Guardian SGS Baghouse

Baghouse/Charge Bucket Radiation Detection System

A customisable system for radiation monitoring of vehicle and freight loading operations.

The modular design of Guardian vehicle monitoring systems provides several benefits. This 'plug and play' approach results in 'off the shelf' yet customisable solutions for baghouse, charge buckets, containers, rail or conveyors. The modular construction means ease of maintenance enabling on site personnel can act as the first line of defence for any service or maintenance needs. Furthermore, the networking and avanced remote monitoring and debugging capabilities mean fewer interruptions for maintenance or service, saving time and money.

The system hardware can be monitored from anywhere on the network or over the internet (when access is granted into the site network), using the included service and diagnostic software. This software application provides complete control of all system hardware settings; there are no controls or manual adjustments required at the hardware.

All systems are designed to meet ANSI, ASTM, or IAEA performance standards; however, if a customer has a special request, systems can be designed to meet those requirements.

Features

- 2 available detector sizes 51 mm x 103 mm x 406 mm (2" x 4" x 16") NaI(Tl) or 76 mm x 76 mm (3" x 3") NaI(Tl) for optimisation of the application.

- Resolution: 7.3% at 661 keV.

- Fully digital system design.

- Superior signal to noise ratio.

- Patented Threat Matrix, customisable for your location.

- Advanced analysis algorithms for high sensitivity results with essentially zero false alarms.

- Minimum nuisance alarms with patented NORM rejection.

- Direct connection to the plant network, enabling RSO over view of all alarms on all systems.

- Multi-faceted alarm notification methods.

- Real-time state of health reporting for identification of issues before they turn into problems.

- Automatic system sensitivity monitoring.

- Modular system design for easy service.

- System designed for easy on site service by local staff for 'instant' service support.

- Available remote 24/7/365 monitoring and support by trained experts.


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Software

RADNet software used to operate the system can be installed on any number of computers connected to the network, each running its own user-defined configuration. This allows the portal to be operated in a variety of ways. Each instance of the programme will not interfere with each other instance running at any other location.

The Threat Matrix provides a runtime rule evaluation engine consisting of numeric, logical, and string operations combined with logical and mathematical operands. The result of the expression becomes a true or false value. If true, the user can specify a rule definition, including a message to be displayed, a visible alarm indicator, an audible alarm indicator, and hyperlinks to other files.

The engine to build the Threat Matrix is contained in an independent software module. Typically, the application and specific rule set is controlled, prohibiting unauthorised or unintentional access and modification.

Software controls and parameters at a glance

- Detector high voltage.
- Detector gain.
- Detector pole zero.
- Detector ROI settings.
- Detector noise threshold.
- Detector temperature.
- SSA temperature.
- Sampling rate.
- Time 1 (T1) and Time 2 (T2) averaging rate.
- IP and network addressing.
- Counts per ROI.
- Live time.
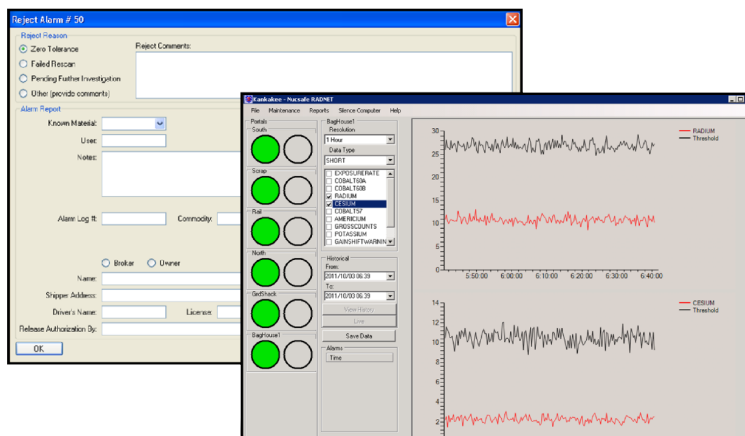
System options

- Remote relay box.
- 51 mm x 103 mm x 406 mm (2" x 4" x 16") or 76 mm x 76 mm (3" x 3") NaI(Tl) crystals available.
- Light and horn.
- Customisable Threat Matrix.
- 24/7/365 remote monitoring plans available.
- 24/7/365 remote service plans available
- Battery backup.
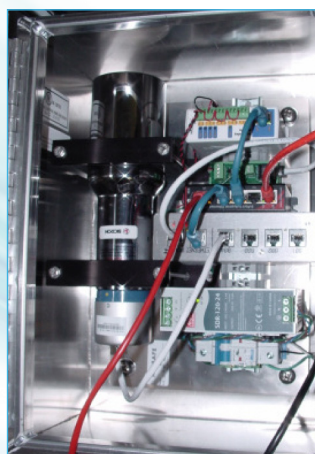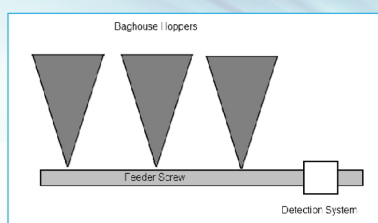
Specifications (Standard Configuration)

Architecture

- Modular and compact design.
- Dynamic background updating for lowest possible detection levels, even when weather is a problem.
- 50 mSec (20/Sec) data sampling rate for pinpoint accuracy.
- State of health and error reporting via internet, enabling fast fault diagnosis and resolution.
- Design enables fast fault diagnosis and resolution.
- Full ethernet connectivity to plant network.
- Remote alarm validation and reporting.
- 24/7/365 technical support for fast, responsive support from technical specialists.
- System sensitivity analysis and auto correction to minimise signal loss, with no radioactive sources required to test system performance.
- RSO overview of all system alarms via plant network.
- Multi-plant connectivity via internet.

System controller

- 90/240 VAC input.
- Industrial COTS processor operating temperature range: -40°C to +80°C
- All data storage on solid state memory.
- Windows XP OS.
- IP67 rated enclosure.
- Ethernet (wired, fibre, or wireless) communication.
- Weight: Approximately 24 kg (53 lbs).

Detector

- Type: NaI(TI).
- Sizes: 51 mm x 103 mm x 406 mm (2" x 4" x 16") or 76 mm x 76 mm (3" x 3").
- Resolution: 7.3% at 661 keV.
- Total DSP (Digital Signal Processing).
- Low noise operation.
- 1024 channel MCA spectrometer.
- -20°C to + 50°C system operating temperature range.
- No user adjustments required.
- Energy range: 20 keV to 3.3 MeV
- 4 digitally controlled output drivers (24 VDC @ 100 mA)
- Automated system sensitivity checks.
- 24 VDC detector and controller operation.
- Automated report generation with detailed alarm analysis.
- Exposure-rate or count-rate output (user selectable).
- Background trending analysis.
- Management reports.
- Maximum, minimum, and average speeds reported.
- Remote communications package (standard).
- Battery backup for 8 hours of operation (optional).
- Password protected.
- Built-in RSO and operator procedure following messages.
- Automated e-mail and SMS generation to multiple recipients.
- Data traceability.