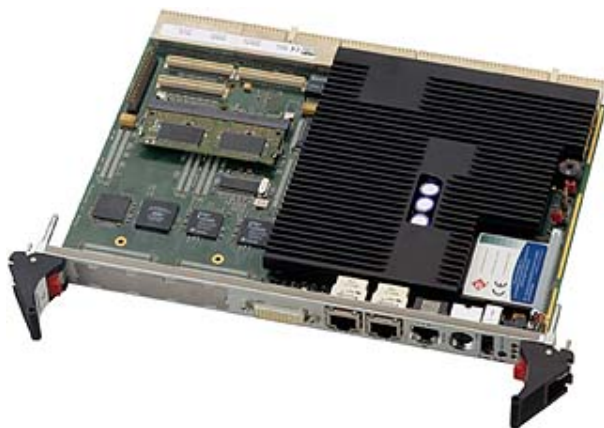


# D4 - 6U CompactPCI®/PXI™ Pentium® 4 SBC



- **Mobile Pentium® 4 up to 2.2GHz**
- **1-slot CompactPCI® 64-bit/66MHz**
- **PXI™ system controller**
- **1GB DRAM, CompactFlash®**
- **Graphics controller/digital video output**
- **2 Gigabit Ethernet (front)**
- **1 Gigabit Ethernet (PICMG 2.16) - depending on model**
- **3 USB**
- **2 COMs, IDE, floppy, parallel, keyboard/mouse**
- **1 PMC or 2 PC-MIP® mezzanine slots**

With the Mobile Pentium® 4 processor, the 845G chipset technology (400MHz local bus frequency) and its 64-bit/66-MHz bridge to the CompactPCI® bus (32-bit/33-MHz on board), the D4 is one of the most powerful 6U single-board computers today. Standard versions come with the 1.7 GHz and 2.2 GHz processors from the Intel® "Embedded Line".

The D4 can operate as a system-slot card for any CompactPCI® or PXI™ system, with the system slot capable of being placed either left or right in the enclosure. The 1-slot D4 supports full hot swap and is compatible with PICMG 2.16 and the requirements of a server blade.

The 845G chipset supports up to 1 GB of 200-MHz DDRAM. Application code is conveniently stored in a scalable CompactFlash® which is controlled via IDE. A second IDE channel allows direct connection of an onboard 2.5" hard disk.

The chipset also features a DVI graphics controller

which allows for attachment of both advanced and legacy flat-panel displays and CRT monitors. Three onboard USB ports provide universal interfaces to a variety of peripheral devices (such as keyboard, mouse, printer, modem, or camera). For high-speed networking and field bus interfacing, the D4 features two or three Gigabit Ethernet lines (depending on the model). Further interfaces include two COMs, keyboard/mouse, floppy and parallel ports. DVI, keyboard/mouse, 2 Gigabit Ethernet, 1 USB and 1 COM are conveniently available at the front panel of the D4. All the other functions are available via the rear I/O adapter. The rear I/O adapter is compatible with that of the MEN D2 CPU board (Pentium® MMX SBC) to provide an easy upgrade path from D2 to D4. Further flexible I/O extension is provided by using the two PC-MIP® slots or one PMC slot on the D4 CPU board. The mezzanine signals are provided at the front or via the rear I/O adapter. The Phoenix® BIOS on the D4 was especially designed for embedded system applications.

## Technical Data

### CPU

- Pentium® 4 Mobile Processor
- MPGA478 Socket
- 1.2 to 2.2GHz
- 25..35W power consumption

### Host Bridge

- 845G Chipset
- 400MHz local bus frequency
- 200MHz DDRAM support
- Internal graphics controller

### Memory

- 200MHz DDRAM support
- Up to 1GB SO-DIMM
- Onboard CompactFlash® via IDE

### I/O

- One USB 2.0 at front (Type A connector)
- Two USB 2.0 at rear
- Three Ethernet interfaces
- Two Ethernet 10/100/1000Mbps/s at front
- One Ethernet 10/100/1000Mbps/s at rear (2.16)
- Supports network boot (depending on BIOS version)
- Graphics via DVI at front
- PS/2 keyboard/mouse at front
- COM1 at front
- COM2 via onboard ribbon cable or rear I/O
- LPT at rear
- Floppy at rear

### Mass Storage

- Fast IDE ports
- Primary IDE hard-disk/CD-ROM port; either via rear I/O (40-pin ribbon-cable connector U-DMA66) or onboard hard disk
- Secondary IDE port for local CompactFlash® (or 44-pin ribbon cable connector)

### PXI&#x2122;

- Prepared for eight trigger lines compliant with PXI&#x2122; Specification
- Available on request

### Rear I/O

- Mainly compatible with D2 board

### CompactPCI® Bus

- 66-MHz/64-bit PCI-to-PCI Bridge
- CompactPCI® system slot
- CompactPCI® peripheral slot available on request
- Full hot swap
- Blue LED at front
- 2.16 compatible

- V(I/O): +5V (+3.3V on request)
- Rear I/O compatible with D2

### Mezzanine Extensions

- Two PC-MIP® Type I/II modules compliant with PC-MIP® specification or
- One PMC module compliant with PMC standard IEEE 1386.1

### Graphics

- Integrated in 845G chipset
- DVI connector at front

### Miscellaneous

- Real-time clock
- Watchdog timer
- Temperature measurement
- User LEDs
- Reset button

### Electrical Specifications

- Supply voltage/power consumption:
- +5V (4.85V..5.25V), 0.9A (1.7 GHz, modest load), 5.4A (1.7 GHz full load), 1.1A (2.2 GHz, modest load), 7.2A (2.2 GHz, full load)
- +3.3V (3.2V..3.5V), 2.2A (1.7 GHz, modest load), 2.9A (1.7 GHz full load), 2.2A (2.2 GHz, modest load), 2.9A (2.2 GHz, full load)
- MTBF: 88,000h @ 20°C

### Mechanical Specifications

- Dimensions: conforming to CompactPCI® specification for 6U boards
- Weight: tbd.

### Environmental Specifications

- Temperature range (operation):
- 0..+45°C or 0..+60°C
- Industrial temperature range on request
- Airflow: min. 10m³/h
- Temperature range (storage): -40..+85°C
- Relative humidity (operation): max. 95% non-condensing
- Relative humidity (storage): max. 95% non-condensing
- Altitude: -300m to + 3,000m
- Shock: 15g/0.33ms, 6g/6ms
- Vibration: 1g/5..2,000Hz

### Safety

- PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers

### EMC

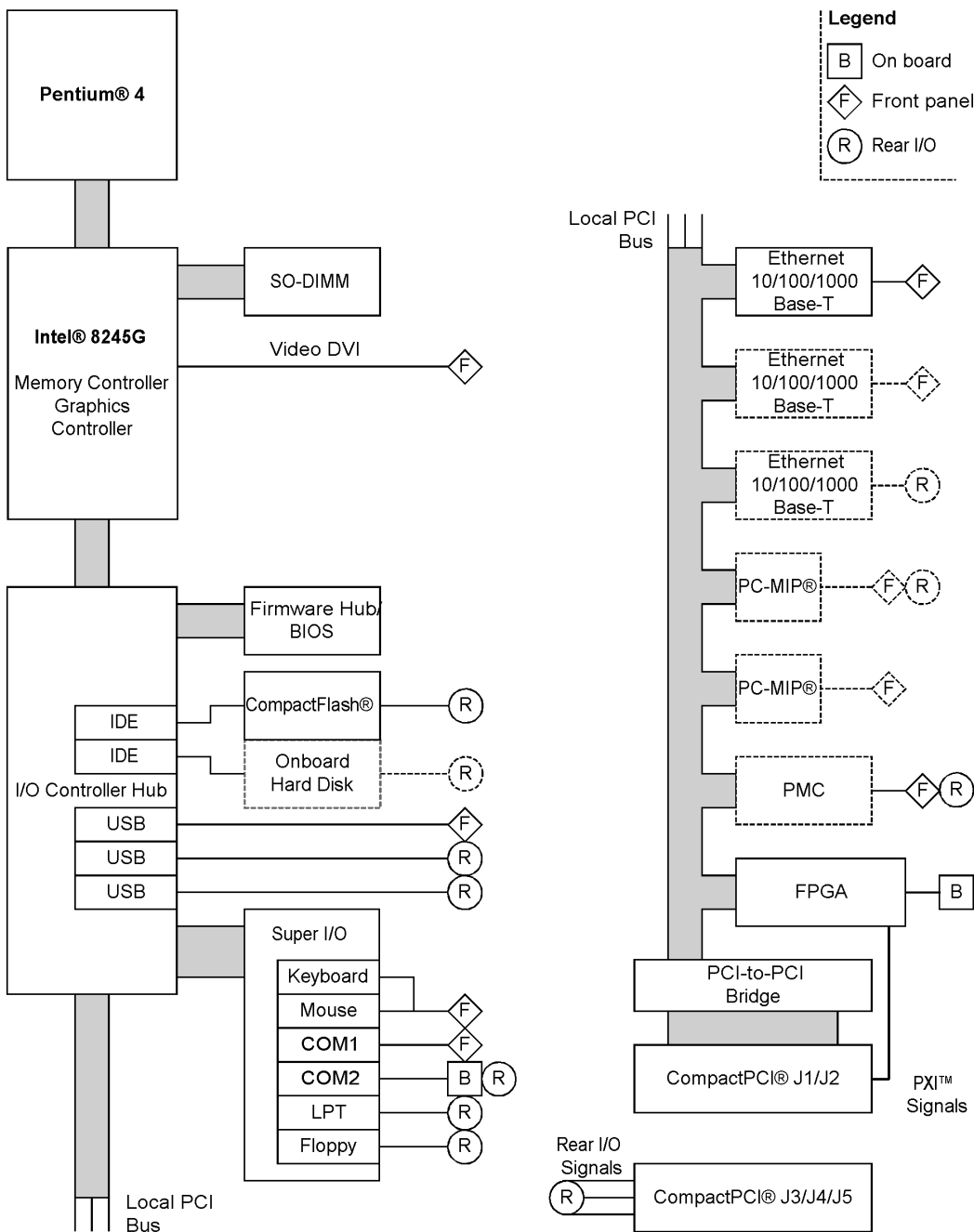
- Tested according to EN 55022 / 1999-05 (radio disturbance) and EN 55024 / 1999-05 (immunity) with regard to CE conformity

## Technical Data

### Software Support

- Phoenix® BIOS
- Windows® 2000/XP
- Linux (on request)
- VxWorks® (on request)
- QNX® (on request)
- RTX (on request)

## Diagram



## Related Products

### Standard Hardware

02D004-00	D4, 64-bit CompactPCI® 6U single-board computer, system slot version, Pentium® 4 / 2.2GHz, 2 Gigabit Ethernet (front), 1 Gigabit Ethernet (PICMG 2.16), DVI graphics, USB, 1 PMC slot, SO-DIMM DDR slot, CompactFlash® slot, no PXI™ support, 0..+45°C
02D004-01	D4, 64-bit CompactPCI® 6U single-board computer, system slot version, Pentium® 4 / 1.7GHz, 2 Gigabit Ethernet (front), DVI graphics, USB, 2 PC-MIP® slots, SO-DIMM DDR slot, CompactFlash® slot, no PXI™ support, 0..+60°C
02D004-02	D4, 64-bit CompactPCI® 6U single-board computer, system slot version, Pentium® 4 / 1.7GHz, 2 Gigabit Ethernet (front), DVI graphics, USB, 1 PMC slot, SO-DIMM DDR slot, CompactFlash® slot, no PXI™ support, 0..+60°C
02D004-03	D4, 64-bit CompactPCI® 6U single-board computer, system slot version, Pentium® 4 / 2.2GHz, 2 Gigabit Ethernet (front), DVI graphics, USB, prepared for on-board hard disk, SO-DIMM DDR slot, CompactFlash® slot, no PXI™ support, 0..+45°C
02D004-05	D4, 64-bit CompactPCI® 6U single-board computer, peripheral slot version, Pentium® 4 / 2.2GHz, 2 Gigabit Ethernet (front), 1 Gigabit Ethernet (PICMG 2.16), DVI graphics, USB, 1 PMC slot, SO-DIMM DDR slot, CompactFlash® slot, no PXI™ support, 0..+45°C

Please refer to our 6U CompactPCI® compare chart for a selection of further single-board computers with different processors and on-board functionality.

### Memory

0751-0006	CompactFlash® card, 512MB, Type I, 0..+60°C
0751-0007	CompactFlash® card, 512MB, Type I, -40..+85°C
0751-0008	CompactFlash® card, 64MB, Type I, 0..+60°C
0751-0009	CompactFlash® card, 128MB, Type I, 0..+60°C
0751-0012	CompactFlash® card, 256MB, Type I, 0..+60°C
0751-0013	CompactFlash® card, 64MB, -40..+85°C
0751-0014	CompactFlash® card, 128MB, -40..+85°C
0751-0018	CompactFlash® card, 256MB, Type I, -40..+85°C
0752-0082	256MB DDRAM 0..+60°C for 02D004-01
0752-0104	512MB DDRAM 0..+60°C for 02D004-00

## Related Products

0752-0106	512MB DDRAM 0..+60°C for 02D004-01
0752-0113	256MB DDRAM 0..+60°C for 02D004-00
0752-0114	1GB DDRAM 0..+60°C for 02D004-00
0752-0115	1GB DDRAM 0..+60°C for 02D004-01
0752-0116	256MB DDRAM 0..+60°C for 02D004-02
0752-0117	512MB DDRAM 0..+60°C for 02D004-02
0752-0118	1GB DDRAM 0..+60°C for 02D004-02
0752-0119	256MB DDRAM 0..+60°C for 02D004-03
0752-0120	512MB DDRAM 0..+60°C for 02D004-03
0752-0121	1GB DDRAM 0..+60°C for 02D004-03
0752-0211	256MB DDRAM 0..+60°C for 02D004-05

### SA-Adapters

08SA01-00	SA1, serial interface adapter, RS232, not optically isolated, 0..+60°C
08SA02-00	SA2, serial interface adapter, RS422/485, half duplex, optically isolated, 0..+60°C
08SA02-01	SA2, serial interface adapter, RS422/485, full duplex, optically isolated, 0..+60°C
08SA02-07	SA2, serial interface adapter, RS422/485, full duplex, optically isolated, temperature range: -40..+85°C
08SA03-00	SA3, serial interface adapter, RS232, optically isolated, 0..+60°C
08SA03-01	SA3, serial interface adapter, RS232, optically isolated, -40..+85°C
08SA04-00	SA4, serial interface adapter, TTY, optically isolated, 0..+60°C

### Accessories

05A000-10	Keyboard/mouse Y-cable 0.1m, 6-pin Mini DIN plug to two 6-pin Mini DIN receptacles
05F006-00	RS232 interface cable 9-pin D-Sub plug to 8-pin RJ45 plug, 2m
05F007-02	DVI-to-VGA cable, DVI plug to 15-pin HD-Sub plug, 2m, -20..+70°C
05F007-03	Adapter, DVI analog plug to VGA 15-pin HD-Sub receptacle, -20..+70°C
0501-0001	DVI-I to DVI-D and VGA Y-adapter cable (for example for D4, F7/N, F8, F9, P17)
0710-0009	IDE hard disk 2.5", 9.5mm, 20GB; for mounting on-board (harddisk mounting kit may be additionally required)

## Related Products

08CT02-02	CompactPCI transition module 6U/80mm, I/O connection for D4 CompactPCI CPU board, 0..+60°C
-----------	--

### Systems & Card Cages

Disk drives for basic systems are delivered as requested. Different rack sizes, power supplies and backplanes on request.

0701-0010	CompactPCI® 19" 7U/84HP rack-mount enclosure for 6U cards vertical, 8-slot 6U CompactPCI® backplane, system slot left, prepared for rear I/O, space for hard-disk drive, floppy drive, CD-ROM drive, 300W ATX power supply, incl. 1U fan tray
0701-0022	CompactPCI® 19" 3U/84HP horizontal rack-mount enclosure for 6U cards, 5-slot 6U CompactPCI® backplane, system slot right (bottom), prepared for rear I/O, space for hard-disk drive, floppy drive, CD-ROM drive, 300W ATX power supply wide range 100..240VAC, fan

### Software

10D004-60	VxWorks® 5.5 / Tornado® 2.2 BSP for MEN D4
10D004-70	Windows® 2000/XP driver package for MEN's D4; graphic driver for the 845 chipset (win2k_xp131.exe), Gigabit Ethernet driver for the 82540 chip (pro2kxpm.exe)

This MEN board is designed to work in a Microsoft® Windows® environment. This does not imply that the complete board functions have been tested in this environment, nor that specific MEN BSP or driver packages are available. If you don't find ordering numbers for additional Windows® driver packages provided or recommended by MEN, please contact sales.

VxWorks® software for this MEN board is available from WindRiver Systems. This does not imply that the complete board functions have been tested in this environment, nor that specific MEN BSP or driver packages are available. If you don't find ordering numbers for additional VxWorks® BSP or driver packages provided or recommended by MEN, please contact sales.

This board is an MEN product running Linux. This does not imply that the complete board functions have been tested in any Linux environment, nor that specific MEN BSP or driver packages are available. If you don't find ordering numbers for additional Linux BSP or driver packages provided or recommended by MEN, please contact sales.

To use MDIS4™ low-level drivers, you also need one of the MDIS4™ system packages available for Windows®, Linux, VxWorks®, QNX®, RTX or OS-9® (MDIS4™ = MEN Driver Interface System).

13Z011-06	MDIS4™/2004 low-level driver sources for F7/F7N/F9/D4/EM02 watchdog
-----------	---

## Related Products

13Z011-70	MDIS4™/2004 Windows® NT4/W2K driver for F7/F7N/F9/D4/EM02 watchdog
-----------	--

### Documentation

20ABMX-00	Phoenix® BIOS user manual
20APPN001	Application Note: Using MEN +5V CompactPCI® Boards with +3.3V V(I/O)
20CT02-00	CT2 user manual
20D004-00	D4 user manual

*For the most up-to-date ordering information and direct links to other data sheets and downloads, see the D4 online data sheet under [www.men.de](http://www.men.de). --> [Click here!](#)*

*The date of issue stated in this data sheet refers to the Technical Data only. Changes in ordering information given herein do not affect the date of issue.*

*All brand or product names are trademarks or registered trademarks of their respective holders.*

*Information in this document has been carefully checked and is believed to be accurate as of the date of publication; however, no responsibility is assumed for inaccuracies. MEN Mikro Elektronik accepts no liability for consequential or incidental damages arising from the use of its products and reserves the right to make changes on the products herein without notice to improve reliability, function or design. MEN Mikro Elektronik does not assume any liability arising out of the application or use of the products described in this document.*

*The products of MEN Mikro Elektronik are not suited for use in nuclear reactors and for application in medical appliances used for therapeutical purposes.*

*Application of MEN's products in such plants is only possible after the user has precisely specified the operation environment and after MEN Mikro Elektronik has consequently adapted and released the product.*

*Copyright © 2005 MEN Mikro Elektronik GmbH. All rights reserved.*