RadSpect
RADIATION PORTAL MONITOR

Reliable detection of hidden radioactive material
for safe inspection of trucks, trains and cargo

BERTHOLD

PORTAL MONITORING SYTEM FOR RADIOACTIVE MATERIALS

The radiation portal monitor RadSpect is a high-performance solution designed to reliably detect radioactive sources or contaminated materials in vehicles, goods, and personnel. It provides continuous, automated monitoring to ensure safety and regulatory compliance across various industrial and security applications. With advanced scintillation detectors and intelligent background radiation compensation, RadSpect delivers fast, accurate, and user friendly radiation monitoring. A robust design and flexible configuration makes it suitable for recycling plants, waste facilities, steel mills, logistics terminals, and border protection.

The measuring principle

The system operates using high-efficiency scintillation detectors capable of detecting gamma radiation throughout a wide range of energy. When a vehicle, container, or person enters the detection zone, photocells, installed at the detectors, trigger „Start“ and „Stop“ of the measurement. The system continuously determines both the natural background and the reference background, the latter being automatically recalculated for each passage to compensate for shielding effects caused by the load. The corresponding transmitter processes detector signals, evaluates transit speed and direction, and applies customizable alarm thresholds. After the object exits the detection zone, the system automatically calculates results and provides detailed measurement data.
The system software manages parameter settings, background tracking, alarm evaluation, data logging and reporting to ensure consistent and reliable operation.

Advantages of the measurement

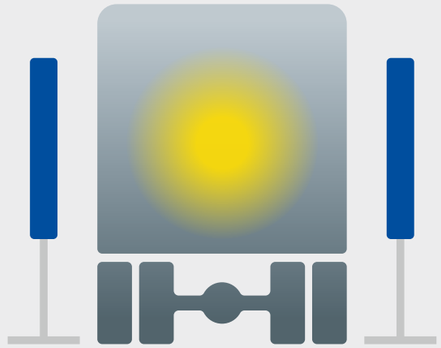
- High sensitivity due to large-volume scintillation detectors
- Stable results achieved by automatic compenation of background radiation
- Versatile use e.g. for vehicles, goods and personnel
- Adjustable alarm levels adapted to direction, load type and background radiation conditions
- Robust design for industrial and outdoor environments

CUSTOMISED ARRANGEMENTS FOR YOUR MEASURING TASK

The detectors of the radiation portal monitor can be combined or reconfigured in terms of number and orientation to fit different site layouts and traffic needs. This flexible design allows easy expansion, maintenance, and upgrades while ensuring reliable radiation detection at entry points such as borders, ports, or secure facilities.

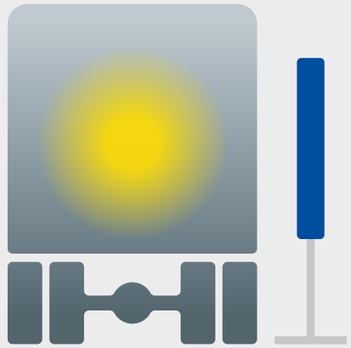
Successful Applications

- Load on vehicles and trucks
- Containers and naval containers
- Rail wagons and trains
- Conveyor belt systems
- Bins and drums
- Scrap metal monitoring
- Recyclable materials



Arrangement with vertical detectors on both sides

- Automatic drive-through radiation detection – no manual detection required
- Dual side monitoring for enhanced accuracy, with detectors positioned on both sides of the vehicle
- Immediate identification of radioactive materials before entering or leaving the facility
- Safe, fast and uninterrupted material flow during daily operations.



Arrangement with top and one or two side detectors

- Enhanced detection for low-profile or compact loads
- Space-saving single-side installation for narrow or wall-mounted setups
- Improved sensitivity from above when sources may be positioned higher inside the load
- Flexible setup for special applications

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The portal measuring system

The system consists of three main components: the detector, the transmitter and the PC-software. The detector enables precise radiation measurement, while the transmitter processes the signal and manages system control processes the signal, monitors background radiation, calculates alarm thresholds and manages the alarm functions. The software is used for data display and post-processing: it visualizes measurement values, allows exporting and storing data, supports report generation and enables integration with external systems such as networks, or printers.

The system can be supplemented with various optional accessories, such as traffic lights or license plate recognition, allowing flexible configuration for different applications. Together, these modules form a robust and modular solution for accurate portal monitoring.

Detector

- High-efficiency scintillation detector with large detection volume for maximum sensitivity
- Wide detection range for reliable gamma radiation monitoring
- Robust housing for outdoor and industrial use
- Pre-assembled with photomultiplier, shield, and preamplifier
- RS485 ensuring stable, noise- resistant data transfer and excellent signal-to-noise performance

Transmitter

- Central processing and control unit for the entire system
- Reliable data acquisition and real-time processing
- Integrated HMI concept for intuitive operation
- Ethernet and serial interfaces for easy system integration
- Designed for industrial environments

Software

- Comprehensive software suitable for system configuration and monitoring
- Real-time visualization of detector data and alarm conditions
- Optional: Advanced spectral analysis with automated nuclide identification
- Integrated event logging and reporting tools for compliance needs
- Remote access functionality for diagnostics, updates, and maintenance
- Multi language selection

TECHNICAL DATA & FACTS

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Transmitter

Application	Radiation portal monitoring
Power supply (Control master unit)	100 to 240 V AC (10%), 50/60 Hz, 65 W
Ambient temperature	–20 to +50 °C (–4 to 122 °F)
Digital input	6 inputs
Digital output	8 relays
Weight	~1.9 kg
Dimensions (H x W x L)	~71 x 196 x 300 mm
Interfaces	1 Ethernet (RJ45 to PC) 1 RS 485 (RJ45 to first detector)
IP protection	IP40

Detector

Scintillator	25 l PVT scintillator (1000 x 500 x 50 mm)
Housing material	Housing in painted carbon steel. Cover in aluminium
IP protection	IP65
Dimensions (H x W x L)	~1560 x 150 x 726 mm
Weight	~160 kg
Ambient temperature	–20 to +60 °C (–4 to 140 °F)
Energy range	40 keV – 2 MeV
Sensitivity	180,000 cps/µSv/h (Cs-137 reference)
Temperature range	Operating: –20 to +60 °C (–4 to +140 °F); RH 25% to 90% without condensation Storage: –30 to +80 °C; (–22 to +176 °F); RH 5 % to 90% without condensation
Integrated preamplifier	1024 channels, 48 V DC (10 W) power supplied by transmitter Interfaces: PMT socket (14 pin), RS485 (2× RJ45), 3 digital inputs, 1 digital output, 1 +12 V auxiliary output

THE EXPERTS

IN MEASUREMENT TECHNOLOGY

Berthold Technologies stands for excellent know-how, high quality and reliability. The customer is always the focus of our solution.
No matter where you are, our highly qualified experts and specialists are ready and waiting and will be with you in no time at all with the ideal solution for even the most difficult measurement task.

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