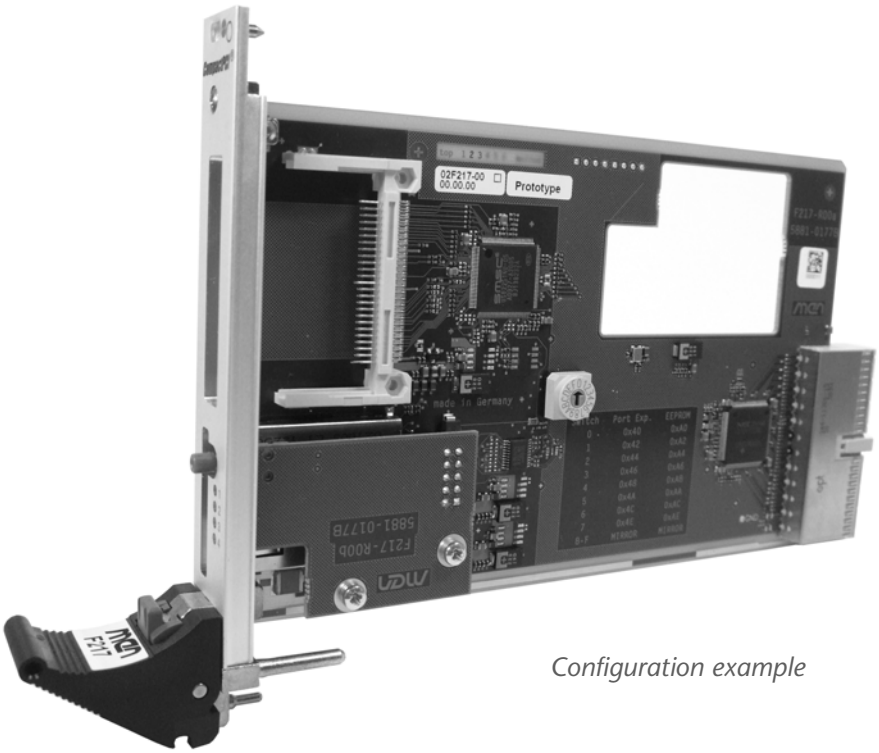
Embedded Solutions

F217 – 3U CompactPCI®
Memory Card Carrier



Configuration example

User Manual

mikro elektronik
gmbh · nürnberg

F217 - 3U CompactPCI® Memory Card Carrier

The F217 is a 3U 4HP CompactPCI® board which offers a multitude of memory configurations. It is equipped with a CompactFlash® socket and a multi card reader which supports MS, SD and MMC plus cards.

The memory cards are accessible at the front and can be inserted and removed during operation (hot plug). They can optionally be protected by an EMC-proof cover which also secures the cards mechanically, so that they cannot fall out. This protection makes the boards especially suited for harsh environments. A button for hot-extraction request and four status LEDs are also provided at the front panel.

The F217 is screened for operation in the extended temperature range of -40 to +85°C.

Technical Data

Memory

- One CompactFlash® card interface
  - Type I/II
  - UDMA Mode 0..4
  - PIO Mode 0..6
  - Via USB Flash media controller
- One multi card reader
  - MS (Memory Stick 1.43)
  - SD/SDHC (Secure Digital 2.0)
  - MMC plus (Multi Media Card 4.2)
  - Via USB Flash media controller

CompactPCI® Bus

- Compliance with CompactPCI® Core Specification PICMG 2.0 R3.0
- Peripheral slot
- V(I/O): +3.3 V

Electrical Specifications

- Isolation voltage:
  - 1000 VAC between GND and SHIELD
- Supply voltage/power consumption:
  - +3.3 V (-3%/+5%), 1.06 W (with CompactFlash and SD card)

Mechanical Specifications

- Dimensions: conforming to CompactPCI® specification for 3U boards
- Front panel: 4 HP with ejector
- Weight: 124 g (without cards)

Environmental Specifications

- Temperature range (operation):
  - -40..+85°C (screened, depending on the cards used)
  - Airflow: 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

MTBF

- 1,190,023h @ 40°C according to IEC/TR 62380 (RDF 2000)

Safety

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

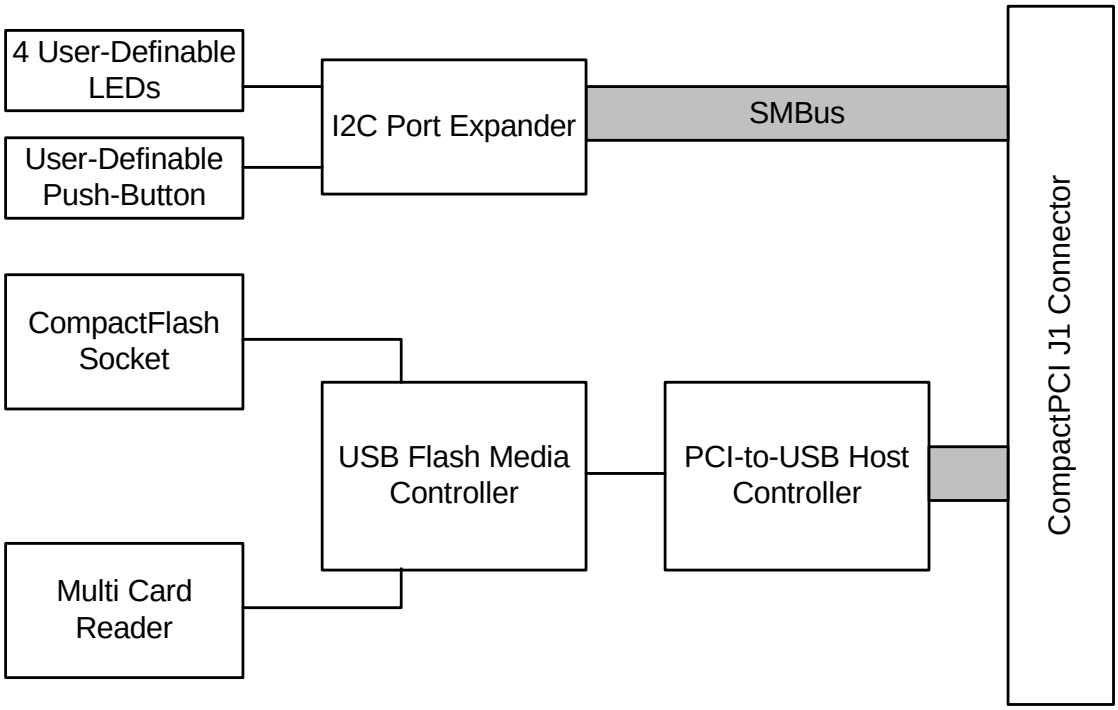
EMC

- Conforming to EN 55022 (radio disturbance), IEC1000-4-2 (ESD) and IEC1000-4-4 (burst)

Software Support

- Windows®
- Linux
- For more information on supported operating system versions and drivers see online data sheet.

Block Diagram



Configuration Options

Mechanics

- Front panel cover for EMC and mechanical protection

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

For available standard configurations see online data sheet.

Product Safety

Electrostatic Discharge (ESD)

Computer boards and components contain electrostatic sensitive devices. Electrostatic discharge (ESD) can damage components. To protect the board and other components against damage from static electricity, you should follow some precautions whenever you work on your computer.

- Power down and unplug your computer system when working on the inside.
- Hold components by the edges and try not to touch the IC chips, leads, or circuitry.
- Use a grounded wrist strap before handling computer components.
- Place components on a grounded antistatic pad or on the bag that came with the component whenever the components are separated from the system.
- Store the board only in its original ESD-protected packaging. Retain the original packaging in case you need to return the board to MEN for repair.

About this Document

This user manual describes the hardware functions of the board, connection of peripheral devices and integration into a system. It also provides additional information for special applications and configurations of the board.

The manual does not include detailed information on individual components (data sheets etc.). A list of literature is given in the appendix.

History

Issue	Comments	Date
E1	First issue	2010-08-13

Conventions

This sign marks important notes or warnings concerning proper functionality of the product described in this document. You should read them in any case.

italics Folder, file and function names are printed in *italics*.

bold **Bold** type is used for emphasis.

`monospace` A `monospaced` font type is used for hexadecimal numbers, listings, C function descriptions or wherever appropriate. Hexadecimal numbers are preceded by "0x".

hyperlink Hyperlinks are printed in blue color.

The globe will show you where hyperlinks lead directly to the Internet, so you can look for the latest information online.

IRQ# /IRQ Signal names followed by "#" or preceded by a slash ("/") indicate that this signal is either active low or that it becomes active at a falling edge.

in/out Signal directions in signal mnemonics tables generally refer to the corresponding board or component, "in" meaning "to the board or component", "out" meaning "coming from it".

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1 Getting Started

This chapter gives an overview of the board and some hints for first installation in a system.

1.1 Map of the Board

Figure 1. *Map of the board – front panel*

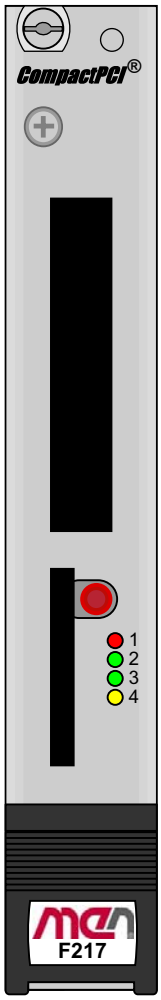
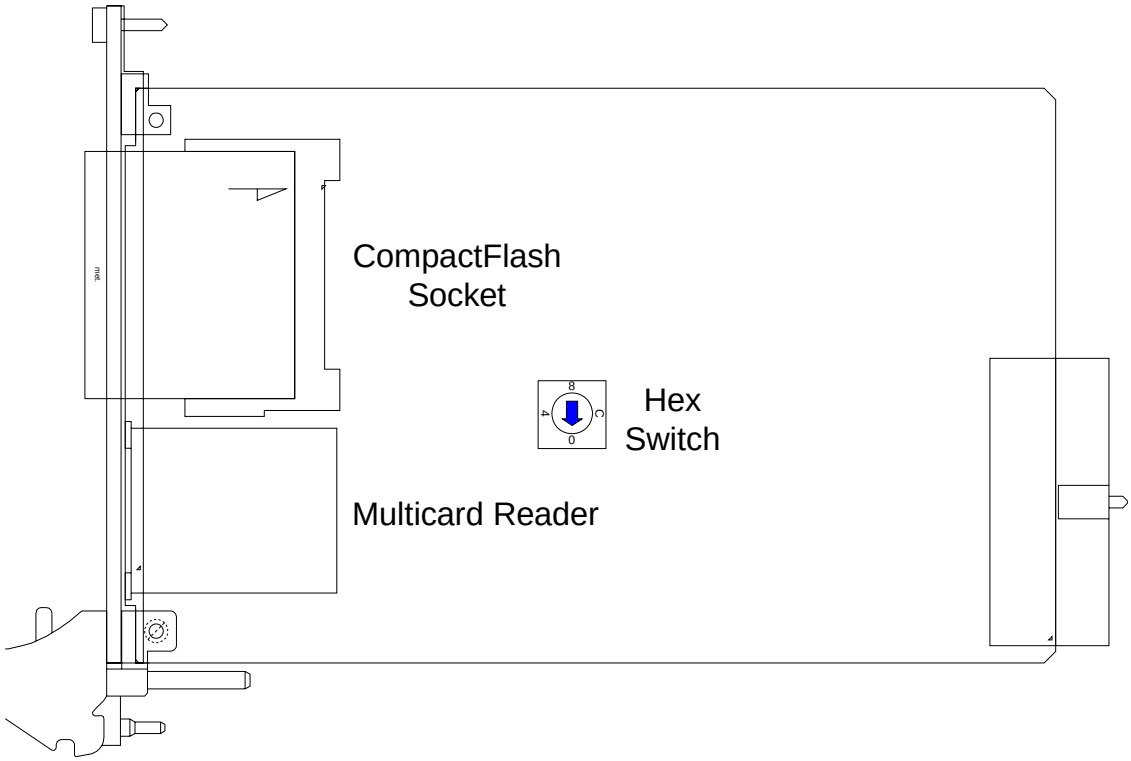


Figure 2. *Map of the board – top view*



1.2 Integrating the Board into a System

You can use the following check list when installing the board in a system for the first time and with minimum configuration.

- ☑ Power-down the system.
- ☑ Insert the F217 into a peripheral slot of your CompactPCI system, making sure that the CompactPCI connectors are properly aligned.

  Note: The peripheral slots of every CompactPCI system are marked by a circle ○ on the backplane and/or at the front panel.
- ☑ Insert a CompactFlash and/or MS/SD/MMC card.
- ☑ Power-up the system.
- ☑ You can now install driver software.

1.3 Installing Driver Software

For a detailed description on how to install driver software please refer to the respective documentation.

You can find any driver software available for download on MEN's website.

2 Functional Description

2.1 Power Supply

Power supply is fed via the CompactPCI backplane. The board operates on +3.3 V.

2.2 Flash Media Controller

The F217 offers the possibility to connect a CompactFlash as well as an SD, MMC or MS Flash device. They are controlled by a Flash Media Controller which is connected to the PCI bus via a PCI to USB host controller.

2.3 CompactFlash Socket

The F217 offers a CompactFlash socket for CompactFlash media type I and II which supports UDMA Mode 0..4 and PIO Mode 0..6. The cards can be inserted from the front panel.

2.4 Multicard Reader

The F217 provides a multi card socket for SD, MMC and MS media accessible on the front panel. The following types of flash media device can be used on the F217:

Table 1. *Supported card formats*

Type	Standard	Comment
SD/SDHC	Secure Digital 2.0 [SD]	
miniSD/ micro SD		with SD adapter
MS	Memory Stick 1.43	
MS Pro	Memory Stick Pro Format 1.02	
MS Duo	Memory Stick Duo 1.10	with MS adapter
MS Pro-HG Duo	Memory Stick Pro-HG Duo 1.01	with MS adapter
MMC plus	Multi Media Card 4.2	1/4/8 bit MMC
RS-MMC/ MMC-micro		with MMC adapter

2.5 LEDs and Request Button

The F217 provides four user-definable LEDs and a request button at the front panel which can be controlled via an I²C expander connected to the SMBus. MEN provides a driver for accessing the SMBus. See MEN's website for more information and downloads.

Eight different SMBus addresses can be set for the I²C expander using a hex switch to avoid conflicts with other SMBus devices in the system. See Table 2, SMBus addresses of port expander on page 17.

For the position of the hex switch see Figure 2, Map of the board – top view on page 14.

Table 2. *SMBus addresses of port expander*

	Switch Position	SMBus Address
	0	40
	1	42
	2	44
	3	46
	4	48
	5	4A
	6	4C
	7	4E
	8..F	Mirror

2.5.1 LED Control

The four LEDs are controlled by the first four GPIOs of the port expander.

- Logic High on related SMBus data results in an inactive LED
- Logic Low on related SMBus data results in an active LED.

Per default the four LEDs are inactive after power up.

Table 3. *LED control*

	LED Number	GPIO of SMBus
	LED 1	I/O0
	LED 2	I/O1
	LED 3	I/O2
	LED 4	I/O3

2.5.2 Button Control

The request button at the front panel is controlled by I/O4 of the port expander.

Table 4. *Button control*

	GPIO of SMBus
Button	I/O4

2.6 CompactPCI Interface

The F217 supports a 32-bit 33-MHz CompactPCI interface fully compatible with CompactPCI specification PICMG 2.0 Rev. 3.0. The board works with 3.3V and tolerates 5V V I/O.

For full CompactPCI functionality only the J1 connector is needed, therefore the board only has a J1 connector to the bus.

Connector type of J1:

- 110-pin shielded, 2mm-pitch, 5-row receptacle according to IEC 917 and IEC 1076-4-101

The pin assignment of connector J1 as defined in the CompactPCI specification will not be repeated here.

2.7 Front Panel Cover (Optional)

As an option the F217 can be equipped with a front panel cover which ensures EMC protection and also mechanical fixation for the cards to ensure that they do not fall out. A special board version is required for this. Please contact MEN's sales team for further information.

3 Appendix

3.1 Literature and Web Resources

- F217 data sheet with up-to-date information and documentation:
  www.men.de/products/02F217-00.html

3.1.1 CompactFlash

- CompactFlash Association:
  www.compactflash.org

3.2 Finding out the Product's Article Number, Revision and Serial Number

MEN user documentation may describe several different models and/or design revisions of the F217. You can find information on the article number, the design revision and the serial number on two labels attached to the board.

- **Article number:** Gives the product's family and model. This is also MEN's ordering number. To be complete it must have 9 characters.
- **Revision number:** Gives the design revision of the product.
- **Serial number:** Unique identification assigned during production.

If you need support, you should communicate these numbers to MEN.

Figure 3. *Labels giving the product's article number, revision and serial number*