RadPavise

Users Manual

RAYCAN

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1.Introduction

The RadPavise | Personal Radiation Detector is an all digital Alarming Dosimeter with the basic function of detecting radiated emission, which covers a wide range of Gamma, X-Ray and Beta.

2.Device Highlight

Digital Data Acquisition	➢ All Digital solid-state detection
High-performance Detection Design	➢ High performance YSO crystal ➢ Miniaturized SiPM ➢ High-speed chip enables fast response and the smallest dead time in industry ➢ Patented MVT Digital signal processing technology, excellent performance and stability ➢ Background radiation virtually eliminated
Rapid Response	➢ Full range reading and Alarm response in less than 2 seconds ➢ Higher Sensitivity - our devices allows our users to detect much earlier ➢ An audible output will quickly alert responders of rapidly changing radiation levels. ➢ Real-Time “Active Self Reading”
Quality Control System	➢ Auto-calibrating ➢ Virtually eliminated False Alarms ➢ Ability to discriminate between Background radiation and man-made source ➢ Programmable chips enable firmware updates and system upgrades* ➢ Ultra-low power consumption ➢ High system stability and reliability ➢ Accurate and reliable data ➢ Precise quantitative analysis

3. specifications

Specifications	**The RadPavise | Personal Radiation Detector**
Detector	YSO Scintillator + SiPM
Type of Radiation Detected	Beta, Gamma and X-Ray radiation
Energy Range	20keV~3MeV
Dose equivalent rate Range	0.01μSv/h~1mSv/h
Accumulated Dose Range	0.01μSv~999.99Sv
Sensitivity	Cs137: 34cps/μSv/h
Energy Response	±15%
Dose Rate Linearity Error	≤±10%
Accurate Dose Rate	Accumulated Dose Rate Error < 3%
Alarm Threshold	adjustable threshold through entire range (1μSv/h~1mSv/h)
Display	LCD Display
Display Unit	(μ~m)Sv/h; μSv~Sv
Alarm	Audible, visible and vibrating alarms
Full Range Reading and Alarm Response	<2 Seconds
Data Storage	Accumulated Dose Data
Data Transfer	USB
Power Supply	Lithium Ion Rechargeable Battery
Battery Life	280 h Run Time
Temperature	-10℃-60℃
Dimensions	113 x 70 x 24 mm / 4.4 x 2.8 x 0.9 in
Weight	190 g / 6.7 oz
Regulatory	FCC Part 15 compliant

4.Applications

Homeland Security/ Real-time Data for Crisis Control: Homeland security has become a top priority in recent years to assure the safety of individuals around the world. Personnel must be prepared to deter and respond to potential exposure to radiation. If asked to perform duties in an environment where radiation may be present, assessing exposure levels is crucial and reporting on a regular basis a necessity. RAYCAN understands how critical it is that all personnel be protected to reduce or avoid short-term, or acute, exposure to radiation.

State and Federal Agencies/ Military: Many state and federal and Military agencies work in environments that monitor radiation programs or environments as well as carry the responsibility for crisis management in the event of an emergency. Ensuring public health, safety, and the integrity of our environment is the primary concern of these government organizations and safety personnel.

First Responders: In any emergency situation, time is of the essence. First responders to any critical scene may not know immediately if the area has been contaminated. Therefore, it is imperative that those first to respond to a crisis carry radiation monitoring dosimeters. First Responders may include law enforcement, fire personnel, emergency medical teams, HAZMAT, or even state, federal or military organizations. RAYCAN recognizes the special requirements of these agencies. RadPavise | Personal Radiation Detector is specifically tailored to the requirements of any agency.

5.Benifit Statement

- As an “Active Self Reading” device, BOTH dose rate AND accumulated dose are measured in real time enabling user to always be aware of current exposure.
- Large OLED display offers user readability in dark or bright environments.
- 3 types of alarms - our users are alerted by a multitude of ways: vibration, audible and flashing lights
- Alarm - either preset or user programmable through entire measurement range
- Intuitive menu-driven navigation allows user to adjust settings in the field
- Easy operation with one hand with just two buttons allowing total control with a thumb
- Proportional real-time “Detection and Measurement” provides meaningful readouts which focus on the awareness and safety of the user during critical times
- Patented MVT sampling method resulting in no signal loss and high signal to noise ratio
- Low-power CMOS digital electronics combined with digital silicon photomultiplier chip (SiPM)
- Dose and dose rate alarms provide additional awareness of high radiation levels.

6.Operation

1. Turn on: Long press OK button for 2 seconds and release the button when hear the startup sound and feel the vibration, the equipment will show the boot screen. Two seconds after the boot is completed， it will automatically enter to the main interface and start measuring the environmental radiation levels, then display the dose equivalent rate.

2. Shutdown: Long press OK key for 2 seconds in any interfaces, release the button after the shutdown picture appear. Interface switching: Press the Page-turning button on the left side to switch interfaces.

3. Dose rate interface: this is a main interface and it automatically shows up after the boot. The data column/bar shows the dose equivalent rate.

(*shall be 0.016 ! I copied same image for many times, the error is still here, it might be Mac book system error)*

Count rate interface: using (CPS) as the unit, displays the count rate for the detector.

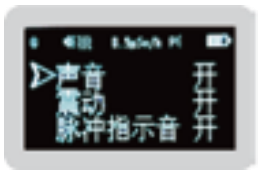
4. The cumulative dose of interface: data column shows two groups of dose

data, the first line shows the cumulative measured dose after this boot, the second line shows the measured dose for this single time since the last measurement was cleaned up to zero.

5. Source interface: data column with the histogram shows dose equivalent rate trends within the last 2 minutes, to guide users to find or stay away from radiation sources.

6. Setting: press the flip key to enter the setup interface, press OK for setting; please press the return button when you need return to the previous menu.

The alarm switch setting: press the flip button to find the "alarm switch", press OK to enter the "alarm" setting interface; then press page turning button to select alarm functions, press OK to turn on or turn off the alarm function and this setting is effected in real-time.



Threshold settings: press the flip button to find the "threshold setting". Press OK to enter the "threshold" interface. When cursor moves to the right, press the flip button to change the values. If you need change threshold unit, press

OK to move the cursor to the threshold unit, then press flip button to change it. When the cursor is pointing at the threshold unit, please press OK to save the settings and return to the setting interface.

Work mode setting: press flip button, move the arrow pointing to "work mode", press OK to enter the "mode" setting interface, press the flip button to select "personal radiation dose equivalent mode" or "environmental radiation dose mode", press OK , then the work mode is selected and it will display the data according to the relevant unit.

Clear dose: press flip button, move the arrow pointing to "clear dose", press OK to enter the "clear dose" setting interface, press the flip button to select the "clear the current dose" or "remove the total dose", press OK, the setting is complete.

Language setting: press flip button, move the arrow pointing to "Language", press OK to enter the "language" setting interface, press the flip button to select the Chinese or English, press OK, the setting is completed.

Smoothing settings: press flip button, move the arrow pointing to "smooth display settings", press OK to enter the "smooth" interface settings, the default setting is smooth, the device only can be set by using even second, the shortest is 2S, the longest is 60s. Press flip buttons to select the "smooth" time, press the up flip button to select the 02s settings, press the down flip button to enter the 60s setting. When the arrow is pointing at tens, press OK, the cursor will move to the right one, press the flip button to change the value pointed by the cursor, when the cursor is in units position, press OK to save the settings and back to the setting interface.

Date and time settings: press flip button, move the arrow pointing to "date & time", press OK to enter the "date & time" interface setting. Press OK button to enter the “Date & Time” display interface, press OK again to enter the “Date-setting” interface. In accordance with the cursor indicator, press the flip button to set up the value pointed by the cursor. Press OK, the cursor will move to the right one. Press OK to complete the date setting and move to the time setting interface. When cursor is pointing to the last digit of time, press OK to save the settings, and return to the date & time” display interface.

7. Expanded external probe and Lemo interface: connecting with different types of high SiPM performance radiation detectors that developed by Raycan through the Lemo interface to extend the dynamic range and sensitivity of the instrument, and to be suitable for different practice requirements.

MicroUSB interface: insert the MicroUSB line which connecting with the power supply to the interface, if the green light on the up-left corner is on, it is charging. When the green light is off, charging is completed and you can continue using the equipment. The MicroUSB interface is also meant to transmit radiation measurement result data with PC terminal.

7.Electromagnetic Compatibility

This product complies with relevant international and national laws and standards on EMC (electromagnetic compatibility) for this type of product when used as intended. Such laws and standards define both the permissible electromagnetic emission levels from equipment and its required immunity to electromagnetic interference from external sources.
Other electronic products exceeding the limits defined in such EMC standards could, under unusual circumstances, affect the operation of the product.
• Information Technology Equipment (ITE) need special precautions regarding EMC, and need to be installed and put into service according to EMC information provided in the accompanying documents.
• Please use the shielding USB port which is meant to connect with PC, the use of accessories and cables other than those specified may result in increased emission or decreased immunity levels.
• The product should not be used adjacent to or stacked with other products and that if adjacent or stacked use is necessary, it should be observed to verify normal operation.
This equipment is intended for use in a hospital environment. Operation in other than hospital environments may compromise electromagnetic compatibility.

The RadPavise | Personal Radiation Detector complies with part 15 of the FCC Rules. Operation is subject to the following conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

8.Safety

Important safety directions

If the product is not functioning correct or damage is visible, please contact your RAYCAN representative, who will take appropriate actions in order not to create harm. Handle the product with care. Make sure that the product is used and stored in a secured environment to prevent unauthorized access.

Maintenance & faults

WARNING Do not use the product for any application until you are sure that the user routine-checks have been satisfactorily completed, and that the periodic maintenance of the product is up to date. If any part of the product is known (or suspected) to be defective or wrongly adjusted, DO NOT USE the product until a repair has been made. Operation of the product with defective or wrongly adjusted components could expose the user or the patient to radiation or other safety hazards. This could lead to fatal or other serious personal injury.

Safety awareness

WARNING Do not use the product for any application until you have read, understood and know all the safety information, safety procedures and emergency procedures contained in this Safety section. Operation of the product without a proper awareness of how to use it safely could lead to fatal or other serious personal injury.

Adequate training

WARNING Do not use the product for any application until you have received adequate and proper training in its safe and effective operation. If you are unsure of your ability to operate this product safely and effectively, DO NOT USE IT. Operation of this product without proper and adequate training could lead to fatal or other serious personal injury.

Safety devices

Warning Never attempt to remove, modify, override or frustrate any safety device on the product. Interfering with safety devices could lead to fatal or other serious personal injury.

Intended use and compatibility

Warning Do not use the product for any purpose other than those for which it is intended. Do not use the product with products other than that which RAYCAN recognizes as compatible. Operation of the product for unintended purposes, or with incompatible products, could lead to fatal or other serious injury.

Electrical safety

WARNING Do not remove covers or cables from this product. Dangerous electrical voltages are present within this product. Removing covers or cables could lead to serious or fatal personal injury. Covers or cables should only be removed by qualified and authorized service personnel. Use this product in rooms or areas that comply with all applicable laws (or regulations having the force of law) concerning electrical safety for this type of product. Electrically isolate this product from the mains electrical supply before cleaning, disinfecting or sterilizing it.

Mechanical safety

WARNING Do not remove covers from this product. Removing covers could lead to serious or fatal personal injury. Covers should only be removed by qualified and authorized service personnel. In this context, qualified means those legally permitted to work on this type of medical electrical product in the jurisdiction(s) in which the product is being used, and authorized means those authorized by the user of the product.

Explosion safety

WARNING Do not use this product in the presence of explosive gases or vapors.

WARNING Do not use flammable or potentially explosive disinfecting sprays.

WARNING Use of this product in an environment for which it was not designed can lead to fire or explosion.

Fire safety

Use of electrical product in an environment for which it was not designed can lead to fire or explosion. Fire regulations for the type of medical area being used should be fully applied, observed and enforced. Fire extinguishers should be available for both electrical and non-electrical fires.

WARNING Only use extinguishers on electrical or chemical fires, which are specifically labeled for those purposes. Using water or other liquids on an electrical fire can lead to fatal or other serious personal injury. If it is safe to do so, attempt to isolate the product from electrical and other supplies before attempting to fight a fire. This will reduce the risk of electric shocks.

Electrostatic discharge (ESD)

CAUTION Always wait at least ten seconds after the product is switched OFF before switching the product back to ON.

CAUTION Always use proper static procedures, protection, and product prior to opening and during handling of this product. This product contains components that are electrostatic sensitive. Failure to use ESD procedures may cause damage to these components. Such damage to components is not covered by RAYCAN warranties.

ESD can amount to a significant voltage, which may cause damage to PCBs or other system components.

ESD damage is cumulative and may not be apparent at first, as indicated by a hard failure, but can cause degraded performance. Therefore, always use proper ESD handling procedures. ESD can result from low humidity conditions, use of electrical equipment on carpeting, linens, and clothing.

9.Trouble shooting

Problems	**Solutions**
Unable to start up	Check whether Power button was pressed for longer than 2 seconds and if charged.
Automatic shutdown	Check if electricity is sufficient, if insufficient, please charge it
Insufficient power Indicator	Check if charging is completed, if not, continue charging
Charging indicator light is not blinking	Confirm whether power supply has power and connection is connected
Alarm continuously jangling	Confirm whether there is a radiation source nearby
Alarm is not jangling when a radiation source nearby	Check if the threshold range is set up correctly
* If the problem listed above can't be solved, please contact us	

10. The package contain

Name	**Number**
Host	1
USB charging cable	N.A
The warranty card	1
Certificate	1
Users manual	1

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