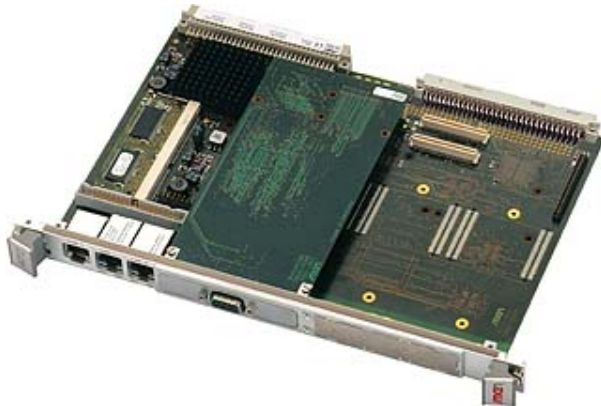


# A15c - 6U VME64 PowerPC SBC with PMCs



- ◆ **PowerPC MPC8245/400MHz**
- ◆ **1-slot 64-bit VMEbus master and slave**
- ◆ **512MB DRAM, CompactFlash**
- ◆ **Graphics via PMC**
- ◆ **Dual 10/100Mbit Fast Ethernet**
- ◆ **4 COMs, USB, IDE, keyboard/mouse**
- ◆ **2 PMC slots**

The A15 is an advanced PowerPC based single-board computer for embedded applications. It features full VME64 support and it can be used as a master or a slave in a VMEbus environment. The A15 provides 1MB local dual-ported SRAM for slave access and communication between the local CPU and another VMEbus master.

The A15 comes with the MPC8245 PowerPC with 400MHz clock frequency and local 32-bit/33MHz PCI data bus. It is a complete state-of-the-art SBC offering DRAM, Flash and CompactFlash memory, dual Fast Ethernet, four COMs, USB, IDE and keyboard/mouse interfaces as well as an optional on-board hard disk. A software-loadable FPGA is available for individual user-defined

functions such as additional UARTs, a CAN bus interface, DSP functions etc.

In addition, the A15c can be equipped with PMC mezzanine cards supporting both front I/O and rear I/O. PMCs may particularly be used for intelligent telecom I/O. The modular combination of I/O functionality on a single-board computer allows to build up tailored control systems which appear as customized solutions based on standard components. Depending on the kind of I/O requirements, further standard versions of A15 are available for other mezzanine standards.

The A15 single-board computer is partly compatible with the MVME2100 board by Motorola.

## Technical Data

### CPU

- PowerPC
  - MPC8245
  - 400MHz

### Memory

- Level 1 Cache integrated in MPC8245
- SO-DIMM slot for up to 512MB SDRAM
- 133MHz memory bus operation
- Boot Flash 2MB or 4MB
  - 8-bit data bus
- Optional 32MB application Flash
  - 64-bit data bus
- Serial EEPROM 4kbits for factory settings
- CompactFlash (TM) card interface for Flash ATA (true IDE) via on-board IDE

### Interfaces

- Two 10/100Mbps Ethernet channels
  - Intel 82551ER
  - RJ45 at front panel with two LEDs
- One UART RS232 serial interface (COM1)
  - 16-byte send/receive buffer
  - RJ45 at front panel
- One UART (COM2)
  - 16-byte send/receive buffer
  - Physical interface at front panel or using SA adapter via 10-pin ribbon cable on I/O connector, depending on board version
  - RS232..RS485, isolated or not: for free use in system (e. g. cable to front)
- Two MPC8245 UARTs
  - Accessible via I/O connector
- IDE port for hard disk drives
  - Drive can be connected via ribbon cable or mounted directly on the CPU board using MEN's adapter kit
  - Only one CompactPCI slot needed even with hard disk
- Keyboard/mouse
  - PS/2 compatible
  - External adapters for line drivers required
- USB port
  - External line drivers

### Local PCI Bus

- PCI Spec. 2.2 compliant
- 32-bit data bus, 33MHz, 3.3V

### VMEbus

- Compliant with VME64 Specification
- Slot-1 function with autodetection
- Master D08(EO):D16:D32:D64:A16:A24:A32:ADO:BLT:RMW; transfer rate max. 25MB/s

- Slave D08(EO):D16:D32:D64:A16:A24:A32:BLT:RMW; transfer rate max. 25MB/s
- 1MB dual-ported fast SRAM
- Interrupter D08(O):I(7-1):ROAK
- Interrupt handler D08(O):IH(7-1)
- Single level 3 fair requester
- Single level 3 arbiter
- Bus timer
- Location Monitor
- DMA
- Mailbox

### Mezzanine Extensions

- A15a: three PC-MIPs Type I/II on local PCI bus
  - Compliant with PC-MIP specification
- A15b: three M-Modules
  - Compliant with M-Module standard
  - Characteristics: D16, D32, A08, A24, INTA, INTC
- A15c: two PMCs
  - Compliant with PMC standard IEEE P1386
- Rear I/O for mezzanine I/O on P2

### Miscellaneous

- Serial real-time clock with integrated 56-byte NVRAM
- Serial hardware watchdog in supervisory circuit
- Temperature sensor
- Hex switch for user settings
- User LEDs (integrated into COM1 connector)
- Reset button in ejector handle
- Abort button via I/O connector
- JTAG/BDM connector

### Electrical Specifications

- Supply voltage/power consumption:
  - +5V (4.85V..5.25V), 1.3A typ.
  - ±12V for mezzanines only, tbd.
- MTBF: 63,000h @ 50°C

### Mechanical Specifications

- Dimensions: standard double Eurocard, 233.3mm x 160mm
- Weight (without mezzanines and accessories):
  - A15a: 330g
  - A15b: 330g
  - A15c: 330g

### Environmental Specifications

- Temperature range (operation):
  - 0..+60°C or -40..+85°C
  - Airflow: min. 10m<sup>3</sup>/h
- Temperature range (storage): -40..+85°C
- Relative humidity (operation): max. 95% non-condensing

## Technical Data

- 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

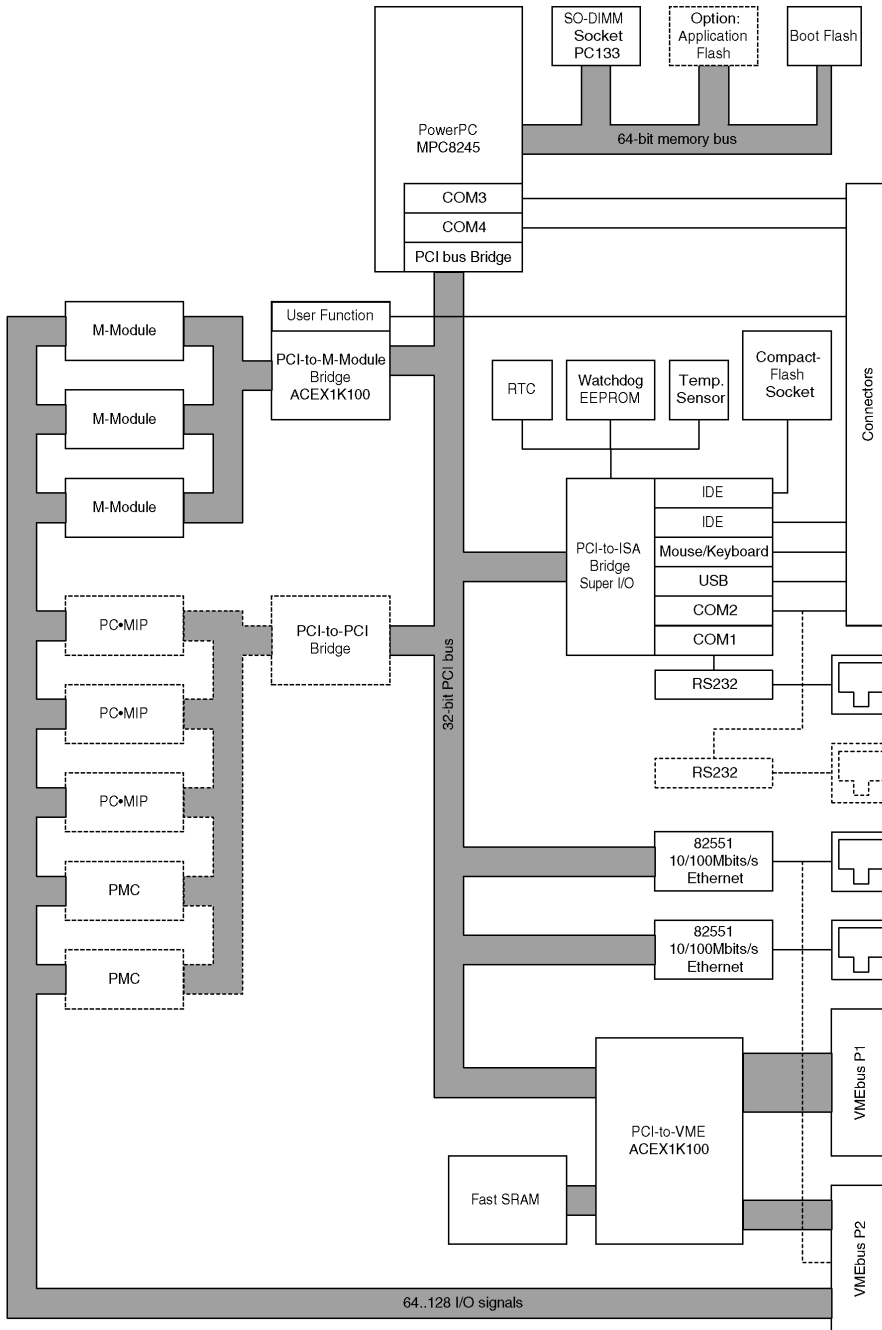
### EMC

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

### Software Support

- MENMON
- Linux
- VxWorks
- OS-9
- QNX (on request)

# Diagram



## Related Products

### Standard Hardware

01A015A00	A15a, VME64 6U Single-Board Computer, PowerPC MPC8245/400MHz, 2MB boot Flash, CompactFlash slot, SO-DIMM slot, 3 PC-MIP slots, 0..+60°C
01A015A01	A15a, VME64 6U Single-Board Computer, PowerPC MPC8245/400MHz, 2MB boot Flash, CompactFlash slot, SO-DIMM slot, 3 PC-MIP slots, -40..+85°C
01A015B00	A15b, VME64 6U Single-Board Computer, PowerPC MPC8245/400MHz, 2MB boot Flash, CompactFlash slot, SO-DIMM slot, 3 M-Module slots, 0..+60°C
01A015B01	A15b, VME64 6U Single-Board Computer, PowerPC MPC8245/400MHz, 2MB boot Flash, CompactFlash slot, SO-DIMM slot, 3 M-Module slots, -40..+85°C
01A015C00	A15c, VME64 6U Single-Board Computer, PowerPC MPC8245/400MHz, 2MB boot Flash, CompactFlash slot, SO-DIMM slot, 2 PMC, 0..+60°C
01A015C01	A15c, VME64 6U Single-Board Computer, PowerPC MPC8245/400MHz, 2MB boot Flash, CompactFlash slot, SO-DIMM slot, 2 PMC, -40..+85°C

The A15 is partly compatible with the MVME2100 board by Motorola. You can download the corresponding compare chart [here](#).

Please refer to our 6U VMEbus 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.

0700-0006	CE-conforming housing for VMEbus 6U: closed 19" rack, 5U, 7 slots, J1+2 backplane (not VME64), power supply 230V, fan incl. power cable no. 6080-0020
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### Accessories

05AD67-00	IDE mounting kit 44-pin to 44-pin; 50.8 mm; installation kit for Kahlua Box or A12, D3, A15 with AD67, temperature range: -40..+85°C
05A012-01	Mounting kit for 2 SA adapters for A12/A15/D3, incl. 6U 1-slot VME or CompactPCI front panel incl. ribbon cable, without SA adapters
05F006-00	RS232 interface cable 9-pin D-Sub plug to 8-pin RJ45 plug, 2m

## Related Products

05M000-17	25 mounting screw sets to fix M-Modules on carrier boards
You can download the data sheet for hard disk 0710-0012 from MEN's website.	
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)
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
0752-0080	256MB DRAM 0..+60°C for 01A015C00
0752-0089	128MB DRAM 0..+60°C for 01A015C00
0752-0112	512MB DRAM 0..+60°C for 01A015C00
08AD67-01	I/O extension 19" 6U 4HP incl. 1 USB connector, 1 keyboard connector, 1 mouse connector; prepared for 3 SA adapters, prepared for HDD 2.5", reset, abort, 0..+60°C
08AD71-00	AD71, 2,5" HD-adapter for A013, A015
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
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

## Related Products

10ABMX-20	ElinOS V.3.0 - Embedded Linux incl. RTAI real-time extension for PowerPC, English version. The Sysgo Development Kit includes the board support packages (BSPs) for MEN cards F1N, B11, A12, A15, D3, SC13, F6, EM04/N and PP01. The package includes 1 year ElinOS development support and all ElinOS updates and upgrades during this period for free. It additionally includes the BSP support for MEN hardware by MEN. --- N.B.: For correct handling of the ElinOS software support it is mandatory to sign and return the enclosed support agreement directly to Sysgo! The Sysgo support agreement is automatically prolonged for another year if not cancelled 3 months prior to expiration.
10ABMX-21	ElinOS V.3.0 - Embedded Linux incl. RTAI real-time extension for PowerPC, German version. The Sysgo Development Kit includes the board support packages (BSPs) for MEN cards F1N, B11, A12, D3, SC13, F6, EM04/N and PP01. The package includes 1 year ElinOS development support and all ElinOS updates and upgrades during this period for free. It additionally includes the BSP support for MEN hardware by MEN. --- N.B.: For correct handling of the ElinOS software support it is mandatory to sign and return the enclosed support agreement directly to Sysgo! The Sysgo support agreement is automatically prolonged for another year if not cancelled 3 months prior to expiration.
10F001N02	OS-9(000) V4.2: BSP for F1N, B11, A12, A15, D3, SC13, Kahlua Box (object code, MEN)
10F001N60	VxWorks V.5.4..5.5 / Tornado 2.0..2.2 BSP for F1N, B11, A12, D3, SC13, Kahlua Box, A15

This board is an MEN product running Sysgo's ElinOS Embedded Linux. Sysgo provides full support for MEN hardware. Please contact [www.sysgo.de](http://www.sysgo.de).

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.

For OS-9 BSP and driver support provided by MEN please refer to the ordering numbers below.

13Z014-90	Linux device driver for MEN PCI to VME bridge on A12, A13, B11, A15 Including Documentation
14A015-00	MENMON (Firmware) for A15 (object code)

You can download the data sheet for the MENMON firmware for PowerPC platforms from MEN's website.

### Documentation

20A015-00	A15 user manual
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## Related Products

21APPN003 Application Note: Using P1/P501 Graphics on MEN 824x/ALI boards under ELinOS

*For the most up-to-date ordering information and direct links to other data sheets and downloads, see the A15c online data sheet under [www.men.de](http://www.men.de). --> Click here!*

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