



Product Information

PR1-RIO • *CompactPCI*® PlusIO
Rear I/O Transition Module

Suitable for PICMG 2.30 CompactPCI® PlusIO Systems

Document No. 5778 • 28 September 2017



The PICMG® 2.30 CompactPCI® PlusIO specification defines standardised high speed rear I/O across the backplane connector J2, such as PCI Express®, SATA, and Gigabit Ethernet. The **PR1-RIO** is a rear I/O transition module for PlusIO systems, provided with back panel connectors for external usage, and also connectors for system internal cabling. The PR1-RIO can be used together with any PlusIO compliant CPU board, e.g. the PC1-GROOVE.

The PR1-RIO uses a special CPCI J2 connector, suitable for high speed signals. Two Gigabit Ethernet RJ45 ports are available from the PR1-RIO back panel, and in addition 2 x USB/eSATA via combo connectors. For system internal usage the PR1-RIO is provided with 2 x SATA and 2 x USB connectors. In addition, the PR1-RIO can be equipped with up to four connectors according to the PCI Express® External Cabling Specification (PCI-SIG®).



CPU Card & PR1-RIO

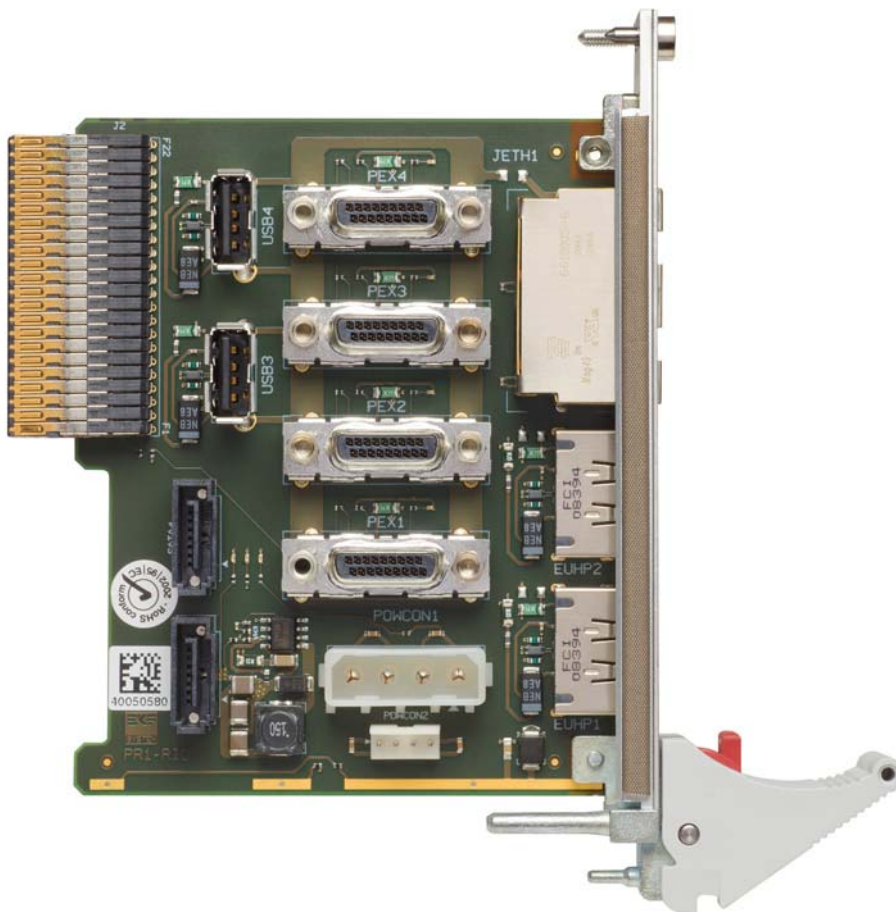
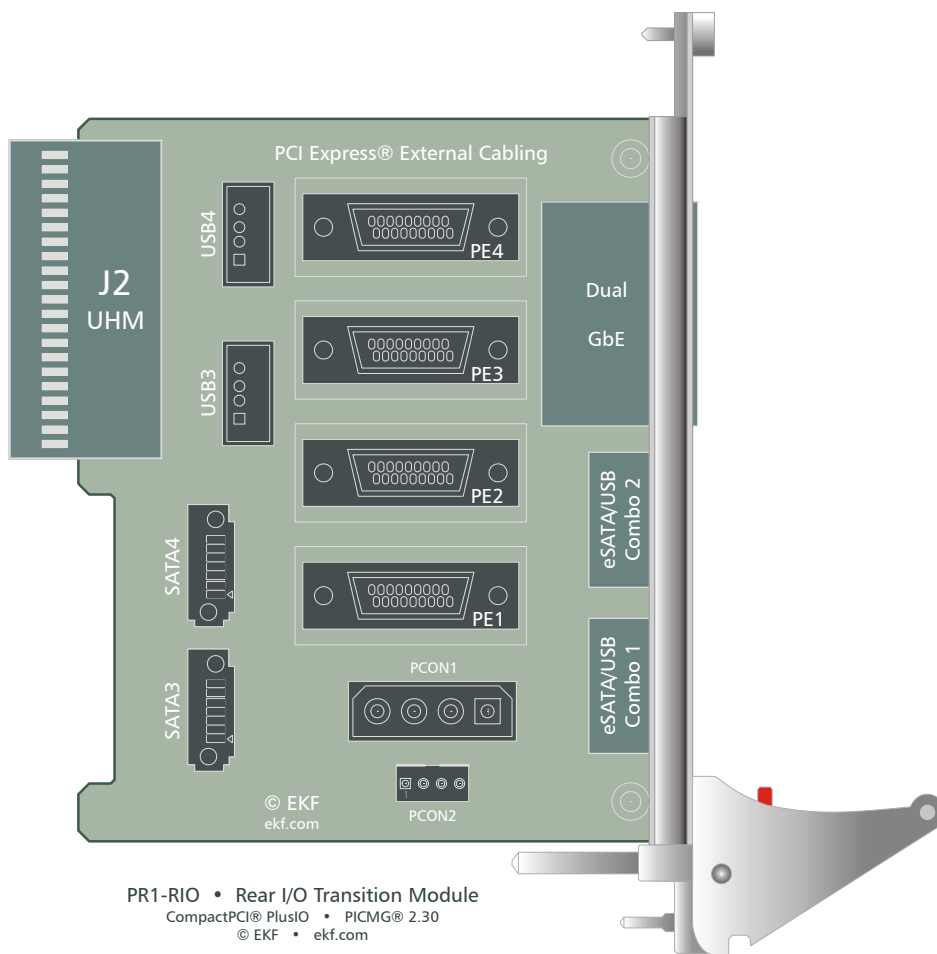
Major Benefits of the PR1-RIO

- ▶ *CompactPCI®* PlusIO Rear I/O According to PICMG® 2.30
- ▶ J2 High Speed Connector (3M UHM)
- ▶ Internal Connectors: 4 x PCI Express® Cabling, 2 x SATA, 2 x USB, Aux Power
- ▶ Back Panel Connectors: 2 x Gigabit Ethernet, 2 x eSATA/USB Combo
- ▶ Long Term Availability
- ▶ RoHS compliant

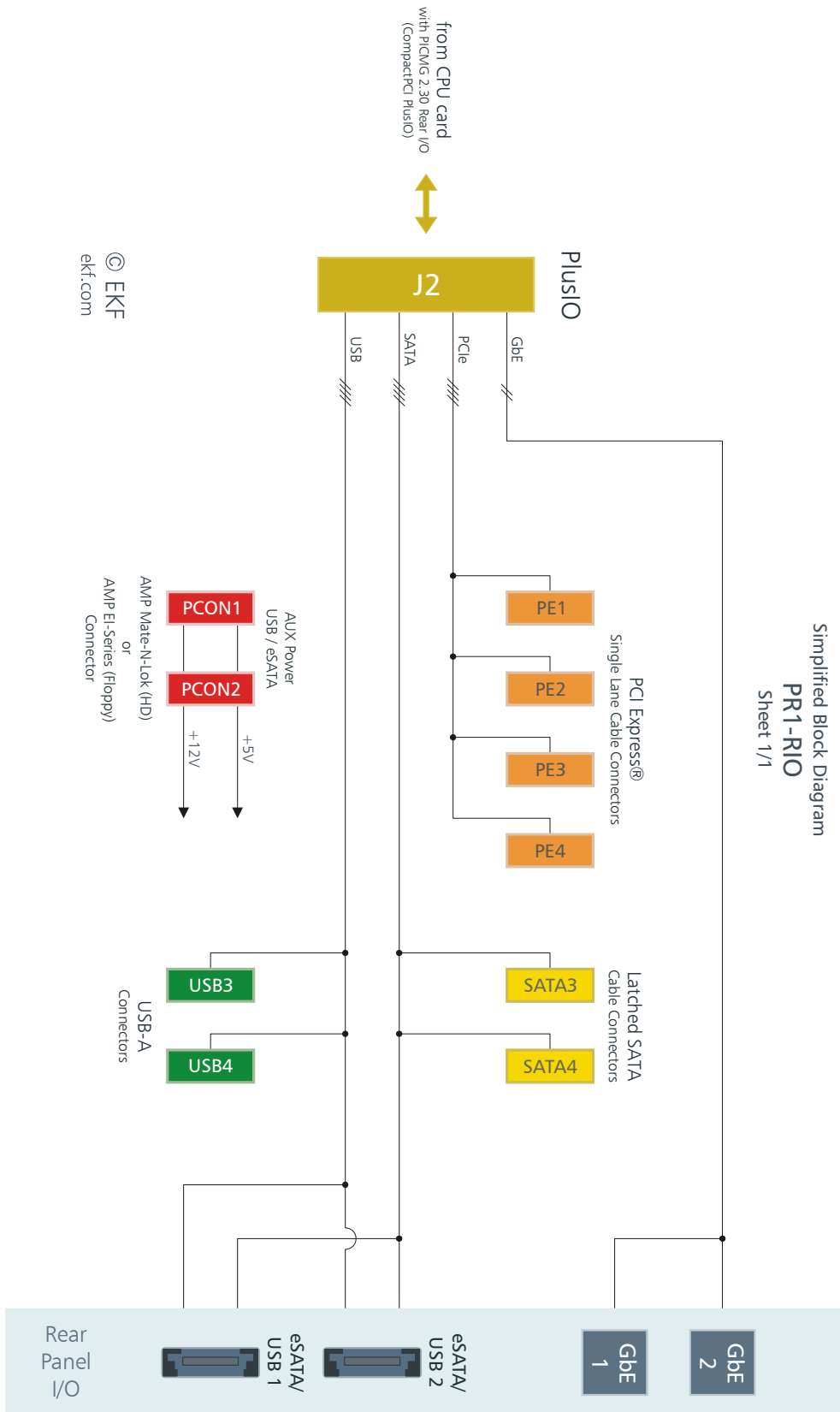
Related Links CompactPCI® PlusIO

CompactPCI® PlusIO Home	www.ekf.com/p/plus.html
PC3-ALLEGRO PlusIO CPU Card	www.ekf.com/p/pc3/pc3.html
PC4-PRESTO PlusIO CPU Card	www.ekf.com/p/pc4/pc4.html
PC5-LARGO PlusIO CPU Card	www.ekf.com/p/pc5/pc5.html
PC6-TANGO PlusIO CPU Card	www.ekf.com/p/pc6/pc6.html
PR1-RIO PlusIO RIO Module	www.ekf.com/p/pr1/pr1.html

Connector Assembly

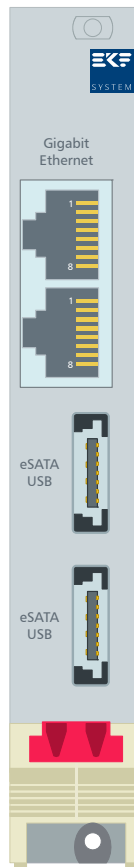


Block Diagram



Simplified Block Diagram
PR1-RIO
Sheet 1/1

Rear Panel



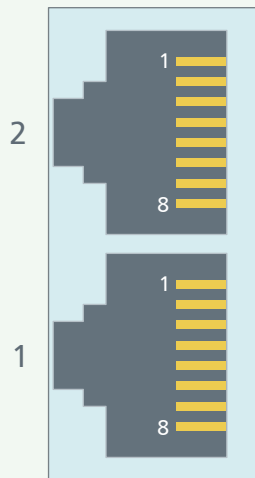
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PR1-RIO



Rear Panel Connectors

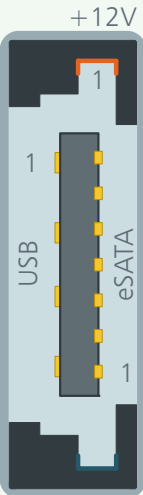
Gigabit Ethernet • Dual RJ45 Jack • #270.02.08.5



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		Ports	1-2
	1		MDX0+
	2		MDX0-
	3		MDX1+
	4		MDX2+
	5		MDX2-
	6		MDX1-
	7		MDX3+
	8		MDX3-

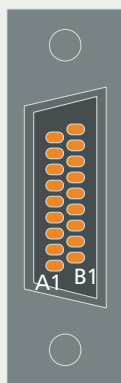
The PR1-RIO is equipped with a dual RJ45 jack with integrated Gigabit Ethernet magnetics, for attachment of twisted pair cables to the back panel.

eSATA1 eSATA2 USB1 USB2 • eSATA/USB Combo • #256.013.20.01			
 <p style="text-align: center;">© EKF • ekf.com EKF Part # 256.013.20.01</p>	USB	1-USB	+5V
		2-USB	D-
		3-USB	D+
		4-USB	GND
	eSATA	1-eSATA	GND
		2-eSATA	T+
		3-eSATA	T-
		4-eSATA	GND
		5-eSATA	R-
		6-eSATA	R+
		7-eSATA	GND
Power	1-Power	+12V	
	2-Power	GND	

Due to their special profile, the back panel connectors for eSATA/USB can accommodate either an USB type A cable connector, or an eSATA cable connector. As an option, the PR1-RIO can be equipped with even more advanced combo-connectors, which provide also +12V power to external devices. This feature e.g. allows attachment of eSATA drives without need for an external power supply.

On-Board Connectors for System Internal Usage

PE1 - PE4 • #255.3.1.018.01 • PCI Express® External Cabling



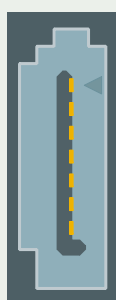
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EKF Part # 255.3.1.018.01

A	#	B
PE RX-	1	GND
PE RX+	2	RSVD
RSVD	3	NC (WAKE#)
GND	4	PRSNT#
PE CLK-	5	GND
PE CLK+	6	+3.3V/0.5A
GND	7	PWRON (PU 301R)
RESET#	8	PE TX-
GND	9	PE TX+

The PR1-RIO can be equipped with up to 4 connectors according to the PCI-SIG® PCI Express® External Cabling Specification Rev. 1.0. Each connector provides a single PCI Express® Lane for attachment of external devices. Suitable cable assemblies are available from Molex (EKF part #255.3.9.018.10 - 1m).

SATA3 SATA4 • #256.007.22.01 • Latched Headers

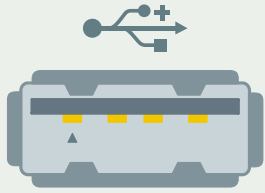
Latched SATA Header



256.007.22.01 © EKF ekf.com

1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND

USB3 USB4 • Vertical Mount Receptacles • #270.20.04.5



USB Receptacle
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1	+5V
2	D-
3	D+
4	GND

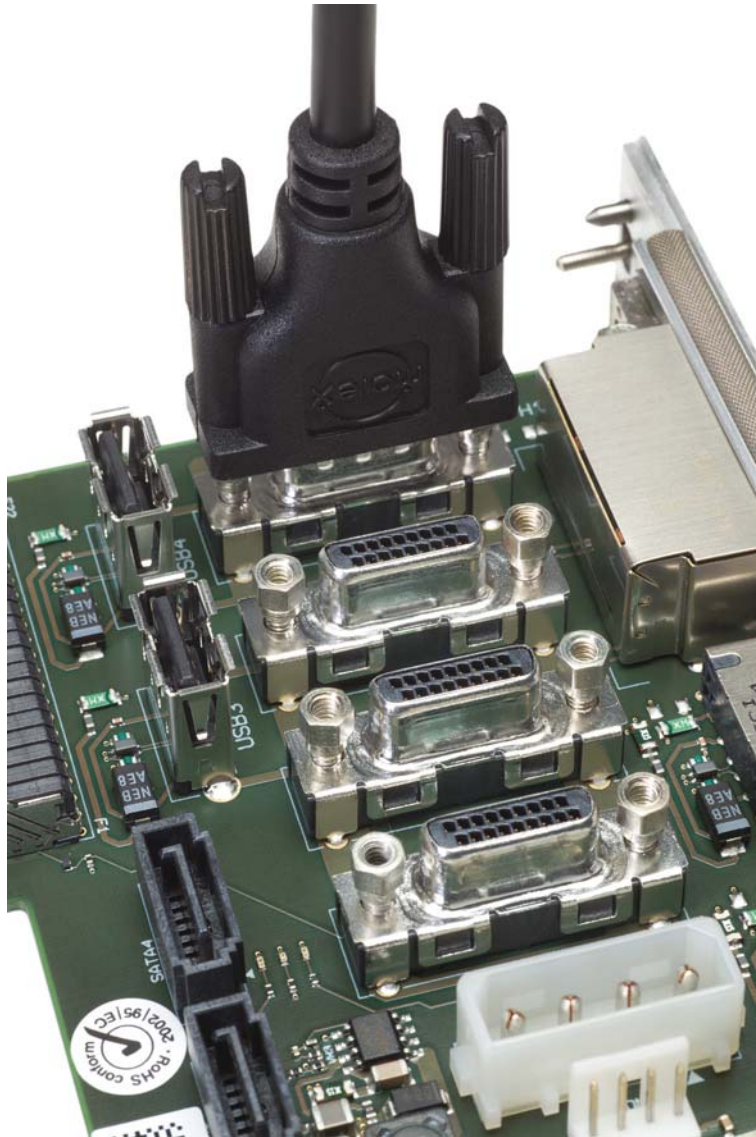
CompactPCI® PlusIO Backplane Connector J2

The PR1-RIO makes use of 2 x GbE, 4 x PCIe, 4 x SATA and 4 x USB, passed for rear I/O from a CompactPCI® PlusIO CPU card across J2 (CPU) via P2 (backplane) to J2 (RIO module).

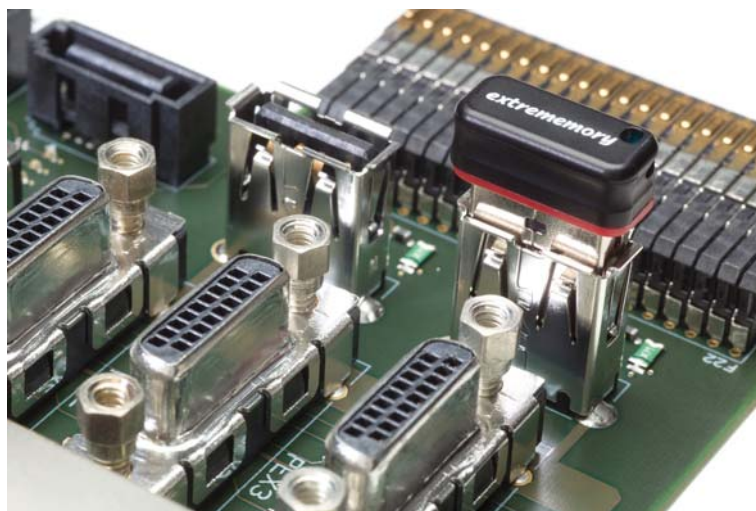
J2	A	B	C	D	E
22	GA4	GA3	GA2	GA1	GA0
21	CLK6	GND	2_ETH_B+	1_ETH_D+	1_ETH_B+
20	CLK5	GND	2_ETH_B-	1_ETH_D-	1_ETH_B-
19	GND	GND	2_ETH_A+	1_ETH_C+	1_ETH_A+
18	2_ETH_D+	2_ETH_C+	2_ETH_A-	1_ETH_C-	1_ETH_A-
17	2_ETH_D-	2_ETH_C-	PRST# RST# ¹⁾	REQ6#	GNT6#
16	4_PE_CLK-	2_PE_CLK+	DEG#	GND	reserved
15	4_PE_CLK+	2_PE_CLK-	FAL#	REQ5#	GNT5#
14	3_PE_CLK-	1_PE_CLK+	4_PE_CLKE#	SATA_SCL	reserved
13	3_PE_CLK+	1_PE_CLK-	3_PE_CLKE#	SATA_SDO	SATA_SL
12	4_PE_RX00+	1_PE_CLKE#	2_PE_CLKE#	SATA_SDI	4_SATA_RX+
11	4_PE_RX00-	4_PE_TX00+	4_USB2+	4_SATA_TX+	4_SATA_RX-
10	3_PE_RX00+	4_PE_TX00-	4_USB2-	4_SATA_TX-	3_SATA_RX+
9	3_PE_RX00-	3_PE_TX00+	3_USB2+	3_SATA_TX+	3_SATA_RX-
8	2_PE_RX00+	3_PE_TX00-	3_USB2-	3_SATA_TX-	2_SATA_RX+
7	2_PE_RX00-	2_PE_TX00+	2_USB2+	2_SATA_TX+	2_SATA_RX-
6	1_PE_RX00+	2_PE_TX00-	2_USB2-	2_SATA_TX-	1_SATA_RX+
5	1_PE_RX00-	1_PE_TX00+	1_USB2+	1_SATA_TX+	1_SATA_RX-
4	V(I/O)	1_PE_TX00-	1_USB2-	1_SATA_TX-	reserved
3	CLK4	GND	GNT3#	REQ4#	GNT4#
2	CLK2	CLK3	SYSEN#	GNT2#	REQ3#
1	CLK1	GND	REQ1#	GNT1#	REQ2#

The PlusIO specification does not provide any power pins on J2. However, the connectors for USB, eSATA (when the esatap power pins are engaged), and PCI Express® require suitable power supply voltages. Please use a spare strap from the system power supply attached to either PCON1 or PCON2, in order to feed the PR1-RIO with external power.

- 1) PRST# is by specification the push button (manual reset actuator) to the CPU card. As an option, this pin may be reconfigured on some CPU boards such as the PC6-TANGO as RST# output (platform reset). This will be required for applications which address PCI Express® peripheral devices via the PR1-RIO.



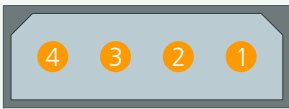
PCI Express Cable Connectors



Auxiliary Power

The CompactPCI® PlusIO specification does not provide any power pins on the rear I/O backplane connector J2. However, the PR1-RIO is equipped with connectors for USB, eSATA and PCI Express®, which require suitable power supply voltages in order to support non self-powered devices.

A spare strap from the system power supply connected to either PCON1 or PCON2 should be used to energize the PR1-RIO. The maximum current consumption depends on the external devices attached to the I/O ports. Up to 3A@5V for the USB and/or PCI Express® connectors (PCIe via 3.3V switching regulator), and 1.5A@12V for the eSATA connectors (12V powered devices only) may be needed.

PCON1 • #264.02.004.13 • MATE-N-LOK		
© EKF • ekf.com  264.02.004.13 AMP MATE-N-LOK	1	+12V
	2	GND
	3	GND
	4	+5V

The PR1-RIO is optionally provided with a MATE-N-LOK header for attachment of external auxiliary power +5V and +12V. This header is suitable for most ATX style power supplies (also in use on many hard disk drives).

PCON2 • #264.02.004.03 • EI-Series Header

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264.02.004.03
AMP EI-Series

1	+5V
2	GND
3	GND
4	+12V

As an alternate, the PR1-RIO can be optionally provided with an AMP EI-Series header for attachment of external auxiliary power +5V and +12V. This header is suitable for many ATX style power supplies (was frequently in use for floppy disk drives in the past).

Warning:

Assembly may not be protected against misalignment with respect to +5V, +12V and GND
Confusing PCON* pins may cause permanent damage to the board and/or attached devices



Ordering Information

For popular PR1-RIO SKUs please refer to www.ekf.com/liste/liste_21.html#PR1

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