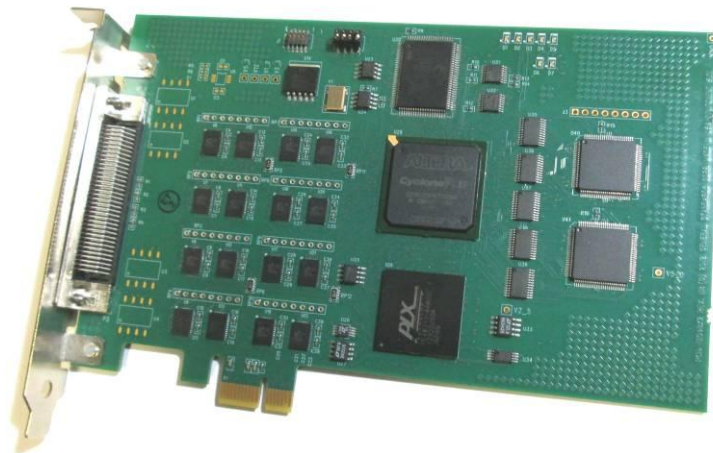


# **General Standards Corporation**

## **High Performance Bus Interface Solutions**

# **PCIe-SIO4BX2-SYNC**

**Four Channel High Performance Serial I/O PCIe Card  
Featuring RS422/RS485/RS232 Software Configurable Transceivers  
and 32K Byte FIFO Buffers (256K Byte total)**



The PCIe-SIO4BX2-SYNC is four channel synchronous serial interface card which provides high speed, full-duplex, multi-protocol serial channels for PCIe applications. The PCIe-SIO4BX2-SYNC combines a flexible serial interface, deep external FIFOs, and software selectable multi-protocol transceivers to provide four fully independent synchronous serial channels. These features, along with a high performance one lane PCIe interface engine, give the PCIe-SIO4BX2-SYNC unsurpassed performance in a synchronous serial interface card.

### **Features:**

- One Lane PCI Express (PCIe) Interface
- Four Independent Multi-Protocol Synchronous Serial Channels
- Independent Transmit and Receive FIFOs for each Serial Channel – 32K byte each
- Multi-protocol Transceivers support RS422/RS485, RS232
- 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
- SCSI type 68 pin front edge I/O Connector
- Standard Cable to four 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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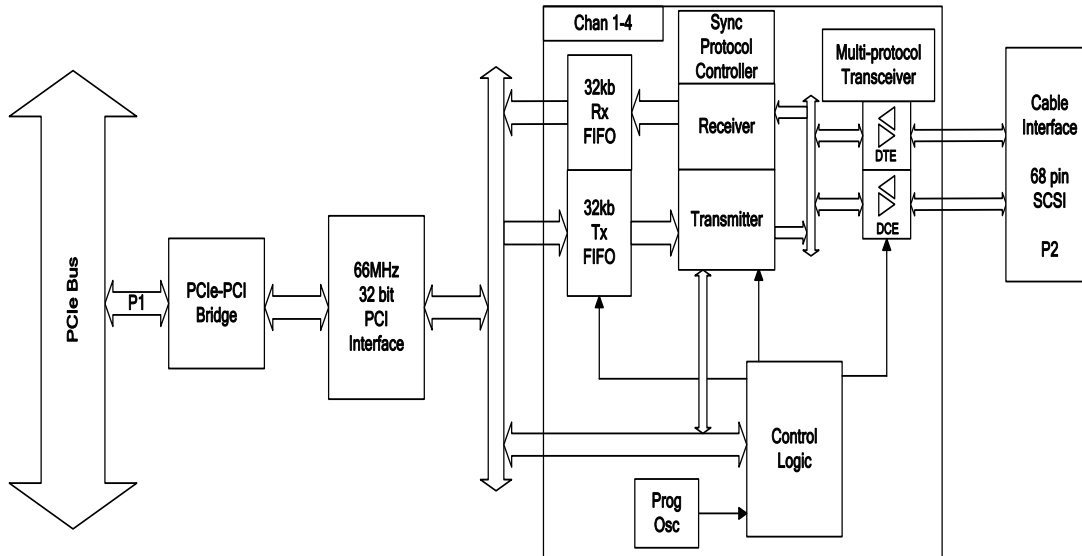
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## High Performance Bus Interface Solutions

### Functional Diagram:

The PCIe-SIOBX2-SYNC is a high performance, four channel serial board based on the SIO4BX-SYNC product line from General Standards Corporation. The PCIe-SIO4BX2-SYNC has a one lane PCIe interface, multi-protocol transceivers, and 68 Pin SCSI Front Panel IO Connector.



### 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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## High Performance Bus Interface Solutions

### Power Requirements (@25° C):

- +3.3VDC ± 0.2 VDC at 1.5 Amps Max (typical 1.1 Amps)
- +12VDC ± 0.2 VDC at 0.05Amps Max (typical 0.03 Amps)
- Typical Total Power Dissipation: ~4W

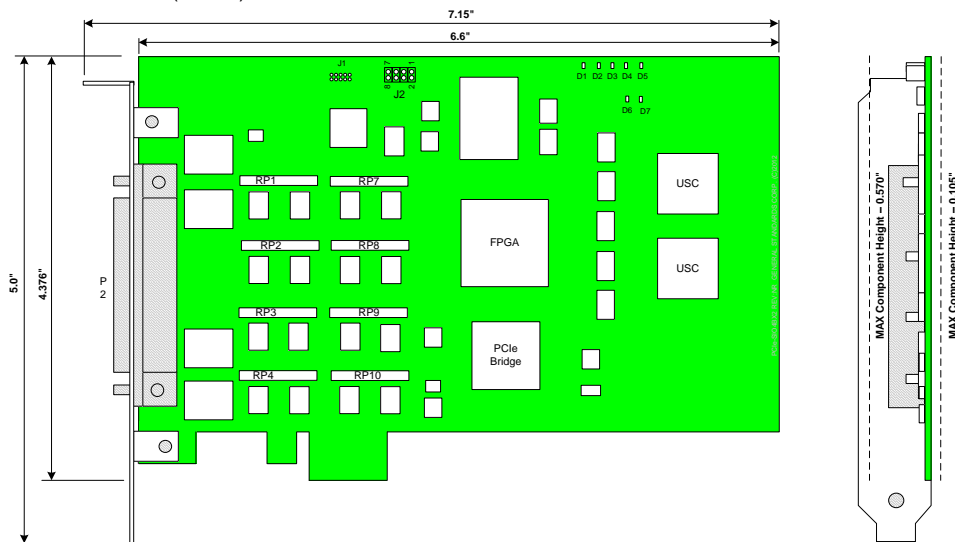
### PCIe Compatibility:

- PCI Express Base Specification (Revision 1.1)
- 1 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:

PCIe – SIO4BX2 - SYNC - <Temperature>

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

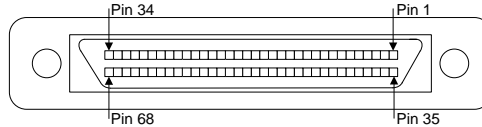
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## High Performance Bus Interface Solutions

### System I/O Connections:

User I/O Connector: 68-pin SCSI connector (female) (P2)  
 Part Number: AMP/TYCO 787170-7  
 Mating Connector: AMP/TYCO 749111-6 (or equivalent)



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

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

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