

EK01 - ESM Starter Kit with Pentium® III



Embedded System Modules are complete computers on a module. A final ESM-based embedded application consists either of a stand-alone ESM (the power supply connection being sufficient to operate the module), an ESM with an application-specific carrier card and/or an ESM with additionally plugged PCI-104 modules. The EK01 is a ready-to-use starter kit that allows evaluation of the functions of the EM02 Embedded System Module. The kit consists of the standard CPU module, DRAM memory, the carrier card with I/O connectors, an external PSU, and an adapter for mounting a PCI-104 module. The EK01 provides versatile mounting options and can also be installed in a standard PC (including a PCI-104 module). After evaluation, the design overhead for each application is limited to I/O. Depending on the application and quantity it may be necessary to develop a simple carrier card, choose PCI-based standard components, write software drivers for those additional functions, or design a housing. This minimal additional design effort can be carried out by the user or by MEN.

The EM02 is an ideal computing platform for embedded industrial PCs under Windows® or Linux. It is

- **Computing module ESM EM02:**
 - ULP Pentium® III / 933MHz or Celeron® / 400MHz
 - 512MB SDRAM, CompactFlash slot
 - Graphics, Gigabit Ethernet, USB 1.1 (front)
 - COM, keyboard/mouse, (E)IDE, floppy (rear)
- **Carrier card EC01 (ATX-compatible format):**
 - 1 ESM slot, 3 PCI slots
 - USB 2.0, COM, IDE, floppy connector
- **Accessories:**
 - External PSU, PCI-104 adapter

controlled by an Ultra-Low Power Pentium® III with 933MHz or an Ultra-Low Voltage Celeron® Processor with 400MHz. It provides 16KB L1 and 512KB/256KB L2 cache. The EM02 uses the Intel® 815G chip set, including graphics. It provides one VGA connector, one USB 1.1 connector Type A and one Gigabit Ethernet interface at the front panel. It also provides 512MB of DRAM and a CompactFlash slot on board. As an alternative to onboard USB, legacy I/O is routed to the carrier board via the J2 system connector of the EM02. It includes a serial interface, (E)IDE, a floppy interface, as well as two PS/2 interfaces for keyboard and mouse. The carrier board has an ATX-compatible format and provides the mechanical platform, the power supply and the I/O connectors. It comes with one ESM slot and three PCI slots, which allow the use of standard extension cards in the PC. It is equipped with USB 2.0 (front), a 9-pin D-Sub for an RS232 serial interface (front) and connectors for IDE and floppy. The ESM carrier also features an I2C EEPROM for the board ID and revision information.

DVI/TFT/video are not supported on the EK01 kit but are available on the EM02 itself for implementation as a hub interface on other (custom) carrier cards.

Technical Data

EC01 ESM Carrier Card

- One ESM slot
- J1 and J2 assembled
- I/O connectors
 - USB 2.0
 - RS232 COM interface
 - IDE connector
 - Floppy disk interface
 - PS/2 keyboard/mouse connector, via SA adapter
 - PCI interface
 - Three PCI slots
 - 33MHz, 32-bit data bus, 5V V-I/O
 - Reset button and power LED

EM02 ESM Module

- CPU: Celeron®/400MHz or Pentium® III/933MHz
- Graphics: VGA, connector at front panel
- Memory
 - 256MB or 512MB SO-DIMM SDRAM installed
 - CompactFlash interface
- Interfaces
 - 10/100/1000Base-T PCI Ethernet, RJ45 at front panel
 - USB 1.1, connector at front panel
 - Mass storage: Fast IDE ports for IDE devices (40-pin, via EC01) and CompactFlash
 - I/O Extension
 - Accessible on EC01
 - Keyboard
 - Mouse
 - COM1
 - Floppy
 - PCI Interface
 - 32-bit/33-MHz PCI interface at PCI-104 connector J1
 - Support of one external master

Accessories

- External PSU
- Adapter for mounting of one PCI-104 module

Electrical Specifications

- Supply voltage/power consumption:
 - EC01: +24V (12V..36V), 1.6A; +24V on pin 1, GND on pin 2
 - EM02: +5V (4.85V..5.25V), 796mA (Celeron® version)
 - EM02: +3.3V (3.2V..3.4V), 794mA (Celeron® version)
 - MTBF EM02: 165,000h @ 50°C

Mechanical Specifications

- Dimensions of EC01 PCB: 170mm x 150mm
- EM02 conforming to ESM specification (PCB: 149mm x 71mm)
- Weight
 - EC01: 200g (without floppy drive)
 - EM02: 215g (incl. heat sink)

Environmental Specifications

- Temperature range (operation):
 - 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/11ms
 - Bump: 10g/16ms
 - Vibration (sinusoidal): 2g/10..150Hz

Safety

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

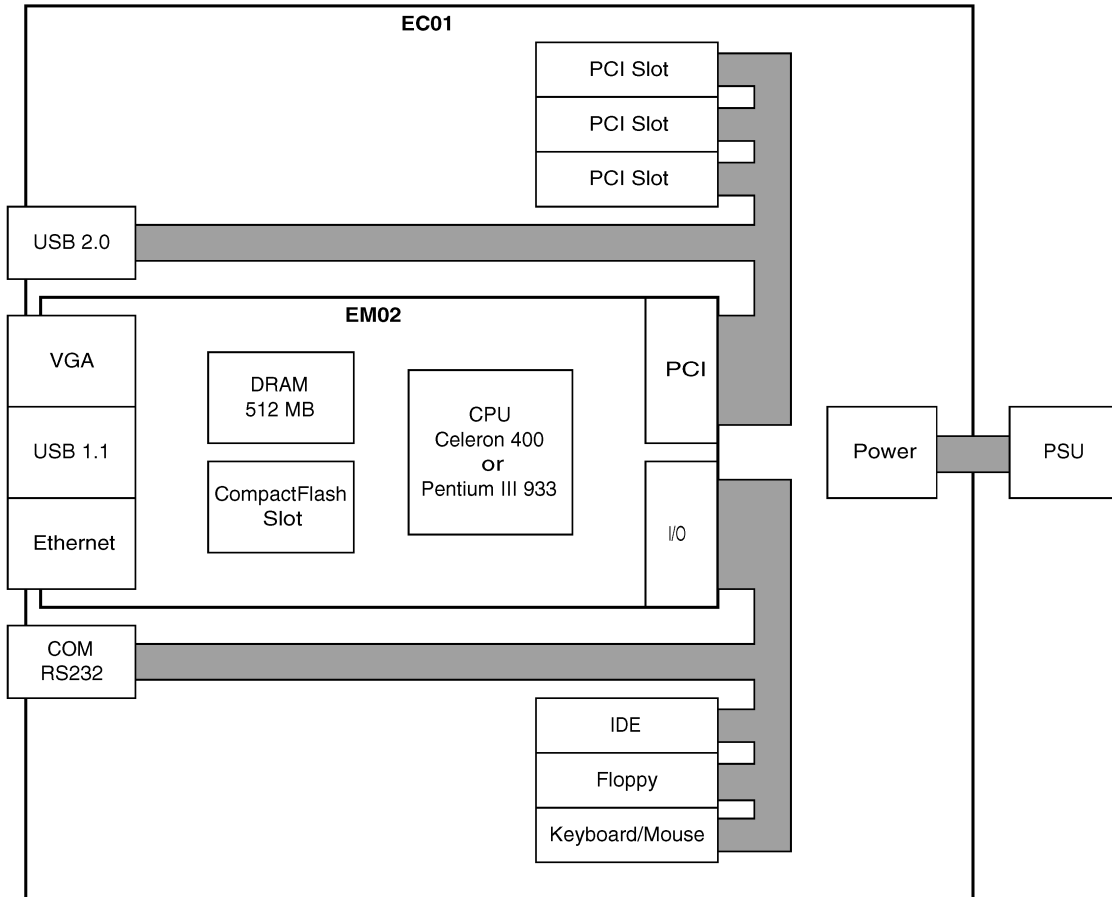
EMC

- Tested according to EN 55022 (radio disturbance), IEC1000-4-2 (ESD) and IEC1000-4-4 (burst) with regard to CE conformity

Software Support

- Phoenix BIOS
- Windows
- Linux
- QNX
- VxWorks

Diagram



Related Products

Standard Hardware

08EK01-01	ESM evaluation kit: Mini ATX carrier board EC01 with 1 ESM slot, 3 PCI slots, floppy interface; ESM EM02 with ULP Pentium® III / 933MHz, graphics, Gigabit Ethernet, USB; temperature range: 0..+60°C; incl. external PSU and adapter for mounting of one PCI-104 module - 512MB DRAM installed, CompactFlash not installed (08EK01-01 = EC01-03 + EM02-04)
08EK01-02	ESM evaluation kit: Mini ATX carrier board EC01 with 1 ESM slot, 3 PCI slots, floppy interface; ESM EM02 with ULV Pentium® III Celeron®/ 400MHz, graphics, Gigabit Ethernet, USB; temperature range: 0..+60°C; incl. external PSU and adapter for mounting of one PCI-104 module - 512MB DRAM installed, CompactFlash not installed (08EK01-02 = EC01-03 + EM02-07)
08EK01-03	ESM evaluation kit: Mini ATX carrier board EC01 with 1 ESM slot, 3 PCI slots, floppy interface; ESM EM02 with ULV Pentium® III Celeron® 650MHz, graphics, Gigabit Ethernet, USB; temperature range: 0..+60°C; incl. external PSU and adapter for mounting of one PCI-104 module - 512MB DRAM installed, CompactFlash not installed (08EK01-03 = EC01-03 + EM02-09)
15EM02-04	EM02, ESM - Embedded System Module, ULP Pentium® III / 933MHz, CompactFlash slot, 512MB DRAM installed, graphics, Gigabit Ethernet, USB; PCI-104 stackable; temperature range: 0..+60°C
15EM02-07	EM02 for ESM Kit EK01-02, ESM - Embedded System Module, ULV Pentium® III Celeron® / 400MHz, CompactFlash slot, 512MB DRAM installed, graphics, Gigabit Ethernet, USB; temperature range: 0..+60°C
15EM02-09	EM02 for ESM Kit EK01-03, ESM - Embedded System Module, ULV Pentium® III Celeron® / 650MHz, CompactFlash slot, 512MB DRAM installed, graphics, Gigabit Ethernet, USB; temperature range: 0..+60°C

Please refer to our ESM - Embedded System Modules compare chart for a selection of further single-board computers with different processors and on-board functionality.

FPGA IP Cores

This MEN board offers the possibility to add customized I/O functionality in FPGA. Every standard board comes with a preconfigured FPGA configuration. For additional functions already developed by MEN please refer to our FPGA IP Core overview. More IP cores that can be used in combination with MEN IP cores are available for example from www.altera.com or www.opencores.org. MEN also offers integration of existing and development of new (customized) IP cores. Depending on the hardware platform, SA adapters can be used to realize the physical lines - see below.

Altera offers free download of its FPGA development software: The Quartus II Web Edition software includes a complete environment for FPGA and CPLD design, including schematic- and text-based design entry, integrated VHDL and Verilog HDL synthesis and support for third-party synthesis software, SOPC Builder system generation software, place-and-route, verification, and programming. For more information and free download of the software please refer to www.altera.com/products. The Altera Tools Selector guide describes the Altera tool offerings and requirements. The online version of the document is available at www.altera.com/literature.

Accessories

Related Products

0751-0006	CompactFlash card, 512MB, Type I, 0..+60°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
0751-0018	CompactFlash card, 256MB, Type I, -40..+85°C
0752-0096	512MB DRAM 0..+60°C for 15EM02-04 (08EK01-01)
0752-0156	512MB DRAM 0..+60°C for 15EM02-07 (08EK01-02)
0752-0166	512MB DRAM 0..+60°C for 15EM02-09 (08EK01-03)

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. 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.

QNX® software for this MEN board is available from QNX® (www.qnx.com). 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 QNX® BSP or 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.

13EM02-70	Windows® 2000/XP graphics driver (Intel® graphics driver for 815 chipset) for A13, EM02 (ESM kit EK01)
13EM02-71	Windows® 2000/XP network driver (Intel®) for A13 and EM02 (ESM kit EK01) - only for 933MHz versions!

Documentation

20ABMX-00	Phoenix BIOS user manual
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Related Products

20EK01-00 EK01 user manual, includes EM02 user manual (20EM02-00)

For the most up-to-date ordering information and direct links to other data sheets and downloads, see the EK01 online data sheet under www.men.de. --> Click here!

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