



CP9

High Performance 6U CompactPCI® Embedded Computer

Single Board Computers

Features

- Intel® Pentium® M processor, 1.4 GHz to 1.8 GHz and Intel® Celeron® M processor 1 GHz and 1.3 GHz
- Optimized for front I/O
- Hot Swap (Full) PICMG 2.1 compliant
- System & Non-system (peripheral) mode
- Extensive Software Support
- Up to 2 GB DDR SDRAM (200MHz) with ECC
- Flash Drive or local 2.5" hard disk
- VGA/LCD up to 1600 x 1200
- Two Gigabit Ethernet ports 10/100/1000 BaseT front or rear optional
- PICMG 2.16 compliant
- Two PMC extension slots, one 64-bit/133 MHz and one 32-bit/33 MHz
- Ultra ATA/100 onboard, second channel rear I/O
- 2x serial I/O with FIFOs RS-232/422/485 interface
- USB 2.0 ports, one front, four rear
- IEEE 1284 parallel port
- Watchdog, temperature sensors
- Optional -40 °C / +85 °C
- Customer specific, low cost assembly versions
- RoHS compliant with version 3.x



CP9 is a 6U CompactPCI all-in-one CPU board with a low power Intel® Pentium® M processor and dual Gigabit Ethernet channels. The CP9 supports full hot swap and is capable of being used in a system or non-system (peripheral) slot. Adhering to the PICMG 2.16 dual Ethernet specification, the CP9 supports the 64-bit/66 MHz CompactPCI bus.

The dual slot wide front panel allows to install on the CP9 two PMC modules and a Hard disk or a Flash drive in parallel. This compact all-in-one CPU module is very well suited for I/O intensive applications in market segments like automation, industrial control, transportation, and others.

The CP9 platform is designed to support processors starting with 1 GHz up to 1.8 GHz. It offers low power consumption and eliminates the need for on-board fans. The design is ready to accept future higher performance Intel Pentium M processor versions.

The CP9 provides a unique feature set, including up to 2 GB of DDR SDRAM (200MHz) with ECC, three independent on-board PCI buses, high speed support for the CPCI backplane, two PMC interfaces (64-bit/133MHz and 32-bit/33 MHz). A high level of functional integration (VGA/TFT, USB, serial interfaces, etc.) within a single board and wide front panel gives users the freedom to use the PMC interfaces as extension for their applications. This combined with a custom specific assembly service provides optimized price/performance for a range of OEM applications. The CP9 is also available in an extended temperature version ranging from -40 °C to +85 °C.

Supported operating systems include Windows® XP, VxWorks® and Linux®. QNX6 and LynxOS® are on request.

CP9 version 3.x is RoHS compliant.

Specifications

CompactPCI – PLX 6254 PCI-to-PCI Bridge

- PICMG 2.0 R3.0 compliant CPCI local bus standard
- 64-bit PCI-to-PCI bridge for up to 8 slots (33 MHz) or 5 slots (66 MHz)
- Supports System and Peripheral Mode
- J1+2, 2 mm pin and socket connectors (IEC-1076-4-101)

Processor - µFCBGA, Low Power Design

- Scalable processing power with flexible processor design
- Intel Pentium M processor: 1.4 GHz to 1.8 GHz
- Intel Celeron M processor: 1.0 GHz and 1.3 GHz
- High efficiency on-board switching regulator (DC/DC)
- Fanless cooling with heatsink
- Contact factory for latest CPU versions

Chipset – Intel E7501/P64H2/ICH4

- 400 MHz system bus to processor
- PCI burst mode transfers up to 512 MB/s (64-bit/66 MHz)
- Two 64-bit wide PCIbusses with 66 MHz
- One 32-bit wide PCIbus with 33 MHz

Cache

		Level 1	Level 2
Pentium M	90nm	32 KB	2048 KB, full speed
Pentium M	130nm	32 KB	1024 KB, full speed
Celeron M	90nm	32 KB	512 KB, full speed
Celeron M	130nm	32 KB	512 KB, full speed

Memory – DDR 200

- High-speed registered DDR SDRAM
- 72-bit wide with error correction (ECC)
- 512 Mbytes to 2 Gbyte with soldered chips

Dual Gigabit Ethernet – Intel 82546GB

- Highly integrated Dual Channel Ethernet Controller with 64-bit/66 MHz PCI local bus DMA
- 64 Kbyte Transmit and Receive FIFO
- 10/100/1000BaseT auto-negotiation
- Versions with front and rear I/O available
- Compliant to PICMG 2.16

Hard Disk or Flash Drive

- Internal 2.5" IDE hard disk or 2.5" Flash Drive (for extended temperature range and higher shock/vibration immunity)

PMC Extension Slots - IEEE P1386/1386.1

- One high bandwidth 64-bit/133 MHz PMC and one 32-bit/33 MHz PMC interface
- Enhancement to processor PMC standard VITA 32-2003 (non-monarch)
- Both PMC slots support front panel I/O and rear I/O
- Cardbus adapter available on PMC2

VGA and LCD – NVIDIA® GeForce™4 420 Go

CP9 board version 2.x only

- 256-bit 3D and 2D graphics accelerator
- On-chip 32 Mbytes frame buffer (66-190 MHz)
- 32-bit/33 MHz PCI interface
- Dual CRT/ Simultaneous Dual Display
- 350 MHz Palette-DAC for analog VGA (up to 1600 x 1200)
- DVI-I interface (PanelLink®) for TFT displays up to 1024 x 768, single channel DVI (165 MHz), EDID display PnP supported
- Fully compliant support for OpenGL™ 1.2 for all supported Windows operating systems and Linux

VGA and LCD – ATI MOBILITY™ RADEON™

CP9 board version 3.x only, RoHS version

- 128/256-bit 2D, 3D and multimedia graphics accelerator
- Local DDR memory (16 MB or 64 MB) @ 125 MHz to 200 MHz
- 32-bit/33 MHz PCI interface
- Dual independent CRT controllers to support two asynchronous simultaneous display paths
- RAMDAC (300 MHz to 400 MHz) for analog VGA (1600 x 1200)
- TDMS transmitter up to 165 MHz (1024 x 768 at 60 Hz); DVI
- Full support of OpenGL 1.3 (Windows) and xFreeX86 (Linux)
- Support for DirectX 6.0 to DirectX® 8.1 under Windows

EIDE- ICH4

- Ultra ATA/100 sync. DMA mode up to 100 Mbytes/sec
- PIO mode 4 and bus master IDE up to 16 Mbytes/sec
- Two devices supported via local EIDE connector and two devices via rear I/O

Serial I/O - RS232/422/485

- Two async. 16550 compatible full duplex serial channels at rear I/O
- High-speed transfer up to 115.2 kbaud with 16 byte FIFOs
- User selectable RS232/422/485 interface
- COM1 optional available at front

Parallel Port

- Bi-directional, IEEE 1284 compatible enhanced parallel port (including EPP and ECP) for printer

USB 2.0 – ICH4

- One USB 2.0 connector at front
- Four universal serial bus channels at rear

General Purpose I/O (software configurable)

- Eight GPIO (input or output) pins
- Interrupt capability (edge, level)

Keyboard and Mouse

- PS/2 compatible

Real-time clock

- RTC 146818 compatible, on-board Li-battery

CMOS RAM

- 242 bytes non-volatile CMOS RAM

EEPROM

- 512 Kbit serial EEPROMs for non-volatile user data

Floppy

- One channel 3.5" floppy drive controller

Watchdog (user programmable)

- Watchdog 1: 4.8 µs to 76 s, 0.6 s increments
- Watchdog 2: 1 min to 255 min, 1 min increments

Timer

- Integrated in E7501/ICH4 chipset

Temperature Sensors

- CPU die and heat sink temperature software readable from -65 °C to +127 °C

LED

- Front panel LED System control
- Hot swap (blue), Status (red / yellow / green)

Hot-Swap - compliant to PICMG 2.1

- Peripheral mode: Board can be inserted or removed in a powered system
- System controller mode: Other, non system (peripheral) boards can be removed or added with power on

BIOS Features

- New AMI BIOS Core 8, in-system programmable Flash ROM
- CPU, memory and IDE auto-detection/selection
- Integrated VGA, and Ethernet BIOS ROM
- USB Mass Storage support and booting capability (floppy, HDD, CDROM)
- Password protection, BIOS post, system and video BIOS shadowing
- Extensive setup with remappable serial/parallel ports
- Operation without disk, keyboard and video
- Remote BIOS through serial port

Software

- The following software is supported to the extent listed below.

OS	On Request	Available
WIN XP	-	√
QNX 6	√	-
VxWorks	-	√
Lynx OS	√	-
Linux	-	√

Front and Rear I/O (with transition module CTM12)

- The pinouts of the transition module connectors (rear I/O) corresponds to standard PC connectors (press-fit cables).

Function	Front	Rear J3/J4/J5
DVI-I	-	√ ¹
VGA	√	√ ¹
Eth 1	√ ²	√ ²
Eth 2	√ ²	√ ²
Keyb+Mouse	√	√
Reset	√	√
LEDs	√	√
USB 2.0 1-5	1	2-5
IDE primary	-	√
IDE secondary	onboard	-
Floppy	-	√
COM 1-2	1	1, 2
LPT	-	√
GPIO (8 pins)	-	√
PMC 1 (64-bit 133MHz)	√	√
PMC 2 (32-bit 33MHz)	√	√

*1 Rear DVI-I connector for DVI and VGA

*2 Either front or rear as an order option

Styles (Non-RoHS)	C	I
(RoHS)	1	3
Front Panel	yes	yes
Front Stiffener	no	no
Middle Stiffener	no	no
Wedge Locks	no	no
Parts Soldered	yes	yes
Li-Battery	yes	yes
Extended Temp.	no	yes
Conformal Coating	no	no
Conduction Cooled	no	no

Power Requirements

- +5 V, +3.3V, +12V Required
- -12V If required by mounted PMC module

Power Consumption - typical operating current

- w/o keyboard, hard disk, modules, Ethernet (no link), measured at DOS prompt, no power savings.

Processor, Memory	5 V	3.3 V	Total Power
1.0 GHz, 1 GB	1.0 A	5.9 A	24.5 W
1.3 GHz, 1 GB	2.2 A	5.9 A	30.5 W
1.4 GHz, 2 GB	1.4 A	5.9 A	26.5 W
1.6 GHz, 2 GB	2.7 A	5.9 A	33.0 W
1.8 GHz, 2 GB	2.5 A	5.9 A	32.0 W

- w/o keyboard, hard disk, modules, Windows XP, 3D graphics active. Both Gigabit Ethernet channels linked, CPU running at instruction mix for maximum power consumption.

Processor, Memory	5 V	3.3 V	Total Power
1.0 GHz, 1 GB	1.3 A	7.5 A	31.3 W
1.3 GHz, 1 GB	4.6 A	7.5 A	47.8 W
1.4 GHz, 2 GB	2.7 A	7.5 A	38.3 W
1.6 GHz, 2 GB	5.4 A	7.5 A	51.8 W
1.8 GHz, 2 GB	4.8 A	7.5 A	48.8 W

Power Allowances - PMC slot

- +5 V, +3.3V: Total power max. 7.5 W
- ±12 V: 100mA each

Mechanical – PICMG 2.0

- 6U, 2 slots wide
- 233 x 160 x 40 mm (including Flash drive) or hard disk

Temperature

- Note: For detailed information about the operating temperature behavior of the board of any style it is absolutely necessary to consult the manual. The processor type and speed, altitude, the use or not use of Ethernet and video, ambient conditions and the type of cooling influences the board temperature range.
- All values under typical conditions without a PMC module

	Operating	Storage
Standard	0 °C to +70 °C	-40 °C to +85 °C
Extended	-40 °C to +85 °C	-40 °C to +85 °C

	Operating	Storage
Humidity	5 – 95 % @ 40 °C	5 – 95 % @ 40 °C
Altitude	15.000 ft. (4.5 km)	40.000 ft. (12 km)

Shock (3 axis, up & down, 5 hits / direction)

- Style (C, I, 1, 3): 12g / 6 ms

Vibration (30 minutes each axis)

- Style (C, I, 1, 3): 2 g rms @ 5 to 100 Hz

MTBF

- Calculations are available in accordance with MIL-HDBK-217. Please contact factory.

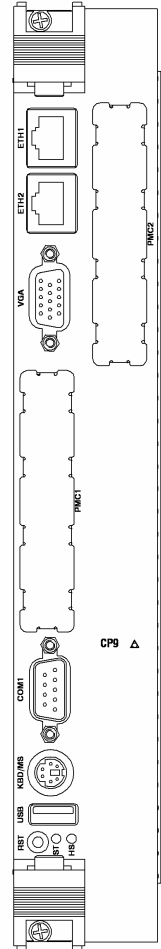
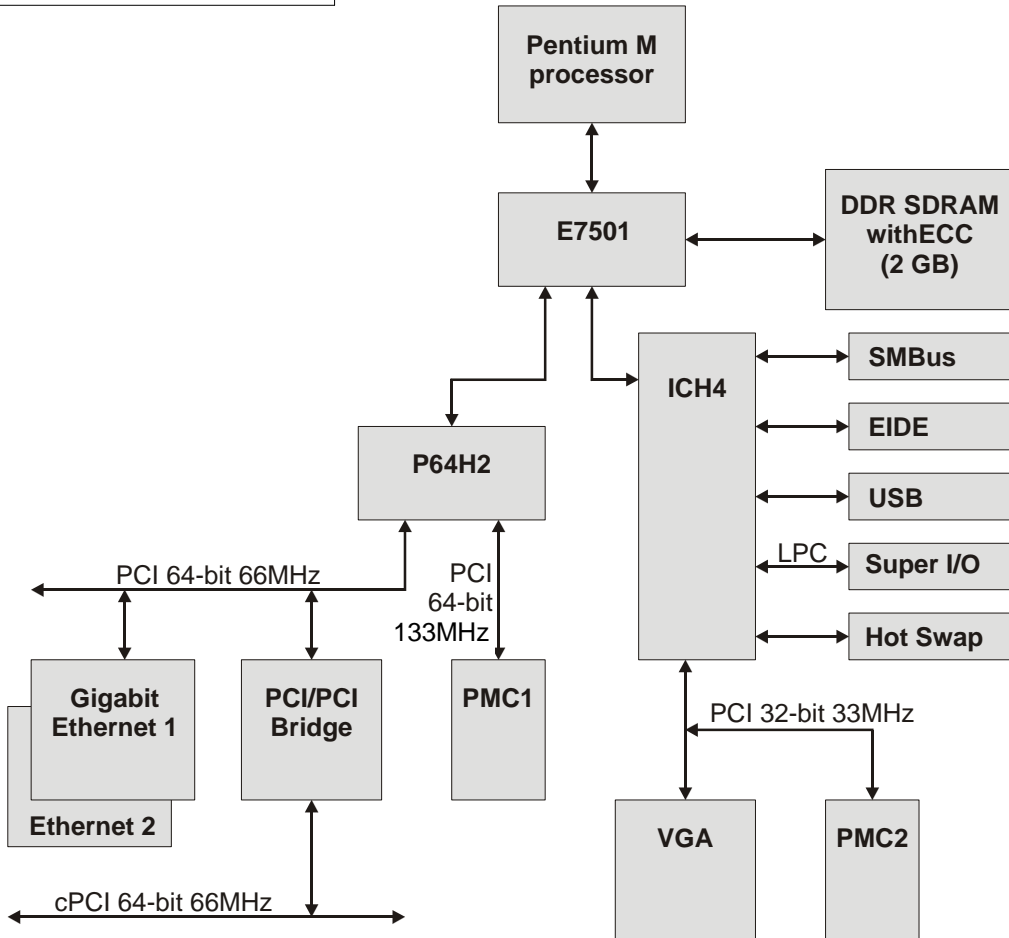
Safety

- Designed to meet standard UL1950, CE class A, FCC-A



CP9

Block Diagram



Ordering Information

Hardware Accessories

- CTM12: I/O transition module for 6U backplane (IEEE 1101.11-1998 compliant)
- SCM184TL00C: 1U 19" chassis with 2 CPCI slots, backplane and power supply
- SCC784UE05CP9: CP9 starter cage, 19", 7U, 84HP, 5 CPCI slots, fans, HDD and DVD
- ZKAAPS2SPLIT: Cable for keyboard and mouse on front panel

Operating Systems

Extensive operating systems support are available (see page 3).
 Chassis with power supplies, backplanes and drives on request.
 For detailed information and further options, contact SBS.

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