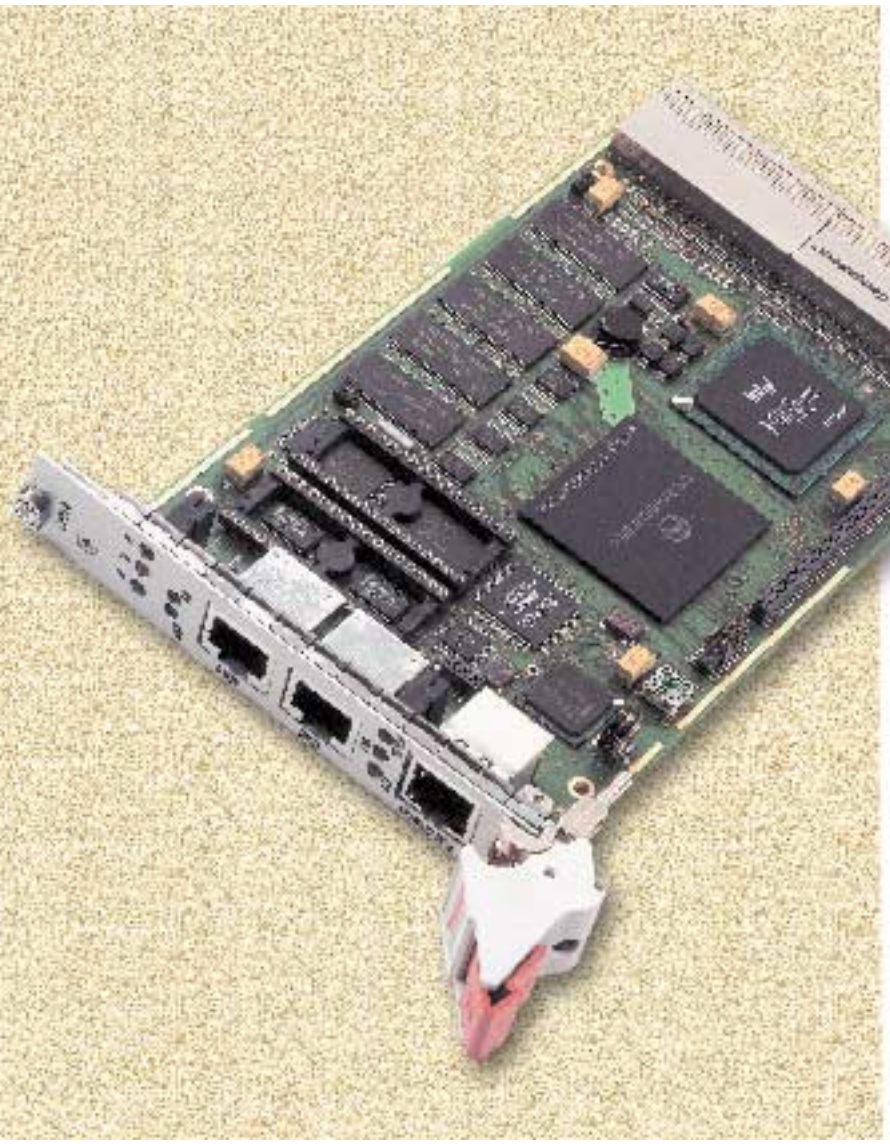
HIGH-PERFORMANCE CPUs
SINGLE-BOARD COMPUTERS

CP320

PowerPC Performance for CompactPCI



Fulfilling critical requirements in harsh environment

- Integrated PowerPC MPC8240 with internal MPC603e core
- 64 bit/33 MHz CompactPCI bus
- PCI Expansion Connector
- Up to 128 MB SDRAM/100 MHz
- Up to 8 MB Flash
- Two DIP sockets for memory extension
- Fast Ethernet & 2 Serial Ports
- Extended temperature version
- Rugged 3U/4HP design
- Universal Boot Loader

CP320 – the PowerPC alternative for CompactPCI
– Plug and Play
– Rugged design

CERTIFIED DIN ISO 9001 QUALITY SYSTEM
Reg. No. 0548 - 02

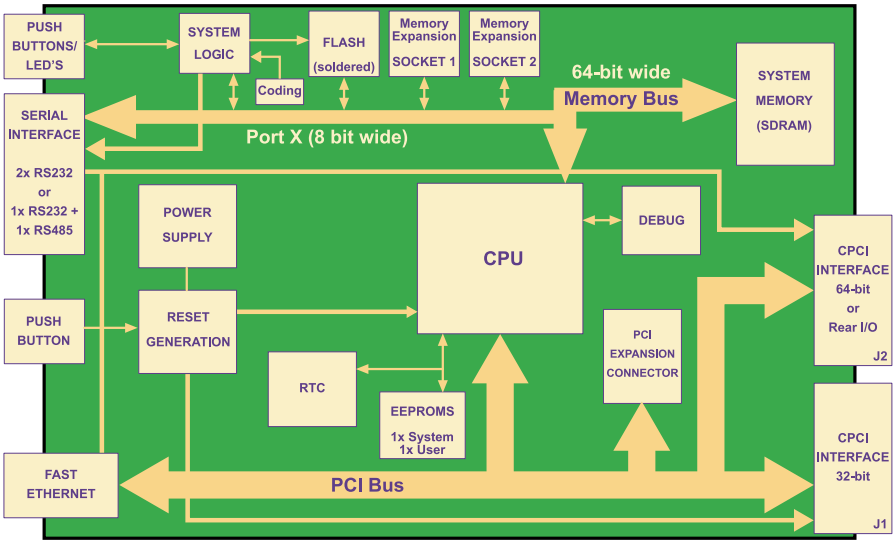
Modular Computers®

Product Overview

CP320

HIGH-PERFORMANCE CPUs SINGLE-BOARD COMPUTERS

PEP's CompactPCI processor board with FPU based on the 32 bit PowerPC 603e core MPC8240 is designed for mission critical applications.



CPU, Memory and DMA
Anticipating the CP320'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 100 MHz synchronous access of the direct soldered SDRAM up to 128 MB. For boot code and romable RTOS 8 MB of direct soldered Flash is provided. For mass data transmission a dual channel DMA controller is provided.
Two memory expansion sockets allow the addition of Flash (single chip or Disk On Chip) and/or SRAM (chip or NVSRAM) in a very flexible way.

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

CompactPCI interface
The CP320 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 i82559 10/100 Mbps Fast Ethernet controller is ideal for power and space constrained environments.

Serial ports
Two software configurable serial ports (RS232 and RS485 opto isolated) are realized with the 16C2550 UART and supports baud rates up to 1.5 Mbps.

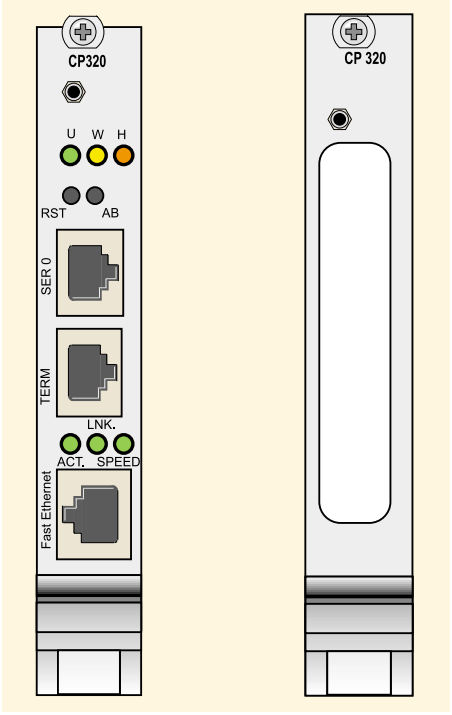
Parameter storage
Two EEPROM's 64 Kbit, one for factory settings and one for user setting as well as a rotary coding switch with 16 binary values helps the user to identify the CP320 individually.

Support
The MPC8240 supports processor control and visibility through the JTAG/COP interface that is accessible as a pin row connector on CP320. 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 Boot Loader
The CP320 employs an operating system independent boot loader that enables the loading of any OS. This boot loader makes an update of the Flash contents and accomplishes an automatic download from Flash to DRAM before booting the OS . For performance reasons the OS is always started from the fast SDRAM.

Front-Panel

CP320



Specifications

CP320

Processor

Integrated PowerPC microprocessor
Motorola MPC8240
L1 cache 2 × 16 kB data/instruction cache;
Internal processor core MPC603e
Core Frequency 250 MHz (350 MHz planned)
6.6 SPECint95/250 MHz
5.5 SPECfp95/250 MHz
375 Dhrystone (2.1) MIPS/250 MHz
PCI bridge and PCI arbiter
Two channel controller DMA with chaining
Programmable IRQ controller
Multiple timers and counters
Max. case temperature +105 °C

Memory

SDRAM up to 128 MB direct soldered, 64 bit/100 MHz with ECC protection (8 bit parity)
Flash up to 8 MB direct soldered (Boot Device and Program Storage)
Two 32 pin DIP sockets (one optional 36 pin) for memory expansion:

- Flash DiskOnChip (up to 96 MB)
- Flash chip (512 kB)
- NV-SRAM (512 kB)/Cell Storage Life 10 years; 2 MB chip with 36 pin socket extension (Cell Storage Life 5 years)
- SRAM chip (512 kB) with battery backup option (GoldCap 5 days or replaceable battery up to 5 years)
- Two serial EEPROM's (8×8 kByte)
- One EEPROM for board default settings
- One EEPROM for user settings

Front I/O

- Fast Ethernet Channel 10 Base-T/100 Base-TX; RJ-45; LAN Status LED's (Activity, Link, Speed)
- Two serial ports
  16550 compatible Dual UART; RJ-45
  – RS232
  – RS485 optical isolated (or 2nd RS232)
- Two push buttons RESET, ABORT (NMI) 3 Board Status LED's (watchdog active, 2× general purpose)

PCI Expansion Interface

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

Software Support

A Universal Boot Loader supports the start of any operating system like WindRiver V×Works.

CompactPCI Bus Interface

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

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 (5 days) or optional via replaceable battery (20 years, if RTC only)
Debug Port JTAG/BDM; 16 Pin row connector

Common

Temp. Ranges:	0 °C to +60 °C (standard)	
	–40 °C to +85 °C (extended)	
	–55 °C to +125 °C (storage)	
Relative Humidity:	0% to 95% (non-condensing)	
MTBF according to MIL-HDBK 217F		
	CP 320	170,400 h
	CP 320-IO1	251,000 h
Safety:	EN 60950, IEC 950, UL 1950	
EMI/EMC:	EN 50081-1/EN 50082-2	
Vibration:	IEC 68-2-6, 10-300 Hz, 5 g	
Cont. Shock:	IEC 68-2-29, 11 ms, 15 g	
Single Shock:	IEC 68-2-27, 9 ms, 30 g	
Altitude:	50,000 ft. (15,240 m)	
Warrenty:	2 years	
Power Consumption:		7.5 W* /typ.
	+5 V	4.5 W* /typ.
	+3.3 V	2.8 W* /typ.
	+12 V	0 W*
	–12 V	0 W*
	* Without PCI Expansion Module and at 250 MHz, 64 MB SDRAM, 8 MB Flash	
Dimensions:	100 mm × 160 mm (3U card size)	
Front Panel Hight:	128.5 mm;	
Width:	20 mm (0.8 inch)/4 HP	
Weight::	200 g	

Ordering Information

CP320

Product	Description	Order No.
CP320 1)	250 MHz MPC8240, 128 MB SDRAM with ECC, 8 MB Flash, Ethernet, two RS232,	21671
CP320 1)	250 MHz MPC8240, 64 MB SDRAM with ECC, 8 MB Flash, Ethernet, two RS232,	21286
CP320-E1 1)	Same as above but extended temperature range E1 (–25 °C .. +75 °C)	21862
CP320-E2 1)	Same as above but extended temperature range E2 (–40 °C .. +85 °C)	21863
CP320-IO1 2)	PCI expansion I/O; one PMC slot (adds another 4 HP in width)	21608
FLD-16 3)	16 MByte FLASH-Disk	19643
FLD-24 3)	24 MByte FLASH-Disk	19194
FLD-32 3)	32 MByte FLASH-Disk	19644
29F040-120	Flash device, 512 KB	12978
SR512K8-70	SRAM device, 512 KB	14158
NVSRAM-512 4)	512 kByte non volatile SRAM; 32 pin DIP	20656
Cable-RS232	3 meter RS232 Serial Interface cable with RJ45 to 25Pin D-Sub (male) for terminal connection	10890
VxW-BSP-CP320 5)	VxWorks Board Support Package for development with Tornado2	21288
KIT-CP320	User's manual documentation in PDF format on 3.5" floppy disk	21287

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Note: 1) Second RS232 instead of RS485 on request
Frontpanel interfaces routed to the rear to J2 connector on request
Rear I/O module on request
Battery on socket; min. 5 years life time (replacement of GoldCap) on request
All versions also in extended temperature range on request
Rear I/O module on request
2) PC*MIP or custom I/O modules on request
3) FLASH-Disks up to 96 MByte are also available on request (low profile package)
4) Smaller NVSRAM capacity on request
2 MB, 36 pin NVSRASM on request
5) Further Operating System support on request
Power On-Code Module on request

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