» User Guide «

CP-RIO3-05

3U CompactPCI Rear Transition Module

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Disclaimer

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Caution, Electric Shock!

This symbol and title warn of hazards due to electrical shocks (> 60V) when touching products or parts of them. Failure to observe the pre-cautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.

Please refer also to the section "High Voltage Safety Instructions" on the following page.

Warning, ESD Sensitive Device!

This symbol and title inform that electronic boards and their compo-nents are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Please read also the section "Special Handling and Unpacking Instructions" on the following page.

Warning!

This symbol and title emphasize points which, if not fully understood and taken into consideration by the reader, may endanger your health and/or result in damage to your material.

Note ...

This symbol and title emphasize aspects the reader should read through carefully for his or her own advantage.

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Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

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Special Handling and Unpacking Instructions

ESD Sensitive Device!

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Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

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In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the device, which are not explicitly approved by Kontron and described in this manual or received from Kontron's Technical Support as a special handling instruction, will void your warranty.

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In performing all necessary installation and application operations, please follow only the instructions supplied by the present manual.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the board, please re-pack it as nearly as possible in the manner in which it was delivered.

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Chapter **1**

Introduction

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1. Introduction

1.1 Board Overview

The CP-RIO3-05 3U CompactPCI rear transition module has been designed for use with the CP3002-RC and the CP3002-RA 3U CompactPCI CPU boards from Kontron and provides comprehensive rear I/O functionality for peripherals. In order to use the CP-RIO3-05, a 3U CompactPCI backplane with rear I/O support as well as a compatible and correctly configured CPU board are required. For further information concerning possible compatibility with other 3U Kontron CompactPCI boards, please contact Kontron.

The CP-RIO3-05 comes with four Gigabit Ethernet ports, two USB 2.0 ports, one VGA (CRT) port, and two serial ports (COM1 and COM2) on the front panel, as well as two onboard SATA ports for connection to external SATA devices, one onboard GPIO port, two onboard serial ports (COM1 and COM2), and one CompactPCI connector for connecting the CP-RIO3-05 to the backplane. For resetting the CP3002-RC/CP3002-RA, the CP-RIO3-05 provides an on-board reset button.

1.2 Board Diagrams

The following diagrams provide additional information concerning the boards' functionality and component layout.

1.2.1 Functional Block Diagram

Figure 1-1: CP-RIO3-05 Functional Block Diagram
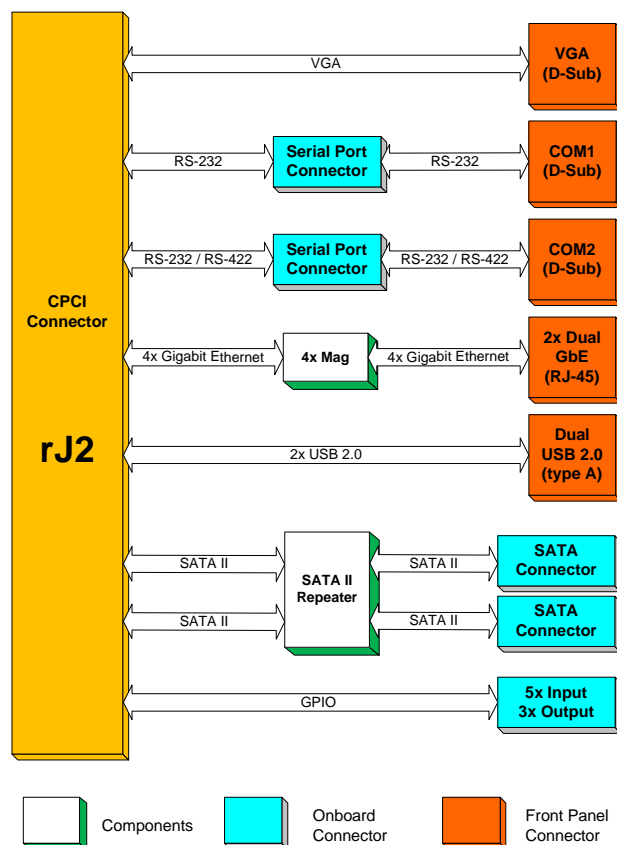
1.2.2 Front Panel

Figure 1-2: CP-RIO3-05 Front Panel
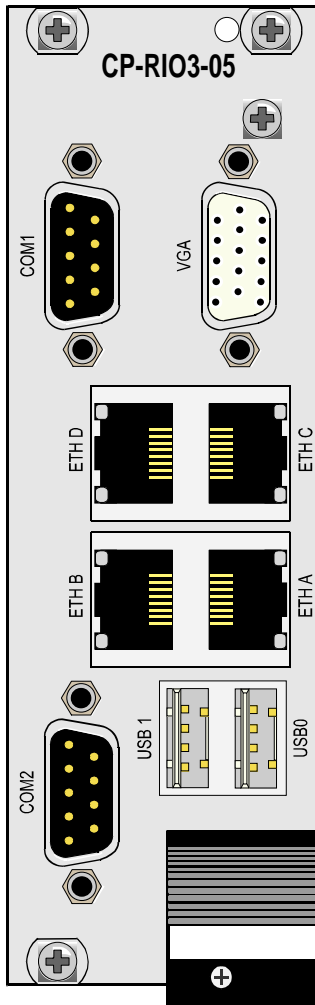
Note …

The Ethernet LEDs have no functionality on the CP-RIO3-05.

1.2.3   Board Layout

Figure 1-3: CP-RIO3-05 Board Layout – Top View
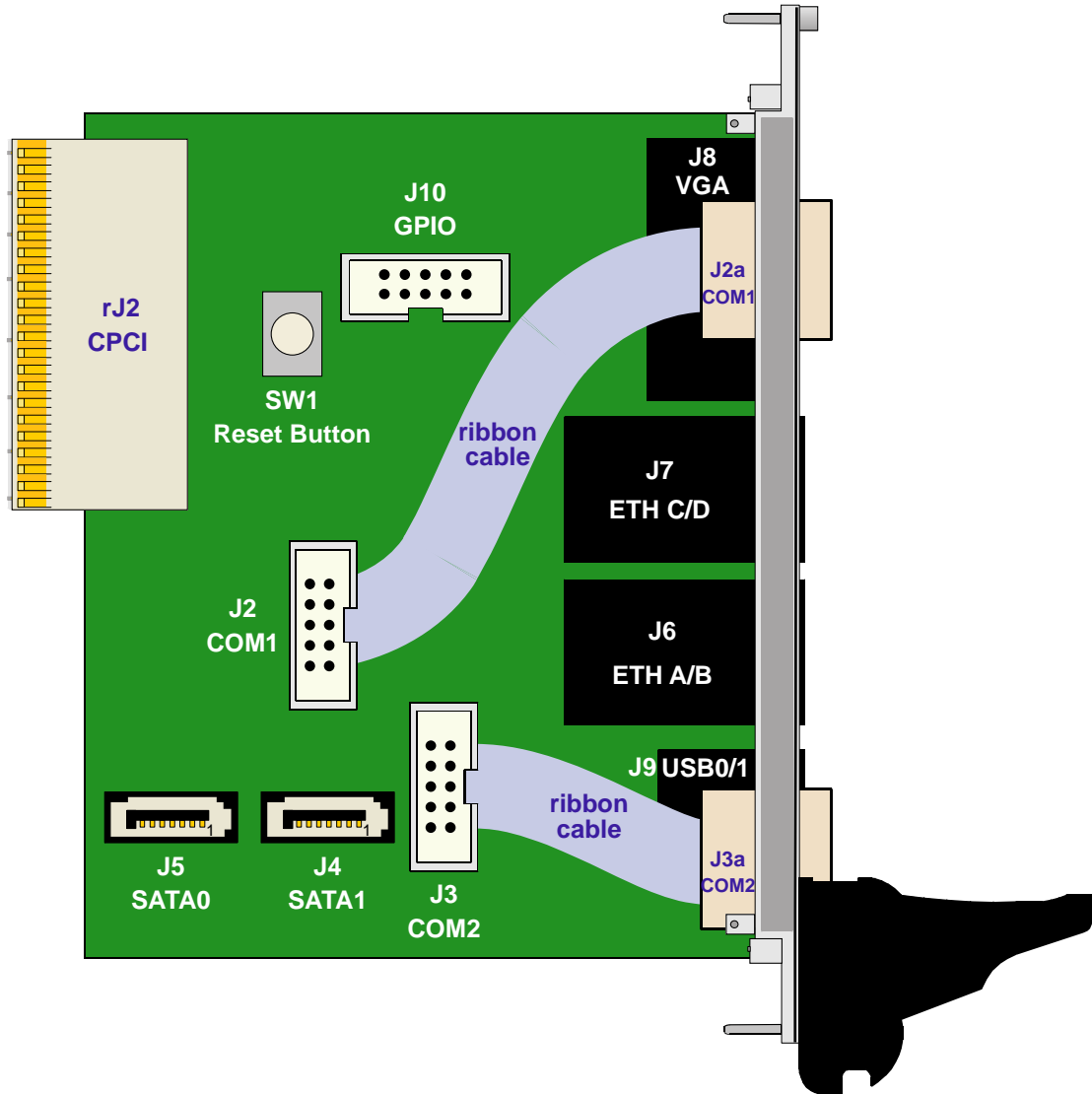
1.3 Technical Specification

Table 1-1: CP-RIO3-05 Main Specifications

CP-RIO3-05		SPECIFICATIONS
Front Panel Interfaces	VGA	One VGA interface on a 15-pin, D-Sub connector, J8, for connecting a standard analog monitor
	Ethernet	Four Gigabit Ethernet interfaces implemented as two dual RJ-45 connectors, J6 (ETH A / ETH B) and J7 (ETH C / ETH D)
	COM	Two serial ports: • COM1, RS-232, implemented as a 9-pin, D-Sub connector, J2a • COM2, RS-232/RS-422, implemented as a 9-pin, D-Sub connector, J3a
Onboard Interfaces	SATA	Two SATA II interfaces (with SATA II repeater) implemented as two onboard connectors, J4 and J5, for connecting external SATA devices via a SATA cable
	COM	Two serial ports: • COM1, RS-232, implemented as a 10-pin connector, J2 • COM2, RS-232/RS-422, implemented as a 10-pin connector, J3 The onboard serial port connectors, J2 and J3, are connected to the front panel COM connectors, J2a and J3a, via flat cables.
	GPIO	One 10-pin general purpose I/O connector, J10, with the following features: • Five general purpose inputs • Three general purpose outputs
	CompactPCI	One CompactPCI connector, rJ2, for connecting the CP-RIO3-05 to the backplane
General	Temperature Range	Operational: -40°C to +70°C Storage: -55°C to +85°C Without any additional components ***Note ...*** When additional components are installed, refer to their operational specifications as this will influence the modules' operational and storage temperature.
	Mechanical	3U, 8HP, CompactPCI-compliant form factor
	Dimensions	100 mm x 80 mm
	Board Weight	166 g

1.4 Standards

The CP-RIO3-05 complies with the requirements of the following standards.

Table 1-2:   **Standards**

TYPE	ASPECT	STANDARD
CE	Emission	EN55022 EN61000-6-3
	Immission	EN55024 EN61000-6-2
	Electrical Safety	EN60950-1
Mechanical	Mechanical Dimensions	IEEE 1101.10
Environmental	Climatic Humidity	IEC60068-2-78 **(see note below)**
	WEEE	Directive 2002/96/EC Waste electrical and electronic equipment
	RoHS	Directive 2002/95/EC Restriction of the use of certain hazardous substances in electrical and electronic equipment

Note …

Kontron performs comprehensive environmental testing of its products in accordance with applicable standards.

Customers desiring to perform further environmental testing of Kontron products must contact Kontron for assistance prior to performing any such testing. This is necessary, as it is possible that environmental testing can be destructive when not performed in accordance with the applicable specifications.

In particular, for example, boards **without conformal coating** must not be exposed to a change of temperature exceeding 1K/minute, averaged over a period of not more than five minutes. Otherwise, condensation may cause irreversible damage, especially when the board is powered up again.

Kontron does not accept any responsibility for damage to products resulting from destructive environmental testing.

In addition, modules providing ruggedized service comply with the following standards as well.

Table 1-3: Additional Standards for Modules Providing Ruggedized Service

TYPE	ASPECT	STANDARD	REMARKS
Environmental	Vibration (Sinusoidal)	IEC60068-2-6	Ruggedized version test parameters: • 10-300 (Hz) frequency range • 5 (g) acceleration • 1 (oct/min) sweep rate • 10 cycles/axis • 3 axis
	Single Shock	IEC60068-2-27	Ruggedized version test parameters: • 30 (g) acceleration • 9 (ms) shock duration half sine • 3 number of shocks per direction (total: 18) • 6 directions • 5 (s) recovery time
	Permanent Shock	IEC60068-2-29	Ruggedized version test parameters: • 15 (g) acceleration • 11 (ms) shock duration half sine • 500 number of shocks per direction • 6 directions • 5 (s) recovery time

1.5 Related Publications

The following publications contain information relating to the CP-RIO3-05.

Table 1-4: Related Publications

PRODUCT	PUBLICATION
CompactPCI Systems and Boards	CompactPCI Specification 2.0, Rev. 3.0
	Kontron CompactPCI Backplane Manual, ID 24229
All Kontron products	Product Safety and Implementation Guide, ID 1021-9142

Chapter **2**

Functional Description

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2. Functional Description

2.1 Board Interfaces

2.1.1 VGA Interface

The CP-RIO3-05 provides one 15-pin, D-Sub VGA connector, J8, on the front panel. This connector is used to connect an analog VGA (CRT) monitor to the CP-RIO3-05.

The following figure illustrates the D-Sub VGA connector J8.

Figure 2-1: D-Sub VGA Connector J8
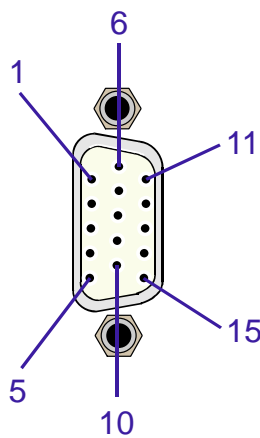
The following table indicates the pinout of the D-Sub VGA connector J8.

Table 2-1: D-Sub VGA Connector J8 Pinout

PIN	SIGNAL	FUNCTION	I/O
1	Red	Red video signal output	O
2	Green	Green video signal output	O
3	Blue	Blue video signal output	O
4	NC	Not connected	--
5 - 8	GND	Signal ground	--
9	VCC	Power +5V, 140 mA fuse protection	O
10	GND	Signal ground	--
11	NC	Not connected	--
12	SDA	I²C data (EDID)	I/O
13	Hsync	Horizontal synchronization	TTL Out
14	Vsync	Vertical synchronization	TTL Out
15	SCL	I²C clock (EDID)	I/O

2.1.2 Gigabit Ethernet Interfaces

The CP-RIO3-05 provides two dual Gigabit Ethernet connectors J6 (ETH A / ETH B) and J7 (ETH C / ETH D) realized as two dual RJ-45 connectors. The interfaces provide automatic detection and switching between 10Base-T, 100Base-TX and 1000Base-T data transmission (Auto-Negotiation). Auto-wire switching for crossed cables is also supported (Auto MDI-X).

Figure 2-2: GbE Connectors J6 and J7

Table 2-2: Pinout of GbE Con. J6 and J7
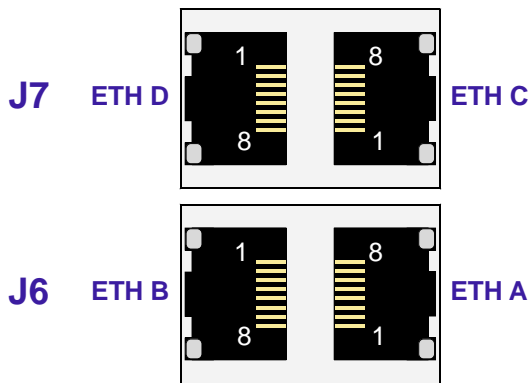
PIN	MDI / STANDARD ETHERNET CABLE					
	10BASE-T		100BASE-TX		1000BASE-T	
	I/O	SIGNAL	I/O	SIGNAL	I/O	SIGNAL
1	O	TX+	O	TX+	I/O	BI_DA+
2	O	TX-	O	TX-	I/O	BI_DA-
3	I	RX+	I	RX+	I/O	BI_DB+
4	-	-	-	-	I/O	BI_DC+
5	-	-	-	-	I/O	BI_DC-
6	I	RX-	I	RX-	I/O	BI_DB-
7	-	-	-	-	I/O	BI_DD+
8	-	-	-	-	I/O	BI_DD-

Note …

The Ethernet LEDs have no functionality on the CP-RIO3-05.

2.1.3   USB Interfaces

The CP-RIO3-05 provides two identical USB interfaces implemented as a dual USB connector J9 (USB0/USB1). Both interfaces provide a maximum transfer rate of 480 Mb/s for connecting USB devices. One USB peripheral may be connected to each port. To connect more USB devices than there are available ports, an external hub is required.

Figure 2-3: Dual USB Connector J9   **Table 2-3: Dual USB Connector J9 Pinout**
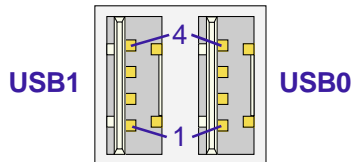
PIN	SIGNAL	DESCRIPTION	I/O
1	VCC	VCC signal	O
2	UV0-	Differential USB-	I/O
3	UV0+	Differential USB+	I/O
4	GND	GND signal	--

Note ...

The USB host interfaces on the CP-RIO3-05 rear I/O module can be used with maximum 500 mA continuous load current as specified in the Universal Serial Bus Specification, Revision 2.0. Short-circuit protection is provided. All the signal lines are EMI-filtered.

Note ...

The rear I/O interface supports the USB 1.1 and USB 2.0 standards.

When connecting peripheral devices to USB 2.0 ports, always ensure that appropriate cables are used.

2.1.4   COM Interfaces

The CP-RIO3-05 module provides two COM ports, COM1 and COM2, on the front panel for connecting RS-232/RS-422 devices. The COM ports are realized as 9-pin D-Sub connectors, J2a and J3a, and connected via flat cables to the 10-pin onboard connectors, J2 and J3.

COM1 is a full-featured RS-232 interface. COM2 is an RS-422 interface switchable to limited RS-232 via the uEFI BIOS of the CP3002-RC/CP3002-RA.

COM1 corresponds to COMA on the CP3002-RA/-CP3002-RC. COM2 corresponds to COMB on the CP3002-RA/-CP3002-RC.

The following figure and tables provide pinout information for the 9-pin D-Sub COM connectors J2a and J3a located on the front panel.

Figure 2-4: D-Sub COM Connectors J2a (COM1) and J3a (COM2)
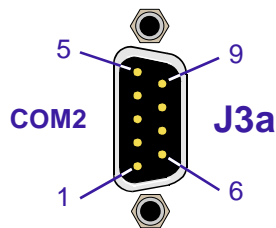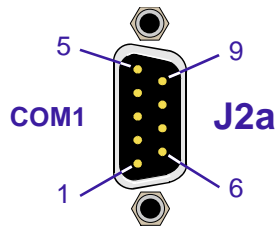
Table 2-4: D-Sub COM Connector J2a (COM1) Pinout

PIN	SIGNAL	DESCRIPTION	I/O
1	DCD	Data carrier detect	I
2	RXD	Receive data	I
3	TXD	Transmit data	O
4	DTR	Data terminal ready	O
5	GND	Signal ground	--
6	DSR	Data send request	I
7	RTS	Request to send	O
8	CTS	Clear to send	I
9	RI	Ring indicator	I

Table 2-5: D-Sub COM Connector J3a (COM2) Pinout

RS-232			PIN	RS-422		
I/O	DESCRIPTION	SIGNAL		SIGNAL	DESCRIPTION	I/O
--	Not connected	NC	1	NC	Not connected	--
I	Receive data	RXD	2	RXD+	Receive data +	I
O	Transmit data	TXD	3	TXD-	Transmit data -	O
--	Not connected	NC	4	NC	Not connected	--
--	Signal ground	GND	5	GND	Signal ground	--
--	Not connected	NC	6	NC	Not connected	--
O	Request to send	RTS	7	TXD+	Transmit data +	O
I	Clear to send	CTS	8	RXD-	Receive data -	I
--	Not connected	NC	9	NC	Not connected	--

Note ...

The RS-232 signals DCD, DTR, DSR, and RI are not supported on the J3 connector.

The following figure and tables provide pinout information for the onboard COM connectors J2 and J3.

Figure 2-5: Onboard Serial Port Connectors J2 (COM1) and J3 (COM2)
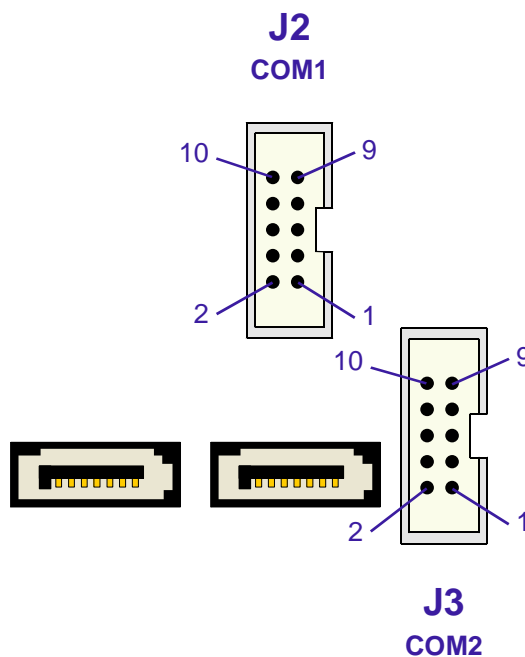
Table 2-6: Onboard Serial Port Connector J2 (COM1) Pinout

PIN	SIGNAL	DESCRIPTION	I/O
1	DCD	Data carrier detect	I
2	DSR	Data send request	I
3	RXD	Receive data	I
4	RTS	Request to send	O
5	TXD	Transmit data	O
6	CTS	Clear to send	I
7	DTR	Data terminal ready	O
8	RI	Ring indicator	I
9	GND	Signal ground	--
10	NC	Not connected	--

Table 2-7: Onboard Serial Port Connector J3 (COM2) Pinout

RS-232			PIN	RS-422		
I/O	DESCRIPTION	SIGNAL		SIGNAL	DESCRIPTION	I/O
--	Not connected	NC	1	NC	Not connected	--
--	Not connected	NC	2	NC	Not connected	--
I	Receive data	RXD	3	RXD+	Receive data +	I
O	Request to send	RTS	4	TXD+	Transmit data +	O
O	Transmit data	TXD	5	TXD-	Transmit data -	O
I	Clear to send	CTS	6	RXD-	Receive data -	I
--	Not connected	NC	7	NC	Not connected	--
--	Not connected	NC	8	NC	Not connected	--
--	Signal ground	GND	9	GND	Signal ground	--
--	Not connected	NC	10	NC	Not connected	--

Note ...

The RS-232 signals DCD, DTR, DSR, and RI are not supported on the J3 connector.

2.1.5   General Purpose Input/Output Port

The CP-RIO3-05 module provides one general purpose input/output port with five general purpose inputs and three general purpose outputs. The GPIO port is implemented as a 10-pin onboard connector J10.

Note ...

The GPI signals tolerate only 3.3 V signaling and the inputs have internal pull-up resistors.

The GPI and GPO signals support LVTTL signaling.

The following figure and table provide pinout information for the onboard GPIO connector J10.

Figure 2-6: GPIO Connector J10

J10
GPIO
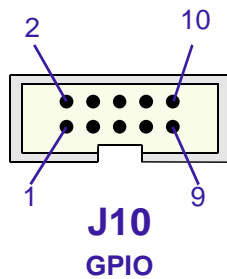
Table 2-8: GPIO Connector J10 Pinout

PIN	SIGNAL	DESCRIPTION	I/O
1	GPI0	General purpose input 0	I
2	GPO0	General purpose output 0	O
3	GPI1	General purpose input 1	I
4	GPO1	General purpose output 1	O
5	GPI2	General purpose input 2	I
6	GPO2	General purpose output 2	O
7	GPI3	General purpose input 3	I
8	3.3V	3.3V power	--
9	GPI4	General purpose input 4	I
10	GND	Signal ground	--

2.1.6 Serial ATA Interfaces

The CP-RIO3-05 provides two onboard SATA II interfaces implemented as two onboard SATA connectors, J4 and J5, used to connect standard SATA devices via SATA cables. A SATA II repeater is provided on the CP-RIO3-05 to improve the signal performance.

The following figure and table provide pinout information for the SATA connectors J4 and J5.

Figure 2-7: SATA Con. J4 and J5

J5
SATA0

J4
SATA1
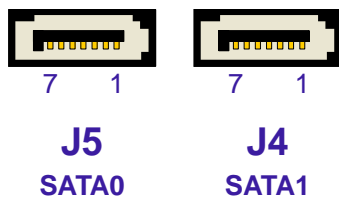
Table 2-9: SATA Connectors J4 and J5 Pinout

PIN	SIGNAL	DESCRIPTION	I/O
1	GND	Ground signal	--
2	SATA_TX+	Differential Transmit +	O
3	SATA_TX-	Differential Transmit -	O
4	GND	Ground signal	--
5	SATA_RX-	Differential Receive -	I
6	SATA_RX+	Differential Receive +	I
7	GND	Ground signal	--

Note ...

When using a Serial ATA cable, it is recommended to use a special right-angled Serial ATA cable due to possible space limitations within the system. For further information, please contact Kontron.

Note ...

To ensure secure connectivity, the SATA connector supports the use of SATA II cables (SATA cables with locking latch).

SATA II support for external SATA devices is a function of the backplane, the SATA device and cabling. In general, the more connectors and cabling involved, the less chance of achieving proper external SATA II device operation.

2.1.7 Rear I/O Interface on CompactPCI Connector rJ2

The CP-RIO3-05 is equipped with one CompactPCI rear I/O connector rJ2.

Warning!

To support the rear I/O feature, a 3U CompactPCI backplane with rear I/O support as well as a compatible and correctly configured CPU board are required. Do not plug the CP-RIO3-05 in a backplane without rear I/O support.

Failure to comply with the above will result in damage to the CP-RIO3-05.

Warning!

The CP-RIO3-05 may be used only with CPU boards that have a compatible rear I/O CompactPCI connector pinout, such as the CP3002-RA and the CP3002-RC from Kontron.

Failure to comply with the above may result in damage to the CP-RIO3-05 or the CPU board.

Figure 2-8: Rear I/O CompactPCI Connectors rJ2

Note:
Pinrow F: GND
Pinrow Z: NC
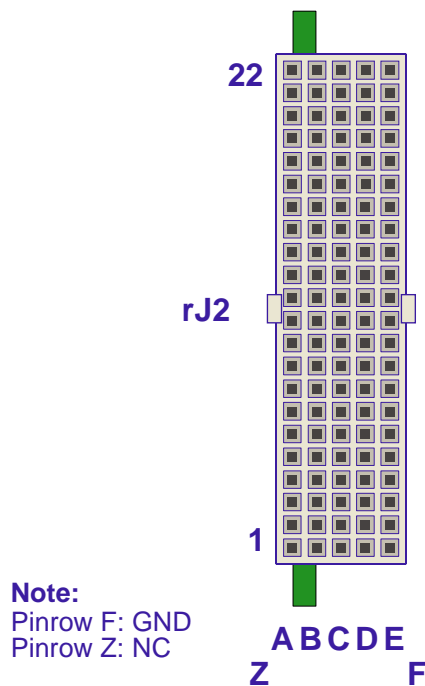
Table 2-10: Rear I/O CompactPCI Bus Connector rJ2 Pinout

PIN	ROW Z	ROW A	ROW B	ROW C	ROW D	ROW E	ROW F
22	NC	NC	NC	NC	NC	NC	GND
21	NC	GPI4	GND	USB1+	USB0+	USB1_PWR_5V	GND
20	NC	GPO1	GND	USB1-	USB0-	USB0_PWR_5V	GND
19	NC	GND	GND	RIO_3.3V (BAT)	GPI2	RIO_3.3V	GND
18	NC	IPC_DA+	IPC_DA-	GPO0	IPD_DA+	IPD_DA-	GND
17	NC	IPC_DB+	IPC_DB-	PRST#	IPD_DB+	IPD_DB-	GND
16	NC	IPC_DC+	IPC_DC-	NC	GND	IPD_DC+	GND
15	NC	IPC_DD+	IPC_DD-	NC	GPI0	IPD_DC-	GND
14	NC	IPB_DA+	IPB_DA-	IPD_DD+	IPB_DC+	IPB_DC-	GND
13	NC	IPB_DB+	IPB_DB-	IPD_DD-	IPB_DD+	IPB_DD-	GND
12	NC	IPA_DA+	IPA_DA-	IP_PWR	IPA_DC+	IPA_DC-	GND
11	NC	IPA_DB+	IPA_DB-	COM1_RI#	IPA_DD+	IPA_DD-	GND
10	NC	GND	GND	VGA_RED	COM1_DSR#	GND	GND
9	NC	SATA0TX+	COM1_RXD	VGA_HSYNC	COM2_RX+/ RXD	SATA1TX+	GND
8	NC	SATA0TX-	COM1_CTS#	VGA_BLUE	COM2_RX-/ CTS#	SATA1TX-	GND
7	NC	GND	GND	VGA_DDC_DATA	GND	GND	GND
6	NC	SATA0RX+	COM1_RTS#	VGA_GREEN	COM2_TX+/ RTS#	SATA1RX+	GND
5	NC	SATA0RX-	COM1_TXD	VGA_VSYNC	COM2_TX-/ TXD	SATA1RX-	GND
4	NC	VI/O	RIO_5V	VGA_DDC_CLK	COM1_DCD#	COM1_DTR#	GND
3	NC	GPI1	GND	NC	GPI3	GPO2	GND
2	NC	NC	NC	NC	NC	NC	GND
1	NC	NC	GND	NC	NC	NC	GND

Warning!

The RIO_XXX signals are power supply INPUTS to supply the rear I/O module with power. These pins **MUST NOT** be connected to any other power source, either within the backplane itself or within a rear I/O module.

Failure to comply with the above will result in damage to your board.

Legend for Table 2-10:

SATAx	Serial ATA port
IPx	Gigabit Ethernet port
VGAx	VGA signals
COM1x	COM1 port (corresponds to COMA on the CP3002-RA/-CP3002-RC)
COM2x	COM2 port (corresponds to COMB on the CP3002-RA/-CP3002-RC)
PWRx	Power Management signals
RIO_5V/3.3V	Power
GPIx	General purpose input signal
GPOx	General purpose output signal

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Chapter **3**

Installation

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3.   Installation

The CP-RIO3-05 has been designed for easy installation. However, the following standard precautions, installation procedures, and general information must be observed to ensure proper installation and to preclude damage to the CP-RIO3-05, other system components, or injury to personnel.

3.1   Safety Requirements

The following safety precautions must be observed when installing or operating the CP-RIO3-05. Kontron assumes no responsibility for any damage resulting from failure to comply with these requirements.

Caution!

Ensure that the system main power is removed prior to installing or removing the CP-RIO3-05. Ensure that there are no other external voltages or signals being applied to the CP-RIO3-05 or other boards within the system. Failure to do so could endanger your life or health and may damage the CP-RIO3-05 or other system components including process-side signal conditioning equipment.

ESD Equipment!

The CP-RIO3-05 contains electrostatically sensitive devices. Please observe the necessary precautions to avoid damage to the CP-RIO3-05:

- Discharge your clothing before touching the assembly. Tools must be discharged before use.
- Do not touch components, connector-pins or traces.
- If working at an anti-static workbench with professional discharging equipment, please do not omit to use it.

3.2 Initial Installation Procedures

The following procedures are applicable only for the initial installation of the CP-RIO3-05 in a system.

To perform an initial installation of both the CP-RIO3-05 in a system, proceed as follows:

1. Ensure that the safety requirements indicated in Chapter 3.1 are observed.

> *Warning!*
>
> Failure to comply with the instruction below may cause damage to the CP-RIO3-05 or result in improper system operation.

2. Ensure that the CP-RIO3-05 is compatible with the CPU board and the backplane prior to installation.

3. If appropriate, ensure that the onboard peripheral devices are properly installed prior to installation of the CP-RIO3-05.

4. Ensure that no power is applied to the system before proceeding.

> *Warning!*
>
> Even though power may be removed from the system, the CP-RIO3-05 front panel cables may have power applied which comes from an external source.
>
> In addition, these cables may be connected to devices that can be damaged by electrostatic discharging or short-circuiting of pins.
>
> It is the responsibility of the system designer or integrator to ensure that appropriate measures are taken to preclude damage to the system or injury to personnel which may arise from the handling of these cables (connecting or disconnecting).
>
> Kontron disclaims all liability for damages or injuries resulting from failure to comply with the above.

> *Warning!*
>
> When performing the next step, **DO NOT** push the CP-RIO3-05 into the backplane connector. Use the ejector handle to seat the CP-RIO3-05 into the backplane connector.

5. Carefully insert the CP-RIO3-05 into the slot designated by the application requirements for the CP-RIO3-05 until it makes contact with the backplane connector.
6. Using the ejector handle, engage the CP-RIO3-05 with the backplane. When the ejector handle is locked, the CP-RIO3-05 is engaged.
7. Fasten the front panel retaining screws.
8. Connect all external interfacing cables to the CP-RIO3-05 as required.
9. Ensure that the CP-RIO3-05 and all required interfacing cables are properly secured.

The CP-RIO3-05 is now ready for initial operation.

3.3   Standard Removal Procedures

To remove the CP-RIO3-05 proceed as follows:

1. Ensure that the safety requirements indicated in Chapter 3.1 are observed.

> *Warning!*
>
> Care must be taken when applying the procedures below to ensure that neither the CP-RIO3-05 nor system boards are physically damaged by the application of these procedures.

2. Ensure that no power is applied to the system before proceeding.

> *Warning!*
>
> Even though power may be removed from the system, the CP-RIO3-05 front panel cables may have power applied which comes from an external source.
>
> In addition, these cables may be connected to devices that can be damaged by electrostatic discharging or short-circuiting of pins.
>
> It is the responsibility of the system designer or integrator to ensure that appropriate measures are taken to preclude damage to the system or injury to personnel which may arise from the handling of these cables (connecting or disconnecting).
>
> Kontron disclaims all liability for damages or injuries resulting from failure to comply with the above.

3. Disconnect any interfacing cables that may be connected to the CP-RIO3-05.
4. Unscrew the front panel retaining screws.
5. Disengage the CP-RIO3-05 from the backplane by first unlocking the ejection handle and then by pressing the handle as required until the CP-RIO3-05 is disengaged.
6. After disengaging the CP-RIO3-05 from the backplane, pull it out of the slot.
7. Dispose of the CP-RIO3-05 as required.

3.4 Installation of External Serial ATA Devices

Up to two external SATA devices may be connected to the CP-RIO3-05 via the onboard SATA connectors J4 and J5 as well as the appropriate SATA cables.

Some symptoms of incorrectly installed SATA devices are:

- Device on a SATA channel does not spin up: check power cables and cabling. May also result from a bad power supply or SATA device.
  The SATA connector on the CP-RIO3-05 provides only a data connection. The power for this device must be supplied by a separate connector. For further information, refer to the respective documentation of the device.

- SATA device fail message at boot-up: may be a bad cable or lack of power going to the drive.

Warning!

The incorrect connection of power or data cables may damage the SATA device and/or the CP-RIO3-05.