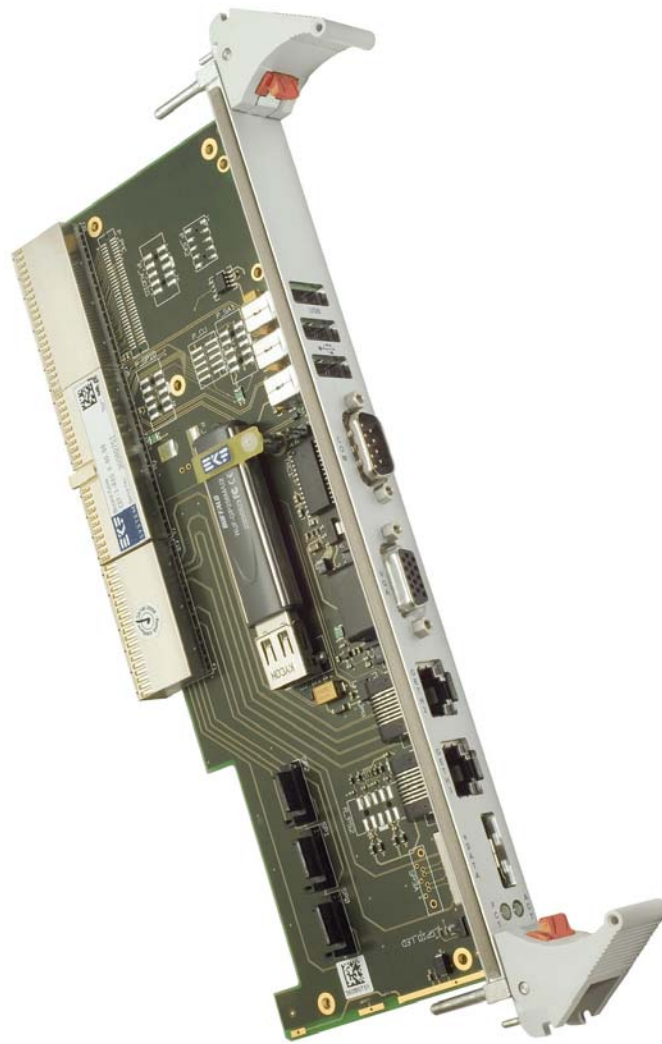




Technical Information

CDT-RIO • Rear I/O Transition Module

Document No. 4245 • Edition 3 • 2007-11



Contents

About this Manual	- 3 -
Edition History	- 3 -
Related Documents	- 4 -
Nomenclature	- 4 -
Trade Marks	- 4 -
Legal Disclaimer - Liability Exclusion	- 4 -
 CDT-RIO Features	 - 5 -
Short Description	- 6 -
Image CDT-RIO	- 7 -
Image CDT-RIO with CD3-JIVE	- 8 -
Block Diagram CDT-RIO	- 9 -
Top View Component Assembly	- 10 -
On-Board Connectors	- 11 -
Back Panel Connectors	- 12 -
Back Panel LED	- 12 -
 Installing and Replacing Components	 - 13 -
Before You Begin	- 13 -
Warnings	- 13 -
Caution	- 13 -
Installing the Board	- 14 -
Removing the Board	- 15 -
EMC Recommendations	- 16 -
 Technical Reference	 - 17 -
Caution	- 17 -
Back Panel Elements	- 18 -
FCT/ACT Dual LED	- 19 -
eSATA External Serial ATA	- 19 -
ETH2 / ETH3 Ethernet	- 20 -
VGA Video	- 21 -
COM2 Serial Port	- 22 -
USB1-USB3 High Speed Serial Bus	- 22 -
Mezzanine Bezel	- 23 -
On-Board Connectors	- 24 -
J3, J4, J5 CompactPCI	- 24 -
P-AUDIO	- 28 -
P-CU Serial Interface Connectors	- 29 -
P-GPIO Connector	- 30 -
P-PMC Mezzanine Connector	- 31 -
Power Connector P-POW	- 32 -
P-SA1 / P-SA2 Serial Interface Connectors	- 33 -
SP0 ... SP3A Serial ATA onboard Connectors	- 34 -
USB4 High Speed Serial Bus	- 34 -
Schematics	- 35 -

About this Manual

This manual is a short form description of the technical aspects of the CDT-RIO, required for installation and system integration. It is intended for the very advanced user only.

Edition History

EKF Document	Ed.	Contents/ <i>Changes</i>	Author	Date
Text # 3223 cdt_tie.wpd	1	Technical Information CDT-RIO English Preliminary edition, to be completed later on	jb	27. June 2006
	2	General review	jj	17 August 2006
	3	Added photos	jj	6 November 2007

Related Documents

For a description of the CD3-JIVE CPU card, which acts as a controller board with respect to the CDT-RIO transition module, please refer to the correspondent CPU user guide, available by download at http://www.ekf.com/c/ccpu/cd3/cd3_e.html.

Theme	Document Title	Origin
<i>CompactPCI</i>	<i>CompactPCI</i> Specification, PICMG 2.0 R3.0, Oct. 1, 1999	www.picmg.org
PCI Express	PCI Express™ Base Specification Revision 1.0a, April 15, 2003	www.pcisig.com
Ethernet	IEEE Std 802.3, 2000 Edition	standards.ieee.org
USB	Universal Serial Bus Specification	www.usb.org
Serial ATA	Serial ATA Revision 2.5	www.serialata.org
PMC	Common Mezzanine Card Family P1386/2.4a & P1386.1/2.4	www.ieee.org

Nomenclature

Signal names used herein with an attached '#' designate active low lines.

Trade Marks

Some terms used herein are property of their respective owners, e.g.

- ▶ Intel, Pentium, Celeron, Pentium M, Core Duo: ® Intel
- ▶ **CompactPCI**: ® PICMG
- ▶ PCI Express: ® PCI-SIG
- ▶ Windows 2000, Windows XP: ® Microsoft
- ▶ EKF, ekf system: ® EKF

EKF does not claim this list to be complete.

Legal Disclaimer - Liability Exclusion

This manual has been edited as carefully as possible. We apologize for any potential mistake. Information provided herein is designated exclusively to the proficient user (system integrator, engineer). EKF can accept no responsibility for any damage caused by the use of this manual.

CDT-RIO Features

Feature Summary	
Form Factor	80x233mm ² , back panel width 4HP (20mm)
On-Board Connectors ¹	<ul style="list-style-type: none"> ▶ Triple (quad optionally) Serial ATA vertical connectors SP0 SP1 SP2 (SP3A optionally) ▶ Internal USB connector USB4, suitable for system internal cabling or USB stick flash drive ▶ UART serial port pin header P-CU 2x5-position 2.00mm (TTL level, suitable for EKF CU series PHY modules) ▶ UART serial port pin header P-SA1 2x5-position 2.54mm (TTL level, suitable for MEN SA series PHY modules) ▶ GPIO header P-GPIO 2x5 position 2.54mm ▶ PS/2 style legacy keyboard/mouse port pin header P-PS2 2x5-position 2.54mm ▶ Auxiliary power connector P-POW 4-lead horizontal floppy style AMP EI series
Mezzanine Area On-Board Connectors ^{1,2}	<ul style="list-style-type: none"> ▶ IEEE1386 mezzanine connector P-PMC for custom specific cross-over module with external back panel connector (custom specific back panel with bezel required) ▶ UART serial port socket P-SA2 2x5-position 2.54mm (TTL level, suitable for MEN SA series PHY modules) ▶ AC'97/HD-Audio header P-AUDIO 2x5 position 2.54mm
Back Panel Elements ¹	<ul style="list-style-type: none"> ▶ eSATA External Serial ATA receptacle ▶ 2 x Gigabit Ethernet (RJ45) ▶ COM2 EIA/TIA 232E (9-pos. D-Sub male) ▶ 3 x USB2.0 Connector (type A connectors) ▶ VGA Graphics output (HD D-Sub 15) ▶ Bezel for mezzanine rear I/O cross-over adapter, or mezzanine HD-Audio module, or MEN SA module ▶ Dual LED indicates SATA activity (ACT) and programmable function (FCT)
CPCI Rear I/O Connectors ¹	Hard Metric connectors 2.00mm <ul style="list-style-type: none"> ▶ J3 5x19 Dual Gigabit Ethernet & Quad SATA ▶ J4 5x25 Legacy I/O ▶ J5 5x22 PMC rear I/O cross-over mezzanine module
Thermal Conditions	<ul style="list-style-type: none"> ▶ Operating temperature 0°C ... +70°C (industrial temperature range available on request) ▶ Storage temperature -40°C ... +85°C, max. gradient 5°C/min
Environmental Conditions	<ul style="list-style-type: none"> ▶ Humidity 5% ... 95% relative humidity, non condensing ▶ Altitude -300m ... +3000m ▶ Shock 15g 0.33ms, 6g 6ms ▶ Vibration 1g 5-2000Hz
Regulations	<ul style="list-style-type: none"> ▶ EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1) ▶ 2002/95/EC (RoHS)
MTBF	tbd

¹ Please note: The CDT-RIO is predominantly a custom specific product. Not all of the components mentioned in this manual may be present on your actual board. Please discuss your individual needs with sales@ekf.com before buying this component.

² Please note: Mezzanine connector options are *not* available concurrently, i.e P-PMC, P-AUDIO and P-SA2 are stuffed exclusively only, due to sharing the reserved area for a mezzanine adapter module.

Short Description

Available as a companion board to the CD3-JIVE CPU card, the CDT-RIO is provided with several additional I/O ports. Being mainly a passive rear I/O transition module, groups of signals from the CD3 CPU board are passed across the CompactPCI J3/P3, J4/P4 and J5/P5 connectors to the CDT-RIO transition module.

Utilization of the CDT-RIO transition module adds a level of I/O functionality, which is not available with the CD3-JIVE CPU board alone. Further on, swapping the CPU card is simplified by means of rear I/O, which is important for efficient system maintenance (MTTR).

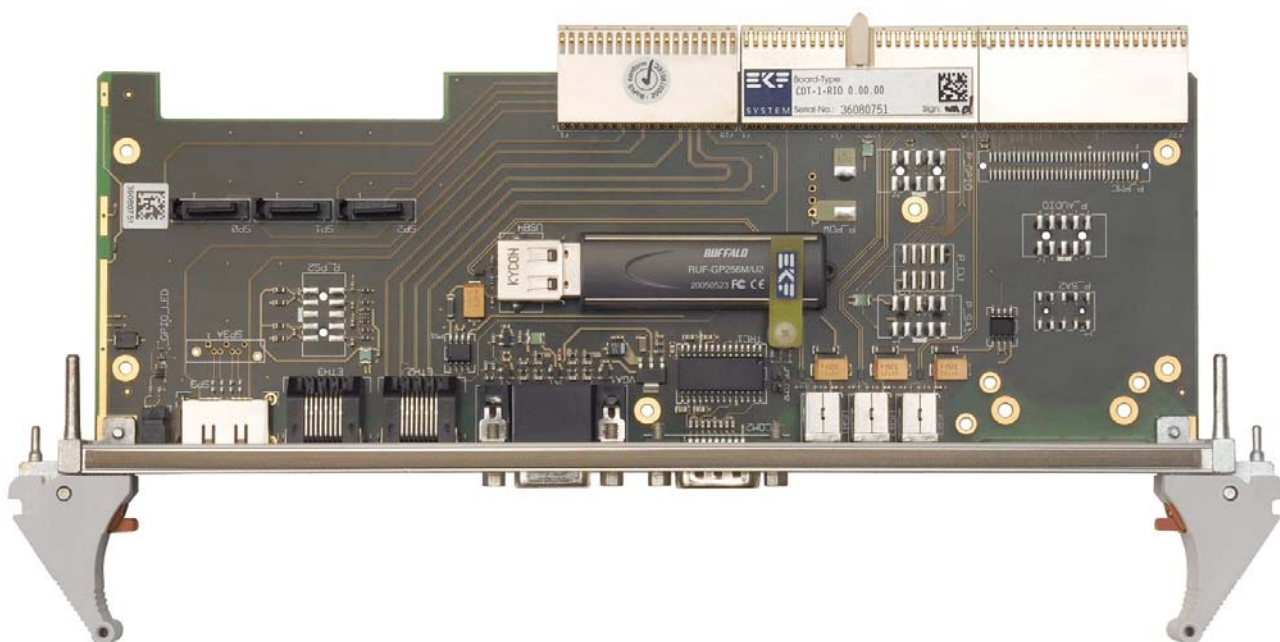


Image CDT-RIO

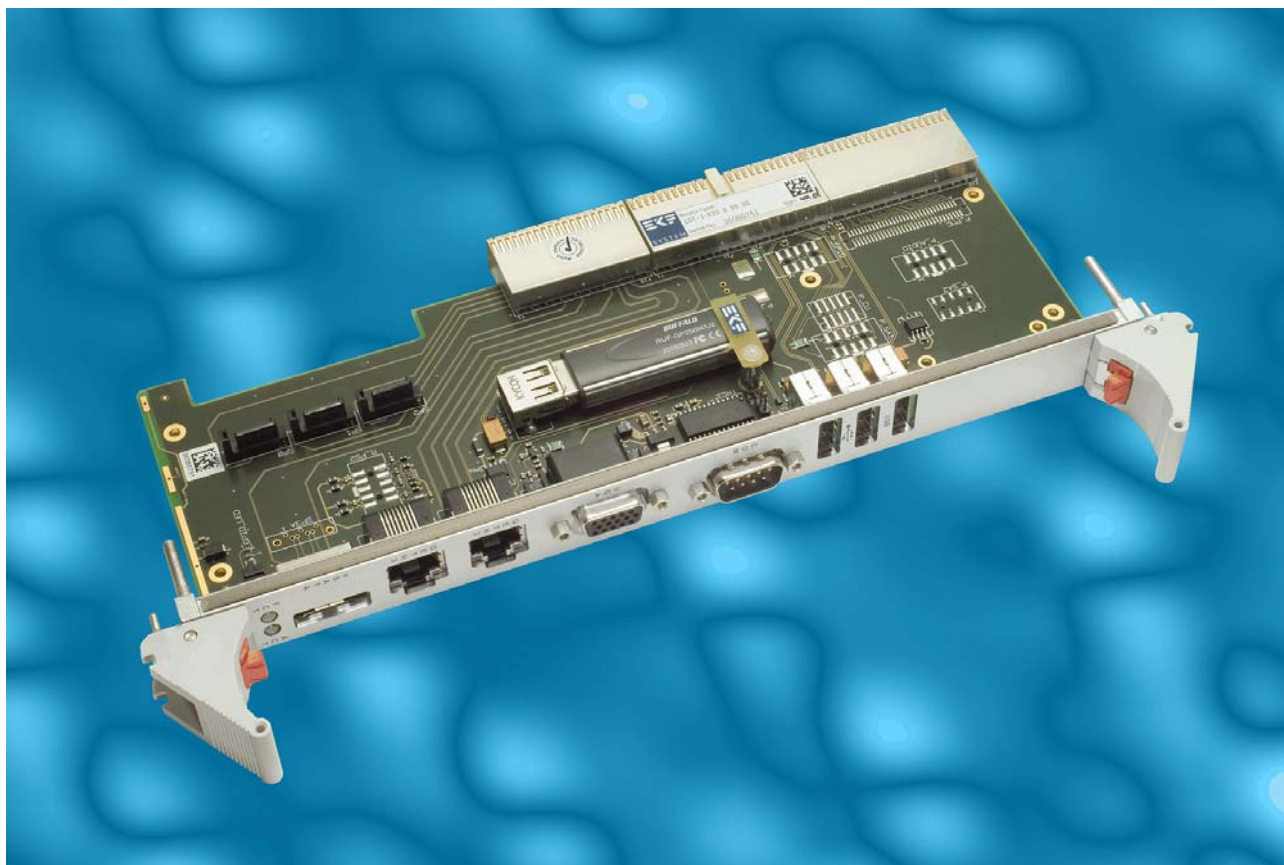
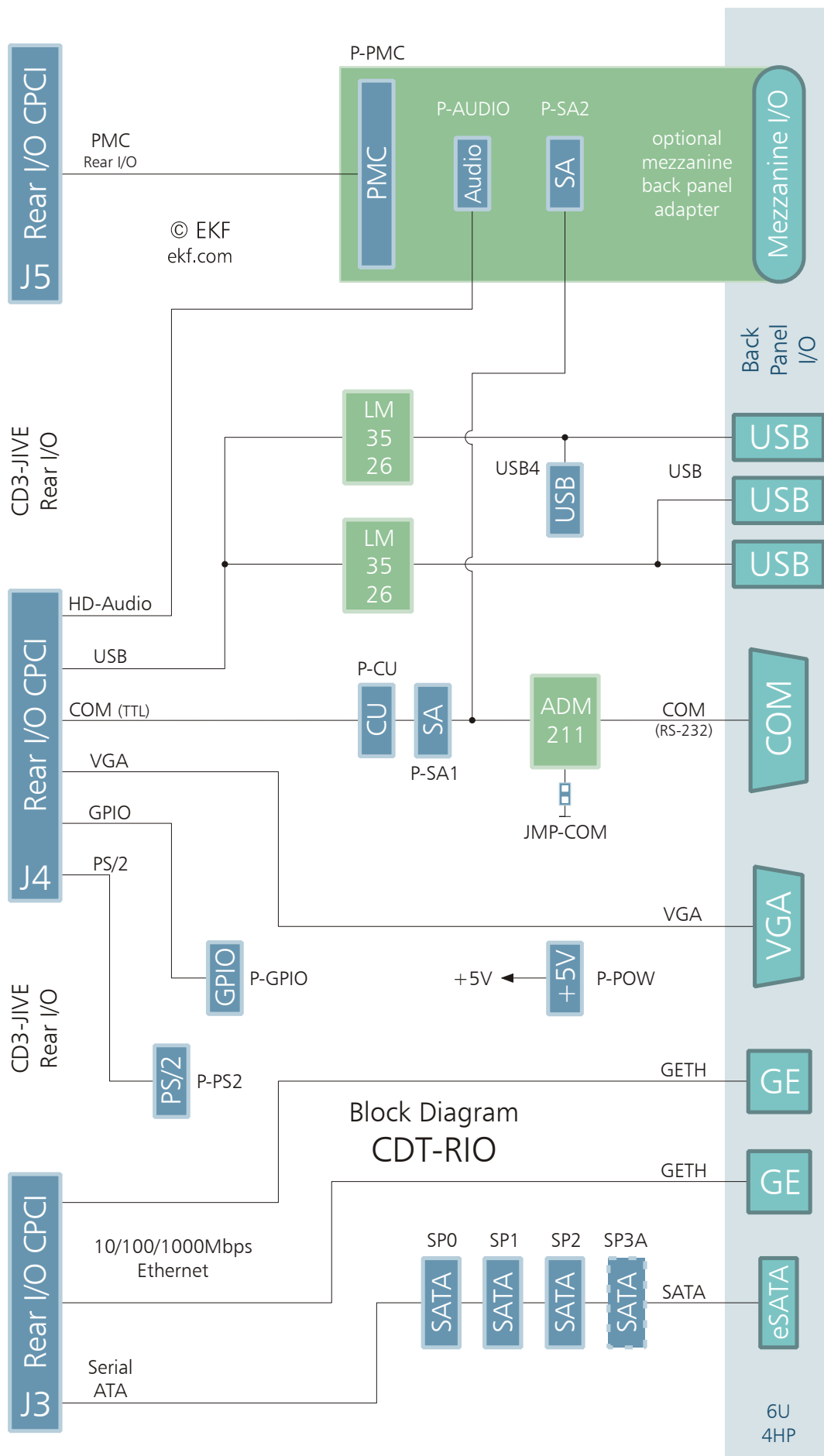


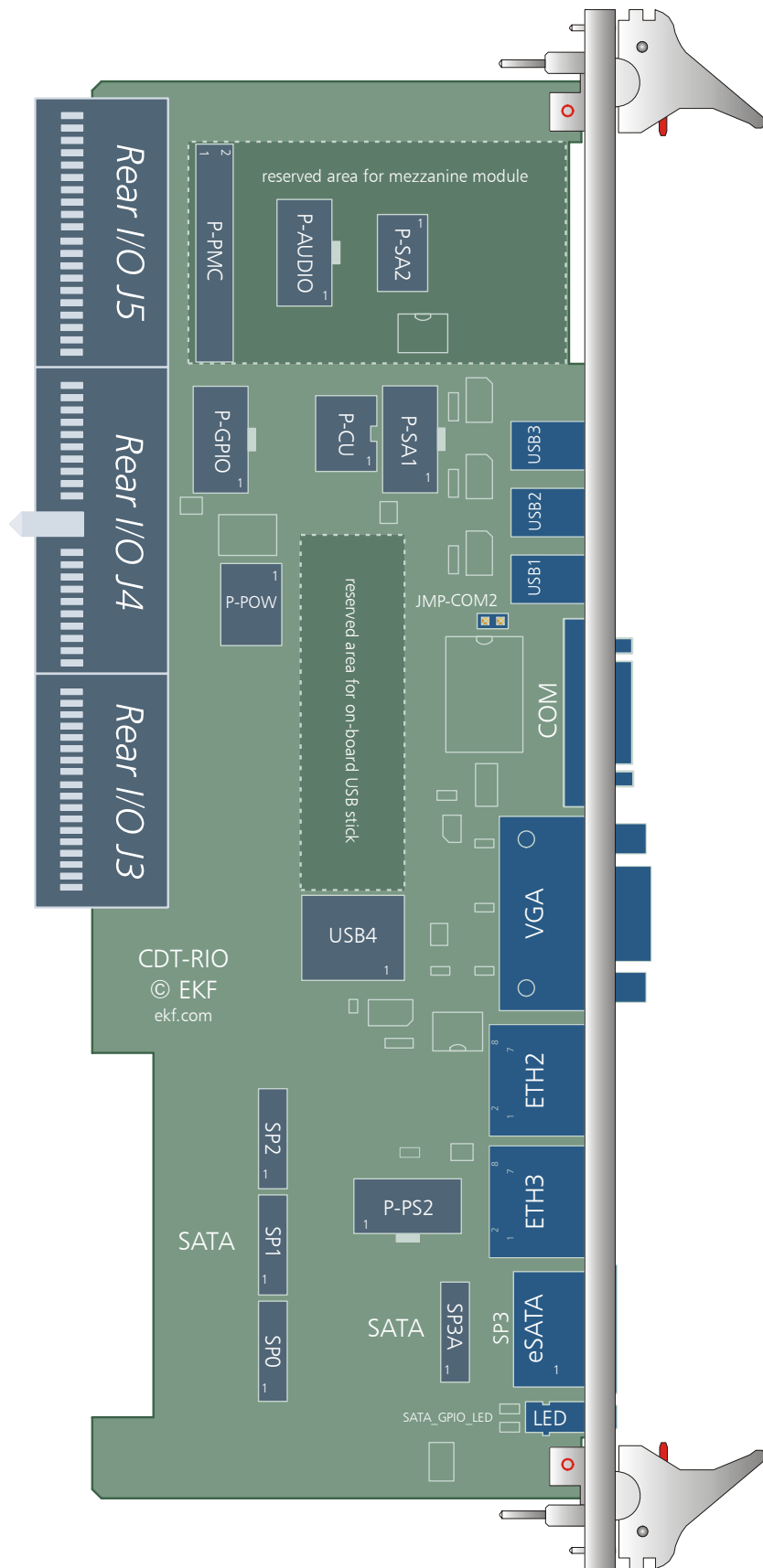
Image CDT-RIO with CD3-JIVE



Block Diagram CDT-RIO



Top View Component Assembly



On-Board Connectors

J3	CompactPCI receptacle, matches the CPCI backplane P3 connector ¹ Dual Gigabit Ethernet & Quad Serial ATA
J4	CompactPCI receptacle, matches the CPCI backplane P4 connector Classic I/O Functions
J5	CompactPCI receptacle, matches the CPCI backplane P5 connector ² If a PMC Module with rear I/O is in use on the CD3-JIVE, J5 is required to pass these signals from the PMC Module to the CDT-RIO
P-AUDIO	10-pin Audio header, providing the AC'97 / HD Audio signals derived from the ICH6 on the CD3-JIVE ⁵ Suitable for back panel I/O with custom specific mezzanine module and custom specific rear panel
P-CU	Serial interface 10-pin header, suitable for attachment of EKF CU-series PHY modules (e.g. CU7-RS485 and CU8-RS232) ³
P-GPIO	10-pin GPIO header, for custom specific use
P-PMC	IEEE 1386 receptacle, PMC mezzanine rear I/O, matches the signal order of connector 14 on a PMC module with rear I/O function ^{2 5} Suitable for back panel I/O with custom specific mezzanine module and custom specific rear panel
P-POW	Power connector +5V ⁴
P-PS2	10-pin header providing the legacy PS/2 keyboard and mouse signals
P-SA1	Serial interface 10-pin header, suitable for attachment of MEN SA-series PHY modules ³
P-SA2	Serial interface 10-position socket, suitable for plug-in of MEN SA-series PHY modules ^{3 5} Suitable for back panel I/O with custom specific custom specific rear panel
SP0-SP2	Vertical Serial ATA connectors, SATA channels 0-2, for system internal strapping to SATA compliant devices
SP3A	Serial ATA connector channel 3 Stuffing alternate to the back panel eSATA receptacle SP3
USB4	USB type A receptacle, USB 2.0 interface The connector is aligned to a component free zone, which allows to provide an on-board USB stick as low cost Flash drive

¹ J3 is available as an option. Use of J3, which passes the ETH3 Ethernet connector signals, comes into conflict with the PICMG® 2.16 Packet Switching Backplane Specification. It is possible to provide a partial J3 which is cut off, in order to leave out the Ethernet ports but nevertheless give access to the SATA channels.

² J5 is used to pass over the mezzanine modules rear I/O signals. On your actual CDT-RIO J5 may be left out, as well as the rear I/O mezzanine connector P-PMC, which provides the signals

in the same order as on the CD3-JIVE. When used as a rear panel I/O, an additional back panel adapter module would be required. Please discuss your needs with EKF.

³ Normally the CDT-RIO is equipped with an on-board RS-232E transceiver and therefore does not require an additional PHY module. As an option, the on-board transceiver can be omitted or switched off, and an external PHY module (e.g. isolated RS-485) may be attached.

⁴ The CDT-RIO is powered across the J4 connector from the CD3-JIVE. If P-POW is stuffed as an option, the systems +5V power supply may be redundantly connected directly to the CDT-RIO, which may discharge the CD3-JIVE considerably.

⁵ The P-AUDIO connector shares a reserved board area with P-PMC and P-SA2 and is provided for a custom specific mezzanine module with AC'97 or Azalia HD-Audio codec circuitry; its use is exclusive with respect to P-PMC and P-SA2.

Back Panel Connectors

COM2	9-pin male D-Sub connector, RS-232E serial interface
ETH2/ETH3	Gigabit Ethernet connectors (RJ45) ¹
Mezzanine I/O	Normally closed, custom specific back panels may be provided with a cutout which is suitable for a custom specific mezzanine adapter module attached to either connector P-PMC, P-AUDIO or P-SA2
SP3	eSATA Receptacle Serial ATA channel 3
USB1-3	USB type A receptacles, USB 2.0 interfaces
VGA	Video graphics output, 15-pos. high density D-SUB female connector

¹ ETH2/ETH3 are provided as an option only. Usage of ETH2/ETH3 comes into conflict with the PICMG[®] 2.16 Packet Switching Backplane Specification.

Back Panel LED

A dual-LED is provided in the rear panel. The right LED indicates activity on any of the SATA channels (Activity ACT). The left LED is user programmable (Function FCT) and follows the status of the GPIO25 (SIO1 IT8761 on the CD3-JIVE).

ACT	SATA Activity
FCT	Special Function

Installing and Replacing Components

Before You Begin

Warnings

The procedures in this chapter assume familiarity with the general terminology associated with industrial electronics and with safety practices and regulatory compliance required for using and modifying electronic equipment. source and from any telecommunication performing any of the procedures disconnect power, or telecommunication perform any procedures can result in Some parts of the system can continue to operate even though the power switch is in its off state.



Disconnect the system from its power links, networks or modems before described in this chapter. Failure to links before you open the system or personal injury or equipment damage.

Caution

Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation. If provide some ESD protection by wearing to a metal part of the system chassis or in its original ESD protected packaging.



such a station is not available, you can an antistatic wrist strap and attaching it board front panel. Store the board only Retain the original packaging (antistatic bag and antistatic box) in case of returning the board to EKF for rapair.

Installing the Board

Warning

This procedure should be done only by qualified technical personnel. Disconnect the system from its power source before doing the procedures described here. Failure to disconnect power, or telecommunication links before you open the system or perform any procedures can result in personal injury or equipment damage.

Typically you will perform the following steps:

- Switch off the system, remove the AC power cord
- Attach your antistatic wrist strap to a metallic part of the system
- Remove the board packaging, be sure to touch the board only at the front panel
- Identify the related CompactPCI slot (peripheral slot for I/O boards, system slot for CPU boards, with the system slot typically most right or most left to the backplane)
- Insert card carefully (be sure not to damage components mounted on the bottom side of the board by scratching neighboured front panels)
- A card with onboard connectors requires attachment of associated cabling now
- Lock the ejector lever, fix screws at the front panel (top/bottom)
- Retain original packaging in case of return



Removing the Board

Warning

This procedure should be done only by qualified technical personnel. Disconnect the system from its power source before doing the procedures described here. Failure to disconnect power, or telecommunication links before you open the system or perform any procedures can result in personal injury or equipment damage.

Typically you will perform the following steps:

- Switch off the system, remove the AC power cord
- Attach your antistatic wrist strap to a metallic part of the system
- Identify the board, be sure to touch the board only at the front panel
- unfasten both front panel screws (top/bottom), unlock the ejector lever
- Remove any onboard cabling assembly
- Activate the ejector lever
- Remove the card carefully (be sure not to damage components mounted on the bottom side of the board by scratching neighboured front panels)
- Store board in the original packaging, do not touch any components, hold the board at the front panel only



Warning

Do not expose the card to fire. Battery cells and other components could explode and cause personal injury.



EMC Recommendations



In order to comply with the CE regulations for EMC, it is mandatory to observe the following rules:

- The chassis or rack including other boards in use must comply entirely with CE
- Close all board slots not in use with a blind front panel
- Front panels must be fastened by built-in screws
- Cover any unused front panel mounted connector with a shielding cap
- External communications cable assemblies must be shielded (shield connected only at one end of the cable)
- Use ferrite beads for cabling wherever appropriate
- Some connectors may require additional isolating parts (e.g. 10Base-2 BNC T-connector)

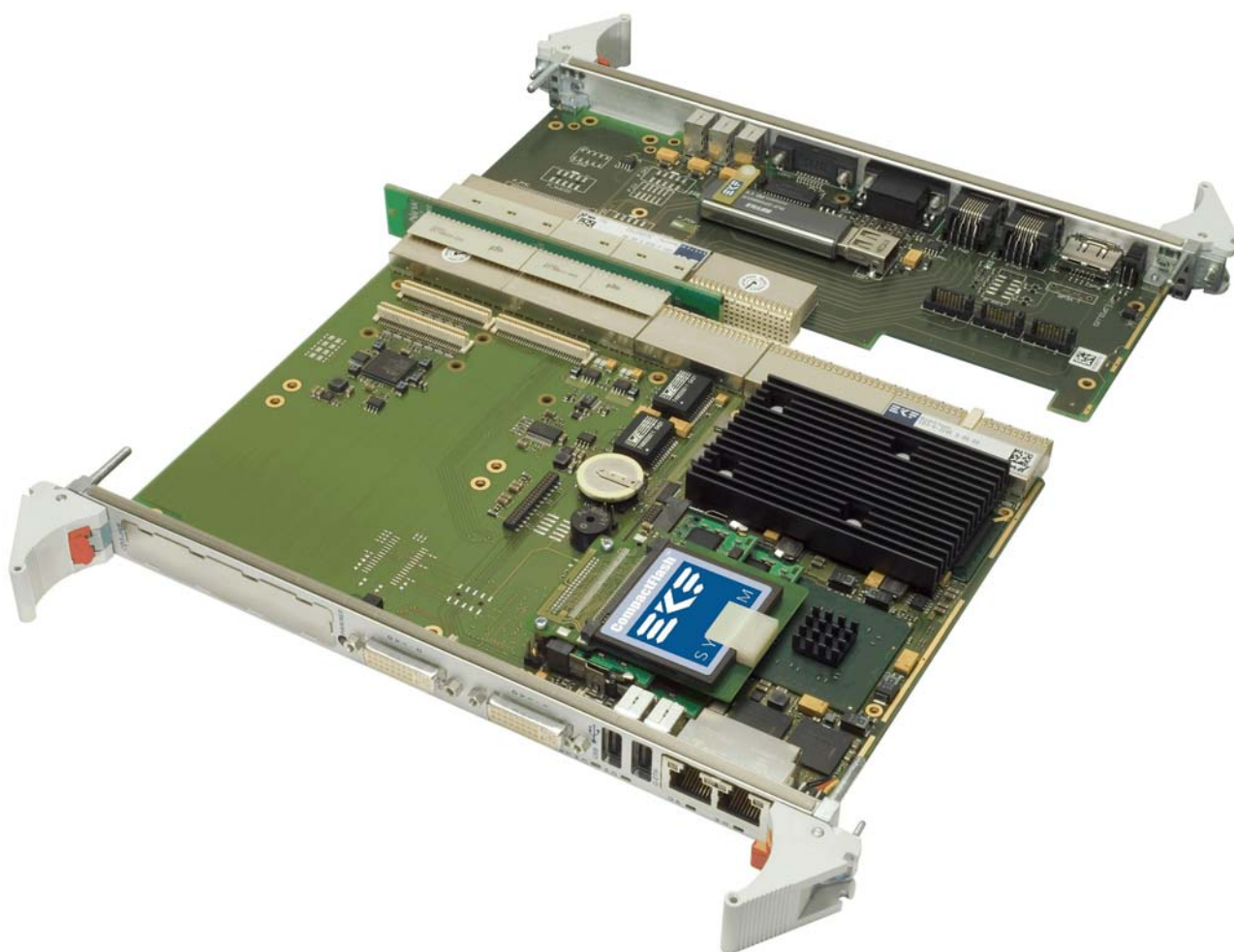
Reccomended Accessories

Blind CPCI Front Panels	EKF Elektronik	Widths currently available (1HP=5.08mm): with handle 4HP/8HP without handle 2HP/4HP/8HP/10HP/12HP
Ferrit Bead Filters	ARP Datacom, 63115 Dietzenbach	Ordering No. 102 820 (cable diameter 6.5mm) 102 821 (cable diameter 10.0mm) 102 822 (cable diameter 13.0mm)
Metal Shielding Caps	Conec-Polytronic, 59557 Lippstadt	Ordering No. CDFA 09 165 X 13129 X (DB9) CDSFA 15 165 X 12979 X (DB15) CDSFA 25 165 X 12989 X (DB25)

Technical Reference

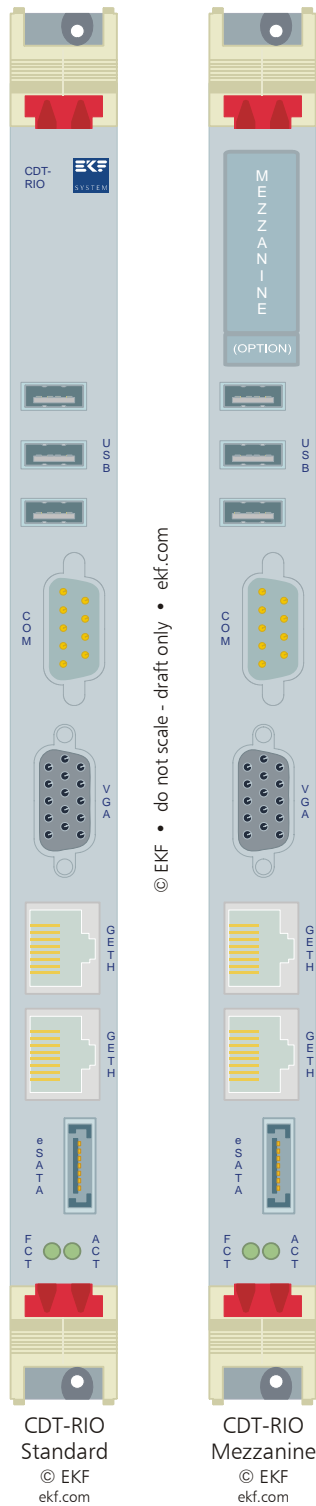
Caution

Some of the connectors may provide operating voltage (e.g. 5V) to devices inside the system chassis, such as internal drives. Not all of these connectors are overcurrent protected. Do not use these connectors for powering devices external to the computer chassis. A fault in the load presented by the external devices could cause damage to the board, the interconnecting cable and the external devices themselves.

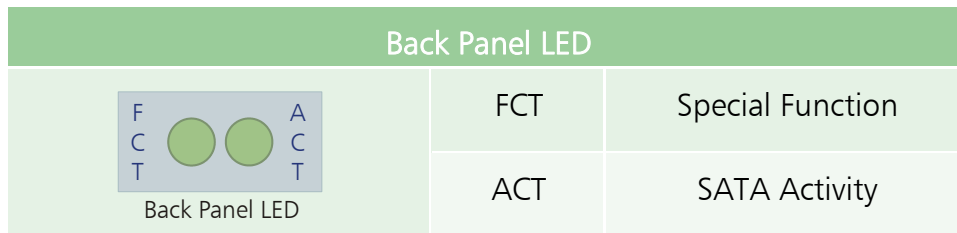


Back Panel Elements

The CDT-RIO is provided with a 6U/4HP rear panel, which contains an eSATA receptacle, the RJ45 Ethernet jacks, VGA output D-SUB female connector, a serial COM port and three USB receptacles. In addition, a mezzanine rear I/O connector may be mounted into a cutout, which is covered by a bezel (custom specific back panels only). Characteristic features and the pin assignments of each connector are described on the following pages (detail order from bottom up to top of the back panel).



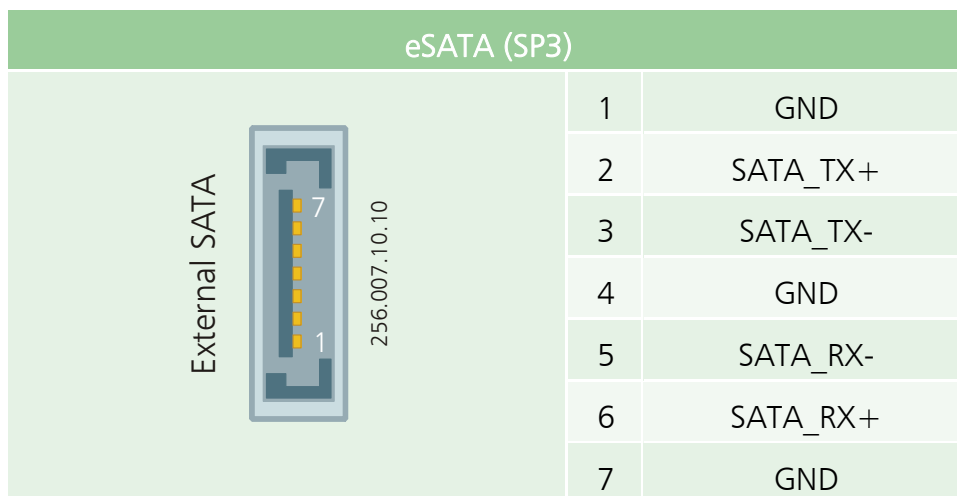
FCT/ACT Dual LED



The Activity-LED is controlled by the ICH6 on the CD3-JIVE CPU board and reflects any traffic on either one of the SATA channels (drive activity). The Function-LED is controlled by GPIO25 of the Low Pin Count I/O chip IT8761 on the CD3-JIVE host and lights when GPIO25 is low. After the CD3-JIVE reset, the GPIO25 defaults to output low (LED on). During the reset, GPIO25 is tri-stated (LED off). A programming manual of the IT8761 may be obtained from www.ite.com.tw.

eSATA External Serial ATA

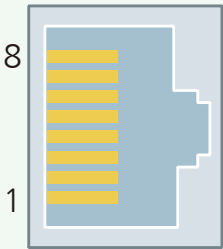
The CDT-RIO back panel is equipped with an eSATA connector, suitable for attachment of an external SATA device. The eSATA connector differs slightly from the standard (internal) SATA connector in order to provide better shielding, and likewise requires a shielded eSATA cable assembly. Available as accessory from computer stores or EKF are eSATA cable harnesses, either with dual eSATA connectors on both cable endings, or eSATA to SATA adapter cables. The typical external SATA cable length is either 1m or 2m (3ft or 6ft).



ETH2 / ETH3 Ethernet

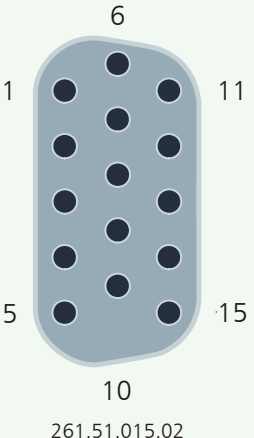
The CD3-JIVE is equipped with three Gigabit Ethernet controllers. Port 1 is routed directly to the front panel. Port 2 port is software switchable (BIOS) between front panel and rear I/O access. Port 2 and 3 are reserved for either backplane communication or rear I/O.

The ETH2/3 Ethernet jacks are provided as an option, due to a conflict situation when a Packet Switching Backplane according to PICMG® 2.16 is present. That means, if a 2.16 backplane is present in a CompactPCI system, the CPCI connector J3 of the CDT-RIO must be omitted. This measure separates the backplane Ethernet signals from the CDT-RIO ETH2/ETH3 jacks. As an alternate, a cropped J3 connector could be stuffed in order to leave out the Ethernet ports, but passing over the SATA channels which use as well J3. Be sure to discuss your actual needs with sales@ekf.com before ordering the CDT-RIO.

ETH2 & ETH3 (RJ45)		
	1	MDX0+
	2	MDX0-
	3	MDX1+
	4	MDX2+
	5	MDX2-
	6	MDX1-
	7	MDX3+
	8	MDX3-

VGA Video

Alternatively, either the CD3-JIVE front panel DVI-I connector (integrated digital & analog video interface) may be used for attachment of a flat panel display or classic monitor, or the CDT-RIO back panel VGA socket (high density D-Sub 15-position, analog signals only). Electronic switches are provided on the CD3-JIVE to route the video signals to their required destination.

VGA Video Connector		
 <p>261.51.015.02</p>	1	red
	2	green
	3	blue
	4	nc
	5	GND
	6	GND
	7	GND
	8	GND
	9	+5V (PolySwitch 0.75A) DDC Power
	10	GND
	11	nc
	12	DDC Data
	13	Hsync
	14	Vsync
	15	DDC Clock

COM2 Serial Port

The CD3-JIVE CPU board passes over its SIO (Super-I/O) serial interface to the CDT transition module as TTL level signals. Therefore, an on-board RS-232E transceiver is provided (ADM211E).

Alternatively, the transceiver may be omitted or disabled, and an external PHY module can be attached via either one of the optional on-board headers P-CU (EKF series of CU modules) or P-SAx (MEN SA-series). In addition, the transceiver (if stuffed) can also be deactivated by removing the Jumper JMP-COM. If provided, the jumper JMP-COM must be set in order to enable the transceiver and in turn the connector COM2.

COM2 (Male D-Sub 9)					
			1	DCD	
	DSR	6			
				2	RXD
	RTS	7			
				3	TXD
	CTS	8			
				4	DTR
	RI	9			
				5	GND

USB1-USB3 High Speed Serial Bus

The rear I/O USB1-3 ports on the CDT-RIO transition module are independent from the CD3-JIVE CPU front panel USB receptacles, thus increasing considerably the overall USB bandwidth available. Each connector can source up to 500mA into external devices and is protected by an electronic switch located on the CDT-RIO board. The interfaces complies to the USB2.0 and USB1.1 specification.

Another USB connector USB4 is available on-board for system internal usage.

USB1-4			
		1	+5V/0.5A
		2	DATA-
		3	DATA+
		4	GND

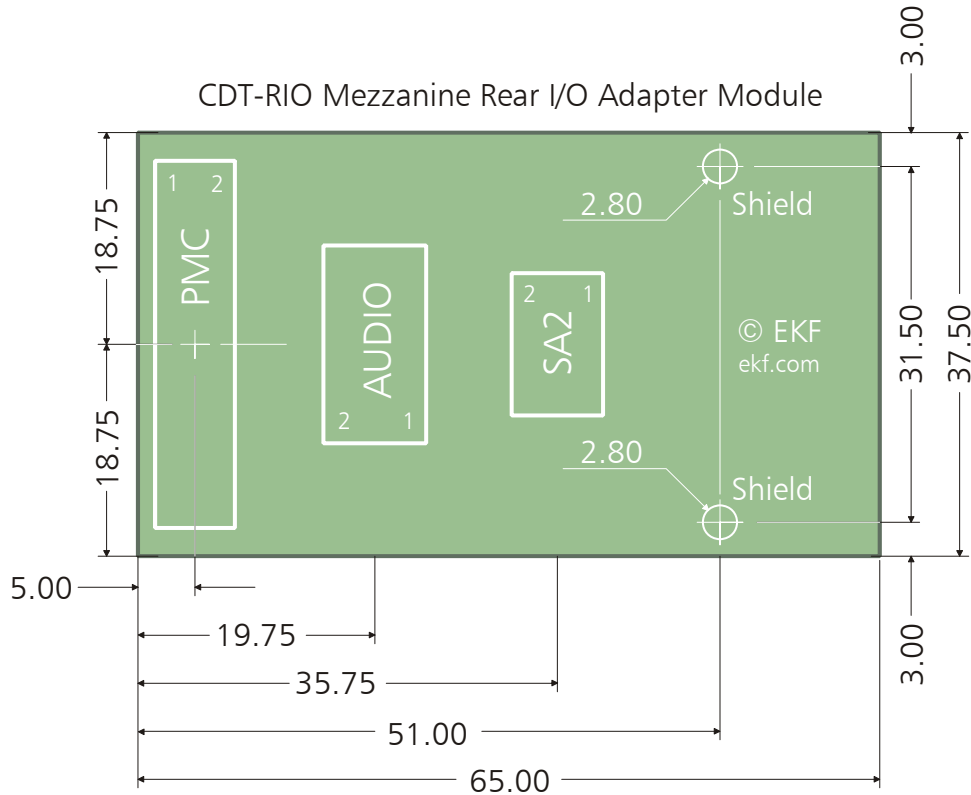
Mezzanine Bezel

As a custom specific option, the CDT-RIO rear panel is provided with a cutout, which is filled with a bezel and a keeper, which in turn is fixed with a screw. The bezel can be deinstalled after removing the keeper. The purpose of the cutout is to accommodate a custom specific I/O connector as part of a mezzanine rear I/O adapter module. When attached to P-PMC, the adapter module corresponds to the mezzanine board actually in use on the CD3-JIVE (assuming that the mezzanine module itself makes use of the rear I/O opportunity as specified in the PMC standard). Hence the mezzanine rear I/O adapter module is a proprietary solution, adjusted to the particular mezzanine module. Simply to say, the mezzanine rear I/O module is a crossover connector board with an IEEE 1386 plug/receptacle on the the inner edge to match P-PMC, and the I/O connector towards the CDT-RIO back panel. Please contact sales@ekf.de to receive a quote for a mezzanine rear I/O adapter board tailored to your individual needs.

As an alternate, the CDT-RIO can be equipped with the audio connector P-AUDIO. A custom specific mezzanine module would have to be provided with a codec compliant either with AC97 Audio, or Azalia HD-Audio. Please contact sales@ekf.de to receive a quote for a audio mezzanine module tailored to your individual needs.

If neither connector P-PMC nor P-AUDIO is required, the vacant space may be used to plug-in a SA-series PHY module onto the socket P-SA2 (serial interface).

These three alternates (P-PMC, P-AUDIO, P-SA2) are not available concurrently, but are exclusively provided with respect to each other, due to the fact that all share a common area on the CDT-RIO dedicated to the particular mezzanine module.



Dimensions of the Crossover Module (mm)

On-Board Connectors

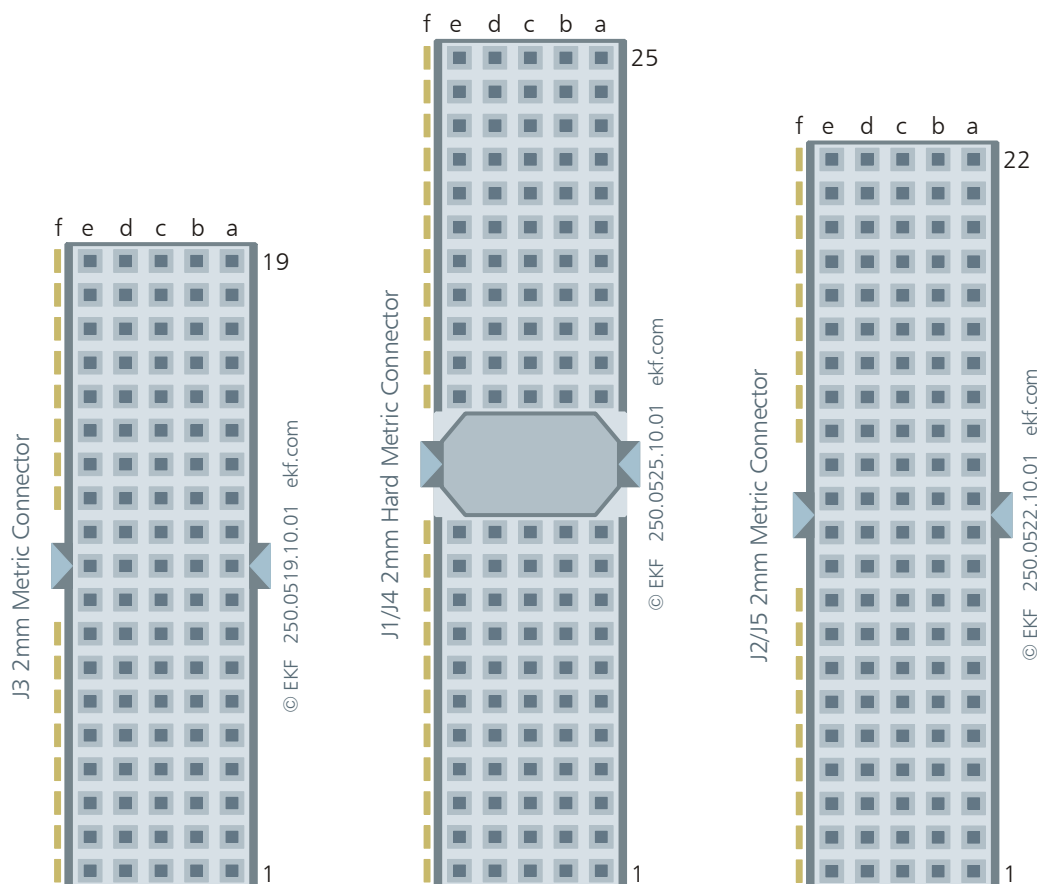
The CDT-RIO transition module may be equipped with several on-board connectors for system internal usage. Not all of these connectors may be present on a particular board, and some connectors are available on an exclusive basis only with respect to others. Be sure to specify your individual needs when ordering the CDT-RIO board. Characteristic features and the pin assignments of each connector are described on the following pages (connector designation in alphabetical order).

J3, J4, J5 CompactPCI

J3 is optionally available, due to a conflict situation when a Packet Switching Backplane according to PICMG® 2.16 is present. J3 is required for passing signals to the ETH2/ETH3 Ethernet jacks. Since J3 is also used for the SATA channels, a situation may exist where the Ethernet ports are reserved for backplane traffic, while the SATA channels must remain available on the CDT-RIO. This problem can be solved by a partial (cropped) connector J3.

J4 is stuffed always - it is used for mixed I/O.

J5 may be left if no PMC mezzanine rear I/O facility is needed. J5 is responsible for passing signals from the CD3-JIVE PMC slot (PMC connector 14) to the P-PMC connector on the CDT-RIO.



Column f is used for shielding

CompactPCI J3

#J3	A	B	C	D	E
19	GND	GND	GND	GND	GND
18	LPa_DA+	LPa_DA-	GND	LPa_DC+	LPa_DC-
17	LPa_DB+	LPa_DB-	GND	LPa_DD+	LPa_DD-
16	LPb_DA+	LPb_DA-	GND	LPb_DC+	LPb_DC-
15	LPb_DB+	LPb_DB-	GND	LPb_DD+	LPb_DD-
14	GND	GND	GND	GND	GND
13	NC	NC	NC	NC	NC
12	NC	NC	NC	NC	NC
11	NC	NC	NC	NC	NC
10	NC	NC	NC	NC	NC
9	GND <i>NC</i>	GND <i>NC</i>	GND <i>NC</i>	GND <i>NC</i>	GND <i>NC</i>
8	SATA_TX3- <i>NC</i>	SATA_TX3+ <i>NC</i>	GND <i>NC</i>	SATA_RX3- NC	SATA_RX3+ <i>NC</i>
7	GND <i>NC</i>	GND <i>NC</i>	+5V <i>NC</i>	GND <i>NC</i>	GND <i>NC</i>
6	SATA_TX2- <i>NC</i>	SATA_TX2+ <i>NC</i>	GND <i>NC</i>	SATA_RX2- <i>NC</i>	SATA_RX2+ <i>NC</i>
5	GND <i>NC</i>	GND <i>NC</i>	+5V <i>NC</i>	GND <i>NC</i>	GND <i>NC</i>
4	SATA_TX1- <i>NC</i>	SATA_TX1+ <i>NC</i>	GND <i>NC</i>	SATA_RX1- <i>NC</i>	SATA_RX1+ <i>NC</i>
3	GND <i>NC</i>	GND <i>NC</i>	+5V <i>NC</i>	GND <i>NC</i>	GND <i>NC</i>
2	SATA_TX0- <i>NC</i>	SATA_TX0+ <i>NC</i>	GND <i>NC</i>	SATA_RX0- <i>NC</i>	SATA_RX0+ <i>NC</i>
1	SATA_ACT# <i>NC</i>	GND <i>NC</i>	GND <i>NC</i>	GND <i>NC</i>	GND <i>NC</i>

J3 is optional (concurrent to PICMG 2.16 backplane)

Signals orange/italic: Deviant usage on CD2/CDY

CompactPCI J4

#J4	A	B	C	D	E
25	MS_DATA	SIO_GPIO20	SIO_GPIO24	KB_DATA	USB P2+
24	MS_CLK	SIO_GPIO21	SIO_GPIO25	KB_CLK	USB P2-
23	GND	SIO_GPIO22	SIO_GPIO26	GND	USB P1+
22	COM2 RI#	SIO_GPIO23	SIO_GPIO27	+5V	USB P1-
21	COM RTS#	COM DSR#	COM CTS#	COM DCD#	USB OC1#
20	NC	+5V	COM TXD	COM RXD	COM DTR#
19	GND	GND	NC	USB OC2# NC	USB P3+ NC
18	NC	NC	+5V	GND	USB P3- NC
17	+3.3V	+3.3V	NC	NC	USB P4+ NC
16	+5V	+5V	NC	NC	USB P4- NC
15	GND	GND	GND	GND	GND
14	KEY AREA				
13					
12					
11	VGA_RED	VGA_GREEN	VGA_BLUE	VGA_VSYNC	VGA_HSYNC
10	GND	GND	GND	DDC_SDA ¹⁾	DDC_SCL ¹⁾
9	+5V	GND	GND	GND	GND
8	+5V	GND	NC	GND	NC IDE CBLID#
7	+5V	NC IDE CS1#	GND	NC IDE CS3#	NC IDE ACT#
6	NC IDE DACK#	NC IDE IRQ14	NC IDE A01	NC IDE A00	NC IDE A02
5	GND	NC IDE IOW#	GND	NC IDE IOR#	NC IDE IORDY
4	NC IDE D14	NC IDE D00	NC IDE D15	GND	NC IDE DREQ
3	NC IDE D03	NC IDE D12	NC IDE D02	NC IDE D13	NC IDE D01
2	NC IDE D09	NC IDE D05	AC_SDIN0 IDE D10	AC_SDIN1 IDE D04	AC_SDIN2 IDE D11
1	AC_BITCLK IDE RST#	GND	AC_SYNC IDE D07	AC_SDOOUT IDE D08	AC_RST# IDE D06

Signals orange/italic: Deviant usage on CD2/CDY
Coloured green - these signals may be in use for PXI trigger

¹⁾ This pin is pulled up with 2.4kΩ to +4.3V.

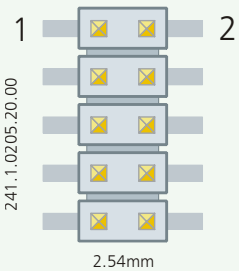
CompactPCI J5

#J5	A	B	C	D	E
22					
21	NC <i>SATA_TX2-</i>	NC <i>SATA_TX2+</i>	NC <i>GND</i>	NC <i>SATA_RX2-</i>	NC <i>SATA_RX2+</i>
20	NC <i>SATA_ACT#</i>	NC <i>GND</i>	NC <i>+5V</i>	NC <i>GND</i>	NC <i>ACTLED#</i>
19	NC <i>SATA_TX3-</i>	NC <i>SATA_TX3+</i>	NC <i>GND</i>	NC <i>SATA_RX3-</i>	NC <i>SATA_RX3+</i>
18					
17					
16	GND	GND	GND	GND	GND
15	GND	PMC1	PMC2	PMC3	PMC4
14	PMC5	PMC6	PMC7	PMC8	PMC9
13	PMC10	PMC11	PMC12	PMC13	PMC14
12	+3.3V	+3.3V	+3.3V	+5V	+5V
11	PMC15	PMC16	PMC17	PMC18	PMC19
10	PMC20	PMC21	PMC22	PMC23	PMC24
9	PMC25	PMC26	PMC27	PMC28	PMC29
8	PMC30	PMC31	PMC32	PMC33	PMC34
7	PMC35	PMC36	PMC37	PMC38	PMC39
6	PMC40	PMC41	PMC42	PMC43	PMC44
5	PMC45	PMC46	PMC47	PMC48	PMC49
4	PMC50	PMC51	PMC52	PMC53	PMC54
3	PMC55	PMC56	PMC57	PMC58	PMC59
2	PMC60	PMC61	PMC62	PMC63	PMC64
1	+3.3V	+3.3V	+3.3V	+5V	+5V

PMC signals derived from PMC mezzanine connector J4
Signals orange/italic: Deviant usage on CD2/CDY

P-AUDIO

The pin header P-AUDIO is populated exclusively with respect to P-PMC and P-SA2, because these connectors share the same board area reserved for a custom specific mezzanine module. P-AUDIO provides all legacy AC'97 / Intel High Definition Audio Link (Azalia) signals derived from the ICH6 on the CD3-JIVE CPU board. A custom specific audio mezzanine module must provide the suitable codec(s) and analog or digital audio connectors. Do not hesitate to discuss your particular requirements with EKF.

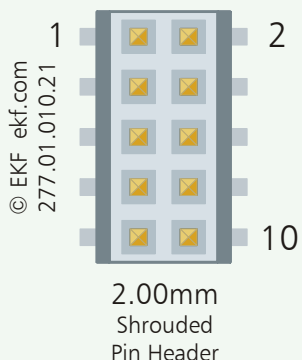
P-AUDIO (2.54mm Header 2 x 5)				
	AC-BITCLK	1	2	GND
	+5V	3	4	GND
	AC_RST#	5	6	AC_SDIN0
	AC_SYNC	7	8	AC_SDIN1
	AC_SDOUT	9	10	AC_SDIN2

P-CU Serial Interface Connectors

If the on-board RS-232 transceiver ADM211E is either not stuffed or disabled by removing the jumper JMP-COM, alternatively external PHY modules can be attached to the CDT-RIO by means of a flat ribbon cable.

The rear I/O transition module is equipped with the header P-CU, suitable for the EKF CU7/CU8 series of PHY modules. The CU7-RS485 is an isolated fieldbus interface, available either for party-line configuration or full-duplex point-to-point.

Another pair of headers P-SA1/2 may be provided on the CDT-RIO which complies with the MEN SA-series of PHY modules. No more than one transceiver may be in use, either P-CU, P-SA or the on-board transceiver.

P-CU (2.00mm Pin Header 2 x 5)				
 <p>© EKF ekf.com 277.01.010.21</p> <p>2.00mm Shrouded Pin Header</p>	+5V/0.5A	1	2	DSR#
	RI#	3	4	RXD
	TXD	5	6	DTR#
	RTS#	7	8	CTS#
	DCD#	9	10	GND

JMP-COM

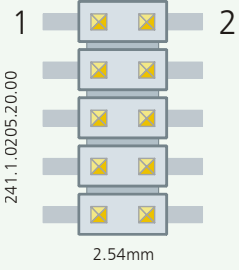


Remove JMP-COM to disable the on-board transceiver when using P-CU

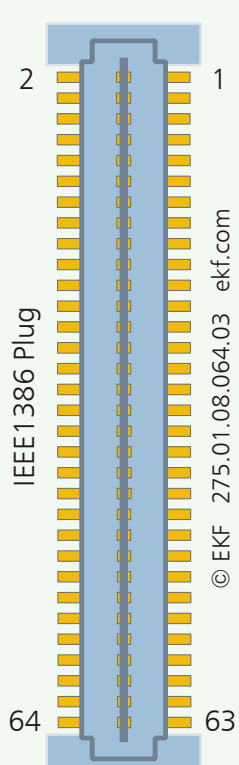
P-GPIO Connector

A group of 8 GPIOs are passed through from the CD3-JIVE to the CDT rear I/O transition module connector GPIO (optional), dual row 2 x 5, 2.54mm pin header, which makes several general purpose input/output signals available. The GPIO lines are TTL (8mA sink as an output) or CMOS compatible, 3.3V logic (inputs are 5V tolerant). The behaviour of each particular line can be programmed.

As of current, the P-GPIO feature is not yet available. Please contact sales@ekf.de to discuss your specific needs.

P-GPIO (2.54mm Header 2 x 5)				
	GND	1	2	+5V/0.5A
	GPIO20	3	4	GPIO21
	GPIO22	5	6	GPIO23
	GPIO24	7	8	GPIO25
	GPIO26	9	10	GPIO27

P-PMC Mezzanine Connector

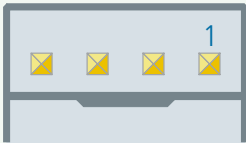
P-PMC				
	MDJ4 (PMC) 1	1	2	MDJ4 (PMC) 2
	MDJ4 (PMC) 3	3	4	MDJ4 (PMC) 4
	MDJ4 (PMC) 5	5	6	MDJ4 (PMC) 6
	MDJ4 (PMC) 7	7	8	MDJ4 (PMC) 8
	MDJ4 (PMC) 9	9	10	MDJ4 (PMC) 10
	MDJ4 (PMC) 11	11	12	MDJ4 (PMC) 12
	MDJ4 (PMC) 13	13	14	MDJ4 (PMC) 14
	MDJ4 (PMC) 15	15	16	MDJ4 (PMC) 16
	MDJ4 (PMC) 17	17	18	MDJ4 (PMC) 18
	MDJ4 (PMC) 19	19	20	MDJ4 (PMC) 20
	MDJ4 (PMC) 21	21	22	MDJ4 (PMC) 22
	MDJ4 (PMC) 23	23	24	MDJ4 (PMC) 24
	MDJ4 (PMC) 25	25	26	MDJ4 (PMC) 26
	MDJ4 (PMC) 27	27	28	MDJ4 (PMC) 28
	MDJ4 (PMC) 29	29	30	MDJ4 (PMC) 30
	MDJ4 (PMC) 31	31	32	MDJ4 (PMC) 32
	MDJ4 (PMC) 33	33	34	MDJ4 (PMC) 34
	MDJ4 (PMC) 35	35	36	MDJ4 (PMC) 36
	MDJ4 (PMC) 37	37	38	MDJ4 (PMC) 38
	MDJ4 (PMC) 39	39	40	MDJ4 (PMC) 40
	MDJ4 (PMC) 41	41	42	MDJ4 (PMC) 42
	MDJ4 (PMC) 43	43	44	MDJ4 (PMC) 44
	MDJ4 (PMC) 45	45	46	MDJ4 (PMC) 46
	MDJ4 (PMC) 47	47	48	MDJ4 (PMC) 48
	MDJ4 (PMC) 49	49	50	MDJ4 (PMC) 50
	MDJ4 (PMC) 51	51	52	MDJ4 (PMC) 52
	MDJ4 (PMC) 53	53	54	MDJ4 (PMC) 54
	MDJ4 (PMC) 55	55	56	MDJ4 (PMC) 56
	MDJ4 (PMC) 57	57	58	MDJ4 (PMC) 58
	MDJ4 (PMC) 59	59	60	MDJ4 (PMC) 60
	MDJ4 (PMC) 61	61	62	MDJ4 (PMC) 62
	MDJ4 (PMC) 63	63	64	MDJ4 (PMC) 64

If a PMC mezzanine module is present on the CD3-JIVE (mezzanine module slot D), then this modules rear I/O lines are passed across J5 of the CDT-RIO to the connector P-PMC (IEEE 1386 receptacle). A crossover mezzanine rear I/O adapter module would be needed in addition, aligned with its I/O connector protruding through the cutout covered normally by a bezel (requires custom specific CDT-RIO back panel option), thus providing access from the rear panel. Because each PMC module may have its own signal order on the rear I/O channel, and due to a variety of rear panel connector types, the mezzanine adapter module also must be individually designed to meet the specifications of the particular PMC in use. Please contact sales@ekf.de for a quote.

Power Connector P-POW

The CDT rear I/O transition module can be supplied with +5V across the J4/J5 connectors from the CD3-JIVE CPU board. +5V would be required e.g. for the CDT-RIO on-board RS-232E transceiver, optional mezzanine modules, and the USB receptacles (which can source up to 0.5A each).

With the optional connector P-POW, the systems power supply can be directly connected to the CDT-RIO transition module, discharging the CD3-JIVE up to a maximum of 2.5A @5V. The connector is an AMP EI series 4-position header (#171826-4), being very popular since it is used also on 3.5-inch floppy disk drives. The current is limited by a resettable fuse.

P-POW		
	1	+5V/2.5A
	2	GND
	3	GND
	4	NC

Alternatively, P-POW may instead be used to source +5V to a system internal device, e.g. SATA drive or USB peripheral.

P-SA1 / P-SA2 Serial Interface Connectors

If the on-board RS-232 transceiver ADM211E is either not stuffed or disabled by removing the jumper JMP-COM, alternatively external PHY modules can be attached to the CDT-RIO by means of a flat ribbon cable.

The rear I/O transition module may be equipped with the header P-SA1 and/or socket P-SA2, suitable for the MEN SA-series of PHY modules. P-SA2 would allow to plug the SA-module directly onto the CDT-RIO, if no mezzanine rear I/O adapter module is present.

Another header P-CU may be provided on the CDT-RIO which complies with the EKF CU-series of PHY modules. No more than one transceiver may be in use, either P-CU, P-SAx or the on-board transceiver.

P-SA1 (2.54mm Pin Header 2 x 5)				
	GND	1	2	+5V/0.5A
	TXD	3	4	RXD
	DTR#	5	6	RTS#
	DSR#	7	8	CTS#
	DCD#	9	10	RI#

P-SA2 (2.54mm Socket 2 x 5)				
	+5V/0.5A	2	1	GND
	RXD	4	3	TXD
	RTS#	6	5	DTR#
	CTS#	8	7	DSR#
	RI#	10	9	DCD#

JMP-COM

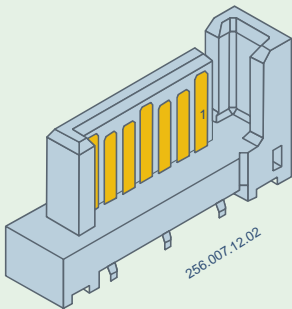
removed COM2 disabled

set COM2 enabled

Remove JMP-COM to disable the on-board transceiver when using P-SAx

SP0 ... SP3A Serial ATA onboard Connectors

The CDT-RIO is provided with three (as an option 4) SATA connectors (SP0 SP1 SP2, and SP3A) for attachment of Serial ATA drives. Standard SATA cables for system internal strapping can be used. Right angled SATA connectors at the CDT-RIO side could be helpful in saving space. As an alternate to the eSATA back panel receptacle, a fourth on-board SATA connector SP3A can be stuffed. Please contact sales@ekf.de to discuss your specific needs.

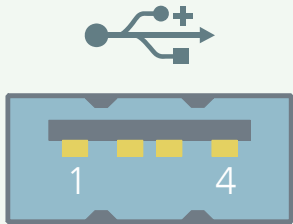
SP0- SP2 (SP3A Option)		
	1	GND
	2	SATA_TX+
	3	SATA_TX-
	4	GND
	5	SATA_RX-
	6	SATA_RX+
	7	GND

The SATA channel 0 and 1 may be already in use on the CD3-JIVE host (dual SATA hard disk mezzanine module C14). In this case only SP2 and SP3A (or eSATA) are functional on the CDT-RIO.

USB4 High Speed Serial Bus

The on-board USB4 receptacle on the CDT-RIO transition module is provided for attachment of a system internal USB device. The connector is positioned so, that there is a zone free of components next to it, which may be used for plugging of an USB stick (Flash drive). The USB4 connector can source up to 500mA into the attached device and is protected by an electronic switch located on the CDT-RIO board. The interface complies to the USB2.0 and USB1.1 specification.

Another three USB connectors USB1 ... USB3 are available at the rear panel for external usage.

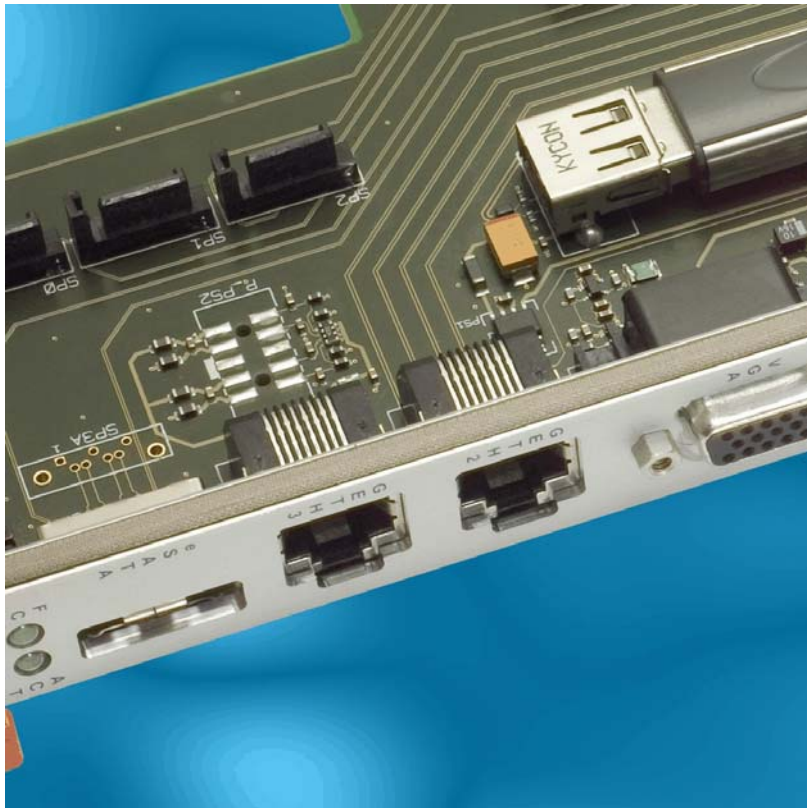
USB4		
	1	+5V/0.5A
	2	DATA-
	3	DATA+
	4	GND

If using an on-board USB stick, there are fixing holes next to it. EKF can provide a suitable fastener solution with respect to the dimensions of your particular USB device - please contact sales@ekf.de.

Schematics

Complete circuit diagrams for this product are available for customers on request. Signing of a non-disclosure agreement would be needed. Please contact sales@ekf.de for details.

EKF reserves the right to refuse distribution of confidential information material for any reason that EKF may consider substantial.



EKF Elektronik GmbH
Philipp-Reis-Str. 4
59065 HAMM
Germany



Fax. +49 (0)2381/6890-90
Tel. +49 (0)2381/6890-0
Internet www.ekf.com
E-Mail info@ekf.de