MIRION TECHNOLOGIES

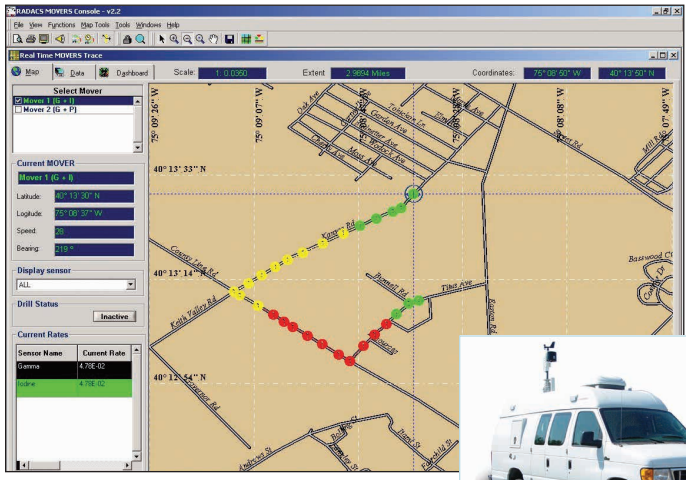
MOVERS™ Mobile Vehicle-based Emergency Radiation Monitoring Systems

Features

- Real-time emergency field radiation monitoring
- Fully integrated radioactivity data management
- Enables rapid response in the event of radiological terrorism or accident
- High sensitivity radiation detection for beta particulates, iodine and ambient gamma fields
- Survey mapping for plotting radioactive plume dispersion
- Local data storage for independent operation
- Optional wireless communication to base station
- User friendly interface, supportive graphical display
- Optional weather monitoring

Major Assemblies

- CAM110PIFF, particulate and Iodine monitor
- GP110, High sensitivity area monitoring SMART detector
- ADM606M, Portable Ratemeter
- GPS450, Global Positioning System
- Optional omni directional antenna
- Mobile station computer with RADACS™ software



Real-time radiological trace with position coordinates

Description

The Mobile Vehicle based Emergency Radiation System (MOVERS) is designed for the vehicle based monitoring of Gamma, Particulate and Iodine radiation with optional wireless transmission of monitored data to a centralized data acquisition base station and the option of adding on neutron, alpha/beta particulate and tritium monitoring to increase the range of applications covered.

MOVERS offers dependable radiation detection in applications such as real-time accident and post-accident scenarios at nuclear facilities, environmental surveying or in response to radiological terrorism. MOVERS incorporates high sensitivity proven detectors for gamma dose rate, iodine and beta/gamma particulate monitoring and so is able to measure all the likely hazardous releases from NPPP or fuel transport accidents or radiation from a ‘dirty bomb’.

The Radiological Assessment Display and Control System, RADACS software enables fast and accurate decision making based on integrated radioactivity data management.

MOVERS includes the following major assemblies:

A. CAM110PIFF, Continuous Air Monitor for beta particulate and iodine gas monitoring.

B. GP110, High sensitivity, Geiger Mueller tube detector for ambient gamma radiation connected to the ADM606M portable ratemeter.

C. GPS450 module and antenna.
   - Options: Wireless hardware and omni directional antenna.

MOVERS Mobile Vehicle-based Emergency Radiation Monitoring System

D. Mobile Computer station with RADACS (optional base station computer).

Options:

- Met station for meteorological data.
- NP100 neutron probe.
- *i*CAM™ alpha/beta particulate in air monitor.
- TAM100D tritium in air monitor.

A. Beta Particulate and Iodine Monitoring
The CAM110PIFF is a low profile air monitor for the detection of beta particulates and ^{131}I. Visual indication and contact outputs for remote alarms are provided for High and Alert alarms, low sample flow and failure conditions.

The air inlet and outlet mounted on the top of the vehicle, along with the monitor's built in vacuum pump, allow for continuous air sampling. A filter paper collects the airborne particulate while a TEDA impregnated charcoal cartridge enables collection of ^{131}I.

A scintillation detector is mounted in close proximity to the filter and cartridge. CANBERRA scintillation detectors operate with a unique gain stabilization circuitry for temperature-compensated and drift-free operation. This results in improved accuracy and extended calibration cycles.

The detector works in conjunction with three Single Channel Analyzers in the in the model PA300E Preamplifier.

The ADM606M takes the signals from the detector preamplifier, digitally filters the rate and presents the activity on the display. The ADM606M also provides power through the relay contact to energize the check source solenoid and to the system mass flow controller to set the system flow rate.

The solenoid operated check source assembly, MX9BV21 contains 0.1 µCi of ^{90}Sr isotope for use in checking the detector, preamplifier and ratemeter operational status.

The CAM110PIFF includes a complete sample transport system made up of stainless steel tubing, a mass flow controller and a vacuum pump.

For complete information on assemblies and functionality, see the CAM110PIFF data sheet.

B. Area Gamma Monitoring
A GP110 detector and ADM606M ratemeter are used for monitoring ambient gamma radiation. The GP110 detector is mounted on the top of the vehicle and is connected to the inside portable ratemeter.

The GP110 is a high sensitivity Geiger Mueller tube detector specifically designed for low level environmental gamma radiation monitoring. The GM tube operates under the unique CANBERRA "Time-to-Count" technique, enabling many decades of linear performance. Additionally, this is a SMART detector which retains probe information in non-volatile memory.

The ADM606M is a portable, rugged ratemeter microprocessor-based with an auto-ranging digital/analog display that provides both high accuracy and trending of results. Both visual and audible alarms occur when radiation levels exceed user-selected set-points.

For complete information on GP110 and ADM606M, see the GM Series detectors and ADM606M data sheets.

C. GPS
MOVERS is equipped with a Global Positioning System composed of a GPS450 module and a roof mounted GPS antenna with cable. The GP450 is a self-contained receiver with eight channels to track up to eight satellites. The unit is capable of differential accuracy better than 10 meters and velocity accuracy of 1 cm/s.

D. Data Collection
Data collected on the vehicle is sent back to the base station computer using wireless IP messages. The hardware for wireless communication includes a wireless PC card, wireless router and antennas.

For more complex applications CANBERRA will work with you to achieve the communication reliability required by the application. This includes conducting a site survey and proposing the specific wireless hardware to best fit the application.

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E. RADACS MOVERS

MOVERS includes a computer station with installed RADACS MOVERS software. The computer is connected to the ADM606M, CAM110PIFF (specifically ADM606M), GPS450, and any other optional monitoring devices (ex. weather, vehicle speed). Field data is sent to the base station computer through wireless IP routing.

RADACS MOVERS is a member of the Radiological Assessment Display and Control System (RADACS) suite of software applications. RADACS is designed to collect, manage, store and distribute information from radiation detection instrumentation as well as other types of instruments, such as GPS, sensors, or meteorological.

RADACS is a client/server technology built around standardized protocols and tools, including SQL data bases and TCP/IP communication.

The RADACS MOVERS main interface displays the real-time position of the vehicle along with the radiological data acquired superimposed over the territory's maps. This application resides both on vehicle and base station computers, receiving data from its local server. In addition, this application includes functions for viewing historical data and multiple configuration tools for map display, alarms set-up, reports creation.

For complete information, see the RADACS data sheet.

Specifications

Environment

- TEMPERATURE – –30 °C to +50 °C (–22 °F to +122 °F).
- HUMIDITY – 0 to 95% relative humidity.

System

- SIZE (CAM110PIFF) – 724 x 762 x 1041 mm (28.5 x 30 x 41 in.) (L x W x H).
- WEIGHT – 340 kg (750 lb), approximately.
- POWER – 120 V ac ±10%, 60 ±5 Hz (other voltages optional).

MD455V6 Beta/Gamma Detector

- DETECTOR TYPE – Plastic scintillator, 0.25 mm (0.010 in.) thick, 50.8 mm (2 in.) diameter.
- BGO crystal, 47.2 x 7.9 mm (1.86 x 0.31 in.) (Dia. x thick).
- DYNAMIC RANGE – 0.37 to 3.7 x 10^5 Bq/m^3 (10^{-11} to 10^{-5} µCi/cc).

GP110 Ambient Gamma Detector

- Detector Type – High sensitivity, halogen quenched Geiger Mueller tube.
- Dynamic Range GP110 – 1 µR/h to 1000 R/h.
- Dynamic Range GP110SI – 0.01 µSv/h to 10 Sv/h.

Mobile Station Desktop-grade computer

- 1 GHz Pentium® III or higher CPU
- 512 MB RAM
- 20 GB hard drive
- 17 in. monitor
- 10/100BT network interface card
- 64 MB graphic accelerator card
- Windows® 2000 Professional
- Three RS-232 ports; RS-232 to RS-485 converter
- Microsoft® Access 2002 with MSDE

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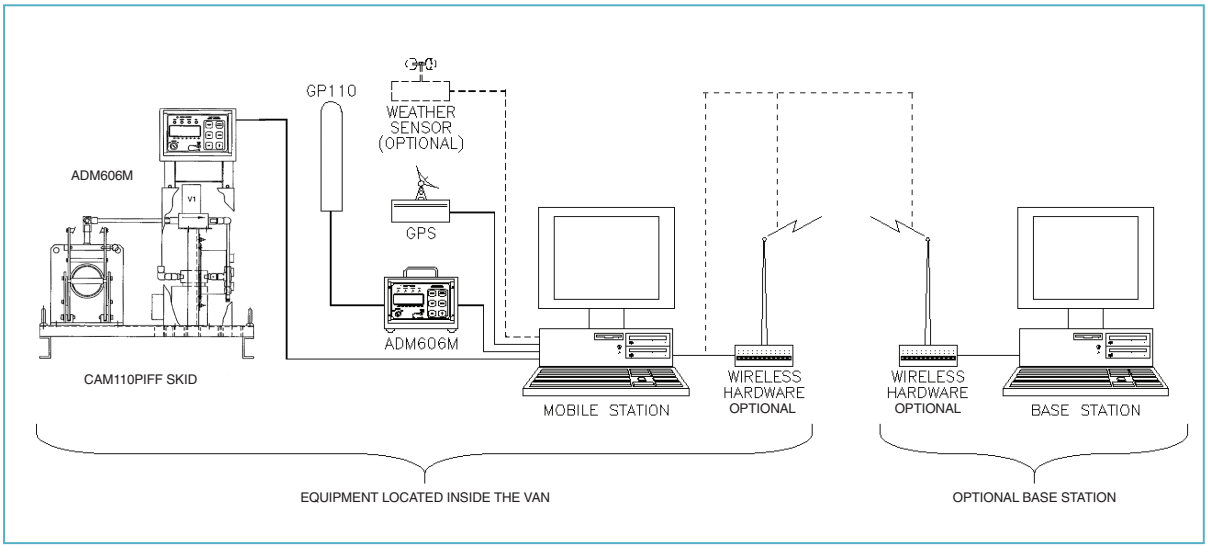
Model Numbers

- MOVERS-100 – A stand-alone vehicle system comprising:
  - CAM110PIFF Continuous Air Monitor (Particulate and Iodine)
  - GP110 High Sensitivity Gamma Probe with roof mount
  - PC with RADACS MOVERS mobile software
  - ADM606M Local Processor
  - GPS Global Positioning System
  - Two-way flow splitter
  - Power inverter (12 dc/120 V ac)
  - System assembly and test
  - Standard documentation
- MOVERS-100SI – Version with GP110SI in place of GP110.
- Options:
  - Met station for logging and recording of meteorological data.
  - NP100H neutron probe.
  - *i*CAM/D alpha/beta particulate in air monitor (with pump).
  - TAM100D Tritium in air monitor.
- MOVERS-110 – Vehicle system as above, but with wireless/cellular communications hardware for transmission of readings to a CBS-110 central base station.
- MOVERS-110SI – Version with GP110SI in place of GP110.
- CBS-110 – Comprises wireless/cellular communications hardware, server PC and RADACS MOVERS software. The CBS-110 can receive and display information from up to six MOVERS-110 vehicles simultaneously.

MOVERS is designed and manufactured under a quality system in compliance with ISO 9001.

ISO 9001 SYSTEM CERTIFIED



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