

## Company Presentation

Budapest, 2023



Personal Protective Equipment



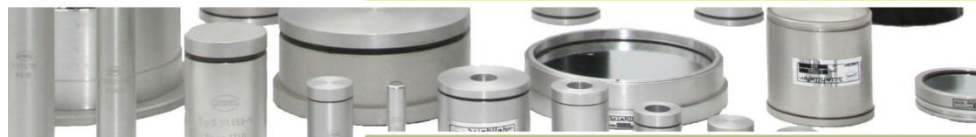
Decontamination Systems



Special Vehicles



Measuring Instruments



Nuclear Devices and laboratories



Precision machining, OEM production

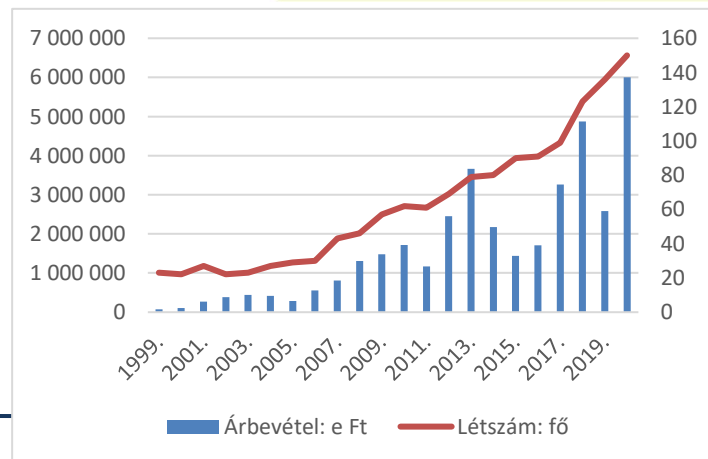


Simulation and Training Systems

- 100% Hungarian,
- significant defence equipment manufacturer company
- **with the widest product portfolio** in Hungary

## Main GAMMA group members:

- CBRN Hungary (trading)
- TESTLAB (test laboratories, services)
- Artifex (simulation and training)
- Hungarian Defence Holding (trading)
- MLR Tech (monitoring system maintenance services)
- Inter-Mentor (facility management)
- Mentorex (facility management)



100 év  1920  
2020

- 1920** Foundation of **Gamma Zrt.** Juhász brothers - mechanical and optical instruments
- 1930-39** Development of defensive devices - mechanical computer for aiming guns, (Gamma-Juhász), Barabas telescope, light telephone, theodolites.
- 1939-45** Expansion of production - special requirements of the army
- 1945-49** New product lines - precision accessories, microscopes, projectors, geodesic instruments, DUFLEX camera.
- 1949** State property, new name: Gamma Works - new profile: nuclear detectors and instruments, industrial measurement and control, geophysical well-logging systems
- 1955** NBC devices, nuclear diagnostic
- 1994** The company is re-privatized under the former name of Gamma Technical Corporation. Additional development in the field of NBC defense, environment protection instruments and nuclear medical instruments.
- 1998** Core business: Radiation measurement, Scintillation crystals and probes, Meteorological and monitoring systems
- 2007** Strategic partnership with Respirator Zrt
- 2007** Foundation of CBRN Hungary
- 2008** After 88 years, moving to a new location
- 2009** Foundation of Testlab Ltd
- 2010** New product line: Armoured vehicles
- 2014** Foundation of Hungarian Defence Holding
- 2015** Integration of **Respirator Zrt**, ATAX Ltd, AGR informatic, Ltd, DKM Ltd
- 2017** Improving production capabilities
- 2017** Integration of Gamma Mechanical Ltd
- 2019** New group member: ARTIFEX Ltd
- 2020** Increased infrastructure capabilities, R&D and training center

**1928** The ancestor of the **Respirátor** company is founded by the German AUER Co. and Hungarian Defence Treasury in order to supply the army with respiratory protective devices from domestic production.

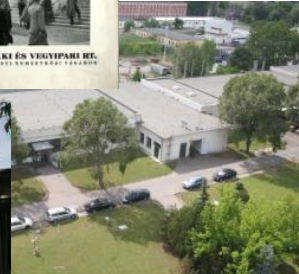
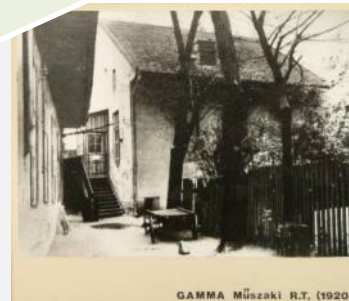
**1938-45** The company is owned by the Hungarian Defence Forces.

**1945** State property with the same field of activity.

**1963** The company becomes one of the factories of Medicor Works, the activity is expanded with production of medical instruments, equipment.

**2007** New ownership and management from Gamma

**2015** Merging into the Gamma Technical Corporation





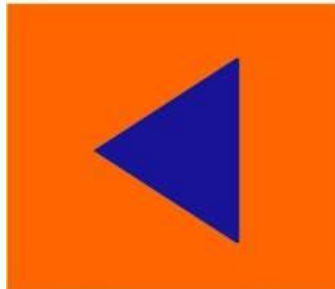
## Products and services

Our products and services are accessible for our clients via thematic divisions.

We are offering our clients not just products, but complex, tailor made solutions that are designed to fully meet their demands and requirements, with all necessary auxiliary accessories, as well as full life cycle maintenance and logistic support.



### Defence/Government Division



Laboratories



Personal Protective Equipment



Decontamination Systems



Special Vehicles



Measuring Instruments



Nuclear Devices and laboratories



Precision machining, OEM production



Simulation and Training Systems

## The Divisions

in details



Personal Protective Equipment



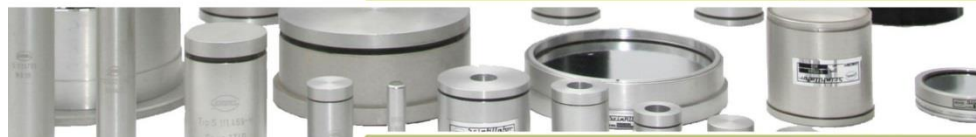
Decontamination Systems



Special Vehicles



Measuring Instruments



Nuclear Devices and laboratories



Precision machining, OEM production



Simulation and Training Systems





## Personal Protective Equipment Division

Measuring Instruments Division

Nuclear Devices Division

Field Deployable Supporting Systems Division

Special Vehicles Division

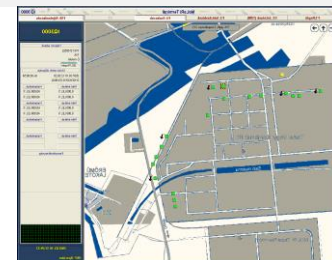
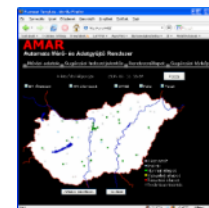
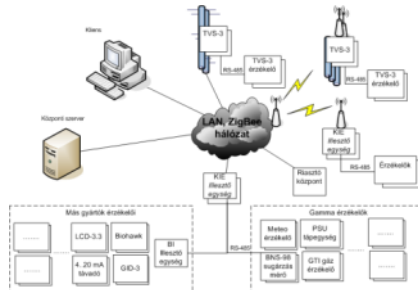
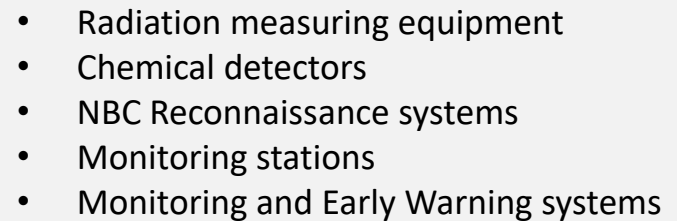
Simulation and Training Systems Division



- Full and half mask
- Filter canisters
- Escape hoods
- NBC & Fire fighter protective suits
- Filters for collective protection



## Simulation and Training Systems Division



Personal Protective Equipment Division

## **Measuring Instruments Division**

Nuclear Devices Division

Field Deployable Supporting Systems Division

Special Vehicles Division

Simulation and Training Systems Division



LABV  
aerial reconnaissance system



RABV  
aerial reconnaissance  
system for UAV



VS-BRDM 2  
NBC  
reconnaissance  
vehicle



VS-BTR 80  
NBC  
reconnaissance  
vehicle



Light CBRN  
reconnaissance  
vehicle



KOMONDOR CBRN reconnaissance vehicle



First Response Teams'  
vehicles



BNS-94M/ F / FM / B  
portable portal  
monitors



- Radiation measuring equipment
- Chemical detectors
- NBC Reconnaissance systems
- Monitoring stations
- Monitoring and Early Warning systems



FABV M  
reconnaissance  
system

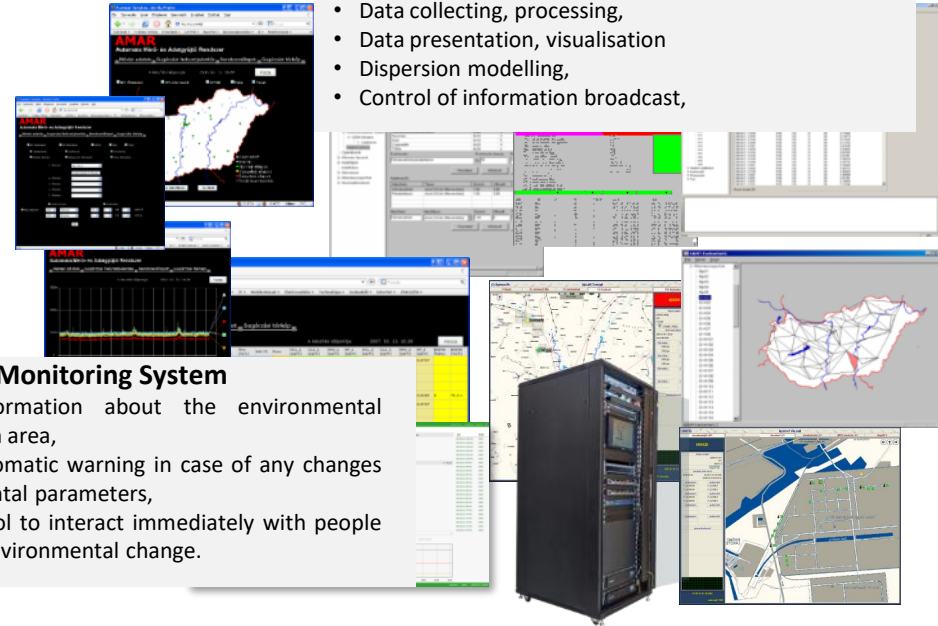




Personal Protective Equipment Division  
**Measuring Instruments Division**  
 Nuclear Devices Division  
 Field Deployable Supporting Systems Division  
 Special Vehicles Division  
 Simulation and Training Systems Division

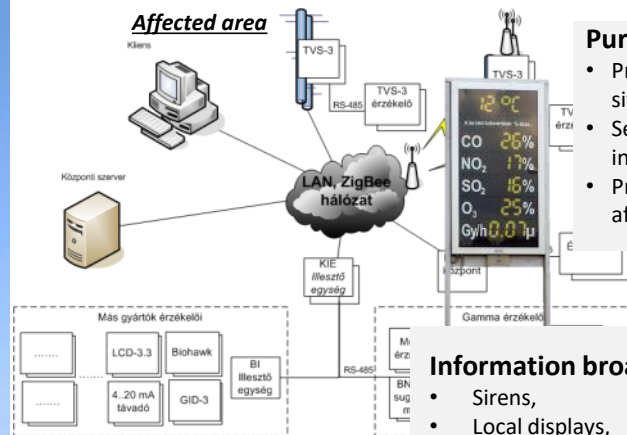
## Data centre, management and control

- Communication,
- Data collecting, processing,
- Data presentation, visualisation
- Dispersion modelling,
- Control of information broadcast,



## Purpose of a Monitoring System

- Provides information about the environmental situation of an area,
- Sends an automatic warning in case of any changes in environmental parameters,
- Provides a tool to interact immediately with people affected by environmental change.



## Information broadcast, warning

- Sirens,
- Local displays,
- Web, SMS, email etc.... publication

## Management area

- Radiation measuring equipment
- Chemical detectors
- NBC Reconnaissance systems
- Monitoring stations
- Monitoring and Early Warning systems:
  - ambient air quality monitoring
  - water quality monitoring
  - radiation monitoring
  - dangerous plant monitoring
  - mobile laboratories

## Monitoring stations, instruments

- Fixed or mobile stations,
- Detectors



## Surveyed area

Personal Protective Equipment Division

**Measuring Instruments Division**

Nuclear Devices Division

Field Deployable Supporting Systems Division

Special Vehicles Division

Simulation and Training Systems Division



Portal monitors



TVS-3 AMAR



TVS-3 MLR



TVS-3 RTH



CUBE



- Radiation measuring equipment
- Chemical detectors
- NBC Reconnaissance systems
- Monitoring stations
- Monitoring and Early Warning systems



UWDS



TVS-3M Mobile AMAR



TVS-3ML



Personal Protective Equipment Division

## Measuring Instruments Division

Nuclear Devices Division

Field Deployable Supporting Systems Division

Special Vehicles Division

Simulation and Training Systems Division



IH-111 / 111L Radiological  
Field food testers



Intelligent scintillation  
detectors (NDI)



BNS98 L dose  
rate transmitter



IH 95 Radiation level  
and contamination  
meter



SFK



BNS 97 Radiation  
protection  
monitor



BNS 298 DECO  
Surface beta  
contamination transmitter



IH 295 / BNS 295  
Combined radiation level  
and contamination meter



BNS 94FM  
Radiation recce  
system

- Radiation measuring equipment
- Chemical detectors
- NBC Reconnaissance systems
- Monitoring stations
- Monitoring and Early Warning systems



GTI-...



Intelligent gas detectors





# Fields of Activity

Personal Protective Equipment Division  
Measuring Instruments Division

## **Nuclear Devices Division**

Field Deployable Supporting Systems Division  
Special Vehicles Division  
Simulation and Training Systems Division



- Laboratory measuring systems
- In situ measuring systems
- Radiation protection devices
- Emission control systems

Personal Protective Equipment Division  
Measuring Instruments Division

## **Nuclear Devices Division**

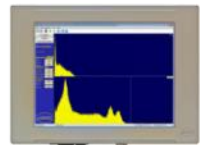
Field Deployable Supporting Systems Division  
Special Vehicles Division  
Simulation and Training Systems Division



FH-20 shielded  
syringe carrier



Scintillation crystals (since 1960)  
and Intelligent detectors



Spectrometry  
software



Low  
background  
measuring  
stations



4Pi measuring  
stations

- Laboratory measuring systems
- In situ measuring systems
- Radiation protection devices
- Emission control systems
- Software

Personal Protective Equipment Division  
Measuring Instruments Division

## **Nuclear Devices Division**

Field Deployable Supporting Systems Division  
Special Vehicles Division  
Simulation and Training Systems Division



Surface  
beta-contamination  
transmitters



Portable lead shielded  
measuring instruments



Portable intelligent  
scintillation detectors

- Laboratory measuring systems
- In situ measuring systems
- Radiation protection devices
- Emission control systems
- Software



Personal Protective Equipment Division  
Measuring Instruments Division

## **Nuclear Devices Division**

Field Deployable Supporting Systems Division  
Special Vehicles Division  
Simulation and Training Systems Division



OnREM Radioactive particle monitoring systems for liquid and gaseous substances

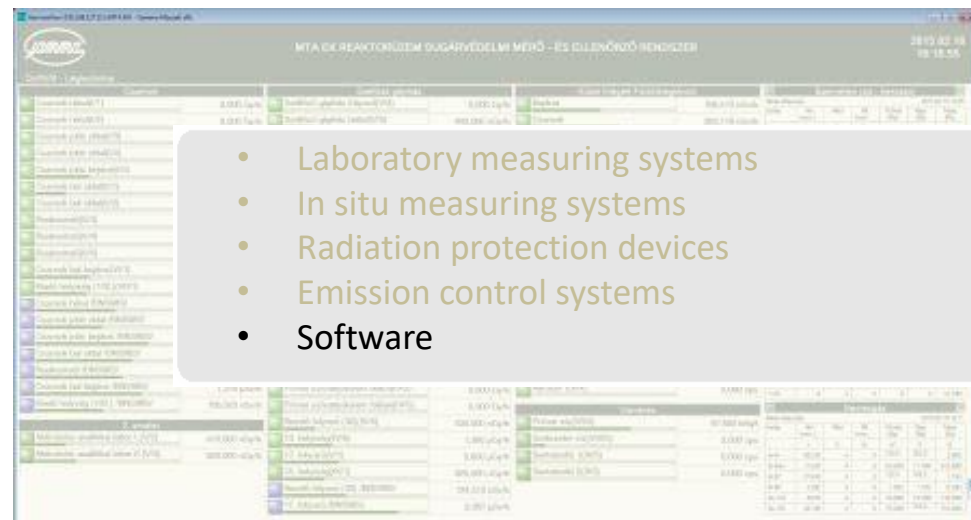
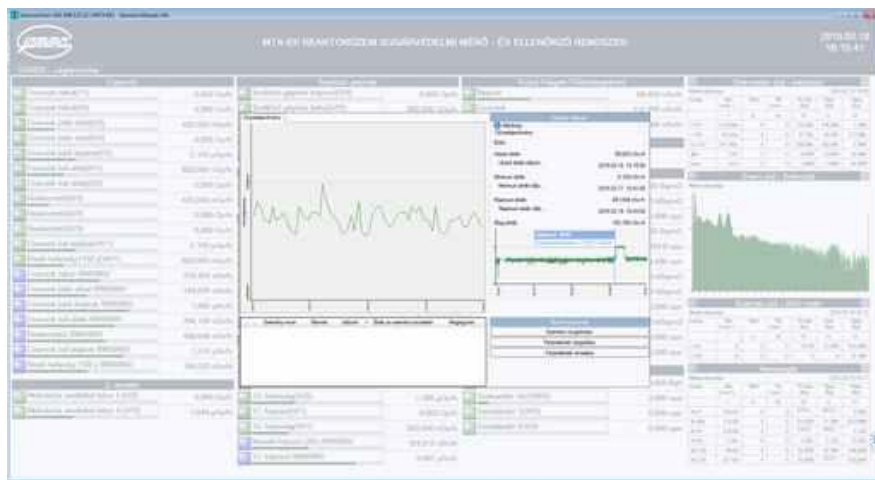
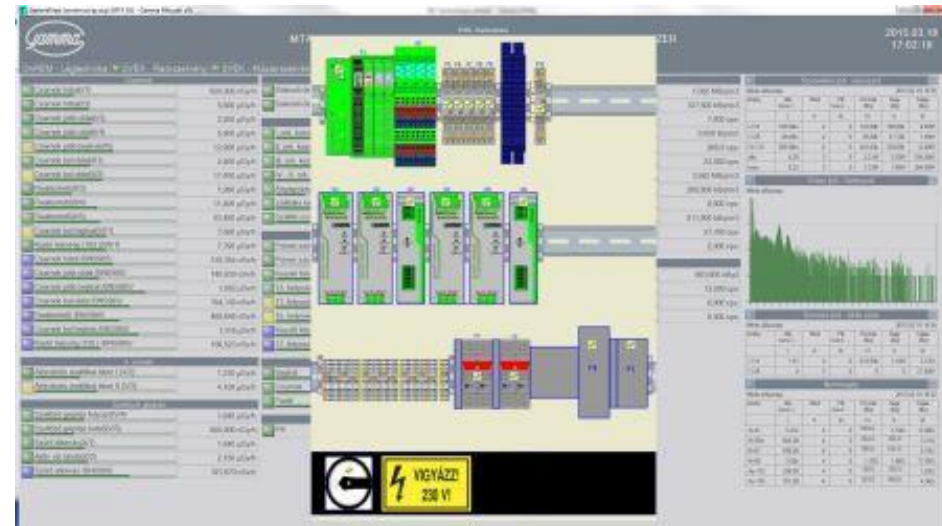
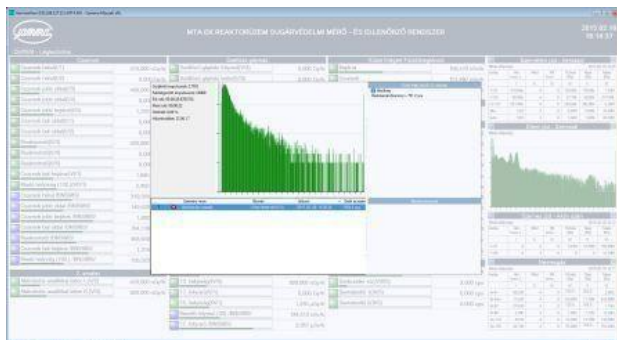


- Laboratory measuring systems
- In situ measuring systems
- Radiation protection devices
- Emission control systems
- Software

Personal Protective Equipment Division  
Measuring Instruments Division

## Nuclear Devices Division

Field Deployable Supporting Systems Division  
Special Vehicles Division  
Simulation and Training Systems Division



- Laboratory measuring systems
- In situ measuring systems
- Radiation protection devices
- Emission control systems
- Software

# Fields of Activity

Personal Protective Equipment Division  
 Measuring Instruments Division  
 Nuclear Devices Division  
**Field Deployable Supporting Systems Division**  
 Special Vehicles Division  
 Simulation and Training Systems Division



- Decontamination systems
- Field camp systems

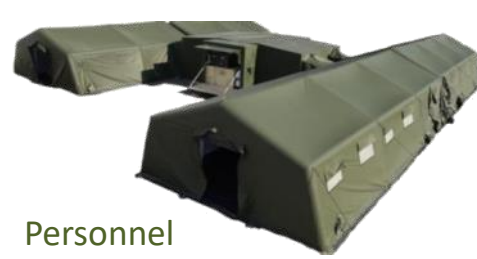




Personal Protective Equipment Division  
Measuring Instruments Division  
Nuclear Devices Division

## **Field Deployable Supporting Systems Division**

Special Vehicles Division  
Simulation and Training Systems Division



Personnel  
decontamination  
container



Containerized decon system



Battalion level decontamination equipment



First responder decontamination set



Casualty  
Decontamination  
system



Personnel  
Decontamination  
systems



CBRN-e decontamination  
vehicle for VIP

- Decontamination systems
- Field camp systems



Decontamination  
collecting troughs



Water supply modules

Personal Protective Equipment Division  
Measuring Instruments Division  
Nuclear Devices Division  
**Field Deployable Supporting Systems Division**  
Special Vehicles Division  
Simulation and Training Systems Division



Subunit level cooking sets, kitchen trailers



Cleaning and showering systems



- Decontamination systems
- Field camp systems



Container & tent integrations



Frame supported tent systems

Personal Protective Equipment Division  
Measuring Instruments Division  
Nuclear Devices Division  
Field Deployable Supporting Systems Division  
**Special Vehicles Division**  
Simulation and Training Systems Division



- system integration into / and refurbishment of existing vehicles, superstructures
- development and production of special purpose vehicles / trailers
- development and production of superstructures
- vehicle development and production





Personal Protective Equipment Division  
Measuring Instruments Division  
Nuclear Devices Division  
Field Deployable Supporting Systems Division  
**Special Vehicles Division**  
Simulation and Training Systems Division



Fire fighter C2 vehicle



- system integration into / and refurbishment of existing vehicles, superstructures
- development and production of special purpose vehicles / trailers
- development and production of superstructures
- vehicle development and production



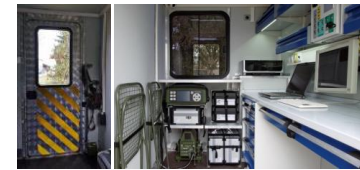
Disaster Management C2 vehicles





# Fields of Activity

Personal Protective Equipment Division  
 Measuring Instruments Division  
 Nuclear Devices Division  
 Field Deployable Supporting Systems Division  
**Special Vehicles Division**  
 Simulation and Training Systems Division



Mobile laboratory, deco and recce vehicles



- system integration into / and refurbishment of existing vehicles, superstructures
- development and production of special purpose vehicles / trailers
- development and production of superstructures
- vehicle development and production



Special purpose trailers

Personal Protective Equipment Division  
Measuring Instruments Division  
Nuclear Devices Division  
Field Deployable Supporting Systems Division  
**Special Vehicles Division**  
Simulation and Training Systems Division

## The KOMONDOR light armoured vehicle family

Multipurpose armoured vehicle, providing multiple variations of utilization by being able to be modified for inter-service battle, special services and tasks.



4x4 WD vehicle  
with monocoque armour body



6x6 WD vehicle  
with monocoque armour body



4x4 or 6x6 WD vehicle  
with half armour body



4x4 WD patrol vehicle  
with monocoque armour body

- system integration into / and refurbishment of existing vehicles, superstructures
- development and production of special purpose vehicles / trailers
- development and production of superstructures
- vehicle development and production





# General technical parameters of RDO variants



| Variants examples    |   |   | RDO 3121  | RDO 3221 | RDO 3222  | RDO3231   | RDO 3921  | RDO 3931  | RDO 3932  | RDO 4332  | RDO 4336  |
|----------------------|---|---|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Length (mm)          | -   |   | 5200-5500 |          | 6000-6400 | 7000-7500 | 6400-6900 | 7500-8200 |           | 8500-9000 |           |
| Width (mm)           |   |   | 2440      | 2445     | 2445      | 2445      | 2500      | 2500      | 2500      | 2550      | 2550      |
| Height (mm)          |   |   | 2500      | 2880     | 2880      | 2790      | 2790      | 2790      | 2790      | 2790      | 3050      |
| Crew                 | -   | - | 2-6       | 2-9      | 2-5       | 2-12      | 2-5       | 2-12      | 2-5       | 2-14      | 2-6       |
| Wheel formula        |   |   | 4x4       | 4x4      | 4x4       | 6x6       | 4x4       | 6x6       | 6x6       | 6x6       | 6x6       |
| Wheel base (mm)      |   |   | 3100      | 3200     | 3200      | 3200+1400 | 3900      | 3900+1400 | 3900+1400 | 4300+1500 | 4300+1500 |
| G.V.W. (kg)          |   |   | 17500     | 17500    | 16500     | 16500     | 18000     | 27000     | 27000     | 31000     | 31000     |
| Fording (mm)         | 900-1200 according to chosen tyres and suspension   |   |           |          |           |           |           |           |           |           |           |
| Road speed (km/h)    | up to 120   |   |           |          |           |           |           |           |           |           |           |
| Range (km)           | on normal road condition not less than 800  |   |           |          |           |           |           |           |           |           |           |
| Engine               | Non rated or with requested emission level up to EURO 6 in the range of 260-550 HP                |   |           |          |           |           |           |           |           |           |           |
| Transmission         | Base version is automatic with retarder optionally semiautomatic or mechanical                    |   |           |          |           |           |           |           |           |           |           |
| Suspension           | Independent suspension with coil springs, but can be rigid solution as well                       |   |           |          |           |           |           |           |           |           |           |
| Brakes               | Air cooled disk brakes with double circuit air system, ABS, CTIS, drum brakes available as option |   |           |          |           |           |           |           |           |           |           |
| Tyres                | Michelin XZL2 military tyres with run-flat system   |   |           |          |           |           |           |           |           |           |           |
| Hull                 | Welded "V" shaped monocoque body under the whole vehicle  |   |           |          |           |           |           |           |           |           |           |
| Ballistic protection | Basic L2 (NATO 4569) can be upgraded up to L4   |   |           |          |           |           |           |           |           |           |           |
| Mine protection      | Basic 2a/2b (NATO 4569) can be upgraded up to 3a/3b   |   |           |          |           |           |           |           |           |           |           |



\* any parameter can be changed without notice



# Reconnaissance vehicle based on RDO 3121

## Main components:

- The Adaptive Multi-sensory System integrates various surveillance sensors such as radars, thermal imagers, video cameras and other devices into one complex but easy to use system.
- NBC filtered, over pressurized and air-conditioned compartment
- 5 seat, 2+1 workstation

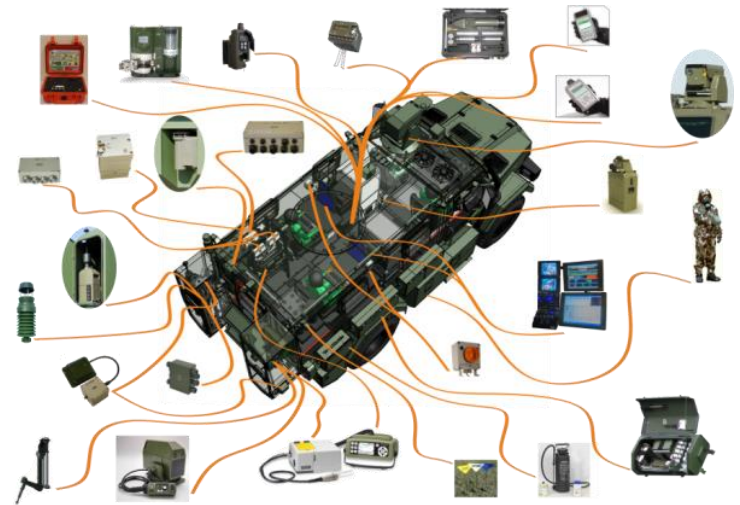




# CBRN reconnaissance vehicle based on RDO 3221

## Main components:

- on-board radiation level meters
- chemical agent detection system
- chemical agent identification system
- CWA stand-off-detection system
- on-board meteorological system
- GPS module, data logger
- biological alarm monitor
- contaminated area marking system
- LCD display with ATP-45 NBC report preparing function
- sampling system with remote controlled semi-automatic manipulator
- dose rate and contamination meter
- chemical agent monitor
- bio detection kit





# Radiation Shielded Emergency Vehicle on RDO 3221

## Main features:

- High level of radiation shielding
- 2 stage collective protection system
- Off-road capability
- Passenger area is suitable for decontamination with high pressure technique
- Measuring areas: outside, driver and passenger area
- On board radiation control system (separate dose measurement for driver, commander and passenger area)
- Automatic calculation of exposure limit
- Alarms in case of high level external radiation, reaching the exposure limit value, internal contamination...



# Ambulance vehicle based on RDO 3921

## Main features:

- Crew of 3 (driver plus 2 medical person)
- Convertible stretcher systems both side for one lying patient or for three sitting ones
- Easy to operate/load stretchers for NATO standard litters
- Built in oxygen supply system
- Infusion holders
- Numerous space for medical equipment and materials
- Onboard power supply
- Armoured and NBC filtered, over pressurized compartment
- Good off-road capability





# Infantry vehicle based on RDO 3921

## Main features:

- Crew capacity up to 2+9 person
- Space and fixing points for personal weapons and stuff
- Armoured , NBC filtered, over pressurized, and air conditioned compartment
- All around surveillance camera system
- Blast mitigation seats
- Rotatable roof hatches (preparation of turret or automatic weapon station, or any other equipment)
- Good off-road capability





# Armoured recovery vehicle based on RDO 3932



## Main features:

- 2+3 crew capacity in armoured compartment
- Space for personal weapons and stuff
- NBC filtered, over pressurized and air-conditioned compartment
- 5t crane with 3,5 m operational length
- 40t pulling force hydraulic winch
- 10t lift & tow equipment
- Storage spaces for tools and rescue devices
- Good off-road capability



# Armoured transport vehicle based on RDO 3932

## Main features:

- 2+3 crew capacity in armoured compartment
- Space for personal weapons and stuff
- NBC filtered, over pressurized and air-conditioned compartment
- 9 t load capacity
- Numerous load fixing points on vehicle platform
- 35t towing capability
- Good off-road capability





# Armoured firefighter / technical recovery vehicle



## The RDO 4336 MPV main features (based on RDO 4332):

### Multipurpose armoured base vehicle:

- Armoured double cab and body for 2+4 crew
- Unique quick fixing solution for interchangeable superstructures
- Integrated hydraulic drive system for external equipment
- Universal front mounting (snowplough, blade, snowblower)
- 38 t towing capacity, 14 t load capacity
- Protection against fragments (gas tanks, UXO)
- Preparation for fire-fighter equipment
- Built-in Ultra High Pressure extinguisher System

### Firefighter:

- 7000 l water tank with fire-fighter pump
- Remote controlled front nozzles
- Field extinguishing ability
- Self extinguishing capacity
- Integrated command elements

### Technical recovery:

- 11 t meter hydraulic crane
- Lift-tow fork with 10 t capacity
- 5 kVA electric power generator
- Hydraulic power rescue set
- 38 t towing ability





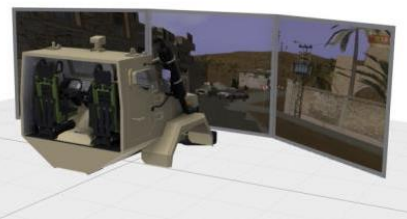
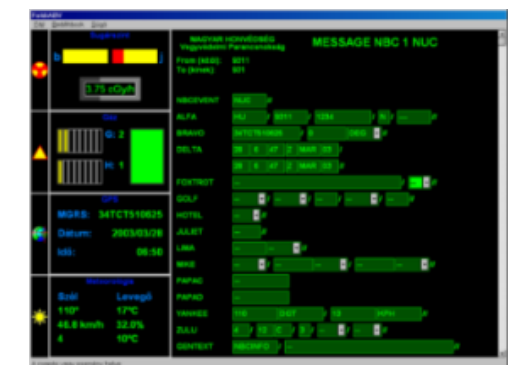
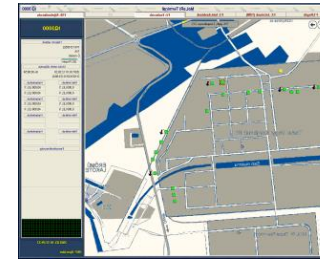
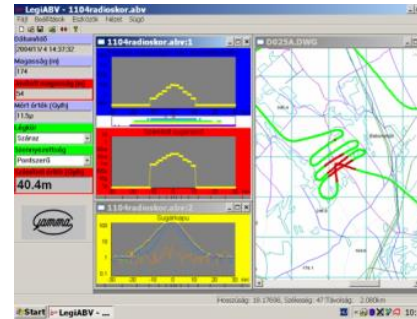


- relatively low competitive price
- wide range of installed basic subsystems
- flexible to individual customers' requirements
- fast reaction to demands, even of small series, some pieces
- wide range of interchangeable specialized modular superstructures
- **Ready for technology transfer / local production**



# Fields of Activity

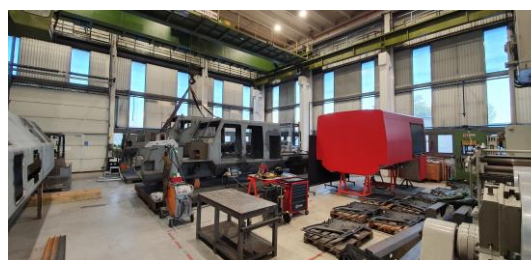
Personal Protective Equipment Division  
 Measuring Instruments Division  
 Nuclear Devices Division  
 Field Deployable Supporting Systems Division  
 Special Vehicles Division  
**Simulation and Training Systems Division**



- constructive simulation
- virtual simulation
- vehicle and weapon system simulators
- cyber security and operations training
- CBRN recce simulators
- CBRN operations training
- product trainings



Personal Protective Equipment Division  
Measuring Instruments Division  
Nuclear Devices Division  
Field Deployable Supporting Systems Division  
Special Vehicles Division  
Simulation and Training Systems Division  
**+1,2: Precision Machining /OEM R&D and production Divisions**



- Precision Machining
- Welding
- Painting
- Clean room
- Antistatic assembly
- 3D printing
- ...
- Customized products
- OEM production



Personal Protective Equipment Division  
Measuring Instruments Division  
Nuclear Devices Division  
Field Deployable Supporting Systems Division  
Special Vehicles Division  
Simulation and Training Systems Division  
Precision Machining /OEM R&D and production Divisions  
**+3: Test laboratories**



Chemical lab



Nuclear lab



Prototype testing



Chemical calibration lab



Nuclear calibration lab



Climatic and environmental  
resistance test lab

# Capabilities

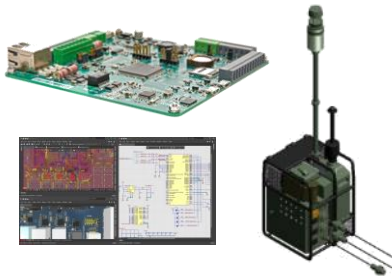
## Infrastructure:

- BUDA SITE: 5.800 m2 offices, workshops (for rent),
- **PEST SITE: 12.000 m2 workshops, warehouses, offices, laboratories, training center within 53.000 m2 land**



## R&D

- Mechanical engineering
- Electrical engineering
- Software development
- Customized products
- Measurement devices, CBRN, Armoured Vehicle expertise



## Maintenance

- On-site/In-site maintenance



## Laboratories

- Nuclear lab
- Nuclear calibration lab
- Chemical lab
- Chemical calibration lab
- Prototype testing
- Climatic and environmental resistance test lab



## Production

- Precision Machining,
- Welding
- Painting
- Clean room
- Antistatic assembly
- 3D printing
- ...
- Customized products
- OEM production



## Training and demonstration

- Training center
- Conference halls
- Demonstration area



# Main Partners and Customers in Education (in Hungary)



**SZÉCHENYI  
EGYETEM**  
UNIVERSITY OF GYŐR



National University of  
Public Service Budapest



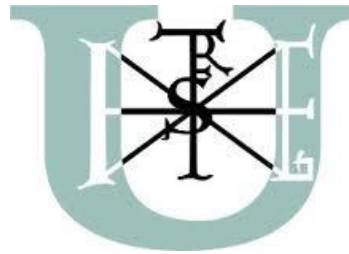
Budapest University of  
Technology and Economics



Óbuda University



University of Miskolc



Szent István University Gödöllő



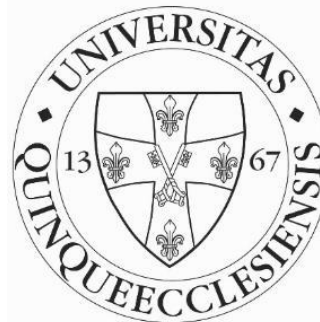
University of Pannonia Veszprém



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# Thank you for Your kind attention!

# Question?



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