

F8 - 3U CompactPCI Infotainment SBC



The F8 is a powerful CompactPCI or busless industrial PC for multimedia and infotainment applications -- for vehicles (railways, buses, planes, trucks...) and stationary information systems. It is designed to operate in harsh environments up to EN 50155 (railway standard).

The F8 is controlled by the Crusoe TM5900 microprocessor from Transmeta, a Pentium III-like x86 CPU with an integrated Northbridge that operates at 800MHz. What makes this CPU especially attractive is its extremely low power consumption of typically 5W at 800MHz and a guaranteed long-term availability of five years.

The SBC is equipped with an onboard 133MHz fast DDR RAM SO-DIMM socket for data storage, a CompactFlash slot for scalable program storage and an integrated graphics RAM.

- ◆ 32-bit cPCI system slot or stand-alone, 12 HP
- ◆ Transmeta Crusoe TM5900 / 800 MHz
- ◆ 512 MB DDR RAM (SO-DIMM) installed
- ◆ CompactFlash slot
- ◆ 2.5" hard disk slot
- ◆ Dual Fast Ethernet, COM 1, USB1.1 (front)
- ◆ DVI and DVI-I (front)
- ◆ LCD (up to UXGA) and CRT
- ◆ 16 MB integrated graphics RAM
- ◆ Up to 1600 x 1200 pixels
- ◆ AC'97 (opt. isolation), keyboard/mouse, CAN, COMs... optional via FPGA with SA adapters
- ◆ Option: up to 8 SA adapters

At its front panel the F8 provides one RS232 interface and two Fast Ethernet channels via RJ45 connectors or 9-pin D-Sub connectors. The front panel also includes two Digital Video Interfaces (DVI and DVI-I) for long-distance connectivity and USB 1.1.

The onboard display controller supports enhanced multi-display capabilities at a maximum of 1600 x 1200 pixels resolution (235-MHz, 24-bit RAMDAC). It can drive two independent digital displays (dual digital), alternatively with identical or with different screen displays. Simultaneously, it can drive two DVI and one CRT display (DualMon).

The F8 provides slots for eight SA adapters for all kinds of serial interfaces (RS232, RS422/485, HDLC, binary I/O, CAN, AC'97 audio, keyboard/mouse). The functionality of the SA adapters (and other individual functions) can be flexibly implemented in the onboard FPGA as a customization of F8. The FPGA content can be programmed by the application software.

Technical Data

CompactPCI Bus

- 3U CompactPCI CPU board PICMG Spec. 2.0 R3.0 compliant
- 32-bit CompactPCI system slot functionality with 7 possible external loads
- PCI-to-PCI bridge
- Double-slot solution (plus 1 mechanical slot for hard disk)
- V(I/O): +3.3V or +5V (Universal Board)
- Also available as busless version (with external 5V supply)

CPU

- Transmeta Crusoe TM5900 Microprocessor with integrated Northbridge
- 800MHz

Graphics

- SM731 controller
 - DVI and DVI-I connectors at front panel
 - 235-MHz, 24-bit RAMDAC
 - Maximum resolution: 1600 x 1200 pixels
 - DualMon support

Memory

- 64KB L1 and 512KB L2 Cache integrated in Crusoe CPU
- Up to 1GB SO-DIMM DDR RAM (512MB installed)
 - 133MHz memory bus operation
 - 64-bit data bus, 2.5V
- Flash 4MB
 - 8-bit data bus, 3.3V
 - Hardware data protection
- Serial EEPROM 4kbit for factory settings
- CompactFlash (TM) card interface for Flash ATA (true IDE) via on-board IDE
- Up to 8MB SDRAM, connected to FPGA, e.g. for video data
- 16MB embedded SGRAM in SM731 graphics controller

Interfaces

- Two 10/100Mbps/s Ethernet channels
 - Intel GD82551ER internal controllers
 - Two RJ45 connectors at front panel
- UART RS232 serial interface COM1
 - One 9-pin D-Sub connector at front panel
 - Up to 230 kbaud
- USB 1.1
 - Type A at front panel
 - Option: second interface via onboard connector
- Option: Up to 8 SA adapters
 - Implemented in onboard FPGA
 - RS232, RS422/485, binary I/O, keyboard/mouse, AC'97 audio, CAN...

- Typical configuration (example): 2 CAN (SA08), 2 RS485 (SA16), 1 RS232 (SA03), 1 digital I/O (5 out, 5 in, 3 in/out) (SA15), 1 AC'97 audio with optical isolation (SA12)

Mass Storage

- Fast IDE ports
 - One IDE port for local CompactFlash
 - One IDE hard-disk/CD-ROM port via 44-pin ribbon cable connector Ultra DMA100

PCI Interface

- 32-bit PCI interface at PCI-104 connector J1
- Support of 2 external masters

Electrical Specifications

- Supply voltage/power consumption:
 - +5V (4.85V..5.25V), 2A typ. (w/o SA adapters)
- MTBF: tbd. @ 50°C

Mechanical Specifications

- Dimensions: conforming to CompactPCI specification for 3U boards
- Weight: 525 g (without hard disk)

Environmental Specifications

- Tested according to EN 50155
- Temperature range (operation): -40..+85°C (without hard disk; please regard the manufacturer's specifications for your hard disk regarding temperature)
- Temperature range (storage): -40..+85°C
- Relative humidity (operation): < 75% (95% condensing for 30 days/year)
- Altitude: 1,200m
- Vibration (random): 0.75m/s² (5..150Hz)
- Vibration (shock): 50m/s² (30ms)

Safety

- Electric strength: 500V AC (50Hz)
- PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers

EMC

- Tested according to EN 55022 / 1999-05 (radio disturbance) and EN 55024 / 1999-05 (immunity) with regard to CE conformity

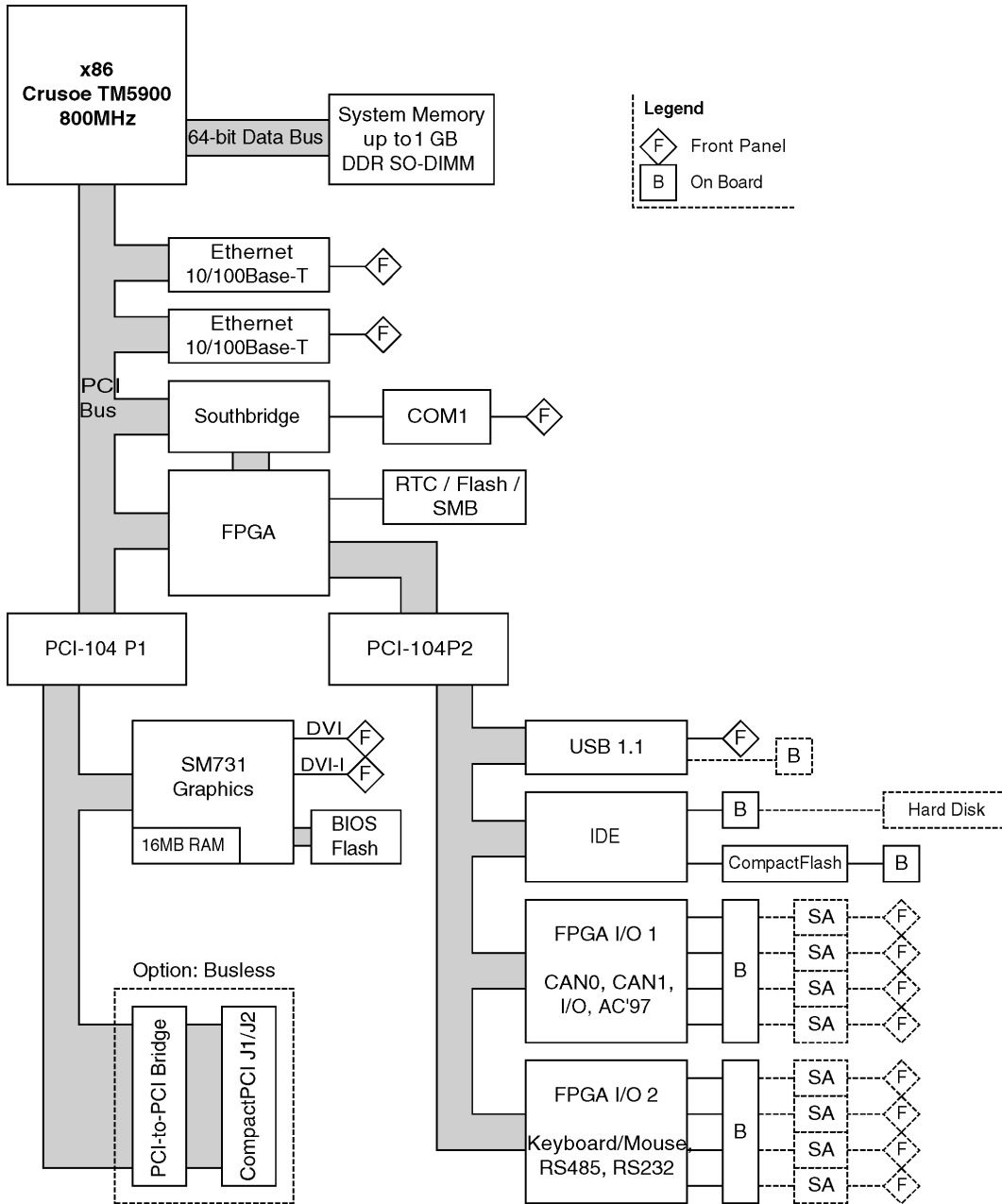
Software Support

- Linux (on request)
- Windows 2000/XP
- VxWorks (on request)

Technical Data

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Diagram



Related Products

Standard Hardware

02F008-00	F8, 3U 12TE 32-bit CompactPCI system slot infotainment SBC with Transmeta Crusoe TM5900/800MHz, 512MB SDRAM, CompactFlash slot, 2.5" hard disk slot, dual Fast Ethernet (RJ45 front), 1 RS232 (D-Sub front), USB 1.1 (front), CRT/LCD (up to UXGA) graphics controller, DVI and DVI-I (front), 16 MB integrated graphics RAM, up to 1600 x 1200 pixels, operating temperature -40..+85°C without hard disk (operating temperature with hard disk according to the corresponding hard disk data sheet)
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Please refer to our 3U CompactPCI compare chart for a selection of further single-board computers with different processors and on-board functionality.

Systems & Card Cages

Disk drives for basic systems are delivered as requested. Different rack sizes, power supplies and backplanes on request.

0701-0009	Abk13.10.04 - nur intern; Preis wird nicht erhBuy:offen feexistierende Kunden Last Delivery:offen feexistierende Kunden Name: B.Schmitz Grund: Ersatz-Standardsystem 0701-0021 kann falle 3U-Karten verwendet werden -----CompactPCI 19" 3U rack-mount enclosure, 3U 7-slot CompactPCI backplane, ATX power supply
0701-0018	CompactPCI 19" 4U/84HP rack-mount enclosure for 3U cards (vertical), 8-slot 3U CompactPCI backplane, system slot right, no rear I/O, space for hard-disk drive, floppy drive, 300W ATX power supply wide range 100..240VAC on front, 1U fan tray included

Accessories

05A000-10	Keyboard/mouse Y-cable 0.1m, 6-pin Mini DIN plug to two 6-pin Mini DIN receptacles
05F006-00	RS232 interface cable 9-pin D-Sub plug to 8-pin RJ45 plug, 2m
05F007-02	DVI-to-VGA cable, DVI plug to 15-pin HD-Sub plug, 2m, -40..+85°C
05F008-00	Ribbon cable kit for connection of 8 SA adapters to F8 (front panel to be ordered separately)
0501-0001	DVI-I to DVI-D and VGA Y-adaptor cable (for example for D4, F7/N, F8, F9, P17)
0502-0001	3U front panel kit for 3 SA adapters, with covers for two SA adapter cut-outs (cables to be ordered separately)

You can download the data sheet for hard disk 0710-0012 from MEN's website.

Related Products

0710-0009	IDE hard disk 2.5", 9.5mm, 20GB; for mounting on-board (harddisk mounting kit may be additionally required)
0710-0012	Industrial IDE hard disk 2,5", 40GB, 24 hours/7 days, 0..+60°C; for on-board mounting (hard disk mounting kit may be required additionally)
0751-0006	CompactFlash card, 512MB, Type I, 0..+60°C
0751-0007	CompactFlash card, 512MB, Type I, -40..+85°C
0751-0008	CompactFlash card, 64MB, Type I, 0..+60°C
0751-0009	CompactFlash card, 128MB, Type I, 0..+60°C
0751-0012	CompactFlash card, 256MB, Type I, 0..+60°C
0751-0013	Compact Flash card, 64MB, -40..+85°C
0751-0014	Compact Flash card, 128MB, -40..+85°C
0751-0018	CompactFlash card, 256MB, Type I, -40..+85°C
0752-0169	512MB DDRAM 0..+60°C for 02F008-00
0752-0170	1GB DDRAM 0..+60°C for 02F008-00
08SA01-00	Serial interface adapter, RS232, not optically isolated, 0..+60°C
08SA02-00	Serial interface adapter, RS422/485, half duplex, optically isolated, 0..+60°C
08SA02-01	Serial interface adapter, RS422/485, full duplex, optically isolated, 0..+60°C
08SA02-07	Serial interface adapter, RS422/485, full duplex, optically isolated, temperature range: -40..+85°C
08SA03-00	Serial interface adapter, RS232, optically isolated, 0..+60°C
08SA03-01	Serial interface adapter, RS232, optically isolated, -40..+85°C
08SA04-00	Serial interface adapter, TTY, optically isolated, 0..+60°C
08SA08-00	Serial interface adapter, CAN ISO high-speed, optically isolated, 0..+60°C
08SA08-01	Serial interface adapter, CAN ISO high-speed, optically isolated, -40..+85°C
08SA12-00	Serial interface adapter, audio codec AC'97, -40..+85°C
08SA13-00	Serial interface adapter, PS/2 for keyboard/mouse, -40..+85°C
08SA15-00	Serial interface adapter, 8 digital I/O, -40..+85°C

For more functions realized with SA adapters, see the listing on MEN's website. You can also view our SA adapter compare chart for a quick overview of different functions. Please contact sales to make sure that these SA adapters can be used in the board configuration you are looking for.

Software

Related Products

This MEN board is designed to work in a Microsoft Windows environment. For additional Windows driver packages provided or recommended by MEN please refer to the ordering numbers below.

This board is an MEN product running Sysgo's ELinOS Embedded Linux. Sysgo provides full support for MEN hardware. Please contact www.sysgo.de.

This board is an MEN product running Linux. For Linux BSP and driver support provided by MEN please refer to the ordering numbers below.

13EM05-70	MEN Windows drivers for EM05
13EM05-71	Windows 2000/XP network driver for F8 and EM05 (ESM kit EK03)
13F008-70	Windows 2000/XP graphics drivers for MEN's F8

To use MDIS4 low-level drivers, you also need one of the MDIS4 system packages available for Windows, Linux, VxWorks, QNX, RTX or OS-9 (MDIS4 = MEN Driver Interface System).

13Z015-06	MDIS4/2004 low-level driver sources for MSCAN/Layer2
13Z018-06	MDIS4/2004 low-level driver sources for EM05 watchdog

For the most up-to-date ordering information and direct links to other data sheets and downloads, see the F8 online data sheet under www.men.de. --> [Click here!](#)

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