

General Standards Corporation

High Performance Bus Interface Solutions

PCIe4-SIO8BX2-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-SIO8BX2-SYNC is an eight channel synchronous serial interface card which provides high speed, full-duplex, multi-protocol serial capability for PCIe applications. The PCIe4-SIO8BX2-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-SIO8BX2-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
- Low Force Helix (LFH) type 160 pin front edge I/O Connector
- Standard Cable to eight DB25 connectors and Custom Cables available
- Interchangeable 120Ω Termination Resistors (RS422/RS485 Mode)
- Available drivers include VxWorks, WinNT, Win2k, WinXP, Linux, and Labview
- Industrial Temperature Option Available

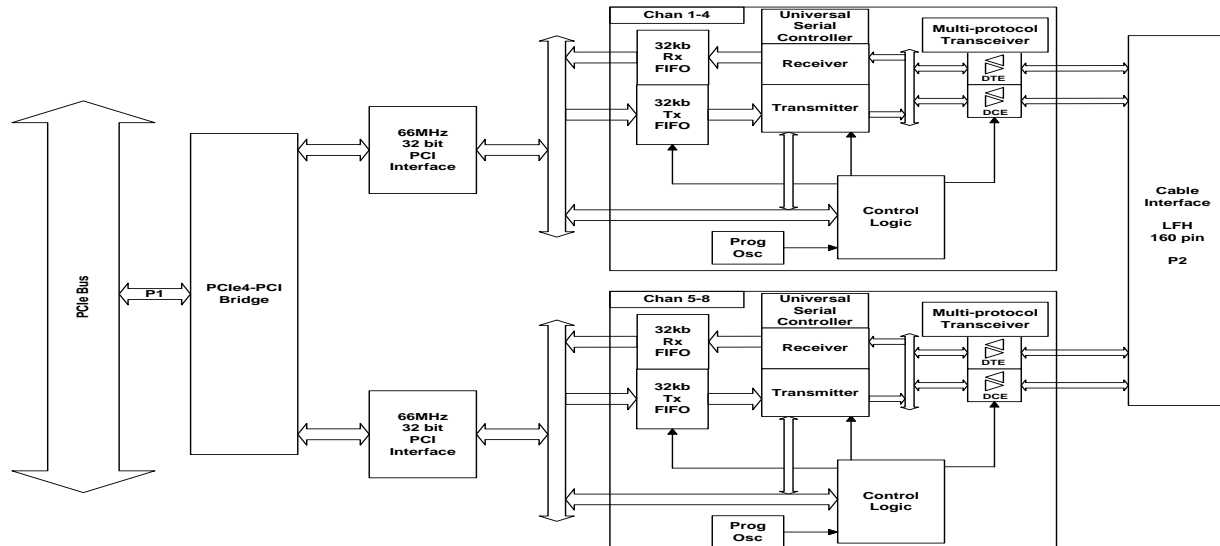
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Functional Diagram:

The PCIe4-SIO8BX2-SYNC is a high performance, eight channel serial board based on the SIO4BX2-SYNC product line from General Standards Corporation. In order to maintain software compatibility, the PCIe4-SIO8BX2-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-SIO8BX2-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

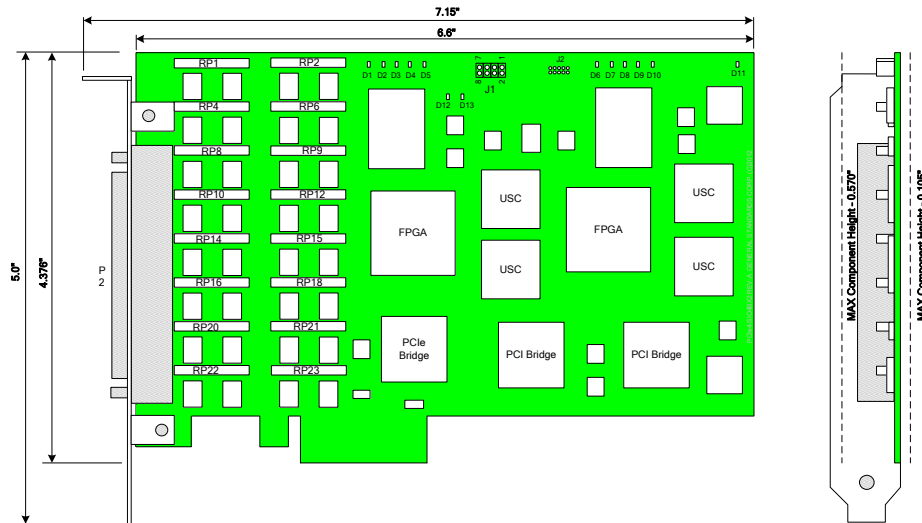
PCIe Compatibility:

- 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 – SIO8BX2 - SYNC - <Temperature>

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

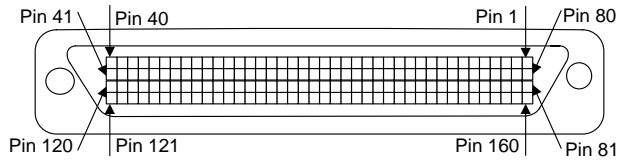
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System I/O Connections:

User Interface Connector: 160-pin LFH connector (female) - P2.
 Part Number: Molex 51-24-1040.
 Mating Connector: Molex 70984-4009 (contacts – qty 4)
 Molex 71624-3000 (housing).



Note: RS422/RS485 mode or RS232 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	TXC1+	RXC1+	Unused (Hi)		80	TXD1+	RXD1+	Unused (Hi)	
2	TXC1-	RXC1-	TXC1	RXC1	79	TXD1-	RXD1-	TXD1	RXD1
3	RXC1+	TXC1+	Unused (Hi)		78	RXD1+	TXD1+	Unused (Hi)	
4	RXC1-	TXC1-	RXC1	TXC1	77	RXD1-	TXD1-	RXD1	TXD1
5	AUXC1+		Unused (Hi)		76	SPARE1+		Unused (Hi)	
6	AUXC1-		AUXC1		75	SPARE1-		SPARE1	
7	Unused		Unused		74	RXE1+	TXE1+	Unused (Hi)	
8	Unused		Unused		73	RXE1-	TXE1-	RXE1	TXE1
9	TXE1+	RXE1+	Unused (Hi)		72	SGND1		SGND1	
10	TXE1-	RXE1-	TXE1	RXE1	71	Unused		Unused	
11	TXC2+	RXC2+	Unused (Hi)		70	Unused		Unused	
12	TXC2-	RXC2-	TXC2	RXC2	69	SGND2		SGND2	
13	RXC2+	TXC2+	Unused (Hi)		68	TXD2+	RXD2+	Unused (Hi)	
14	RXC2-	TXC2-	RXC2	TXC2	67	TXD2-	RXD2-	TXD2	RXD2
15	AUXC2+		Unused (Hi)		66	RXD2+	TXD2+	Unused (Hi)	
16	AUXC2-		AUXC2		65	RXD2-	TXD2-	RXD2	TXD2
17	Unused		Unused		64	SPARE2+		Unused (Hi)	
18	Unused		Unused		63	SPARE2-		SPARE2	
19	TXE2+	RXE2+	Unused (Hi)		62	RXE2+	TXE2+	Unused (Hi)	
20	TXE2-	RXE2-	TXE2	RXE2	61	RXE2-	TXE2-	RXE2	TXE2
21	TXC5+	RXC5+	Unused (Hi)		60	TXD5+	RXD5+	Unused (Hi)	
22	TXC5-	RXC5-	TXC5	RXC5	59	TXD5-	RXD5-	TXD5	RXD5
23	RXC5+	TXC5+	Unused (Hi)		58	RXD5+	TXD5+	Unused (Hi)	
24	RXC5-	TXC5-	RXC5	TXC5	57	RXD5-	TXD5-	RXD5	TXD5
25	AUXC5+		Unused (Hi)		56	SPARE5+		Unused (Hi)	
26	AUXC5-		AUXC5		55	SPARE5-		SPARE5	
27	Unused		Unused		54	RXE5+	TXE5+	Unused (Hi)	
28	Unused		Unused		53	RXE5-	TXE5-	RXE5	TXE5
29	TXE5+	RXE5+	Unused (Hi)		52	SGND5		SGND5	
30	TXE5-	RXE5-	TXE5	RXE5	51	Unused		Unused	
31	TXC6+	RXC6+	Unused (Hi)		50	Unused		Unused	
32	TXC6-	RXC6-	TXC6	RXC6	49	SGND6		SGND6	
33	RXC6+	TXC6+	Unused (Hi)		48	TXD6+	RXD6+	Unused (Hi)	
34	RXC6-	TXC6-	RXC6	TXC6	47	TXD6-	RXD6-	TXD6	RXD6
35	AUXC6+		Unused (Hi)		46	RXD6+	TXD6+	Unused (Hi)	
36	AUXC6-		AUXC6		45	RXD6-	TXD6-	RXD6	TXD6
37	Unused		Unused		44	SPARE6+		Unused (Hi)	
38	Unused		Unused		43	SPARE6-		SPARE6	
39	TXE6+	RXE6+	Unused (Hi)		42	RXE6+	TXE6+	Unused (Hi)	
40	TXE6-	RXE6-	TXE6	RXE6	41	RXE6-	TXE6-	RXE6	TXE6

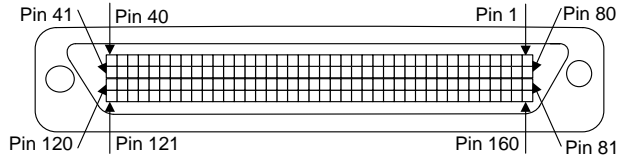
Table 1- Front Panel (P2) IO Connections

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System I/O Connections (cont):



Note: RS422/RS485 mode or RS232 mode is set on a per channel basis

Pin #	RS422/RS485		RS232		Pin #	RS422/RS485		RS232	
	DTE	DCE	DTE	DCE		DTE	DCE	DTE	DCE
81	TXD3+	RXC3+	Unused (Hi)		160	TXC3+	RXC3+	Unused (Hi)	
82	TXD3-	RXC3-	TXD3	RXD3	159	TXC3-	RXC3-	TXC3	RXC3
83	RXD3+	TXC3+	Unused (Hi)		158	RXC3+	TXC3+	Unused (Hi)	
84	RXD3-	TXC3-	RXD3	TXD3	157	RXC3-	TXC3-	RXC3	TXC3
85	SPARE3+		Unused (Hi)		156	AUXC3+		Unused (Hi)	
86	SPARE3-		SPARE3		155	AUXC3-		AUXC3	
87	RXE3+	TXE3+	Unused (Hi)		154	Unused		Unused	
88	RXE3-	TXE3-	RXE3	TXE3	153	Unused		Unused	
89	SGND3		SGND3		152	TXE3+	RXE3+	Unused (Hi)	
90	Unused		Unused		151	TXE3-	RXE3-	TXE3	RXE3
91	Unused		Unused		150	TXC4+	RXC4+	Unused (Hi)	
92	SGND4		SGND4		149	TXC4-	RXC4-	TXC4	RXC4
93	TXD4+	RXD4+	Unused (Hi)		148	RXC4+	TXC4+	Unused (Hi)	
94	TXD4 -	RXD4-	TXD4	TXD4	147	RXC4-	TXC4-	RXC4	TXC4
95	RXD4+	TXD4+	Unused (Hi)		146	AUXC4+		Unused (Hi)	
96	RXD4-	TXD4-	RXD4	TXD4	145	AUXC4-		AUXC4	
97	SPARE4+		Unused (Hi)		144	Unused		Unused	
98	SPARE4-		SPARE4		143	Unused		Unused	
99	RXE4+	TXE4+	Unused (Hi)		142	TXE4+	RXE4+	Unused (Hi)	
100	RXE4-	TXE4-	RXE4	TXE4	141	TXE4-	RXE4-	TXE4	RXE4
101	TXD7+	RXD7+	Unused (Hi)		140	TXC7+	RXC7+	Unused (Hi)	
102	TXD7-	RXD7-	TXD7-	RXD7-	139	TXC7-	RXC7-	TXC7	RXC7
103	RXD7+	TXD7+	Unused (Hi)		138	RXC7+	TXC7+	Unused (Hi)	
104	RXD7-	TXD7-	RXD7-	TXD7-	137	RXC7-	TXC7-	RXC7	TXC7
105	SPARE5+		Unused (Hi)		136	AUXC7+		Unused (Hi)	
106	SPARE7-		SPARE7		135	AUXC7-		AUXC7	
107	RXE7+	TXE7+	Unused (Hi)		134	Unused		Unused	
108	RXE7-	TXE7-	RXE7	TXE7	133	Unused		Unused	
109	SGND7		SGND7		132	TXE7+	RXE7+	Unused (Hi)	
110	Unused		Unused		131	TXE7-	RXE7-	TXE7	RXE7
111	Unused		Unused		130	TXC8+	RXC8+	Unused (Hi)	
112	SGND8		SGND8		129	TXC8-	RXC8-	TXC8	RXC8
113	TXD8+	RXD8+	Unused (Hi)		128	RXC8+	TXC8+	Unused (Hi)	
114	TXD8-	RXD8-	TXD8	RXD8	127	RXC8-	TXC8-	RXC8	TXC8
115	RXD8+	TXD8+	Unused (Hi)		126	AUXC8+		Unused (Hi)	
116	RXD8-	TXD8-	RXD8	TXD8	125	AUXC8-		AUXC8	
117	SPARE8+		Unused (Hi)		124	Unused		Unused	
118	SPARE8-		SPARE8		123	Unused		Unused	
119	RXE8+	TXE8+	Unused (Hi)		122	TXE8+	RXE8+	Unused (Hi)	
120	RXE8-	TXE8-	RXE8	TXE8	121	TXE8-	RXE8-	TXE6	RXE6

Table 1- Front Panel IO (P2) Connections (continued)

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