

CP321

3U PowerPC CPU



Fast

Performant

Rugged

CompactPCI

- ▶ Optimized design achieving a maximum of computer performance versus power dissipation.
- ▶ Designed for mission critical applications.
- ▶ The enhanced PowerPC alternative for CompactPCI, built around the Motorola MPC8245.

Looking for a WINTEL alternative ?

The CP321 is the answer ...

Kontron's CompactPCI processor board with floating point unit based on the 32bit PowerPC 603e core MPC8245 is designed for mission critical applications.

CPU, Memory and DMA

Anticipating the CP321's use in data critical applications, the memory data path contains a selectable in-line ECC controller which can provide SDRAM single bit error correct or double bit error detect at 133 MHz synchronous access of the direct soldered SDRAM up to 256MB. For boot code and romable RTOS 8MB of direct soldered Flash is provided.

For mass data transmission a dual channel DMA controller is provided. It can be programmed directly or through the use of descriptor chains located in memory. Data can thus be moved from PCI to memory or vice versa, memory to memory, or PCI to PCI. Two memory expansion sockets allow the addition of Flash (single chip or Disk On Chip) and/or SRAM (or NVSRAM) in a very flexible way.

PCI Expansion

A 100 pin PCI expansion connector can be used to add further functionality to the CP321 without occupying CPCI slots. One or two CP320-IO modules can be plugged together with the CP321 (e.g. two PMC slots can be added) resulting in a total package of either 8HP or 12HP.

CompactPCI interface

The CP321 supports all necessary signals to allow other peripheral boards to be removed or added with power on. The individual clocks for each slot and access to or interrupt on the backplane ENUM# signal are compliant to the PICMG 2.1 Hot-Swap specification.

LAN

The i8255x 10/100 Mbps Fast Ethernet controller is ideal for power and space constrained environments.

Serial ports

Two configurable serial ports (One RS232, one RS232/485 optional opto isolated) are realized with a 16C2550 UART and supports baud rates up to 1.5Mbps.

Parameter storage

A 64Kbit EEPROM one for user settings as well as a coding switch with 16 binary values helps the user to identify the CP321 individually.

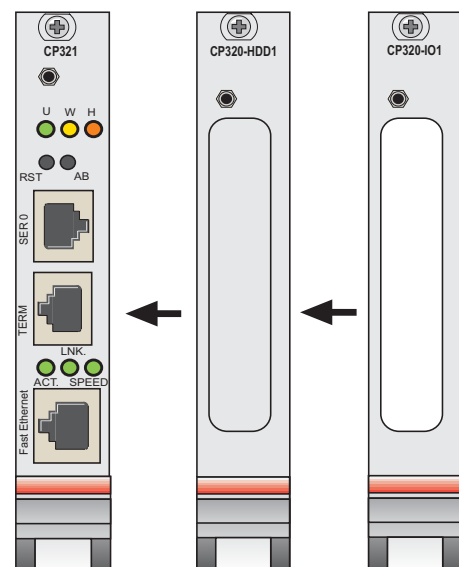
Support

The MPC8245 supports processor control and visibility through the JTAG/COP interface that is accessible as a pin row connector on the CP321. Utilizing third party tools, the developer can access and control the microprocessor. The ECC data path has a mechanism to manually inject errors into memory for use with maintenance and diagnostic utilities. Further a watch point and capture register on the internal bus as well as a set of address attributes on the external memory and PCI buses aid in debugging analysis.

Universal Netboot Loader

The CP321 employs an operating system independent boot loader that enables loading of OS and application software via Ethernet/Internet or serial line. The boot loader is used to update Flash contents and accomplishes an automatic download from Flash to DRAM before booting the OS.

Front-Panel



Specifications

... even in harsh environments

Processor

Integrated PowerPC microprocessor Motorola MPC8245 (330MHz) with 603e core
L1 cache 2 x 16 kB data/instruction cache;
7.8 SPECint95,
6.6 SPECfp95,
465 Dhrystone (2.1) MIPS

PCI arbiter
Two channel controller DMA with chaining
Programmable IRQ controller
Multiple timers and counters

Memory

Up to 256MB direct soldered SDRAM /64bit /133MHz with ECC protection (8 bit parity)
Up to 8MB direct soldered Flash (Boot Device and Program Storage)
2 DIL Sockets for:
NV-SRAM (up to 512kB) / Cell Storage Life 10 years
Flash DiskOnChip (up to 144MB)

Front Panel Functions

Fast Ethernet Channel 10Base-T/100Base-TX; RJ-45; LAN Status LED's (Activity, Link, Speed)
integrated IEEE 802.3 10BASE-T and 100BASE-TX compatible PHY
integrated power management functions
dynamic transmit chaining with multiple priorities transmit queues
full duplex support at both 10 and 100 Mbps operation
IEEE 802.3u Auto-Negotiation support
3 Kbyte Transmit FIFO and 3 Kbyte Receive FIFO
back-to-back transmission support with minimum inter frame spacing
IEEE 802.3x 100BASE-TX Flow Control support
TCP/UDP checksum off-load capabilities

One full modem RS232 port, one configurable RS232/485 port, opto isolation optional, 16550 compatible Dual UART; RJ-45
Two push buttons RESET, ABORT (NMI) Board Status LED's (watchdog active, general purpose)

CompactPCI Bus Interface

PICMG 2.0 Rev. 3.0 compliant
3.3V/5.0V compatible signaling / universal
64-bit/33 MHz system master interface
Rear I/O version 32-bit/33 MHz
J2 rear I/O: 2x serial ports, Ethernet, LEDs

PCI Expansion Interface

32bit/33MHz; 5V Signaling;
Up to two expansion modules are stackable.
8HP/12HP version with one/two PMC slots or two/four PC*MIP slots. This port can also be used to add customized functionality.

Miscellaneous Functions

Coding switch (read back binary code from 0 to 15)
Timers: Four 32-bit timers, one 16-bit timer, one watchdog timer (0.5 / 1 / 1.5 / 2 sec)
RTC: Time keeper, counter for s/ h/ m/ d/ date/ month/ years and century; backup via GoldCap (5days) or optional via replaceable battery (20 years, if RTC only)
Debug Port: JTAG/BDM; 16Pin row connector

Software Support

The CP321 employs an operating system independent boot loader that enables loading of OS and application software via Ethernet/Internet or serial line. The boot loader is used to update Flash contents and accomplishes an automatic download from Flash to DRAM before booting the OS.
Board Support Packages:
VxWorks 5.4/5.5
Linux (SUSE PowerPC)

Reliability

MTBF according to MIL-HDBK 217F
CP321: 170,400h
CP320-I01: 251,000h
Safety: EN 60950, IEC 950, UL 1950
EMI/EMC: EN 50081-1/EN 50082-2
Vibration: IEC 68-2-6, 10-300Hz, 5g
Cont. Shock: IEC 68-2-29, 11ms, 15g
Single Shock: IEC 68-2-27, 9ms, 30g
Altitude: 50,000 ft. (15,240 m)

General

Dimensions: 100mm x 160mm (3U card size)
Front Panel Height: 128.5mm ;
Width: 20mm (0.8inch) / 4HP
Weight:: 200 g

Power Consumption

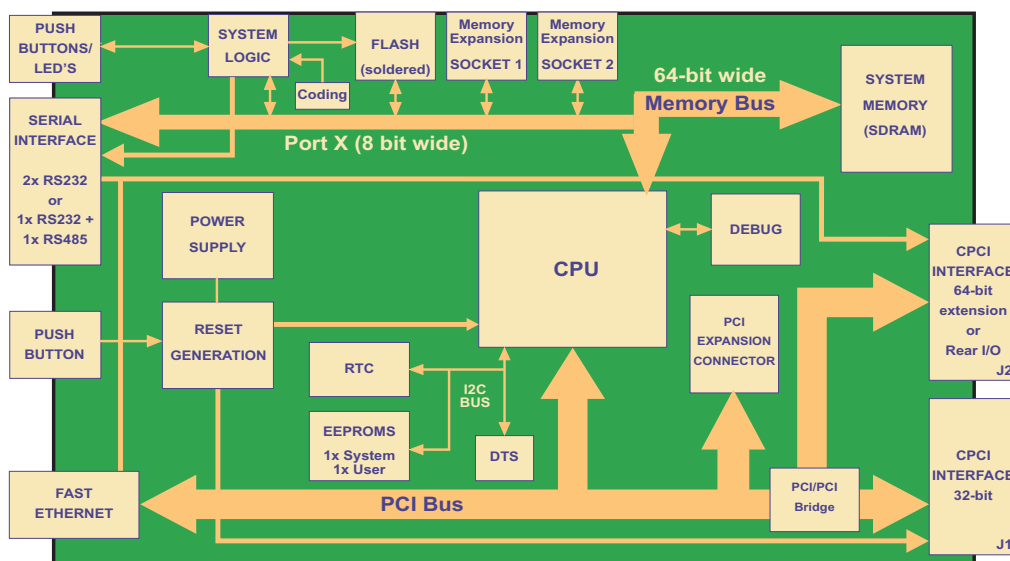
Power Consumption: 6.5W/*typ.
+5V 4W* /typ.
+3.3V 2.5W* /typ.
+12V 0W*
-12V 0W*

*Without PCI Expansion Module and at 330MHz, 64MB SDRAM, 8MB Flash

Environmental

Temperature Ranges: 0°C to + 55°C (standard)
-40°C to + 85°C extended)
-55°C to + 125°C (storage)
Operating humidity: 0% to 90% non-condensing
Altitude: 50,000 ft. (15,240 m)

Functional Block Diagram



Ordering Information

Product	Description	Order No.
CP321	330MHz MPC8245, 64MB SDRAM with ECC, 8MB Flash	23957
CP321-E2	330MHz MPC8245, 64MB SDRAM with ECC, 8MB Flash, Extended temperature range -40°C to +85°C	24125
CP321	330MHz MPC8245, 256MB SDRAM with ECC, 8MB Flash	25794
CP320-I01	PCI expansion I/O; one PMC slot	21608
CP320-HDD1	Hard disk extension module, 2,5" HDD, current size (>10GByte)	26446
FLD-16	16 MByte FLASH-Disk	19643
FLD-32	32 MByte FLASH-Disk	19644
FLD-96	96 MByte FLASH-Disk	22146
NVSRAM-512	512kByte non volatile SRAM; 32pin DIP	20656
CABLE-SM-RS232-9	3 meter RS232 Serial Interface cable with RJ45 to 9Pin D-Sub (female) for connection to PC	10890
VxW-BSP-CP320	VxWorks Board Support Package for CP320/CP321 for use with Tornado	21288
LIN-BSP-CP320	Linux BSP for CP320/CP321 for use with a SUSE PowerPC distribution	24106
KIT-CP321	User's manual documentation in PDF format on CD-ROM	24028

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