PEP-CP306
Pentium® M
Rugged CPU

Effective
Even-tempered
Robust

Compact PCI

➢ More value with Intel® Pentium® M up to 1.6GHz and 1MB L2 cache

➢ Less rejected heat through better power saving

➢ Extended Temperature and shock/vibration resistance
Kontron Modular Computer’s CompactPCI PEP-CP306 CPU demonstrates high PC computing performance in a first-rate resistant construction.

The PEP-CP306 CompactPCI system controller board combines the performance of Intel’s Mobile Pentium® M processor with the high integration of the 855GME chipset and the I/O Controller Hub ICH4. Realized as a 3U single slot processor card it contributes to high density packaging.

Computing performance
Pentium M clock speed statements are not directly comparable to those of Pentium 4. The new low power Pentium M processors offers at 1.6GHz the same performance as Pentium 4 at 2.4GHz up to 2.7GHz, but dissipates only half of the thermal. This is achieved by several architecture improvements over Pentium 4 like larger caches, faster busses, enhanced SpeedStep with aggressive clock gating to turn off circuits not in use very quick and enables real-time dynamic switching between multiple voltage and frequency points to reduce idle power.

Temperature resistance
The Pentium M architecture allows a high internal temperature and thus make it possible to work up to high extended temperature ranges. Together with its directly soldered thin BGA package it enables sufficient space for a passive heatsink within 4HP.

Shock resistance
The direct soldered processor and memory provide less weight and a higher shock/vibration- resistance than socket devices can. The fan-less heat sink is tightly screwed on the board.

Graphic performance
With the 855GME integrated graphics accelerator delivering high performance 2D, 3D and video capabilities it supports intense, realistic 3D graphics with sharp images and enables balanced memory usage between graphics and system for optimal performance (up to 64MB of dynamic video memory allocation).

I/O connectivity
The 4HP version comes with the most important interfaces, the 8HP version supports legacy interfaces as well. With the PCI and LPC expansion connectors, the CP306 is an ideal platform for 8HP customized CPU’s as well.

**Functional Block Diagram**

**Frontpanel**
Specifications
...just technical facts:

**Processor**
Mobile low power Pentium<sup>®</sup> M processor in Micro-FCBGA 479 package
2x 32KB L1 cache and 1MB/Byte L2 cache
400MHz processor system bus
0.13u silicon process with 1.48V (1.6GHz) / 1.18V (1.1GHz) / 0.96V / 600MHz core voltage
Maximum internal junction temperature 100°C
Long term available versions:
- 1.1GHz LV low power dissipation, extended temperature range option
- 1.6GHz high performance /higher frequency versions when available
All board versions are passive cooled, fan-less heatsink within 4HP height

**Memory**
333 MHz memory speed, Intel<sup>®</sup> 82855GME GMCH
256MByte or 512MByte soldered DDR-SDRAM with ECC
CompactFlash socket type II (Flash or Microdrive HDD)
Onboard 2.5” HDD mounting within 8HP
1MB Firmware Hub for BIOS
8KByte EEPROM for CMOS data storing (no battery operation)

**Connectivity**
4HP board:
- Ethernet: 1st: Intel<sup>®</sup>-82540EM based 10/100/1000MBit/s Gigabit Ethernet controller at front
- 2nd: Intel<sup>®</sup>-82801DB ICH4 10/100Base-TX Ethernet controller (based on 82559; front or rear IO)
- VGA: Intel<sup>®</sup>-82855GME GMCH internal VGA controller providing 2048x1536x6bit/60Hz resplution, max. shared memory 64MB
- USB: 4x USB2.0 channels up to x480Mbit/s, 2 as front IO, 2 as rear IO
- COM: Uart with two UARTS compatible RS232 ports as rear IO
- IDE: Two IDE interfaces, Ultra ATA/100, 100MB/sec Primary port ATA(33) connected to CompactFlash socket & rear IO
- Secondary port ATA(100) 40-pin, 2.54mm connector onboard

8HP additions:
- COM: Additional 2 COM ports (front IO), 4 COM ports in total
- PS/2: PS/2 for keyboard and mouse legacy support (front IO)
- IDE: Secondary port ATA(100) two 40-pin, 2.54mm connector s, one for onboard 2.5” IDE IDE Flash Disk or HDD mounting option, another one for external devices like CD-ROM
- Floppy: Standard Floppy connector
- LPT: The parallel port is accessible as onboard 26-pin row connector

**Front Panel Functions**
4HP:
- Two R3-45 with integrated LED’s (ACT, SPEED)
- Top connector: VGA-CRT 15-pin D-Sub SVGA connector
- USB: Two 4-pin connectors
- LED s: ACT, SPEED (LAN), Thermal, Watchdog or both general purpose
8HP:
- Additional to 4HP
- COM1/2: Two 9-pin D-Sub (RS232/422/485 jumper selectable)
- Keyb/Mouse: PS/2
- Reset: Reset button, guarded
- LED: HDD active

**On-board inter-module interfaces**
PCE and LPC (Low Pin Count - the ISAbus replacement) build the connection between the basic CPU board with any I/O extension module, resulting in a double slot (8HP) solution

**Rear I/O via J2**
The Rear I/O versions support:
- 32-bit/33 MHz CompactPCI interface
- Two USB1.1 ports
- One Fast Ethernet port without LED
- Two COM ports (TTL level)
- CRT VGA port
- One fan control input
- One general purpose output
- Input for external backup battery

**CompactPCI Bus Interface**
PICMG 2.0 Rev 3.0 compatible, 32-bit/33MHz System master
5V VI/O (3.3V on request), 7 Req/Gnt & clock lines
Version with rear I/O on 32 PICMG 2.0

**Supervisory Functions, Clock/Calendar**
Watchdog, software configurable, 125 msec to 256 sec. In 12 steps, generates IRQ, NMI or hardware reset, two stage configuration for NMI and Reset
Hardware monitor LM87 for thermal control, fan-sense and all important onboard voltages
ICH9 internal RTC (MC146818 compatible), RTC and 256 Byte CMOS RAM with backup, battery replaceable

**Hot Swap**
Support for all signals to allow peripheral boards to be hot swapped. The individual clocks for each slot and access to the backplane ENUM# signal comply with the PICMG 2.1 Hot-Swap specification.

**Compliancy**
CompactPCI Core Specification PICMG 2.0 Rev. 3.0
CompactPCI Hot Swap Specification PICMG 2.1 R2.0
Designed to meet or exceed:
- Safety: UL 1950, UL 94, CSA 22.2 No 950, EN 60950, IEC 950
- EMI/EMC: EN 55022 / EN 55024, EN 50081-1 / EN 6100-6-2
- Altitude: 50,000 ft. (15,240 m)
- Operating humidity: 0% to 90% non-condensing
- Storage temp.: -55°C to +85°C
- Power Consumption:
  - +5V/ J2: typ. 6W at 600MHz
  - +5V/ J2: typ. 9W at 1.1GHz
  - +5V/ J2: typ. 16W at 1.2GHz
  - +5V/ J2: typ. 20W at 1.6GHz
  - +5V/ J2: typ. 28W at 1.6GHz
  - +12V: -12V not used

**Environmental**
- Operating temp.: 0°C to +60°C standard
- -40°C to +85°C E2 (optional)
- Storage temp.: -55°C to +85°C
- Operating humidity: 0% to 90% non-condensing
- Altitude: 50,000 ft. (15,240 m)

**Software Support**
Phoenix BIOS with QuickBoot, QuietBoot, BootBlock, MultiBoot III, PC Health Monitoring, Serial port remote control with CMOS setup access, BIOS parameters saved in EEPROM, diskless, keyboardless, videoless operation. LAN boot support, USB Floppy boot, USB memory stick boot. Plug&Play capability. Board identification number accessible via EEPROM
Support for Windows 2000, XP Pro, XP Embedded, Linux<sup>®</sup>, VxWorks<sup>®</sup>, (other OS's may be possible, please contact us for information).

**Power Consumption**
+5V: 3W, 3.3V: 3W
+5V: 4W, 3.3V: 5W
+5V: 6W, 3.3V: 5W
+5V: 8W, 3.3V: 9W
+5V: 10W, 3.3V: 18W
+12V: 28W at 1.6GHz

**General**
Dimensions: 100mm x 160mm
Weight: 300g / 4HP, 400g / 8HP
MTBF: 117,000h

**Designation**
### Ordering Information

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>CP306</td>
<td>Pentium® M 1.1GHz, LV, 1MByte L2 cache, 256MByte DDR-SDRAM</td>
<td>26712</td>
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<tr>
<td>CP306-E2</td>
<td>Pentium® M 1.1GHz, LV, 1MByte L2 cache, 256MByte DDR-SDRAM, -40/+85 C</td>
<td>26714</td>
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<tr>
<td>CP306-RIO</td>
<td>Pentium® M 1.1GHz, LV, 1MByte L2 cache, 256MByte DDR-SDRAM, Rear I/O routing to J2</td>
<td>26713</td>
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<td>CP306-RIO</td>
<td>Pentium® M 1.6GHz, 1MByte L2 cache, 256MByte DDR-SDRAM</td>
<td>26715</td>
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<td>CP306-RIO</td>
<td>Pentium® M 1.6GHz, 1MByte L2 cache, 512MByte DDR-SDRAM</td>
<td>26716</td>
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<tr>
<td>CP306-EXT-CRT</td>
<td>4HP front panel extension module (2x Ethernet, 2x USB, LED’s, VGA)</td>
<td>26717</td>
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<tr>
<td>CP306-EXT-IOIDE</td>
<td>8HP (additional to 4HP COM1/2, PS/2, Reset button, Floppy port, parallel port)</td>
<td>26718</td>
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<tr>
<td>CP-RIO3-03</td>
<td>4HP rear I/O module (one Ethernet, COM1/2, onboard IDE connector)</td>
<td>26725</td>
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<tr>
<td>CP-RIO3-03</td>
<td>8HP rear I/O module (additional to 4HP VGA, USB1/2, LED)</td>
<td>26726</td>
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<td>CF128</td>
<td>CompactFlash 128MByte</td>
<td>23441</td>
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<tr>
<td>CP-HDD-2,5-IDE</td>
<td>Notebook-style 2.5” Hard disk 18GB or higher for board mounting</td>
<td>22531</td>
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<tr>
<td>CP-ADAP-ATA100</td>
<td>IDE cable for ATA/100 (40 pin connector with 80 lines, 3x40 pin connectors, length 0.6m)</td>
<td>23671</td>
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<tr>
<td>KIT-CP306</td>
<td>Windows Drivers, setup utilities, user’s manual in PDF format on CD-ROM</td>
<td>26723</td>
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<td>VXW-BSP-CP306</td>
<td>VxWorks Board Support Package for use with Tornado on CD-ROM</td>
<td>26724</td>
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<tr>
<td>LIN-INSTALLATION</td>
<td>Linux installation service on HDD (SuSE, RedHat or other according to request)</td>
<td>26939</td>
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</tbody>
</table>

**Note:**

1. A front panel extension module must be ordered in conjunction with the basic CPU board.
2. Other configuration options for volume orders are available on request.
3. Higher clock speed when available (next generation Pentium M/Dothan processor).
4. Ultra Low Power processors (ULV) when available.
5. CompactFlash is available from 32MByte to 1GByte, also in extended temperature range -40/+85 C
6. Today’s fast hard disk drives need ATA/100 cable