

COTS Embedded Solutions and Custom Design Expertise

Rugged Computer Boards and Systems for
Harsh, Mobile and Mission-Critical Environments



Modular Computer Systems

With board-to-board communication being based on serial interconnects and/or a parallel bus system, 19" IEEE 1101.10/11 compliant systems offer a maximum of configuration flexibility and maintainability. MEN partners with Schroff® to provide system solutions which are often modified with customized backplanes and PSUs. Dedicated PSUs, e.g., with wide-range inputs for transport applications are developed by MEN.



Safe Computers Dual redundant 3U CompactPCI® or triple redundant 6U CompactPCI® and VMEbus SBCs for safety-critical applications, developed according to DO-254 and EN 50129. The boards are compliant with DO-160 and EN 50155 and are certifiable up to DAL-A and SIL 4.

- SBCs with PowerPC® and Intel® Atom™ processors
- Dual or triple redundancy (CPU, memory and FPGA)
- Certifiable up to SIL 4 and DAL-A
- Development according to DO-254
- Lock-step architecture
- Safe operating system

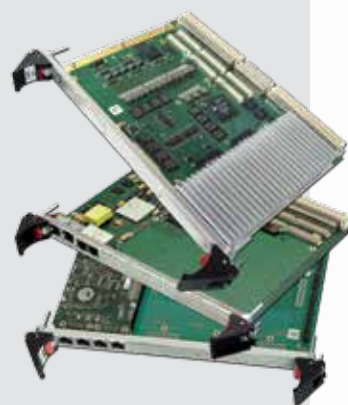
Read more: www.men.de/000467



Box & Panel PCs MEN box and panel PCs are based on a flexible modular configuration concept in terms of processor performance, interface and PSU types as well as display type and size. The design is always realized without fans, using conductive cooling to spread the dissipated heat to the outside of the housing. Standard versions comply with the EN 50155, class Tx railway standard and are prepared for e1 certification.

- Intel® Atom™, AMD G-Series or Intel® multi-core CPUs
- Interfaces, e.g., DisplayPort®, Ethernet, USB, UARTs, CAN bus, IBIS, GPS
- PCIe® MiniCard and SIM card slots for wireless connections
- Screen sizes from 10.4" to 60"
- Complete devices or display electronics only
- Fanless and maintenance-free, vandal-proof
- Wide-range PSU (up to EN 50155 class S2), Power over Ethernet
- -40°C to +70 (85)°C operating temperature

Read more: www.men.de/000471



VMEbus 6U VME64 and 2eSST CPU boards based on Intel® or PowerPC® processors, completed by a huge number of industrial I/O boards based on the M-Module™, PMC and XMC mezzanine standards.

- SBCs with Intel® multi-core and Freescale architecture
- Memory soldered
- PMC or M-Module slots
- Standard front I/O, e.g., Ethernet, USB, UARTs, VGA, PMC
- Rear I/O, e.g., PMC, SATA, UARTs, graphics
- Peripheral cards for M-Modules
- Standard 19" chassis with 6-slot backplane

Read more: www.men.de/000470

CompactPCI® Serial 3U system and peripheral slot cards for communication-intensive high performance applications based on modern serial interfaces and proven 19" mechanics according to the PICMG CPCI-S.0 specification.

- SBCs with Intel® multi-core processors
- Memory soldered
- Standard front I/O e.g., Ethernet, USB, UARTs, VGA, DVI, DisplayPorts
- Standard rear I/O up to 8 PCIe®, 8 Ethernet, 8 USB, 8 SATA
- Ethernet mesh with up to 8 channels on mezzanine card
- Peripheral cards for SATA HDD/SDD, multi-display control, XMC/PMC modules, PCIe® MiniCards, Ethernet, USB
- Standard 19" chassis with 9-slot backplane

Read more: www.men.de/000468



CompactPCI® PlusIO 3U CPU boards based on Intel® or Freescale™ processors in accordance with PICMG 2.30 offer fast serial communication, can be combined with CompactPCI® Serial peripheral cards and are 100% downward-compatible to parallel CompactPCI® (PICMG 2.0).

- SBCs with Intel® multi-core and Freescale™ processors
- Usable in CompactPCI® PlusIO and CompactPCI® 2.0 systems
- Memory soldered
- Standard front I/O, e.g., Ethernet, USB, VGA
- Standard rear I/O up to 4 PCIe®, 4 Ethernet, 4 USB, 4 SATA
- Additional functions in combination with side cards (DVI, audio, FireWire etc.)
- Peripheral card functions with CompactPCI® Serial and CompactPCI® 2.0
- Standard 19" chassis with 8-slot hybrid backplane

Read more: www.men.de/000468



CompactPCI® 3U and 6U CPU boards according to PICMG 2.0 and PICMG 2.16 based on Intel® or PowerPC® processors, completed by a wide range of I/O and controller cards. In addition to state-of-the-art PC functionality, including multi-core technology, all CPU boards feature industrial functions such as real-time clock, or watchdogs for temperature and voltage control.

- SBCs with Intel® multi-core, Intel® Atom™ and Freescale™ processors
- Memory soldered
- Standard front I/O, e.g., Ethernet, USB, UARTs, VGA, PMC
- Rear I/O, e.g., SATA, Ethernet, PMC, UARTs, graphics
- Peripheral cards for binary I/O and M-Modules™, PCIe® MiniCards, Ethernet, USB, WLAN, GSM, GPS etc.
- Standard 19" chassis

Read more: www.men.de/000469





Computer-On-Modules Highly robust and EMC-proof COMs in two different sizes. Providing a fanless conduction cooling concept, they are prepared for a power dissipation of up to 35 W. The CPU PCBs are mounted into an aluminum frame and cover, to be completely enclosed. The modules are fixed on the carrier card using eight screws and have a rugged board-to-board connector.

ESMexpress®

- ANSI-VITA 59 standard in process, COM Express™ compatible
- Intel® Atom™, Intel® multi-core and Freescale™ processors
- Memory soldered
- Uniform size 95 x 125 mm
- Fixed pin-out for COM interchangeability
- Closed aluminum housing and/or heat sink
- ATX evaluation carrier XC1

ESMini™

- Intel® Atom and Freescale™ processors
- Memory soldered
- Uniform size 95 x 55 mm
- Pin-out depending on onboard FPGA
- Closed aluminum housing and/or heat sink
- MicroATX evaluation carrier XC4

Read more: www.men.de/000472

Mezzanine I/O MEN uses PMC and XMC modules to add modular computing I/O to any 19" system or on stand-alone SBCs while M-Modules™ allow to add any kind of real-world I/O to a system in a very flexible way. Typical M-Module™ functions comprise instrumentation, process I/O, motion, robotics and various general-purpose analog and binary I/O.

- Graphics accelerator and frame buffer interfaces
- Gigabit Ethernet
- CAN bus, Profibus and UART interfaces
- Reflective memory
- Convection and conduction cooled versions
- USM concept with user-defined I/O in FPGA
- Up to 32 binary inputs and/or outputs
- Up to 16 analog inputs or outputs
- TTL I/O, relay outputs
- Data and temperature acquisition
- Oscilloscopes, digital multimeters, function & waveform generator
- Motor controllers and motion counters

Read more: www.men.de/000473



Networks & Connectivity Rugged Ethernet switches, routers and gateways for 19" CompactPCI® and stand-alone systems, providing market-specific fieldbus interface cards and IP cores as well as wired and wireless communication.

Ethernet

- Managed or unmanaged Ethernet switches
- PoE (Power over Ethernet) versions
- Rugged Ethernet switches according to IP67
- Configuration via web interface, CLI, SNMP, dongle
- M12, RJ45 or D-Sub connectors
- Ethernet interfaces on 3U CompactPCI® / Serial, on PMC / XMC modules and as IP cores

Fieldbus

- CAN bus, Profibus, MVB/WTB, IBIS, AFDX interfaces on M-Modules™, SA-Adapters™ or as IP cores

Wireless

- WLAN, UMTS, GPS, GSM, HSDPA interfaces on 3U CompactPCI® and CompactPCI® Serial

Read more: www.men.de/000474

System Packaging Offering a range of different standard enclosures we also provide you with an individual packaging solution tailored to the needs of your application in terms of performance, functionality and environmental conditions.

- Standard and customized solutions
- 19", DIN-rail, wall-mounting or stand-alone
- Conduction and convection cooling
- Up to IP65 and EN 50155
- Environmental tests for temperature, humidity, shock, vibration and customized specifications

Read more: www.men.de/000475



Custom Design Expertise

Custom design of computer boards and systems

Often the most cost-effective solution results in a custom design – while using as many standard components as possible. Synergy effects emerge through the mutual development of standard and custom boards and systems.

Complete system solutions based on in-house mechanical design

Whether 19" system, wall-mount, stand-alone or DIN-rail, we guarantee overall operability of each system, minimizing the integration effort and the handling cost on the client's side. The quality of our systems is assured by applying traceability through the V-model.

Customer assistance in configuration of mission-critical systems

Computer architectures with safety-critical requirements are very complex. Considerations include safety-critical characteristics and levels (SIL, DAL), reliability questions, error behavior modes, and the major IEC and EN standards – backed by a professional safety and risk management.



MEN – The Rugged and Mission-Critical Embedded Experts

Development and production of rugged and reliable products

Our boards and systems are developed to meet requirements like temperature ranges between -40°C and +85°C through convection or conduction cooling, shock, vibration, chemical influence, or the option of coating against humidity right from the start.

Development based on quality management systems of our markets

We are certified according to ISO 9001 and ISO 14001, plus EN/AS 9100 (aero-space), IRIS (railways) and e1 (automotive). We develop according to the GRESS requirements by Airbus and are preparing for EFQM (European Foundation for Quality Management).

Development based on relevant standards know-how for our markets

Preparing products for qualification according to vertical market standards is one of our key services, for example EN 50155 for railways, DO-254 and DO-178B for avionics, German Lloyd for shipbuilding or e1 for automotive.

Fully automated, high-quality in-house production

To achieve the highest product quality, our manufacturing and test process is fully automated. Vapor-phase soldering assures smooth processing of the components. Traceability is guaranteed by time stamps throughout the whole process.

All relevant environmental tests in-house

We carry out the preliminary qualifications in our own environmental test lab (temperature, shock, vibration, humidity), high-voltage and EMC chambers. Further calculations and analyses include MTBF, FMEA, Hazard Tree, HASS or HALT.

FPGA technology expertise

FPGAs allow us to customize our hardware without touching the board layout at an attractive price even in low quantities. FPGA-based solutions are flexible, offer long term availability and support extended temperature operation.



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ISO 9001:2008
 ISO 14001:2005
 EN 9100:2009

