



Technical Information

CCO-CONCERT

Mezzanine I/O Expansion Board Multifunction Side Board

Document No. 5369 • Ed. 14 • 8 February 2011



Contents

About this Manual	4
Edition History	4
Related Documents	5
Nomenclature	5
Trade Marks	5
Legal Disclaimer - Liability Exclusion	5
Standards	6
CCO-CONCERT Features	7
Short Description	7
Stuffing Options	10
Theory of Operation	15
HD Audio Codec	19
Front Panel Options	20
Block Diagram CCO-CONCERT	23
Feature Summary	29
Top View Component Assembly CCO-CONCERT	31
Front Panel Connectors	34
On-Board Connectors	34
Jumpers	34
Inter-Board Connectors (Host)	35
Inter-Board Connector (C32-FIO)	35
Rear I/O Connectors	35
Installing and Replacing Components	36
Before You Begin	36
Warnings	36
Caution	36
Installing the Board	37
Removing the Board	38
EMC Recommendations	39
Technical Reference - Connectors	40
Caution	40
Please Note	40
Front Panel Connectors	41
AUDIO IN/OUT Audio Jacks	43
COM-A/COM-B Serial Port Connectors	45
Digital Audio	46
Video (DVI)	48
USB	49
On-Board Connectors	50
P-SATA1A	51
P-SATA1B	53
P-SATA2 P-SATA3	55
P-SATA45	56
P-SP3 P-SP4	60
P-UFD1 P-UFD2 P-UFD3	62
On-Board Jumpers	63
J-RES Reset	63
J-FWH2	63

Inter-Board Connectors	64
J-EXP	67
J-HSE	68
J-PCIE	69
J-SDVO	70
J-FIO	71
Rear I/O Connectors	74
J1	75
J2	76
Additional Functions	77
Firmware Hub 2	77
SMBus EEPROM	77
Trusted Platform Module	78
Power Distribution	79
Schematics	81

About this Manual

This manual is a short form description of the technical aspects of the CCO-CONCERT, required for installation and system integration. It is intended for the advanced user only. The latest version of this document may be obtained from www.ekf.com/c/ccpu/cco/cco_tie.pdf.

Edition History

EKF Document	Ed.	Contents/Changes	Author	Date
Text # 5369 cco_tie.wpd	1	Technical Information CCO-CONCERT English, Preliminary Edition	jj	13 January 2009
	2	Modified Table J-FIO	jj	23 January 2009
	3	Adjustments to revision 0 schematics and PCB layout: Modified block diagram, modified connector assignment J1/J2 rear I/O, modified power distribution scheme, modified table feature summary	jj	4 February 2009
	4	Diagram 'Power Distribution' modified (J1)	jj	10 February 2009
	5	Modified block diagram, modified connector assignment J1/J2 rear I/O (SATA channel distribution)	jj/mib	10 March 2009
	6	Swapped assignment of left/right audio channels on both 3.5mm audio jacks	jj/mib	16 March 2009
	7	P-SATA1A & P-SATA1B power pins explained more clearly	jj/mib	25 March 2009
	8	Added photos CCO-CONCERT	jj	3 September 2009
	9	Added photos C20-SATA	jj	13 November 2009
	10	Changed block diagram sheets 2 and 6, reflecting all serial ports SP1-SP4 are wired to J2	jj	19 February 2010
	11	Added photos CCO-CONCERT with 2 x RS232 front panel connectors	jj	21 May 2010
	12	Added photo CCO-CONCERT & PC1-GROOVE	jj	28 May 2010
	13	COM-A/COM-B Serial Port Connectors & J2 Rear I/O Connector: Usage of serial ports 1 and/or 2 for rear I/O across J2 requires on-board RS-232 transceivers to be not populated. Serial ports 3 and 4 are not available for rear I/O via J2 if the mezzanine module C32-FIO is engaged on the CCO-CONCERT.	jj	15 November 2010
	14	Table connector J2 modified in order to harmonize SP2/SP4 signal assignment with active schematics	jj	8 February 2011

Related Documents

For a description of the CCM-BOOGIE CPU cards, which act as carrier board with respect to the CCO-CONCERT, please refer to the correspondent CPU user guide, available by download from www.ekf.com/c/ccpu/ccm/ccm_e.html (change path accordingly for other possible CPU carrier boards). The mezzanine module C32-FIO (3rd floor front panel I/O) is described at www.ekf.com/c/ccpu/c32/c32_tie.pdf.

Nomenclature

Signal names used herein with an attached '#1' designate active low lines.

Trade Marks

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

- ▶ Intel, Pentium, Celeron, Core 2 Duo, Merom, Penryn, iAMT: ® Intel
- ▶ Santa Rosa Platform, Crestline Chipset GM965: Intel
- ▶ Montevina Platform, Cantiga Chipset GS45: 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	
CompactFlash	CF+ and CompactFlash Specification Revision 3.0 (www.compactflash.org)
CompactPCI	PICMG 2.0 (www.picmg.org)
DVI	Digital Visual Interface Rev. 1.0 (Digital Display Working Group www.ddwg.org)
HD Audio	High Definition Audio Specification Rev.1.0 www.intel.com/design/chipsets/hdaudio.htm
PCI Express	PCIe Base Spec. 1.1 and other (PCI SIG www.pcisig.com)
SATA	Serial ATA 2.5/2.6 Specification (www.sata-io.org)
TPM	Trusted Platform Module 1.2 (https://www.trustedcomputinggroup.org)
USB	Universal Serial Bus Revision 2.0 specification (www.usb.org/developers)



CCO-CONCERT on a CPU Carrier Board

CCO-CONCERT Features

Short Description

Available as a mezzanine add-on expansion board (aka side board) to the CCM-BOOGIE and successor CompactPCI® CPU cards, the CCO-CONCERT provides a number of frequently required I/O functions. In addition, the user can choose between several SATA and USB based mass storage options.

The on-board HD Audio codec is useful e.g. for passenger information systems. Analog inputs and outputs are available from 3.5mm stereo jacks situated in the front panel, each individually configurable by driver software as microphone in, line in, headphones out or line out. As an option, a D-SUB connector provides also S/PDIF digital audio along with additional analog lines.

The CCO-CONCERT can be equipped with up to three RAID0/1 capable PCIe dual channel SATA controllers, useful for attachment of mass-storage devices, either on-board mounted, or externally (by cable or via rear I/O).

For dual screen applications (in addition to the primary DVI connector on the CPU carrier board), the CCO-CONCERT can be equipped with either a SDVO to PanelLink transmitter (for digital video output), or a SDVO to VGA DAC (for analog video output), with both signal types available on the secondary front panel DVI connector.

Furthermore the CCO-CONCERT is equipped with a SIO, which provides legacy I/O ports, such as serial (UART) and PS/2 keyboard/mouse interfaces. Two RS-232E COM port connectors are mounted in the front panel.

A secondary Firmware Hub can be configured as alternate- or backup-BIOS. Another option available is the Trusted Platform Module according to TPM 1.2 for safety critical applications.

The CCO-CONCERT will be attached on top of the CPU carrier board, and typically shares its front panel with the host carrier (usually 8HP front panel width in total). Interconnection between the CCO-CONCERT side board and the CPU carrier card is achieved by up to four expansion connectors, which comprise the PCIe (PCI Express x 4), SDVO (serial digital video), SATA/USB and LPC (Low Pin Count legacy) interfaces.

As a popular mass storage solution, the CCO-CONCERT is available with an 2.5-inch on-board SATA SSD (solid state drive) or HDD (hard disk).

Another mass storage option is the mezzanine module C20-SATA, which accommodates one or two 2.5-inch SATA drives (RAID0/1 option).

Alternatively, the C42-SATA mezzanine module accommodates a 1.8-inch SSD, as well rugged as affordable.

The C40-SCFA mezzanine module provides a CompactFlash socket, which is controlled by a SATA to PATA bridge.

Optionally, up to three low profile USB Flash drive modules (2.00mm pitch connector) can be accommodated, 2 x top and 1 x bottom mount. USB SSD modules are available for the industrial temperature range from several vendors.

For even more front panel I/O, the C32-FIO mezzanine board can be mounted on top of the CCO-CONCERT, offering another two RS-232 COM ports, 2 x USB, and a Mini-DIN connector with KB/MS. This solution would result in a 12HP front panel.

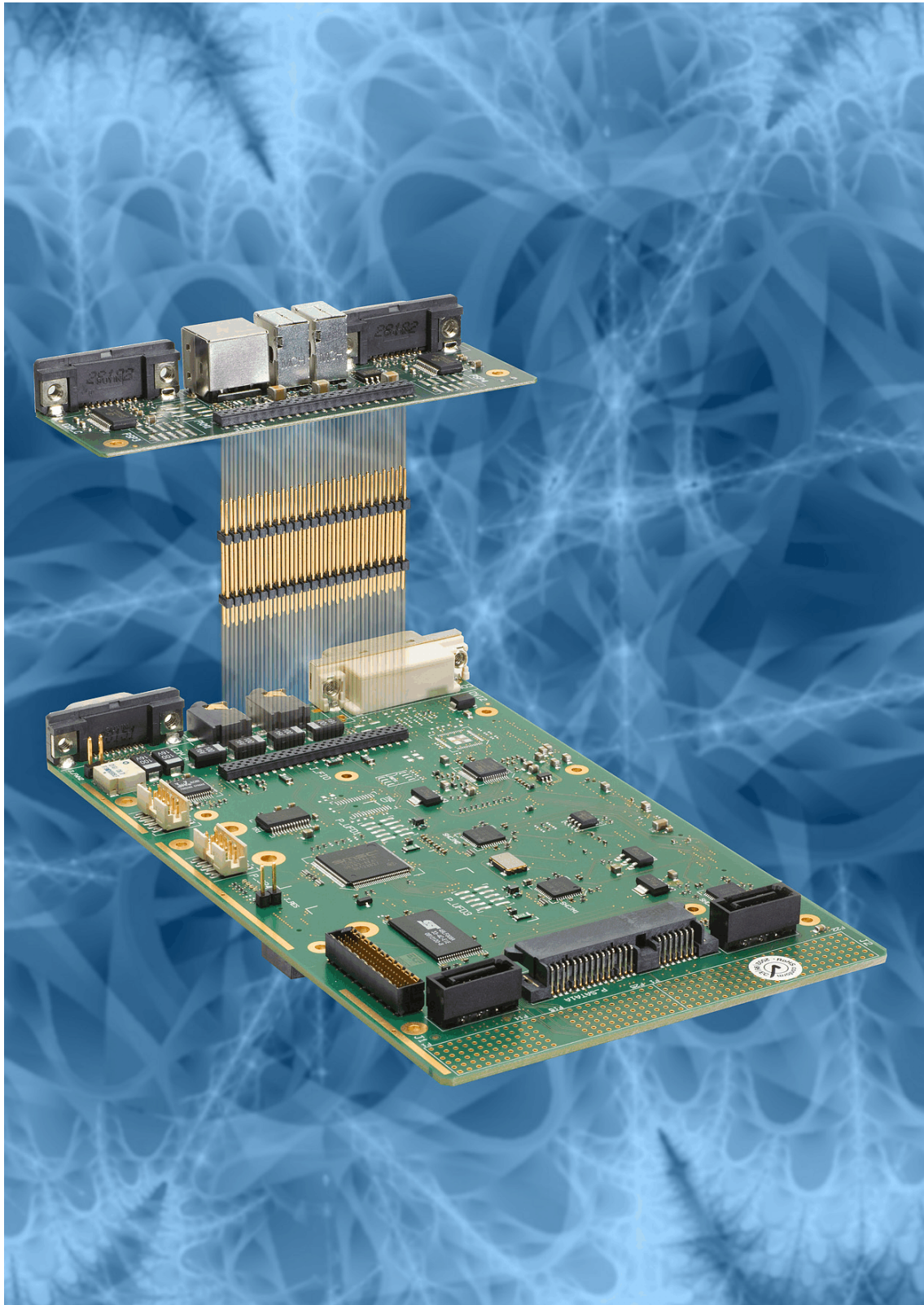
The CCO-CONCERT can be optionally provided with J1/J2 rear I/O connectors for custom specific system solutions.



C20-SATA Dual SSD on Top of CCO-CONCERT



Single SATA Drive on Top of CCO-CONCERT

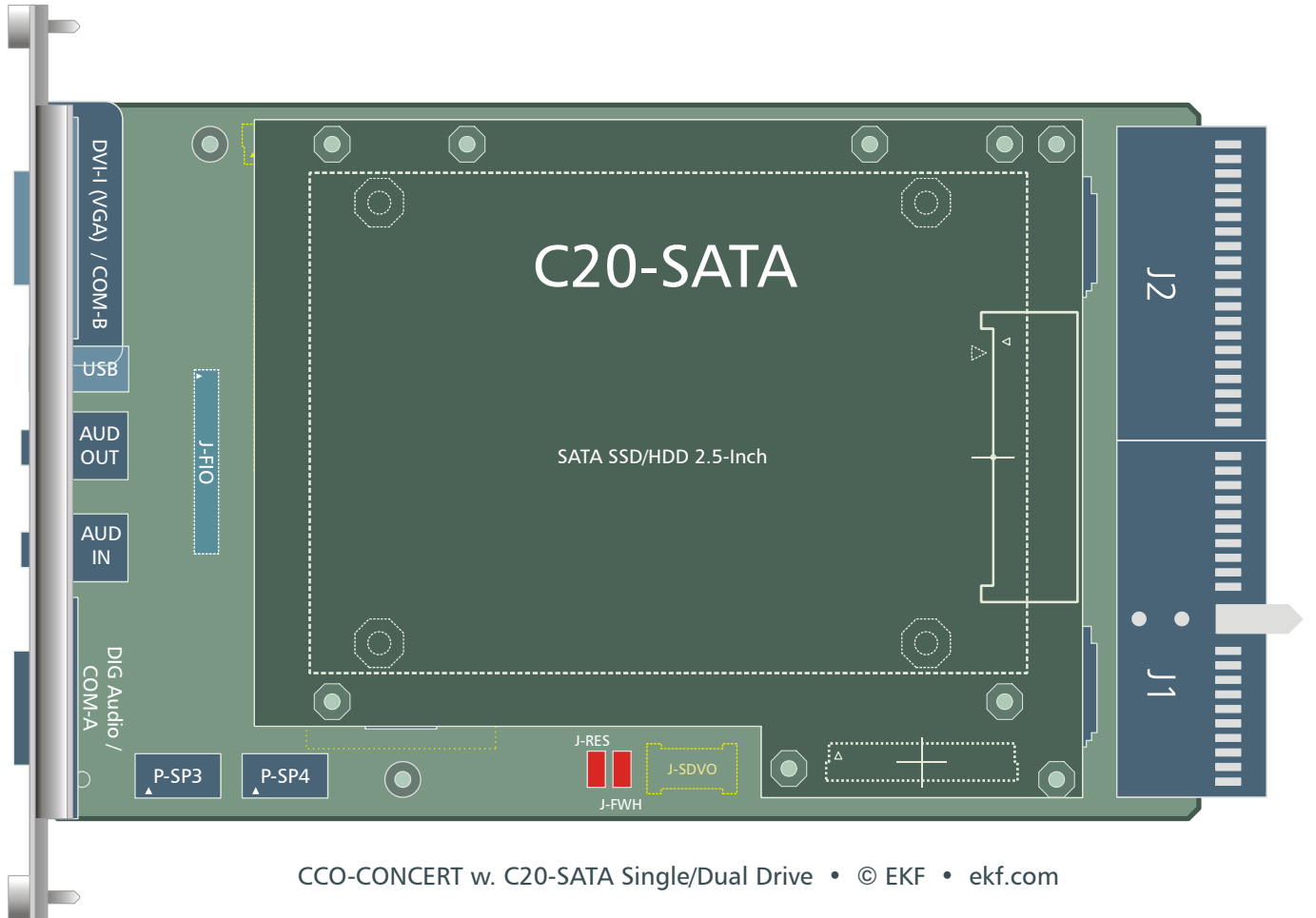


C32-FIO Optional Front Panel I/O Mezzanine Module

Stuffing Options

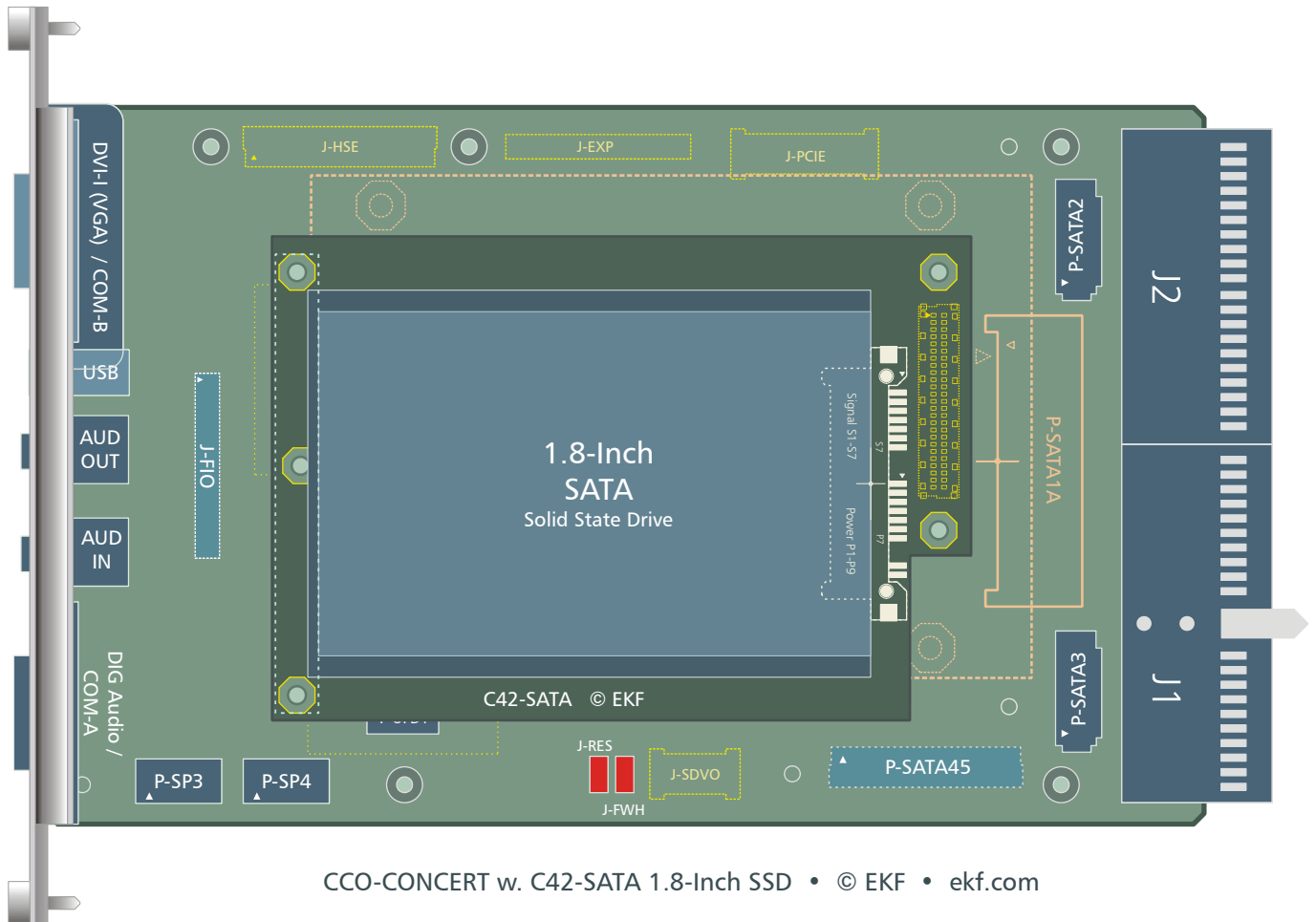


As a straight mass-storage solution, a 2.5-inch SATA drive, either hard disk (HDD) or solid state (SSD) can be directly mounted on top of the CCO-CONCERT. Replacement of the drive is practicable without disassembling the CCO-CONCERT and associated CPU carrier board.



The mezzanine module C20-SATA is the most powerful storage solution available for the CCO-CONCERT. It can be provided with one or two SATA drives, which can be operated as RAID0/1 or non RAID. The dual drive version of the C20-SATA requires a 12HP front panel (including the CPU carrier board).

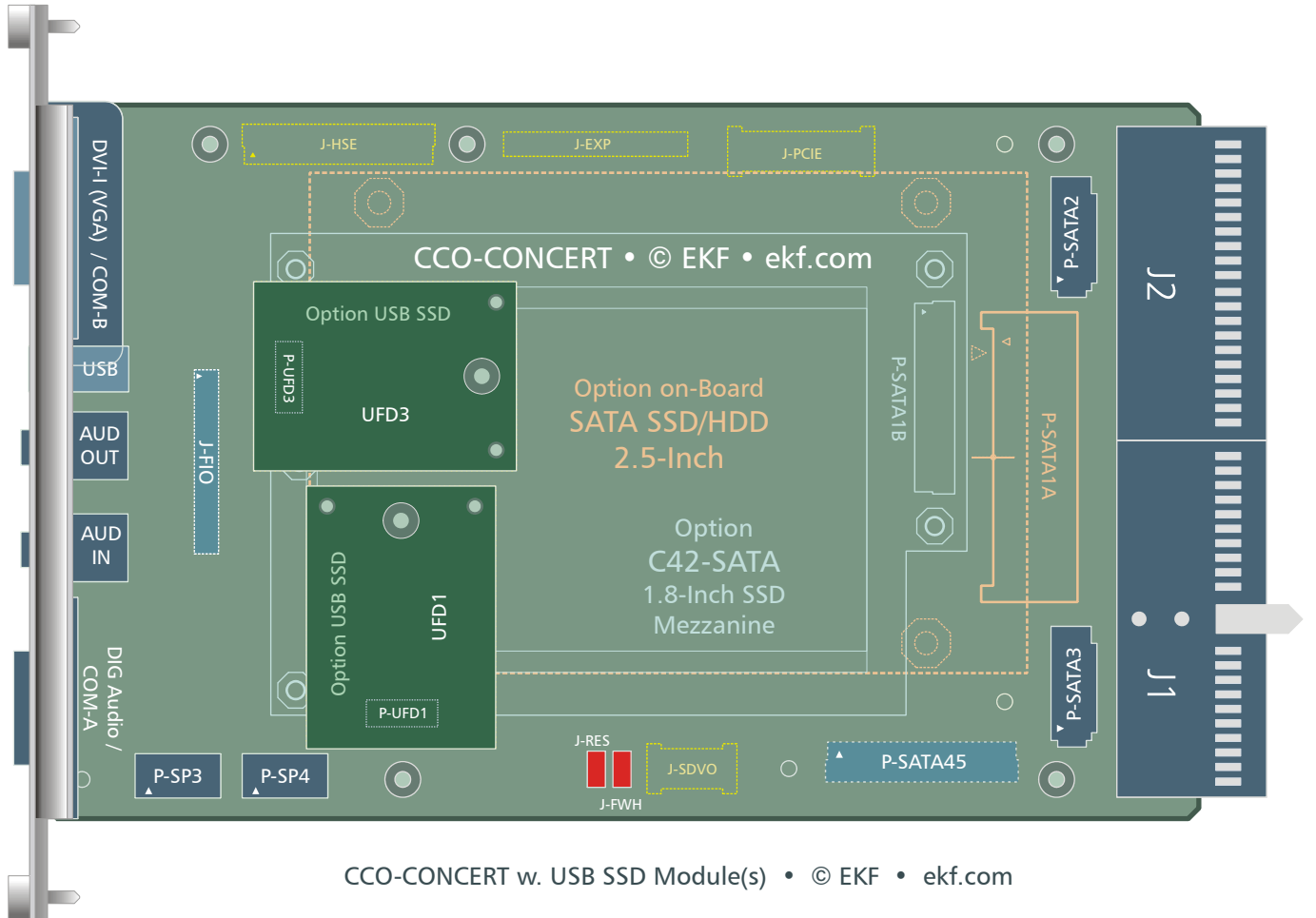
As a low cost alternate, a single SATA drive can be mounted directly on the CCO-CONCERT, w/o need of a mezzanine PCB.



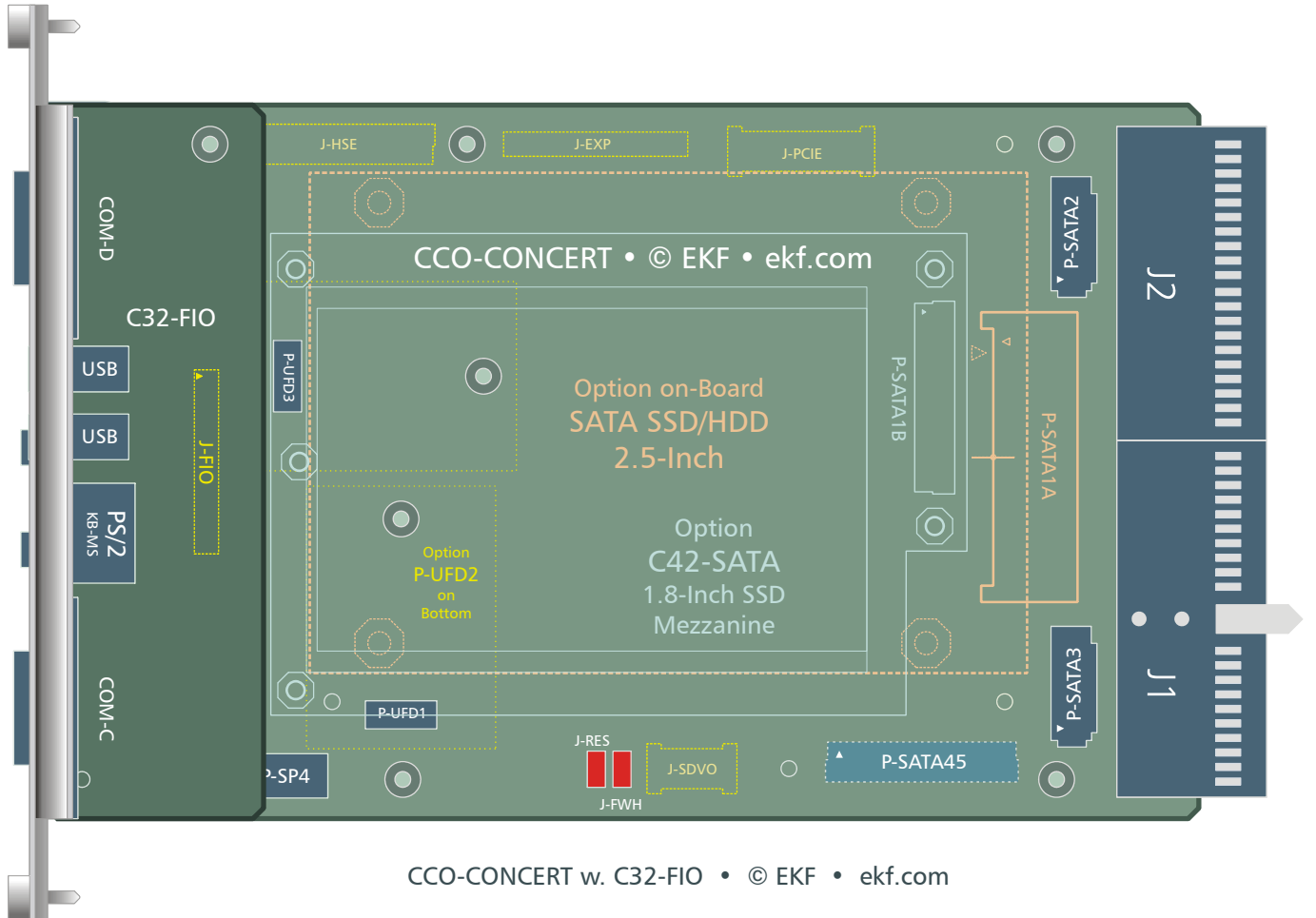
CCO-CONCERT w. C42-SATA 1.8-Inch SSD • © EKF • ekf.com

With a capacity of 128GB and beyond as of current, Solid State Drives (SSD) have become very popular for industrial applications, due to their superior operation conditions compared to rotating hard drives. SSDs are available for the industrial temperature range and withstand shock and vibration. While there are also some other form factors for flash drives such as 2.5-inch (available with C20-SATA), the 1.8-inch drives provide considerable smaller dimensions and lower profile, which is advantageous in ruggedized systems. In addition, a modern SSD outperforms a hard disk drive with respect to the maximum data transfer rate.

For the CCO-CONCERT, EKF offers the C42-SATA mezzanine storage module, equipped with a 1.8-inch SSD. If a CompactFlash module is sufficient for a particular application, the C40-SCFA CF card adapter module is available. It is equipped with a SATA to PATA bridge, for emulating the true IDE mode required for a CompactFlash storage card.



For extremely rugged conditions, EKF recommends low profile USB Flash modules, available e.g. from SMART, STEC, Sandisk or Silicon Systems, as of current up to 8GB capacity. Up to three USB flash drives can be fixed on the CCO-CONCERT, two on top of the PCB, and one on bottom.



The CCO-CONCERT can be upgraded with an additional front panel I/O mezzanine module, the C32-FIO. It is provided with another two COM port connectors, 2 x USB, and a Mini-DIN connector for the everlasting PS/2 mouse/keyboard based applications. The C32-FIO requires a 12HP front panel in total.

Theory of Operation

The CCO-CONCERT side board communicates by means of up to four bottom mount expansion connectors with the host CPU: J-PCIE (PCI Express x 4), J-SDVO (Serial Digital Video), J-HSE (High Speed Expansion meaning SATA and USB), and J-EXP (multi-function legacy I/F such as LPC, SMB). CPU carrier boards earlier than the CCM-BOOGIE do not provide all of these interfaces. The CCG-RUMBA e.g. misses the J-HSE connector. The CCO-CONCERT can be nevertheless used together with the CCG-RUMBA, but will not support some USB bound functions (consult CCO-CONCERT block diagram sheet 4).

The PCI Express interface (connector J-PCIE) is comprised of 4 PCIe lanes, which are derived from the ICH (southbridge chip) on the CPU carrier board. As of current, only 3 lanes are in use on the CCO-CONCERT, assigned to the (up to) three on-board PCIe SATA controllers. With the resulting 6 SATA channels (in addition to the 3 lines from J-HSE), the CCO-CONCERT has been designed for maximum flexibility in mass storage.

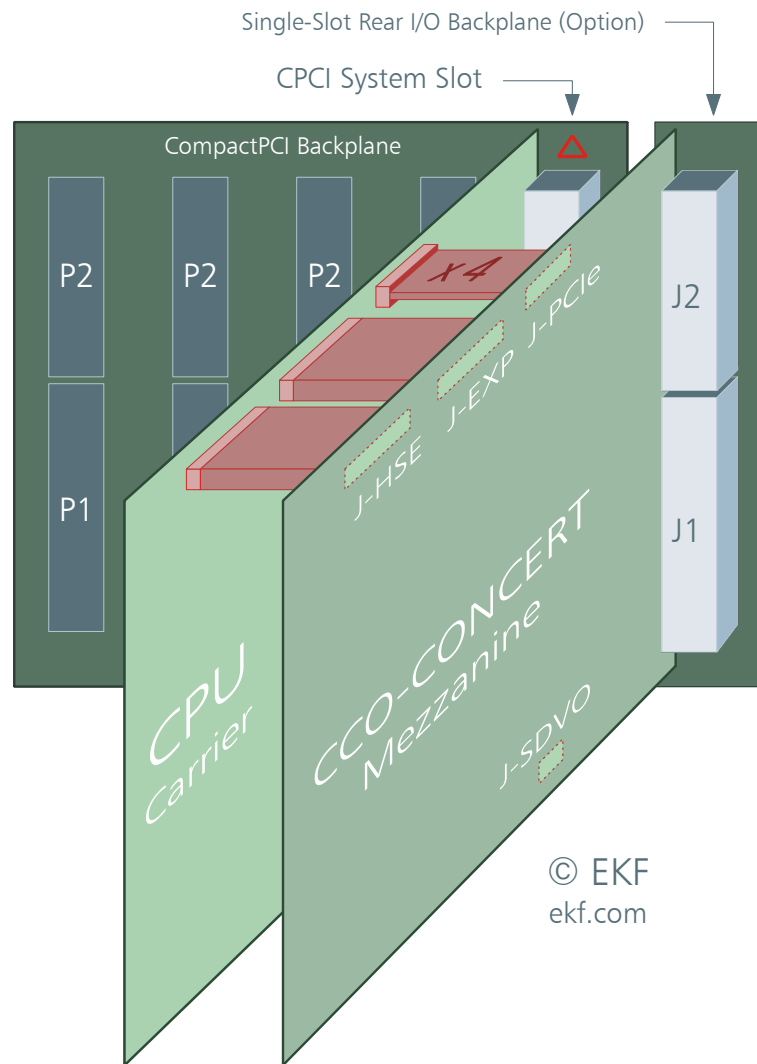
J-SDVO is provided for applications with need for a secondary DVI video connector. Typically, a PanelLink transmitter is engaged between the SDVO port and the DVI connector (DVI-D digital video). For legacy applications however, a VGA DAC can be stuffed instead. The analog signals can be derived from the micro cross section of the DVI connector (pinout according to DVI-I).

The J-HSE connector has been introduced first time with the CCM-BOOGIE in 2008, passing through 3 x SATA channels and 4 x USB from the host CPU to the CCO-CONCERT side board. A simple mass storage solution such as an on-board SATA drive thus could be realized w/o stuffing any of the optional on-board SATA controllers. On the other hand, if the CPU carrier board does not provide the J-HSE connector such as the CCG-RUMBA, three SATA channels from the on-board controllers can be redirected in order to replace the J-HSE with respect to the SATA lines.

Connector J-EXP combines several other southbridge data channels: The HD Audio interface (aka Azalia) is a data path to the on-board audio codec. The SMBus is used for system management. The LPC (Low Pin Count) is a multiplexed ISA bus, e.g. enabling the super-I/O (SIO) controller chip to emulate the legacy I/O interfaces; among these are the classic serial (COM) and PS/2 keyboard/mouse ports. Two on-board RS-232E transceivers for up to 230kbps are assigned to front panel D-SUB connectors (connector COM-A exclusive to D-AUDIO, connector COM-B exclusive to DVI video connector). The remaining serial ports are available (TTL-level) either for attachment of EKF CUX PHY modules via flat cable assembly (P-SP3, P-SP4), or for use on a special next floor mezzanine card, named C32-FIO, connected across the J-FIO socket. Another two USB channels, which are provided across J-EXP in addition to J-HSE, are also passed through to J-FIO, as well as the PS/2 keyboard/mouse port. In addition, most of the signals mentioned are optionally available for rear I/O across J1/J2.

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.

The CCO-CONCERT fits on the top side of the CPU board, which is on the right side when viewing the common front panel. A suitable backplane provides its CPCI slots beginning with the CPU carrier board (CPCI system slot) from right to left. The CPCI system must provide additional mounting space to the right side for the CCO-CONCERT. In addition, a single slot rear I/O backplane would be needed for rear I/O usage, and a also custom specific rear I/O transition module.

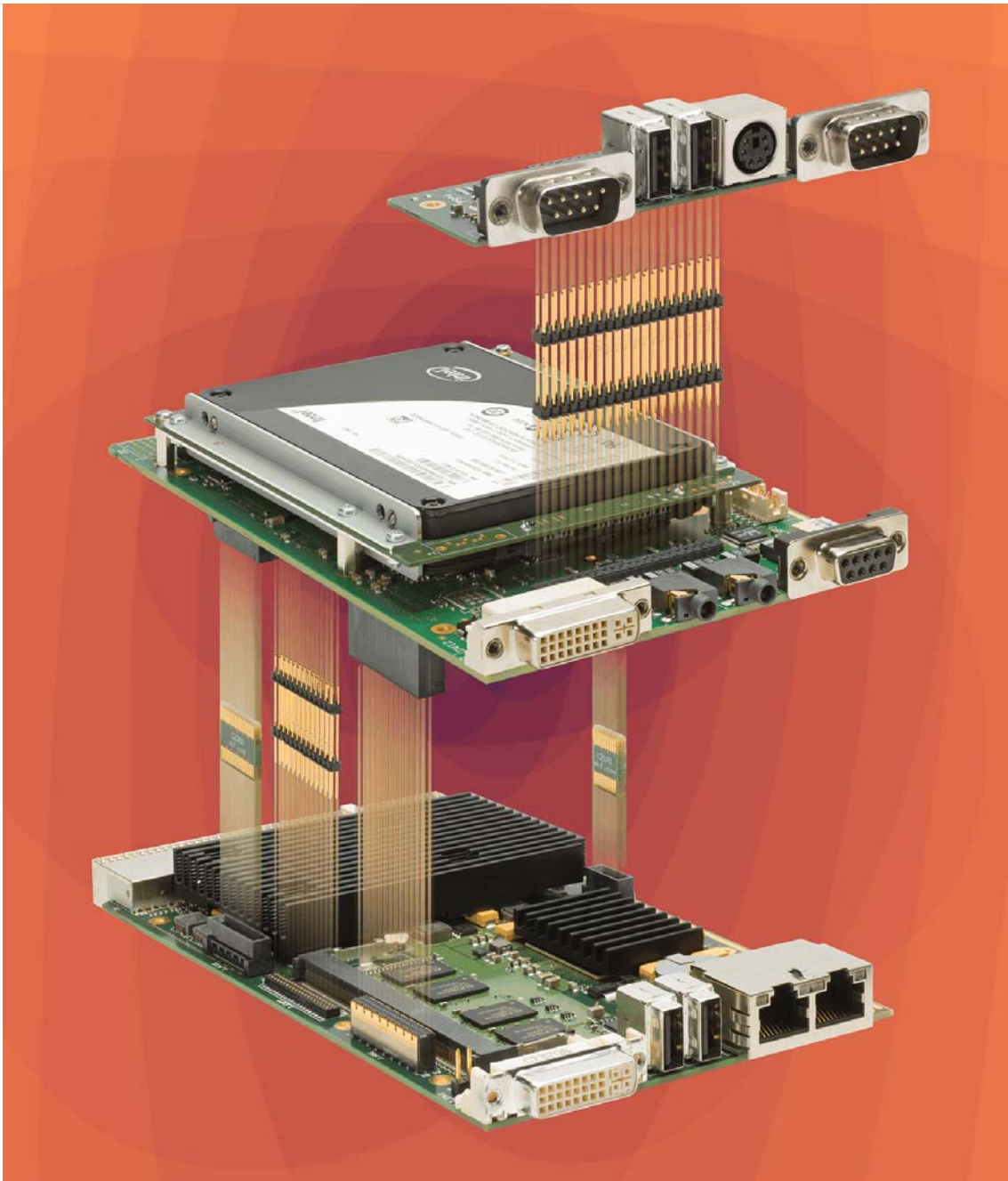


As of current, a suitable CPU carrier board for use together with the CCO-CONCERT mezzanine module is either the CCG-RUMBA, or its successor CCM-BOOGIE (recommended). The CCO-CONCERT expansion board mounts on top (at the right side) of the CPU carrier card. The CCG-RUMBA does not provide the J-HSE mezzanine connector, which requires redirecting of several SATA channels on the CCO-CONCERT to cope with this situation.

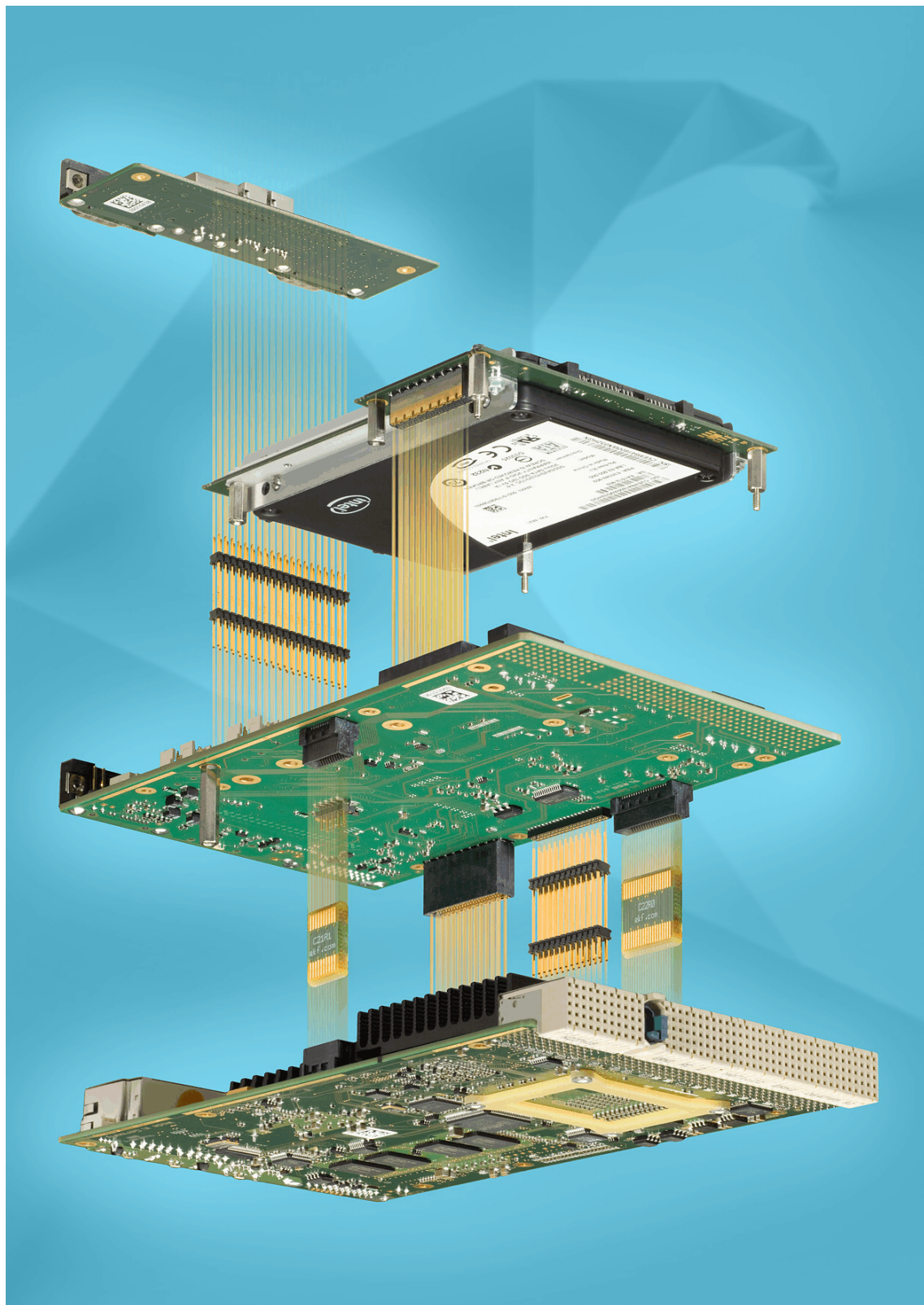
If the CompactPCI backplane is provided with a right aligned system slot, be sure to position the CPU carrier board to the rightmost CPCI slot (and not the CCO-CONCERT). Consequently, the CCO-CONCERT then occupies the next card slot to the right, outside of the CPCI backplane, which may be provided with a single slot rear I/O P1/P2 backplane. In order to make use of the rear I/O capability of the CCO-CONCERT, 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 in a system for the CCO-CONCERT.

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

The picture below illustrates a typical mezzanine stack, comprised of the CPU carrier board (shared front panel from 4HP to 12HP, individually tailored to customers configuration), the mezzanine side card (CCO-CONCERT), and a SATA storage module (either SSD or hard disk, 1.8-inch or 2.5-inch, dual or single drive, RAID option), and in addition the C32-FIO legacy front panel I/O.



CCM-BOOGIE with CCO-CONCERT, C20-SATA, C32-FIO

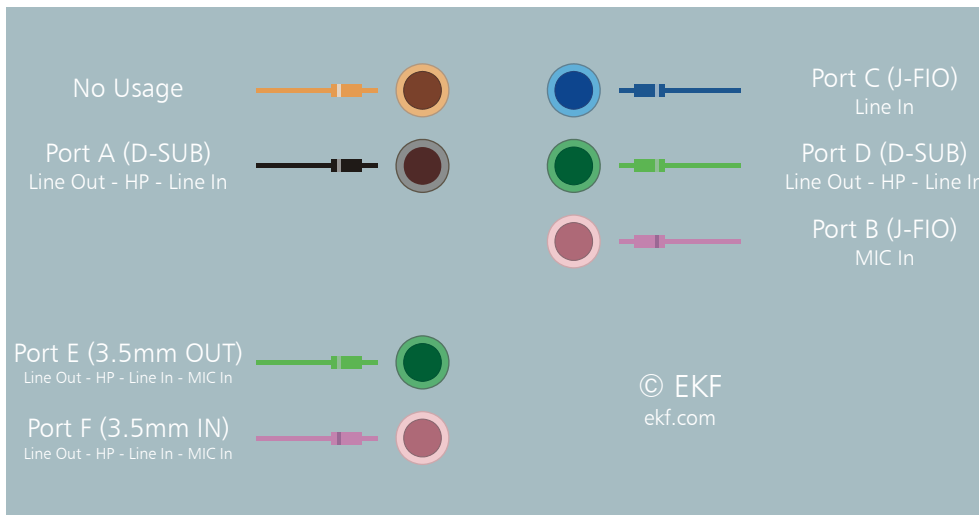


HD Audio Codec

The ALC262 is provided with several software configurable I/O cells. As well the 3.5mm front panel audio jacks, as the optional D-SUB front panel audio connector are provided with input- and output-capable channels. Additional expansion inputs are available across J-FIO (option). Microphone (MIC) capable inputs provide a bias voltage. Headphone (HP) outputs are buffered, with lower output resistance compared to straight line outputs (recommended also for long cables).

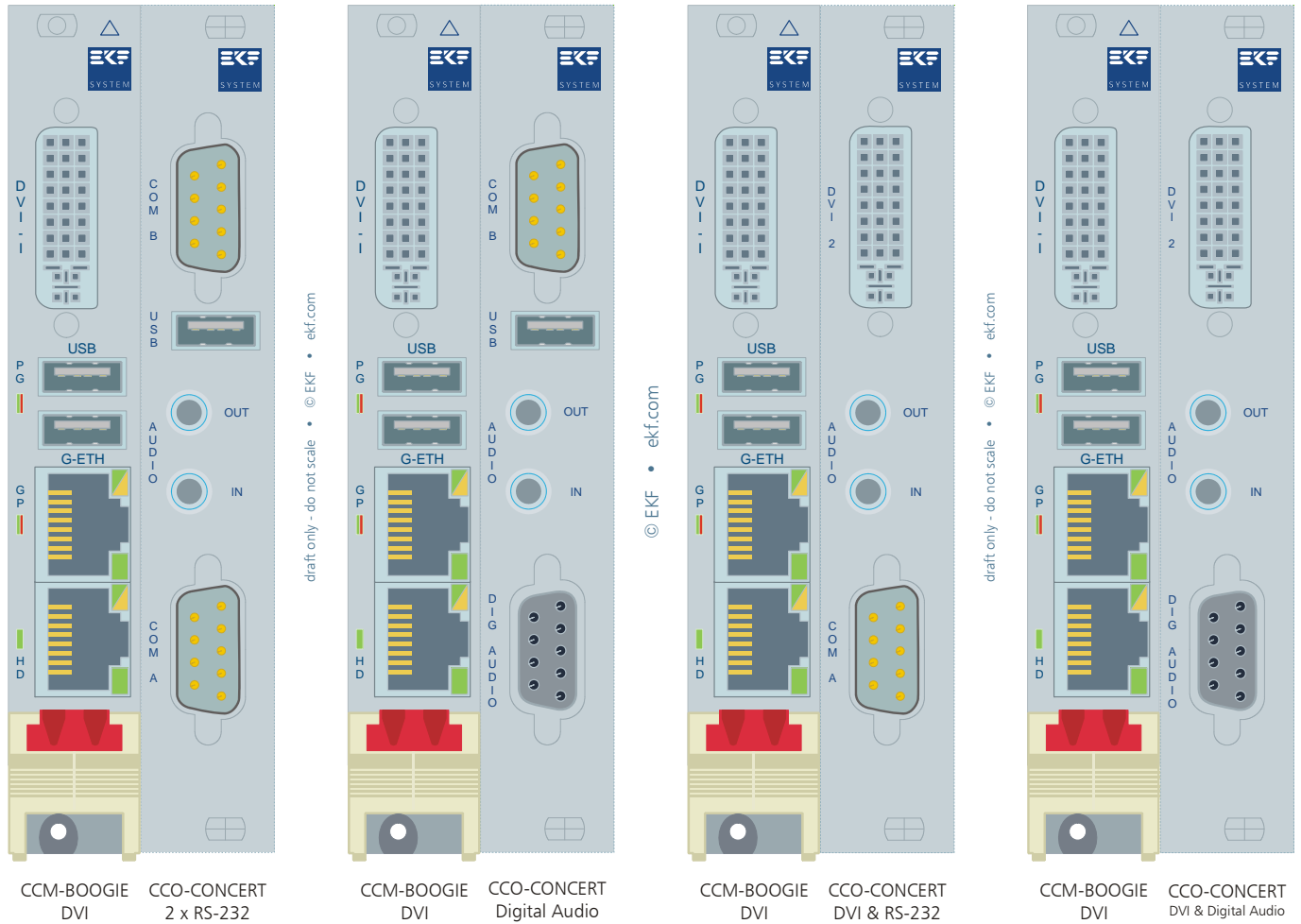
ALC262 Port Configurability					
Port	Name	LINE OUT / HP	LINE IN	MIC	Connector
A	HP	✓	✓		Dig. Audio
B	MIC1			✓	J-FIO
C	LINE1		✓		J-FIO
D	LINE-OUT	✓	✓		Dig. Audio
E	LINE2	✓	✓	✓	Audio Out
F	MIC2	✓	✓	✓	Audio In
	CD		✓		J-FIO
	S/PDIF				Dig. Audio J-FIO

The illustration below shows the Realtek Audio Manager (Windows), menu "Audio I/O". It allows to setup most ports adequately.



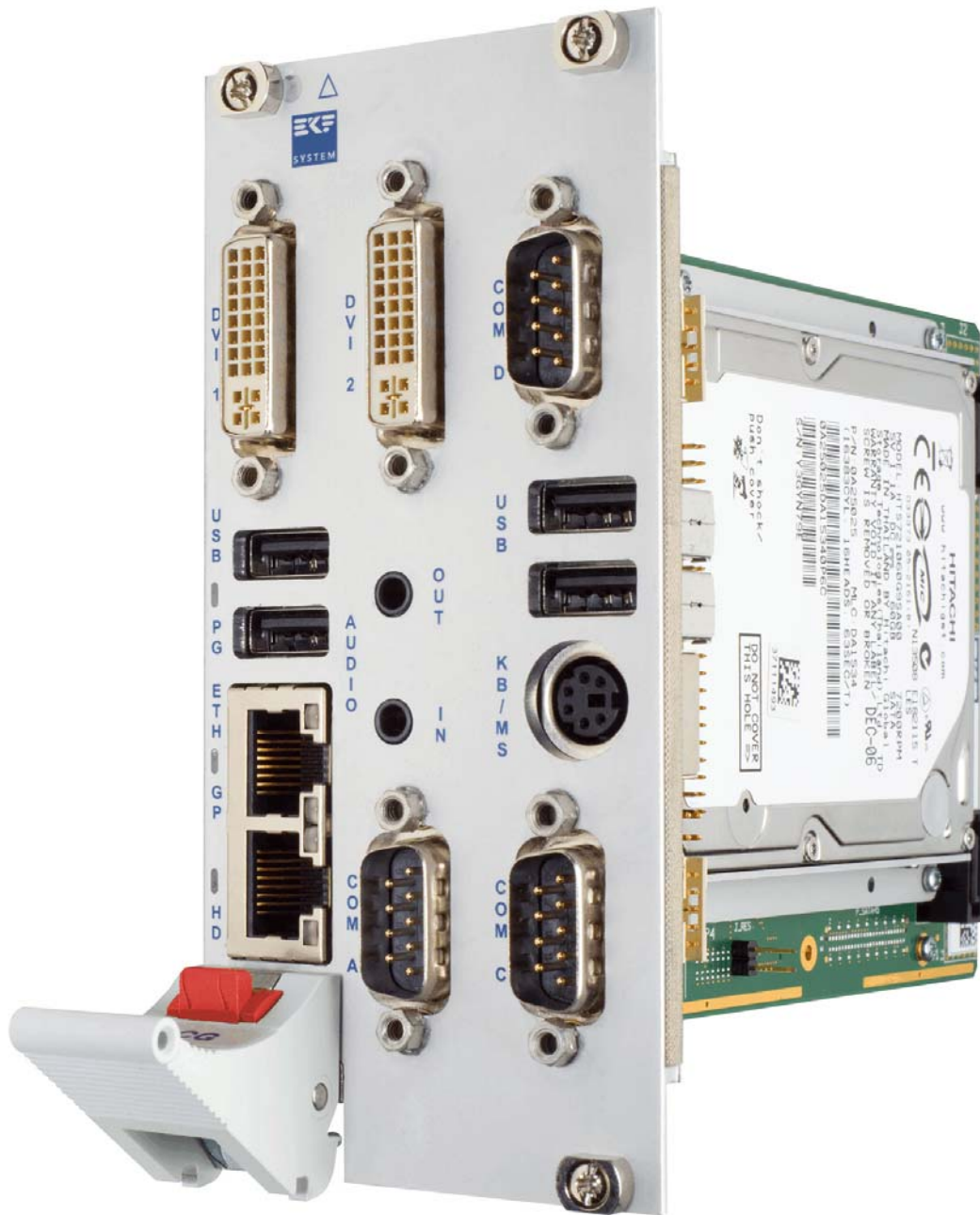
CCO-CONCERT
Realtek Audio Driver Analog Configurations

Front Panel Options

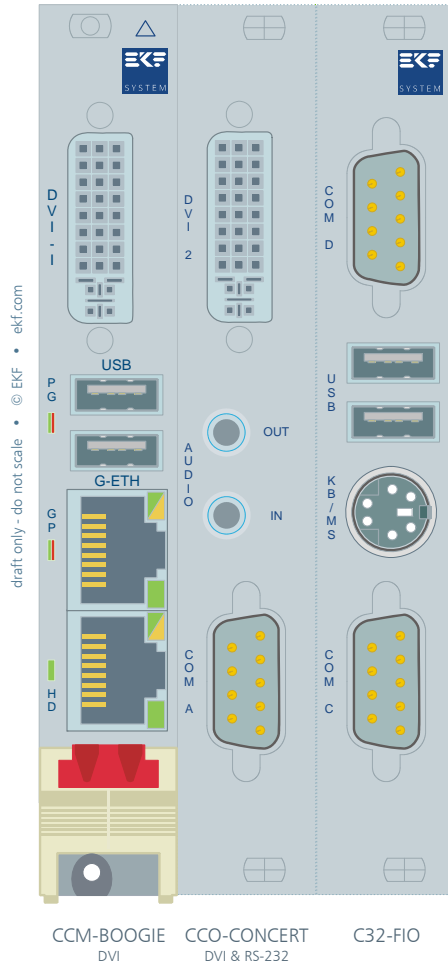


Typically the CCM-BOOGIE carrier board CPU and the CCO-CONCERT share a common 3U/8HP front panel. Not shown in the illustration above are variations of the CCM-BOOGIE (e.g. with VGA connector rather than DVI).

There may be reasons for further widening of the front panel (e.g. 12HP width); this would provide additional space e.g. for serial port connectors (CUX-series PHY modules, C32-FIO). Please discuss your needs for an individual solution with EKF.

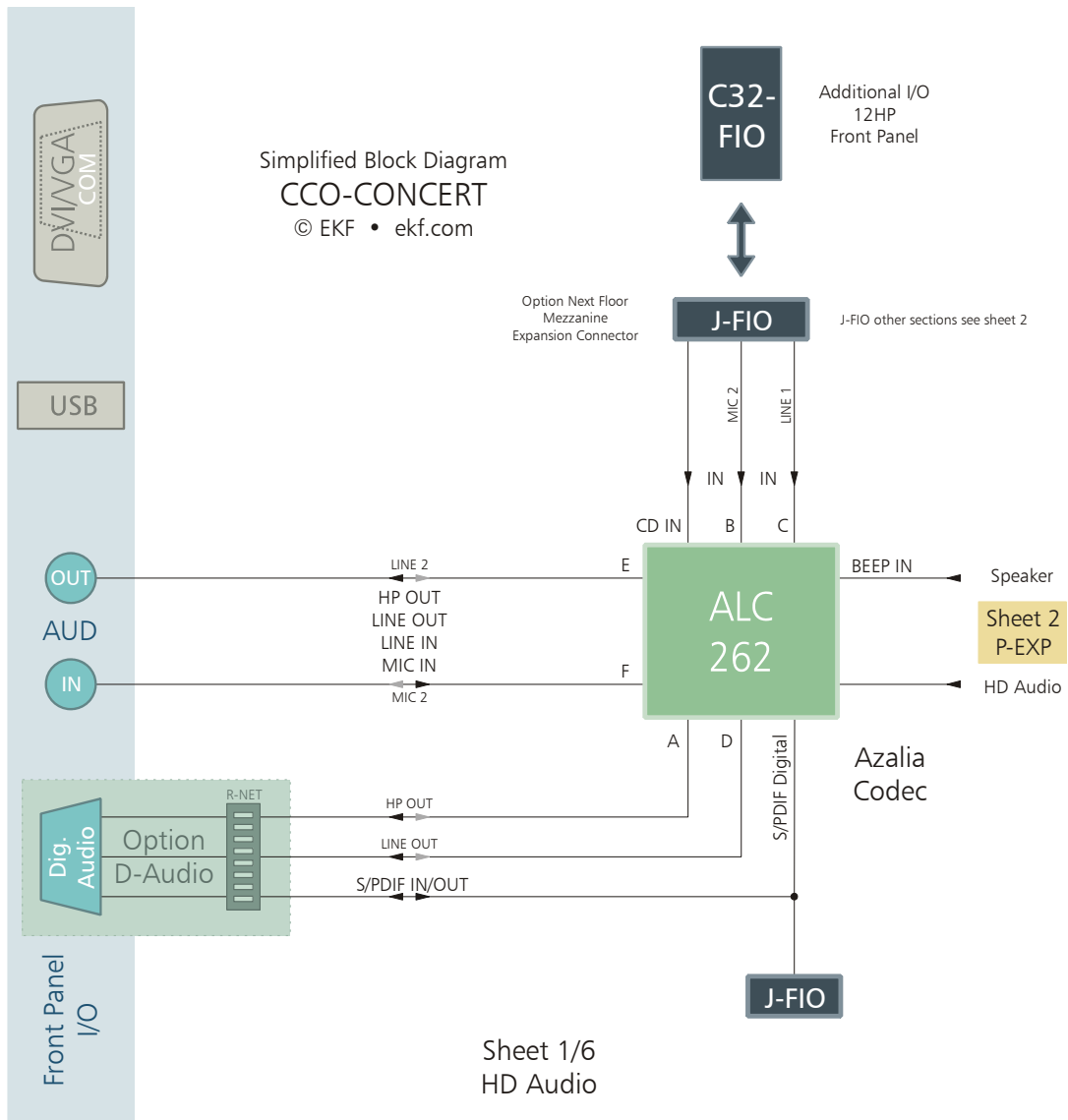


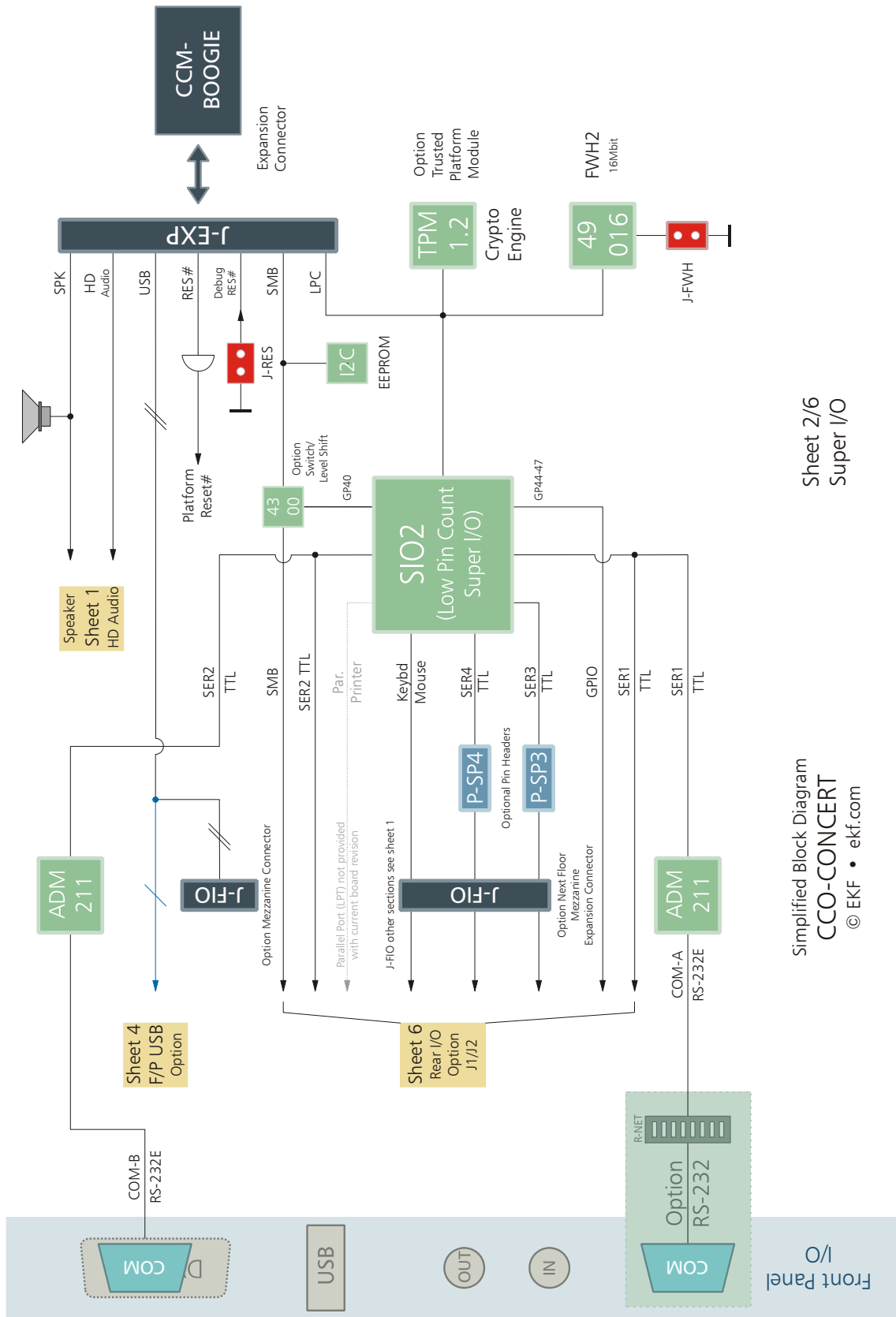
Typical 12HP Front Panel



When combined with the C32-FIO, a 12HP front panel is mandatory. The dimensions of the C32-FIO allow a C20-SATA dual drive storage module to be coexistent on a CCO-CONCERT, which requires 12HP assembly height as well.

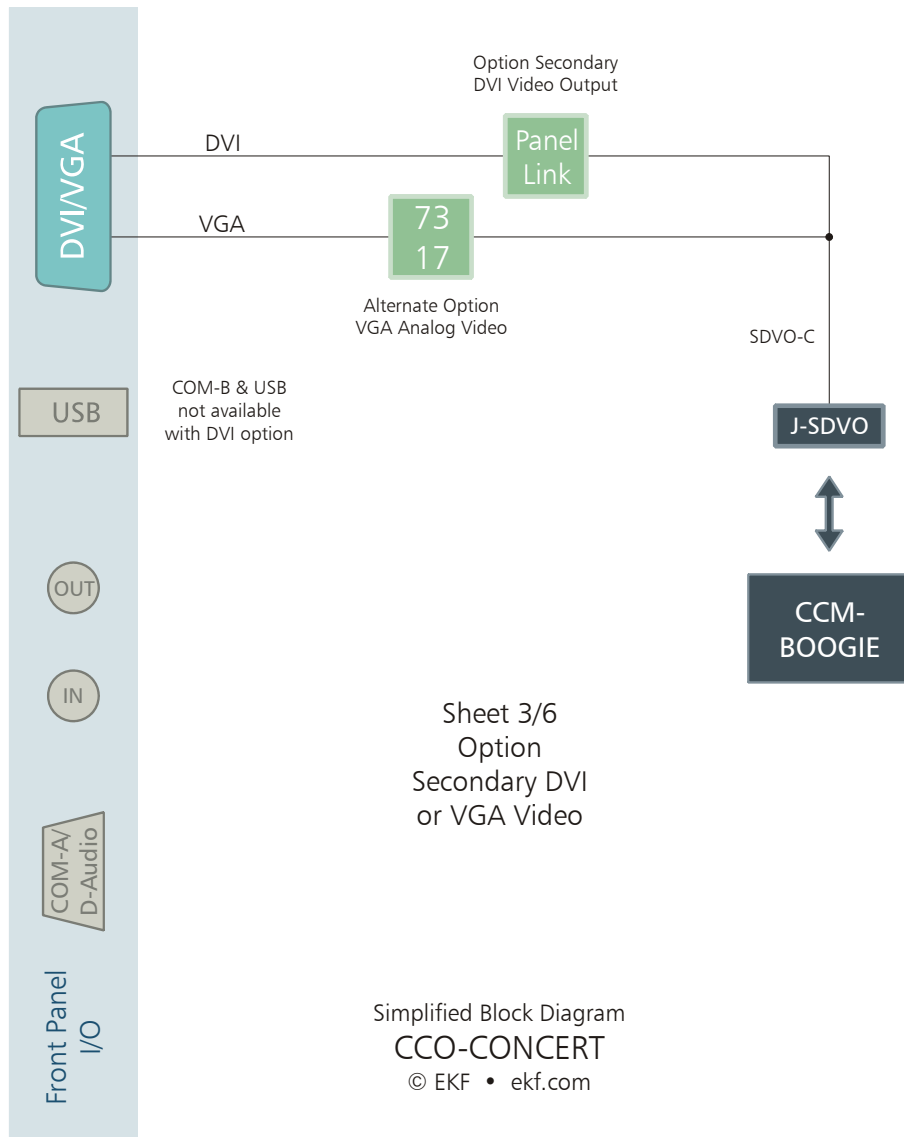
Block Diagram CCO-CONCERT

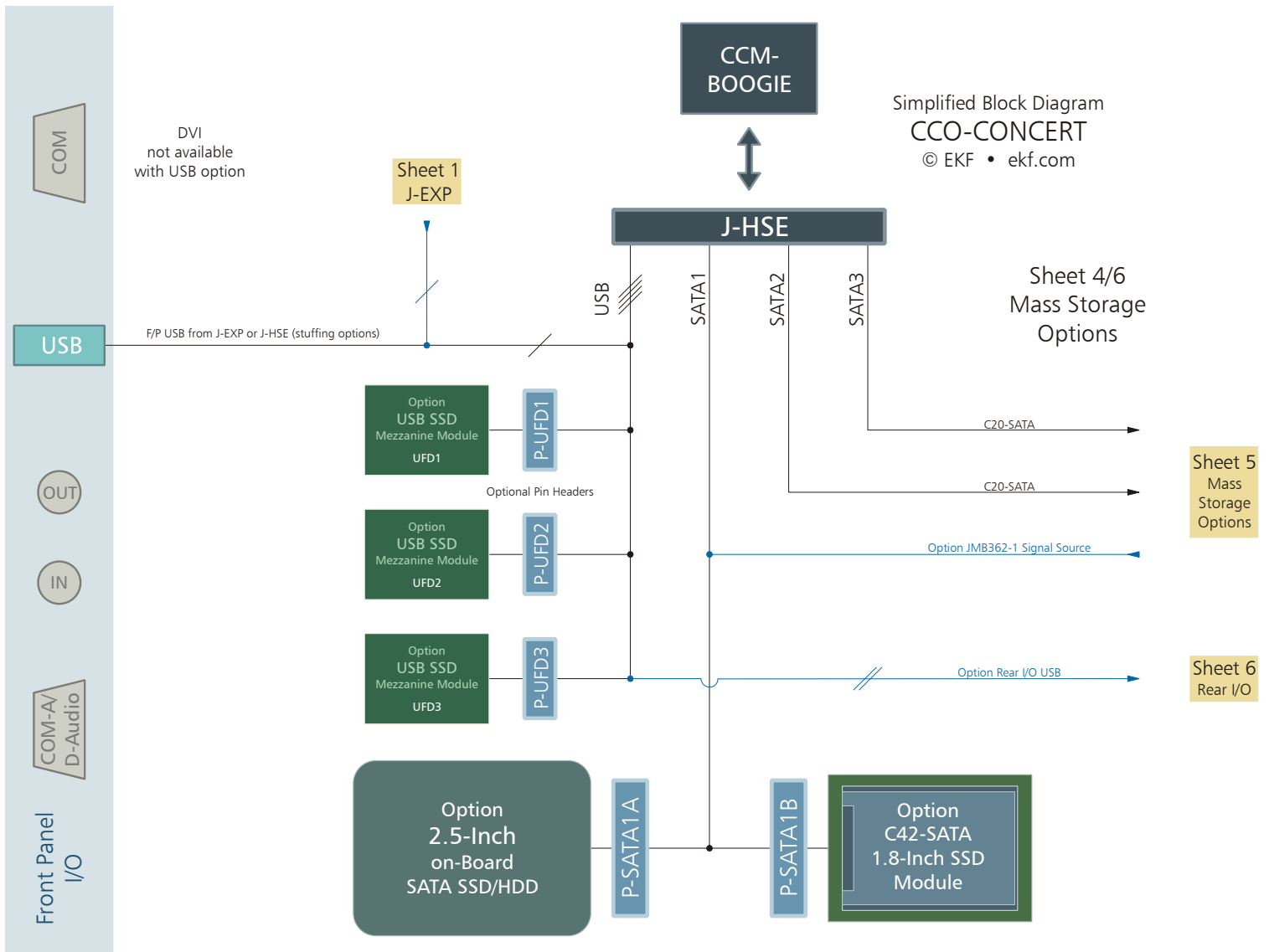




Sheet 2/6
Super I/O

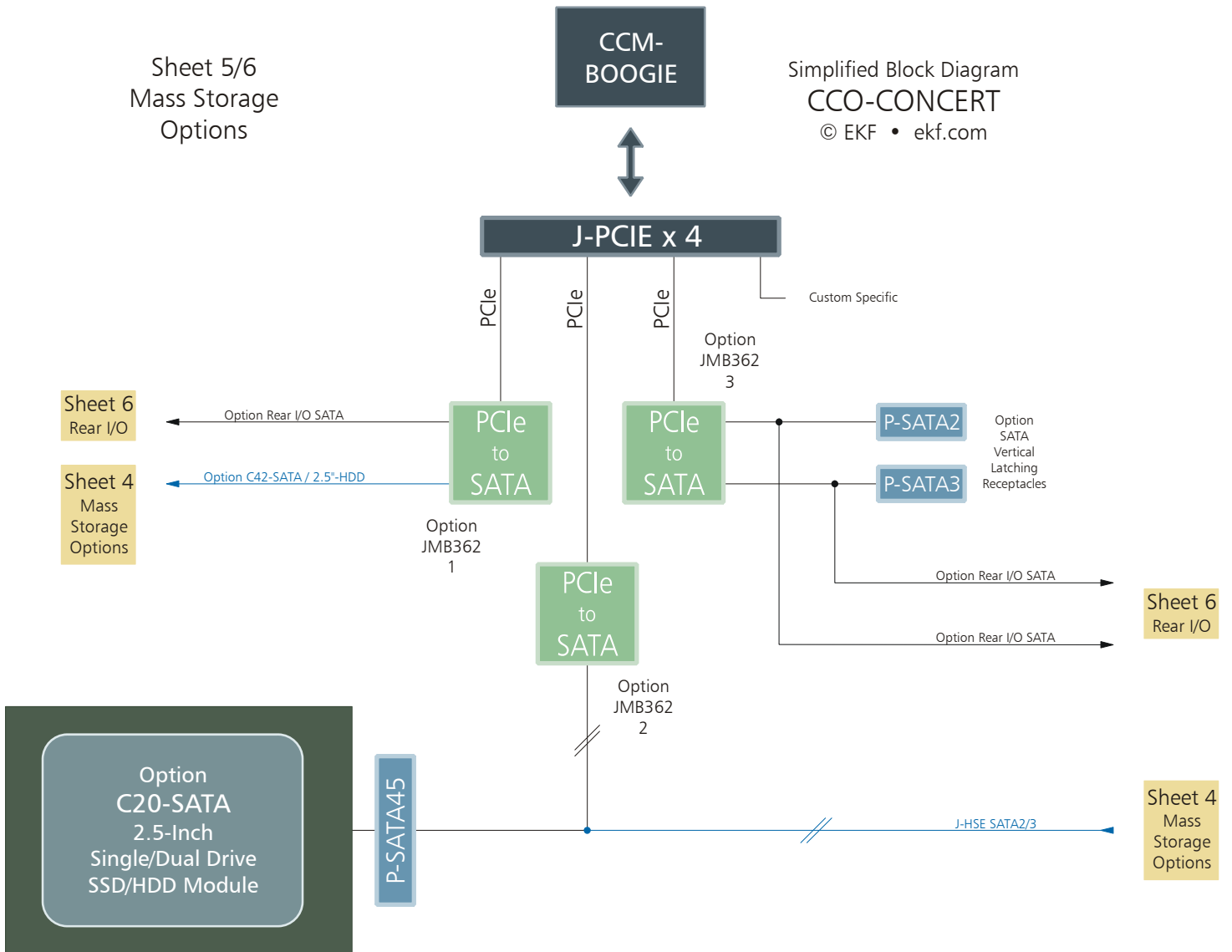
Simplified Block Diagram
CCO-CONCERT
© EKF • ekf.com





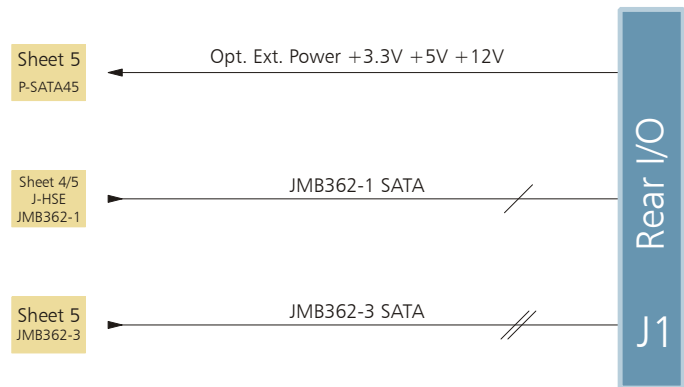
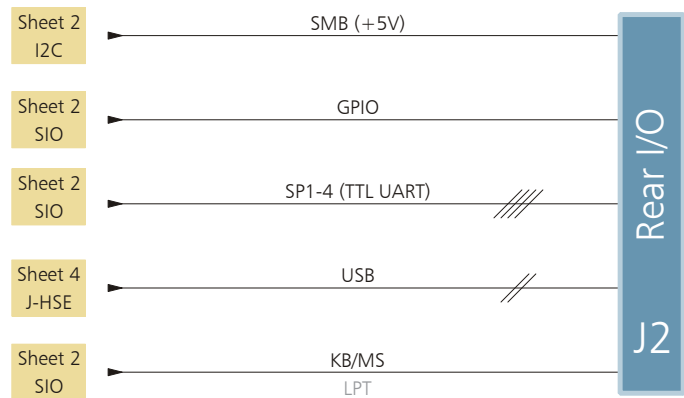
Sheet 5/6
Mass Storage
Options

Simplified Block Diagram
CCO-CONCERT
© EKF • ekf.com



Simplified Block Diagram
CCO-CONCERT
 © EKF • ekf.com

Sheet 6/6
 Rear I/O
 Options



Feature Summary

Feature Summary	
Form Factor	Single size Eurocard (160x100mm ²), needs 4HP (20.3mm) mounting space in addition to CPU carrier board, typically delivered as a ready to use assembly unit (including the CCM-BOOGIE or successor CPU card), provided with a common 8HP front panel shared with the CPU board (12HP together with C32-FIO), mounting position right (on top of CPU board)
PCIe Usage	<ul style="list-style-type: none"> Up to 3 lanes in use from J-PCIE host I/F mezzanine connector, dedicated to SATA controllers
SATA Ressources	<ul style="list-style-type: none"> Up to 3 SATA channels derived from inter-board mezzanine connector J-HSE Up to 6 SATA channels generated by on-board SATA controllers
SATA Mass Storage Options ² (on-board)	<ul style="list-style-type: none"> SATA 2.5-inch SSD (solid state drive) or HDD (hard disk) on-board C20-SATA mezzanine storage module, 2.5-inch single or dual drive(s) ⁵ C42-SATA mezzanine storage module, 1.8-inch SSD C40-SCFA mezzanine storage module, SATA to CompactFlash bridge
External SATA ^{1 2}	<ul style="list-style-type: none"> Up to 2 SATA receptacles (vertical latching connectors) ⁵ Up to 3 x rear I/O SATA channels
SATA Controllers ³ (on-board)	<ul style="list-style-type: none"> Up to three JMB362 PCIe to 2 x SATA II on-board controllers provided, assigned to either on-board storage devices, and/or as external and rear I/O SATA channels, various stuffing configuration options RAID level 0/1 capable, drivers RAID or non-RAID Latest drivers available from JMicron ftp://driver.jmicron.com.tw/jmb36x/
Video Display Options ²	<ul style="list-style-type: none"> SDVO to DVI transmitter, DVI-I front panel video connector digital section SDVO to VGA transmitter, DVI-I front panel video connector analog section Dual screen video capable in combination with primary DVI-I video output on CPU carrier board SDVO-C channel derived from CPU carrier board across mezzanine connector J-SDVO Intel graphics drivers
Audio Codec ³	<ul style="list-style-type: none"> Realtek ALC 262 Azalia HD Audio Codec Two front panel stereo audio jacks input and output (free configurable) Option S/PDIF digital audio and analog audio via D-SUB front panel connector ¹ Latest drivers available from Realtek www.realtek.com.tw
USB	<ul style="list-style-type: none"> Up to 6 USB channels derived from CPU carrier board J-EXP (2) and J-HSE (4) Up to 3 USB SSD on-board mezzanine storage modules ² Front Panel USB receptacle ² Another two USB front panel jacks available with C32-FIO mezzanine board
LPC Super-I/O ³ (SIO2, Legacy Ports)	<ul style="list-style-type: none"> SCH3114, 4 serial ports, PS/2 keyboard & mouse port, GPIO Up to 2 x RS-232 COM ports available via front panel connectors ¹ Up to 2 serial ports (TTL-level) optionally available for attachment of EKF CU-Series PHY modules, or C32-FIO front panel I/O mezzanine module C32-FIO is provided with 2 x RS-232 D-SUB and PS/2 KB/MS Mini-DIN connectors in addition to CCO-CONCERT front panel connectors
Serial Transceivers ³	<ul style="list-style-type: none"> Up to 2 x ADM211 or equivalent EIA/TIA-232E (RS-232E) 230kbps max.
Firmware Hub ³ (FWH2)	<ul style="list-style-type: none"> 82802 generic device, 8/16Mbit Flash, LPC interface, can be configured (jumper) as secondary or primary (boot code) FWH, provided for recovering carrier board BIOS or as custom data storage
TPM ³	<ul style="list-style-type: none"> Option Trusted Platform Module cryptographic chip according to TPM 1.2 Choice between several chip manufacturers
Front Panel Connectors ^{1 2}	<ul style="list-style-type: none"> COM-A COM-B up to 2 x RS-232 (COM-A may be replaced by D-AUDIO, COM-B may be replaced by DVI Video) AUDIO-IN AUDIO-OUT 2 x 3.5mm audio jacks, by default headphones out and microphone in (software configurable) D-AUDIO Digital audio female D-SUB connector (if present, replaces COM-A RS-232) DVI Video connector, either digital video output (DVI-D signals), or (exclusive) analog video output (signals on cross-hair section DVI-I, DVI to VGA HD D-SUB adapters available), if DVI connector is present, it replaces the COM-B RS-232 connector USB receptacle (not available together with the DVI connector, due to space constraints)
Host I/F Connectors (to CPU Carrier) ¹	<ul style="list-style-type: none"> J-PCIE PCI Express interface (PCIe x 4) J-EXP Multifunction expansion interface (LPC, USB, SMB) J-SDVO Video interface J-HSE High speed expansion port (3 x SATA, 4 x USB)

On-Board I/O Connectors ^{1 2}	<ul style="list-style-type: none"> ▶ <i>P-SATA1A</i> Docking connector for 2.5-inch on-board drive (P-SATA1A is exclusive to P-SATA1B) ▶ <i>P-SATA1B</i> Mezzanine connector for C42-SATA 1.8-inch SSD storage module or C40-SCFA CompactFlash module (P-SATA1B is exclusive to P-SATA1A) ▶ <i>P-SATA2 P-SATA3</i> Latched SATA headers 7-pos. (option)⁵ ▶ <i>P-SATA45</i> Connector for mounting of an optional C20-SATA mezzanine card with 1 or 2 SATA drives 2.5-inch (RAID capable)⁵ ▶ <i>P-UFD1 P-UFD2 P-UFD3</i> Up to 3 headers suitable for USB Solid State Drive (SSD) module (top & bottom mount) ▶ <i>P-SP3 P-SP4</i> Serial port headers (TTL-level) ▶ <i>J-FIO</i> Mezzanine expansion socket for attachment of the C32-FIO next floor mezzanine module (12HP assembly in total inclusive CPU carrier board) ▶ <i>J-RES</i> Reset
Rear I/O Connector Option ¹	Optional <i>J1/J2</i> 2.0mm hard metric connectors (CompactPCI style with proprietary signal mapping) for custom specific transition module or backplane, major signal groups: <ul style="list-style-type: none"> ▶ COM ports 1 - 4 (TTL-level UART signals) ▶ PS/2 keyboard & mouse ▶ GPIO ▶ SMBus ▶ Parallel Port (LPT) ▶ SATA rear I/O option ▶ USB rear I/O option
On-Board Functions	Speaker, LEDs, SMBus EEPROM, temperature sensors
Thermal Conditions ⁴	<ul style="list-style-type: none"> ▶ Operating temperature: 0°C ... +70°C ▶ Storage temperature: -40°C ... +85°C, max. gradient 5°C/min
Environmental Conditions	<ul style="list-style-type: none"> ▶ Humidity 5% ... 95% RH non condensing ▶ Altitude -300m ... +3000m ▶ Shock 15g 0.33ms, 6g 6ms ▶ Vibration 1g 5-2000Hz
EC Regulations	<ul style="list-style-type: none"> ▶ 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 CCO-CONCERT board. Assembly of these connectors is highly custom specific. Discuss your needs with EKF before ordering.

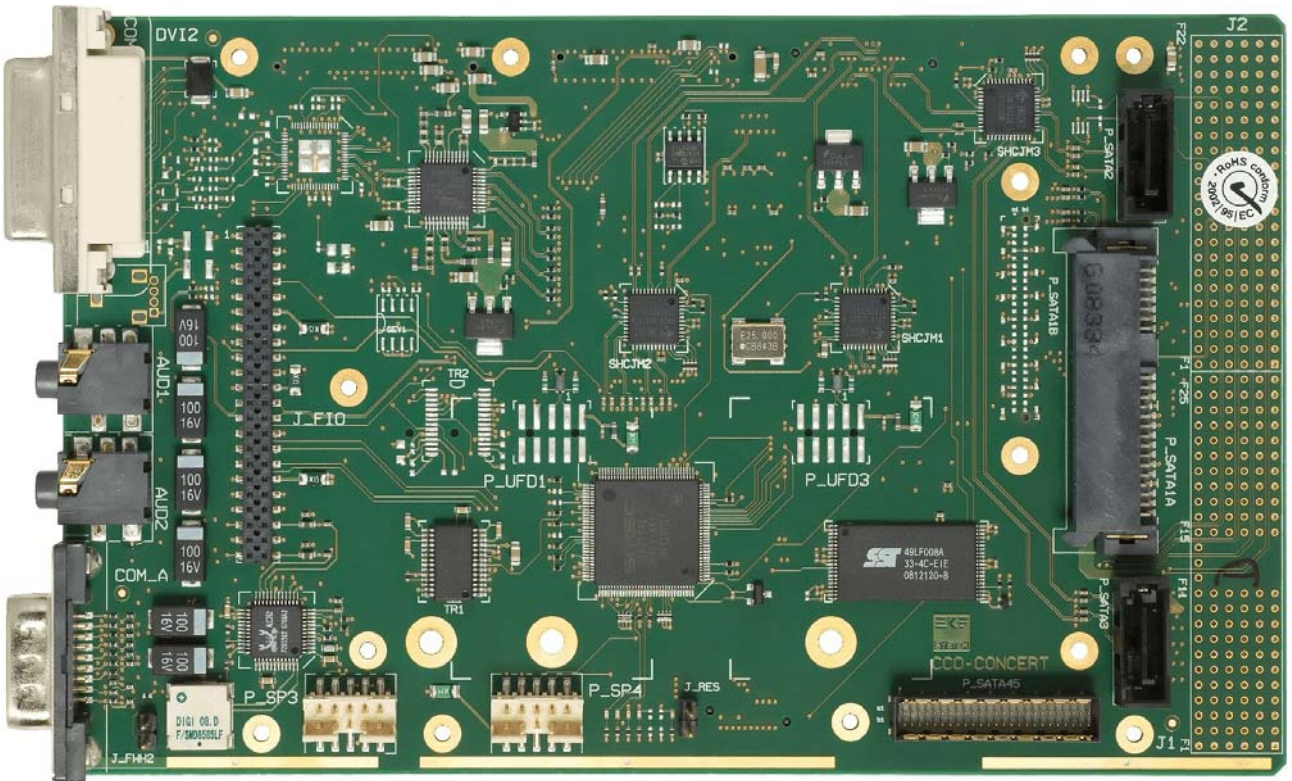
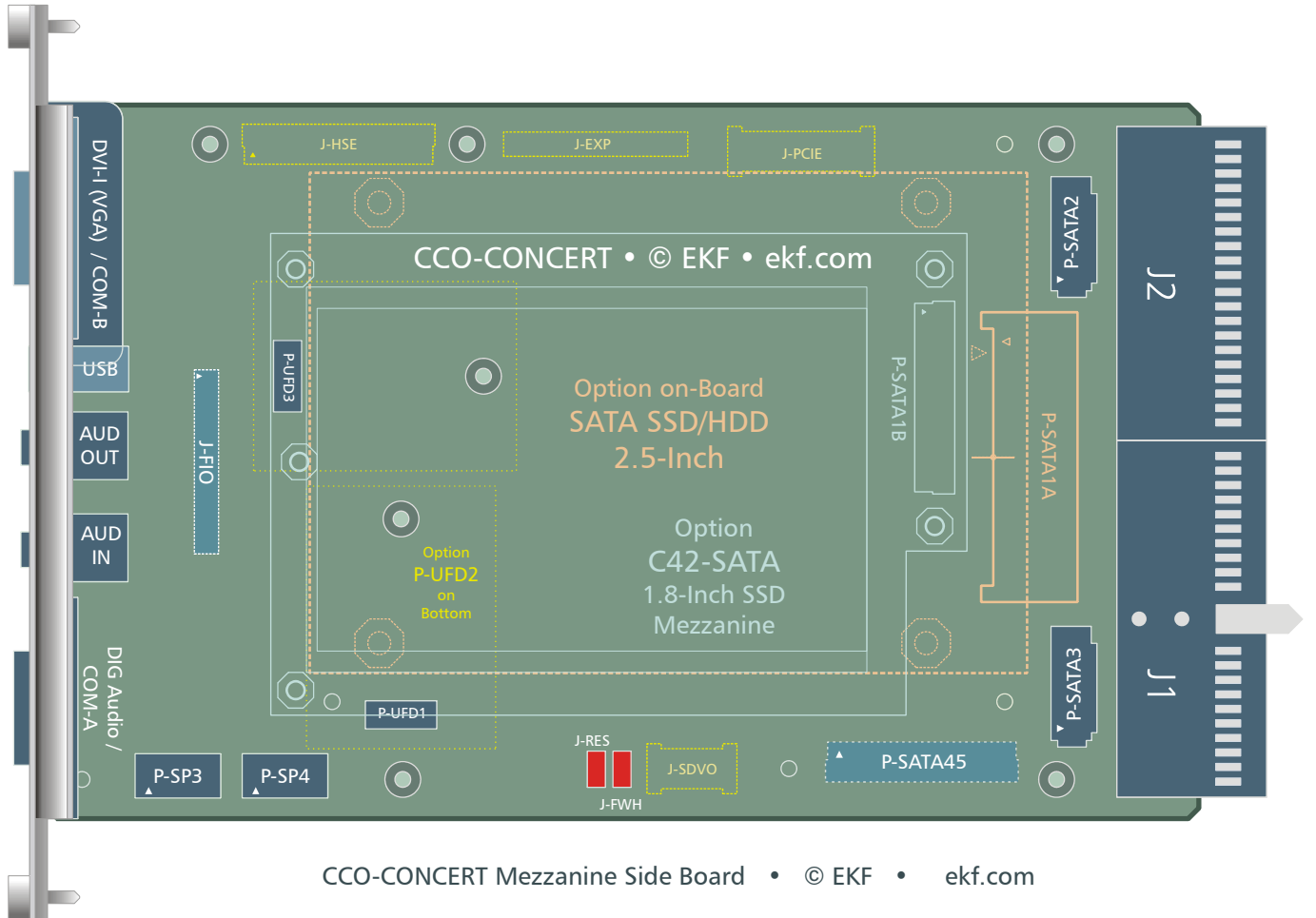
² Options may be exclusive, i.e. not necessarily concurrently present. Ask EKF for special solutions if required.

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

⁴ Hard disk option may require decrease

⁵ Option may exceed the 4HP envelope of the CCO-CONCERT, resulting in a 10HP or 12HP assembly stack

Top View Component Assembly CCO-CONCERT





CCG-RUMBA with CCO-CONCERT and C32-FIO



CCM-BOOGIE with CCO-CONCERT, C20-SATA and C32-FIO



PC1-GROOVE with CCO-CONCERT

Front Panel Connectors

AUDIO-OUT	3.5mm stereo audio jack, analog audio, software configurable (default = HP output)
AUDIO-IN	3.5mm stereo audio jack, analog audio, software configurable (default = MIC input)
COM-A ¹	male D-SUB 9-position, RS-232E (exclusive to Digital Audio connector)
COM-B ¹	male D-SUB 9-position, RS-232E (exclusive to DVI connector)
DIG-AUDIO	female D-SUB 9-position, S/PDIF (exclusive to COM-A connector)
USB	USB Type A receptacle (exclusive to DVI connector)
DVI	DVI-I video connector (exclusive to USB and COM-B connectors)

On-Board Connectors

P-SATA1A	SATA Docking connector, suitable for on-board 2.5-inch SATA SSD/HDD (exclusive to P-SATA1B)
P-SATA1B	Mezzanine connector, suitable for C42-SATA (1.8-inch SSD) or C40-SCFA (CompactFlash) storage module (exclusive to P-SATA1A)
P-SATA2 P-SATA3	Vertical latched SATA headers, 7-position, for attachment of additional SATA devices by cable assembly, stuffing option
P-SP3 ¹ P-SP4	Pin headers 10-lead 2.00mm, provide TTL level serial COM port signals (CU-series modules)
P-UFD1 ²	Socket (top mount) 10-lead 2.00mm pitch, for low profile USB SSD (Solid State Drive)
P-UFD2 ²	Socket (bottom mount) 10-lead 2.00mm pitch, for low profile USB SSD (Solid State Drive)
P-UFD3 ²	Socket (top mount) 10-lead 2.00mm pitch, for low profile USB SSD (Solid State Drive)

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 CCO-CONCERT, e.g. COM2/COM3/COM4/COM5.

² USB channel shared (stuffing option) with J2 for rear I/O

Jumpers

J-FWH	Jumper 2.54mm, determines if the optional on-board firmware hub is acting as boot BIOS (jumper set) or as secondary BIOS (jumper removed = default).
J-RES	Jumper 2.54mm, allows to force a CPU debug reset on the CCM-BOOGIE CPU carrier board

Please note:

Not all of the connectors or other elements listed above may be present or functional on your actual CCO-CONCERT board. Assembly of these connectors is highly custom specific. Discuss your needs (target application) with EKF before ordering, for an optimum board configuration.

Inter-Board Connectors (Host)

J-EXP	Dual row socket, available from bottom of the CCO-CONCERT PCB, matching with the corresponding socket on the CPU carrier board, connected through a board stacker, comprised of: <ul style="list-style-type: none"> ▶ LPC Low Pin Count interface ▶ HD Audio (Azalia) ▶ 2 x USB ▶ SMB, Speaker, Reset
J-HSE ¹	High speed mezzanine connector, available from bottom of the CCO-CONCERT PCB, matching with the corresponding connector on the CPU carrier board, comprising of: <ul style="list-style-type: none"> ▶ Host CPU (ICH9) SATA (single channel) ▶ Host CPU (JMB362) SATA dual channel) ▶ Host CPU (ICH9) 4 x USB
J-PCIE ¹	High speed socket edge card connector, available from bottom of the CCO-CONCERT PCB, matching with the corresponding socket on the CPU carrier board, connected through a high speed strip line PCB (C22), comprising of: <ul style="list-style-type: none"> ▶ Host CPU (ICH8, ICH9) PCI Express (PCIe) x 4 interface
J-SDVO ¹	High speed mezzanine connector, available from bottom of the CCO-CONCERT PCB, matching with the corresponding connector on the CPU carrier board, comprising of: <ul style="list-style-type: none"> ▶ SDVO-C Serial Digital Video Out, from host CPU GMCH (Intel chipset graphics)

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

Inter-Board Connector (C32-FIO)

J-FIO	Dual row socket 2.00mm, on top of the CCO-CONCERT PCB, matching with the corresponding socket on the C32-FIO next floor expansion board, connected through a board stacker, comprised of: <ul style="list-style-type: none"> ▶ Serial (UART) ports 3-4 ▶ 2 x USB ▶ PS/2 keyboard/mouse ▶ Analog and digital audio (not in use on C32-FIO)
-------	---

Rear I/O Connectors

J1 ²	2.00mm brown keyed Hard Metric female connector, signal groups SATA rear I/O option
J2 ²	2.00mm Hard Metric female connector, signal groups GPIO, parallel port, serial ports (TTL-level signals), USB, SMB (+5V), speaker

² J1/J2 are optional

Please note:

Not all of the connectors or other elements listed above may be present or functional on your actual CCO-CONCERT board. Assembly of these connectors is highly custom specific. Discuss your needs (target application) with EKF before ordering, for an optimum board configuration.

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 any telecommunication links, networks or procedures described in this chapter. Failure links before you open the system or perform or equipment damage. Some parts of the the power switch is in its off state.



the system from its power source and from modems before performing any of the to disconnect power, or telecommunication any procedures can result in personal injury system can continue to operate even though

Caution

Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation. If such a some ESD protection by wearing an metal part of the system chassis or board original ESD protected packaging. Retain the antistatic box) in case of returning the board to EKF for repair.



station is not available, you can provide antistatic wrist strap and attaching it to a front panel. Store the board only in its original packaging (antistatic bag and

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 assembly 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 neighbored 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 any front panel screws (top/bottom), unlock the ejector lever
- Remove any onboard cabling assembly
- Activate the ejector lever
- Remove the card assembly carefully (be sure not to damage components mounted on the bottom side of the board by scratching neighbored front panels)
- Store board in the original packaging, do not touch any components, hold the board at the front panel only



Warning

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





EMC Recommendations

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

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

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. CDFSFA 09 165 X 13129 X (DB9) CDFSFA 15 165 X 12979 X (DB15) CDFSFA 25 165 X 12989 X (DB25)

Technical Reference - Connectors

Caution

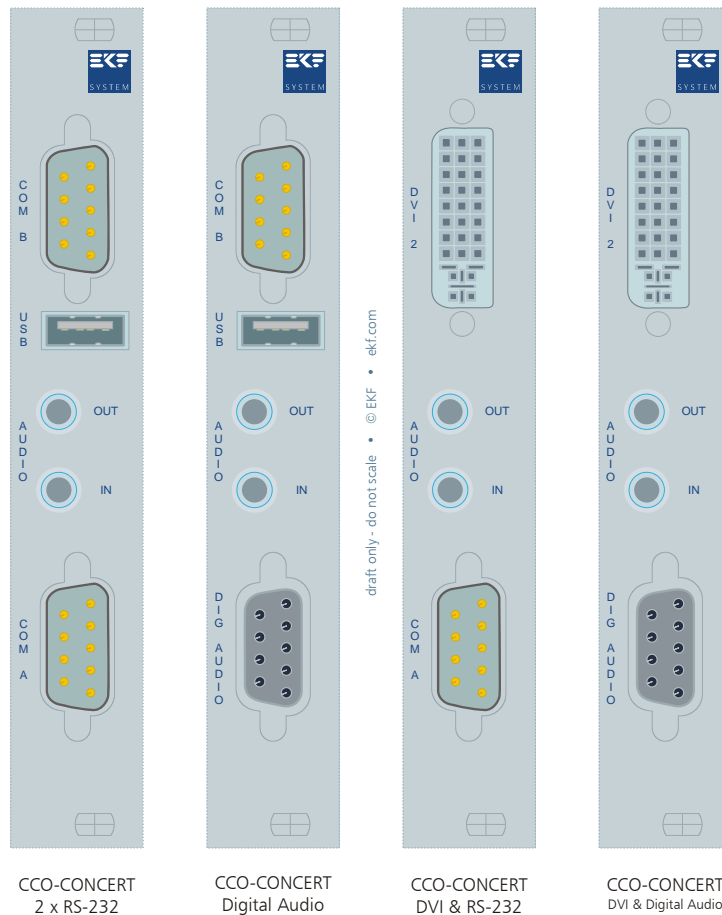
Some of the connectors may provide operating voltage (e.g. +12V, +5V and +3.3V) to devices inside the system chassis, such as internal peripherals. Not all of these connectors are overcurrent protected. Do not use these connectors for powering devices external to the computer chassis. A fault in the load presented by the external devices could cause damage to the board, the interconnecting cable and the external devices themselves.

Please Note

The CCO-CONCERT 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 CCO-CONCERT 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', 'inter-board connectors', and 'rear I/O connectors').

Front Panel Connectors

As of current, the suitable CPU carrier board for use together with the CCO-CONCERT mezzanine module is the CCM-BOOGIE. The CCO-CONCERT side board mounts on top (at the right side) of the CCM-BOOGIE. By default, the CCO-CONCERT 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 variants of the CCO-CONCERT (illustration w/o CCM-BOOGIE front panel).



As can be seen, the DVI connector is exclusive to COM-B and USB, and the D-Audio connector is exclusive to COM-A. The USB connector is associated to J-HSE (not functional or available with CCG-RUMBA CPU carrier board).

AUDIO-OUT	3.5mm stereo audio jack, analog audio, software configurable (default = HP output)
AUDIO-IN	3.5mm stereo audio jack, analog audio, software configurable (default = MIC input)
COM-A ¹	male D-SUB 9-position, RS-232E (exclusive to Digital Audio connector)
COM-B ¹	male D-SUB 9-position, RS-232E (exclusive to DVI connector)
DIG-AUDIO	female D-SUB 9-position, S/PDIF (exclusive to COM-A connector)
USB	USB Type A receptacle (exclusive to DVI connector)
Video (DVI)	DVI-I video connector (exclusive to USB and COM-B connectors)



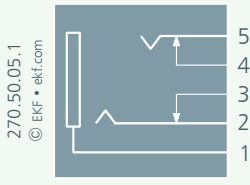
CCO-CONCERT 2xRS232 Option

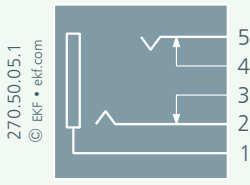
AUDIO IN/OUT Audio Jacks

The CCO-CONCERT 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 Intel Azalia HDA link. Two 3.5mm stereo audio jacks are available from the CCO-CONCERT 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 ≥ 32 Ohms. Other configurable options are line in and line out. The typical full scale input voltage is $1.5V_{rms}$ (input resistance $\geq 10k\Omega$), and the typical full scale output voltage is $1.4V_{rms}$ (10 k Ω / 50pF external load).

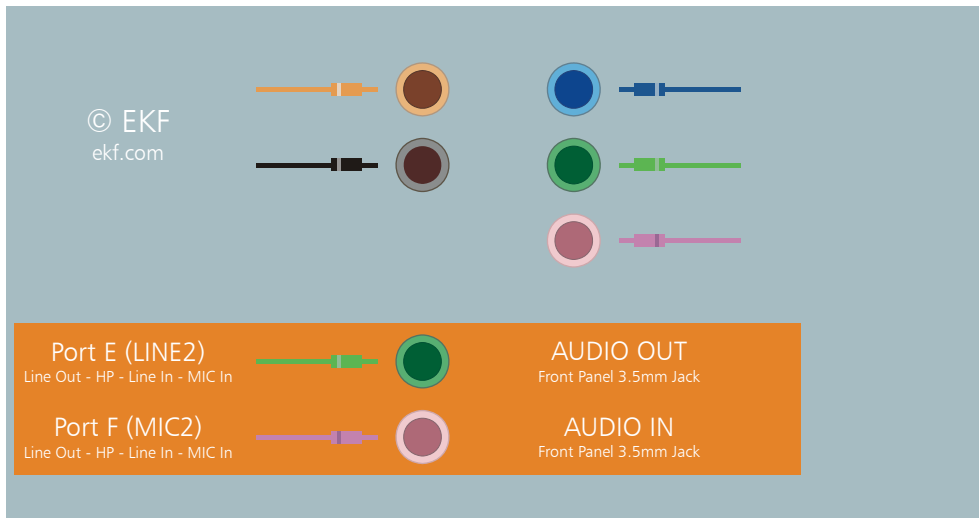
The difference between headphones out mode and line out mode is mainly the low output impedance of 1 Ohm when in HP mode, compared to 200 Ohms in line out mode. This is also useful for noise immunity when long external audio cables are required. For optimum THD however chose line out mode.

AUDIO OUT Stereo Audio Jack 3.5mm 270.50.05.1 Front Panel		
HeadPhones Out		
 <p>270.50.05.1 © EKF • ekf.com</p> <p>Stereo Audio Jack 3.5mm</p>	1	AGND
	2	ALC262 Port E Input/Output Signal Right
	3	AGND
	4	AGND
	5	ALC262 Port E Input/Output Signal Left

AUDIO IN Stereo Audio Jack 3.5mm 270.50.05.1 Front Panel		
MIC In		
 <p>270.50.05.1 © EKF • ekf.com</p> <p>Stereo Audio Jack 3.5mm</p>	1	AGND
	2	ALC262 Port F Input/Output Signal Right
	3	AGND
	4	AGND
	5	ALC262 Port F Input/Output Signal Left

ALC262 Port Configurability - 3.5mm Audio Jacks					
Port	Name	LINE OUT / HP	LINE IN	MIC	Connector
E	LINE2	✓	✓	✓	Audio Out
F	MIC2	✓	✓	✓	Audio In

The assignment of input or output to the audio jacks is highly ambiguous, due to the software configurable ports E and F of the ALC262. For details of the ALC262 and latest HD Audio driver software, please refer to www.realtek.com.tw.



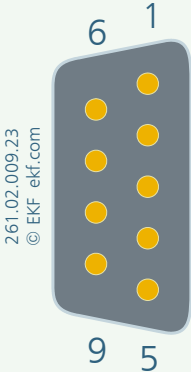
CCO-CONCERT

Realtek Audio Driver Analog Configurations - Front Panel Stereo Jacks 3.5mm

COM-A/COM-B Serial Port Connectors

The on-board secondary Super-I/O (SIO) on the CCO-CONCERT provides four asynchronous serial interfaces, two of them available from the front panel (EIA/TIA 232). The other two (TTL-level) are available either as on-board pin headers, or at the J2 rear I/O connector, or can be used across J-FIO on the C32-FIO mezzanine board.

Due to another (primary) SIO typically available on the CCM-BOOGIE or 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 CPU 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

The on-board ESD protected RS-232E transceivers on the CCO-CONCERT will allow a bit rate of up to 230kbps.

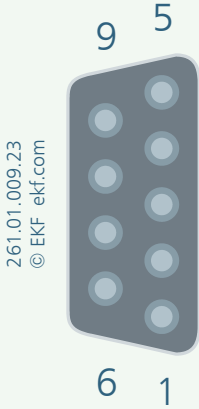
If a Digital Audio connector is provided on the CCO-CONCERT, the COM-A connector will be removed. If a DVI receptacle is provided on the CCO-CONCERT, the COM-B connector will be removed.

In addition, all serial ports are also available for rear I/O across J2, as an option. When using the serial ports 1 and/or 2, there is a conflict with the on-board EIA-232 transceivers. Hence, in order to avoid signal interference, *the on-board ADM211E serial transceivers must not be stuffed*, for signal usage of the serial ports 1 and/or 2 on a rear I/O transition module. Consider usage of the serial ports 3 and 4 as an alternative to serial ports 1 and 2 for rear I/O. However, if the C32-FIO mezzanine module is engaged on the CCO-CONCERT, serial ports 3/4 are also in use for additional EIA-232 transceivers and C32-FIO front panel D-SUB connectors. If in doubt, please discuss your individual requirements with sales@ekf.de before ordering.

Digital Audio

The CCO-CONCERT is equipped with a HD Audio Codec, which is controlled by the ICH (Input/Output Controller Hub) southbridge on the CPU board. The optional digital audio connector provides analog stereo I/O and digital S/PDIF I/O. The analog lines are software configurable as line input, line output or headphone output. Default is output.

Digital Audio Option RS-232 Female D-Sub 9 261.01.009.23

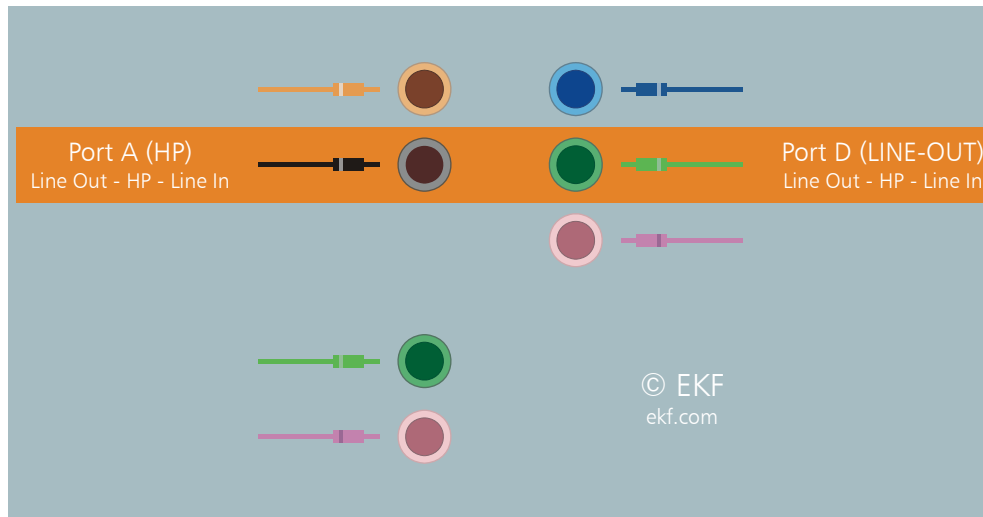


		5	Port A In/Out L
Port A In/Out R	9		
		4	A-GND
Port D In/Out R	8		
		3	Port D In/Out L
A-GND	7		
		2	S/PDIF OUT
S/PDIF IN	6		
		1	D-GND

The D-SUB female connector is a proprietary solution and was chosen for reliability reasons, targeting industrial applications. A custom specific cable assembly is required therefore. It is highly recommended to use 75 Ohm coaxial cables for both the S/PDIF signals (shield = D-GND). Any shielded wire should be sufficient for each of the analog signals (shield = A-GND). For longer cable distances, configure the analog outputs as headphone. Due to the lower output impedance of a buffered HP output, a superior noise immunity will be achieved.

ALC262 Port Configurability - D-SUB Connector

Port	Name	LINE OUT / HP	LINE IN	MIC	Connector
A	HP	✓	✓		Dig. Audio
D	LINE-OUT	✓	✓		Dig. Audio
	S/PDIF				Dig. Audio



CCO-CONCERT

Realtek Audio Driver Analog Configurations - DIG-AUDIO D-SUB Front Panel Connector

Video (DVI)

As an option, the CCO-CONCERT is available with a SDVO to PanelLink transceiver for digital video. The secondary DVI receptacle on the CCO-CONCERT can be used in addition to the primary DVI connector on the CCM-BOOGIE or CCG-RUMBA CPU carrier board for dual digital screen operation mode.

As an alternate, the CCO-CONCERT can be equipped with a SDVO to VGA DAC for analog video. Though also the analog video output is available from the (analog section of the) DVI connector, analog and digital video are not available concurrently. The choice between analog or digital video is a stuffing option of the board - please consider your requirements before ordering.

If the DVI option was chosen, the connector COM-B and the USB receptacle will be removed, due to front panel space constraints.

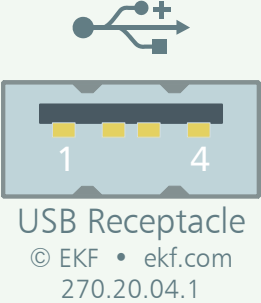
DVI Connector 261.70.029.01						
<p>261.70.029.01 • © EKF • ekf.com</p> <p>DVI</p>	17	TX0-	9	TX1-	1	TX2-
	18	TX0+	10	TX1+	2	TX2+
	19	GND	11	GND	3	GND
	20		12		4	
	21		13		5	
	22	GND	14	DDC_POW ¹⁾	6	DDC_SCL
	23	TXC+	15	GND	7	DDC_SDA
	24	TXC-	16	DVI_HP	8	VSYNC
			c3	BLUE	c1	RED
			c6	GND	c5	GND
		c4	HSYNC	c2	GREEN	

¹⁾ +5V protected by a PolySwitch Fuse 1.5A

The digital signals are assigned equivalent to DVI-D. Any DVI cable can be used to attach a flat panel display. The analog signals are assigned as DVI-I (micro cross area of the connector). Adapter cables and adapter connectors are available for translation from DVI-I to VGA HD D-SUB.

USB

The host CPU board is equipped with an ICHx (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 CCO-CONCERT mezzanine companion board across the expansion port connector J-EXP, and another 4 ports are passed through J-HSE. One of the J-HSE assigned USB ports is available via the CCO-CONCERT front panel, while the other are dedicated to optional USB Solid-State Drives, or to rear I/O. The USB front panel receptacle is exclusive to the DVI video connector, due to space restrictions.

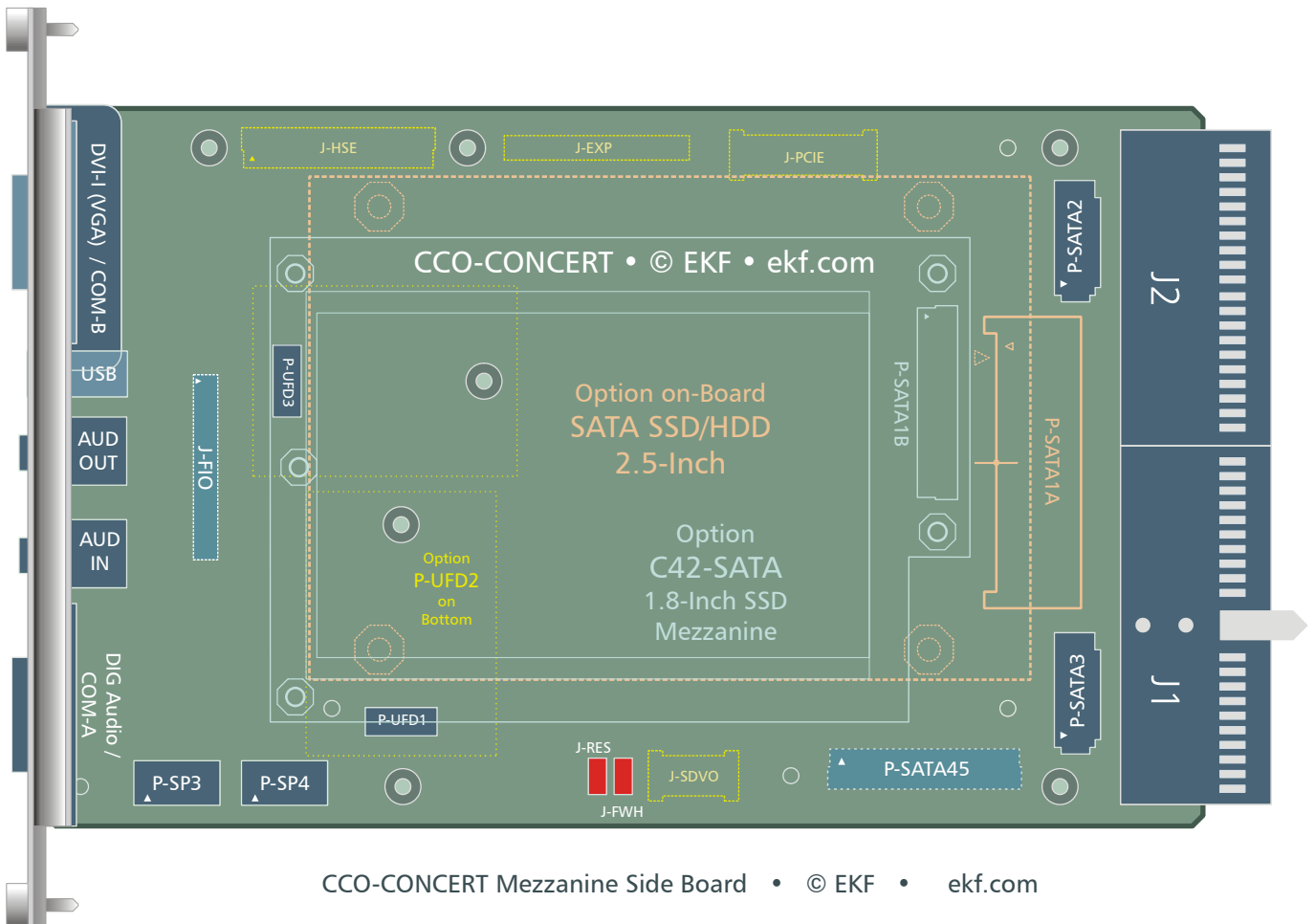
USB Receptacle 270.20.04.1		
	1	+5V_USB 0.5A 1)
	2	DATA-
	3	DATA+
	4	GND

1) Electronic Power Switch

On-Board Connectors

The CCO-CONCERT 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 functional or even present on your actual board.

Assembly of these connectors is highly custom specific. Discuss your needs with EKF before ordering, so that the optimum board configuration for your application will be chosen.

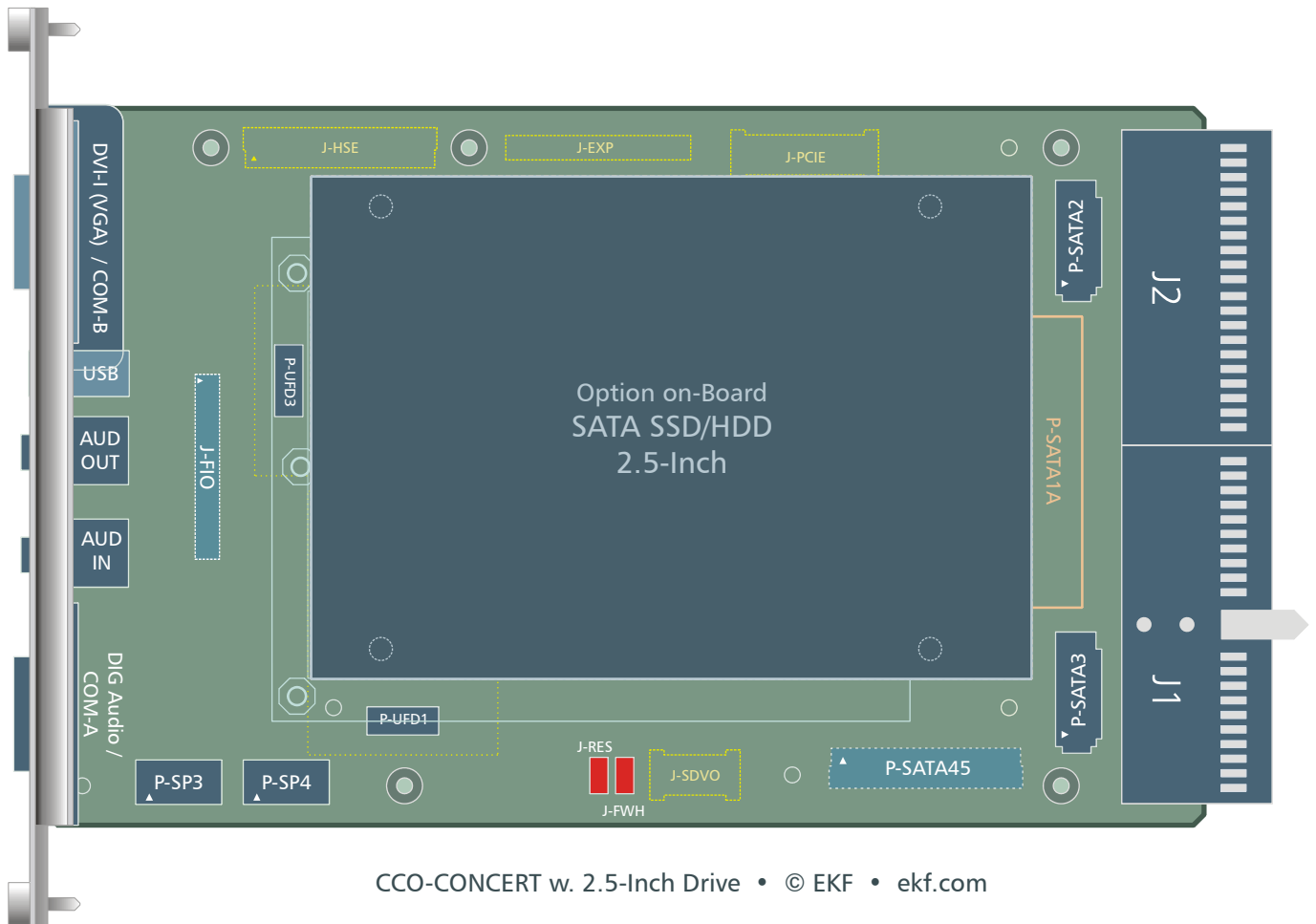


P-SATA1A	SATA Docking connector, suitable for on-board 2.5-inch SATA SSD/HDD (exclusive to P-SATA1B)
P-SATA1B	Mezzanine connector, suitable for C42-SATA or C40-SCFA (exclusive to P-SATA1A)
P-SATA2 P-SATA3	Vertical latched SATA headers, 7-position, for attachment of additional SATA devices
P-SP3 P-SP4	Pin headers 10-lead 2.00mm, provide TTL level serial COM port signals
P-UFD1 P-UFD3	Socket (top mount) 9-lead 2.00mm pitch, for low profile USB SSD
P-UFD2	Socket (bottom mount) 9-lead 2.00mm pitch, for low profile USB SSD

P-SATA1A

The CCO-CONCERT can be equipped with a SATA host receptacle, suitable for attachment of an on-board 2.5-inch SATA HDD/SSD. P-SATA1A is stuffed exclusive to P-SATA1B only. P-SATA1A has a reasonable standoff for stuffing components below the drive, which requires 2 mounting rails in order to fix and carry the drive.

There are two potential signal sources for P-SATA1A: By default, P-SATA1A is connected to the mezzanine connector J-HSE port SATA1. This signal would be derived from the ICH southbridge on a CPU carrier board, e.g. CCM-BOOGIE. Alternately, as a stuffing option, P-SATA1A can be sourced from the CCO-CONCERT on-board JMB362-1 SATA controller (suitable e.g. for CCG-RUMBA carrier CPU).



Signal designations RX/TX shown with respect to the SATA host controller. Typical SATA devices are powered from a single +5V rail. By default, power is supplied from the CPU carrier board, across the CCO-CONCERT mezzanine connectors. As an alternate, external power can be sourced across the optional rear I/O connector J1.

P-SATA1A Serial ATA Docking Connector 256.022.10.02



Part No. 256.022.10.02 • SATA Host Receptacle • © EKF • ekf.com

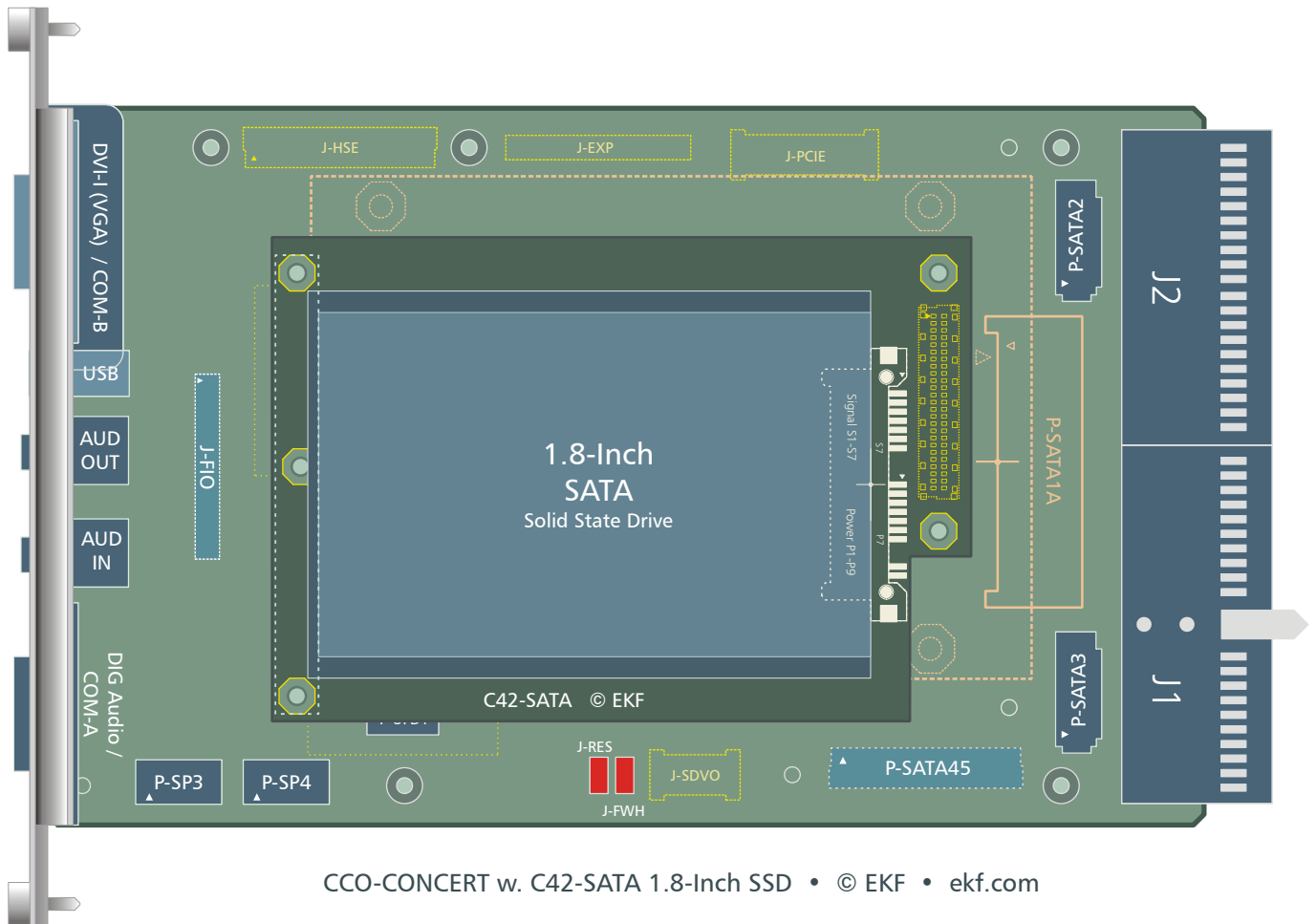
S1	GND
S2	TX+ SATA
S3	TX- SATA
S4	GND
S5	RX- SATA
S6	RX+ SATA
S7	GND
P1	+3.3V_SATA
P2	+3.3V_SATA
P3	+3.3V_SATA
P4	GND
P5	GND
P6	GND
P7	+5V_SATA
P8	+5V_SATA
P9	+5V_SATA
P10	GND
P11	RSVD
P12	GND
P13	+12V_SATA
P14	+12V_SATA
P15	+12V_SATA

+3.3V_SATA (P1-P3) and +12V_SATA (P13-P15) may not be available on P-SATA1A (left unconnected). As a stuffing option, +3.3V_SATA can be attached via a self-resettable fuse (1.5A, derived from either the +3.3V_CR switched or the +3.3V_A always on power rail), and +12V can be connected through another self-resettable fuse (0.5A) to +12V_A.

P-SATA1B

The CCO-CONCERT can be equipped with a mezzanine connector, suitable for attachment of the C42-SATA storage module (1.8-inch SSD), or the C40-SCFA (CompactFlash socket adapter). P-SATA1B is stuffed exclusive to P-SATA1A only.

There are two potential signal sources for P-SATA1B: By default, P-SATA1B is connected to the mezzanine connector J-HSE port SATA1. This signal would be derived from the ICH southbridge on a CPU carrier board, e.g. CCM-BOOGIE. Alternately, as a stuffing option, P-SATA1B can be sourced from the CCO-CONCERT on-board JMB362-1 SATA controller (suitable e.g. for CCG-RUMBA carrier CPU).



JMicron JMB36x drivers must be installed before using the on-board SATA controllers, either RAID drivers or non-RAID drivers: <ftp://driver.jmicron.com.tw/jmb36x/>

P-SATA1B Mezzanine Connector
 1.00mm Pitch Female Connector 8mm Height • 275.90.08.068.01

<p>© EKF • 275.90.08.068.01 • ekf.com</p> <p>1.00mm Pitch High Speed Female Connector (H=4mm)</p>	GND	a1	b1	GND
	SATA1 TXP	a2	b2	
	SATA1 TXN	a3	b3	
	GND	a4	b4	GND
	SATA1 RXN	a5	b5	
	SATA1 RXP	a6	b6	
	GND	a7	b7	GND
		a8	b8	
		a9	b9	
	GND	a10	b10	GND
		a11	b11	
		a12	b12	
	GND	a13	b13	GND
		a14	b14	
		a15	b15	
	GND	a16	b16	GND
		a17	b17	
		a18	b18	
	GND	a19	b19	GND
		a20	b20	
		a21	b21	
	+3.3V_SATA 1)	a22	b22	+5V_SATA 2)
	+3.3V_SATA 1)	a23	b23	+5V_SATA 2)
	+3.3V_A 4)	a24	b24	+5V_A 4)
		a25	a25	RSVD 3)

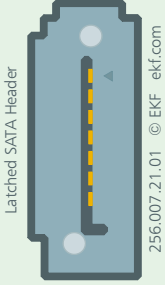
- 1) +3.3V_SATA through self resettable fuse 1.5A, either derived from +3.3V_A (always on power rail) or +3.3V_CR (switched on/off according to Sx state power rail)
- 2) +5V_SATA through self resettable fuse 1.5A, either derived from +5V_CR or +5V_A power rail
- 3) NC - reserved for future use
- 4) NC - assigned for reference only

Notes:

- ▶ All s# pins (connector shield) are tied to GND
- ▶ All TX/RX designations with respect to the SATA controllers on the CPU carrier board (TX controller = RX drive, RX controller = TX drive)

P-SATA2 P-SATA3

The CCO-CONCERT can be optionally stuffed with two vertical latched SATA signal headers, for attachment of SATA drives by cable. TX/RX designation of signals is with respect to the SATA controller. P-SATA2 and P-SATA3 correspond to the JMB362-3 on-board SATA controller.

P-SATA2	P-SATA3	#256.007.21.01	Latched Headers	
			1	GND
			2	SATA_TX+
			3	SATA_TX-
			4	GND
			5	SATA_RX-
			6	SATA_RX+
			7	GND

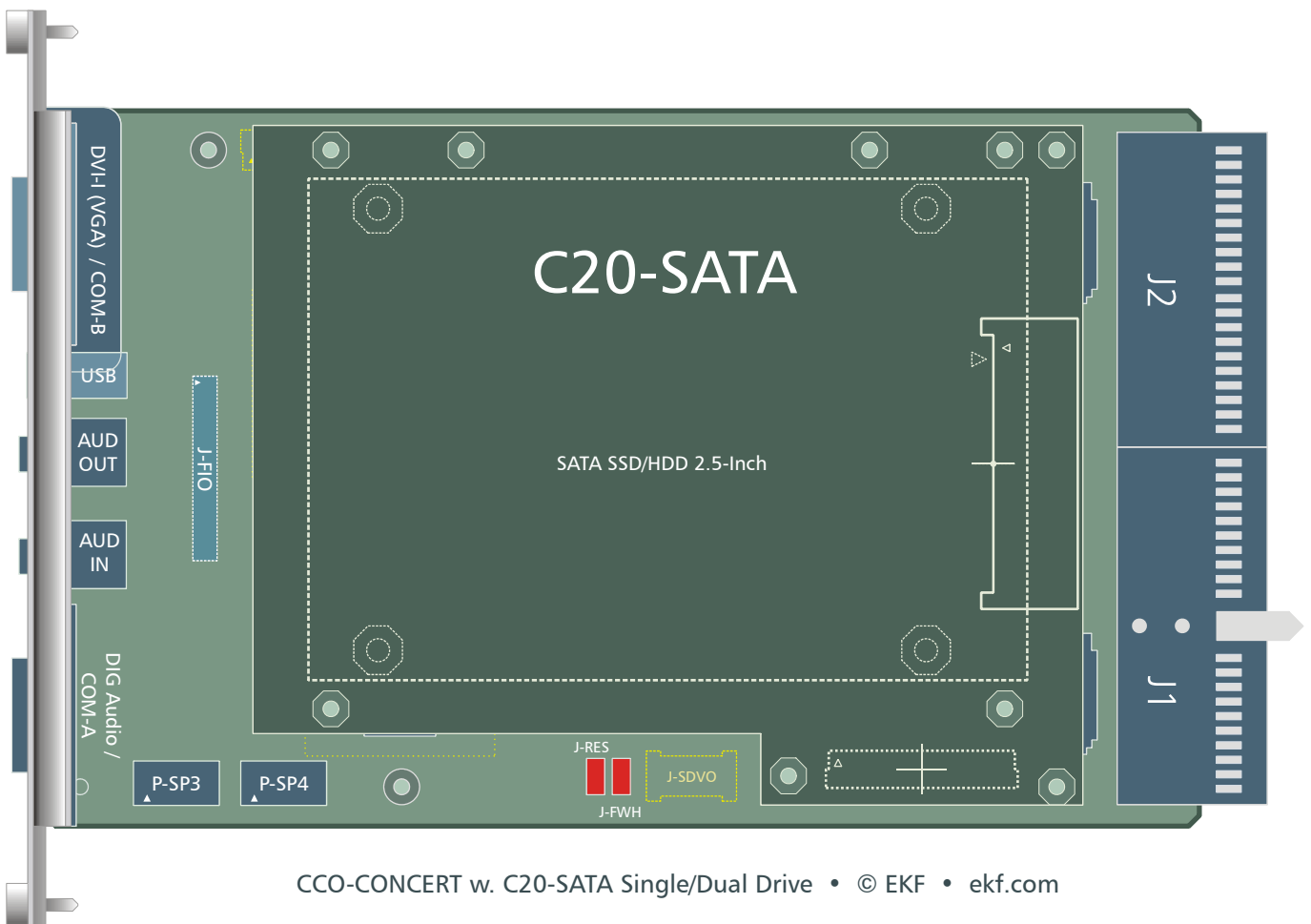
P-SATA45

The CCO-CONCERT can be provided with a high speed mezzanine connector for attachment of the C20-SATA single/dual drive storage module. TX/RX designation of signals is with respect to the on-board SATA controller. The C20-SATA can be equipped with up to two drives (top and bottom mount), and hence is suitable for RAID Level 0/1 operation.

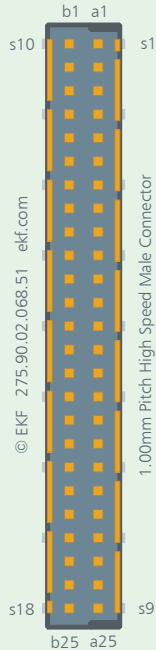
There are two potential signal sources for SATA45: By default, SATA45 is connected to the mezzanine connector J-HSE ports SATA2/SATA3. These signals would be derived from the JMB362 SATA controller on a CPU carrier board, e.g. CCM-BOOGIE. Alternately, as a stuffing option, P-SATA45 can be sourced from the CCO-CONCERT on-board JMB362-2 SATA controller (suitable e.g. for CCG-RUMBA carrier CPU).

By default, only a single supply voltage (+5V_SATA) is wired to P-SATA45, since popular 2.5-inch SATA hard disk drives do not require +3.3V and/or +12V, as of current. However, these voltages can be supplied as a stuffing option.

By default, the supply voltage(s) on the P-SATA45 connector are derived from the CPU carrier board. As an alternative, SATA hard disk power could be attached externally, across the rear I/O connector J1 (stuffing option).



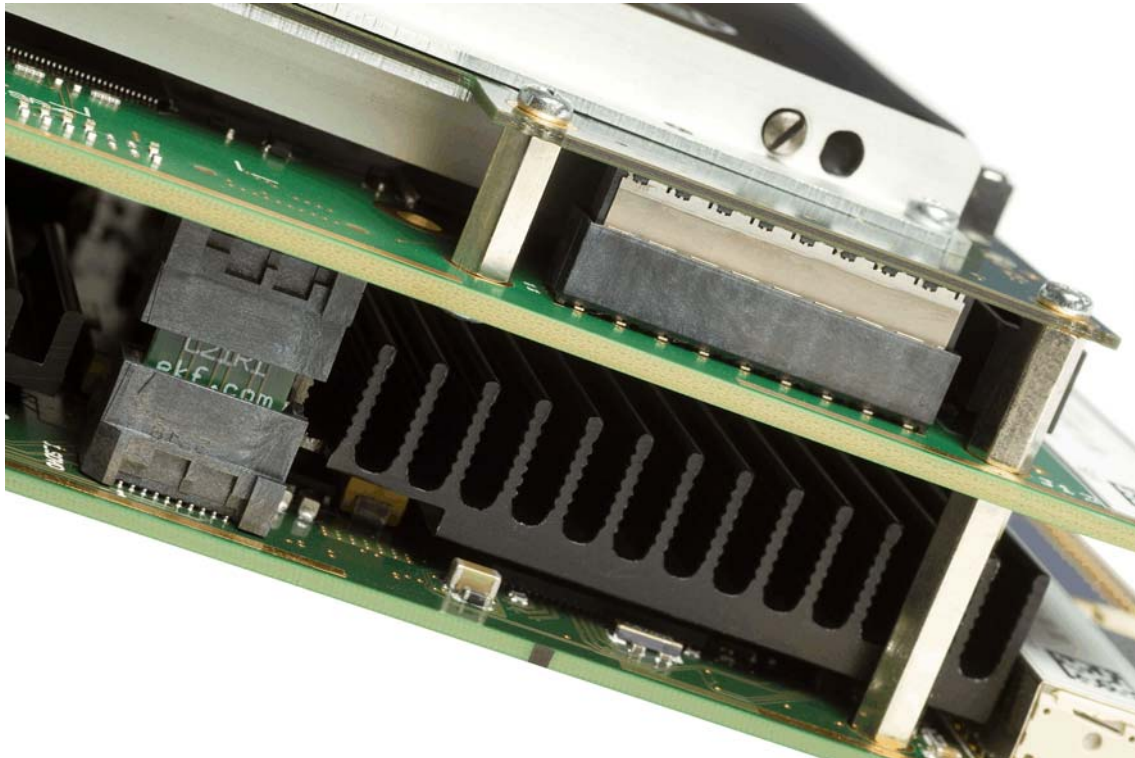
P-SATA45 SATA Expansion Interface 1.00mm Pitch Male Connector 2mm Height (275.90.02.068.51)



GND	b1	a1	GND
	b2	a2	SATA4_TXP
	b3	a3	SATA4_TXN
GND	b4	a4	GND
	b5	a5	SATA4_RXN
	b6	a6	SATA4_RXP
GND	b7	a7	GND
	b8	a8	SATA5_TXP
	b9	a9	SATA5_TXN
GND	b10	a10	GND
	b11	a11	SATA5_RXN
	b12	a12	SATA5_RXP
GND	b13	a13	GND
	b14	a14	
	b15	a15	
GND	b16	a16	GND
	b17	a17	
	b18	a18	
	b19	a19	
	b20	a20	
	b21	a21	
+5V_SATA	b22	a22	+3.3V_SATA
+5V_SATA	b23	a23	+3.3V_SATA
	b24	a24	
	b25	a25	+12V_SATA

Notes:

- ▶ +3.3V_SATA is not connected by default - can be tied to either +3.3V_CR or +3.3V_A as stuffing option
- ▶ +5V_SATA by is connected to +5V_CR across 1.5A PolySwitch resettable fuse - can be tied to +5V_A as stuffing option
- ▶ +12V_SATA is not connected by default - can be tied to either +12V_CR or +12V_EXT as stuffing option
- ▶ All sx pins (shield) are tied to GND
- ▶ All TX/RX designations with respect to SATA controller (TX controller = RX drive, RX controller = TX drive)



P-SATA45 (Top Mount, Right) with C20-SATA Dual SSD Attached



C20-SATA



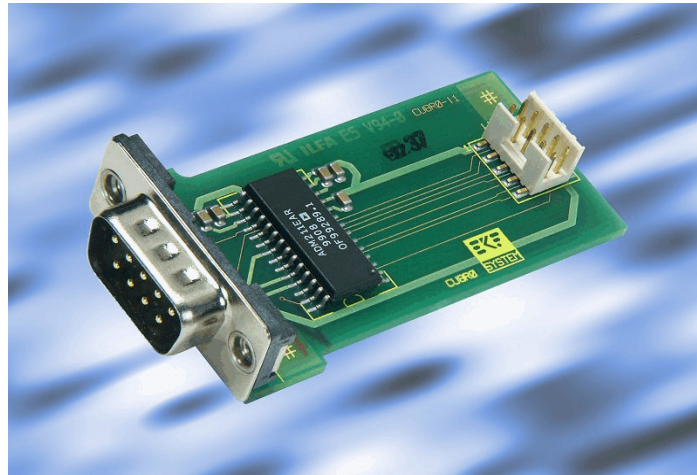
C20-SATA Top View



C20-SATA Bottom View

P-SP3 P-SP4

The on-board SIO (Super I/O controller) provides up to four serial interfaces (UART, DOS COM ports). While the serial ports SP1 and SP2 are already assigned to the front panel RS-232 COM port connectors, another two UARTs are available in addition from the optional pin headers P-SP3 and P-SP4 (TTL-level on all signals). 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.



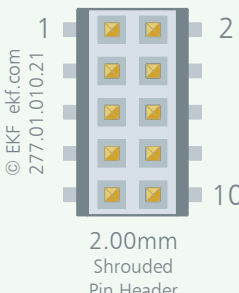
CU-Series PHY Module

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

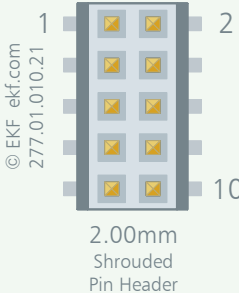
Alternatively the connectors P-SP3/P-SP4 can be used as 5V tolerant programmable I/O (GPIO). Details can be derived from the SCH3114 Super I/O controller data sheet (www.smsc.com).

In addition, all the serial ports also available for rear I/O across J2 (option). In order to avoid signal interference, attach a transceiver module or other circuitry either on-board to P-SP3/4, or on the rear I/O transition module, but not both.

P-SP3 TTL-Level Serial I/O or GPIO 2.00mm Pin Header 2 x 5 (277.01.010.21)

 <p>© EKF ekf.com 277.01.010.21</p> <p>2.00mm Shrouded Pin Header</p>	+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

P-SP4 TTL-Level Serial I/O or GPIO 2.00mm Pin Header 2 x 5 (277.01.010.21)

 <p>© EKF ekf.com 277.01.010.21</p> <p>2.00mm Shrouded Pin Header</p>	+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

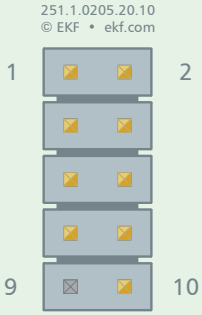
¹ short circuit protection by a PolySwitch resettable fuse, voltage derived from +5V_CR carrier board switched power well

P-UFD1 P-UFD2 P-UFD3

As an option, the CCO-CONCERT can be equipped with up to three connectors for industrial style USB Flash disk mezzanine modules. 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 SMART, STEC, SiliconSystems, SanDisk and other manufacturers, up to 8GByte, either SLC (single-level cell) or MLC (multi-level cell).

P-UFD1 P-UFD2 P-UFD3 • 2.00mm Pin Header 2x5 (251.1.0205.20.10)

USB Solid-State Drive (Low Profile) 562.20.0004.00 (4GB)
 Sandisk SDUS5EB-004G • STec SLUFDM • Intel Z-U130 SSDUSMS
 SMART SG9ED52M4GGCN • SiliconSystems SSD-M04GUI-4001

	+5V_CR	1	2	NC
	USB_D-	3	4	NC
	USB_D+	5	6	NC
	GND	7	8	NC
	Mech. Key	9	10	NC



USB SSD

P-UFD1-3 are provided as a stuffing option only, for top and/or bottom mount SSD module(s). The USB ports are derived from the CPU carrier board ICH (southbridge), available throughout the connector J-HSE (CCM-BOOGIE CPU carrier board or later required). If P-UFD1-3 are not filled on the CCO-CONCERT, the associated USB ports are alternatively available for rear I/O across J2.



On-Board Jumpers

Most options on the CCO-CONCERT are stuffing options, so there are only 2 jumpers which are available for user interaction, J-RES (force reset) and J-FWH2 (select Firmware Hub).

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.



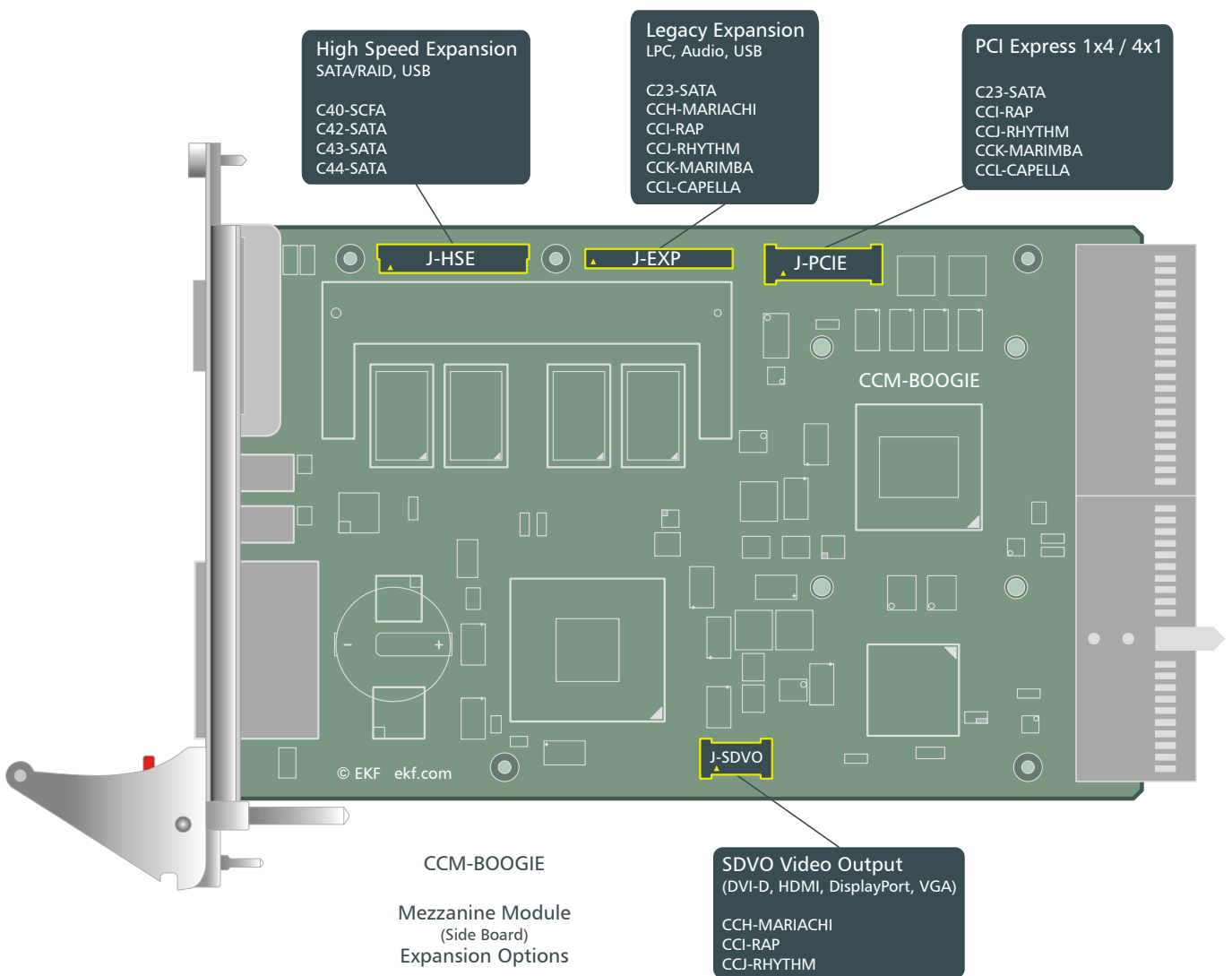
J-FWH2

Please see description in chapter 'Firmware Hub 2'.

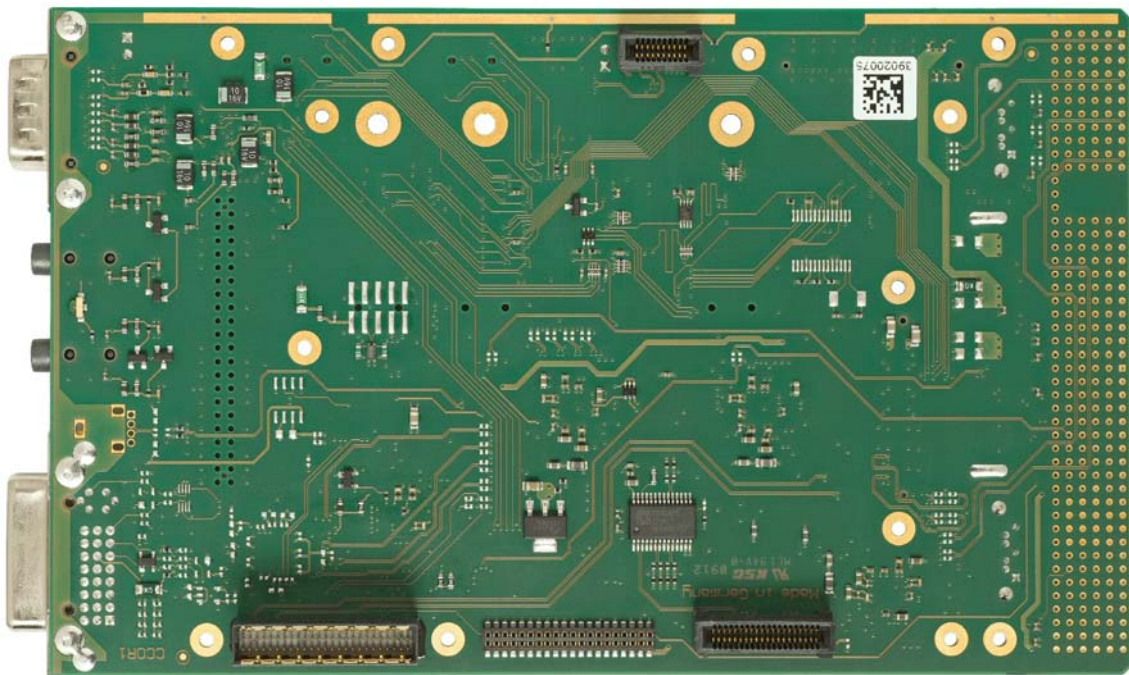
Inter-Board Connectors

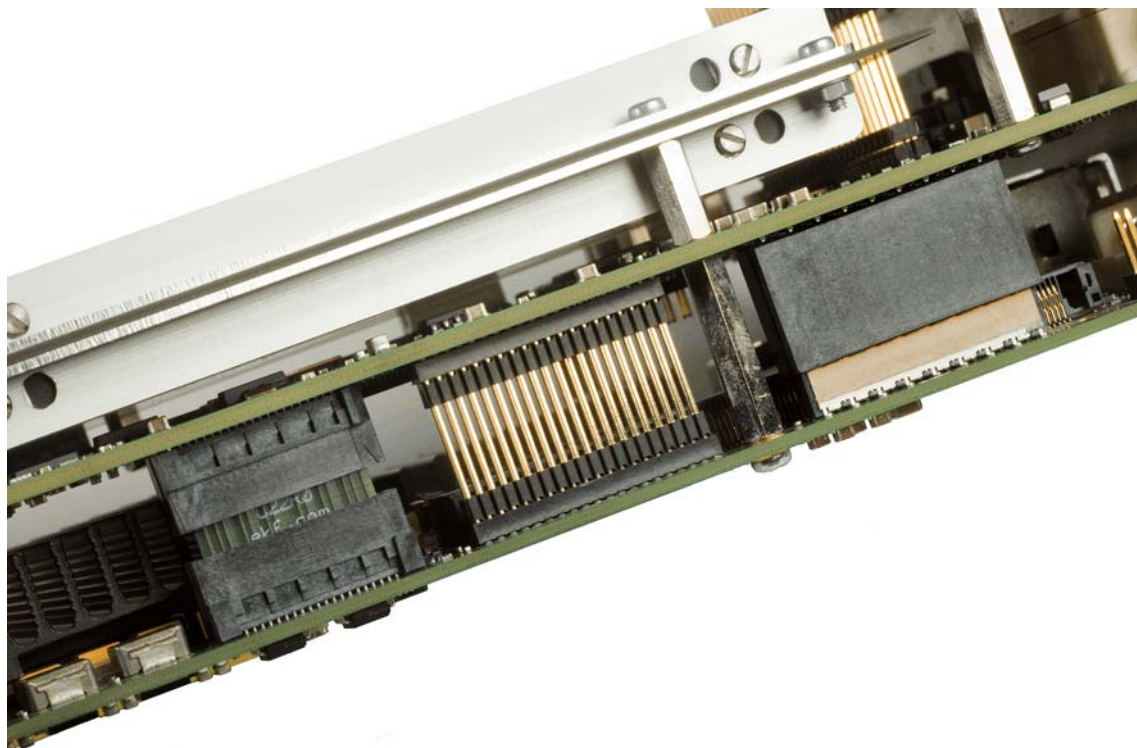
The CCO-CONCERT is equipped with up to 5 inter-board connectors. With respect to the carrier board CPU, these are the J-EXP (LPC and mixed signals), the J-HSE (SATA & USB), the J-PCIE (4-Lane PCI Express), and the J-SDVO (video) connectors. All host CPU inter-board connectors are situated at the bottom of the CCO-CONCERT and establish the data path and power link to the carrier board CPU. As an option, J-FIO (front panel I/O) is situated on top of the CCO-CONCERT, for attachment of the C32-FIO mezzanine module (12HP assembly).

As the CCO-CONCERT comes typically mounted as a unit together with the CCM-BOOGIE (or other carrier board), there is normally no need for the user to get access to any of the inter-board connectors. They are described here as a reference only and for better understanding of the CCO-CONCERT.



J-EXP	<p>Dual row socket, available from bottom of the CCO-CONCERT PCB, matching with the corresponding socket on the CPU carrier board, connected through a board stacker, comprised of:</p> <ul style="list-style-type: none"> ▶ LPC Low Pin Count interface ▶ HD Audio (Azalia) ▶ 2 x USB ▶ SMB, Speaker, Reset
J-HSE	<p>High speed mezzanine connector, available from bottom of the CCO-CONCERT PCB, matching with the corresponding connector on the CPU carrier board, comprising of:</p> <ul style="list-style-type: none"> ▶ Host CPU (ICH9) SATA (single channel) ▶ Host CPU (JMB362) SATA dual channel) ▶ Host CPU (ICH9) 4 x USB
J-PCIE	<p>High speed socket edge card connector, available from bottom of the CCO-CONCERT PCB, matching with the corresponding socket on the CPU carrier board, connected through a high speed strip line PCB (C22), comprising of:</p> <ul style="list-style-type: none"> ▶ Host CPU (ICH8, ICH9) PCI Express (PCIe) x 4 interface
J-SDVO	<p>High speed mezzanine connector, available from bottom of the CCO-CONCERT PCB, matching with the corresponding connector on the CPU carrier board, comprising of:</p> <ul style="list-style-type: none"> ▶ SDVO-C Serial Digital Video Out, from host CPU GMCH (Intel chipset graphics)
J-FIO	<p>Dual row socket 2.00mm, on top of the CCO-CONCERT PCB, matching with the corresponding socket on the C32-FIO next floor expansion board, connected through a board stacker, comprised of:</p> <ul style="list-style-type: none"> ▶ Serial (UART) ports 3-4 ▶ 2 x USB ▶ PS/2 keyboard/mouse ▶ Analog and digital audio (not in use on C32-FIO)

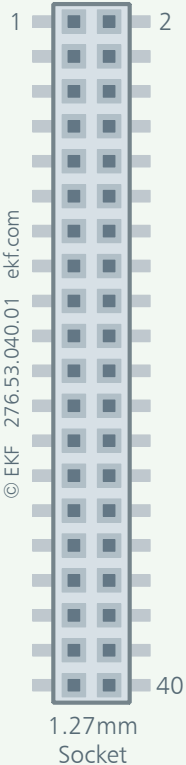




From Left to Right: J-PCIE J-EXP J-HSE

J-EXP

The inter-board connector J-EXP is mounted on bottom of the CCO-CONCERT PCB, with its face aligned towards the corresponding connector on the CCM-BOOGIE. This allows to attach the CCO-CONCERT mezzanine companion card on top of the CPU carrier board. A suitable board stacker is used in addition to bridge the gap between the two boards (exactly 4HP distance between PCBs). J-EXP is used to pass the Low Pin Count I/F to the CCO-CONCERT, besides USB channels and other sideband signals.

J-EXP Expansion Board Interface (LPC/HD-Audio/USB) 1.27mm Socket 2 x 20 (276.53.040.01)				
 <p>pin orientation shows CPU carrier board top view</p>	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 *
	PE Port Cfg Bit 1 ⁴ HDA_SDOOUT	33	34	HDA_SDINO
	HDA_RST#	35	36	PE Port Cfg Bit 0 ⁴ HDA_SYNC
	HDA_BITCLK	37	38	HDA_SDIN1
	SPEAKER	39	40	+12V_A

¹ connects to USB Port 6 on CCM-BOOGIE

² connects to USB Port 5 on CCM-BOOGIE

³ connects to USB_OC56# on CCM-BOOGIE

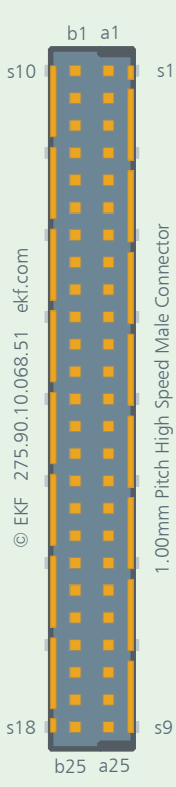
⁴ PCI Express port configuration is strapped to 4 links x 1 lane on the CCO-CONCERT

* switched power supply lines from CPU carrier board according to Sx state

J-HSE

The connector J-HSE is a 10mm height shielded male pin header. Its counterpart on the CPU carrier board is a 8mm height receptacle, for a nominal headroom of 18.72mm between the boards (equivalent to 4HP board to board CL pitch).

J-HSE SATA & USB Mezzanine Interface 1.00mm Pitch Male Connector 10mm Height (275.90.10.068.51)

	GND	b1	a1	GND
	SATA3_TXP 4)	b2	a2	SATA1_TXP 3)
	SATA3_TXN 4)	b3	a3	SATA1_TXN 3)
	GND	b4	a4	GND
	SATA3_RXN 4)	b5	a5	SATA1_RXN 3)
	SATA3_RXP 4)	b6	a6	SATA1_RXP 3)
	GND	b7	a7	GND
	SATA4_TXP	b8	a8	SATA2_TXP 4)
	SATA4_TXN	b9	a9	SATA2_TXN 4)
	GND	b10	a10	GND
	SATA4_RXN	b11	a11	SATA2_RXN 4)
	SATA4_RXP	b12	a12	SATA2_RXP 4)
	GND	b13	a13	GND
	USB3_P	b14	a14	USB1_P
	USB3_N	b15	a15	USB1_N
	GND	b16	a16	GND
	USB4_P	b17	a17	USB2_P
	USB4_N	b18	a18	USB2_N
	GND	b19	a19	GND
	USB3_OC#	b20	a20	USB1_OC#
	USB4_OC#	b21	a21	USB2_OC#
	+5VS 2)	b22	a22	+3.3VS 1)
	+5VS 2)	b23	a23	+3.3VS 1)
	+5V	b24	a24	+3.3V
	RSVD	b25	a25	+12V

- 1) 2) Switched voltages from carrier board, according to CPU sleep state S0
- 3) This SATA channel has been derived from ICH southbridge (dedicated to PATA bridge on C40-SCFA CompactFlash mezzanine module)
- 4) These SATA channels are derived from the additional secondary PCIe SATA controller, RAID 0/1/10 capable

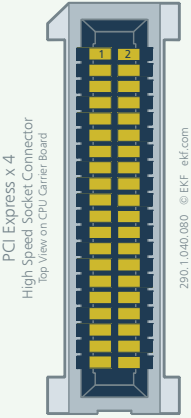
Notes:

- ▶ All s# connector pins (shield) are tied to GND
- ▶ All TX/RX designations with respect to SATA controller (TX controller = RX drive, RX controller = TX drive)

J-PCIE

The high speed expansion socket J-PCIE is mounted on bottom of the CCO-CONCERT. This allows to attach the mezzanine companion card on top of the CPU carrier board. A mating strip line spacer PCB (C22-PCIEX2) 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.

J-PCIE is organized as 4x1 link (i.e. 4 single PCIe lanes) on the CCO-CONCERT (refer to hardware strapping signals on J-EXP which are used to configure the link status to the ICH southbridge on the CPU carrier board).

J-PCIE PCI Express x 4 High Speed Dual Row Socket 0.8mm Pitch 290.1.040.080				
 <p>pin assignment shows CPU carrier board top view (see-trough mezzanine side board PCB)</p> <p>¹ switched on/off power lines on CPU carrier boards according to S3 state</p>	GND	1	2	GND
	+5V_CR ¹	3	4	+3.3V_CR ¹
	+5V_CR ¹	5	6	+3.3V_CR ¹
	GND	7	8	GND
	PE_CLKP	9	10	PLTRST#
	PE_CLKN	11	12	PE_WAKE#
	GND	13	14	GND
	PE0_TP	15	16	PE0_RP
	PE0_TN	17	18	PE0_RN
	GND	19	20	GND
	GND	21	22	GND
	PE1_TP	23	24	PE1_RP
	PE1_TN	25	26	PE1_RN
	GND	27	28	GND
	PE2_TP	29	30	PE2_RP
	PE2_TN	31	32	PE2_RN
	GND	33	34	GND
	PE3_TP	35	36	PE3_RP
	PE3_TN	37	38	PE3_RN
	GND	39	40	+12V_A ²

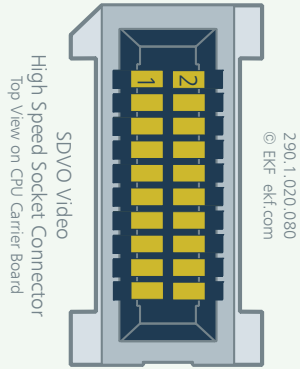
¹ Supply voltages from carrier board, switched on/off according to sleep state

² Stuffing option, no feed through by default

J-SDVO

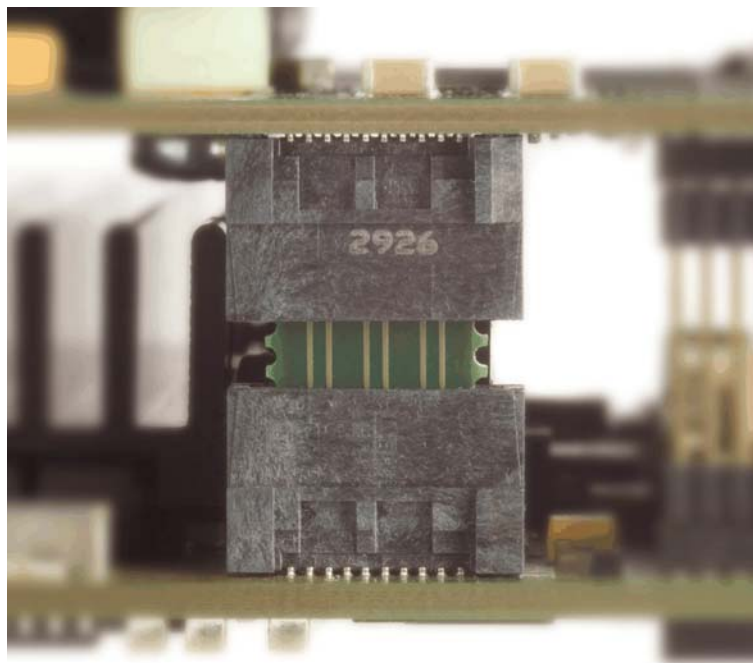
As an option, the high speed expansion socket J-SDVO is mounted on bottom of the CCO-CONCERT. This allows to attach the mezzanine companion card on top of the CPU carrier board. A mating strip line PCB (C21-PCIEX1) is used in addition to bridge the gap between the two boards, which results from the horizontal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

J-SDVO SDVO Video High Speed Dual Row Socket 0.8mm Pitch (290.1.020.080)



pin orientation shows CPU carrier board top view

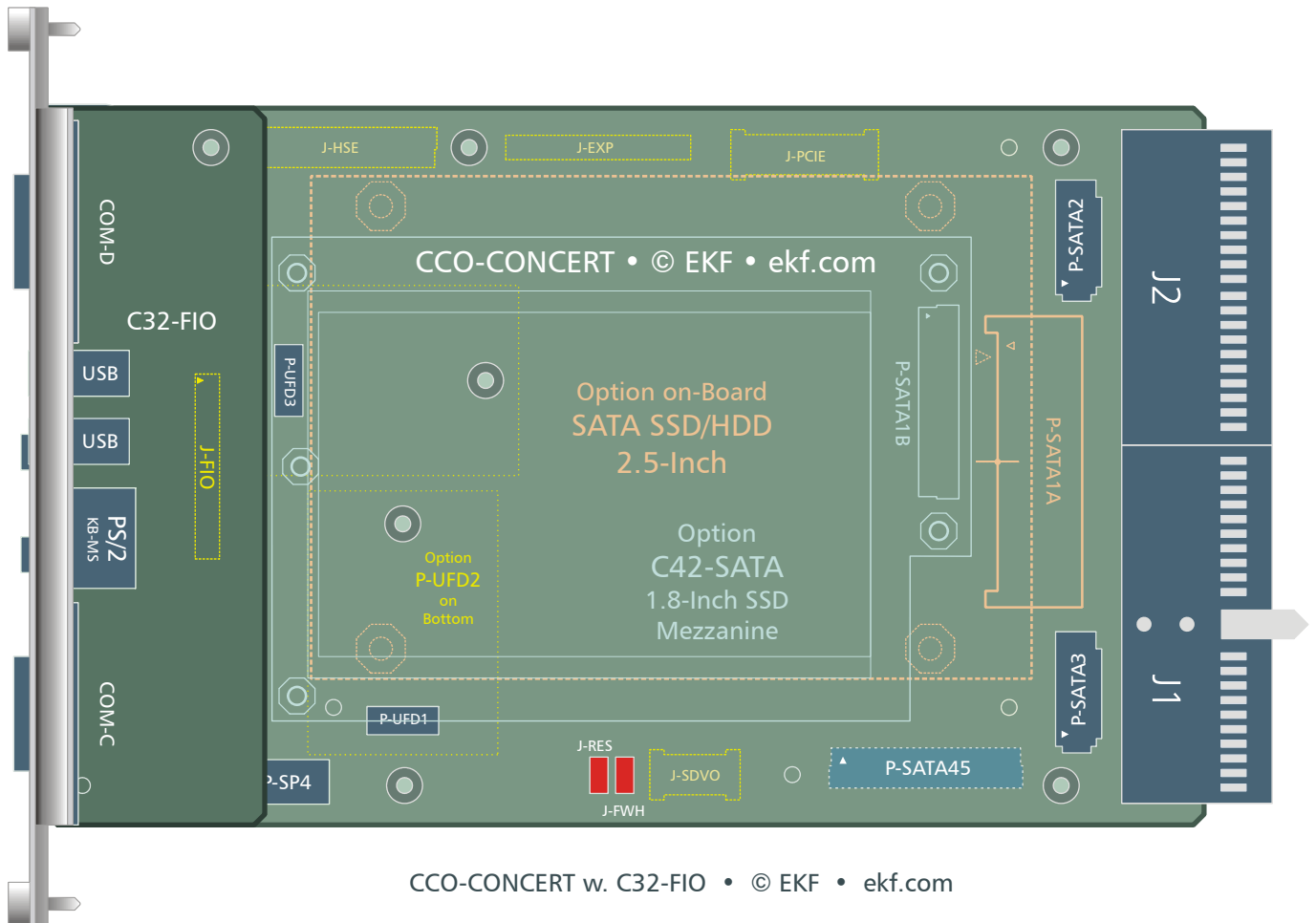
GND	1	2	GND
SDVO_RED+	3	4	SDVO_CLK+
SDVO_RED-	5	6	SDVO_CLK-
GND	7	8	GND
SDVO_GREEN+	9	10	SDVO_INT+
SDVO_GREEN-	11	12	SDVO_INT-
GND	13	14	GND
SDVO_BLUE+	15	16	SDVO_CTR_CLK
SDVO_BLUE-	17	18	SDVO_CTR_DATA
GND	19	20	GND



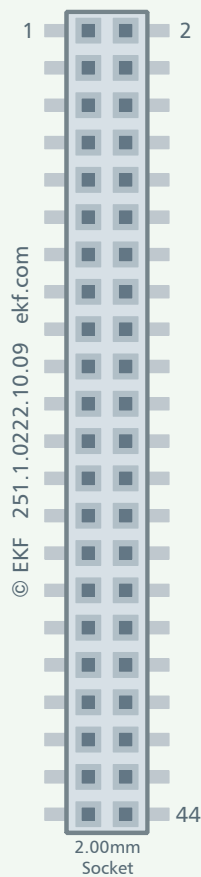
J-FIO

As an option, the CCO-CONCERT can be expanded by a small front panel I/O mezzanine module, the C32-FIO. This requires a 12HP front panel in total (CPU carrier, CCO-CONCERT, C32-FIO). The C32-FIO provides additional COM-Ports, USB, and a PS/2 legacy Mini-DIN connector.

J-FIO is a 2mm pitch dual row socket on top of the CCO-CONCERT, which connects to the C32-FIO by means of a board stacker element.



For a description of the C32-FIO mezzanine module refer to www.ekf.com/c/ccpu/c32/c32_tie.pdf.

J-FIO Miscellaneous Signals Secondary Expansion Board Interface (Audio - COM - PS/2 - USB)
 Part #251.1.0222.10.09 2.00mm Socket 2 x 22


GND	1	2	+3.3V_CR *
SP4_RI#	3	4	SP4_DSR#
SP4_TXD	5	6	SP4_RXD
SP4_RTS#	7	8	SP4_DTR#
SP4_DCD#	9	10	SP4_CTS#
GND	11	12	+3.3V_CR *
SP3_RI#	13	14	SP3_DSR#
SP3_TXD	15	16	SP3_RXD
SP3_RTS#	17	18	SP3_DTR#
SP3_DCD#	19	20	SP3_CTS#
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	GND
PS/2 Clock Keyboard	29	30	PS/2 Clock Mouse
PS/2 Data Keyboard	31	32	PS/2 Data Mouse
GND	33	34	+5V_A **
<i>S/PDIF_IN</i>	35	36	<i>S/PDIF_OUT</i>
<i>CD_L</i>	37	38	<i>CD_R</i>
<i>LINE1_L</i>	39	40	<i>MIC1_L</i>
<i>AGND</i>	41	42	<i>CD_GND</i>
<i>LINE1_R</i>	43	44	<i>MIC1_R</i>

¹ connects to USB Port 6 on CCM-BOOGIE or CCG-RUMBA

² connects to USB Port 5 on CCM-BOOGIE or CCG-RUMBA

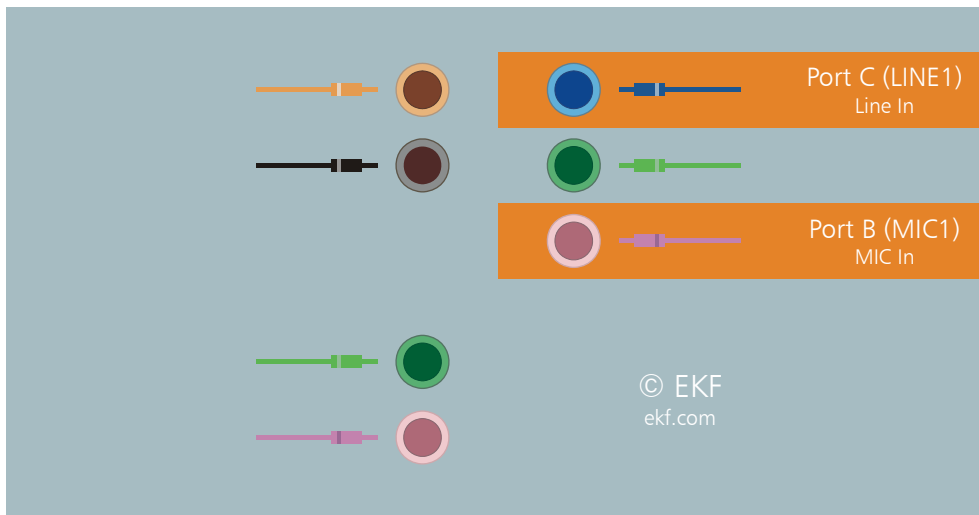
³ connects to USB_OC56# on CCM-BOOGIE or CCG-RUMBA

* switched power supply lines from CPU carrier board according to Sx state

** always on power supply line from CPU carrier board

ALC262 Analog Port Configurability - J-FIO

Port	Name	LINE OUT / HP	LINE IN	MIC	Connector
B	MIC1			✓	J-FIO
C	LINE1		✓		J-FIO
	CD		✓		J-FIO
	S/PDIF				J-FIO



CCO-CONCERT
Realtek Audio Driver Analog Configurations - J-FIO Mezzanine Connector



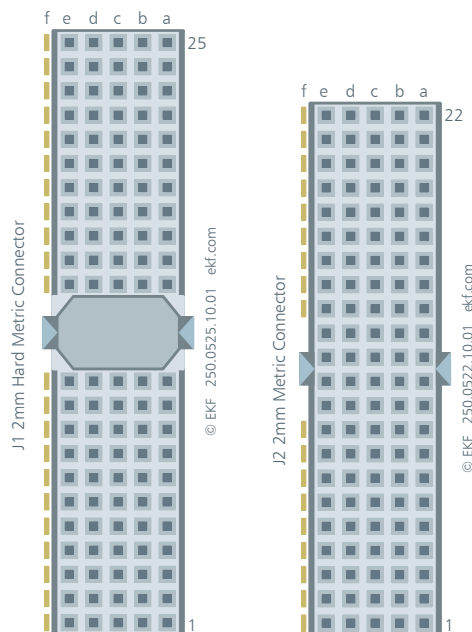
Rear I/O Connectors

As an option, the CCO-CONCERT 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.

Please note, that quite a lot of signals are also available either on-board or via front panel (stuffing options). Be sure to have connected any signal only once, in order to avoid interference or even damage.

SATA channels may not be present on J1, if either elsewhere in use for on-board connectors on the CCO-CONCERT, or if the particular SATA controller JMB321-1 (-2 -3) is not populated. Discuss stuffing options with sales@ekf.com before ordering.

The CCO-CONCERT 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 CCO-CONCERT 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 SCH3114 datasheet for details (www.smsc.com).

J1

Connector Assignment J1 Rear I/O

#J1	A	B	C	D	E
25	+5V_CR			+3.3V_CR	+5V_CR
24		GND		GND	
23		GND		GND	
22		GND		GND	
21		GND		GND	
20	GND	GND	GND	GND	GND
19		GND		GND	
18		GND		GND	
17	GND	GND	GND	GND	GND
16		GND		GND	
15		GND		GND	
14					
13			KEY (BROWN)		
12					
11	SATA30 TX+	GND	SATA11 TX+	GND	
10	SATA30 TX-	GND	SATA11 TX-	GND	
9	+5V_EXT *	+3.3V_EXT *	GND	-12V_EXT *	+12V_EXT *
8	SATA30 RX-	GND	SATA11 RX-	GND	
7	SATA30 RX+	GND	SATA11 RX+	GND	GND
6	GND	GND	GND	GND	1394_TPAP
5	SATA31 TX+	GND		GND	1394_TPAN
4	SATA31 TX-	GND		1394_12V	GND
3	GND	GND	GND	GND	1394_TPBN
2	SATA31 RX-	GND		GND	1394_TPBP
1	SATA31 RX+	GND		GND	GND

* optional external supply voltages for C20-SATA mezzanine (Hard Disk)

SATA Signal Groups:

- ▶ SATA0x → J-HSE (ICH)
- ▶ SATA1x → JMB362-1
- ▶ SATA2x → JMB362-2
- ▶ SATA3x → JMB362-3

pins not assigned = reserved

J2

Connector Assignment J2 Rear I/O

#J2	A	B	C	D	E
22	+5V_CR	+3.3V_CR	GND		+12V_A
21	GND	GND	SP2_RI# / GP50	GND	GND
20	SP1_RI#	SP1_CTS#	SP2_RXD / GP52	SP2_CTS# / GP56	
19	SP1_RXD	GND	SP2_DSR# / GP54	GND	FWH_GPI1
18	SP1_DSR#	SP1_DCD#	SP2_DTR# / GP57	SP2_DCD# / GP51	FWH_GPI2
17	SP1_DTR# 3)	GND	SP2_RTS# / GP55 3)	GND	GND
16	SP1_RTS# 3)	SP1_TXD		SP2_TXD / GP53	DBRESET#
15		GND	SP4_RI# / GP31	GND	
14	SP3_RI# / GP13	SP3_CTS# / GP16	SP4_RXD / GP64	SP4_CTS# / GP62	SMB_DAT 1)
13	SP3_RXD / GP10	GND	SP4_DSR# / GP66	GND	SMB_CLK 1)
12	SP3_DSR# / GP14	SP3_DCD# / GP12	SP4_DTR# / GP34 2)	SP4_DCD# / GP63	GND
11	SP3_DTR# / GP15	GND	SP4_RTS# / GP67 2)	GND	USB1_D- 4)
10	SP3_RTS# / GP17	SP3_TXD / GP11		SP4_TXD / GP65	USB1_D+ 4)
9		GND		GND	GND
8				SIO_GP47	USB_OC#
7		GND	GND	SIO_GP46	GND
6				SIO_GP45	USB2_D- 4)
5		GND		SIO_GP44	USB2_D+ 4)
4				SPEAKER	GND
3		GND		KBDAT	KBCLK
2				GND	+5V_CR
1	GND	GND	GND	MSDAT	MSCLK

Parallel Port Option (LPT) not provided on current board revision

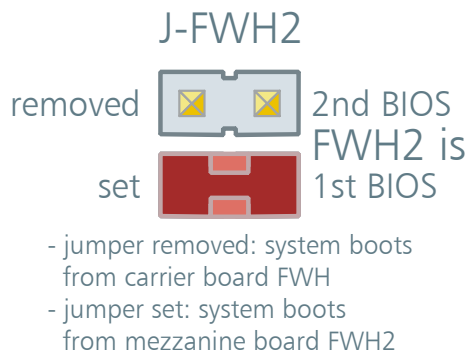
- 1) Stuffing option: SM Bus signals buffered via LTC4300A-3, voltage level @ +5V_CR buffer enable input is controlled by GP40 SCH3114 SIO (high=enabled)
- 2) GP34 may be used to control serial EEPROM A1 (stuffing option)
GP67 may be used to control serial EEPROM WP (stuffing option)
- 3) These serial 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
- 4) Stuffing option - USB port(s) may be in use for on-board Solid State Disk(s)

When using the serial ports 1 and/or 2 for rear I/O, there is a conflict with the on-board EIA-232 transceivers. Hence, in order to avoid signal interference, *the on-board ADM211E serial transceivers must not be stuffed*, for signal usage of the serial ports 1 and/or 2 on a rear I/O transition module. Consider usage of the serial ports 3 and 4 as an alternative for rear I/O. However, if the C32-FIO mezzanine module is engaged on the CCO-CONCERT, serial ports 3/4 are in use for additional EIA-232 transceivers and front panel D-SUB connectors.

Additional Functions

Firmware Hub 2

The CCO-CONCERT is optionally provided with a 82802 compatible 8/16Mbit 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 CCM-BOOGIE SPI Flash BIOS ID to 1) - hence the system will use the BIOS on the CCO-CONCERT after power-on.



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

SMBus EEPROM

The CCO-CONCERT is provided with a 24C01 1Kbit I²C EEPROM, for storing board configuration data. The EEPROM is accessed via the SMBus. If there is need for storing additional customer data, EKF can place an EEPROM instead with custom specific data space, e.g. 24C16.

If required, the SMBus EEPROM A1 can be optionally controlled (stuffing option) by SIO GP34 (serial port 4 DTR#), and the SMBus EEPROM WP is likewise tied to GP67 (serial port 4 RTS4#).

Trusted Platform Module

The CCO-CONCERT 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.

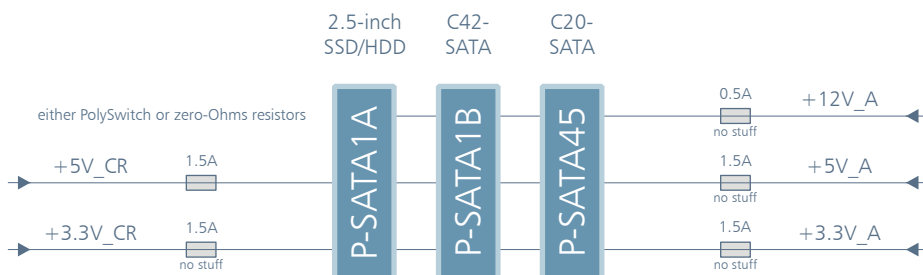
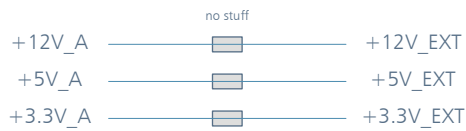
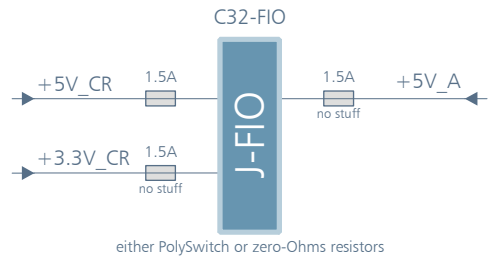
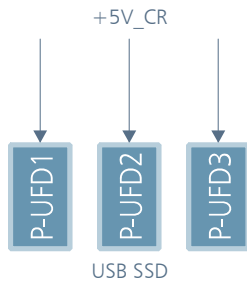
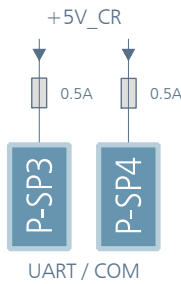
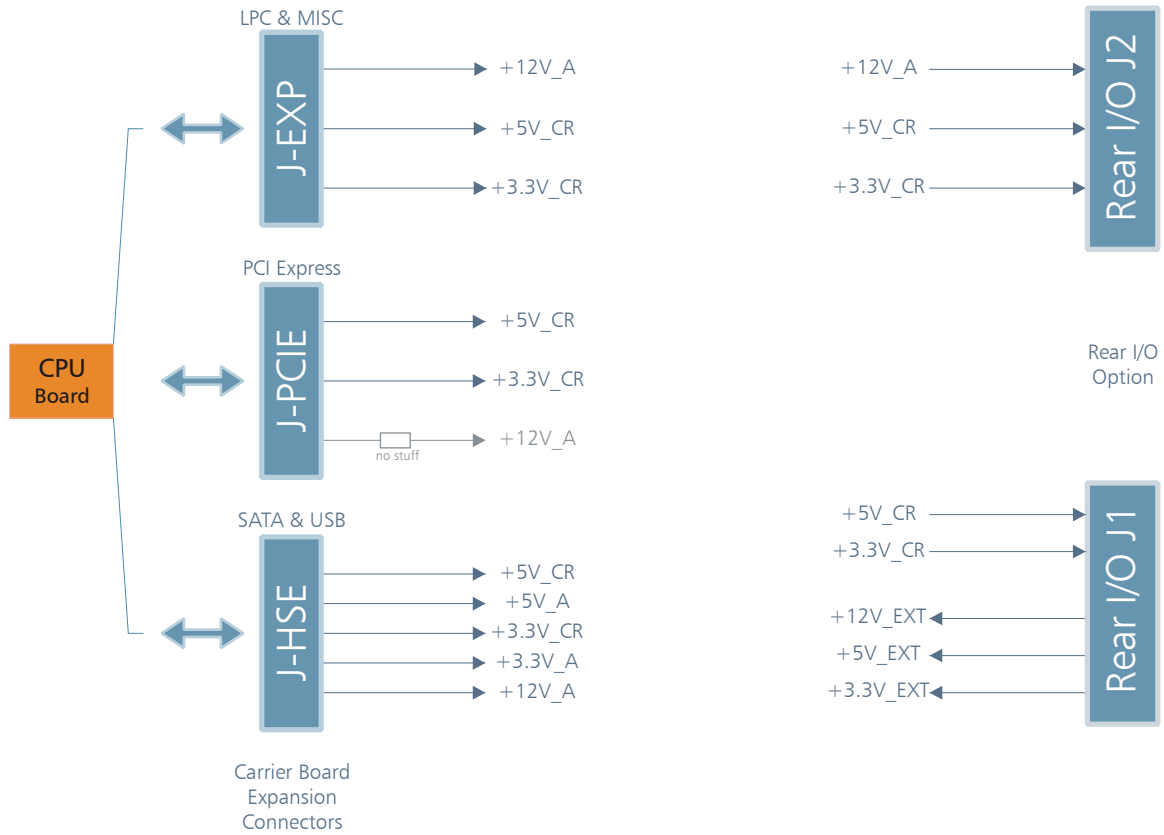
Power Distribution

The CCO-CONCERT gets its power from two possible sources:

The CPU carrier board supplies +3.3V_CR and +5V_CR, which may be switched off according to the current system sleep state, and +12V_A (A = always on). In addition, if the J-HSE is populated (CCM-BOOGIE CPU carrier board), +3.3V_A and +5V_A will be also passed through.

As an option, the rear I/O connector J1 can also be used to deliver power from an external supply to the connector P-SATA45 (+12V_EXT, +5V_EXT, +3.3V_EXT), as an alternate to the CPU carrier board voltages. P-SATA45 is suitable for a C20-SATA mezzanine storage module, which may be equipped with up to 2 hard disk drives, resulting in a considerable inrush current.

Power Distribution
CCO-CONCERT
© EKF ekf.com



Schematics

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

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



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



Phone +49 (0)2381/6890-0
Fax +49 (0)2381/6890-90
Internet www.ekf.com
E-Mail sales@ekf.com