cPCI-R6500

6U CompactPCI® Rear Transition Module
MXM Graphics Carrier

User's Manual



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Part No:	50-15084-1000

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Revision History

Revision	Release Date	Description of Change(s)
0.10	2015/10/23	Preliminary release

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Preface

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Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.



Additional information, aids, and tips that help users perform tasks.



Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.



Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

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1 Introduction

1.1 Overview

The cPCI-R6500 Series is 6U CompactPCI rear transition module (RTM) designed for use with ADLINK 6U CompactPCI CPU blades. The cPCI-R6500 is an RTM equipped with an ATI or NVIDIA MXM graphics module to provide additional graphics performance for embedded applications and supports comprehensive rear I/O functionality. Dual independent display output is via two DVI ports and an onboard Realtek ALC262 High Definition Audio Codec provides analog audio output from the audio controller on the CPU blade. The cPCI-R6500 requires a compatible 6U CompactPCI backplane with rear I/O support and correctly configured CPU blade.

Three models are available: the cPCI-R6500D and cPCI-R6501D (8HP) for ATI MXM graphics modules and the cPCI-R65N0D for NVIDIA MXM graphics modules. The cPCI-R6500D is an 8HP RTM equipped with two DVI ports, two GbE ports, two USB Type A ports, one COM port (RS-232/422/485 selectable), and PS/2 keyboard mouse on the faceplate. The cPCI-R6501D is an 8HP RTM that provides two DVI ports, two GbE ports, one USB Type A port, and space to mount a 2.5" SATA drive for onboard storage requirements. The cPCI-R65N0D is an 8HP RTM equipped with two DVI ports, two GbE ports, one USB Type A port, and one COM port (RS-232/422/485 selectable), and PS/2 keyboard mouse on the faceplate.

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1.2 Features

- 6U CompactPCI RTM in 8HP width form factor
- Compliant with CompactPCI Specification 2.0, Rev. 3.0
- Compliant with CompactPCI Packet Switching Backplane Specification PICMG 2.16 Rev. 1.0
- 64-bit/66 MHz CompactPCI interface based on PCI specifications
- Realtek ALC262 HD Audio codec and Mic-in, Line-in, Line-out via onboard 10-pin audio box header
- Two DVI-I ports for dual independent displays (MXM graphics module dependent)
- One DB-9 serial port supporting RS-232/422/485 and one RS-232 via 10-pin box header supporting TX/RX only
- One USB 2.0 Type A port, 2x USB 2.0 via box header
- Two Gigabit Ethernet ports from processor blade by PICMG 2.16
- One PS/2 keyboard mouse on faceplate (cPCI-R6500D, cPCI-R65N0)
- Three SATA 7-pin connectors
- 2.5” drive space on cPCI-R6501D

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1.3 Block Diagram

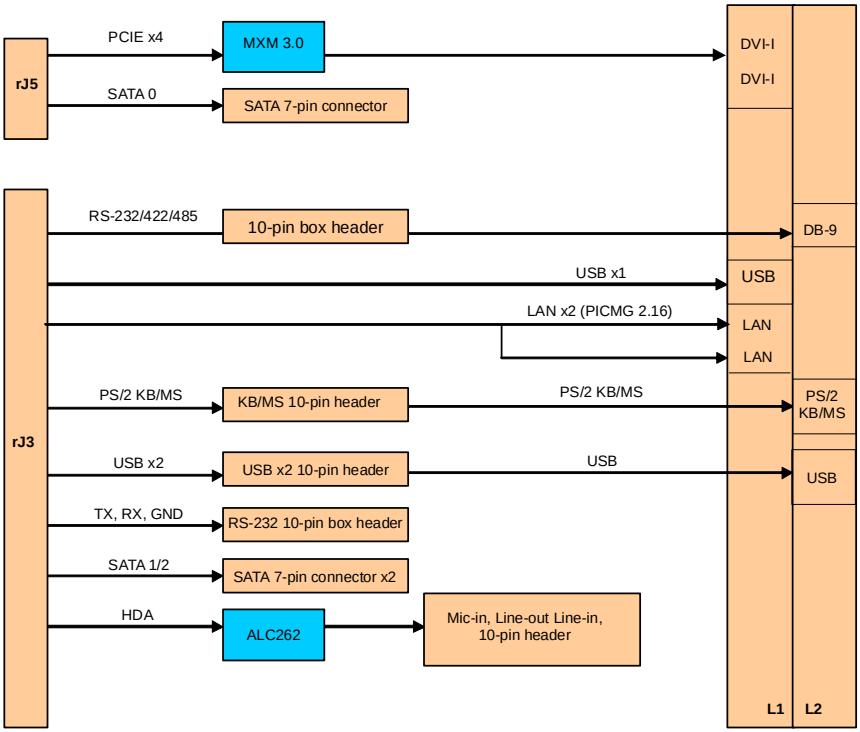


Figure 1-1: cPCI-R6500 Functional Block Diagram

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1.4 Package Contents

The cPCI-R6500 is packaged with the following components. If any of the items on the contents list are missing or damaged, retain the shipping carton and packing material and contact the dealer for inspection. Please obtain authorization before returning any product to ADLINK.

- cPCI-R6500 Series MXM carrier
- MXM graphics module, model dependent on model selected (installed)
- 2.5" drive bracket kit (cPCI-R6501D only)
- Auxiliary power cord (4-pin Molex to 6-pin RTM onboard connector, 20cm)



This product must be protected from static discharge and physical shock. Never remove any of the components except at a static-free workstation. Use the anti-static bag shipped with the product when putting the board on a surface. Wear an anti-static wrist strap properly grounded on one of the system's ESD ground jacks when installing or servicing system components.

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2 Specifications

2.1 cPCI-R6500 General Specifications

Standards	• CompactPCI® Specification 2.0, Rev. 3.0 • CompactPCI® Packet Switching Backplane Specification PICMG 2.16 Rev. 1.0
Form Factor	• Standard 6U CompactPCI® Rear Transition Module • Board size: 233.35mm x 80mm • Dual-slot (8HP, 40.64mm) • CompactPCI® connectors rJ3 and rJ5
GPU	• PCI Express x4 interface through rJ5 • Dependent on the MXM module selected
Audio	• Realtek ALC262 HD Audio codec
Faceplate I/O	**cPCI-R6500D** • 2x 10/100/1000BASE-T Ethernet ports • 2x USB 2.0 Type A ports • 2x DVI-I ports from MXM module • 1x DB-9 COM port (RS-232/422/485) • 1x PS/2 Mini-DIN keyboard/mouse **cPCI-R6501D** • 2x 10/100/1000BASE-T Ethernet ports • 1x USB 2.0 Type A ports • 2x DVI-I ports from MXM module **cPCI-R65N0D** • 2x 10/100/1000BASE-T Ethernet ports • 1x USB 2.0 Type A ports • 2x DVI-I ports from MXM module • 1x DB-9 COM port (RS-232/422/485) • 1x PS/2 Mini-DIN keyboard/mouse
Onboard Peripherals	• 3x 7-pin SATA connectors • 1x RS-232/422/485 box header (COM2) • 1x RS-232 10-pin box header (COM1, TX, RX signals only) • 1x KB/MS 10-pin box header • 1x USB 10-pin box header (2 ports) • 1x Mic-in/Line-out 10-pin box header
OS Compatibility	• Microsoft Windows 7 32/64-bit • Microsoft Windows Server 2003 32/64-bit • Microsoft Windows Server 2008 32/64-bit • Red Hat Enterprise Linux 6.0 64-bit (dependent on CompactPCI processor blade)

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Environmental	• Operating Temperature: 0 °C to +60 °C • Extended Temperature: -20 °C to +70 °C (by screening)

Figure 2-1: cPCI-R6500 Series General Specifications

2.2 I/O Connectivity

Function	cPCI-R6500D		cPCI-R6501D		cPCI-R65N0	
	Faceplate	Board	Faceplate	Board	Faceplate	Board
LAN	Y x2	-	Y x2	-	Y x2	-
USB	Y x2	Y x2	Y x1	Y x2	Y x1	Y x1 (box header)
COM	Y x1	Y x1 (RS-232 TX/RX, box header)	Y x1	Y x1 (RS-232 TX/RX, box header)	Y x1	Y x1 (RS-232 TX/RX, box header)
DVI-I	Y x2	-	Y x2	-	Y x2	-
Serial ATA	-	Y x3	-	Y x3	-	Y x3
KB/MS	-	Y x1	-	Y x1	Y x1	-
Audio	-	Y x1 (box header)	-	Y x1 (box header)	-	Y x1 (box header)
2.5” drive space	-	-	-	Y x1	-	-

Table 2-1: cPCI-R6500 Series I/O Connectivity

2.3 GPU

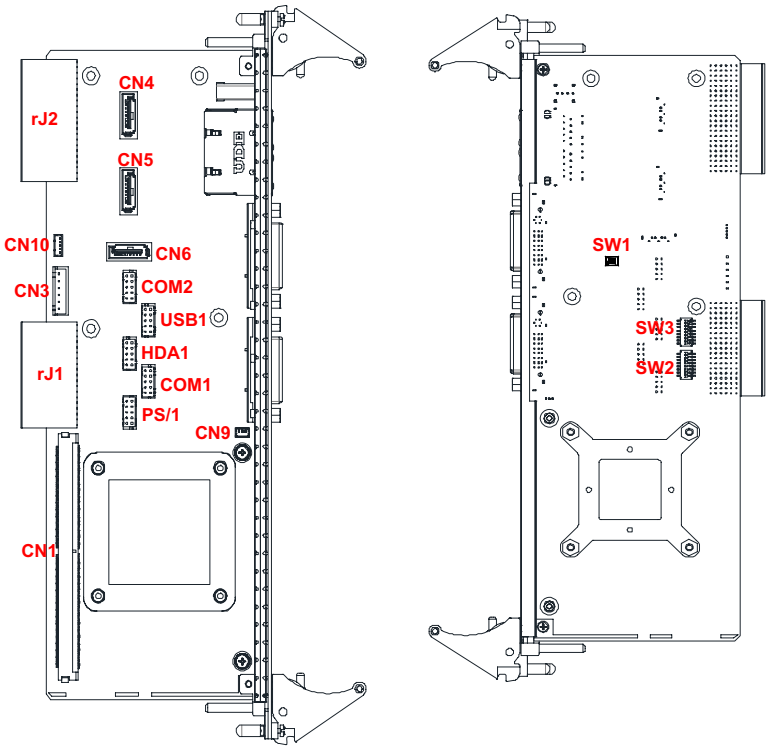
The GPU specification is dependent on the MXM module selected.

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3 Board Interfaces

This chapter illustrates the board layout, connector pin assignments, and switch settings to familiarize users with the cPCI-R6500.

3.1 cPCI-R6500 Board Layout



rJ1/2	CompactPCI connectors	**COM1/2**	Serial port box header
CN1	MXM connector	**HDA1**	Audio box header
CN4/5/6	SATA connectors	**LAN1**	LAN connectors (RJ-45)
CN3	Auxiliary Power connector	**SW1**	COM2 mode switch
CN9	Fan power connector	**SW2/SW3**	LAN switches
CN10	SATA Power connector	**USB1**	USB box header

Figure 3-1: cPCI-R6500 Board Layout - Component Side

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3.2 cPCI-R6500D Assembly Layout

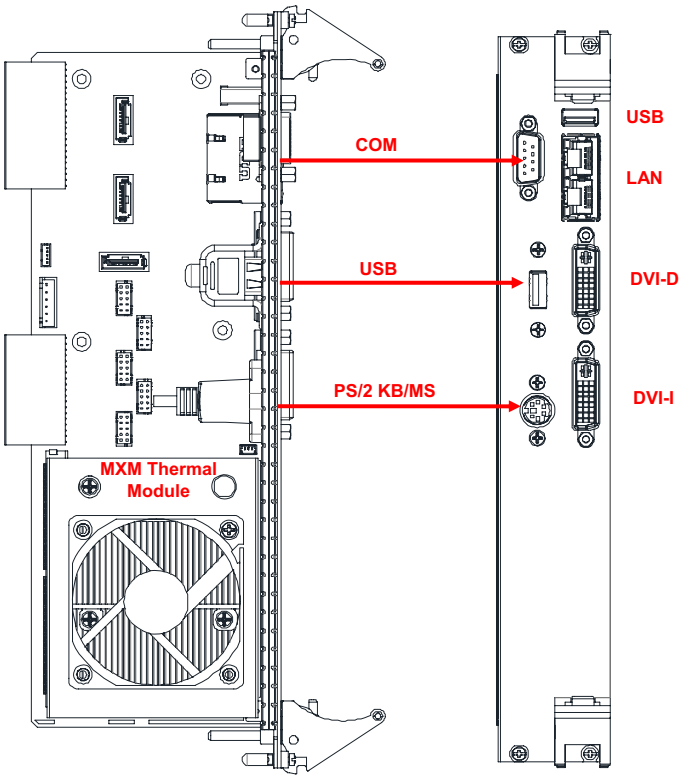


Figure 3-2: cPCI-R6500D Assembly Layout

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3.3 cPCI-R6501D Assembly Layout

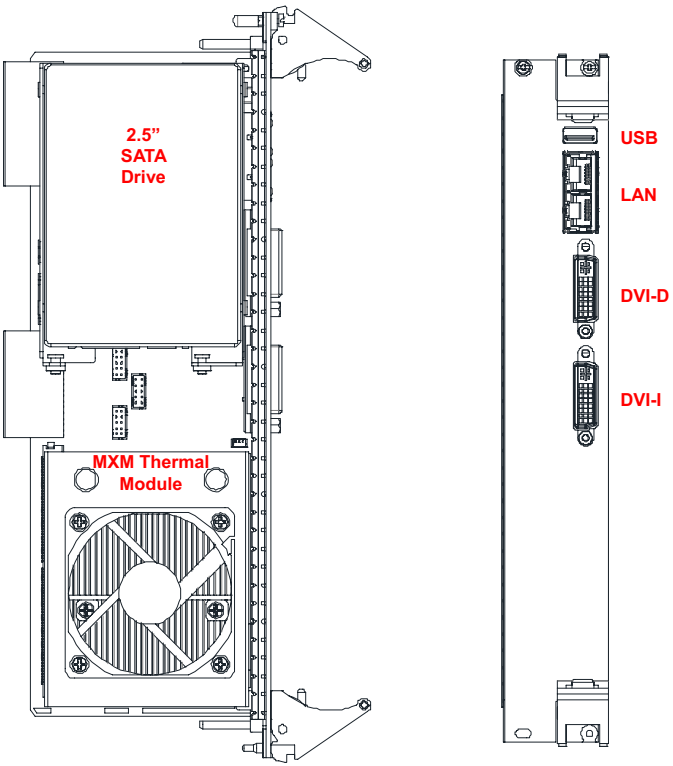


Figure 3-3: cPCI-R6501D Assembly Layout

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3.4 cPCI-R65N0 Assembly Layout

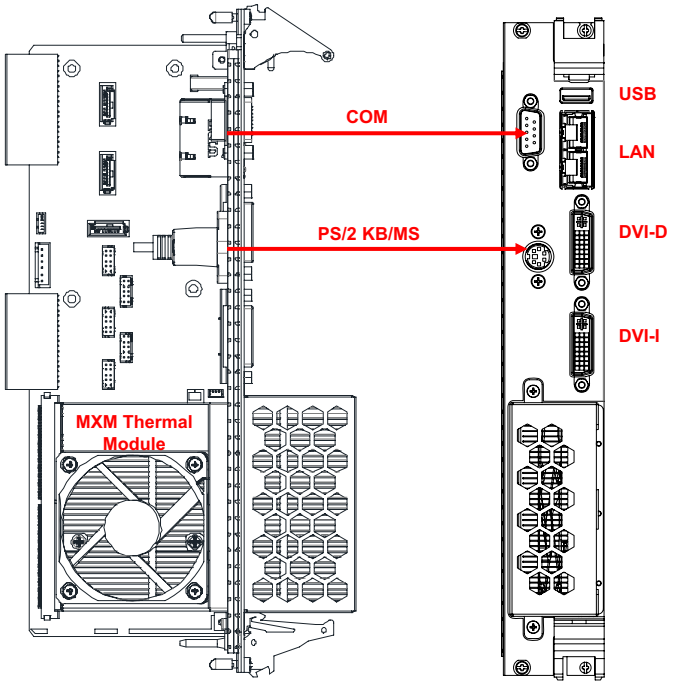


Figure 3-4: cPCI-R65N0 Assembly Layout

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3.5 cPCI-R6500 Series Faceplate

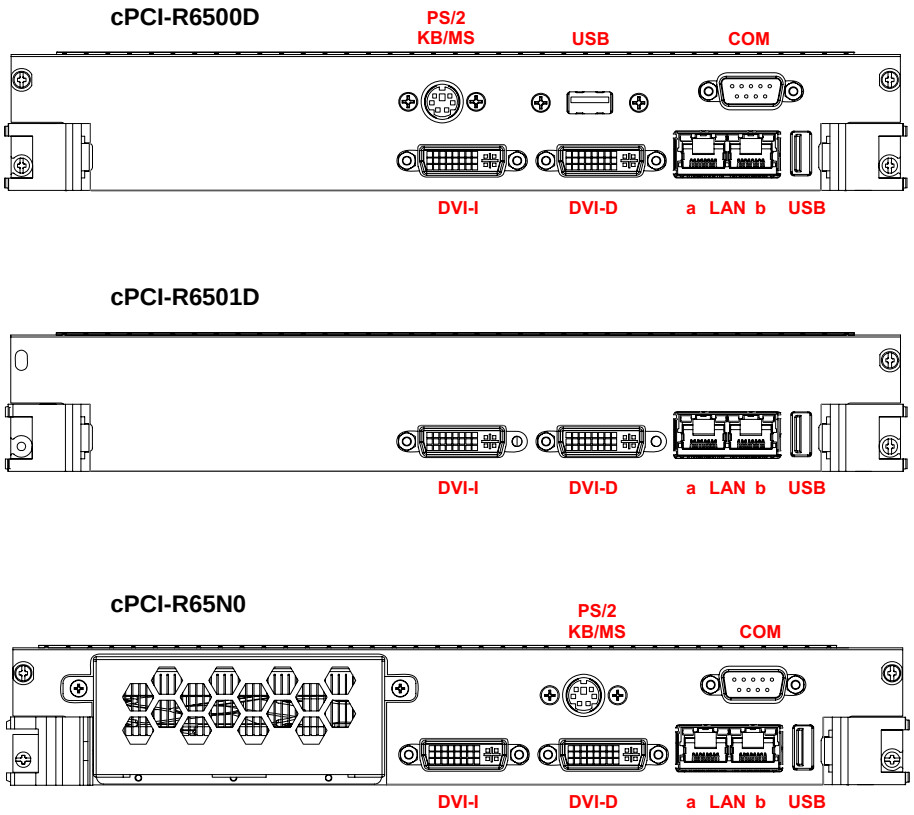
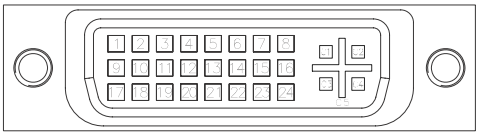


Figure 3-5: cPCI-R6500 Series Faceplate

3.6 Connector Pin Assignments

Faceplate Connectors

DVI-I Connectors

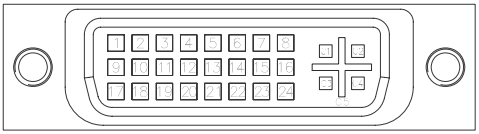


Pin #	Signal	Pin #	Signal
1	TMDS Data2-	16	Hot Plug Detect
2	TMDS Data2+	17	TMDS Data0-
3	TMDS Data2/4 Shield	18	TMDS Data0+
4	TMDS Data4-	19	TMDS Data0/5 Shield
5	TMDS Data4+	20	TMDS Data5-
6	DDC Clock [SCL]	21	TMDS Data5+
7	DDC Data [SDA]	22	TMDS Clock Shield
8	Analog vertical sync	23	TMDS Clock +
9	TMDS Data1-	24	TMDS Clock -
10	TMDS Data1+	C1	Analog Red
11	TMDS Data1/3 Shield	C2	Analog Green
12	TMDS Data3-	C3	Analog Blue
13	TMDS Data3+	C4	Analog Horizontal Sync
14	+5 V Power	C5	Analog GND Return
15	GND		

Table 3-1: DVI-I Connector Pin Definition

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DVI-D Connectors

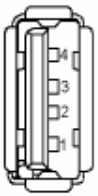


Pin #	Signal	Pin #	Signal
1	DVI_D_DAN2	16	DVI_D_HPD_L
2	DVI_D_DAP2	17	DVI_D_DAN0
3	GND	18	DVI_D_DAP0
4	NC	19	GND
5	NC	20	NC
6	DDCCLK_D	21	NC
7	DDCDATA_D	22	GND
8	NC	23	DVI_D_CLKP
9	DVI_D_DAN1	24	DVI_D_CLKN
10	DVI_D_DAP1	C1	NC
11	GND	C2	NC
12	NC	C3	NC
13	NC	C4	NC
14	DVI_D_5V	C5	NC
15	GND		

Table 3-2: DVI-I Connector Pin Definition

USB 2.0 Type A Connectors

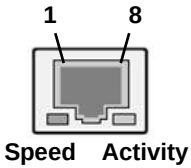
Pin #	Signal Name
1	Vcc
2	USB_D-
3	USB_D+
4	GND



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LAN Connectors (RJ-45)

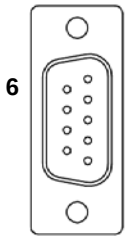
Pin #	10BASE-T/ 100BASE-TX	1000BASE-T
1	TX+	LAN_TXP0
2	TX-	LAN_TXN0
3	RX+	LAN_TXP1
4	--	LAN_TXP2
5	--	LAN_TXP2
6	RX-	LAN_TXN1
7	--	LAN_TXP3
8	--	LAN_TXN3



Status		Speed LED (Green/Amber)	Activity LED (Amber)
Network link is not established or system powered off		OFF	OFF
10 Mbps	Link	OFF	ON
	Active	OFF	Blinking
100 Mbps	Link	Green	ON
	Active	Green	Blinking
1000 Mbps	Link	Amber	ON
	Active	Amber	Blinking

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COM2 RS-232/422/485 Connector



Pin #	RS-232	RS-422	RS-485
1	DCD	TXD-	Data-
2	RXD	TXD+	Data+
3	TXD	RXD+	--
4	DTR	RXD	--
5	GND	GND	GND
6	DSR	--	--
7	RTS	--	--
8	CTS	--	--
9	RI	--	--

NOTE:

See “COM2 Mode Switches (SW1)” on page 22.

PS/2 Keyboard/Mouse Port (cPCI-R6500D/R65N0 only)

Pin #	Signal	Function
1	KB_DATA	Keyboard Data
2	MS_DATA	Mouse Data
3	GND	Ground
4	KM_VCC	Power
5	KB_CLK	Keyboard Clock
6	MS_CLK	Mouse Clock

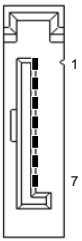


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Onboard Connectors

SATA Connectors (CN4/5/6)

Pin #	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



Auxiliary Power Connector (CN3)

(6-pin, 2.5 mm pitch Wafer - use with cable PN: 30-20077-2000)



Pin #	Signal
1	P12V
2	P12V
3	GND
4	GND
5	GND
6	P5V

SATA Power Connector (CN10)

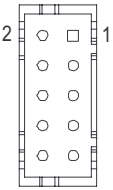
(5-pin, 1.25 mm pitch Wafer)



Pin #	Signal
1	GND
2	GND
3	NC
4	P12V
5	P5V

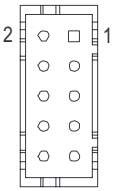
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COM1 Box Header (RS-232 RX/TX only)
(2x5-pin, 2.0 mm pitch Wafer)



Pin #	RS-232 Signal
1	NC
2	NC
3	RXD
4	NC
5	TXD
6	NC
7	NC
8	NC
9	GND
10	NC

COM2 Box Header (RS-232/422/485)
(2x5-pin, 2.0 mm pitch Wafer)



Pin #	RS-232	RS-422	RS-485
1	DCD	TXD-	Data-
2	TXD	TXD+	Data+
3	DSR	RXD+	--
4	CTS	RXD-	--
5	RXD	GND	GND
6	DTR		--
7	RTS		--
8	RI		--
9	GND		--
10	GND		--

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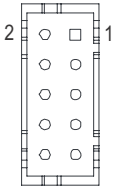
Fan Power Connector (CN9)



Pin #	Signal
1	GND
2	P12V
3	NC

Audio Box Header (HDA1)

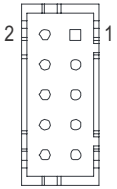
(2x5-pin, 2.0 mm pitch Wafer)



Pin #	Signal	Pin #	Signal
2	L_OUT_L	1	GND
4	GND	3	L_OUT_R
6	L_IN_L	5	GND
8	GND	7	L_IN_R
10	MIC_LR	9	GND

PS/2 Keyboard/Mouse Box Header (PS/2)

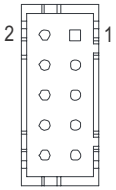
(2x5-pin, 2.0 mm pitch Wafer)



Pin #	Signal	Pin #	Signal
2	KB_CLK	1	KB_DATA
4	MS_CLK	3	MS_DATA
6	GND	5	KM_VCC
8	GND	7	GND
10	NC	9	GND

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USB Box Header (USB1)
(2x5-pin, 2.0 mm pitch Wafer)



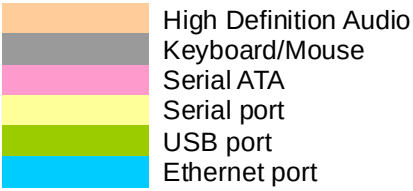
Pin #	Signal	Pin #	Signal
2	+5V	1	+5V
4	USB4_D-	3	USB7_D-
6	USB4_D+	5	USB7_D+
8	GND	7	GND
10	NC	9	Key

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CompactPCI rJ3 Pin Assignment

Pin	Z	A	B	C	D	E	F
19	GND	P5V	P5V	P12V	P5V	P5V	GND
18	GND	LAN2_TXP0 (b)	LAN2_TXN0 (b)	GND	LAN2_TXP2 (b)	LAN2_TXN2 (b)	GND
17	GND	LAN2_TXP1 (b)	LAN2_TXN1 (b)	GND	LAN2_TXP3 (b)	LAN2_TXN3 (b)	GND
16	GND	LAN1_TXP0 (a)	LAN1_TXN0 (a)	GND	LAN1_TXP2 (a)	LAN1_TXN2 (a)	GND
15	GND	LAN1_TXP1 (a)	LAN1_TXN1 (a)	GND	LAN1_TXP3 (a)	LAN1_TXN3 (a)	GND
14	GND	NC	NC	USB-OC7-L	USB-OC8-L	NC	GND
13	GND	USB8P	USB8N	GND	NC	NC	GND
12	GND	NC	NC	GND	USB7P	USB7N	GND
11	GND	USB4P	USB4N	GND	NC	NC	GND
10	GND	USB-OC4-L	NC	NC	NC	NC	GND
9	GND	CTS1-L	RI1-L	NC	NC	NC	GND
8	GND	SIN1	SOUT1	DTR1-L	DSR1-L	RTS1-L	GND
7	GND	COM_TXD	COM_RXD	DCD1-L	NC	NC	GND
6	GND	SATA3_RXP0	SATA3_RXN0	GND	SATA3_RXP1	SATA3_RXN1	GND
5	GND	GND	GND	NC	GND	GND	GND
4	GND	SATA3_TXP0	SATA3_TXN0	GND	SATA3_TXP1	SATA3_TXN1	GND
3	GND	KB_DATA	KB_CLK	NC	MS_DATA	MS_CLK	GND
2	GND	HDA_SDIN1	HDA_SDIN2	HDA_SDIN3	HDA_EN-L	AUD_RST-L	GND
1	GND	HDA_RST-L	HDA_SYNC	HDA_BIT_CLK	HDA_SDOUT	HDA_SDIN0	GND

Table 3-3: CompactPCI J3 Connector Pin Definition



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CompactPCI rJ5 Pin Assignment

Pin	Z	A	B	C	D	E	F
22	GND	NC	LAN1_LINK_ ACT_L (a)	NC	LAN2_LINK_ ACT_L (b)	NC	GND
21	GND	NC	NC	GND	NC	NC	GND
20	GND	NC	NC	GND	NC	NC	GND
19	GND	NC	NC	NC	NC	NC	GND
18	GND	NC	NC	NC	NC	NC	GND
17	GND	NC	NC	NC	NC	NC	GND
16	GND	NC	NC	NC	NC	NC	GND
15	GND	NC	NC	NC	SATA_RXP0	SATA_RXN0	GND
14	GND	NC	NC	GND	SATA_TXP0	SATA_TXN0	GND
13	GND	LAN1_100-L (a)	LAN2_100-L (b)	NC	LAN2_1G-L (b)	LAN1_1G-L (a)	GND
12	GND	NC	NC	NC	NC	NC	GND
11	GND	NC	NC	GND	NC	NC	GND
10	GND	NC	NC	GND	NC	NC	GND
9	GND	NC	NC	NC	NC	NC	GND
8	GND	NC	NC	GND	NC	NC	GND
7	GND	GND	GND	BAT_RTM	GND	GND	GND
6	GND	PCIE_CLKP	PCIE_CLKN	GND	PLTRST-L	NC	GND
5	GND	GND	GND	GND	GND	GND	GND
4	GND	PCIE_TXP4	PCIE_TXN4	GND	PCIE_RXP4	PCIE_RXN4	GND
3	GND	PCIE_TXP3	PCIE_TXN3	GND	PCIE_RXP3	PCIE_RXN3	GND
2	GND	PCIE_TXP2	PCIE_TXN2	GND	PCIE_RXP2	PCIE_RXN2	GND
1	GND	PCIE_TXP1	PCIE_TXN1	GND	PCIE_RXP1	PCIE_RXN1	GND

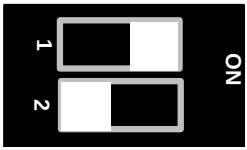
Table 3-4: CompactPCI J5 Connector Pin Definition

PCI-Express x4
Serial ATA
Ethernet port

3.7 Switch Settings

COM2 Mode Switches (SW1)

The COM2 serial port supports RS-232/422/485 modes. Switch SW1 can be used to configure the COM2 port to the desired mode using the settings shown below (set to RS-232 by default).



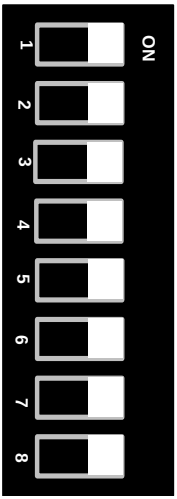
Serial port mode	SW1
RS-232	1 ON, 2 OFF
RS-485	1 OFF, 2 ON
RS-422	1 ON, 2 ON

Table 3-5: COM2 Mode Switch Settings

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LAN Control Switches (SW2, SW3)

The cPCI-R6500 can route LAN signals from the CPU blade to either the PICMG 2.16 backplane or to LAN a/b on the face-plate I/O (but not both simultaneously). Switch SW2 can be used to route the LAN “a” signals and (set to faceplate RJ-45 connectors by default).



LAN signals routed to	SW2 (LAN “a”)	SW3 (LAN “b”)
PICMG 2.16 Backplane	All OFF	All OFF
Faceplate RJ-45 connectors (default)	All ON	All ON

Table 3-6: LAN Control Switch Settings

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Important Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

- Read these safety instructions carefully.
- Keep this user's manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment:
  - Turn off power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources;
  - Keep equipment away from high heat or high humidity;
  - Keep equipment properly ventilated (do not block or cover ventilation openings);
  - Make sure to use recommended voltage and power source settings;
  - Always install and operate equipment near an easily accessible electrical socket-outlet;
  - Secure the power cord (do not place any object on/over the power cord);
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings; and,
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.

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- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

A Lithium-type battery may be provided for uninterrupted, backup or emergency power.



Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries appropriately.

- Equipment must be serviced by authorized technicians when:
  - The power cord or plug is damaged;
  - Liquid has penetrated the equipment;
  - It has been exposed to high humidity/moisture;
  - It is not functioning or does not function according to the user's manual;
  - It has been dropped and/or damaged; and/or,
  - It has an obvious sign of breakage.

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Getting Service

Contact us should you require any service or assistance.

ADLINK Technology, Inc.
Address: 9F, No.166 Jian Yi Road, Zhonghe District
New Taipei City 235, Taiwan
新北市中和區建一路 166 號 9 樓
Tel: +886-2-8226-5877
Fax: +886-2-8226-5717
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.
Address: 5215 Hellyer Avenue, #110, San Jose, CA 95138, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-360-0222
Email: info@adlinktech.com

ADLINK Technology (China) Co., Ltd.
Address: 上海市浦东新区张江高科技园区芳春路 300 号 (201203)
300 Fang Chun Rd., Zhangjiang Hi-Tech Park,
Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5132-3588
Email: market@adlinktech.com

ADLINK Technology Beijing
Address: 北京市海淀区上地东路 1 号盈创动力大厦 E 座 801 室(100085)
Rm. 801, Power Creative E, No. 1,
Shang Di East Rd., Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8626
Email: market@adlinktech.com

ADLINK Technology Shenzhen
Address: 深圳市南山区科技园南区高新南七道 数字技术园
A1 栋 2 楼 C 区 (518057)
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7,
High-Tech Industrial Park S., Shenzhen, 518054 China
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353
Email: market@adlinktech.com

LiPPERT ADLINK Technology GmbH
Address: Hans-Thoma-Strasse 11, D-68163, Mannheim, Germany
Tel: +49-621-43214-0
Fax: +49-621 43214-30
Email: emea@adlinktech.com

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ADLINK Technology, Inc. (French Liaison Office)
Address: 15 rue Emile Baudot, 91300 Massy CEDEX, France
Tel: +33 (0) 1 60 12 35 66
Fax: +33 (0) 1 60 12 35 66
Email: france@adlinktech.com

ADLINK Technology Japan Corporation
Address: 〒101-0045 東京都千代田区神田鍛冶町 3-7-4
神田 374 ビル 4F
KANDA374 Bldg. 4F, 3-7-4 Kanda Kajicho,
Chiyoda-ku, Tokyo 101-0045, Japan
Tel: +81-3-4455-3722
Fax: +81-3-5209-6013
Email: japan@adlinktech.com

ADLINK Technology, Inc. (Korean Liaison Office)
Address: 서울시 서초구 서초동 1675-12 모인터빌딩 8 층
8F Mointer B/D,1675-12, Seocho-Dong, Seocho-Gu,
Seoul 137-070, Korea
Tel: +82-2-2057-0565
Fax: +82-2-2057-0563
Email: korea@adlinktech.com

ADLINK Technology Singapore Pte. Ltd.
Address: 84 Genting Lane #07-02A, Cityneon Design Centre,
Singapore 349584
Tel: +65-6844-2261
Fax: +65-6844-2263
Email: singapore@adlinktech.com

ADLINK Technology Singapore Pte. Ltd. (Indian Liaison Office)
Address: 1st Floor, #50-56 (Between 16th/17th Cross) Margosa Plaza,
Margosa Main Road, Malleswaram, Bangalore-560055, India
Tel: +91-80-65605817, +91-80-42246107
Fax: +91-80-23464606
Email: india@adlinktech.com

ADLINK Technology, Inc. (Israeli Liaison Office)
Address: 6 Hasadna St., Kfar Saba 44424, Israel
Tel: +972-9-7446541
Fax: +972-9-7446542
Email: israel@adlinktech.com

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