RAMESIS

support to Citizen Radiation Monitoring Network in the Czech Republic

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Introduction

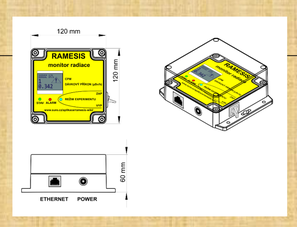
The research programme **RAMESIS** "**Radiation Monitoring network for institutions and schools to assure early awareness and enhancing safety of citizens**" is aimed to increasing of the public knowledge and understanding of matters concerning radioactivity and radiation protections through introducing a radiation monitoring system operated by institutions, schools and citizen on voluntarily basis.

This paper presents equipment for fixed-station based monitoring of radiation situation through dose-rate measurements using detectors developed in the frame of the RAMESIS project.

Design of the detector

The system includes

- detection subsystem –detector based on plastic scintillator approx. 15x15x10 mm^3,
- central unit based on ARM mini-CPU board for processing the signal from detection unit and displaying measured values
- communication subsystem - for data transfer to a central database and for remote control of detection units using common internet connection (wired
- .Powered by adapter or by power-bank



Modes of operation:

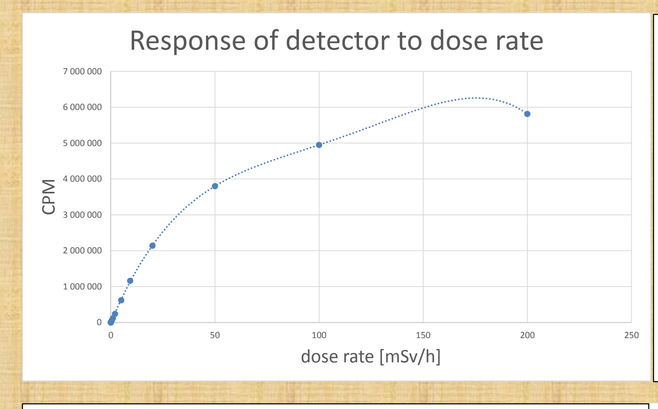
	Standard	Experimental
• Monitoring	continuous	on demand
• Data transfer	on-line, continuous	no
• Data storage	internal memory	internal memory
• Data display	actual values over 5 seconds	actual values over 5 seconds
• Powered by	wall power outlet via adapter	power-bank

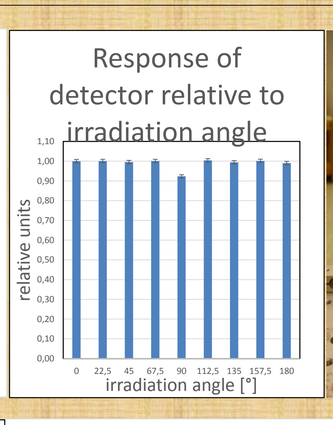
Discussion

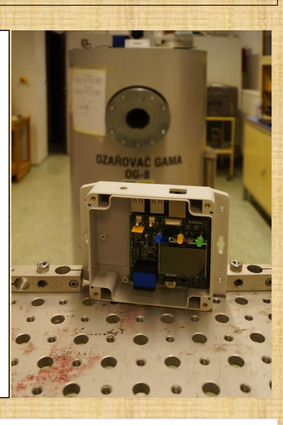
- Technical solution matching appropriate requirements was discussed, tested, optimized and verified by the project participants, considering both technical and economical aspects, to reach the level of industrial production capability and wide applicability.
- The device was registered as „Industrial design"
- System enables continuous monitoring of radiation situation by measuring gamma dose rate in range from tens of nSv/h up to tens of mSv/h, covering both monitoring of natural background in given locality and values of dose rate considered in case of emergency,
- System enables obtaining warnings in case of occurrence of higher dose rate values.
- System ensure automatic operation (24 hours per day 7 days a week) with transferring data into central database (using common internet connections)
- System enables use as semi-portable for demonstrations and performing experiments in laboratories, schools, etc..

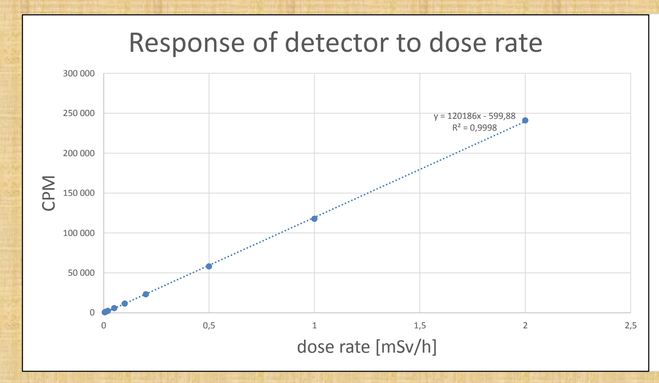
Testing and evaluation of the system

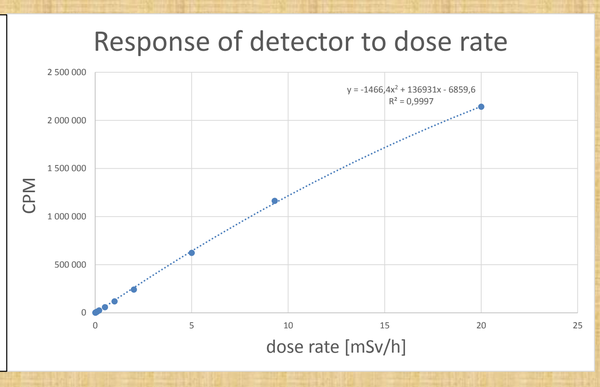
- detection subsystem:
  - tests in the calibration laboratory of SURO, equipped by ^{137}Cs a ^{60}Co sources and rtg irradiator
  - tests for lower dose rates in low-background WBC shielding chamber will follow,
- communication subsystem:
  tested for secure communication with RAMESIS server using secured web services
- RAMESIS central application and database:
  basic operational tests are completed successfully, routine operation testing will follow

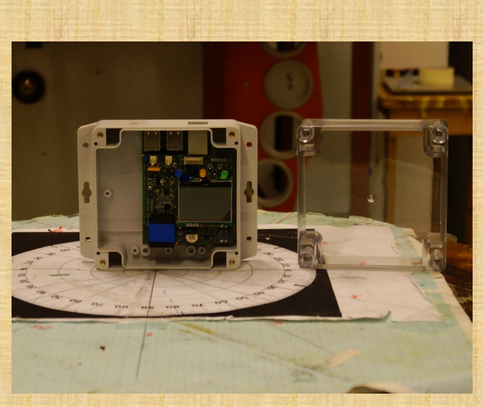








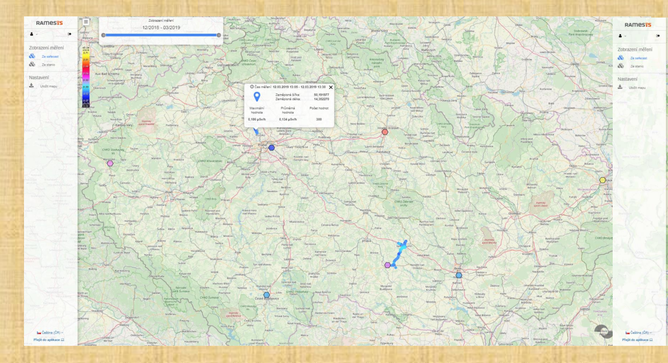


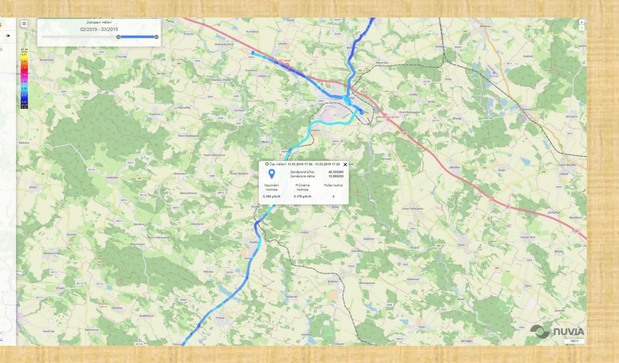


Central application design

The system includes

- Central database for storing data coming from all kinds of detectors (both fixed and mobile)
- Communication part for receiving data from detectors and for exporting data to external systems (using secured web services)
- Presentation part for showing results of monitoring
- Administrator´s part





Conclusions

Implementation of the fixed units for both continuous and laboratory measurements in schools of all levels and selected institution, municipalities and other public subjects as well civil ones (for example fire-brigades basis, kindergartens and schools of all levels, senior houses, sport and recreational facilities etc.), including citizens, can became significant benefit to nation-wide monitoring of radiation situation, especially as quick indicating of areas where more detailed monitoring performed by professional team is required.

Capability of the units to be used for laboratory experiments and demonstration in schools can contribute significantly to increasing public information and understanding in this field, as well as usage of stand-alone units for emergency purposes aimed at technical education.

The system is suitable for future implementation in official monitoring networks.

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