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CXM-SIO3

Extension for the Serial Ports
of the CXC Interface

Manual Order Nr. 14411
User's Manual
Issue 3

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This PepCard product is carefully designed for a long and fault-free life; nonetheless, its life expectancy can be drastically reduced by improper treatment during unpacking and installation.

Observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings, etc. If the product contains batteries for RTC or memory back-up, ensure that the board is not placed on conductive surfaces, including anti-static plastics or sponges. These can cause shorts and damage to the batteries or tracks on the board.

When installing the board, switch off the power mains to the chassis. Do not disconnect the mains as the ground connection prevents the chassis from static voltages, which can damage the board as it is inserted.

Furthermore, do not exceed the specified operational temperature ranges of the board version ordered. If batteries are present, their temperature restrictions must be taken into account.

Keep all of the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the board, re-pack it as it was originally packed.

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REVISION HISTORY
CXM-SIO3 User's Manual

Issue	Brief Description of Changes	PCB Index	Date of Issue
1	First Issue	00/1	December, 1995
2	Information on other CXM-SIO3 versions added	00/1	February, 1996
3	Redundant SI piggzback information removed		March, 1995

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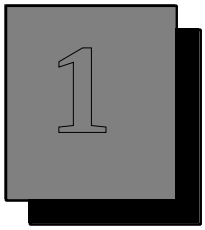
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Appendix Controller eXtension Connector

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1. INTRODUCTION

1.1 Product Overview

The CXM-SIO3 is designed to interface the three serial interfaces that are available through the CXC interface on the VM42/62, VSBC-32 and IUC-32 PEP CPU boards. There are four versions currently available. They are:-

- *Module with three RJ45 connected RS232 ports (CXM-SIO3-1);*
- *Module with two RJ45 connected SC piggyback ports and one SI piggyback (CXM-SIO3-2);*
- *Module with three RJ45 connected SC piggyback ports (CXM-SIO3-3);*
- *Module with three 15-pin D-Sub connected SC piggyback ports (CXM-SIO3-4).*

In general, the interface signals TCLK, RCLK, TXD, RXD, RTS, CTS, DTR and DCD are supported by the CXM interface. Their use however, is dependent on the board version. Only one CXM-SIO3 should be used on a CXM interface as it makes use of all the serial channels available on the CXC. If combinations with other serial CXM boards are needed, a CXM-SIO3 version fitted with an SC interface should be used. This is due to the fact that a serial CXM channel that is used by a different CXM module may remain undriven and unloaded if no SC piggyback is fitted.

Two versions of the CXC connector are available. They are:-

- *CXC connector to fit the board into a CXC backplane;*
- *CXC connector, fitted at 90˚ to the board, to connect the board directly to a CPU board.*

Note

The diagrams contained in this manual only show versions of the CXM-SIO3 that are to be fitted in a CXC backplane.

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1.2 Ordering Information

Name	Description	Order No
CXM-SIO3-1	CXM module with 3 RJ45 connected RS232 ports for use with a CXC backplane	14379
CXM-SIO3-1	CXM module with 3 RJ45 connected RS232 ports, compatible for direct connection to a CPU board	13692
CXM-SIO3-2	CXM module with 2 RJ45 connected SC piggyback ports and one SI piggyback interface, no front panel (*delivered with SI piggyback*) for use with a CXC backplane	14380
CXM-SIO3-2	CXM module with 2 RJ45 connected SC piggyback ports and one SI piggyback interface, no front panel (*delivered with SI piggyback*), compatible for direct connection to a CPU board	13693
CXM-SIO3-3	CXM module with 3 RJ45 connected SC piggyback ports for use with a CXC backplane	14381
CXM-SIO3-3	CXM module with 3 RJ45 connected SC piggyback ports, compatible for direct connection to a CPU board	13694
CXM-SIO3-4	CXM module with 3 15-pin D-Sub connected SC piggyback ports, 8HP front panel for use with a CXC backplane	14382
CXM-SIO3-4	CXM module with 3 15-pin D-Sub connected SC piggyback ports, 8HP front panel, compatible for direct connection to a CPU board	13695
Cable SM-RS232-9	3 meters with 9-pin D-Sub (female) and RJ45 connectors for PC	10890
Cable SM-RS232-MOD	3 meters with 25-pin D-Sub (male) and RJ45 connectors for Modem	10891
SI-485-ISO	RS485 optoisolated interface piggyback for 2 wire half-duplex (PROFIBUS) connection with 9-pin D-Sub connector	14383

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All available SC piggybacks may be used, such as SC-232CCM, SC-422E, SC-CLOOP, SC-485F, SC-PFI, SC232X21, SC-232I and SC-485I. It should be noted that some SC piggybacks need more than 8 signals available to the RJ45 connector, so a CXM-SIO3 with a 15-pin D-Sub connector must be used.

SC-xxx	RJ45	15-pin D-Sub
SC-232CCM	*	*
SC-422E		*
SC-CLOOP	*	*
SC-485F	*	*
SC-PFI		*
SC-232X21		*
SC-232I	*	*
SC-485I	*	*

1.3 Glossary of Terms

RxD	*Receive data*
TxD	*Transmit data*
RTS	*Ready to send*
CTS	*Clear to send*
DTR	*Data terminal ready*
DCD	*Data carrier detect*
TCLK	*Transmit clock*
RCLK	*Receive clock*
CXM	*Controller extension module*
CXC	*Controller extension connector*
SI Piggyback	*Serial interface piggyback used by the CPU boards VM42/62, VSBC-32 and IUC-32*
SC Piggyback	*Serial interface piggyback used by the CPU boards IUC, VIUC, VSBC-4, VM20, VM30, VM40 and others*

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1.4 Specifications

Power supply	+5V DC via CXC
Supply current	Dependent on board version and piggyback(s) used
Operating temperature	0 .. +70˚C *Standard* -40˚C .. +85˚C *Extended*
Storage temperature	-55˚C .. +85˚C
Operating humidity	0 .. 95%, non-condensing
Identification byte	None required
Serial channels	MC68(EN)360 SCC2, SCC3, SCC4 via CXC
Supported signals	TCLK, RCLK, TXD, RXD, RTS, CTS, DTR, DCD *Use of signals dependent on board type*
MAX232A Specifications (*CXM-SIO3-1 only*)	
Data transfer rate	Typ. 200 kBaud
Max. signal input voltage	± 30V *For more details, please refer to the MAXIM data sheet*

Notes

- The board cannot be used with the actual version of the the following backplanes:
  - *CXC 5S*
  - *CXC 8S*
  - *CXC 8E*
  - *CXC 8ES*

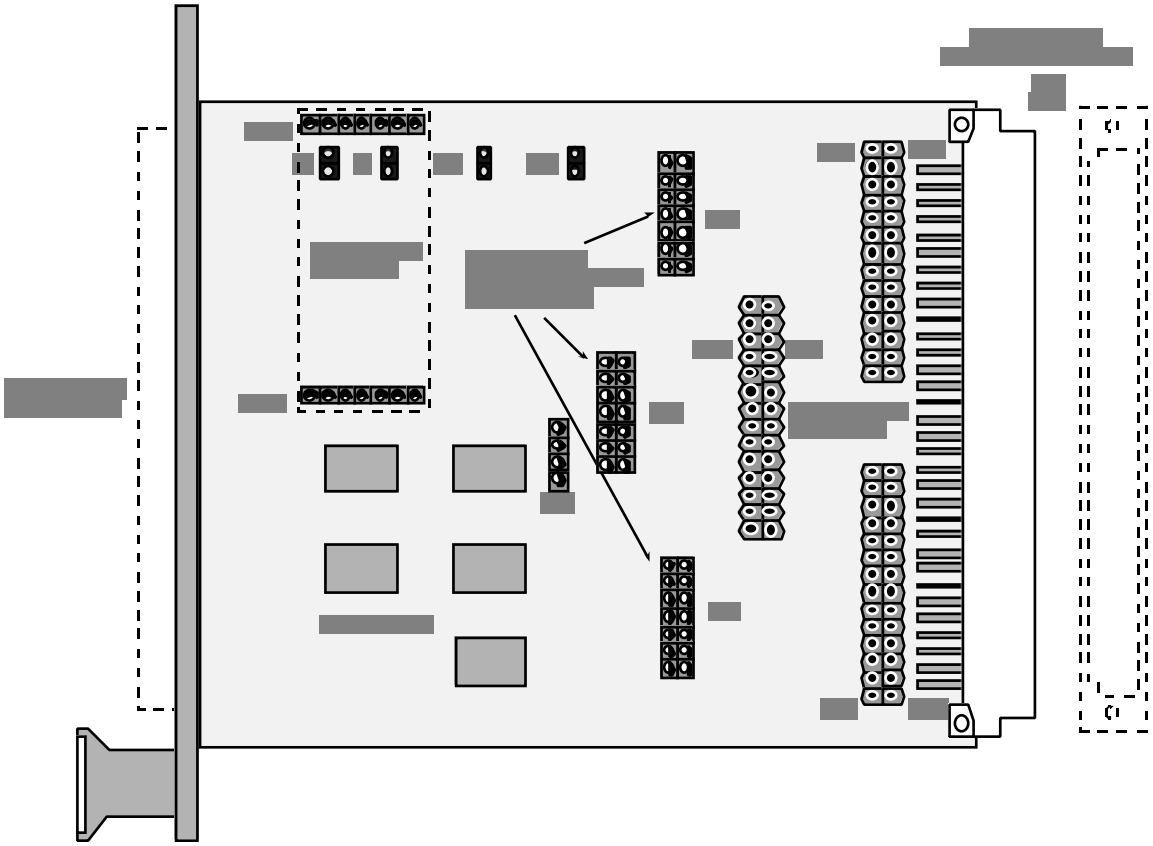
- The board has been designed to be used in conjunction with CPU boards based on the 68(EN)360. It is also fully compatible with the CXC interface. It can be used with CPU boards based on the 68302 but makes no sense, as only ONE serial channel (SCC2) is usable through the CXC on these boards. These needs are provided by other CXM boards, such as the CXM-SCC2, CXM-STAT2 etc.

  The CXM-SIO3 should, therefore, not be used with the VM30, VIUC, VSBC-4 and IUC boards.

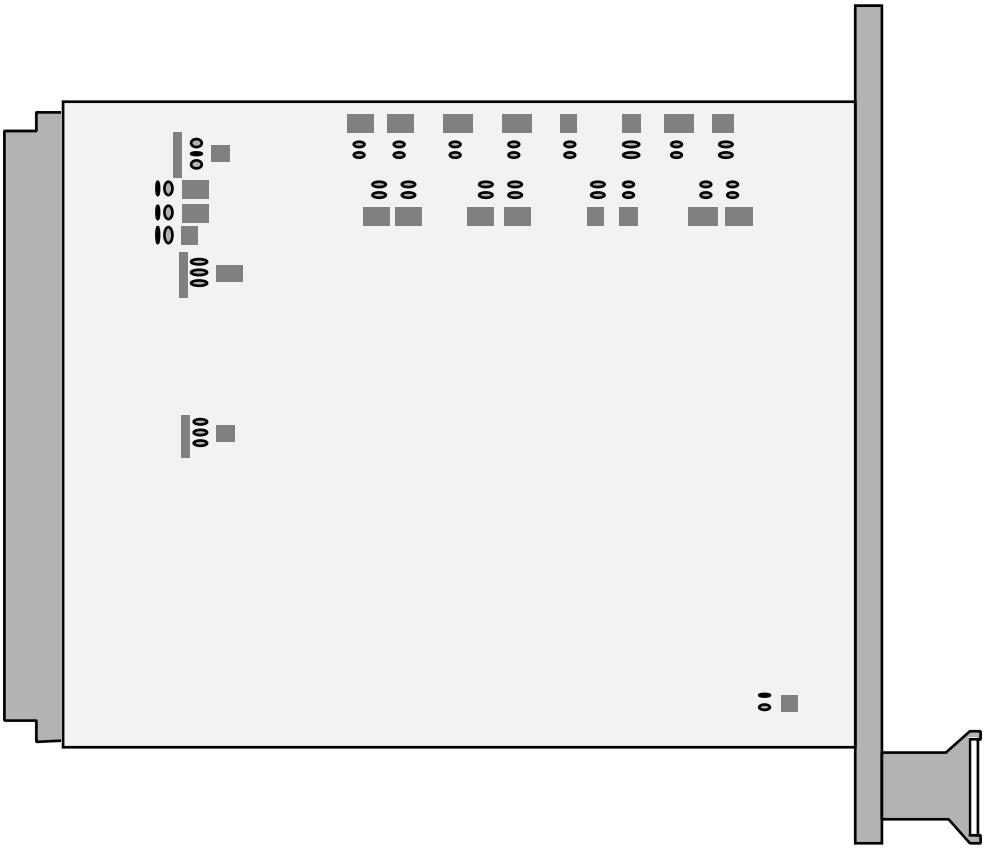
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1.5 Board Overview

Component Side



Solder Side



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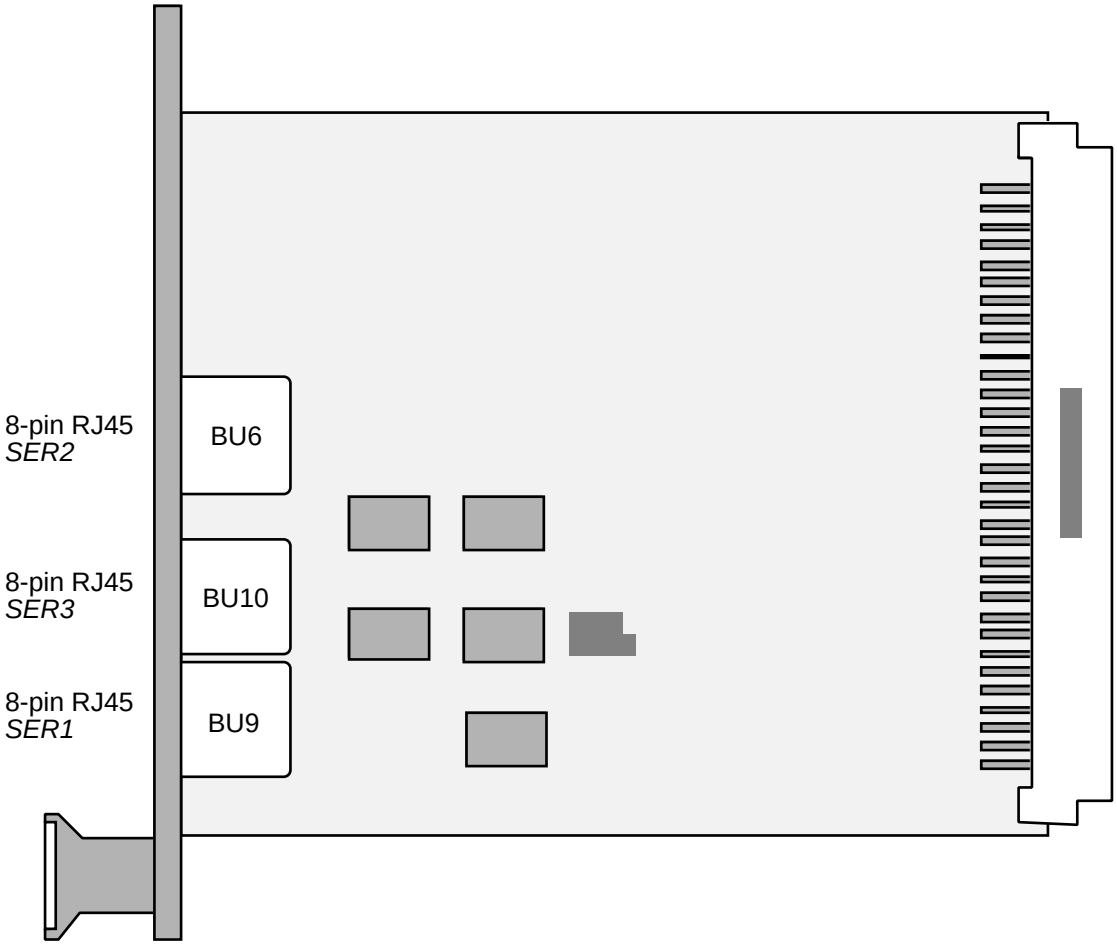
2. CXM-SIO3-1

2.1 Introduction

The CXM-SIO3-1 consists of three serial channels realized using MAX232A transceiver chips. The signals RXD, TXD, RTS, CTS, DTR and CD are supported via an RJ45 connector.

2.2 Board Overview

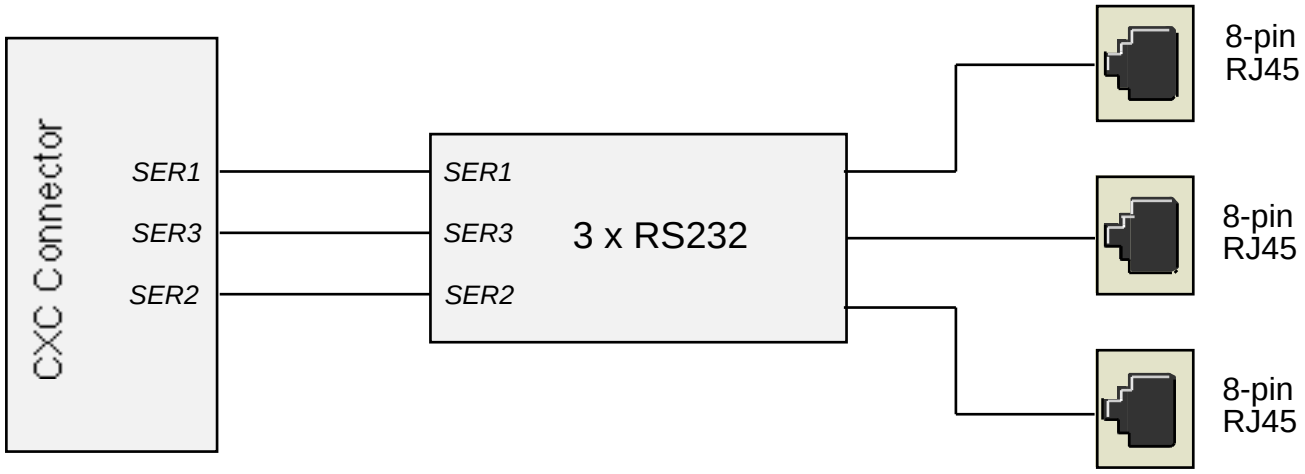
Component Side



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2.3 Functional Description

Figure 2.3.0.1: CXM-SIO3-1 Block Diagram



CXC Name	68(EN)360 Channel
SER1	SCC2
SER2	SCC3
SER3	SCC4

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2.3.1 Signal Reference to Controller and Connector

Serial Port 1 (*SER1*)

This port is connected to BU6 via the serial RS232 interface.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC2)
SCC1_0	SER1_TCLK	PA10/CLK3/BRGO2/L1TCLKA/TIN2
SCC1_1	SER1_RCLK	PA8/CLK1/BRGO1/L1RCLKA/TIN1
SCC1_2	*User Defined*	PB10/SMTXD2/L1CLKOB
SCC1_3	SER1_CD	PC7/CD2/TGATE2
SCC1_4	SER1_CTS	PC6/CTS2
SCC1_5	SER1_RTS	PB13/RTS2/L1ST2
SCC1_6	SER1_RXD	PA2/RXD2
SCC1_7	SER1_TXD	PA3/TXD2
PB0	SER1_DTR	PB17/RSTRT1/STRBI

Serial Port 2 (*SER2*)

This port is connected to BU9 via the serial RS232 interface.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC3)
SCC2_0	SER2_TCLK	PA12/CLK5/BRGO3/TIN3
SCC2_1	SER2_RCLK	PA13/CLK6/TOUT3/L1RCLKB/BRGCLK2
SCC2_2	*User Defined*	PB7/SMTXD1/DONE2
SCC2_3	SER2_CD	PC9/CD3/L1RSYNCB
SCC2_4	SER2_CTS	PC8/CTS3/L1TSYNCB/SDACK2
SCC2_5	SER2_RTS	PB14/RTS3/L1RQB/L1ST3
SCC2_6	SER2_RXD	PA4/RXD3/L1TXDB
SCC2_7	SER2_TXD	PA5/TXD3/L1RXDB
PB2	SER2_DTR	PB16/BRGO3/STRBO

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Serial Port 3 (*SER3*)

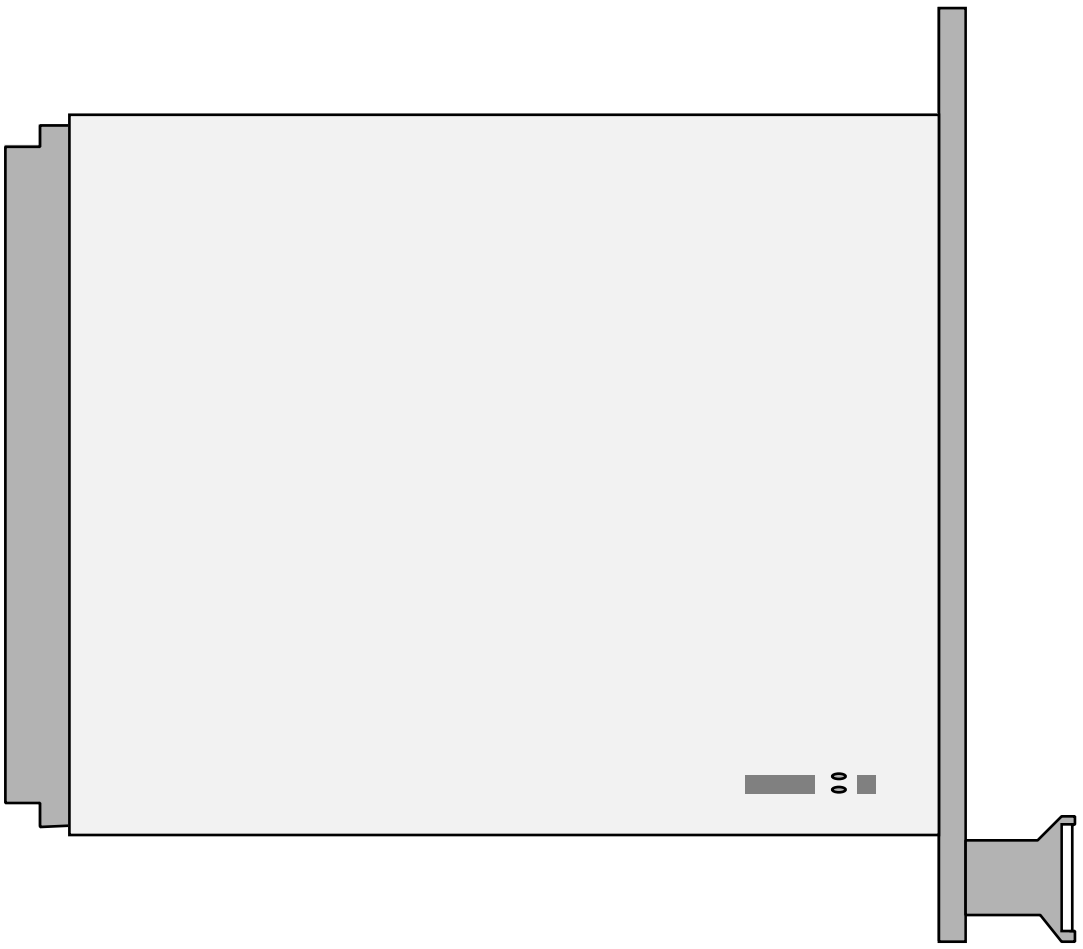
This port is connected to BU10 via the serial RS232 interface.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC4)
SCC3_0	SER3_TCLK	PA14/CLK7/BRGO4/TIN4
SCC3_1	SER3_RCLK	PA15/CLK8/TOUT4/L1TCLKB
SCC3_2	*User Defined*	PB11/SMRXD2/LTCLKOA
SCC3_3	SER3_CD	PC11/CD4/L1RSYNCA
SCC3_4	SER3_CTS	PC10/CTS4/L1TSYNCA/SDACK1
SCC3_5	SER3_RTS	PB15/RTS4/L1RQA/L1ST4
SCC3_6	SER3_RXD	PA6/RXD4/L1TXDA
SCC3_7	SER3_TXD	PA7/TXD4/L1RXDA
PB1	SER3_DTR	PB9/SMSYN2/DACK2

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2.4 Configuration

Figure 2.4.0.1: CXM-SIO3-1 Jumper Layout (Solder Side)



Note

The jumper (J6) may be closed by soldering or using a 0805 0Ω resistor.

2.4.1 Jumper J6: Front panel / Shield Connection

The front panel and shield of all connectors is routed to this jumper, where they may be connected to GND. The default setting is open, as only one shield to GND connection per system is recommended in order to minimize hum.

Setting	Description	
Open	*Shield isolated from GND*	*Default*
Set	Shield connected to GND	

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2.5 Pinouts

2.5.1 CXC Connector (ST1)

Two versions of the CXC connector are available, with identical pinouts. They are:-

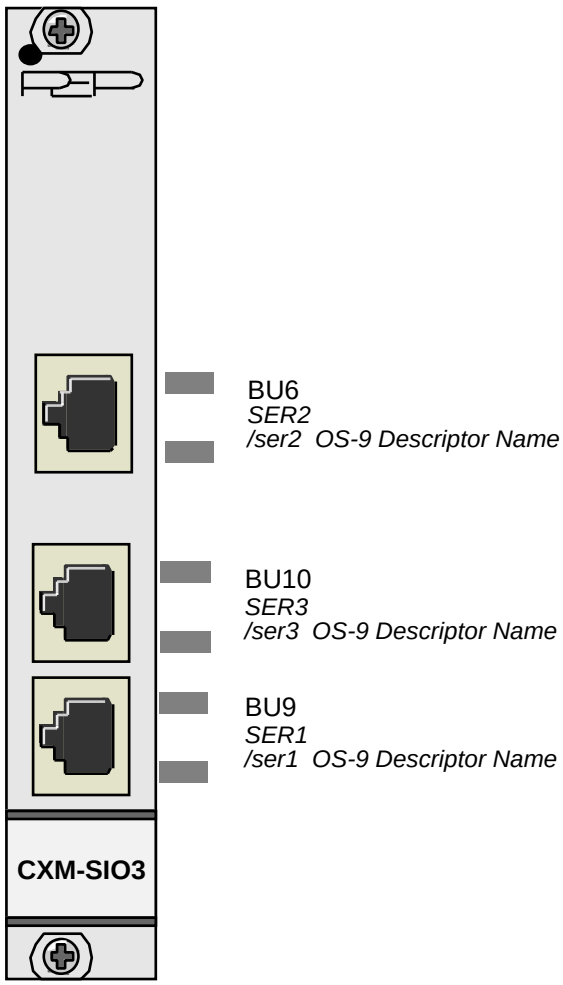
- *CXC connector to fit the board into a CXC backplane;*
- *CXC connector, fitted at 90˚ to the board, to connect the board directly to a CPU board.*

For CXC connector pinouts, please refer to the *CXC Appendix*.

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2.5.2 Front Panel Connectors

Figure 2.5.2.1: CXM-SIO3-1 Front Panel



8-pin RJ45 Serial Interface Connector (BU6, BU9 and BU10)

Pin Nr.	Signal
1	*Not Connected*
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	DTR

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3. CXM-SIO3-2

3.1 Introduction

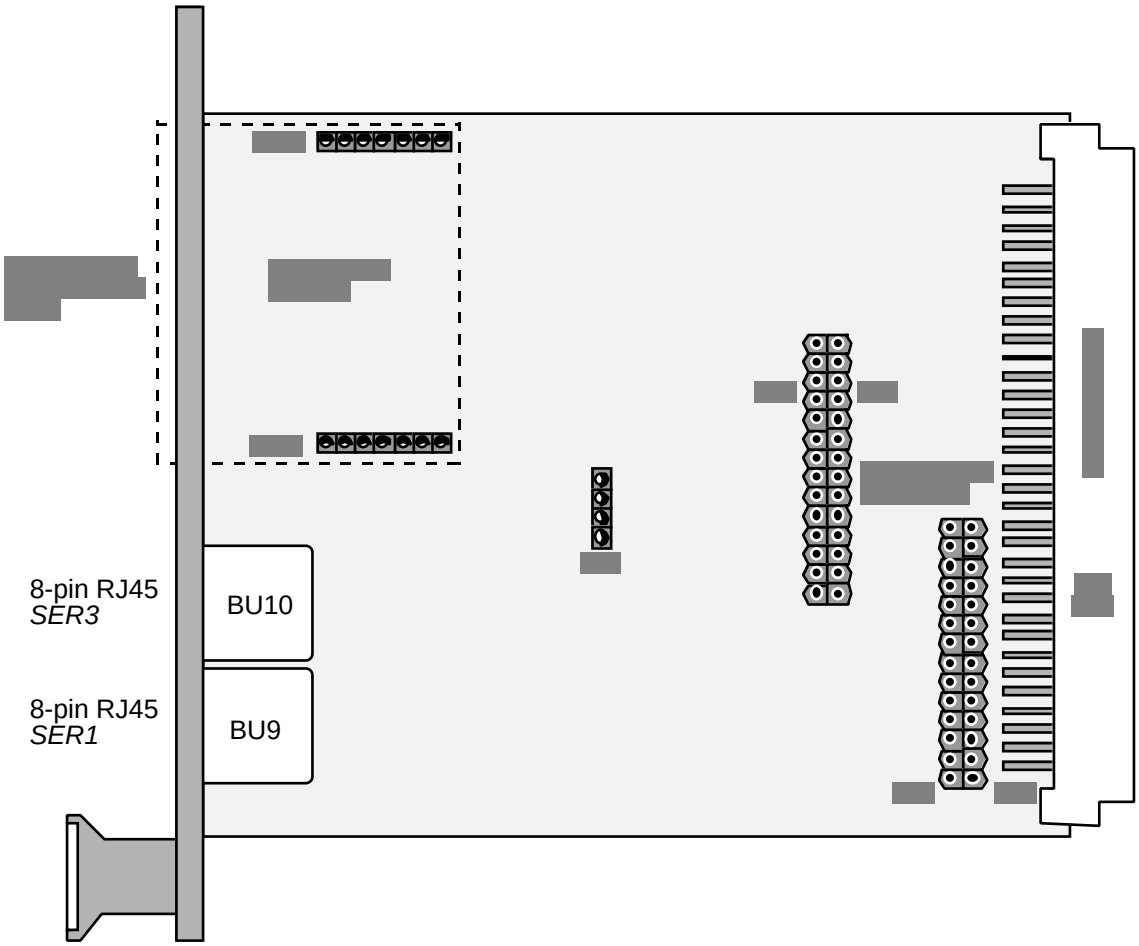
The CXM-SIO3-2 consists of two serial channels realized using SC piggybacks routed to RJ45 connectors, and one serial channel routed to the SI piggyback interface.

The CXM-SIO3-2 is not delivered with a front panel, as this is part of the SI-485-ISO piggyback delivery.

The whole range of SC piggybacks can be fitted to the CXM-SIO3-2. However, as the RJ45 connectors have eight pins available, it only makes sense to fit SC piggybacks that have up to eight interface lines, such as SC-232CCM, SC-CLOOP or SC-485F. For those SC piggybacks that use more than eight interface lines, the CXM-SIO3-4 version of the board should be used, as the interface lines are routed to 15-pin D-Sub connectors. For more details, please refer to the *CXM-SIO3-4* chapter in this manual.

3.2 Board Overview

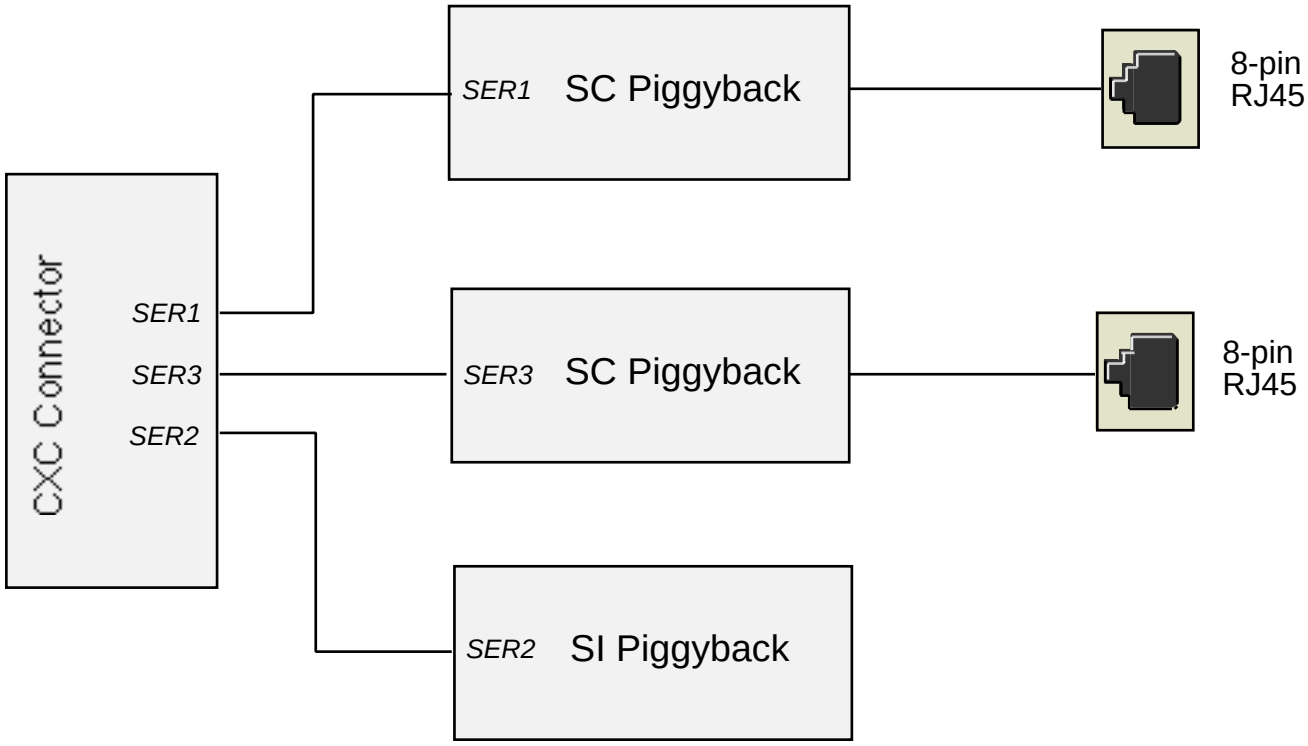
Component Side



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3.3 Functional Description

Figure 3.3.0.1: CXM-SIO3-2 Block Diagram



CXC Name	68(EN)360 Channel
SER1	SCC2
SER2	SCC3
SER3	SCC4

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3.3.1 Signal Reference to Controller and Connector

Serial Port 1 (*SER1*)

This port is routed to BU9 via the SC piggyback connector BU2/3.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC2)
SCC1_0	SER1_TCLK	PA10/CLK3/BRGO2/L1TCLKA/TIN2
SCC1_1	SER1_RCLK	PA8/CLK1/BRGO1/L1RCLKA/TIN1
SCC1_2	*User Defined*	PB10/SMTXD2/L1CLKOB
SCC1_3	SER1_CD	PC7/CD2/TGATE2
SCC1_4	SER1_CTS	PC6/CTS2
SCC1_5	SER1_RTS	PB13/RTS2/L1ST2
SCC1_6	SER1_RXD	PA2/RXD2
SCC1_7	SER1_TXD	PA3/TXD2
PB0	SER1_DTR	PB17/RSTRT1/STRBI

Serial Port 2 (*SER2*)

This port is routed to the SI connector.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC3)
SCC2_0	SER2_TCLK	PA12/CLK5/BRGO3/TIN3
SCC2_1	SER2_RCLK	PA13/CLK6/TOUT3/L1RCLKB/BRGCLK2
SCC2_2	*User Defined*	PB7/SMTXD1/DONE2
SCC2_3	SER2_CD	PC9/CD3/L1RSYNCB
SCC2_4	SER2_CTS	PC8/CTS3/L1TSYNCB/SDACK2
SCC2_5	SER2_RTS	PB14/RTS3/L1RQB/L1ST3
SCC2_6	SER2_RXD	PA4/RXD3/L1TXDB
SCC2_7	SER2_TXD	PA5/TXD3/L1RXDB
PB2	SER2_DTR	PB16/BRGO3/STRBO

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Serial Port 3 (*SER3*)

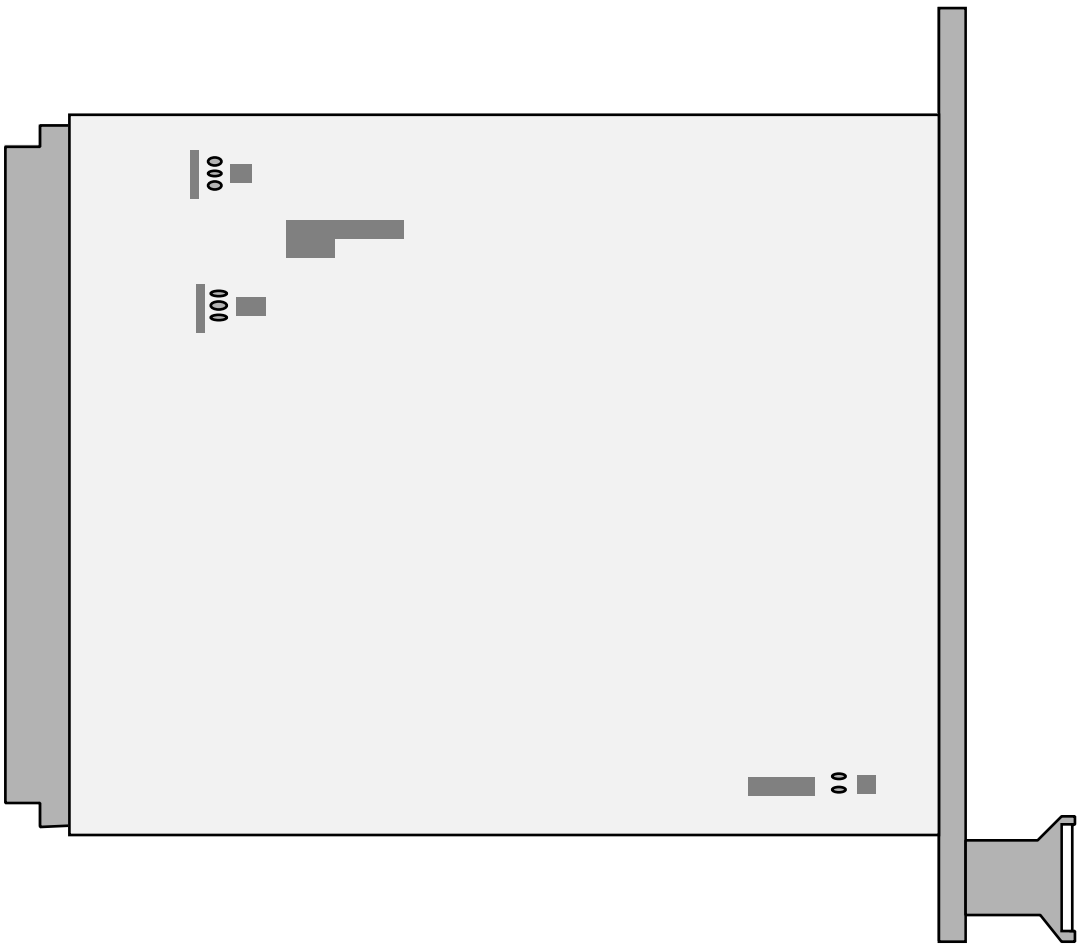
This port is routed to BU10 via the SC piggyback connector BU7/8.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC4)
SCC3_0	SER3_TCLK	PA14/CLK7/BRGO4/TIN4
SCC3_1	SER3_RCLK	PA15/CLK8/TOUT4/L1TCLKB
SCC3_2	*User Defined*	PB11/SMRXD2/LTCLKOA
SCC3_3	SER3_CD	PC11/CD4/L1RSYNCA
SCC3_4	SER3_CTS	PC10/CTS4/L1TSYNCA/SDACK1
SCC3_5	SER3_RTS	PB15/RTS4/L1RQA/L1ST4
SCC3_6	SER3_RXD	PA6/RXD4/L1TXDA
SCC3_7	SER3_TXD	PA7/TXD4/L1RXDA
PB3	SER3_DTR	PB9/SMSYN2/DACK2

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3.4 Configuration

Figure 3.4.0.1: CXM-SIO3-2 Jumper Layout (Solder Side)



Note

The above jumpers may be closed by soldering or using a 0805 0Ω resistor.

3.4.1 Jumper J6: Front panel / Shield Connection

The front panel and shield of all connectors is routed to this jumper, where they may be connected to GND. The default setting is open, as only one shield to GND connection per system is recommended in order to minimize hum.

Setting	Description	
Open	*Shield isolated from GND*	*Default*
Set	Shield connected to GND	

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3.4.2 Jumpers J8 and J10: Clocks to SC Piggybacks

The CXM interface provides two clock lines (TCLK and RCLK). In order to connect one of these lines to an SC piggyback, which has one pin available for clock connection, the jumpers J8 and J10 are fitted.

Jumper J8

This jumper provides clock connection to the SC piggyback using the SER1 channel (*BU2/3 routed to BU9*).

Setting	Description
1-2	SER1_TCLK
1-3	SER1_RCLK

Jumper J10

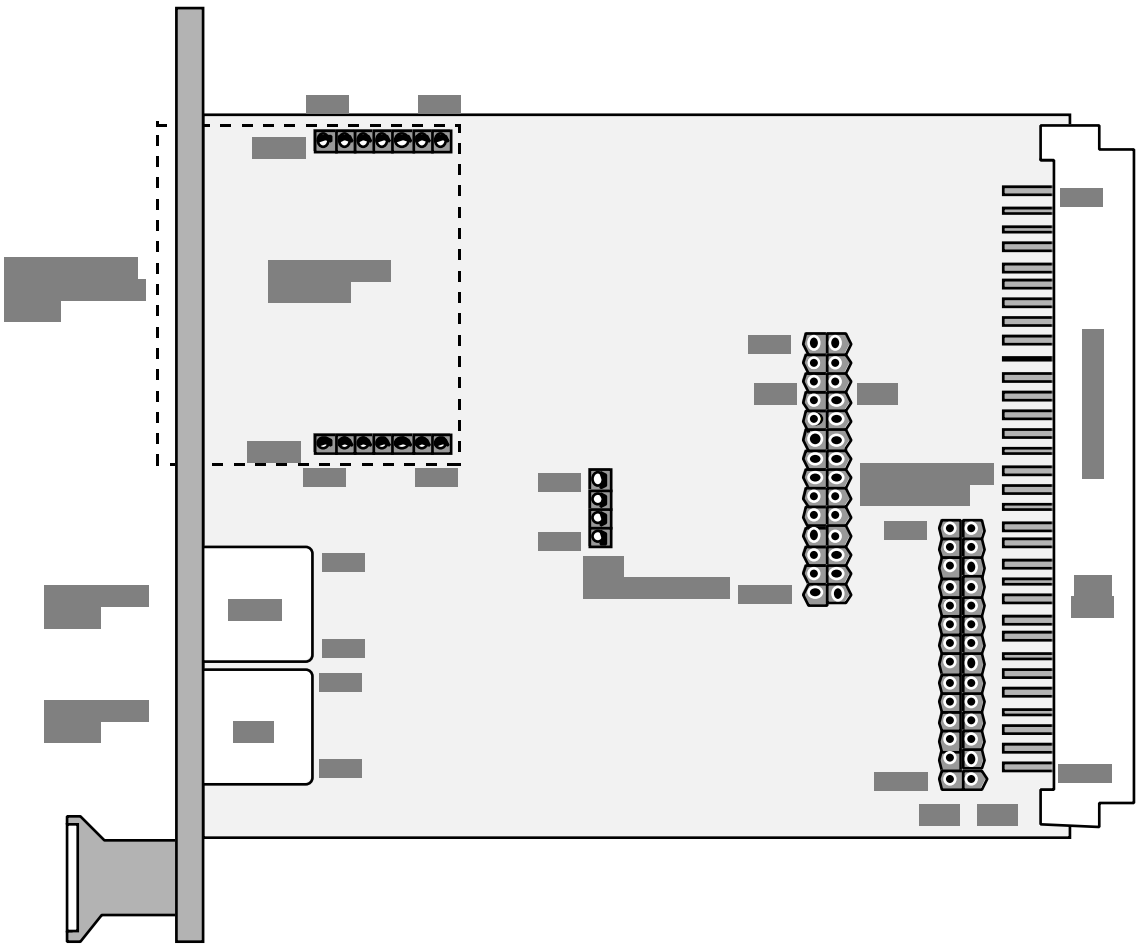
This jumper provides clock connection to the SC piggyback using the SER3 channel (*BU7/8 routed to BU10*).

Setting	Description
1-2	SER3_TCLK
1-3	SER3_RCLK

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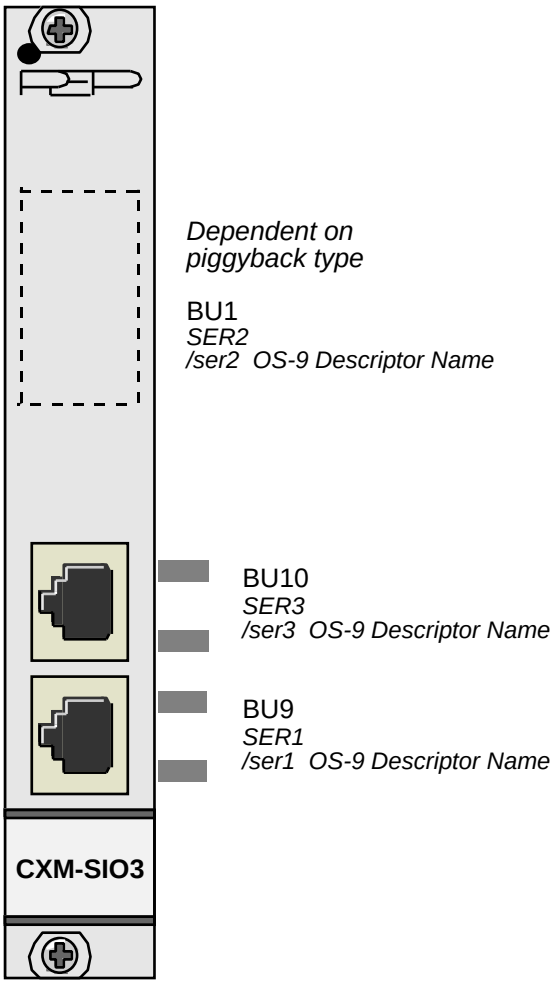
3.5 Pinouts

Figure 3.5.0.1: CXM-SIO3-2 Main Board Connectors



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Figure 3.5.0.2: CXM-SIO3-2 Front Panel



3.5.1 CXC Connector (ST1)

Two versions of the CXC connector are available, with identical pinouts. They are:-

- *CXC connector to fit the board into a CXC backplane;*
- *CXC connector, fitted at 90˚ to the board, to connect the board directly to a CPU board.*

For CXC connector pinouts, please refer to the *CXC Appendix*.

3.5.2 External Power Supply (ST6)

This connector has been designed to be used as an external +12V supply for the AUI interface.

Pin Nr.	Signal
1	GND
2	External +12V
3	External +12V
4	GND

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3.5.3 SC Piggyback Connector (System Side)

Connector BU3

Pin Nr.	CXC Generic Name	Schematic Signal Name
1	GND	System GND
2	Vcc	VCC
3	---	RTXC1 (jumpered to TCLK/RCLK)
4	SER1_RXD	SCC1_6
5	SER1_TXD	SCC1_7
6	SER1_DTR	PB0
7	SER1_RTS	SCC1_5
8	SER1_CTS	SCC1_4
9	SER1_CD	SCC1_3
10	---	*Not Connected*
11	---	*Not Connected*
12	---	*Not Connected*
13	---	*Not Connected*
14	---	*Not Connected*

Connector BU8

Pin Nr.	CXC Generic Name	Schematic Signal Name
1	GND	System GND
2	Vcc	VCC
3	---	RTXC3 (jumpered to TCLK/RCLK)
4	SER3_RXD	SCC3_6
5	SER3_TXD	SCC3_7
6	SER3_DTR	PB1
7	SER3_RTS	SCC3_5
8	SER3_CTS	SCC3_4
9	SER3_CD	SCC3_3
10	---	*Not Connected*
11	---	*Not Connected*
12	---	*Not Connected*
13	---	*Not Connected*
14	---	*Not Connected*

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3.5.4 SC Piggyback Connector (Process Side)

BU2 (SCC1) is routed to BU9 (RJ45 connector)
BU7 (SCC3) is routed to BU10 (RJ45 connector)

The pinouts on a particular front panel connector are dependent on the SC piggyback that is fitted to the relevant SC socket.

SC-232CCM

SC Pin Nr.	RJ45 Pin Nr.	Piggyback Signal
1	6	EDCD
2		*Not Connected*
3	3	System GND
4		*Not Connected*
5		EDSR
6		*Not Connected*
7	2	ERTS
8		EFREE
9	7	ECTS
10		*Not Connected*
11	5	ERXD
12	8	EDTR
13	4	ETXD
14		*Not Connected*

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SC-CLOOP

SC Pin Nr.	RJ45 Pin Nr.	Piggyback Signal
1	6	*Not Connected*
2		*Not Connected*
3	3	EGND*
4		*Not Connected*
5		*Not Connected*
6		*Not Connected*
7	2	*Not Connected*
8		*Not Connected*
9	7	*Not Connected*
10		*Not Connected*
11	5	ERxD
12	8	*Not Connected*
13	4	ETxD
14		*Not Connected*

* EGND is process side GND, isolated from system GND.

SC-485F

SC Pin Nr.	RJ45 Pin Nr.	Piggyback Signal
1	6	*Not Connected*
2		*Not Connected*
3	3	System GND
4		*Not Connected*
5		VCC
6		*Not Connected*
7	2	DTR
8		*Not Connected*
9	7	RT-
10		*Not Connected*
11	5	CTS
12	8	*Not Connected*
13	4	RT+
14		*Not Connected*

If an external supply is required for termination, the SC-485F must be connected using the 16-pin connector (ST2, ST4). These connectors are detailed in the *CXM-SIO3-4* chapter in this manual.

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SC-485I

SC Pin Nr.	RJ45 Pin Nr.	Piggyback Signal
1	6	*Not Connected*
2		*Not Connected*
3	3	GNDI*
4		*Not Connected*
5		VCCI
6		*Not Connected*
7	2	*Not Connected*
8		*Not Connected*
9	7	-TXRD
10		*Not Connected*
11	5	*Not Connected*
12	8	*Not Connected*
13	4	+TRxD
14		*Not Connected*

SC-232I

SC Pin Nr.	RJ45 Pin Nr.	Piggyback Signal
1	6	EDCD
2		*Not Connected*
3	3	GNDI*
4		*Not Connected*
5		*Not Connected*
6		*Not Connected*
7	2	ERTS
8		EFREE
9	7	ECTS
10		*Not Connected*
11	5	ERxD
12	8	EDTR
13	4	ETxD
14		*Not Connected*

* GNDI is process side GND, isolated from system GND.

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SC Piggyback Pinout Summary

The following Table gives a summary of the SC piggyback pinout in relation to the RJ45 pinout fitted to the front panel of the CXM-SIO3.

RJ45 Pin	SC Pin
1	*Not Connected*
2	7
3	3
4	13
5	11
6	1
7	9
8	12

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3.5.5 SI Piggyback Pinouts

The SI piggyback connector fitted to the base board only supports rows a and b of the SI interface, the signals being routed via the SER2 channel of the CXC.

Note

PEP only gives hardware and software support for the SI-485-ISO piggyback.

Connector ST5A

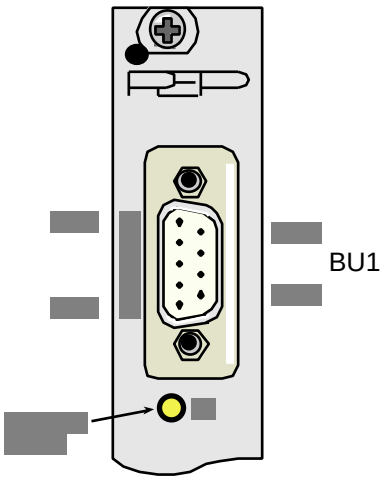
Pin Nr.	CXC Generic Name	Schematic Signal Name
1	GND	GND
2	Vcc	VCC
3	SER2_TXD	SCC2_7
4	SER2_RTS	SCC2_5
5	SER2_RCLK	SCC2_1
6	SER2_CTS	SCC2_4
7	GND	GND

Connector ST5B

Pin Nr.	CXC Generic Name	Schematic Signal Name
1	GND	GND
2	---	ST6, pin 2,3
3	SER2_RXD	SCC2_6
4	SER2_CD	SCC2_3
5	SER2_DTR	PB2
6	Vcc	VCC
7	GND	GND

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RS485 Interface (SI-485-ISO)

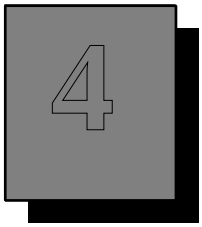


Pin Nr.	Signal	Description
1	SHIELD	Shield, Protective Ground resp.
2	RP	Reserved for power
3	RxD+/TxD+	Receive/Transmit Data +
4	CNTR+	Control +
5	DGND	Data Ground
6	VP	Voltage Plus
7	RP	Reserved for power
8	RxD-/TxD-	Receive/Transmit -
9	CNTR-	Control -

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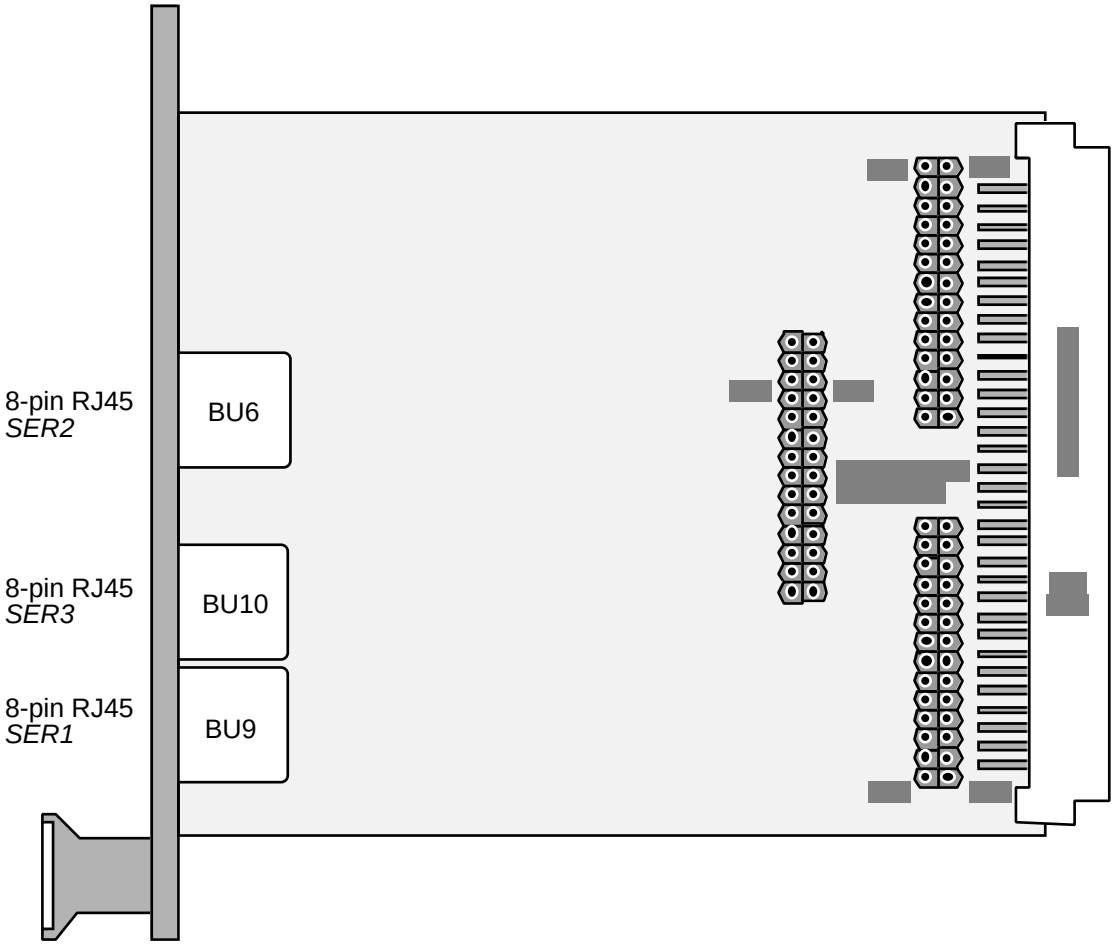
4. CXM-SIO3-3

The CXM-SIO3-3 consists of three serial channels realized using SC piggybacks routed to RJ45 connectors.

The whole range of SC piggybacks can be fitted to the CXM-SIO3-3. However, as the RJ45 connectors have eight pins available, it only makes sense to fit SC piggybacks that have up to eight interface lines, such as SC-232CCM, SC-CLOOP or SC-485F. For those SC piggybacks that use more than eight interface lines, the CXM-SIO3-4 version of the board should be used, as the interface lines are routed to 15-pin D-Sub connectors. For more details, please refer to the *CXM-SIO3-4* chapter in this manual.

4.1 Board Overview

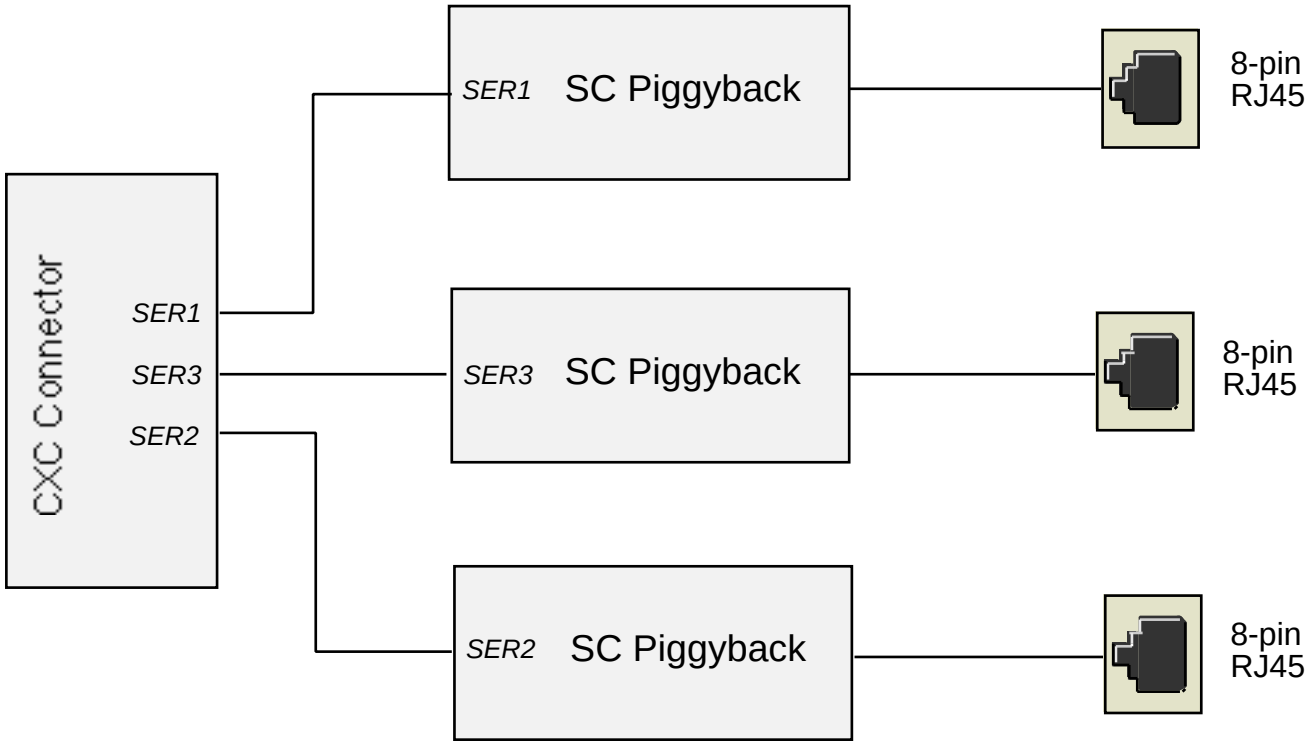
Component Side



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4.2 Functional Description

Figure 4.2.0.1: CXM-SIO3-3 Block Diagram



CXC Name	68(EN)360 Channel
SER1	SCC2
SER2	SCC3
SER3	SCC4

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4.2.1 Signal Reference to Controller and Connector

Serial Port 1 (*SER1*)

This port is routed to BU9 via the SC piggyback connector BU2/3.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC2)
SCC1_0	SER1_TCLK	PA10/CLK3/BRGO2/L1TCLKA/TIN2
SCC1_1	SER1_RCLK	PA8/CLK1/BRGO1/L1RCLKA/TIN1
SCC1_2	*User Defined*	PB10/SMTXD2/L1CLKOB
SCC1_3	SER1_CD	PC7/CD2/TGATE2
SCC1_4	SER1_CTS	PC6/CTS2
SCC1_5	SER1_RTS	PB13/RTS2/L1ST2
SCC1_6	SER1_RXD	PA2/RXD2
SCC1_7	SER1_TXD	PA3/TXD2
PB0	SER1_DTR	PB17/RSTRT1/STRBI

Serial Port 2 (*SER2*)

This port is routed to BU6 via the SC piggyback connector BU4/5.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC3)
SCC2_0	SER2_TCLK	PA12/CLK5/BRGO3/TIN3
SCC2_1	SER2_RCLK	PA13/CLK6/TOUT3/L1RCLKB/BRGCLK2
SCC2_2	*User Defined*	PB7/SMTXD1/DONE2
SCC2_3	SER2_CD	PC9/CD3/L1RSYNCB
SCC2_4	SER2_CTS	PC8/CTS3/L1TSYNCB/SDACK2
SCC2_5	SER2_RTS	PB14/RTS3/L1RQB/L1ST3
SCC2_6	SER2_RXD	PA4/RXD3/L1TXDB
SCC2_7	SER2_TXD	PA5/TXD3/L1RXDB
PB2	SER2_DTR	PB16/BRGO3/STRBO

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Serial Port 3 (*SER3*)

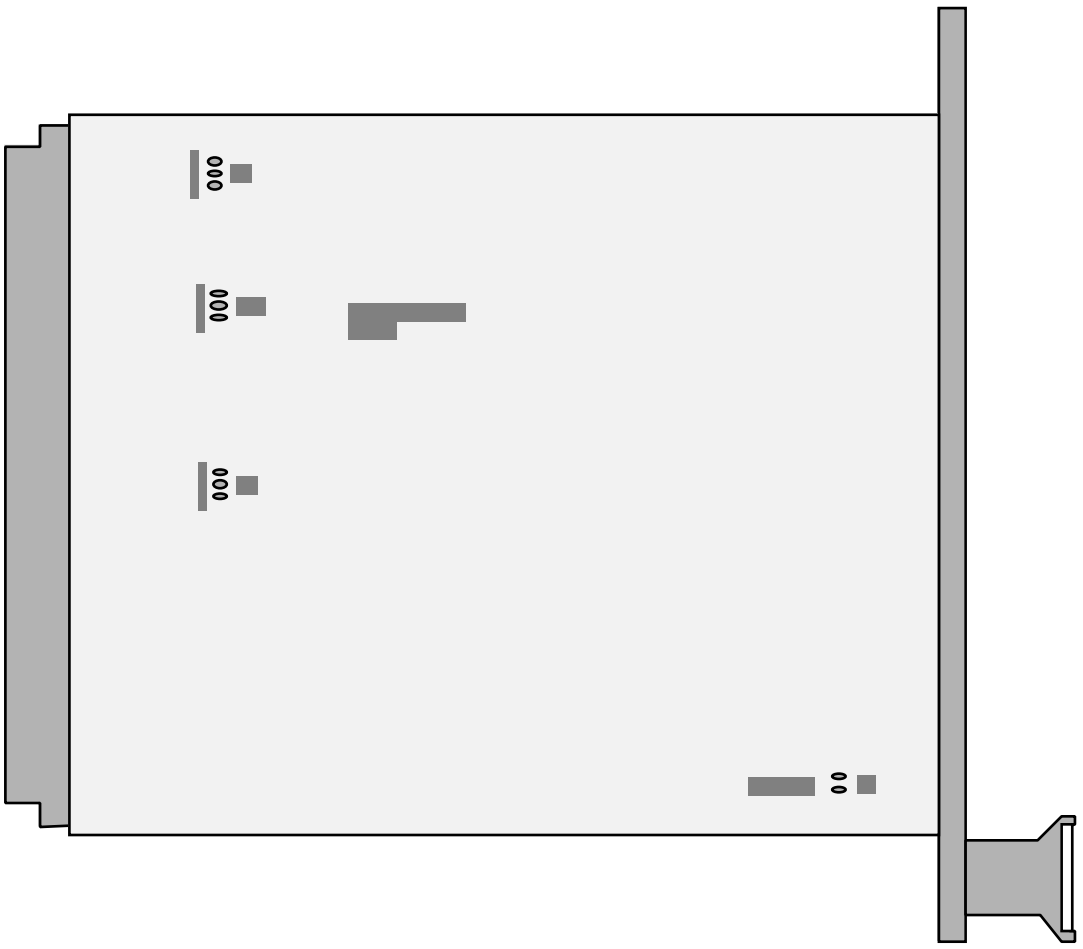
This port is routed to BU10 via the SC piggyback connector BU7/8.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC4)
SCC3_0	SER3_TCLK	PA14/CLK7/BRGO4/TIN4
SCC3_1	SER3_RCLK	PA15/CLK8/TOUT4/L1TCLKB
SCC3_2	*User Defined*	PB11/SMRXD2/LTCLKOA
SCC3_3	SER3_CD	PC11/CD4/L1RSYNCA
SCC3_4	SER3_CTS	PC10/CTS4/L1TSYNCA/SDACK1
SCC3_5	SER3_RTS	PB15/RTS4/L1RQA/L1ST4
SCC3_6	SER3_RXD	PA6/RXD4/L1TXDA
SCC3_7	SER3_TXD	PA7/TXD4/L1RXDA
PB1	SER3_DTR	PB9/SMSYN2/DACK2

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4.3 Configuration

Figure 4.3.0.1: CXM-SIO3-3 Jumper Layout (Solder Side)



Note

The above jumpers may be closed by soldering or using a 0805 0Ω resistor.

4.3.1 Jumper J6: Front panel / Shield Connection

The front panel and shield of all connectors is routed to this jumper, where they may be connected to GND. The default setting is open, as only one shield to GND connection per system is recommended in order to minimize hum.

Setting	Description	
Open	*Shield isolated from GND*	*Default*
Set	Shield connected to GND	

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4.3.2 Jumpers J8, J9 and J10: Clocks to SC Piggybacks

The CXM interface provides two clock lines (TCLK and RCLK). In order to connect one of these lines to an SC piggyback, which has one pin available for clock connection, the jumpers J8, J9 and J10 are fitted.

Jumper J8

This jumper provides clock connection to the SC piggyback using the SER1 channel (*BU2/3 routed to BU9*).

Setting	Description
1-2	SER1_TCLK
1-3	SER1_RCLK

Jumper J9

This jumper provides clock connection to the SC piggyback using the SER2 channel (*BU4/5 routed to BU6*).

Setting	Description
1-2	SER2_TCLK
1-3	SER2_RCLK

Jumper J10

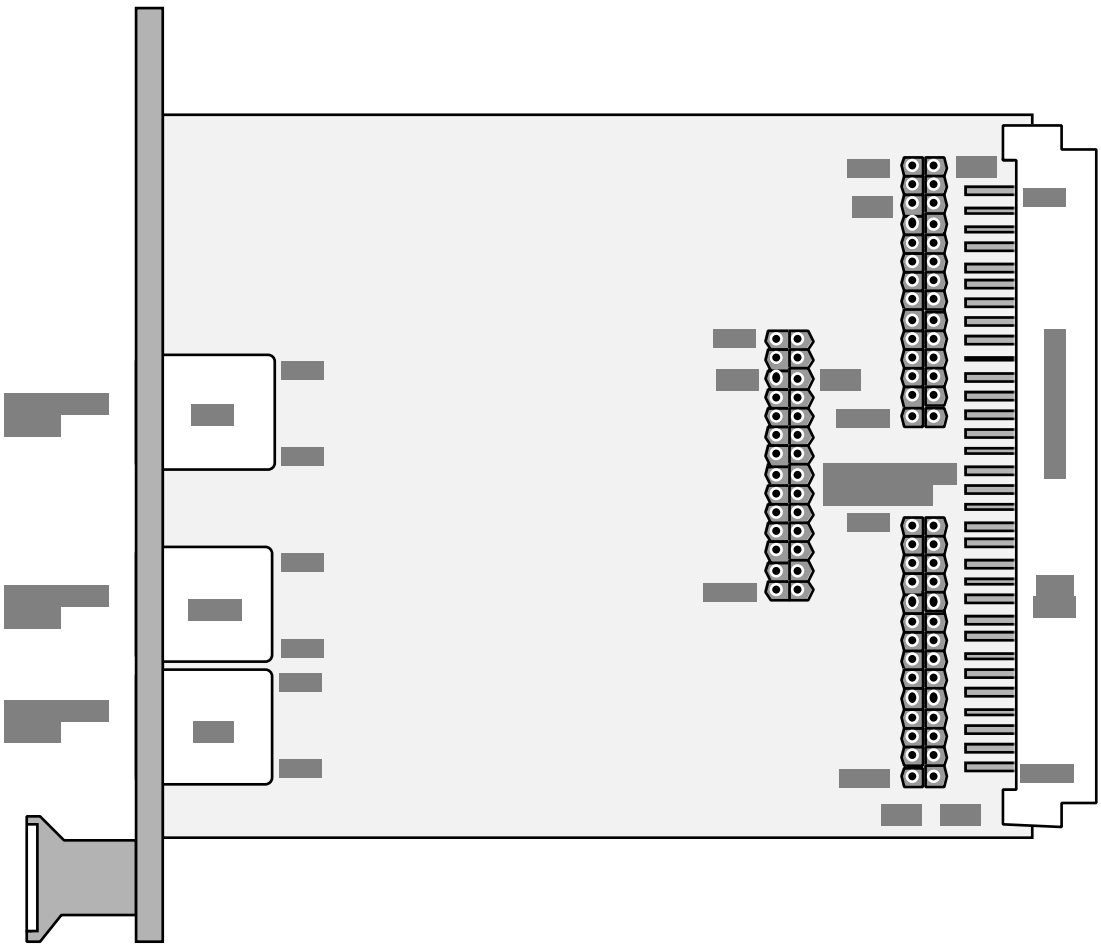
This jumper provides clock connection to the SC piggyback using the SER3 channel (*BU7/8 routed to BU10*).

Setting	Description
1-2	SER3_TCLK
1-3	SER3_RCLK

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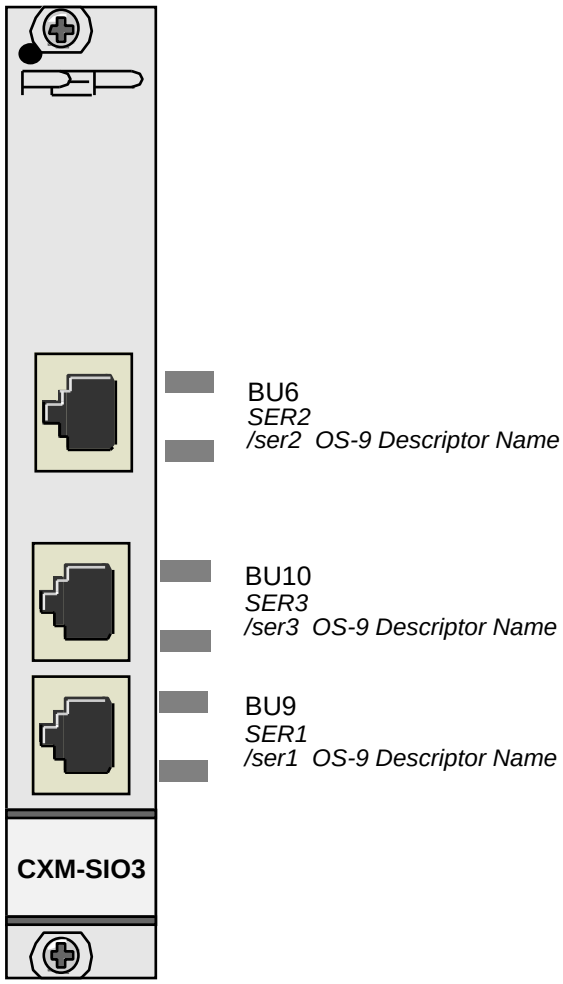
4.4 Pinouts

Figure 4.4.0.1: CXM-SIO3-3 Main Board Connectors



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Figure 4.4.0.2: CXM-SIO3-3 Front Panel



4.4.1 CXC Connector (ST1)

Two versions of the CXC connector are available, with identical pinouts. They are:-

- *CXC connector to fit the board into a CXC backplane;*
- *CXC connector, fitted at 90˚ to the board, to connect the board directly to a CPU board.*

For CXC connector pinouts, please refer to the *CXC Appendix.*

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4.4.2 SC Piggyback Connector (System Side)

Connector BU3

Pin Nr.	CXC Generic Name	Schematic Signal Name
1	GND	System GND
2	Vcc	VCC
3	---	RTXC1 (jumpered to TCLK/RCLK)
4	SER1_RXD	SCC1_6
5	SER1_TXD	SCC1_7
6	SER1_DTR	PB0
7	SER1_RTS	SCC1_5
8	SER1_CTS	SCC1_4
9	SER1_CD	SCC1_3
10	---	*Not Connected*
11	---	*Not Connected*
12	---	*Not Connected*
13	---	*Not Connected*
14	---	*Not Connected*

Connector BU5

Pin Nr.	CXC Generic Name	Schematic Signal Name
1	GND	System GND
2	Vcc	VCC
3	---	RTXC2 (jumpered to TCLK/RCLK)
4	SER2_RXD	SCC2_6
5	SER2_TXD	SCC2_7
6	SER2_DTR	PB2
7	SER2_RTS	SCC2_5
8	SER2_CTS	SCC2_4
9	SER2_CD	SCC2_3
10	---	*Not Connected*
11	---	*Not Connected*
12	---	*Not Connected*
13	---	*Not Connected*
14	---	*Not Connected*

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Connector BU8

Pin Nr.	CXC Generic Name	Schematic Signal Name
1	GND	System GND
2	Vcc	VCC
3	---	RTXC3 (jumpered to TCLK/RCLK)
4	SER3_RXD	SCC3_6
5	SER3_TXD	SCC3_7
6	SER3_DTR	PB1
7	SER3_RTS	SCC3_5
8	SER3_CTS	SCC3_4
9	SER3_CD	SCC3_3
10	---	*Not Connected*
11	---	*Not Connected*
12	---	*Not Connected*
13	---	*Not Connected*
14	---	*Not Connected*

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4.4.3 SC Piggyback Connector (Process Side)

BU2 (SCC1) is routed to BU9 (RJ45 connector)
BU4 (SCC2) is routed to BU6 (RJ45 connector)
BU7 (SCC3) is routed to BU10 (RJ45 connector)

The pinouts on a particular front panel connector are dependent on the SC piggyback that is fitted to the relevant SC connector.

SC-232CCM

SC Pin Nr.	RJ45 Pin Nr.	Piggyback Signal
1	6	EDCD
2		*Not Connected*
3	3	System GND
4		*Not Connected*
5		EDSR
6		*Not Connected*
7	2	ERTS
8		EFREE
9	7	ECTS
10		*Not Connected*
11	5	ERXD
12	8	EDTR
13	4	ETXD
14		*Not Connected*

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SC-CLOOP

SC Pin Nr.	RJ45 Pin Nr.	Piggyback Signal
1	6	*Not Connected*
2		*Not Connected*
3	3	EGND*
4		*Not Connected*
5		*Not Connected*
6		*Not Connected*
7	2	*Not Connected*
8		*Not Connected*
9	7	*Not Connected*
10		*Not Connected*
11	5	ERxD
12	8	*Not Connected*
13	4	ETxD
14		*Not Connected*

* EGND is process side GND, isolated from system GND.

SC-485F

SC Pin Nr.	RJ45 Pin Nr.	Piggyback Signal
1	6	*Not Connected*
2		*Not Connected*
3	3	System GND
4		*Not Connected*
5		VCC
6		*Not Connected*
7	2	DTR
8		*Not Connected*
9	7	RT-
10		*Not Connected*
11	5	CTS
12	8	*Not Connected*
13	4	RT+
14		*Not Connected*

If an external supply is required for termination, the SC-485F must be connected using the 16-pin connector (ST2, ST4). These connectors are detailed in the *CXM-SIO3-4* chapter in this manual.

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SC-485I

SC Pin Nr.	RJ45 Pin Nr.	Piggyback Signal
1	6	*Not Connected*
2		*Not Connected*
3	3	GNDI*
4		*Not Connected*
5		VCCI
6		*Not Connected*
7	2	*Not Connected*
8		*Not Connected*
9	7	-TXRD
10		*Not Connected*
11	5	*Not Connected*
12	8	*Not Connected*
13	4	+TRxD
14		*Not Connected*

SC-232I

SC Pin Nr.	RJ45 Pin Nr.	Piggyback Signal
1	6	EDCD
2		*Not Connected*
3	3	GNDI*
4		*Not Connected*
5		*Not Connected*
6		*Not Connected*
7	2	ERTS
8		EFREE
9	7	ECTS
10		*Not Connected*
11	5	ERxD
12	8	EDTR
13	4	ETxD
14		*Not Connected*

* GNDI is process side GND, isolated from system GND.

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SC Piggyback Pinout Summary

The following Table gives a summary of the SC piggyback pinout in relation to the RJ45 pinout fitted to the front panel of the CXM-SIO3.

RJ45 Pin	SC Pin
1	*Not Connected*
2	7
3	3
4	13
5	11
6	1
7	9
8	12

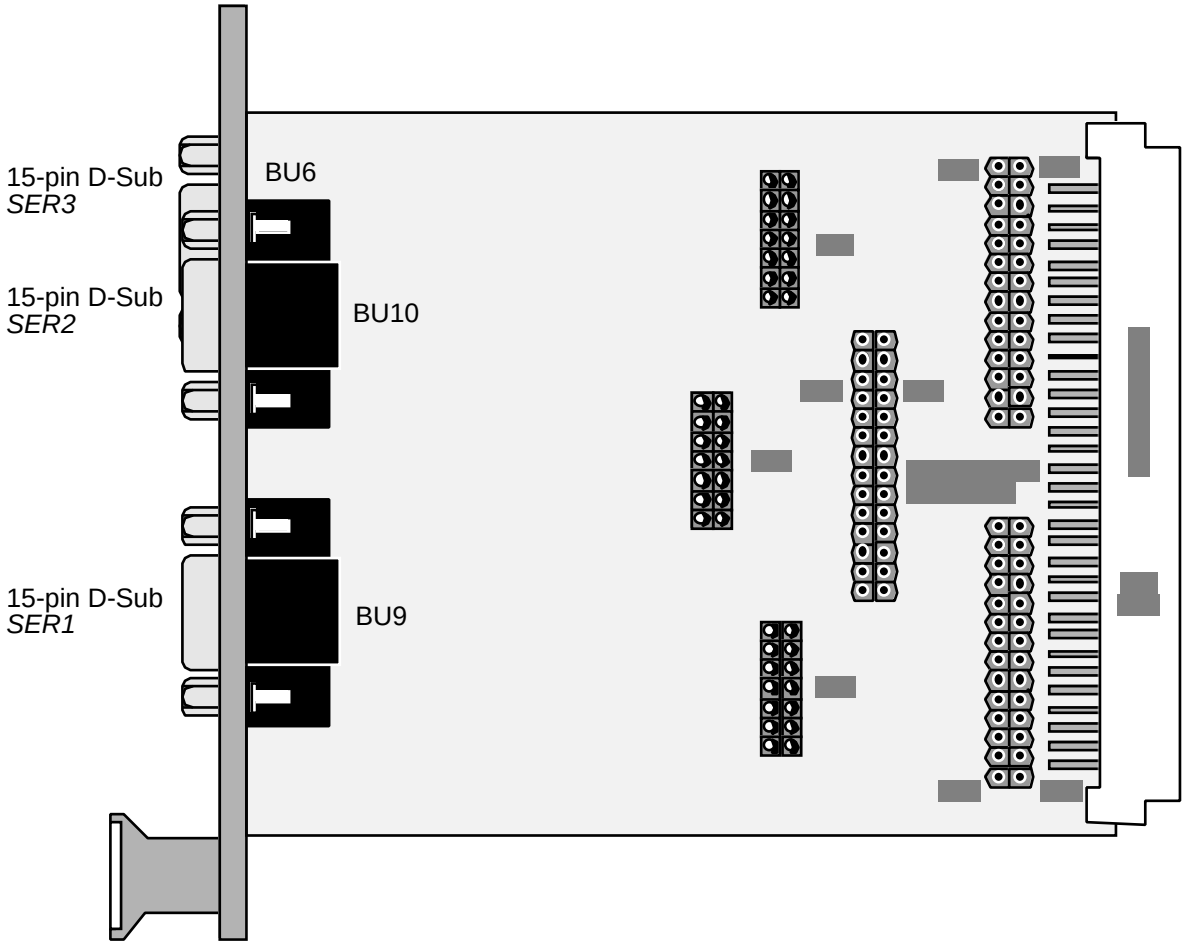
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5. CXM-SIO3-4

The CXM-SIO3-4 consists of three serial channels routed to SC piggyback connectors. The outputs of the connectors are routed to three 16-pin pinrow headers that, in turn, are routed using flat cable to three female 15-pin D-Sub connectors on the front panel. This means that the whole range of SC piggybacks can be used, including those piggybacks that have more than eight interface lines.

5.1 Board Overview

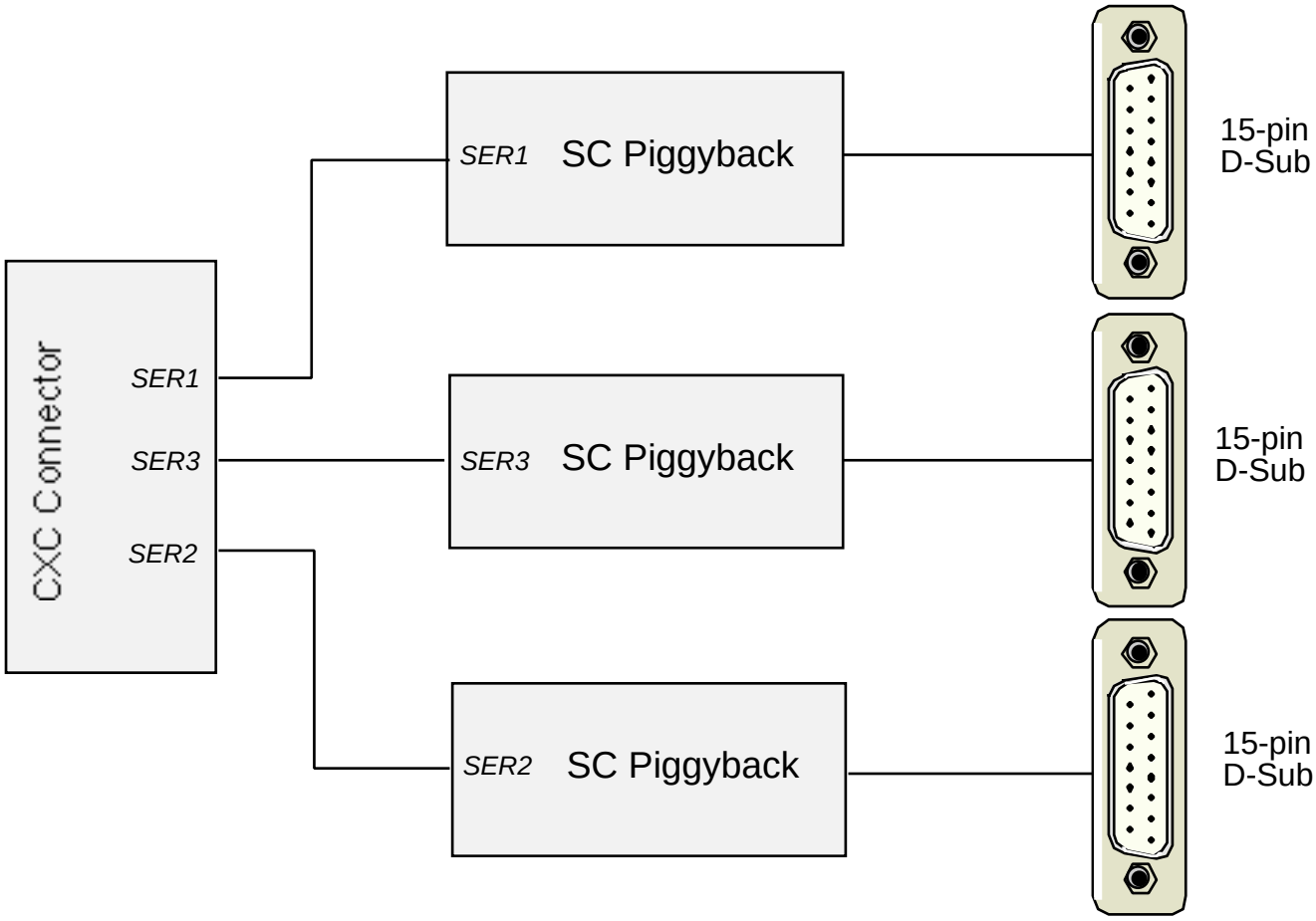
Component Side



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5.2 Functional Description

Figure 5.2.0.1: CXM-SIO3-4 Block Diagram



CXC Name	68(EN)360 Channel
SER1	SCC2
SER2	SCC3
SER3	SCC4

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5.2.1 Signal Reference to Controller and Connector

Serial Port 1 (*SER1*)

This port is routed to ST2 via the SC piggyback connector BU2/3.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC2)
SCC1_0	SER1_TCLK	PA10/CLK3/BRGO2/L1TCLKA/TIN2
SCC1_1	SER1_RCLK	PA8/CLK1/BRGO1/L1RCLKA/TIN1
SCC1_2	*User Defined*	PB10/SMTXD2/L1CLKOB
SCC1_3	SER1_CD	PC7/CD2/TGATE2
SCC1_4	SER1_CTS	PC6/CTS2
SCC1_5	SER1_RTS	PB13/RTS2/L1ST2
SCC1_6	SER1_RXD	PA2/RXD2
SCC1_7	SER1_TXD	PA3/TXD2
PB0	SER1_DTR	PB17/RSTRT1/STRBI

Serial Port 2 (*SER2*)

This port is routed to ST3 via the SC piggyback connector BU4/5.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC3)
SCC2_0	SER2_TCLK	PA12/CLK5/BRGO3/TIN3
SCC2_1	SER2_RCLK	PA13/CLK6/TOUT3/L1RCLKB/BRGCLK2
SCC2_2	*User Defined*	PB7/SMTXD1/DONE2
SCC2_3	SER2_CD	PC9/CD3/L1RSYNCB
SCC2_4	SER2_CTS	PC8/CTS3/L1TSYNCB/SDACK2
SCC2_5	SER2_RTS	PB14/RTS3/L1RQB/L1ST3
SCC2_6	SER2_RXD	PA4/RXD3/L1TXDB
SCC2_7	SER2_TXD	PA5/TXD3/L1RXDB
PB2	SER2_DTR	PB16/BRGO3/STRBO

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Serial Port 3 (*SER3*)

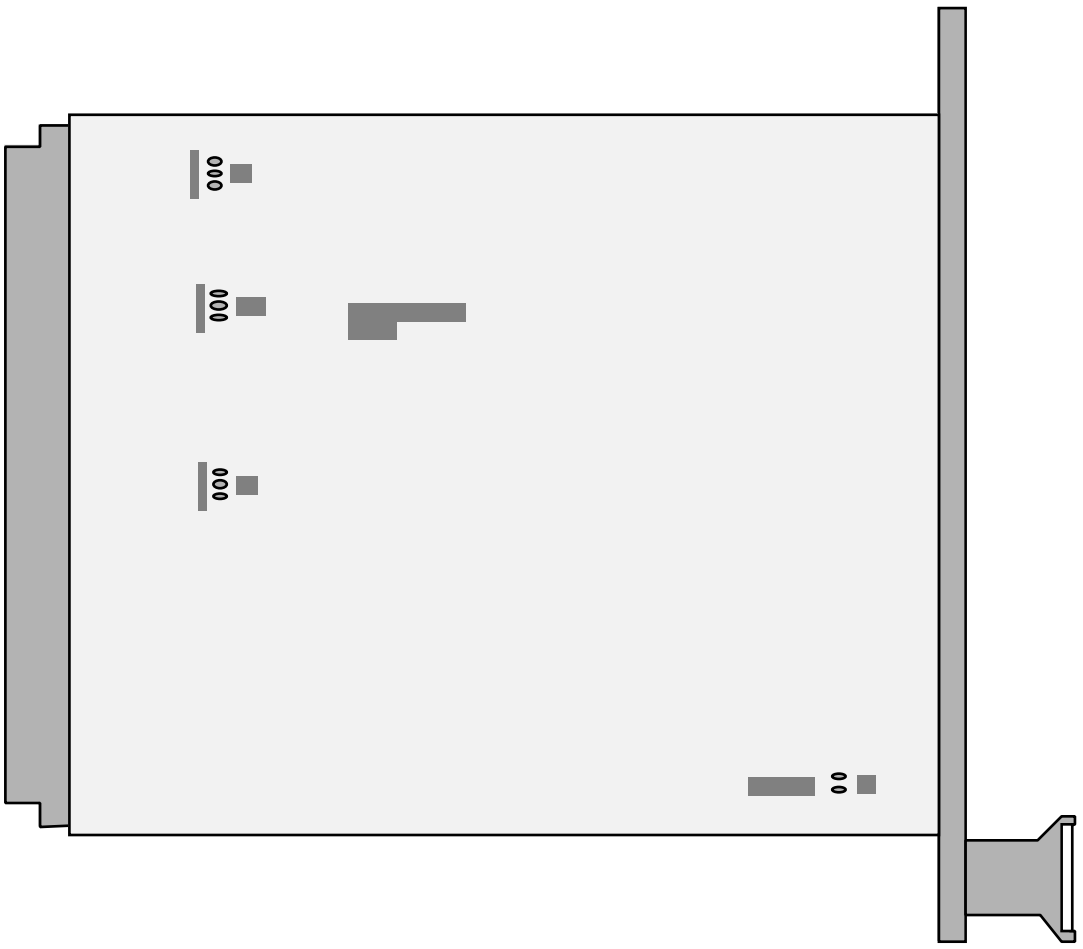
This port is routed to ST4 via the SC piggyback connector BU7/8.

Schematic Signal Name	CXC Generic Name	68(EN)360 Signal (SCC4)
SCC3_0	SER3_TCLK	PA14/CLK7/BRGO4/TIN4
SCC3_1	SER3_RCLK	PA15/CLK8/TOUT4/L1TCLKB
SCC3_2	*User Defined*	PB11/SMRXD2/LTCLKOA
SCC3_3	SER3_CD	PC11/CD4/L1RSYNCA
SCC3_4	SER3_CTS	PC10/CTS4/L1TSYNCA/SDACK1
SCC3_5	SER3_RTS	PB15/RTS4/L1RQA/L1ST4
SCC3_6	SER3_RXD	PA6/RXD4/L1TXDA
SCC3_7	SER3_TXD	PA7/TXD4/L1RXDA
PB1	SER3_DTR	PB9/SMSYN2/DACK2

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5.3 Configuration

Figure 5.3.0.1: CXM-SIO3-4 Jumper Layout (Solder Side)



Note

The above jumpers may be closed by soldering or using a 0805 0Ω resistor.

5.3.1 Jumper J6: Front panel / Shield Connection

The front panel and shield of all connectors is routed to this jumper, where they may be connected to GND. The default setting is open, as only one shield to GND connection per system is recommended in order to minimize hum.

Setting	Description	
Open	*Shield isolated from GND*	*Default*
Set	Shield connected to GND	

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5.3.2 Jumpers J8, J9 and J10: Clocks to SC Piggybacks

The CXM interface provides two clock lines (TCLK and RCLK). In order to connect one of these lines to an SC piggyback, which has one pin available for clock connection, the jumpers J8, J9 and J10 are fitted.

Jumper J8

This jumper provides clock connection to the SC piggyback using the SER1 channel (*BU2/3 routed to ST2*).

Setting	Description
1-2	SER1_TCLK
1-3	SER1_RCLK

Jumper J9

This jumper provides clock connection to the SC piggyback using the SER2 channel (*BU4/5 routed to ST3*).

Setting	Description
1-2	SER2_TCLK
1-3	SER2_RCLK

Jumper J10

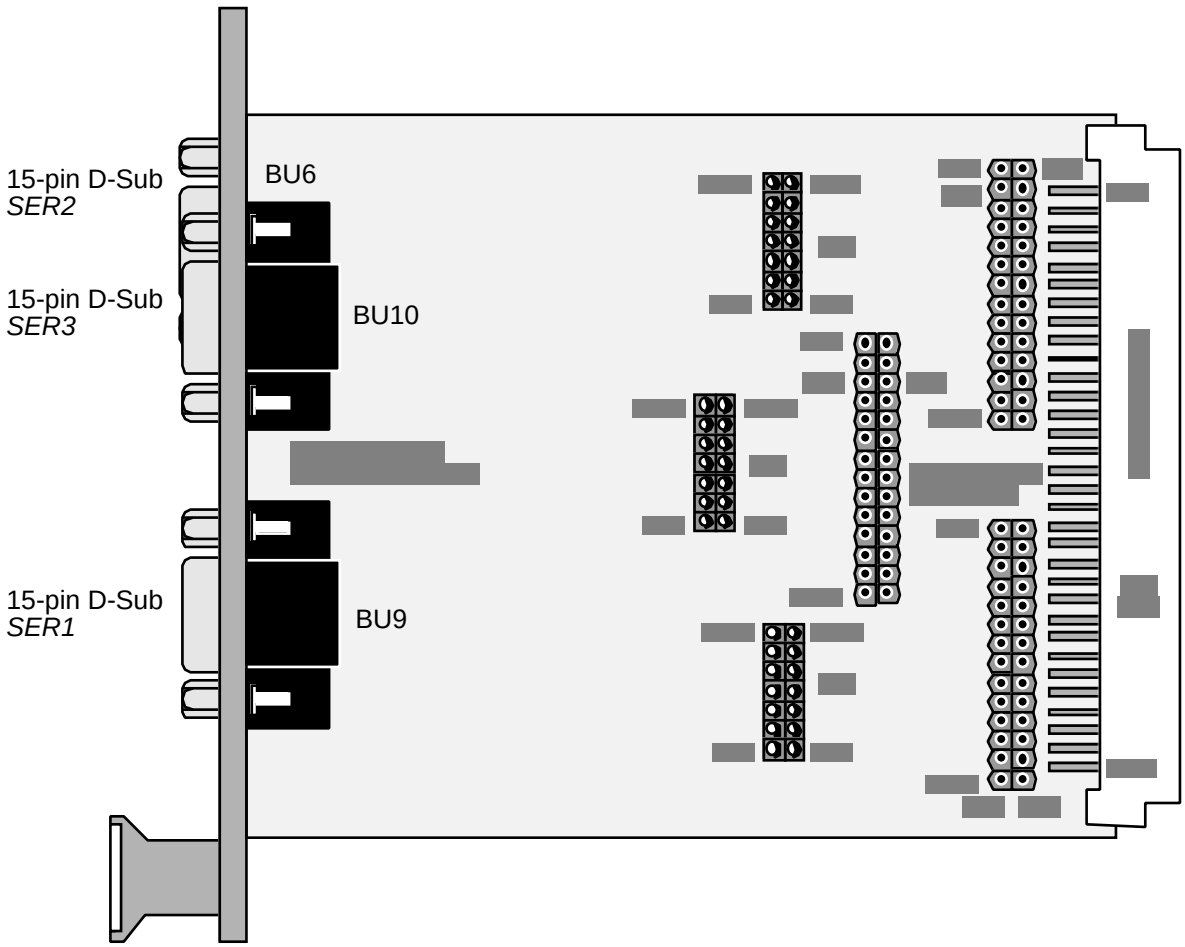
This jumper provides clock connection to the SC piggyback using the SER3 channel (*BU7/8 routed to ST4*).

Setting	Description
1-2	SER3_TCLK
1-3	SER3_RCLK

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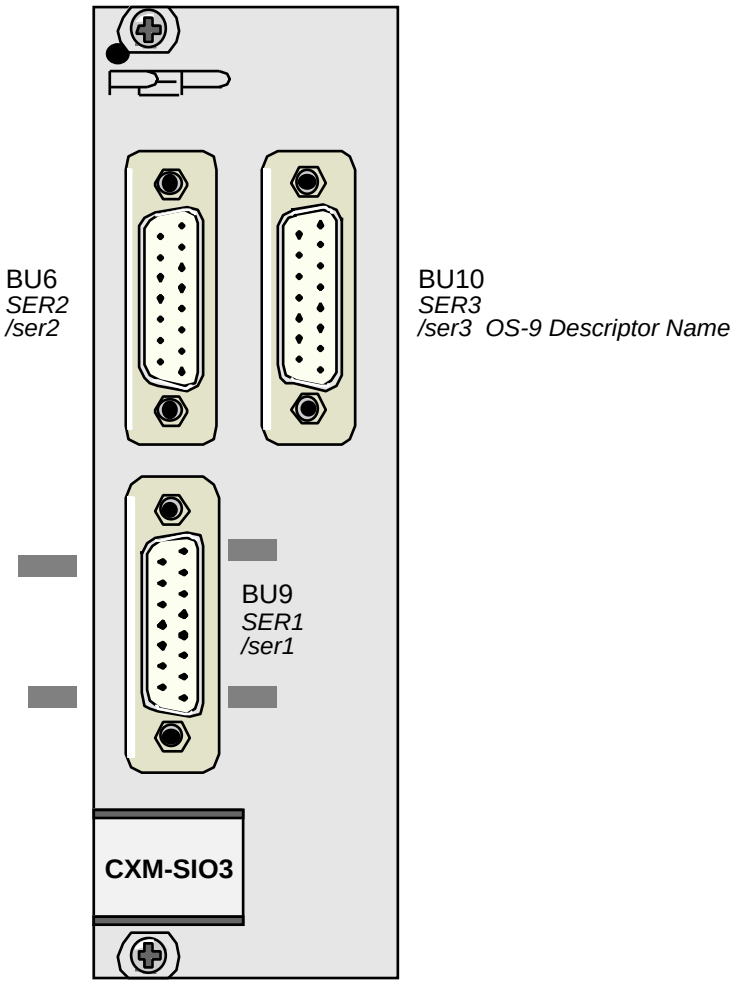
5.4 Pinouts

Figure 5.4.0.1: CXM-SIO3-4 Main Board Connectors



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Figure 5.4.0.2: CXM-SIO3-4 Front Panel



5.4.1 CXC Connector (ST1)

Two versions of the CXC connector are available, with identical pinouts. They are:-

- *CXC connector to fit the board into a CXC backplane;*
- *CXC connector, fitted at 90˚ to the board, to connect the board directly to a CPU board.*

For CXC connector pinouts, please refer to the *CXC Appendix.*

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5.4.2 SC Piggyback Connector (System Side)

Connector BU3

Pin Nr.	CXC Generic Name	Schematic Signal Name
1	GND	System GND
2	Vcc	VCC
3	---	RTXC1 (jumpered to TCLK/RCLK)
4	SER1_RXD	SCC1_6
5	SER1_TXD	SCC1_7
6	SER1_DTR	PB0
7	SER1_RTS	SCC1_5
8	SER1_CTS	SCC1_4
9	SER1_CD	SCC1_3
10	---	*Not Connected*
11	---	*Not Connected*
12	---	*Not Connected*
13	---	*Not Connected*
14	---	*Not Connected*

Connector BU5

Pin Nr.	CXC Generic Name	Schematic Signal Name
1	GND	System GND
2	Vcc	VCC
3	---	RTXC2 (jumpered to TCLK/RCLK)
4	SER2_RXD	SCC2_6
5	SER2_TXD	SCC2_7
6	SER2_DTR	PB2
7	SER2_RTS	SCC2_5
8	SER2_CTS	SCC2_4
9	SER2_CD	SCC2_3
10	---	*Not Connected*
11	---	*Not Connected*
12	---	*Not Connected*
13	---	*Not Connected*
14	---	*Not Connected*

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Connector BU8

Pin Nr.	CXC Generic Name	Schematic Signal Name
1	GND	System GND
2	Vcc	VCC
3	---	RTXC3 (jumpered to TCLK/RCLK)
4	SER3_RXD	SCC3_6
5	SER3_TXD	SCC3_7
6	SER3_DTR	PB1
7	SER3_RTS	SCC3_5
8	SER3_CTS	SCC3_4
9	SER3_CD	SCC3_3
10	---	*Not Connected*
11	---	*Not Connected*
12	---	*Not Connected*
13	---	*Not Connected*
14	---	*Not Connected*

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5.4.3 SC Piggyback Connector (Process Side)

BU2 (SCC1) is routed to ST2
BU4 (SCC2) is routed to ST3
BU7 (SCC3) is routed to ST4

The pinouts on a particular front panel connector are dependent on the SC piggyback that is fitted to the relevant SC connector.

SC-232CCM

SC Pin Nr.	ST2, ST3, ST4 Pin Nr.	15-pin D-Sub Pin Nr.	Piggyback Signal
1	8	8	EDCD
2	15		*Not Connected*
3	7	7	System GND
4	14		*Not Connected*
5	6	*Not Connected*	EDSR
6	13		*Not Connected*
7	5	5	ERTS
8	12	*Not Connected*	EFREE
9	4	4	ECTS
10	11		*Not Connected*
11	3	3	ERXD
12	10	10	EDTR
13	2	2	ETXD
14	9		*Not Connected*

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SC-CLOOP

SC Pin Nr.	ST2, ST3, ST4 Pin Nr.	15-pin D-Sub Pin Nr.	Piggyback Signal
1	8		*Not Connected*
2	15		*Not Connected*
3	7	7	EGND*
4	14		*Not Connected*
5	6		*Not Connected*
6	13		*Not Connected*
7	5		*Not Connected*
8	12		*Not Connected*
9	4		*Not Connected*
10	11		*Not Connected*
11	3	3	ERxD
12	10		*Not Connected*
13	2	2	ETxD
14	9		*Not Connected*

* EGND is process side GND, isolated from system GND.

SC-485F

SC Pin Nr.	ST2, ST3, ST4 Pin Nr.	15-pin D-Sub Pin Nr.	Piggyback Signal
1	8	8	*Not Connected*
2	15	15	*Not Connected*
3	7	7	System GND
4	14	14	*Not Connected*
5	6	6	VCC
6	13	13	*Not Connected*
7	5	5	DTR
8	12	12	*Not Connected*
9	4	4	RT-
10	11	11	*Not Connected*
11	3	3	CTS
12	10	10	*Not Connected*
13	2	2	RT+
14	9	9	*Not Connected*

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SC-232X21bis

SC Pin Nr.	ST2, ST3, ST4 Pin Nr.	15-pin D-Sub Pin Nr.	Piggyback Signal
1	8	8	DCD
2	15	15	RTxCIN
3	7	7	GND
4	14	14	RTxCOUT
5	6	6	DSR
6	13	13	*Not Connected*
7	5	5	RTS
8	12	12	*Not Connected*
9	4	4	CTS
10	11	11	RTE
11	3	3	RXD
12	10	10	DTR
13	2	2	TXD
14	9	9	*Not Connected*

SC-422E

SC Pin Nr.	ST2, ST3, ST4 Pin Nr.	15-pin D-Sub Pin Nr.	Piggyback Signal
1	8	8	TxD+
2	15	15	RTS-
3	7	7	DTR-
4	14	14	RTS+
5	6	6	DTR+
6	13	13	CTS-
7	5	5	DCD-
8	12	12	CTS+
9	4	4	DCD+
10	11	11	RxD-
11	3	3	CLK-
12	10	10	RxD+
13	2	2	CLK+
14	9	9	TxD-

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SC-485I

SC Pin Nr.	ST2, ST3, ST4 Pin Nr.	15-pin D-Sub Pin Nr.	Piggyback Signal
1	8	8	*Not Connected*
2	15	15	*Not Connected*
3	7	7	GNDI*
4	14	14	*Not Connected*
5	6	6	VCCI
6	13	13	*Not Connected*
7	5	5	*Not Connected*
8	12	12	*Not Connected*
9	4	4	-TXRD
10	11	11	*Not Connected*
11	3	3	*Not Connected*
12	10	10	*Not Connected*
13	2	2	+TRxD
14	9	9	*Not Connected*

SC-232I

SC Pin Nr.	ST2, ST3, ST4 Pin Nr.	15-pin D-Sub Pin Nr.	Piggyback Signal
1	8	8	EDCD
2	15	15	*Not Connected*
3	7	7	GNDI*
4	14	14	*Not Connected*
5	6	6	*Not Connected*
6	13	13	*Not Connected*
7	5	5	ERTS
8	12	12	EFREE
9	4	4	ECTS
10	11	11	*Not Connected*
11	3	3	ERxD
12	10	10	EDTR
13	2	2	ETxD
14	9	9	*Not Connected*

* GNDI is process side GND, isolated from system GND.

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SC Piggyback Pinout Summary

The following Table gives a summary of the SC piggyback pinout in relation to the 15-pin D-Sub pinouts fitted to the front panel of the CXM-SIO3.

D-Sub Pin	SC Pin
1	*Not Connected*
2	13
3	11
4	9
5	7
6	5
7	3
8	1
9	14
10	12
11	10
12	8
13	6
14	4
15	2

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