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SYSTEM

Technical Information

CC6-ACID • LPC Super-I/O Board

Document No. 2333 • Edition 9

2004-04



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About this Manual

This manual is a short form description of the technical aspects of the CC6-ACID, required for installation and system integration. It is intended for the very advanced user only.

Edition History

EKF Document	Ed.	Contents/*Changes*	Author	Date
Text # 2333 cc6tie.wpd	1	Technical Information CC6-ACID English Preliminary edition, to be completed later on	jj	4 Jul 00
	2	Photographic images included	jj	15 Sep 00
Text # 2333 cc6r1tie.wpd	3	Reflects revision 1 of the PCB (modified connector assembly, board versions with 8 and 4HP front panel width)	jj	25 Jan 01
	4	Added drawing (mounting bracket CC5/CC6)	jj	23 Mrch 01
	5	Added images of 4HP front panel versions CC6-3, CC6-4	jj	11 Apr 01
Text # 2333 cc6r2tie.wpd	6	Reflecting the board revision 2, removed versions CC6-2, CC6-4, added version CC6-8 (hard disk option), removed rear I/O feature across J2, added IDE bus switcher activated by JSEL, schematic sheets exchanged against current revision 2	jj	17 Dec 01
	7	Added chapter 'Top/Bottom Mounting', added images CC6 mounted on top or bottom of CPU, LPC connector	jj	27 May 2002
	8	Changed *Assembly Drawing* for better readability, added information on CC0-CHILLOUT under *Related Documents*, removed *Schematics* for reduced filesize (schematics available on request)	jj	18. Nov 03
	9	Added MTBF	jj	23 April 2004

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Related Documents

For a description of the host CPU card, which acts as a LPC controller and carrier board with respect to the CC6-ACID, please refer to the correspondent CPU user guide, available by download at http://www.ekf.de/c/ccpu/ccpu.html.

The CC6-ACID is suitable for front panel I/O. A similar solution is available which provides rear I/O across J1/J2. It is named CC0-CHILLOUT. The Technical Information CC0-CHILLOUT can be downloaded from http://www.ekf.de/c/ccpu/cc6/cc0_tie.pdf.

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.

Pentium, Celeron, Socket 370: ® Intel
CompactPCI : ® PICMG
Windows 98, Windows NT, Windows 2000, Windows XP: ® Microsoft

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.

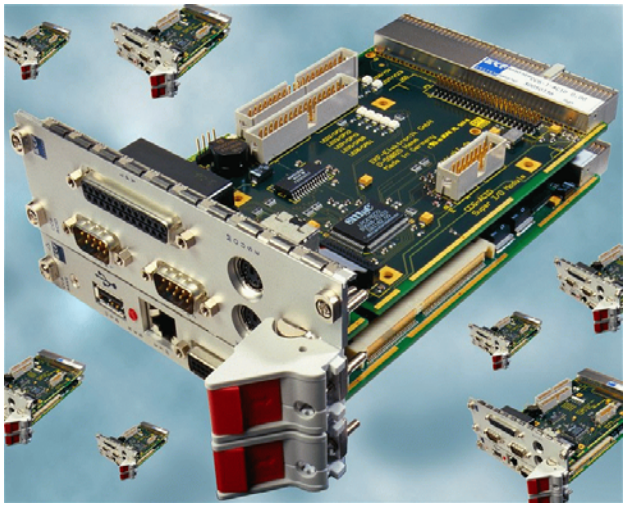
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CC6-ACID Features

Feature Summary	
Form Factor	Single size *CompactPCI* style Eurocard (160x100mm^2), front panel width CC6-1: 8HP (40.6mm), CC6-3: 4HP (20.3mm)
LPC Super-I/O Chip	LPC47B27x, parallel port, 2 serial ports, floppy drive controller port, keyboard controller & mouse port, infrared port, MIDI/gameport, fan control ports, GPIOs, serial IRQs
Front Panel Connectors	CC6-1: keyboard PS/2, mouse PS/2, COM1 COM2 (RS-232E 9-pos. D-Sub male), LPT (25-pos. D-Sub female) CC6-3: keyboard PS/2, mouse PS/2 available with external splitter-cable (accessory), COM1 COM2 (RS-232E 9-pin D-Sub male)
On-Board Connectors	LPC Interface, IDE/ATA 40-pin header 2.54mm, IDE/ATA 44-pin header 2.00mm, floppy disk header 34-pin 2.54mm Optional: floppy disk power, 2 x fan heatsink header (pulse width modulation), 2 x fan heatsink header (tacho generator), MIDI/gameport header
CPCI Connector	J1 (optional), allows for redundancy in power attachment 3.3V 5V 12V, in addition to LPC connector
On-Board Functions	Speaker, LEDs: IDE activity, optional LEDs: GPIO21, GPIO22, GPIO43, GPIO60, GPIO61, 3.3V, 5V, 12V
Hard Disk Option	HDD 2.5-inch optional on-board, Ultra ATA/66
MTBF	0.185 * 10^{6}h

Subject to technical changes



CC5-RAVE and CC6-ACID

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Short Description

Available as a companion board to the CC5-RAVE and the CC8-BLUES, the CC6-ACID is provided with the most common legacy I/O ports of a classic PC. Interconnection between the CC6 I/O module and the CC5/CC8 CPU board is achieved by the LPC (Low Pin Count) interface. As an option, the CC6-ACID is available with a rugged on-board 2.5-inch hard disk drive.

The connectors COM1/2, LPT, mouse and keyboard are situated at the front panel, while an external floppy disk drive can be attached via the on-board pin header.

The CC6-ACID is available with a 4HP or 8HP front panel. The module can be attached either to the left or to the right of the CPU card.



CC1-1-ACID



CC6-1-ACID



CC6-1-ACID w. CC8-HDK

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The CC6-ACID communicates to the host CPU by means of the LPC interface. This is a multiplexed ISA bus, enabling the super-I/O controller chip to emulate the legacy I/O interfaces. Among these are parallel and serial ports, the PS/2 connectors, and last not least the classic 1.4/2.8MB floppy disk controller. As an option, the CC6-ACID provides MIDI and gameport attachment, and control outputs for fans with either tachometer output or pulse width modulation input.

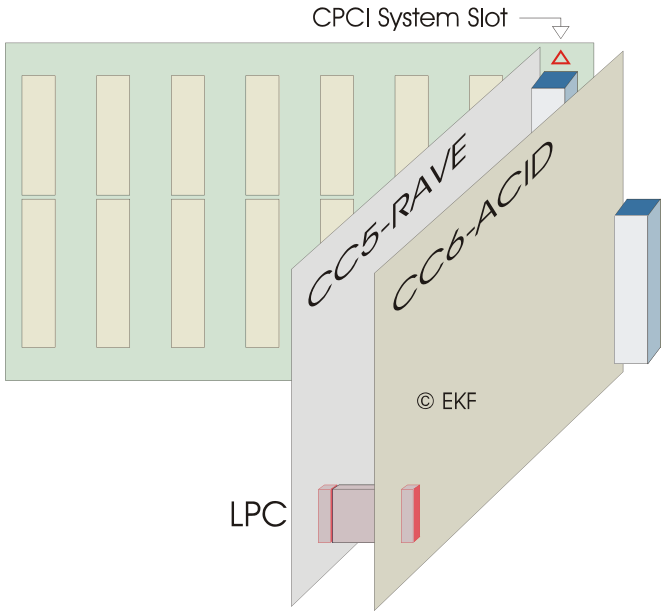
By connecting the boards together, the hosts ATA/IDE interface is also available on the CC6-ACID. Optionally, the board is equipped with a robust 2.5-inch hard disk drive, particularly suited for use in a rugged environment.

The CC6-ACID can be mounted either on the left (bottom) side of the CPU board (version CC6-3 only), or right (top) side (both CC6-1 and CC6-3). The way of attachment (top or bottom with respect to the CPU) can be easily changed by the user himself.

Regarding the CC6-1-ACID, the connectors COM1, COM2, LPT, keyboard and mouse are can be reached from the boards front panel (width 8HP). The CC6-3-ACID comes with a 4HP front panel, and has the LPT connector removed. When using the CC6-3, mouse and keyboard are sharing the same Mini-Din connector by means of an external splitter cable.

The remaining I/O functions are available by on-board headers.

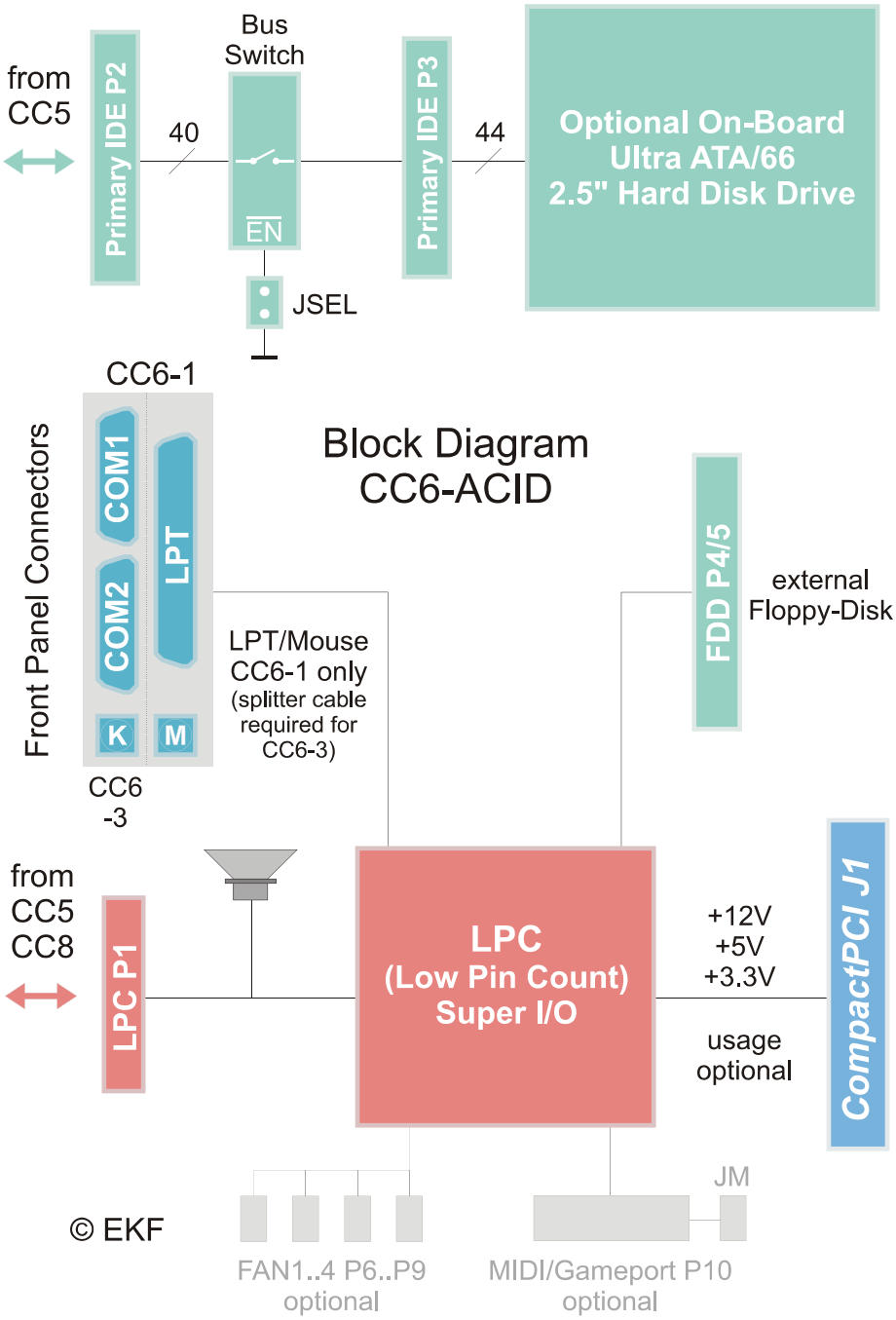
Since using of the connector J1 is not mandatory, the CC6-ACID can be mounted outside of the *CompactPCI®* bus. By default, EKF systems have the CPCI busprint situated leftmost to the 19-inch rack, with the system slot oriented to the right end of the backplane. Following next to the right side, the CC6-ACID should be placed in between the remaining free mounting space. This orientation prevents from loss of peripheral slots on the CPCI bus, otherwise occupied by the CC6-ACID.



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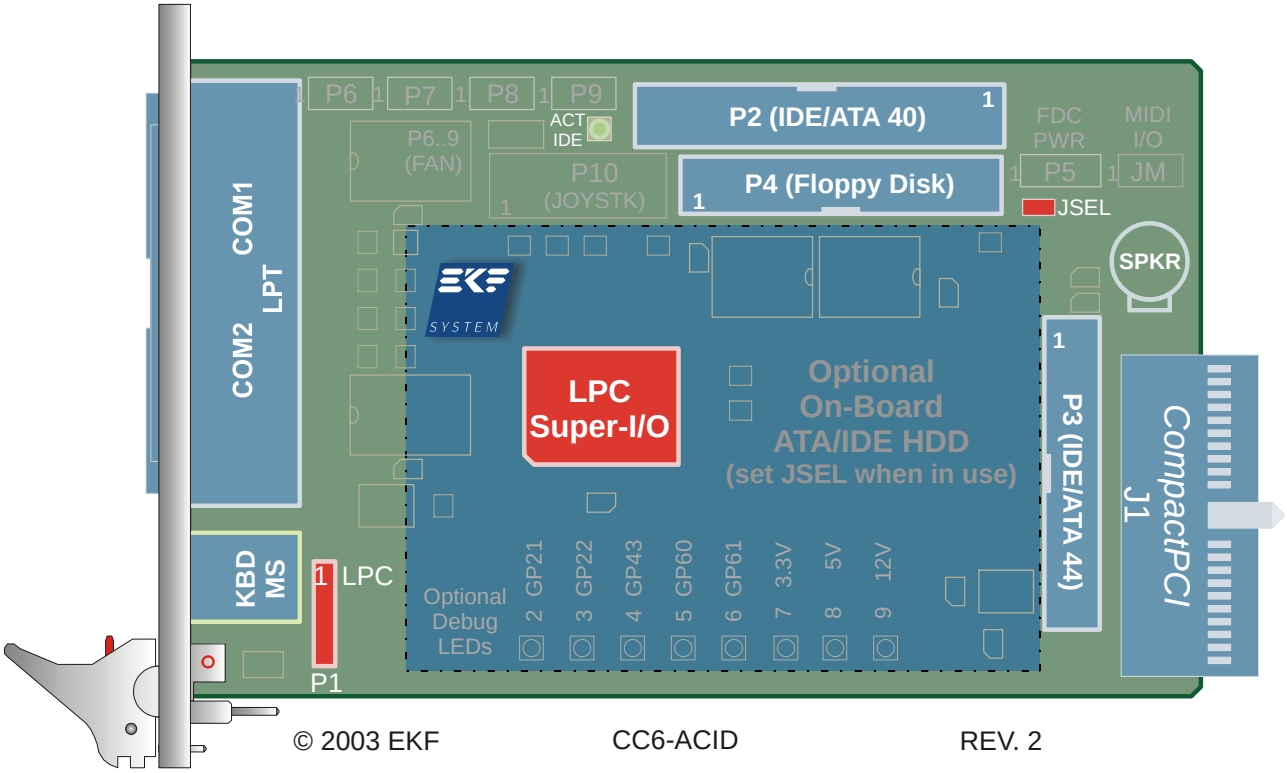
Block Diagram



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Top View Component Assembly



© 2003 EKF CC6-ACID REV. 2



CC6-3-ACID

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Onboard Connectors

P1	LPC Low Pin Count interface
P2	IDE 40-pin header
P3	IDE 44-pin header
P4	Floppy disk header
P5	Floppy disk power (opt.)
P6..P9	Fan heatsink headers (opt.)
P10	MIDI/gameport header (opt.)
J1	Metric Connector, power (J1)

Front Panel Connectors

KBD/Mouse	PS/2 style (Mini-DIN) connectors, dual (stacked) receptacle comes with 8HP front panel version CC6-1, single Mini-DIN connector KBD comes with 4HP front panel width version CC6-3. In addition to its native signals the connector KBD incorporates mouse clock and data signals on the remaining free pins in order to allow attachment of both, KBD and mouse device across an external splitter cable (available as accessory).
COM1, COM2	RS-232, 9-pin D-Sub male connectors
LPT	25-pin D-Sub connector, ECP parallel port (not available with 4HP front panel version CC6-3)

Jumpers

JSEL	Enables IDE bus switches when set Please note: In order to make use of the header P3 (IDE interface for 2.5-inch hard disk), either connected to an on-board HDD or an external drive, the jumper JSEL must be set. However, if P3 is not in use, JSEL must be removed in order to avoid reflections on the IDE bus caused by tapped signal traces.

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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. Disconnect the system from its power source and from any telecommunication links, networks or modems before performing any of the procedures described in this chapter. Failure to disconnect power, or telecommunication links before you open the system or perform any procedures can result in personal injury or equipment damage. Some parts of the system can continue to operate even though the power switch is in its off state.



Caution

Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis or board front panel. Store the board only in its original ESD protected packaging. Retain the original packaging (antistatic bag and antistatic box) in case of returning the board to EKF for rapair.



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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

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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.

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EMC Recommendations

CE

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)
Isolating Elements	ARP Datacom, 63115 Dietzenbach	Ordering No. 182 068 (Cheapernet T-connector)
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)

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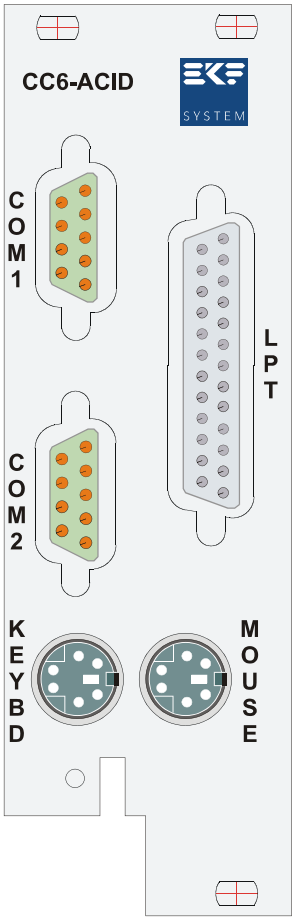
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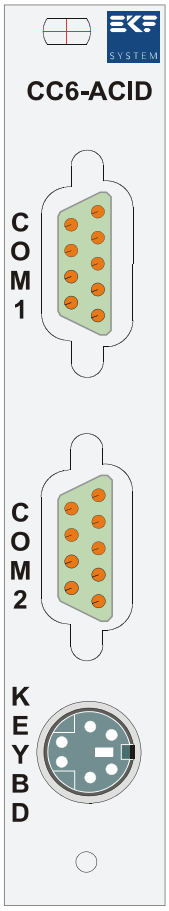
Technical Reference - Connectors

Caution

Some of the connectors provide operating voltage (e.g. 5V and 12V) to devices inside the system chassis, such as fans and internal peripherals. 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.

Front Panel



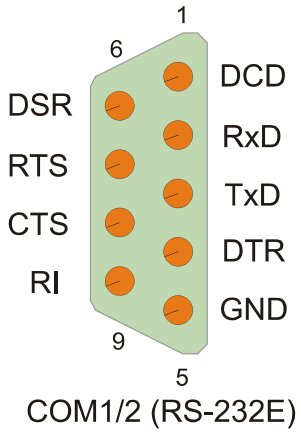


The version CC6-1 is provided with an 8HP front panel, while the CC6-3 comes with a 4HP front panel. The connectors LPT and Mouse are available with the 8HP front panel only. When using the 4HP front panel version, signals for keyboard and mouse are both sourced by the Keyboard jack. A splitter cable must be used for simultaneous attachment of both devices, keyboard and mouse, to the single connector. The splitter is available as notebook computer accessories from EKF or computer stores. Please note, that the mouse and keyboard function have been intentionally swapped against each other, in order to allow keyboard only attachment without splitter cable. When using the splitter cable, the mouse has to be connected to the keyboard splitter end, and the keyboard must be attached to the splitter end labelled with the mouse symbol.

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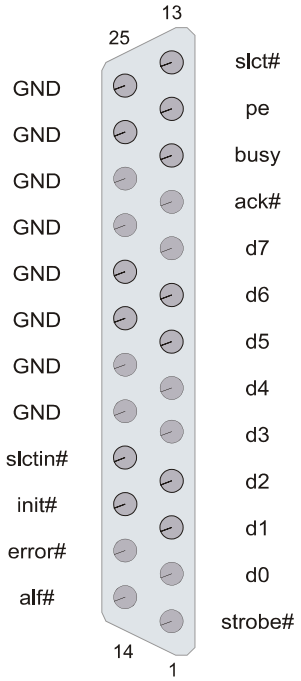
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COM1, COM2 Serial Ports



COM1/2 (RS-232E)

LPT Parallel Port



LPT (Printer)

The LPT port is available with the CC6-1 only (8HP front panel). There is no LPT port available with the CC6-3 (4HP front panel).

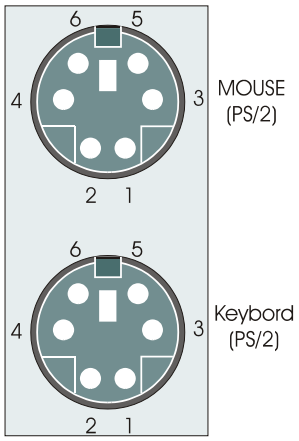
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Keyboard, Mouse

Keyboard	
1	DAT K
2	*DAT M*
3	GND
4	5V
5	CLK K
6	*CLK M*

Mouse	
1	DAT M
2	
3	GND
4	5V
5	CLK M
6	



The version CC6-1 is provided with both connectors Mouse and Keyboard. However, due to the limited front panel width (4HP) of the version CC6-3, the Mouse jack has been omitted. Instead, keyboard and mouse signals can be derived both from the connector Keybord by means of a suitable splitter cable, available from EKF or computer suppliers. Please use the splitter in reverse order: Connect your keyboard with the splitter designated as mouse, and vice versa attach your mouse to the keyboard splitter. The mouse and keyboard function have been intentionally swapped against each other, in order to allow keyboard only attachment without splitter cable.

LPC Connector P1

P1			
GND	1	2	pciclk
GND	3	4	lad0
GND	5	6	lad1
GND	7	8	lad2
GND	9	10	lad3
GND	11	12	lframe#
GND	13	14	ldrq#
serirq	15	16	lpme#
lsmi#	17	18	pcirst#
5V	19	20	3.3V
rcin#	21	22	a20gate
12V	23	24	3.3V
sio_clk14	25	26	speaker

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IDE/ATA Connector P2

P2			
reset#	1	2	GND
dd07	3	4	dd08
dd06	5	6	dd09
dd05	7	8	dd10
dd04	9	10	dd11
dd03	11	12	dd12
dd02	13	14	dd13
dd01	15	16	dd14
dd00	17	18	dd15
GND	19	*20*	KEY
dmarq	21	22	GND
diow#	23	24	GND
dior#	25	26	GND
iordy	27	28	
dmack#	29	30	GND
intrq	31	32	
da1	33	34	cblid#
da0	35	36	da2
cs0#	37	38	cs1#
asp#	39	40	GND

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IDE/ATA Connector P3

P3			
reset#	1	2	GND
dd07	3	4	dd08
dd06	5	6	dd09
dd05	7	8	dd10
dd04	9	10	dd11
dd03	11	12	dd12
dd02	13	14	dd13
dd01	15	16	dd14
dd00	17	18	dd15
GND	19	*20*	KEY
dmarq	21	22	GND
diow#	23	24	GND
dior#	25	26	GND
iordy	27	28	
dmack#	29	30	GND
intrq	31	32	
da1	33	34	cblid#
da0	35	36	da2
cs0#	37	38	cs1#
dasp#	39	40	GND
drvpwr	41	42	drvpwr
GND	43	44	

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Floppy Disk Connector P4/P5

P4			
GND	1	2	drvden0#
GND	3	4	NC
KEY	5	6	drvden1#
GND	7	8	index#
GND	9	10	mtr0#
GND	11	12	
GND	13	14	ds0#
GND	15	16	
GND	17	18	dir#
GND	19	20	step#
GND	21	22	wdata#
GND	23	24	wgate#
GND	25	26	trk0#
GND	27	28	wrtprt#
	29	30	rdata#
GND	31	32	hdsel#
	33	34	dskchg#

P5	
1	+5V
2	GND
3	GND
4	+12V

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Fan Heatsink Header P6..P9

P6/P7	
1	GND
2	+12V
3	tacho

P8/P9	
1	GND
2	+12V
3	pwm

MIDI/Gameport Header P10

P10			
5V	1	2	5V
joy1but1	3	4	joy2but1
joy1x	5	6	joy2x
GND	7	8	midi_out
GND	9	10	joy2y
joy1y	11	12	joy2but2
joy1but2	13	14	midi_in
GND	15	16	

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CompactPCI J1

#J1	A	B	C	D	E
25	5V	*REQ64#*	*ENUM#*	3.3V	5V
24	*AD1*	5V	*VI/O*	*AD0*	*ACK64#*
23	3.3V	*AD4*	*AD3*	5V	*AD2*
22	*AD7*	GND	3.3V	*AD6*	*AD5*
21	3.3V	*AD9*	*AD8*	*M66EN (GND)*	*C/BE0#*
20	*AD12*	GND	*VI/O*	*AD11*	*AD10*
19	3.3V	*AD15*	*AD14*	GND	*AD13*
18	*SERR#*	GND	3.3V	*PAR*	*C/BE1#*
17	3.3V	*IPMB SCL*	*IPMB SDA*	GND	*PERR#*
16	*DEVSEL#*	GND	*VI/O*	*STOP#*	*LOCK#*
15	3.3V	*FRAME#*	*IRDY#*	*BD SEL*	*TRDY#*
14					
13					
12					
11	*AD18*	*AD17*	*AD16*	GND	*C/BE2#*
10	*AD21*	GND	3.3V	*AD20*	*AD19*
9	*C/BE3#*	*IDSEL*	*AD23*	GND	*AD22*
8	*AD26*	GND	*VI/O*	*AD25*	*AD24*
7	*AD30*	*AD29*	*AD28*	GND	*AD27*
6	*REQ#*	GND	3.3V	*CLK*	*AD31*
5	*BRSVP1A5*	*BRSVP1B5*	*RST#*	GND	*GNT#*
4	*IPMB PWR*	*HEALTHY# (GND)*	*VI/O*	*INTP*	*INTS*
3	*INTA#*	*INTB#*	*INTC#*	5V	*INTD#*
2	*TCK*	5V	*TMS*	*TDO*	*TDI*
1	5V	-12V	*TRST#*	+12V	5V

pin positions printed italic/coloured brown: not connected
pin positions printed italic/coloured blue: not connected

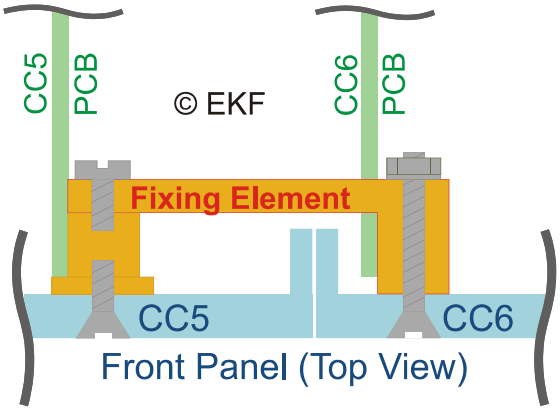
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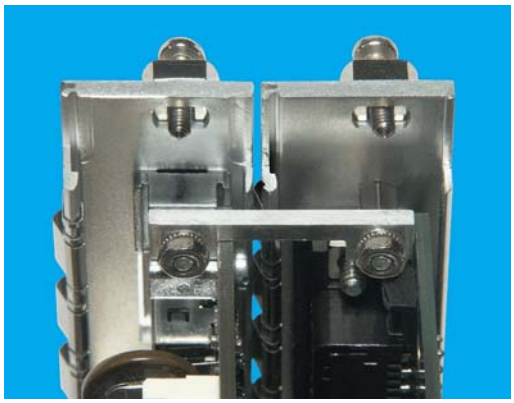
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Power Supply Requirements

Operating Voltage	max. Current
+5V / ±0.25V	TBD
+3.3V / ±0.1V	TBD
+12V / ±0.5V	TBD

Mounting Bracket to Fix CC5/CC6





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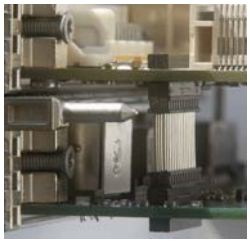
Top/Bottom Mounting

The CC6-ACID can be attached either to the top of the CC5-RAVE (or other hosting CPU board) or to the bottom (bottom attachment restricted to the 4HP version of the CC6-ACID).





The photo above (left) shows the bottom attachment of the CC6-ACID. The boards are fixed together by the LPC connector and the IDE connector, and in addition by a bracket which bolts together both front panels. The right image shows the top attachment of the CC6-ACID.



The photo above shows the CC5-RAVE and CC6-ACID connected by the LPC interface. Together, the CC5-RAVE and the CC6-ACID represent an ultra-compact, complete desktop functionality, industrial grade computer system.



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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.

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