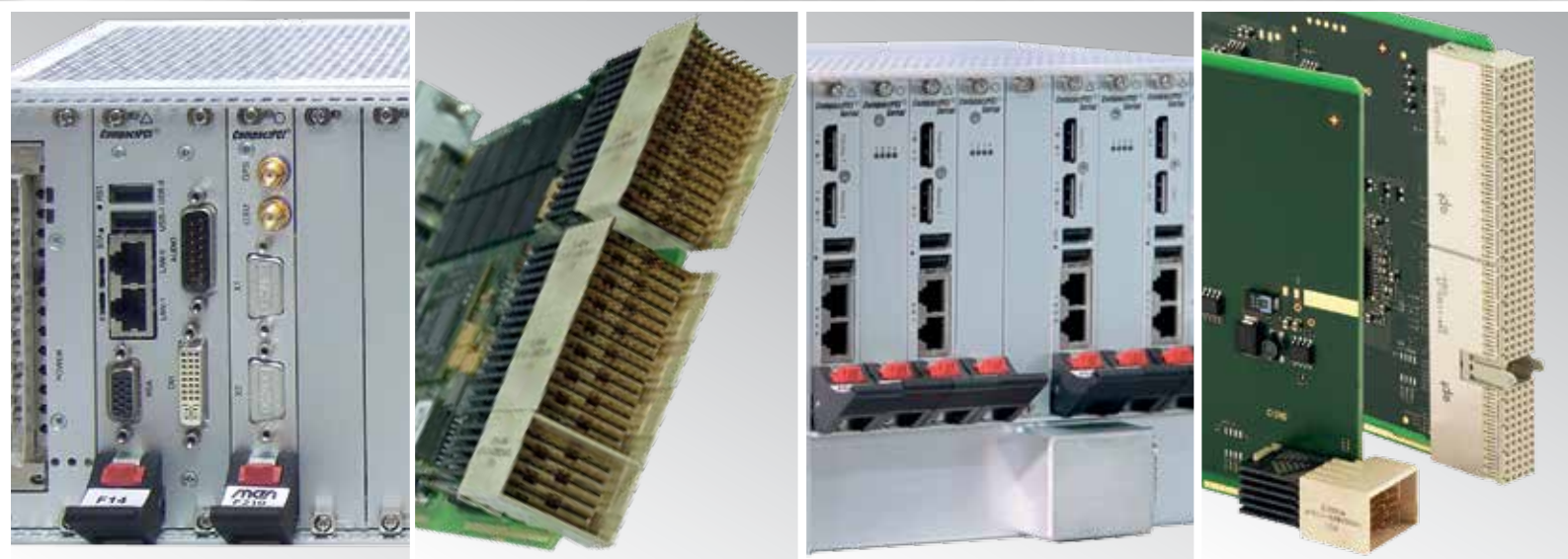


CompactPCI® goes Serial!

Solutions with CompactPCI®,
CompactPCI® PlusIO and
CompactPCI® Serial



CompactPCI® Serial SBCs

CompactPCI® Serial PICMG CPCI-S.0 is a new independent base standard. This standard introduces a completely new connector, which enables a much higher signal density and supports higher transmission frequencies of 12 Gbit/s and more. In addition this connector only supports modern point-to-point connections. CompactPCI® Serial is consistently based on the mechanics of CompactPCI® (PICMG 2.0), so it remains 100% compatible to IEC 1101. For this reason, all 19" system solutions can be used without limitations. The dimensions of the backplanes are identical to those of the CompactPCI® backplanes and are fixed in the same way. Front panels and handles, as well as the well-proven hot plug mechanics – the switch in the handle – remain the same and acquire a new meaning for hard disk RAID. Only the connector is replaced by a modern type which is able to support the high frequencies.



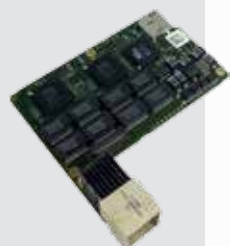
G22 – 3U CompactPCI® Serial Intel® Core™ i7 SBC, 3rd Gen.

- Intel® Core™ i7, 3rd generation
- Quad-core 64-bit processor
- 4 HP system master and peripheral slot
- 4 or 8 GB DDR3 DRAM soldered, ECC
- mSATA and microSD™ card slots
- Standard front I/O: 2 DisplayPorts, 2 Gb Ethernet, 2 USB 2.0
- Standard rear I/O: 7 PCIe®, 4 USB 2.0, 4 USB 3.0, 5 SATA, DisplayPort®/HDMI
- Intel® Turbo Boost, Hyper-Threading, AMT 8.0, Open CL support



G20 – 3U CompactPCI® Serial Intel® Core™ i7 SBC

- Intel® Core™ i7-610E, 2.53 GHz
- Dual-core 64-bit processor
- 4 HP system master and peripheral slot
- Up to 4 (8) GB DDR3 DRAM soldered, ECC
- mSATA and microSD™ card slots
- Standard front I/O: 2 DisplayPorts, 2 Gb Ethernet, 2 USB 2.0
- Standard rear I/O: 7 PCIe®, 8 USB 2.0, 6 SATA, DisplayPort®/HDMI
- Intel® Turbo Boost, Hyper-Threading, Active Management Technology



GM2 – Octal Gigabit Ethernet Mezzanine Card

- Mezzanine card for CompactPCI® Serial SBCs
- Eight 10/100/1000Base-T Ethernet channels
- Support of full mesh and star architecture
- TCP/IP checksum offload



GM1 – Quad Gigabit Ethernet Mezzanine Card

- Mezzanine card for CompactPCI® Serial SBCs
- Four 10/100/1000Base-T Ethernet channels
- Support of full mesh and star architecture
- TCP/IP checksum offload

CompactPCI® PlusIO SBCs

CompactPCI® PlusIO SBCs (PICMG 2.30) can be used in parallel CompactPCI® 2.0 systems, with the advantage to support a standardized rear I/O pinout. Their primary function however is to combine the enhanced speed and data throughput of CompactPCI® Serial peripheral cards with legacy CompactPCI® peripheral cards in hybrid system configurations.

F75P - 3U CompactPCI® PlusIO Safe Railway Computer

- 2x Intel® Atom™ E6xx, 512 MB DDR2 RAM (each) for onboard dual redundancy
- 1x Intel® Atom™ E6xx, 1 GB DDR2 for I/O
- Independent supervisors for each block
- Fail-safe and fail-silent board architecture
- Certifiable up to SIL 4 (with report from TÜV SÜD)
- Developed according to EN 50129, EN 50128 and IEC 61508
- Full EN 50155 compliance, -40°C to +85°C qualified



F21P – 3U CompactPCI® PlusIO Intel® Core™ i7 SBC

- Intel® Core™ i7-2715QE, 2.1 GHz
- Up to 4 (8) GB DDR3 DRAM soldered, ECC
- microSD™ card and mSATA slots
- Standard front I/O: VGA, 2 Gb Ethernet, 2 USB
- Standard rear I/O: 4 PCIe®, 4 USB, 4 SATA, 1 Gb Ethernet
- Other I/O (onboard, side card): SATA, SDVO, HDMI/Display Port®, HD audio, USB, UART etc.
- 2.0..3.0 GHz Turbo Boost, Hyper-Threading, Active Management Technology



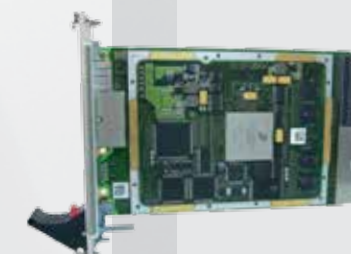
F19P – 3U CompactPCI® PlusIO Intel® Core™ 2 Duo SBC

- Intel® Core™ 2 Duo SP9300, 2.26 GHz
- Up to 4 (8) GB DDR3 DRAM soldered
- CompactFlash® and microSD™ card slots
- Standard front I/O: VGA, 2 Gb Ethernet, 2 USB
- Standard rear I/O: 4 PCIe®, 4 USB, 4 SATA, 1 Gb Ethernet
- Other I/O (onboard, side card): SATA, SDVO, HD audio, USB, UART etc.



F50P – 3U CompactPCI® PlusIO MPC8548 SBC

- MPC8548 (or MPC8543), up to 1.5 GHz
- 8 HP or 12 HP with front I/O
- Up to 2 GB (ECC) DDR2 SDRAM
- Up to 128 KB FRAM, 2 MB SRAM, up to 16 GB SSD Flash
- Standard front I/O: 2 Gb Ethernet, 2 USB
- Standard rear I/O: 4 USB, 2 SATA
- FPGA for user-defined I/O functions (option)



CompactPCI® Serial Peripheral Boards

The requirements for bandwidth and data processing capacity are constantly growing in the embedded area. Modular systems based on fast serial interconnects help to meet such demands. To do this, you need a suitable CPU, but also powerful I/O. The first peripheral cards for CompactPCI® Serial now provide a concrete approach. In addition, these CPCI-S.0 peripheral cards are a special plus – their fast interfaces can both be used in hybrid solutions and with CompactPCI® Serial. In this manner they support a smooth transition into a purely serial world. With CPCI-S.0, the peripheral slots have up to eight Gigabit Ethernet channels and one PCI Express®, SATA und USB 2.0/3.0 each.



G501 – 3U SATA HDD/SSD Shuttle

- Hard disk drive or solid state drive shuttle
- 2.5" SATA HDD/SSD slot
- -40°C to +85°C with qualified components
- Compliant with EN 50155



G212 – 3U PCIe® MiniCard Carrier for Wireless Functions

- Up to 2 PCI Express® MiniCards (full-size)
- Optional 2 Express Cards 34 or 54
- For cards with internal PCIe® and USB interface
- For HF applications (WLAN, UMTS, GPS, GSM, HSDPA)
- -40°C to +85°C screened



G213 – 3U XMC Carrier

- 1 XMC slot (PCIe® 2 x4 links)
- Or 1 PMC slot (32/64 bits, 33/66/133 MHz, PCI-X)
- -40°C to +85°C screened



G214 – 3U Multi-Display Controller

- Graphics processor Radeon E6760, 600 MHz
- 6 SIMD engines, 480 shaders
- 1 GB integrated graphics RAM
- AMD EyeSpeed, Eyefinity and HD3D technologies
- PCIe® x8 CPU interface
- Up to 6x DisplayPort® (4x DP 1.2, 2x DP 1.1a)
- DirectX® 11, OpenGL® 4.1, OpenCL™ 1.1



G215 – 3U Universal Interface Board

- 8 HP CompactPCI® Serial with 5 interfaces at the front
- Physical layers via SA-Adapters™
- For protocols/physical layers like RS232/422/485, HDLC, CAN bus, binary I/O
- Standard configuration: 2 CAN, 2 UART, 1 binary I/O port (8-bit)
- Other functions via FPGA IP cores
- -40°C to +85°C with qualified components

G211 – 3U Quad Gigabit Ethernet Interface

- Four 10/100/1000Base-T Ethernet channels
- Alternatively two redundant channel pairs
- Full-duplex or half-duplex
- RJ45 or robust M12 connectors
- 1500 V isolation voltage
- -40°C to +85°C screened

G211F – 3U Quad Fiber Optics Interface

- Four optical transceiver channels 1000Base-SX
- Alternatively two redundant channel pairs
- Full-duplex or half-duplex depending on transceiver
- -40°C to +85°C screened (without transceivers)

G201 – 3U USB 3.0 Interface

- 4 USB 3.0 host interfaces
- Data rate up to 5 Gbit/s per direction per port
- -40°C to +85°C screened

G301 – 3U Unmanaged 4+1-Port Ethernet Switch

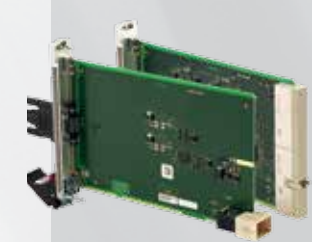
- 4 Gigabit Ethernet ports on RJ45 or M12 connectors
- 4 Power over Ethernet (PoE) PSE
- LEDs for Ethernet activity
- -40°C to +85°C screened

G302/G303 – 3U 16-Port Ethernet Switches

- Managed and unmanaged versions
- Up to 16 Gigabit Ethernet ports at rear side
- Or: 3 ports at front and up to 13 ports at rear
- Service interface via M12 connector
- -40°C up to +70 (+85)°C with qualified components

F100/G100 – CompactPCI® Serial to CompactPCI® Interface Cards

- F100 - Replaces system slot card in CompactPCI® systems
- G100 - For operation together with F100 system slot card for CompactPCI®
- 1 PCI Express® x1 link
- -40°C to +85°C with qualified components



CompactPCI® PlusIO/Serial Systems

To package CompactPCI®, CompactPCI® PlusIO and CompactPCI® Serial boards we use enclosures and backplanes from Schroff®. In addition to their maintenance friendly and robust architecture, 19" systems have a modular set-up regarding housing dimensions, backplane sizes and pinout, PSUs and use of different mass storage devices. The following enclosures are the basis for individually tailored system configurations.

CPCI Serial Rack – Single Euro with Conduction Cooling



- For standard 3U cards within CCA frames
- 3-slot 3U backplane
- System slot left, horizontal installation
- Outline 200 mm x 350 mm x 145 mm
- 4 MIL-C-38999 connectors (59 user I/O pins)
- PSU 18-32 V, 35 W
- -40°C to +70(+85)°C operating temperature
- IP65 compliant

CPCI to CPCI Serial Hybrid Rack for Single Eurocards



- 19" rack-mountable
- 4U / 84 HP system (incl. 1U fan tray)
- 8-slot hybrid backplane
- CompactPCI® PlusIO system slot
- 4 CompactPCI® Serial peripheral slots to the right
- 3 CompactPCI® peripheral slots to the left
- All slots prepared for rear I/O
- 250 W plug-in PSU 90-264 VAC
- 44HP space for individual extensions

CPCI Serial Rack for Single Eurocards



- Serial Rack for Single Eurocards
- 19" rack-mountable
- 4U / 84 HP system (incl. 1U fan tray)
- 9-slot CompactPCI® Serial backplane
- System slot left
- Full Ethernet mesh
- 460 W ATX PSU, 90-264 VAC
- Prepared for slim-line DVD drive

System Solutions & Application Examples

The rugged CompactPCI® Serial/PlusIO products from MEN are especially suited for transportation and other mobile applications, e.g. for infotainment systems, as well as for mission-critical industrial systems.

RAID Storage Systems

CompactPCI® PlusIO systems are downward-compatible to CompactPCI® 2.0 and feature additional high-speed serial interfaces on the backplane. With 4 SATA interfaces (up to 8 SATA in CompactPCI® Serial systems) RAID systems for the storage of video data can be built very effectively. A train can contain several (redundant) recorders typically operating 24 hours a day. Every recorder can have a memory of several terabytes and can store data from 20 cameras for up to 30 days.

Automatic Train Operation

Mass transit vehicles are more and more often equipped with driverless systems to increase traffic speed and frequency, lower energy consumption, or to stop at the station precisely. ATO computers are typically based on modular systems because they control a multitude of functions and communicate with wayside equipment. As ATO functions are always safety-critical, the same computer can be used to control other safety systems of the train.

Content Servers

Computer systems for these applications are preferably based on modular 19" CompactPCI®, CompactPCI® PlusIO or CompactPCI® Serial because they allow flexible configuration with a multitude of different functions – including integration of multimedia access units or even security features. Requirements are in general according to EN 50155, with an operating temperature from -40°C to +85°C and conformal coating of all components.

Multimedia Access Units

Solutions include small and compact boxes as well as multifunctional 19" CompactPCI® (PlusIO) and 19" CompactPCI® Serial systems. Full EN 50155 compliance is typically required.

Camera Control

CompactPCI® PlusIO and Serial systems can flexibly be populated with standard, modified and custom cards. These systems can be extended by additional boards or scaled with CPU cards of different performance levels. Several independent subsystems may also find space inside a single enclosure. Connection to IP cameras is realized via Fast or Gigabit Ethernet, while analog cameras are typically connected via FireWire.



Key Features of CompactPCI® PlusIO

CompactPCI® PlusIO (PICMG 2.30) is downward-compatible to CompactPCI® (PICMG 2.0). It offers the modularity, robustness and economic efficiency of CompactPCI®, adding fast serial data transfer inside the same 19" standard environment via a different connector from 3M with 5 Gbit/s. PICMG 2.30 solely fixes the pin assignment and the function of the free user pins of PICMG 2.0 on the J2 connector for 32-bit system slots. The pin number is sufficient for leading 4 PCI Express® x1 links, 4 SATA, 4 USB 2.0 as well as 2 Ethernet 1000Base-T interfaces to the backplane. These new serial interfaces can either be wired via a rear I/O adapter or up to 4 new peripheral slots are added to the system backplane. These slots have identical assignment for PCI Express®, SATA and USB. The first 2 peripheral slots support Ethernet in addition. CompactPCI® PlusIO can be combined with existing CompactPCI® boards in hybrid systems which also offer the possibility to integrate boards with serial interconnects beside the parallel bus-based boards – an easy and cost-saving way to migrate to modern technologies like CompactPCI® Serial.

Key Features of CompactPCI® Serial

With CompactPCI® Serial (PICMG CPCI-S.0) the CompactPCI® architecture moves to serial high-speed interconnects. A configuration of one system slot and up to eight peripheral slots does not need switches and bridges. Keeping the proven 19" mechanics of the IEC 1101 as well as hot-plug, the standard introduces a new rugged connector with a signal density of up to 184 pin pairs (on 3U) and transmission frequencies of 12 Gbit/s. The system slot supports 8 PCI Express® links, 8 SATA/SAS, 8 USB 2.0/3.0 and 8 Ethernet interfaces plus signals for general system management. It is supplied with 12 V. Each peripheral slot offers 1 PCI Express® link, 1 SATA/SAS and 1 USB 2.0/3.0 interface and supports up to 8 Ethernet interfaces to build a full mesh. The pin assignment of the system and the peripheral slot is congruent. This way it is possible to plug a system slot board into each peripheral slot to support symmetrical multiprocessing. Ethernet is wired as a full mesh. Transmission is based on the proven standards for copper connections up to 10GBase-T to allow configuration of redundant, safety-critical systems.

Rugged and Safe Computing with CompactPCI® from MEN

The modularity and maintenance-friendliness of the 19" mechanics together with the robust connection and compact Eurocard size of the CompactPCI® boards, plus hotswappability, multi-processing capabilities and conductive cooling possibilities are the ideal basis to build and offer solutions for harsh environments and for mission-critical applications. CompactPCI® PlusIO and CompactPCI® Serial combine all these advantages with much higher speed and data throughput using modern serial interconnects. MEN COTS and custom boards come in 3U and 6U for operating temperatures up to -40°C to +85°C, prepared for coating, with all components firmly soldered, using onboard FPGAs where additional flexibility is required. The outstanding product quality is guaranteed by development and production according to market standards like EN 50155 or DO-178, based on quality management systems ISO 9001, EN/AS 9100 and IRIS. MEN computer systems are made in Germany on fully automated production lines supporting traceability. A well implemented obsolescence management allows long-term delivery agreements up to 15 years and more.



Learn more about CompactPCI®/
CompactPCI® PlusIO/ CompactPCI® Serial!
www.men.de/000468



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

