



Product Guide

PROD-01-2021-V01 (preliminar)

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Power Supply

Gaugit GPWR6BIAS6AO162022

High performance and precision with great cost-effectiveness.

Gaugit GPWR6BIAS6A series power supplies are designed to provide DC supply voltage for Silicon Photomultipliers (SiPM) and readout board operational amplifiers.

Technical features:

- 6 individually adjustable Bias voltage outputs from 20 V to 42 V with maximum noise of $73\mu\text{V}_{\text{rms}}$ and maximum current of 5 mA for each output.
- 6 dual symmetric voltage outputs with a maximum current of 3 A for amplification circuits supply with voltages of $\pm 1.6\text{ V}$; $\pm 2.0\text{ V}$ or $\pm 2.2\text{ V}$ selectable.

More technical information in the Product Datasheet.

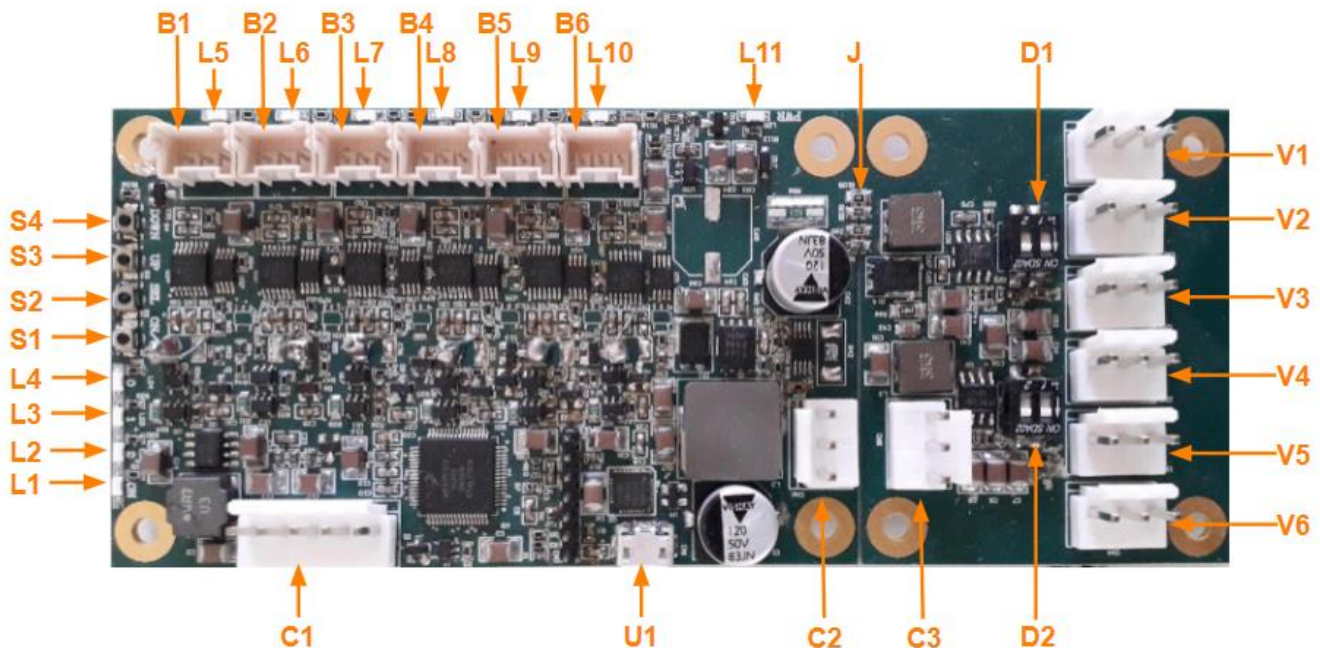


Figure 1 - Photo of **Gaugit GPWR6BIAS6AO162022** power supply board designed and developed by Gaugit.

* Product available.

SiPM Evaluation Kit

Gaugit Single

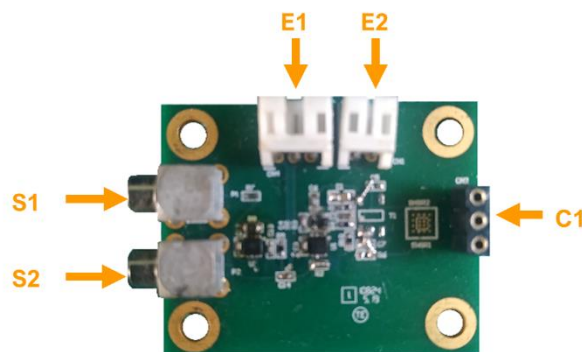
Simple and versatile.

The Silicon Photomultipliers (SiPM) Evaluation Kit is designed for testing and evaluating the performance of preamp circuits and filters, scintillating crystals and SiPM.

Technical features:

- 1 DC power input for preamp circuits and filters.
- 1 Bias DC power input for SiPM.
- 1 or 2 analog signal outputs, depending on the number of stages of the preamp circuits and filters you want to test.
- 1 connection for SiPM that can also be soldered directly to the board.

More technical information in the Product Datasheet.



Figur2 1 – Photo of **Gaugit Single** board.

* Product available.

Detection System

Gaugit Readout SiPM Array series

The detection system of the **Gaugit Readout SiPM Array** series allows the multiplexed signals readout from an array of Silicon Photomultipliers (SiPM). It is composed of a monolithic LYSO scintillating crystal, SiPM array, Active plates and SUMRC plate. Part of the radiation energy is converted into light photons in the scintillating crystal. According to the deposited energy, light photons are transformed into electrical signals by the SiPM array. These signals are pre-amplified and filtered by the Active boards circuits that transfer them to the SUMRC board, which is responsible for the sum of the signals and for the input connections for supply and the analog signals output.

Technical features:

- 1 Ketek SiPM array and compatible coupled to a scintillator crystal.
- 1 power input for amplification circuits.
- 1 SiPM array power input.
- 1 analog signal output.

More technical information in the Product Datasheet.

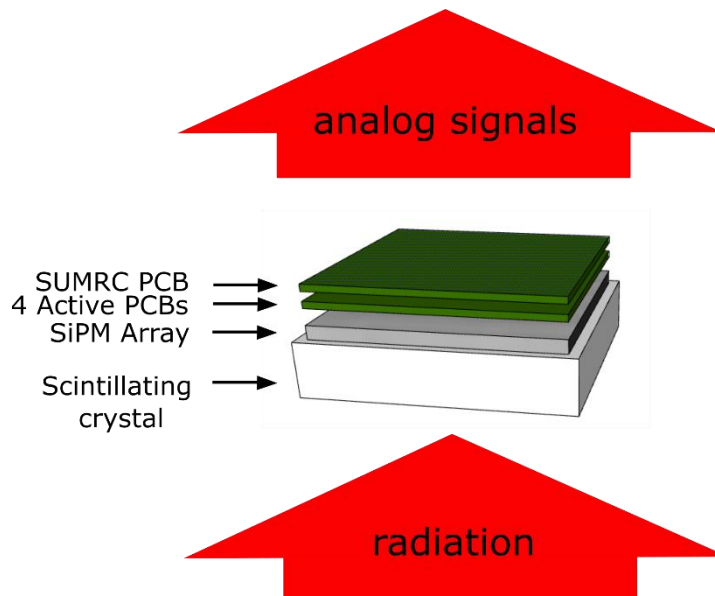


Figure 1 – Detection system schematic of **Gaugit Readout SiPM Array** series.

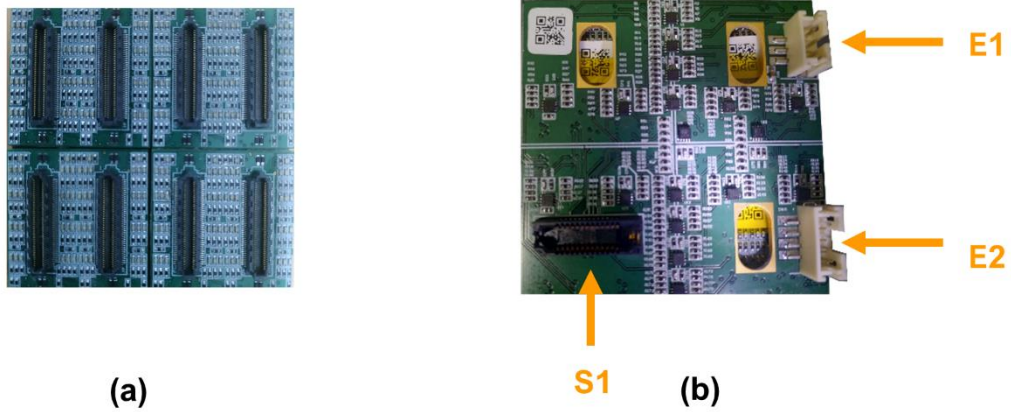


Figure 2 – Top view (a) of the four Active boards and (b) the SUMRC board. The top connectors on the Active boards plug into the bottom connectors of the SUMRC board. The bottom connectors of the Active boards are fitted to Ketek SiPM arrays and compatible. SiPM array are coupled to a scintillating crystal.

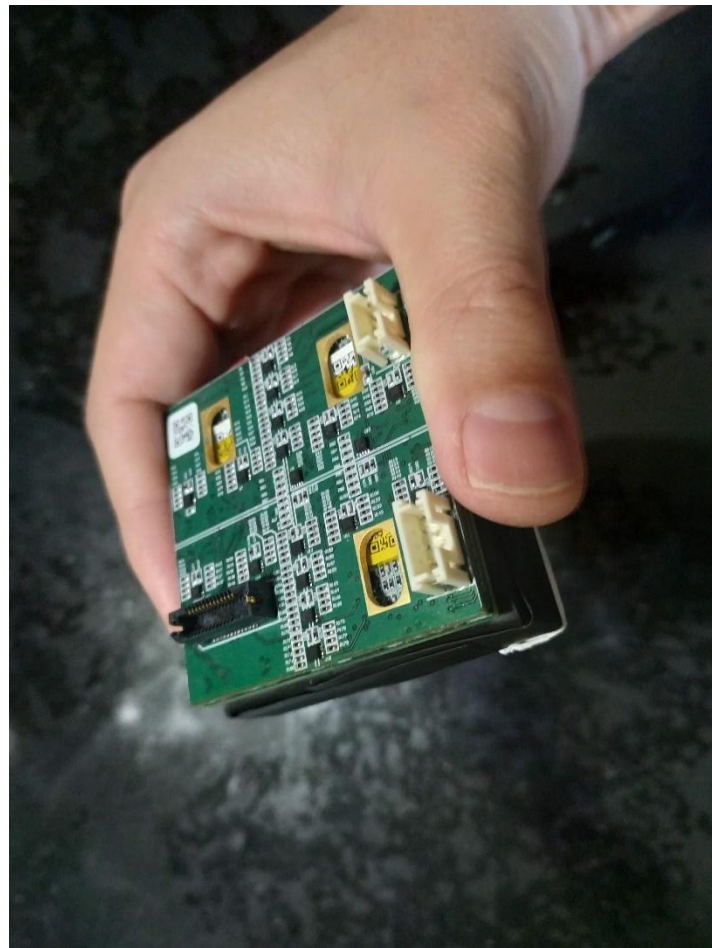


Figure 3 – Photo of the **Gaugit Readout SiPM Array** series detection system according to the figure 1 schematic.

* Product in testing phase.

Multichannel Digitizers

Gaugit DC16 series

DSP ready with cutting-edge components and customizable algorithms

The **Gaugit DC16** series multichannel digitizers provide real-time signal processing commonly found in scientific research, nuclear safety and monitoring of areas at risk of exposure to ionizing radiation. End customers can be research laboratories, clinics, hospitals, food industry, civil construction, oil and mineral prospecting area.

As a modular and reconfigurable device, it is also possible to incorporate user algorithms to adapt your application to ultrasound, radar, LiDAR and Internet of things (IoT).

Technical features:

- Gaugit Carrier board:
 - 2 Ethernet Gigabit RJ45
 - 2 Ethernet Gigabit SFP
 - 2 USB 2.0 OTG
 - 2 USB 3.0 type C
 - 1 HDMI
 - 1 microSD slot
 - 16/20 MCX analog signal inputs – ADC 12/14 bits @ 125/200/250 MS/s
 - 2 MCX digital signal inputs – DAC 14 bits @ 500 MS/s
 - 1 GSOM compatible connection for iWave Systems SOM ZU7EV and Gaugit SOM (System On Module)
- Gaugit Mezzanino Board:
 - 4 MCX GPIO
 - 2 MCX trigger inputs
 - 6 USB 3.0 type C for LVDS
- Gaugit SOM Board with Zynq Ultrascale+ FPGA:
 - 1 JTAG
 - 4 Gb DDR4 for ARM processor
 - 1 Gb DDR4 for FPGA
 - 8 Gb eMMC for data and Operational System (Linux)

More technical information in the Product Datasheet.

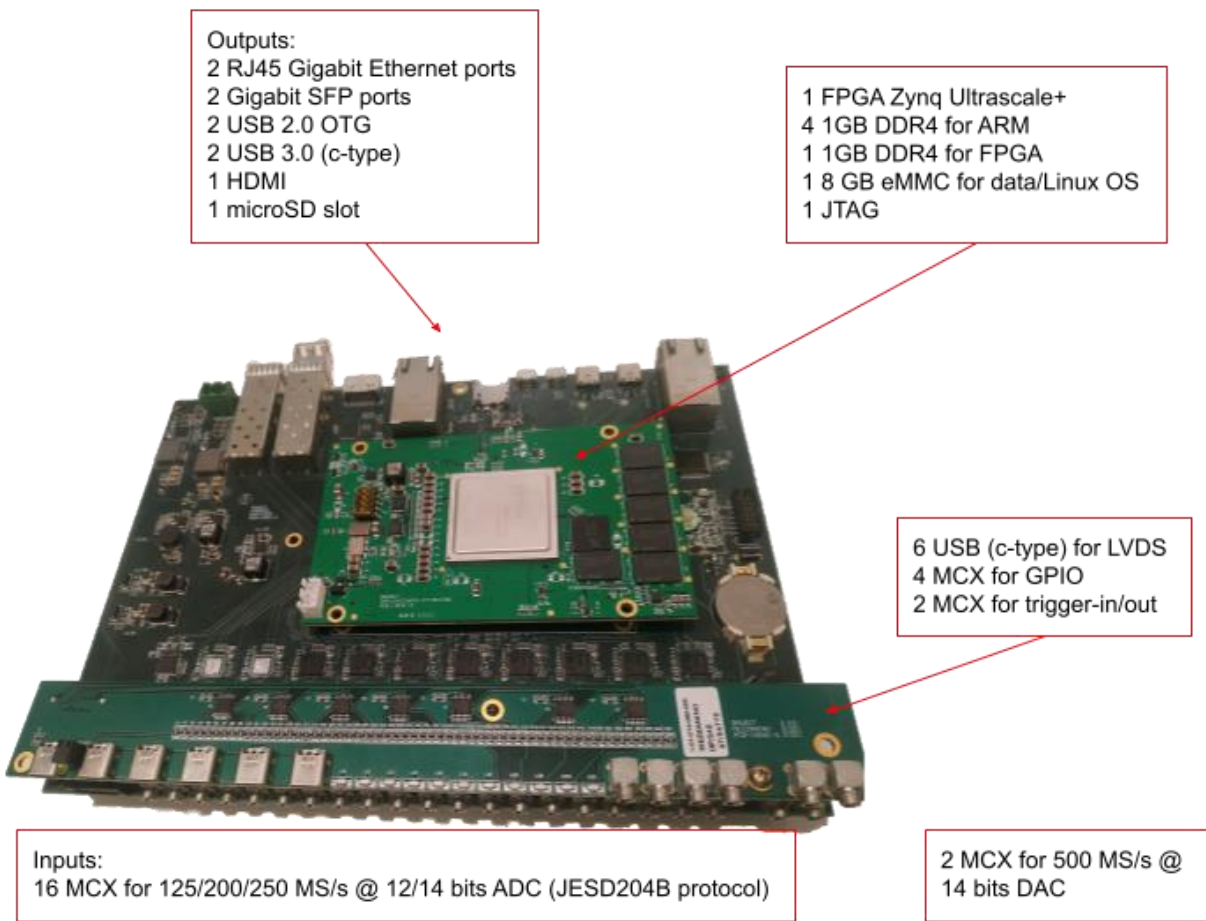


Figure 1 – Photo of the boards of the **Gaugit DC16B1250** multichannel digitizer composed of the Gaugit Carrier, Gaugit Mezzanino and Gaugit SOM boards. All boards were designed and developed by Gaugit team.



Figura 2 – Photo of **Gaugit DC16B1250** multichannel digitizer boards with ZU7EV SOM board from iWave Systems.

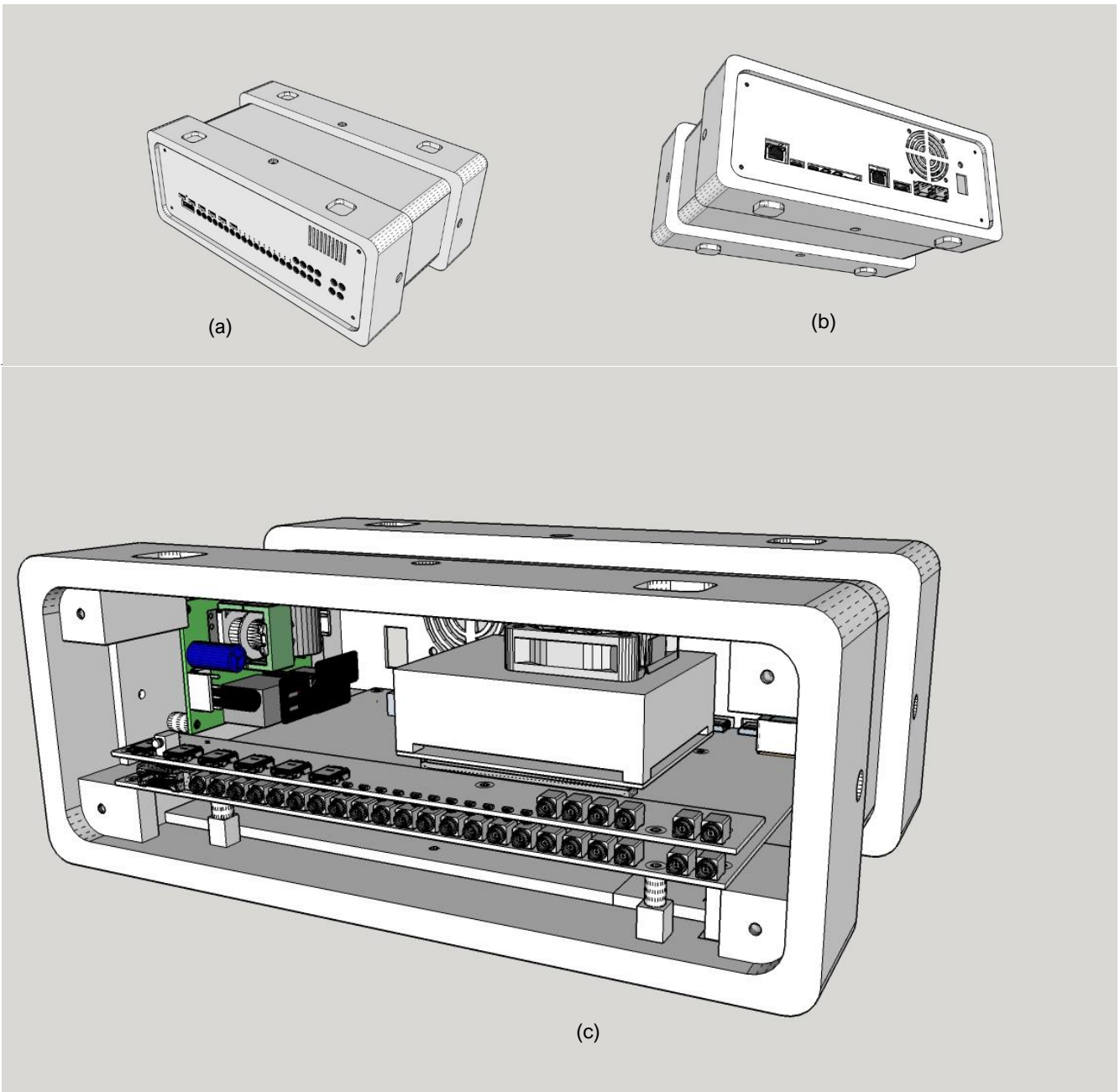


Figure 3 – Design of the **Gaugit DC16** series multi-channel digitizer enclosure. (a) Front and top views, (b) Rear and bottom views, demonstrating the possibility of digitizers stacking. In (c) shows the digitizer boards accommodated inside the enclosure with the Meanwell RPS-120S-12 power supply on the left of the module.

* Product in testing phase.

PET Instrumentation

Gaugit PET pre-clinical system (prototype)

Customizable Algorithms and Time-of-Flight (ToF) ready

The **Gaugit DC16** series multichannel digitizers in conjunction with the **Gaugit Readout SiPM Array** series detection system can be used in PET instrumentation. Our sophisticated algorithms for position determination of the gamma radiation interaction within the detector will be embedded in our digitizer. Our high-performance algorithms in conjunction with our digitizers enable the use of Time-of-Flight (ToF), which is the state of the art in PET systems. A pre-clinical PET prototype will be built as a proof of concept, demonstrating the reconfigurability and innovative potential of our solutions.

Technical features:

- Ring with 2/4/6/8 Gaugit Readout SiPM Array series detection systems.
- Connections with 2/4/6/8 Gaugit DC16 series multichannel digitizers.
- 1 computer for image reconstruction.

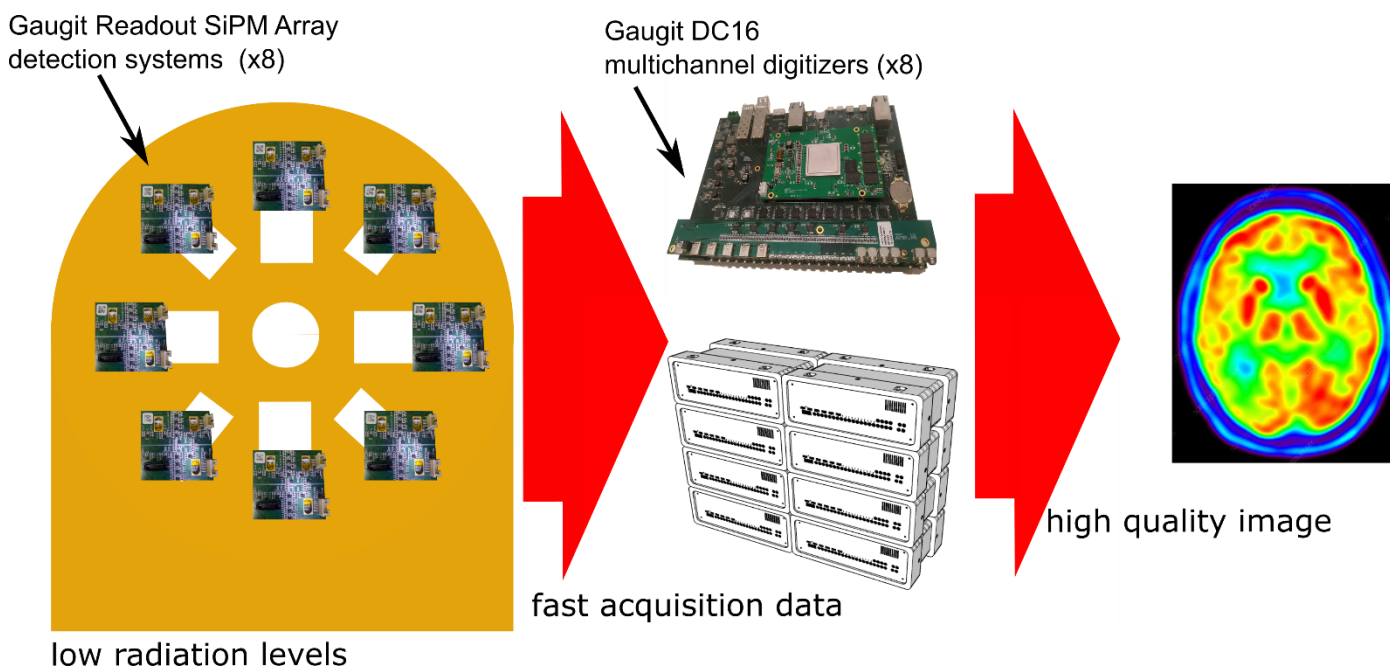


Figure 1 – General scheme of **Gaugit PET pre-clinical system** prototype.

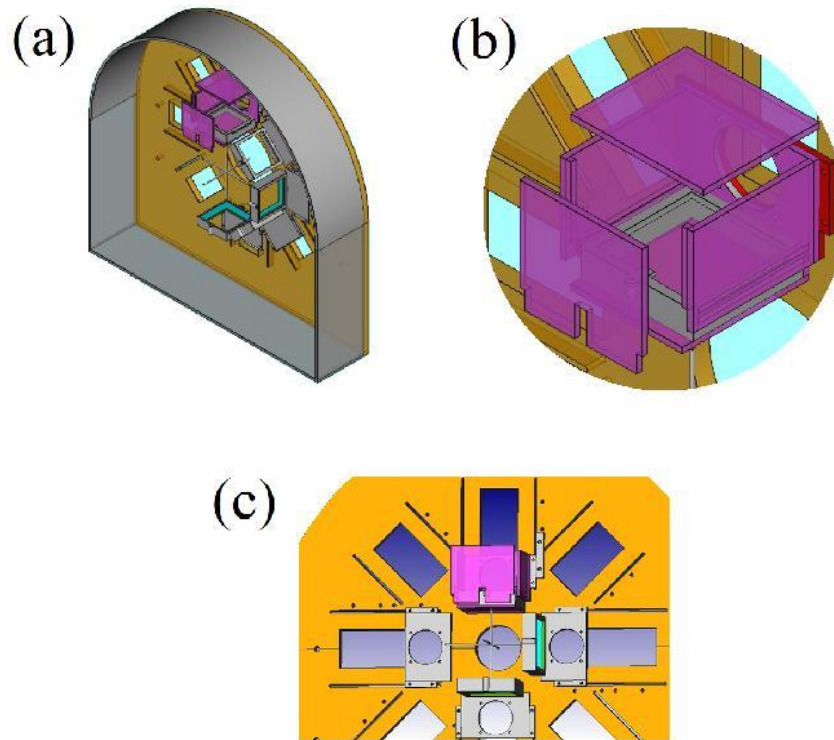
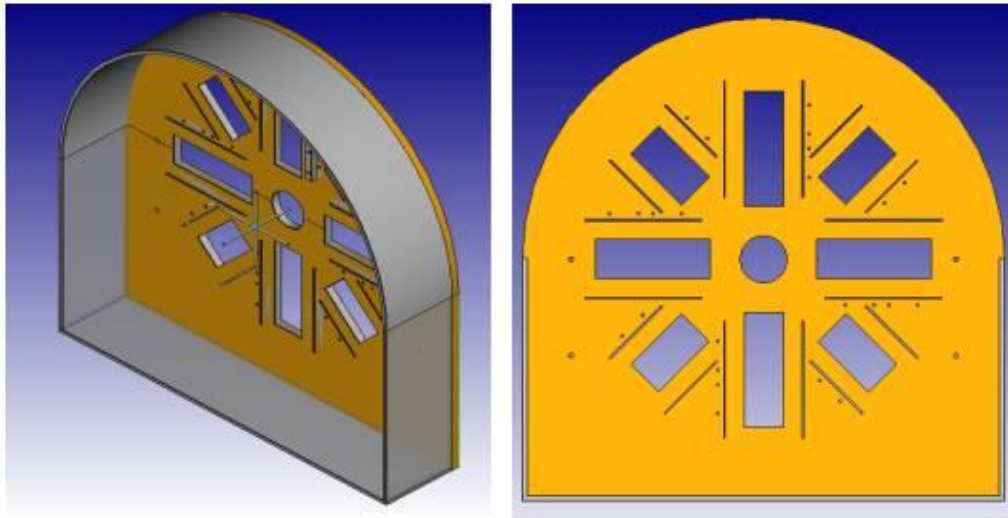


Figure 2 – (a) Conception of the enclosure of each **Gaugit Readout SiPM Array** detection system in the prototype ring. (b) Enclosure detail for each detection system. (c) Example of positioning with 4 detection systems.



Figure 3 – Photo of the general structure of **Gaugit PET pre-clinical system** prototype.

* Product under development.