Embedded Solutions

Kahlua Box - Industrial Control System

- **Compact aluminum EMC enclosure**
- **24V / 40W DC power supply**

- **MPC8245/300MHz**
- **256MB DRAM (max. 512MB)**
- **32MB CompactFlash**
- **Configurable with:**
  - **M-Modules**
  - **PC-MIPs**
  - **PMCs**
  - **SA adapters**

The Kahlua Box is a powerful, small footprint control unit for low-cost target applications based on the Kahlua PowerPC processor family.
The core of the Kahlua Box is a single-board computer based on the MPC8245/300MHz which delivers 450 MIPs. It comes with scalable memory of up to 512MB DRAM via SO-DIMM (256MB mounted as a standard) and with a user-friendly ATA-compatible CompactFlash slot. Two 100-Mbit Ethernet interfaces can be used both for standard networking functions and for fieldbus connection. One serial interface is available as RS232 via RJ45, and another three UARTs can be configured as RS232, RS422/485 or TTY, with or without optical isolation, via SA adapters. A real-time clock, watchdog, temperature monitor, hex switch, and user LEDs make the SBC complete.
The modular combination of I/O functions allows for tailor-made control systems, which can be expanded later. The Kahlua Box combines M-Modules, PC-MIPs and PMCs, the three most important ANSI mezzanine standards with worldwide acceptance and an unlimited spectrum of I/O options.

As a model with three M-Module slots, the SBC in the Kahlua Box is especially suited for industrial control with diverse process I/O, drive control and instrumentation functions. The SBC with three PC-MIP slots offers a multitude of expansion options for computing functions, e. g. through graphics and additional mass storage and serial interfaces. Another model with two PMC slots makes the Kahlua Box a suitable platform for complex data and telecommunications applications.
All three versions can be extended by four additional M-Modules controlled by the CPU via CPCI bus and mounted on a carrier board on the second level.
Packaging of the Kahlua Box has been designed to provide optimum space saving. Apart from control electronics, the aluminum EMC enclosure is equipped with a 24-V DC power supply. For mass storage needs, the Kahlua Box can be equipped with a 2.5" hard disk.
All Ethernet and serial lines as well as the I/O signals of the different mezzanine cards are available at the front of the Kahlua Box - concentrated on one side only. The whole unit can be directly mounted to any type of machine in any position.

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Technical Data

Mechanical Specifications
- Aluminum enclosure
- Dimensions: depth 245mm, width 266mm, height 80mm
- IP rating: IP30 according to EN 60529
- Weight: tbd. kg (depending on set-up)

CPU
- 6U/4HP single-board computer for sandwich mounting
- PowerPC MPC8245 @ 300MHz

Memory
- Level 1 Cache integrated in MPC8245
- SO-DIMM slot for up to 512MB SDRAM
- 100MHz memory bus operation
- Flash 2MB
  - 8-bit data bus
- Serial EEPROM 2KB for factory settings
- CompactFlash (TM) card interface for Flash ATA (true IDE) via on-board IDE

Interfaces
- Two 10/100Mbits/s Ethernet channels
  - 82559ER controller
  - RJ45 at front panel with two LEDs
- One UART RS232 serial interface (COM1)
  - 16-byte send/receive buffer
  - RJ45 at front panel
- Three UARTs (COM2..COM4)
  - 16-byte send/receive buffer
  - Physical interfaces using SA adapters via 10-pin ribbon cable on I/O connector
  - RS232..RS485, isolated or not: for free use in system (e. g. cable to front)
- IDE port for hard disk drives
  - Drive can be connected via ribbon cable or mounted directly on the PCB using MEN's adapter kit
- Keyboard/mouse
  - PS/2 compatible
- USB

Mezzanine Extensions
- 090009-04: three PC-MIPs Type I/II on local PCI bus
  - Compliant with PC-MIP specification
- 090009-03: three M-Modules
  - Compliant with M-Module standard
  - Characteristics: D16, D32, A08, A24, INTA, INTC
- 090009-05: two PMCs
  - Compliant with PMC standard IEEE 1386.1
- Option for all three versions: carrier board for four additional M-Modules
  - Compliant with M-Module standard
  - Characteristics: A08, A24, D16, D32, INTA, INTC

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 (external)
- Reset/abort buttons

Electrical Specifications
- Power supply unit PSU
  - Input: 18..36V DC; 0.8A typ., 2A max.
  - Output current of internal DC/DC converter: +5.1V/6A, +12V/+0.4A, -12V/-0.4A
  - Output current for keyboard/mouse connector: 200mA max. each
  - Output current for USB connector: 300mA max.
  - Output current for SA adapter: 200mA max. each
  - Output current total: 1.05A max.
- MTBF: tbd.

Environmental Specifications
- Temperature range (operation):
  - 0..+45°C (w/o fan: derated by 2.25°C per Watt power dissipation on mezzanines; with fan: no deration)
  - 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 / 1999-05 (radio disturbance) and EN 55024 / 1999-05 (immunity) with regard to CE conformity

Software Support
- VxWorks
- OS-9
- Linux
- QNX
- MENMON

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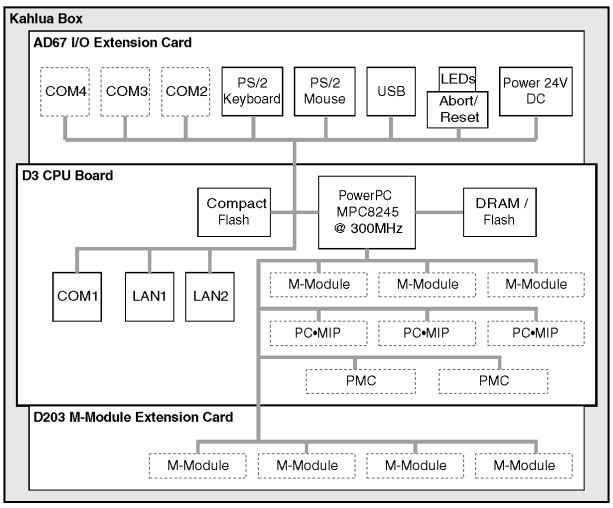
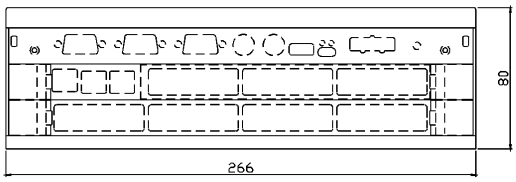
Diagram

Functional Blocks

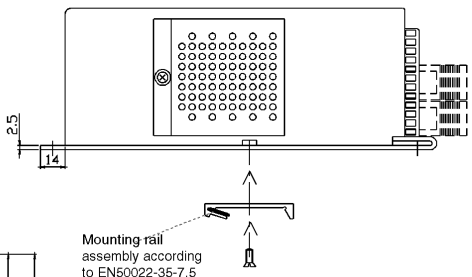


Views and Dimensions

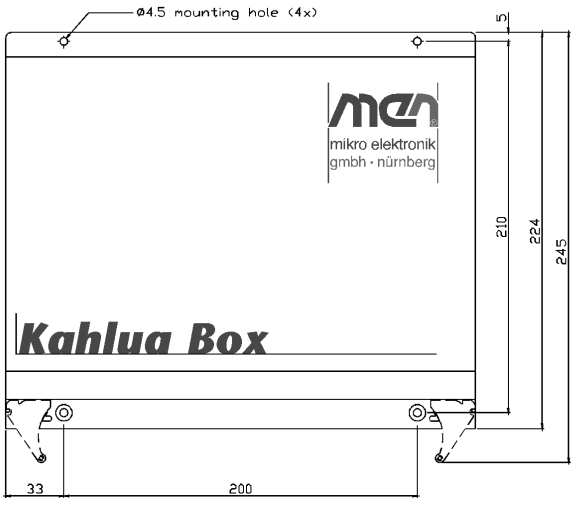
Front View



Side View



Top View



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Related Products

Standard Hardware

090009-03	Kahlua Box with M-Module slots, consisting of: aluminum enclosure, width: 266mm, depth: 245mm, height: 80mm; PSU, 24V DC, 40W; 6U 4HP single-board computer for sandwich mounting, CPU MPC8245/300MHz, 256MB DRAM, 32MB CompactFlash, 2MB Flash, 3 M-Module slots; 0..+45°C. Fanless version: max. ambient temp. = +45°C w/o mezzanine modules, derated by 2.25°C per Watt power dissipation on mezzanines.
090009-04	Kahlua Box with PC-MIP slots, consisting of: aluminum enclosure, width: 266mm, depth: 245mm, height: 80mm; PSU, 24V DC, 40W; 6U 4HP single-board computer for sandwich mounting, CPU MPC8245/300MHz, 256MB DRAM, 32MB CompactFlash, 2MB Flash, 3 PC-MIP slots; 0..+45°C. Fanless version: max. ambient temp. = +45°C w/o mezzanine modules, derated by 2.25°C per Watt power dissipation on mezzanines.
090009-05	Kahlua Box with PMC slots, consisting of: aluminum enclosure, width: 266mm, depth: 245mm, height: 80mm; PSU, 24V DC, 40W; 6U 4HP single-board computer for sandwich mounting, CPU MPC8245/300MHz, 256MB DRAM, 32MB CompactFlash, 2MB Flash, 2 PMC slots; 0..+45°C. Fanless version: max. ambient temp. = +45°C w/o mezzanine modules, derated by 2.25°C per Watt power dissipation on mezzanines.
090009-06	Kahlua Box with M-Module slots, consisting of: aluminum enclosure, width: 266mm, depth: 245mm, height: 80mm; PSU, 24V DC, 40W; 6U 4HP single-board computer for sandwich mounting, CPU MPC8245/300MHz, 256MB DRAM, 32MB CompactFlash, 2MB Flash, 3 M-Module slots; 0..+45°C. Forced air cooling.
090009-07	Kahlua Box with PC-MIP slots, consisting of: aluminum enclosure, width: 266mm, depth: 245mm, height: 80mm; PSU, 24V DC, 40W; 6U 4HP single-board computer for sandwich mounting, CPU MPC8245/300MHz, 256MB DRAM, 32MB CompactFlash, 2MB Flash, 3 PC-MIP slots; 0..+45°C. Forced air cooling.
090009-08	Kahlua Box with PMC slots, consisting of: aluminum enclosure, width: 266mm, depth: 245mm, height: 80mm; PSU, 24V DC, 40W; 6U 4HP single-board computer for sandwich mounting, CPU MPC8245/300MHz, 256MB DRAM, 32MB CompactFlash, 2MB Flash, 2 PMC slots; 0..+45°C. Forced air cooling.

Systems & Card Cages

Tailor your individual Kahlua Box by selecting the desired I/O functionality from our range of M-Module, PC-MIP and PMC mezzanine cards.

Accessories

02D203-04	D203, 6U 4HP, for sandwich mounting inside Kahlua Box, carrier board for 4 M-Modules

Related Products

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

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)
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
0752-0133	512MB DRAM 0..+60°C for 02D003A03
0752-0134	512MB DRAM 0..+60°C for 02D003B02
0752-0136	512MB DRAM 0..+60°C for 02D003C04
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

10ABMX-20	ELinOS V.3.1 - 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.

Related Products

10ABMX-21	ELinOS V.3.1 - 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.
10F001N01	OS-9(000) V.2.2/3.x: BSP for F1N, B11, A12, D3, SC13, Kahlua Box (object code, MEN)
10F001N02	OS-9(000) V4.2: BSP for F1N, B11, A12, A15, D3, SC13, Kahlua Box (object code, MEN)
10F001N40	QNX® 6 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.

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.

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

XiBase9, a graphical user interface for Linux and OS-9 from XiSys, is running on the MEN graphics controller PC-MIP and PMC modules P1, P17 and P517 in combination with the PowerPC-based Single-Board Computers A11, A12, D3, F1N, B11 and SC13 (further SBCs on request). For more information, purchase and support please apply to www.xisys.de.

14A012-00	MENMON (Firmware) for A12, D3, SC13 (object code)

Documentation

20SYST001	Kahlua Box product overview

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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 Kahlua Box online data sheet under www.men.de. --> Click here!

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