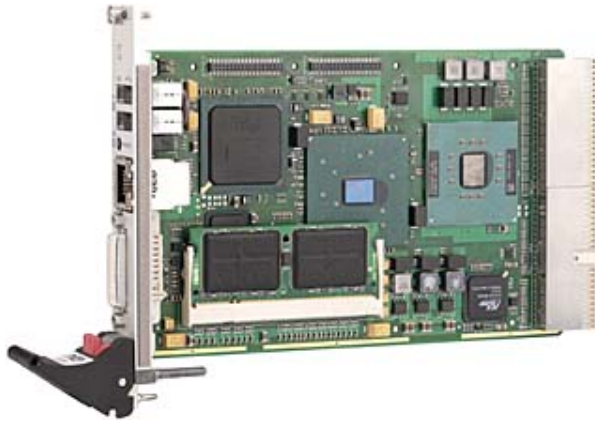


# F9 - 3U CompactPCI/PXI Pentium® M SBC



- Pentium® M (LV) up to 1.8 GHz
- Celeron® M (ULV) 600 MHz
- 1-slot 32-bit CompactPCI system master
- PXI system controller
- 1 GB DDR RAM (SO-DIMM), CompactFlash
- Graphics controller / DVI-I (front)
- Gigabit Ethernet (front)
- Dual USB 2.0 (front)
- COM 1, IDE, 2 USB, keyboard/mouse via rear I/O

Equipped with either the Intel® (LV) Pentium® M or the Celeron® M processor, the 3U single-board computer is a versatile 4HP/3U (single size Eurocard) CompactPCI board, designed especially for systems which require low power consumption.

Available either with the 1.8-GHz Pentium® M 745, or the 1.4-GHz low-voltage Pentium® M, or the 1.6-GHz Pentium® M, or the 1.1-GHz low voltage Pentium® M, or a 600-MHz Celeron® M processor and up to 1 GB RAM, the F9 covers a wide range of industrial applications.

The DVI-I video interface allows for attachment of both advanced (digital) and legacy (analog) flat panel displays and CRT monitors (D-Sub connector optional).

The F9 is also equipped with a Gigabit Ethernet controller. The onboard CompactFlash socket allows for utilization of a CompactFlash card, an IBM Microdrive, or a 1.8" hard-disk drive. A local expansion interface connector may be used to directly attach a companion I/O board, which can carry in addition a 2.5" hard-disk drive. As an option, rear I/O across the J2/P2 connector is available.

Equipped with a PCI-bridge chip, the F9 offers a full CompactPCI interface for reliable system expansion. Last but not least, the F9's Phoenix BIOS was especially designed for embedded system applications.

## Technical Data

### CompactPCI Bus

- 3U CompactPCI CPU board PICMG Spec. 2.0 R3.0 compliant
- 32-bit CompactPCI system slot functionality with 7 possible external loads
- PCI-to-PCI bridge
- Single-slot solution
- Rear I/O via J2/P2
- V(I/O): +5V (+3.3V on request)

### CPU

- Intel® Celeron® M (ULV) or Pentium® M
- 600MHz..1.8GHz

### Chipset

- Intel® i855 chip set consisting of:
  - 82855GME Graphics/Memory Controller Hub (GMCH)
  - 82801D I/O Controller Hub (ICH4)
  - 82802 Firmware Hub (FWH)

### Graphics

- Integrated VGA graphics controller
- Connection at front panel (DVI-I connector) or via rear I/O / transition module
- Maximum resolution: 2048 x 1536, 16M colors @ 75Hz refresh rate (analog); 1600 x 1200, 16M colors @ 60Hz refresh rate (digital)
- Panellink Digital technology

### Memory

- CPU L2 Cache
- Celeron® M: 512KB
- Pentium® M: 1MB or 2MB
- Up to 1 GB DRAM
- One 200-pin SO-DIMM socket for DDR SDRAM modules
- PC2100/2700
- DDR266/333-SDRAM

### Interfaces

- 10/100/1000Mbps/s Gigabit Ethernet controller
- RJ45 interface at front panel or via rear I/O transition module
- Two display LEDs in RJ45 connector to signal LAN Link and Activity status
- Supports network boot
- USB 2.0 interfaces
- Conforming to Open HCI 1.0a
- Two ports via Type A connectors at front panel
- Two ports via rear I/O transition module
- Data throughput up to 480Mbps/s

### Mass Storage

- Fast IDE ports
- One IDE port for local CompactFlash or 1.8" hard disk or connection to mezzanine expansion board with onboard hard disk drive or external device (Secondary IDE)

- One IDE port via rear I/O transition module (Primary IDE)
- CompactFlash interface (Secondary IDE)
- Type I and Type II
- True IDE
- For CFA ATA memory card or Microdrive

### Electrical Specifications

- Supply voltage/power consumption:
  - +5V (4.85V..5.25V), 5.8A max. @ 1.6GHz (0.96A WinXP idle mode)
  - +3.3V (3.2V..3.47V), 3.5A max. @ 1.6GHz (2.1A WinXP idle mode)
- MTBF: tbd. @ 50°C

### Mechanical Specifications

- Dimensions: conforming to CompactPCI specification for 3U boards
- Weight: tbd.

### Environmental Specifications

- Temperature range (operation):
  - 0..+60°C
  - Industrial temperature range on request
  - Airflow: min. 10m<sup>3</sup>/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/11ms
  - Bump: 10g/16ms
  - Vibration (sinusoidal): 2g/10..150Hz

### 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

### Software Support

- Phoenix BIOS for industrial applications
- Windows NT, Windows 2000/XP, Embedded Windows
- Linux (on request)
- VxWorks (on request)
- QNX (on request)
- RTX (on request)

## Product Options

### Secondary IDE

- 1.8" hard disk adapter instead of CompactFlash

### Rear I/O on F9

- Via rear I/O transition module F9R
- Primary IDE (onboard)
- Two USB 2.0 ports (back panel)
- PS/2 keyboard/mouse (back panel)
- COM1 (onboard, TTL level), for connection of MEN SA adapters
- Gigabit Ethernet (back panel)
- VGA analog video (back panel)

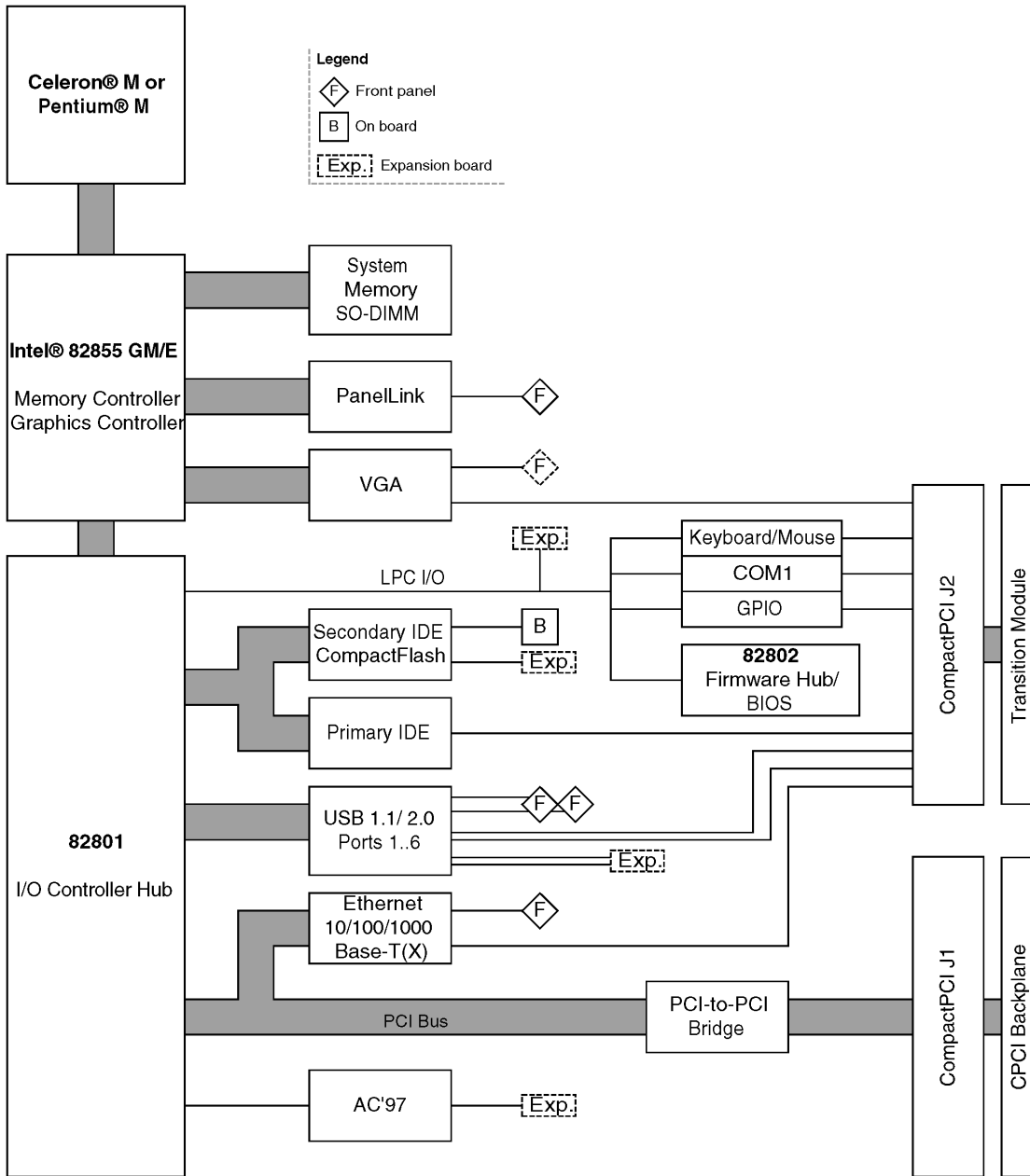
### I/O on Expansion Board F9E

- COM1 (front)
- USB 2.0 (front)
- AC'97 audio (front)
- PS/2 keyboard/mouse (front)
- Secondary IDE usage for
  - CompactFlash or
  - 1.8" hard disk or
  - 2.5" hard disk or
- Floppy disk
- Local GPIO
- Rear I/O

### Miscellaneous

- F9 for 64-bit CompactPCI systems only in combination with special rear I/O and extension board versions
- Extension possibility for F9 to 6U height
- Second Ethernet port via special I/O extension board
- More different legacy I/O combinations via special I/O extension board
- One-piece 3U/8TE front panel for F9 in combination with different I/O extension boards

Diagram



## Related Products

### Standard Hardware

02F009E00	F9E, 1-slot 3U I/O extension for F9 with PS/2 keyboard/mouse, USB, 1 COM, audio, prepared for 2.5" hard disk (replaces CompactFlash facility), mounting on top or bottom of F9, 0..+60°C
02F009-00	F9, 3U 4HP 32-bit CompactPCI system slot SBC with ULV Celeron® M 600MHz (512KB L2 cache, 7W), SO-DIMM slot, CompactFlash slot, 1 Gigabit Ethernet (front), 2 USB 2.0 (front), CRT/LCD graphics (DVI-I front); operation temperature 0..+60°C
02F009-01	F9, 3U 4HP 32-bit CompactPCI system slot SBC with LV Pentium® M 1.4GHz (2MB L2 cache, 10W), SO-DIMM slot, CompactFlash slot, 1 Gigabit Ethernet (front), 2 USB 2.0 (front), CRT/LCD graphics (DVI-I front); operation temperature 0..+60°C
02F009-02	F9, 3U 4HP 32-bit CompactPCI system slot SBC with Pentium® M 1.8GHz (2MB L2 cache, 21W), SO-DIMM slot, CompactFlash slot, 1 Gigabit Ethernet (front), 2 USB 2.0 (front), CRT/LCD graphics (DVI-I front); operation temperature 0..+60°C

F9 offers different combination possibilities with I/O extension and rear I/O cards.

Please refer to our 3U CompactPCI compare chart for a selection of further single-board computers with different processors and on-board functionality.

### Systems & Card Cages

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

0701-0021	CompactPCI 19" 4U/84HP rack-mount enclosure for 3U cards (vertical), 8-slot 3U CompactPCI backplane, system slot right, prepared for rear I/O, space for hard-disk drive, floppy drive, CD-ROM drive, 300W ATX power supply wide range 100..240VAC on front, 1U fan tray with 2 fans included
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

### Accessories

05A000-10	Keyboard/mouse Y-cable 0.1m, 6-pin Mini DIN plug to two 6-pin Mini DIN receptacles
05F007-02	DVI-to-VGA cable, DVI plug to 15-pin HD-Sub plug, 2m, -40..+85°C

## Related Products

05F007-03	Adapter, DVI analog plug to VGA 15-pin HD-Sub receptacle, -20..+85°C
0501-0001	DVI-I to DVI-D and VGA Y-adapter cable (for example for D4, F7/N, F8, F9, P17)

You can download the data sheet for hard disk 0710-0012 from MEN's website. -->  
Download

0710-0009	IDE hard disk 2.5", 9.5mm, 20GB; for mounting on-board (harddisk mounting kit may be additionally required)
0710-0012	Industrial IDE hard disk 2,5", 40GB, 24 hours/7 days, 0..+60°C; for on-board mounting (hard disk mounting kit may be required additionally)
0710-0015	IDE hard disk 1.8", 20GB, for on-board mounting
0713-0001	CompactPCI 1-slot 3U I/O midplane
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	Compact Flash card, 64MB, -40..+85°C
0751-0014	Compact Flash card, 128MB, -40..+85°C
0751-0018	CompactFlash card, 256MB, Type I, -40..+85°C
0752-0176	512 MB DDRAM 0..+60°C for 02F009-00
0752-0177	1 GB DDRAM 0..+60°C for 02F009-00
0752-0178	512 MB DDRAM 0..+60°C for 02F009-01
0752-0179	1 GB DDRAM 0..+60°C for 02F009-01
08F009R00	F9R, 1-slot 3U rear I/O transition module for F9 and F11 (32-bit PCI systems), with primary IDE, USB ports 3 and 4, PS/2 keyboard/mouse, COM1 (TTL level); optional: VGA analog video and Gigabit Ethernet, 0..+60°C
08SA01-00	Serial interface adapter, RS232, not optically isolated, 0..+60°C
08SA02-00	Serial interface adapter, RS422/485, half duplex, optically isolated, 0..+60°C
08SA02-01	Serial interface adapter, RS422/485, full duplex, optically isolated, 0..+60°C
08SA02-07	Serial interface adapter, RS422/485, full duplex, optically isolated, temperature range: -40..+85°C

## Related Products

08SA03-00	Serial interface adapter, RS232, optically isolated, 0..+60°C
08SA03-01	Serial interface adapter, RS232, optically isolated, -40..+85°C
08SA04-00	Serial interface adapter, TTY, optically isolated, 0..+60°C

For more functions realized with SA adapters, see the listing on MEN's website. You can also view our SA adapter compare chart for a quick overview of different functions. Please contact sales to make sure that these SA adapters can be used in the board configuration you are looking for.

### Software

This MEN board is designed to work in a Microsoft® Windows® environment. For additional Windows® driver packages provided or recommended by MEN please refer to the ordering numbers below.

VxWorks® software for this MEN board is available from WindRiver Systems. For VxWorks® BSP and driver support provided by MEN please refer to the ordering numbers below.

This board is an MEN product running Linux. For Linux BSP and driver support provided by MEN please refer to the ordering numbers below.

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).

### Documentation

20ABMX-00	Phoenix BIOS user manual
20APPN001	Application Note: Using MEN +5V CompactPCI Boards with +3.3V V(I/O)
20F009-00	F9 user manual

*For the most up-to-date ordering information and direct links to other data sheets and downloads, see the F9 online data sheet under [www.men.de](http://www.men.de). --> [Click here!](#)*

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