



DETECTION

 **LUDLUM MEASUREMENTS, INC.**

Model 4530 Series Radiation Portal Monitors

Features

- Made in USA
- Monitor Trucks, Rail Cars, Personal Vehicles, etc.
- Large, Highly Sensitive, Industrial Duty Plastic Scintillation Detectors
- Reliable Operation with Very Low False Positives
- Flexible Configurations Accommodate Up to Four Lanes, Each with One to Six Detectors
- Real-Time Central Data Logging, Reporting, and Alarm Notification
- Bi-Directional Entry
- User-Friendly Operation
- Excellent Factory Service and 24-Hour Tech Support
- Modular and Upgradeable
- Variety of Options to Customize the System to Meet Your Needs



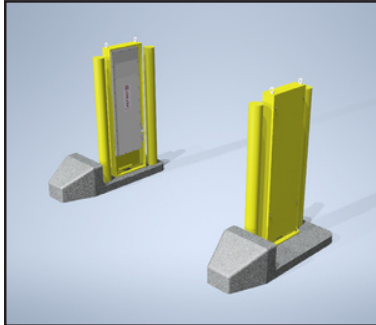
The Model 4530 Series of Radiation Portal Monitors (RPMs) represents state-of-the-art technology for detecting low levels of radiation, such as orphan radiation sources and NORM (naturally occurring radioactive materials), at facilities including scrap yards, recycling companies, landfills, and foundries. These systems are composed of ruggedized, large plastic scintillation detectors optimally arranged to monitor items passing through. Each system can be configured with one to six large detectors, with individual detector volumes of 39.7 L (2117 in³) or 57 L (3500 in³).

Real-time data acquisition and analysis is performed directly at each detector system and then reported to the internal PC for logging, reporting, and alarm notification. Up to four detector systems (lanes) can be networked together via Ethernet or wirelessly to a central PC so that vehicles entering from either direction can be monitored in real time. An optional remote control/annunciator panel is available to support operator awareness, alarm acknowledgment, and if necessary, backup operation in the event the internal PC is unavailable.

Data from all the system sensors are acquired and checked by powerful, field-tested, and time-proven algorithms designed to check each load vigorously in a multi-dimensional and multi-layered manner before declaring any load as clean. Any abnormality is immediately indicated via both local and remote alarms. An optional camera system can capture an image of the offending vehicle and store the image with the logged data for permanent record keeping. Alarms can also be configured to automatically notify shift supervisors directly by e-mail if desired. The system is designed for ease of use and can be customized to accommodate a wide variety of site and application specific criteria. Intuitive menus and controls combined with pre-defined automatic event handlers ensure each situation is handled properly and consistently. All of the main components of these systems are manufactured in-house in the USA.

Standard Configurations

Detector Size
34.7 L (2117 in³)



Model 4530-4200

PN: 48-4422-B

Detectors: 2
Total Detector Volume:
69.4 L (4234 in³)

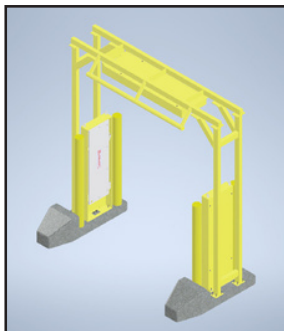
Detector Size
57 L (3500 in³)



Model 4530-7000

PN: 48-4452-B

Detectors: 2
Total Detector Volume:
115 L (7000 in³)



Model 4530-6300

PN: 48-4454-B

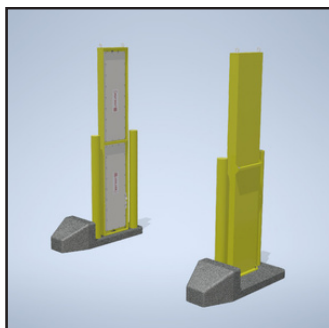
Detectors: 3
Total Detector Volume:
104 L (6351 in³)



Model 4530-10500

PN: 48-4459-B

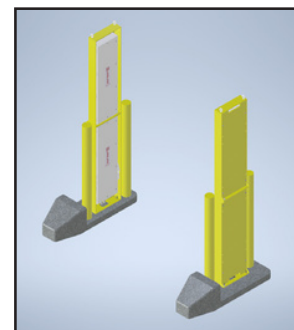
Detectors: 3
Total Detector Volume:
172 L (10,500 in³)



Model 4530-8400

PN: 48-4423-B

Detectors: 4
Total Detector Volume:
139 L (8468 in³)



Model 4530-14000

PN: 48-4457-B

Detectors: 4
Total Detector Volume:
229 L (14,000 in³)

Base System

- One to six plastic scintillation detectors
- High gain, low noise, 2 in. dia. photomultiplier tubes (PMTs), 2 ea. per detector; Dual PMT design delivers 30% more efficiency than single PMT designs
- Carbon steel frame and detector enclosure
- NEMA 4 rated detector enclosure for environmental protection
- Low density aluminum detector door for enhanced low energy measurements
- Dual-Channel: Increased sensitivity by analyzing separate Hi and Low Gamma channels with independent thresholds and alarm ratios
- Two pairs of IR sensors
- Alarms: Radiation, Overspeed, Detector Fail
- Model 4530 Series Vehicle Monitoring Software
- Reporting Feature
- Embedded Windows Computer
- Power: 120 - 240 Vac, 2 A
- 6.4 mm (0.25 in.) thick lead shielding on four sides of detector to reduce background
- Max. recommended cable length from control box to detector is 61 m (200 ft.)
- Temperature Range: -40 to 150 °F (-40 to 65 °C)

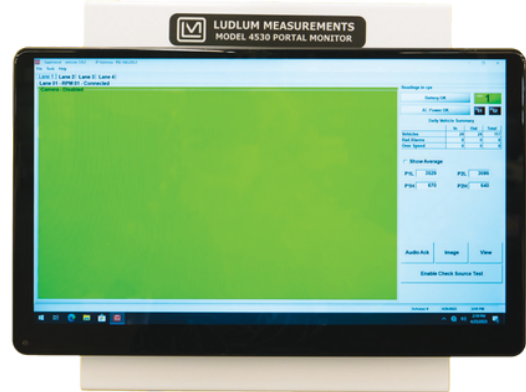
Recommended Options

- Remote Annunciator Panel (4517-637-02): Provides audible and visible alarm annunciation.
 - LED status indicators: POWER OK, CHECKING, GAMMA ALARM, OVERSPEED ALARM, INSTRUMENT FAIL
 - Audio Alarm: 85 dB at 30.5 cm (1 ft.)
- Additional Two Pairs of IR Sensors (4517-576)
- Stainless Steel Detector Enclosure Upgrade
- Fog-Free Plastic Scintillation Detector Upgrade
- Strobe & Horn (4517-073-2): 12 Vdc strobe and horn assembly (with 2 ft conduit whip and 3 ft cable)

Other Available Options

- Detector Stand Set
- Indoor/Outdoor Bullet Camera Kit (4511-448)
- Ethernet and Wi-Fi network capability
- Uninterruptible power supply (UPS)
- Color laser printer
- USB keyboard with built-in touch-pad

Control Box



Detector



Remote Annunciator Panel



Strobe & Horn



Camera



Vehicle Monitoring Software

- Supports Up To 4 Lanes
- 8 Relay Outputs for Options
- Radiation Profile
- Data Logging with Automatic Daily Back-Up

The base Model 4530 Series system includes vehicle monitoring software for the system control computer that can be used to monitor up to four separate Model 4530 Series configured systems (lanes) via an Ethernet or wireless connection. The software automatically collects and archives data from all available lanes, displays alarms, and generates reports. When equipped with optional cameras, the system can be configured to automatically capture images of vehicles passing through the system, either every vehicle or only those triggering an alarm, and store the images in the database.

The vehicle monitoring software has three main component programs:

- **Supervisor:** Collects all data, saves to databases, and contains all parameter settings. It displays alarms and provides all control over the system.
- **Echo:** Used for remote monitoring. It mirrors the Supervisor component and performs all alerting and reporting functions, but does not allow any control functions. Up to 10 Echo stations can be configured per Supervisor computer. Each Echo station can monitor an unlimited number of Supervisor computers.
- **Data Viewer:** Used to query the databases (background, alarms, and event log), filtering records based on date, alarm, and lane number. The Data Viewer can also reprint an alarm report, print summary reports for user-defined data and time ranges, and create new databases based on the current search queries.

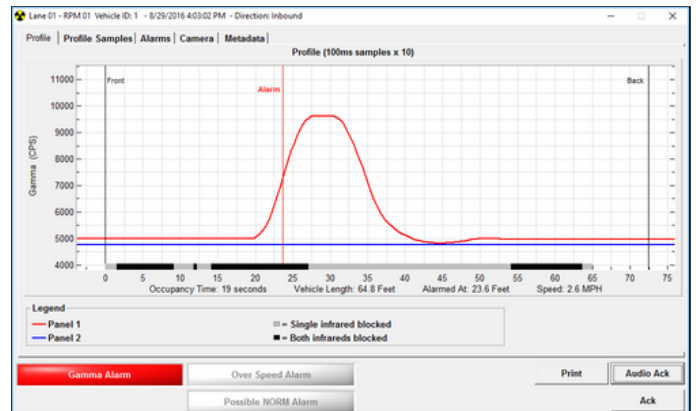
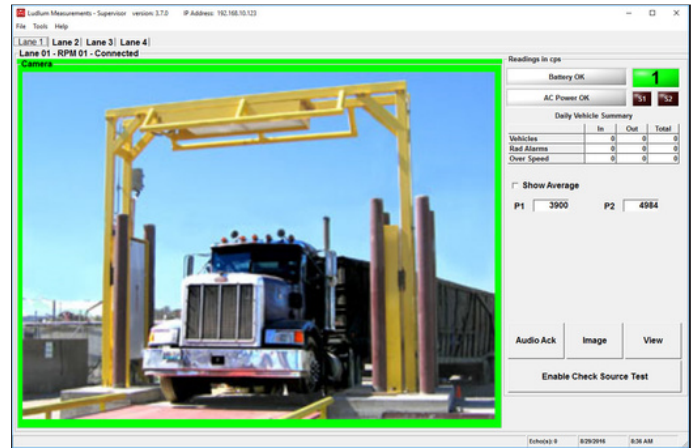
Reporting Feature

Ludlum's reporting feature accumulates the data, and sends you an easy-to-read report on a regular basis (weekly, monthly, or quarterly) about the activity during that timeframe.

Reports include:

- How many vehicles passed through the system
- How many radiation alarms occurred
- Detail (date, time, extent) of radiation alarms
- How many overspeed alarms occurred
- Any other failure alerts or messages
- Any unusual background radiation issues
- Indication if vehicles are parking the system for too long
- Indication if parameters have been changed

When you receive these reports on a regular basis, it's easy to see when something changes, or when you need to address a training or hardware problem. You determine how often to get these reports, and you can also choose to have Ludlum technicians review the data for an additional fee.



The screenshot shows the 'Data Viewer' software interface. It displays a 'Calibration Constant' table with the following data:

Panel	Alarm Type	Background (CPS)	Max (CPS)	Set Point (CPS)
P1L	Stagn	3350	4532	3930
P1H		4762	4264	5179
P2L		N/A	N/A	N/A
P2H		N/A	N/A	N/A
GL Sum	Sum	3350	4532	3930
GH Sum		4762	4764	5003
Percent 1	Percent Sum	3350	3350	3930
Percent 2		0	0	0
P1 Ratio Low		41.2 %	49.3 %	91.2 %
P2 Ratio Low		0.0 %	0.0 %	50.0 %
Ratio Low Sum		41.2 %	49.3 %	91.2 %
P1 Ratio High		58.7 %	59.6 %	108.7 %
P2 Ratio High		0.0 %	0.0 %	50.0 %
Ratio High Sum		58.7 %	59.6 %	108.7 %

Below the table are buttons for 'Gamma Alarm', 'Over Speed Alarm', 'Ratio Low Alarm', 'Neutron Alarm', 'Possible NORM Alarm', 'Ratio High Alarm', and a 'Local' dropdown menu. The bottom right corner shows 'Record: 9 of 9' and '8/29/2016 4:14:06 PM'.

The screenshot shows a 'Lane Summaries' report generated on Jan 31, 2020. It contains two sections: 'Lane 1 Summary' and 'Lane 2 Summary'. Each section includes a table with columns for Location, System Type, Lane, Number of Vehicles, Down time, Report Start Date, and Report End Date. Below these tables are summary statistics for 'Number of Inbound', 'Number of Outbound', 'Number of Radiation Alarms', 'Number of Overspeed Alarms', and 'Number of Sensor Blockage Events'.