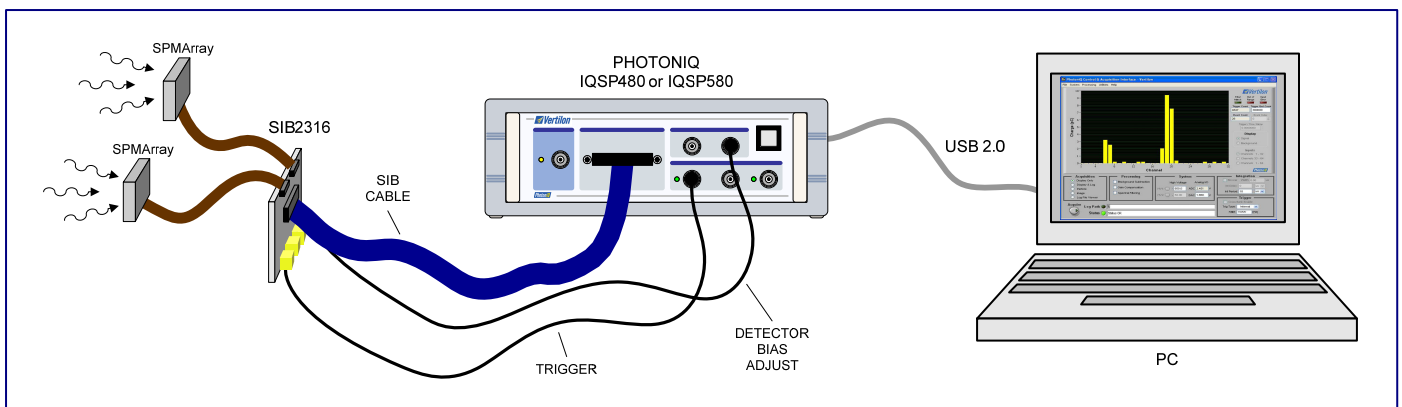
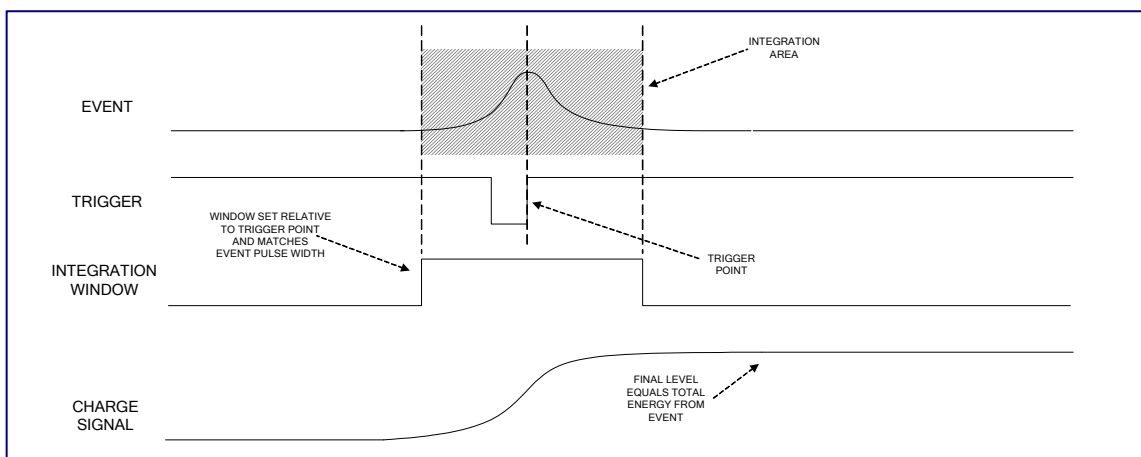


A typical setup for a PET scanner application using a PhotoniQ, a SIB2316 and two silicon photomultiplier arrays (SPMArray) is shown below. The SPMArrays are positioned to detect incoming light from a scintillator crystal or optical assembly and connected to the SIB2316 by two FPC cables. The sensor interface board cable (SIB cable) connects the 32 detector outputs from the SIB2316 to a PhotoniQ IQSP480 or IQSP580 32 channel data acquisition system. Bias to the detectors is controlled by connecting the front panel DAC output from the PhotoniQ to the detector bias adjust input on the SIB2316. This allows the user to control the negative high voltage detector bias through the PhotoniQ GUI. The trigger output from the SIB2316 supplies the trigger to the PhotoniQ when coincident pulses exceeding a user-programmed energy threshold are detected on the two SPMArrays. Alternatively, the coincidence function can be bypassed altogether and the PhotoniQ triggered when a single pulse on either SPMArray exceeds the energy threshold. The energy threshold is also controlled through the PhotoniQ GUI as is carried to the arrays over the SIB cable. Digitized output data from the PhotoniQ is sent to a PC over a USB 2.0 connection for display, logging, or real time processing. By simply exchanging sensor interface boards, the PhotoniQ can easily be used with multianode PMTs instead of silicon photomultipliers.



In a PET application, the PhotoniQ is configured in pre-trigger mode whereby the unit can capture charge data from the detectors that occurred prior to the trigger signal. This powerful triggering mode allows the data acquisition unit to be timed to the pulse peaks yet still collect all of the charge from the particle event — including the charge that preceded the peak of the event. Timing for this mode is shown below.





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