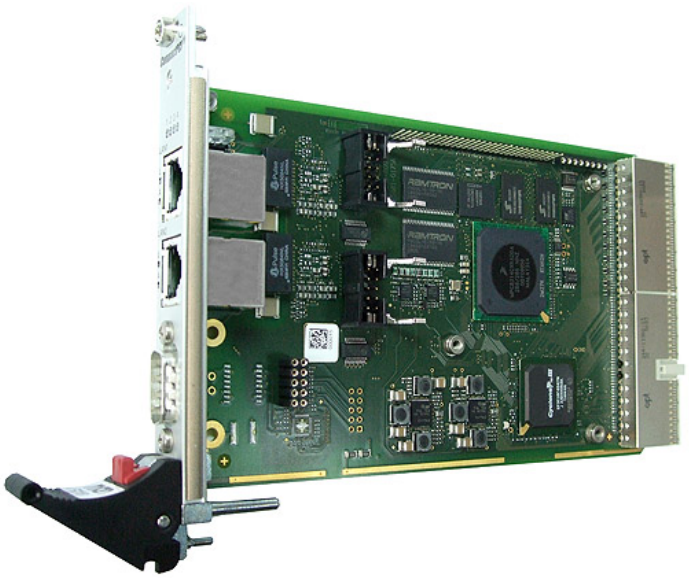
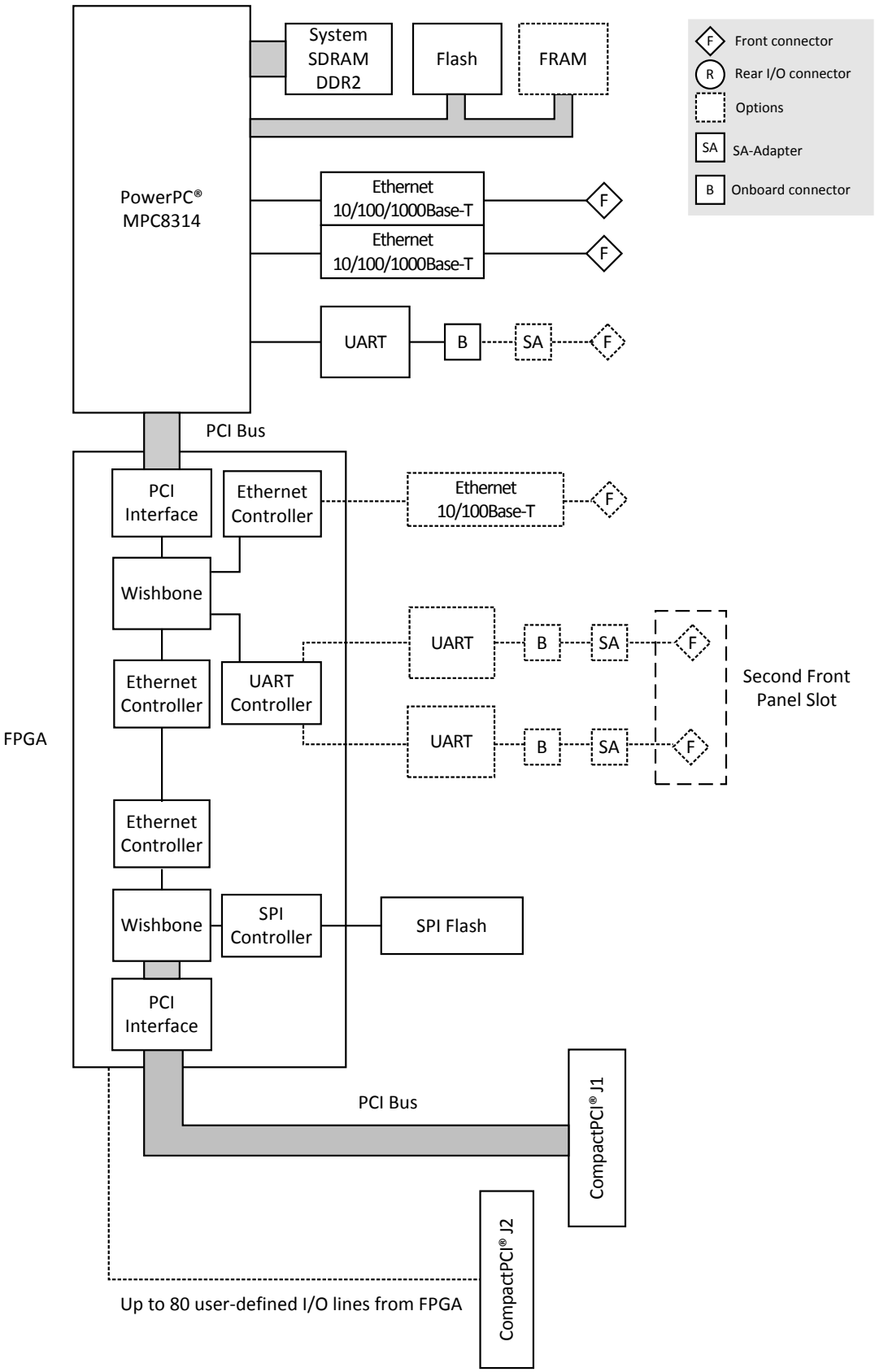
F218 – 3U CompactPCI® PowerPC® MPC8314 Slave CPU Board

- **32-bit/33-MHz CompactPCI®**
- **4HP peripheral slot or stand-alone function**
- **PowerPC® MPC8314, 266 MHz**
- **Host CPU communication via Ethernet**
- **Ultra fast boot < 2 seconds**
- **Flexible FPGA-Flash structure**
- **256 MB SDRAM, 16 MB Flash**
- **Front I/O: 2 Gb Ethernet, 1 UART via SA-Adapter™**
- **Rear I/O: user-defined via FPGA (option)**
- **-40 to +85°C with qualified components**



The F218 is a 3U 4HP CompactPCI® slave CPU card which can be used as an Ethernet diagnosis buffer. It communicates with the host CPU board via Ethernet. The F218's processor is connected to the CompactPCI® bus via the FPGA. The connection is realized via two Ethernet controllers inside the FPGA so that the host CPU board sees the F218 as an Ethernet device. This kind of connection is similar to a front connection of 2 CPU boards via Ethernet cable.
The F218 is controlled by the PowerPC® MPC8314, an e300 core processor with a performance of up to 266 MHz. The core is built on Power Architecture technology and is a cost-effective, low-power, highly integrated processor that addresses the requirements of industrial applications.
As memory the F218 offers 256 MB DDR2 SDRAM, 16 MB Flash and optionally 1 MB non-volatile FRAM.
Two Gigabit Ethernet interfaces and one serial interface which is realized via an additional SA-Adapter™ are available at the front panel. As an option, the onboard FPGA offers the possibility to realize an additional Fast Ethernet and two UART interfaces which can be accessed via SA-Adapters™ on a second front panel slot.
The F218 is qualified for operation in a -40°C to +85°C temperature range. It operates in VxWorks® and Linux environments and is supported by the U-Boot Universal bootloader. The boards boots a VxWorks®-supported BSP in less than 2 seconds.

Diagram


System SDRAM DDR2
Flash
FRAM
PowerPC® MPC8314
Ethernet 10/100/1000Base-T
Ethernet 10/100/1000Base-T
UART
B
SA
F
Front connector
Rear I/O connector
Options
SA-Adapter
Onboard connector
PCI Bus
PCI Interface
Ethernet Controller
Ethernet 10/100Base-T
Wishbone
UART
Ethernet Controller
UART Controller
Second Front Panel Slot
FPGA
Ethernet Controller
Wishbone
SPI Controller
SPI Flash
PCI Interface
PCI Bus
CompactPCI® J1
CompactPCI® J2
Up to 80 user-defined I/O lines from FPGA

Technical Data

CPU	■ PowerPC® MPC8314 PowerQUICC™ II Pro □ 266 MHz
Memory	■ 256 MB SDRAM system memory □ Soldered □ 133 MHz memory bus frequency ■ 16 MB Flash ■ 1 MB non-volatile FRAM optional ■ Serial EEPROM 2 KB for factory settings ■ 4 MB SPI Flash (FPGA-controlled)
I/O	■ Ethernet □ Two 10/100/1000Base-T Ethernet channels □ One 10/100Base-T Ethernet channel (optional, FPGA-controlled, on 4-pin Lemo connector) □ RJ45 connector at front panel □ Two status LEDs for each channel ■ One RS232 or RS422 UART via SA-Adapter™ □ D-Sub connector at front panel □ Via 10-pin onboard connector □ Data rates up to 230,400 bit/s □ Handshake lines: DTR, RTS, CTS ■ 80 GPIO lines from FPGA □ Accessible via J2 rear I/O connector
Front Connections	■ Two Ethernet (RJ45) ■ COM1 (D-Sub)
Rear I/O	■ 80 GPIO lines from FPGA
FPGA	■ The FPGA offers the possibility to realize additional I/O functionality. See Options
Miscellaneous	■ Supply voltage supervision ■ Four programmable user LEDs
CompactPCI® Bus	■ Compliance with CompactPCI® Core Specification PICMG 2.0 R3.0 ■ Peripheral slot ■ 32-bit/33-MHz ■ V(I/O): +3.3 V
Busless Operation	■ Board can be supplied with +5 V only, all other voltages are generated on the board ■ Backplane connectors used only for power supply
Electrical Specifications	■ Supply voltage/power consumption: □ +5 V (-3%/+5%), tbd typ./max.
Mechanical Specifications	■ Dimensions: conforming to CompactPCI® specification for 3U boards ■ Front panel: 4 HP / 8 HP with ejector ■ Weight: 166 g (w/o heat sink and SA-Adapter™)
Environmental Specifications	■ Temperature range (operation): □ -40..+85°C (qualified components) □ Airflow: min. 1.0 m/s ■ Temperature range (storage): -40..+85°C ■ Relative humidity (operation): max. 95% non-condensing ■ Relative humidity (storage): max. 95% non-condensing ■ Altitude: -300 m to + 3,000 m ■ Shock: 15 g, 11 ms ■ Bump: 10 g, 16 ms ■ Vibration (sinusoidal): 1 g, 10..150 Hz ■ Conformal coating on request

Technical Data

MTBF	■ 427,994h @ 40°C according to IEC/TR 62380 (RDF 2000)
Safety	■ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers
EMC	■ Conforming to EN 55022 (radio disturbance), IEC1000-4-2 (ESD) and IEC1000-4-4 (burst)
BIOS	■ U-Boot Universal Boot Loader
Software Support	■ Linux (in preparation) ■ VxWorks® (in preparation) ■ QNX® (on request) ■ For more information on supported operating system versions and drivers see Downloads.

FPGA

This product offers the possibility to add customized I/O functionality in FPGA.

Flexible Configuration	■ Customized I/O functions can be added to the FPGA. ■ It depends on the board type, pin counts and number of logic elements which IP cores make sense and/or can be implemented. Please contact MEN for information on feasibility. ■ You can find more information on our web page "User I/O in FPGA"
FPGA Capabilities	■ FPGA Altera® Cyclone® III EP3C40 □ 39,600 logic elements □ 1,134 Kbits total RAM ■ Connection □ Total available pin count: 80 pins □ Functions available via rear I/O connector J2 □ SA-Adapters™ are used to realize the physical lines.

Configuration & Options

Standard Configurations

Article No.	Ethernet	System RAM	Flash	FRAM
02F218-00	2 Gigabit Ethernet	256 MB	16 MB	none

Options

Memory	■ Non-volatile FRAM □ 0 MB, 1 MB
I/O	■ Third Ethernet interface (10/100MBit/s) at front via 4-pin Lemo connector □ Controlled via FPGA ■ All three Ethernet (10/100MBit/s) interfaces via 4-pin Lemo connectors (up to 3 on 4HP front panel) ■ 2 additional FPGA interfaces via MEN SA-Adapters™ (e.g. CAN, IBIS, UART, binary I/O) on 8HP front panel ■ 80 I/O lines from FPGA for user-defined functionality on CompactPCI® J2 connector
Mechanical	■ 4HP or 8HP
Cooling Concept	■ Also available with conduction cooling in MEN CCA frame

Please note that some of these options may only be available for large volumes. Please ask our sales staff for more information.

Ordering Information

Standard F218 Models	**02F218-00**	PowerPC® MPC8314, 2x Gigabit Ethernet, 256 MB DRAM, 16 MB Flash, -40..+85°C with qualified components
SA-Adapters™	You can find a more detailed overview of possible carrier board/SA-Adapter™ combinations along with software support in our option matrix (PDF).	
	08SA01-00	RS232, not optically isolated, 0..+60°C
	08SA02-01	RS422/485, full duplex, optically isolated, 0..+60°C
	08SA02-07	RS422/485, full duplex, optically isolated, -40..+85°C screened
	08SA03-00	1 RS232, optically isolated, 0..+60°C
	08SA03-01	1 RS232, optically isolated, -40..+85°C screened
Software: Firmware/BIOS	This product uses the U-Boot bootloader available from DENX together with board-specific additions from MEN.	
	14F218-00	U-Boot Bootloader (MEN) for F218

For operating systems not mentioned here contact MEN sales.

Documentation	Compare Chart 3U CompactPCI® / PlusIO CPU cards » Download	
	Compare Chart 3U CompactPCI® / PlusIO peripheral cards » Download	
	20F218-00	F218 User Manual

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