

Human-Machine Interfaces - Individual Solutions



- **For example:**
- **Aluminum EMC enclosure**
- **24V power supply**
- **TFT with touch interface**
- **Integrated keyboard**
- **Resolution 480 x 640 to 600 x 800**
- **Printer, CompactFlash at front**
- **I/O connections at rear**
- **MPC8245/266..400MHz**
- **DRAM, CompactFlash**
- **CAN, Ethernet, serial ... interfaces**
- **Additional I/O via on-board FPGA**
- **Java (Internet access)**

A Human-Machine Interface (HMI) is a computer which handles the communication between machines and humans. Thus it deals with any aspects that have an impact on a user's interaction with that system. A machine can be anything from a wristwatch to a large factory. The communication can be the human pushing a button or the machine flashing a lamp.

MEN designs and manufactures the hardware-control electronics, peripheral devices such as printer, touch etc. and housings for Human-Machine Interfaces for a range of applications in the automation industry. Because of the variety of different individual requirements these designs are always full custom solutions.

The HMI design example described here is based on an aluminum front panel covered with a printed plastic film. It houses an 800 x 600 pixel TFT with integrated keyboard (touch input). Located at the front and protected against dust by a cover, a fast printer, an RS232 debug/service connection and optionally a CAN interface are available. The rear side of the HMI provides further interfaces, such as one or two Fast Ethernet lines, another CAN interface, another two to four COMs and the 24V supply.

The electronics inside the HMI consists of two main components: An ESM - Embedded System Module (a complete computer on a single board) and a carrier board for the remaining functions like physical interfaces for the field busses etc. and the power supply. All permanent connections are done at the rear of the system.

The electronics of the HMI is based on a powerful, low-dissipation PowerPC MPC 8245 processor. For scalable memory configuration it provides an SO-DIMM socket for data and a CompactFlash slot for program storage. I/O functionality can also be scaled: it comprises various COMs, Ethernet, CAN etc. -- with CAN, several UARTs and graphics implemented in an FPGA. Additional I/O functionality can be realized in a very flexible and cost-effective way by extending the FPGA.

The standard operation temperature for the whole system is 0 to 60°C.

The HMI runs Embedded Linux or real-time operating systems. The Java implementation allows both local operation and access via any type of network, i.e. also the Internet.

Similar HMI configurations are also possible based on a PC core (x86) running Windows®. Independent of the processor core, all HMIs can be delivered in a once defined configuration for a minimum of 5 years.

Technical Data

Mechanical Specifications

- Aluminum enclosure
- Dimensions: depth 75 mm (max.), width 483 mm, height 288 mm
- IP rating: IP20 according to EN 60529

CPU

- PowerPC Kahlua II, 266..400MHz

Memory

- 32..512MB SO-DIMM / 133MHz
- Two CompactFlash slots
- One located at the front, dust protection cover
- One inside the system, for program data

Graphics

- 32MHz video frequency
- 16MB video SDRAM
- 16 bits/pixel (5-5-6)
- Linearly organized frame buffer interface

TFT

- Hitachi TX31D30VC1CAA
- 800 x 600 pixels, 6 bits/color
- 300 cd/m²
- TTL interface

Touch panel

- Analog resistive touch panel

Printer

- Fast thermal printer, e.g. Seiko LP1245
- Printing speed > 15mm/s
- Paper feed speed > 30mm/s
- Push button for form feed

Interfaces

- Serial Connection
- RS232/RS422/RS485 selectable through software setup
- Isolated
- Standard baud rates up to 115.2 kbaud
- Two handshake lines in RS232 mode
- Ethernet
- 10/100Mbps/s Ethernet interface
- One or two channels
- RJ45 connectors at rear side
- CAN bus
- ISO high speed
- Optically isolated
- Baud rate up to 1Mbit/s
- Debug/Service Connection
- RS232
- Standard connector at front

Further I/O options through FPGA

- All functions optional, can be factory-programmed as needed
- IDE interface
- SRAM controller
- Quad UART
- GPIO

PCI bus Extension Interface

- PCI-104 extension slot

Miscellaneous Features

- SA adapter extension interface
- For flexible serial interfacing
- Connection at rear side

Power Supply

- 24V +/-25%, 0,8A typical, 2A max.
- 3.15t fuse

Environmental Specifications

- Temperature range (operation):
 - 0..+50°C
 - Airflow: min. 10m³/h
- Temperature range (storage): -20..+60°C
- Relative humidity (operation): max. 85% non-condensing
- Relative humidity (storage): max. 85% non-condensing
- Altitude: -300m to + 3,000m
- Shock: 6g/6ms
- Crash: 15g/0.33ms
- Vibration (sinusoidal): 1g/5..2000Hz

Safety

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

EMC

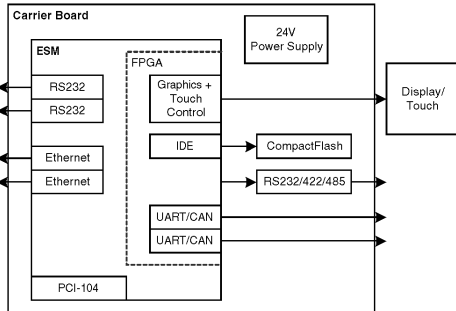
- Tested according to EN 55022 (radio disturbance), IEC1000-4-2 (ESD) and IEC1000-4-4 (burst) with regard to CE conformity

Software Support

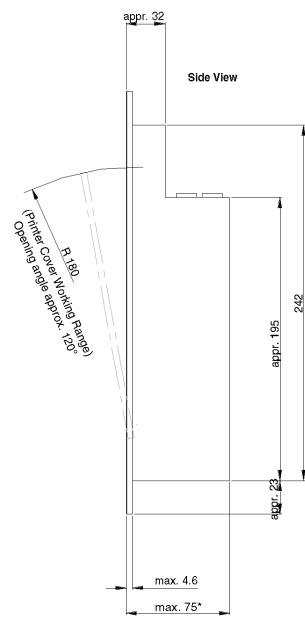
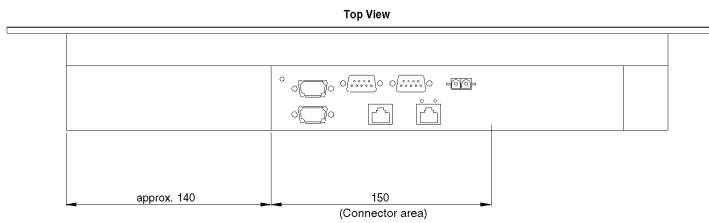
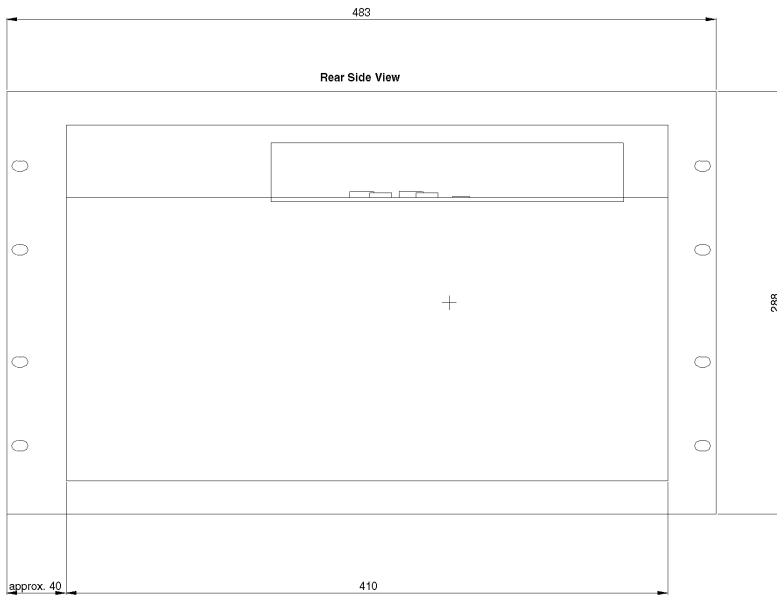
- Embedded Linux
- VxWorks
- OS-9

Diagram

Functional Blocks



Views and Dimensions



* without PC/104-Plus extension

Contact Information

Germany

MEN Mikro Elektronik GmbH
Neuwieder Straße 5-7
90411 Nuremberg
Phone +49-911-99 33 5-0
Fax +49-911-99 33 5-901
E-mail info@men.de
www.men.de

France

MEN Mikro Elektronik SA
18, rue René Cassin
ZA de la Châtelaine
74240 Gaillard
Phone +33 (0) 450-955-312
Fax +33 (0) 450-955-211
E-mail info@men-france.fr
www.men-france.fr

UK

MEN Micro Ltd
Whitehall, 75 School Lane
Hartford, Northwich
Cheshire UK, CW8 1PF
Phone +44 (0) 1477-549-185
Fax +44 (0) 1477-549-178
E-mail info@menmicro.co.uk
www.menmicro.co.uk

USA

MEN Micro, Inc.
PO Box 4160
Lago Vista, TX 78645-4160
Phone (512) 267-8883
Fax (512) 267-8803
E-mail sales@menmicro.com
www.menmicro.com

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.