



Innovator In Spectroscopy Equipment

VRPM2220



VEHICLE RADIATION PORTAL MONITORING MODEL VRPM2220

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CATALOG



SPECTROMETER



FREE DOWNLOAD

VEHICLE RADIATION PORTAL MONITORING

MODEL VRPM2220

Features

- Wide energy range
- Ready for field operation
- Easy to assemble design
- Large plastic scintillators
- Vehicle information display
- Traffic management indicator
- Background updating Procedure
- Optional gate monitoring camera
- Data storage for further exploration
- Programmable detection parameters
- Easily visible informative alarm indicator
- Accurate alarms with low false alarm rate
- Slow natural degradation of the light yield
- Individual and sum detectors measurements
- Intelligent contamination detection algorithm
- Occupancy sensors to detect vehicle presence
- Different scan scenarios (Drive-Thru, Drive-Pause-Drive)
- Ethernet (TCP/IP) communication protocol with connecting to PC for monitoring, controlling and download data

FAST AND RELIABLE WITH LOW FALSE ALARMS



Description

The VRPM2220 from Control Farayand Pasargad (CFP) is a vehicle radiation portal monitoring system. The system is capable of detecting abnormal gamma radiation in a vehicle passing through its gate in either direction. VRPM2220 utilizes 2, 4 or 8 large plastic scintillators with efficient and superb detection parameters leading to precisely detect gamma-ray abnormalities.

The VRPM2220 has four versions.

1. Car version, it has two layouts of 2 horizontal panels.
2. Car version, it has two layouts of 4 horizontal panels.
3. Truck version, it has two layouts of 4 vertical panels.
4. Truck version, it has two layouts of 8 vertical panels.

The system comes with two indicators. One indicator is responsible to handle the traffic of vehicles entering the gate and the other one manages the abnormality situations and indicates special lights corresponding to abnormality level detected by the system.

To detect the presence of a vehicle in the gate, VRPM2220 can be equipped with optical sensors. These sensors would help the device emphasize on the time when the vehicle is inside the

gate and the detection unit presents the most relevant information. An optional camera can also be added to VRPM2220 to take photos synchronized with the optical vehicle detection system and alarm system.

VRPM2220 comes with different user modes including drive-Thru and drive-pause-drive. Each mode results in a different throughput, sensitivity and count time.

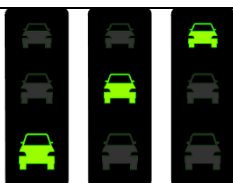
The device can update background measurements manually or automatically for considering different locations natural radiation. The set-up and configuration can be easily done by pc using a password-protected administrator panel.

One important feature in VRPM2220 is the design considerations for fast assembling. The plastic scintillators have highly efficient detection parameters and the natural degradation of their light yield is slow.

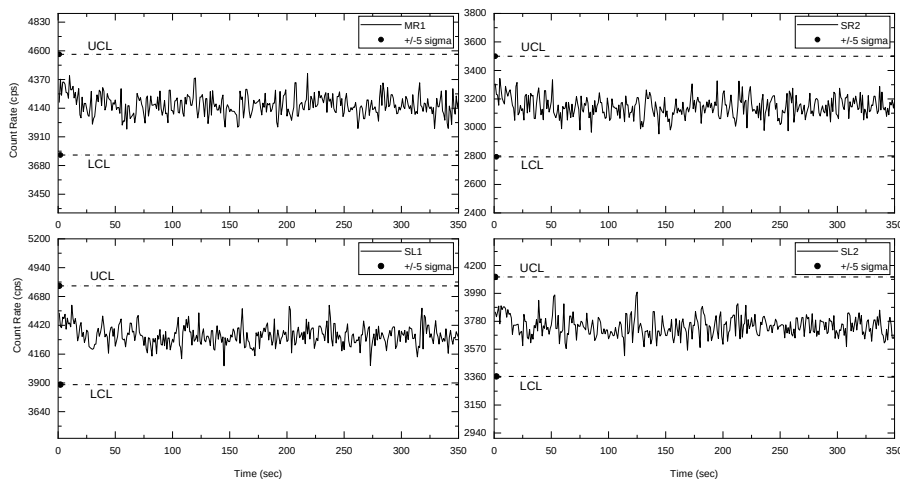
Intelligent analysis of the counts from different scintillators and their fusion based on the statistical modeling of underlying phenomena makes VRPM2220 decisions accurate and decreases the false alarm rate. VRPM2220 is equipped with an external DCUPS2121 which makes it suitable for industrial applications.



Specifications

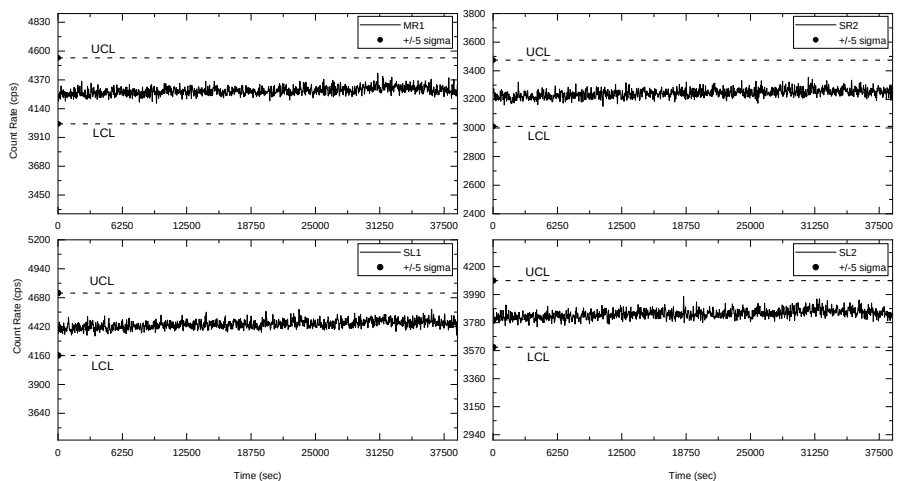
Unit: VRPM2220				
Type	Vehicle radiation portal monitoring			
Version	Car:2 Horizontal panel (2H)	Car: 4 Horizontal panel (4H)	Truck: 4 Vertical panel (4V)	Truck: 8 Vertical panel (8V)
Radiation Detection	Gamma			
Type	Outdoor			
Color	White			
Input(s)				
LAN	Setting configure via LAN cable (read and write)			
Power	DC power supply – 12V – 4A			
Optical sensor	Vehicle detection sensor			
Camera (optional)	Image Acquisition			
Output(s)				
Output	Alarm output signal			
Control(s)				
Power key (on the master panel)			Power push button to turn the system on or off (Embedded on the master panel)	
Indicator(s)				
Light alarm	Easily visible super bright LED indicator with alarm dependent color (Green, Yellow, Blue)			
Sound alarm	Sound alarm			
Traffic Management	LED indicator for traffic management			
	Entrance allowed	Entrance not allowed	Gate closed	
				
Display				
Type	No display			
Performance				
Gamma energy range	50keV – 3MeV			
MDA (Comply with: ANSI N42.35-2016)	16µci ¹³⁷ Cs @ 100 nSv/h background < 7µci ⁶⁰ Co @ 100 nSv/h background			
Coefficient of Variation (COV) Comply with: ANSI N42.35-2016 (confirmed by tests SSDL)	Typ. < 2.3% @ 1 sec Typ. < 1.4% @ 2 sec Typ. < 1.02% @ 5 sec Typ. < 1% @ 10 sec			

Background count rate 4 panels @ 1 sec sampling (confirmed by tests SSDL)

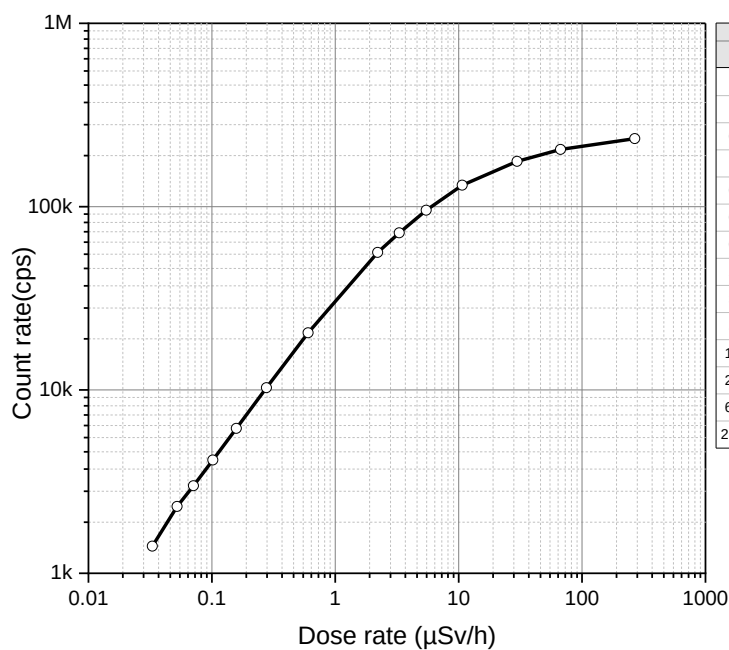


without false alarm @ 10 hour measurement

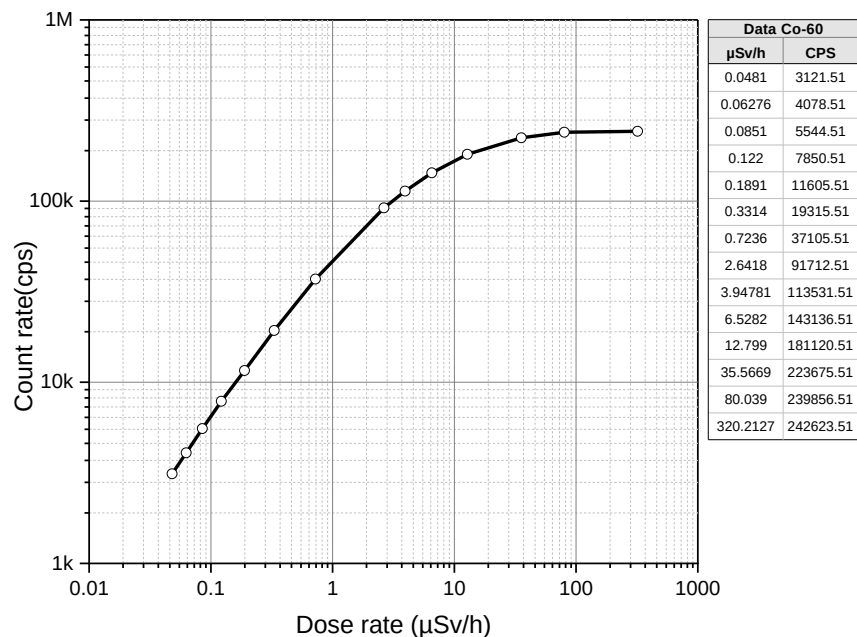
False alarm
Comply with: ANSI N42.35-2016 (confirmed by tests SSDL)



Sensitivity (^{137}Cs & ^{60}Co)
confirmed by tests SSDL



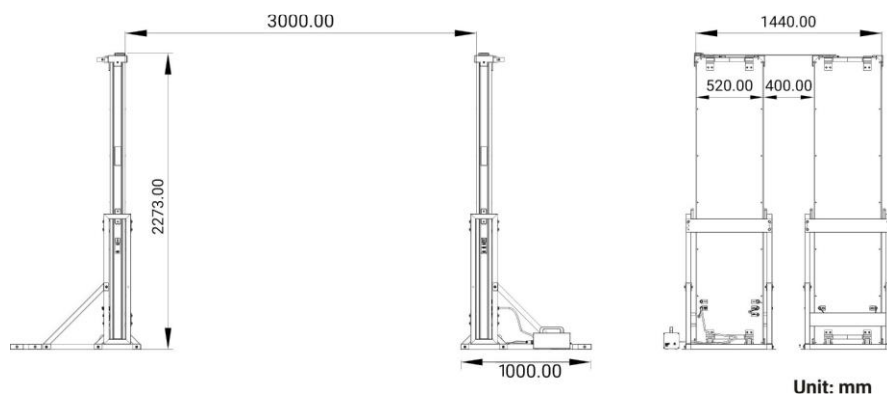
Data Cs-137	
$\mu\text{Sv/h}$	CPS
0.033	1406.18
0.0523	2313.82
0.07107	3001.53
0.1018	4150.77
0.15798	6166.95
0.27685	10281.36
0.60366	20503.58
2.20841	56299.27
3.30028	71932.65
5.45778	95503.57
10.70141	130860.63
29.73801	176735.45
66.92357	205140.82
267.74641	234964.94



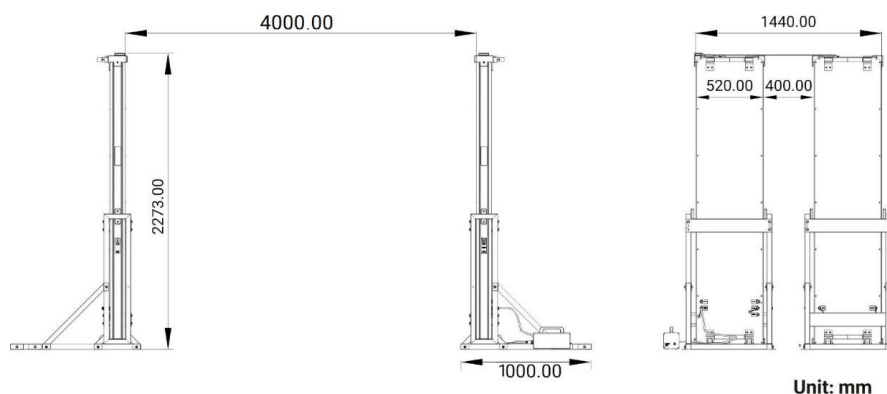
Detector response to gamma radiation

Comply with: ANSI N42.35-2016 (confirmed by tests SSDL)

300 cm the distance between two panel (car vehicle): through the bottom, middle, and top of the detection zone with a speed of 2.2 m/s and sources ^{241}Am , ^{57}Co , ^{137}Cs , ^{60}Co (20 trials).



400 cm the distance between two panel (truck vehicle): through the bottom, middle, and top of the detection zone with a speed of 2.2 m/s and sources ^{241}Am , ^{57}Co , ^{137}Cs , ^{60}Co (20 trials).



Alarm response time
(confirmed by tests SSDL)

100 msec @ BG-0.02μSv/h
100 msec @ BG-1μSv/h
100 msec @ BG-10μSv/h

Storage response time
(confirmed by tests SSDL)

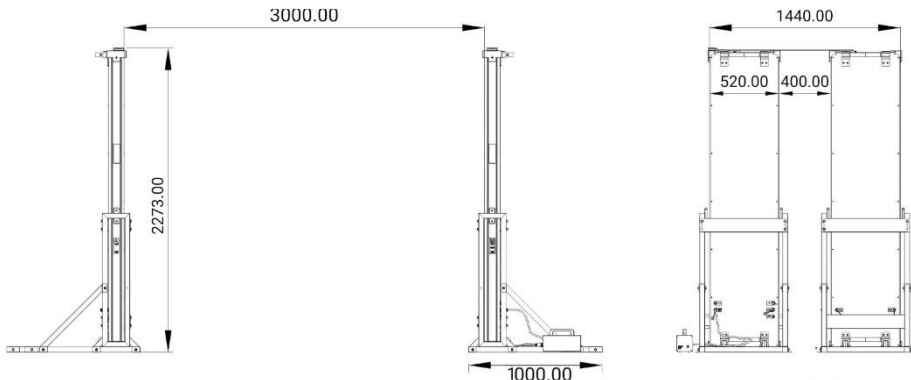
1000 msec @ BG-0.02μSv/h
1000 msec @ BG-1μSv/h
1000 msec @ BG-10μSv/h

Over range Comply with: ANSI N42.35-2016	> 150k count rate (confirmed by tests SSDL)			
Readout	Counts in CPS from 0 to 240k (confirmed by tests SSDL)			
Internal sampling	20 /second			
Conversion time	50 nsec (20MHz ADC, 4096 channel)			
Detector				
Gamma detector	Type: Plastic scintillator			
	No:2	No:4	No:4	No:8
	Sensitive area: 410 mm × 1898mm ×50.8mm. 40 Lit (Sum: 80 Lit)	Sensitive area: 410 mm × 1898mm × 50.8mm. 40 Lit (Sum: 160 Lit)	Sensitive area: 410 mm × 1898mm × 50.8mm. 40 Lit (Sum: 160 Lit)	Sensitive area: 410 mm × 1898mm × 50.8mm. 40 Lit (Sum: 320 Lit)
	Hamamatsu 14-pin 10-stage PMTs			
PMT	Hamamatsu 14-pin 10-stage PMTs			
Data Acquisition and Analysis				
OS	Windows 8 or higher versions			
Software	VRPM2220 (SOFTWARE)			
Measurement				
Count rate	Each 50ms sampling interval			
	Maximum count rate: 240K			
High voltage	0-1200 V, Positive, 12 Bit resolution			
Backup Battery				
Battery power	8 hours at 20°C in standard condition (no alarm)			
	6 hours at 0°C in standard condition (no alarm)			
Memory				
Memory	8GB SSD			
	Storage all device information including settings, alarm status, count rate, etc.			

Application

- Inspection in the case of nuclear disasters
- Radiation inspection at airports & rail-way
- Hospitals and nuclear medicine centers
- Metal waste recycling factories
- Customs and Border Control
- Critical infrastructure
- Homeland security

Electrical, Mechanical and Environmental

Unit : VRPM2220				
Type	Vehicle radiation portal monitoring			
Version	Car:2 Horizontal pannel (2H)	Car: 4 Horizontal pannel (4H)	Truck: 4 Vertical pannel (4V)	Truck: 8 Vertical pannel (8V)
Electrical				
Power required	DC power supply – 12V – 4A			
	battery (8 hours in standard condition, no alarm)			
Physical				
Dimensions	2270×5000×620 mm	2270×5000×1540 mm	5000×5000×620 mm	5000×5000×1540 mm
Sensitive area detection	3000×2500 mm			
Weight	180 kg	380 kg	380 kg	650 kg
Mechanical				
	Unit: mm			
Typ. VRPM2220-car (4H)				
Environmental				
Storage temperature	10°C to 30°C @ controlled and roofed environment with less than 65% humidity			
Operating temperature	-20°C to 50°C			

Software and user interface

PC software

VRPM2220 (software)

The VRPM2220 is provided with utility software to download the data stored in the memory.

Input /Output (Using supplied CFP-VRPM2220 software)

LAN communication

Data Output formats

LOG

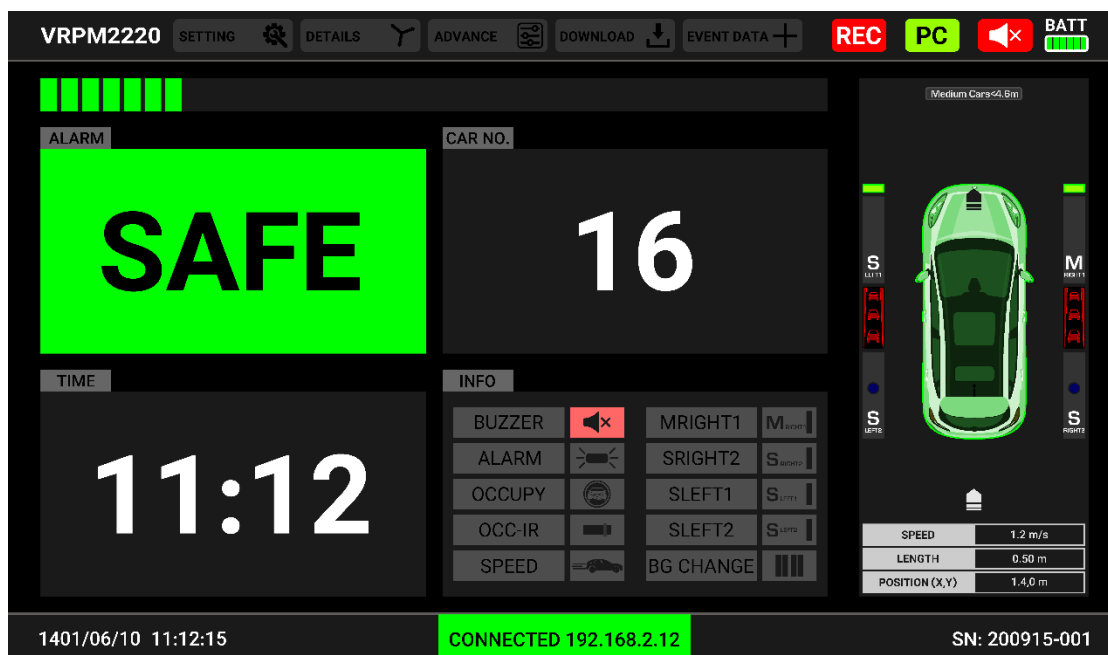


Figure1: No radioactive material (safe mode)

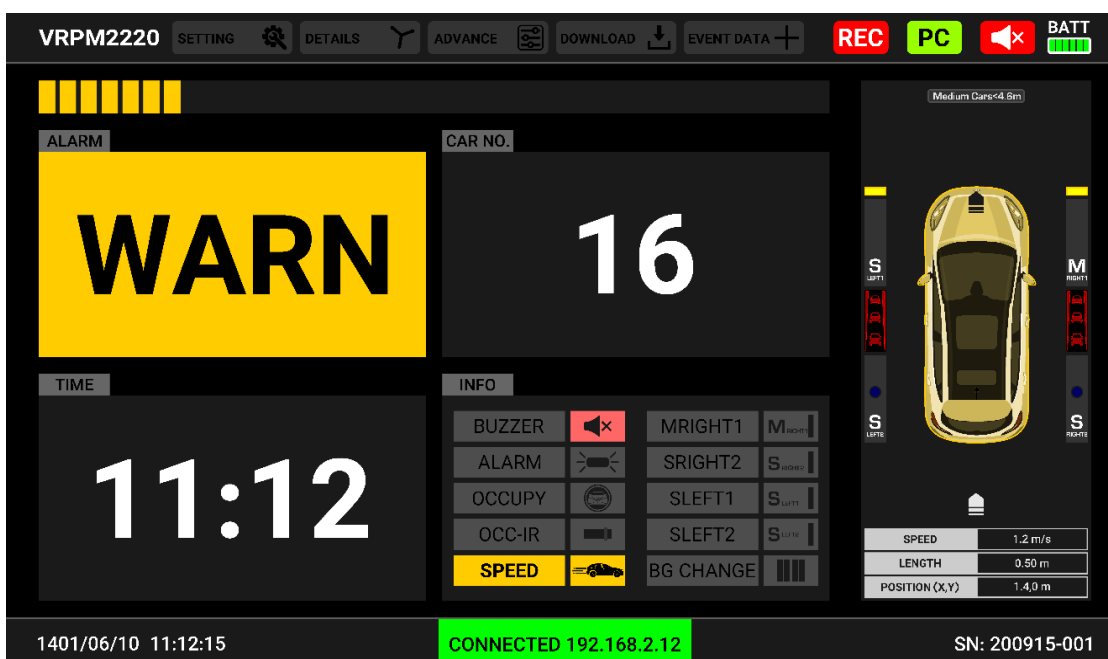


Figure2: Warning status (High speed vehicle or longer stay vehicle at the VRPM2220 and or background count rate changes)

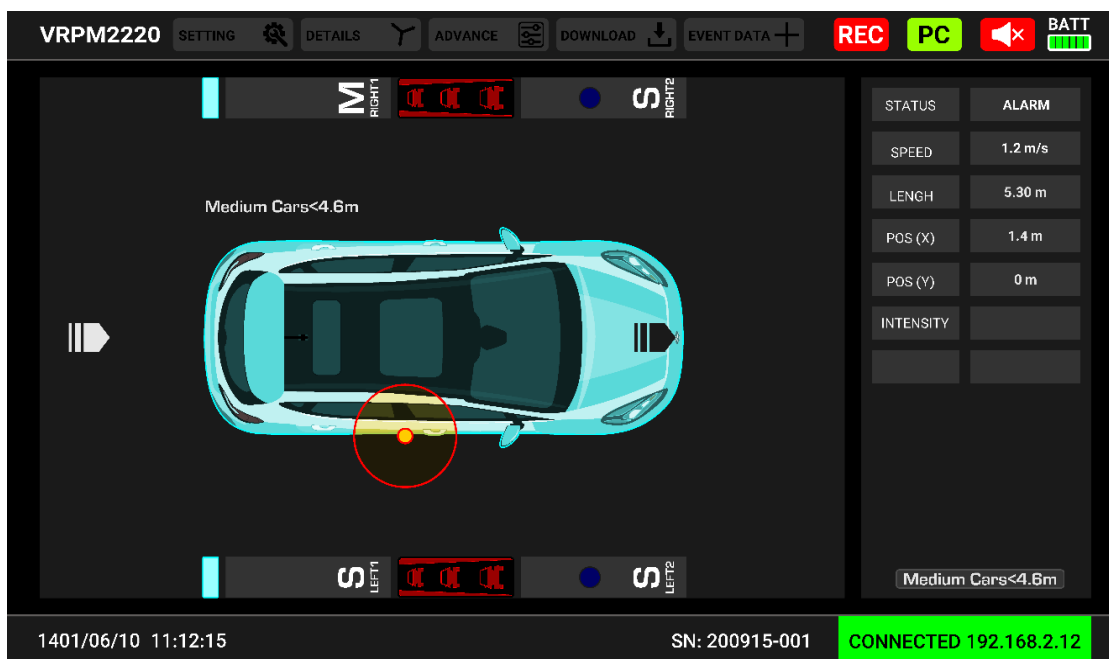


Figure3: Radioactive alarm with determining the location of contamination on the vehicle.

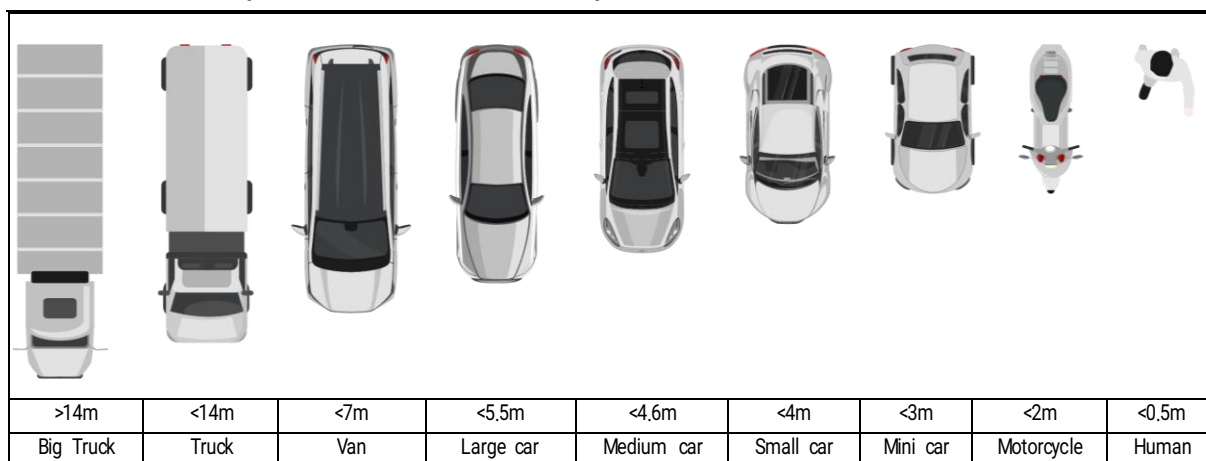
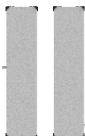


Figure4: Classification of the passing vehicle based on its length

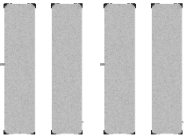
Ordering info

VRPM2220-CAR-2H Standard package includes

Part #	Image	Description
VRPM2220-CAR-2H		Vehicle radiation portal monitoring system, Model VRPM2220-CAR-2 H, include: 2 horizontal panel.
ACCE2220001		User guide CD (1 Pack)
ACCE2220002		Strong and large wooden case with inserted foam for detection panel, 2 pcs.
ACCE2220003*		Guaranty (one year)
ACCE2220011		DC UPS2121, 12V (separate packaging)
ACCE2220012		Interface cable, 8pin 1m, (IP68), 2 pcs.
ACCE2220014		Interface cable, 8pin 5m, (IP68), 2 pcs.
ACCE2220015		Interface network cable (RJ45 LAN), 8pin 10m, 1 pcs.

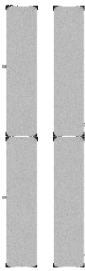
ACCE2220016		Indicator with Interface cable, 5 pin 20cm, (IP67), 2 pcs.
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VRPM2220-CAR-4H Standard package includes

Part #	Image	Description
VRPM2220-CAR-4H		Vehicle radiation portal monitoring system, Model VRPM2220-CAR-2 H, include: 4 horizontal panel.
ACCE2220001		User guide CD (1 Pack)
ACCE2220002		Strong and large wooden case with inserted foam for detection panel, 4 pcs.
ACCE2220003*		Guaranty (one year)
ACCE2220011		DC UPS2121, 12V (separate packaging)
ACCE2220012		Interface cable, 8pin 1m, (IP68), 2 pcs.
ACCE2220014		Interface cable, 8pin 5m, (IP68), 2 pcs.

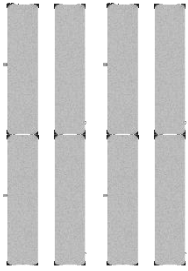
ACCE2220015		Interface network cable (RJ45 LAN), 8pin 10m, 1 pcs.
ACCE2220016		Indicator with Interface cable, 5 pin 20cm, (IP67), 2 pcs.

VRPM2220-TRUCK-4V Standard package includes

Part #	Image	Description
VRPM2220-TRUCK-4V		Vehicle radiation portal monitoring system, Model VRPM2220-TRUCK-4V, include: 4 vertical panel.
ACCE2220001		User guide CD (1 Pack)
ACCE2220002		Strong and large wooden case with inserted foam for detection panel, 4 pcs.
ACCE2220003*		Guaranty (one year)
ACCE2220011		DC UPS2121, 12V (separate packaging)
ACCE2220013		Interface cable, 8pin 3m, (IP68), 2 pcs.

ACCE2220014		Interface cable, 8pin 5m, (IP68), 2 pcs.
ACCE2220015		Interface network cable (RJ45 LAN), 8pin 10m, 1 pcs.
ACCE2220016		Indicator with Interface cable, 5 pin 20cm, (IP67), 2 pcs.

VRPM2220-TRUCK-8V Standard package includes

Part #	Image	Description
VRPM2220-TRUCK-8V		Vehicle radiation portal monitoring system, Model VRPM2220-TRUCK-8V, include: 4 vertical panel.
ACCE2220001		User guide CD (1 Pack)
ACCE2220002		Strong and large wooden case with inserted foam for detection panel, 8 pcs.
ACCE2220003*		Guaranty (one year)
ACCE2220011		DC UPS2121, 12V (separate packaging)

ACCE2220012		Interface cable, 8pin 1m, (IP68), 2 pcs.
ACCE2220013		Interface cable, 8pin 3m, (IP68), 2 pcs.
ACCE2220014		Interface cable, 8pin 5m, (IP68), 2 pcs.
ACCE2220015		Interface network cable (RJ45 LAN), 8pin 10m, 1 pcs.
ACCE2220016		Indicator with Interface cable, 5 pin 20cm, (IP67), 2 pcs.

* We fully support our products. We guarantee your satisfaction in the quality of our product by providing a complete one-year warranty covering any defect of workmanship, material and design. If our product do not work correctly, we will provide complete repair and/or replacement services. For guaranty conditions, please refer to device manual document (VRPM2220- Manual)

Optional accessories and services

Part #	Image	Description
ACCE2220004		Installation 1- Temporary installation: Installation on a holder base with the ability to move the VRPM2220 2- Permanent installation: Fixed installation on the ground (concreting, ducting and channeling)
ACCE2220005		Training
ACCE2220006**		Re-Calibration (Interval) services. 1year factory maintenance suggested, not required.

ACCE2220010		Base holder with connection, 4 pcs.
ACCE2220017		Independent display, 1 pcs.
ACCE2220018		Computer case with all the software needed to work with the VRPM2220, 1 pcs.
ACCE2220019		Keyboard and mouse, 1 pcs.
ACCE2220020		Gate monitoring camera 1 pcs.
ACCE2220021		Camera cable 5pin-0.5m (IP67), 1 pcs.
ACCE2220022		Network cable 8pin (IP67) custom length, 1 pcs.

** The proper maintenance & calibration of your instruments is critical to ensure correct performance & accuracy. For Re-calibration (Intervals) services, please call CFP company (021-57416073)



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