of explosive compositions.

Compositions based on octogen (HMX)

- Compositions of octogen with trinitrotoluene,
- Octogen phlegmatized with compositions waxes,
- Octogen phlegmatized with Viton,
- Octogen phlegmatized with Viton 10%

Pangolin – family of explosive reactive armours

Military Institute of Armament Technology ► p. 345

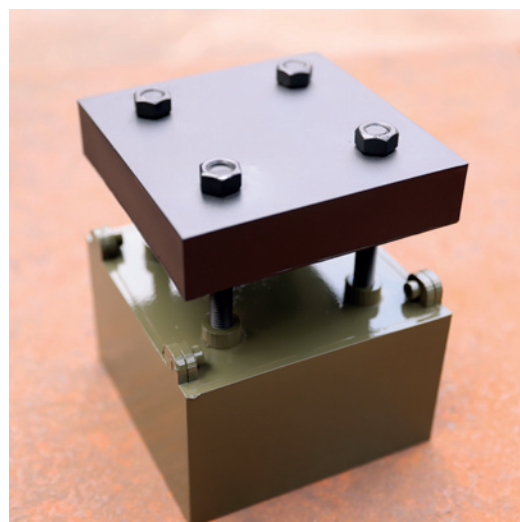
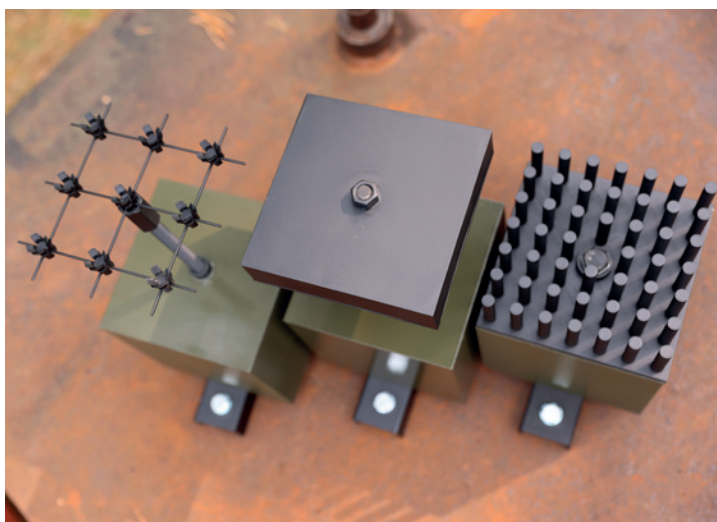
The PANGOLIN explosive reactive armours family, with attachable additional modules which increase the protective capabilities, is one of the latest WITU solutions, designed to protect vehicles especially against kinetic projectiles, projectiles equipped with HEAT warheads and EFPs. The modules of the PANGOLIN ERA family are mounted on the vehicle's main armour.

The different types of PANGOLIN armour modules, depending on their application on a specific vehicle, differ in their internal design determining the protection capability of a vehicle. Explosive materials of different sensitivity as well as functional layers made of different materials with different shapes and arrangements may be used inside of the modules

The PANGOLIN armour modules are designed for a specific vehicle type. Developed variants include lighter solutions dedicated to armoured personnel carriers, self-propelled artillery systems (especially the Krab self-propelled cannon howitzer and the Rak self-propelled mortar), as well as heavy modules for use on tanks, including modules designed for the K2 Black Panther tank and its licensed polish version K2PL.

The basic PANGOLIN armour module is suitable for attaching additional interchangeable modules (designed in several variants) increasing both the overall level of protection of the vehicle and the effectiveness of protection of individual zones (roof, sides) against threats specific to these areas.

The effectiveness of the PANGOLIN armour has been confirmed in experimental tests using several types of HEAT warheads and EFP charges.



Recoilless Anti-tank Missile Launcher RPG-75-M

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

The RPG-75 M is a recoilless launcher with an armor-piercing projectile, designed to combat tanks and armored structures. The weapon has a telescopic design.

Length in transport position is only 630 mm.

Length in firing position is 890 mm

RPG-75 M is able to destroy objects with 300 mm armor from a range of 300 m.



Recoilless Launcher for Thermobaric-cumulative Missiles RPG-75-MP

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

The RPG-75-MP dual-purpose recoilless launcher fires a thermobaric / cumulative projectile. The dual purpose of the projectile is achieved by forming the thermobaric explosive into a cumulative charge. The thermobaric cumulative charge is activated by impact fuze with a self-destruct mechanism.

The RPG-75-MP is designed to combat armored vehicles (cumulative effect), hardened targets (cumulative and thermobaric effects) and enemy personnel (thermobaric effect).

The weapon has telescopic design.



Recoilless Thermobaric Missile Launcher

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

The RTG is a recoilless launcher firing a thermobaric projectile, designed for destroying bunkers and other field fortifications. The sighting device has been designed for precise firing at the range of 300 m with temperature compensation. The RTG has a telescopic design.

Length in transport position is only 630 mm. Length in firing position is 890 mm.

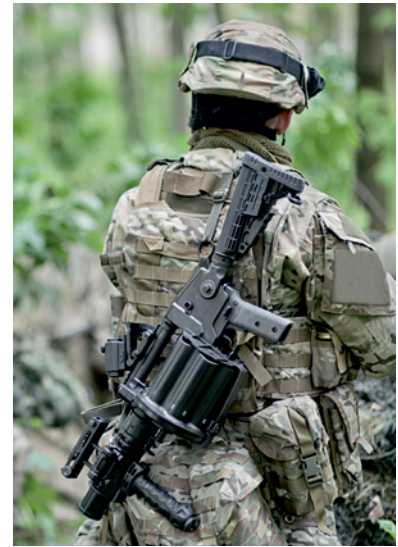
Operation of the weapon is very simple, the instructions for use are placed on the launcher's tube. The training version of the launcher - RTG-Sk is designed for teaching basic operation, aiming and maneuvering. The practice version of the launcher – RTG-Nh (Projectile filled with inert material) is designed for practicing accurate shooting.

RGP 40 Multi-shot Grenade Launcher

Zakłady Mechaniczne "Tarnów" S.A. (PGZ) ► p. 369

The weapon is designed to incapacitate and combat enemy forces, destroy technical equipment, buildings, squad automatic weapons and other support weapons, lightly armored vehicles, as well as, creating smoke screens and other non-lethal actions. RGP-40 is semi-automatic six-shot design that shoots grenades caliber 40 mm x 46 NATO. It has integrated drum with six chambers, each 140 mm long,

which allows the use of wide range of ammunition, including special ammunition. Appointed with three rails on the cover for mounting additional accessories. The grenade launcher's firing capabilities allow it to cover with fire an area of 20x60 m dimension on a distance of 400 to 800 meters.



SA-35 – Self-Propelled Gun System

PIT-RADWAR S.A. (PGZ) ► p. 351

State of the art combination of AM-35 mm superior fire power, integrated with a programmable munition system, an independent optoelectronic target tracking system ZGS-35, the Hybrid Fire Control System with the TUGA radar and optoelectronic sensors, as well as a highly mobile third-generation 6x6 JELCZ platform. Developed for a dynamic change of a combat position with an intention to engage winged and rotary aircraft, cruise missiles and UAVs.

- Versatile air defence solution (effective against a wide spectrum of air targets)
- Operation range in Elevation from -10° to 85° and $n \times 360^{\circ}$ in Azimuth
- Range up to 5000 meters
- ZGS-35 tracking head features daylight and thermal imaging cameras, laser rangefinder and a short range interrogator



SHAPE CHARGE

Military Institute of Armament Technology ► p. 345

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

The Shaped Charge is a combat means which is designed to perform engineering work, destroy/damage military equipment, neutralize explosive objects, as well as to conduct unconventional activities (preparing IED).

The advantage of the Shaped Charge is its simple construction and effective impact on objects made of various materials (steel wood, concrete).

The way in which USC is designed guarantees complete safety of the user. USC can be handled safely by a soldier with only basic training in military engineering.

The charge performance stays unaffected after thermal or mechanical shocks.

TYPE 1 Shape Charge

- total mass: 811,6 g;
- dimensions: 93 x 168,5;
- mass of explosive: approx. 350 g;
- minimum penetration thickness of the armor plate: 180 mm;
- Initiation by:
 - electric primer;
 - powder cords;
 - shock tube system;
- casing: plastic.



TYPE 2 Shape Charge

- total mass: 1026,4 g;
- dimensions: 100x80x166,5;
- mass of explosive: approx. 350 g;
- minimum penetration thickness of the armor plate: 180 mm;
- Initiation by:
 - electric primer;
 - powder cords;
 - shock tube system;
- casing: plastic.



Sniper Rifle MSBS 762N cal. 7.62 x 51 mm (.308 Win)

Fabryka Broni "ŁUCZNIK" – Radom Sp. z o.o. (PGZ) ► p. 330

The MSBS GROT 762N designated marksman rifle is designed as a support weapon, enabling precise fire at distances of up to 1100 meters. The modular design of the rifle allows for easy adaptation to various operational requirements. The rifle features interchangeable barrels (available in 20" and 16" lengths), stock types, and a trigger mechanism (standard AR15). The rifle's modularity ensures full customization for both right- and left-handed users, enhancing comfort and operational efficiency. A key feature of the design is the Picatinny rail, integrated with the receiver in accordance with the STANAG 2324/

MIL-STD 1913 standard. This enables the attachment of various aiming devices, such as scopes, thermal sights, red dot and holo sights, night vision and mechanical sights.

Calibre:	7.62 x 51 mm (.308 Win)
Firing mode:	single
Range 20"/16":	1100 m/ 900 m
Weight 20"/16" without sights:	~5.4 kg/~4.5 kg
Number of grooves:	4 right twisted
Grooves Twist:	1:10-254 mm (10")
Barrel length:	20" (508 mm)/16" (406 mm)



Tactical Heads for Unmanned Aerial Vehicles

Bydgoskie Zakłady Elektromechaniczne BELMA S.A. (PGZ) ► p. 321

Tactical heads are designed to combat lightweight armoured tanks and transporters, as well as shooters, machine-guns and resistance points.

The heads are configured for integration with Unmanned Aerial Vehicles (UAV). The integration is carried out in terms of: mechanical, electrical, functional and IT aspects, ensuring proper exchange of data and signals between devices. A UAV equipped with tactical heads enables the monitoring of

the foreground, guiding and carrying out combat and drill fire tasks. The assembly and handling are performed by one operator. The heads are available in HE, HEAT, thermobaric, drill and mock-up versions. Each of the heads may be set and dismantled repeatedly during the flight, ensuring that the mission can be cancelled, interrupted or changed at any time. The heads may also be detonated at any time at the discretion of the operator.

GX-1 DG HEADS

Specifications	High Explosive head GO-1 DG HE	High Explosive Anti Tank head GK-1 DG HEAT	Thermobaric GTB-1 DG FAE	Training GO-1 DG HE-TR
Head weight	1000 g	1000 g	1000 g	1000 g
MW type	A-IX-1	OCTOGEN	TBX	INERT
Striking/piercing range	30 m	200 mm RHA	10 m	---
Diameter		62/72 mm		
Length		185 mm		
Power supply		12 V		
Daytime camera resolution		640 x 480 pix		
Centre of gravity		93,5 +/- 2 mm		

GX-1 TYPE HEADS

Specifications	High Explosive head GO-1 HE	High Explosive Anti Tank head GK-1 HEAT	Thermobaric GTB-1 FAE	Training GO-1 HE-TR
Head weight	1450 g	1450 g	1450 g	1450 g
MW type	A-IX-1	OCTOGEN	TBX	INERT
Striking/piercing range	12 m (30 m)	180 mm RHA	10 m	--
Diameter		98/122 mm		
Length		210/226 mm		
Power supply		12 V		
Daytime camera resolution		640 x 480 pix		
Centre of gravity		67.5 +/- 2.5 mm		

GX-2 TYPE HEADS

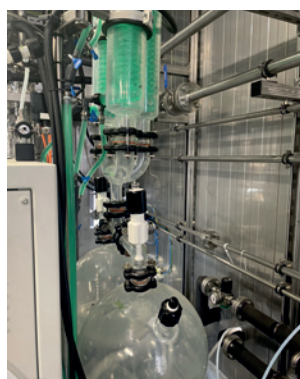
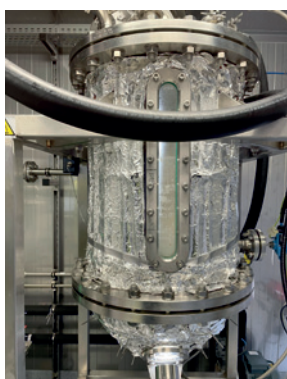
Specifications	High Explosive head GO-2 HE	High Explosive Anti Tank head GK-2 HEAT	Thermobaric GTB-2 FAE	Training GO-2 HE-TR
Head weight	4800 g	4800 g	4800 g	4800 g
MW type	COMP-B	OCTOGEN	TBX	INERT
Striking/piercing range	50 m	700-800 mm RHA	50 m	--
Diameter		140/150 mm		
Length		260/280/305 mm		
Power supply		12 V		



Licensed product

TECHNOLOGICAL LINE FOR HTPB (hydroxyl-terminated polybutadiene) PRODUCTION

Jakusz Sp. z o.o. ► p. 337



- Applications of HTPB
 - military eg. improving properties of propellants (binder to solid rocket motors), PBX compositions,
 - civil eg. rubbers industry (car tyres).

TURN-KEY LINE

- high quality of manufactured products as per military standards – compliance with MIL-P-82809 standard,
- line enables production of HTPB R-45M Resin,
- production lines in stationary or transportable (containerized) versions,
- full scope of delivery from design to start-up,
- modern equipment performed according to the EU standards,
- technological solutions and process logic ensuring high safety for people and the environment,
- modern control system based on PLC,
- 2 sublimes among 1 line for alternate production of HTPB as per MIL-P-82809,
- line capacity: 60 kg/shift (by 2 sublimes),
- required personnel: 3 persons,
- special safety system for reduction of any overpressure, incineration at the flare of butadiene residues & residual gases.

Production line is batch type and undergoes 4 stages:

- 1ST STAGE – polymerization of 1,3-butadiene in presence of hydrogen peroxide and isopropanol as a solvent occurs.
- 2ND STAGE – gravity separation of post-reaction mixture and washing.
- 3RD STAGE – evaporation of purified HTPB for removal of impurities, drying.
- 4TH STAGE – stabilization of purified HTPB and its transfer to a storage tank.

TNT

Zakłady Chemiczne “Nitro-Chem” S.A. (PGZ) ► p. 368



TNT IN FLAKES

Blasting explosive widely applied for filling of artillery missiles, mines and other military applications as well as for production of industrial explosives e.g. boosters, demolition charges

TNT IN SOLID PIECES

Blasting explosive applied for production of cast charges. Usage of TNT in solid pieces improves the density of the cast charge and eliminates the risk of cavities which degrades the quality of the charge.

Compositions:

TNT+HNS: 99,5% TNT, 0,5: HNS



UKM 2020S General-purpose Machine Gun

Zakłady Mechaniczne “Tarnów” S.A. (PGZ) ► p. 369

UKM 2020S General Purpose Machine Gun fed with 7.62 x 51mm NATO from M13 disintegrating belt serves as the all-purpose tool for combating variety of threats. Thanks to its high rate of fire and long range, it can

be used to effectively incapacitate enemy forces, squad automatic weapons and other support weapons and technical equipment, which contributes to providing safety for soldiers. Ergonomic construction of the gun,





foldable and regulatable buttstock as well as the ability to regulate the height of the bipod allow for adjustment to personal needs and preferences for the soldiers of different physique. UKM 2020S by being a general-purpose machine gun makes it possible to be used in variety of operations – ranging from difficult mountain terrains

to dynamic urban combat on the streets of a city, as well as special operations. Thanks to its versatility and high effectiveness it is an invaluable asset for soldiers, by being an effective weapon regardless of the fighting environment.





UŁK Universal Shaped Charge

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. ► p. 371

The UŁK universal cumulative charge is designed to make a single firing shelter in hard and frozen ground by means of explosive action.

The composition of the UŁK includes:

- one UŁK cumulative charge made of two pressed bricks made of A-IX-1, one booster and a cumulative liner, placed in a plastic housing
- two charges of PMW plastic explosive
- one holder and friction igniters

The cumulative charge may be initiated by a powder fuse or an electric igniter.

VIS 100 Cal. 9x19 mm The Semi-Automatic Pistol

Fabryka Broni "ŁUCZNIK" – Radom Sp. z o.o. (PGZ) ► p. 330



The 9 mm semi-automatic pistol has been designed in Poland for military and law enforcement personnel. Due to its modern design it can be carried with a chambered round in completely safe, accelerating the firearms response to a scenario. The pistol is an ergonomically shaped, reliable and fast-pointing. It features high-contrast day-and-night sights and high-capacity magazine; and it is also fully ambidextrous. The Tenifer metal coating assures maximum protection of the metal parts against abrasion and corrosion – as well as attractive looks. The frame features a mil-std 1913 (Picatinny) compatible rail, enabling attaching tactical lights or laser sighting equipment.

Technical data:

Calibre:	9 x 19 mm
Trigger system:	Single Action / Double Action
Trigger pressure:	25N (SA) / 50N (DA)
Trigger path:	~ 7 mm (SA) / ~ 14 mm (DA)
Magazine capacity:	15 rounds

Dimensions:

Height:	136 mm (without magazine)
Length:	197 mm
Width:	32 mm
Barrel length:	110 mm
Sight length:	156 mm

MASS:

Weight without magazine:	695 g
--------------------------	-------

WKM-Bm/NSW-UTIOS Heavy Machine Gun

Zakłady Mechaniczne "Tarnów" S.A. (PGZ) ► p. 369

High-caliber WKM-Bm Heavy Machine Gun is an automatic weapon fed with 12.7 mm x 99 NATO (.50 NMG). It can be used as the weaponry for remotely controlled weapon modules ZSMU and placed on different types of bases: pillar, tank turret, vehicle rotating turret, universal tripod, tripod for a ground use. WKM-Bm machine gun is an automatic weapon designed for destroying lightly armored targets, squad automatic weapons and other support weapons, low flying air targets and enemy forces (also behind light cover).

Machine gun has the following features:

- Light, modern construction in comparison to other machine guns of the same caliber
- Light weight in comparison to other machine guns in the world
- High rate of fire
- Reliability
- Easy to use and maintain
- Manufactured as standard with technology to protect against humid climate and sea waters



WLKM 12.7 Multi-barrel Machine Gun

Zakłady Mechaniczne "Tarnów" S.A. (PGZ) ► p. 369

The WLKM Multi-Barrel Machine Gun is an advanced externally driven electric-powered weapon based on the Gatling system, fed with 12.7x99 mm NATO (.50 BMG) loaded on M9 disintegrating ammunition belt. Four spinning barrels used in the machine gun allow to achieve maximum rate of fire at the level of 3600 rounds per minute. The WLKM is a module construction what makes it able to be easily integrated with various combat platforms. It can be used on fixed as well as mobile firing stations, as weaponry for land vehicles, watercrafts or remotely controlled weapon modules. Thanks to its versatility the WLKM works well in a variety of operating environments.

The weapon is designated to combat manpower, ground and air targets with different resistance parameters. The WLKM finds its use in protecting from unmanned combat aerial vehicles, naval mines and rocket missiles, functioning also as a weaponry of last chance. The WLKM Multi-barrel Machine Gun is an answer to the armed forces needs for modern weaponry with high stopping power and density of fire. Thanks to its innovative design and wide range of application the WLKM is a key element of modern military equipment.



ZMT WKW-50 Large Caliber Sniper Rifle

Zakłady Mechaniczne "Tarnów" S.A. (PGZ) ► p. 369

Bolt-action sniper rifle ZMT WKW-50 was designed for precision shooting at targets up to 1700m distance, and effective destruction of technical equipment within 2000m. The weapon is highly workable against:

- Lightly armored all-terrain vehicles
- Field targets reinforced with light improvised shields
- Grounded airplanes and helicopters
- Radiolocation stations
- Technical and optoelectronic devices

The rifle is equipped with highly effective muzzle device, which reduces the vertical and horizontal recoil by as much as 70%. Thanks to the bullpup design, the rifle is equipped with one of the longest barrels available on the market. Such form allows greater maneuverability and easier use of the rifle in a limited space. ZMT WKW-50 is a powerful and reliable tool for snipers who expect the highest precision, stopping power and ergonomics in every operating environment.



ZSMU A3/A3B/A5 Remotely Controlled Weapon Station

Zakłady Mechaniczne "Tarnów" S.A. (PGZ) ► p. 369



The ZSMU-1276 A3, ZSMU-1276 A3B, and ZSMU A5 are modern remote-controlled weapon modules that enable vehicle and facility crews to effectively conduct accurate fire from within the vehicle or facility, minimizing risk to operators. Both systems are designed to support ground units, neutralize enemy personnel, technical equipment, lightly armored vehicles, and engage low-flying aerial targets both during the day and at night, regardless of weather conditions.

The modules are armed with 7.62 mm machine guns (UKM-2000C) in the ZSMU A3 variant and 12.7 mm machine guns (WKM-Bm) in the ZSMU A3B variant. The ZSMU A5 can be equipped with both weapon types. Depending on the configuration, their weight ranges from approximately 165 kg to 190 kg. The integrated fire control systems, weapon and camera stabilization, and automatic target-tracking systems allow for effective engagement of stationary, moving, and small aerial targets with high accuracy, even when the vehicle is moving at speeds of up to 60 km/h on unpaved roads.

All modules are equipped with daytime and thermal cameras, laser rangefinders, and optical target-tracking systems, integrated into a compact unit with a self-cleaning function. The modules can be integrated with vehicle systems such as meteorological stations and radiation detection systems. In case of failure or power loss, manual control remains available.

The ZSMU modules are designed for installation on various platforms, including wheeled armored personnel carriers, off-road vehicles, specialized vehicles (both wheeled and tracked), stationary facilities, and naval units. They are currently in use on vehicles such as the KTO ROSOMAK in reconnaissance, technical, and con-

tamination detection variants, as well as other combat units. These systems ensure precision, versatility, and safety, enabling combat operations in all terrain and operational conditions.



COMPANIES

Advanced Protection Systems S.A.

CONTACT

apsystems.tech

e-mail: sales@apsystems.tech

Kadłubowców 4

81-366 Gdynia, Poland

tel.: +48 784 329 302; +48 509 014 666



advanced
protection
systems



Advanced Protection Systems (APS) is a fast-growing Polish high-tech company, founded by two scientists: Maciej Klemm PhD and Radosław Piesiewicz PhD. APS develops the groundbreaking FIELDctrl 3D MIMO radars and, based on these radars, the SKYctrl anti-drone system, which effectively detects, tracks, classifies and counteracts unmanned aerial vehicles (UAVs). In addition, the use of ML algorithms makes it possible to automatically distinguish between birds and drones. FIELDctrl and SKYctrl have been developed entirely in Poland, and are the intellectual property of the company.

With a team of over 150 technology, military and business experts, scientists, engineers and programmers, Advanced Protection Systems independently designs, manufactures and implements every component of the technology—antennas, electronics and mechatronics—as well as software, assembly, testing and final implementation. APS also provides network-centric software (CyView C2). Any sensor or effector can be integrated. APS is flexible – it is not limited to specific solutions as it develops technologies in-house.

Our solutions are designed to protect human lives, military assets, and critical infrastructure in strategic locations. Worldwide, SKYctrl protects critical national infrastructure such as refineries, airports and seaports as well as military bases and government buildings from drone threats. APS is also a strategic supplier of SKYctrl systems to the Polish Armed Forces. The cooperation with the Polish Armed Forces was preceded by a series of rigorous tests aimed at selecting the best technology and CUAS system to protect Poland from drone threats. SKYctrl systems are also being supplied to the Ukrainian Armed Forces to defend against all classes of drone threat, including the Shahed 136. The adoption of SKYctrl by the Polish Armed Forces as well as the Ukrainian Armed Forces provides credible evidence of SKYctrl's role in protecting the airspace in conflict zones or in peacetime.

APS has won many prestigious awards, including the President of the Republic of Poland's International Achievement Award, the Armed Forces Operational Command Award at the 30th International Defence Industry Exhibition (MSPO 2022) in the Force Protection category for the SKYctrl container system, and the Defender Award at MSPO 2018.

Most important achievements

- Polish Armed Forces – SKYctrl is used in the Integrated Air Defence System
- Avinor, Norway – protection of Stavanger Airport
- SKYctrl systems are in service with the Ukrainian Armed Forces in support of the fight for independence

Key products and services (approved for export)

Advanced Protection Systems has developed several versions of the FIELDctrl 3D MIMO radar and the SKYctrl system to meet different expectations and needs of its partners

FIELDctrl 3D MIMO radars:

- Advance
- Range
- Runway
- Ultra

SKYctrl anti-drone system:

- SKYctrl S
- SKYctrl L
- APS&MSI DS-MSI-DS TERRAHAWK PALADIN
- SKYctrl Interceptor Drone

CyView C2

■ **CyView C2** ► p. 129

■ **FIELDctrl 3D MIMO Radars – Advance, Follow, Range, Runway and Ultra** ► p. 228

■ **MSI-DS TERRAHAWK PALADIN** ► p. 86

■ **SKYctrl Interceptor Drone** ► p. 89

■ **SKYctrl L Containerized system** ► p. 90

■ **SKYctrl Omnidirectional FPV drone neutralizer** ► p. 91

■ **SKYctrl S Containerized system** ► p. 91

Air Force Institute of Technology

(Instytut Techniczny Wojsk Lotniczych – ITWL)

CONTACT

www.itwl.pl
e-mail: poczta@itwl.pl
Księcia Bolesława 6
01-494 Warszawa, Poland
tel.: +48 261 851 300



Air Force Institute of Technology (AFIT) is a research organization supervised by the Minister of National Defence. Its mission is to support the operation of aeronautical engineering. The contribution of the Air Force Institute of Technology to the development of aviation is mainly due to reliability and flight safety works. National and international achievements include hundreds of scientific-research, experimental-design manuscripts, which were applied in the Polish Air Force.

Research areas:

- On-ground and in-flight tests
- Diagnostics systems for aeronautical engineering
- Supporting operation control
- Simulation and modelling
- Integration of avionics systems
- Aircraft armament
- Reconnaissance and training systems
- C4ISR systems integration
- Unmanned Aerial Systems
- Composite structures
- Diagnostics of airfield and road pavements
- Testing of petroleum and working fluids
- Products testing and certification

Key products and services

- Aircraft armament
- Unmanned Aerial Systems
- C4ISR systems integration
- Supporting operation control

■ MUP-RESCUE PACK MARINE PILOT SUIT ► p. 272

AIR-POL Sp. z o.o.

CONTACT

air-pol.com.pl
e-mail: air-pol@air-pol.com.pl
Olszankowa 52
05-120 Legionowo, Poland
tel.: +48 22 774 07 11



Design, production, research, sale and delivery of military and civilian use parachutes and high-altitude rescue equipment, comprehensive maintenance of parachute and Automatic Activation Devices.

Design and delivery of devices supporting the parachute training process, including jumping and open canopy flight simulators.

The most important achievements

- Supporting Member of PIA (Parachute Industry Association)
- Member of National Aviation Council the Association of Polish Aviation Industry
- Holder of ISO 9001-2015, AQAP 2110.2016, Certificate in design, production and operation on parachute equipment, Combined Airworthiness Organization Certificate, Production Organisation Certificate, NATO Commercial and Government Entity Code NCAGE Certificate

Key Products and Services

- Basic Parachute Main an AD-95 series 3, Basic Parachute Reserve AZ-95 series 3
- Operational Parachute AD-2000
- Sport Parachute FENIKS S/F
- High Altitude High Opening Parachute System FENIKS MILITARY G9
- Supplier of Parachute Training Simulator SOKOL M

- AD-2000 Parachute System ► p. 196
- DEDAL (AD-95s.3 AZ-95s.3) series 3 Parachute System ► p. 201
- Feniks Future Parachute System ► p. 203
- Feniks Military G-9 Parachute System ► p. 204
- Feniks S Parachute System ► p. 205
- SOKOL Parachute Simulator ► p. 259

AMZ-KUTNO S.A.

CONTACT

www.amz.pl
e-mail: amz@amz.pl
Sklęczkowska 18
99-300 Kutno, Poland
tel.: +48 24 357 99 00



AMZ-KUTNO S.A. is a leader in the production of speciality vehicles and conversions based on commercial vehicles, operating since 1999.

It specializes in providing vehicles for the medical sector, uniformed services, value transport, and the army.

It offers ambulances, speciality vehicles, armoured transporters and other bespoke solutions, combining the latest technologies with an individual approach to projects.

AMZ-KUTNO S.A. is known for its high quality, innovative approach and enjoys recognition in both domestic and international markets.

The most important achievements

- Economic Award for the year 2021 in the Family Business category from the President of Poland, Andrzej Duda
- State Security Leader Award – 2022 for the LOTR vehicle
- Defender – LOTR 2022

Main services and products

- BÓBR 3
- TUR VI
- ŻUBR
- Armored vehicles such as: Jeep, Toyota land cruiser, etc
- 4-stretcher ambulance
- Police vehicles

- BÓBR – A modern 4x4 amphibious armoured vehicle ► p. 102
- TUR VI ► p. 121

AP-FLYER

CONTACT

ap-flyer.pl
e-mail: info@ap-flyer.pl
Żegańska 2d
04-713 Warszawa, Poland
tel.: +48 22 613 04 87



The AP-FLYER company has been operating on the market since 2007. Initially, the main activity of the company was VIP air services. Over time, the activity has expanded to professional implementation (integration) of modern

technologies, IT products and services – a broad range of computer and telecommunication equipment, as well as products and services related to security and biometrics. The company is an authorized distributor and representative of leading manufacturers offering advanced solutions for business, uniformed services, industry or health care. We also offer our own rugged notebooks and laptops under the brand MILBOOK.

AP-FLYER offers systems and devices for EMC laboratories.

We cooperate with the leader in the field of installation of anechoic chambers used to test antenna systems and all devices, and vehicles for compliance with electromagnetic compatibility directives. AP-FLYER is the only Polish company that has successfully built several chambers which meet the SDIP-27/2 NATO standard.

Since 2015 we have been building a cutting-edge, multi-sensor drone detection and neutralization system MADDOS. As an experienced technology company we design and manufacture main components such as passive RF sensors and active jammers. The brain of MADDOS system is an advanced C2 system, which is being developed in-house and where we integrate 3rd party sensors and effectors.

At the beginning of 2020, we opened a new department in the company that deals with the design and construction of unmanned aerial vehicles with vertical take-off and landing (VTOL) capability for ISR missions.

The company holds the following certificates: ISO 9001:2015 and WSK (Internal Control System).

Major achievements

- Dozens of MADDOS C-UAS systems implemented in the EU, African and Asian countries.
- MADDOS UAVs are in service in African and Asian intelligence agencies for border security.
- As a technology company we have quickly adapted our systems to fit in the modern battlefield, based on experience from recent worldwide conflicts.

Main services and products

- VTOL UAV 600h surveillance drone
- VTOL UAV 350e surveillance drone
- Portable C-UAS systems
- MADDOS (Multi-sensor Automatic Drone Detection&Observation System)

■ MADDOS Multi-sensor Automatic Drone Detection & Observation System ► p. 51

■ MADDOS VTOL Vertical take-off and landing UAV

VTOL 600h ► p. 52

VTOL 350e ► p. 53

■ PORTABLE C-UAS SYSTEMS

Handheld jammer (Handheld-9 Drone C-UAS ► p. 57

Manpack jammer (Manpack-9 Drone C-UAS) ► p. 57

Vehicle protection system (MADDOS MDP) ► p. 57

ARMPOL Research and Development Company

CONTACT

www.armpol.com.pl

e-mail: info@armpol.com

Krubki-Górki 32

05-326 Poświętne, Poland

tel.: +48 22 799 94 04



ARMPOL conducts development and implementation works and manufactures various types of products in the field of mechanics, electrical engineering, electronics, hydraulics and pneumatics. ARMPOL mainly offers products for special purposes, including military ones. The main areas of activity include: special containers, air-conditioning systems, filter-ventilation systems and power generating sets.

Depending on the construction details and the basic and specialist equipment used, the containers are intended for use as: command and communication centers, command and social centers, storage and energy centers, energy centers, maintenance and repair workshops, medical, specialist laboratories, decontamination stations, canteens, laundries and others.

The special products offered by ARMPOL have the required tests and the necessary attestations and certificates, as well as agreed or approved technical documentation for production. The production is monitored on an ongoing basis and received by the Regional Military Representation. ARMPOL has a concession from the Ministry of Interior and Administration for the design, production, storage and trade of special products for the needs of the Ministry of National Defence.

The company has got the following certificates: ISO 9001:2015 and WSK (Internal Control System).

The most important achievements

Defender Awards at International Defence Industry Exhibition MSPO in Kielce:

- in 2013 y. – Aviation Workshops Container Set designed for airplane and helicopter maintenance and repair type KWL.SX-02
- in 2006 y. – Mobile Command Post Container Set type MMSD
- in 2003 y. – Vehicle Air Filtering And Ventilation Unit type UFS.B2.01-100FW

Key products and services

- Vehicle Air Filtering And Ventilation Unit type UFS.B2.02-100FW/24V,w,02A
- Mobile high-capacity evacuation ferry PEP.30-01 type

■ Mobile high-capacity evacuation ferry PEP.30-01 type ► p. 208

■ Vehicle Filtration and Ventilation Unit UFS.B2.02-100FW/24V,w,02A ► p. 217

Asseco Poland S.A.

CONTACT

asseco.pl

e-mail: infoprw@asseco.pl

Olchowa 14

35-322 Rzeszów, Poland

tel.: +48 502 737 490

asseco



Asseco – Technology for Business. Solutions for People.

Asseco is the largest IT group in Poland and Central and Eastern Europe, with over 30 years of experience in developing advanced software for key economic sectors. It leads in IT solutions for defence and uniformed services, creating innovative software for military and public security institutions.

Asseco offers systems for intelligence support, border control, and logistics, enhancing efficiency for military and border guard services. Its solutions include crisis management systems, mission support, and near real-time data integration and processing analytical tools. Collaborating with military and public security institutions, Asseco supports complex operations and ensures high-level security.

Most important achievements

- Comprehensive Defence Solutions: Asseco enhances global security with cutting-edge technologies in cybersecurity, border integration, and situational awareness.
- Trusted Partner: over 70 successful projects for NATO, EU, and global agencies.
- Proven Expertise: advanced solutions in image analysis, unmanned systems, and space technologies.
- Certified Security Leader: industrial and personnel security certifications.

Key products and services

- Interoperable sharing of data within the NATO Coalition (CSD EP System Client)
[<https://pl.asseco.com/en/sectors/public-institutions/csd-ep-system-client/>]

■ CSD EP System Client ► p. 128

AUTOCOMP MANAGEMENT Sp. z o.o.

CONTACT

ac-m.pl

e-mail: biuro@autocomp.com.pl

1 Maja 36

71-627 Szczecin, Poland

tel.: +48 91 462 40 84; +48 91 820 73 61


AUTOCOMP // MANAGEMENT
CENTRUM BADAWCZO-ROZWOJOWE



ACM Sp. z o.o. is an internationally operating manufacturer and supplier of technologically advanced systems to support training processes for the national defense and uniformed services sectors, as well as for the rail, road and water transportation industries. Autocomp is also a manufacturer of dedicated specialized automation projects for industry and the Polish Navy, as well as instrumental optics solutions.

The company has its own research and development facilities including laboratories for information technology, electronics, optics and mechanics. Many proprietary solutions have been patented and implemented in company's original products. Autocomp has the status of a Research and Development Center. All of the company's solutions have been successfully implemented in the Polish Armed Forces.

Autocomp's key business lines are:

- Military training and training systems;
- Training vehicle simulators;
- Automation and control projects;
- Instrumental optics solutions.

Autocomp Management's solutions are open systems and can be delivered either as standalone modules, subsystems for third-party training platforms, or allow third-party training simulator modules to be included.

Autocomp's largest foreign partner is Germany's Krauss Maffei Wegmann (KMW) for which the company supplies simulators of the entire Leopard 2A tank family and vehicles based on those chassis. In 2022, Autocomp Management, as the only Polish private entity, was qualified by the US Department of Defense to participate in Lockheed Martin projects.

The following projects completed by Autocomp Management deserve special mention:

- ŚNIEŻNIK – a military combat training support system
- A comprehensive shooting simulator for the APC Rosomak crew in a platoon version
- POJEDYNEK – a civilian shooting training system
- WSB04 – wireless control system with feedback
- PPZR Grom/Piorun – training simulator for shooters of the Grom/PIORUN portable anti-aircraft missile system
- DP system – ship's dynamic positioning system

- Combat Training Support System "ŚNIEŻNIK" ► p. 245
- Complex Tactical and Fire Simulators for Crews of Combat Vehicles and Tanks in the Platoon Version ► p. 246
- Optical Sights Simulators for Military Equipment ► p. 255
- Ship's Dynamic Positioning System ► p. 238
- Wireless Control System WSB-04M for Battlefield Areas ► p. 261

B4 Limits Sp. z o.o.

CONTACT

b4limits.com/en

e-mail: support@b4limits.pl

Świętego Rocha 10/2

15-879 Białystok, Poland

tel.: +48 533 338 159



B4 Limits Sp. z o.o., ("B4L") located in Białystok, Poland, has over 10 years of jamming experience in the field of radio frequency jamming culminating in the introduction of the fully Polish made and designed Defender line of Wideband jamming products in 2023. The experience gained in jammer development for our external partners over years, starting in 2015, allowed B4L team of highly qualified, PhD level engineers access to various jamming systems and platforms used by NATO allies, as well as, other recognisable special forces and VIP's. As a result of this experience and growing interest in UAV jamming the company made a decision in 2021 to begin the development of its own products in the form of the Defender line of products, predominantly dedicated to UAV, prison and telecommunications jamming.

The B4L team consists of over 30 engineers, 15 of whom actively contribute to the creation and development of Defender brand jammers. B4L foundation of jamming development is deeply grounded in countless hours of hands-on field testing supplemented by extensive lab testing. As a result, and because of this experience B4L is also a preferred development partner in the RF jamming space for a number of well-known external companies, located in the EU, Switzerland and the Middle East.

The Defender CUAV jammers are known in Ukraine and have twice appeared at Anaconda Military Exercises in 2023 and 2024 towering above competition.

Key Products & Services

- Defender Wideband fully Reactive jammers with full bandwidth coverage (dependent on the amount of real-time bandwidth ordered) between 20 MHz – 8 GHz in manpack, mobile or stationary versions completed according to client's specification;

- Antennas for Jamming application;
- Battery and Accessory development for Jamming;
- Software & Hardware development;
- RF related Mechanical Engineering.

■ Defender Wideband RF Jamming Product Family ► p. 227

BORIMEX Sp. z o.o.

CONTACT

www.borimex.pl

e-mail: borimex@borimex.pl

Borowa 110A

39-305 Borowa, Poland

tel.: +48 17 581 05 30



Borimex is a manufacturer of technologically advanced products and components for the Armed Forces and entities of the Polish Armament Group.

Borimex, with nearly 50 years of experience, has been working with the Polish Armament Group (PGZ) for two decades, providing components and technological solutions for the defence sector. The company has implemented NATO requirements regarding quality assurance AQAP 2110 and operates based on a license from the Ministry of Interior and Administration with the number B-010/2008. The company specializes in the design and production of hydraulic winches, other parts and assemblies for vehicles, armored steel components, structural elements of vehicles, such as suspensions, hydro drive components, hydraulic, pneumatic, and electrical assemblies. The quality of products is confirmed by military acceptances, conducted by local Military District Representatives.

The primary objective in working with the business partners is to ensure close collaboration at every stage of product development. Borimex Research & Development Department works closely with the design engineering teams of its partners to deliver solutions that are fully customized and meet specific needs.

The products are tailored both in terms of usability and functionality, while fully complying with all the requirements set by the end customer.

Borimex cooperates with universities. These academic partnerships infuse its endeavors with fresh perspectives, groundbreaking research, and a continuous influx of innovative ideas.

They bridge the gap between theoretical knowledge and practical application, ensuring that the company stays updated with the latest in scientific advancements while cultivating a culture of perpetual learning and adaptation.

In response to a growing market demand, a line of Gomander silencers by Borimex was created, dedicated to uniformed services, sports shooters and hunters. These silencers, are the only ones to have a patented QD-Lock solution and are designed with the Reduced Backpressure System. Gomander conducts a lot of research of gun silencer designs and performs calculations using the Finite Element Method.

Most important achievements

- Obtaining:
 - the AQAP Certificate and Internal Control System Certificate, AQAP 2110
 - CONCESSION OF MINISTRY OF INTERNAL AFFAIRS No. B-010/2008
 - NATO CODE NCAGE 1835H
 - INTERNAL CONTROL SYSTEM W-253/1/2013
 - ISO 3834-2 (Welding)
 - ISO 15085 (Welding)
- Expanding the range of hydraulic winches such as central assembled and side from 7T up to 30T
- Creating a new brand of Gomander silencers that have been subjected to tests and examinations conducted by, among others, Military Institute of Armament Technology (WITU).
- Developing an innovative electric off-road vehicle and autonomous platform.
- Involved in the precision machining of an autoclave table designed for measuring panels assembled in space satellites.
- Implementing Robotized Station with dimensions of 17m x 8m.
- Production of independent and stub axles based on the client's documentation and implemented for heavy-duty vehicles, armoured transporters, and fire brigade vehicles in POLAND, FRANCE, IRELAND AND USA.

Key products and services

- Borimex hydraulic winches (with a pulling force of 70kN, 100kN, 82kN, 119-130kN, 240kN).
- Borimex gearing system – company supports production in the area of gears and transmissions-both to meet customers' needs and manufacture of its own products.
- In-house supply chain excellence (technology & planning, material purchasing, cutting/bending, welding, small & large machining, shot blasting/painting, sub-assembly/assembly.
- Own Research & Development Department (which works closely with the design engineering teams of its partners to deliver solutions that are fully customized and meet specific needs).
- Types of assembly: pneumatic, electrical, hydraulic, mechanical.
- CNC Measuring Machine – Zeiss Accura Inspection (Measuring scope 1800 x 1200 x 1000 mm)
- Welded constructions, vehicle frames, independent suspensions, stub axle, hydraulic winches, armoured doors, hydraulic & fuel tanks, stainless steel tanks for fire protection systems, break discs.
- Parts and assemblies for armoured vehicles, including hatches, ammunition boxes, ballistic shields, vehicle silencers, carriages, cradles, winches, armoured doors, breakwaters, back propeller, turret elements, hydro drives components, hydraulic, pneumatic and electrical elements.
- Gomander silencers brand with Reduced Backpressure System and BLOW BACK reduction in the Tactinox QD-Lock products.

- BORIMEX GEARBOXES RANGE ► p. 99
- GOMANDER TACTINOX QD LOCK SILENCER ► p. 289
- HYDRAULIC WINCHES ► p. 106

Bydgoskie Zakłady Elektromechaniczne BELMA S.A.

CONTACT

belma.pl
e-mail: bze@belma.com.pl
Łochowska 69
86-005 Białe Błota, Poland
tel.: +48 52 36 36 201



Bydgoskie Zakłady Elektromechaniczne BELMA S.A. is among the oldest industrial plants in the Kujawsko-Pomorskie region. The company dates back to 1868. Starting as a locksmith plant, the company produced devices for the railway, automotive, defense industry, mining, and provided various types of industrial services. Currently, it is a modern entity in terms of technology and organization, able to meet the needs of demanding customers from Poland, the European Union and the world. It has appropriate technical and production potential and highly qualified team of experienced engineering and technical staff. The company has its own design offices. It employs specialists in the field of mechanics, electrical engineering and electronics designing modern products, using computer support systems in the design and production process as well as many years of experience in precise metal processing. For a number of years we have applied a management system which adheres to EN-ISO 9000 standards, fulfilling the highest quality demands of our customers.

Most important achievements

- Design and implementation of the SPŁW anti-tank mine
- Implementation into production of heads for unmanned systems
- Research and development work for the armed forces the latest result of which is BAOBAB-K

Main services and products

- CONTROLLED ANTI-TANK ANTI-VEHICLE MINES – SPŁW
- TACTICAL HEADS FOR UNMANNED AERIAL VEHICLES
- HEAT MINE FOR MANUAL LAYING – MR-123

- CONTROLLED ANTI-TANK, ANTI-VEHICLE MINES SPŁW ► p. 286
- HEAT MINE FOR MANUAL LAYING MR-123 ► p. 291
- TACTICAL HEADS FOR UNMANNED AERIAL VEHICLES ► p. 304

BZB UAS Sp. z o.o.

CONTACT

bzbuas.com
e-mail: sales@bzbuas.com
Międzyleska 4
50-540 Wrocław, Poland
tel.: +48 507 265 115



BZB UAS is a dynamically developing expert company with an established position on the Polish market, which offers innovative solutions that meet the expectations of the most demanding customers.

Our company is the official partner of ARDUPILOT and an authorized distributor of CUBEPILOT – the largest global brands related to unmanned systems. Based on almost 18 years of experience in the unmanned systems industry and programming, we have built a team of experts who provide professional advice when purchasing equipment and training in the use of educational stations.

The fundamental value of our business is an individual approach to each client and honesty and conscientiousness in the implementation of services, which is confirmed by numerous references and hundreds of satisfied customers.

Most important achievements

- VTOL (Vertical take-off and landing)

Key products and services

- ekoSKY 2.0

■ ekoSKY 2.0 ► p. 30

Centrum Rozwojowo-Wdrożeniowe Telesystem-Mesko Sp. z o.o. (Development and Implementation Center Telesystem-Mesko Ltd.)

CONTACT

telesystem.eu
e-mail: sekretariat@telesystem.eu
Warszawska 51, Lubiczów
05-082 Stare Babice, Poland
tel.: +48 22 722 00 15



The Development and Implementation Center TELESYSTEM-MESKO is a Polish leader in guidance systems for missile and ammunition technologies. It is the manufacturer of “smart” solutions designed for MANPADS GROM/PIORUN anti-aircraft missiles, Precision-Guided Munitions (PGM) of 155mm and 120mm calibers, and PIRAT anti-tank guided missiles (ATGM). We develop and produce unique photodetectors and photodiodes for MANPADS, ATGMs, and PGMs on a global scale, as well as specialized optics and complete electronics that constitute the “intelligence” of missiles and precision munitions—ensuring unmatched target engagement accuracy.

With the development of programs related to guidance using reflected laser radiation, we have created the Polish Laser Target Designator compliant with the STANAG 3733 standard, as well as a “silent” communication system based on “low-noise” laser rangefinders. As a result, we can offer comprehensive precision-strike systems.

We possess the capability to implement innovative solutions in the development, design, testing, and production of optoelectronic and electronic components for missile technology and “smart ammunition.”

Key Achievements of TELESYSTEM-MESKO:

- The “intelligence” systems for MANPADS GROM/PIORUN missiles.
- The “intelligence” systems for 155mm and 120mm PGMs and PIRAT ATGMs.
- The Mobile Missile System KUSZA, equipped with PIORUN MANPADS missiles, including an autonomous tracking and firing system.
- The Data Reading Device (UOD) for MANPADS PIORUN systems to enhance firing efficiency, as well as the Control and Measurement Station (SKP) for automated periodic inspections and repeated testing of missiles, launch mechanisms, and authorization keys for the PIORUN MANPADS systems.
- The UST-2 training devices for soldier instruction using portable anti-aircraft missile systems (MANPADS PIORUN).
- Laser Target Designators.
- “Low-noise” laser rangefinders, along with a laser-based “silent” communication system.

Key products and services

- Optoelectronics for GROM/PIORUN anti-aircraft and anti-tank missiles and for 155 and 120 mm precision-guided munitions
- „KUSZA” (CROSSBOW)
- Control and Measurement Station

- Control and Measurement Station ► p. 82
- Laser Target Designators ► p. 268
- Twin-Round Mobile Air Defence Manpads System „KUSZA (CROSSBOW)” ► p. 92

Centrum Techniki Morskiej PGZ

CONTACT

ctm.gdynia.pl
e-mail: sales@ctm.gdynia.pl
Dickmana 62
81-109 Gdynia, Poland
tel.: +48 735 999 748



OBR CTM has been providing technology for the Polish Navy and Armed Forces since 1982. It specializes in the design and integration of command and communications systems, data analysis and processing, as well as R&D activities.

CTM's modern Research Laboratories meet the latest market needs and promote innovations. The modernized infrastructure provides an optimal environment for testing electronic equipment in the scope of accreditation.

The company's international activities involve participation in NATO, European Union, European Defense Fund and European Defense Agency initiatives – including efforts focused on environment preservation. Current CTM's main field of development is critical infrastructure protection using the latest technologies to collect and aggregate data from multiple sources.

Key products and services

- Digital Baltic
- RKP-8100
- MLM-PROMIENICA

- Digital Baltic ► p. 131
- MLM – PROMIENICA ► p. 222
- RKP-8100 ► p. 141

Centrum Techniki Okrętowej S.A.

CONTACT

cto.gda.pl
e-mail: marketing@cto.gda.pl
Szczecińska 65
80-392 Gdańsk, Poland
tel.: +48 58 307 46 97



Centrum Techniki Okrętowej S.A. (CTO S.A.) is a modern, multidisciplinary research and design center, recognized internationally for its high-quality services and broad expertise. The company provides specialized solutions for both maritime and land-based industries, offering:

Key products and services

- Ship model testing
- Dynamic testing
- Sea trials
- Corrosion testing
- Cavitation and hydroacoustic testing of ship propellers
- Vibroacoustic testing and trials
- Fire resistance testing

- Design and manufacture of test and measurement equipment
- Product certification

CTO S.A. is committed to delivering cutting-edge research and development services, ensuring innovation, safety, and efficiency across multiple industrial sectors.

■ Dynamic testing ► p. 220

Creotech Instruments S.A.

CONTACT

www.creotech.pl
e-mail: kontakt@creotech.pl

Jana Pawła II 66
05-500 Piaseczno, Poland
tel.: +48 22 246 45 75



Creotech Instruments is a leading manufacturer of satellites, satellite subsystems, and quantum computer electronics. The company delivers proprietary solutions to governmental, commercial and research partners, such as the ESA, CERN, and the Polish Military. CTI's subsystems have performed flawlessly on more than 40 space missions.

Most important achievements

- MIKROGLOB: CTI-led Military Satellite Earth Observation System composed of four HyperSat microsatellites to be launched in 2027.
- PIAST: A constellation of three HyperSat nanosatellites for optoelectronic imaging reconnaissance, ordered by the Polish Military, with a planned launch in 2025.
- CAMILA Constellation: CTI is building a multi-sensor SAR & Optical Earth Observation constellation of at least 4 satellites for European Space Agency and Poland.

Key products and services

- Custom HyperSat modular microsatellite platform for Optical Earth Observation, SAR, Comms, SIGINT, PNT or Technology missions in the 20-200 kg launch mass range.
- ISO-9001, ECSS, ISO 7 certification
- Turn-key mission design, systems qualification, launch campaign and mission operations.
- Quantum Systems electronics design and manufacturing.
- Electronics Manufacturing Services.
- Transfer of knowledge and training.

- G6060 SST sCMOS camera ► p. 39
- HyperSat Eagle HR EO a 1-2m GSD high resolution Earth Observation microsatellite ► p. 42
- HyperSat satellite family Versatile, Reliable, and ITAR-Free Solutions ► p. 44
- HyperSat Seagull SAR Microsatellite ► p. 45
- White Rabbit Solutions: the sub-nanosecond time-synchronization switch for large distributed systems ► p. 149

Cryptomage Inc.

CONTACT

www.cryptomage.com
e-mail: jaroslaw.eitelthaler@cryptomage.com

Borowska 283b
50-556 Wrocław, Poland
tel.: +48 533 326 614



Cryptomage Inc. offers cutting-edge cybersecurity solutions with its Cryptomage Cyber Eye™ probe. This hi-tech ICT company specializes in Network Detection and Response, providing organizations with high-quality, technologically advanced tools.

Cryptomage Cyber Eye™ goes beyond traffic flow analytics, offering real-time anomaly detection and prediction based on network behavior. By analyzing protocol behavior, packet analysis, and host communications behavior, powered by ML and AI algorithms, it provides a unique approach to network traffic analysis.

Unlike many security solutions that focus solely on user and host behavior, Cryptomage Cyber Eye™ also incorporates unusual low-level network behavior. This comprehensive analysis enables organizations to identify, monitor, and triage traffic flows, connections, and potential malicious events, empowering security teams to enhance security and automate threat detection and prevention.

One of the key strengths of Cryptomage Cyber Eye™ is its ability to evolve and integrate with other security solutions, augmenting threat detection capabilities. With AI and ML at its core, the probe continuously adapts to emerging threats, ensuring robust protection.

Key features of Cryptomage Cyber Eye™ include real-time network monitoring, event management, real-time threat detection, a forensic module, and a GDPR module. These functionalities equip organizations with the tools to detect and predict hidden network traffic, botnet C2 communication, malware activity, 0-day attacks, and DDoS attacks.

Cryptomage Cyber Eye™ addresses various business challenges across industries such as financial services (banking, insurance), telecommunications (operators, providers), utilities (including critical infrastructure), government, military and uniformed services, manufacturing, healthcare, and pharmaceuticals. Its versatility makes it suitable for diverse sectors seeking comprehensive cybersecurity solutions.

The most important achievements

- The winner of the Polish edition of the European Cyber Security Organisation (ECSO) European STARTup Award 2022
- STARTup Award 2022, Audience Award, 2nd Place, European Cybersecurity Competition Out of the Box, organized by the European Cyber Security Organization (ECSO)

Key products and services

- Cryptomage Cyber Eye

■ Cryptomage Cyber Eye ► p. 154

Cybersecurity Foundation

CONTACT

cybsecurity.org

e-mail: kontakt@cybsecurity.org

Czyżewska 10

02-908 Warszawa, Poland

tel.: +48 22 11 20 800



The Cybersecurity Foundation (CSF) is a non-governmental organization founded in June 2010. Our mission is to raise awareness of cyber threats through education, cyber exercises, and professional events. We also conduct R&D in IT security and critical infrastructure protection. Our vision is to be a leading institution addressing evolving cybersecurity challenges.

CSF has extensive experience in cybersecurity exercises, including strategic (Cyber-EXE, since 2012) and operational (CERT Games, CTF). We also developed CyberBastion (initially Cyber Fortress), a strategy game designed to simulate a holistic security approach.

Since 2014, we have hosted the SECURITY CASE STUDY conference, focusing on the technical aspects of cybersecurity with an emphasis on case studies.

Most Important Achievements

- Organized 4 seasons of the CyberBastion League and training sessions.
- Conducted Cyber-EXE Polska exercises for the banking, energy, and telecom sectors.
- Hosted KSC-EXE 2020 & KSC-EXE 2024 National Cybersecurity Exercises.
- Organized the SECURITY CASE STUDY conference.
- Co-created cybersecurity courses with universities.

Key products and services

- CyberBastion

■ Cyber Bastion ► p. 154

DEMARKO S.A.

CONTACT

demarko-military.com
e-mail: mateusz.komarec@demarko.com
Kolonia Zygmunt 32B
41-909 Bytom, Poland
tel.: +48 601 768 066

DEMARKO.
MILITARY
VEHICLES



DEMARKO S.A. the company existing for 34 years specializes in production of dedicated products. Owner of the highest level of skills, covering the entire range of production process activities, starting from design and finalizing with sales of highly dedicated to a customer product. Products of own design were sold to customers in 12 countries always following individual and very particular requirements. Medium in size company situated in town Świętochłowice, south of Poland, employs over 200 well educated, engaged and dedicated engineers, technicians and workers. Formally owned and managed by the members of one family. Climbing up during all these years on the stairs of experience, DEMARKO S.A. successfully completed few re-organizations, adapting own structure of organization and production to the new, set intentionally targets and goals. Rewarded in consequence, between others, with ISO 9001:2015 and ISO 3834-2 certificates, implementing AQAP 2110:2016 was certified for production and delivery of military products of own design. Consequently, registered under NATO NCAGE number 99NMH. Currently, DEMARKO is involved in development and delivery of flexible, modular systems for military and supply logistics as well as customized solutions for transportation of specialized equipment. Becoming this way one between very few suppliers of the means dedicated for heavy duty transport, became the partner of the Army of Republic of Poland and supplier to countries – members of NATO.

Main services and products

- Semi-trailers of different sizes and configurations.
- Trailers of various configurations and applications.
- Multi stretches ambulances.
- Trucks of various different superstructure applications.
- Subcontracting of production capability.
- Production of metal components, parts, elements.

- AMBULANCE ► p. 174
- GENERAL PURPOSE TRUCK WITH CRANE ► p. 180
- SEMI-TRAILER ST555-20W.M and ST775-20W.M ► p. 186
- SEMI-TRAILER ST775-20W ► p. 188
- SEMI-TRAILER ST775-24W.H-PA ► p. 189

Enamor International

CONTACT

enamorint.com
e-mail: enamorint@enamorint.com
Mołdawska 9
02-127 Warszawa, Poland
tel.: +48 22 822 06 73



The company is delivering cybersecurity, IT, software and electronics to national and NATO military forces and critical infrastructure companies. We are implementing complex IT systems processing classified information for field, mobile and naval national and allied systems. We implement cybersecurity measures in Security Operation Center. Company is delivering tailored software products for data analysis, fusion, correlation and crawling of Internet and Darknet.

The most important achievements

- Participation in Alliance Ground Surveillance Battle Lab system for NATO AGS Forces
- Participation in Naval Strike Missile Coastal Defence System for Polish Marine Forces
- Cybersecurity system: data analysis and fusion, Internet and DarkNet monitoring, image/video analysis
- Security Operation Center implementation

Key Products and Services

- Network processor PLUMLA NGN (<https://plumla.com>)
- IT systems implementation and delivery including systems processing classified information for field and naval platforms
- IT security measures implementation
- Military communication and IT systems
- Analytical software for data processing, image/video analysis, cybersecurity threats detection, Internet and DarkNet monitoring
- Security Operation Center implementation – packet analysis and threat detection

■ Plumla-NGN ► p. 161

■ WRK-01 ► 149

Enigma Systemy Ochrony Informacji Sp z o.o.

CONTACT

enigma.com.pl

e-mail: biuro@enigma.com.pl

Jutrzenki 116

02-230 Warszawa, Poland

tel.: +48 22 570 57 10



ENIGMA Systemy Ochrony Informacji Sp z o.o. was established in 1993. The company's core business is extensive integration of ICT systems, solutions in the field of security and protection of classified information, creation and delivery of innovative technological solutions in the area of hardware and software.

Enigma is part of the COMP capital group. As a result of transformations and fusions that followed, the resource of three entities was incorporated into the Company: Safe Technologies (Qualified Certification Centre operating under the CenCert brand), M2Net (a software house) and Pacomp (a design and production company). The culmination of the transformation process was the incorporation into the Company's structures, in 2021, of the separated divisions from Comp (Cryptography Development Division and System Solutions Development Production Division).

At the end of 2023, we were hiring 365 employees, which demonstrates Enigma's dynamic growth. In 2023, share capital exceeded PLN 30 million.

We have seen very dynamic growth in previous years as a result of the launch of new products such as keypads and the Electronic Monitoring System, based on our own hardware and software solutions.

Thanks to our work and commitment, we are able to meet increasing market challenges and continue to grow in the security and information protection sector.

Most important achievements

- Implementation of the biggest Electronic Monitoring System in the East-Central Europe.
- Launch of the Electronic Monitoring System in Italy, Armenia, Czech Republic.
- Delivery of BORDERSCAN devices for biometric registration for the needs of the Border Guard.
- Establishment of the "Centre for Abductions system".
- Development of ETA-MIL cryptographic products.
- Modernization of the new version of PEM-HEART and Centaur software for NATO needs, certified by the Internal Security Agency.

Main services and products (approved for export)

- ENIGMA ELECTRONIC MONITORING SYSTEM
- BORDERSCAN
- AVISPON CRISIS MANAGEMENT SYSTEM
- DIGITAL DOCUMENT ARCHIVING
- rSIGN VIRTUAL ELECTRONIC QUALIFIED SIGNATURE

■ Enigma Electronic Monitoring System (EMS) ► p. 155

Enigma Information Security Systems – ELFO Consortium

CONTACT

enigma.com.pl
e-mail: biuro@enigma.com.pl
Jutrzenki 116
02-230 Warszawa, Poland
tel.: +48 22 570 57 10



The Enigma – Elfo Consortium is a unique partnership that combines the experience and expertise of two high-profile companies, Enigma Information Protection Systems and Elfo. The consortium focuses on a common goal: ensuring border security through modern technologies and dedicated solutions.

Enigma Information Security Systems: Enigma is a producer, supplier and integrator of advanced system security solutions, with a particular focus on specialist security. With over 30 years of experience, the company offers unique expertise on the Polish market, providing services in the area of information protection. Copyrighted cryptographic hardware and application solutions form the basis of the systems created by Enigma, ensuring full security of processed data.

Elfo: Elfo has specialised in the production and supply of lighting equipment and accessories for photographic studios for 40 years. For the last 20 years, the company has also been supplying police photography systems, border guards and other uniformed services. With its unique knowledge and experience, Elfo develops equipment is being developed to meet the growing demands for both hardware and software. Elfo products stand for reliability and durability.

The joint efforts of the Enigma – Elfo Consortium aim to create solutions that are not only effective in providing border security, but also innovative and tailored to the needs of smart borders. By combining the knowledge and expertise of both companies, the consortium offers a comprehensive approach to security, covering both hardware and software application aspects of border security.

Most important achievements

- Delivery of BORDERSCAN devices for biometric registration for the needs of the Border Guard.
- Implementation of electronic dactyloscopy stations, so-called “booking cabins” for the Polish National Police.

Main services and products (approved for export)

- BORDERSCAN – for the protection of smart borders
- BOOKING CABINS

■ [Borderscan for the protection of smart borders ► p. 153](#)

ETC-PZL Aerospace Industries Sp. z o.o.

CONTACT

ai.com.pl
e-mail: postbox@ai.com.pl
Al. Krakowska 110/114
02-256 Warszawa, Poland
tel.: +48 22 846 54 17



AEROSPACE INDUSTRIES
SP. Z O. O.



For over 30 years, we have been developing advanced technology that saves lives, optimizes budgets, and secures our clients' critical missions. We leverage cutting-edge technology and deep expertise in engineering and design to deliver world-class simulation systems. These highly effective training solutions support comprehensive training needs for clients worldwide across the military, security, aviation, medical, and transportation sectors.

With years of experience collaborating with global leaders in aviation, space, and defense industries—including Leonardo, L3 Communications, Sikorsky Helicopters, Environmental Tectonics Corporation, Airbus, and Thales—we are at the forefront of innovation. Partnerships with top scientific institutions and military academies further strengthen our ability to develop innovative solutions. The three-decade legacy of pioneering simulation technology and defense solutions underscores an unparalleled commitment to enhancing operational readiness and safety across complex mission environments.

Key products and services

- Flight Simulator for Fixed-Wing and Rotary-Wing Aircraft
- Combat Mission Simulator for Fixed-Wing and Rotary-Wing Aircraft
- Ejection Seat Simulator (ESS)

- Helicopter Hoist Simulator
- Helicopter Deployment Operator Simulator
- Helicopter Crew Chief and Gunners Simulator
- Disorientation Training Device
- UAV Operator Simulator
- Counter-Drone Operator Simulator
- Air Defense and Land Forces Radar Recognition Operator Simulator
- Tracked and Wheeled Vehicle Driving Simulator, Convoy Driving Simulator
- UGV Operator Simulator
- Floating Bridge & Ferry Crew Simulator
- Fast Boat Crew Simulator
- JTAC, FAO, FAC, CAS, MANPADS, MEDEVAC Simulation Training Systems

- Advanced Hoist Simulation Training System ► p. 244
- Combat Mission Simulator for Fixed-Wing and Rotary-Wing Aircraft ► p. 245
- Ejection Procedure Training Simulator ► p. 249
- Flight Simulator for Fixed-Wing and Rotary-Wing Aircraft ► p. 250

EUROTECH Sp. z o.o

CONTACT

eurotech.com.pl
e-mail: info@eurotech.com.pl
Strefowa 3
39-300 Mielec, Poland
tel.: +48 17 7887760



EUROTECH Sp. z o.o. is Polish medium-sized company established in 2001, specializing in the design and production of CUSTOM MADE technologically advanced products and systems.

For military market, the company is constantly developing Unmanned Aerial Platform operating in BVLOS mode.

Based on experience and creative specialists, the company offers complete Multifunction UAS HAASTA as well as Ground Control Stations, Launchers, dedicated software, engines, and on-board systems tailored to customer needs.

Most important achievements

- Participation and leading R&D projects
- Defender Award for the Aerial Platform Szogun
- Defender Award for the Aerial Target Vermin
- Defender Award for the Unmanned Aircraft System
- Eagle Wprost Award for Innovative Company
- Participation in ERA RPAS standardization project for EDA

Key products and services

- UAS HAASTA
- Vermin Aerial Target System
- Pneumatic and Hydraulic Launchers for UAS
- Hybrid Power Drive Unit for UAS
- Military Controllers

- UAS HAASTA ► p. 71

Eycore Sp. z o.o

CONTACT

eycore.com
e-mail: contact@eycore.com
Józefa Piłsa Dziekońskiego 3
00-728 Warszawa, Poland
tel.: +48 539060372



Eycore Ltd. is a Polish space company based in Warsaw, specializing in the design and manufacture of Synthetic Aperture Radar (SAR) payloads. The company consists of a team of scientists and engineers with extensive experience in developing advanced military-grade radar technology solutions for the space, defense and civilian markets.

Leveraging its expertise in radar technology, Eycore has developed SAR payloads (sensors) that are satellite platform agnostic. This enables customers to have a greater choice of third-party microsatellite platforms in the market that integrate Eycore's SAR payload. This also enables customers to achieve rapid delivery timescales. In doing so, governments and private clients can have enhanced sovereign radar imaging capabilities thereby ensuring full control over their Earth observation (EO) space assets and how they choose to use them.

In 2025, the European Space Agency recognized the company's professionalism by awarding the CAMILA (Country Awareness Mission in Land Analysis) program to a consortium of Polish space companies, led by Creotech Instruments as the prime contractor. The program marks the first Synthetic Aperture Radar (SAR) satellite ever contracted by Poland. The consortium secured this prestigious project ahead of several well-established industry competitors.

Key products and services:

→ SAR Payload

Equipped with an advanced radar system, ready to be integrated with any microsatellite platform available on the market.

→ SAR Satellite

SAR satellite fully integrated with SAR payload, ready for launch through launch-proven suppliers. Post-launch mission service is also available.

■ Synthetic Aperture Radar (SAR) Payload ► p. 68

Fabryka Broni "ŁUCZNIK" – Radom Sp. z o.o.

CONTACT

Fabrykabroni.pl

e-mail: sekretariat@fabrykabroni.pl

Grobickiego 23

26-617 Radom, Poland

tel.: +48 48 38 99 100



We are proud to present Fabryka Broni "Łucznik" – Radom sp. z o. o. – recognized as one of the most reputable weapons factories in Poland and Europe. For a century we have been a leader in the production of high-quality small arms.

Our factory, located in Radom, is a place where tradition meets modernity, precision and innovation. We are a leading manufacturer and supplier of weapons to the domestic and foreign markets, including the Polish Armed Forces, the Ministry of Internal Affairs and Administration, as well as civilian shooters. The Company's flagship products include GROT carbines from the Modular Small Arms System family, Beryl carbines, VIS 100 pistols and modular MPS pistols. While we are proud of our heritage, we are constantly evolving, investing in the latest technologies and manufacturing processes to meet the expectations of our customers from around the world.

The most important achievements

- Design (in cooperation with the Military University of Technology) and development of the MSBS Grot system
- The company successfully provides solutions for the Polish Armed Forces and uniformed services as well as foreign users.
- Numerous awards and distinctions including a special award from the Minister of Defence for the VIS 100 pistol at the 2021 International Defence Industry Exhibition

Key products and services

- MSBS GROT rifle
- VIS – 100 semi-automatic pistol
- BERYL rifle

- MSBS Grenade Launcher cal. 40x46 mm ► p. 294
- MSBS Grot – Grot Modular Firearm System ► p. 295
- Sniper Rifle MSBS 762N cal. 7.62 x 51 mm (.308 Win) ► p. 303
- VIS 100 CAL. 9x19 MM – THE SEMI-AUTOMATIC PISTOL ► p. 308

Farada Group Sp. z o.o.

CONTACT

faradagroup.com

e-mail: info@faradagroup.com

Przemysłowa 20

21-100 Lubartów, Poland

tel.: +48 531 179 532



Farada is a group of innovative companies building a comprehensive drone ecosystem from A to Z. We specialize in designing and manufacturing of unmanned aerial vehicles (UAVs), creating advanced software solutions, training professional drone operators. We are also highly skilled in integrating various types of systems to the drone from high-resolution cameras to specialized sensors. The scope of the company's activity additionally covers service and support in operation.

We are able to provide such a wide range of services and products tailored to our customers' needs thanks to our highly qualified team. From professional pilots who can operate worldwide from our flight control center, to experienced engineers and workers in our factory who ensure the continuous development of our technology and the consistently high quality of the machines we produce. Additionally, also in Poland, we have a logistics and sales office where qualified staff provide the best possible customer support.

Our factory has the capacity to produce up to 40 drones per month, which adds up to 480 machines annually that can be delivered to customers. This is an excellent result, made possible by our 50 employees working in the factory. Our entire production takes place in a facility spanning over 2,000 square meters.

Our main focus is creating solutions for our customers' needs with our drones flying mainly beyond visual line of sight (BVLOS). This means we can deliver a wide array of UAV-based solutions that are fully automatic, tailored to different industries with operational costs.

We actively engage with universities and research centers, both domestically and internationally, to drive innovation and stay at the forefront of technological advancements.

Farada Group has the ISO 9001:2015 and the NCAGE CODE certificates, which confirms quality in the process of manufacturing aircraft and components, air freight transportation and the sale of aircraft and aircraft components. It also proves also that the company has been verified and can provide solutions for the armed forces of the Republic of Poland and the militaries of the North Atlantic Alliance countries as well as for the Alliance itself.

Most important achievements

- Winning 2023 Lukaszewicz Institute of Aviation National Contest in the category "Drone companies in Poland"
- Obtaining MSWiA License, for the trade of explosives, weapons, ammunition, and military or police-designated products and technology.
- Winning the NCBR Nevada Acceleration Program
- Creating a team of specialists with an extensive military and civilian experience from many years of specialization in drone topics, including, in particular, work for NATO, Civil Aviation Authorities (ULC), the Military Institute of Armament Technology (WITU), the Air Force Institute of Technology (ITWL)
- Being one of the 7 members in coalition created from leading technological companies called "Drone Alliance Europe" with is representing the commercial drone industry before European political leaders, regulators and other industry stakeholders.
- Have experience in more than <133 000 km in commercial flights (medical deliveries only)
- Cooperation with the biggest Polish companies in the field of: retail, power network, airport administration, laboratories networks and food delivery

Key products and services

- Farada G1, VTOL drone
- Farada G2, VTOL drone
- Farada G2, FIXED WING model
- Farada G1-B, VTOL drone
- FARADA MR "HEAVY LIFTER", multirotor drone
- Training for UAV plane type specialisation
- Training for UAV Technic
- Training for INS certified instructor
- Training for UAV certified operator

■ Farada G1-B, VTOL drone ► p. 32

■ Farada G2, VTOL drone ► p. 33

Flyfocus Sp. z o.o.

CONTACT

flyfocus.pl

e-mail: przemyslaw.gmerek@aeromind.pl

Fort Wola 22

01-258 Warsaw, Poland

tel.: +48 535 544 101



FlyFocus sp. z o.o. specializes in the design, manufacturing, and integration of unmanned aerial vehicles (UAVs), along with their subsystems and components, leveraging advanced technologies in automation, radio communications, aerodynamics, and electronics. Since its inception, the company has focused on developing tethered UAV power systems that enable continuous hovering for applications like terrain surveillance. A key innovation patented by FlyFocus is a system that allows for the automatic release of the power cable at operational altitude, enabling the UAV to switch seamlessly to battery power in response to the operator's commands or during emergencies.

The FlyFocus's portfolio includes a diverse range of UAV systems and subsystems, tailored to meet various operational needs. In addition to its product offerings, FlyFocus provides specialized engineering services, primarily in the field of unmanned aviation. The company caters to a broad spectrum of clients, from private enterprises to state institutions, handling projects with varying complexities.

The FlyFocus team consists of 20 skilled engineers, each bringing extensive expertise in areas such as aerodynamics, mechanical engineering, electronics design, software development, flight testing, and more.

Most important achievements

- US Patent No. US-2020-0369408-A1 DETACHABLE POWER CABLE FOR UNMANNED AERIAL VEHICLE
- Flyfocus technology and devices implemented in UAVs of the Polish Army
- Flyfocus devices implemented in UAVs for the US Army

Main services and products

- Cableguard Tethered UAV System
- Polaris ISR UAV System
- Bad Bullet automatic targeting system for loitering munition UAVs
- Striker long range single-use drone
- UAV accessories: Emergency localizer. Magnetometer, Mission Computer etc.

- Flyfocus Cableguard Patented Tethered UAS ► p. 35
- Flyfocus Lemur VTOL UAV Vertical takeoff landing fixed-wing aircraft ► p. 36
- Flyfocus Polaris Ultimate aerial surveillance tool ► p. 37

Fudo Security Sp. z o.o.

CONTACT

fudosecurity.com

e-mail: sales@fudosecurity.com

marketing@fudosecurity.com

Al. Jerozolimskie 178

02-486 Warsaw, Poland

tel.: +48 22 100 67 00



Fudo Security is a global leader in Privileged Access Management, specializing in secure remote access. Its flagship product, Fudo Enterprise, is an Intelligent PAM solution designed to help organizations secure critical infrastructure while ensuring compliance with NIS2, ISO/IEC 27001, GDPR, and DORA. With R&D based in Poland, Fudo Security continues to drive innovation in the field of access management.

The technology enables real-time monitoring, access control, and rapid detection of suspicious behavior using AI, including behavioral and biometric analysis—a capability first introduced to the PAM market by Fudo Security in 2020. This ensures that organizations can quickly identify and mitigate credential theft and unauthorized access risks.

Recognized for innovation, Fudo Security holds a NATO certificate, supports nearly 500 clients across 35 countries, and has received multiple awards, including the Global Infosec Award 2024 and Cyber Security Excellence Award 2024.

Currently, the company is focused on a new Instant Access solution, designed to redefine third-party access management. This technology will enable organizations to grant to external users immediate, secure access to critical re-

sources—eliminating delays and enhancing operational efficiency. As third-party access remains a significant security challenge, this solution aims to set a new industry standard.

Why Fudo?

1. FreeBSD-Based Architecture – Trusted OS core for hardened security.
2. Agentless Deployment – No footprint on target systems.
3. No Data Access. No Backdoors/Vendor-Neutral by Design – We don't see your data/ No system-level access to your environment.
4. Fully Isolated On-Premises Environment – Air-gapped readiness.
5. Zero Trust & Just-in-Time Access.
6. AI-Powered Threat Prevention – Our AI is adaptive, 100% on-premises.

Key products and services

→ Fudo Enterprise and Fudo ShareAccess

■ Fudo Enterprise ► p. 158

GISS Sp. z o.o.

CONTACT

giss.pl

e-mail: info@giss.pl

Kościuszkowców 63

04-545 Warszawa, Poland

tel.: +48 22 625 09 52



GISS was founded in 2012, operating within the airport systems and military communications sectors. Its primary areas of expertise include satellite communications (such as manpack satellite terminals, mobile Fly Away, and Hub stations), shooting training support systems (Shooting House, shooting range systems, reactive target systems, container shooting ranges), ATC (radar systems, WAM/MLAT, ILS/DME/DVOR), and systems integration. The company offers its own range of solutions and collaborates with foreign partners.

In the years 2012-2013, the company focused on radar systems and ILS equipment installation in the aviation industry. From 2014 to 2015, GISS expanded its product offerings to include training facilities, shooting bases, and shooting range equipment. In 2016, GISS established an R&D department and embarked on the development of innovative and proprietary products in the satellite communications segment. By 2018, GISS had established a strong presence in the satellite communications, air traffic management, navigation systems, and shooting solutions sectors, particularly within the training facilities domain.

Since 2021, the company has been headquartered in new, well-equipped facilities dedicated to R&D, complying with the latest standards.

The most important achievements

- Opening of the GISS Research and Development Center
- Delivery more than 100 tactical level satellite terminals for the Polish Armament Agency
- Achieving the position of the main SatCom supplier to the Polish military
- Delivery and commissioning of 4 MSSR radars for PANSA
- Delivery of a MLAT system at the Warsaw Chopin Airport for PANSA

Key products and services

- | | |
|--------------------------------------|---------------------------------------|
| → Manpack satellite terminals | → Shooting house type shooting ranges |
| → FlyAway mobile satellite terminals | → ATC systems integration |
| → HUB type stations | → SATCOM Training |
| → VSAT systems integration | → ATC integrations |
| → Designing SatCom systems | → Project Management |
| → Containerized shooting ranges | |

- Container Shooting Range ► p. 247
- CQB House Shooting Range ► p. 248
- FlyAway SMART Terminal ► p. 133
- SatPack AutoMate ► p. 142
- SatPack Cobalt Terminal ► p. 143
- TacNet400 ► p. 144
- VSAT MASTER Satellite Terminal ► p. 148

HERTZ SYSTEMS Sp. z o.o.

CONTACT

hertzsystems.com
e-mail: hertz@hertzsystems.com
al. Zjednoczenia 118A
65-120 Zielona Góra, Poland
tel.: +48 68 328 70 00



Hertz Systems has been providing advanced defence solutions for over 35 years, specialising in military GPS receivers and counter-drone systems. As the only Polish manufacturer of GPS receivers integrated with SAASM, the company provides secure and accurate position, velocity and time (PVT) data for military platforms. More than 3,000 receivers have been delivered to the Polish Armed Forces, providing resistance to jamming and spoofing. Hertz Systems is also developing Galileo PRS receivers for public services (critical infrastructure, police, border guards, military).

Hertz Systems provides end-to-end defence solutions, including design, production, integration, training and service. The company cooperates with key players in the defence industry, both in Poland and abroad. Hertz Systems cooperates with the Ministry of Defence, NATO and other European institutions. The company is at the forefront of UAV countermeasures innovation with its HAWK multi-sensor detection and neutralisation system.

Hertz Systems operates to ISO 9001:2015, AQAP 2110:2016 and AQAP 2210:2022 standards, ensuring the highest levels of safety and quality. It holds industrial security certifications up to SECRET, EU SECRET and NATO SECRET, ESA SECRET. As a trusted partner in advanced defence technology, Hertz Systems continues to enhance the military capabilities of Poland and allied countries.

Most important achievements

- The only Polish and one of the few global manufacturers of military navigation receivers resistant to jamming and interference (GPS receivers with SAASM, M-CODE and Galileo PRS modules)
- More than 3,000 GPS receivers delivered to the Polish Armed Forces
- Cooperation and deliveries to other NATO militaries
- Leader in unmanned aircraft countermeasures technology (HAWK system)
- More than 35 years of experience in the defence and security sector

Key products and services

- HGPST4 Pollux
- HGPST UAV
- HGPST uG
- HAWK C-UAS

- HAWK ► p. 230
- Hertz GPS Terminal 4 Pollux (HGPST4 Pollux) ► p. 231
- Hertz GPS Terminal UAV (HGPST UAV) ► p. 231
- Hertz GPS Terminal uGram (HGPST uG) ► p. 231

Huta Stalowa Wola S.A.

CONTACT

hsw.pl
e-mail: hsw@hsw.pl
gen. Tadeusza Kasprzyckiego 8
37-450 Stalowa Wola, Poland
tel.: +48 15 813 42 15



Huta Stalowa Wola S.A. has a long tradition in the defence industry, having operated in the market for 86 years. It has experience in the civil industry as a manufacturer of construction machinery. As a leading manufacturer of artillery military equipment IFVs and the equipment for the engineering forces, HSW S.A. has a recognizable brand and is guided in its activities by values and standards that distinguish the Company from its competitors.

Most important achievements

- The company has for years remained one of the most important suppliers of solutions for the Polish Armed Forces being also a major exporter
- Cooperation with renowned foreign partners

- Development of new weapons systems, including Waran 4x4 Multi-Purpose Tactical Vehicle, M120 Rak Automatic Mortar, Borsuk Amphibious Infantry Fighting Vehicle, Baobab-K Scattered Mine Laying Vehicle, ZSSW 30 Remote Controlled Turret System, 155 mm Self-Propelled Howitzer Krab
- Numerous awards, including:
 - Numerous “Defender” Awards at International Defence Industry Exhibition MSPPO
 - “Laur Bezpieczeństwa” [Safety Laurel] at the International Defence Industry Exhibition under the honorary patronage of the Head of the National Security Bureau and the Director of the National Centre for Research and Development
 - Numerous “Orły Bezpieczeństwa” [Eagles of Security] awards.
 - Several President of the Republic of Poland Awards

Key products and services

- M120 RAK 120 mm Automatic Mortar Turret System
- KRAB 155 mm Self-Propelled Howitzer
- BORSUK Amphibious Infantry Fighting Vehicle
- ZSSW 30 Remote Controlled Turret System
- BAOBAB-K Scattered Mine Laying Vehicle
- WARAN 4x4 Multi-purpose tactical vehicle

- BAOBAB-K SCATTERED MINE LAYING VEHICLE ► p. 98
- BORSUK Amphibious Infantry Fighting Vehicle ► p. 100
- KRAB 155 mm – Self-Propelled Howitzer ► p. 110
- M120 RAK 120 mm Mortar Turret ► p. 111
- WARAN 4x4 MULTI-PURPOSE TACTICAL VEHICLE ► p. 122
- ZSSW-30 REMOTE CONTROL TURRET SYSTEM ► p. 123

ICEYE POLSKA Sp. z o.o.

CONTACT

www.iceye.com
 e-mail: poland@iceye.com
 Wspólna 70
 00-687 Warszawa, Poland
 tel.: +48 668 660 077

ICEYE



ICEYE is the global New Space leader in satellite synthetic aperture radar (SAR) imaging technology with a track record of 40+ SAR satellite missions successfully launched. ICEYE, a Polish-Finnish company, empowers commercial and government partners with unmatched persistent monitoring capabilities for any location on Earth. The company helps customers make informed, data-driven decisions to address time-critical challenges in various industries, to ensure infrastructure safety, and to protect the environment. ICEYE operates two key lines of business: Data sales focused on delivering imagery acquired via its own constellation, Solutions (providing insights during natural catastrophes) and Mission Sales, whereby satellites are launched on behalf of clients for sovereign use. Following the beginning of the armed conflict in Ukraine, ICEYE has delivered one of its satellites for exclusive use by Ukrainian armed forces, and continues to support efforts in providing reliable daily intelligence.

A TYPICAL ICEYE SATELLITE MISSION SOLUTION:

- Example: 4-10 of ICEYE's latest SAR Satellites
- Delivered Launch-ready in approximately 18-24 months
- Arrangement of launch services on client's behalf into low earth sun-synchronous orbit (LEO SSO)
- Provision of a mission ground segment in client's country for sovereign satellite control and data receipt
- Support for operations and maintenance throughout the satellite service life
- Training by world experts for constellation operations, data acquisition and processing

Most important achievements

- First miniaturized SAR satellite launched to orbit globally in 2018
- Sovereign satellites delivered to clients in UAE, as well as governments of Ukraine and Brazil
- Largest SAR satellite constellation, offering fastest revisit of any location in the world

Main services and products

- SAR Imagery (see diagram):
 - Scan Mode
 - Strip Mode

- Spot Mode
- Spot Fine
- Dwell
- Dwell Fine
- Spot & Dwell Precise (to be announced soon)
- SAR Satellite Manufacturing, Assembly, Launch (via SpaceX Rideshare) for clients
- Satellite Capacity – purchase access to ICEYE's constellation for extended periods
- Natural Disaster Solutions (analytics): Floods, Wind, Wildfire, Hail

■ ICEYE's Latest Generation Satellite ► p. 46

ICsec S.A.

CONTACT

www: icsec.pl
e-mail: sales@icsec.pl
Wichrowa 1A
60-449 Poznań, Poland
tel.: +48 506 931 953



ICsec provides advanced cybersecurity solutions for protecting industrial infrastructure.

The company built a comprehensive Industrial Control Systems (ICS) security platform comprising of both software and hardware elements designed to minimize business risks associated with cyber-attacks on industrial control networks.

The platform boasts a broad range of functionalities, setting a new standard in the cybersecurity of industrial OT networks.

The most important achievements

- Developing a comprehensive security platform for real-time monitoring of industrial networks, consisting of both software and hardware components.

Key products and services

- SCADvance XP® – the next generation IDS system for industrial networks

■ SCADvance XP® ► p. 164

IDENTT

CONTACT

identt.pl
e-mail: kontakt@identt.pl
Generała Romualda Traugutta 45
50-416 Wrocław, Poland
tel.: +48 882 184 848



IDENTT enables automated identity proofing and recognition in mission-critical systems across the globe. Ensuring the highest assurance level of your identity, IDENTT is synonymous with state-of-the-art safety and trust in identity verification.

Using its proprietary artificial intelligence, IDENTT automates the onboarding, authentication or access control processes for industry leaders in banking, telecommunications, entertainment and heavy industry. PKO BP, KGHM, Swisscom, BNP Paribas, FEG, and many others rely on IDENTT's world-renowned expertise in biometrics and identity document processing.

Developing its entire AI and identity processing engines in house, IDENTT offers custom cloud and on-premise-based deployments meeting the strictest governmental and enterprise requirements. With an in-house team of experts in identity verification and biometrics, IDENTT supports the needs of agile, future-driven solutions, while ensuring top-grade security, reliability, and no external access, as required by law enforcement and government deployments.

IDENTT is the first company in Poland which received the certificate confirming compliance with eIDAS regulation for remote identity proofing based on an identity document processes for trusted services. This is an extraordinary achievement, demonstrating that IDENTT not only prioritizes security but is also substantively prepared to serve as an identity verification entity.

Achievements

- Bank Accounts Opened in Poland using IDENTT Vision AI for identity recognition
- AI-Based eKYC Processes Completed for EMEA customers
- Identity Document Versions Issued Around The World Supported by IDENTT Vision
- eWallet Identity Verifications Performed using IDENTT EUDI Wallet (Q3/23-Q1/24)

- IDENTT Biometrics Engine ► p. 158
- IDENTT eWallet ► p. 159
- IDENTT Vision ► p. 159

Jakusz Sp. z o.o.

CONTACT

www.jakusz.com

e-mail: jakusz@jakusz.com

Przemysłowa 40

83-400 Kościerzyna, Poland

tel.: +48 58 686 85 27

JAKUSZ 



JAKUSZ is a company with 40 years of manufacturing experience. It operates in the international defense and security market in the area of design, production and implementation of innovative solutions for equipment and technologies. Our expertise comprises ammunition disposal, special chemical technologies, and handling of hazardous items containing explosives. The company conducts extensive research and development activities including dynamic detonation tests. Company owns design, technology and manufacturing capabilities.

Jakusz SpaceTech Sp. z o.o. is a manufacturer of “green” rocket fuel – HTP (hydrogen peroxide with purity up to 98%). It conducts scientific research in cooperation with the European Space Agency (ESA).

Most important achievements

Jakusz Group is an internationally recognized brand. It operates in more than 40 countries, providing after sales service with local partners. The company has accomplished multi-branch projects including transportable containerized facilities in different countries. Each product or technological line is always designed and adjusted to specific local requirements and conditions.

Key products and services

- isolation, transportation, storage and neutralization of unexploded ordnance, improvised explosive devices,
- design of technological lines for the production of components of rocket fuels and explosives,
- industrial methods of disposal and recycling of munitions – complete technological lines,
- security of data processing in ICT systems – mobile server rooms on chassis with electromagnetic and ballistic protection,
- combat modules for loitering munition and combat drone warheads.

- ALEXA Light Weight Gas-Tight EOD Container ► p. 199
- Combat Modules for Tactical Warheads ► p. 285
- EVA – Gas-Tight Explosion-Proof Container ► p. 202
- Filling of Ammunition Ammo Filling Lines / Special Chemical Installations ► p. 287
- Liquid Rocket Fuel: HTP (hydrogen peroxide) in concentrations ranging from 85% to 98% and DMAZ (2-dimethylaminoethylazide) ► p. 50
- Lunar – Rotary Detonation Kiln for Disposal of Explosives and Ammunition ► p. 181
- Safety of Critical Data Electromagnetic and Ballistic Protection in a Transportable (Mobile) Container ► p. 163
- Technological Line for HTPB (hydroxyl-terminated polybutadiene) Production ► p. 305

JELCZ Sp. z o.o.

CONTACT

jelcz.com.pl
e-mail: sekretariat@jelcz.com.pl
ul. Inżynierska 3
55-220, Jelcz-Laskowice, Poland
tel.: +48 71 381 51 35



JELCZ Ltd was established on 1 July 2001 as a result of the transformation of JELCZ SA, which is a producer of Polish well-known buses, trucks and specialized fire vehicles of the JELCZ brand.

For years, the new Jelcz trucks and chassis have not only dominated the logistics equipment parks of the Polish Army, but have also been an important element of support for the artillery armament systems. They provide carriers for specialized electronic equipment and even weapon systems. Used in key technical modernization programs of almost all branches of the Polish Armed Forces. With its 3rd generation chassis, JELCZ delivers even better technological and construction solutions, with independent suspension at the forefront.

Most important achievements

- about 70 types of vehicles for special vehicle
- unarmored and armored chassis in the drive system from 4x4 to 10x10
- participation in the key armament programs including WISŁA, NAREW, PILICA, WWR

Key products and services

- production of truck vehicles with up to 34 tons of total weight
- production of parts and assemblies for wheeled and rail-vehicles and also devices for agriculture in compliance with the provided construction documentation
- production of spare parts for usage vehicles of the JELCZ brand.

■ Special Transporter JELCZ brand. Type 663.45 ► p. 120

KLIMAWENT S.A.

CONTACT

www.mostrange.pl
e-mail: biuro@mostrange.pl
Chwaszczyńska 194
81-571 Gdynia, Poland
tel.: +48 58 629 64 80



Klimawent was founded in 1992 as a private company. We are a wellknown producer of filtration and ventilation units. Our assortment includes the following groups of products, i.e. fans, blowers (air-supply fans), filtering units, vehicle exhaust extractors, systems of snow removal from the roofs.

In 2017 the company started the production of container and modular tactical shooting ranges MoST and mobile bullet traps. Shooting ranges MoST are equipped with effective ventilation and filtration system which eliminates the level of the lead to the limit of quantification.

All our appliances are our own solutions worked out by our engineers' team. Manufacturing takes place in our premises under the supervision of technological employees.

We continually invest in a high-tech infrastructure, advanced technologies as well as enhancing the qualifications of our engineers. What is especially important is the development of our company. The innovative implementations are based on the results of our Research and Development Lab, which makes us more successful.

The most important achievements

- patented technical solutions of the shooting range MoST
- innovative idea and design of shooting ranges MoST
- shooting ranges MoST have the certificates which were issued by the Military Armament Technical Institute

Key products and services

- modular tactical shooting range MoST-5 and MoST-10
- container shooting range MoST-2

- mobile container shooting range MoST-1
- mobile bullet traps KMB-600 and KMR-600

- Container shooting range MoST-2 ► p. 247
- Mobile Bullet Traps ► p. 251
- Mobile Container Shooting Range MoST-1 ► p. 252
- Modular Tactical Shooting Ranges MoST-5 and MoST-10 ► p. 254

Komes

CONTACT

www.komes.pl
e-mail: biuro@komes.pl
Na Grobli 34
50-421 Wrocław, Poland
tel.: +48 662 123 001



KOMES®
moc obliczeń



KOMES is an engineering company which specializes in the application of numerical methods (FEM and CFD) as well as high precision measurements of deformations and vibrations, offering a wide array of services to the defence sector.

The company supports its partners in the development of their designs, utilizing virtual twin 3D models for the purpose of virtual tests, thus minimizing the risk of failure and increasing associated safety margins.

KOMES has an accredited laboratory (AB 1873), specialising in the area of acceleration and deformation measurements performed using resistance strain gauging. The laboratory primarily conducts field tests verifying the performance of structures during operation.

Furthermore, the company holds an MSWiA concession (B-025/2023) to perform business activities in the field of production and distribution of explosive materials, weaponry, ammunition and products and technology dedicated for the military or the police forces, which attests to a high level of security and compliance with rigorous norms.

Most important achievements

- Participation in B+R projects.
- Accreditation PCA 17025 – since 2023.
- ISO 9001 – DNV – since 2015.
- Permanent cooperation with the defence industry.

Key products and services (approved for export)

- | | |
|--|---|
| → Numerical structural analysis FEM | → Strain gauge and vibration measurements |
| → Explosion FE numerical analysis and crash analysis | → operational tests |
| → Ballistic shield penetration FE analysis | → Displacement measurements |
| → Numerical analyzes of explosives in buildings | → Acoustic emission |
| → Non-linear dynamic analysis of systems | |
| → CFD analysis, combustion simulations | |

■ Engineering simulations and research ► p. 176

Lubawa S.A.

CONTACT

lubawa.com.pl
e-mail: info@lubawa.com.pl
Staroprzygodzka 117
63-400 Ostrów Wielkopolski, Poland
tel.: +48 56 699 40 00


LUBAWA SA



Lubawa S.A. is a Polish manufacturer of tents, protective vests, demining and EOD equipment and tool sets, gear for the Polish Armed Forces, firefighters, Police and other uniformed formations. The company has 70 years of business experience, and the products have been deployed by several NATO member country armies.

The most important achievements

- Launching a Research and Development Center with the ballistics laboratory as the first such a comprehensive laboratory in central Europe
- Development of export sales to more than 40 countries around the world
- Manufacturing innovative products and introducing them to international markets

Key products and services

- Vests protecting against various types of threats: fragments, bullets, combat knife and spike (e.g. Gryf, MKO 2.0, Sigma)
- Inflatable and rigid tents (e.g. NS Series, NPM, MMT, NX)
- EOD One Suit with the P2 support unit
- Lightweight fragment proof and fire retardant demining suit
- Inflatable decoys (e.g. Rosomak APV, T-72 and Leopard 2 MBT)
- Multispectral camouflage systems

- **Lightweight Flame-retardant Fragment-proof Suit** ► p. 269
- **Modular Bulletproof Vest MKO 2.0** ► p. 270
- **NS-26** ► p. 184
- **Pneumatic Decoys** ► p. 256

Łukasiewicz Research Network – Industrial Research Institute for Automation and Measurements PIAP

CONTACT

www.iedd.eu / www.piap.lukasiewicz.gov.pl

e-mail: mds@piap.lukasiewicz.gov.pl

Aleje Jerozolimskie 202

02-486 Warszawa, Poland

tel.: +48 22 87 40 164; fax: +48 22 87 40 221



Established in 1965 Łukasiewicz Research Network – Industrial Research Institute for Automation and Measurements PIAP is the leading center of robotics, automation, and industrial measurements in Poland. Over 250 employees, divided into interdisciplinary teams, conduct research on new technologies. Łukasiewicz – PIAP Institute is the first and largest Polish manufacturer of mobile robots for special applications in army, police, border guards and fire fighters. Robots and robotic devices are used in C-IED operations, surveillance and remote observation, protection of borders and infrastructure, search and rescue missions, crisis management, monitoring and patrolling, detection and CBRN threats analysis.

The Łukasiewicz research network is the third largest research network in Europe, consisting of 22 Polish research institutes, including Łukasiewicz-PIAP.

The Łukasiewicz Research Network offers businesses attractive, broad and competitive technological solutions. Łukasiewicz provides a unique “challenge system” powered by a group of 4,500 scientists, who take up a business challenge and present the entrepreneur with potential solutions. At the same time, it provides access to cutting-edge capabilities and unique scientific infrastructure in the country. Most importantly – the entrepreneur does not bear the cost of preparing the conception of the research works. Łukasiewicz conveniently meets the expectations of the business. The entrepreneur can contact Łukasiewicz through an online form on our website lukasiewicz.gov.pl/en/business/, but also directly in over 50 locations of Łukasiewicz Institutes and their branches throughout Poland. Each site provides the same, high quality, product or service. Łukasiewicz focused on research areas such as: Health, Smart and Clean Mobility, Digital Transformation and Green and Low-emission Economy.

- **PIAP FENIX Lightweight EOD & reconnaissance robot** ► p. 210
- **PIAP GRYF EOD mobile robot** ► p. 210
- **PIAP IBIS Heavy robot for pyrotechnic operations** ► p. 211
- **PIAP PATROL Robot for C-IED and CBRN tasks** ► p. 211

Łukasiewicz Research Network – Tele and Radio Research Institute

CONTACT

itr.lukasiewicz.gov.pl
e-mail: itr@itr.lukasiewicz.gov.pl
ul. Ratuszowa 11
03-450 Warszawa, Poland
tel.: +48 22 619 22 41



Łukasiewicz Research Network – Tele and Radio Research Institute (Łukasiewicz – ITR) research institute conducting comprehensive and interdisciplinary scientific and research and development on highly developed technologies and innovations which are implemented in many areas of the economy. Łukasiewicz – ITR continues the scientific traditions of two institutes with many years of history in the area of electronics and electrical engineering: Radiotechnical Research Institute – the first national research and development unit devoted to electrical engineering, established in 1929 by a renowned Polish radio – electronic specialist Janusz Groszkowski and Industrial Institute of Electronics created in the year 1956.

The strategic aim of Łukasiewicz – ITR is to: strengthen its position as the leading research institute; stimulate innovation, entrepreneurship and competitiveness of the market through the increase in the effectiveness of the conducted research. Scientific research conducted by Łukasiewicz – ITR is compliant with research priorities of the Polish National Research Program, domestic intelligent specializations and European Union's programs. It also concentrates on two prospective directions:

- systems and devices for intelligent Smart Grid Networks and the Internet of Things;
- innovative technologies and products in the area of electronics for products and devices with high added value.

Most important achievements

- AQAP 2110:2016 certification for the production of printed circuit boards and assembly of electronic packages.
- Accredited laboratory among the ten recommended by the European Space Agency (ESA).
- 60 years of experience in the printed circuit board (PCB) market.

Key products and services

- Systems and devices for intelligent Smart Grid networks and the Internet of Things (IoT)
- Innovative technologies and products in the field of electronics for high-value-added devices and products
- Research and development of technology for vacuum components and actuating elements for special applications
- Electron beam welding in a vacuum for prototype series
- Assembly of electronic components
- Testing and validation of electronic units and their components
- Accredited testing of printed circuit boards, electronic components, packages, and soldered connections (Accreditation AB045)
- Design and construction of advanced electronic systems
- Creation of new applications integrating various technologies

■ Special-use printed circuit boards ► p. 66

MACRO-SYSTEM SP. Z O.O.

CONTACT

www.macro-system.com.pl
e-mail: mdeles@macrossystem.pl
Gajdy 44,
02-878 Warszawa, Poland
tel.: +48 22 100 56 92; +48 885 500 153



Founded in 1984, privately-owned Polish company MACRO-SYSTEM has established itself as a pioneering force in the fields of IT/OT for public transportation, advanced software design for authorized entities and the design and production of unmanned vehicles. The company specializes in designing, manufacturing, implementing and maintaining dedicated complex systems with respect to both hardware and dedicated software.

Its offer is addressed to a wide range of clients, including the army, government agencies, corporations, telecommunication operators, public transport organizers, domestic carriers, railway vehicle and bus manufacturers.

The company has received an award for unmanned vehicles in the “Innovation” category at the Warsaw Security Expo 2024.

Key products and services

UNMANNED SYSTEMS – since 2013, MACRO-SYSTEM has been at the forefront of designing unmanned ground vehicles in Poland. The company has designed the universal high mobility unmanned vehicle UNL with reconnaissance and combat version named GOBLIN, and a ground loitering munition GNOM.

MONITORING AND INFORMATION PROTECTION – scalable solutions for law enforcement and intelligence, capturing data transmitted via ICT networks, including voice calls, video and the Internet, as well as governmental secure communication.

PUBLIC TRANSPORT – solutions used at private and public carriers, and supplied to the bus and railway rolling stock manufacturer: systems for passenger information, advertising and content management, monitoring, Internet connectivity, remote diagnostics and fleet management.

- GNOM Ground Loitering Munition ► p. 288
- UNL Universal High Mobility Unmanned Vehicle with Reconnaissance and Combat Version GOBLIN ► p. 216

MASKPOL S.A.

CONTACT

maskpol.com.pl
e-mail: maskpol@maskpol.com.pl
Konieczki
42-140 Panki, Poland
tel.: +48 34 310 94 16



Protective Equipment Company MASKPOL S.A. is the Polish leader of this market sector with advanced Research and Development as well as manufacturing technologies. We manufacture a wide range of ballistic protection, such as helmets and bulletproof vests, chemical protection equipment – gasmask, protective clothing and decontamination equipment and also anti-riot equipment; shields, batons and riot suits. The main clients include military and police units and border guard. All our products are made in accordance with highest quality and safety norms, afford highest possible levels of protection and are exceptionally ergonomic. Our products are constantly developed, meeting our clients ever changing expectations.

Main Services and Products

→ HELMETS → VESTS → GAS MASKS → PROTECTIVE GARMENTS

- CBRN-E protective suit ► p. 264
- HB-04 ballistic helmet ► p. 265
- HP-05 ballistic helmet ► p. 265
- KKT-01 Bullet Proof Vest ► p. 267
- KKZ SG-01 bullet-proof vest ► p. 267
- MP-6 gas mask ► p. 271
- ROCK 2.0 Vest ► p. 275
- ROCK one bullet-proof vest ► p. 275

Matic SA

CONTACT

matic.com.pl
e-mail: office@matic.com.pl
Puławska 300A
02-819 Warszawa, Poland
tel.: +48 22 543 90 00



Matic SA has been operating on the Polish IT market since 1990. We specialize in delivering advanced information technology services and solutions as well as systems vital for national security and defence. Our offering is especially

tailored to the needs of institutions of public administration, uniformed services and the enterprises which operate in strategic industries. We can say with pride that we actively participate and support the technology transformation processes of Polish companies and state institutions.

The Matic SA Company has:

- Quality Management System,
- Information Security Management System (in accordance with the following standards: ISO 9001: 2015, AQAP 2110: 2016, ISO / IEC 27001: 2017),
- Industrial Security Certificate,
- Concession for the manufacture and marketing of products for military or police purposes.

Key products and services

IT Infrastructure:

- servers,
- Disk arrays,
- Tape Libraries,
- Virtualization,
- Operating systems and databases,
- Designing and implementing dedicated IT systems,
- IT infrastructure management systems,
- Backup systems.

Data Management and Analysis:

- Digital Archives,
- Efficient databases and hardware solutions,
- Data warehouses and Big Data class systems,
- Reporting tools (BI).

Security:

- Training and education,
- Vulnerability management systems,
- SIEM class solutions,
- Internal network protection systems,
- Data protection on mobile devices.

Investigative IT:

- Forensic analysis system,
- Financial Trail: Standardization and analysis of financial data,
- Analysis of retention data in GSM communication,
- White intelligence (OSINT solutions),
- Monitoring data streams (COM-INT),
- Drone detection and protection system.

Research and development projects:

- Development of a tool for combating financial crimes in economic transactions, based on innovative methods of processing and visualizing large data sets,
- DisinfoRmation detection system using artificial intelligence methods.

■ Financial Trail ► p. 156

MESKO S.A.

CONTACT

mesko.com.pl

e-mail: info@mesko.com.pl

Legionów 122

26-111 Skarżysko-Kamienna, Poland

tel.: +48 41 253 62 81



MESKO S.A. is a manufacturer of world-class defence products with over 100 years of manufacturing experience. Its core business includes manufacturing for defence and national security needs. The company's products are used by the Polish Armed Forces and other entities responsible for national security. The company is an internationally recognized product supplier to the armies of NATO countries. The company possesses modern technology for the production of missiles and ammunition, including sub-caliber ammunition, kinetic energy ammunition, and infrastructure for the disposal of redundant combat assets.

MESKO S.A., based in Skarżysko-Kamienna, began operations in 1924 as a State Ammunition Factory. It has spent years building up its manufacturing experience, being the largest producer of ammunition and rockets in Poland from the very beginning.

Our missile programmes are crucial and of strategic importance for the Polish army. They include first and foremost the PIORUN MANPADS, combat-proven and one of the global leaders in terms of effectiveness and precision of operation in its class.

Most important achievements

- Numerous export contracts for the PIORUN MANPADS and its predecessor GROM MANPADS (Poland, Indonesia, USA, Georgia, Japan, Lithuania, Estonia, Latvia, Norway, Moldova)
- Export of small and medium caliber ammunition to, among others: the Czech Republic, the USA, Oman, Indonesia, Ukraine, Saudi Arabia, India, Bulgaria, Germany
- Implementation of the GROM and PIORUN MANPADS, JACK-S ATGM programmes
- Over 100 years of manufacturing experience
- Cooperation with renowned foreign partners
- Numerous awards and distinctions, including the Award of the President of the Republic of Poland for the PIORUN MANPADS

Key products and services

- Small caliber ammunition
- Medium caliber ammunition
- Tank ammunition
- Artillery ammunition
- Mortar ammunition
- PIORUN MANPADS
- 122 mm M-21 FHD "FENIKS" rocket (intended for MLRS)
- 70 mm unguided NATO standard rocket system
- Propellant charges and powders

- 122 mm M-21 FHD "FENIKS" rocket ► p. 280
- Ammunition ► p. 281
- PIORUN MANPADS ► p. 87
- PRACTICE AND TRAINING DEVICE UST-2 PIORUN ► p. 257

Military Aviation Works No. 2 (Wojskowe Zakłady Lotnicze Nr 2 S.A.)

CONTACT

www.wzl2.mil.pl
e-mail: sekretariat@wzl2.mil.pl
Szubińska 107,
85-915 Bydgoszcz, Poland
tel.: +48 52 36 28 601



WZL2 has been offering comprehensive maintenance and modernization services including airframes and engines for almost 80 years, as part of the one-stop shop formula. In addition to military aviation, the company's activity in the field of General Aviation is constantly developing. The plant is an Authorized Service Centre for Cirrus and Diamond aircraft under the PART CAO approved comprehensive airworthiness organization and PART 145 approved maintenance organization for EMBRAER ERJ 170/190 aircraft. The company is also a manufacturer of Unmanned Aircraft Vehicle Systems, including UAV category Tactical Short Range or Loitering Munition System DragonFly.

The company is equipped with a very modern machine park. Most components are manufactured on the basis of fully automated, precise and efficient production lines. WZL2 has modern machines for machining (CNC and measuring), modern lines for applying electroplating coatings and a chemical laboratory, professional department of paint shops and stations for non-destructive failure-detection tests (NDT).

Most important achievements:

- Design and production of aviation products;
- Loitering Munition System (LMS) DRAGONFLY production;
- F-16 / C-130 MRO;
- Civil aircraft repair and maintenance;
- Aircraft painting.

Main services and products

- Scope of services:
 - Repair and overhaul of military aircraft;
 - Periodical maintenance of aircraft;
 - Servicing and overhaul of LRUs;
 - Production and repair of service equipment;
 - Modernization and integration of avionics;
 - Aircraft painting;
 - Civil aircraft repair and maintenance;
 - Loitering Munition System (LMS) DRAGONFLY production;
 - Service on site or at airbases.
 - Design and production of aviation products:
 - Aircraft avionics equipment;
 - Testers and control equipment;
 - Aircraft ground support equipment (GSE);
 - Spare parts;
 - Electrical connections.
- Civil aviation CAO ► p. 25
 - Design and production of aviation products ► p. 26
 - Dragon Fly Loitering Ammunition System (LMS) ► p. 29
 - Maintenance of C-130 Hercules ► p. 54
 - Maintenance of F-16 ► p. 55
 - Maintenance, Repair and Overhaul (MRO), Aircraft Painting ► p. 56

Military Institute of Armament Technology (Wojskowy Instytut Techniczny Uzbrojenia – WITU)

CONTACT

www.witu.mil.pl
e-mail: witu@witu.mil.pl
Wyszyńskiego 7
05-220 Zielonka, Poland
tel.: +48 22 761 44 25



Military Institute of Armament Technology (WITU) is the leading military institute in Poland, carrying out scientific and R&D work in the field of defence and security. The Institute supports Armed Forces of Poland by providing innovative and comprehensive solutions for armaments and military equipment. The Institute experience includes multiple high-tech projects started at TRL1 and later included in the service in the Polish Armed Forces. Such project are often effect of synergic cooperation with partners such as universities, startups and industry. Areas of activity include:

- scientific research, analytical work,
- small arms and individual equipment,
- rocket / missiles and artillery,
- radiolocation and optoelectronics,
- simulators and trainers,
- UAV's and their armament.

Military Institute of Armament Technology uses three proving grounds that can support multitude of tests. Due to desolation of those grounds it is possible to detonate up to 1000kg of TNT equivalent and test long range munitions for up to 40 km.

The most important achievements

- one of the largest military institutes in Poland
- 98 years of experience in weaponry development and testing
- own proving grounds

Key products and services

- SPARTAN simulators and training facilities
- family of GK warheads dedicated for UAVs
- 120mm ammunition for LEOPARD MBT

- Explosive Device for Armament Neutralization "PULS" ► p. 286
- Giez/WarbleFly – Loitering Ammunition System ► p. 38
- GX WARHEADS FOR UNMANNED VEHICLES ► p. 290
- "Moskit" anti-tank guided missile ► p. 293
- Pangolin – family of explosive reactive armours ► p. 298
- SHAPE CHARGE ► p. 302

MIRANDA Sp. z o.o.

CONTACT

www.mirandamilitary.pl
www.miranda.pl
e-mail: miranda@miranda.pl

Jedwabnicza 1
62-700 Turek, Poland
tel.: +48 63 280 01 00



Miranda Spółka z o.o. is known on the textile market as a modern manufacturer of high quality and technologically advanced polyester, polyamide, as well as mixed fabrics and knits. As one of the few textile manufacturers in Europe, we can offer a full production cycle, located in one place and based on a constantly modernised machinery park.

Miranda Spółka z.o.o has a 70-year tradition in textile production and a 15 year tradition in the production of camouflage systems. We are mainly engaged in the production of static and mobile camouflage. Over the past 5 years, we have significantly developed our research and development facilities, employing qualified personnel and equipping laboratories. We have a professional anechoic chamber, thermal cameras in the 3-5 μ , 8-14 μ ranges, hyperspectral cameras and a drone equipped with cameras operating in the optical, near-infrared, and thermal ranges. As a result, we are able to perform many tests in a short period of time.

Our mission is to produce products tailored to individual customer requirements. Miranda's R&D facilities over the past 5 years have focused on the development of various camouflage systems, such as multispectral and optical camouflage covers (3D, 2D, single-sided or double-sided), tailor-made mobile camouflage for each vehicle, customized camouflage suits, camouflage and anti-drone screens, and anti-radar and thermal insulation liners for aircraft hangars. Our biggest achievement is the development of a knitted camouflage fabric with excellent strength and durability parameters.

Key products and services

- Static camouflage: optical and multispectral static camouflage 3D
- Static camouflage: optical and multispectral static camouflage 2D single and double-sided versions
- Mobile camouflage
- Individual anti-drone systems: Individual winter camouflage suit and the Antidrone Poncho
- Thermal and anti-radiation inner liners

- Individual Anti-Drone Systems – the Antidrone Poncho ► p. 266
- Individual Anti-Drone Systems – Individual winter camouflage suit ► p. 266
- Mobile camouflage ► p. 206
- Static camouflage – 2D Multispectral Winter Camouflage Net ► p. 212
- Static camouflage – Optical and multispectral static camouflage 2D single and double-sided versions ► p. 213
- Static camouflage – Optical and multispectral static camouflage 3D ► p. 214
- Thermal and anti-radiation inner liners ► p. 215

MODULAR SYSTEM Sp. z o.o.

CONTACT

modularsystem.pl
e-mail: biuro@modularsystem.pl

Bielska 19
09-412 Ogorzelice, Poland
tel.: +48 24 366 79 00



Modular System is one of Europe's largest manufacturers of container systems. Over the last few years, Modular System has been providing turnkey critical infrastructure solutions for the needs of refugees, uniformed services and medical care sector. The company's experience and professionalism ensure rapid delivery of safe and high-quality modular container systems in emergency situations, including armed conflicts, humanitarian emergencies and natural disasters. The mobile container systems offered by Modular System are appreciated by many users throughout Europe, Saudi Arabia and the United States. MODULAR SYSTEM delivers products to 19 countries worldwide.

We guarantee good lead time while maintaining high quality and aesthetics.

- Experience in container application in civil and military environment in Poland and Europe
- The latest trends in container design and production
- Knowledge and experience of the container production process and material technology
- Modern production facilities
- NATO SUPPORT PROCUREMENT AGENCY – standards and requirements for securing military infrastructure for the functioning of NATO units
- A wide range of portable cabins for office, sanitary, WC, military and special design purposes
- Efficient processing of complex orders
- Build-up and flat-pack versions
- Individual approach to each project
- Functional and easy to adjust schemes for various installations

CERTIFICATES AND LICENCE

- ISO 9001:2015 Quality Management System Certificate;
- AQAP 2110:2016 Quality Management System Certificate;
- NATO Code for National Economy Entity,
- NATO storage numbers (NSN) for manufactured containers
- License no. B-022/2019 dated 5th April 2019 on conduct economic activity in the manufacture and marketing of products for military or police

■ Professional military containers for uniformed services ► p. 185

N7 Space Sp. z o.o.

CONTACT

n7space.com
e-mail: sales@n7space.com
Puławska 182
02-670 Warszawa, Poland
tel.: +48 22 299 20 50



N7 Space specializes in critical software development for embedded systems used in space real-time systems. The company has flight proven experience in space missions and applicability of formal ESA ECSS criticality B level software processes in all stages of development lifecycle (based on ISO 12207).

With over 10 years of experience, the company has been successfully involved in more than 30 projects in the space sector, primarily for the European Space Agency (ESA). In addition to embedded software activities, N7 Space is involved in the development of tools for the automatic development and validation of flight code based on modeling in formal languages (Model-Based Software Engineering, MBSE), as well as the usage of modern programming languages (such as C++ or Rust) in qualified critical software development.

Most important achievements

- PROBA-3: development and validation of complete software for the ASPIICS instrument (mission in operational phase)
- HERA: validation of main spacecraft control software (mission in operational phase)
- Providing software components for upcoming ESA missions:
 - Comet Interceptor
 - ARIEL
 - EnVision
 - TRUTHS
- Long-term contract for Extremely Large Telescope (ELT) control software development, European Southern Observatory (ESO)

Key products and services

- ESA ECSS criticality B pre-qualified flight software components:
 - TRL9 boot software (BSW) (<https://bootloader.space>)
 - TRL9 board support packages (BSP)
 - TRL6 CANopen library (<https://canopen.space>)

- Custom software development for scientific embedded systems
- Testing and validation of software
- Onboard Computers and Control Units for scientific instruments, CubeSats and ISS experiments (<https://obc.n7space.com>)
- Independent Software Verification and Validation (ISVV)

- Board Support Package (BSP) ► p. 24
- Bootloader (BSW) ► p. 24
- CANopen On-Board Protocol Stack ► p. 24
- ICE Cube On-board Control Unit ► p. 46

NOVOL Sp. z o.o.

CONTACT

novol.com
 e-mail: industrial@novol.com
 Żabikowska 7/9,
 62-052 Komorniki, Poland
 tel.: +48 61 810 98 00

NOVOL



The NOVOL company has been involved in developing a system of products for car painting for 45 years: from a wide range of paint materials to advanced color selection systems. An extension of these experiences is the specialized INDUSTRIAL Coating Systems line addressed to industrial customers, manufacturers of containers, steel structures, agricultural machines, wagons, semi-trailers, frames and buses. The latest position in the brand's portfolio is the ARMOR product line tailored to the needs of the production and renovation of military vehicles.

INDUSTRIAL paint systems are characterized by special physicochemical properties that allow paint coatings to work in extreme climate conditions and under high mechanical loads. The NOVOL paint coatings not only protect the painted surface, but are also environmentally friendly. The quality of the ARMOR system is confirmed by obtaining a prestigious certificate from the Military Institute of Engineering Technology. This certificate, consistent with the NO-80-A200:2021 standard, confirms the compliance of the products with the requirements for masking military equipment and vehicles.

Most important achievements

- Certificate from the Military Institute of Engineering Technology following NO-80-A200:2021 (https://novol.com/industrial/wp-content/uploads/sites/14/2024/10/Certyfikat_001_OiB_23_wyd2_NOVOL.pdf)
- "Przedsiębiorstwo Fair Play" Business Quality Certificate for 2024
- Winner of the Best Managed Companies award, organized by Deloitte
- Main award of the 10th edition of the competition Polish Company – International Champion in the category "Exporter – large enterprises"

Key products and services

- | | |
|----------------------------------|----------------|
| → Polyurethane camouflage enamel | → alkyd |
| → Epoxy primer | → acrylic |
| | → other paints |

- ARMORTOPCOAT PU 1000-10 Polyurethane camouflage enamel ► p. 175

Nowak Innovations Sp. z o.o.

CONTACT

nowak-innovations.pl
 e-mail: biuro@nowak-innovations.pl
 Juliusza Słowackiego 8
 38-400 Krosno, Poland
 tel.: +48 602 446 855

NI[®]
NOWAK
 INNOVATIONS



Nowak Innovations's technologies protect crews and vehicles on the modern battlefield.

Nowak Innovations's Safety Systems enhance the safety of military vehicle crews and civilian vehicle passengers. They are fit for all types of military and civilian vehicles.

Nowak Innovations has developed globally, innovative technologies such as:

Automatic Emergency Door Opening (AEDO) System – opens military vehicles' doors and hatches in emergency situations.

Automatic Decompression System (ADS) – designed for use in military vehicles, provides automatic decompression during the initial phase of an explosion inside a vehicle in the event of a hit by ATGM (Anti-Tank Guided Missile) or other type of projectile, as well as an explosion of its own ammunition.

Nowak Innovations offers to sell licenses for AEDO and ADS Systems or to sell complete Systems directly.

Most important achievements

- The AEDO Safety System has been tested and applied by the Polish Company “GERMAZ” in the 4x4 M-ATV Armored Infantry Vehicle, as well as in Ford Ranger, Mercedes Sprinter, Toyota LC 300, and GMC Yukon Denali armored vehicles and civilian vehicles: Ford Mondeo, Ford Focus.
- The ADS System has been tested and implemented in serial production by one of Polish defense company.
- Our technologies are protected by patents in Poland, the EU, the US, and China.

Key products and services

- AEDO Safety System
- ADS Safety System – for use in special military equipment

■ ADS Safety System – for use in special military equipment ► p. 197

■ AEDO Safety System ► p. 198

OBRUM Sp. z o.o.

CONTACT

obrum.pl

e-mail: info@obrum.pl

Toszecka 102

44-117 Gliwice, Poland

tel.: +48 32 30 19 209



OBRUM is a supplier and professional center for engineering vehicles and training solutions including simulators for the Polish Armed Forces and foreign military customers. Extensive competencies of OBRUM in the field of design of mechanical, hydraulic solutions for engineering and combat vehicles, and even tracked combat platforms prove that the company is capable to handle projects of the highest complexity.

OBRUM is a well recognized point of reference in the field of engineering vehicles on an international scale. Company also develops and manages technical documentation and interactive user manuals.

OBRUM is dedicated supplier within PGZ of digital training solutions, including simulators for crews of MBT's and Infantry Fighting Vehicles (driver, gunner, commander), Computer Based Trainings and procedural simulators supporting the training process of crews including those of MS-20 Bridge crews as well as of engineering staff.

OBRUM cooperates with the world-class defense companies including those from the USA, France, and Germany. The company participates in EDF programs aimed at developing innovative solutions in the land domain.

- Wide range of capabilities
- Extensive experience
- Proven track record
- Commitment to innovation

Most important achievements

- MS-20 Bridges
- Driving simulators for Leopard 2 MBT
- Containerized simulators for driver, gunner and commander
- Simulators for crews of MS-20 Bridges
- CBT's and procedural simulators for technical staff
- Service applications

Main services and products

- | | |
|--|---------------------------|
| → Design and integration of engineering vehicles | → Training and simulation |
| → Mobile Bridges | → R&D Services |

■ MS-20 „DAGLEZJA” A WHEELED VEHICLE-LAUNCHED SUPPORT BRIDGE ► p. 182

■ SJCL-6P Driving Simulator for Leopard 2A4 Main Battle Tank ► p. 258

PCO S.A.

CONTACT

pcosa.com.pl

e-mail: pco@pcosa.com.pl

Jana Nowaka-Jeziorańskiego 28

03-982 Warszawa, Poland

tel.: +48 22 515 75 01



PCO S.A. is a company with over 45 years of experience. It is the biggest Polish producer of optoelectronic devices with the use of night vision, thermal imaging and laser technology. All products are a result of research and development activities of the company. PCO SA produces a wide range of optoelectronic observation and aiming devices with laser, night vision and thermal vision technologies for military personnel and uniformed services. These include night vision goggles and monoculars, aviator's goggles, as well as day-night thermal imaging and night vision aiming sights, collimator sights. PCO produces also observation systems for various armoured vehicles, including night vision and thermal imaging systems, as well optoelectronic heads with various sensors (NV, IR, TV cameras, laser rangefinders) and laser warning systems. It also modernises periscopes and observation systems for armoured vehicles. Nowadays the company employs over 650 skilled employees. PCO S.A. is a member of the Polska Grupa Zbrojeniowa S.A. (PGZ S.A.) consolidating Polish defence industry.

Most important achievements

- The company successfully provides solutions for the Polish Armed Forces and uniformed services as well as for foreign customers
- Numerous awards and distinctions including multiple Defender awards at MSPO exhibition in Kielce, Poland
- Development of a number of new products and systems comprising night vision, thermal vision and laser technologies

Main services and products

- Night vision monocular & goggles MU-3M
- Night vision goggles PNL-2ADM
- Thermal imaging monocular MT-1
- Thermal binoculars NPL-1T
- Night vision aviator's goggles PNL-3X
- Daytime modular sight DCM-1
- Laser warning system SSP-1 OBRA-3
- Optoelectronic head GOS-1
- Stabilized commander's optoelectronic head GOD-1
- Stabilized gunner's optoelectronic head GOC-1
- Omnidirectional observation system SOD-1

- Anti-Aircraft Missile and Artillery Systems PILICA ► p. 79
- DAYTIME MODULAR SIGHT DCM-1 ► p. 265
- LASER WARNING SYSTEM SSP-1 OBRA-3 ► p. 268
- MT-1 THERMAL IMAGING MONOCULAR ► p. 271
- MU-3ADM MODULAR NIGHT VISION GOGGLE SYSTEM ► p. 271
- NIGHT VISION GOGGLES PNL-3X ► p. 273
- NIGHT VISION GOGGLES PNL-2ADM ► p. 273
- NIGHT VISION MONOCULAR/GOGGLES MU-3M/MU-3ADM ► p. 274
- OMNIDIRECTIONAL OBSERVATION SYSTEM SOD-1 ► p. 274
- STABILIZED COMMANDER'S OPTOELECTRONIC HEAD GOD-1 ► p. 276
- STABILIZED GUNNER'S OPTOELECTRONIC HEAD GOC-1 ► p. 276
- STABILIZED OBSERVATION AND TRACKING OPTOELECTRONIC HEAD FOR ANTIAIRCRAFT SYSTEMS GOS-1 ► p. 277
- THERMAL IMAGING BINOCULARS NPL-1T ► p. 277
- THERMAL IMAGING MONOCULAR MT-1 ► p. 277

PIT-RADWAR S.A.

CONTACT

pitradwar.com
e-mail: office@pitradwar.com
Poligonowa 30
04-051 Warszawa, Poland
tel.: +48 22 540 22 00



PIT-RADWAR S.A. is one of the leading suppliers of professional electronic equipment for the Armed Forces of the Republic of Poland. For decades, the Company has conducted research and development activities in the field of radar technology, electronic support and measures, C2 systems and related armament systems, especially air defence systems. The products of PIT-RADWAR S.A. are used by all types of the Armed Forces of the Republic of Poland, as well as abroad.

PIT-RADWAR S.A. handles the full supply cycle – starting from setting requirements, through research and development work and production to logistic support offered to the users.

Most important achievements

- The company has for years remained one of the most important suppliers of solutions for the Polish Armed Forces, and is also a major exporter
- Cooperation with renowned foreign partners
- Development of a number of new radar systems, including the first Polish radar with an AESA antenna – continued development of anti-aircraft and command systems
- Numerous awards and distinctions including the Award of the President of the Republic of Poland for the Passive Location System and the Lider Bezpieczeństwa Państwa (State Security Leader) distinction in the Innovative Product category for the OSU-35K Naval Armament System

Key products and services

- | | |
|--|-------------------------------------|
| → Anti-Aircraft Missile System POPRAD | → SA-35 – Self-Propelled Gun System |
| → BYSTRA – Mobile 3D Short Range Radar | → TUGA – 4D AESA Radar |
| → OSU-35K – Naval Armament System | → IFF Mark XIIIA Family Products |

- Anti-Aircraft Missile System POPRAD ► p. 78
- Anti-aircraft Rocket-artillery System PSR-A PILICA ► p. 79
- BYSTRA – Mobile 3D Short Range Radar ► p. 80
- IFF Mark XIIIA Family Products ► p. 233
- OSU-35K ► p. 223
- SA-35 – Self-Propelled Gun System ► p. 301
- TUGA – 4D AESA Radar ► p. 241

PONAR Wadowice S.A.

CONTACT

www.ponar.pl
e-mail: export@ponar.pl
Wojska Polskiego 29
34-100 Wadowice, Poland
tel.: +48 33 488 28 20-29



PONAR Wadowice S.A. products are used in many devices and applications for the defence industry. We offer complete special versions, designed to work in combat conditions, in extreme temperatures, high dustiness or humidity. Our offer includes solutions tailored to the individual needs of our customers. We manufacture products based on documentation provided by the Customer or developed by our own design and construction department.

The most important achievements

- 60 years in the industry
- polonisation of SH KRAB howitzer
- delivery of hydraulic systems for radar stations
- hydropneumatic rocker arms for tracked vehicles

Key products and services

- hydropneumatic suspension for tracked vehicles
- oil hydraulic systems for tracked and wheel vehicles
- hydraulic systems for missile defence vehicles
- hydraulic cylinders (incl. special coating)
- spool valves (incl. special versions for extreme temperatures, humidity, sea fog, etc.)

- Directional Spool Valves for Extreme Environmental Conditions ► p. 104
- Hydraulic System for Anti-Aircraft Defence Vehicles ► p. 106
- Hydropneumatic Suspension for Tracked Vehicles ► p. 108
- Oil Hydraulic Systems for Tracked and Wheel Vehicles ► p. 113

Przedsiębiorstwo PREXER Sp. z o.o.

CONTACT

prexer.com.pl
e-mail: prexer@prexer.com.pl
Kilińskiego 16
90-209 Łódź, Poland
tel.: +48 42 632 54 64

PREXER®



The PREXER company is a manufacturer of products for the national defense and security. We offer:

- Target sights for anti-aircraft artillery: thermal, night vision and daylight, working as an autonomous fire control system.
- Observation devices – periscopes (glass and acrylic) equipped with a heating system and anti-laser filters, to be installed in armored vehicles, including day-night periscopes with a night vision module and a thermal imaging module.
- Unmanned aerial vehicle jamming systems.
- 9 mm WIST 94 and WIST 94L military pistols.
- Electronic and optoelectronic assemblies: laser rangefinder components, night vision and thermal imaging assemblies.

PREXER Sp. z o.o. specializes in the production of devices and systems tailored to the customer's requirements, used in all types of armed forces, at home and abroad. Our offer is very flexible, the solutions offered can be easily adapted to the individual requirements of the customers.

Key products and services

- DJ-25 unmanned aerial vehicle (UAV) jammer system.
- CKE-1T, CKE-1TM thermal imaging target sights and CKE-1N, CKE-2N night vision target sights for anti-aircraft guns.
- Classic observation devices, e.g. OPO-170F, OPO-130F.
- Day-night periscopes, e.g. M17T and OPO-170T thermal imaging observation devices, and OPO-170N with high quality passive night vision module.
- Modernization and renovation of periscopes.

- CKE-1T thermal target sight for anti-aircraft gun and missile system ► p. 82
- DJ-25 Jammer Unmanned Aerial Vehicle (UAV) jammer system ► p. 84
- Heated observation devices OPO-120F, OPO-125F, OPO-130F ► p. 105
- M17T – thermal imaging periscope ► p. 112

REKORD Hale Namiotowe

CONTACT

halenamiotowe.com.pl
e-mail: rekord@halenamiotowe.com.pl
Mazowiecka 17
50-412 Wrocław, Poland
tel.: +48 71 34 38 388



Rekord Hale Namiotowe Sp. z o.o. is a supplier of modern tent halls recognized on the Polish and European markets. We offer rental and sale of seasonal and year-round tents. Our tent constructions will suit wherever there is a need to quickly cover a large area. In the offer, our contractors will find warehouse, trade halls, event, spherical and sports halls.

The most important achievements

- Global Certified ISO 9001:2015, ISO 3834-2:2007, PN-EN 1090-2+A1:2012
- Quality Management System ISO 9001:2015; AQAP 2110:2016; AQAP 2131,
- Winner Gazeta Biznesu 2018

Key products and services

- Rental and sale of year-round and seasonal tents
- Our offer includes warehouse, trade halls, event, spherical and sports halls
- Comprehensive sanitary facilities
- Rental of power generators, heaters, set lights, air conditioners
- Rental of mobile kitchens, laundry
- Car washes

■ Tent halls ► p. 190

Remontowa Shipbuilding S.A.

CONTACT

www.remontowa-rsb.pl

e-mail: sekretariat@remontowa-rsb.pl

Swojska 8

80-958 Gdańsk, Poland

tel.: +48 58 309 66 00



Remontowa Shipbuilding, a member of Remontowa Holding S.A. is a recognized partner and prime supplier of naval vessels for the Polish Navy. Thanks to many years of shipbuilding experience, the Shipyard offers a wide range of products while the ships it builds stand out in the market due to the cutting-edge technology and high level of automation responding to the latest trends and meeting the Owners' requirements. Cooperation within the Remontowa Holding allows to offer comprehensive technical solutions with final products being fully equipped, modern vessels.

For several years, the Shipyard has actively participated in the technical modernization program of The Polish Armed Forces. Over this time, the Shipyard has delivered 6 navy tugs and 3 Mine Countermeasure Vessels (MCMVs) type Kormoran II which are among the most advanced vessels of their class in the world. At the same time, the Shipyard began the construction of the next 3 MCMVs and 2 Signal Intelligence Ships. Experience gained from the construction of over 600 modern naval ships and special vessels is a guarantee of reliability and successful execution of new orders.

Most important achievements

- Completion of the Kormoran II program during which in the phase 1 three vessels have already been delivered and in the phase 2 the next three units have been started,
- Completion of the program "Technical security and rescue operations at sea with code name "HOLOWNIK" under which 6 highly versatile vessels have been handed over to the Polish Navy.

Key products and services

- Naval vessels
- Special vessels
- Offshore vessels
- Car – Passenger Ferries

■ Minehunter Kormoran II ► p. 221

ROSOMAK S.A.

CONTACT

rosomaksa.pl

e-mail: rosomaksa@rosomaksa.pl

Powstańców 5/7

41-100 Siemianowice Śląskie, Poland

tel.: +48 32 228 57 51



We are specialists in manufacturing and servicing combat vehicles. Our products have been tested in military missions, the quality of designs incorporated by our solutions contribute to the safety of the modern soldier.

We provide solutions based on the latest technology backed by extensive knowledge and research. We also provide comprehensive training, development and support services at each stage of use of our products. Thanks to our commitment our customers can feel at ease at every stage of the product life cycle.

Our clients must face the challenges of the modern battlefield, they are aware that at every stage they can count on our support and that we are a partner who understands the challenges they face. With years of experience we have learned precisely how to tackle the problems at hand, flawlessly providing solutions for success in every mission. Our professionals provide high quality service, extensive technical knowledge and creative approaches to problem solving.

Quality and trust are the values that guide us in our work. Our customers can rely on the commitment, support and expertise of our professionals who will not disappoint them in the course of achieving new objectives. We are aware that the environment in which our customers use our products, often there is no second chance – which is why we provide solutions that work first time – always.

Main Services and Products

- IFV Rosomak integrated with ZSSW-30 turret
- Medical Evacuation Vehicle – Medevac
- Reconnaissance Vehicle
- Armored Recovery Vehicle
- Fire Command Vehicle

■ ROSOMAK 8x8 APC ► p. 117

SATIM Satellite Monitoring

CONTACT

www.satim.co
e-mail: hello@satim.co

Królewska 65
30-081 Kraków, Poland



SATIM is a world-leading AI technology company specializing in Automatic Target Recognition (ATR) using Synthetic Aperture Radar (SAR) imagery. Our advanced solutions enable rapid, highly accurate object detection, classification, and identification—anywhere, anytime.

At the core of our technology is OREC, our cutting-edge AI-powered software designed for strategic site monitoring across open ocean, littoral zones, ports, and land.

OREC is powered by SSIG, an advanced synthetic signature SAR simulator developed by SATIM. By generating high-fidelity, simulated SAR datasets, SSIG enables rapid expansion of object catalogs tailored to customer needs and offers a cost-effective alternative to real-world SAR data, ensuring robust AI model training and operational versatility across a wide range of scenarios.

With an industry-leading 90% accuracy in object detection and classification, SATIM's technology delivers unparalleled insights for military, government, and commercial applications, empowering effective decision-making in dynamic environments.

Most important achievements

- Over 20 years of experience in SAR Data Analysis
- Wide catalog of detected and classified objects (110 Vessels, 18 Aircraft, 7 Vehicles)
- 90% accuracy in object detection and classification
- Specialized in Military and Civil objects
- ISO 27001 certificate validating SATIM as an entity with world-class standards in the information security field.
- Partnerships with companies such as ICEYE, AIRBUS, Capella Space, Thales, MDA Space, Umbra, SkyFi, BAE Systems and Synspective
- Cooperation with the European Space Agency (ESA)
- Official United States Geospatial Intelligence Foundation (USGIF) small business partner

Key products

- OREC cutting-edge AI-driven Automatic Target Recognition (ATR) solutions with three highly accurate AI models for detecting vessels, aircraft, and vehicles on SAR imagery.
- SSIG – proprietary SAR signature simulator

Key services

SATIM provides advanced AI-driven solutions, including OREC for precise object detection and classification, powered by the SSIG SAR simulator, to meet the evolving needs of our clients.

Detection and Classification in Specific Areas

We provide precise image data acquisition according to client specifications, followed by detailed detection and classification within the defined area. Our advanced algorithms ensure high accuracy in objects detection and classification.

Satellite Tasking for Report Delivery

SATIM deals with commercial SAR data providers and is able to imagery tasking upon request to capture specific areas of interest and provide comprehensive reports based on the images on time. These reports are tailored to meet the needs of our clients and support informed decision-making.

We offer a range of flexible option for accessing and utilizing our services and tools:

- STANDALONE: A user-friendly, standalone solution for direct use.
- API: Seamlessly integrate our services into your own systems with our robust API.
- CONTAINER: For clients requiring a self-contained solution, we provide containerized options for easy deployment and operation.

At SATIM, we ensure that our services are adaptable and designed to provide the best possible results for a variety of use cases.

- OREC – AI-Based software for object detection and classification on SAR imagery ► p. 160
- SSIG – SAR Signature Simulator ► p. 168

Scanway S.A.

CONTACT

scanway.space
e-mail: space@scanway.pl
Strzegomska 140A
54-429 Wrocław, Poland
tel.: +48 71 733 62 64



Scanway is a Polish company specializing in electro-optical solutions for imaging in space and manufacturing industries. Its branch, Scanway Space, offers advanced optical payloads for Earth Observation and other remote sensing applications, providing adaptable imagers for different resolutions, fields of view, altitudes, and spectra, compatible with small satellites. Furthermore, the company provides camera systems dedicated to working on applications such as space situational awareness, spacecraft self-inspection or space exploration. With over 9 years in the space industry, Scanway's solutions have achieved TRL 9 and contribute to key Polish space missions like EagleEye, PIAST, and European projects such as LUWEX, Ariane 6 or SEMOVIS. Scanway is a public listed company with currently 60+ employees on board, supporting both space and manufacturing industries with vision systems enhanced by machine learning.

Most important achievements

- Proprietary STAR VIBE in-orbit demonstration mission
- Member of the largest Polish satellite projects (EagleEye, PIAST)
- TRL 9 products offered
- Company's camera system as a part of Ariane 6 first flight
- Intuitive Machines, Nara Space Technology among the clients

Key products and services

- Scanway Optical Payload (SOP) – instruments for Earth Observation and other remote sensing applications
- Scanway Camera System (SCS) – camera systems for space applications
- Modular camera systems for quality control in manufacturing industry

- Scanway Camera Systems (SCS) ► p. 63
- Scanway Optical Payload (SOP) ► p. 63

SecureVisio

CONTACT

securevisio.com
e-mail: kontakt@securevisio.com
Hoffmanowej 19
35-016 Rzeszów, Poland
tel.: +48 564 421 963



Discover SecureVisio

SecureVisio is a major EU-based and the largest Polish cybersecurity software vendor established in 2010 offering automated cybersecurity management platform. Our platform integrates 9 critical cybersecurity solutions within security operations, risk, compliance and data protection

Our suite of cybersecurity capabilities include asset discovery, risk management, vulnerability management, data protection, threat intelligence, XDR, SIEM, SOAR and UEBA solutions

Having collaborated with over 100 clients across various sectors including healthcare, telecommunications, manufacturing, energy, and banking we have established a strong presence in both the public and private segments

We have developed network of over 30 certified implementation partners in Central Europe, Asia and Africa ready to support platform implementations

Most important achievements

- Deloitte Technology Fast 50 2022 Central Europe Impact Stars

Key products and services

- | | |
|----------------------------|--------|
| • Asset discovery | • XDR |
| • Risk management | • SIEM |
| • Vulnerability management | • SOAR |
| • Data protection | • UEBA |
| • Threat intelligence | |

■ SecureVisio cybersecurity management platform ► p. 165

SILTEC Sp. z o.o.

CONTACT

www.siltec.pl
e-mail: biuro@siltec.pl
Parzniewska 12
05-800 Pruszków, Poland
tel.: +48 22 572 18 00



SILTEC Sp. z o.o. is a private held Polish company with over 40 years of experience on the market. We provide reliable, trusted products and services for defense, security and civil customers mainly in the EU & NATO. Our experience, technical proficiency and over 160 highly qualified employees set us apart among many other market players.

Our headquarters include offices, production lines, laboratories and testing rooms.

We design, manufacture, test and hold full scope of project management.

We are leading TEMPEST manufacturer and tester with the EU & NATO certification.

Our expertise in this field enables us to provide a full scope of related trainings and support in creation of the necessary technical environment in new locations.

Most important achievements

- Deliveries of TEMPEST IT to the Armed Forces Cyber Resources Center, NATO Multinational Corps Northeast and other customers in Poland and abroad,
- 7-year-long Framework Agreement with DALO for delivery of TEMPEST IT,
- Ongoing contracts for the delivery of: aircraft communication systems for JTACs, Reconnaissance Sensor System, Medium Satellite Terminals as well as Container Postal Modules, Container Desalination Modules, mobile container shooting ranges and mobile data centers.

Key products and services

- equipment and services for classified and sensitive information protection (NATO SDIP-28, NATO SDIP-27 and EU IASG 7-03 compliant),

- customized container structures (Mobile Data Centers and Mobile Training Centers, Armored Observation Container),
- customized power supply systems,
- systems and solutions for military and governmental entities.

- All-in-One Zero Client Terminal SIL720 – L/T ► p. 152
- Armored Observation Container (OKO) ► p. 200
- Mobile Access Node – SIL720-MWD ► p. 137
- Mobile Data Center ► p. 207
- Mobile RACK Transport Case – ShMRC1904 ► p. 209
- Portable VTC System SIL788 – MVTC/WRB ► p. 162
- Servers Room ► p. 166
- Shielded Cabinet SIL720-SzE19xx Series ► p. 167
- Small Intelligent Light satellite terminal SilPack series ► p. 240
- TEMPEST NATO SDIP-27 and EU IASG 7-03 compliant IT equipment ► p. 170

Smart Fluid S.A.

CONTACT

www.smartfluid.pl
 e-mail: smartfluid@qemetica.com
 Rydygiera 8/20
 01-793 Warszawa, Poland
 tel.: +48 506 951 829, +48 22 639 15 26



Smart Fluid S.A. is an innovative company that develops and produces materials based on shear thickening fluids (STF), also known as non-Newtonian (commercial name 'flexible ceramics').

It belongs to the Qemetica Group (previously named Ciech Group), which is one of the leading chemical companies in Europe with transatlantic presence (in total: >EUR 1.2Bn revenues, >3500 employees, >100 export countries).

Smart Fluid products are next-generation materials that were developed for the absorption of any form of kinetic energy. The technology is ready to use and production-scale batches are available. The materials are great to apply in new projects, upgrades of the existing equipment as well as to create new composites.

Key products and services

- Smart ceramic gel
- Smart ceramic fluid
- Smart ceramic foam
- Exceptional and customized solutions allow to design individual systems with tailored protection level and response time.

- Smart & flexible ceramic materials ► p. 118

Solaris Optics S.A.

CONTACT

www.solarisoptics.eu
 e-mail: info@solarisoptics.eu
 Sobieskiego 49
 05-410 Józefów, Poland
 tel.: +48 22 483 39 68



Solaris Optics S.A. – Precision Optics for a High-Tech Future

For over 30 years, Solaris Optics S.A. has been a trusted leader in designing and manufacturing high-precision optical components and systems. We collaborate with global partners from Germany, the Netherlands, France, Taiwan, and the United States, delivering world-class solutions tailored to the most demanding applications. We have had an ISO 9001 certificate for twenty years.

Our portfolio includes premium-quality lenses, mirrors, optical windows, prisms, and fully assembled optical systems.

Our in-house production covers everything from concept to completion. We control every stage of production, ensuring exceptional precision and reliability. By blending time-honored craftsmanship—such as manual polishing—with state-of-the-art CNC machining for milling and precision grinding, we meet our clients' expectations.

Equipped with three advanced vacuum coating machines, we apply cutting-edge thin-film coatings and perform full characterization of both individual components and optical systems.

Our expertise extends to the defense sector, where our optics enhance missile guidance systems and Earth observation telescopes. As part of the European projects, we have produced highly precise lenses, mirrors, and filters for defense applications. Additionally, we support upcoming space missions, crafting ultra-precise astronomical mirrors for future exploration.

Most important achievements

- Development of Light-Weight Super-Teleobjective for ESA in the framework of the Polish Industry Incentive Scheme programme (Solaris as the leader),
- Space Qualification of Optical Coatings for ESA as part of the Polish Industry Incentive Scheme programme (Solaris as the leader),
- ESA's PROBA 3: Solaris Optics provided optical filters (contractor);
- ESA's Sentinel 5: Solaris Optics supplied coated optical elements, including gradient filters (contractor).

Key products and services

- Optical Systems
- Prisms
- Lenses
- Beamsplitters
- Mirrors
- Coatings
- Services (design, metrology)

■ LENSES ► p. 48

■ PRISMS ► p. 58

■ Space Optical in-house production ► p. 64

SpaceForest Sp. z o.o.

CONTACT

www.spaceforest.pl

e-mail: spaceforest@spaceforest.pl

Bolesława Krzywoustego 1B

81-035 Gdynia, Poland

+48 58 770 56 46



SpaceForest
innovative solutions



SpaceForest specializes in the development and commercialization of advanced technologies, focusing on synthetic aperture radar (SAR), advanced electronics, microwave filters and rocket technologies. Our comprehensive services include the design, optimization and production of devices and software with a particular focus on the space sector. Additionally, we develop our own space and supersonic rockets, supported by in-house composite production.

We deliver top-quality solutions tailored to various industries, including defense, aviation, telecommunications and space technologies. With expertise, passion, and state-of-the-art laboratories, we provide solutions of the highest standards, enabling us to undertake the most complex projects in the realm of space technology.

Most important achievements

- Development of Own SAR Radar – Advanced synthetic aperture radar (SAR) system for real-time imaging and target detection.
- JUICE – Control and Data Management System for ESA's Jupiter Icy Moon Explorer Project.
- PERUN – Eco-friendly hybrid propulsion suborbital rocket development.
- SALTO – Reusable Strategic Space Launcher Technologies & Operations (2021).
- IMU – Universal Navigation Inertial Measurement Unit for rocket guidance.

Key products and services

- HUSSAR – Lightweight and mobile X-band SAR radar for real-time imaging and tracking of objects.
- RASEL – Autonomous tracking and communication system for flying vehicles.

- FTS – AI-powered Filter Tuning Solutions for RF and microwave applications.
- PERUN – Suborbital rocket system with hybrid propulsion.
- RF and microwave electronics products.
- Advanced electronics R&D and prototyping.

■ FTS – Filter Tuning Solutions powered by AI ► p. 157

■ HUSSAR – Lightweight and Portable X-Band Synthetic Aperture Radar ► p. 40

■ Rasel – Autonomous Tracking and Telemetry Communication System ► p. 60

Spectre Solutions Sp. z o.o.

CONTACT

spectre.solutions

e-mail: franciszek.milczarski@spectre.solutions

Aleje Jerozolimskie 85/21,

02-001 Warszawa, Poland

tel.: +48 881 005 129



Spectre Solutions is an innovative drone company that was founded in 2014. For ten years, the organisation has been designing and producing drones for special purposes. Spectre Solutions' flagship products are the SPECTRE-1 and SPECTRE-2 drones, which can transport or monitor critical infrastructure. These drones have a wingspan of 3.5 m and can reach speeds of up to 140 km/h. Depending on the order specifications, they can fly up to 700 km and 6.5 hours. At the MSPO2023 in Kielce, Spectre Solutions showcased a joint military project with the Polish Armaments Group. The firm also has much experience in research and development projects. With Polish funds' support, they developed the first civilian drone project, SPECTRE-1, in collaboration with the Warsaw University of Technology. The company are now working on its next project – a system for measuring vehicle speed – a mobile speed camera. In 2024, Spectre Solutions won another EU-funded project and will carry it out in an international consortium. The organisation team consists of 50 people who have extensive skills and experience in the drone and aviation industry.

Most important achievements

- At the MSPO2023 in Kielce, Spectre Solutions showcased a joint military project with the Polish Armaments Group.
- The firm has much experience in research and development projects. With Polish funds' support, they developed the first civilian drone project, SPECTRE-1, in collaboration with the Warsaw University of Technology. The company are now working on its next project – a system for measuring vehicle speed – a mobile speed camera. In 2024, Spectre Solutions won another EU-funded project and will carry it out in an international consortium.
- Spectre Solutions has been a leading drone company for 10 years, with a team of 50 experts in the drone and aviation industry.

Main services and products

- SPECTRE-2 drone, which can transport various medical supplies or monitor critical infrastructure.

■ SPECTRE-2 ► p. 67

SybillaTechnologies Sp. z o.o.

CONTACT

www.sybillatechnologies.com

e-mail: info@sybillatechnologies.com

Toruńska 59,

85-023 Bydgoszcz, Poland

tel.: +48 792 356 675



Sybilla Technologies is a leading European company specializing in the design, development of hardware and software for ground-based sensors, precise photometric and astrometric measurements, space traffic management, and the collection and delivery of data necessary for the detection and monitoring of satellites and other space objects in low, medium, and geostationary Earth orbits (LEO, MEO, GEO). Our company designs, delivers, integrates and operates advanced observation systems.

We have extensive experience in comprehensive service and collaboration with observatories across five continents, academic communities, and external partners. Our comprehensive approach encompasses design, assembly of telescopic sets, and professional data management. Additionally, we have a specialized team of scientists focused on precise photometric and astrometric measurements.

We are developing advanced technologies that support the safety of space and the Earth, monitoring objects in orbits and reducing space debris to ensure that future generations have access to orbits around the Earth that are as valuable and limited as water or natural resources.

Most important achievements

- Main contractor for POLSA in the development of the POLON observation network (Chile, South Africa, Australia, Utah).
- Contract to provide observation data for EU SST.
- Participation in the European Defence Industry Development Programme projects (SAURON, INTEGRAL), European Defence Fund projects (SPRING, ODIN'S EYE II, EMISSARY) as well as multiple ESA projects.

Key products and services

- Perseus – Ground-Based Observation System
- Hydra – Multicolor Photometry For Orbital Object Characterization
- ABOT – Autonomous observatory management
- Astrometry24.NET – Advanced Automated Astrometry For Space Surveillance
- Astrodrive.io – Space Safety Data Platform

- Hydra – Multicolor Photometry For Orbital Object Characterization ► p. 232
- Perseus – High-End Ground-Based Observation System ► p. 236

SZCZEŚNIAK Pojazdy Specjalne Sp. z o.o.

CONTACT

www.psszczesniak.pl

e-mail: biuro@psszczesniak.pl

Bestwińska 105A

43-346 Bielsko-Biała, Poland

tel.: + 48 33 827 3400; fax: + 48 33 818 2614



SZCZEŚNIAK Pojazdy Specjalne Sp. z o.o. is a private company established in 1992 and it's one of the leading producer of vehicles for fire services, police, army and civil services. Over 300 vehicles are manufactured yearly, where 70% represents vehicles for fire services and remaining 30% – military or special vehicles. They are being operated in 35 countries.

Since 2006, the company is in possession of concession No. B-046/2006 of the Ministry of the Interior and Administration to conduct business activities in the field of manufacturing and trading: explosives, weapons, ammunition, products and technology for military or police purposes. It has implemented the management system compliant with AQAP 2110 and the Internal Control System according to the Act of November 29, 2000 on Foreign Trade in Goods, Technologies and Services of Strategic Significance for State Security and for Maintaining International Peace and Security, (Dz.U. 2000 nr 119 pos. 1250, with later changes) enabling to provide deliveries for armed forces. Moreover, the company received the NATO Code of National Economy Entity (NCAGE) 1798H, issued under the NATO Codification System.

In 2019 the company was included in the group of enterprises of special economic and defense importance by the Ministry of National Defense. By decision of MoD the company has assigned tasks for Polish Armed Forces.

Most important achievements

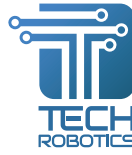
- An enterprise of special economic and defense importance for Polish MoD
- Restricted information office
- Concession of the Ministry of Interior and Administration No. B-046/2006
- AQAP 2110 implemented
- NCAGE code granted

- Heavy wheeled recovery vehicle ► p. 105

Tech Robotics S.A.

CONTACT

www.TechRobotics.pl
e-mail: office@techrobotics.pl
Lindleya 16
02-013 Warszawa, Poland
tel.: +48 798 737 246



We are a provider of cutting-edge unmanned ground vehicle (UGV) drone technologies. We utilize the latest advancements to develop best-in-class lightweight mobile platforms. Our expertise lies in battlefield-oriented robotics. Our team consists of experienced engineers and service veterans. We specialize in designing, developing, manufacturing, and delivering ground robots and drones.

The most important achievements

- Development of an innovative training system OSCAR™, which utilizes robotic technology for simulating moving targets
- Implementation of the proof of concept the HALNY™ Tactical System (defensive and offensive) with proprietary software for autonomous navigation, location, and perception

Key products and services

- Mobile shooting Robotic Target™ 2WD
- Mobile shooting Robotic Target™ 4WD
- Shooting target Dummy 3D TechFlex™

- Mobile shooting target: Robotic Target™ 2WD, Robotic Target™ 4WD ► p. 253
- ReconSKY ► p. 62

TELBUD S.A.

CONTACT

www.telbud.pl
e-mail: telbud@telbud.pl
Krauthofera 23
60-203 Poznań, Poland
tel.: +48 61 866 88 48



Since 1987 we have been providing telecommunications, facility protection, automation and supervision and control solutions. We specialize in designing, developing, implementing and maintaining comprehensive security systems with dedicated communication and supply systems of various manufacturers. Invented and developed by us – ARGUS platform featuring computer supervision and control system is based on our own, proprietary software of PSIM (Physical Security Information Management) class. We are an engineering company, 100% owned by Polish shareholders. We have the license from the Ministry of Internal Affairs and Administration to run business operations consisting in property security services (technical security of facilities), and in particular in the area of the installation of electronic devices and alarm systems signalling threats to any protected persons or property items as well as in the area of their operation, maintenance and repairs on site.

The rights granted to us enabled us to implement many important projects for military units, mainly in the area of technical security devices, telecommunications networks and supply systems. We focus mainly on the provision of design and installation services in the area of technical security devices, including burglar alarms, access control systems, CCTV, fire alarms and fire safety systems with the entire infrastructure of telecommunications and supply networks. We provide the services of integration of these systems with the use of our major product - ARGUS PSIM (physical security information management). At present, we are working on many comprehensive technical security systems and security management systems for our key clients, in particular PSE, PERN, The Polish Border Guard Headquarters and other military units.

Protection of classified information:

- IT system security accreditation certificate,
- first degree industrial security certificate, secret clause,
- first degree industrial safety certificate, NATO clause,
- first degree industrial safety certificate, SECRET EU clause.

Most important achievements

- PGE EO S.A. – comprehensive modernization of technical security systems
- PSE S.A. – construction of technical security systems, implementation of argus integrating systems
- POLISH AIR NAVIGATION SERVICES AGENCY – implementation of central supervision of field and airport radio navigation, radio location and radio communication facilities
- PERN S.A. 0150 construction of comprehensive technical security systems and security management centers
- THE POLISH BORDER GUARD HEADQUARTERS – construction of an electronic barrier on the border with the Russian Federation and modernization of electronic security on the border with Belarus

Key product

- ARGUS PSIM – a physical security information management class platform, integrating technical security systems

Key services

- designing, developing, implementing and maintaining comprehensive security systems with dedicated communication and supply systems of various manufacturers
- design and construction of perimeter protection of the area using integrated electronic security systems

■ ARGUS PSIM ► p. 226

TELDAT

CONTACT

teldat.com.pl

e-mail: teldat@teldat.com.pl

Cicha 19-27

85-650 Bydgoszcz, Poland

tel.: +48 52 341 97 00

TELDAT



TELDAT is the only Polish company specializing in the field of military ICT (including wide-area command and communication battle and crisis management systems) that has been dynamically and effectively operating in the security and defense for nearly 30 years. TELDAT core product is the Network Centric Data Communication Platform JASMINE which is an automated system that supports military and communication activities. Our hardware and software solutions have been successfully used and tested in the majority of the Polish Armed Forces units and institutions, NATO, European and American research laboratories and in largest military exercises such as Combined Endeavor, NATO CWID / NATO CWIX, Bold Quest and many others.

Most important achievements

- long-term cooperation with the Polish Ministry of National Defense;
- delivery of software/multidomain Combat Management System of Systems JASMINE and ICT Nodes in a container and portable version with system and management software to the Polish Armed Forces;
- delivery of routers with system software for the PATRIOT system to Raytheon Technologies;
- numerous prizes and honours awarded by the Ministry of National Defense and Raytheon Technologies.

Main services and products (approved for export)

- Network Centric Data Communication Platform JASMINE – Multidomain Combat Management System of Systems along with its subsystem:
 - C3IS JASMINE – Multidomain Combat Management System of Systems dedicated to all command echelons and combat operations,
 - HMS JASMINE – Headquarters Management System for Operational and Tactical Level,
 - BMS JASMINE – Battlefield Management System for Battalion, Company, Platoon & Section,
 - VIS JASMINE – Vehicle Intercom System,
 - DSS JASMINE – Dismounted Soldier System,
 - JFSS JASMINE – Joint Fires Support System,
 - CID JASMINE – Combat IDentification Server,
 - CMS JASMINE – Crisis Management System;
- ICT Nodes in shelter and portable versions;
- Tactical Terminal Tablets.

- BMS JASMINE ► p. 126
- C3IS JASMINE ► p. 130
- HMS JASMINE ► p. 136
- Tactical Terminals ► p. 145

THORIUM SPACE S.A.

CONTACT

thorium.space
e-mail: ewa.cybulska@thoriumspace.com
Bierutowska 57-59
51-317 Wrocław, Poland
tel.: +48 690 518 002, +48 573 352 113



Thorium Space is a leading Polish technology company specializing in cutting-edge communication systems for both ground and space segments, dedicated for commercial, governmental, military and scientific purposes. Supported by R&D funding from the EU, the Polish Ministry of Defense, and the European Space Agency (ESA), the company delivers next-generation, innovative space systems with increased efficiency and reduced size, which translates into lower launch costs.

Most important achievements

- Revolutionary flat panel electronically steered antennas (AESA technology), used in the Aurora and Aurora PRO communication terminals, enabling connectivity with several satellites at the same time, bigger transmission capacity (high throughput), and a possibility to be easily integrated on military vehicles, drones, and navy ships.
- Software-defined telecommunication satellite payload – the solution that allows the satellite's functionality to be flexibly adapted to the operator's needs, even during the mission, which increases operational efficiency.
- High-performance chipsets for satellite communication systems, equipped with built-in data encryption features, and technologies to resist signal interference and jamming that protect sensitive information from interception and unauthorized access, crucial for both commercial and military applications.

Key products and services

- Aurora and Aurora PRO Satellite Terminals (Ku/Ka bands)
- RF payloads (Ku/Ka bands)
- Active Electronically Steered (AESA) Antennas
- Proprietary Thorium Space Chipsets

- Aurora Satellite Terminal ► p. 23
- Thorium Space chipsets ► p. 70

TRANSBIT Sp. z o.o.

CONTACT

www.transbit.com.pl
e-mail: biuro@transbit.com.pl
Łukasza Drewny 80
02-968 Warszawa, Poland
tel.: +48 22 550 48 00



Transbit Sp. z o.o. is a leading manufacturer of tactical communication systems in Poland, supplying the Polish Army with the highest-class military equipment and is a partner of the Polish Armed Forces in modernization and development programs of the Polish Military.

The Company's offer includes proprietary technologies and solutions in its entire scope from concept, design, to production, integration, delivery of equipment and service that meet the requirements of the modern battlefield.

Transbit specializes of communications equipment in SDR (Software Defined Radio) technologies: horizontal radio relay systems – High Capacity Line of Sight (HCLOS), digital wideband radios, radio links for drones. It also offers complete connectivity solutions – Voice over Internet Protocol (field exchanges, telephones), tactical routers, switches and network servers, digital tract switches. The equipment is designed for use at tactical and operational levels, for installation in combat vehicles, wheeled transporters, field and mobile command posts, communication nodes.

Most important achievements

- Transbit plays a key role in the implementation of technical modernization programs of the Polish Armed Forces, supplies communications equipment to the Air and Missile Defense Forces, Command and Communications Forces, Radio Technical Forces, Naval Forces, Aeromobility and Motorized Forces, Armored and Mechanized Forces, provides communications systems for tactical-class airborne drones.

- Transbit supplies advanced communications systems that fulfill a key role in the integration of command and control (C2) systems within a modern network-centric architecture e.g. BMS – Battle Communications System, IBCS – Air Defence Command and Communication System)
- Transbit's solutions are designed to meet the rapidly changing requirements of the modern battlefield, including:
- State-of-the-art tactical and operational communications systems that ensure secure and reliable data transmission in the military environment.
- ICT solutions that support the operation of command and control systems.
- Flexibility of deliveries, which are tailored to the current needs of the customer, which guarantees efficient implementation of solutions in military units.

- Digital Radio Relay R-460A ► p. 131
- Digital Wideband Radio R-450C-01 ► p. 132
- RP-201-01 Routing Platform ► p. 162
- SUS-24-02 Tactical server ► p. 170
- UAV Radio Data Link
- BMR-10-N1 Ground Radio Module ► p. 147
- Aircraft Radio Module SMR-10-S ► p. 147
- VoIP gateway CV-12r-01 ► p. 148

VECTOR SYNERGY

CONTACT

www.vectorsynergy.com
 e-mail: info@vectorsynergy.com
 Marcelińska 90
 60-324 Poznań, Poland
 tel.: +48 61 667 07 44



Vector Synergy is a NATO Prime IT Partner with 15+ years of experience, specialising in cyber defence and IT services. We are trusted by organisations such as NATO and multiple European agencies, as well as companies in defence, critical infrastructure, and BFSI industries.

All of our highly skilled experts possess a personal security clearance, allowing them to work on secret and top-secret classified IT projects. Close to 200 of our tech professionals are currently involved in projects with classified and sensitive information, while over 1000 ready-to-go talents stand ready to support your projects.

Regardless of the kind of IT expertise you require, Vector Synergy can deliver innovative, scalable solutions, and act as a one-stop destination for all your tech needs. As the central hub for a network of specialised consultants, we're the best choice for organisations striving for excellence.

We have been at the forefront of advanced security and IT solutions since our inception in 2010. That only intensified back in 2016, when CDeX was created as one of our projects.

CDeX is a complex cyber range platform, offering a fully scalable, automated, and hyperrealistic training environment. It allows you to build cyber defence competencies, benchmark them against other experts, and acquire skills in a live cyberattack conditions.

Most important achievements

- NCI Agency Innovation Challenge Top 10 Innovators
- 1,000+ Security-Cleared Talents with Comprehensive Skill Sets
- ISO 9001:2015 Quality Management System (QMS), ISO 20000 – IT Service Management, and ISO 27001 – Information Security Management certifications

Key products and services

- Security-Cleared IT Talents Supply Chain & Procurement Services
- Cybersecurity Services
- Secure Software Development Services
- IT Integration Services
- CDeX Cyber Range

- CDeX Cyber Range ► p. 244

WB GROUP

CONTACT

www.wbgroup.com
e-mail: info@wb.com.pl

Poznańska 129/133
05-850 Ożarów Mazowiecki, Poland
tel.: +48 22 731 25 00



WB GROUP is the largest entirely Polish private manufacturer operating in the defence industry, with a large investment share of the State Treasury (Polish Development Fund). It employs nearly 1,700 people, more than half of whom are engineers. It is the largest national entity conducting independent research and development projects in the defence, public security and IT security industries in Poland.

WB GROUP solutions are based on many years of experience in the operation of systems implemented in Poland's Armed Forces and a long-term cooperation with the most demanding customers. The Group's companies specialize in the field of communication systems, battlefield management and command systems, unmanned systems, information and communication technology and mechatronics.

WB GROUP is the largest Polish exporter of defence technologies to dozens of countries. The company is the only entity in the Polish defence industry that has sold the production license for the FONET system to the United States. The system is used by the US Armed Forces and several dozen other countries. Military radios, unmanned systems – both reconnaissance and loitering munitions, are also exported.

WB GROUP's solutions are implemented in self-propelled howitzers (Krab, Goździk, Dana and K9PL among others), self-propelled mortars (Rak), multiple rocket launchers (Langusta), as well as other artillery systems used by the Polish Army Forces. They are to be integrated with the systems recently purchased for the Land Forces, including Homar/HIMARS and K239 rocket and missile launchers. The Group's companies are engaged in the modernization of artillery assets in other countries as well.

The key advantage of the solutions offered by WB GROUP is their modularity and scalability. This allows a great number of WB GROUP's systems' configurations, making it a comprehensive suite of tools for a multi-domain battlefield management in accordance with user expectations.

The most important achievements

- Award of the President of the Republic of Poland
- Special Honours of the Minister of National Defence
- Numerous Defender awards for the Group's products
- The award of the Interior Minister and the Police Commander in Chief
- CIO Applications for the Top 10 Drone Tech Solutions Providers
- Leader of the Energy award
- Border Guard's Laurel award
- Award of the Minister Entrepreneurship and Technology
- Award of the National Centre for Research and Development

Key products and services

- TOPAZ
- FONET
- FLYEYE
- WARMATE
- PIK
- Comp@n radio
- AMSTA

- AMSTA Digital border and critical infrastructure system ► p. 22
- COMP@N Software Defined Radio ► p. 127
- EyeQ Land ► p. 132
- FLYEYE mini Unmanned Aerial System ► p. 34
- FONET Digital Communication Platform ► p. 134
- FT-5 Digital Communication Platform ► p. 135
- PERAD 6010 Digital Personal Radio ► p. 138
- PIK MC Communication Integration Platform – Mission Critical ► p. 139
- Topaz – Integrated Combat Management System ► p. 146
- WARMATE Loitering Munition System ► p. 72
- X-FRONTER Mini UAV ► p. 73

WOJSKOWE ZAKŁADY MOTORYZACYJNE S.A.

CONTACT

www.wzm.pl
e-mail: wzm@wzm.pl
Dąbrowskiego 262/280
60-406 Poznań, Poland
tel.: +48 261 576 112



WOJSKOWE ZAKŁADY MOTORYZACYJNE S.A.



Wojskowe Zakłady Motoryzacyjne S.A. offers to the Polish Armed Forces a full range of supplies and services connected with the company's principal activity related to armoured tracked vehicles as part of separate organisation units – the Competence Centres:

- Centre for Tracked Vehicles,
- Centre for Drive Trains / Power-packs for military vehicles,
- Centre for Training.

The Centres provides a wide range of services of the military equipment now used by the Polish Armed Forces and develops competence in research and development in the area of designing new equipment.

The offer of Wojskowe Zakłady Motoryzacyjne includes:

- deliveries, inspections, maintenance, repairs, modifications, modernisation of the military equipment,
- deliveries, maintenance, modifications, modernisation, training in the realm of training simulators and simulators, as a support of other PGZ companies,
- deliveries of technical material resources and spare parts for the military equipment,
- recycling of the military equipment,
- theoretical and practical training of the User's Technical Services, crew and military trainers,
- vehicle's passport,
- mobile service and technical assistance,
- research and development into the new armoured tracked and wheeled vehicles as well as the drive units,
- providing exhaustive technical documentation.

Most important achievements

For several decades, Wojskowe Zakłady Motoryzacyjne S.A. has specialised in modifications and modernisations, as well as overhauls and repairs of tracked and wheeled military vehicles. Currently, the company is focusing exclusively on armoured tracked platforms, while maintaining the potential for wheeled vehicles. In addition to the ongoing overhauls and upgrade of the BWR-1D/IS Reconnaissance Fighting Vehicles, the company has established a capability for the maintenance of the Leopard 2 tanks, and is in the process of establishing Competence Centres for the Abrams tanks and other US based tracked vehicles. As a result, actions and investments have been undertaken aimed at launching in 2025 the first maintenance of the Abrams tanks, and in 2026 other tracked equipment purchased by Poland and in use by Polish Land Forces – like ARV M88A2.

After many years of experience in servicing military vehicle power packs, the company has extended these competences to include the design and manufacture of quick-change Power-Packs.

Cooperation with the world's technological leaders in the armament market has contributed to the company's dynamic product development. A consistent strategy has resulted in the establishment of the first service centre in the country for the Leopard 2 tanks, and in the near future also for the Abrams, the ARV M88A2 and transmissions of Allison Transmission for tracked vehicles, as well as production and MRO of powerpacks for IFV "Borsuk".

- Authorized service, repairs, servicing, modification and modernization of the Leopard 2 tanks ► p. 97
- BWR-1S/1D ► p. 103
- Power-Pack designer and manufacturer ► p. 116

Wojskowe Zakłady Uzbrojenia S.A. (WZU S.A.)

CONTACT

wzu.pl
e-mail: wzu@wzu.pl
Parkowa 42
86-300 Grudziądz, Poland
tel.: +48 56 64 462 00



Wojskowe Zakłady Uzbrojenia S.A. operates in the field of defense missile technology, support safety and maintains technical condition of weapons and military equipment at the level of full technical efficiency by providing modifica-

tions, modernizations and maintenance of missile technology and tube and rocket artillery. WZU S.A. offers deliveries of, among others, elements of radar systems for initial target detection and missile guidance, optoelectronic systems, training simulators for anti-aircraft missile systems and missile transloaders.

WZU S.A. is a stable and developing company with nearly 65 years of tradition. Our cooperation with largest armaments companies in the world enabled achieving significant position in the international group of companies dealing with modernizations of missile weapons and made our company recognized as one of the leaders in the field of refurbishment and modernization of anti-aircraft missile systems in the European and American markets.

As a member of Polska Grupa Zbrojeniowa S.A. capital group, we participate in Wisła, Narew and Pilica+ Programs, crucial for Polish Armed Forces. Moreover, we have recently established The Center of Excellence that allows us to manufacture cable harnesses.

Latest key achievements::

- Establishment of The Cable Harness Center of Excellence.
- Defender Award for the product SPECIAL VEHICLES OF WISŁA SYSTEM – wheeled special platforms with logistic trailer

Main services and products:

- Refurbishment, modernization, modification, integration, maintenance at the depot level
- Cable harnesses
- Electro Optical Systems
- Training simulators

- CABLE HARNESSES ► p. 81
- ELECTRO OPTICAL SYSTEMS ► p. 85
- Repairs, modernizations, modifications, integration, maintenance at the depot level ► p. 88
- Training Simulators:
 - Modified Training Simulator 9F632.M1 ► p. 261
 - Simulator of Anti-Aircraft Missile Combat Vehicle prwb osa (sa-8) based on vbs3 technology ► p. 261

XY-Sensing Sp. z o.o.

CONTACT

www.xysensing.pl
e-mail: office@xysensing.pl
Pl. Konstytucji 1
00-647 Warszawa, Poland
tel.: +48 726 567 045



The XY-Sensing company is an entity specializing in designing and preparing solutions in line with the customer's expectations in the field of high-technology radar systems, in particular SAR imaging radars (Synthetic Aperture Radar), passive radar location (Passive Coherent Location-PCL) and signal acquisition and processing for Electronic Warfare. Over 30 years of experience of the XY-Sensing staff in the development of advanced radio signal processing techniques allows us to offer world-class, unique solutions in the area of building situational awareness in the air, on land, and at sea, detection and acquisition, digital processing of RF signals, as well as creation and implementation of advanced algorithms using artificial intelligence. Thanks to practical and academic experience, we also offer technical and expert assistance in these areas.

The technical solutions we develop are an excellent source of reliable and credible information necessary to build situational awareness for security and defense purposes. Our radar sensors, both active and passive, support the security and monitoring system of individual customers, companies, workplaces (factories, mines, petrochemical plants, etc.), as well as critical infrastructure installations and state facilities.

Most important achievements

- Supporting the Polish Armed Force's modernization through the delivery of surveillance, reconnaissance, and EW systems
- Active participation in European Defense Funds projects (REACT-II, ARTHURO, TIRESYAS, EISNET)
- Innovation Diamonds 2024 Award (12th edition) – Technology category

Key products and services

- XY-SAR-X SAR Imaging Radar Pod
- XY-SAR-AESA-X Steerable Beam SAR Imaging Radar Pod

- Compact Dual Band SAR Radar XY-Demo-Rad
- XY-ActiveEcho radar calibrator
- XY-IFTE System radar station interference emulator (Intelligent Falls Targets Emulator)
- Container-based Passive Airspace Reconnaissance Radar XY-PCL(C)
- Mobile Passive Airspace Reconnaissance Radar XY-PCL(MU)

- Mobile Passive Radar XY-PCL-MU ► p. 234
- Passive Coherent Location Radar XY-PCL-K ► p. 235
- Transportable Passive Radar XY-PCL-C ► p. 240
- XY-IFTE ► p. 74
- XY-SAR-X ► p. 75

Zakłady Chemiczne "Nitro-Chem" S.A.

CONTACT

nitrochem.com.pl

e-mail: kancelaria@nitrochem.com.pl

Theodora Wulffa 18

85-862 Bydgoszcz, Poland

tel.: +48 52 374 83 38



Chemical Works NITRO-CHEM JSC is one of the world's largest producers of explosives. The company provides its products for the Polish Armed Forces and the world's largest producers of ammunition. It specializes in the production of high-energy materials and their compositions as well as engineer ammunition. It also provides filling services for tank and artillery ammunition, aerial bombs, anti-tank and naval mines. For the civil market it successfully supplies blasting agents for mining industry and plastic films. The Triniflex brand is a trade name of our cast films.

Products:

- explosives: Trinitrotoluene (TNT), Hexogen (RDX), Octogen (HMX)
- explosive compositions based on TNT, RDX and HMX
- ammunition: artillery, tank and mortar ammunition, engineer ammunition,
- aircraft bombs (Mk 82)
- ammunition filling services,
- civil products: blasting explosives for mining and science
- Drillex shaped charges

Plastic films:

- polypropylene cast film cPP Triniflex 12-250 µm (standard, antifog, peel, deep freeze, ultrathin 12 µm, colouration)
- polyester cast film cPET Triniflex 15-200 µm
- polylactide cast film cPLA Triniflex 40-150 µm

Most important clients: USA, Spain, France, Great Britain, Germany, Czech Republic, Ukraine, Sweden, Finland, Austria, Israel, Canada, Türkiye, Norway, Italy, Taiwan.

Most important achievements

- Over 75 years of industry experience
- Presence in over 30 countries around the world
- One of the export leaders in the PGZ group
- ISO 9001:2015, AQAP 2110:2016 certificates
- Product quality confirmed by MIL and STANAG standards

Key products and services

- TNT IN FLAKES
- OCTOGEN (HMX)
- HEXOGEN (RDX)
- FILLING SERVICES

- FILLING SERVICES ► p. 287
- HEXOGEN (RDX) ► p. 291
- OCTOGEN (HMX) ► p. 298
- TNT ► p. 306

Zakłady Mechaniczne "BUMAR-ŁABĘDY" S.A.

CONTACT

www.bumar.gliwice.pl
e-mail: bumar@bumar.gliwice.pl

Mechaników 9
44-109 Gliwice, Poland

tel.: +48 32 734 50 00



Zakłady Mechaniczne "BUMAR-ŁABĘDY" S.A. with the registered seat in Gliwice is one of the companies of Polish Armaments Group (PGZ S.A.). It is an organization of strategic importance for the country's defence system. Company has been specialising in the production, overhauls and retrofitting of armoured vehicles. Modernization packages and overhaul services covering all types of armoured vehicles include MBT Leopard, MBT PT-91, Armoured Recovery Vehicles WZT-2 and WZT-3 as well as various types of T-72 family tanks. Zakłady Mechaniczne "BUMAR-ŁABĘDY" S.A. is the general contractor of Leopard 2A4 tanks modernization to Leopard 2PL/M1 version. As the only plant in Poland has its own testing ground.

More than 70-year experience both in terms of production and technology creates the company's potential. Successive generations of armoured equipment supplied to the Polish Army and foreign clients have established the company's position on the domestic as well as global equipment and armament market.

Main services and products

- Overhauls and retrofitting of MBT Leopard 2A4/T-72/PT-91
- Overhauls of Armoured Recovery Vehicles (WZT-2/WZT-3)

- Overhauls and Retrofitting of MBT Leopard 2A4/T-72/PT-91 ► p. 114
- Overhauls of Armoured Recovery Vehicle (WZT-2/WZT-3) ► p. 115

Zakłady Mechaniczne "Tarnów" S.A.

CONTACT

zmt.tarnow.pl
e-mail: sekretariat@zmt.tarnow.pl

Kochanowskiego 30
33-100 Tarnów, Poland

tel.: +48 14 63 06 202



Zakłady Mechaniczne Tarnów S.A. operate since 1917 and have over 70 years of experience in production of weaponry and military equipment. Company's competencies currently allow for production of devices in the field of mechanical constructions, electric, electronic, computer systems including software.

Most Important Achievements:

- Designing technologically advanced anti-aircraft systems: "PILICA"
- Wide product offer: machine guns, sniper rifles, mortars, grenade launchers, remotely controlled weapon modules and artillery sets
- Foreign markets: exporting products and strengthening Poland's multinational position in the military sector
- Research and development: implementing modern technologies, demonstrative models of rocket launchers, and identification and anti-drone systems
- Support of Polish Armed Forces: supplying high-quality equipment and technology

Key products and services:

- Mobile Container Shooting Range (40 FT HC)
- Modular Weapon System ZMT MWS-25
- ALEX-338 Sniper Rifle
- ZMT WKW-50 Large Caliber Sniper Rifle
- UKM 2020S General-purpose Machine Gun
- WLKM-12.7 Multi-barrel Machine Gun
- WKM-Bm/NSW-UTIOS Heavy Machine Gun
- RGP 40 Multi-shot Grenade Launcher (40mm)

- LMC 2021 Light Infantry Mortar
- ZSMU A3/A3B/A5 Remotely Controlled Weapon Stations
- Ant-aircraft Rocket-artillery System: PSR-A PILICA
- ZU-23-2CP Anti-aircraft Artillery System

- ALEX-338 Sniper Rifle ► p. 281
- Anti-aircraft Rocket-artillery System PSR-A PILICA ► p. 79
- LMC-2021 60 MM Light Infantry Mortar ► p. 291
- LMP-2017 60 mm Light Infantry Mortar ► p. 292
- Mobile Container Shooting Range (40 FT HC) ► p. 253
- Modular Weapon System ZMT MWS-25 ► p. 293
- MWS Modular Weapon System ► p. 297
- RGP 40 Multi-shot Grenade Launcher ► p. 300
- UKM 2020S General Purpose Machine Gun ► p. 306
- WKM-Bm/NSW-UTIOS Heavy Machine Gun ► p. 309
- WLKM 12.7 Multi-barrel Machine Gun ► p. 309
- ZMT WKW-50 Large Caliber Sniper Rifle ► p. 310
- ZSMU A3/A3B/A5 Remotely Controlled Weapon Station ► p. 311
- ZU-23-2CP Anti-aircraft Artillery System ► p. 93

ZAKŁADY METALOWE DEZAMET S.A.

CONTACT

www.dezamet.com.pl

e-mail: dezamet@dezamet.com.pl

Szypowskiego 1

39-460 Nowa, Poland

tel.: +48 15 845 1544



The company that is part of the Polish Armaments Group S. A., originating from the 1939 Ammunition Factory No. 3, was created as part of the Central Industrial District.

Dezamet S.A. is a manufacturer of modern medium and large caliber ammunition for defence needs, offering a wide range of products: hand and rifle grenades, 40 mm grenade launchers, 40 mm ammunition for single-shot and automatic grenade launcher, 60 mm, 98 mm and 120 mm mortar ammunition and 155 mm artillery ammunition.

Moreover, the company provides services and sales in civilian manufacturing and metalworking and is equipped with a measuring and testing laboratory.

Key products and services

- 155 mm Artillery Ammunition
- 120 mm Mortar Ammunition
- 98 mm Mortar Ammunition
- 60 mm Mortar Ammunition
- 40 x 65 mm HV Ammunition
- 40 x 46 mm LV Ammunition
- 40 mm Grenade Launchers
- 81 mm Launchers System
- Hand Grenades
- Rifle Grenades
- Fuzes

- 40 MM GRENADE LAUNCHERS ► p. 280
- Ammunition Dezamet
 - 40 x 46 mm LV AMMUNITION ► p. 282
 - 40 x 53 mm HV AMMUNITION ► p. 283
 - 60 mm MORTAR AMMUNITION ► p. 283
 - 120 mm MORTAR AMMUNITION ► p. 284
 - 155 mm ARTILERY AMMUNITION ► p. 284

Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o.

CONTACT

www.zspniewiadow.pl

e-mail: info@zspniewiadow.pl

os. Niewiadów 49

97-225 Ujazd, Poland

tel.: +48 44 719 20 04



Zakłady Sprzętu Precyzyjnego NIEWIADÓW Sp. z o.o. with a bang (literally) returns to the tradition of military production. This time the hit are smoke grenades, imitators, missiles, thermal cartridges, universal shaped charges, signal mines and others. We hope that after many years of our little share in this industry, we will re-enter the market widely. You can rest assured about the quality of the products, as the Niewiadów company has a long tradition in this matter. In 2020, it celebrated its 100th anniversary and for a long time after the Second World War it was a mainly military plant, while the production for the needs of the Armed Forces has been continued throughout the entire period of the Plant's operation.

The most important achievements

- 100 years of continuous production for the Polish Armed Forces
- The Bronze Leader of economic activity
- Gold Certificate of the WAT Quality Certification Center for creating quality and building the potential of the defence industry

Key products and services

- Rocket Launchers RPG-75M, RPG-75MP and RTG
- Smoke screen grenades GAK-81
- Signal mine FLAME
- Shaped Cumulative Charges UŁK
- 155 mm artillery ammunition
- 152 mm artillery ammunition
- 122 mm artillery ammunition
- Rockets S-5KO, S-5MO
- Anti-tank weapon RPG-76 „KOMAR”

- 122 mm Ammunition with HE-462 Projectile and Reduced Charge for D-30/2S1 ► p. 96
- 152 mm Ammunition with HE-540 Projectile and Full or Reduced Charge for D20/2S3 ► p. 96
- 155 mm Artillery High-Explosive Base-Bleed Round with Extended Range ► p. 96
- FLAME Signal Mine ► p. 206
- GAK-81 Smokescreen Grenade ► p. 104
- Imitator of a Cannon Shot ISA-155 – Training Ammunition ► p. 109
- ISA-73 mm cannon shot imitator ► p. 109
- M107 155 mm Artillery Ammunition ► p. 292
- Recoilless Anti-tank Missile Launcher RPG-75-M ► p. 299
- Recoilless Launcher for Thermobaric-cumulative Missiles RPG-75-MP ► p. 299
- Recoilless thermobaric missile Launcher ► p. 299
- Rockets S-5KO, S-5MO ► p. 88
- SHAPE CHARGE ► p. 302
- UŁK Universal Shaped Charge ► p. 308

ZAMET-GŁOWNO 2 sp. z o.o. sp. k

CONTACT

www.zamet-glowno.com

e-mail: marketing@zamet-glowno.com

Ludwika Norblina 28a

95-015 Głowno, Poland

tel.: +48 42 719 13 21



ZAMET-GŁOWNO 2 is a dynamically developing company that combines rich technical and personnel experience with modern engineering solutions. It was created on the basis of the traditions of the Military Motor Works, which is the foundation of our knowledge and competence in the field of transport and logistics equipment for the defense and rescue sector.

Strategic Location and Modern Infrastructure

Facility: 3.5 hectares, including production halls equipped with machinery park

Location: Only 9 km from the junction of the A1 (E75) and A2 (E30) freeways, which provides excellent business contacts and logistical needs solutions

Expert Team and Highest Quality Standards

Employment: Over 120 qualified specialists

Quality certifications: ISO 9001, AQAP, PN-EN ISO 14001:2015

Individual approach to each project – we tailor solutions to the unique requirements of the ordering party

Product and Service Offerings:

Production and supply of transport equipment

- Specialized and military containers
- Trailers and transport platforms
- Self-loading systems

Testing and Certification Services:

Strength and watertightness testing of containers for CSC certificates and other transportation approval documents.

Modernization and repair of transportation and logistics equipment.

Experience and Global Reach

Our products are in operation in the UK, Germany, Denmark, Czech Republic, Lithuania etc.

ZAMET-GŁOWNO 2 equipment has been proven in missions in Afghanistan and Iraq

Trusted Partners:

We cooperate with key institutions and organization including:

- Ministry of Defense
- Land Forces Command
- Polish Navy
- State Fire Service

Key products and services

- Flatracks
- Trailers
- Special Containers

■ Flatrack Load Platforms ► p. 178

■ Fortis M.165 Hooklift System – Advanced Logistic Solution for the Armed Forces ► p. 179

■ UNIVERSAL EXPANDABLE 20' CONTAINERS ► p. 192

■ Versatile Transport Trailers ► p. 193

For years, Poland has been increasing its defense spending, modernizing its Armed Forces and preparing itself for growing threats. An accurate diagnosis of the international situation has translated into the development of innovative solutions in the defense industry. The war in Ukraine has accelerated the technological development process of Polish companies, whose products are largely tested in the full-scale armed conflict and constantly modernized according to the changing requirements of the modern battlefield. Now, thanks to the establishment of the NATO Ukraine Analysis, Training and Education Center in Bydgoszcz, the exchange of experience in the use of various systems will be even more systematic. This makes our national solutions extremely innovative, future-oriented and often ahead of the competition. They have been positively verified in combat conditions, which testifies to the high quality of Polish armaments production. As a result, they meet both the high expectations of the Polish state and those of the most demanding foreign customers.



Ministry of
National Defence



Ministry of Economic Development and Technology
Republic of Poland