



Product Information

CCD-CALYPSO • General Purpose **CompactPCI**® CPU

Dual-Screen Video • Dual Gigabit Ethernet • Dual Channel Memory • Triple SATA

Document No. 3816 • Edition 1 October 2010

*Scalable from the ULV Celeron® M processor up to the 2.0GHz Pentium® M, and provided with 2GB dual channel capable DDR2 RAM, the CCD-CALYPSO is a universal 4HP/3U (single size Eurocard) **CompactPCI**® CPU board, designed especially for systems which require reasonable performance at low power consumption.*

The chipset is based on PCI Express technology and has a powerful dual-screen integrated graphics accelerator. The DVI-I video interface allows for simultaneous attachment of both, advanced (digital) and legacy (analog) flat panel displays and CRT monitors (D-SUB connector optionally).



CCD-CALYPSO

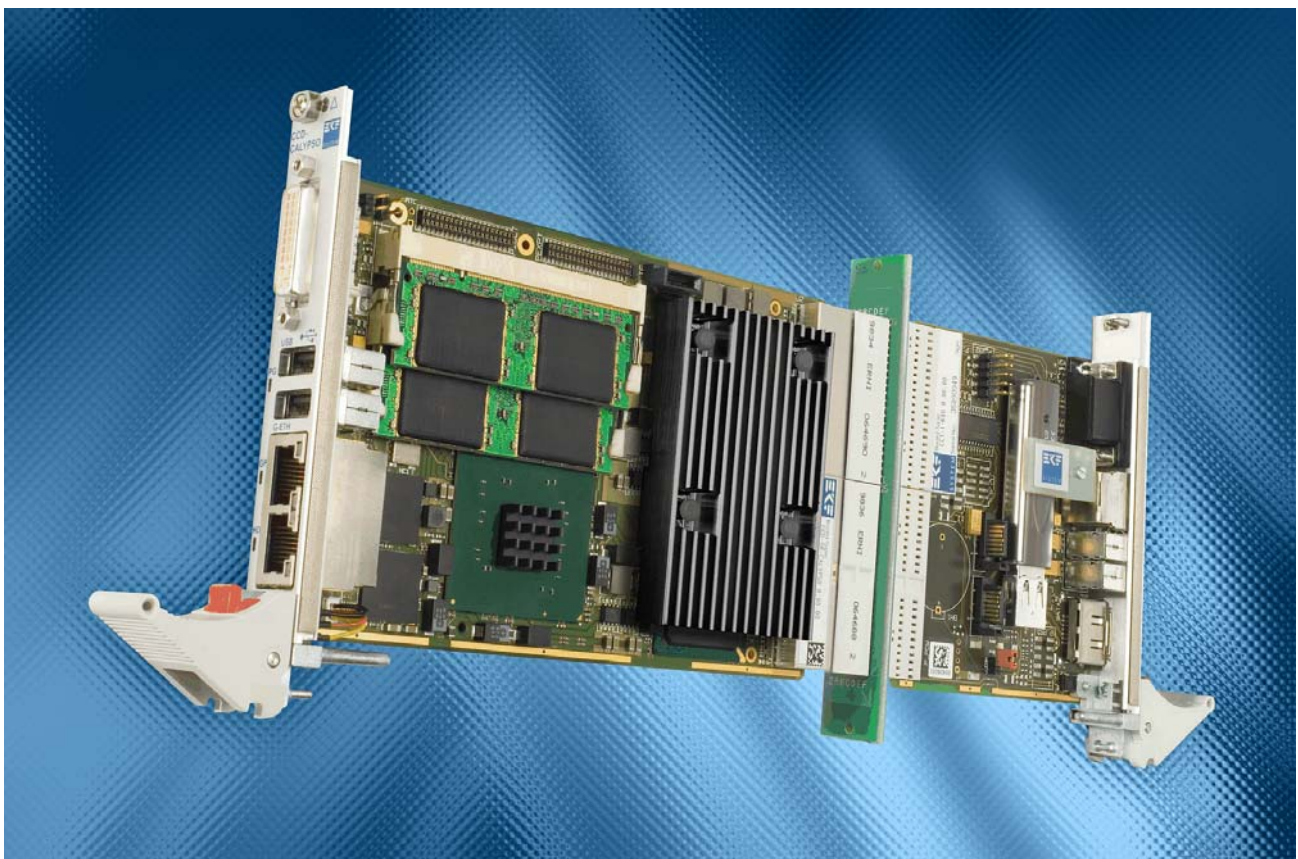
The CCD-CALYPSO is equipped with two independent PCIe Gigabit Ethernet controllers for high speed communication. Seven USB 2.0 ports are provided for attachment of peripheral devices. In addition, a CompactFlash mezzanine module (C10-CFA) can accommodate an industrial grade CF card. As an alternate, the 1.8-inch HDD/SSD carrier module C30-PATA is available as on-board mass-storage device (option).

A local expansion interface connector may be used to directly attach a mezzanine companion card (aka side board) for audio- and legacy support, which can carry in addition a 2.5-inch IDE hard disk drive.

As an option, a rear I/O transition module is available to the CCD-CALYPSO, which e.g. provides the Serial ATA connectors (2 x SATA, 1 x eSATA).

Benefits of the CCD-CALYPSO

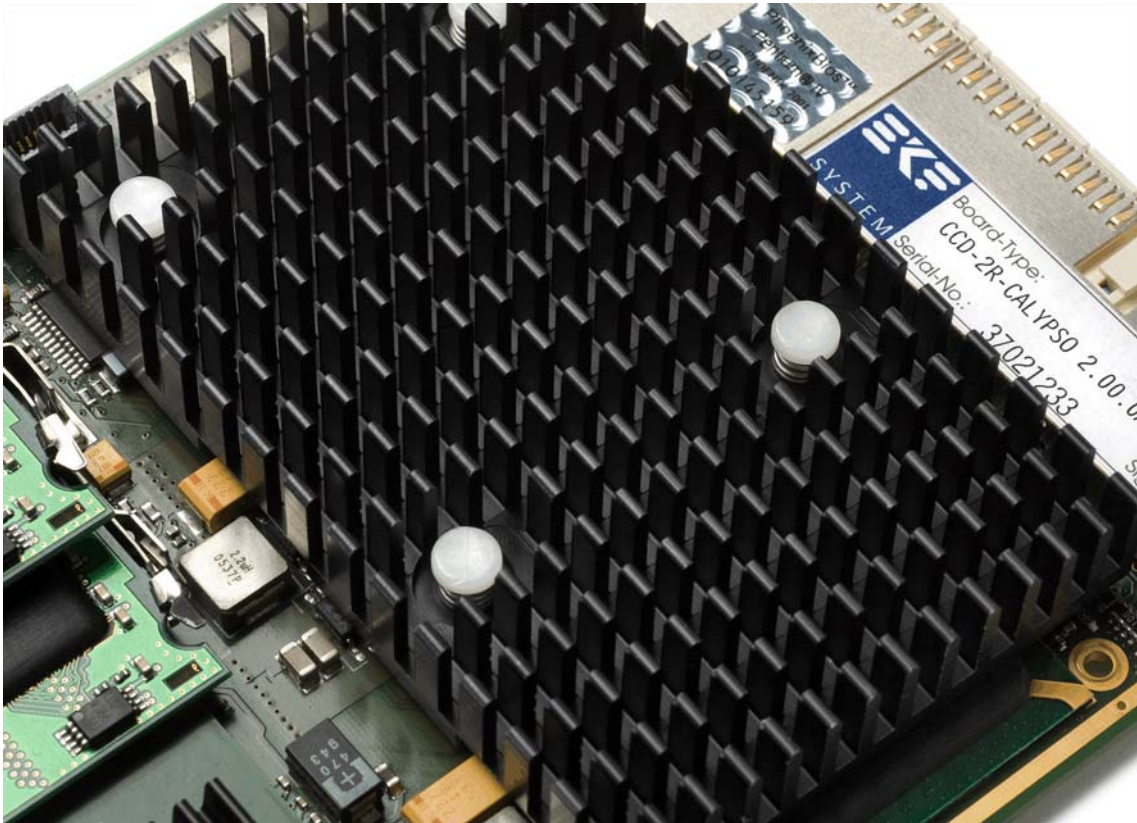
- ▶ Pentium® M 2GHz (FSB 533MHz) CompactPCI CPU
- ▶ 2 x 1GB DDR2 Memory (Dual Channel Mode Capable)
- ▶ Dual-Screen Graphics Controller
- ▶ Dual Gigabit Ethernet Controllers
- ▶ Triple SATA I/F
- ▶ Seven USB 2.0 channels
- ▶ On-Board CompactFlash or on-Board 1.8-Inch Hard Disk
- ▶ PCI Express Chipset i915GM Alviso
- ▶ Mezzanine Expansion Board and Rear I/O Transition Module Options
- ▶ RoHS compliant



CCD-CALYPSO with CCT-RIO



CCD-CALYPSO with Optimized Pin Heatsink for Improved Horizontal Airflow (Option)



Optimized Heatsink for Improved Horizontal Airflow (Option)

Feature Summary CCD-CALYPSO

Form Factor	Single size <i>CompactPCI</i> style Eurocard (160x100mm ²), front panel width 4HP (20.3mm)
Processor	<p>Designed for Intel® Pentium® M Micro FC-BGA 479 processors (90nm Dothan), maximum junction temperature 100°C</p> <ul style="list-style-type: none"> ▶ CCD-2: 1.0GHz ULV Celeron® M (Dothan 373), 400MHz FSB, 512KB L2 cache, 5W ▶ CCD-3: 1.4GHz LV Pentium® M (Dothan 738), 400MHz FSB, 2MB L2 cache, 10W ▶ CCD-6: 2.0GHz Pentium® M (Dothan 760), 533MHz FSB, 2MB L2 cache, 27W
Chipset	<p>Intel® i915GM chipset (Alviso) consisting of:</p> <ul style="list-style-type: none"> ▶ 82915GM Graphics/Memory Controller Hub (GMCH) with Intel® Graphics Media Accelerator (GMA) 900 ▶ 82801FB I/O Controller Hub (ICH6) ▶ 82802 Compatible Firmware Hub (FWH)
Memory	Dual 200-pin SO-DIMM socket, DDR2 533 SDRAM, 2 x 1GB maximum, single or dual channel mode
Video	<p>Analog monitor and digital flat-panel display support by DVI-I connector (front panel), up to 2048x1536 pixel 16M colours @75Hz refresh rate (analog), up to 1600 x 1200 pixel 16M colours @60Hz (digital), incorporates Panellink Digital technology (Silicon Image).</p> <ul style="list-style-type: none"> ▶ Front panel option: D-Sub (female HD15) VGA connector available, replaces DVI-I connector ▶ Rear I/O option: Analog video across J2/P2 CCT-RIO rear I/O transition module) ▶ Dual screen capable 2 x 1600 x 1200 pixel (one display attached to the front panel, the other to the back panel, or both to the front panel by means of a DVI-I splitter cable)
USB	<p>All ports over-current protected, data transfer rate of up to 480Mbps, conforming to USB2.0:</p> <ul style="list-style-type: none"> ▶ 2 x USB type A connector (front panel) ▶ 3 x USB ports J2/P2 Rear I/O option (CCT-RIO rear I/O transition module) ▶ 2 x USB ports expansion interface option (CCA-LAMBADA / CCB-BOSSANOVA / CCE-PUNK mezzanine companion board) ▶ USB Flash drive module C15-DON option (USB stick on-board module)
Ethernet	<ul style="list-style-type: none"> ▶ Dual 10/100/1000Mbps Gigabit Ethernet controller ▶ Accessible via RJ45 jacks from the front panel ▶ Option 1 x GbE across J2/P2 with attached CCT-RIO rear I/O transition module ▶ Jumbo Frame support up to 9KB
Mezzanine I/O	<ul style="list-style-type: none"> ▶ On-board LPC/USB/Audio Super-I/O, USB and HD-Audio or AC'97 Audio expansion interface connector ▶ ATA/IDE expansion connector ▶ High Speed PCI Express expansion connector ▶ Suitable mezzanine companion boards available: <ul style="list-style-type: none"> ▶ C10-CFA: CompactFlash adapter module ▶ C13-RD: Front Panel CF Card Slot ▶ C15-DON: On-board USB stick module (USB Flash disk) ▶ C17-CFA: Bottom mount CF Card Adapter ▶ C23-SATA: PCIe to SATA controller, USB SSD, COM ports ▶ C30-PATA: 1.8-inch HDD/SSD module ▶ C33-DON: Bottom mount alternate to C15-DON ▶ CCA-LAMBADA: Front panel COM, USB, AC'97 Audio, PS/2 keyboard/mouse, on board hard disk drive 1.8-inch or 2.5-inch ▶ CCB-BOSSANOVA: Front panel up to 2 x COM, up to 2 x USB, PS/2 keyboard/mouse, on board hard disk drive 1.8-inch or 2.5-inch ▶ CCE-PUNK: Front panel 2 x COM, 2 x USB, 2 x 1394a FireWire, on board hard disk drive 1.8-inch or 2.5-inch ▶ CCO-CONCERT: HD Audio codec, SATA controller, on board 2.5-inch SSD/HDD
PATA (IDE)	<ul style="list-style-type: none"> ▶ Ultra ATA/100 connector, handover to CCA-LAMBADA / CCB-BOSSANOVA / CCE-PUNK mezzanine expansion board with optional on-board 2.5-inch hard disk drive or external device CompactFlash socket C10-CFA supplied for a CF memory card ▶ Option front panel CompactFlash slot C13-RD ▶ Option 1.8-inch on-board HDD/SSD module C30-PATA, replaces CompactFlash facility
SATA	<ul style="list-style-type: none"> ▶ Triple-channel Serial ATA I/F available for J2/P2 rear I/O option, suitable rear I/O transition module CCT-RIO (2 x system internal SATA, 1 x eSATA for attachment of external devices) ▶ Side Card SATA solutions available, e.g. CCO-CONCERT

Feature Summary CCD-CALYPSO

CompactPCI	ICH6 integrated 32-bit PCI bridge, 133MBps CPCI master				
PCI Express	1-Lane PCIe connector (option) for CCE-PUNK, C23-SATA and other mezzanine companion boards				
J2/P2 Rear I/O	<ul style="list-style-type: none"> ▶ 3 x Serial ATA (SATA), 2 x system internal SATA connectors, 1 x external eSATA connector ▶ 1 x GB Ethernet (switched by BIOS between front panel I/O and rear I/O) ▶ 3 x USB ▶ VGA Analog Video, or GPIO ▶ Keyboard, Mouse ▶ COM1 (TTL Level) ▶ Suitable rear I/O transition module CCT-RIO available 				
BIOS	<ul style="list-style-type: none"> ▶ Phoenix BIOS with EKF enhancements ▶ 8Mbit Flash memory ▶ Updates available from website ekf.com 				
Drivers (All Major OS)	<ul style="list-style-type: none"> ▶ Intel graphics drivers ▶ Intel networking drivers 				
Typical Power Requirements	Board	+3.3V +0.17V/-0.1V		+5V +0.25V/-0.15V	
		MaxPower LFM/HFM ¹⁾	WinXP Idle LFM/HFM ¹⁾	MaxPower LFM/HFM ¹⁾	WinXP Idle LFM/HFM ¹⁾
	CCD-2-CALYPSO	2.7A ²⁾	2.2A ²⁾	1.2A ²⁾	0.5A ²⁾
	CCD-3-CALYPSO	2.9A/2.9A	2.2A/2.2A	1.2A/2.4A	0.7A/0.9A
CCD-6-CALYPSO	3.0A/3.3A	2.3A/2.3A	1.2A/5.2A	0.7A/1.6A	
Thermal Conditions Environmental Conditions	<ul style="list-style-type: none"> ▶ Operating temperature: 0°C ... +70°C (CPU dependent) ▶ 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	<ul style="list-style-type: none"> ▶ EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1) ▶ 2002/95/EC (RoHS) 				
MTBF	tbd				
Performance Rating	Board	Processor		CPU/MEM Score	
Measured with PCMark2002 under Windows XP, 1GB DDR2 533	CCD-2-CALYPSO	1.0GHz ULV Celeron® M (Dothan 373)		4735/8642	
	CCD-3-CALYPSO	1.4GHz LV Pentium® M (Dothan 738)		tbd	
	CCD-6-CALYPSO	2.0GHz Pentium® M (Dothan 760)		tbd	

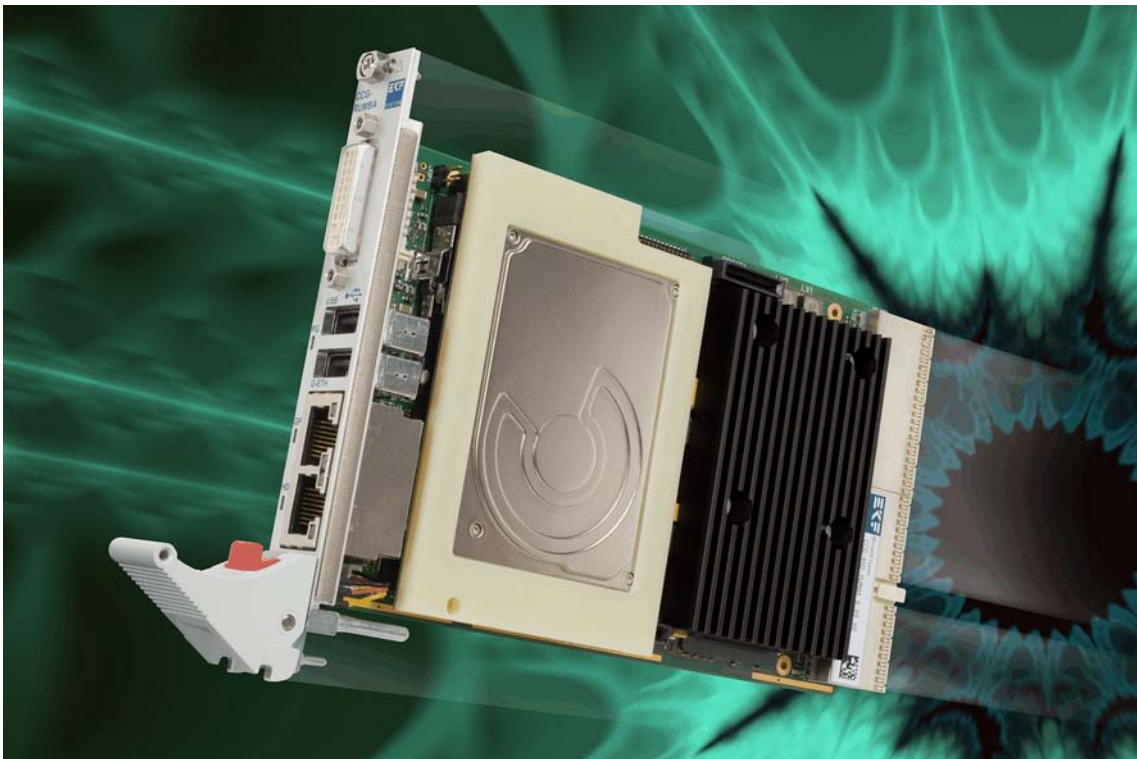
¹⁾ Intel SpeedStep® Frequency Modes. LFM: Low Frequency Mode, HFM: High Frequency Mode

²⁾ The ULV Celeron® M processor on CCD-2 does not support Intel SpeedStep® (always High Frequency Mode)

subject to changes



CCD-CALYPSO w. C10-CFA CompactFlash Adapter Module



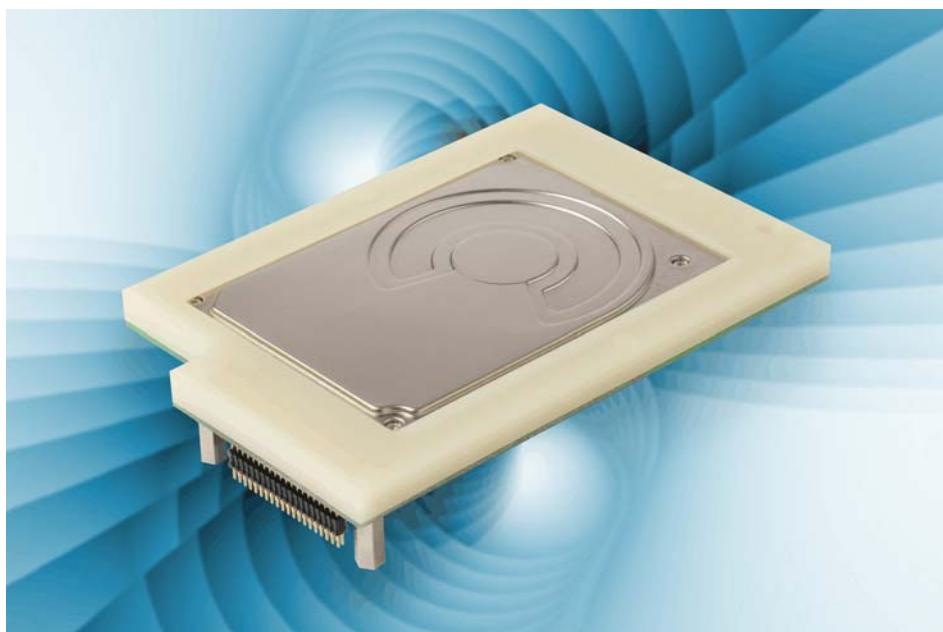
CCD-CALYPSO w. C30-PATA 1.8-Inch HDD/SSD (Picture Similar)



C10-CFA (Top Mount CF Card Adapter)

The CCD-CALYPSO comes with a CompactFlash adapter module (C10-CFA), which is suitable to hold a silicon memory CF card, operated in 'True IDE Mode' similar to a hard disk. If the CCD-CALYPSO is accompanied by a mezzanine expansion module such as the CCA-LAMBADA or CCB-BOSSANOVA, the position of the C10-CFA CompactFlash adapter module changes to the mezzanine card.

Optionally an on-board 1.8-inch drive (HDD or SSD) module is available (C30-PATA). When ordered, it replaces the CompactFlash adapter module (please request for a special solution which allows to use both the CF slot and the 1.8-inch drive simultaneously). The C30-PATA allows to maintain the 4HP envelope and can be combined with additional expansion side boards on the CCD-CALYPSO.



C30-PATA Option

Available as a rear I/O expansion board to the CCD-CALYPSO CPU card, the CCT-RIO is provided with several I/O port connectors, to be used either in addition to the CCD front panel connectors or alternatively. Being mainly a passive rear I/O transition module, groups of signals from the CCD-CALYPSO CPU board are passed across the CompactPCI J2/P2 connector to the CCT-RIO. Some of the data lines are available locally on the CCT board for system internal wiring only, while other connectors such as VGA-Video and Gigabit Ethernet are mounted into the back panel for external use. USB and SATA (eSATA) channels are provided both on-board and externally.

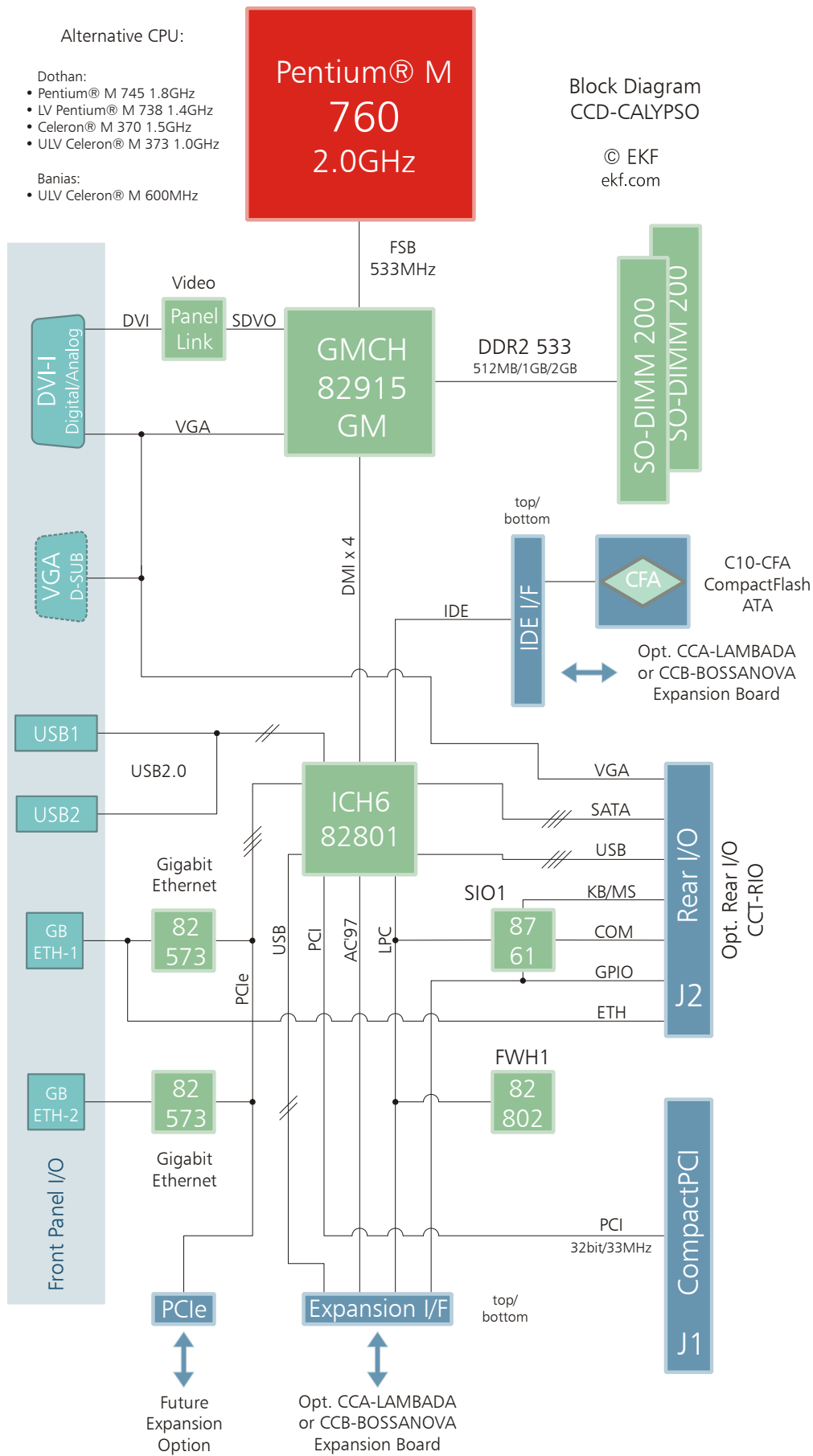
Typically the CCT-RIO is equipped with a 4-HP rear panel (20.3mm width). As a custom specific option, an 8-HP panel is available with additional connectors.

Utilization of the CCT-RIO transition module adds a level of I/O functionality that is not available with the CCD-CALYPSO CPU board alone. Further on, swapping the CPU card is simplified by means of rear I/O, which is important for efficient system maintenance (MTTR). Be sure to have ordered a CCD-CALYPSO rear I/O capable version and also the CPCI backplane suitable for rear I/O in order to use the CCT-RIO transition module.

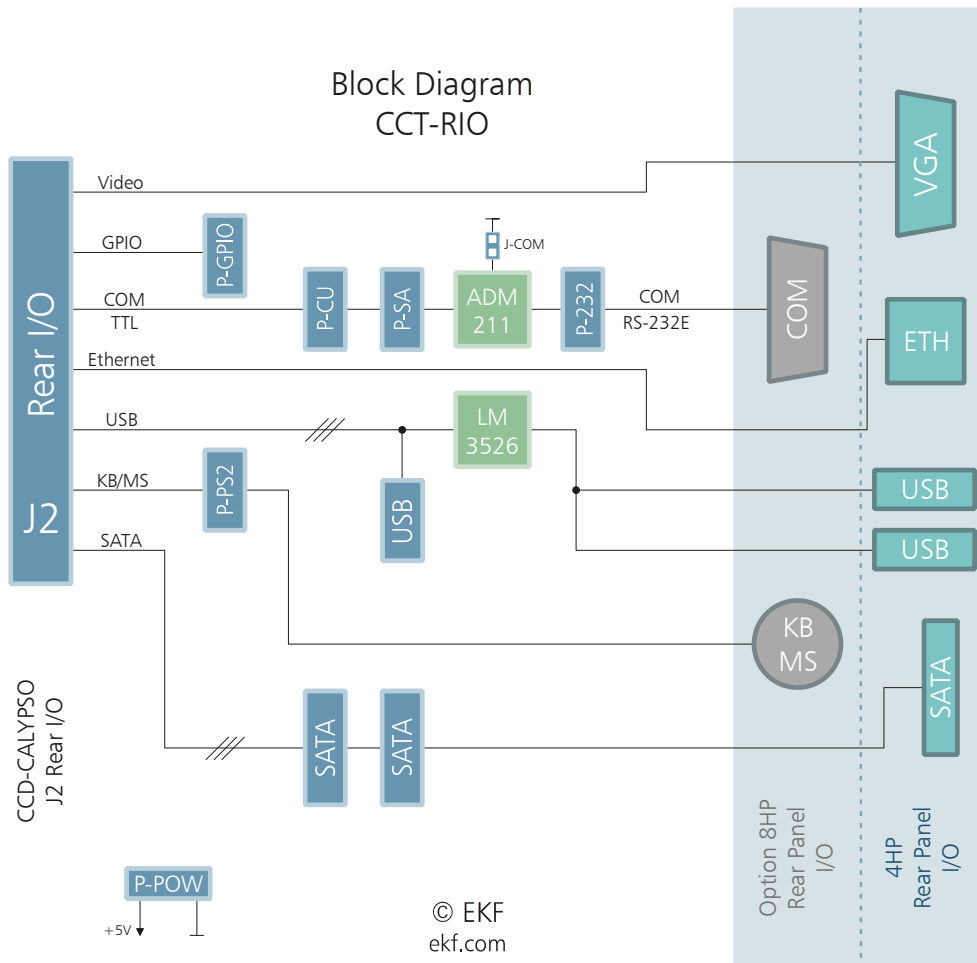


CCT-RIO (Shown with on-Board USB Stick)

Block Diagram CCD-CALYPSO

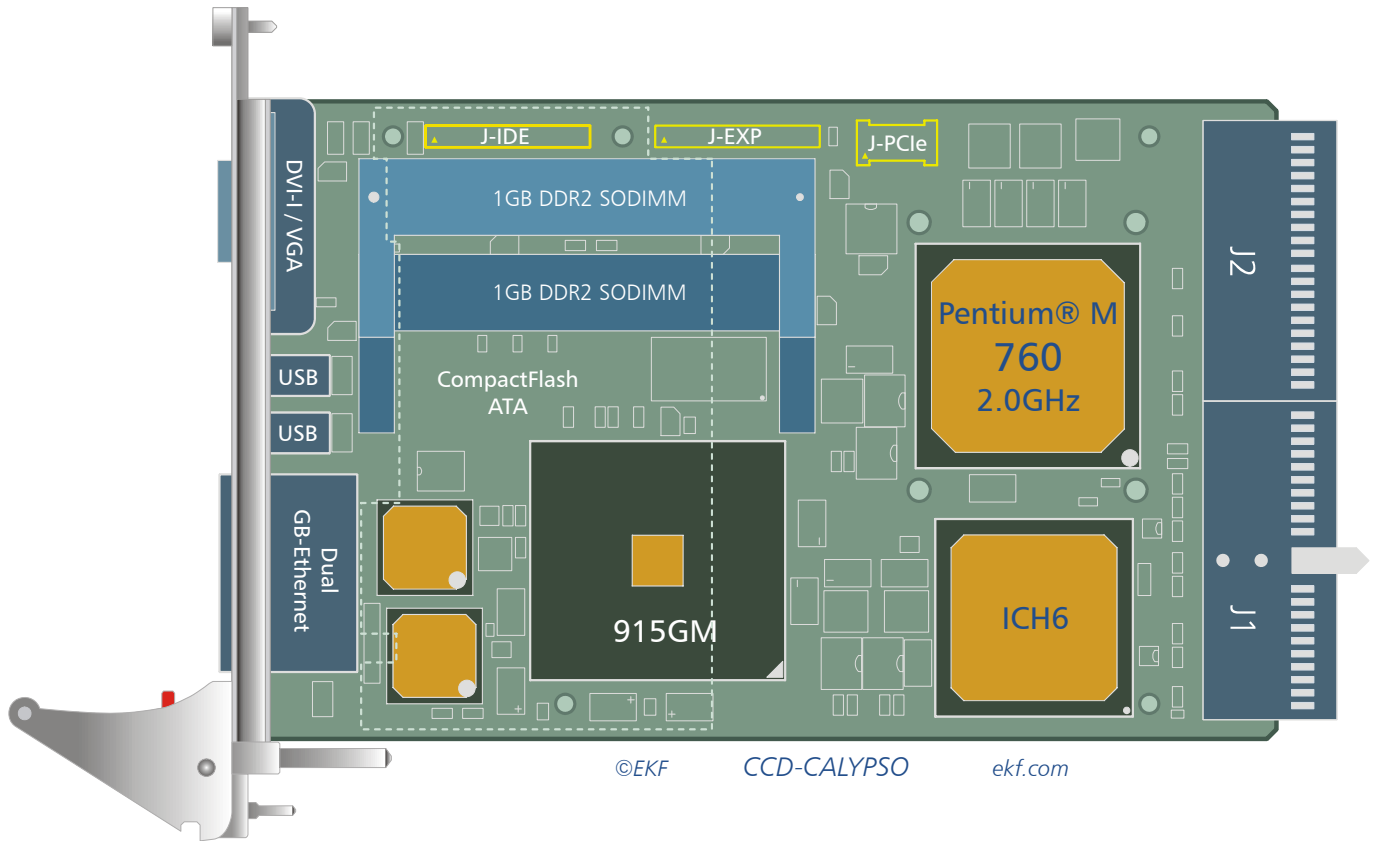


Block Diagram CCT-RIO

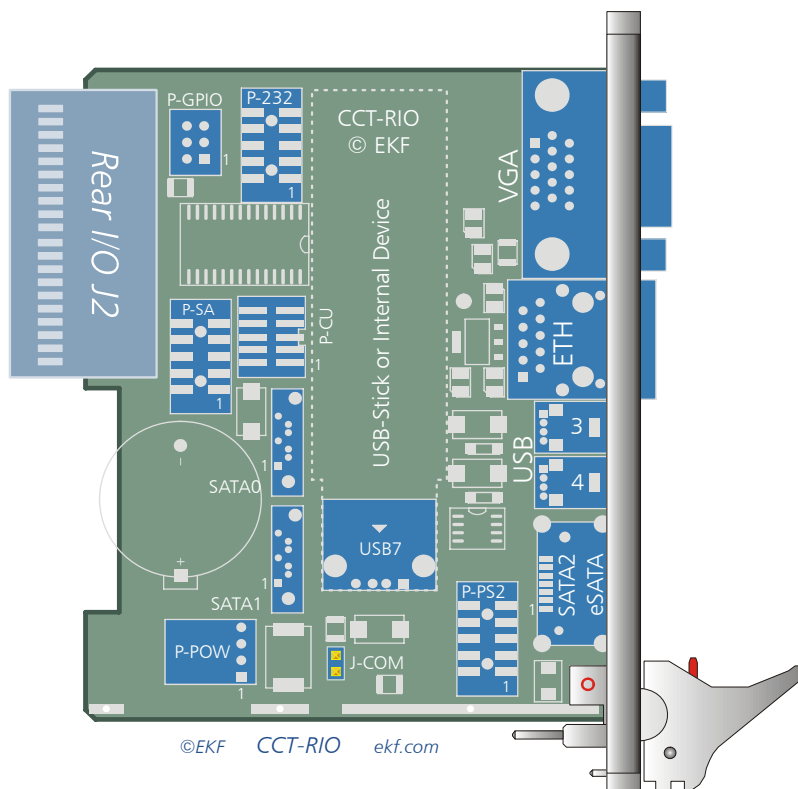


Single Slot Backplane EKF Part No. 932.4.01.000

Component Assembly CCD-CALYPSO (Top View)

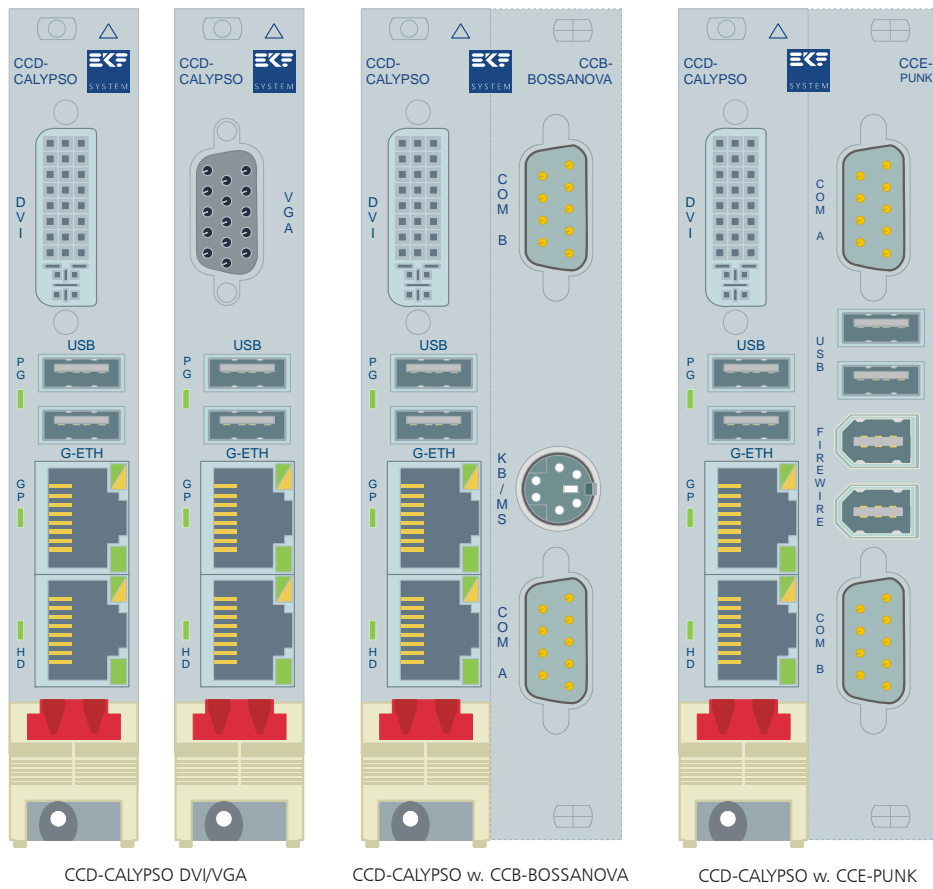


Component Assembly CCT-RIO (Top View)



Front Panel CCD-CALYPSO - Back Panel CCT-RIO

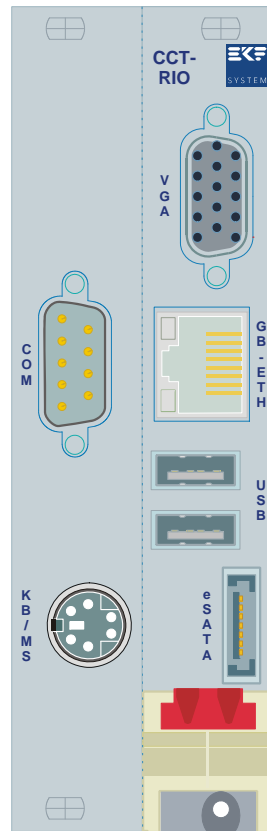
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CCD-CALYPSO DVI/VGA

CCD-CALYPSO w. CCB-BOSSANOVA

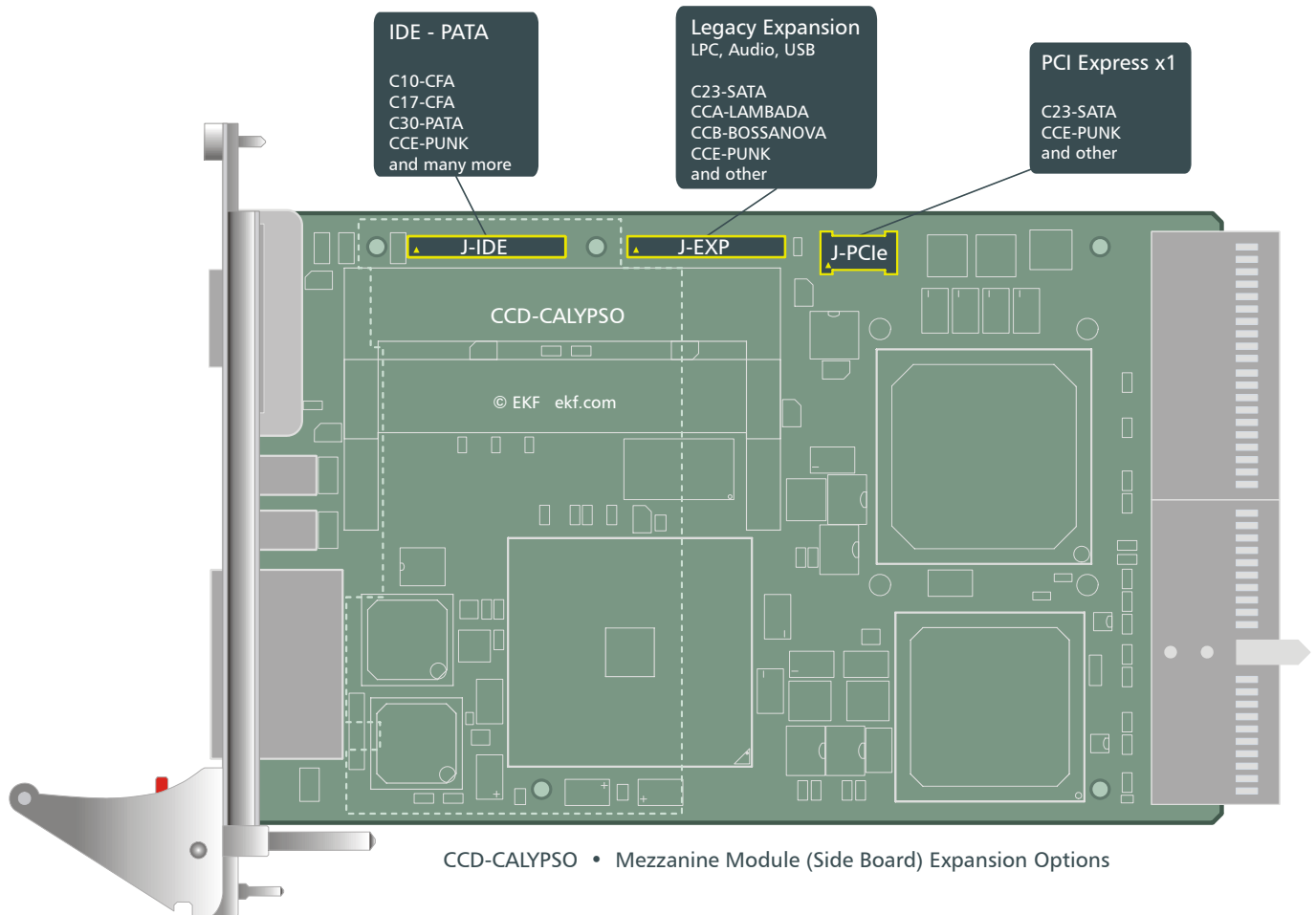
CCD-CALYPSO w. CCE-PUNK



CCT-RIO 4/8HP

CCD-CALYPSO Mezzanine Expansion Options

The CCD-CALYPSO is provided with several stacking connectors for attachment of a mezzanine expansion module (aka side board), suitable for a variety of readily available mezzanine cards (please refer to www.ekf.com/c/ccpu/mezz_oww.pdf for an overview). EKF furthermore offers custom specific development of side boards (please contact sales@ekf.de).



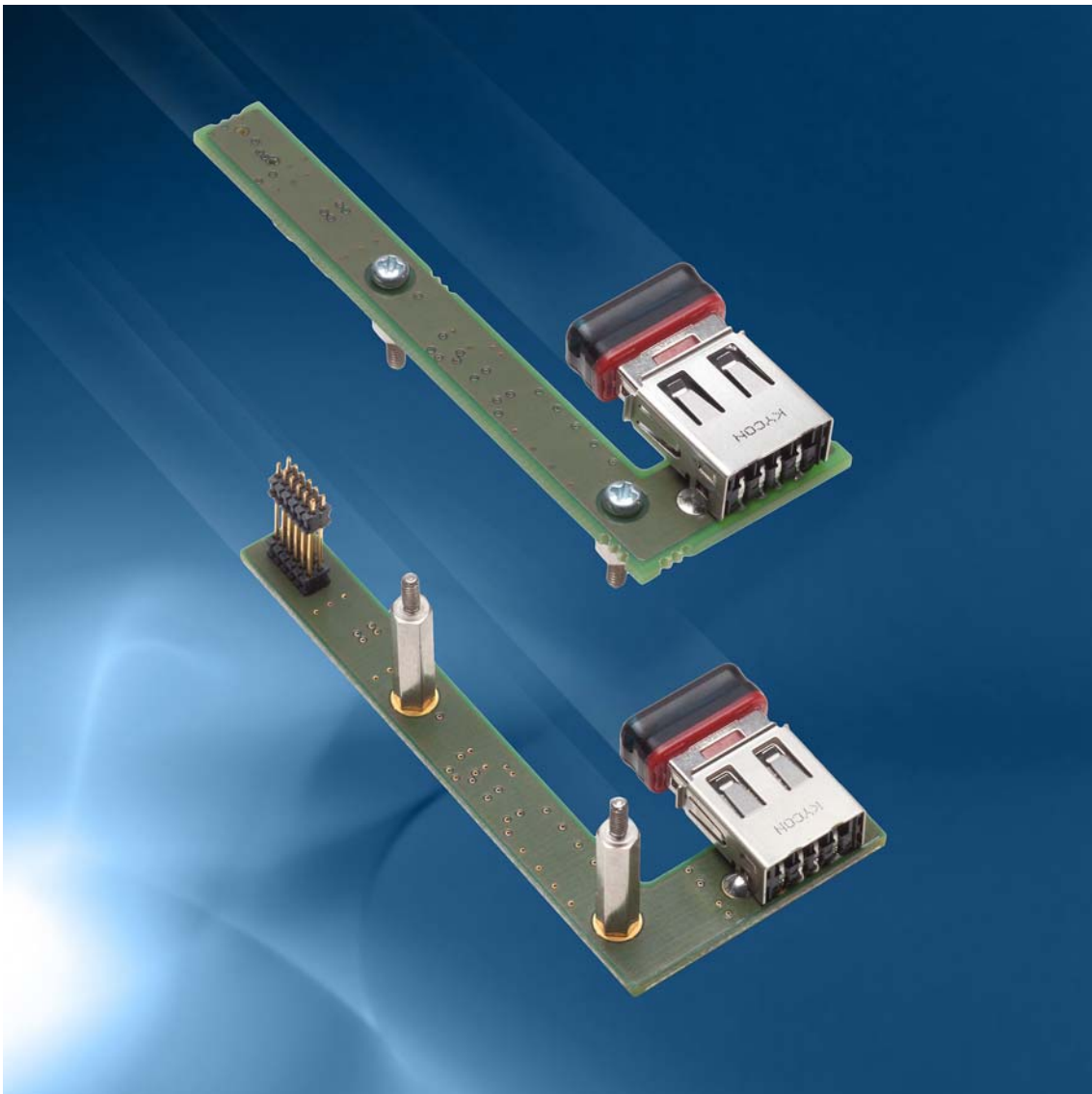
Most mezzanine expansion modules require an assembly height of 8HP in total, together with the CPU carrier board (resulting from two cards at 4HP pitch each).

In addition, reduced size mezzanine modules are available for mass storage, which maintain the 4HP envelope (C10-CFA, C30-PATA), for extremely compact systems. Furthermore these small size modules may be combined with the full-size expansion boards (that means an assembly comprised of 3 PCBs).

C15-DON (Top) & C33-DON (Bottom) Internal USB Connectors

In order to attach an internal USB dongle or USB stick (Flash Drive) to a CompactPCI® CPU board or side card, the C15-DON or C33-DON can be used, connected to the EXP expansion port connector. These adapters are functionally identical, however differ with respect to their mounting position.

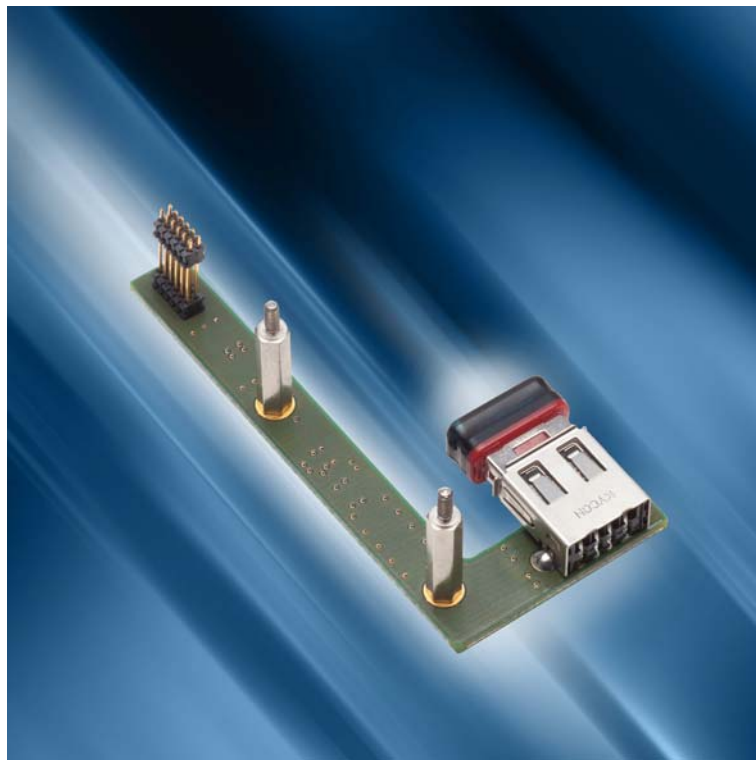
The C15-DON is suitable for top mount, typically on a mezzanine side card such as the CCB-BOSSANOVA, thus maintaining the overall assembly stack height. The C33-DON has been designed for bottom mount, directly under the CPU board, hence additional 4HP front panel width would have to be considered.



USB Flash Drive Options C15 (Top Mount) • C33 Bottom Mount)



C15-DON (Shown w. USB Stick)



C33-DON (Shown with USB Stick)

CCA-LAMBADA Mezzanine Module

Available as a mezzanine companion board to the CCD-CALYPSO CPU card, the CCA-LAMBADA is provided with with an audio codec (AC'97) and several common legacy I/O ports. As an option, the CCA-LAMBADA is available with an on-board 2.5-inch hard disk drive (or 1.8-inch as a mezzanine module).

The CCA-LAMBADA will be attached on top or bottom of the CPU card, and shares its front panel typically with the host CPU carrier board (8HP front panel width in total).



CCA-LAMBADA Mezzanine Side Board on Top of a CPU Carrier Board

CCB-BOSSANOVA Mezzanine Module

Available as a mezzanine side board to the CCD-CALYPSO CPU card, the CCB-BOSSANOVA is provided with several common legacy I/O ports. As an option, the CCB-BOSSANOVA is available with an on-board 2.5-inch HDD (or 1.8-inch as a mezzanine module).

The CCB-BOSSANOVA will be attached on top or bottom of the CPU card, and shares its front panel typically with the host CPU carrier board (8HP front panel width in total).



CCD-CALYPSO w. CCB-BOSSANOVA Mezzanine Companion Board & 2.5-Inch HD

CCE-PUNK Mezzanine Module

Available as a mezzanine companion board to the CCD-CALYPSO CPU card, the CCE-PUNK is provided with high-speed communication channels such as FireWire™ and USB, and common legacy I/O ports as well. Interconnection between the CCE-PUNK I/O module and the CPU carrier board is achieved by several expansion connectors, which comprise the PCIe (PCI Express), LPC (Low Pin Count) and ATA/IDE interfaces.

As an option, the CCE-PUNK is available with a rugged on-board 2.5-inch hard disk drive (1.8-inch as a mezzanine module).

The CCE-PUNK will be attached on top of the CPU board, and shares its front panel typically with the host CPU carrier board (8HP front panel width in total).



CCD-CALYPSO CPU Board with CCE-PUNK Mezzanine Companion Module

CCO-CONCERT Mezzanine Module

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.



CCD-CALYPSO CPU Board with CCO-CONCERT Mezzanine Companion Module

C13-RD Front Panel CompactFlash Slot

Available as a mezzanine expansion option to the CCD-CALYPSO CPU card, the C13-RD is provided with a CF Card socket for front panel insertion.

The overall front panel width available for the entire assembly may be either 6HP (smallest) or 8HP (standard). The C13-RD uses the J-IDE connector of the CPU card.



C13-RD (6HP Version)

C23-SATA Mezzanine Module

The C23-SATA is a mezzanine side board, equipped with a PCI Express to SATA/PATA controller. Two SATA connectors and a master/slave IDE header are provided for attachment of system internal storage devices.

The front panel contains three COM port connectors RS-232. One port can be configured as RS-485.

As an option, the C23-SATA can be stuffed with a TPM 1.2 (Trusted Platform Module) compliant encryption chip. Also as an option available is an audio codec (AC'97 compliant).

The C23-SATA will be attached on top of the CPU board, and shares its front panel typically with the host CPU carrier board (8HP front panel width in total).



CCD-CALYPSO w. C23-SATA Side Board



Links to Related Documents

Short Description	URL (click to open document)
CCD-CALYPSO CPU Card Home	www.ekf.com/c/ccpu/ccd/ccd_e.html
CCD-CALYPSO CPU Card User Guide	www.ekf.com/c/ccpu/ccd/ccd_uge.pdf
CCT-RIO Rear I/O Transition Module Technical Information	www.ekf.com/c/ccpu/cct/cct_tie.pdf
C13-RD CF Card Front Panel Adapter Product Information	www.ekf.com/c/ccpu/c13/c13_pie.pdf
C15-DON/C33-DON Internal USB Connector Product Information	www.ekf.com/c/ccpu/c15/c15_pie.pdf
C23-SATA SATA RAID Controller Side Card Technical Information	www.ekf.com/c/ccpu/c23/c23_tie.pdf
CCA-LAMBADA Multifunction Side Card Technical Information	www.ekf.com/c/ccpu/cca/cca_tie.pdf
CCB-BOSSANOVA Multifunction Side Card Technical Information	www.ekf.com/c/ccpu/ccb/ccb_tie.pdf
CCE-PUNK Multifunction Side Card Technical Information	www.ekf.com/c/ccpu/cce/cce_tie.pdf
CCO-CONCERT Multifunction Side Card Technical Information	www.ekf.com/c/ccpu/cco/cco_tie.pdf



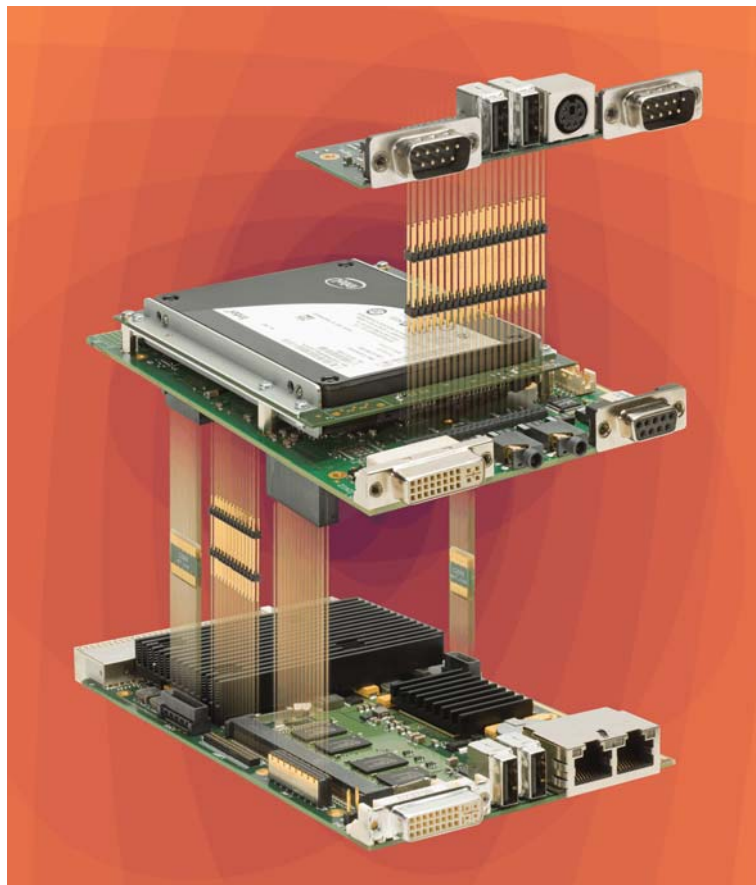
Ordering Information	
Ordering No.	Short Description
CCD-2(R)-CALYPSO	3U/4HP CPCI CPU board, 1.0GHz ULV Celeron® M (Dothan 373), 1GB (2 x 512MB) DDR2 SDRAM, CompactFlash Adapter (C10-CFA)
CCD-3(R)-CALYPSO	Similar to CCD-2-CALYPSO, 1.4GHz LV Pentium® M (Dothan 738)
CCD-6(R)-CALYPSO	Similar to CCD-2-CALYPSO, 2.0GHz Pentium® M (Dothan 760)
CCT-RIO	Rear I/O transition module for CCD-CALYPSO with SATA connectors
CCA-LAMBADA	3U Super-I/O module, local mezzanine expansion board complementing the CCD-CALYPSO, additional front panel width 4HP, with PS/2 keyboard/mouse, RS-232, optional audio connectors & AC'97 Codec, mounting on top or bottom of the CCD-CALYPSO, 2.5-inch HDD option
CCB-3-BOSSANOVA	3U Super-I/O module, local mezzanine expansion board complementing the CCD-CALYPSO, additional front panel width 4HP, 2 x USB, 1 x RS-232, PS/2 keyboard/mouse, mounting on top or bottom of the CCD-CALYPSO, 2.5-inch HDD option
CCB-4-BOSSANOVA	3U Super-I/O module, local mezzanine expansion board complementing the CCD-CALYPSO, additional front panel width 4HP, 2 x RS-232, PS/2 keyboard/mouse mounting, on top or bottom of the CCD-CALYPSO, 2.5-inch HDD option
CCE-PUNK	3U Super-I/O module, local mezzanine expansion board complementing the CCD-CALYPSO, additional front panel width 4HP, 2 x USB, 2 x RS-232, 2 x 1394a FireWire 400Mbps, mounting on top of the CCD-CALYPSO, 2.5-inch HDD option
CCO-2-CONCERT	3U Super-I/O module, local mezzanine expansion board complementing the CCD-CALYPSO, HD Audio codec, SATA controller, additional front panel width 4HP or 8HP, mounting on top of the CCD-CALYPSO, 2.5-inch SATA SSD/HDD option
C23-SATA	3U Super-I/O module, local mezzanine expansion side board complementing the CCD-CALYPSO, additional front panel width 4HP, PCIe to SATA/PATA controller, 2 x RS-232, 1 x RS-232/RS-485, USB SSD, option audio codec AC'97, option TPM module, mounting on top of the CCD-CALYPSO

CCD-*-CALYPSO: suitable for 64-bit CPCI J2/P2 backplane
 CCD-*R-CALYPSO: suitable for rear I/O across J2

For custom specific configurations please mail to sales@ekf.de



EKF BluLine Small CPCI Systems





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