Radioactivity monitor with GPS-data logging for rapid response vans

Product Specifications

FHT 1376 MobiSys

Mobile radioactivity monitor

Features

High sensitivity 5 liter plastic detector for locating radio-active source

Dose rate change in nSv/h range immediately detected

Natural Background Rejection (NBR) indicates artificial sources

Advanced Digital Filter (ADF) makes possible data collection at road speed

Automatic adjustment to background variations

Radiation data recorded with GPS and time stamp

Familiar Windows® operating environment

The Measurement System

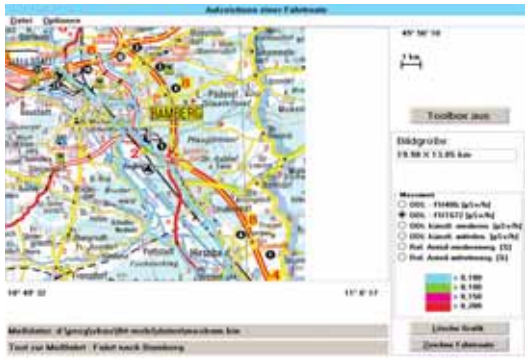
The FHT 1376 MobiSys was developed for the rapid detection and location of gamma emitting radioactive sources in large areas. The FHT 1376 system provides survey teams with a tool for effectively addressing the problems of orphaned sources, radiological contamination, and maliciously introduced sources.

The system continuously records radiation data associated with GPS location and time data, while mounted in a moving vehicle. It is readily adaptable to a wide range of vehicles.

The FHT 1376 MobiSys consists of a high sensitivity, 5 liter plastic gamma radiation detector and a compact Global Positioning System (GPS). With the addition of an optional FH 40 GL-Ω advanced survey meter, accuracy is ensured in high radiation environments. All components (with the exception of the antenna) are contained in a rugged carrying case and can be transported in any conventional vehicle.

A notebook computer links the gamma radiation detector, the GPS system, and the FH 40 GL-Ω. The system may be powered by the vehicles 12 volt power supply or any equivalent supply. The GPS system uses an external magnetic mount vehicle antenna.

The FHT 1376 MobiSys makes use of both the Natural Background Rejection (NBR) and the Advanced Digital Filter (ADF) technologies. NBR identifies the signature of artificial radiation sources, while rejecting the signature of naturally occurring background sources which are always present and fluctuating. ADF ensures optimal extraction of the data. Together, NBR and ADF allow for the routine detection of artificial gamma radiation levels in the range of nSv/h in the presence of changing natural backgrounds.



The following data are collected and stored every second:

- GPS (i.e., position, velocity)
- Total gamma dose rate (1 nSV/h to 20 µSv/h measured by the NBR-detector)
- Total gamma dose rate (100 nSv/h to 100 mSv/h) measured by the optional FH 40 GL-Ω advanced survey meter
- Artificial gamma dose rate (NBR)
- Raw data count rates for offline analysis
- Date and time (UTC)

Display and alarms

Measured gamma radiation and GPS data are acquired and displayed by the notebook computer each second.
Gamma radiation anomalies, identified by NBR as artificial, will be indicated in real time by visible and audible alarms. System failures are also signaled.
The route of the FHT 1376 may be displayed in real time on the notebook computer GPS mapping system. The FHT 1376 system is implemented in German, English and French languages. Other languages available upon request.

Detector Specification

Technical data

Measured quantity:	Gamma radiation > approx. 100 keV
Sensitivity:	Typical 20000 cps/µSvh-1 (^{137}Cs)
Detection limits:	
Gross:	approx. 2 nSv/h equivalent count rate relative to background level (^{137}Cs)
NBR:	20% artificial dose rate contribution to the current natural gamma background level typically
Features of the equipment case:	
Dimensions:	approx. 520 x 280 x 200 mm (20.5" x 11" x 7.9")
Accessories case:	approx. 360 x 280 x 140 mm (14.2" x 11" x 5.5")
Total weight:	approx. 14 kg (31 lbs.)
External connections and cables (5 m each):	12 VDC with connector for vehicle power supply GPS-antenna USB-interface to the notebook
Current consumption:	approx. 200 mA by 12 VDC (without notebook)
Notebook (optional):	Requirements: USB-interface, Pentium-processor, 32 MB RAM, hard disk 5 GB, Windows™ 98 or 2000, accumulator supply and/or 12 VDC vehicle power supply

Detector Specification

NBR = Natural Background Rejection

The NBR measurement method has been developed for extremely fast discrimination between natural and artificial gamma radiation. Worldwide more than 1000 devices, based on this technology, are in use.

NBR has a rapid response time. Artificial gamma radiation sources are identified in seconds by operators with basic training levels.

Unlike conventional spectroscopic based gamma identification systems, the systems using NBR do not require the presence and resolution of gamma spectral lines. Because of this flexibility, NBR can also definitively distinguish artificial high energy beta sources and heavily shielded gamma ray sources from fluctuating natural background sources.

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