

# KOMONDOR ABVF



## CBRN RECONNAISSANCE VEHICLE

### FIELDS OF APPLICATION:

- Reconnaissance of nuclear contamination, chemical and biological agents
- NBC reports

### PARTS OF THE SYSTEM:

- Light armoured vehicle "KOMONDOR"
- Internal dose rate meter
- On-board radiation level meters (2 pcs)
- Chemical agent detection system
- Chemical agent identification system
- Stand-off chemical detection system
- Biological alarm monitor
- Sampling system with remote controlled semi-automatic manipulator
- Radiological contamination measuring instrument for food and soil samples
- On-board meteorological system
- GPS module
- Central data logger
- Central display with ATP-45 NBC report preparing function
- Contaminated area marking system
- Hand-held dose rate and contamination meter
- Hand-held chemical agent monitor
- Lightweight chemical agent detector
- Biosensor detection kit
- Contamination sampling set
- Personal protective equipment



Our latest development, the CBRN reconnaissance vehicle is based on the RDO-3221 KOMONDOR monocoque bodied, multipurpose light armoured vehicle. It incorporates all the relevant system components such as the on-board radiation, chemical and biological detectors, sampling and collective protection systems.

## Technical parameters

### RDO-3221 KOMONDOR

Axle configuration	4x4
Gross weight	15 t
Wheelbase	3240 mm
Engine	optional
Transmission	optional
Ballistic and mine protection according to NATO STANAG 4569 Ed.1 B	
Mine protection – up to 3a/3b	

### NBC 1 reports:

NBC 1 CHEM, NBC 1 NUC, NBC 1 ROTA, NBC 1 BIO

### NBC 4 reports:

NBC 4 CHEM, NBC 4 NUC, NBC 4 ROTA, NBC 4 BIO

### NBC 5 reports:

NBC 5 CHEM, NBC 5 NUC, NBC 5 ROTA, NBC 5 BIO

### CDR report

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## RADIATION LEVEL AND CONTAMINATION METER

### GENERAL FEATURES:

- Measuring in wide range:
  - $\gamma$  dose rate
  - $\gamma$  dose
  - $\alpha$ ,  $\beta$  surface contamination
  - $\beta$  radioactive concentration
- High sensitivity
- Easy to use
- Adjustable alarm levels
- Audible alarm signal
- Wide temperature range
- Rugged/Military construction
- Nuclear parameters tested by the Metrological Division of the Hungarian Trade Licensing Office
- Peacetime/wartime norm selection



The IH-95 is a nuclear radiation measuring device with two operational modes. It operates as a gamma radiation dose and dose rate meter while placed in the carrying case and functions as a contamination meter when it is taken out of it. The thresholds for dose and dose rate alarms are manually adjustable. When the radiation level exceeds one of the thresholds an audio alarm signal is activated. The built-in LCD display shows the actual measurement values and other functional information as well. The device has a digital bidirectional communication interface. Used either in routine environment checking or in accident area monitoring, the IH-95 is a rugged and reliable device with practically proven outstanding features.

### Technical parameters

#### Effective gamma dose-rate measurement range

**Range**  
50nGy/h ... 0,5Gy/h

**Indication range**  
8nGy/h ... 10 Gy/h

**Energy range**  
60keV...1,5MeV

#### **Other nuclear parameters**

According to IEC 532

**Alarm levels** (sound warning):  
Changeable alarm + event alarm

#### Measuring gamma dose

##### **Range**

1nGy...10Gy  
(or 0.1 ... 1000cGy according to NATO STANAG 2083)

**Alarm levels** (sound warning):  
Changeable

#### Measuring $\alpha$ , $\beta$ surface contamination

##### **$\beta$ range**

0,2 Bq/cm<sup>2</sup> ... 300 kBq/cm<sup>2</sup>

##### **$\alpha$ range**

2 Bq/cm<sup>2</sup> ... 3 MBq/cm<sup>2</sup>

**Alarm levels** (sound warning):

>10 Bq/cm<sup>2</sup> according to NATO STANAG 2473

#### Measuring $\beta$ radioactive concentration

##### **$\beta$ range**

2 kBq/l ... 3 GBq/l

#### General

##### **Measurement time**

2s ... 4min,  
changing automatically

##### **Power supply**

+4,5V (3xAA)  
(Powered by dry or rechargeable batteries)

##### **Temperature range**

-25 ... + 50°C

##### **Mechanical construction**

Air-tight, ruggedized

**NSN:** 6665-51-000-1533

## RADIATION LEVEL AND CONTAMINATION METER

### GENERAL FEATURES:

- Measuring in wide range:
  - $\gamma$  dose rate
  - $\gamma$  dose
  - $\alpha$ ,  $\beta$  surface contamination
  - $\beta$  radioactive concentration
- High sensitivity
- Easy to use
- Adjustable alarm levels
- Audible alarm signals
- Wide temperature range
- Rugged/Military construction



The BNS-92S is a nuclear radiation measuring device with two operational modes. It operates as a gamma radiation dose and dose rate meter while placed in the carrying case and functions as a contamination meter when it is taken out of it. The thresholds for dose and dose rate alarms are manually adjustable. When the radiation level exceeds one of the thresholds an audio alarm signal is activated. The LCD display of the instrument shows the actual measurement values and other functional information as well. The device has a digital bidirectional communication interface. Used either in routine environment checking or in accident area monitoring, BNS-92S is a rugged and reliable device with practically proven outstanding features.

### Technical parameters

#### **Effective gamma dose-rate measurement range**

According to IEC 60846-1

#### **Range**

30 nSv/h ... 1 Sv/h (15%)

#### **Indication range**

10 nSv/h..... 30 nSv/h (30%)  
1 Sv/h..... 10 Sv/h (30%)

#### **Energy range**

55 keV...1,5 MeV

#### **Alarm levels** (sound warning):

Changeable alarm + event alarm

#### **Measuring gamma dose**

##### **Range**

1n Sv ...10 Sv

##### **Alarm levels** (sound warning):

Changeable

#### **Measuring surface contamination**

According to IEC 60325

##### **$\beta$ range**

0.2 Bq/cm<sup>2</sup> ... 500 kBq/cm<sup>2</sup>

##### **$\alpha$ range**

2 Bq/cm<sup>2</sup> ... 5 MBq/cm<sup>2</sup>

#### **Measuring $\beta$ radioactive concentration**

##### **$\beta$ range**

2 kBq/l ... 5 GBq/l

#### **General**

##### **Measurement time**

2s ... 4min,  
changing automatically

##### **Power supply**

+4,5V (3xAA)  
(Powered by dry or  
rechargeable batteries)

##### **Temperature range**

-25 ... + 50°C

##### **Mechanical construction**

Air-tight, ruggedized

## Portable radiological measuring instrument

### FUNCTIONS

- Rapid food testing in standalone mode

With PC and MultiAct software package:

- Isotope identification
- Activity determination in samples

### FEATURES

- Easily transportable
- Built-in sample-tray dispenser
- Automatic determination of consumability of foods and drinks following nuclear incident
- Simultaneous measurement of beta and gamma radiation
- MultiAct software package with user programmable isotope library
- Simultaneous data acquisition and data evaluation procedures



With the IH-111L user can rapidly obtain several information about the contamination in samples, through the selective measuring of beta and gamma radiation of any radioisotopes of fission or activation origin. The principle of the process is the fact that isotopes having characteristically simultaneous beta and gamma radiation, either with short or long half-life period, can be divided into groups as a function of their energy. Based on the measured radiation in the groups, the instrument compares the activity of the sample with relevant norms and determines if the foodstuff is consumable or not. The device is using a compound scintillation detector, the measurement method and the system technological scheme are patented by Gamma Technical Corporation.

## Technical parameters

#### In standalone mode

Measurement time: 5s ... 10min, automatic timing  
Automatic background compensation  
Automatic energy calibration with enclosed Am-241 source

**With MultiAct spectrometric software package**  
adjustable: measurement time from 1s, high voltage, discrimination level.

Four kinds of calibration procedure are available:

- pulse width calibration
- channel number versus radiation energy
- peak width versus radiation energy
- counting efficiency versus radiation energy

#### Operating conditions

Temperature range:  
-10 ... +50°C  
Relative Humidity:  
max. 98% RH  
Power supply:  
230V +- 15%, 50 Hz  
Operating time on battery:  
12 hours  
Weight:  
27 kg unpacked  
34 kg packed

#### Detection limits

in standalone mode with max. 10 min measurement time:

Permissible values according to decree 3954/87/EURATOM for drinking water and liquid foodstuffs as well as for other foodstuffs in the case of contamination of beta- and gamma radiating materials with short and long half-life period:  
I-131: 500Bq/kg  
Cs-137: 1000Bq/kg

# BNS-94



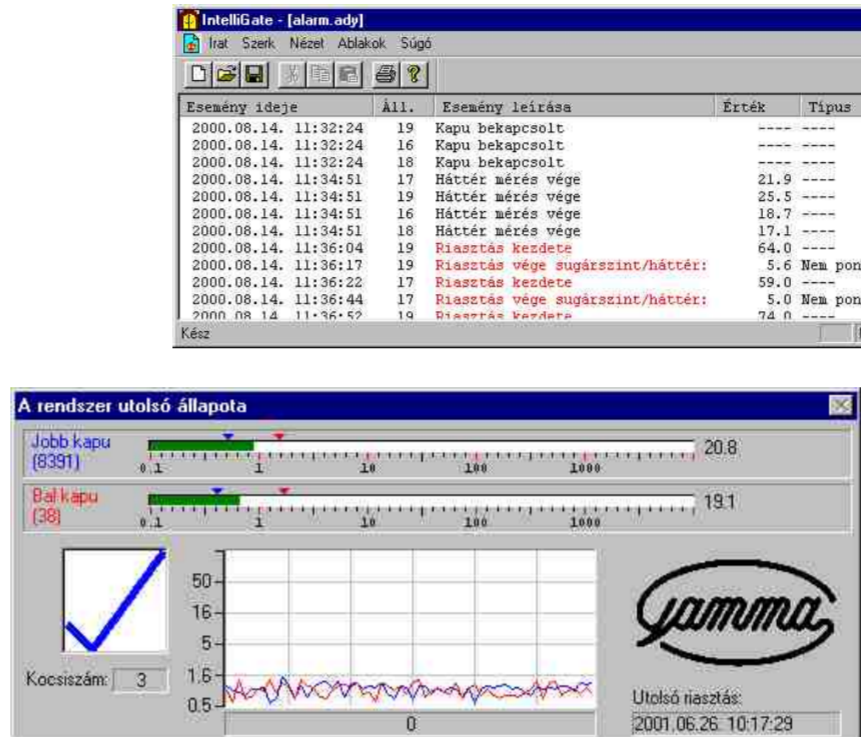
## RADIATION PORTAL MONITOR

### PLACES OF APPLICATION:

- Border stations
- Customs checkpoints
- Defence systems
- Nuclear facilities
- Metal processors

### OBJECTS OF INSPECTION:

- Train cars
- Trucks
- Ships
- Cargoes
- Hand luggage
- Pedestrian traffic



The BNS-94 Radiation Portal Monitor was developed by Gamma Technical Corporation to serve as a high-sensitivity device for reconnaissance and testing natural and artificial radiation sources. The detector of the BNS-94 is a scintillation probe with high sensitivity for gamma and neutron radiation. A patented measurement method assures background, shielding, and speed compensation in one single detector. The connected computer receives the data from the detectors in every half seconds then calculates the actual alteration from the average background level. If the difference exceeds the preset value then the alarm goes off and the event gets registered into a log file.

### Technical parameters

#### Radiation Detector

NaI(Tl) + boronpolyester sandwich crystal detector with in-house high voltage power supply, lead collimator

#### Gamma energy range

25 keV ... 2.5 MeV

#### Sampling time

0.5 s

#### Alarming threshold

automatic with

- background compensation
- speed compensation
- vehicle shielding effect compensation

#### Alarm level for gamma radiation

1.02 ... 2,3 times the actual background level

#### Alarm level for neutron radiation

without shielding: 0.5g Pu-239 (2m distance)  
with 10mm lead shielding: 50g Pu-239 (2m distance)

#### Angle of detection

conical,  $\pm 30^\circ$

#### Construction

For outdoor applications the detector is fixed on a 1.2 m or 1.8 m high stand (60 kg). Airtight, rustproof, shutterproof design.

#### Temperature range

-25°C ... +50°C

# BNS-94M



## MOBILE RADIATION PORTAL MONITOR

### PLACES OF APPLICATION

- Monitoring radiation contamination of vehicles, defence equipment and ground troops further to control radiation-releasing effects in the area of the incident following AB or NPP disaster.
- Temporary checkpoints



The mobile version of BNS-94 Radiation Portal Monitor was developed by Gamma Technical Corporation to serve as a high-sensitivity device for reconnaissance gamma contamination. The detector of the BNS-94M is a scintillation probe with high sensitivity for gamma radiation. A patented measurement method assures background, shielding and speed compensation in one single detector. The optionally connected computer receives data from the detectors in every half second then calculates the actual alteration from the average background level. If the difference exceeds the preset value the alarm goes off.

### Technical parameters

#### Radiation Detector

NaI(Tl) crystal detector with in-house high voltage power supply, lead collimator

#### Gamma energy range

25 keV ... 2.5 MeV

#### Sampling time

0.5 s

#### Alarming threshold

automatic with

- background compensation
- speed compensation
- vehicle shielding effect compensation

#### Alarm level for gamma radiation

1.02 ... 2,3 times the actual background level  
Adjustable sensitivity for military operation.

#### Angle of detection

horizontally  $\pm 30^\circ$   
vertically  $\pm 30^\circ$

#### Construction

For outdoor applications detector is adjustable on a 1.2 m to 1.8 m high stand. Airtight, rustproof, shatterproof design.

#### Temperature range

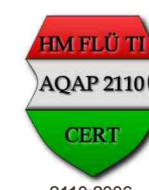
-25°C ... +50°C

NSN: 6665-51-000-6322

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# BNS-94MH



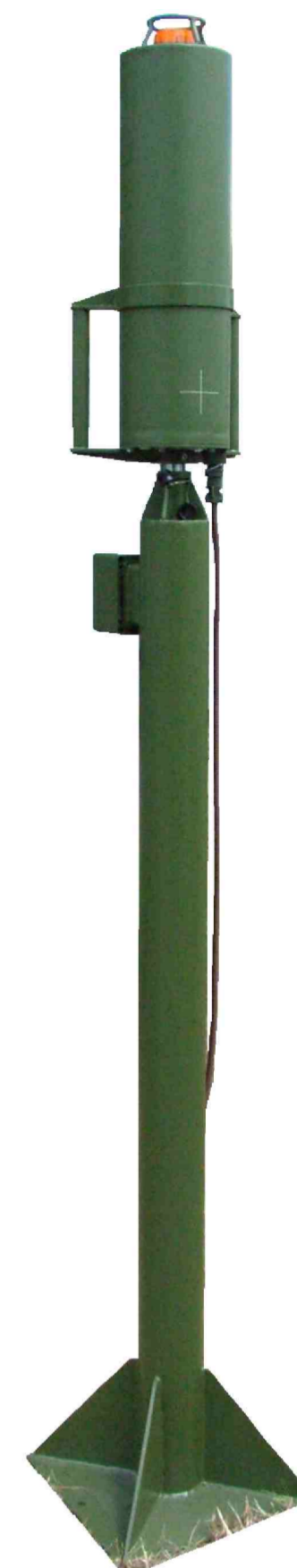
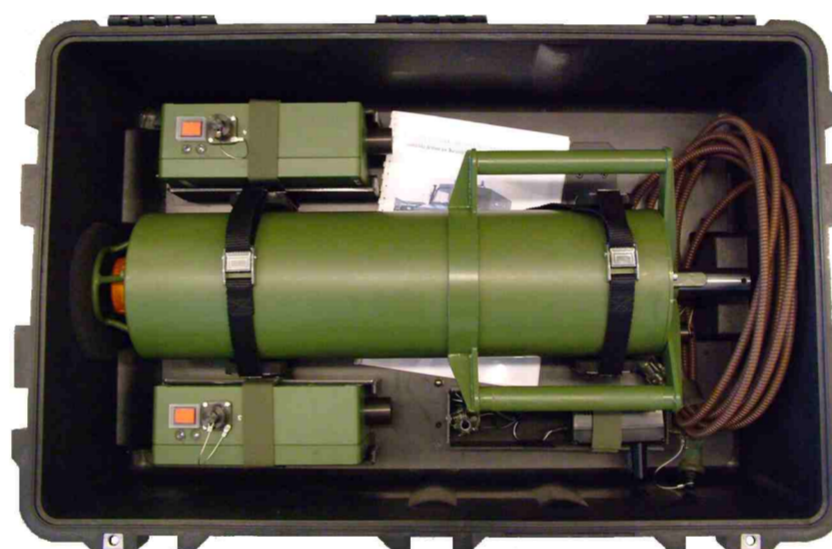
## MOBILE RADIATION PORTAL MONITOR

### PLACES OF APPLICATION

Monitoring and swift checking of the radioactive contamination of troops, vehicles and equipment, detecting hidden radioactive sources at temporary or permanent checkpoints

### FEATURES

- Fast system setup and packing time
- High sensitivity up to 30-40 Km/hour vehicle speed
- Portable detectors with carrying case
- Fixed and mobile stands
- Environmental resistance



This mobile version of the BNS-94 Radiation Portal Monitor family was developed to serve as a high-sensitivity device for reconnaissance of gamma contamination. The two detectors of the BNS-94MH are scintillation probes with high sensitivity for gamma radiation. A patented measurement method assures background, shielding and speed compensation in a single detector. The optionally connected computer receives data from the detectors in every half second, then calculates the actual alteration from the average background level. If the difference exceeds the preset threshold value the detectors send an alarm signal.

### Technical parameters

#### Radiation Detector

NaI(Tl) crystal detector with built-in high voltage power supply, lead collimator

#### Gamma energy range

25 keV ... 2.5 MeV

#### Sampling time

0.5 s

#### Automatic:

- Background compensation
- Vehicle speed compensation
- Vehicle shielding effect compensation

#### Alarm level for gamma radiation

1.02 ... 2,3 times the actual background level

#### Operating temperature range:

-25 ... +50°C

#### Storage temperature range:

-40 ... +60°C

**Relative humidity:** max. 95% at 35°C

#### Dimensions installed:

1200 x 1200 x 1780-2280 mm

#### Detector storage size:

802 x 520 x 316 mm in Ip67 plastic case

#### Radiation pattern

horizontally  $\pm 30^\circ$   
vertically  $\pm 30^\circ$

#### Power supply

230 V  $\pm 15\%$ , 50 Hz

#### Operating time on battery

min. 24 hours/battery

#### Packing time:

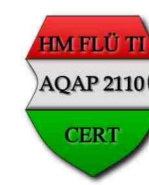
Maximum 10 minutes

**Weight:** 60 Kg

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## RADIATION PORTAL MONITOR

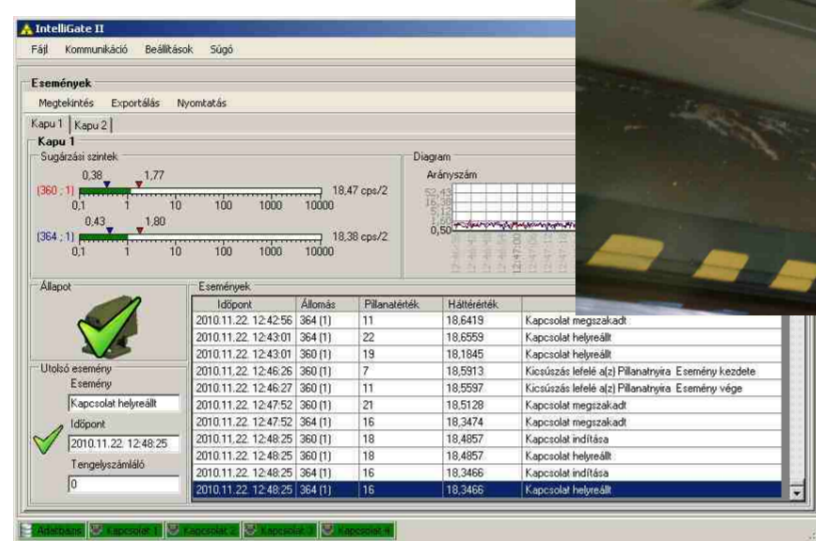
### Places of application:

- Border control
- Customs checkpoints
- Defence systems
- Nuclear facilities
- Metal processors



### Objects of inspection:

- Personnel
- Conveyors
- Cargoes
- Hand luggage



The BNS-94L/P Radiation Portal Monitor was developed by Gamma Technical Corporation to serve as a highly sensitive portal monitor device for finding natural and artificial radiation sources. The detector of the BNS-94L/P is a scintillation probe sensitive for gamma and/or neutron radiation. A patented measurement method assures background, shielding and speed effect compensation in one single detector. The connected computer receives the measurement data in every half second and calculates the actual deviation from the average background level. If the difference exceeds the preset value the alarm goes off and the event gets registered into a log file.

### Technical parameters

#### Radiation Detector

NaI(Tl) or boron polyester (optional) detector with in-house high voltage power supply, lead collimator

#### Gamma energy range

25 keV ... 2.5 MeV

#### Sampling time

0.5 s

#### Alarm threshold

automatic with  
 - background compensation  
 - speed compensation  
 - vehicle shielding effect compensation

#### Alarm level for gamma radiation

NaI: 1.02 ... 2,3 times the actual background level

#### Alarm level for neutron radiation

without shielding: 0.5g Pu-239 (2m distance)  
 with 10mm lead shielding: 50g Pu-239 (2m distance)  
 Boron: with shielding: 0.5g Pu-239

#### Angle of detection

horizontally:  $\pm 45^\circ$   
 vertically:  $\pm 60^\circ$

#### Construction

Airtight, rustproof, shatterproof design

#### Temperature range

-25°C ... +50°C



## WHEELED RADIATION PORTAL MONITOR

### PLACES OF APPLICATION:

- Logistics centers,
- Airports,
- Postal facilities,
- Custom's checkpoints, etc.

Suitable for the swift check of persons, baggages, mails and whole cargoes.



The BNS-94PM Wheeled Radiation Portal Monitor was developed by Gamma Technical Corporation to serve as a mobile, highly sensitive device for reconnaissance and testing natural and artificial radiation sources. The basic version of BNS-94PM contains 2 scintillation probes with high sensitivity for gamma radiation, optionally neutron detector(s) are also available. The applied patented measurement method assures background, shielding and speed compensation. The integrated computer receives the data from the detector units in every half second and calculates the actual alteration from the average background level. If the difference exceeds the preset value an alarm goes off and the event gets registered into a log file.

### Technical parameters

**Radiation Detector**

NaI(Tl) crystal detector with in-house high voltage power supply, lead collimator

**Gamma energy range**

25 keV ... 2.5 MeV

**Sampling time**

0.5 s

**Alarming threshold**

automatic with

- background compensation
- speed compensation
- vehicle shielding effect compensation

**Alarm level for gamma radiation**

1.02 ... 2,3 times the actual background level

**Angle of detection**

horizontally:  $\pm 45^\circ$   
vertically:  $\pm 60^\circ$

**Power supply**

UPS

**Data connection**

RS-232 and Bluetooth

**Construction**

Two, vertically placed detectors, one above the other, on a wheeled frame with integrated computer and alarm unit.

**Temperature range**

-30°C ... +60°C

## HYBRID PERSONAL RADIATION PORTAL MONITOR

### PLACES OF APPLICATION

- Isotope laboratories
- Medical labs
- Nuclear facilities

### FUNCTION

- Reconnaissance of radioactive contamination on hand, feet and clothes
- Detection of beta and gamma contamination on hands and feet and gamma contamination on clothes at the front and back sides
- Audible and visible alarm and the prohibition of passing in case of value over the limit



The BNS-94PH Hand-feet and clothes monitor may control the access control system, prohibit passing and generate audible and visible alarm if the measured value is over the preset threshold value. The front frame contains the front clothes detector, the data logger and display unit, the flashlight and the beeper. The hand detectors are fixed on the sides of the front frame where user can start measurement by pressing the detectors' surface. The rear frame contains the detector that scans the subject's clothes from behind. Feet detectors are built into the platform.

### Technical parameters

#### Detectors

- Clothes detectors:  
2 pcs.  $\text{R}25 \times 289\text{mm}$  NaI(Tl)  
in lead collimator
- Hand and foot detectors:  
4 x 2 pcs. large surface GM tube

#### Alarm thresholds

- For gamma radiation:  
Over 4 sigma background
- For surface contamination:  
< 0.5 Bq/cm<sup>2</sup>

#### Background compensation

Automatic

**Measuring time:** 4 s

**Passing on:** 5 s  
Adjustable parameters!

#### Alarm

Audible for 5 s, flashing red light until acknowledgement

#### Status display

With coloured LEDs  
Operating and display functions on touchscreen

#### Measurement results per body parts

n times the actual background or Bq/cm<sup>2</sup>

#### Hand and foot detectors calibrated

<sup>90</sup>Sr - <sup>90</sup>Y equivalent Bq/cm<sup>2</sup>

#### Power supply

230 V AC

#### Environment resistance

+ 5 ... +40°C, 20 ... 80 RH%

#### Dimensions

125 x 75 x 200 cm

# BNS-94H



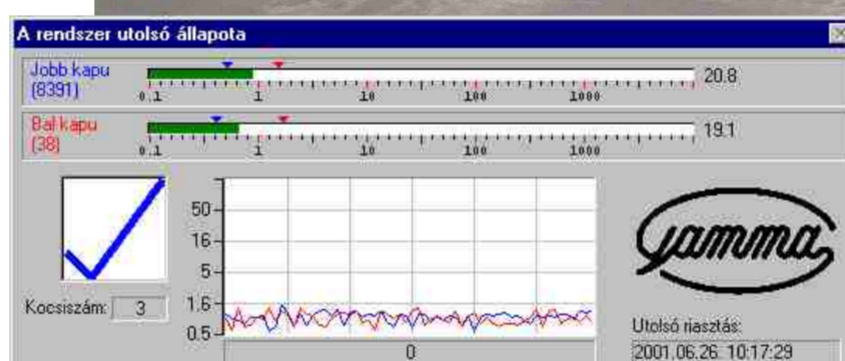
## RADIATION PORTAL MONITOR

### PLACES OF APPLICATION:

- Scrap metal yards
- Waste processing plants
- Incineration plants
- Smelters
- Foundries
- Metal processors

### OBJECTS OF INSPECTION:

- Railway cars
- Road cargoes
- Containers



The BNS-94H Radiation Portal Monitor was developed by Gamma Technical Corporation to serve as a high-sensitivity device for reconnaissance and testing natural and artificial radiation sources. The detector of the BNS-94H is a scintillation probe with high sensitivity for gamma radiation. A patented measurement method assures background, shielding and speed compensation in one single detector. The connected computer receives the data from the detector units in every half second then calculates the actual alteration from the average background level. If the difference exceeds the preset value then the alarm goes off and the event gets registered into a log file.

### Technical parameters

#### Radiation Detector

NaI(Tl) crystal detector with in-house high voltage power supply, lead collimator

#### Gamma energy range

25 keV ... 2.5 MeV

#### Sampling time

0.5 s

#### Measuring time

0.5 ... 9.5 s

#### Alarming threshold

automatic with  
- background compensation  
- speed compensation  
- vehicle shielding effect compensation

#### Alarm level for gamma radiation

1.02 ... 2,3 times the actual background level

#### Angle of detection

horizontally  $\pm 30^\circ$   
vertically  $\pm 30^\circ$

#### Construction

Airtight, rustproof, shutterproof design for outdoor applications

#### Temperature range

-25°C ... +50°C

# BNS-94B



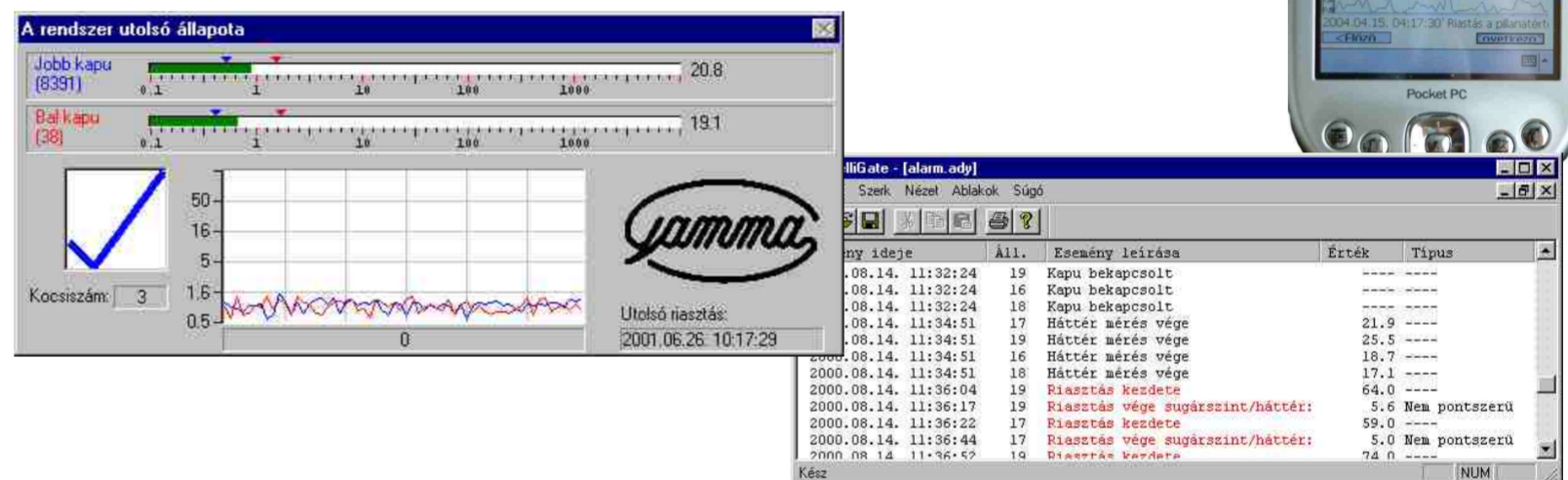
## PORTABLE RADIATION PORTAL MONITOR

### Places of application:

- Hidden inspection
- Customs checkpoints
- Hidden mobile defence systems
- Threatened facilities
- Conferences

### Objects of inspection:

- Individuals
- Baggage
- Hand luggage



The BNS-94B Portable Radiation Portal Monitor was developed by Gamma Technical Corporation to serve as a high-sensitivity device for detecting nuclear materials and radioisotopes. The detector of the BNS-94B is a scintillation probe with high sensitivity for gamma and neutron radiation. A patented measurement method assures background compensation and measuring time optimization in one single detector. The probe in every half second calculates the actual alteration from the background level. If the difference is significant, the alarm goes off. The optionally connected computer receives the data and the event gets registered into a log file.

## Technical parameters

### Radiation Detector

NaI(Tl) + boron polyester sandwich crystal detector with in-house high voltage power supply, lead collimator.

### Gamma energy range

25 keV ... 2.5 MeV

### Sampling time

0.5 s

### Alarming threshold

automatic with

- background compensation
- speed compensation
- vehicle shielding effect compensation

### Alarm level for gamma radiation

NaI: 1.04 ... 3,5 times the actual background level

### Angle of detection

conical,  $\pm 45^\circ$

### Construction

Airtight, rustproof, shatterproof design

### Temperature range

-25°C ... +50°C

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# BNS-94FM



## RADIATION RECONNAISSANCE SYSTEM

### Places of application:

- Temporary, mobile checkpoints
- Defence systems
- First responder teams
- Naval application

### Objects of inspection:

- Individuals
- Ships
- Cargoes
- Vehicles



The BNS-94FM Radiation Reconnaissance System was developed by Gamma Technical Corporation to create a multipurpose detector that can be used as a built-in or as a standalone device. It's easy to mount it onto any type of vehicles (cars, ships....) or can be used with a stand. Easy to operate with remote controller. BNS-94FM is able to scan the gamma radiation continuously and to make audible and visual alarm when an isotope is revealed.

With this device both hidden radioisotopes and radioactive contamination can be detected.

## Technical parameters

### Radiation Detector

dia. 75 x 50 mm NaI(Tl) crystal detector with Built-in high voltage power supply, lead collimator

### Gamma energy range

25 keV ... 1.5 MeV

### Sampling time

0.5 s

### Alarming threshold

automatic with

- background compensation
- speed compensation
- vehicle shielding effect compensation

### Distinguishing between widespread and single radiation sources.

### Alarm level for gamma radiation

NaI: 1.04 ... 3.5 times the actual background level

### Angle of detection

conical,  $\pm 30^\circ$

### Construction

Airtight, rustproof, shatterproof design

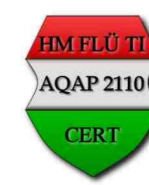
### Temperature range

-30°C ... +50°C

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## RADIATION PROTECTION MONITOR

### PLACES OF APPLICATION

- Nuclear plants
- Isotope laboratories
- Environmental applications
- Waste yards

### PURPOSE OF MONITORING

- Continuous measurement and display of gamma dose-rate
- Area monitoring in system or stand-alone mode
- Local and central alarm signal management
- Event storage with RayMon software



The improved version of BNS-97 is a highly sensitive gamma radiation meter and an alarm unit. Due to our patented invention the device measures radiation in a very wide range. BNS-97 is provided with the certification of the National Measurement Office of Hungary which is accredited by NAMAS (UK) for its use as authorized radiation protection device. The device alarms in case of significant increase of the radiation level both in short or long periods of time. The measured values appear locally on the LCD display of the device. BNS-97 alerts if the radiation level exceeds any of the three preset thresholds. The remote computer enables to create audible and visible alarm signals by parameter programming. In its basic configuration it is mounted with one single alarm unit, further alarm units are optional. BNS-97S version is available for measuring equivalent dose rate (Sv/h).

### Technical parameters

#### Nuclear parameters

According to IEC 1017  
BNS-97S: according to IEC 60846:2009

#### Measurement range

50 nGy/h...500 mGy/h 15%  
BNS-97S: 30 nSv/h.... 1 Sv/h (15%)

#### Indication range

10-50 nGy/h, 500 mGy/h..... 10Gy/h  
BNS-97S: 10...30 nSv/h, 1...10 Sv/h (30%)

#### Energy range

60keV...1,5MeV  
BNS-97S: 55keV...1,5MeV

#### Setup time

2 s - 240 s

#### Communication

RS-485, 19200 Bps

#### No. of devices on one cable

32

#### Calibration and test

Remote

#### Power supply

12V DC, built-in accumulator  
(24 h, 3xAA 1.2V)

#### Electromagnetic compatibility

IEC 801 EMC (resistance)  
IEC 55011 (emission)

#### Temperature range

-25°C ...+50°C

#### Housing

Sealed

## REMOTE DOSE-RATE TRANSMITTER

### PLACES OF APPLICATION

- Nuclear establishments
- Environment survey
- Mobile monitoring

### FEATURES

- Gamma radiation measurement
- High sensitivity
- Wide measurement range
- Quick operation
- Excellent reliability
- Full parameter programming
- Storage of measurement values
- Special average calculation
- Two fixed, one dynamic alarm thresholds
- Military construction



The BNS-98 is a highly sensitive gamma radiation meter with an extremely wide measurement range. The device was designed to operate even under extreme meteorological conditions. Its case is sealed and it does not contain any manual control buttons. The remote dose-rate meter is suitable to operate on vehicles, aeroplanes or as the radiation detector of the TVS-3 environment monitoring station. The device contains a special algorithm as well, which alarms in case of the significant increase of radiation level both in short or long periods of time. The BNS-98 communicates via a bidirectional line and can be connected to a computer. BNS-98S version is available for measuring equivalent dose rate (Sv/h).

### Technical parameters

#### Nuclear parameters

According to IEC 1017

BNS-98S: according to IEC 60846:2009

#### Measurement range

50 nGy/h...500 mGy/h 15%

BNS-98S: 30 nSv/h.... 1 Sv/h (15%)

#### Indication range

10-50 nGy/h, 500 mGy/h...10Gy/h (30%)

BNS-98S: 10-30 nSv/h, 1...10 Sv/h (30%)

#### Energy range

60keV....1,5MeV

BNS-98S: 55keV....1,5MeV

#### Set up time

4s - 120 s

#### Measuring time

2s - 240 automated

#### Communication

RS-485, 19200 Bps

#### No. of devices on one cable

32

#### Calibration and test

Remote

#### Power supply

+9-27V remote

#### Electromagnetic compatibility

IEC 801 EMC (resistance)

IEC 55011 (emission)

#### Temperature range

-25°C ...+50°C

#### Housing

Sealed

NSN: 6665-51-000-5269

# BNS-98L



## REMOTE DOSE-RATE TRANSMITTER

### PLACES OF APPLICATION

- Field survey
- Environment monitoring
- Vehicles
- UAVs

### FEATURES

- Measuring gamma radiation from natural background to catastrophe level
- Two fixed, one dynamic alarm thresholds
- Automatic data collection
- Easily replaceable data memory
- Data reader with USB port
- Location by GPS, continuous connection to PC
- Optional meteo sensors
- High reliability
- Military construction



The BNS-98L is a highly sensitive gamma radiation meter coupled with an extensively usable data logger. Measuring range of gamma radiation is seven orders from natural background. The applied special algorithm generates alarm in case of quick or slow significant increase of radiation level besides the two adjustable and fixed alarm thresholds. The device is designed to operate under extreme meteorological and mechanical conditions and suitable to be used for reconnaissance on vehicles and UAVs or planted for continuous automatic data collecting. Optional GPS and meteo sensors. Memory card is removeable from outside the device and can be connected to the evaluating computer by a data reader with USB port.

### Technical parameters

#### Nuclear parameters

According to IEC 1017

#### Measurement range

50 nGy/h....500 mGy/h (15%)

#### Indication range

10 nGy/h..... 10Gy/h

#### Energy range

60keV....1,5MeV

#### Threshold level

- two adjustable
- one automatic

#### Set up time

4s - 120 s

#### Communication

RS-232, 9600 Bps

#### No. of devices on one cable

32

#### Calibration and test

Remote

#### Power supply

+9-27V remote

#### Environmental resistance

According to MIL STD

#### Temperature range

-25°C ...+50°C

#### Housing

Sealed

#### GAMMA Technical Corporation

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www.gammatech.hu \* gamma@gammatech.hu





## SURFACE BETA-CONTAMINATION TRANSMITTER

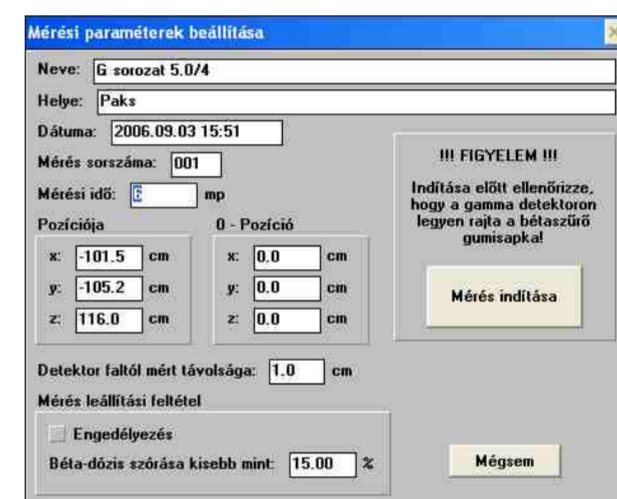
### APPLICATION FIELD

Determination of surface activity by measuring beta radiation in intensive gamma-background after

- defect or accident in a nuclear power plant,
- atomic blast.

### CHARACTERISTICS

- In situ gamma and gamma + beta measurements on large surface with registering the place of the measurement at the same time,
- Determination of beta surface activity on subtraction principle even in the case when the disturbing gamma-background is several hundredfolds of the dose-effect coming from the surface,
- Measuring range comprehending six orders of magnitude,
- Measurement start from a distant computer,
- Automatic measurement time,
- Environment-proof housing.



BNS-298 DECO contains two transmitters with the same construction, one detector of which measures only gamma-radiation with beta-filter while the other one measures total gamma+beta radiation. In every 2 seconds the transmitters calculate the dose-effect of the caesium equivalent, the data of the measuring error and the time that has passed from the beginning of the measurement and send these survey data to the BETADECO software on request via serial line. The software does subtraction, the value of beta-activity and determines its error. The automatic measurement continues as long as the statistical error drops under the given value or the detection limit decreases below the preset value or the allowed maximum measuring time passes. Besides, user can make adjustments, calibration, tests and visualizations as well as storing survey data and results with BETADECO software.

## Technical parameters

### Surface beta-measurement:

- Measuring range: 0,2 Bq/cm<sup>2</sup> ... 500 kBq/cm<sup>2</sup>
- Statistical deviation can be adjusted in the program
- Measuring time: 2 s ... 30 minutes, automatic

### Gamma background compensation:

- Measuring range: 50 nGy/h ... 0,5 Gy/h
- Overload: up to 100 Gy/h

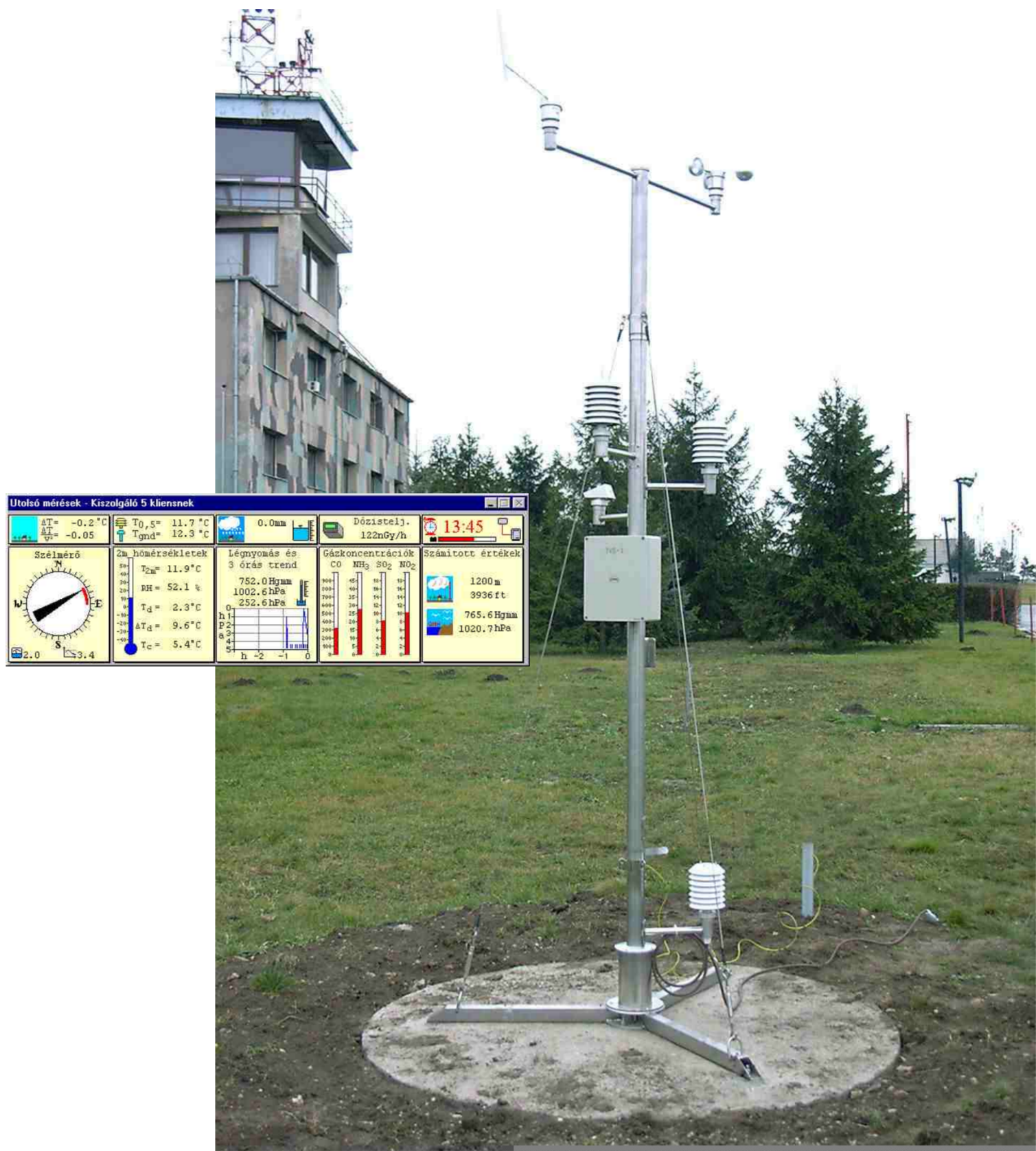
### General characteristics:

- Data transfer: via RS-485 serial line
- Distance of transferring data: max. 1 km
- Temperature range: -25 ... +50°C
- Hermetically closed housing
- Easy to decontaminate

## ENVIRONMENT MONITORING STATION

### GENERAL FEATURES:

- Measurement of:
  - Gamma dose rate
  - Toxic gases
  - Meteorological parameters
- High sensitivity
- Continuous operation
- Reliable alarm with early warning functions
- Stainless steel mast
- Computerised data display in graphics and tables



The TVS-3 monitoring station was developed to measure the different parameters of the environment and to evaluate, summarize and store all the received and calculated data. The main purpose of its application is to check and control the environment. The TVS-3 functions as a high quality, reliable device to monitor the radiation level and the concentration of industrial and other dangerous gases around industrial or nuclear facilities or at any other permanent monitoring point. The major goal of its development was to create a reliable, automatic device that is capable for continuous and independent monitoring of an observed area with features for early warning of emergency situations helping the prompt evaluation of a current situation and the determination of the spreading of environmental pollutants with the knowledge of meteorological parameters.

### Technical parameters

#### Industrial and other dangerous gases

Measurement of the concentration of harmful materials in the air:  
The intelligent gas detectors are capable of monitoring 4 different gases at the same time. These detectors may be multiplied according to special requirements. A wide range of electrochemical gas sensors are available.

#### Meteorological parameters

The basic configuration of the TVS-3 is equipped with the following sensors: thermometers at two heights and in soil, relative humidity, air pressure, wind direction and velocity gauges. The data processing program calculates the following meteorological parameters:  
Air stability (inversion, isometry, convection, etc.), dew point, comfort temperature, air pressure calculated to sea level, air pressure trend.

#### Radiation

The station can be equipped with BNS-98 Dose Rate Meter, developed by Gamma Technical Corporation to monitor the actual level of background radiation.

The BNS-98 device has two alarm thresholds with the function of registering sudden rises in background radiation.

# TVS-3 MLR



## ENVIRONMENT MONITORING STATION

### GENERAL FEATURES:

- Measured parameters:
  - Concentration of toxic and combustible gases
  - Meteorological parameters
- High sensitivity
- Continuous operation
- Reliable alarm with early warning
- Stainless steel mast
- Nationwide/local networking possibility



The function of TVS-3 MLR monitoring station is measuring and forwarding gas concentration data and meteorological parameters. Continuous operation is provided by duplicated sensors and redundant system components. The concentration of hazardous materials in air is measured by means of two GTI intelligent gas transmitters per station, each of them is capable for measuring 4 different gases at the same time. Wide range of gas sensors, various data transmission possibilities and explosion-proof housing are available for TVS-3 MLR stations.

### Technical parameters

Two basic types of the monitoring station are available:

- type 1 monitoring site (gas measurement)
- type 2 monitoring site (gas + meteo measurements)

Further subtypes are differentiated by the measured gases.

According to data transmission there are 5 different versions:

1. Direct RS232 connection
2. GPRS modem connection
3. Direct wire Ethernet connection
4. Optical Ethernet network connection
5. Microwave Ethernet network connection

#### Meteorological parameters (basic)

Measurement range:

1. Wind direction: 0 ... 360°, ± 5°
2. Wind speed: 0,4 ... 40 m/s, ± 3 % over 5 m/s
3. Air temperature: - 40 ... + 60 °C, ± 0,2 °C
4. Air temperature meters are selected for 0,1 °C tracking
5. Fault of shielding at + 50 °C is maximum 0,6 °C
6. Relative humidity: 0 ... 100 % RH, ± 2%
7. Electronic and mechanical assembly according to military standards
8. Galvanic, chemical, lacquer coatings and paints meet military standard requirements

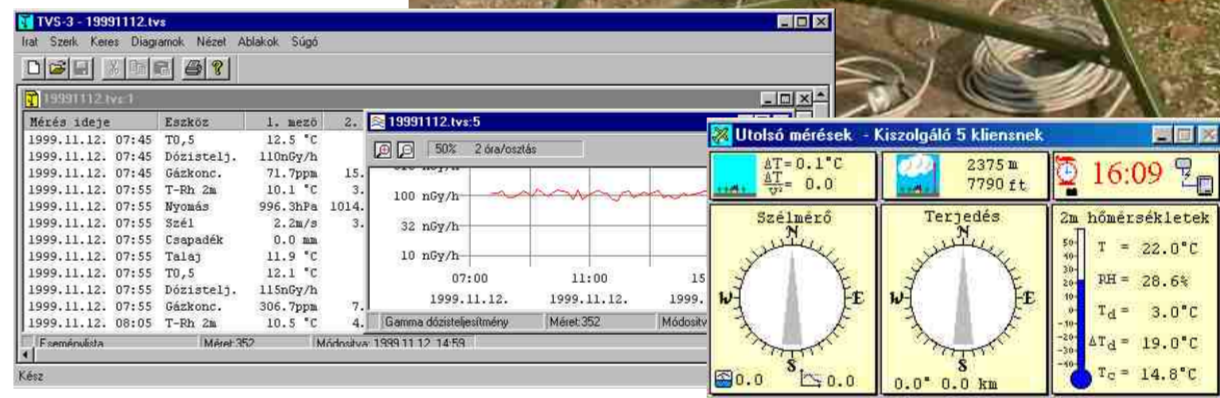
According to explosion-proofness, 3 versions of the monitoring station are available:

1. Configuration for Zone 1 and 2 classified areas, certified by Notified Body
2. Configuration can be cut off in case of explosion danger, contains no accumulator
3. Configuration cannot be used in explosion-hazardous environments, with redundant high power storage

## MOBILE ENVIRONMENT MONITORING STATION

### GENERAL FEATURES:

- Measurement of:
  - Industrial gases
  - Meteorological parameters
  - Background radiation
- High sensitivity
- Continuous operation
- Reliable alarm with early warning functions
- Mobile version with carrying case
- Computerised data display in graphics and tables
- Networking possibilities
- Data logger
- GPS
- GSM/GPRS
- NSN: 6665-51-000-6325



The TVS-3 M monitoring station was developed to measure the different parameters of the environment and to evaluate, summarize and store all the received and calculated data. The main purpose of its application is to check and control the environment. The TVS-3 M functions as a high quality, reliable device to monitor the radiation level and the concentration of industrial and other dangerous gasses in the air at the scene of an accident or at any other temporary monitoring points. The major goal of its development was to create a reliable, automatic device that is capable for continuous and independent monitoring of an observed area helping the prompt evaluation of a current situation and the determination of the spreading of environmental pollutants with the knowledge of meteorological parameters.

### Technical parameters

**Industrial and other dangerous gases**

Measurement of the concentration of harmful materials in the air:  
The intelligent gas detectors are capable of monitoring 4 different gases at the same time. These detectors may be multiplied according to special requirements. A wide range of electrochemical gas sensors are available.

**Meteorological parameters**

The basic configuration of the TVS-3M is equipped with the following sensors: thermometers at two heights and in soil, relative humidity, air pressure, wind direction and velocity gauges. The data processing program calculates the following meteorological parameters: Air stability (inversion, isometry, convection, etc.), dew point, comfort temperature, air pressure calculated to sea level, air pressure trend.

**Radiation**

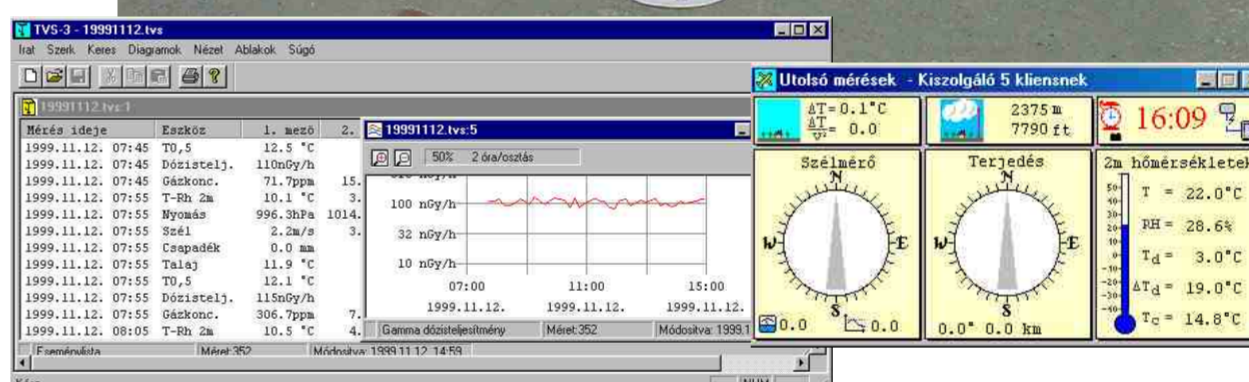
The station is equipped with BNS-98 Dose Rate Meter, developed by Gamma Technical Corporation to monitor the actual level of background radiation.

The BNS-98 device has two alarm thresholds with the function of registering sudden rises in background radiation.

## MOBILE ENVIRONMENT MONITORING STATION

### GENERAL FEATURES:

- Measurement of:
  - Industrial gases
  - Meteorological parameters
- High sensitivity
- Continuous operation
- Reliable alarm with early warning functions
- Mobile version with carrying case
- Computerised data display in graphics and tables
- Networking possibilities
- NSN: 6665-51-000-6326



The TVS-3 ML monitoring station was developed to measure the different parameters of the environment and to evaluate, summarize and store all the received and calculated data. The main purpose of its application is to check and control the environment. The TVS-3 ML functions as a high quality, reliable device to monitor the meteorological parameters and the concentration of industrial and other dangerous gases in the air at the scene of an accident or at any other temporary monitoring points. The major goal of its development was to create a reliable, automatic device that is capable for continuous and independent monitoring of an observed area helping the prompt evaluation of a current situation and the determination of the spreading of environmental pollutants with the knowledge of meteorological parameters.

### Technical parameters

#### Industrial and other dangerous gases

Measurement of the concentration of harmful materials in the air:  
The intelligent gas detectors are capable of monitoring 4 different gases at the same time. These detectors may be multiplied according to special requirements. A wide range of electrochemical gas sensors are available.

#### Meteorological parameters

The basic configuration of the TVS-3ML is equipped with the following sensors: thermometers at two heights and in soil, relative humidity, air pressure, wind direction and velocity gauges. The data processing program calculates the following meteorological parameters: Air stability (inversion, isometry, convection, etc.), dew point, comfort temperature, air pressure calculated to sea level, air pressure trend.

#### Radiation

The station can be equipped with BNS-98 Dose Rate Meter, developed by Gamma Technical Corporation, to monitor the actual extent of background radiation. The BNS-98 device has two alarm thresholds with the function of registering sudden rises in background radiation.

## MOBILE ENVIRONMENT MONITORING STATION

### GENERAL FEATURES:

- Mobile version for first response vehicles
- Measurement of:
  - Industrial gases
  - Meteorological parameters
- Easily deployable
- High sensitivity
- No moving parts
- Continuous operation
- Reliable alarm with early warning functions
- Graphic data display
- Networking possibilities



The deployed TVS-3 MLU monitoring station measures the different parameters of the environment and sends the measurement data to the central data acquisition unit of the system. The main purpose of its application is to check and control the environment. The TVS-3 MLU functions as a high quality, reliable device to monitor the meteorological parameters and the concentration of industrial and other dangerous gases in the air at the scene of an accident or at any other temporary monitoring points. The major goal of its development was to create a reliable, automatic device that is capable for continuous and independent monitoring of an observed area helping the prompt evaluation of a current situation and the determination of the spreading of environmental pollutants with the knowledge of meteorological parameters.

### Technical parameters

#### Measurement of industrial and other dangerous gases

Measurement of the concentration of harmful materials in the air:  
Each of the applied intelligent gas transmitters are capable of monitoring 1 to 4 different gases at the same time. These detectors may be multiplied according to user requirements. A wide range of electrochemical gas sensors are available for specific needs.

#### Meteorological parameters

The weather sensors of the TVS-3MLU station contain no moving parts. In the basic configuration they are capable of measuring the following parameters: wind speed and direction, temperature and relative humidity.  
In addition, the data processing program calculates and displays the following parameters, as well: air stability, spreading, dew point, comfort temperature.

#### Radiation

The station is equipped with a BNS-98 dose rate transmitter to monitor the current level of background radiation.

The BNS-98 device has two alarm thresholds with the function of registering the sudden rises in radiation level.

# INTELLIGENT GAS DETECTORS

## PLACES OF APPLICATION

- Industrial facilities
- Environment survey
- Mobile monitoring

## FEATURES

- Robust design
- Highly poison resistant
- Excellent zero and span stability
- Quick operation
- Excellent reliability



Gamma Technical Corporation's GTI 1-4 channel gas detectors was developed for the TVS-3 Environment Monitoring Stations. The transmitters can be coupled with the TVS-3 data logger or can be used as an individual gas detector device, connected directly to a data processing computer.

GTI detectors are built with electrochemical sensors and can measure 1-4 different gases at the same time.

The built-in microprocessor provides data processing, evaluation and automatically corrects the sensitivity and the shift in base line caused by the change of the environment.

The calibration of all detectors is performed individually with certified gas samples and divider pumps.

In its basic configuration GTI is available with the undermentioned sensors.

Explosion proof construction is also available with some sensors.

## Technical parameters

**Relative humidity range:**

15 to 90 % non condensing

**Pressure range:**

Atmospheric +/- 10%

**Temperature range:**

-20.....+40 C

**Baseline range**

Automatically compensated

**Maximum zero shift:**

Considerably less than indicated in the sensors data sheet

**Available sensors:**

CO, CO<sub>2</sub>, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, NH<sub>3</sub>, H<sub>2</sub>S, Cl<sub>2</sub>, HF, CH<sub>4</sub>, COCl<sub>2</sub>, HCl, HCN, H<sub>2</sub>, AsH<sub>3</sub>, hydrocarbons etc.

**ATEX Certificate:**

electrochemical cell(s) :  
II 2 G Ex d e mb IIB T5 Gb  
(Ta= -20°C - +55°C)  
catalytic cell(s) :  
II 2 G Ex d e mb IIB T4 Gb  
(Ta= -20°C - +55°C)

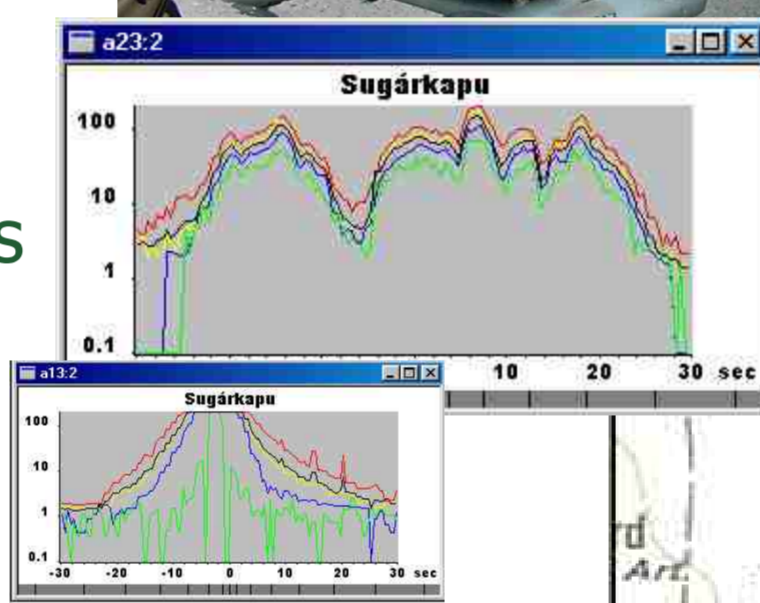
## AIRBORNE NUCLEAR RECONNAISSANCE SYSTEM

### FIELDS OF APPLICATION

- Reconnaissance of widely contaminated areas
- Localization of distinct radiation sources
- Four-channel spectrometry

### GENERAL FEATURES

- GM-tube and scintillation detectors
- GPS based geo coordinates
- 4 hour continuous, autonomous operation
- Map-display
- Low weight, small size
- Suitable for UAVs



The task of the system is the aerial reconnaissance of an area for primary survey. The system includes two nuclear detectors, GPS-receiver, barometric altitude-meter and data logger which can send the recorded data to the on-board notebook or to the PC of the operation center. One of the two detectors is a BNS-98 dose rate meter while the other one is a specially designed, highly sensitive NDI-65/SK type intelligent scintillation detector, built in a lead collimator which ensures the capability of finding and localizing discrete radiation sources on the ground. The system calculates the radiation level of the contaminated area (referred to 1 m altitude) or the dose rate of a discrete radiation source from the dose rate measured at the flying altitude considering the atmospheric and ground conditions.

### Technical parameters

**Nuclear parameters:**  
according to IEC 1017

**Climatic and mechanical parameters:**  
according to MIL Standard

**Weight:** <20 kg

**Measurement time:**  
BNS-98: 2 s ... 2 m, automatic  
NDI-65/SK: 0.5 s, automatic

**Power supply:**  
12V battery

**Operational temperature range:**  
-25 ... + 50°C

**Humidity-proofness:**  
95% at +35°C

**NSN:** 6665-51-000-6323

**Threshold level at 50 m ideal flying altitude:**

**Detection of discrete radiation sources:**  
Above 10-20  $\mu\text{Gy/h}$

**Measurement of dose rate of discrete radiation sources:**  
above 2-5 mGy/h

**Detection of spread contamination:**  
1.5 to 2 times above the level of background radiation



## NUCLEAR RECONNAISSANCE SYSTEM FOR UAV

### FIELDS OF APPLICATION

- Reconnaissance of widely contaminated areas
- Localization of single radiation sources
- Nuclear accidents
- Atomic explosion
- ROTA event

### GENERAL FEATURES

- Measuring gamma radiation from natural background to catastrophe level
- Automatic time constant
- Independent data collecting and simultaneous data transfer to the radio transmitter
- Easily replaceable data memory
- Data reader with USB port
- Barometric altimeter, location by GPS
- Map-display
- High reliability
- Military construction



The RABV nuclear reconnaissance system, developed with MoD Institute of Military Technology, mounted on UAV robot plane is intended to serve for determining the radiation level on any ground surface from the air considering flying-altitude, atmospheric and ground conditions. By indicating points with radiations significantly different from background radiation, the system determines the topographical coordinates of single radiation sources. The system is based on a BNS-98L dose-rate data logger. Measuring range of gamma radiation is seven orders from natural background. If the measured value significantly differs from background radiation the applied special algorithm changes time constant. The device is developed to operate under extreme meteorological and mechanical conditions. Memory card can be replaced from outside the instrument and can be connected to the evaluating computer by a data reader with USB port.

### Technical parameters

Nuclear parameters  
According to IEC 1017

Measurement range  
50 nGy/h....500 mGy/h (15%)

Indication range  
10 nGy/h.... 10Gy/h ( 30%)

Energy range  
60keV....1,5MeV

Threshold level  
- two adjustable  
- one automatic

Setup time  
4 s - 120 s

Communication  
RS-232, 9600 Bps

Power supply  
+9-27V remote

Ability to resist environmental effects  
According to MIL STD

Temperature range  
-25.....+50 °C

Housing  
Sealed

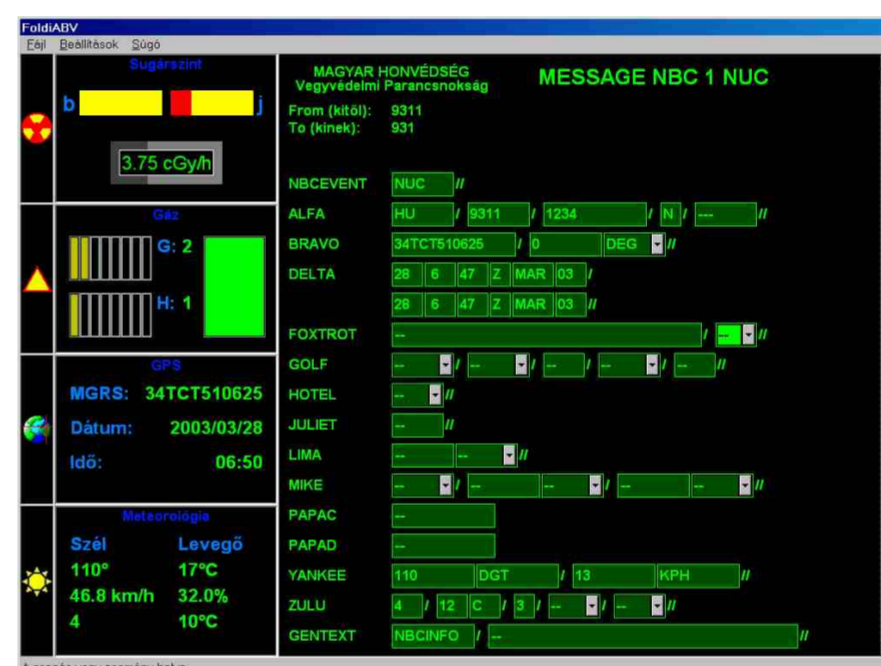
## ON-BOARD NBC RECONNAISSANCE SYSTEM

### FIELDS OF APPLICATION:

- Reconnaissance of nuclear contamination and chemical agents
- NBC reports

### PARTS OF THE SYSTEM:

- 2 pcs IH-99D on board radiation level meter system
- TVS-3ML Mobile meteorological station
- GPS
- IH-99L Data logger
- IH-99LCD display
- MAP Display
- GID-3 chemical agent detection system
- BNS-98 internal dose-rate meter
- VSMF sampling set



The FABV NBC reconnaissance system is able to detect blister and nerve gases and to measure radiation level and meteorological parameters. The survey data are stored and displayed with GPS coordinates. User can follow the measurements on LCD and can create different NBC reports.

### Technical parameters

#### NBC 1 reports:

NBC 1 CHEM, NBC 1 NUC, NBC 1 ROTA, NBC 1 BIO

#### NBC 4 reports:

NBC 4 CHEM, NBC 4 NUC, NBC 4 ROTA, NBC 4 BIO

#### NBC 5 reports:

NBC 5 CHEM, NBC 5 NUC, NBC 5 ROTA, NBC 5 BIO

#### CDR report

# RDC III AGM



## EVALUATION UNIT FOR TLD

### FEATURES

- Wide evaluation range
- Automatic calibration
- Adjustable alarm level
- Wide temperature range
- Easy processing
- LCD display board
- Temporary record storage
- Bidirectional link to computer
- Military construction



The RDC III AGM is a sensitive TL capsule evaluating device, which has a very wide measurement range. During capsule evaluation it measures the emitted light that is proportional to the accumulated energy of gamma radiation in the capsule. The device continuously checks the accuracy of the measurements and asks for self-calibration if necessary. An additional keyboard helps to type in the ID number of each capsule. The ID number, the date and the measurement value get registered into a log file, which is temporarily stored in the device (more than 32 thousand records can be stored). During the evaluation process, when a measurement value exceeds the previously adjusted alarm level, the unit warns with an audible alarm signal. Easy handling, short processing time, portable construction, mechanical strength, communication possibility with a computer make this device suitable for field and laboratory use.

### Technical parameters

<b>Measurement range</b> 400 $\mu$ Gy ... 10 Gy	<b>Power supply</b> 220V AC or 12V 1A battery
<b>Evaluation time of 1 capsule</b> 1 minute maximum	<b>Operational temperature</b> -20...+40°C
<b>Number of stored register</b> 32.000	<b>Relative humidity</b> 95% at 40°C
<b>Communication</b> RS-232	<b>Weight</b> 9,5 kg
	<b>Size</b> 240x210x200 mm

### TLD technical parameters



<b>Relative humidity</b> 98%, 35 °C
<b>Under water operation</b> 1hour at 1m depth
<b>Accuracy</b> $\pm$ 20%
<b>Number of evaluations</b> 250
<b>Weight</b> 20g
<b>Temperature</b> -50 ... +50°C

## CONTAMINATION SAMPLING SET

### SAMPLING

- Air (gas, aerosol)
- Water
- Soil
- Food
- Plants, organic materials
- Other materials

### TOOLS

- Electric air pump
- Aerosol filters
- Sampling tubes
- Water and sediment sampling set
- Water sampling ladle
- Awl, shovel, dagger
- Scalper, scissors, forceps
- Sealed plastic bags



NSN: 6665-51-000-6324

The VSMF Contamination Sampling Set is a versatile collection of tools for sampling solid materials, liquids and air in the course of a chemical or radiation related inspection. All devices and accessories are fixed in a portable suitcase which prevents damage or loss. It solves the problem of safe storage and transportation and ensures the reliability of the inspection results. The VSMF Sampling Set is suited to take samples from air, pool water, rivers, wells, soil, food, plants, greens and many other materials. The sampling instruments can be fixed in the suitcase so they do not get damaged during a bumpy, rough transportation. The samples are ready to be used for chemical and nuclear laboratory inspection.

## INTELLIGENT SCINTILLATION DETECTOR

### FIELDS OF APPLICATION

- Physical research
- Chemical research
- Medical isotope diagnostics
- Environment monitoring

### GENERAL PURPOSE OF APPLICATION

- For performing user defined measurement tasks with programming features.
- Connecting possibility of an RS-485 serial line to PC, max. 32 units on one cable

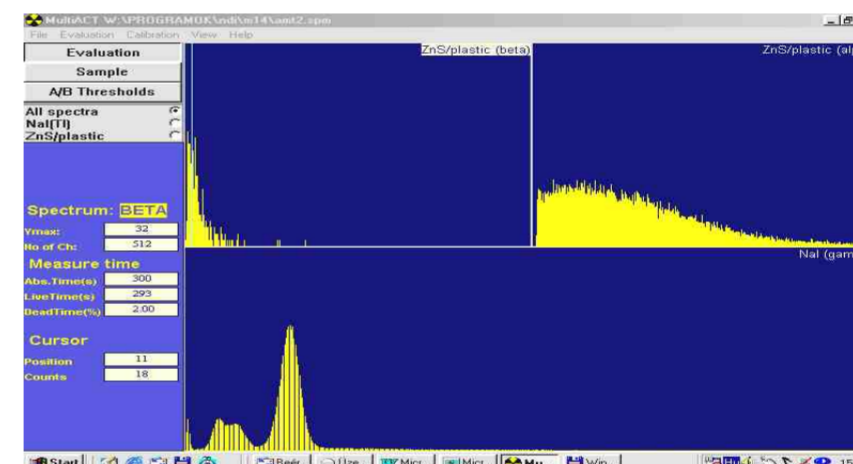
### SOFTWARE

- Analysing program for the identification of up to 100 isotopes
- Medical applications (thyroid uptake, renography)
- Software package for special purposes



The MultiACT multipurpose nuclear spectrometric software package may be coupled with the NDI intelligent detector system.

Alpha counting, beta counting and gamma spectrometry is possible at the same time with sandwich crystals.



In the NDI probes the analyzer is built into the detector itself. This design is creating an intelligent detector that contains all the necessary electronic units. Its microcontroller not only forwards the spectrums but analyses and separates the impulses according to width and amplitude and forwards the measurement results towards the data acquisition unit. The optional spectrum stabilizer circuit measures the light of the LED that is built into the NaI scintillator allowing long endurance and maintenanceless operation even under extreme climatic conditions.

The built-in electronics contain a memory module large enough to perform the user defined specific measurement tasks. The regulation of the power supply is mastered digitally so the individual calibration procedure can be performed easily and precisely. The intelligent detector is an excellent tool for measuring specific radioisotopes with high sensitivity. Compound scintillators are available with the NDI probes making separation of alpha, beta and gamma radiation possible. The output signal can be connected to PC.

### MultiACT functions

#### Sample measurements

- Alpha counting
- Beta counting
- Gamma spectrometry

#### Calibration procedure

- pulse width calibration
- channel number versus radiation energy
- peak width versus radiation energy
- counting efficiency versus radiation energy

#### The MultiACT menu system

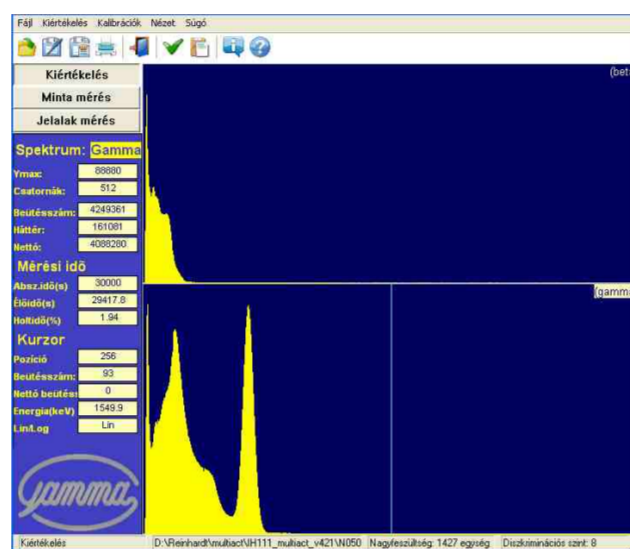
The interactive structure has three functional modes:

- EVALUATION
- SAMPLE measuring
- A/B threshold pulse shape discrimination

## Radioactive particle monitoring systems

### FIELDS OF USE:

- Emission-control of nuclear facilities and radiological laboratories
- Emission-control of technologies of isotope production or emitting plants



### FEATURES:

- User-defined alarm and emergency levels
- Measurement of alpha, beta and gamma radiation
- Continuous, uninterrupted measurements
- Four types of filters (can be extended on demand)
- Isotope identification
- Measurement of noble gases

The system measures the amount and activity of the emitted radioactive materials. The base configuration that can be extended on demand, contains four types of air filters. It is capable to continuously show measurement information to the users online, trigger alarms and send emergency stop signal to the connected systems if the activity is above the pre-set threshold level or the measured activity-increase is significant. The system generates error messages if the filters are torn, damaged, obturated or the filter contains a pre-set amount of activity.

The system contains no moving parts (automatic filter-exchanger) to maximise reliability. Hence the software algorithm the system has an optimised filter lifetime. With the use of sandwich detectors it is possible to evaluate the quality and quantity of the radiation, to determine the type of radiation (alpha, beta or gamma), as well as it is also capable of gamma spectroscopy. The system measures the air-flow and temperature parameters, monitors the input power and reports any unauthorised entry into the system.

### Detector properties, types:

Physical parameters	Crystal types	Crystal functions
Operating temperature: 0-40°C	Plastic+CsI(Tl)	beta counting with background subtraction
Extended operating temperature range: -25-60°C	Plastic+NaI(Tl)	beta counting with background subtraction, gamma spectrometry
Relativ humidity: maximum 85% RH	ZnS(Ag)+Plastic+NaI(Tl)	alpha, beta counting with background subtraction, gamma spectrometry
Weight of detector: max. 3,5 kg	CaF+NaI(Tl)	beta counting with background subtraction, gamma spectrometry
Warm up time: 3 minutes	Boron-polieszter+NaI(Tl)	gamma and neutron measurements simultaneously

### Default filter-types:

1. Aerosol filter	- non-organic iodine in aerosol form
2. PACI filter	- non-organic iodine, extended lifetime
3. Active-carbon filter	- organic iodine, expanded efficiency
4. Air-filled tank	- measurement of noble-gases

# COMPOUND SCINTILLATORS

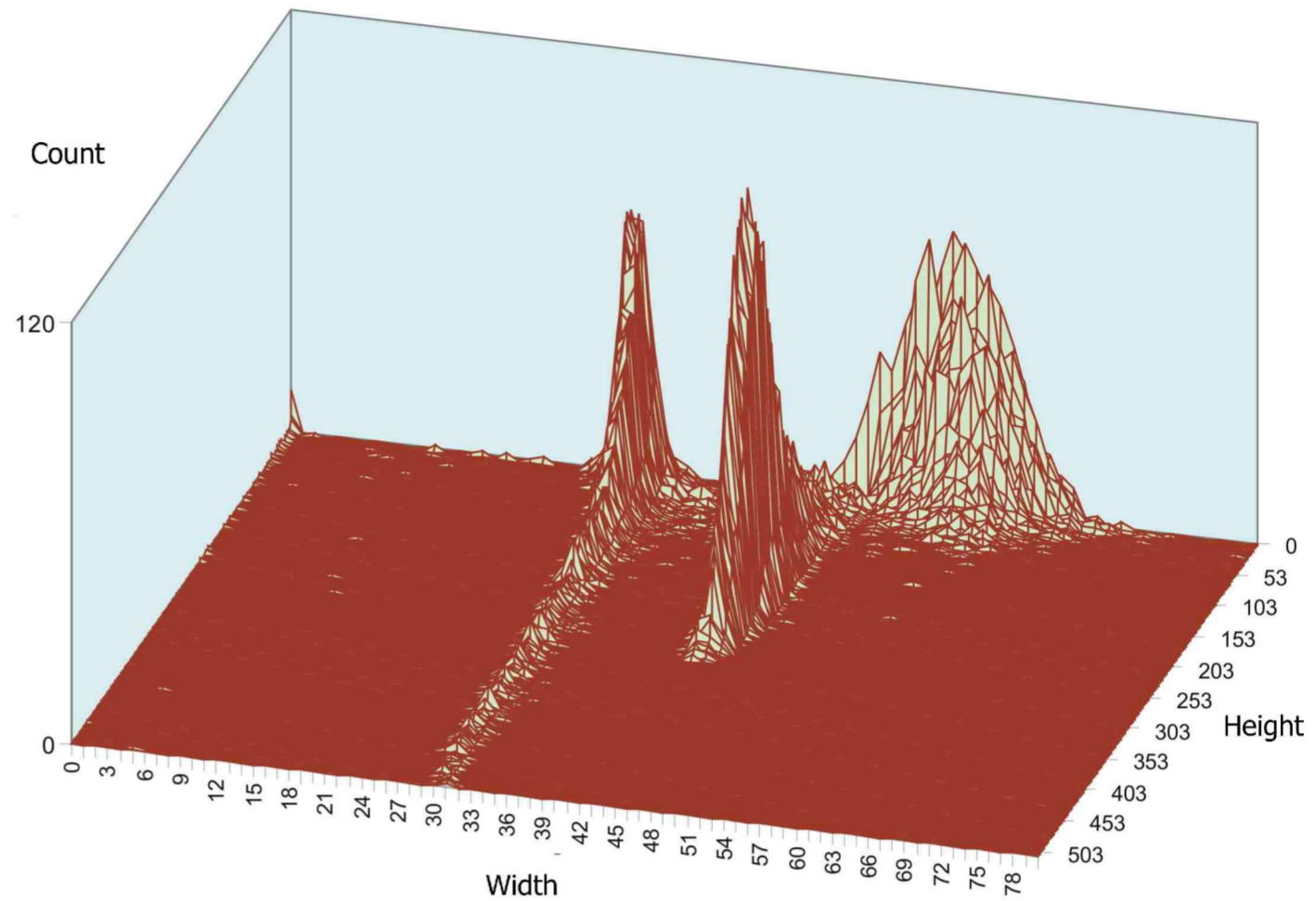
Compound scintillators coupled with NDI intelligent detector system can be used for alpha counting, beta counting and gamma spectrometry at the same time.

## SCOPE OF APPLICATION

- Environment protection
- Medical diagnostics
- Scientific research
- Nuclear safety

## FEATURES

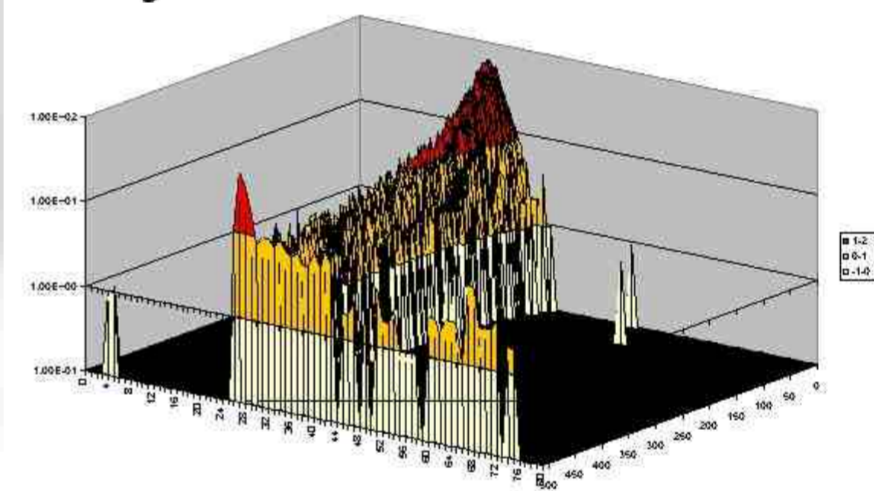
- High sensitivity
- Stability
- Long life



Compound scintillator with NDI probe  
Waterfall diagram



gamma + neutron sandwich detector



Gamma Technical Corporation has been manufacturing scintillators since 1960. The company's commitment to high quality ensures that leading companies in the field of radiation measurement appreciate our expertise worldwide. Wide range of NaI(Tl), CsI(Tl), plastic, ZnS(Ag)+boronpolyester types are available with diameter from 0,5" to 5" and thickness up to 5". Gamma Technical Corporation offers Well-type and transversally bored NaI(Tl) crystals, ZnS+Plastic+NaI and CsI+plastic combined crystals, as well. Customers' request for custom-made scintillators are also welcome.

In compound scintillators impulses are generated with different pulse-height and pulse shape as an effect of alpha, beta, gamma and neutron radiation. An appropriate way for discrimination is based on the significantly different duration of alpha, beta and gamma responses. In the NDI intelligent detector system lower and upper threshold values should be selected experimentally upon visual inspection of the spectral distribution. Once the threshold values are fixed, the compound alpha/beta/gamma detector will produce separate pulse height versus energy distribution for all kinds of radiation.

Combinations	Application field
Plastic+CsI	beta counting with background correction
Plastic+NaI	beta counting with background correction, gamma spectrometry
ZnS+Plastic+NaI	alpha, beta counting with background correction, gamma spectrometry
CaF+NaI	beta counting with background correction, gamma spectrometry
CsI+plastic	alpha, beta counting and gamma spectrometry at the same time
B polyester+NaI	gamma and neutron counting at the same time

## Detection, Identification and Monitoring Vehicle

### FIELDS OF APPLICATION:

- Detection, Identification and Monitoring of chemical, biological, radiological or nuclear hazardous materials

### EQUIPMENT:

- personal protective equipment
- 4-channel gas detectors
- Ex-Ox measuring instrument
- chemical detection kit
- personal dosimeters
- hand-held radiation level and contamination measuring instrument
- deployable / vehicle-mountable environment monitoring station (meteo sensors, radiation and gas detectors)
- hand-held Raman spectrometer
- hand-held FTIR spectrometer
- bio agent detection kit
- sampling kit
- portable decontamination kit
- marking kit
- area lighting set
- power generator
- thermo camera
- communication equipment



The crew of the Detection, Identification and Monitoring (DIM) Vehicle provides the first accurate information on the site of an incident involving actual or potential chemical, biological, radiological or nuclear hazardous materials. The crew enters the hot zone area using appropriate PPE, reconnaissance instrumentation, sampling and marking equipment.

The DIM vehicle is the main component of an efficient HazMat fleet. Completed with further radio-linked subunits such as mobile lab, mobile command post, ambulance and decon system the fleet creates a highly effective disaster management force.

### Features

- Customized CBRN/HazMat detection, identification and monitoring instrumentation.
- Meteorological sensors.
- Full scale of respiratory and skin protective equipment.

- Personal decontamination kit.
- Auxiliary (sampling, marking, lighting, protecting, power generating) equipment.
- Tetra communication.
- Flexible choice of base vehicle, or the option of full function superstructure and instrumentation only.



# HazMat Laboratory Vehicle

## FIELDS OF APPLICATION:

- Evaluation of CBRN/HazMat related incidents, on-site monitoring and personnel decontamination

## EQUIPMENT:

- personal protective equipment
- 4-channel gas detectors
- Ex-Ox measuring instrument
- chemical detection kit
- portable GC/MS
- personal dosimeters
- hand-held radiation level and contamination measuring instrument
- radioactive contamination measuring instrument for food and other bulk or liquid samples
- deployable / vehicle-mountable environment monitoring station (meteo sensors, radiation and gas detectors)
- hand-held Raman spectrometer
- hand-held FTIR spectrometer
- bio agent detection kit
- sampling kit
- first responder decontamination kit
- marking kit
- area lighting set
- power generator
- thermo camera
- communication equipment



The HazMat Laboratory Vehicle takes position outside the hot zone fully prepared to start the on-site examination of the samples gathered either by the DIM teams or the crew of the lab vehicle. State-of-the-art instrumentation supports the crew in analysing and evaluating the samples such as portable GC/MS and IH-111 radiological contamination measuring instrument that enables the identification of radioactive contamination in food, soil or other liquid or bulk samples.

The Mobile Lab vehicle is a key component of an efficient HazMat fleet. Completed with further radio-linked subunits such as Detection, Identification and Monitoring (DIM) vehicle, mobile command post, ambulance and decon system the fleet creates a highly effective disaster management force.

## Features

- Customized CBRN/HazMat detection, identification and monitoring instrumentation.
- Meteorological sensors.
- Full scale of respiratory and skin protective equipment.

- First responder decontamination kit.
- Auxiliary (sampling, marking, lighting, protecting, power generating) equipment.
- Tetra communication.
- Flexible choice of base vehicle, or the option of full function superstructure and instrumentation only.

## Mobile CBRN Detection System

### FIELDS OF APPLICATION:

- Securing VIP meetings, mobile facilities
- High-security buildings

### Features

- Provides comprehensive protection against CBRN threats
- Simultaneously used CBRN Boxes automatically set up a communication network
- Monitoring capability of a large area via the network of CBRN boxes
- Extends the capability of the common security elements
- Portable, easy to install
- Does not require expert personnel
- Rugged, can be used under extreme weather conditions



The CUBE detects the presence of chemical, biological substances and nuclear radiation. The system offers an overall view and fast response to nearly all challenges. It detects chemical warfare agents (CWAs) and a wide range of toxic industrial chemicals (TICs). The applied biological alarm monitor is continuously analyzing particles in the air searching for specific signatures of bacteria or toxins such as anthrax, plague, Botox, legionella, etc., and alarms when the concentration of those particles increases. The system contains a gamma dose rate meter with an extremely wide measurement range, as well and can optionally be completed with a highly sensitive scintillation detector for radiation reconnaissance. The detection system also includes a combined meteorological sensor providing measurement data that supports the users in determining the direction of the spread of actual or potential hazardous materials and to find safe escape routes.

### Properties

#### Detection of:

- chemical warfare agents (CWAs),
- toxic industrial chemicals (TICs),
- biological warfare agents (BWAs).

#### Measurement of:

- nuclear radiation (gamma),
- meteorological parameters (temperature, humidity, wind speed and direction).

Warning levels: local and network warnings, alarms, evacuation warning.

Alarm signals: silent, audible, visual

Auxiliary system components:

- Data logger,
- Wired and wireless secure communication,
- Display unit (local and remote data + events),
- Battery backup (UPS),
- Optionally: mobile gamma and/or neutron radiation portal monitor.

# Handheld RPM, search and identification unit

## FIELDS OF APPLICATION:

- Secondary screening
- Field radionuclide analysis
- Localisation of lost or hidden sources

## Features

Five functions in one instrument:

- **Detector:** Highly sensitive, large scintillation detector with RPM working mode.
- **Finder:** Detector head with narrow directional sensitivity featuring navigation arrows to find point-like sources.
- **Identifier:** Radionuclide identification function with expandable isotope library.
- **Quantifier:** Activity estimation with embedded range finder.
- **Decision supporter:** Built-in customizable alarm process handling with automatic report generator.



The SFK is based on Gamma Technical Corporation's well proven intelligent scintillation detectors. The basic combination of scintillator and PMT is integrated with a preamplifier, analyser and HV power supply. The probe is built into an environment-proof, robust housing and completed with a rugged tablet PC that runs the versatile spectrometric software, thus providing a highly effective device for finding radioactive sources and on-site isotope identification.

## Technical parameters

Scintillation detectors:

- detector head with 3"x 3" NaI crystal, and
- detector head with narrow directional sensitivity 1"x 1" NaI crystal

Optional LaBr3 or BGO scintillator

Optional neutron detection

Measuring range: 18 KeV to 3 MeV

Built in isotope library

IP56 protection

Operating temperature range: -10°C - +50°C

Integrated GPS and WiFi communication