Detector Integrated with SiPM Frequently Asked Questions

Q: What are the different 2X2NaI(Tl)-ANALOG part numbers?
A: S690-1065-XX-00

Part Number	PHR
690-1065-04-00	≤9.5%
690-1065-12-00	≤8.5%
690-1065-16-00	≤7.5%

Q: What is typical lead-time?
A: An existing 2X2NaI(Tl)-ANALOG part number is 8 to 12 weeks. New designs are 12 - 14 weeks

Q: What SiPM do we use
A: We use the SensL J-series and some designs that use SensL C-Series or Broadcom S4N Series.

Q: Mechanical question specific to the SiPM
A: SiPM manufacturer would be better suited to answer question

Q: Which scintillator types are available with SiPM?
A: currently NaI(Tl), NaIL, CLLB, CsI, $LaBr_3$(Ce) and Enhanced LaBr as well as organic scintillator options.

Q: At the end, we would like to get TTL signal from individual detected photons. If the sensor provides the TTL signal can it be read in parallel with the analog I-V preamp output?
A: You cannot have both analog and TTL out at the same time. It has to be one or the other.

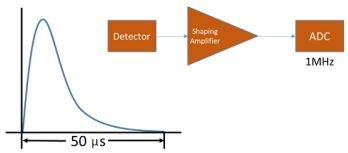
Q: Would we need an external discriminator or does the sensor provide this by default? (pin 3 TTL Out?)
A: In the 2X2NaI(Tl)-ANALOG configuration there is a need for an external discriminator. However, we do have the option of providing a version of the detector with a built in discriminator.

Q: What functionalities OUTPUT ADAPTER, SiPM ANALOG, USB provides and what is the CAP SUB-ASSEMBLY?
A: It provides a quick adapter for testing and MCX connector.

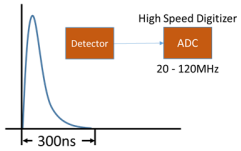
Q: Detector has a gain self-adjusting algorithm, but in our application we fine tune the gain with a self-regulating loop. We would like to be able to apply the same method. In the manual it is not described how to set gain: how can we change it?
A: We can set the gain here or turn off the auto temperature compensation.

Q: Does the SiPM signal output read the same as PMT?
A: No – the SiPM units have a preamp that produces a positive pulse on the analog output pin.

Q: What is the difference between charge sensitive analog versus the digital I to V version?
A: The Charge Sensitive Pre-Amp version is designed to feed into existing PMT based electronics. The I to V version is designed to feed into newer, high speed digitizers.



Analog Charge Sensitive Pre-Amp Detector



I to V Detector

CRYSTALS

SAINT-GOBAIN

Q: At what point does the noise due to temp overwhelm the low energy signal?
A: We currently offer a solution that is low noise up to 50°C, and are developing one to even higher temps.

Q: What are the power in and signal out requirements?
A: Power in 5 volts at 15 milliamps

Q: Is a Scintillation detector integrated with SiPM more robust than a detector with PMT?
A: No, the scintillator package has the same conditions. However, SiPM detectors are immune to magnetic fields, where PMTs are not.

Q: Is the performance comparable to a PMT
A: It depends on the size of the crystal but yes for 2" diameter x 2" thick

Q: What is the rise and decay time of the pulse of the preamp?
A: They both have a rise time of approximately 110ns. The decay time depends on the scintillator, but the advanced analog option is 250x faster than the standard analog version.

Q: What is the absolute maximum rating on the 5V input pin?
A: 6.5V

Q: Does the unit feature any kind of reverse polarity or over-voltage protection?
A: No. If reverse polarity voltage (-5V) or >6.5V is applied to the detector, the unit will be damaged and may not be repairable.

Q: Are all of the grounds internally connected, and is the enclosure grounded?
A: Yes. There is only one common ground, and the housing for the unit is grounded.

Q: What is the maximum output voltage?
A: 3.1V

Q: What is the output impedance of the signal?
A: 50Ω

Q: Do you have any recommended interfacing circuits?
A: Typically, the output is directly input to a 12 bit DAC.

Q: What is the shaping time?
A: As the preamp is designed to be standard across all product lines, there is no shaping.

Q: Are the units factory calibrated for temperature response?
A: Each unit has a standard gain stabilization feature to operate at < ±10% across -20°C to +50°C.

SAINT-GOBAIN

Saint-Gobain Crystals

www.crystals.saint-gobain.com