RadTarge II

Users Manual

RAYCAN

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1.Introduction

The RadTarge II | Personal Alarming Dosimeter 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	RadTarge II | Personal Alarming Dosimeter
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~100Sv
Sensitivity	5cps/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	240 h Run Time
Temperature	-10℃-60℃
Dimensions	2.7x1.8x0.7 inches / 69x46x17 mm
Weight	60 g / 2.1 oz

Regulatory	FCC Part 15 compliant

4.Applications

Dental Office: Over time, even low levels of ionizing radiation from X-Ray machines present potential health hazards. Although dental technicians or hygienists may stand outside the examination room during X-Rays administration, the risk of overexposure still exists and should be monitored to ensure the health of your employees. RAYCAN RadTarge II can give your staff real-time protection.

Veterinary Practice: Extra care is required in X-Raying animals, because human intervention is needed. Therefore, the possibility of radiation exposure is higher than in other medical practices. The best way to monitor radiation is with reliable, quality radiation monitoring service from RAYCAN. Use RAYCAN RadTarge II to know the cumulative exposure levels of your employees to ensure their safety.

Hospital: The multitudes of diagnostic equipment in the modern hospital environment have varying levels of radiation exposure risks. For example, hospital staff in radiation oncology and radiology departments need to accurately measure the dose of radiation they receive while working near medical equipment containing radioisotopes, and to ensure that the radioactive sources in the equipment are not leaking and emitting hazardous radiation levels. RAYCAN RadTarge II ensures that you assess risk levels appropriately and that the proper dosimetry monitoring is implemented in a cost-efficient manner.

Radiological Center: X-ray or diagnostic equipment in your office have varying levels of radiation exposure risks. RAYCAN Dosimetry Solutions can ensure that you assess risk levels appropriately and that the proper dosimetry monitoring is implemented in a cost-efficient manner.

High-energy Physics: High-energy nuclear physics and high-energy physics experiments (HPE) frequently require scintillator detectors that are immune to both static and changing magnetic fields. In most cases, this precludes the use of photomultiplier tubes. RAYCAN RadTarge II provides the required immunity to magnetic disturbances, plus the extremely high photon sensitivity and speed required to capture the decay-chain characteristics of nuclear disintegrations and high-energy particle collisions.

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.

- Ergonomic Upward facing large backlit LCD display offers user readability in dark or bright environments
- Pocket-sized portability with convenient belt clip
- 3 types of alarms - our users are alerted by a multitude of ways: vibration, audible and visible
- Alarm level - 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 alarm provides additional awareness of high radiation levels.
- Blue acrylic tamper proof label prevents user from opening instrument thus ensuring operational integrity for compliance and liability concerns

6.Operation

1. Basic operation: Two key operation is simple, easy to operate and easy to use. Powering on and off: Press the power key for 2 seconds until screen lights up. Automatically enters the main interface/dose equivalent rate after the machine starts. Automatic and instant measurement of exposure level while displaying the current real time dose equivalent rate. Pressing power button for 2 seconds to power off when screen turns off.

*(top line):*Icons from left to right are: sound alarm, vibration alarm function and wireless communication function in the open position

Left line: Digital real-time display   *Image 000.00*   ---*1st right line:* the charging and battery indicator

the dose equivalent rate, accurate to 10nSv/h--

---- *2nd right line*: According to different radiation intensity, automatically choose the appropriate unit for display.

Bottom line: The main interface (real-time dose equivalent rate interface)

2. The cumulative dose interface: press settings button (directly under power key) and switch to cumulative dose, the interface displays the cumulative dose equivalent.

$$\boxed{000.00\ ^{mSv}_{\mu Sv}}$$

Setup mode: Press the settings button until settings interface is displayed. Press the settings button to change settings for sound alarm, vibration alarm and wireless communication. Press power button to turn on / off.

$$\boxed{OFF}$$

Threshold settings: enter setup mode, press the settings button 3 times, "threshold" will flash in display; then press power button to setup, threshold level values will start flashing; press the settings button to choose values, press power button to apply changes.

$$\boxed{003.00\ \mu Sv/h}$$

3. Dose clearing: enter setup mode, press settings button 4 times to display dose-clearing interface, "CLR" is displayed: press the power button to clear dose, when "yes" is displayed press the power key to confirm. "done" is displayed when dose is cleared. Press settings button at any time to cancel.

Press the setting button in any setting interface to exit setup mode and return to main interface.

$$\boxed{CLr}$$

$$\boxed{YES}\quad \boxed{dOnE}$$

4. Charging function: Insert MicroUSB line, charging light indicates charging status.

5. Real time setting: enter setup mode, press the Settings button 5 times, "RTC" is displayed; press power button to enter setup; press the settings button to choose Year, month, day and time; press power button to apply changes. Press settings button until "done" is displayed to complete.

Press settings button to return to the main interface.

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.

RadTarge II | Personal Alarming Dosimeter 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 rings	Confirm whether there is a radiation source nearby
Alarm is not ringing 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

America

Wuhan Suzhou

HongKong

Branch office

2440 Camino Ramon, Suite 264

San Ramon, CA 94583,USA

Headquarters

Bldg 17, 8 Jinfeng Rd, Suzhou New

District, Suzhou, 215163, China

1-925-359-6908 (T)

1-925-380-6784 (F)

Web: http://www.x-zlab.com/

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