## Modular remote radiation monitor

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Originally thought as the next generation of MRA 7027 [1], a well-known radiation monitor designed and produced by CNEN in the past, the Modular Remote Radiation Monitor (MRRM) is being designed as a portable microprocessor-based radiation monitor suitable for monitoring environmental exposure to ionizing radiation. Besides its low-power highly-integrated circuit design, the MRRM is presented in an unique modular architecture, which promotes full compliance to the technical requirements of different applications while minimizing cost, size and power consumption.



Fig. 1: MRRM diagram with all modules connected



Fig. 2: Detection module prototype

Additionally, the MRRM provides its monitoring data to other electronic systems, physically distant from it, by means of an electronic communication channel, which can be wired or wireless according to the requirements of each application.

Its communication capability also supports the implementation of a network of multiple MRRMs connected to a supervisory system, capable of remotely controlling each monitor independently as well as visualizing the radiation levels from all monitors.

The radiation monitor physically consists of compact-size modules attached to each other with an intermodule data bus for internal communication (Figure 1), each module implementing one specific task of the MRRM as follows:

(1) Detection module (Figure 2), responsible for detection of ionizing radiation through its integrated detector, digital analysis of radiation data and activation of both visual and audible integrated alarms when radiation level exceeds a programmable predefined limit

(2) Communication module for transmission of digital data, concerning system status as well as radiation levels, to other electronic systems via communication channel, which can be wired or wireless

(3) Visualization module, optional for visualization of radiation levels in integrated digital LCD screen and local storage of such levels over time in nonvolatile memory

(4) Interlock module, optional for activation of remote alarm and safety interlock signals once radiation level exceeds a programmable predefined value

(5) Power module, which provides electrical power to all modules connected to the intermodule data bus, by means of internal batteries, connection to an electrical wall outlet or both.

## References

[1] OLIVEIRA, M. V.; AGHINA, M. A. C. Sistema de Monitoração de Radiação 7027 do Reator Argonauta. In: V Encontro Nacional de Aplicações Nucleares, 2000. V ENAN - V Encontro Nacional de Aplicações Nucleares, 2000.