



Si-BDM-2250

USER MANUAL



CONTENT

1. Introduction.....	3
2. Specifications.....	3
3. Operate Guide	5
4. Electromagnetic Compatibility	6
5. Safety	6
6. Trouble shooting	8
7.The Package Contain	9

1. Introduction

Si-BDM-2250 is an all-digital, high performance detector module which can capture Gamma photon's information, digitalize it and transfer output data to the host computer. Si-BDM-2250 can be expediently applied as the basic module in design of position-emission tomography. With its dual-head structure and prominent timing performance, Si-BDM-2250 could also play an important role in scientific research experiment.

2. Specifications

Detector Blocks	
Constitution	LYSO crystal array + Silicon Photomultiplier (SiPM)
Crystal Pixel Size	3.8x3.8x20mm ³ (20mm as height)
Radiation Type	511KeV Gamma photon
Energy Resolution	15% @511KeV
Timing Resolution	550ps@[450~650] KeV
Detector module	
Number of Detector Blocks	2
Number of Channels	72
Dimension	205×99.5×14.8 mm ³ (The top surface designed in camber angle, the height varies from 14.8 to 25)
Weight	577g (189 g for Detector Blocks)
Power adapter input voltage	100~240V /AC, 50/60Hz
Power Consumption	10.5W
Data Interface	RJ45
Operating Environment	

Temperature	Room temperature
Humidity	30%~80%
Atmospheric Pressure	700hpa~1060hpa
Regulatory	FCC Part 15 compliant

3. Operate Guide



1. Plug one end of Gigabit Ethernet cable into the RJ45 interface in the detector module, connect another end of this cable to host computer or router;
2. Connect the detector module and global clock board with an clock signal wire ;
3. Connect the detector module and host computer with an Micro-USB to UART wire, and this USB port was used to debug the software by professionals.
4. Connect the power adapter and tight the bolt of junction. The voltage input ranges from 100V to 240V AC;
5. Turn on the power and configure digitalize parameters on host computer by using the software packed;
6. Acquire the output data on host computer. During the module operation, keep the detector blocks in light-proof situation.

4. 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 RJ45 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 Si-BDM-2250 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.

5. 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.

6. Trouble shooting

Problems	Solutions
The yellow and green LEDs on RJ45 interface don't shine	Check Gigabit Ethernet cable connection situation
No data acquired in host computer	Confirm that detector blocks stay in light-proof situation and reset global clock board
* If the problem listed above can't be solved, please contact us	

7. The Package Contain

Name	Number
Power adaptor	1
Global clock board	1
Clock signal wire	1
Gigabit Ethernet cable	1
Configure Software	1
Micro-USB to UART wire	1
User Manual	1

Federal Communications Commission (FCC) Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two 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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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/>