

General Standards Corporation

High Performance Bus Interface Solutions

PCIe4-SIO8BX2V-SYNC

Eight Channel High Performance Synchronous Serial I/O PCIe Card

**Featuring RS422/RS485/RS232 Software Configurable Transceivers
and 32K Byte FIFO Buffers (512K Byte total)**



The PCIe4-SIO8BX2V-SYNC is an eight-channel synchronous serial interface card which provides high speed, full-duplex, multi-protocol serial capability for PCIe applications. The PCIe4-SIO8BX2V-SYNC combines a flexible serial interface, deep external FIFOs, and software selectable multi-protocol transceivers to provide eight fully independent serial channels. These features, along with a high performance four lane PCIe interface engine, give the PCIe4-SIO8BX2V-SYNC unsurpassed performance in a synchronous serial interface card.

Features:

- Four Lane PCI Express (PCIe4) Interface
- Eight Independent Multi-Protocol Synchronous Serial Channels
- Independent Transmit and Receive FIFOs for each Serial Channel – 32K byte each
- Fast RS422/RS485 Differential Cable Transceivers Provide Data Rates up to 10Mbps
- RS232 Cable Transceivers Provide Data Rates up to 250kbps
- Two Signal (Clock/Data) or Three Signal modes (Clock/Data/Data Valid)
- Programmable Oscillators provide increased flexibility for Baud Rate Clock generation
- Programmable Transmit Bit Counts allow for various transmit word lengths
- Programmable Transmit Gap Bit Counts allow for variable gap between words
- Fully Programmable Polarity on all signals
- Eight signals per channel, configurable as either DTE or DCE:
3 Serial Clocks (TxC, RxC, AuxC), 2 Serial Data (TxD, RxD), 2 Data Valid (TxE, RxE), plus Spare
- Unused signals may be reconfigured as General Purpose IO
- Two VHDCI 68 pin front edge I/O Connectors
- Standard Cable - VHDCI to four DB25 connectors. Custom Cables available
- Interchangeable 120Ω Termination Resistors (RS422/RS485 Mode)
- Available drivers include Windows, Linux, and VxWorks
- Industrial Temperature Option Available

General Standards Corporation

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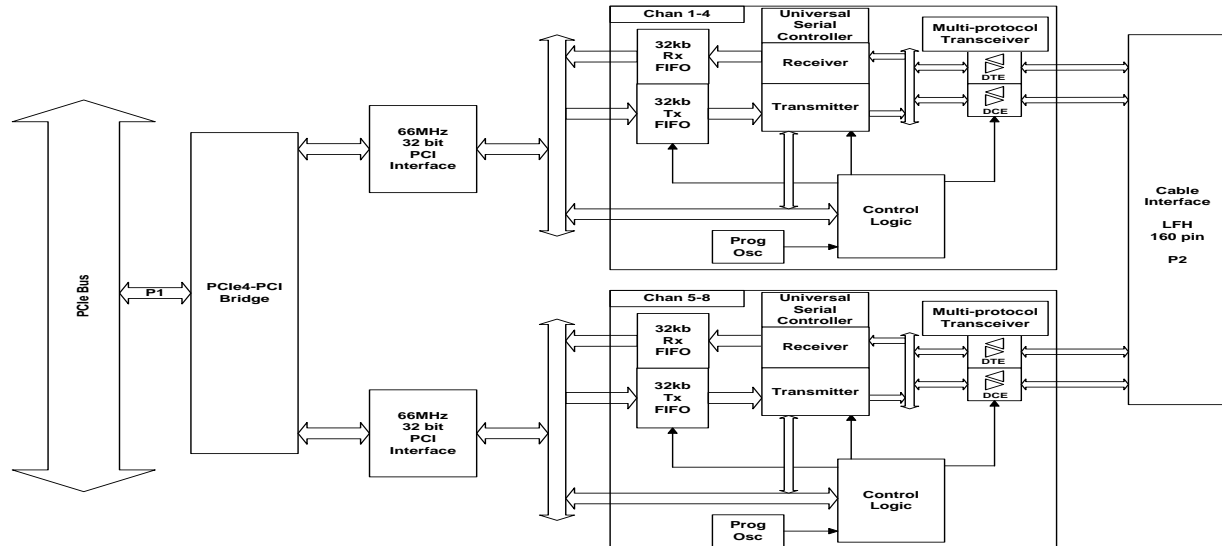
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Functional Diagram:

The PCIe4-SIO8BX2V-SYNC is a high performance, eight channel serial board based on the SIO4BX-SYNC product line from General Standards Corporation. In order to maintain software compatibility, the PCIe4-SIO8BX2V-SYNC is implemented as two independent four channel SIO4BX2-SYNC cards.



Serial Interface:

The flexible synchronous interface may be configured as a three-signal interface - Clock, Data, and Envelope (Data Valid), or an even simpler two signal interface – Clock and Data. The PCIe4-SIO8BX2V-SYNC allows the serial interface to be further customized with the following user configurable options:

- Clocking Data on either rising or falling edge of the clock
- Active Hi or Active Lo polarity for the Envelope Signal
- NRZ (Level) or NRZB (Inverted Level) Data Encoding
- Clock and/or Data may be configured high or low while idle
- Transmit Word Size may be configured from 1 to 64k bits (consecutive bit count)
- Transmit Gap Size (clocks between words) can be configured from 0 to 64k bits
- Data may be transmitted MSB first or LSB first (8-bit or less word size).
- Transmit Clock may be configured from 10MHz down to 50Hz on a per channel basis
- Auxiliary Clock input from cable may be used as Transmit Clock
- Transmit and Receive direction may be defined as DTE or DCE for each channel

Serial Signals:

- TxC - (Out) Transmit Clock
- TxD - (Out) Transmit Data
- TxE - (Out) Transmit Envelope (Data Valid)
- RxC - (In) Receive Clock
- RxD - (In) Receive Data
- RxE - (In) Receive Envelope (Data Valid)
- AuxC - (In/Out) Auxiliary Clock
- Spare - (In/Out) Spare General Purpose IO (May also be used as interrupt input)

The location of the transmit signals (TxC/TxD/TxE) and receive signals (RxC/RxD/RxE) on the cable may be swapped via software by setting DTE/DCE mode.

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Power Requirements (@25° C):

- +3.3VDC ± 0.2 VDC at 2.3 Amps Max (typical 1.5 Amps)
- +12VDC ± 0.2 VDC at 0.05 Amps Max (typical 0.03 Amps)
- Typical Total Power Dissipation: ~6.W

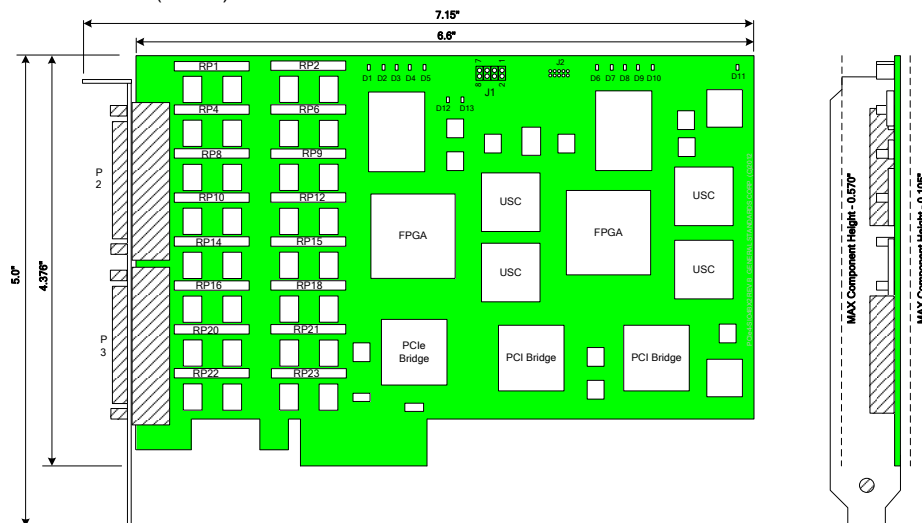
PCIe Compatibility:

- PCI Express Base Specification (Revision 1.1)
- 4 lane PCIe support
- 512byte maximum payload support
- Lane reversal and lane polarity inversion
- End-to-end CRC (ECRC) check and generation
- Up to four outstanding memory reads
- Four, 128-byte read completion buffers
- ASPM L0s link state power management
- Legacy interrupt signaling and MSI interrupts

Physical Characteristics:

Conforms to PCIe Short Card Specification

Length: 167.65 mm (6.600")
 Width: 111.15 mm (4.376")



Environmental Specifications:

Ambient Temperature Range: Operating: 0° to +70° C (Commercial Option)
 -40° to +85° C (Industrial Option)
 Storage: -40° to +85° C

Relative Humidity: Operating: 0 to 80%, non-condensing
 Storage: 0 to 95%, non-condensing

Altitude: Operation to 10,000 ft

Cooling Requirements:

Conventional air-cooling, 200 LPFM

Ordering Information:

PCIe4 – SIO8BX2V - SYNC - <Temperature>

Option	Valid Selections	Description
Temperature	<blank>	0°C to +70°C – Commercial (Standard)
	I	-40°C to +85°C – Industrial

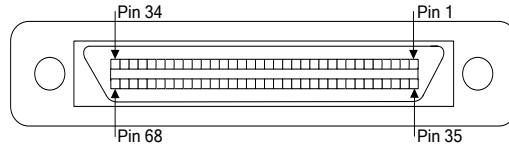
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System I/O Connections:

User I/O Connector: 68-pin VHDCI connector (receptacle)
 Part Number: TE Connectivity 5796055-1
 Mating Connector: TE Connectivity 5787131-3 (or equivalent)



Note: Protocol Mode is set on a per channel basis.

Pin #	RS422/RS485		RS232		Pin #	RS422/RS485		RS232	
	DTE	DCE	DTE	DCE		DTE	DCE	DTE	DCE
1	AUXC5+		Unused		35	AUXC7+		Unused	
2	AUXC5-		AUXC5		36	AUXC7-		AUXC7	
3	SPARE5+		Unused		37	SPARE7+		Unused	
4	SPARE5-		SPARE5		38	SPARE7-		SPARE7	
5	RXE5+	TXE5+	Unused		39	RXE7+	TXE7+	Unused	
6	RXE5-	TXE5-	RXE5	TXE5	40	RXE7-	TXE7-	RXE7	TXE7
7	RXD5+	TXD5+	Unused		41	RXD7+	TXD7+	Unused	
8	RXD5-	TXD5-	RXD5	TXD5	42	RXD7-	TXD7-	RXD7	TXD7
9	RXC5+	TXC5+	Unused		43	RXC7+	TXC7+	Unused	
10	RXC5-	TXC5-	RXC5	TXC5	44	RXC7-	TXC7-	RXC7	TXC7
11	TXE5+	RXE5+	Unused		45	TXE7+	RXE7+	Unused	
12	TXE5-	RXE5-	TXE5	RXE5	46	TXE7-	RXE7-	TXE7	RXE7
13	TXD5+	RXD5+	Unused		47	TXD7+	RXD7+	Unused	
14	TXD5-	RXD5-	TXD5	RXD5	48	TXD7-	RXD7-	TXD7	RXD7
15	TXC5+	RXC5+	Unused		49	TXC7+	RXC7+	Unused	
16	TXC5-	RXC5-	TXC5	RXC5	50	TXC7-	RXC7-	TXC7	RXC7
17	SGND5		SGND5		51	SGND3		SGND7	
18	SGND6		SGND6		52	SGND8		SGND8	
19	RXE6+	TXE6+	Unused		53	RXE8+	TXE8+	Unused	
20	RXE6-	TXE6-	RXE6	TXE6	54	RXE8-	TXE8-	RXE8	TXE8
21	RXD6+	TXD6+	Unused		55	RXD8+	TXD8+	Unused	
22	RXD6-	TXD6-	RXD6	TXD6	56	RXD8-	TXD8-	RXD8	TXD8
23	RXC6+	TXC6+	Unused		57	RXC8+	TXC8+	Unused	
24	RXC6-	TXC6-	RXC6	TXC6	58	RXC8-	TXC8-	RXC8	TXC8
25	TXE6+	RXE6+	Unused		59	TXE8+	RXE8+	Unused	
26	TXE6-	RXE6-	TXE6	RXE6	60	TXE8-	RXE8-	TXE8	RXE8
27	TXD6+	RXD6+	Unused		61	TXD8+	RXD8+	Unused	
28	TXD6-	RXD6-	TXD6	RXD6	62	TXD8-	RXD8-	TXD8	RXD8
29	TXC6+	RXC6+	Unused		63	TXC8+	RXC8+	Unused	
30	TXC6-	RXC6-	TXC6	TXC6	64	TXC8-	RXC8-	TXC8	RXC8
31	SPARE6+		Unused		65	SPARE8+		Unused	
32	SPARE6-		SPARE6		66	SPARE8-		SPARE8	
33	AUXC6+		Unused		67	AUXC8+		Unused	
34	AUXC6-		AUXC6		68	AUXC8-		AUXC8	

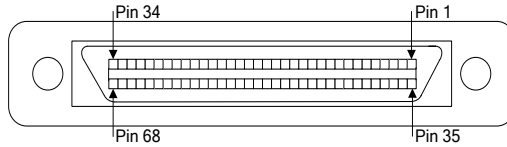
Table 1- Front Panel (P2) IO Connections

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System I/O Connections:

User I/O Connector: 68-pin VHDCI connector (receptacle)
 Part Number: TE Connectivity 5796055-1
 Mating Connector: TE Connectivity 5787131-3 (or equivalent)



Note: Protocol Mode is set on a per channel basis.

Pin #	RS422/RS485		RS232		Pin #	RS422/RS485		RS232	
	DTE	DCE	DTE	DCE		DTE	DCE	DTE	DCE
1	AUXC1+		Unused		35	AUXC3+		Unused	
2	AUXC1-		AUXC1		36	AUXC3-		AUXC3	
3	SPARE1+		Unused		37	SPARE3+		Unused	
4	SPARE1-		SPARE1		38	SPARE3-		SPARE3	
5	RXE1+	TXE1+	Unused		39	RXE3+	TXE3+	Unused	
6	RXE1-	TXE1-	RXE1	TXE1	40	RXE3-	TXE3-	RXE3	TXE3
7	RXD1+	TXD1+	Unused		41	RXD3+	TXD3+	Unused	
8	RXD1-	TXD1-	RXD1	TXD1	42	RXD3-	TXD3-	RXD3	TXD3
9	RXC1+	TXC1+	Unused		43	RXC3+	TXC3+	Unused	
10	RXC1-	TXC1-	RXC1	TXC1	44	RXC3-	TXC3-	RXC3	TXC3
11	TXE1+	RXE1+	Unused		45	TXE3+	RXE3+	Unused	
12	TXE1-	RXE1-	TXE1	RXE1	46	TXE3-	RXE3-	TXE3	RXE3
13	TXD1+	RXD1+	Unused		47	TXD3+	RXD3+	Unused	
14	TXD1-	RXD1-	TXD1	RXD1	48	TXD3-	RXD3-	TXD3	RXD3
15	TXC1+	RXC1+	Unused		49	TXC3+	RXC3+	Unused	
16	TXC1-	RXC1-	TXC1	RXC1	50	TXC3-	RXC3-	TXC3	RXC3
17	SGND1		SGND1		51	SGND3		SGND3	
18	SGND2		SGND2		52	SGND4		SGND4	
19	RXE2+	TXE2+	Unused		53	RXE4+	TXE4+	Unused	
20	RXE2-	TXE2-	RXE2	TXE2	54	RXE4-	TXE4-	RXE4	TXE4
21	RXD2+	TXD2+	Unused		55	RXD4+	TXD4+	Unused	
22	RXD2-	TXD2-	RXD2	TXD2	56	RXD4-	TXD4-	RXD4	TXD4
23	RXC2+	TXC2+	Unused		57	RXC4+	TXC4+	Unused	
24	RXC2-	TXC2-	RXC2	TXC2	58	RXC4-	TXC4-	RXC4	TXC4
25	TXE2+	RXE2+	Unused		59	TXE4+	RXE4+	Unused	
26	TXE2-	RXE2-	TXE2	RXE2	60	TXE4-	RXE4-	TXE4	RXE4
27	TXD2+	RXD2+	Unused		61	TXD4+	RXD4+	Unused	
28	TXD2-	RXD2-	TXD2	RXD2	62	TXD4-	RXD4-	TXD4	RXD4
29	TXC2+	RXC2+	Unused		63	TXC4+	RXC4+	Unused	
30	TXC2-	RXC2-	TXC2	TXC2	64	TXC4-	RXC4-	TXC4	RXC4
31	SPARE2+		Unused		65	SPARE4+		Unused	
32	SPARE2-		SPARE2		66	SPARE4-		SPARE4	
33	AUXC2+		Unused		67	AUXC4+		Unused	
34	AUXC2-		AUXC2		68	AUXC4-		AUXC4	

Table 2- Front Panel (P3) IO Connections

General Standards Corporation assumes no responsibility for the use of any circuits in this product. No circuit patent licenses are implied. Information included herein supersedes previously published specifications on this product and is subject to change without notice.