EKF
SYSTEM

Technical Information

CCH-MARIACHI

CompactPCI®   Mezzanine I/O Companion Board

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Contents

About this Manual

This manual is a short form description of the technical aspects of the CCH-MARIACHI 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 # 4859 cch_tie.wpd	1	Technical Information CCH-MARIACHI English, Preliminary Edition	mib	2007-10-23
	2	Added table 'Feature Availability', added photos, general review	jj	2008-08-18
	3	Update reflects changes from PCB Rev.1	mib	2008-09-03
	4	Added illustrations (Top View Assembly Variations), added images (C10-CFA, C17-CFA)	jj	24 November 2008

Related Documents

For a description of the CCG-RUMBA CPU card, which acts as LPC / HD Audio / SDVO controller and carrier board with respect to the CCH-MARIACHI, please refer to the correspondent CPU user guide, available by download from http://www.ekf.com/c/ccpu/ccg/ccg_e.html.

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 2 Duo, Merom, Penryn, iAMT: ® Intel
- ▸ *CompactPCI®* : ® PICMG
- ▸ Windows 2000, Windows XP, Windows Vista: ® 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.

Standards

Specifications/Standards	
CompactPCI	PICMG 2.0 R3.0 (www.picmg.org)
PCI Local Bus	PCI 2.2/2.3/3.0 Standards (PCI SIG www.pcisig.com)
USB	Universal Serial Bus Revision 2.0 specification (www.usb.org/developers)
CompactFlash	CF+ and CompactFlash Specification Revision 3.0 (www.compactflash.org)
DVI	Digital Visual Interface Rev. 1.0 (Digital Display Working Group www.ddwg.org)
TPM	Trusted Platform Module 1.2 (https://www.trustedcomputinggroup.org)
HD Audio	High Definition Audio Specification Rev.1.0 http://www.intel.com/design/chipsets/hdaudio.htm

CCH-MARIACHI Features

Feature Summary	
Form Factor	Single size Eurocard (160x100mm^2), needs 4HP (20.3mm) additional mounting space, typically delivered as a ready to use assembly unit including the CCG-RUMBA providing a common 8HP front panel shared with the CPU board, mounting position right (on top of CPU board) or left (without DVI)
LPC Super-I/O [3] (SIO2)	SCH3114, parallel port, 4 serial ports, PS/2 keyboard & mouse port, LPC interface
Firmware Hub [3] (FWH2)	82802 generic device, 8Mbit Flash, LPC interface, can be switched as secondary or primary (boot code) FWH
Audio Codec [3]	Realtek ALC 262 HD Audio Codec
Serial Transceivers [3]	Up to 2 x ADM211 or equivalent, EIA/TIA-232E (RS-232E) 230kbps max.
DVI [3]	SDVO to DVI (Digital Visual Interface) PanelLink/TMDS transmitter, dual screen operation (together with the carrier boards primary DVI video output), DVI is a stuffing option (front panel connector replaces 1 x COM and 1 x USB)
TPM [3]	Option Trusted Platform Module cryptographic chip according to TPM 1.2
Front Panel Connectors [12]	▸ 2 x RS-232E male D-Sub COM port connectors (1 x if DVI is provided) ▸ 1 x USB connector (none if DVI is provided) ▸ 1 x DVI receptacle (option, replaces 1 x COM and USB connector) ▸ 2 x Stereo audio jacks MIC input / HP output ▸ 1 x digital / analog audio D-Sub port connectors (S/P DIF in/out, analog stereo in/out)
Host I/F Connectors (to CCG-RUMBA CPU Carrier Board) [1]	▸ Multifunction expansion interface (LPC, USB, SMB, HD Audio) ▸ IDE/PATA interface ▸ SDVO (Serial Digital Video Out) port C graphics interface
On-Board I/O Connectors [12]	▸ Socket for C10-CFA CompactFlash mezzanine module or C30-PATA 1.8-inch ZIF hard disk module (mounted on top of CCH) ▸ Socket for C17-CFA CompactFlash mezzanine module (mounted between CCH and CPU board) ▸ IDE/ATA 40-pin header 2.54mm (IDE Device Header) ▸ IDE/ATA 44-pin header 2.00mm (on-board hard disk 2.5-inch) ▸ 2 x serial port TTL 2.00mm header (suitable for EKF CU-series PHY-modules) ▸ PS/2 legacy keyboard / mouse header 2.54mm ▸ Line printer (parallel port) header 2.54mm ▸ Aux Audio 10-pin header line input/output (stereo) ▸ CD audio input ▸ USB 10-pin headers 2.00mm either top or bottom for a low profile Solid-State Drive (SSD) module ▸ Reset
On-Board Functions	Speaker, LEDs, SMBus EEPROM, temperature sensors
Mass Storage Options [2]	▸ Hard disk drive 2.5-inch optional on-board ▸ Mezzanine module with 1.8-inch hard disk drive (ZIF interface) ▸ CompactFlash mezzanine module optional on-board ▸ External PATA drive

Thermal Conditions [4] Environmental Conditions [4]	‣ Operating temperature: 0°C ... +70°C ‣ Storage temperature: -40°C ... +85°C, max. gradient 5°C/min ‣ Humidity 5% ... 95% RH non condensing ‣ Altitude -300m ... +3000m ‣ Shock 15g 0.33ms, 6g 6ms ‣ Vibration 1g 5-2000Hz
EC Regulations	‣ EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1) ‣ 2002/95/EC (RoHS)
MTBF	tbd

[1] Not all of these connectors may be present or functional on your actual CCH-MARIACHI board. Assembly of these connectors is highly custom specific. Discuss your needs with EKF before ordering.

[2] Options may be exclusive, i.e. not necessarily concurrently present. Ask EKF for special solutions if required.

[3] Silicon/function may not be present on your actual CCH-MARIACHI board. Assembly of components is highly custom specific. Discuss your needs with EKF before ordering.

[4] Hard disk option may require decrease

Side Board Feature Availability				
Mezzanine Module	CPU Carrier Board			
CCH-MARIACHI	CC9-SAMBA	CCD-CALYPSO	CCG-RUMBA	CCM-BOOGIE
HD Audio Codec		✓*	✓	✓
PATA (IDE)	✓	✓	✓	
DVI Video			✓	✓
Serial COM Ports	✓	✓	✓	✓
USB	✓	✓	✓	✓
Firmware Hub	✓	✓	✓	✓
TPM	✓*	✓*	✓*	✓*

* On request, please contact EKF sales

Short Description

Available as a mezzanine add-on companion board (AKA side board) to the CCG-RUMBA card, the CCH-MARIACHI is provided with various I/O ports.

Four different front panel versions are available (see p.12), featuring USB, COM as well as analog and digital audio I/O ports. Optionally, a secondary DVI connector allows for dual screen video operating mode.

The companion board shares its front panel typically with the host carrier (8HP front panel width in total).

In most cases, the CCH-MARIACHI will be attached on top of the CPU board, which is on the right side when looking at the front panel of the boards while inserted into a CPCI rack. Attachment to the bottom side (left) of the CPU board is possible, however only without the secondary DVI option.

As an option, the CCH-MARIACHI is available with a rugged on-board 2.5-inch PATA hard disk (or even Flash) drive. Alternatively, either a CompactFlash card adapter, or an 1.8-inch hard disk can be accommodated as a mezzanine module. In addition an USB Solid-State Disk (SSD) module can be mounted either on top or on bottom of the CCH.

Another option available is the Trusted Platform Module according to TPM 1.2 for safety critical applications.

In addition to its front panel I/O connectors, the CCH-MARIACHI has been designed also for rear I/O and therefore requires a non-bussed single-slot P1/P2 backplane in addition to the CompactPCI bus. However, if solely front panel I/O is needed, the J1/J2 connectors may be omitted as an option.

CCG-RUMBA and CCH-MARIACHI with Digital Audio & Secondary DVI

The CCH-MARIACHI communicates with the host CPU by means of three expansion connectors: P-EXP (LPC, USB, HD audio), P-IDE (mass storage I/F), and P-SDVO (secondary digital video output).

P-EXP combines several southbridge data channels: The LPC (Low Pin Count) is a multiplexed ISA bus, enabling the super-I/O (SIO) controller chip to emulate the legacy I/O interfaces; among these are the classic parallel (printer), serial (COM) and keyboard/mouse ports.

Two USB lines are provided, one assigned to a front panel USB connector, the other to a pin header suitable for on-board attachment of a low profile USB Flash Disk (Solid-State Drive, SSD) module on bottom of the CCH between CPU and mezzanine board. Mounting an USB SSD on top is also possible as a stuffing option if no 2.5-inch hard disk is present. Alternatively the second USB line can be redirected to CPCI rear I/O.

The HD Audio interface (AKA Azalia) is used to control the audio codec on the CCH-MARIACHI. The SMB (System Management Bus) is an enhanced I^2C interface, enabling the BIOS and OS to gain access to special control functions of a rear I/O device.

The Parallel ATA/IDE interface is still essential for embedded applications. Optionally, the CCH-MARIACHI can be equipped with either a CompactFlash mezzanine module, or a robust 2.5-inch hard disk drive, particularly suited for use in a rugged environment. A mezzanine module is also available which carries an 1.8-inch drive (ZIF interface), as an alternative.

The SDVO interface connects to the multiplexed PEG/SDVO graphics I/F of the GMCH (northbridge) on the CPU carrier board. The SDVO-C port is used to establish a secondary PanelLink (DVI) channel on the CCH-MARIACHI, in addition to the primary DVI connector on the CCG-RUMBA. Basically, dual screen operation mode is also possible with the CCG-RUMBA alone. Due to the VGA signals on its DVI-I connector, a digital and in addition a VGA monitor can be attached simultaneously (splitter cable required). However, if two DVI (digital) monitors are mandatory, the CCH-MARIACHI can be optionally ordered with a secondary PanelLink transmitter and DVI front panel connector.

Several I/O functions are also directly available by on-board headers on the CCH-MARIACHI. The on-board interfaces include IDE, serial, parallel, PS/2 and analog audio I/O ports and are only stuffed as an option.

The Trusted Platform Module is an optionally available cryptographic chip, which provides a comprehensive hardware and software solution for safer computing. Conforming to the TPM1.2 standard of the TCG, the TPM is comprised of a 16-bit security controller and additional hardware e.g. to generate 2048 bit RSA keys and true random numbers, thus meeting the highest industry rating for digital security.
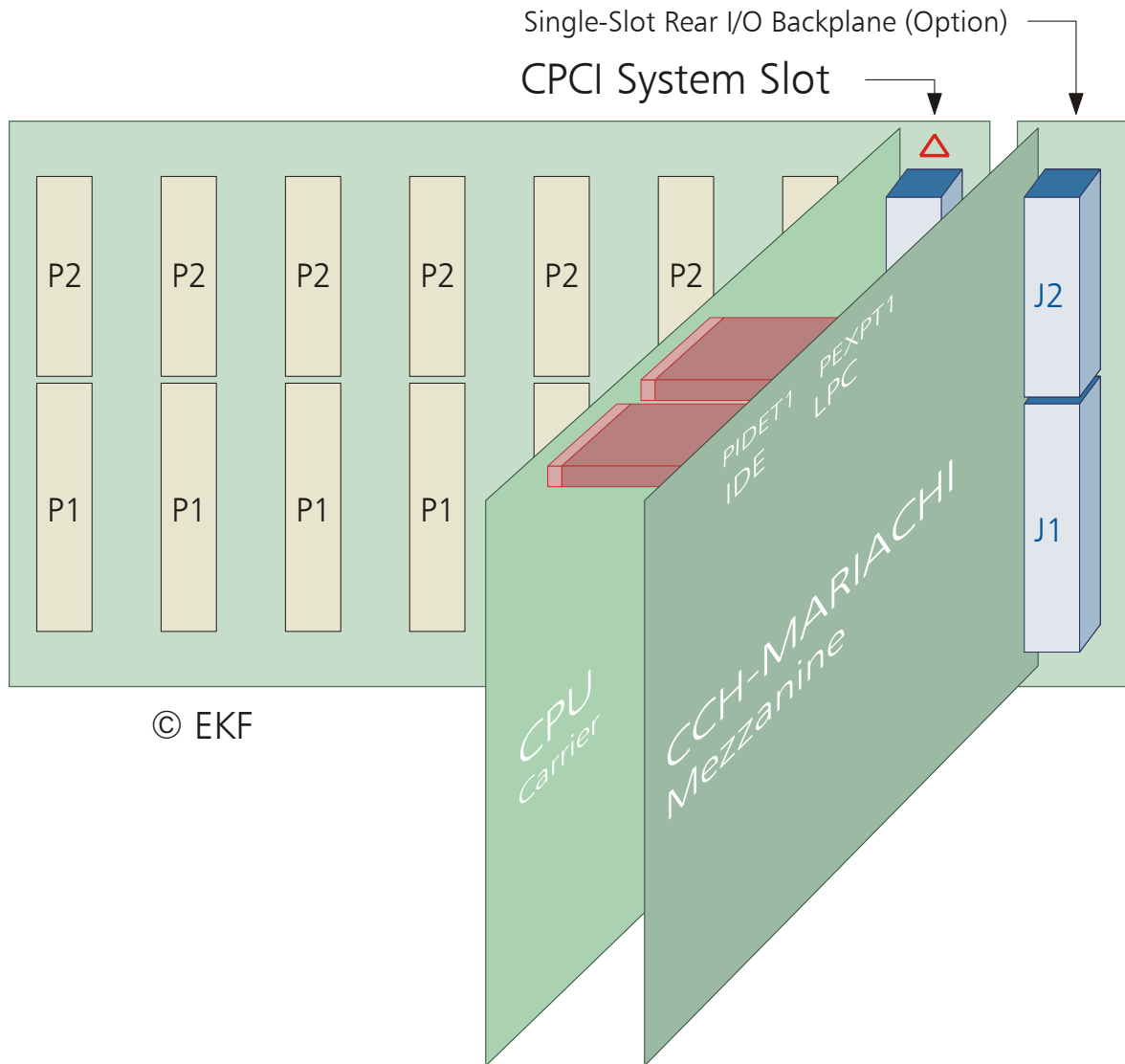
Single-Slot Rear I/O Backplane (Option)

CPCI System Slot

© EKF

The suitable CPU carrier board for use together with the CCH-MARIACHI mezzanine module is the CCG-RUMBA. The CCH-MARIACHI companion board mounts usually on top (at the right side) of the CCG-RUMBA. An attachment on bottom (left) of the CPU board is possible without DVI.

If the CompactPCI backplane is provided with a right aligned system slot, be sure to position the CPU carrier board to the rightmost CPCI slot (and not the CCH-MARIACHI). Consequently, The CCH-MARIACHI then occupies the next card slot to the right, outside of the CPCI backplane, which may be provided with a single slot rear I/O P1/P2 backplane. In order to make use of the rear I/O capability of the CCH-MARIACHI, its optional J1/J2 rear I/O connectors must be stuffed (consider before ordering). This assembly order (right aligned CPCI system slot) is preferred because no CompactPCI slot is lost for the CCH-MARIACHI.

Vice versa, if a CPCI backplane is mandatory with a left aligned system slot, the CCH-MARIACHI must not be equipped with J1/J2 connectors, and occupies a regular CompactPCI slot then. A coding key present on J1 would prevent insertion of the CCH-MARIACHI into a CPCI card slot. Of course, this assembly solution is not suitable for rear I/O of the CCH, and a CPCI slot will be lost.

Front Panel Variations

| CCG-RUMBA DVI | CCH-MARIACHI DVI & RS-232 | CCG-RUMBA DVI | CCH-MARIACHI 2 x RS-232 | CCG-RUMBA DVI | CCH-MARIACHI DVI & Digital Audio | CCG-RUMBA DVI | CCH-MARIACHI Digital Audio |
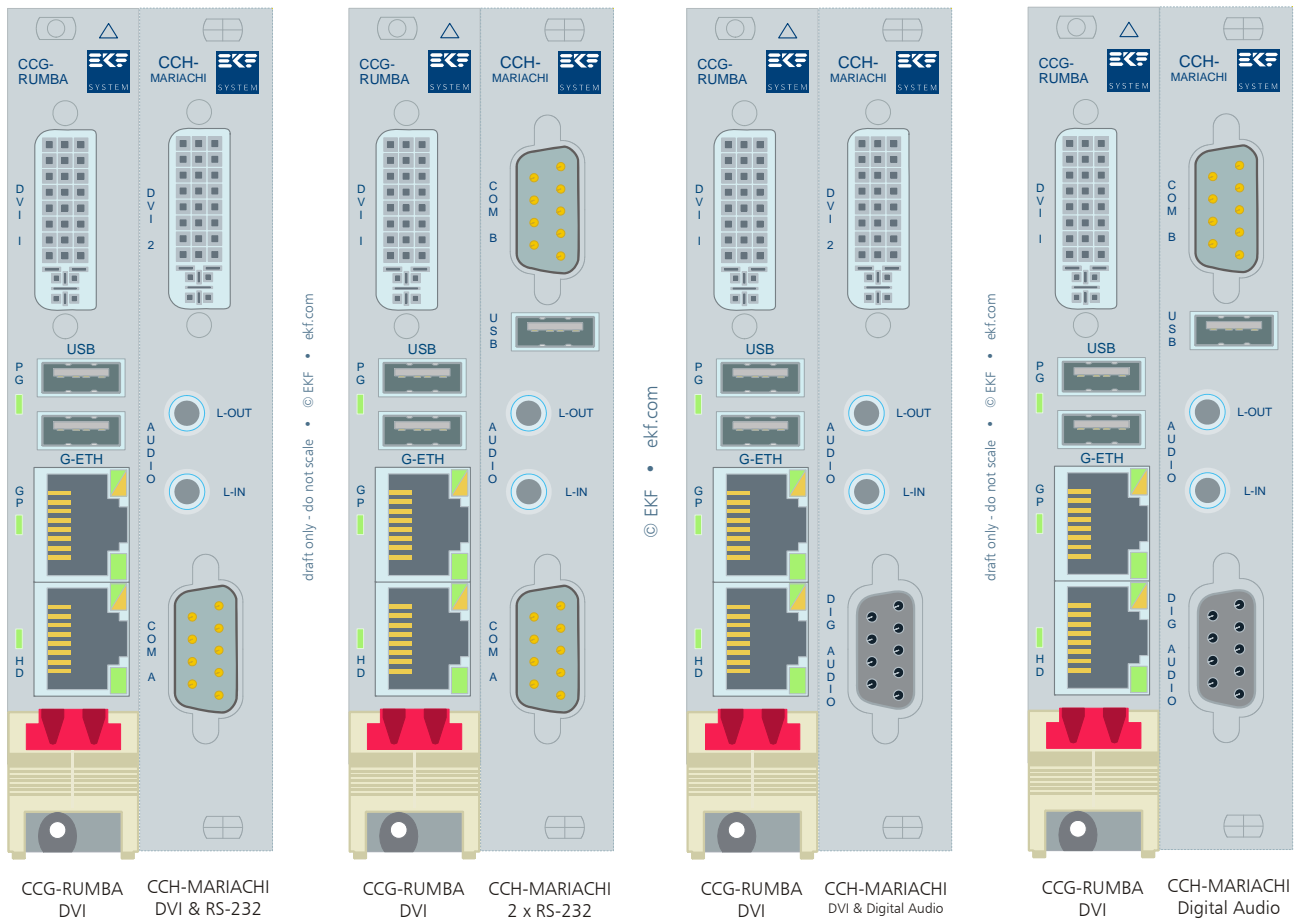
Typically the CCG-RUMBA carrier board CPU and the CCH-MARIACHI share a common 3U/8HP front panel.

The CCH-MARIACHI is available in four versions:

▸ DVI output, COM port connector
▸ dual COM port connectors, USB receptacle
▸ DVI output, digital / analog Audio D-Sub port connectors
  (S/P DIF in/out, analog stereo in/out)
▸ COM port, USB receptacle, digital / analog Audio D-Sub port connectors
  (S/P DIF in/out, analog stereo in/out)

The stereo audio jacks (MIC input / HP output) are present at all of these versions.

Not shown in the illustration above are variations of the CCG-RUMBA (e.g. with VGA connector rather than DVI).

EKF offers in addition custom specific design, for board electronics and also for front panel layout.

Block Diagram CCH-MARIACHI

Block Diagram
CCH-MARIACHI
© EKF

COM-B

USB

AUX Audio
Optional Pin Header

P-AUD

CD Audio
Optional Connector

P-CD

IN   OUT

CD IN   F   E

LINE OUT/
HP OUT

B

OUT

AUD

ALC
262

BEEP IN → Speaker

Sheet 2
P-EXP

MIC IN/
LINE IN

A

IN

HD Audio

C   D

Azalia
Codec

S/PDIF Digital

Front Panel
I/O

R-NET

Dig. Audio

Option
CCH-3/4

LINE IN

LINE OUT

S/PDIF IN/OUT

Sheet 1/5
HD Audio

Block Diagram
CCH-MARIACHI
© EKF

Top &
Bottom

Speaker   SPK
Sheet 1
HD Audio   HD Audio

COM-B
ADM   SER2
211   TTL

COM-B
RS-232E

USB

RES#

LPC

P-EXP

CCD-
CALYPSO
CCG-
RUMBA

Expansion
Connector

COM-A & USB
not available
with DVI option

Sheet 5
Rear I/O

USB

P-LPT   Par.
Printer

J-RES

Option
Trusted
Platform
Module

P-KM   Keybd
Mouse

OUT

Sheet 5
Rear I/O

AUD

Optional Pin Headers

SIO2
(Low Pin Count
Super I/O)

TPM
1.2

Crypto
Engine

IN

P-SP3   SER3
TTL

P-SP4   SER4
TTL

local
reset#

FWH2

R-NET

COM-A

Option
CCH-1/2

COM-A   SER1
RS-232E   TTL

ADM
211

82
802

J-FWH

Front Panel I/O

Sheet 2/5
Super I/O

Block Diagram
CCH-MARIACHI
© EKF

CCD-
CALYPSO
CCG-
RUMBA

IDE/ATA
Connector

P-IDE1

Top or
Bottom

P-IDE2

C10-CFA
CompactFlash

CFA

Optional CompactFlash
Adapter Module C10-1
or
Optional 1.8-Inch
Hard Disk Module C10-2

Bus
Switch

EN

J-IDE

P-IDE3 (ext. IDE)

P-IDE4 (2.5-" HD)

Optional On-Board
2.5-Inch
Hard Disk Drive

Sheet 5
Rear I/O

IDE
40/80
2.54mm

IDE
44
2.00mm

Sheet 3/5
IDE Storage Options

COM-B & USB not available with DVI option

DVI Digital

DVI

Panel Link

SDVO-C

Option
Secondary
DVI Video
Output

SDVO

OUT

AUD

IN

CCG-
RUMBA

COM-A/
D. Audio

Front Panel
I/O

Block Diagram
CCH-MARIACHI
© EKF

Sheet 4/5
Option
Secondary DVI

Block Diagram
CCH-MARIACHI
© EKF

I2C Switch Level Shift	Sheet 4	◄►	SMB (+5V)	
SIO - FWH	Sheet 4	◄►	GPIO (SIO - FWH)	
SIO	Sheet 4	◄►	SP1..4 (TTL UART), LPT	Rear I/O
SIO	Sheet 4	◄►	PS/2 KB/MS	J2
P-EXP	Sheet 4	◄►	USB	

SanDisk SDUS5EB
STec SLUFDM
Intel Z-U130 SSDUSMS

4GB/8GB
USB
Flash Drive
(SSD) Option

P-UFD

USB

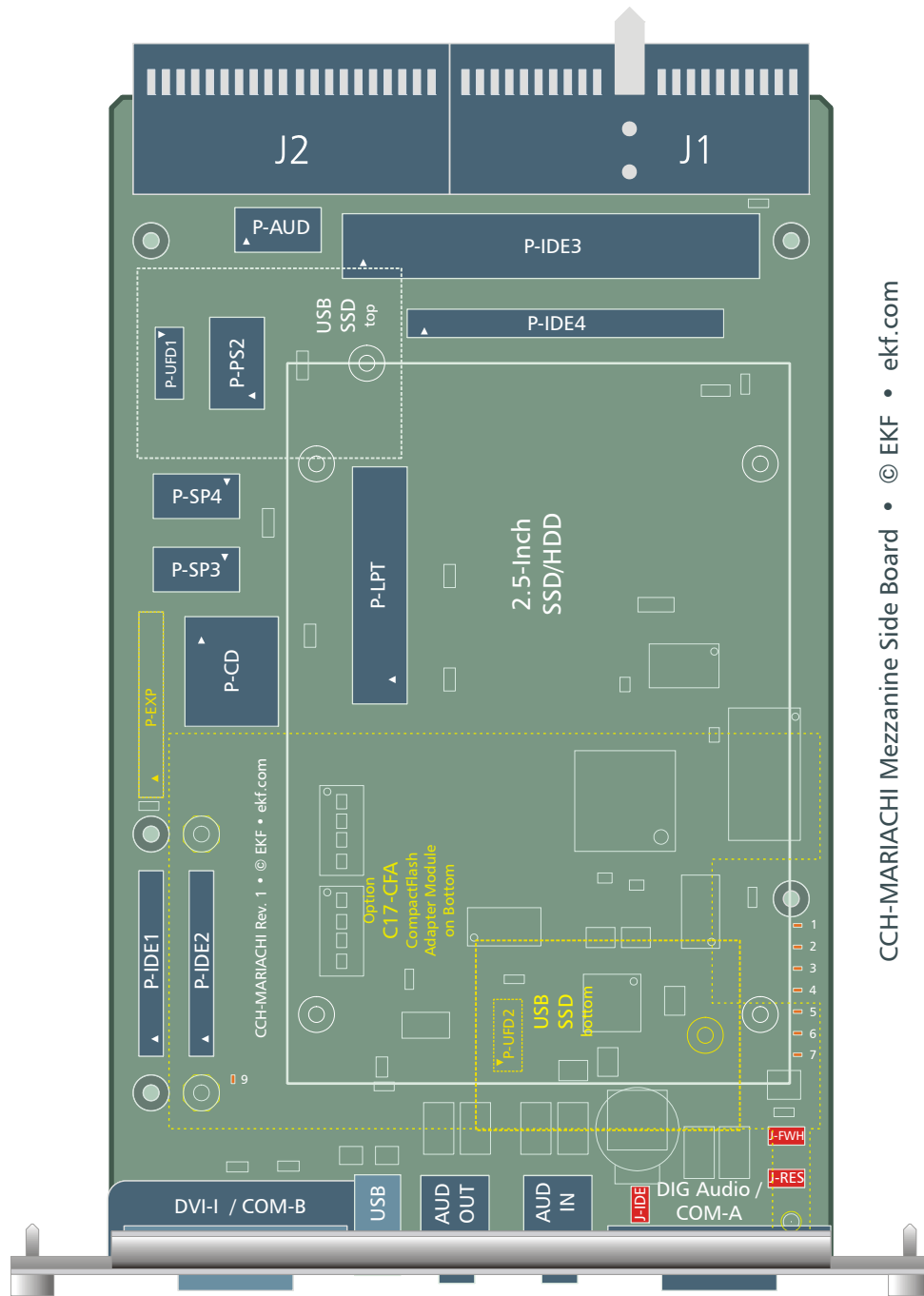Alternates
P-UFD2 - Bottom Mount

Sheet 2
SIO — KB/MS

Sheet 3
IDE — IDE

Rear I/O

J1

Sheet 5/5
Option Rear I/O
Option SSD

Top View Component Assembly CCH-MARIACHI

CCH-MARIACHI Mezzanine Side Board • © EKF • ekf.com

Front Panel Connectors

COM-A [1][2][3]	RS-232E serial communications port (CCH-MARIACHI on-board SIO2 serial port 1), D-Sub 9-position male connector
COM-B [1][2][4]	RS-232E serial communications port (CCH-MARIACHI on-board SIO2 serial port 2), D-Sub 9-position male connector
AUDIO IN [2]	Analog audio stereo line input or mono/stereo microphone input
AUDIO OUT [2]	Analog audio stereo line output or stereo headphone output
DIG AUDIO [2][4]	1 x digital / analog Audio D-Sub port connectors (S/PDIF in/out, analog stereo I/O)
USB [2][3]	USB type A root hub connector (CCG-RUMBA ICH8M-E USB port)
DVI [2][3]	Option Digital Video Port (DVI-D)

[1]   Due to a primary SIO which may be present on the CPU board itself, the BIOS may assign COM port numbers different from COM1/COM2 to these interface lines on the CCH-MARIACHI, e.g. COM2/COM3.

[2]   Not all of these connectors may be present or functional on your actual CCH-MARIACHI board. Assembly of these connectors is highly custom specific. Discuss your needs with EKF before ordering.

[3]   If present, the DIG AUDIO receptacle replaces the COM-A connector, due to insufficient space on the front panel

[4]   If present, the DVI receptacle replaces the COM-B connector and the USB receptacle, due to insufficient space on the front panel

On-Board Connectors

P-IDE1	Dual row socket, available from bottom (from top optional) of the CCH-MARIACHI PCB, matching with the corresponding socket on the CPU carrier board, connected through a board stacker providing Host CPU (ICH8M-E) IDE/ATA Interface Also for attachment of a CompactFlash socket or 1.8-inch hard disk (ZIF interface) on a mezzanine module (C10) on top of CCH
P-IDE2	Dual row socket, for attachment of a CompactFlash socket on a mezzanine module (C17) on bottom of CCH
P-IDE3	Pin header 40-lead 2.54mm, for attachment of an external IDE/PATA device by flat cable assembly
P-IDE4	Pin header 44-lead 2.00mm, for attachment of an on-board 2.5-inch hard disk
P-EXP	Dual row socket, available from bottom of the CCH-MARIACHI PCB, matching with the corresponding socket on the CPU carrier board, connected through a board stacker, comprising of: • LPC Low Pin Count interface • HD Audio (Azalia) • 2 x USB • SMB, Speaker, Reset • power supply
P-SP3 [1] P-SP4 [1]	Pin headers 10-lead 2.00mm, provide TTL level serial COM port signals
P-PS2	Pin header 10-lead 2.54mm, provides PS/2 style keyboard and mouse signals
P-LPT	Pin header 26-lead 2.54mm, provides parallel port I/O
P-AUD	Pin header 10-lead 2.00mm, provides analog stereo in/out

P-CD	CD audio input
P-UFD1 P-UFD2	Pin headers 10-lead 2.00mm, suitable for low profile USB SSD (Flash Disk), alternates P-UFD1 (top mount) or P-UFD2 (bottom mount, not with C17 Compact Flash mezzanine module)
P-SDVO	High speed socket edge card connector, available from bottom of the CCH-MARIACHI PCB, matching with the corresponding socket on the CPU carrier board, connected through a high speed strip line PCB (C21), comprising of: • Host CPU (GMCH 965) SDVO-C digital video

[1]   Due to a primary SIO which may be present on the CPU board itself, the BIOS may assign COM port numbers different from COM3/COM4 to these interface lines on the CCH-MARIACHI, e.g. COM4/COM5.

Please note: Not all of the connectors mentioned above may be present or functional on your actual CCH-MARIACHI board. Assembly of most connectors is highly custom specific. Discuss your needs with EKF before ordering.

Jumpers

J-FWH [1]	Determines if the optional on-board firmware hub is acting as boot BIOS (jumper set) or as secondary BIOS (jumper removed = default).
J-IDE [1]	Enables IDE bus switches when set. Please note: In order to make use of either connector P-IDE3 (external IDE device), or P-IDE4 (2.5-inch on-board hard disk), the jumper J-IDE must be set. However, if neither P-IDE3 nor P-IDE4 is in use, J-IDE must be removed in order to avoid reflections on the IDE bus caused by tapped signal traces. If the board is equipped with resistor arrays rather than bus switches, J-IDE is removed.
J-RES [1]	Jumper 2.54mm, allows to force a CPU debug reset on the CCG-RUMBA carrier board

[1]   Not all of these jumpers may be present or functional on your actual CCH-MARIACHI board. Assembly of these jumpers is highly custom specific. Discuss your needs with EKF before ordering.

Power Distribution

The CCH-MARIACHI gets its power from two sources: The CPU carrier board supplies +3.3V and +5V, which may be switched off according to the current system sleep state. In addition, the CompactPCI backplane also supplies these voltages. This power source is connected via zero-Ohm resistors which are not stuffed by default. An on-board hard disk drive and the USB ports can be supplied separately by a +5V rear I/O power source which can each be selected by a zero-Ohm resistor (stuffing option).

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 repair.

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

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

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 - Connectors

Caution

Some of the connectors may provide operating voltage (e.g. +12V, +5V and +3.3V) to devices inside the system chassis, such as 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.

Please Note

The CCH-MARIACHI mezzanine 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. Be sure to specify your individual needs when ordering the CCH board. Characteristic features and the pin assignments of each connector are described on the following pages (connector designation in alphabetical order within the groups 'front panel connectors', 'on-board connectors', and 'rear I/O connectors').

Front Panel Connectors

The suitable CPU carrier board for use together with the CCH-MARIACHI mezzanine module is the CCG-RUMBA. The CCH-MARIACHI companion board mounts on top (at the right side) of the CCG-RUMBA. Mounting the CCH on bottom of the carrier board is possible without DVI.

By default, the CCH-MARIACHI shares an 8HP (~40.6mm) front panel with the CPU carrier board. Further more, custom specific front panel options are available on request. Shown below are four basic variants of the CCH-MARIACHI (illustration w/o CCG-RUMBA front panel). For further information see p.12.
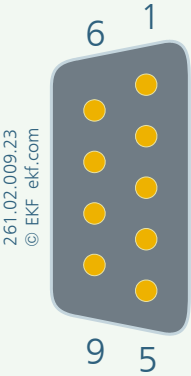
CCH-MARIACHI
DVI & RS-232

CCH-MARIACHI
2 x RS-232

CCH-MARIACHI
DVI & Digital Audio
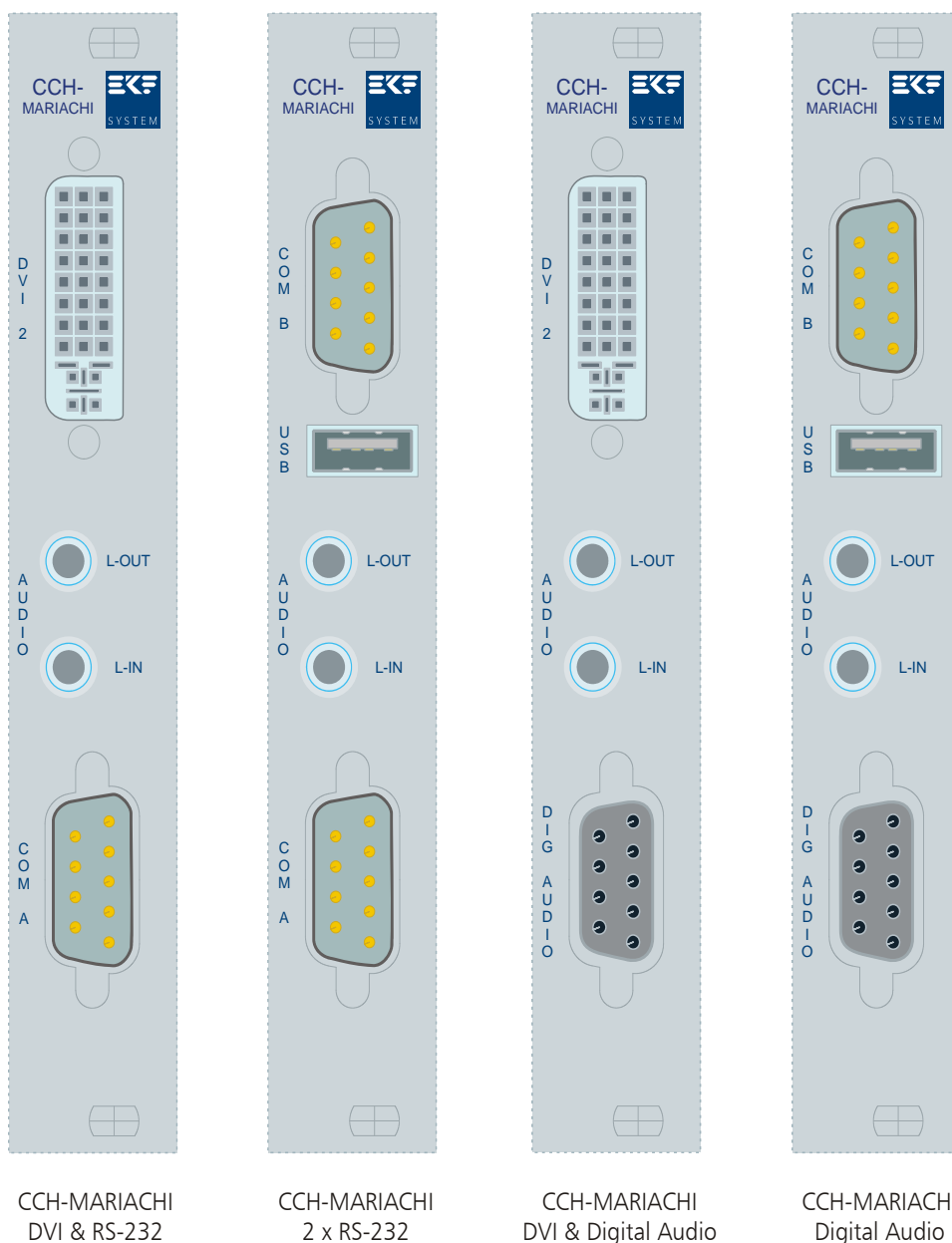
CCH-MARIACHI
Digital Audio

COM-A/COM-B Serial Port Connectors

The on-board secondary Super-I/O (SIO) on the CCH-MARIACHI provides four asynchronous serial interfaces, two of them available from the front panel (EIA/TIA 232). The other two are available either as on-board pin headers or at the J2 rear I/O connector (both TTL).

Due to another (primary) SIO typically available on the CCG-RUMBA host board, the serial interfaces are not necessarily dedicated to the COM-1/COM-4 ports of a typical PC. Verify or modify the accompanying CCG-RUMBA BIOS settings for mapping of physical asynchronous serial I/O ports to the logical COM port order. Being ignorant of the actual port mapping, the serial port front panel connectors are marked neutrally as COM-A and COM-B.

COM-A/B RS-232 Male D-Sub 9 261.02.009.23					
				1	DCD1(2)
	DSR1(2)	6			
				2	RXD1(2)
	RTS1(2)	7			
				3	TXD1(2)
	CTS1(2)	8			
				4	DTR1(2)
	RI1(2)	9			
				5	GND

(Connector view: 6 1 / 9 5, 261.02.009.23 © EKF ekf.com)

The on-board ESD protected RS-232E transceivers on the CCH-MARIACHI allow a bitrate of up to 230kbps.

If a DVI receptacle is provided on the CCH-MARIACHI, the COM-A connector will be removed.

If a DIG Audio receptacle is provided on the CCH-MARIACHI, the COM-B connector wil be removed.

AUDIO IN/OUT Audio Jacks

The CCH-MARIACHI is equipped with an ALC262 HD Audio Codec, which is controlled by the ICH (Input/Output Controller Hub) southbridge on the CPU carrier board via the HDA link. Two 3.5mm stereo audio jacks are available from the CCH-MARIACHI front panel for attachment of audio devices such as audio power amplifier, headphones, microphone.

The particular function of each audio jack is controlled by the driver software (e.g. Realtek). By default, the AUDIO IN audio jack is configured as microphone input, and the AUDIO OUT jack is suitable for headphones $\geq$32 Ohms. Other configurable options are line in and line out. The typical full scale input voltage is 1.5V$_{rms}$ (input resistance 64kOhm), and the typical full scale output voltage is 1.4V$_{rms}$ (10 kOhm / 50pF external load).

The difference between headphones out mode and line out mode is mainly the low output impedance of 1 Ohm when in HP mode, compared to 200 Ohms in line out mode. This is also useful for noise immunity when long external audio cables are required. For optimum THD however chose line out mode.

For details of the ALC262 and driver software, please refer to www.realtek.com.tw.

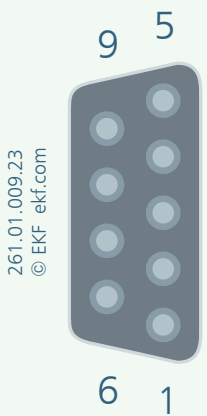| AUDIO OUT Stereo Audio Jack 3.5mm 270.50.05.1 Front Panel		
		HeadPhones Out
	1	AGND
	2	Output Signal Left
	3	AGND
	4	AGND
	5	Output Signal Right

Stereo Audio Jack 3.5mm

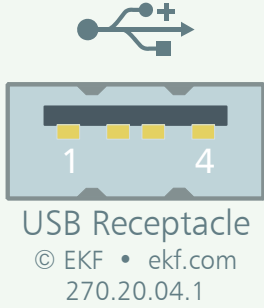| AUDIO IN Stereo Audio Jack 3.5mm 270.50.05.1 Front Panel		
		MIC In
	1	AGND
	2	Input Signal Left
	3	AGND
	4	AGND
	5	Input Signal Right

Stereo Audio Jack 3.5mm

Digital Audio

The CCH-MARIACHI is equipped with an HD Audio Codec, which is controlled by the ICH (Input/Output Controller Hub) southbridge on the CPU board. It provides an analog stereo I/O and an S/PDIF I/O. As software options analog input, output and headphone functions are available on each line. Default is output.

Digital Audio Option RS-232 Female D-Sub 9 261.01.009.23				
			5	Line3 L
	Line3 R	9		
			4	A-GND
	Line4 R	8		
			3	Line4 L
	A-GND	7		
			2	S/PDIF OUT
	S/PDIF IN	6		
			1	D-GND

USB Connector

The host CPU board CCG-RUMBA is equipped with an ICH8M-E (Input/Output Controller Hub), which incorporates a number of USB 1.1/2.0 compliant ports. Two of the USB interfaces are routed to the CCH-MARIACHI mezzanine companion board across the expansion port connector P-EXP. One USB port is available from the CCH-MARIACHI front panel, while the other is assigned to an optional USB Solid-State Drive or to the rear I/O connector J2.

USB Receptacle 270.20.04.1		
USB Receptacle © EKF • ekf.com 270.20.04.1	1	+5V_USB 0.5A 1)
	2	DATA-
	3	DATA+
	4	GND

1) Electronic Power Switch

Note:
Numbering (1, 2) of USB ports within this document (CCH-MARIACHI) does not correspond with the USB port numbering used in the CCG-RUMBA documentation or Intel ICH8M-E data sheet.

DVI-2 Digital Video

As an option, the CCH-MARIACHI is available with a SDVO to PanelLink transceiver for digital video. The secondary DVI receptacle on the CCH-MARIACHI can be used in addition to the primary DVI connector on the CCG-RUMBA for dual digital screen operation mode.

Other than with the CCG-RUMBA, the DVI connector on the CCH-MARIACHI does not provide analog signals (VGA) in addition. Please understand that the CCH-MARIACHI complies with DVI-D, though the actual front panel receptacle may contain (not connected) additional leads conforming to DVI-I. This allows usage of DVI-D and DVI-I cable harnesses (provided that the attached monitor is also equipped with a DVI-I connector).

If the DVI option was chosen, connectors COM-A and USB-1 will be removed.

DVI Connector 261.70.029.01						
17	TX0-	9	TX1-	1	TX2-
18	TX0+	10	TX1+	2	TX2+
19	GND	11	GND	3	GND
20		12		4	
21		13		5	
22	GND	14	DDC_POW [1]	6	DDC_SCL
23	TXC+	15	GND	7	DDC_SDA
24	TXC-	16	DVI_HP	8	VSYNC
		c3	BLUE	c1	RED
		c6	GND	c5	GND
		c4	HSYNC	c2	GREEN

DVI

[1] +5V protected by a PolySwitch Fuse 1.5A

pin positions coloured gray: not connected

On-Board Connectors

The CCH-MARIACHI can be equipped with several on-board connectors. Some of these connectors are available as an option only or exclusive to each other, and therefore may not be present on your actual board.

CCH-MARIACHI Mezzanine Side Board • © EKF • ekf.com
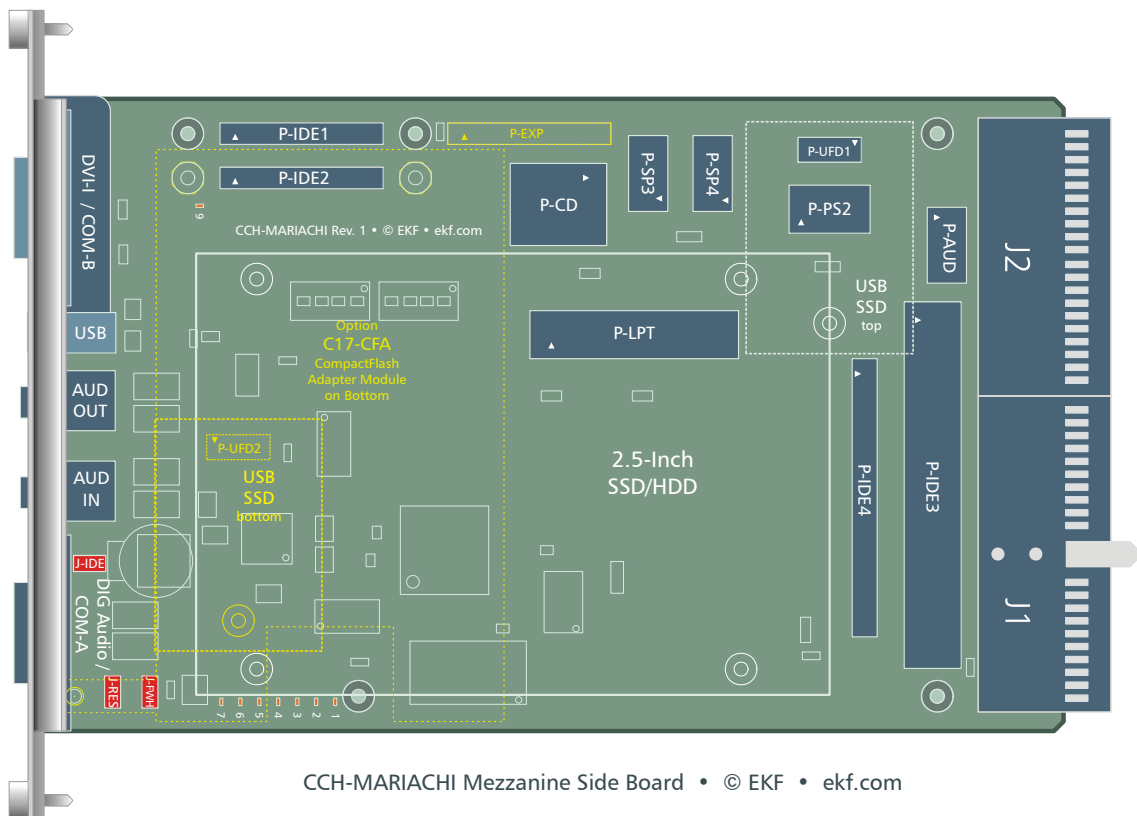
P-IDE1/2 PATA Inter-board

The identical expansion connectors P-IDE1/2 are mounted on top and on bottom of the CCH-MARIACHI PCB. In addition to the expansion interface connector P-EXP1, P-IDE1/2 is dedicated to the Secondary-IDE channel of the ICH8 (Input/Output Controller Hub) on the host CPU board. P-IDE1allows to attach the CCH either on top (EKF standard) or on bottom of the CPU carrier board. A suitable board stacker is used in addition to bridge the gap between the two boards.

P-IDE1 can also be used to attach a mezzanine module with a CompactFlash socket (EKF C10-CFA) or an 1.8-inch hard disk mezzanine module (C30-PATA) on top of the CCH. P-IDE2 is mounted on bottom of the CCH-MARIACHI. If the CCH is mounted on top of the CPU board, it may be used for a mezzanine module with a CompactFlash socket (EKF C17-CFA) placed between CPU and expansion board. However, the C17-CFA cannot be mounted together with the bottom USB SSD flash module.

P-IDE1B CompactFlash Interface 1.27mm Socket 2 x 20 (276.53.040.01)			
IDE_RESET# PLTRST# (P-IDE1B only)	1	2	GND
IDE0_DD07	3	4	IDE0_DD08
IDE0_DD06	5	6	IDE0_DD09
IDE0_DD05	7	8	IDE0_DD10
IDE0_DD04	9	10	IDE0_DD11
IDE0_DD03	11	12	IDE0_DD12
IDE0_DD02	13	14	IDE0_DD13
IDE0_DD01	15	16	IDE0_DD14
IDE0_DD00	17	18	IDE0_DD15
GND	19	20	+3.3V_CR *
IDE0_DMARQ	21	22	+3.3V_CR *
IDE0_DIOW#	23	24	GND
IDE0_DIOR#	25	26	GND
IDE0_IORDY	27	28	+5V_CR *
IDE0_DMACK#	29	30	+5V_CR *
IDE0_INTRQ	31	32	GND
IDE0_DA1	33	34	IDE0_CBLID#
IDE0_DA0	35	36	IDE0_DA2
IDE0_CS0#	37	38	IDE0_CS1#
IDE0_ACT#	39	40	GND

1.27mm Socket

top view pin numbering order

(bottom connectors seen through board)

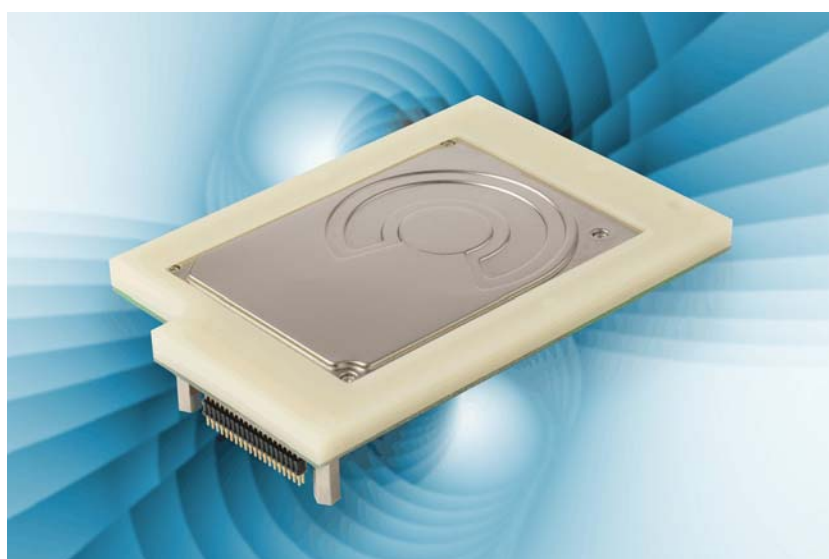*   switched power supply lines from CCG-RUMBA carrier board according to Sx state

If the CompactFlash adapter module is the only IDE device on the CCH-MARIACHI, the IDE signal lines to all other IDE connectors P-IDE3, P-IDE4 should be interrupted (remove jumper J-IDE, which in turn disables an electronic bus switch). This helps to avoid reflections on the IDE bus, which could otherwise degrade the signal quality.
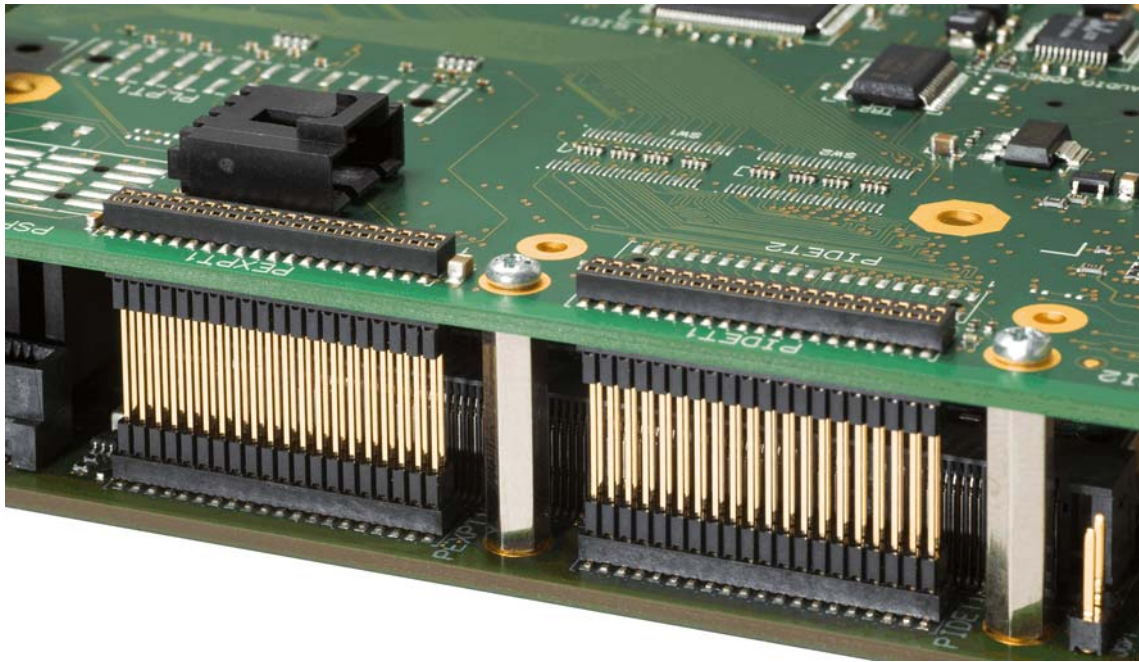
C10-CFA (Top Mount)
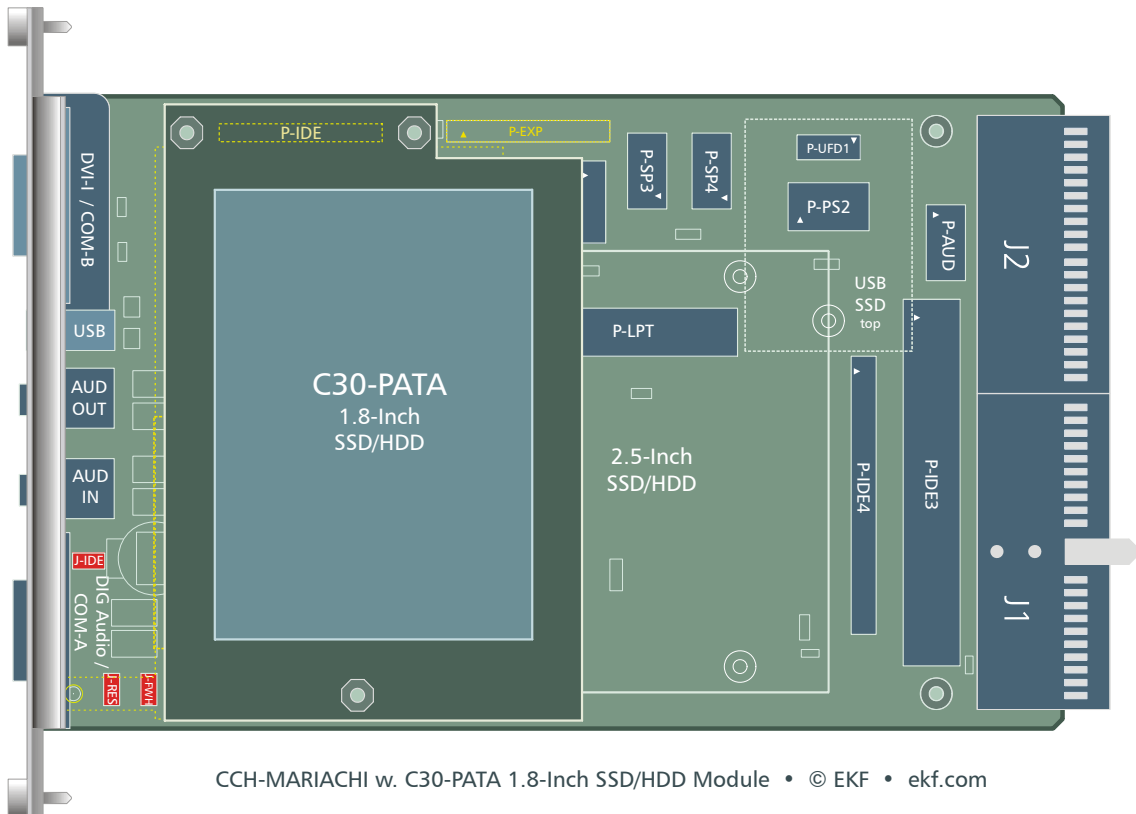

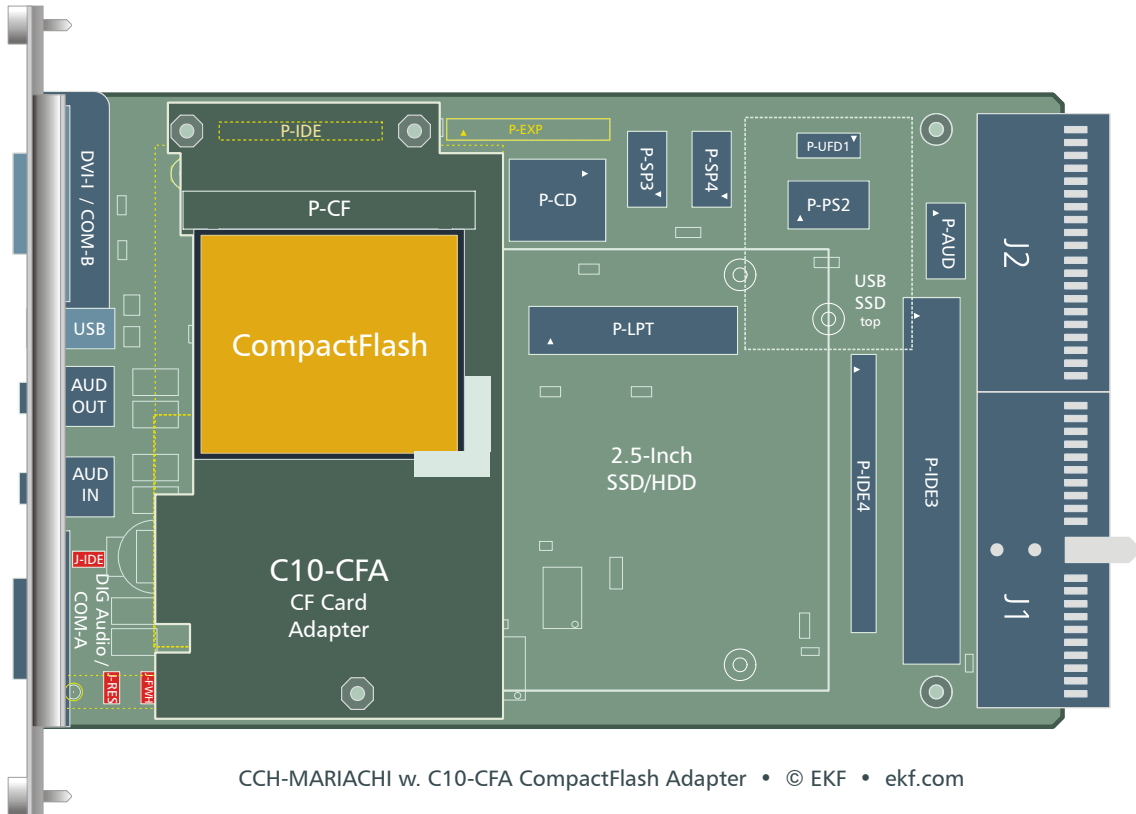C17-CFA (Bottom Mount)

C30-PATA 1.8-Inch SSD (Top Mount)

P-EXP (left) & P-IDE (right)

C30-PATA Hooked on P-IDE

CCH-MARIACHI w. C10-CFA CompactFlash Adapter • © EKF • ekf.com

CCH-MARIACHI w. C30-PATA 1.8-Inch SSD/HDD Module • © EKF • ekf.com

P-IDE3 External IDE Header

P-IDE3 is provided optionally for attachment of classic IDE devices (e.g. 3.5-inch hard disk drive, DVD-ROM). Usage of the IDE connector P-IDE3 requires the IDE bus switches enabled (jumper J-IDE set). No stubs are allowed on an IDE cable assembly, i.e. concurrent operation of devices attached to P-IDE3 and other IDE dedicated connectors cannot be guaranteed.
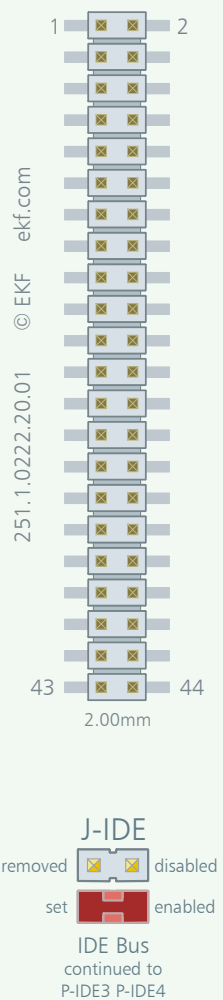
P-IDE3 IDE Device Header 2.54mm 2 x 20 (260.02.040.09)				
IDE_RESET#	1	2	GND
IDE1_DD07	3	4	IDE1_DD08
IDE1_DD06	5	6	IDE1_DD09
IDE1_DD05	7	8	IDE1_DD10
IDE1_DD04	9	10	IDE1_DD11
IDE1_DD03	11	12	IDE1_DD12
IDE1_DD02	13	14	IDE1_DD13
IDE1_DD01	15	16	IDE1_DD14
IDE1_DD00	17	18	IDE1_DD15
GND	19	20	KEY
IDE1_DMARQ	21	22	GND
IDE1_DIOW#	23	24	GND
IDE1_DIOR#	25	26	GND
IDE1_IORDY	27	28	GND
IDE1_DMACK#	29	30	GND
IDE1_INTRQ	31	32	NC
IDE1_DA1	33	34	IDE1_CBLID#
IDE1_DA0	35	36	IDE1_DA2
IDE1_CS0#	37	38	IDE1_CS1#
IDE0_ACT#	39	40	GND

Shrouded Header

1 ... 2

39 ... 40

2.54mm

260.02.040.09 (modified 260.02.040.11)
© EKF   ekf.com

J-IDE

removed — disabled

set — enabled

IDE Bus
continued to
P-IDE3 P-IDE4

The presence of an IDE bus switch and in turn J-IDE is optional. In most cases a fixed resistor array replaces the bus switch, which makes J-IDE superfluous.

P-IDE4 IDE/ATA Connector for 2.5-Inch Drives

P-IDE4 is optionally provided for a 2.5-inch on-board hard disk drive. Usage of P-IDE4 requires the IDE bus switches enabled (jumper J-IDE set). No stubs are allowed on an IDE cable assembly, i.e. concurrent operation of devices attached to P-IDE4 and other IDE dedicated connectors cannot be guaranteed.

P-IDE4 On-Board 2.5-Inch Hard Disk Drive 2.00mm Pin Header 2x22 (251.1.0222.20.01)			
IDE_RESET#	1	2	GND
IDE1_DD07	3	4	IDE1_DD08
IDE1_DD06	5	6	IDE1_DD09
IDE1_DD05	7	8	IDE1_DD10
IDE1_DD04	9	10	IDE1_DD11
IDE1_DD03	11	12	IDE1_DD12
IDE1_DD02	13	14	IDE1_DD13
IDE1_DD01	15	16	IDE1_DD14
IDE1_DD00	17	18	IDE1_DD15
GND	19	20	KEY
IDE1_DMARQ	21	22	GND
IDE1_DIOW#	23	24	GND
IDE1_DIOR#	25	26	GND
IDE1_IORDY	27	28	GND
IDE1_DMACK#	29	30	GND
IDE1_INTRQ	31	32	NC
IDE1_DA1	33	34	IDE1_CBLID#
IDE1_DA0	35	36	IDE1_DA2
IDE1_CS0#	37	38	IDE1_CS1#
IDE0_ACT#	39	40	GND
+5V_HD	41	42	+5V_HD
GND	43	44	NC

Pin header diagram: pins 1, 2 at top; 43, 44 at bottom; 2.00mm

J-IDE
removed [ ] disabled
set [ ] enabled
IDE Bus continued to P-IDE3 P-IDE4

▸ switched power supply lines from CCG-RUMBA carrier board according to Sx state
▸ +5V_HD can be alternatively sourced from CompactPCI Express backplane as stuffing option
▸ short circuit protection by PolySwitch resettable fuse 1.5A

The presence of an IDE bus switch and in turn J-IDE is optional. In most cases a fixed resistor array replaces the bus switch, which makes J-IDE superfluous.

P-EXP Inter Board Connector LPC, USB, HD Audio

The inter-board connector P-EXP is mounted on bottom and optional on top of the CCH-MARIACHI PCB, with its face aligned towards the corresponding connector on the CCG-RUMBA. This allows to attach the CCH-MARIACHI mezzanine companion card on top as well as on bottom of the CPU carrier board. This inter-board connector establishes the data path and power link to the carrier board CPU. A suitable board stacker is used in addition to bridge the gap between the two boards. P-EXP is used to pass the Low Pin Count I/F to the CCH-MARIACHI, besides USB and HD Audio channels and other sideband signals.

P-EXP Expansion Board Interface (LPC/HD-Audio/USB) 1.27mm Socket 2 x 20 (276.53.040.01)			
GND	1	2	+3.3V_CR *
CLK_33MHZ	3	4	PLTRST#
LPC_AD0	5	6	LPC_AD1
LPC_AD2	7	8	LPC_AD3
LPC_FRAME#	9	10	LPC_DRQ#
GND	11	12	+3.3V_CR *
SERIRQ	13	14	PME#
SMI#	15	16	CLK_14MHZ
FWH_ID0	17	18	FWH_INIT#
KBD_RST#	19	20	A20GATE
GND	21	22	+5V_CR *
USB_P2N [1]	23	24	USB_P1N [2]
USB_P2P [1]	25	26	USB_P1P [2]
USB_OC# [3]	27	28	DBRESET#
SMB_CLK	29	30	SMB_DAT
GND	31	32	+5V_CR *
HDA_SDOUT	33	34	HDA_SDIN0
HDA_RST#	35	36	HDA_SYNC
HDA_BITCLK	37	38	HDA_SDIN1
SPEAKER	39	40	+12V_CR *

pin orientation shows
CPU carrier board top view

1.27mm Socket

[1]   connects to USB Port 6 on CCG-RUMBA
[2]   connects to USB Port 5 on CCG-RUMBA
[3]   connects to USB_OC56#on CCG-RUMBA

*   switched power supply lines from CCG-RUMBA carrier board according to Sx state

P-SP3 P-SP4 Serial Port Connectors

The on-board SIO (Super I/O controller) provides up to four serial interfaces (UART, DOS COM ports). While the serial ports SP1 und SP2 have dedicated RS-232 transceivers on-board and are available as COM-A and COM-B from the front panel, another set of two UARTs has been wired to the optional pin headers P-SP3 and P-SP4 (TTL-level) and to the rear I/O connector J2. P-SP3 and P-SP4 are suitable for attachment of EKF CU-series PHY modules via a micro ribbon flat cable assembly. A PHY module is a transceiver from TTL level signals to a specific symmetric or asymmetric interface standard, e.g. EIA-485 or RS-232E, with or w/o galvanic isolation. Please contact sales@ekf.de for availability of different CU-series modules (inquiries for custom specific PHY or transition modules welcome). Also custom specific front panel design can be done.
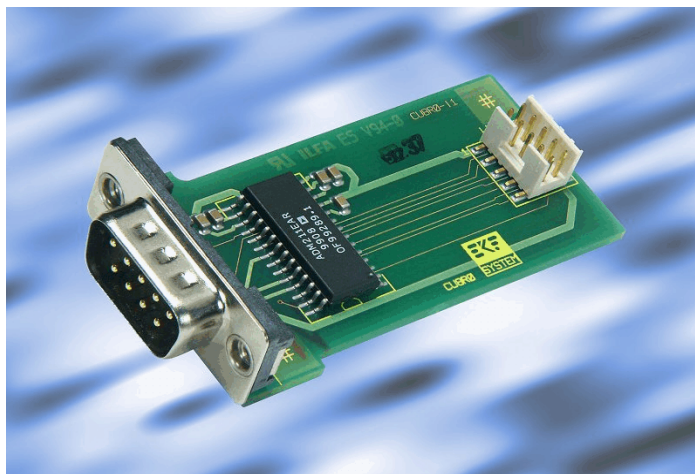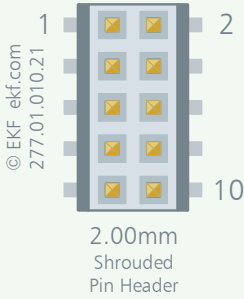

CU-Series PHY Module

Due to another (primary) SIO typically available on the CCG-RUMBA host board, the serial interfaces are not necessarily assigned to COM-1/COM-4 by the operating system. Verify or modify the accompanying CCG-RUMBA BIOS settings for mapping of physical asynchronous serial I/O ports to the logical COM port order.

Alternatively the connectors P-SP3 and/or P-SP4 can be used as 5V tolerant programmable I/O. Details can be derived from the SCH3114 Super I/O controller data sheet (www.smsc.com).

P-SP3 TTL-Level Serial I/O or GPIO 2.00mm Pin Header 2 x 5 (277.01.010.21)				
+5V_SP3 0.5A [1]	1	2	DSR3# / GP12
RI3# / GP13	3	4	RXD3 / GP10
TXD3 / GP11	5	6	DTR3# / GP15
RTS3# / GP17	7	8	CTS3# / GP16
DCD3# / GP12	9	10	GND

2.00mm
Shrouded
Pin Header
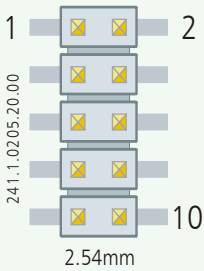
P-SP4 TTL-Level Serial I/O or GPIO 2.00mm Pin Header 2 x 5 (277.01.010.21)				
+5V_SP4 0.5A [1]	1	2	DSR4# / GP66
RI4# / GP31	3	4	RXD4 / GP64
TXD4 / GP65	5	6	DTR4# / GP34
RTS4# / GP67	7	8	CTS4# / GP62
DCD4# / GP63	9	10	GND

[1]   short circuit protection by a PolySwitch resettable fuse, voltage derived from +5V_CR carrier board switched power well

P-PS2 Keyboard / Mouse Connector

In most cases keyboard and mouse will be attached to the USB. As an option, the legacy PS/2 style signals are available from the pin header P-PS/2. A cable harness or small adapter board is required for cross-over to the PS/2 Mini-Din female connector(s).

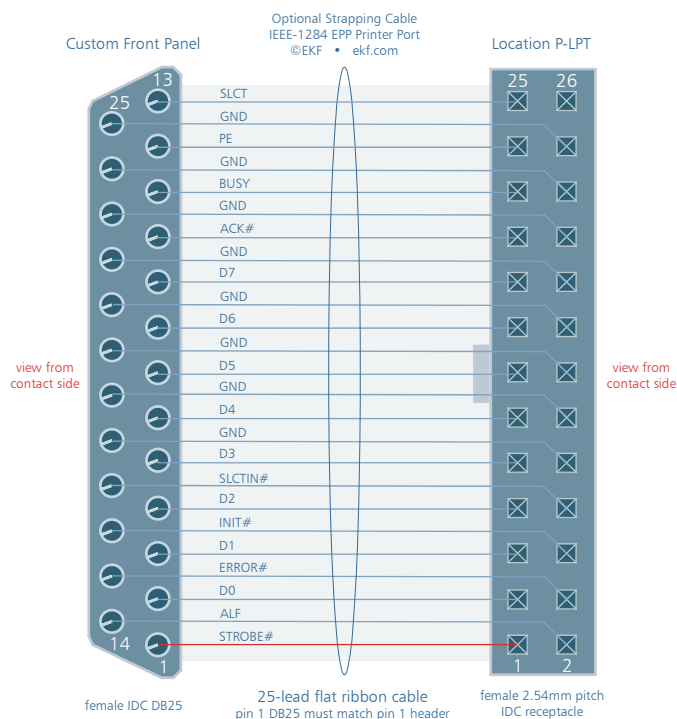| P-PS2 Keyboard - Mouse PS/2 Signals SMT 2.54mm Pin Header 2 x 5 (241.1.0205.20.00)				
+5V Mouse [1]	1	2	Clock Mouse
GND Mouse	3	4	Data Mouse
NC	5	6	NC
+5V Keyboard [1]	7	8	Clock Keyboard
GND Keyboard	9	10	Data Keyboard

[1]   short circuit protection by a common PolySwitch resettable fuse, voltage derived from +5V_CR carrier board switched power well
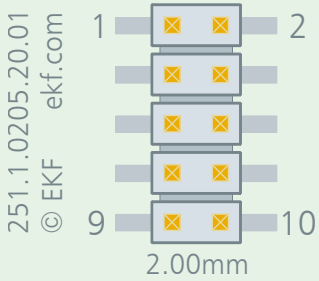
P-LPT Parallel Port

As an option, a parallel port 26-pin header is provided on-board. A flat cable assembly can be used for cross-over to the popular female D-Sub 25-position connector. P-LPT is not stuffed by default. Discuss your needs with EKF before ordering.

P-LPT Parallel Port (Line Printer) SMT 2.54mm Pin Header 2 x 13 (241.1.0213.20.00)				
STROBE#	1	2	ALF#
D0	3	4	ERROR#
D1	5	6	INIT#
D2	7	8	SLCTIN#
D3	9	10	GND
D4	11	12	GND
D5	13	14	GND
D6	15	16	GND
D7	17	18	GND
ACK#	19	20	GND
BUSY	21	22	GND
PE	23	24	GND
SLCT	25	26	

P-AUD Audio Interface

If the CCH-MARIACHI is equipped with an audio codec, the connector P-AUD provides an S/PDIF in/out and an analog stereo in/out interface.

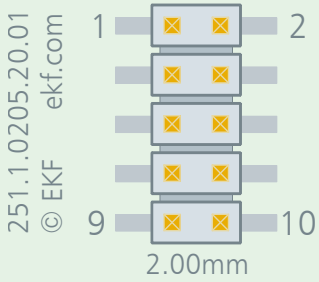| P-AUD Pin header 10-lead 2.00mm				
	MIC2_L	1	2	AGND
	AGND	3	4	MIC2_R
	KEY	5	6	AGND
	LINE2_R	7	8	AGND
	AGND	9	10	LINE2_L

251.1.0205.20.01 ekf.com
© EKF
2.00mm

P-CD Audio Input Connector

If the CCH-MARIACHI is equipped with an audio codec, the connector P-CD can be provided as an optional CD-ROM audio input.

P-CD Audio Connector 4-Pin Header 2.54mm		
	1	CD R
	2	AGND
	3	AGND
	4	CD L

Molex 70553-0003

P-UFD1 P-UFD2 USB SSD

As an option, the CCH-MARIACHI can be equipped with a connector for an industrial style USB Flash disk mezzanine module. The connector is a 2.0mm pitch pin header, suitable for a low profile SSD (Solid-State Drive) 37mm x 26mm. As of current, such modules are available e.g. from M-Systems, STEC, Intel, SanDisk and other manufacturers, up to 8GByte.

| P-UFD 2.00mm Pin Header 2x5 (251.1.0205.20.01) USB Solid-State Drive (Low Profile) 562.20.0004.00 (4GB) STec SLUFDM • Intel Z-U130 • SanDisk SDUS5EB				
	+5V_CR	1	2	NC
	USB+	3	4	NC
	USB-	5	6	NC
	GND	7	8	NC
	Mech. Key	9	10	NC

As a stuffing option, the connector P-UFD is populated either on top (P-UFD1) or on bottom (P-UFD2) of the CCH-MARIACHI. The top mounting alternate (P-UFD1) is not recommended if in addition an on-board 2.5-inch hard disk is present, since the hard disk extends over the space required for the top mount USB SSD module. The bottom mounting alternate (P-UFD2) is not recommended if in addition an C17 Compact Flash mezzanine board is mounted on bottom of the the CCH. Please specify your needs when ordering.
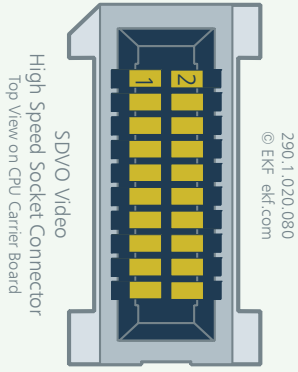

Top Mount USB Low Profile SSD Module
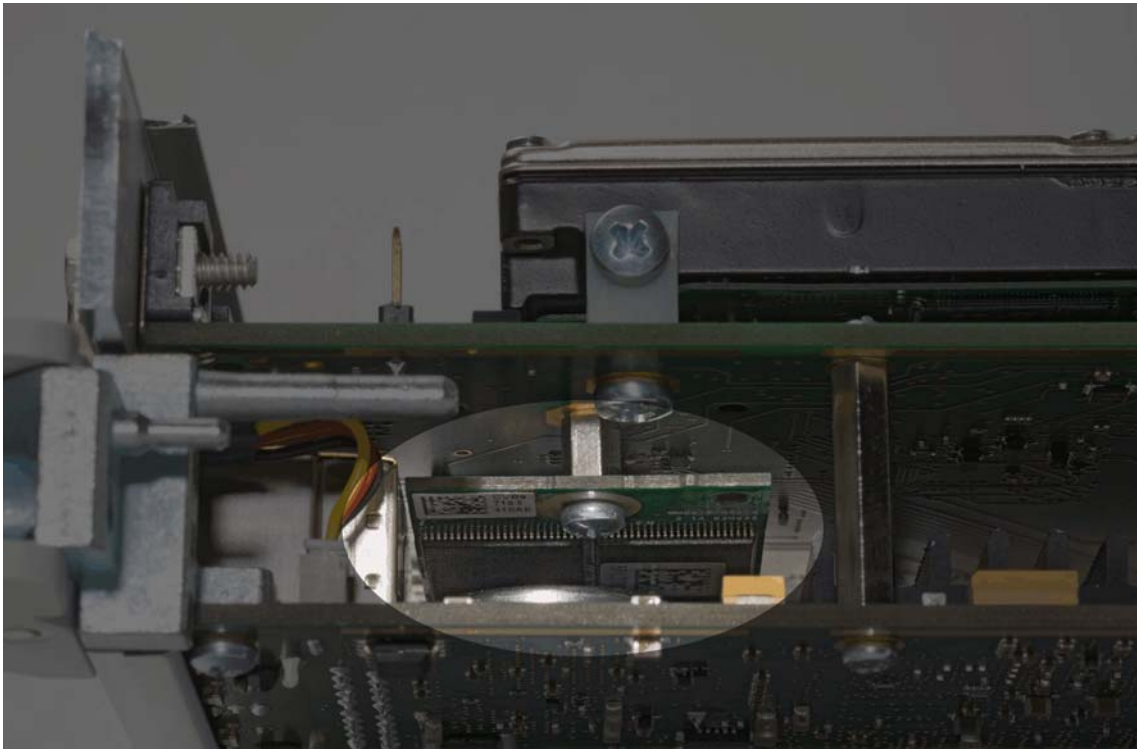
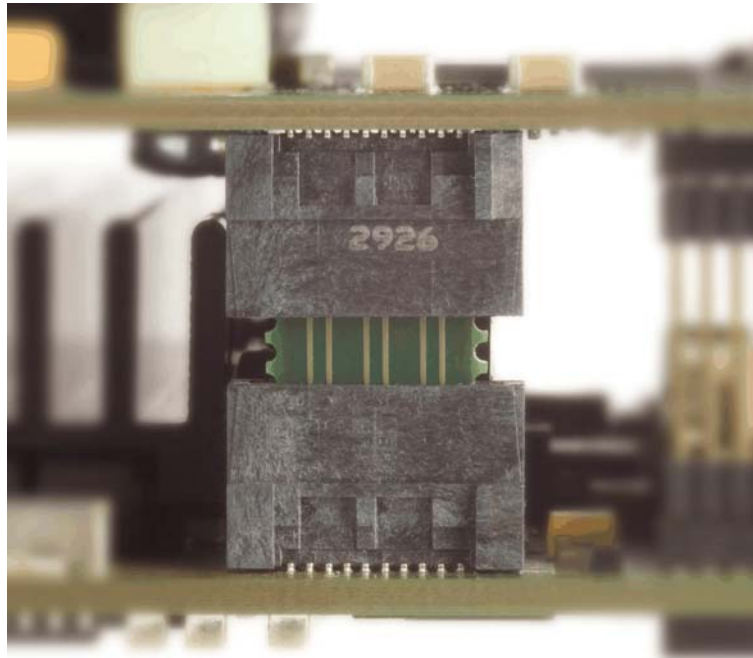Bottom Mount USB SSD (highlighted)
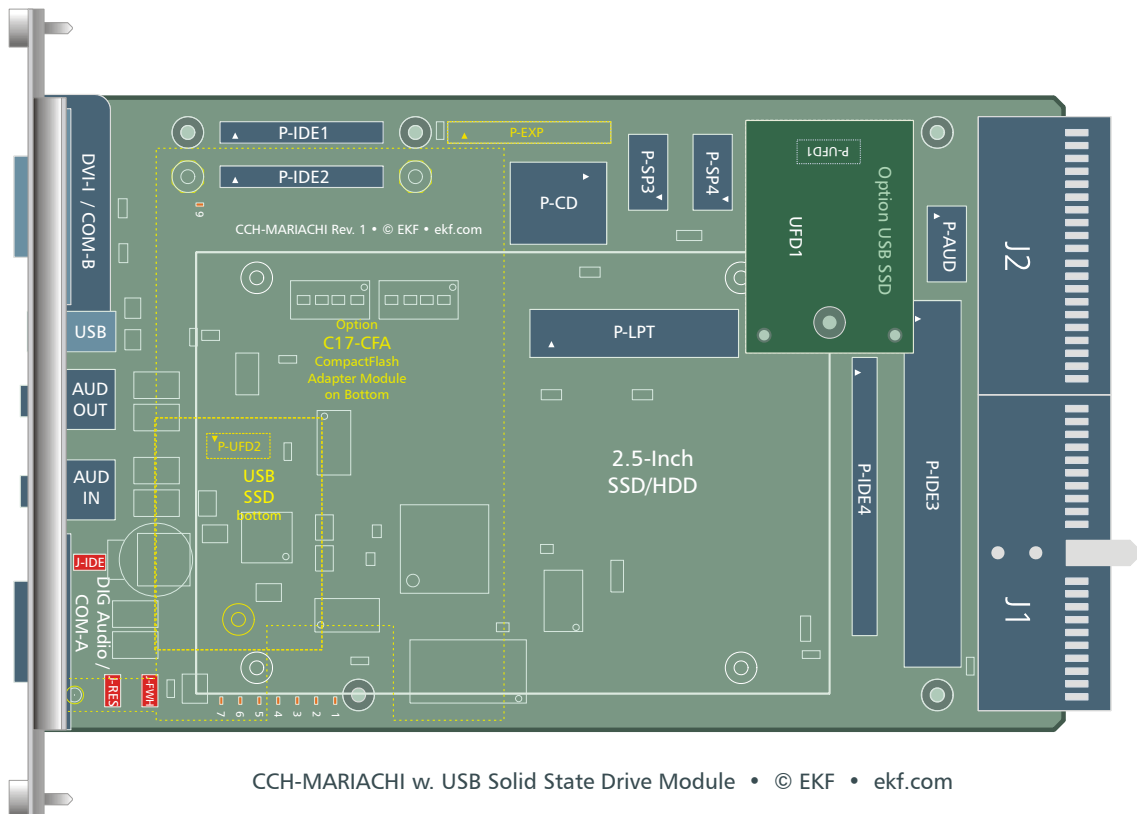
CCH-MARIACHI w. USB Solid State Drive Module • © EKF • ekf.com

P-SDVO

As an option, the high speed expansion socket P-SDVO is mounted on bottom of the CCH-MARIACHI. This allows to attach the mezzanine companion card on top of the CPU carrier board. This inter-board connector establishes the data path to the carrier board CPU. A mating strip line PCB (C21-PCIEX1) is used in addition to bridge the gap between the two boards, which results from the horizontal 0.8-inch (20.32mm) card slot pitch.

P-SDVO SDVO Video High Speed Dual Row Socket 0.8mm Pitch (290.1.020.080)				
GND	1	2	GND
SDVO_RED+	3	4	SDVO_CLK+
SDVO_RED-	5	6	SDVO_CLK-
GND	7	8	GND
SDVO_GREEN+	9	10	SDVO_INT+
SDVO_GREEN-	11	12	SDVO_INT-
GND	13	14	GND
SDVO_BLUE+	15	16	SDVO_CTR_CLK
SDVO_BLUE-	17	18	SDVO_CTR_DATA
GND	19	20	GND

SDVO Video
High Speed Socket Connector
Top View on CPU Carrier Board

290.1.020.080
© EKF ekf.com

pin orientation shows
CPU carrier board top view

J1/J2 Rear I/O

As an option, the CCH-MARIACHI can be equipped with the rear I/O connectors J1 and J2. A single slot rear I/O backplane (directly adjoining the CPCI backplane) would be required for handing over the available signal lines to a suitable rear I/O transition module.

The CCH-MARIACHI must not be plugged into a common CPCI slot in order to avoid damaging the board or other components of the system. A brown key on the J1 connector will prevent the user from erroneously inserting the CCH-MARIACHI into an unsuitable position.
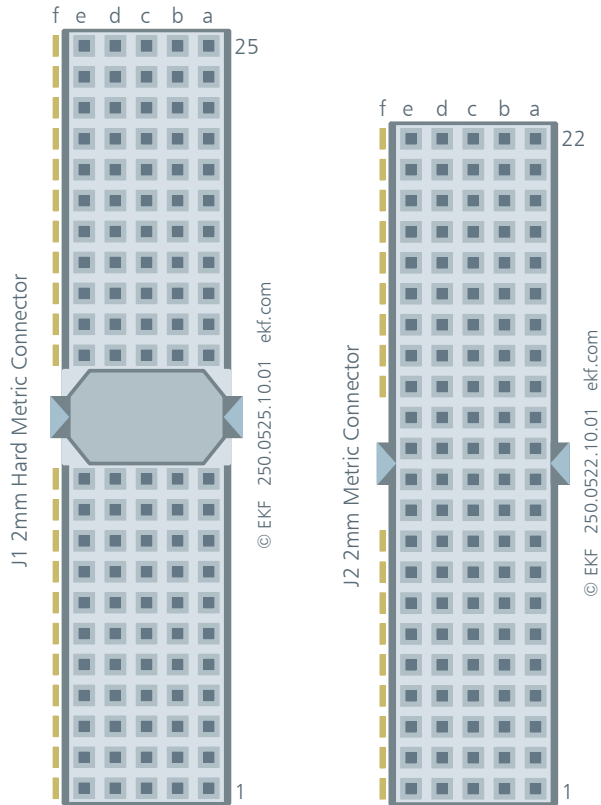
Signal names provided on the J1 and J2 connector tables hereafter are associated with their main function. However, the Super I/O controller allows a number of signals also be used as general purpose I/O. Please consult the SMSC LPC47B27x datasheet for details (www.smsc.com).

Please note, that the majority of signals is also available on-board or via front panel. Be sure to have connected any signal only once, in order to avoid interference.

With respect to the IDE/ATA interface, the jumper J-IDE (if provided) must be set, in order to enable rear I/O mass storage attachment. No stubs are allowed on an IDE cable assembly, i.e. concurrent operation of devices attached to J1 and other IDE dedicated connectors cannot be guaranteed.

J1 Rear I/O Connector

#J1	A	B	C	D	E
25	+5V_EXT [1]			+3.3V_EXT [1]	+5V_EXT [1]
24	IDE_d08	+5V_EXT [1]		IDE_reset#	IDE_d07
23	+3.3V_EXT [1]	IDE_d09	IDE_d10	+5V_EXT [1]	IDE_d06
22	IDE_d11	GND	+3.3V_EXT [1]	IDE_d04	IDE_d05
21	+3.3V_EXT [1]	IDE_d12	IDE_d13		IDE_d03
20	IDE_d14	GND		IDE_d01	IDE_d02
19	+3.3V_EXT [1]	IDE_d15	IDE_dmarq	GND	IDE_d00
18	IDE_dmack#	GND	+3.3V_EXT [1]	IDE_ior#	IDE_iow#
17	+3.3V_EXT [1]	IDE_a1	IDE_cblid#	GND	IDE_iordy
16	IDE_a2	GND		IDE_a0	IDE_intrq
15	+3.3V_EXT [1]	IDE_cs1#	IDE_act#	GND	IDE_cs0#
14					
13			KEY (BROWN)		
12					
11				GND	KB_dat
10		GND			KB_clk
9				GND	MS_dat
8		GND			MS_clk
7				GND	+5V_PS2 [3]
6		GND			
5				GND	
4	dbreset#	GND			
3				+5V [2]	
2		+5V [2]			
1	+5V [2]				+5V [2]

[1] switched power supply lines from CCG-RUMBA carrier board according to Sx state, connected via zero-Ohm resistors which are not stuffed by default

[2] optional external supply voltages, +3.3V reserved for future use, +5V optionally in use as disk drive power source

[3] short circuit protection by a PolySwitch resettable fuse, voltage derived from +5V_CR carrier board switched power well

J2 Rear I/O Connector

#J2	A	B	C	D	E
22	+5V_EXT [1]	+3.3V_EXT [1]	RSVD	RSVD	+12V_EXT [1]
21	GND	GND	GND	GND	GND
20	SP1_RI#	SP1_CTS#	SP2_RI# / GP50	SP2_CTS# / GP56	RSVD
19	SP1_RXD	GND	SP2_RXD / GP52	GND	FWH_GPI1
18	SP1_DSR#	SP1_DCD#	SP2_DSR# / GP54	SP2_DCD# / GP51	FWH_GPI2
17	SP1_DTR# [4]	GND	SP2_DTR# / GP57	GND	GND
16	SP1_RTS# [4]	SP1_TXD	SP2_RTS# / GP55 3)	SP2_TXD / GP53	DBRESET#
15	RSVD	GND	RSVD	GND	RSVD
14	SP3_RI# / GP13	SP3_CTS# / GP16	SP4_RI# / GP31	SP4_CTS# / GP62	SMB_DAT [2]
13	SP3_RXD / GP10	GND	SP4_RXD / GP64	GND	SMB_CLK [2]
12	SP3_DSR# / GP14	SP3_DCD# / GP12	SP4_DSR# / GP66	SP4_DCD# / GP63	GND
11	SP3_DTR# / GP15	GND	SP4_DTR# / GP34 [3]	GND	RSVD
10	SP3_RTS# / GP17	SP3_TXD / GP11	SP4_RTS# / GP67 [3]	SP4_TXD / GP65	RSVD
9	RSVD	GND	RSVD	GND	GND
8	LPT_SLCT	LPT_PE	LPT_BUSY	SIO_GP47	USB_OC#
7	LPT_ACK#	GND	GND	SIO_GP46	GND
6	LPT_D7	LPT_D6	LPT_D5	SIO_GP45	USB2_D- [5]
5	LPT_D4	GND	LPT_D3	SIO_GP44	USB2_D+ [5]
4	LPT_D2	LPT_D1	LPT_SLCTIN#	SPEAKER	GND
3	LPT_D0	GND	LPT_INIT#	KBDAT	KBCLK
2	LPT_ALF#	LPT_ERROR#	LPT_STROBE#	GND	+5V_EXT [1]
1	GND	GND	GND	MSDAT	MSCLK

[1]   switched power supply lines from CCG-RUMBA carrier board according to Sx state, connected via zero-Ohm resistors which are not stuffed by default

[2]   stuffing option: SM Bus signals buffered via LTC4300A-3, voltage level @ +5V_CR buffer enable input is controlled by GP40 SCH3114 SIO (high=enabled)

[3]   GP34 may be used to control serial EEPROM A1 (stuffing option)
GP67 may be used to control serial EEPROM WP (stuffing option)

[4]   These serial port handshake signals may be also in use for power up strapping options of the SCH3114 SIO (10k PU or PD) with no or minor impact on normal operation

[5]   Stuffing option - USB port(s) may be in use for on-board Solid State Disk(s)

Jumpers

For jumper J-IDE please refer to description of on-board connectors P-IDE3 and P-IDE4. For jumper J-FWH please refer to description of Firmware Hub 2.
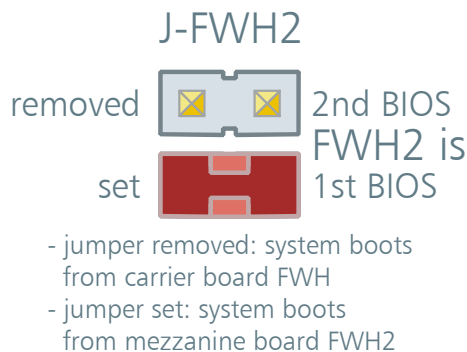
J-RES Reset

Provided as an option, the pin header J-RES can be used for resetting the CPU host board (processor reset) if wired to additional circuitry (e.g. watchdog or manual pushbutton). Tie reset# to GND with an open collector output. While debugging the system, a 2.54mm jumper may be used to force a manual reset.

J-RES

1 = RST#   2 = GND
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Firmware Hub 2

The CCH-MARIACHI is optionally provided with a 82802 compatible 8Mbit Flash (Firmware Hub), which can be used either as alternative boot BIOS, as an expansion memory to the CPU board BIOS, or for BIOS retrieval/rescue. The Firmware Hub is connected to the LPC (Low Pin Count) interface. The device ID of a particular FWH determines whether it is detected as BIOS after power on (ID = 0). If stuffed, the jumper J-FWH sets the on-board FWH2 ID to zero (and simultaneously changes the CCG-RUMBA FWH ID to 1) - hence the system will use the BIOS on the CCH-MARIACHI after power-on.

J-FWH2

removed — 2nd BIOS

set — FWH2 is 1st BIOS

- jumper removed: system boots from carrier board FWH
- jumper set: system boots from mezzanine board FWH2

A programming tool for the Firmware Hub and latest BIOS releases can be obtained from the EKF website.

Trusted Platform Module

The CCH-MARIACHI can be optionally equipped with a Trusted Platform Module cryptographic chip according to the TPM 1.2 specification. The board provides a footprint which is suitable for

▸   SLB9635 (Infineon www.infineon.com/tpm)
▸   AT97SC3203 (Atmel www.atmel.com)

and other brands. The TPM chip communicates with the CPU carrier board through the LPC interface. Recent operating systems such as Windows Vista and Linux provide TPM software support.

Typically, TPM chip manufacturers provide the necessary device driver software for integration into special operating systems, along with BIOS drivers. Full documentation for TCG primitives can be found in the TCG TPM Main Specification, Parts 1 – 3, on the TCG website located at https://www.trustedcomputinggroup.org/. TPM features specific to PC Client platforms are specified in the "TCG PC Client Specific TPM Interface Specification, Version 1.2", also available on the TCG web site. Implementation guidance for 32-bit PC platforms is outlined in the "TCG PC Client Specific Implementation Specification for Conventional BIOS for TCG Version 1.2", also available on the TCG web site.

Atmels TPM includes a cryptographic accelerator capable of computing a 2048-bit RSA signature in 500 ms and a 1024-bit RSA signature in 100ms. Performance of the SHA-1 accelerator is 50us per 64-byte block. TCG key generation operations will be completed using a proprietary mechanism in less than 1 msec. The TPM is offered to OEM manufacturers as a turnkey solution, including the firmware integrated on the chip.

Infineons security controllers have achieved the industry's highest rating for digital security, the Common Criteria EAL 5 high Certificate issued by the German government agency responsible for security in information technology. Infineon provides OEMs with a complete TCG solution that includes all required hardware, software, and management utilities to develop a complete platform security solution.

Audio Codec

The CCH-MARIACHI is equipped with an Realtek ALC 262 audio codec according to the High Definition Audio Specification Rev.1.0 (AKA Intel Azalia). Further information and driver software is available at http://www.realtek.com.tw. This codec does not function together with CPU carrier boards which incorporate an earlier southbridge (e.g. ICH4), providing AC'97 compliant legacy audio only.

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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EKF Elektronik GmbH   Phone +49 (0)2381/6890-0
Philipp-Reis-Str. 4   Fax +49 (0)2381/6890-90
59065 Hamm   Internet www.ekf.com
Germany   E-Mail info@ekf.com