SDS232 32 Channel SMB Distribution System

Product Sheet

Description

The SDS232 SMB Distribution System provides electrical connectivity between Vertilon's PhotoniQ multi-channel PMT & APD data acquisition systems, and up to 32 charge output devices. Multiple single element PMTs and/or avalanche photodiodes are interfaced to the SDS232 through SMB male bulkhead jacks mounted to its front panel. The SDS232 through a connector on its back panel, is connected to the PhotoniQ using a multi-channel, micro-coaxial cable that conforms to Vertilon's standard sensor interface board mating system. This separately ordered cable utilizes Vertilon's low-noise, interconnection method where 32 coaxial connections are made using a single plug.

The SDS232 is useful in PET and SPECT nuclear imaging as well as other applications such as high energy physics and radiation detection where multiple single element photomultiplier tubes or avalanche photodiodes are employed. New high gain solid-state devices like silicon photomultipliers (SPM) and multi-pixel photon counters (MPPC) are easily connected to the SDS232. Having performance approaching PMTs but in a single silicon package, these novel devices combine the small size, low voltage operation and robustness of APDs, with the high gain and stability of PMTs. The SDS232 is particularly well-suited for use with SensL's SPM devices and Hamamatsu's S10362-11 series of MPPCs.

Specifications

Description	Specification
Maximum Charge Signal	2 nC with IQSP480/482, 500 pC with IQSP580/582
Input Noise Charge (RMS)	30 fC with IQSP480/482, 55 fC with IQSP580/582
Crosstalk	< -84 dB
Enclosure Width	9.843 in. (250 mm)
Enclosure Height	3.346 in. (85 mm)
Enclosure Depth	10.236 in. (260 mm)
Panel Connector Type	SMB Male Bulkhead Jack
Compatibility	Models: IQSP480, IQSP482, IQSP580, IQSP582

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Front Panel View

Rear Panel View

Typical Setup

The photo shows an SDS232 connected to a PhotoniQ IQSP480 32-channel PMT / APD data acquisition system. Two channels of the SDS232 are connected to single element silicon photomultiplier (SPM) devices.

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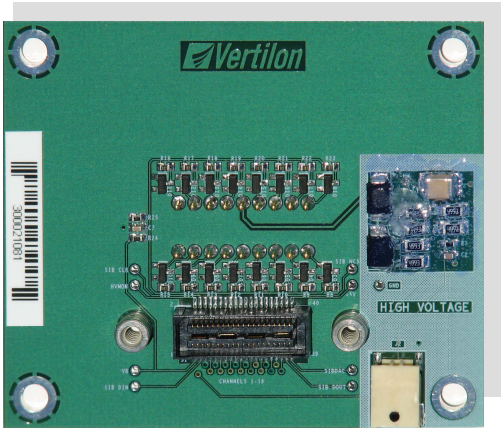
SIB216 Sensor Interface Board APD Array

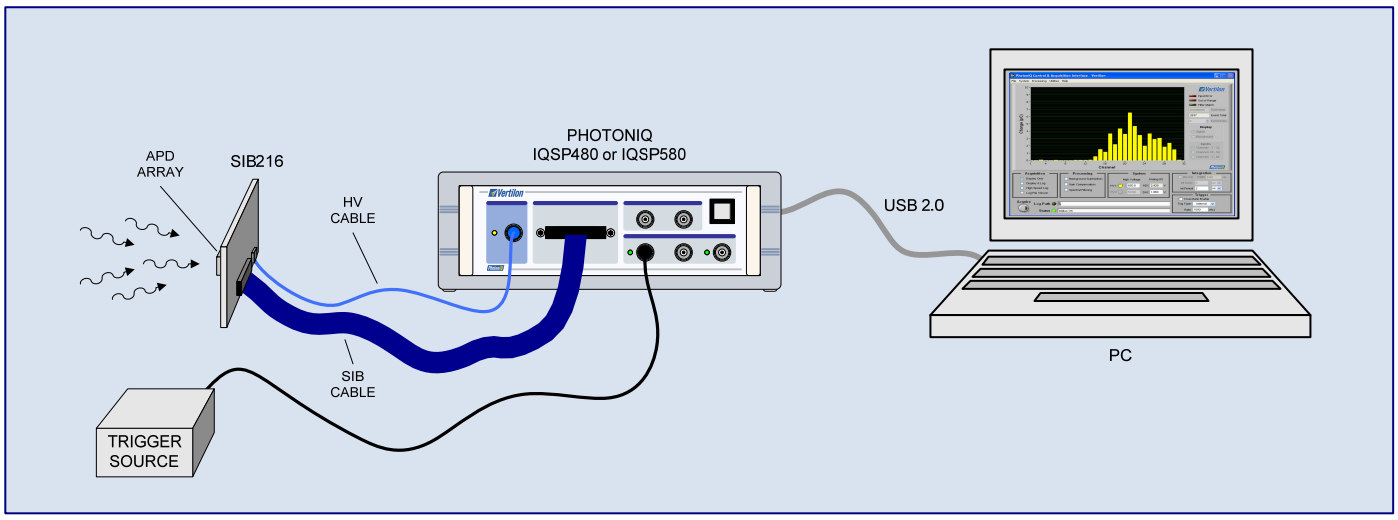
Product Sheet

Description



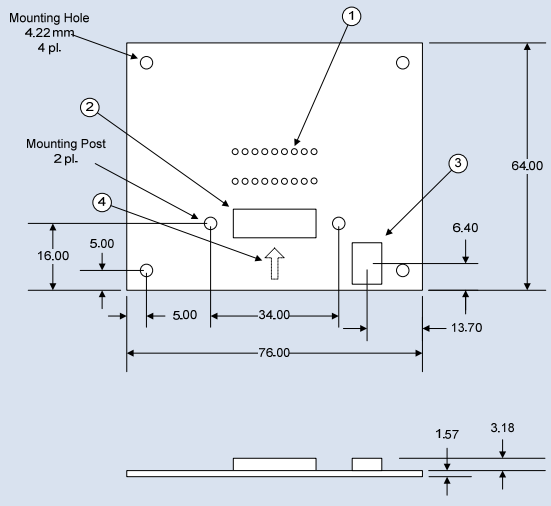
The SIB216 Sensor Interface Board (SIB) provides the electrical and mechanical connectivity between a Silicon Sensor 500038 (Pacific Silicon Sensor AD-LA-16-9-DIL18) avalanche photodiode (APD) array and a Vertilon PhotoniQ multi-channel data acquisition system. The APD array mounts directly to the bottom of the SIB216 through 18 socket pins where electrical connections to the cathodes of the 16 avalanche photodiode elements are made. These signals are routed to the SIB connector located on the top of the board. The SIB connector conforms to Vertilon's standard, low-noise, multi-channel, cable interconnection system. It mates to a micro-coaxial cable assembly that connects the 16 APD cathodes to the PhotoniQ. The high voltage bias to the common anode of the APD array is made through a separate dedicated connector where a high voltage cable connects between it and the high voltage output on the PhotoniQ. A passive circuit on the SIB216 divides the raw high voltage output from the PhotoniQ by a factor of three for input to the APD array.

Typical Setup



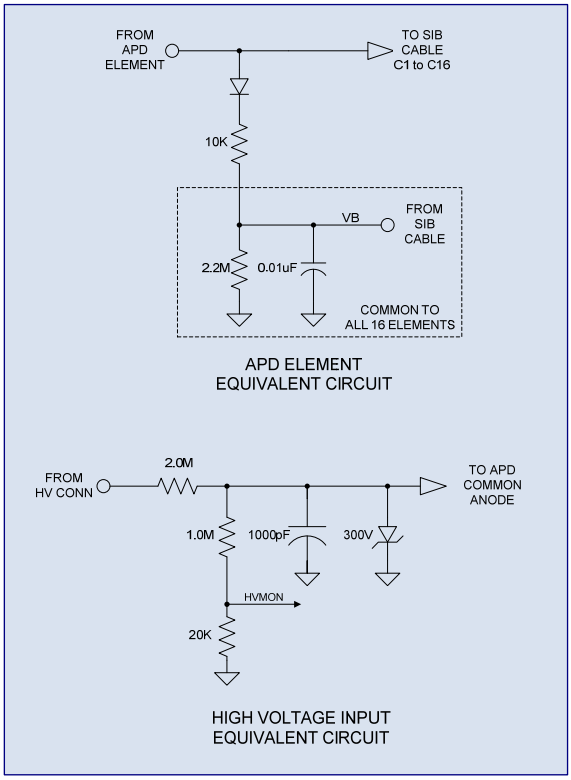
In a typical setup the Silicon Sensor 500038 APD array is plugged into the SIB216 Sensor Interface Board which in turn connects to a Vertilon PhotoniQ IQSP480 or IQSP580 multi-channel data acquisition system using a SIB cable. When triggered from an external source, the PhotoniQ integrates and digitizes the 16 charge signals from the array and outputs a data packet to the PC over a USB connection. The PhotoniQ also supplies the high voltage bias to the common anode of the APD array through a specialized high voltage cable.

Mechanical Data



Notes: Item #1 is APD socket pins. APD centered on bottom side of PCB.
Item #2 is SIB connector. Height is 9.7 mm with cable installed.
Item #3 is high voltage cable connector.
Item #4 indicates cable entry direction.
All dimensions in millimeters.

Electrical Data



General Safety Precautions

Warning: HIGH VOLTAGES – Voltages can exceed 1000V

Operate device within specified range

Electrostatic discharge sensitive

Do not operate in wet, damp or explosive atmosphere

See Silicon Sensor 500038 datasheet or Pacific Silicon Sensor AD-LA-16-9-DIL18 data sheet for specific handling information

SIB Connector Pinout

#	NAME		#	NAME
1	VB		2	HVMON
3	SIB DIN		4	SIB CLK
5	C16		6	N/C
7	C15		8	N/C
9	C14		10	N/C
11	C13		12	N/C
13	C12		14	N/C
15	C11		16	N/C
17	C10		18	N/C
19	C9		20	N/C
21	C8		22	N/C
23	C7		24	N/C
25	C6		26	N/C
27	C5		28	N/C
29	C4		30	N/C
31	C3		32	N/C
33	C2		34	N/C
35	C1		36	N/C
37	SIB DOUT		38	SIB NCS
39	SIBDAC		40	+5V

Pins 3, 4, 37, 38, 39, 40 used by PhotoniQ and should be left unconnected

Pin 1 grounded when not connected to a PhotoniQ

Ground supplied through cable shielding

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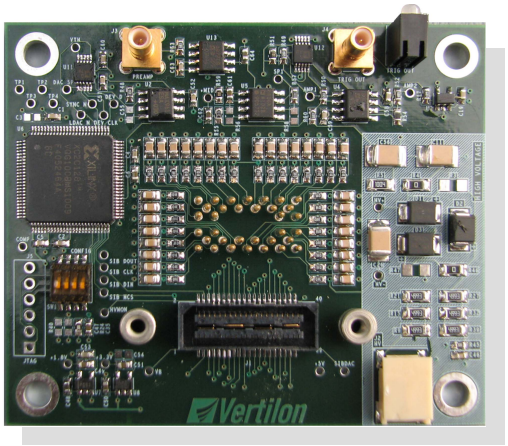
SIB332 Sensor Interface Board APD Array

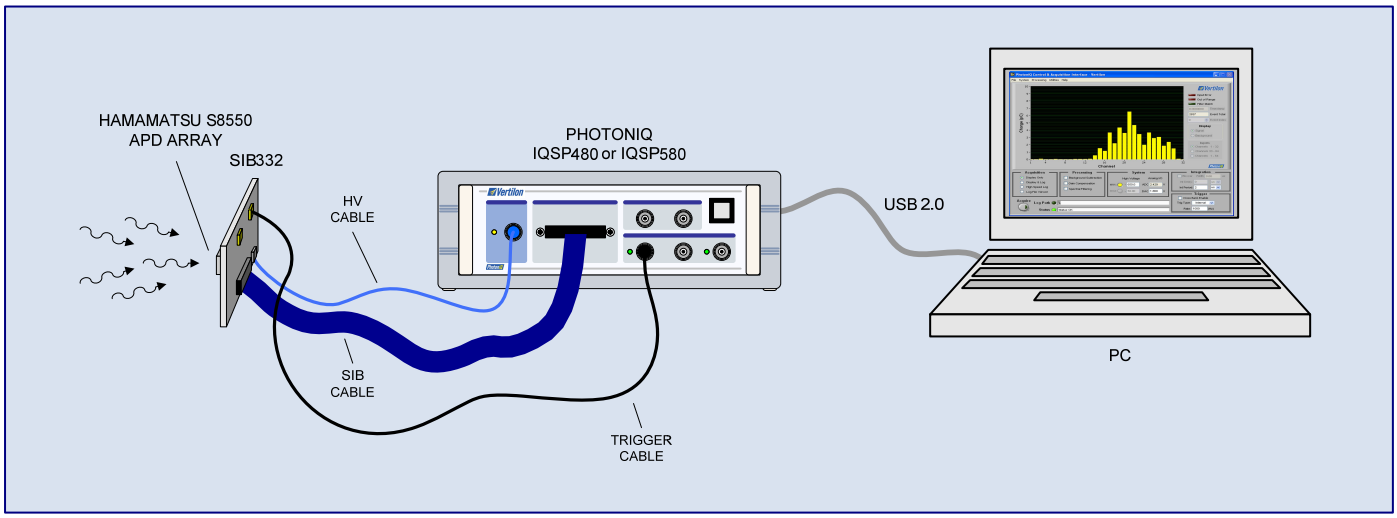
Product Sheet

Description



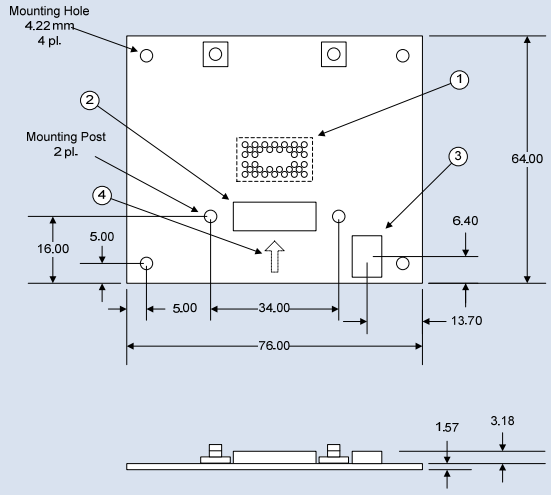
The SIB332 Sensor Interface Board (SIB) provides the electrical and mechanical connectivity between a Hamamatsu S8550 series 4 x 8 element APD array and a Vertilon PhotoniQ multi-channel data acquisition system. The S8550 mounts directly to the bottom of the SIB332 through 34 socket pins where electrical connections to the 32 APD anodes are made to the SIB connector located on the top of the board. The SIB connector conforms to Vertilon's standard, low-noise, multi-channel, cable interconnection system. It mates to a micro-coaxial cable assembly that connects the APD outputs to the PhotoniQ. The negative high voltage bias to the APD array is made through a separate dedicated connector where a high voltage cable connects between it and the high voltage output from the PhotoniQ. A passive circuit on the SIB332 divides the raw high voltage output from the PhotoniQ by two for input to the APD array. Also available on the SIB322 are two outputs that are used in conjunction with the APD array's common cathode current signal — an amplified version of the signal and a pulse discriminator trigger output.

Typical Setup



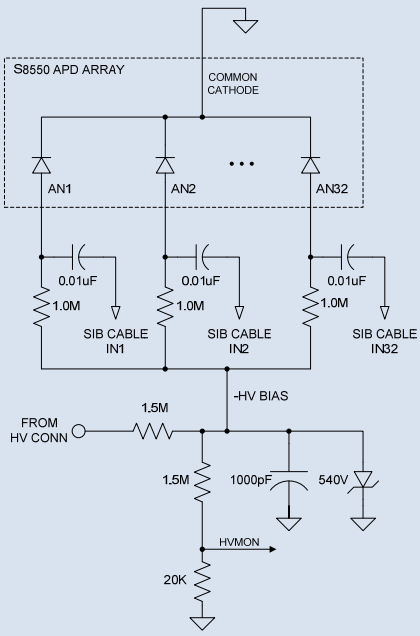
In a typical setup the Hamamatsu S8550 array is plugged into the SIB332 Sensor Interface Board which in turn connects to a Vertilon PhotoniQ IQSP480 or IQSP580 multi-channel data acquisition system using a SIB cable. When triggered from the trigger output on the board or from an external source, the PhotoniQ integrates and digitizes the 32 charge signals from the array and outputs a data packet to the PC over a USB connection. The PhotoniQ also supplies the negative high voltage bias to the APD array through a specialized high voltage cable.

Mechanical Data



Notes: Item #1 is APD socket pins. APD centered on bottom side of PCB.
Item #2 is SIB connector. Height is 9.7 mm with cable installed.
Item #3 is high voltage cable connector.
Item #4 indicates cable entry direction.
All dimensions in millimeters.

Electrical Data



S8550 INTERFACE CIRCUIT

Ordering Information

SIB332 directly compatible with Vertilon PhotoniQ IQSP480 and IQSP580 32 channel data acquisition systems. PhotoniQ systems sold separately. See User Manual for performance specifications.

High voltage cable not included with SIB332. Included with high voltage power supply option HVPS001 or HVPS002 for IQSP480 / IQSP580.

Sensor interface board (SIB) cable ordered separately. Specify part number SBCxxx, where “xxx” equals length in centimeter.

See SIB332 User Guide for complete specification.

See Hamamatsu S8550 datasheet for specific device information

SIB Connector Pinout

#	NAME		#	NAME
1	VB		2	HVMON
3	SIB DIN		4	SIB CLK
5	IN16		6	IN32
7	IN15		8	IN31
9	IN14		10	IN30
11	IN13		12	IN29
13	IN12		14	IN28
15	IN11		16	IN27
17	IN10		18	IN26
19	IN9		20	IN25
21	IN8		22	IN24
23	IN7		24	IN23
25	IN6		26	IN22
27	IN5		28	IN21
29	IN4		30	IN20
31	IN3		32	IN19
33	IN2		34	IN18
35	IN1		36	IN17
37	SIB DOUT		38	SIB NCS
39	SIBDAC		40	+5V

Pins 3, 4, 37, 38, 39, 40 used by PhotoniQ and should be left unconnected

Ground supplied through cable shielding

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