Solution Guide

Embedded Computer

English

2007 DIGITAL-LOGIC

smart embedded computers

MEMBERSHIPS

General Member of the Intel® Communications Alliance

AWARDS

2004
GOLD VENDOR:
PC/104 FAMILY

2003
PLATINUM VENDOR:
PC/104 FAMILY

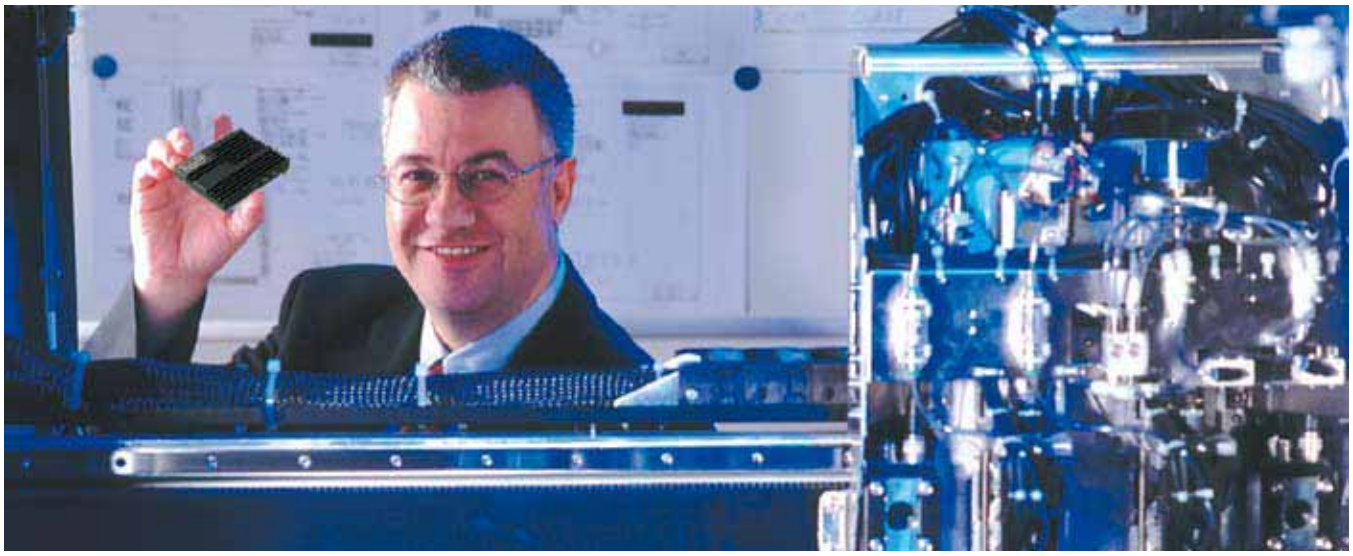
Finalist as Entrepreneur of the Year 2003

FDP KMU-Award 2001

GENERAL INFORMATION

PRODUCT INFORMATION

DIRECTIONS I CONTACTS



Felix Kunz, Chairman and CEO

World leader

DIGITAL-LOGIC is a worldwide leading developer and manufacturer of embedded computer technology that markets miniature computer systems. A so-called embedded computer, similar to the human brain, serves as a control unit for devices and is not visible to the user.

Technology leader

DIGITAL-LOGIC is a high-tech company that responds to strong market growth by developing innovative products.

DIGITAL-LOGIC markets high-quality embedded computers in diverse market segments through subsidiaries and distribution partners throughout the world. DIGITAL-LOGIC defines standards such as PCI/104-*Express*.

Universal use

DIGITAL-LOGIC embedded computers have a proven track record that goes back many years in areas of application such as navigation, telecommunications, medical technology, measurement engineering, Internet applications, production control systems, point-of-sale and information terminals, and an array of other areas.

Product diversity

DIGITAL-LOGIC's varied line of products ranges from the world's smallest Pentium® computer the size of a credit card (smartModule) to MICROSPACE® single and board computers (PC/104, Slot PC, EBX, 3.5" SBC, PCI/104-*Express*, COM Express) to customer-specific embedded computers and computer systems for highly individual requirements.

Global networking

Embedded computers offer global networking thanks to Internet linking via GSM, ISDN and LAN connections.

The DIGITAL-LOGIC embedded computer functions as a web server and empowers machines, household appliances, users and service providers to communicate with each other through the Internet.

The company

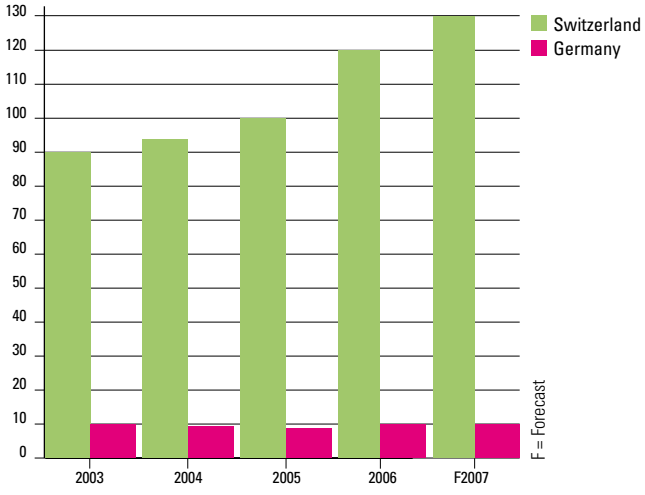
Founded in 1992, DIGITAL-LOGIC is a world leader in technology. The company develops and produces miniature computer systems based on the Intel® architecture, primarily with x 86 and Pentium® processor performance. The product portfolio comprises the standard products with embedded computer boards, embedded computer modules and the MICROSPACE® computer systems. DIGITAL-LOGIC is ISO 9001 certified.

Sales

Represented around the world through subsidiaries and partner companies, DIGITAL-LOGIC is excellently positioned for sales in the high-growth embedded computer market. Experienced sales specialists and engineers provide on-site customer care and supply customers with appropriate products and customer-specific, individualized embedded computers.

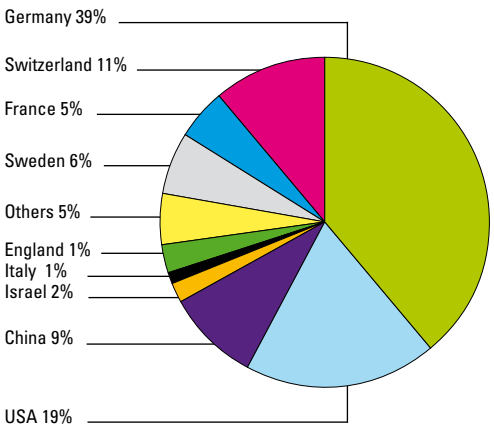
Employees

As of 01. 2007

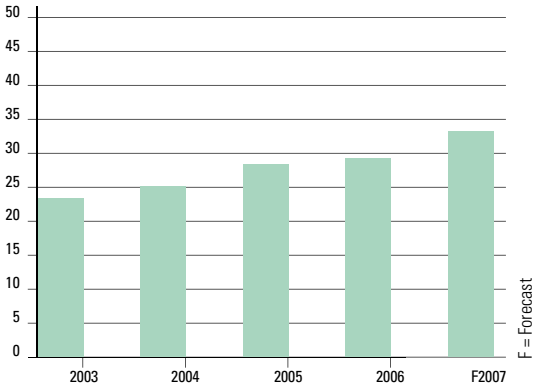


Export countries

As of 01. 2007



Sales consolidated according to IFRS, SFr. in millions
As of 01. 2007



Production

All DIGITAL-LOGIC embedded computers are manufactured in-house in Luterbach, Switzerland. Cutting-edge production facilities include three SMT lines (surface mounted technology) as well as various systems for mounting, functional tests, coating and burn-in.

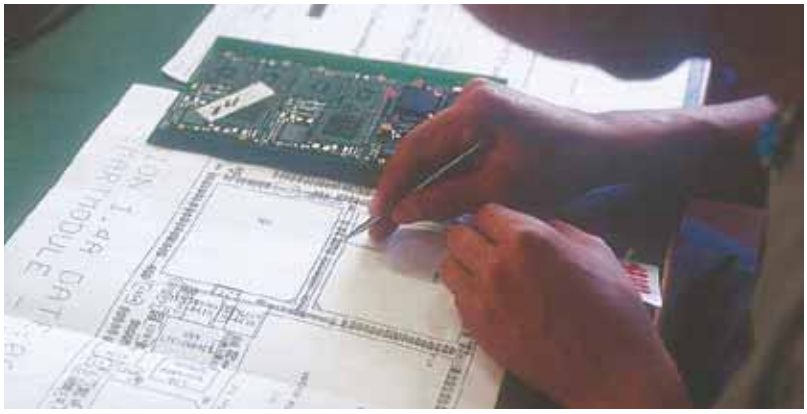
RoHS conformity

DIGITAL-LOGIC has successfully installed the lead-free solder process in its production processes. All MICROSPACE® products conform to RoHS since June 30, 2006.

Technical support

DIGITAL-LOGIC customers are afforded technical support by the Luterbach Support Center and by its subsidiary in Germany. Specially trained engineers consult with customers to ensure that the right DIGITAL-LOGIC product is selected and implemented in the shortest possible time. Repair processing is quick and customer-friendly.

The standard warranty period is 24 months. Support specialists have not only circuit diagrams ready at hand but also the source code of all BIOS programs in use.



Internet

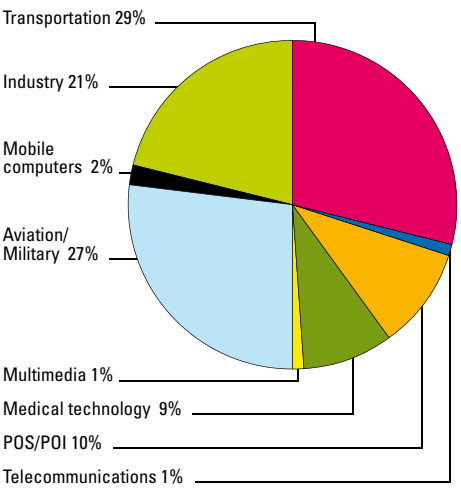
DIGITAL-LOGIC uses the Internet as a powerful communication tool for its online support center. The website provides users around the world with access to technical support and information. Customers can now track the status of their returned material authorization (RMA) online. Also, the DIGITAL-LOGIC website (www.digitallogic.com) has an extensive download area that provides technical specifications, drivers and tools, and a FAQ section with answers to the most important frequently asked questions.

Market segments of MICROSPACE® computer systems and application examples

Point of sale, Point of interest	Check-out systems, cash dispensers, vending machines, information terminals
Medical technology	Respirators, heart monitoring devices, blood analysis devices, EEG machines, X-ray machines, CT scanners, data loggers
Traffic and transportation	Railway control systems, traffic systems, telematics, passenger information, navigation
Industry	Control technology, machine control systems, display and indicator systems, programmable logic controllers (PLC)
Aviation//Military	Scouting equipment, communication server, camerasystems, navigation
Multimedia	Media center application solutions, multimedia
Telecommunications	Test systems

Sales by industry

As of 01. 2007



Reliability

We guarantee over 50,000 hours MTBF (Mean Time Between Failure) thanks to thorough functional and stress tests of each and every component. All relevant measurements are performed on our own testing and simulation systems and documented. Before embedded computers are delivered, they have to pass rigid acceptance tests and are seasoned through continuous operation in the environmental test chamber. Every product receives a test certificate.

Product service life

Products have a service life of at least 5 years from the start of production. In the event of an unexpected component discontinuation, DIGITAL-LOGIC carries out a form & functional compatible redesign so that the application is scarcely influenced.

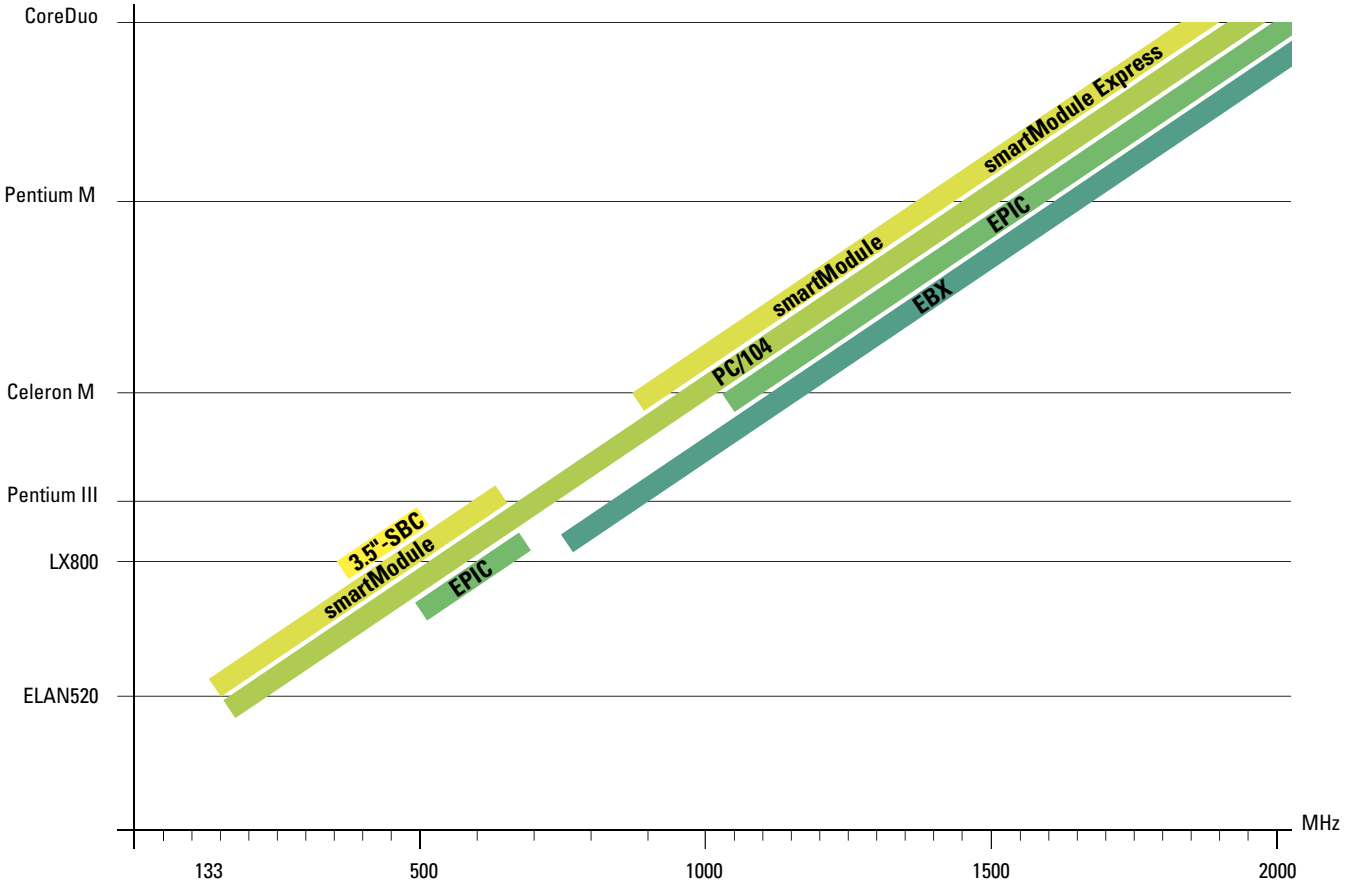
ISO 9001 certification

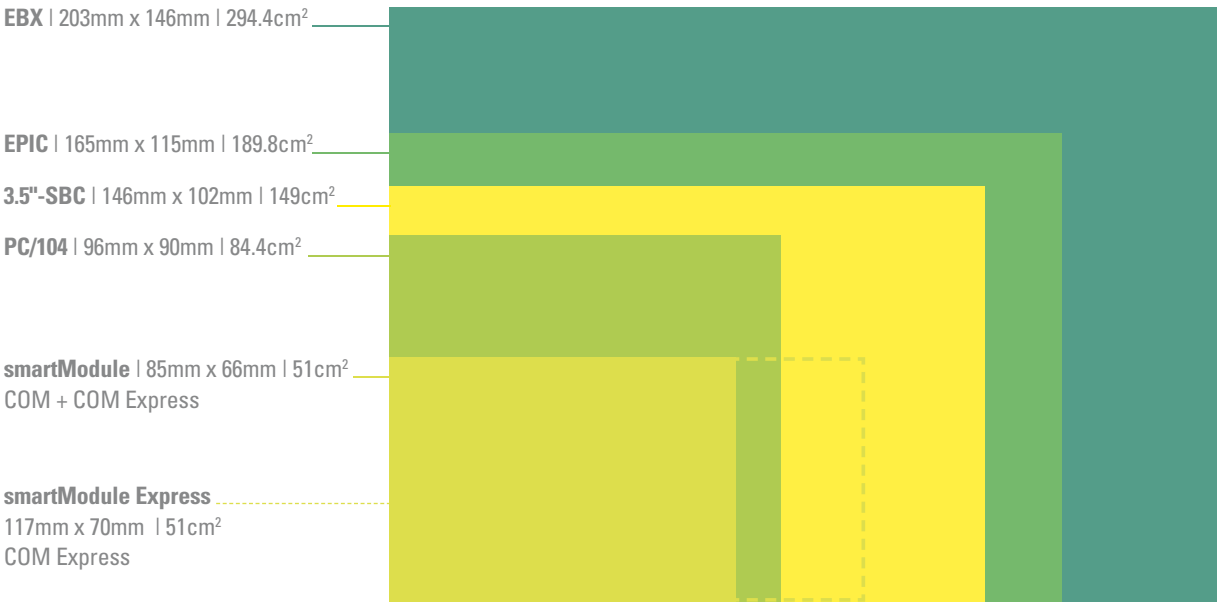
All process data, including data codes of the individual components, is recorded in a quality information database (QIS). All test results as well as support and repair work are fully registered in the database, making it possible to trace back each and every process.

Measurements performed

Immunity:	EN61000-6-3/-6-2, EN55022/55024
ESD:	EN50082-1/-2, EN61000-4-2
Temperature:	IEC60068-2-1, MIL-STD-810
RoHS/WEEE:	Directive 2002/96/EC
Moisture:	IEC60068-2-78, MIL-STD-810
Vibration/Shock:	IEC60068-2-6/-27, MIL-STD-810
Safety:	EN60950, UL
e1:	Emitted interference according to 95/54EC Immunity to interference according to 95/54/EC

DIGITAL-LOGIC Embedded PC's and Module CPU-Form factor-performance diagramm





Advantages of embedded computers

Most embedded computer applications have little in common. Some have special functions that a normal office PC does not have. A variety of extended functions is available for DIGITAL-LOGIC products to be able to withstand harsh environmental conditions. These include solid state disks, extended ambient working temperature, remote access and more.

Solid state disk

Environmental conditions or the type of application often do not permit the use of mechanical data media such as hard disks or diskettes. As an alternative, however, a semiconductor disk that emulates a hard disk can be utilized. The solid state disk variants include onboard flash disk, DiskOnChip, compact flash card, IDE flash disk and PCCard flash card.

Operation without batteries

For an application independent of batteries, all DIGITAL-LOGIC BIOS store the setup parameters in an EEPROM in addition to RTC RAM. The EEPROM reserves 1024 bytes for the customer application. The battery acts only as a backup for the real time clock.

Operating temperature

DIGITAL-LOGIC standard products are designed for a temperature range of -25°C to +60°C and in some cases up to +70°C. An extended temperature range of -40°C to +85°C can be provided upon request.

Low power consumption

All DIGITAL-LOGIC products use specially selected components to ensure that the overall system consumes as little current as possible. This means significant advantages for the customer – no active cooling system, optimized operating time and operational assurance.

Remote access

All computers are equipped with remote functionality. This permits complete control of the computer (keyboard, video, diskette) via the serial interface.

Remote access

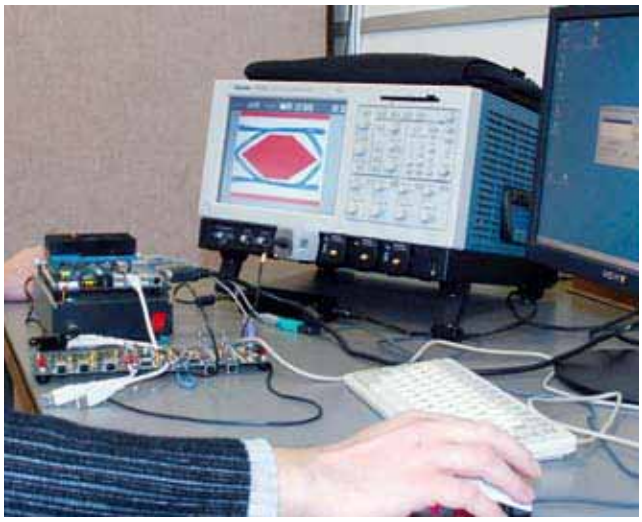
Remote control of the computer is accomplished by means of a serial interface from a host PC. This is especially useful for embedded systems without monitors and keyboards. The console IOs are redirected through the serial interface and controlled remotely from a host PC. In addition to direct routing of the console IOs, the diskette may also be redirected to the host PC. If the diskette can be redirected, booting from the host PC is possible, which enables complete remote file management (format, copy, execute). The remote handlers that work with Windows require a HyperTerminal (in Linux a minicom) and a standard null modem cable. Depending on the product group (chipset), a number of remote functions are available:

Integrated in the standard BIOS:

	Console Redirection	Floppydisk Redirection	DOS	WIN	max. Baud
ELAN520 BIOS	yes	yes	yes	no	115kBd
Pentium®-III BIOS	yes	yes	yes	no	115kBd
Geode™ LX800 BIOS	no	no	-	-	-
855/915 BIOS	yes	no	yes	yes	115kBd
945 BIOS	yes	no	yes	yes	115kBd

DIGITAL-LOGIC remote-BIOS extension:

	Console Redirection	Floppydisk Redirection	DOS	WIN	Baud COM1
Geode™ LX800 BIOS	yes	yes	yes	yes	115kBd
855/915 BIOS	yes	yes	yes	yes	115kBd
945 BIOS	yes	yes	yes	yes	115kBd



Compliance testing

All new USB, SATA, LVDS, and PCI Express interfaces act as differential interfaces. To guarantee the greatest possible functional security of these differential interfaces, all signal parameters are gauged with an eye diagram. The design is optimized to ensure maximum signal integrity. In so doing, the signal propagation delay, attenuation and reflections of both differential signals are measured. The instrument used for this is the Tektronix DSO with 20GS and 6GHz probes and certified software. The figures show examples of the USB and 1GB LAN measurements. DIGITAL-LOGIC also uses a spectrum analyzer and measurement antennas to perform precompliance measurements. The subsequent EMC/EMI measurement is carried out in the certified measurement laboratory of Swisscom, Schaffner and RUAG. For mechanical environmental stress tests, shock and vibration simulators as well as environmental test chambers are available.

PCI Express™

In addition to a 32-bit parallel bus, DIGITAL-LOGIC offers 4-22 PCI Express Lanes. This allows the customer to upgrade the PC technology of embedded computer applications at any time. PCI Express is a highspeed serial interface with maximum bandwidth per pin. This results in compact solutions with high IO performance and reduced costs. Easy connection of devices with high bandwidth requirements is a further advantage.

Serial ATA interface

Serial ATA exceeds parallel ATA in performance and speed. Beginning with transfer rates of 150 Mbit/sec., a future increase to 600 Mbit/sec. is possible. Serial ATA is fully protocol and software compatible with parallel ATA.

High-speed USB

DIGITAL-LOGIC products provide up to 8 USB V2.0 ports. USB V2.0 enables transfer speeds up to 480 Mbit/sec.

Digital audio interface

In addition to standard audio support, DIGITAL-LOGIC offers a digital audio interface for the AC97 or for the high definition audio codec (HDA). The following functions are available:

_ DVD audio
_ Multi-stream capability
_ Telephony (VoIP)
_ Dolby 5.1/6.1/7.1
_ Dynamic connector configuration
_ Conferencing
_ THX

Intel® Pentium® M / Celeron® M / Core™ Duo

The Intel® Pentium® M / Celeron® M processors use a new microphone architecture to keep apace with current and future requirements of the embedded computer. Ideally suited for communication, transaction terminals and industrial applications, it unites advance processor technology and software compatibility with the predecessors of the Intel® processor family.

Intel® processors (availability until at least 2010)

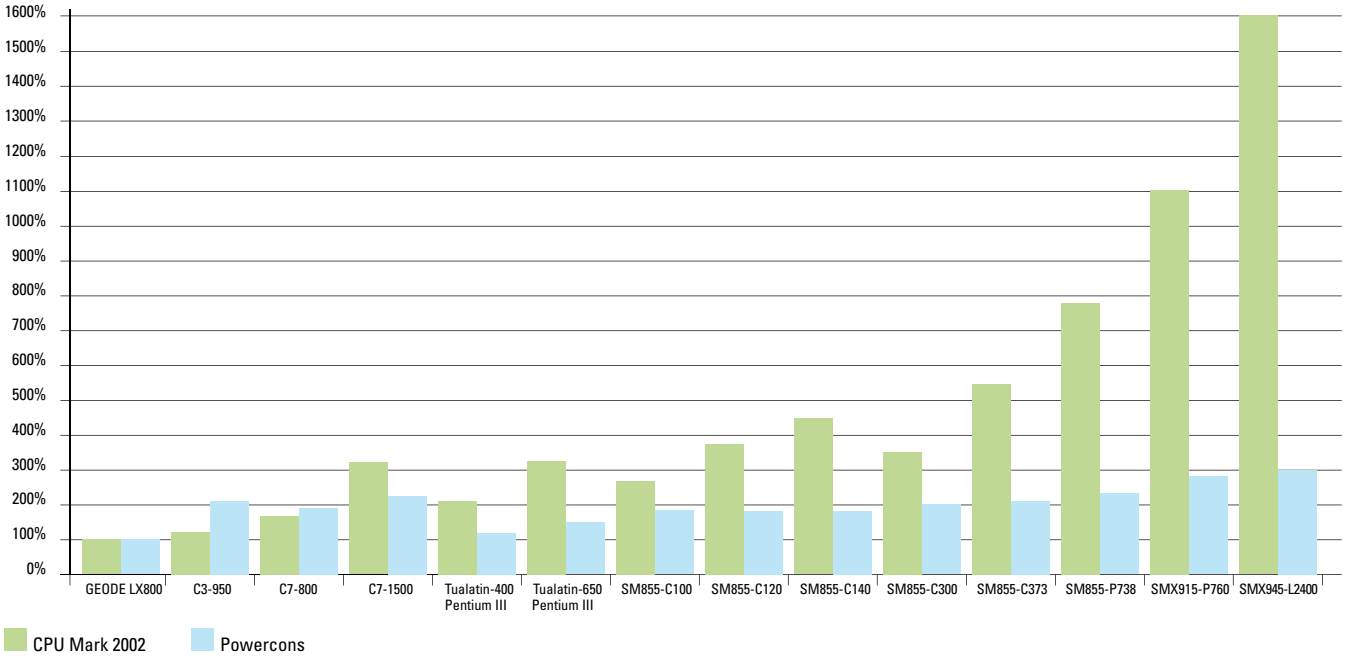
Product number	CPU clock (GHz)	FSB (MHz)	L2 cache	Max. power dissipation	VCC-core	case
130nm process technology						
Celeron® M 300 ULV	600 (MHz)	400	512kB	7.0W	1.004V	uFC-BGA
90nm process technology						
Celeron® M 373ULV	1.0	400	512kB	5.5W	0.940V	uFC-BGA
Processor 140 ULV	1.0	400	0kB	5.0W	0.940V	uFC-BGA
90nm process technology						
Pentium® M 760	2.0	533	2MB	27W	1.116V	uFC-PGA
Pentium® M 745	1.8	400	2MB	21W	1.276V	uFC-PGA
Pentium® M 738LV	1.4	400	2MB	12W	1.116V	uFC-BGA
65nm process technology						
Core™ Duo L2400 LV	2x 1.6	667	2MB	15W	1.187V	uFC-BGA
Celeron® M 423 ULV	1.0	533	1MB	5.5W	0.875V	uFC-BGA
Celeron® M 440 ULV	1.8	533	1MB	10W	0.875V	uFC-PGA
Core™2 Duo L7400	2x 1.5	667	4MB	15W	1.187V	uFC-PGA

AMD processors long-life status (availability until at least 2010)

Product	CPU clock (MHz)	FSB internal	L2 cache	Power dissipation	VCC-core	case
ELAN520	133	66MHz	0kB	2W	2.5V	BGA
Geode™ LX800	500	333MHz	128kB	2W	1.2V	BGA

CPU comparison of performance and power consumption

(determined by DIGITAL-LOGIC)



LCD/BIOS adaptation

DIGITAL-LOGIC has the source code for every Core and LCD BIOS that is used; this allows us to make customer-specific modifications if required. LCDs are adapted to DIGITAL-LOGIC PCs for a flat fee. The customer provides the LCD data sheet, the LCD connector and the monitor including backlight converter.

Intel® video BIOS/driver standard resolutions

Resolution	CRT (85Hz)	DVI (85Hz)	LVDS**
640 x 480	●	●	●
800 x 600	●	●	●
1024x 768	●	●	●
1152x 864	●		**
1280x 720	●		**
1280x 768	●	●	**
1280x 960	●		**
1280x 1024	●	●	●
1400 x 1050	●	**	**
1600x 900	●	**	**
1600x 1200	●	● 60Hz	●
1856x 1392	●		
1920x 1080i	●	● 60Hz	
1920 x 1200	●		
1920 x 1440	●		
2048 x 1536	●		

**The desired resolution has to be individually adapted to the LCD display.

Intel® embedded video driver support

Property, version	Alternative video driver version 6.1 (IEGD)	Standard video driver GMA900/950
Graphic controller		
Non-standard resolution		
Direct 3D / draw		
OpenGL		
Dual Independent		
Dual DVI		
Dual LVDS		
Runtime GUI		
Configuration GUI		
DVO port driver SDK		
Display control API		
Rotation		
Centering / Scaling		
Port on / off control		
ACPI for Windows		
2nd overlay support		
Motion compensation		
WHQL certified		
CETK certified		
Vista support		only GMA950
WinCE V5.0		
WinCE V6.0		

Not supported Supported V5.0 (since Q1/2006) Supported V7.0 (beginning Q3/2007)

Driver support

DLAG = device driver on product CD OS = device drivers are part of the operating system

Unit	DOS	WIN-VISTA		Novel-V6.5		WINNT4 / NT4e		WINXP/XPe		WINCE 6.0		Linux		Vx Works	QNX
	DLAG	DLAG	OS	DLAG	OS	DLAG	OS	DLAG	OS	DLAG	OS	DLAG	OS	DLAG	DLAG
LAN Intel® 82551/ER	●	●		●	●	●		●		●		●			
ISDN						●		●	●						
FrameGrabber BT878						●		●				●			
DOC2000	●					●		●	●	●		●			●
PCMCIA TI 4520			●				●		●		●		●		
FireWire IEEE 1394			●						●				●		
ATI M7				●		●		●					●		
ATI M1				●		●		●					●		
VGA 855GME/945GM		●	945	●		●		●		●		●			
CX 23416/880				●				●				●			
LAN 855GME/945GM	●	●		●				●					●		
SATA-945GM	●		●						●				●		
1GB-LAN82573	●	●	●	●		●		●		●		●			

DIGITAL-LOGIC embedded BIOS

The standard functions of an office computer are usually insufficient for embedded computer users. Thanks to years of experience in the embedded computer market, DIGITAL-LOGIC is able to augment the BIOS functions.

Watchdog

The watchdog can generate NMI, hardware reset or software interrupts. This can be triggered by the software and/or external OEM hardware. It can detect single events in selectable time intervals and/or also a combination of these events and enables flexible monitoring of the embedded software application.

Customer-specific CMOS settings

Because many embedded module users require their own CMOS ROM default settings, DIGITAL-LOGIC's embedded BIOS makes it possible to store customer-specific defaults in flash memory. This reduces the necessity for customer-specific BIOS versions.

Storage of the manufacturer data

The flash BIOS from DIGITAL-LOGIC contains board and manufacturer information, e.g. serial number, article number, manufacturing and repair data and versions. Access to all BIOS information is done with the aid of DIGITAL-LOGIC's APIs.

User data memory

Since some embedded applications require critical data to be stored, DIGITAL-LOGIC provides 1024 bytes of non-volatile memory on the EEPROM for this purpose. The stored EEPROM data is always available.

CMOS battery backup

The EEPROM memory contains a backup copy of the BIOS CMOS settings. If the RTC battery is lacking or not charged, the system starts up nevertheless with the correct BIOS setup.

Customer logo

To hide the boot messages in an embedded computer application, the BIOS can display a customer logo during startup (POST) instead of the usual diagnostic screen. With the embedded BIOS the customer's own OEM logo can be integrated in the standard BIOS.

Hardware monitoring

Key to dependable system functionality is the monitoring of critical components (e.g. fan speed, voltages, temperatures). The DIGITAL-LOGIC BIOS contains the necessary support for that purpose.

System statistics

The BIOS registers runtime information such as number of boots and errors. This information can be accessed by using DIGITAL-LOGIC's API.

ACPI Support

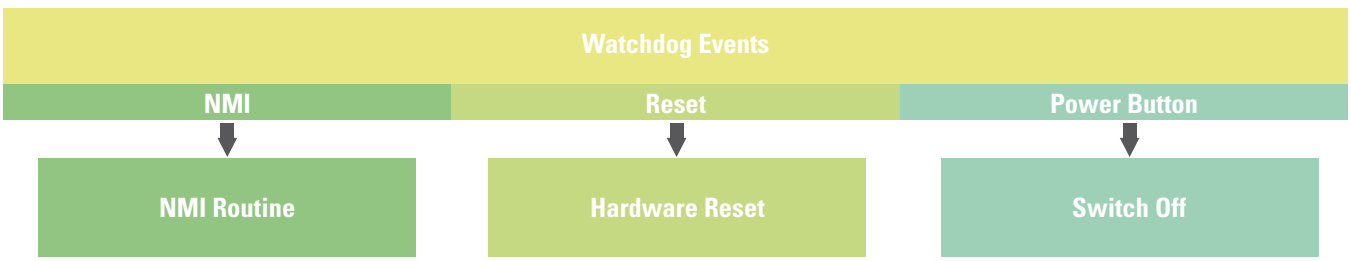
The DIGITAL-LOGIC BIOS supports power management and system configuration based on ACPI V1.1 and V2.0 specifications.

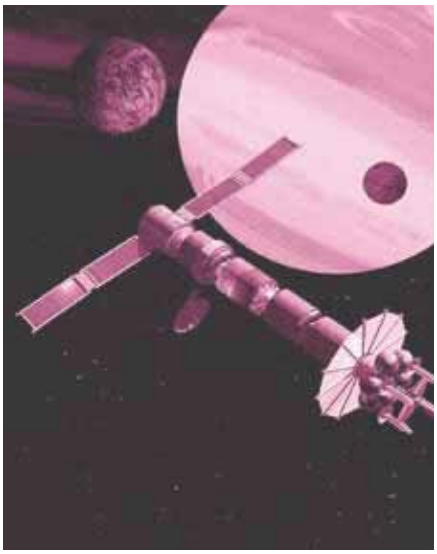
Windows Tool

All BIOS and manufacturing data can be displayed using the DIGITAL-LOGIC Windows tool.

Onboard microcontroller

Independently of the CPU, the microcontroller controls some embedded functions, such as power management, system monitoring and the I2C bus.





The embedded PC as component

smartModules are multi-chip modules. They include the entire functionality of a normal PC. All signals and interfaces are contained on one single bus, the smartBus, so that no wiring is necessary. The smartBus functions at the same as the technology interface. This makes the application independent of the dynamic development of PC architecture. In the future, too, smartModules will remain mechanically, electrically, and functionally compatible.

System design with smartModules

A development kit is available for each smartModule. It consists of diagrams, documentation and a development board with smartModules ready for operation.

If requested, the customer receives support from the DIGITAL-LOGIC DesignIn Center when creating circuit diagrams and commissioning the system.

The customer is then able to produce electronic boards and to equip the PC like a normal electronic component.

The new embedded standard

smartModule PCs provide the easiest, most time-saving and inexpensive integration of an embedded PC in a customer-specific application. This means less development overhead, lower design costs and minimal commissioning risks. Some smartModules have an integrated flash disk that, when delivered with a ROM DOS, are formatted and ready to boot. The user sticks the smartModule PC onto the carrier board, screws down the module with four screws, switches on the power supply, and the PC is ready to start up.

COM Express

smartModuleExpress offers full PC functionality. The new, fast serial buses (PCIe, SATA, PEG) require a new connector definition such as COM Express. COM Express is an open industry standard from PICMG. A TYCO connector with a maximum frequency of 6GHz is used as an adapter for the COMexpress bus and is sufficient for all of today's known LVDS signals. DIGITAL-LOGIC also offers a reliable thermal connection and the smallest form factor for embedded computer modules (COMs).

smartBus480 connector A

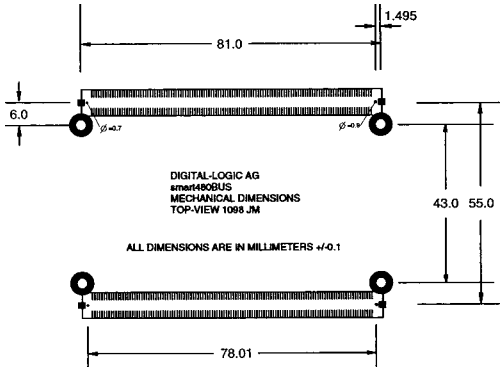
Pin	Series A	Series B
1	VCC (5V)	NC
2	ISA_RESDRV	ISA_IRQ9
3	ISA_SBHE#	ISA_IRQ3
4	ISA_MEMCS16#	ISA_IRQ4
5	ISA_IOCS16#	ISA_IRQ5
6	ISA_IOW#	ISA_IRQ6
7	ISA_IOR#	ISA_IRQ7
8	ISA_SYSCLK	ISA_IRQ10
9	ISA_TC	ISA_IRQ11
10	ISA_ALE	ISA_IRQ12
11	ISA_SD7	ISA_IRQ14
12	ISA_SD6	ISA_IRQ15
13	ISA_SD5	NC
14	ISA_SD4	NC
15	ISA_SD3	ISA_LA21
16	ISA_SD2	ISA_LA20
17	ISA_SD1	ISA_LA19
18	ISA_SD0	ISA_LA18
19	ISA_IOCHRDY	ISA_LA17
20	ISA_AEN	ISA_SD8
21	ISA_SA19	ISA_SD9
22	ISA_SA18	ISA_SD10
23	ISA_SA17	ISA_SD11
24	ISA_SA16	ISA_SD12
25	ISA_SA15	ISA_SD13
26	ISA_SA14	ISA_SD14
27	ISA_SA13	ISA_SD15
28	ISA_SA12	ISA_DRQ 0
29	ISA_SA11	ISA_DRQ 1
30	ISA_SA10	ISA_DRQ 2
31	ISA_SA9	ISA_DRQ 3
32	ISA_SA8	ISA_DRQ 5
33	ISA_SA7	ISA_DRQ 6
34	ISA_SA6	ISA_OSC (14.31MHz)
35	ISA_SA5	ISA_DMA0#
36	ISA_SA4	ISA_DMA1#
37	ISA_SA3	ISA_DMA2#
38	ISA_SA2	ISA_DMA3#
39	ISA_SA1	ISA_DMA5#
40	ISA_SA0	ISA_DMA6#

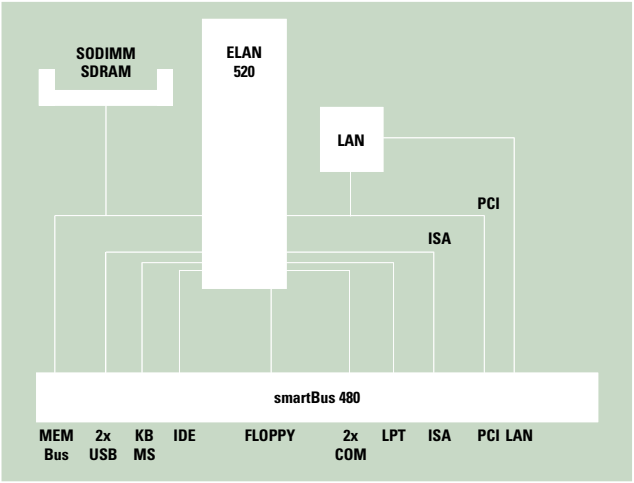
Pin	Series A	Series B
41	TINY_SCL	Speaker
42	TINY_MISO	ZWS#
43	TINY_MOSI	REF#
44	TINY_RST	MEMR#
45	TINY_VCC_PROG	SMEMR#
46	LPC_LAD0	MEMW#
47	LPC_LAD1	SMEMW#
48	LPC_LAD2	Reserved (VIP_VID0)
49	LPC_LAD3	Reserved (VIP_VID1)
50	LPC_LFRAME#	Reserved (VIP_VID2)
51	LPC_FWHCLK	Reserved (VIP_VID3)
52	FWH_CONTROL#	Reserved (VIP_VID4)
53	PCI_RST#	Reserved (VIP_VID5)
54	LAN_LINKLED	Reserved (VIP_VID6)
55	LAN_ACTLED	Reserved (VIP_VID7)
56	LAN_SPDLED	Reserved (VIP_HSYNC)
57	GND	Reserved (VIP_VSYNC)
58	LPC_SERIRQ	Reserved (VIP_SYNC)
59	NC	Reserved (VIP_CLK)
60	NC	Reserved (VIP_VID8)
61	NC	Reserved (VIP_VID9)
62	AC97_BITCLK	Reserved (VIP_VID10)
63	AC97_SDIN0	Reserved (VIP_VID11)
64	AC97_SDOUT	Reserved (VIP_VID12)
65	AC97_SYNC	Reserved (VIP_VID13)
66	GND	Reserved (VIP_VID14)
67	NC	Reserved (VIP_VID15)
68	NC	GND
69	NC	USB_P2+
70	NC	USB_P2-
71	NC	GND
72	NC	USB_P3+
73	NC	USB_P3-
74	NC	GND
75	NC	NC
76	NC	NC
77	NC	NC
78	NC	NC
79	NC	NC
80	NC	24MHz Output

Pin	Series A	Series B
81	NC	GND
82	NC	NC
83	NC	NC
84	NC	NC
85	NC	NC
86	NC	NC
87	NC	NC
88	GND	NC
89	NC	NC
90	NC	NC
91	NC	NC
92	NC	NC
93	NC	NC
94	NC	NC
95	NC	NC
96	NC	NC
97	GND	NC
98	NC	NC
99	NC	NC
100	NC	NC
101	NC	NC
102	NC	NC
103	NC	NC
104	NC	NC
105	NC	NC
106	GND	NC
107	NC	NC
108	NC	NC
109	NC	NC
110	NC	NC
111	NC	NC
112	NC	NC
113	NC	NC
114	NC	NC
115	NC	NC
116	NC	NC
117	NC	NC
118	NC	NC
119	NC	VCC (+5V)
120	NC	VCC (+5V)

smartBus480 connector B

Pin	Series A	Series B	Pin	Series A	Series B	Pin	Series A	Series B
1	LPT_strobe#	COM_DCD1	41	IDE_PDACK#	IrDA TX	81	NC	USB_P1+
2	LPT_auto#	COM_DSR1	42	IDE_PREQ	IrDA RX	82	NC	USB_P1-
3	LPT_error#	COM_RXD1	43	IDE_IRQ	NC	83	NC	NC
4	LPT_init#	COM_RTS1	44	ISA_IOR#	NC	84	NC	NC
5	LPT_slctin#	COM_TXD1	45	ISA_IOW#	NC	85	NC	ISA_LA22
6	LPT_data 0	COM_CTS1	46	VCC (5V)	Battery 3.0V for RTC	86	NC	ISA_LA23
7	LPT_data 1	COM_DTR1	47	PCI_AD0	PCI_AD16	87	NC	PCI_PERR#
8	LPT_data 2	COM_RI1	48	PCI_AD1	PCI_AD17	88	NC	GPIO30
9	LPT_data 3	COM_DCD2	49	PCI_AD2	PCI_AD18	89	GPIO31	SMB-DAT
10	LPT_data 4	COM_DSR2	50	PCI_AD3	PCI_AD19	90	GPIO34	SMB-CLK
11	LPT_data 5	COM_RXD2	51	PCI_AD4	PCI_AD20	91	3.3V	3.3V
12	LPT_data 6	COM_RTS2	52	PCI_AD5	PCI_AD21	92	LAN_TX+	ISA_MASTER#
13	LPT_data 7	COM_TXD2	53	PCI_AD6	PCI_AD22	93	LAN_TX-	ISA_IOCHCK
14	LPT_ack#	COM_CTS2	54	PCI_AD7	PCI_AD23	94	LAN_RX+	JTAG_CLK
15	LPT_busy	COM_DTR2	55	PCI_AD8	PCI_AD24	95	LAN_RX-	JTAG_TDI
16	LPT_paperend	COM_RI2	56	PCI_AD9	PCI_AD25	96	NC	JTAG_TD0
17	LPT_select	FD_index	57	PCI_AD10	PCI_AD26	97	VCC_SUS	JTAG_TMS
18	KB_data	FD_drive select 1	58	PCI_AD11	PCI_AD27	98	PM_SUSA	VGA_SDA
19	KB_clock	FD_disk change	59	PCI_AD12	PCI_AD28	99	PM_SUSB	VGA_SCL
20	MS_clock	FD_motor on 1	60	PCI_AD13	PCI_AD29	100	PM_SUSC	NC
21	MS_data	FD_direction	61	PCI_AD14	PCI_AD30	101	VGA_GREEN	VGA GND
22	GND	FD_step impulse	62	PCI_AD15	PCI_AD31	102	VGA_BLUE	VGA_VSYNC
23	IDE_HD0	FD_write data	63	PCI_CBE0#	PCI_INTA	103	VGA_RED	VGA_HSYNC
24	IDE_HD1	FD_write gate	64	PCI_CBE1#	PCI_INTB	104	NC	LCD_ENAVDD
25	IDE_HD2	FD_track zero	65	PCI_CBE2#	PCI_INTC	105	GND	LCD_SHCLK
26	IDE_HD3	FD_write protected	66	PCI_CBE3#	PCI_INTD	106	LCD_VSYNC	LCD_HSYNC
27	IDE_HD4	FD_read data	67	VCC (5V)	VCC (5V)	107	LCD_D12	LCD_D0
28	IDE_HD5	FD_head select	68	PCI_CLK0	PCI_CLK1	108	LCD_D13	LCD_D1
29	IDE_HD6	FD_drive select 0	69	PCI_REQ0#	PCI_GNT0#	109	LCD_D14	LCD_D2
30	IDE_HD7	FD_motor on 0	70	PCI_REQ1#	PCI_GNT1#	110	LCD_D15	LCD_D3
31	IDE_HD8	PWRBTN#	71	PCI_REQ2#	PCI_GNT2#	111	LCD_D16	LCD_D4
32	IDE_HD9	IDE_RESET#	72	PCI_REQ3#	PCI_GNT3#	112	LCD_D17	LCD_D5
33	IDE_HD10	NC	73	NC	VCC (5V)	113	LCD_D18	LCD_D6
34	IDE_HD11	USB-P0+	74	PCI_FRAME#	PCI_IRDY#	114	LCD_D19	LCD_D7
35	IDE_HD12	USB-P0-	75	PCI_TRDY#	PCI_STOP#	115	LCD_D20	LCD_D8
36	IDE_HD13	IDE_A0	76	PCI_DEVSEL#	PCI_PAR	116	LCD_D21	LCD_D9
37	IDE_HD14	IDE_A1	77	PCI_SERR#	PCI_LOCK#	117	LCD_D22	LCD_D10
38	IDE_HD15	IDE_A2	78	NC	PCI_RESET#	118	LCD_D23	LCD_D11
39	IDE_CS0#	IORDY	79	SYS_RESET#	ISA_DRQ7	119	LCD_BKLENA	LCD_DE
40	IDE_CS1#	NC	80	NC	ISA_DACK7	120	LCD_VCC (3V)	VCORE_OUT





*The video controller is no longer available.

SM520PCN/PCXN

Description

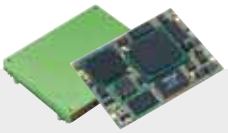
The SM520PCN smartModule is based on the AMD ELAN520 and performs at 133MHz. All interfaces, the memory bus and the PCI/ISA bus are contactable via the 480 pin smartBus. The product is characterized by very low power consumption (6W) and, as a result, operation that requires no fan. The operating temperature range is -40°C to +85°C.

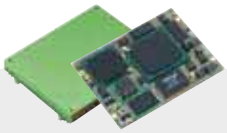
Applications

_ Control tasks
_ Remote controller (LAN, RS232)
_ Intelligent IO

Ordering information

Option/accessories	No.	Description
SM480-CON5	439004	Connector 240pin h = 5mm
SM480-CON7	439022	Connector 240pin h = 7mm



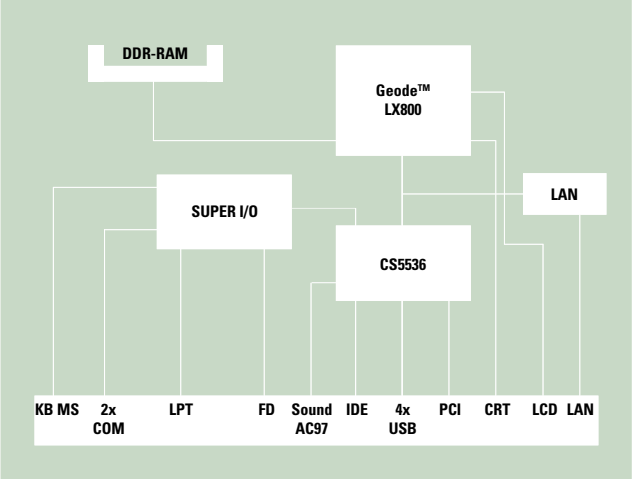


Technical data

Type	smartModule520PCN	smartModule520PCXN
CPU	AMD-ELAN520	AMD-ELAN520
ISA-BUS	8/16Bit	8/16Bit
PCI-BUS	32Bit	32Bit
PCI Express-BUS	-	-
2nd Level cache (kB)	-	-
Performance (MHz)	133	133
DRAM Min-Max (MB)	16-128	16-128
CompactFlash socket	-	-
Keyboard, mouse (PS/2)	yes	yes
BootDrive	FD, HD	FD, HD
Floppy interface	yes	yes
IDE interface P-ATA	1x	1x
IDE interface S-ATA	-	-
COM1	TTL	TTL
COM2	TTL	TTL
COM3	-	-
COM4	-	-
LPT1	yes	yes
USB (1.1)	2	2
LAN port 1 (ext. trafo)	-	yes
LAN port 2	-	-
Audio	-	-
Video controller	-	-
Video memory (MB)	-	-
LCD interface	-	-
DVI interface	-	-
CRT interface	-	-
Video input	-	-
Watchdog	yes	yes
Power normal	5V/1.2A	5V/1.2A
Power suspend	-	-
Power management	-	-
RTC battery onboard	ext.	ext.
Cooling type	passive	passive
Operating temperature	-25°C to +70°C	-25°C to +70°C
Extended operating temperature	-40°C to +85°C	-40°C to +85°C
Size (W x L x H in mm)	66 x 85 x 14	66 x 85 x 14
Weight	90 g	90 g
MTBF	>200'000	>200'000
Special features 1	-	-
Special features 2	-	-
Special features 3	-	-
Part no.	805092	805096

Option/accessories

Article	Description	No.	No.	No.
SDRAM32M-32Bit	32MB-SDRAM, 32Bit	890655	890655	
SDRAM64M-32Bit	64MB-SDRAM, 32Bit	890654	890654	
SDRAM128M-32Bit	128MB-SDRAM, 32Bit	890656	890656	
SM520PCDK	Development-Kit	805025	805025	



SM800PC/X

Description

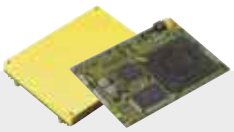
The SM800PC/X smartModule is based on the AMD LX800 and performs at 500MHz. All interfaces, the 16 bit ISA bus and the PCI bus, are contactable via the 480 pin smartBus. The SM800PC smartModule is one of the smallest computers on module (COM) and enables integration of the personal computer in the very small devices and environments. The product is characterized by very low power consumption (8W), a broad temperature range, and an excellent price/performance ratio.

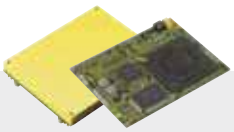
Applications

_ Information terminals
_ Control of interactive devices
_ Play systems with music output
_ Measuring instruments
_ Telecommunication devices

Ordering information

Option/accessories	No.	Description
SM480-CON5	439004	Connector 240pin h = 5mm
SM480-CON7	439022	Connector 240pin h = 7mm
SM480 passive cooler	807120	Passive cooler for SM480





Technical data

Type	SM800PCX	SM800PC	
CPU	AMD Geode™ LX800	AMD Geode™ LX800	
ISA-BUS	8/16-Bit	8/16-Bit	
PCI-BUS	32Bit	32Bit	
PCI Express-BUS	-	-	
2nd Level cache (kB)	128	128	
Performance (MHz)	500	500	
DRAM Min-Max (MB)	128-1024	128-1024	
CompactFlash socket	-	-	
Keyboard, mouse (PS/2)	yes	yes	
BootDrive	FD, HD, LAN, CF, USB	FD, HD, CF, USB	
Floppy interface	yes	yes	
IDE interface P-ATA	1x	1x	
IDE interface S-ATA	-	-	
COM1	TTL	TTL	
COM2	TTL	TTL	
COM3	-	-	
COM4	-	-	
LPT1	-	-	
USB (V1.1)	-	-	
LAN port 1 (ext. trafo)	10/100BASE-T	-	
LAN port 2	-	-	
Audio	yes (AC97)	yes (AC97)	
Video controller	LX800	LX800	
Video memory (MB)	16 (UMA)	16 (UMA)	
LCD interface	24Bit, 240x 320 to 1600x 1200	24Bit, 240x 320 to 1600x 1200	
DVI interface	-	-	
CRT interface	yes	yes	
Video input	-	-	
Watchdog	yes	yes	
Power normal	5V/8W	5V/8W	
Power suspend	-	-	
Power management	yes	yes	
RTC battery onboard	external	external	
Cooling type	passive	passive	
Operating temperature	-25°C to +70°C	-25°C to +70°C	
Extended operating temperature	-40°C to +85°C	-40°C to +85°C	
Size (W x L in mm)	66 x 85 x 14	66 x 85 x 14	
Weight	105 g	105 g	
MTBF	>200'000h	>200'000h	
Special features 1	-	-	
Special features 2	-	-	
Special features 3	-	-	
Part no.	805212	805210	

Option/accessories

Article	Description	No.	No.	No.
DDR-RAM128	128MB RAM	860696	860696	
DDR-RAM256	256MB RAM	860670	860670	
DDR-RAM512	512MB RAM	860671	860671	
DDR-RAM1024	1024MB RAM	860672	860672	
SM800PCDK	Development-Kit	805220	805220	

smartBus855 connector A

Pin	Series A	Series B
1	GND	PCI_CLK1
2	PCI_Frame#	PCI_CLK2
3	PCI_DEVSEL#	PCI_CLK3
4	PCI_IRDY#	PCI_CLK4
5	PCI_TRDY#	GND
6	PCI_STOP#	PCI_AD0
7	PCI_PLOCK#	PCI_AD1
8	PCI_REQ0#	PCI_AD2
9	PCI_REQ1#	PCI_AD3
10	PCI_REQ2#	PCI_AD4
11	PCI_REQ3#	PCI_AD5
12	PCI_REQ4#	PCI_AD6
13	PCI_GNT0#	PCI_AD7
14	PCI_GNT1#	PCI_AD8
15	PCI_GNT2#	PCI_AD9
16	PCI_GNT3#	PCI_AD10
17	PCI_GNT4#	PCI_AD11
18	PCI_PAR	PCI_AD12
19	PCI_SERR#	PCI_AD13
20	PCI_RST#	PCI_AD14
21	PCI_PERR#	PCI_AD15
22	PCI_PME#	PCI_AD16
23	GND	PCI_AD17
24	PCI_PIRQA#	PCI_AD18
25	PCI_PIRQB#	PCI_AD19
26	PCI_PIRQC#	PCI_AD20
27	PCI_PIRQD#	PCI_AD21
28	PCI_PIRQE#	PCI_AD22
29	PCI_PIRQF#	PCI_AD23
30	PCI_PIRQG#	PCI_AD24
31	PCI_PIRQH#	PCI_AD25
32	GND	PCI_AD26
33	IDE_SD0	PCI_AD27
34	IDE_SD1	PCI_AD28
35	IDE_SD2	PCI_AD29
36	IDE_SD3	PCI_AD30
37	IDE_SD4	PCI_AD31
38	IDE_SD5	PCI_C_BE0#
39	IDE_SD6	PCI_C_BE1#
40	IDE_SD7	PCI_C_BE2#

Pin	Series A	Series B
41	IDE_SD8	PCI_C_BE3#
42	IDE_SD9	GND
43	IDE_SD10	IDE_PD0
44	IDE_SD11	IDE_PD1
45	IDE_SD12	IDE_PD2
46	IDE_SD13	IDE_PD3
47	IDE_SD14	IDE_PD4
48	IDE_SD15	IDE_PD5
49	IDE_S-Detect	IDE_PD6
50	IDE_S-CS1#	IDE_PD7
51	IDE_S-CS3#	IDE_PD8
52	IDE_S-A0	IDE_PD9
53	IDE_S-A1	IDE_PD10
54	IDE_S-A2	IDE_PD11
55	IDE_S-DACK#	IDE_PD12
56	IDE_S-DREQ#	IDE_PD13
57	IDE_S-IOR#	IDE_PD14
58	IDE_S-IOW#	IDE_PD15
59	IDE_S-IORDY	IDE_P-Detect
60	SERIAL-IRQ	IDE_P-CS1#
61	IDE_S-IRQ15	IDE_P-CS3#
62	IDE_P-IRQ14	IDE_P-A0
63	PM-CLKRUN#	IDE_P-A1
64	14MHz Clock	IDE_P-A2
65	BIOS-Sel	IDE_P-DACK#
66	GND	IDE_P-DREQ#
67	LAN_CLK	IDE_P-IOR#
68	LAN_RST	IDE_P-IOW#
69	LAN_RXD0	IDE_P-IORDY
70	LAN_RXD1	GND
71	LAN_RXD2	AC97_BITCLK
72	LAN_TXD0	AC97_RST#
73	LAN_TXD1	AC97_SDIN0
74	LAN_TXD2	AC97_SDIN1
75	CPU_VID0	AC97_SDIN2
76	CPU_VID1	AC97_SDOUT
77	CPU_VID2	AC97_SYNC
78	CPU_VID3	VCCCore-OUT
79	CPU_VID4	H-A20GATE
80	CPU_VID5	H-RCIN#

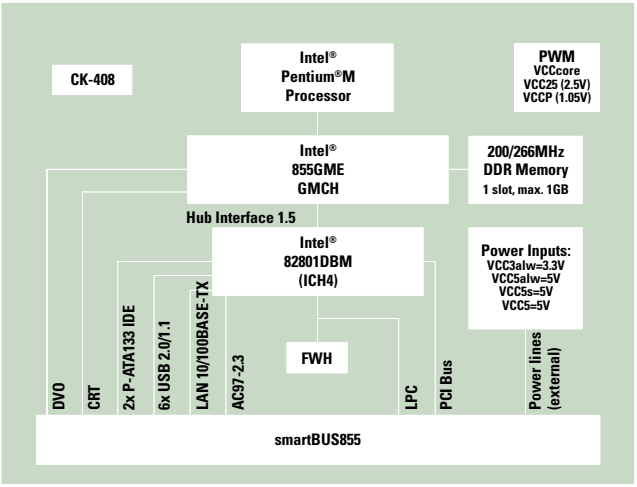
smartBus855 connector B

Pin	Series A	Series B
1	GND	GND
2	DVO_B_BLANK#	LVDS-CLKAM
3	DVO_B_CLKINT	LVDS-CLKAP
4	DVO_B_INT#	AGP-REQ#
5	DVO_B_CLK	AGP-GNT#
6	DVO_B_CLK#	LCD_BKLCLK
7	DVO_B-D0	LCD_BKLENA
8	DVO_B-D1	LCD_VDDENA
9	DVO_B-D10	+1.5 Volt_OUT
10	DVO_B-D11	LVDS-AM0
11	DVO_B-D2	LVDS-AM1
12	DVO_B-D3	LVDS-AM2
13	DVO_B-D4	LVDS-AM3
14	DVO_B-D5	LVDS-AP0
15	DVO_B-D6	LVDS-AP1
16	DVO_B-D7	LVDS-AP2
17	DVO_B-D8	LVDS-AP3
18	DVO_B-D9	Reserved
19	DVO_B_FLDSTL	Reserved
20	DVO_B_HSYN	Reserved
21	DVO_B_VSYN	Reserved
22	DVO_C_BLANK#	Reserved
23	DVO_C-CLK	Reserved
24	DVO_C-CLK#	Reserved
25	DVO_C-D0	Reserved
26	DVO_C-D1	+2.5 Volt_OUT
27	DVO_C-D10	DVO_DICLK
28	DVO_C-D11	DVO_DIDAT
29	DVO_C-D2	DVO_DVICLK
30	DVO_C-D3	DVO_DVIDAT
31	DVO_C-D4	DVO_MI2CLK
32	DVO_C-D5	DVO_MI2DAT
33	DVO_C-D6	ADDID0
34	DVO_C-D7	ADDID1
35	DVO_C-D8	ADDID2
36	DVO_C-D9	ADDID3
37	DVO_C_FLDSTL	ADDID4
38	DVO_C_HSYN	ADDID5
39	DVO_C_VSYN	ADDID6
40	DVO_DETECT	ADDID7

Pin	Series A	Series B
41	DVO_RST#	GND
42	GND	CLK-LPC
43	CRT_VSYNC	CLK-SIO-33MHz
44	CRT_HSYNC	VCCP_OUT
45	CRT_RED	EXTSMI#
46	CRT_GREEN	USB-Port-0N
47	CRT_BLUE	USB-Port-0P
48	CRT_DDAT	USB-Port-1N
49	CRT_DCLK	USB-Port-1P
50	PM_SLP_S3#	USB-Port-2N
51	PM_SLP_S4#	USB-Port-2P
52	PM_SLP_S5#	USB-Port-3N
53	3V_BAT_IN	USB-Port-3P
54	LPC_LAD0	USB-Port-4N
55	LPC_LAD1	USB-Port-4P
56	LPC_LAD2	USB-Port-5N
57	LPC_LAD3	USB-Port-5P
58	LPC_LFRAME#	PM_SERENA
59	LPC_INIT#	USB_OC0#
60	48MHZ_OUT	USB_OC1#
61	LPC_LDRQ0#	USB_OC2#
62	LPC_LDRQ1#	USB_OC3#
63	FWH_TBL#	USB_OC4#
64	FWH_WP#	USB_OC5#
65	PM_RI#	VCC3.3S_OUT
66	PM_SUS_STAT	VCC3.3S_OUT
67	PM_MAIN#_SW	VCC3.3S_OUT
68	PM_PWRBTN#_SW	Main Supply ON
69	PM_ACPRESENT#	PM_THRM#
70	SMB_DATA	VCC5S_IN
71	SMB_CLOCK	VCC5_IN
72	MCH_DVI_REF	GND
73	MASTER_RESET#_IN	AGP-CLK
74	SPEAKER_OUT	PICPOWER_SD#
75	DC_IN	VCC5V-ALW-IN
76	DC_IN	VCC5V-ALW-IN
77	DC_IN	VCC3.3V-ALW-IN
78	DC_IN	VCC3.3V-ALW-IN
79	DC_IN	VCC3.3V-ALW-IN
80	DC_IN	AGP-PIPE#

Passive cooling
Part no. 805170

Active cooling
Part no. 805171



SM855-Celeron® M

Description

The smartModule SM855 –Cxxx is based on the Intel® Celeron® M CPU with a clock speed of 600-1000MHz. The product is characterized by the efficient thermal interface and the large number of interfaces. Functional extensions are possible via the PCI bus and the 16-bit ISA bus (with a bridge). The copper core transports the thermal performance with negligible loss to the heat dissipater and housing. The robust and flat-ground housing protects the computer from vibrations and holds the SODIMM RAM module firmly in the base. The SM855 is the smallest Celeron® M computer and fits, for example, on a PC/104 standard board.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Information displays
_ Measurement engineering
_ Telecommunications

Ordering information

Option/accessories	No.	Description
DDR-RAM128	890669	DDR-SODIMM-Module 128MB
DDR-RAM256	890670	DDR-SODIMM-Module 256MB
DDR-RAM512	890671	DDR-SODIMM-Module 512MB
DDR-RAM1024	890672	DDR-SODIMM-Module 1024MB
SM855-CON5	439008	Molex connector 160pin, 5mm board to board (requires 2 units), package of 9 units
SM855-CON7	439006	Molex connector 160pin, 7mm board to board (requires 2 units), package of 9 units
SM855-CON10	439019	Molex connector 160pin, 10mm board to board (requires 2 units), package of 9 units

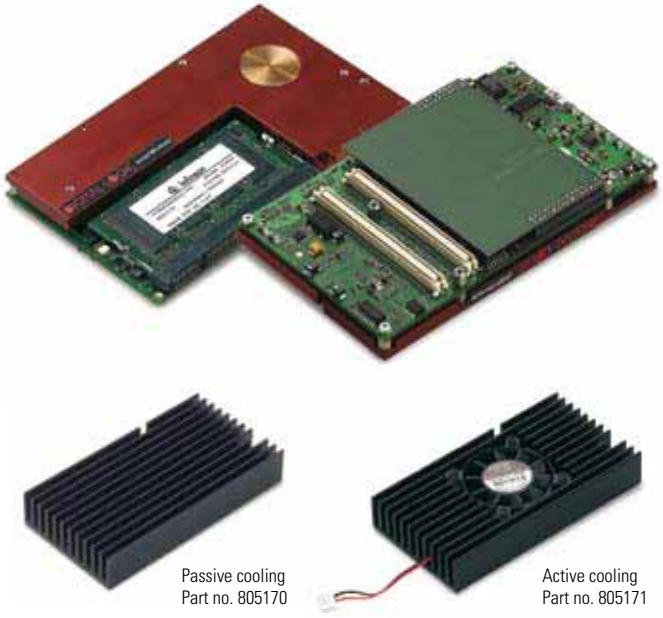


Technical data

Type	SM855-C300	SM855-C140	SM855-C373
CPU	Intel® Celeron® M	Intel® Processor M	Intel® Celeron® M
ISA-BUS	-	-	-
PCI-BUS	32Bit	32Bit	32Bit
PCI Express-BUS	-	-	-
2nd Level cache (kB)	512	0	512
Performance (MHz)	600	1000	1000
DRAM Min-Max (MB)	128-1024	128-1024	128-1024
CompactFlash socket	-	-	-
Keyboard, mouse (PS/2)	ext. SIO	ext. SIO	ext. SIO
BootDrive	FD, HD, USB, LAN	FD, HD, USB, LAN	FD, HD, USB, LAN
Floppy interface	ext. SIO	ext. SIO	ext. SIO
IDE interface P-ATA	2x	2x	2x
IDEinterface S-ATA	-	-	-
COM1	ext. SIO	ext. SIO	ext. SIO
COM2	ext. SIO	ext. SIO	ext. SIO
COM3	-	-	-
COM4	-	-	-
LPT1	ext. SIO	ext. SIO	ext. SIO
USB (2.0)	6x	6x	6x
LAN port 1 (ext. trafo)	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2	-	-	-
Audio	AC97-5.1	AC97-5.1	AC97-5.1
Video controller	i855GME	i855GME	i855GME
Video memory (MB)	16-64 (UMA)	16-64 (UMA)	16-64 (UMA)
LCD interface	ext. 18/24Bit LVDS	ext. 18/24Bit LVDS	ext. 18/24Bit LVDS
DVI interface	ext. 24Bit DVO to DVI Bridge	ext. 24Bit DVO to DVI Bridge	ext. 24Bit DVO to DVI Bridge
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal	typ. 10W (@600MHz)	typ. 9W (@1000MHz)	typ. 12W (@1000MHz)
Power suspend	typ. 0.1W	typ. 0.1W	typ. 0.1W
Power management	yes	yes	yes
RTC battery onboard	ext.	ext.	ext.
Cooling type	passive	passive	passive
Operating temperature	-25°C to +70°C	-25°C to +70°C	-25°C to +60°C
Extended operating temperature	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C
Size (W x L x H in mm)	117 x 70 x 15	117 x 70 x 15	117 x 70 x 15
Weight	110 g	110 g	110 g
MTBF	>300'000h	>300'000h	>300'000h
Special features 1	-	-	-
Special features 2	-	-	-
Special features 3	-	-	-
Part no. (without DDR-RAM-module)	805166	805192	805163

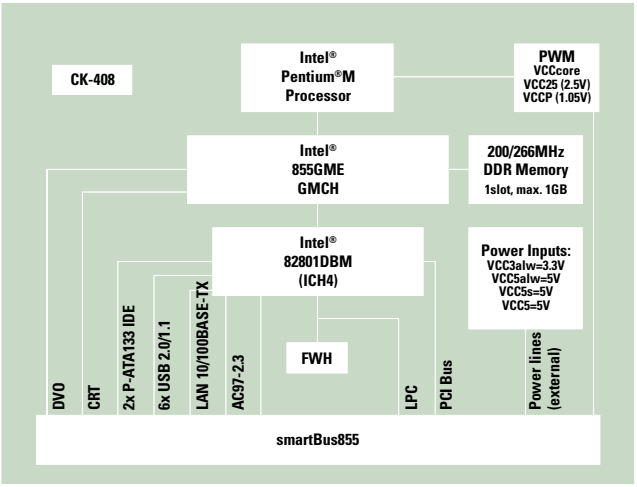
Option/accessories

Article	Description	No.	No.	No.
	Passive cooling	805170	805170	805170
	Active cooling	-	-	805171
SM855DK	Development-Kit	805027	805027	805027



Passive cooling
Part no. 805170

Active cooling
Part no. 805171



SM855-Pentium® M

Description

The smartModule SM855 –Pxxx is based on the Intel® Pentium® M CPU with a clock speed of 600-1800MHz. The product is characterized by the optimal thermal interface and the large number of interfaces. The functional extensions are possible via the PCI bus and the 16-bit ISA bus (with a bridge). The copper core transports the thermal performance with negligible loss to the heat dissipater and housing. The robust and flat-ground housing protects the computer from vibrations and holds the SODIMM RAM module firmly in the base. The SM855 is the smallest Pentium® M computer and fits, for example, on a PC/104 standard board.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Information displays
_ Measurement engineering
_ Telecommunications

Ordering information

Option/accessories	No.	Description
DDR-RAM128	890669	DDR-SODIMM-Module 128MB
DDR-RAM256	890670	DDR-SODIMM-Module 256MB
DDR-RAM512	890671	DDR-SODIMM-Module 512MB
DDR-RAM1024	890672	DDR-SODIMM-Module 1024MB
SM855-CON5	439008	Molex connector 160pin, 5mm board to board (requires 2 units), package of 9 units
SM855-CON7	439006	Molex connector 160pin, 7mm board to board (requires 2 units), package of 9 units
SM855-CON10	439019	Molex connector 160pin, 10mm board to board (requires 2 units), package of 9 units

Technical data

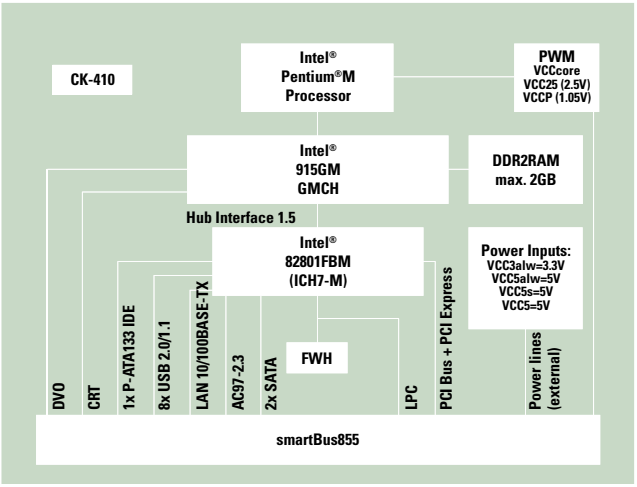
Type	SM855-P738	SM855-P745	
CPU	Intel® Pentium® M	Intel® Pentium® M	
ISA-BUS	-	-	
PCI-BUS	32Bit	32Bit	
PCI Express-BUS	-	-	
2nd Level cache (kB)	2048	2048	
Performance (MHz)	1400	1800	
DRAM Min-Max (MB)	128-1024	128-1024	
CompactFlash socket	-	-	
Keyboard, mouse (PS/2)	ext. SIO	ext. SIO	
BootDrive	FD, HD, USB, LAN	FD, HD, USB, LAN	
Floppy interface	ext. SIO	ext. SIO	
IDE interface P-ATA	2x	2x	
IDE interface S-ATA	-	-	
COM1	ext. SIO	ext. SIO	
COM2	ext. SIO	ext. SIO	
COM3	-	-	
COM4	-	-	
LPT1	ext. SIO	ext. SIO	
USB (2.0)	6x	6x	
LAN port 1 (ext. trafo)	10/100BASE-T	10/100BASE-T	
LAN port 2	-	-	
Audio	AC97-5.1	AC97-5.1	
Video controller	i855GME	i855GME	
Video memory (MB)	16-64 (UMA)	16-64 (UMA)	
LCD interface	ext. 18/24Bit LVDS	ext. 18/24Bit LVDS	
DVI interface	ext. 24Bit DVO to DVI bridge	ext. 24Bit DVO to DVI bridge	
CRT interface	yes	yes	
Video input	-	-	
Watchdog	yes	yes	
Power normal	typ. 10W (@600MHz)-20W	typ. 10W (@600MHz)-26W	
Power suspend	typ. 0.1W	typ. 0.1W	
Power management	yes, speedstep	yes, speedstep	
RTC battery onboard	ext.	ext.	
Cooling type	passive/active	passive/active	
Operating temperature	-25°C to +60°C	-25°C to +50°C	
Extended operating temperature	-40°C to +70°C	-40°C to +50°C	
Size (W x L x H in mm)	117 x 70 x 15	117 x 70 x 15	
Weight	110 g	110 g	
MTBF	>300'000h	>300'000h	
Special features 1	-	-	
Special features 2	-	-	
Special features 3	-	-	
Part no. (without DDR-RAM-module)	805164	805168	

Option/accessories

Article	Description	No.	No.	No.
	Passive cooling	805170	805170	
	Active cooling	805171	805171	
SM855DK	Development-Kit	805027	805027	

Passive cooling
Part no. 805370

Active cooling
Part no. 805371



SM915-Pentium® M

Description

The smartModule SM915-Pxxx is based on the Intel® Pentium® M CPU with a clock speed of 2000MHz and is downwards compatible with the SM855. In addition to the properties of the SM855, it offers a faster CPU, 2x SATA, 8-channel sound output and an accelerated video controller. The product is characterized by the efficient thermal interface and the large number of interfaces. The copper core transports the thermal performance with negligible loss to the heat dissipater and housing. The robust flat-ground housing protects the computer from vibrations and holds the SODIMM RAM module firmly in the base. The SM915 is the smallest Pentium® M computer and fits, for example, on a PC/104 standard board.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Picture recognition
_ Media center, extender

Ordering information

Option/accessories	No.	Description
DDR2RAM256	890674	DDR2-SODIMM-Module 256MB
DDR2RAM512	890675	DDR2-SODIMM-Module 512MB
DDR2RAM1024	890676	DDR2-SODIMM-Module 1024MB
DDR2RAM2048	890677	DDR2-SODIMM-Module 2048MB
SM855-CON5	439008	Molex connector 160pin, 5mm board to board (requires 2 units), package of 9 units
SM855-CON7	439006	Molex connector 160pin, 7mm board to board (requires 2 units), package of 9 units
SM855-CON10	439019	Molex connector 160pin, 10mm board to board (requires 2 units), package of 9 units

Technical data

Type	**SM915-P760**		
CPU	Intel® Pentium® M		
ISA-BUS	-		
PCI-BUS	32Bit		
PCI Express-BUS	4x 1 lane		
2nd Level cache (kB)	2048		
Performance (MHz)	2000		
DRAM Min-Max (MB)	256-2048		
CompactFlash socket	-		
Keyboard, mouse (PS/2)	ext. SIO		
BootDrive	FD, HD, USB, LAN		
Floppy interface	ext. SIO		
IDE interface P-ATA	1x		
IDE interface S-ATA (150Bit/s)	2x		
COM1	ext. SIO		
COM2	ext. SIO		
COM3	-		
COM4	-		
LPT1	ext. SIO		
USB (2.0)	8x		
LAN port 1 (ext. trafo)	10/100BASE-T		
LAN port 2	-		
Audio	AC97-7.1		
Video controller	i915GM		
Video memory (MB)	16-128 (UMA)		
LCD interface	ext.18/24Bit LVDS		
DVI interface	ext. 24Bit DVO to DVI bridge		
CRT interface	yes		
Video input	-		
Watchdog	yes		
Power normal	typ. 10W (@800MHz)-30W		
Power suspend	typ. 0.1W		
Power management	yes, speedstep		
RTC battery onboard	ext.		
Cooling type	passive/active		
Operating temperature	-25°C to +60°C		
Extended operating temperature	-40°C to +70°C		
Size (W x L x H in mm)	117 x 70 x 15		
Weight	110 g		
MTBF	>300'000h		
Special features 1	-		
Special features 2	-		
Special features 3	-		
Part no. (without DDR-RAM-module)	805180		

Option/accessories

Article	Description	No.	No.	No.
	Passive cooling	805370		
	Active cooling	805371		
SM915DK	Development-Kit	805029		

COM Express type 2 BUS of smartModuleExpress connector AB and CD

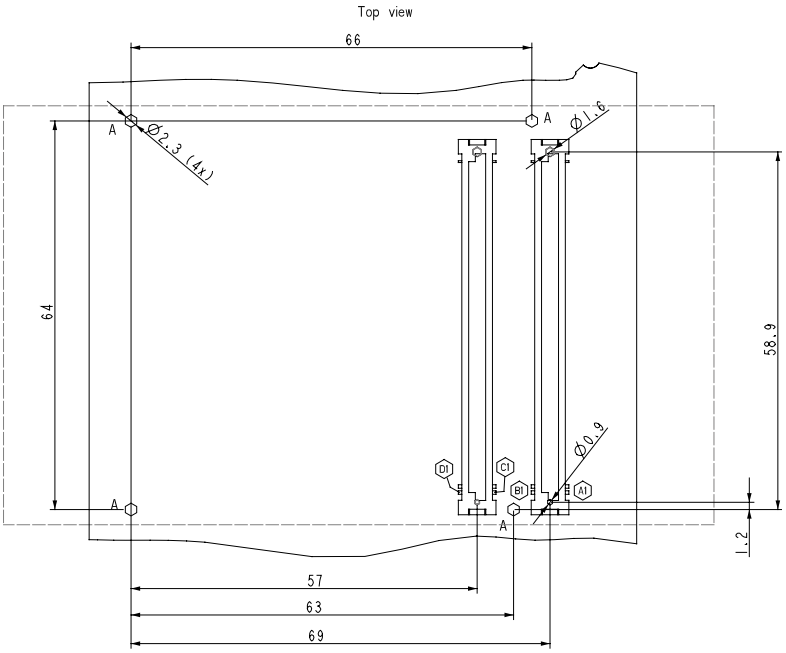
Pin	Series A	Series B	Series C	Series D
1	GND	GND	GND	GND
2	LAN_MDI3-(NC)[1]	LAN_ACT#	IDE_D7	IDE_D5
3	LAN_MDI3+(NC)[1]	LPC_FRAME#	IDE_D6	IDE_D10
4	LAN_SPEED100#	LPC_AD0	IDE_D3	IDE_D11
5	LAN_SPEED1000#	LPC_AD1	IDE_D15	IDE_D12
6	LAN_MDI2-(NC)[1]	LPC_AD2	IDE_D8	IDE_D4
7	LAN_MDI2+ (NC)[1]	LPC_AD3	IDE_D9	IDE_D0
8	LAN_LINK#	LPC_DRQ0#	IDE_D2	IDE_REQ
9	LAN_MDI1-(RXN)[1]	LPC_DRQ1#	IDE_D13	IDE_IOW#
10	LAN_MDI1+(RXP)[1]	LPC_CLK	IDE_D1	IDE_ACK
11	LAN_GND	GND	GND	GND
12	LAN_MDI0-(TXN)[1]	PM_PWRBTN#	IDE_D14	IDE_IRQ
13	LAN_MDI0+(TXP)[1]	SMB_CLK	IDE_IORDY	IDE_A0
14	LAN_CT-Ref	SMB_DAT	IDE_IOR#	IDE_A1
15	PM_SUS_S3#	SMB_ALERT#	PCI_PME#	IDE_A2
16	SATA0-TX+	SATA1-TX+(NC)[1]	PCI_GNT2#	IDE_CS1#
17	SATA0-TX-	SATA1-TX(NC)[1]	PCI_REQ2#	IDE_CS3#
18	PM_SUS_S4#	SUS_STAT#	PCI_GNT1#	IDE_RESET#
19	SATA0-RX+	SATA1-RX+(NC)[1]	PCI_REQ1#	PCI_GNT3#
20	SATA0-RX-	SATA1-RX-(NC)[1]	PCI_GNT0#	PCI_REQ3#
21	GND	GND	GND	GND
22	SATA2-TX+	SATA3-TX+(NC)[1]	PCI_REQ0#	PCI_AD1
23	SATA2-TX-	SATA3-TX(NC)[1]	PCI_RESET#	PCI_AD3
24	PM_SUS_S5#	PWR_OK	PCI_AD0	PCI_AD5
25	SATA2-RX+	SATA3-RX+(NC)[1]	PCI_AD2	PCI_AD7
26	SATA2-RX-	SATA3-RX(NC)[1]	PCI_AD4	PCI_C/BE0#
27	BATLOW#	WDT(NC)[1]	PCI_AD6	PCI_AD9
28	ATA_ATC#	AC_SDIN2	PCI_AD8	PCI_AD11
29	AC_SYNCH	AC_SDIN1	PCI_AD10	PCI_AD13
30	AC_RST#	AC_SDIN0	PCI_AD12	PCI_AD15
31	GND	GND	GND	GND
32	AC_BITCLK	Speaker Out	PCI_AD14	PCI_PAR
33	AC_SDOUT	I2C-CK(TVS0)[1]	PCI_C/BE1#	PCI_SERR#
34	BIOS_DISABLE#	I2C-DAT(TVS1)[1]	PCI_PERR#	PCI_STOP#
35	THRMTRIP#	THRM#	PCI_LOCK#	PCI_TRDY#
36	USB6-	USB7-	PCI_DEVSEL#	PCI_FRAME#
37	USB6+	USB7+	PCI_IRDY#	PCI_AD16
38	USB_6_7_OC#	USB_4_5_OC#	PCI_C/BE2#	PCI_AD18
39	USB4-	USB5-	PCI_AD17	PCI_AD20
40	USB4+	USB5+	PCI_AD19	PCI_AD22
41	GND	GND	GND	GND
42	USB2-	USB3-	PCI_AD21	PCI_AD24
43	USB2+	USB3+	PCI_AD23	PCI_AD26
44	USB_2_3_OC#	USB_0_1_OC#	PCI_C/BE3#	PCI_AD28
45	USB0-	USB1-	PCI_AD25	PCI_AD30
46	USB0+	USB1+	PCI_AD27	PCI_IRQC#
47	VCC_RTC	EXCD1_PERST#	PCI_AD29	PCI_IRQD#
48	EXCD0_PERST#	EXCD1_CPPE#	PCI_AD31	PCI_CLKRUN#
49	EXCD0_CPPE#	SYS_RESET#	PCI_IRQA#	PCI_M66EN
50	LPC_SERIRQ	CB_RESET#	PCI_IRQB#	PCI_CLK
51	GND	GND	GND	GND
52	PCIe_TX5+	PCIe_RX5+	PEG_RX0+	PEG_TX0+
53	PCIe_TX5-	PCIe_RX5-	PEG_RX0-	PEG_TX0-
54	GPI0(MAIN_SW)[1]	GPO1	FWH_TBL / TYPE0	PEG_LANE_RV#
55	PCIe_TX4+	PCIe_RX4+	PEG_RX1+	PEG_TX1+
56	PCIe_TX4-	PCIe_RX4-	PEG_RX1-	PEG_TX1-
57	GND	GPO 2	TYPE1#	GNT4#
58	PCIe_TX3+	PCIe_RX3+	PEG_RX2+	PEG_TX2+
59	PCIe_TX3-	PCIe_RX3-	PEG_RX2-	PEG_TX2-
60	GND	GND	GND	GND
61	PCIe_TX2+	PCIe_RX2+	PEG_RX3+	PEG_TX3+
62	PCIe_TX2-	PCIe_RX2-	PEG_RX3-	PEG_TX3-
63	GPI1(EXTSMI#)[1]	GPO 3	PCI_IRQE#	PCI_IRQG#
64	PCIe_TX1+	PCIe_RX1+	PCI_IRQF#	PCI_IRQH#
65	PCIe_TX1-	PCIe_RX1-	PEG_RX4+	PEG_TX4+
66	GND	PM_WAKE0#	PEG_RX4-	PEG_TX4-
67	GPI2(PM_RI#)[1]	PM_WAKE1#	Reserved	GND
68	PCIe_TX0+	PCIe_RX0+	PEG_RX5+	PEG_TX5+
69	PCIe_TX0-	PCIe_RX0-	PEG_RX5-	PEG_TX5-
70	GND	GND	GND	GND
71	LVDS_A0+	LVDS_B0+	PEG_RX6+	PEG_TX6+
72	LVDS_A0-	LVDS_B0-	PEG_RX6-	PEG_TX6-
73	LVDS_A1+	LVDS_B1+	SDVO_DATA	SDVO_CLK
74	LVDS_A1-	LVDS_B1-	PEG_RX7+	PEG_TX7+
75	LVDS_A2+	LVDS_B2+	PEG_RX7-	PEG_TX7-
76	LVDS_A2-	LVDS_B2-	GND	GND
77	LVDS_VDDENA	PCI_CLK4	REQ4#	PATA_Detect#
78	48MHz OUT	14MHz OUT	PEG_RX8+	PEG_TX8+
79	CLKSIO_33MHz OUT	LVDS_BKLENA	PEG_RX8-	PEG_TX8-
80	GND	GND	GND	GND
81	LVDS_A_CLK+	LVDS_B_CLK+	PEG_RX9+	PEG_TX9+
82	LVDS_A_CLK-	LVDS_B_CLK	PEG_RX9-	PEG_TX9-
83	LVDS_I2C_CK	LVDS_BKL_CTRL	REQ5#	GNT5#
84	LVDS_I2C_DAT	VCC5V_ALW_IN	GND	GND
85	GPI3	VCC5V_ALW_IN	PEG_RX10+	PEG_TX10+
86	KBD_RST#	VCC5V_ALW_IN	PEG_RX10-	PEG_TX10-
87	KBD_A20Gate	VCC5V_ALW_IN	GND	GND
88	PCIe_CK_REF+	RSVD	PEG_RX11+	PEG_TX11+
89	PCIe_CK_REF-	VGA_RED	PEG_RX11-	PEG_TX11-
90	GND	GND	GND	GND
91	RSVD	VGA_GREEN	PEG_RX12+	PEG_TX12+
92	RSVD	VGA_BLUE	PEG_RX12-	PEG_TX12
93	GPO0	VGA_HSYNCH	GND	GND
94	(3.3V Always)*	VGA_VSYNCH	PEG_RX13+	PEG_TX13+
95	(3.3V Always)*	VGA_I2C_CLK	PEG_RX13-	PEG_TX13-
96	GND	VGA_I2C_DAT	GND	GND
97	+12Volt	TV_DAC_A	LPC_FWH_INIT#	PEG_ENABLE#
98	+12Volt	TV_DAC_B	PEG_RX14+	PEG_TX14+
99	+12Volt	TV_DAC_C	PEG_RX14-	PEG_TX14-
100	GND	GND	GND	GND
101	+12Volt_IN	+12Volt_IN	PEG_RX15+	PEG_TX15+
102	+12Volt_IN	+12Volt_IN	PEG_RX15-	PEG_TX15-
103	+12Volt_IN	+12Volt_IN	GND	GND
104	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
105	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
106	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
107	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
108	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
109	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
110	GND	GND	GND	GND

*Output of the internal generated voltages. [1] Specific for SMX945.

6.2.4 SDVO / PEG multiplexed signals

Pin	PEG-function:	SDVO-function:
D78	PEG_TX8+	SDVO_Cannel_C_CLK+
D79	PEG_TX8-	SDVO_Cannel_C_CLK-
D81	PEG_TX9+	SDVO_Cannel_C_Blue+
D82	PEG_TX9-	SDVO_Cannel_C_Blue-
D85	PEG_TX10+	SDVO_Cannel_C_Green+
D86	PEG_TX10-	SDVO_Cannel_C_Green-
D88	PEG_TX11+	SDVO_Cannel_C_Red+
D89	PEG_TX11-	SDVO_Cannel_C_Red-
C85	PEG_RX10+	SDVO_Chanel_C_INT+
C86	PEG_RX10-	SDVO_Chanel_C_INT-
D91	PEG_TX12+	SDVO_Cannel_B_CLK+
D92	PEG_TX12-	SDVO_Cannel_B_CLK-
D94	PEG_TX13+	SDVO_Cannel_B_Blue+
D95	PEG_TX13-	SDVO_Cannel_B_Blue-
D98	PEG_TX14+	SDVO_Cannel_B_Green+
D99	PEG_TX14-	SDVO_Cannel_B_Green-
D101	PEG_TX15+	SDVO_Cannel_B_Red+
D102	PEG_TX15-	SDVO_Cannel_B_Red-
C98	PEG_RX14+	SDVO_Chanel_B_INT+
C99	PEG_RX14-	SDVO_Chanel_B_INT-
C101	PEG_RX15+	SDVO_TVCLK_Input+
C102	PEG_RX15-	SDVO_TVCLK_Input-
C94	PEG_RX13+	SDVO_STALL+
C95	PEG_RX13-	SDVO_STALL-
D97	1K-Pulldown	Open
C73	SDVO	SDVO_DATA
D73	SDVO	SDVO_CLK

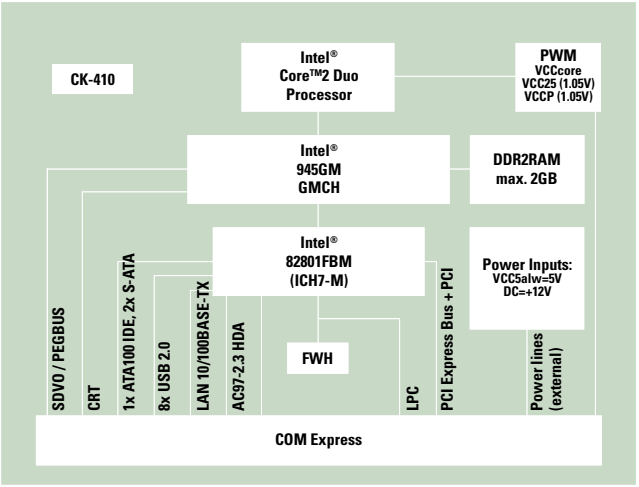
COM Express-connector placement



A = holes for fixing on motherboard

Passive cooling
Part no. 805370

Active cooling
Part no. 805371



SMX945-Core™ Duo COM Express

Description

The smartModule SM945-xxx is based on the Intel® Core™ Duo CPU with a clock speed of 2x 1600MHz. In addition to the properties of the SM855, it offers a faster CPU, PCI Express, 2x SATA, 8-channel sound output and an accelerated video controller. The product is characterized by the efficient thermal interface and the large number of interfaces. The copper core transports the thermal performance with negligible loss to the heat dissipater and housing. The robust flat-ground housing protects the computer from vibrations and holds the SODIMM RAM module firmly in the base. The SMX945 is the smallest Core™2 Duo computer and fits, for example, on a PC/104 standard board.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Picture recognition
_ Measurement engineering
_ Media center, extender

Ordering information

Option/accessories	No.	Description
DDR2RAM256	890674	DDR2-SODIMM-Module 256MB
DDR2RAM512	890675	DDR2-SODIMM-Module 512MB
DDR2RAM1024	890676	DDR2-SODIMM-Module 1024MB
DDR2RAM2048	890677	DDR2-SODIMM-Module 2048MB
SMX-CON8	439250	COM Express-connector, 220 contacts, 8mm board to board (requires 2 units)



Technical data

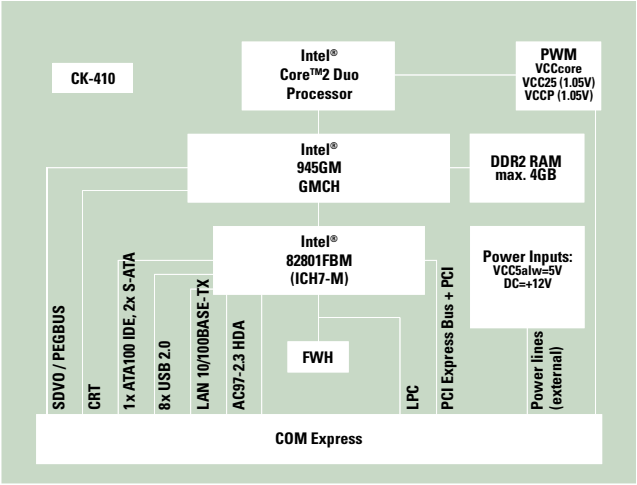
Type	SMX945-L2400	SMX945-C423	SMX945-L7400
CPU	Intel® Core™ Duo LV2400	Intel® Celeron® M ULV423	Intel® Core™2 Duo L7400
ISA-BUS	-	-	-
PCI-BUS	32Bit	32Bit	32Bit
PCI Express-BUS	6x 1 lane	6x 1 lane	6x 1 lane
2nd Level cache (kB)	2048	2048	4096
Performance (MHz)	2x 1600	1000	2x 1500, FSB667
DRAM Min-Max (MB)	256-2048	256-2048	256-2048
CompactFlash socket	-	-	-
Keyboard, mouse (PS/2)	ext. SIO	ext. SIO	ext. SIO
BootDrive	FD, HD, USB, LAN	FD, HD, USB, LAN	FD, HD, USB, LAN
Floppy interface	ext. SIO	ext. SIO	ext. SIO
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA (300MBit/s)	2x	2x	2x
COM1	ext. SIO	ext. SIO	ext. SIO
COM2	ext. SIO	ext. SIO	ext. SIO
COM3	-	-	-
COM4	-	-	-
LPT1	ext. SIO	ext. SIO	ext. SIO
USB (2.0)	8x	8x	8x
LAN port 1 (ext. trafo)	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2	-	-	-
Audio	AC97-7.1, 192kHz	AC97-7.1, 192kHz	AC97-7.1, 192kHz
Video controller	i945GM	i945GM	i945GM
Video memory (MB)	8-224	8-224	8-224
LCD interface	ext. 18Bit LVDS	ext. 18Bit LVDS	ext. 18Bit LVDS
DVI interface	ext. 2x SDVO	ext. 2x SDVO	ext. 2x SDVO
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal	typ. 10W (@800MHz)-20W	typ. 12W (@1000MHz)	typ. 10W (@800MHz) 20W
Power suspend	typ. 0.1W	typ. 0.1W	typ. 0.1W
Power management	yes, speedstep	yes, speedstep	yes, speedstep
RTC battery onboard	ext.	ext.	ext.
Cooling type	passive/active	passive/active	passive/active
Operating temperature	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
Extended operating temperature	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C
Size (W x L x H in mm)	117 x 70 x 15	117 x 70 x 15	117 x 70 x 15
Weight	110 g	110 g	110 g
MTBF	>300'000h	>300'000h	>300'000h
Special features 1	-	-	-
Special features 2	-	-	-
Special features 3	-	-	-
Part no. (without DDR2RAM-module)	805350	805360	805352

Option/accessories

Article	Description	No.	No.	No.
	Passive cooling	805370	805370	805370
	Active cooling	805371	805371	805371
SMX945DK	Development-Kit	805390	805390	805390

Passive cooling
Part no. 805370

Active cooling
Part no. 805371



SMX945B-Core™ Duo COM Express

Description

The smartModule SM945B-xxx is based on the Intel® Core™ Duo CPU with a clock speed of 2x 1600MHz. The SMX945B has more than 2 slots for DDR2RAM-modules (max. 4GB RAM). The product is characterized by the efficient thermal interface and the large number of interfaces. The copper core transports the thermal performance with negligible loss to the heat dissipater and housing. The robust flat-ground housing protects the computer from vibrations and holds the SODIMM RAM module firmly in the base. The SMX945B is the smallest Core™2 Duo computer with 4GB-RAM and fits, for example, on a PC/104 board.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Picture recognition
_ Measurement engineering
_ Media center, extenderr

Ordering information

Option/accessories	No.	Description
DDR2RAM512	890675	DDR2-SODIMM-Module 512MB
DDR2RAM1024	890676	DDR2-SODIMM-Module 1024MB
DDR2RAM2048	890677	DDR2-SODIMM-Module 2048MB*
SMX-CON8	439250	COM Express-connector, 220 contacts, 8mm board to board (requires 2 units)

* For 4GB RAM it is necessary to have two 2GB RAM modules.



Technical data

Type	SMX945B-L2400	SMX945B-C423	SMX945B-L7400
CPU	Intel® Core™ Duo LV2400	Intel® Celeron® M ULV423	Intel® Core™2 Duo L7400
ISA-BUS	-	-	-
PCI-BUS	32Bit	32Bit	32Bit
PCI Express-BUS	6x 1 lane	6x 1 lane	6x 1 lane
2nd Level cache (kB)	2048	2048	4096
Performance (MHz)	2x 1600	1000	2x 1500, FSB667
DRAM Min-Max (MB)	512-4096	512-4096	512-4096
CompactFlash socket	-	-	-
Keyboard, mouse (PS/2)	ext. SIO	ext. SIO	ext. SIO
BootDrive	FD, HD, USB, LAN	FD, HD, USB, LAN	FD, HD, USB, LAN
Floppy interface	ext. SIO	ext. SIO	ext. SIO
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA (300MBit/s)	2x	2x	2x
COM1	ext. SIO	ext. SIO	ext. SIO
COM2	ext. SIO	ext. SIO	ext. SIO
COM3	-	-	-
COM4	-	-	-
LPT1	ext. SIO	ext. SIO	ext. SIO
USB (2.0)	8x	8x	8x
LAN port 1 (ext. trafo)	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2	-	-	-
Audio	AC97-7.1, 192kHz	AC97-7.1, 192kHz	AC97-7.1, 192kHz
Video controller	i945GM	i945GM	i945GM
Video memory (MB)	8-224 (UMA)	8-224 (UMA)	8-224 (UMA)
LCD interface	ext. 18Bit LVDS	ext. 18Bit LVDS	ext. 18Bit LVDS
DVI interface	ext. 2x SDVO	ext. 2x SDVO	ext. 2x SDVO
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal	typ. 10W (@800MHz) -20W	typ. 12W (@1000MHz)	typ. 10W (@800MHz) -20W
Power suspend	typ. 0.1W	typ. 0.1W	typ. 0.1W
Power management	yes, speedstep	yes, speedstep	yes, speedstep
RTC battery onboard	ext.	ext.	ext.
Cooling type	passive/active	passive/active	passive/active
Operating temperature	-25°C to +60°C	-25°C to +60°C	-25°C to +60°C
Extended operating temperature	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C
Size (W x L x H in mm)	117 x 70 x tbd	117 x 70 x tbd	117 x 70 x tbd
Weight	110 g	110 g	110 g
MTBF	>300'000h	>300'000h	>300'000h
Special features 1	-	-	-
Special features 2	-	-	-
Special features 3	-	-	-
Part no. (without DDR2RAM-module)	805450	805460	805452

Option/accessories

Article	Description	No.	No.	No.
	Passive cooling	805370	805370	805370
	Active cooling	805371	805371	805371
SMX945DK	Development-Kit	805390	805390	805390

Developmentkits

All development kits are ready-to-use systems that boot from the hard disk. The development kits are for evaluation and DesignIn of smartModules. The development kits for smartModules come with all documentation, including sample circuit diagrams for the mother-board. Also included is a 90W 110/220V power supply unit with 12-18V output. If required, the other voltages are generated in the development kit. The smartModule and PC/104 development kits contain all periphery connector boards and cable kits so that the standard connector is available for all functions (USB, VGA, DVI, sound). For the EPIC and 3.5" SBC form factors, the MPCV8xx and MPC20 serve as development kit.

Part no.	Article	FD	HD	CD	OS	Comments
805025	SM520DK	yes	yes	-	DOS / Linux	Complete incl. SM520PCNX and 128MB RAM
805220	SM800DK	-	yes	yes	DOS / Linux	Complete incl. SM800PC and 512MB RAM
805027	SM855DK	-	yes	yes	WIN-XP Linux	SM855-xxx and the DDR memory must be separately ordered
805029	SM915DK	-	yes	yes	WIN-XP Linux	SM915-xxx and the DDR2 memory must be separately ordered
805390	SMX945DK	-	yes	yes	WIN-XP Linux	SMX945-xxx and the DDR2 memory must be separately ordered
801378	MSM586SEGDK	yes	yes	-	DOS / Linux	Complete incl. MSM586SEG and 128MB RAM
801818	MSMT3SEGDK	yes	yes	-	DOS / Linux	Complete incl. MSMT3SEG and 128MB RAM
802118	MSM800DK	-	yes	yes	WIN-XP Linux	Complete incl. MSM800BEV and 512MB RAM
803018	MSM855DK	-	yes	yes	WIN-XP Linux	SM855-xxx and the DDR memory must be separately ordered
803218	MSM945DK	-	yes	yes	WIN-XP Linux	SMX945-xxx and the DDR2 memory must be separately ordered
805027	MSEBX855DK = SM855DK	-	yes	yes	WIN-XP Linux	SM855-xxx and the DDR memory must be separately ordered
805029	MSEBX915DK = SM915DK	-	yes	yes	WIN-XP Linux	SM915-xxx and the DDR2 memory must be separately ordered
805390	MSEBX945DK = SMX945DK	-	yes	yes	WIN-XP Linux	SMX945-xxx and the DDR2 memory must be separately ordered

MICROSPACE® PC/104

For building reliable embedded PCs, DIGITAL-LOGIC offers a broad selection of MICROSPACE® PC/104 modules. If the customer does not find the required computer module in the standard product portfolio, DIGITAL-LOGIC will develop and manufacture a custom computer system. Complete cable sets can be delivered with all CPU modules to facilitate the customer's entry into the world of PC/104.

Macro components

As an alternative to the standalone PC/104 board, the PC/104 boards can be integrated directly in the application electronics practically as macro components. All DIGITAL-LOGIC PC/104 computers are available in the "stackthrough" version. This enables direct integration in the application electronics and eliminates wiring costs. The signal connections are robust and extremely dependable.

Advantages

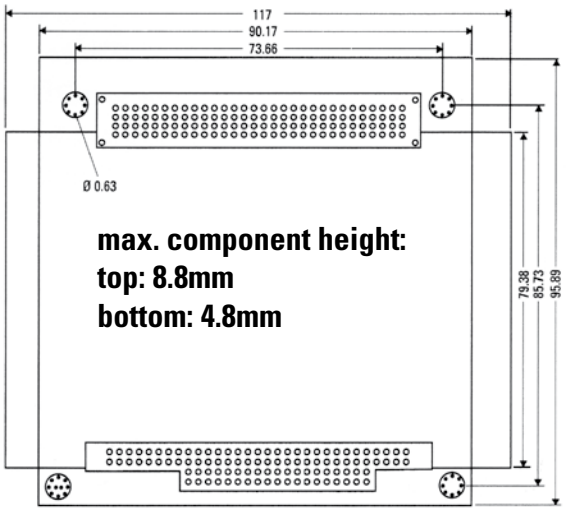
- **Short development time**
- **Reduction of manufacturing costs**
- **Best price-performance ratio**
- **Full PC compatibility**
- **No wiring costs**
- **Maximum system reliability**
- **Extremely robust**
- **Vibration resistant**
- **Various processor performances**
- **Space-saving**
- **Lightweight**

PC/104 connector

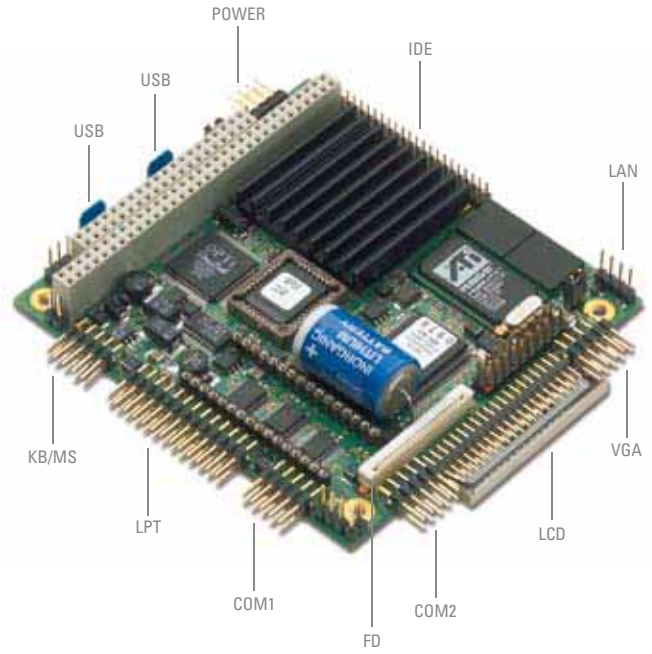
Pin	J1/P1	J1/P1	J2/P2 (1)	J2/P2 (1)
#	Series A	Series B	Series C	Series D
0			GND	GND
1	IOCHK#	GND	SBHE#	MEMCS16#
2	SD7	Reset	LA23	IOCS16#
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12V	LA18	IRQ14
8	SD1	SRDY#	LA17	DACK0#
9	SD0	+12V	MEMR#	DRQ0
10	IOCHRDY	NC	MEMW#	DACK5#
11	AEN	SMEMW#	SD8	DRQ5
12	SA19	SMEMR#	SD9	DACK6#
13	SA18	IOW#	SD10	DRQ6
14	SA17	IOR#	SD11	DACK7#
15	SA16	DACK3#	SD12	DRQ7
16	SA15	DRQ3	SD13	+5V
17	SA14	DACK1#	SD14	MASTER16#
18	SA13	DRQ1	SD15	GND
19	SA12	REFRESH#	NC	GND
20	SA11	BCLK		
21	SA10	IRQ7		
22	SA9	IRQ6		
23	SA8	IRQ5		
24	SA7	IRQ4		
25	SA6	IRQ3		
26	SA5	DACK2#		
27	SA4	TC		
28	SA3	BALE		
29	SA2	+5V		
30	SA1	OSC		
31	SA0	GND		
32	GND	GND		

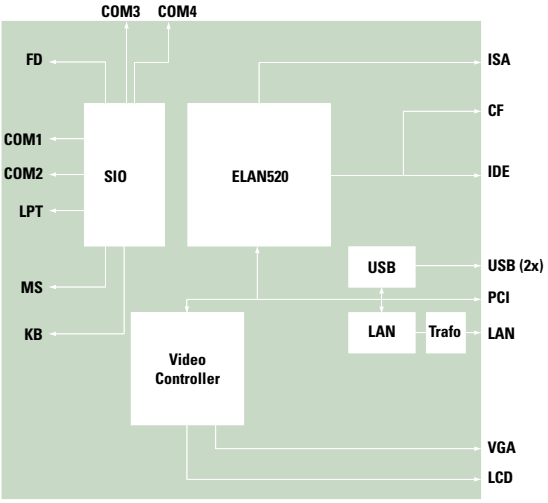
PC/104-*Plus* signals

Pin	Series A	Series B	Series C	Series D
1	GND	Reserved	+5	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0#	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1#	AD15	+3.3V
9	SERR#	GND	Reserved	PAR
10	GND	PERR#	+3.3V	Reserved
11	STOP#	+3.3V	LOCK#	GND
12	+3.3V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3V
14	GND	AD16	+3.3V	C/BE2#
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0#	GND	REQ1#	VI/O
24	GND	REQ2#	+5V	GNT0#
25	GNT1#	VI/O	GNT2#	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD#	+5V	RST#
29	+12V	INTA#	INTB#	INTC#
30	-12V	REQ3#	GNT3#	GND



PC/104-*Plus* Formfactor





MSM586SL/SEL/SEG

Description

The MICROSPACE® MSM586SL/SEN/SEG has all of the PC standard interfaces plus 4 serial interfaces (4x RS232/422/485), Ethernet LAN and DiskOnChip base (DOC) for a solid state disk. The permanently soldered on memory of the MS-M586SL makes the embedded computer extremely robust. The PC/104 bus (ISA) is available as a functional extension. The 4-7W power consumption permits passive cooling within a very broad ambient temperature range.

Applications

_ Control tasks
_ Remote controller (LAN, RS232)
_ Intelligent IO
_ Multi-serial protocol computer

Ordering information

Option/accessories	No.	Description
Option: -R1	807331	Option COM1 as RS485/422 Halfduplex
Option: -R2	807332	Option COM2 as RS485/422 Halfduplex
Option: -R3	807333	Option COM3 as RS485/422 Halfduplex
Option: -R4	807334	Option COM4 as RS485/422 Halfduplex
MSM-CK	802605	PC/104-cablekit
MSFLOPPY	891001	3.5" Micro-Floppydrive (26pin)
MSFDCK	802600	Microfloppy cable (26pin)
MSM586SEGDK	801378	Development-Kit
MD2202-D32-XP	840217	Disk on Chip 32MB

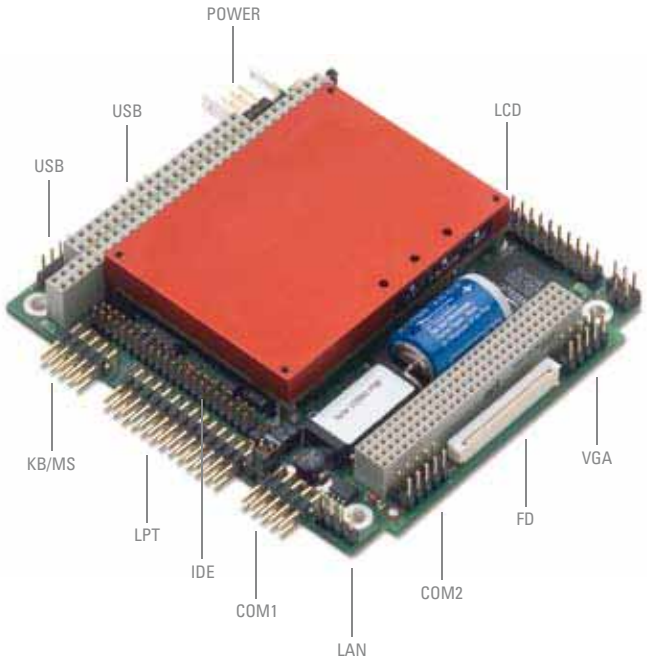


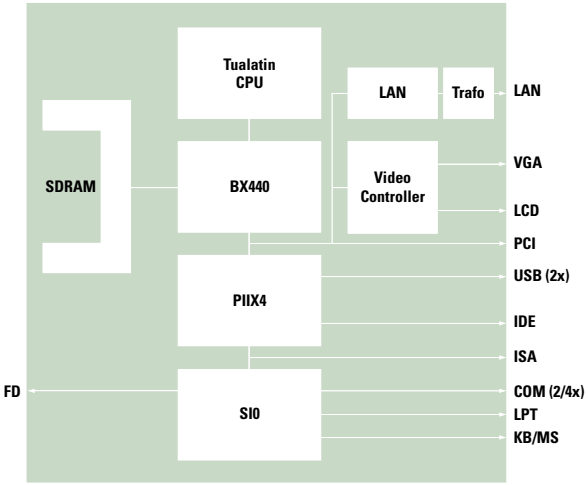
Technical data

Type	MSM586SL	MSM586SEL	MSM586SEG
CPU	AMD ELAN520	AMD ELAN520	AMD ELAN520
ISA-BUS	8/16-Bit	8/16-Bit	8/16-Bit
PCI-BUS	-	-	-
PCI Express-BUS	-	-	-
2nd Level cache	-	-	-
Performance (MHz)	133	133	133
DRAM Min-Max (MB)	32-64 soldered	32-128	32-128
CompactFlash socket	yes (typ 1)	yes (typ 1)	yes (typ 1)
Keyboard, mouse (PS/2)	yes	yes	yes
BootDrive	FD, HD, DOC	FD, HD, DOC, LAN	FD, HD, DOC, LAN
Floppy interface	yes	yes	yes
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA	-	-	-
COM1	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
COM2	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
COM3	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
COM4	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
LPT1	yes	yes	yes
USB (V1.1 / 2.0)	-	2x	2x
LAN port 1 (onboard trafo)	-	10/100BASE-T	10/100BASE-T
LAN port 2	-	-	-
Audio	-	-	-
Video controller	-	-	ATI M1 (PCI), EOL
Video memory (MB)	-	-	8
LCD interface	-	-	24Bit TFT, 3.3V
DVI interface	-	-	Option 801375
CRT interface	-	-	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal	typ. 5V/0.7Amp.	typ. 5V/0.7Amp.	typ. 5V/1.4Amp.
Power suspend	-	-	-
Power management	-	-	-
RTC battery onboard	400mAh	400mAh	400mAh
Cooling type	passive	passive	passive
Operating temperature	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
Extended operating temperature	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Size (W x L in mm)	90 x 96	90 x 96	90 x 96
Weight	80 g	80 g	100 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	DOC-socket 32pin	DOC-socket 32pin	DOC-socket 32pin
Special features 2	soldered RAM	-	Option TV out (CVBS or SVideo)
Special features 3	-	-	-
Part no.	801344 (with 32MB) / 801345 (with 64MB)	801380 (without SDRAM)	801370 (without SDRAM) not for new designs

Option/accessories

Article	Description	No.	No.	No.
SDRAM32M-32Bit	SDRAM-Module 32MB	-	890655	890655
SDRAM64M-32Bit	SDRAM-Module 64MB	-	890654	890654
SDRAM128M-32Bit	SDRAM-Module 128MB	-	890656	890656
MSMSEG-DVI	DVI+TV out interfaceboard	-	-	801375





MSMT3SEN/SEG/XEN/XEG

Description

The MICROSPACE® MSMT3SEN/SEG/XEN/XEG has all of the PC standard interfaces plus an Ethernet LAN; also, the SEN/SEV models have 4 serial interfaces (some with the RS485 interface). The memory is permanently soldered for the XEN/XEG versions, making the embedded computer even more robust. The PC/104-*Plus* bus (ISA) is available as a functional extension. The 8-12W power consumption permits passive cooling.

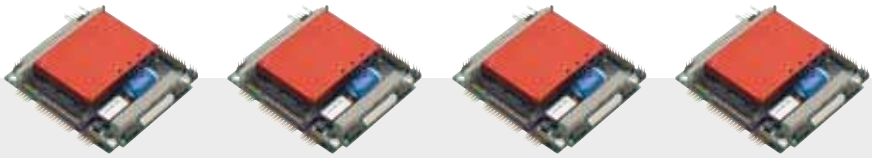
Applications

_ Control tasks
_ Measurement engineering
_ Touchscreen terminals
_ Multi-serial protocol computer

Ordering information

Option/accessories	No.	Description
Option -L+	807006	PC/104-*Plus*, long connector
Option -P+	807005	PC/104-*Plus*, short connector
Option -CF	807008	CompactFlash socket (without option -L)
SDRAM32	890645	SODIMM-Module 32MB*
SDRAM64	890644	SODIMM-Module 64MB*
SDRAM128	890646	SODIMM-Module 128MB*
SDRAM256	890647	SODIMM-Module 256MB*
smartCoreT3-400	805146	smartCore CPU-Module with Ultra Low Voltage Intel® Celeron® Processor 400MHz (Tualatin-256), 256kL2Cache, with passive cooling
smartCoreT3-650	805145	smartCore CPU-Module with ultra low voltage Intel® Celeron® Processor 650MHz (Tualatin-256), 256kL2Cache, with integrated active cooling (805176)
Passive Cooler	805175	Passive cooling for SCT3-xxx
Active Cooler	805176	Active cooling for SCT3-xxx
MSMT3SEGDK	801818	Development-Kit
MSMG-CK	802035	Cablekit

*For SEN/SEG only.

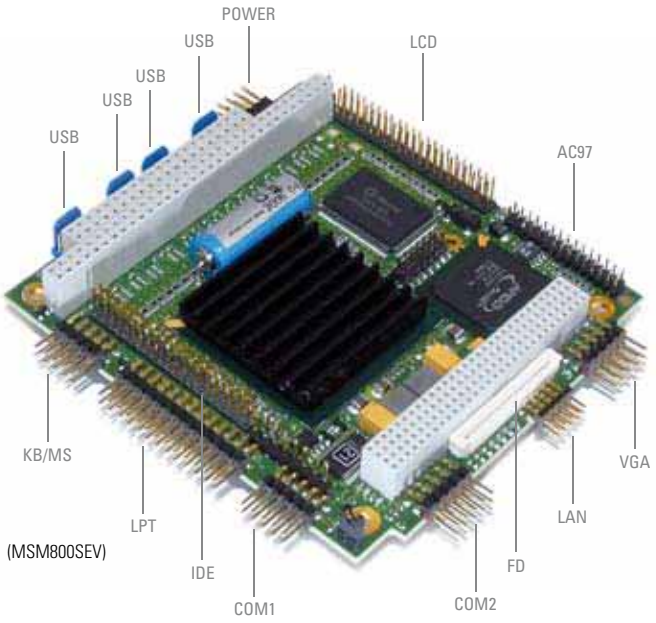


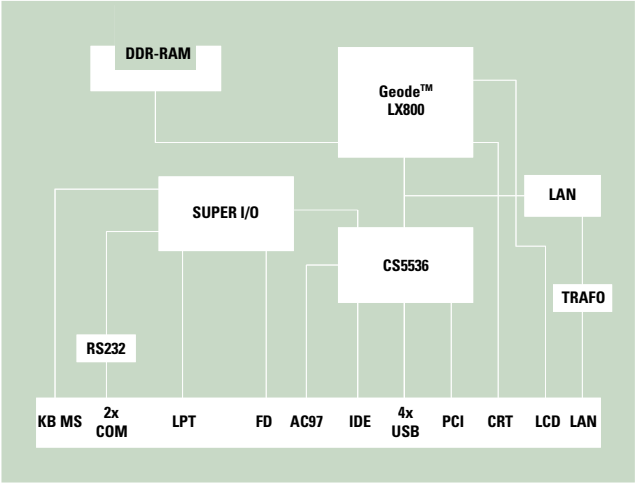
Technical data

Type	MSMT3SEN	MSMT3SEG	MSMT3XEN	MSMT3XEG
CPU	smartCoreT3	smartCoreT3	smartCoreT3	smartCoreT3
ISA-BUS PC/104	8/16Bit	8/16Bit	8/16Bit	8/16Bit
PCI-BUS (option 807006 or 807005)	Option	Option	Option	Option
PCI Express-BUS	-	-	-	-
2nd Level cache	256kB	256kB	256kB	256kB
Performance (MHz)	400/650	400/650	400/650	400/650
DRAM Min-Max (MB)	SODIMM 32-256MB SDRAM	SODIMM 32-256MB SDRAM	soldered 32/64MB SDRAM	soldered 32/64MB SDRAM
CompactFlash socket (option 807008)	Option	Option	Option	Option
Keyboard, mouse (PS/2)	yes	yes	yes	yes
BootDrive	FD, HD, CD, USB	FD, HD, CD, USB	FD, HD, CD, LAN, USB	FD, HD, CD, LAN, USB
Floppy interface	yes	yes	yes	yes
IDE interface P-ATA	1x	1x	1x	1x
IDE interface S-ATA	-	-	-	-
COM1	RS232C	RS232C	RS232C	RS232C
COM2	RS232C	RS232C	RS232C	RS232C
COM3	RS232C / RS485	RS232C / RS485	-	-
COM4	RS232C / RS485	RS232C / RS485	-	-
LPT1	yes	yes	yes	yes
USB (1.1)	2x	2x	2x	2x
LAN port 1 (onboard trafo)	100/10BASE-T	100/10BASE-T	100/10BASE-T	100/10BASE-T
LAN port 2	-	-	-	-
Audio	-	-	-	-
Video controller	-	ATI M1, EOL	-	ATI M1, EOL
Video memory (MB)	-	8MB	-	8MB
LCD interface	-	24Bit	-	24Bit
DVI interface	-	-	-	-
CRT interface	-	yes	-	yes
Video input	-	-	-	-
Watchdog	yes	yes	yes	yes
Power normal	5V/10W	5V/13W	5V/10W	5V/13W
Power suspend	typ. 0.5W	typ. 0.5W	typ. 0.5W	typ. 0.5W
Power management	yes	yes	yes	yes
RTC battery onboard	3.6V/400mAh	3.6V/400mAh	3.6V/400mAh	3.6V/400mAh
Cooling type	passive/active	passive/active	passive/active	passive/active
Operating temperature	-25°C to +50°C	-25°C to +50°C	-25°C to +50°C	-25°C to +50°C
Extended operating temperature	-40°C to +50°C	-40°C to +50°C	-40°C to +50°C	-40°C to +50°C
Size (W x L in mm)	90 x 96/99	90 x 96/99	90 x 96/99	90 x 96/99
Weight	170	170	170	170
MTBF	> 200'000h	> 200'000h	> 200'000h	> 200'000h
Special features 1	-	-	soldered RAM	soldered RAM
Special features 2	-	-	-	-
Special features 3	-	-	-	-
Part no. (*without SDRAM-Module, smartCore)	801872*	801870* not for new designs	801972*	801895* not for new designs

Option/accessories

Article	Description	No.	No.	No.	No.
MSMSEG-DVI	DVI-D + TV out Interfaceboard	-	801375	-	801375
Option-R3	COM3 as RS485	807333	807333	-	-
Option-R4	COM4 as RS485	807334	807334	-	-





MSM800SEL/SEV/BEV

Description

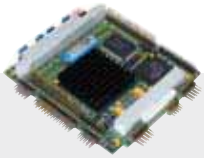
The MICROSPACE® MSM800SEL/SEV/BEV has all of the standard PC interfaces plus Ethernet LAN and a sound controller (SEV/BEV). In the BEV version a PCI to ISA bridge is onboard and provides extensive ISA bus support. The SEV version uses a LPC to ISA bridge. The PC/104-*Plus* bus and 4 USB interfaces are available as functional extensions. The 8W power consumption permits passive cooling within a very broad ambient temperature range. The SEL version is a low-cost variant without battery, sound codec, cooler or ISA bus.

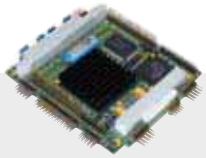
Applications

_ Information terminals
_ Control of interactive devices
_ Play systems with music output
_ Measuring instruments
_ Telecommunication devices

Ordering information

Option/accessories	No.	Description
Option -L+	807006	PC/104-*Plus*, long connector
Option -P+	807005	PC/104-*Plus*, short connector
Option -CF	807007	CompactFlash socket (without option -L)
MSM800-CKCON	803035	MSM800 PC/104-cablekit
MSFLOPPY	891001	3.5" Micro-Floppydrive (26pin)
MSFDCK	802600	Microfloppy cable (26pin)
MSM800-LANCON	803046	LAN cable with connector print
MSM800-DVICON	803042	DVI-D interface
MSM800-LVDSCON	803044	LVDS interface
MSM800DK	802118	Development-Kit
DDR-RAM128	890669	DDR-RAM-Module 128MB
DDR-RAM256	890670	DDR-RAM-Module 256MB
DDR-RAM512	890671	DDR-RAM-Module 512MB
DDR-RAM1024	890672	DDR-RAM-Module 1024MB



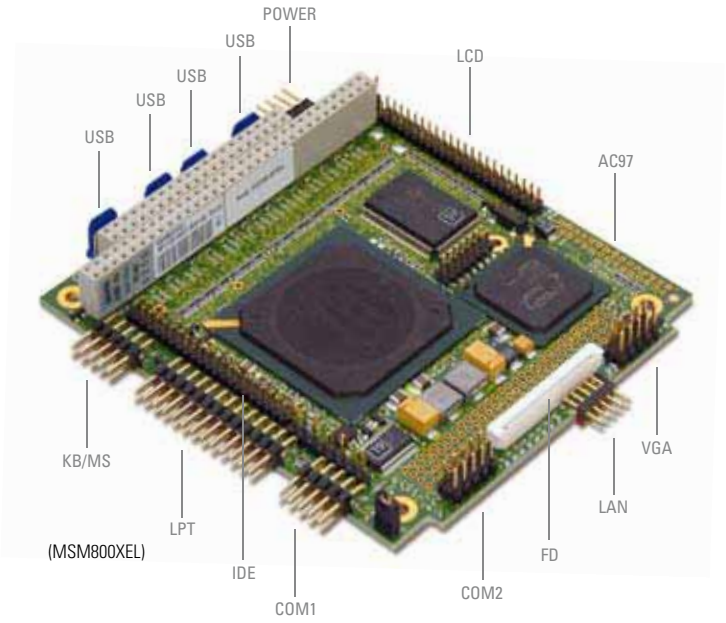


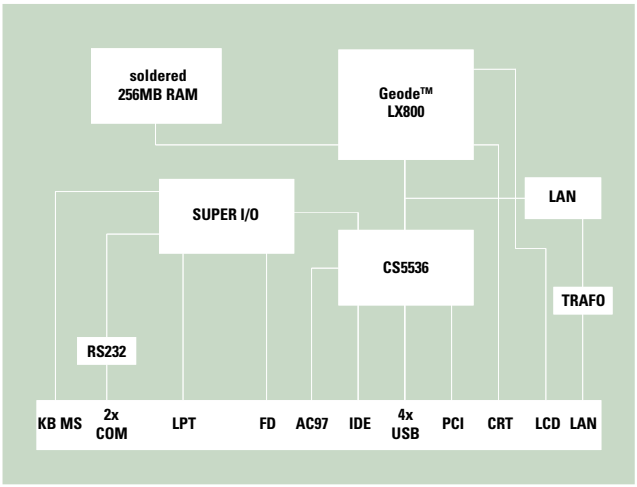
Technical data

Type	MSM800SEL	MSM800SEV	MSM800BEV
CPU	AMD Geode™ LX800	AMD Geode™ LX800	AMD Geode™ LX800
ISA-BUS (option 807006 or 807005)	PC/104-8Bit	PC/104-8Bit	PC/104-8/16-Bit
PCI-BUS	Option (3slot)	Option (3slot)	Option (2slot)
PCI Express-BUS	-	-	-
2nd Level cache (kB)	128	128	128
Performance (MHz)	500	500	500
DRAM Min-Max (MB)	128-1024	128-1024	128-1024
CompactFlash socket (option 807007)	Option typ. II	Option typ. II	Option typ. II
Keyboard, mouse (PS/2)	yes	yes	yes
BootDrive	FD, HD, LAN, CF, USB	FD, HD, LAN, CF, USB	FD, HD, LAN, CF, USB
Floppy interface	yes	yes	yes
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA	-	-	-
COM1	RS232C	RS232C	RS232C
COM2	RS232C	RS232C	RS232C
COM3	-	-	-
COM4	-	-	-
LPT1	-	-	-
USB (2.0)	4x	4x	4x
LAN port 1 incl. trafo	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2	-	-	-
Audio	-	AC97	AC97
Video controller	LX800	LX800	LX800
Video memory (MB)	16 (UMA)	16 (UMA)	16 (UMA)
LCD interface	24Bit, 240x 320 to 1600x 1200	24Bit, 240x 320 to 1600x 1200	24Bit, 240x 320 to 1600x 1200
DVI interface	-	Option 803042	Option 803042
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal	5V/8W	5V/8W	5V/8W
Power suspend	3W	3W	3W
Power management	yes	yes	yes
RTC battery onboard	external	400mAh	400mAh
Cooling type	-	passive	passive
Operating temperature	0°C to +60°C	-25°C to +70°C	-25°C to +70°C
Extended operating temperature	-	-40°C to +85°C	-40°C to +85°C
Size (W x L in mm)	90 x 96/99	90 x 96/99	90 x 96/99
Weight	95 g	105 g	105 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	-	LVDS-option 803044	LVDS-option 803044
Special features 2	-	-	-
Special features 3	-	-	-
Part no. (*without DDR-RAM-Module)	802105*	802100*	802110*

Option/accessories

Article	Description	No.	No.	No.





MSM800XEL/XEV

Description

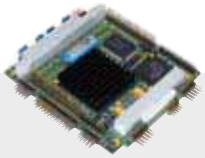
The MICROSPACE® MSM800XEL/XEV has all of the standard PC interfaces plus Ethernet LAN and a sound controller (XEV). The 256MB memory is permanently soldered, adding increased robustness. In the XEV version a PCI to ISA bridge is onboard which supports the ISA bus. The PC/104-*Plus* bus (ISA & PCI) and 4 USB interfaces are available as functional extensions. The 8W power consumption permits passive cooling within a very broad ambient temperature range. The XEL version is a low-cost variant without battery, sound codec or ISA bus.

Applications

_ Used in cars and airplanes
_ Information terminals
_ Play systems with music output
_ Measuring instruments
_ Telecommunication devices

Ordering information

Option/accessories	No.	Description
Option -L+	807006	PC/104-*Plus*, long connector
Option -P+	807005	PC/104-*Plus*, short connector
Option -CF	807007	CompactFlash socket (without Option -L)
MSM800-CKCON	803035	MSM800 PC/104-cablekit
MSFLOPPY	891001	3.5" Micro-Floppydrive (26pin)
MSFDCK	802600	Microfloppy cable (26pin)
MSM800-LANCON	803046	LAN cable with connectorprint
MSM800-DVICON	803042	DVI-D interface
MSM800-LVDSCON	803044	LVDS interface
MSM800DK	802118	Development-Kit

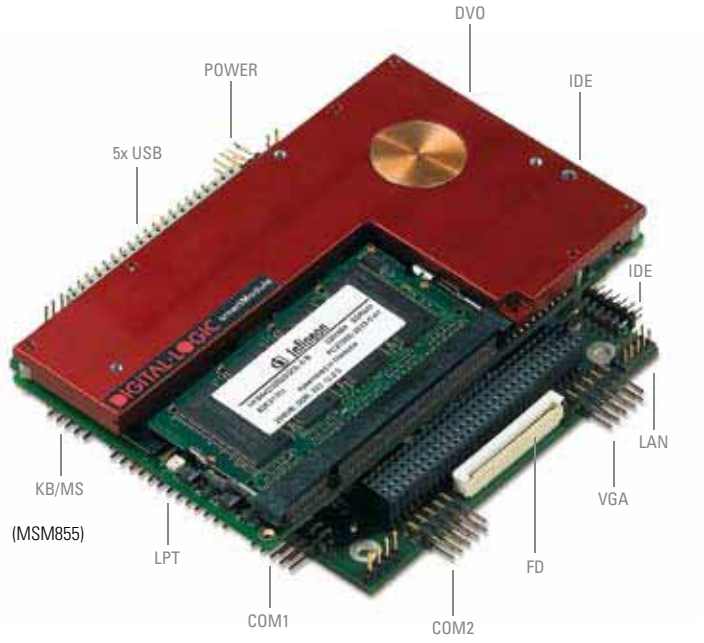


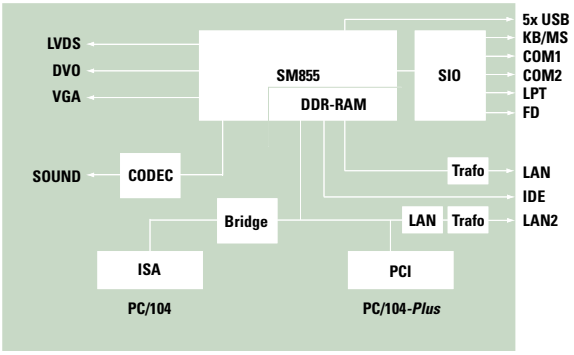
Technical data

Type	MSM800XEL	MSM800XEV	
CPU	AMD Geode™ LX800	AMD Geode™ LX800	
ISA-BUS	PC/104-8/16-Bit	PC/104-8/16-Bit	
PCI-BUS (option 807006 or 807005)	Option (3slot)	Option (2slot)	
PCI Express-BUS	-	-	
2nd Level cache (kB)	128	128	
Performance (MHz)	500	500	
DRAM Min-Max (MB)	soldered 256MB	soldered 256MB	
CompactFlash socket (option 807007)	Option typ. II	Option typ. II	
Keyboard, mouse (PS/2)	yes	yes	
BootDrive	FD, HD, LAN, CF, USB	FD, HD, LAN, CF, USB	
Floppy interface	yes	yes	
IDE interface P-ATA	1x	1x	
IDE interface S-ATA	-	-	
COM1	RS232C	RS232C	
COM2	RS232C	RS232C	
COM3	-	-	
COM4	-	-	
LPT1	-	-	
USB (2.0)	4x	4x	
LAN port 1 incl. trafo	10/100BASE-T	10/100BASE-T	
LAN port 2	-	-	
Audio	-	AC97	
Video controller	LX800	LX800	
Video memory (MB)	16 (UMA)	16 (UMA)	
LCD interface	24Bit, 240x 320 to 1600x 1200	24Bit, 240x 320 to 1600x 1200	
DVI interface	-	Option 803042	
CRT interface	yes	yes	
Video input	-	-	
Watchdog	yes	yes	
Power normal	5V/8W	5V/8W	
Power suspend	-	-	
Power management	yes	yes	
RTC battery onboard	external	400mAh	
Cooling type	-	passive	
Operating temperature	0°C to +60°C	-25°C to +70°C	
Extended operating temperature	-	-40°C to +85°C	
Size (W x L in mm)	90 x 96/99	90 x 96/99	
Weight	105 g	115 g	
MTBF	>200'000h	>200'000	
Special features 1	soldered RAM	soldered RAM	
Special features 2	-	LVDS-option 803044	
Special features 3	-	-	
Part no.	802125	802120	

Option/accessories

Article	Description	No.	No.	No.





MSM855/B/B2

Description

The MICROSPACE® MSM855/B/B2 has all of the standard PC interfaces plus up to two Ethernet LANs (B2 version), optional DVI and LVDS interfaces (dual screen) and a sound controller. In the B/B2 version a PCI to ISA bridge is onboard and provides full ISA bus support, whereas the standard version uses a LPC to ISA bridge. The PC/104-*Plus* bus (ISA & PCI) and 6 USB interfaces are available as functional extensions. Power consumption (12W to 25W), cooling method, ambient working temperature and performance are directly dependent on the smartModule855-xxxx in use.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Image processing, video monitoring
_ Measurement data processing
_ Telecommunication devices

Ordering information

Option/accessories	No.	Description
Option -L+	807006	PC/104-*Plus*, long connector
Option -CF	807008	CompactFlash socket (without -L+)
DDR-RAM128	890669	DDR-SODIMM-Module 128MB
DDR-RAM256	890670	DDR-SODIMM-Module 256MB
DDR-RAM512	890671	DDR-SODIMM-Module 512MB
DDR-RAM1024	890672	DDR-SODIMM-Module 1024MB
Passive cooling	805170	SM855 cooling without fan
Active cooling	805171	SM855 cooling with fan
MSM855-CKCON	803030	Cablekit and connectorprint
MSFLOPPY	891001	3.5" Micro-Floppydrive (26pin)
MSFDCK	802600	Microfloppy cable (26pin)
MSM855-LANCON	803020	LAN cable with connectorprint and RTC-battery
MSM855-DVICON	803040	Converter with DVO to DVI + LVDS (18Bit) + TV-out
MSM855B-LANCON	803021	LAN cable for MSM855B/2
MSM855DK	803018	Development-Kit



Technical data

Type	MSM855	MSM855B	MSM855B2
CPU	SM855-xxx	SM855-xxx	SM855-xxx
ISA-BUS PC/104	8Bit	8/16Bit + DMA	8/16Bit + DMA
PCI-BUS (option 807006)	Option (4slot)	Option (3slot)	Option (3slot)
PCI Express-BUS	-	-	-
2nd Level cache (kB)	0-2048	0-2048	0-2048
Performance (MHz)	600-1800	600-1800	600-1800
DRAM Min-Max (MB)	128-1024	128-1024	128-1024
CompactFlash socket (option 807008)	Option typ. I	Option typ. I	Option typ. I
Keyboard, mouse (PS/2)	yes	yes	yes
BootDrive	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF
Floppy interface	yes	yes	yes
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA	-	-	-
COM1	RS232C	RS232C	RS232C
COM2	RS232C	RS232C	RS232C
COM3	-	-	-
COM4	-	-	-
LPT1	yes	yes	yes
USB (2.0)	5x	5x	5x
LAN port 1 onboard trafo	10/100BASE-T (803020 incl. trafo)	10/100BASE-T	10/100BASE-T
LAN port 2 onboard trafo	-	-	10/100BASE-T
Audio	AC97-5.1	AC97-5.1	AC97-5.1
Video controller	i855GME	i855GME	i855GME
Video memory (MB)	16-64	16-64	16-64
LCD interface	DVO	DVO	DVO
DVI interface (option 803040)	Option	Option	Option
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal	12W (600MHz)-25W	12W (600MHz)-25W	12W (600MHz)-25W
Power suspend	0.1W	0.1W	0.1W
Power management	yes	yes	yes
RTC battery onboard	external 400mAh	80mAh or external 400mAh	80mAh or external 400mAh
Cooling type	passive/active	passive/active	passive/active
Operating temperature	-25°C to +70°C [1]	-25°C to +70°C [1]	-25°C to +70°C [1]
Extended operating temperature	see SM855-xxx	see SM855-xxx	see SM855-xxx
Size (W x L x H in mm)	90/117 x 96/99	90/117 x 96/99	90/117 x 96/99
Weight	250 g	250 g	250 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	-	-	-
Special features 2	-	-	-
Special features 3	-	-	-
Part no.	803010	803060	803062

CPU's

Article	Description	No.	No.	No.
SN855-C300	Intel® Celeron® M C300 (0.6GHz), 0MB RAM	805166	805166	805166
SM855-C140	Intel® Celeron® M C140 (1.0GHz), 0MB RAM	805192	805192	805192
SM855-C373	Intel® Celeron® M C373 (1.0GHz), 0MB RAM	805163	805163	805163
SM855-P738	Intel® Pentium® M P738 (1.4GHz), 0MB RAM	805164	805164	805164
SM855-P745	Intel® Pentium® M P745 (1.8GHz), 0MB RAM	805168	805168	805168

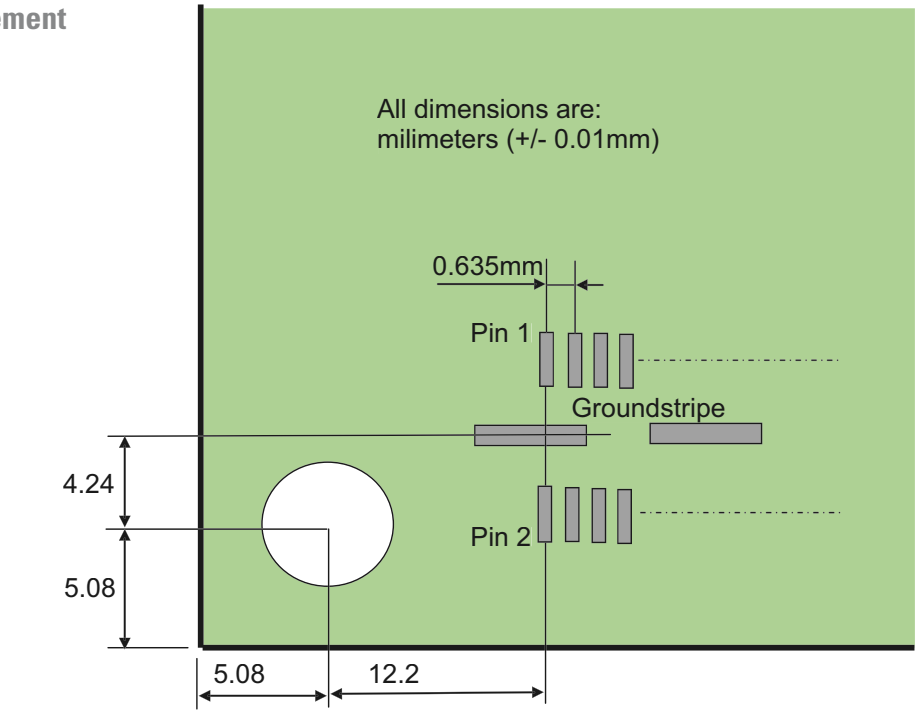
[1] Depending on cooler and CPU-performance.

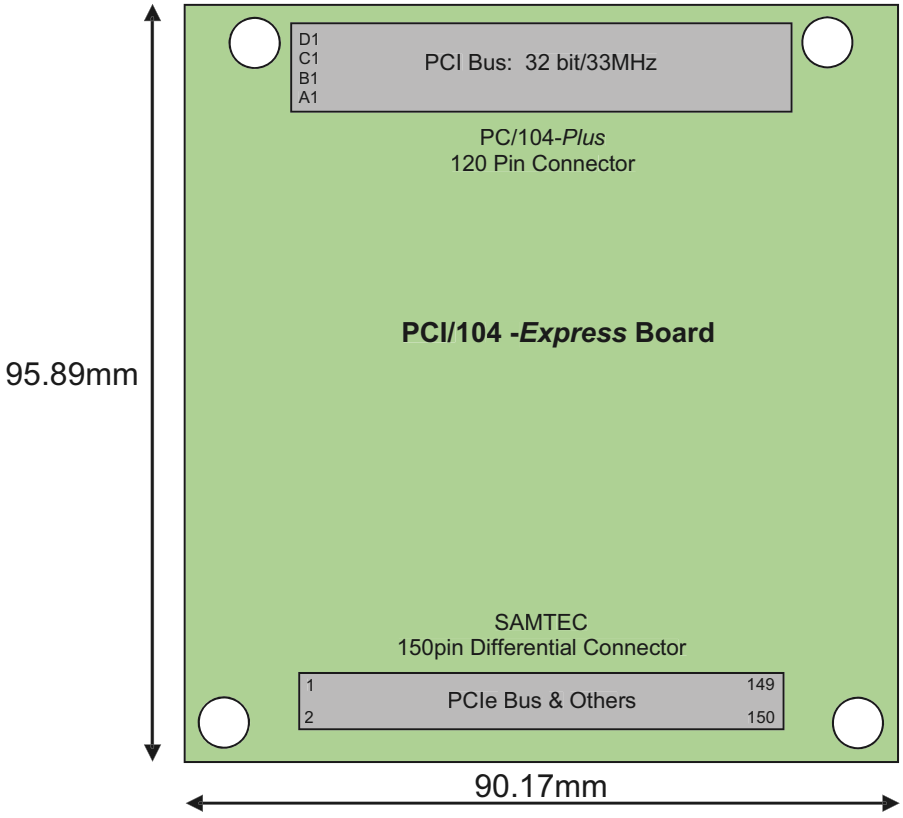
PCI/104-*Express*

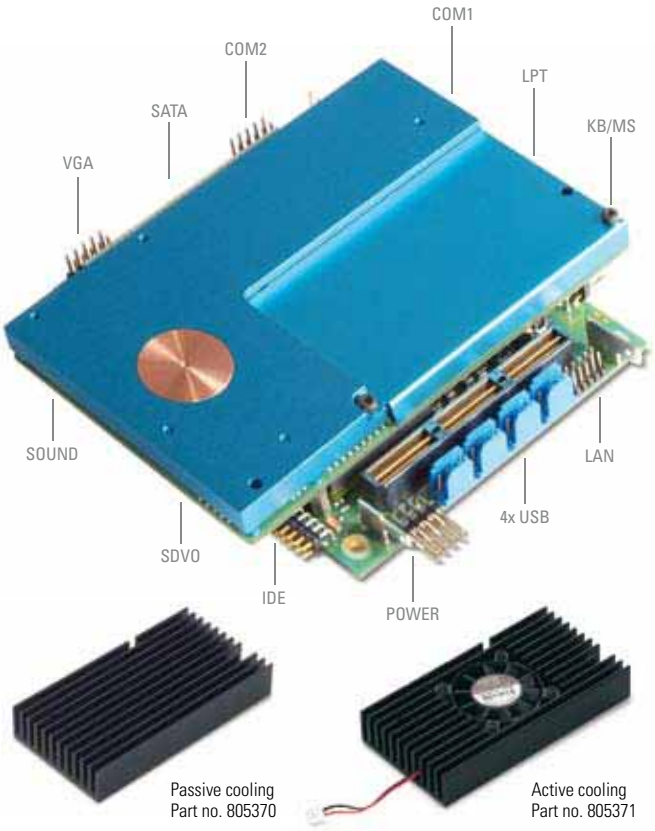
Pin	Signal	Signal	Pin
1	+5V	+5V standby	2
3	+5V standby	PM_WAKE#	4
5	GND	GND	6
7	PCIe_TX_0x1+	PCIe_TX_1x1+	8
9	PCIe_TX_0x1-	PCIe_TX_1x1-	10
11	GND	GND	12
13	PCIe_TX_3x1+	PCIe_TX_2x1+	14
15	PCIe_TX_3x1-	PCIe_TX_2x1-	16
17	GND	GND	18
19	PCIe_RX_0x1+	PCIe_RX_1x1+	20
21	PCIe_RX_0x1-	PCIe_RX_1x1-	22
23	GND	GND	24
25	PCIe_RX_3x1+	PCIe_RX_2x1+	26
27	PCIe_RX_3x1-	PCIe_RX_2x1-	28
29	GND	GND	30
31	PCIe_CK_0x1+	PCIe_CK_1x1+	32
33	PCIe_CK_0x1-	PCIe_CK_1x1-	34
35	GND	GND	36
37	PCIe_CK_3x1+	PCIe_CK_2x1+	38
39	PCIe_CK_3x1-	PCIe_CK_2x1-	40
41	GND	GND	42
43	+3.3V	+5V	44
45	PSON#	PWRGD	46
47	ExCard_PRSNT	PE_RST#	48
49	+5V	+5V	50
51	PCIe_TX_0x4(0)+	PCIe_TX_1x4(0)+	52
53	PCIe_TX_0x4(0)-	PCIe_TX_1x4(0)-	54
55	GND	GND	56
57	PCIe_TX_0x4(1)+	PCIe_TX_1x4(1)+	58
59	PCIe_TX_0x4(1)-	PCIe_TX_1x4(1)-	60
61	GND	GND	62
63	PCIe_TX_0x4(2)+	PCIe_TX_1x4(2)+	64
65	PCIe_TX_0x4(2)-	PCIe_TX_1x4(2)-	66
67	GND	GND	68
69	PCIe_TX_0x4(3)+	PCIe_TX_1x4(3)+	70
71	PCIe_TX_0x4(3)-	PCIe_TX_1x4(3)-	72
73	GND	GND	74
75	PCIe_RX_0x4(0)+	PCIe_RX_1x4(0)+	76
77	PCIe_RX_0x4(0)-	PCIe_RX_1x4(0)-	78
79	GND	GND	80
81	PCIe_RX_0x4(1)+	PCIe_RX_1x4(1)+	82
83	PCIe_RX_0x4(1)-	PCIe_RX_1x4(1)-	84
85	GND	GND	86
87	PCIe_RX_0x4(2)+	PCIe_RX_1x4(2)+	88
89	PCIe_RX_0x4(2)-	PCIe_RX_1x4(2)-	90
91	GND	GND	92
93	PCIe_RX_0x4(3)+	PCIe_RX_1x4(3)+	94
95	PCIe_RX_0x4(3)-	PCIe_RX_1x4(3)-	96
97	+5V	+5V	98
99	SDVO-Data	SDVO-Clock	100
101	PCIe_CK_1x4+	PCIe_CK_0x8_0x4+	102
103	PCIe_CK_1x4-	PCIe_CK_0x8_0x4-	104
105	GND	GND	106
107	+5V	+5V	108
109	+3.3V	CPU_Direction_In	110
111	GND	GND	112
113	SATA_TX0+	SATA_TX1+	114
115	SATA_TX0-	SATA_TX1-	116
117	GND	GND	118
119	SATA_RX0+	SATA _RX1+	120
121	SATA_RX0-	SATA_RX1-	122
123	GND	GND	124
125	Reserved	Reserved	126
127	Reserved	Reserved	128
129	GND	GND	130
131	Reserved	Reserved	132
133	Reserved	Reserved	134
135	GND	GND	136
137	USB_0+	USB_1+	138
139	USB_0-	USB_1-	140
141	USB_OC0#	USB_OC1#	142
143	+5V	+5V	144
145	+5V	SMB_CLK	146
147	SMB_DAT	SMB_ALERT	148
149	+12V	+12V	150

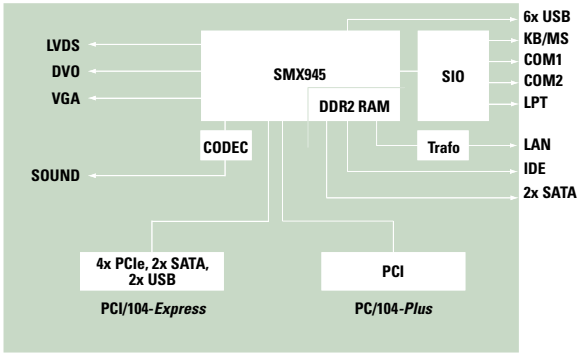
On the PCI/104-*Express* board the PCI Express bus is located at the place of the old ISA-bus connector. The PCI Express bus is stackable on both side with max. 4 peripheral boards. On the new PCI/104-*Express* bus are interfaced 8 PCI Express pairs, SDV, 2x SATA, 2x USB and SMB-signals.

PCI/104-*Express* connector placement









MSM945

Description

The MICROSPACE® MSM945 has all of the standard PC interfaces plus Ethernet LAN, optional DVI and LVDS interfaces (dual screen) and a sound controller. Equipped with the CPU Intel® Core™2 Duo L7400 in the DIGITAL-LOGIC smartModule SMX945 with COMexpress, this product has the highest performance on the PC/104 form factor. The PCI/104-*Express* bus (PCI & PCI Express) and 6 USB interfaces are available as functional extensions. By means of a PC/104-*Plus* ISA bridge card, an 8 bit ISA bus can be emulated from the 32 bit PCI bus. Power consumption, cooling method, ambient working temperature and performance are directly dependent on the smartModule945-xxxx.

Applications

_ Video streaming for HD videos
_ Dual screen applications
_ Image processing, video monitoring
_ Calculation-intensive data processing

Ordering information

Option/accessories	No.	Description
DDR2RAM256	890674	SODIMM DDR2RAM-Module 256MB
DDR2RAM512	890675	SODIMM DDR2RAM-Module 512MB
DDR2RAM1024	890676	SODIMM DDR2RAM-Module 1024MB
DDR2RAM2048	890677	SODIMM DDR2RAM-Module 2048MB*
Passive cooling	805370	SMX945 cooling without fan
Active cooling	805371	SMX945 cooling with fan
MSM945-LANCON	803220	LAN RJ45 interface
MSM945-DVICON	803240	DVI-D interface
MSM945DK	803218	Development-Kit
MSM945CKCON	802230	cablekit MSM945

* For 4GB RAM it is necessary to have two 2GB RAM modules.

Technical data

Type	MSM945	MSM945	
CPU	SMX945-xxx	SMX945B-xxx	
ISA-BUS (PCI/104)	-	-	
PCI-BUS	yes	yes	
PCI Express-BUS (PCI/104-*Express*)	yes, 6 Lanes	yes, 6 Lanes	
2nd Level cache (kB)	512-4096	512-4096	
Performance (MHz)	-	-	
DRAM Min-Max (MB)	256-2048 (1RAM socket)	512-4096 (2RAM socket)	
CompactFlash socket	-	-	
Keyboard, mouse (PS/2)	yes	yes	
BootDrive	FD, HD, CF, LAN, USB	FD, HD, CF, LAN, USB	
Floppy interface	-	-	
IDE interface P-ATA	1x	1x	
IDE interface S-ATA	2x	2x	
COM1	RS232C	RS232C	
COM2	RS232C	RS232C	
COM3	-	-	
COM4	-	-	
LPT1	yes	yes	
USB (2.0)	6x + (2x on PCI/104-*Express*)	6x + (2x on PCI/104-*Express*)	
LAN port 1 onboard trafo	10/100BASE-T	10/100BASE-T	
LAN port 2	-	-	
Audio	AC97-7.1, HDA	AC97-7.1, HDA	
Video controller	i945GM	i945GM	
Video memory (MB)	8-224	8-224	
LCD interface	SDVO	SDVO	
DVI interface (option 803240)	Option	Option	
CRT interface	yes	yes	
Video input	-	-	
Watchdog	yes	yes	
Power normal	typ. 10-20W	typ. 10-20W	
Power suspend	0.1W	0.1W	
Power management	yes	yes	
RTC battery onboard	80mAh (or ext. 400mAh)	80mAh (or ext. 400mAh)	
Cooling type	active	active	
Operating temperature	see SMX945	see SMX945B	
Extended operating temperature	see SMX945	see SMX945B	
Size (W x L in mm)	90/117 x 96/99	90/117 x 96/99	
Weight	250 g	250 g	
MTBF	>200'000h	>200'000h	
Special features 1	-	-	
Special features 2	-	-	
Special features 3	-	-	
Part no. (without RAM, without SMX945)	803200	803200	

CPU's

Article	Description	No.	No.	No.
SMX945-L7400	Intel® Core™2 Duo-L7400, OMB RAM	805352	805452	
SMX945-L2400	Intel® Core™ Duo-L2400, OMB RAM	805350	805450	
SMX945-C423	Intel® Celeron® M 423, OMB RAM	805360	805460	

Highlights

_ CAN Controller
_ 2 channels
_ VECTOR-CAN drivers
_ Ver. 2.0
_ Modular interface converter
_ PC/104: pass-through

MSMC104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMC104+ has a VECTOR-compatible CAN controller. The product enables a 2-channel connection to the CAN bus. All VECTOR CAN interface modules can be attached. Also, the licensed VECTOR driver for Windows is available. The VECTOR CAN tools provide analysis and monitoring of the CAN bus. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

Applications

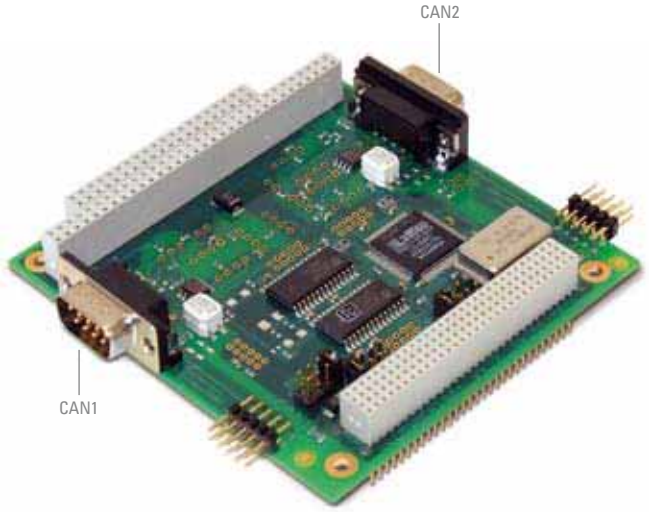
_ Connection to the vehicle CAN bus
_ CAN bus analyzer
_ Measuring technology for vehicles

Technical data

Type	**MSMC104+**
Function	CAN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	VECTOR
Memory	-
1. interface	1. channel
2. interface	2. channel
3. interface	-
Power normal	3.3V/5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd.
Size (W x L x H in mm)	90 x 96 x 17
Weight	106 g
Softwaresupport	WIN
MTBF	100'000h
Special features 1	Required 1-2x CAN piggy
Special features 2	-
Special features 3	-
Part no.	801645

Option/accessories

Article	Description	No.
CAN piggy 251	Std-CAN port	814272
CAN piggy 1054	1MB-CAN port	814276



Highlights

_ CAN controller
_ Ver.2.0
_ 2 channels
_ PC/104: pass-through

MSMCA104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMCA104+ has two CAN controllers. The CAN controllers are design-compatible with the PEAK CAN cards and use the licensed PEAK driver software for Windows and Linux. The two CAN controllers are connected by a FPGA to the 32 bit PCI bus and require only one PCI resource.

Applications

_ Measurement engineering
_ Vehicle bus
_ PLC connection

Technical data

Type	**MSMCA104+ISOL**
Function	CAN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	Peak-CAN
Memory	-
1. interface	CAN 9p. DSUB
2. interface	CAN 9p. DSUB
3. interface	-
Power normal	3.3V/5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd.
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	Win, Linux
MTBF	200'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	801765

Option/accessories

Article	Description	No.

Highlights

_ CAN-Controller
_ Ver.2.0
_ 2 channels
_ 500V isolation
_ PC/104: pass-through

MSMCA104+ISOL

Description

The MICROSPACE® PC/104-*Plus* extension card MSMCA104+ ISOL has two CAN controllers. The two CAN interfaces are electrically isolated in the MSMCA104+ISOL (500V). The CAN controllers are design-compatible with the PEAK CAN cards and use the licensed PEAK driver software for Windows and Linux. The two CAN controllers are connected by a FPGA to the 32 bit PCI bus and require only one PCI resource.

Applications

_ Measurement engineering
_ Vehicle bus
_ PLC connection

Technical data

Type	**MSMCA104+ISOL**
Function	CAN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	Peak-CAN
Memory	-
1. interface	CAN 9p. DSUB
2. interface	CAN 9p. DSUB
3. interface	-
Power normal	3.3V, 5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd.
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	Win, Linux
MTBF	200'000h
Special features 1	500V isolated
Special features 2	-
Special features 3	-
Part no.	801760

Option/accessories

Article	Description	No.

Highlights

_ 100/10 MBit/s Ethernet
_ RJ45 connector
_ LAN BOOT
_ PC/104: pass-through

MSME104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSME104+ has a 100/10Mbit/s Ethernet controller from Intel®. The product can be connected to a 100/10Mbit Ethernet LAN using an RJ45 cable. The drivers for Windows, Linux and other operating systems are available. Booting from the LAN is possible with the onboard boot flash device. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

Applications

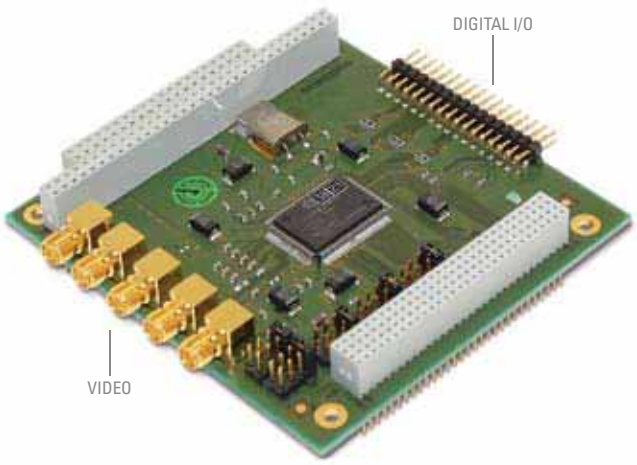
_ Connection to the Ethernet
_ Industrial control with Ethernet

Technical data

Type	**MSME104+**
Function	Ethernet LAN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	i82551
Memory	32KB
1. interface	RJ45
2. interface	-
3. interface	-
Power normal	3.3V
Power management	-
Operating temperature	-25°C to + 70°C
Extended operating temperature	-40°C to + 85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	WIN, CE, Linux
MTBF	100'000h
Special features 1	100/10MBit/sec.
Special features 2	-
Special features 3	-
Part no.	801600

Option/accessories

Article	Description	No.



Highlights

_ Video framegrabber
_ 4 channels
_ PAL, 30fps
_ Digital I/O programmable
_ PC/104: pass-through

MSMG104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMG104+ has a BT878 frame grabber with a 4-channel video multiplexer. Three video cameras (CVBS) and an Svideo camera can be connected to the product. Bandwidth is PAL resolution with 30 frames/sec. (fps). PAL or NTSC can be toggled with software. The 32 bit 33MHz PCI bus permits 2 video streams in PAL resolution with 30 fps. More cameras (3 to 4) are possible with a reduced number of frames or lower resolution (by using multiple MSMG104+ cards). Drivers for Windows and Linux are available. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

Applications

_ Image recording (digitizing)
_ Security technology
_ Image evaluation

Technical data

Type	**MSMG104+**
Function	Video Framegrabber
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	BT878A
Memory	-
1. interface	1. channel CVBS
2. interface	2. channel CVBS
3. interface	3. channel CVBS /SVideo
Power normal	5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	120 g
Softwaresupport	WIN, CE, Linux
MTBF	100'000h
Special features 1	Digital I/O
Special features 2	-
Special features 3	-
Part no.	801610

Option/accessories

Article	Description	No.

Highlights

_ 1Gbit/sec. Ethernet LAN
_ Boot from LAN
_ PC/104: pass-through

MSMGE104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMGE104+ has a 1GB LAN controller. The product can be connected to the 1GB/s Ethernet and has a data transmission speed of 1000/100/10Mbit/sec. Drivers for Windows and Linux are available. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

Applications

_ Connection to a 1GB Ethernet LAN
_ Video transmission

Technical data

Type	**MSMGE104+**
Function	1Gigabit-LAN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	i82541
Memory	32kB
1. interface	RJ45
2. interface	-
3. interface	-
Power normal	3.3V
Power management	-
Operating temperature	-25°C to + 70°C
Extended operating temperature	-40°C to + 85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	100 g
Softwaresupport	WIN, Linux
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	801690

Option/accessories

Article	Description	No.

BUS PC/104-*Plus* ISA 8Bit 16Bit No PCI 32Bit No PCIe

Highlights

_ ISDN interface
_ PC/104: pass-through

MSMI104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMI104+ has an ISDN controller. The product can be connected to an ISDN network and transfers data at 64 Mbit/s. CAPI drivers for Windows are available. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

Applications

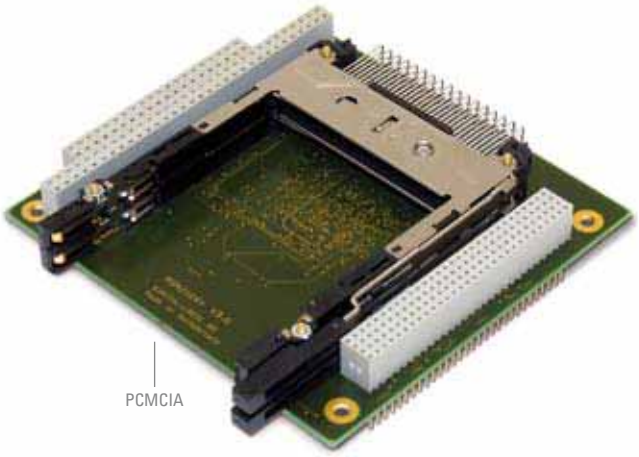
_ Data transfer via ISDN network
_ 64kBit/s data transfer

Technical data

Type	**MSMI104+**
Function	ISDN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	Cologne
Memory	-
1. interface	RJ45
2. interface	-
3. interface	-
Power normal	3.3V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd.
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	WIN2K, XP
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	801640

Option/accessories

Article	Description	No.



Highlights

_ Dual PCMCIA / PCCard
_ Type I/II
_ Onboard 12V generator
_ Hotplug
_ PC/104: pass-through

MSMJ104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMJ104+ has a PCCard bridge for 2 PCCard sockets. The product can take 2 type II PCCards or one type III PCCard. The drivers for the TI1520 PCCard bridge are already integrated in Windows and Linux. 12V is generated onboard so that the programming voltage of 12V/50mA is available. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

Applications

_ SCSI PCCard
_ WLAN PCCard
_ GSM PCCard
_ ISDN PCCard

Technical data

Type	**MSMJ104+**
Function	Dual PCMCIA
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	TI1520
Memory	-
1. interface	1. slot PCCard
2. interface	2. slot PCCard
3. interface	-
Power normal	3.3V/5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	120 g
Softwaresupport	WIN, CE, Linux
MTBF	100'000h
Special features 1	12Volt Generator
Special features 2	-
Special features 3	-
Part no.	801630

Option/accessories

Article	Description	No.

Highlights

_ MiniPCI III adapter
_ Local 3.3V and 1.5V regulator
_ LED's for LAN status
_ AC sound signal
_ PC/104: pass-through

MSMP104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMP104+ has a MiniPCI base. The product can use any MiniPCI card (3.3V and 1.5V) on the PC/104-*Plus* bus. The status LEDs as well as support for 1.5V MiniPCI cards are onboard. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

Applications

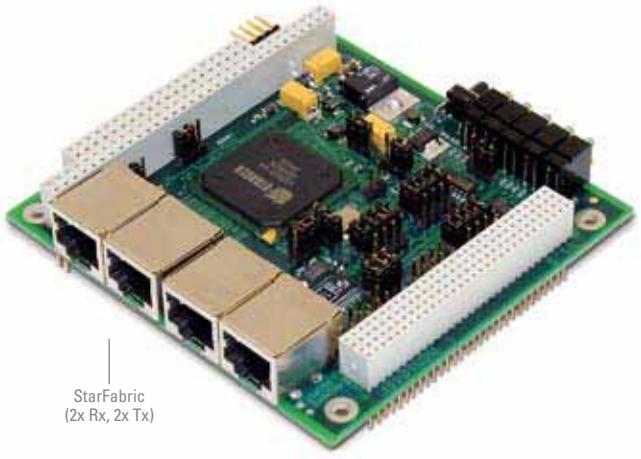
_ Converters for MiniPCI cards
_ LAN MiniPCI
_ WLAN MiniPCI
_ SCSI MiniPCI
_ ISDN MiniPCI
_ NETX MiniPCI (universal field bus card

Technical data

Type	**MSMP104+**
Function	MiniPCI adapter
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	-
Memory	-
1. interface	MiniPCI Type 3
2. interface	-
3. interface	-
Power normal	5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	-
MTBF	200'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	801680

Option/accessories

Article	Description	No.



Highlights

_ StarFabric bridge
_ 2 channels
_ PCI to StarFabric
_ StarFabric to PCI
_ PC/104: pass-through

MSMSF104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMSF104+ has a StarFabric with 4x 2.5 Gbit transfer channels. This card in slave mode can distribute the PCI bus from one CPU card via StarFabric (2x CAT 5 cable) and in master mode generate PCI buses (like a CPU card), which contact up to 4 peripheral boards, out of the StarFabric network decentrally. The StarFabric bus works fully transparently like a PCI to PCI bridge. Thus very complex networks with up to 256 segments each with a length of 100 meters can be designed.

Applications

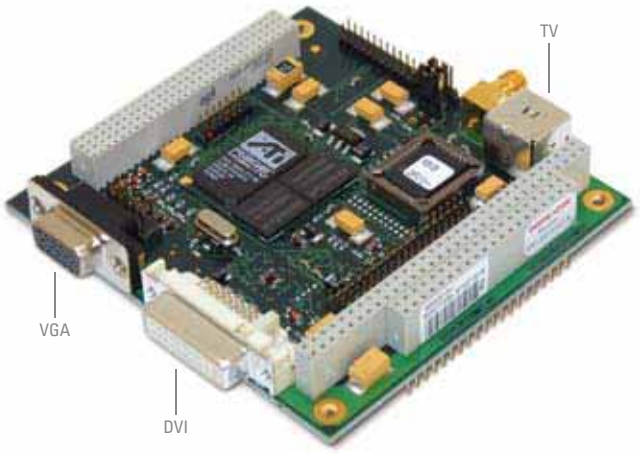
_ Decentral PCI measurement cards
_ Neural high-speed networks
_ Redundant fault-tolerant networks

Technical data

Type	**MSMSF104+**
Function	StarFabric
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	SF2010
Memory	-
1. interface	4x RJ45
2. interface	-
3. interface	-
Power normal	3.3V/5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +70°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	120 g
Softwaresupport	WINXP
MTBF	200'000h
Special features 1	Master mode
Special features 2	Slave mode
Special features 3	-
Part no.	801670

Option/accessories

Article	Description	No.



Highlights

_ ATi Rage Mobility video chip
_ 8MB video RAM
_ MPEG2 decoding
_ Max. 1600 x 1200 resolution
_ LVDS, DVI, CRT
_ PC/104: pass-through

MSMVB104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMVB104+ has an M1 3D video controller from ATI (new AMD). An analogue VGA output and an LVDS or DVI output are available, whereby 2 different pictures can be represented at the same time. Drivers are available for Windows and Linux. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

Applications

_ DVD / video streaming with MPEG2 decoder
_ 3D video
_ Dual screen for information systems

Technical data

Type	**MSMVB104+**
Function	Video controller
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	ATi-M1
Memory	8MB
1. interface	CRT max. 1600 x 1200
2. interface	DVI max. 1280 x1024
3. interface	LVDS max. 1280 x1024
Power normal	5V, 3.3V, 3W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd.
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	WIN2K, XP, Linux, QNX, VxWorks
MTBF	100'000h
Special features 1	reprogrammable BIOS
Special features 2	-
Special features 3	-
Part no.	801627

Option/accessories

Article	Description	No.

Highlights

_ IEEE 1394 Firewire
_ 2 channels
_ 400MBit/sec.
_ Hotplug
_ PC/104: pass-through

MSMW104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMW104+ has a IEEE1394A Firewire controller. There are 2 400 Mbit/s channels available. The drivers are already integrated in Windows and Linux. The peripheral systems are supplied with 12V. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

Applications

_ Measurement engineering
_ Video recording (camera)
_ Firewire network

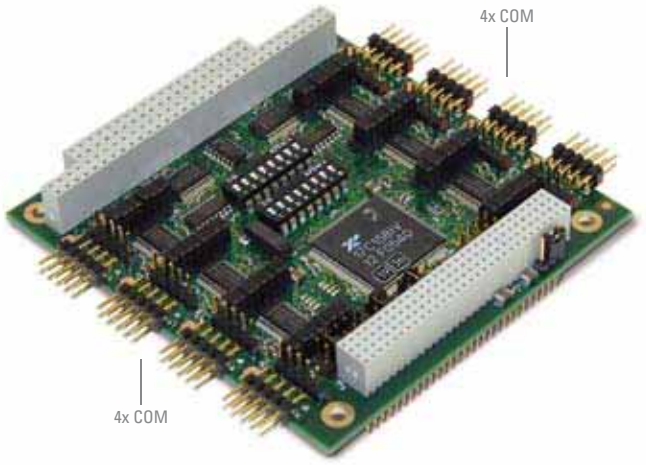
Technical data

Type	**MSMW104+**
Function	Firewire
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	TSB43AB22
Memory	-
1. interface	IEEE 1394
2. interface	IEEE 1394
3. interface	-
Power normal	3.3V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +70°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	WIN, Linux
MTBF	>200'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	801650

Option/accessories

Article	Description	No.

BUS PC/104-*Plus* ISA 8Bit 16Bit No PCI 32Bit No PCIe



Highlights

_ Serial communication
_ 4 channels RS232C
_ 4 channels RS485
_ PC/104: pass-through

MSMX104+

Description

The MICROSPACE® PC/104-*Plus* extension card MSMX104+ has an 8x UART controller from EXAR. There are 8 channels available; RS232C or RS485 interfaces can be selected. Drivers are available for Windows and Linux. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

Applications

_ 8-channel serial interface
_ High-speed UART
_ Protocol converter

Technical data

Type	**MSMX104+**
Function	8x serial
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	PC/104-*Plus*
BUS compatibility	PCI
Controller	EXAR
Memory	-
1. interface	8x 10pin header
2. interface	RS232C (4x)
3. interface	RS485 (4x)
Power normal	3.3V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	WIN, Linux
MTBF	>200'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	801660

Option/accessories

Article	Description	No.

Highlights

_ 10MB Ethernet LAN
_ RJ45 10Base-T interface
_ Coaxial 10Base-2 interface
_ PC/104-ISA bus

MSME104

Description

The PC/104 LAN card is based on the SMC91C96 LAN controller. The 10MBit/s Ethernet LAN is integrated as RJ45 and as coaxial connection. The drivers for DOS, Windows and Linux and are available.

Applications

_ LAN interface in ISA bus systems
_ 10Base-2 LAN networks

Technical data

Type	**MSME104R**
Function	10MB-LAN
ISA-BUS	yes
PCI-BUS	-
PCI Express-BUS	-
BUS compatibility	PC/104
Controller	SMC91C96
Memory	-
1. interface	10 BASE-2 (coaxial)
2. interface	10 BASE-T (RJ45)
3. interface	-
Power normal	5V/0.5A
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	DOS, Linux, WIN
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	806018

Option/accessories

Article	Description	No.
MSME104B		806008

Highlights

_ 2 disks on chip
_ Solid state drive
_ Max. 2x 144MB
_ ISA bus

MSMF104

Description

The MICROSPACE® PC/104 extension card MSMF104 has two DiskOnChip bases to be able to install two DOC modules. The product permits 1-2 solid state disks together with the DOS modules. Drivers are available for Windows and Linux. The card is connected via the ISA bus.

Applications

_ Solid state disk
_ Sockets for DOC modules

Technical data

Type	**MSMF104 -2D**
Function	Flashdisk
ISA-BUS	yes
PCI-BUS	-
PCI Express-BUS	-
BUS compatibility	PC/104
Controller	-
Memory	2x DOC2000
1. interface	-
2. interface	-
3. interface	-
Power normal	5V, 0.1A
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	DOS, WIN
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	806020

Option/accessories

Article	Description	No.

Highlights

_ Wide range power supply
_ UPS function with accumulator

MSMPS104 und MSMBAT 104

Description

The MICROSPACE® PC/104 extension card MSMPS104 has multiple power supplies. Output voltages of 5V and 12V are generated from an input voltage of 8 to 30V. As an option, a rechargeable battery can be connected to enable UPS functionality. A battery charging regulator is onboard that communicates with the CPU via SM bus. The card is connected via the ISA bus.

Applications

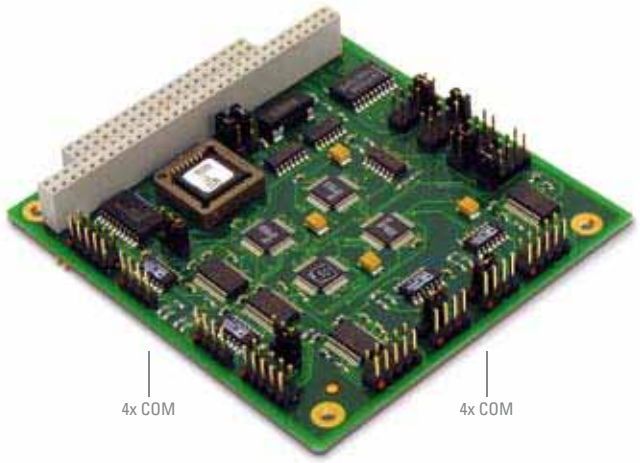
_ Wide range current supply for PC/104 cards
_ UPS function

Technical data

Type	**MSMPS104**
Function	Power supply
ISA-BUS	-
PCI-BUS	-
PCI Express-BUS	-
BUS compatibility	-
Controller	-
Memory	-
1. interface	Supply input 8V-15V DC
2. interface	-
3. interface	-
Power normal	-
Power management	-
Operating temperature	-25°C to + 60°C
Extended operating temperature	-
Size (W x L x H in mm)	90 x 96 x 17
Weight	120 g
Softwaresupport	-
MTBF	100'000h
Special features 1	Output1: 5V, 15A
Special features 2	Output2: 12V, 2A
Special features 3	Option 806030 with charger
Part no.	806032

Option/accessories

Article	Description	No.
MSMBAT	Battery 9.6V 700mAh	806031
MSMPS104UPS	Supply with charger	806030



Highlights

_ 4-channel serial
_ RS232C, RS422, RS485
_ ISA bus

MSMX104

Description

The MICROSPACE® PC/104 extension card MSMX104 has a 4x UART controller. There are 4 channels available; RS232C or RS485 interfaces can be selected. Drivers are available for Windows and Linux. The card is connected to the 16 bit ISA bus.

Applications

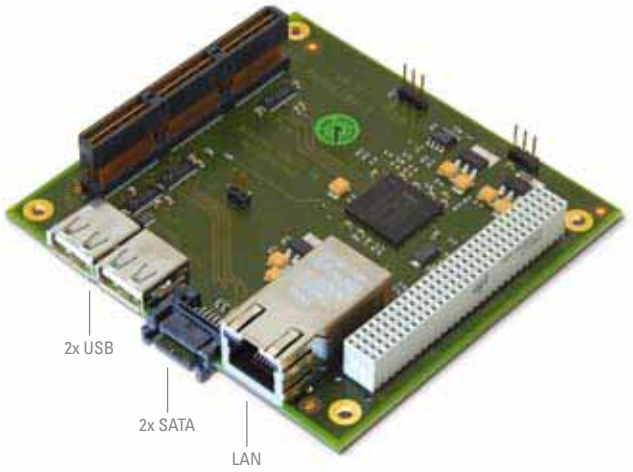
_ 4-channel serial interface
_ High-speed UART
_ Protocol converter

Technical data

Type	**MSMPS104**
Function	4x serial
ISA-BUS	yes
PCI-BUS	-
PCI Express-BUS	-
BUS compatibility	PC/104
Controller	4x 16C550
Memory	-
1. interface	4x COM RS232
2. interface	-
3. interface	-
Power normal	5V, 0.3A
Power management	-
Operating temperature	-25°C to + 70°C
Extended operating temperature	-40°C to + 85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Softwaresupport	DOS, WIN, Linux
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	806011

Option/accessories

Article	Description	No.



Highlights

_ 1GB-LAN
_ PCI Express bus
_ 2x USB
_ 2x SATA

MSMGE104EX

Description

The MICROSPACE® PCI/104-*Express* extension card MSMGE-104EX has a PCI Express 1GB LAN controller. The product permits connection to the 1GB/s Ethernet and by means of the PCI Express bus (2.5GB/s) provides full utilization of the bandwidth of the 1GB network. Drivers are available for Windows and Linux. The card is connected to the PCI Express bus by means of a lane and requires an MSM945 CPU card. Both USB channels and the two SATA channels of the PCI/104-*Express* buses are connected to corresponding plugs.

Applications

_ Connection to a 1GB Ethernet LAN
_ High-speed network
_ Video transmission

Technical data

Type	**MSMG104 EX**
Function	1GB-LAN
ISA-BUS	-
PCI-BUS	-
PCI Express-BUS	yes
BUS Compatibility	PCI/104-*Express*
Controller	PC82573L
Memory	-
1. interface	1GB-LAN
2. interface	2x USB
3. interface	2x SATA
Power normal	3.3V, 1A
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-
Size (W x L x H in mm)	90 x 96 x 17
Weight	120 g
Softwaresupport	WINXP, Linux
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	801730

Option/accessories

Article	Description	No.

Highlights

_ PCI to ISA bridge

MSMPI104EX

Description

The MICROSPACE® PC/104 extension card MSMPI104EX has an ISA bridge.

Applications

_ Connecting ISA cards

Technical data

Type	**MSMPI104EX**
Function	ISA bridge
ISA-BUS	yes
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PCI/104-*Express*
Controller	IT8888
Memory	-
1. interface	-
2. interface	-
3. interface	-
Power normal	3.3/5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd
Size (W x L x H in mm)	90 x 96 x 17
Weight	100 g
Softwaresupport	WIN, Linux
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	801732

Option/accessories

Article	Description	No.

Highlights

_ **SCSI 320**
_ **PCI/104-*Express* bus**

MSMS104EX

Description

The MICROSPACE® PCI/104-*Express* extension card MSMS104EX has a SCSI controller. The product provides a SCSI 320 connection to enable up to 7 mass storage devices to be connected. The PCI Express bus (2.5GB/s) enables the full SCSI bandwidth to be used. Drivers are available for Windows and Linux. The product is connected to the PCI Express bus by means of a lane and requires an MSM945 CPU card.

Applications

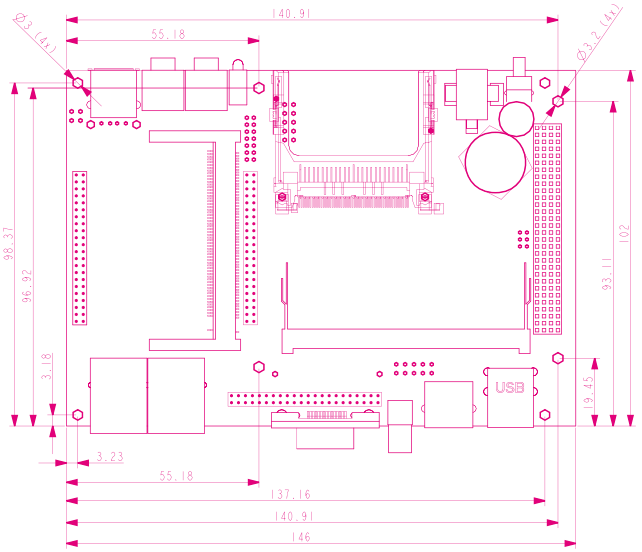
_ Connecting SCSI hard disks
_ Connecting SCSI tapes

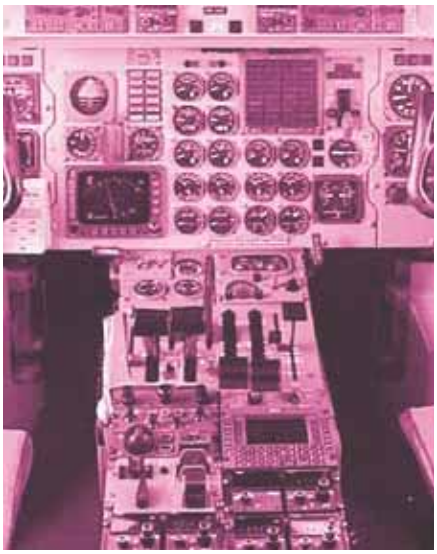
Technical data

Type	**MSMS104 EX**
Function	SCSI
ISA-BUS	-
PCI-BUS	-
PCI Express-BUS	yes
BUS compatibility	PCI/104-*Express*
Controller	Adapter
Memory	-
1. interface	SCSI
2. interface	-
3. interface	-
Power normal	3.3/5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd
Size (W x L x H in mm)	90 x 96 x 17
Weight	100 g
Softwaresupport	WIN, Linux
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no.	801735

Option/accessories

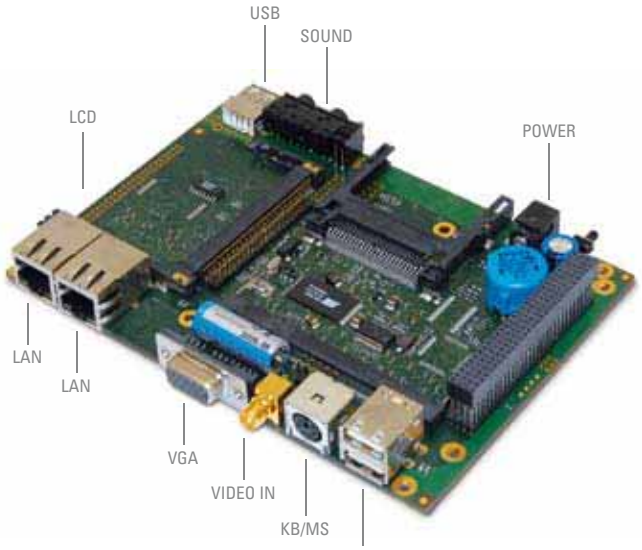
Article	Description	No.



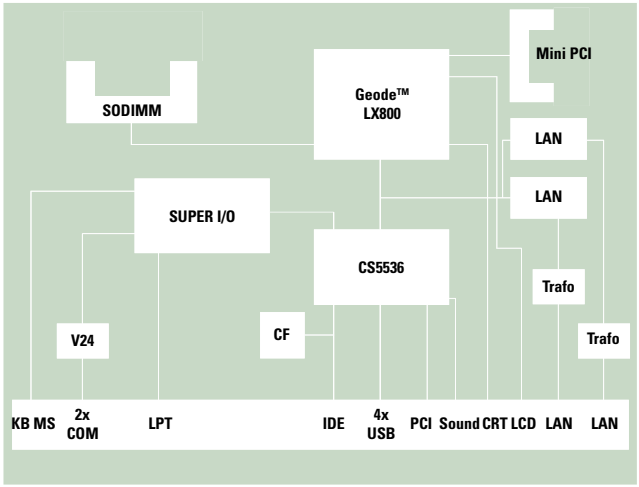


3.5"-SBC Formfactor

The 3.5" SBC boards differ from the PC/104 board primarily in that for all interfaces the EMC filtered standard plug is on the board. This means there is no wiring as is the case with PC/104 boards. The form factor is derived from the size of a 3.5" hard disk and has practically become a standard. With dimensions of 102 x 146 mm, the 3.5" SBCs are the smallest single board computers and can be integrated nearly wirelessly in a housing. To optimize the cooling, the processor is located on the underside of the board, which enables direct connection to the housing. This means passive cooling does not have to be set up. For evaluation of the 3.5" SBC, the CE/EMC certified MPC20 systems are available, each of which is integrated into an MSB board.



(MSB800)



MSB800/L

Description

The MICROSPACE® MSB800/L 3.5" single board computer has all of the standard PC interfaces plus a second Ethernet LAN, a USB disk module (up to 4GB), video input for a video camera, and stereo sound controller. In contrast to the PC/104-*Plus* cards, all interfaces are connected to standard plugs; this means low-cost, cableless housing integration. The PCI/104 bus (32 bit PCI), MiniPCI base and 4 USB interfaces are available as functional extensions. Wide range power supply is also onboard so that cost-effective power supply units can be used.

Applications

_ Information terminals
_ Control of interactive devices
_ Play systems with music output
_ Measuring instruments
_ Telecommunication devices

Ordering information

Option/accessories	No.	Description
DDR-RAM128	860696	DDR-SODIMM-Module 128MB
DDR-RAM256	860670	DDR-SODIMM-Module 256MB
DDR-RAM512	860671	DDR-SODIMM-Module 512MB
DDR-RAM1024	860672	DDR-SODIMM-Module 1024MB

Technical data

Type	MSB800	MSB800L
CPU	LX800	LX800
ISA-BUS	-	-
PCI-BUS	yes (PCI/104), short	-
PCI Express-BUS	-	-
2nd Level cache (kB)	128	128
Performance (MHz)	500	500
DRAM Min-Max (MB)	128-1024	128-1024
CompactFlash socket	yes, typ. II	yes, typ. II
Keyboard, mouse (PS/2)	yes	yes
BootDrive	HD, CF, USB, LAN	HD, CF, USB, LAN
Floppy interface	-	-
IDE interface P-ATA	1x	1x
IDE interface S-ATA	-	-
COM1	RS232C (802205)	-
COM2	RS232C (802205)	-
COM3	-	-
COM4	-	-
LPT1	yes (802205)	yes
USB (2.0)	4x	4x
LAN port 1 incl. onboard trafo	10/100BASE-T	10/100BASE-T
LAN port 2 incl. onboard trafo	10/100BASE-T	-
Audio	Stereo In/Out	Stereo In/Out
Video controller	LX800	LX800
Video memory (MB)	16 (UMA)	16 (UMA)
LCD interface	-	-
DVI interface	-	-
CRT interface	yes	yes
Video input	yes	-
Watchdog	yes	yes
Power normal	8V-30V/10W	8V-30V/10W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	400mAh (>10 years)	external
Cooling type	passive	-
Operating temperature	-25°C to +70°C	0°C to +60°C
Extended operating temperature	-40°C to +85°C	-
Size (W x L x H in mm)	146 x 102 x 20	146 x 102 x 20
Weight	200 g	200 g
MTBF	>200'000h	>200'000h
Special features 1	MiniPCI-socket	MiniPCI-socket
Special features 2	-	-
Special features 3	-	-
Part no.	802200	802201

Option/accessories

Article	Description	No.	No.	No.
MSB800CON	COM1, LPT-Expansion	802205	-	
MSB800-CK	cablekit			

(MPC20)

rearview
(MPC20)

rearview
(MPC21)

MPC20/21

Description

The MICROSPACE® MPC20/21 computer system has the MSB800 board and its interfaces. It boots from CompactFlash, LAN, USB, internally mounted USB flash disk (uDOC) or from the optionally integrated 2.5" hard disk. The MPC20 is 27 mm in height and the smallest computer of its kind. In addition to the MPC20 functions, the MPC21 (46 mm in height) has 2 COMs, LPT and a PCI/104 slot. The MiniPCI base makes it possible to integrate WLAN or field buses. If field buses (MiniPCI) and WLAN (MiniPCI) are both used, the second MiniPCI base is upgraded with MSMP104+. Power is supplied directly with 12/24V or with a 110/220V power supply unit.

Applications

_ Cost-effective information terminals (LAN, VGA)
_ Control of interactive devices
_ Firewall (2 Ethernet LANs)
_ Measuring instruments (integrated PCI/104 measurement card)

Ordering information

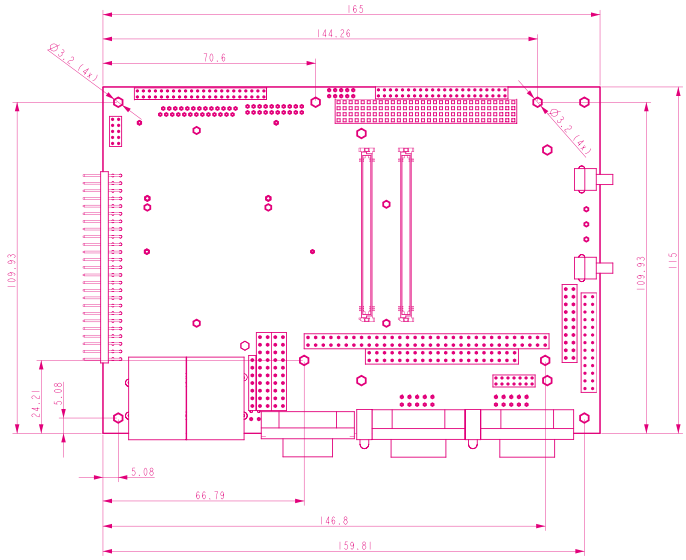
Option/accessories	No.	Description
Upgrade	815060	256 to 512MB memory
Upgrade	815062	256 to 1GB memory

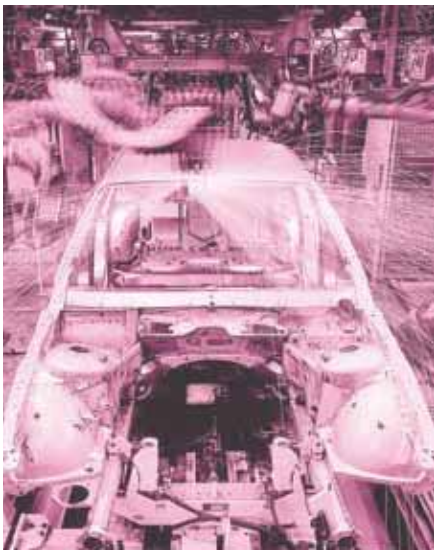
Technical data

Type	MPC20	MPC21	
CPU	LX800	LX800	
ISA-BUS	-	-	
PCI-BUS	-	1slot PCI/104	
PCI Express-BUS	-	-	
2nd Level cache (kB)	128	128	
Performance (MHz)	500	500	
DRAM Min-Max (MB)	256 (max. 1GB)	256 (max. 1GB)	
CompactFlash socket (Type I/II)	yes	yes	
Keyboard, mouse (PS/2)	yes	yes	
BootDrive	CF, USB, LAN, opt. HD	CF, USB, LAN, opt. HD	
Floppy interface	-	-	
IDE interface P-ATA	(1x option)	(1x option)	
IDE interface S-ATA	-	-	
COM1	-	RS232C	
COM2	-	RS232C	
COM3	-	-	
COM4	-	-	
LPT1	-	yes	
USB (2.0)	4x	4x	
LAN Port 1	10/100BASE-T	10/100BASE-T	
LAN port 2	10/100BASE-T	10/100BASE-T	
Audio	Stereo In/Out	Stereo In/Out	
Video controller	LX800	LX800	
Video memory (MB)	16 (UMA)	16 (UMA)	
LCD interface	-	-	
DVI interface	-	-	
CRT interface	yes	yes	
Video input	-	yes	
Watchdog	yes	yes	
Power normal	8V-30V/10W	8V-30V/10W	
Power suspend	0.1W	0.1W	
Power management	yes	yes	
RTC battery onboard	400mAh (>10 years)	400mAh (>10 years)	
Cooling type	passive	passive	
Operating temperature (without harddisk)	-25°C to +70°C	-25°C to +70°C	
Extended operating temperature	-	-	
Size (W x L x H in mm)	160 x 110 x 27	160 x 110 x 46	
Weight	500 g	700 g	
MTBF	>200'000h	>200'000h	
Special features 1	MiniPCI-socket	MiniPCI-socket	
Special features 2	-	PCI/104-slot	
Special features 3	-	-	
Part no.	812020	812021	

Option/accessories

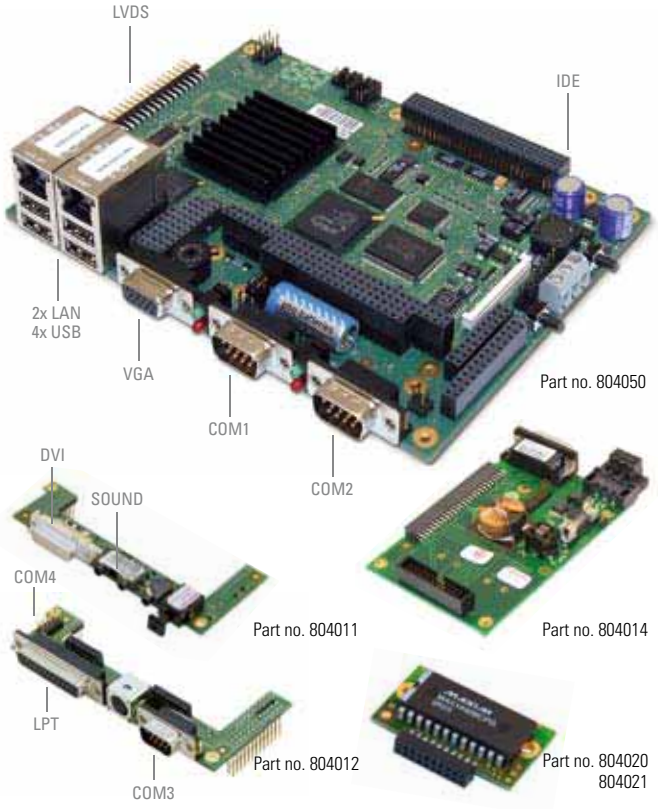
Article	Description	No.	No.	No.
HD40GB	40GB-Harddisk	807460	807460	
HD40GBExt.	40GB-Harddisk erweiterte Temp.	807462	807462	
UFD-1GB	1GB-USB-Flashdisk	807465	807465	

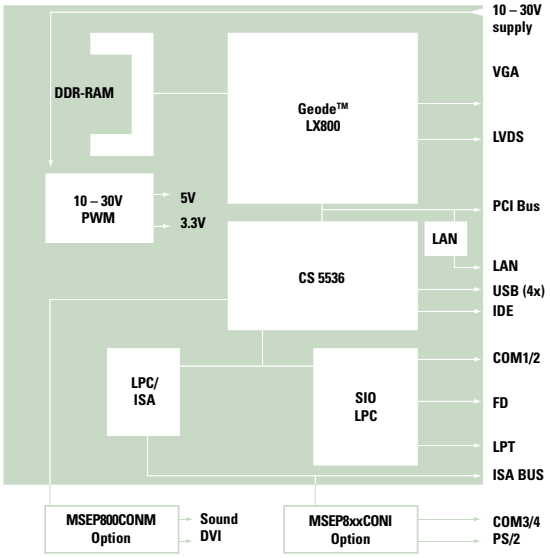




EPIC form factor

The EPIC form factor is a new, open industry standard for embedded computers. Size: 115 x 165 mm. As with the 3.5" SBC boards, all interface plugs are integrated on the board as EMC-filtered standardized plugs. This means there is no wiring as is the case with PC/104 boards. On DIGITAL-LOGIC's EPIC single board computer there is a PC/104-*Plus* slot which permits up to 3 ISA and/or PCI-PC/104-*Plus* cards. The EPIC boards are available with a wide range of performance bandwidths, from the AMD® LX800 (500MHz) to the Intel® Core™ Duo with (2x 1.6GHz). A low-cost variant (-L) has only minimal functionality. The EPIC boards can be integrated nearly cableless in a housing. The filtered and polarity-protected power supply covers a wide voltage range, thereby saving costs and complying with EMC standards. For cooling, passive heat dissipaters or heat pipes can be fitted to the housing. For evaluation of the EPIC embedded single board computers, the CE/EMC certified MPCV800/855 complete systems are available, each of which has an integrated DIGITAL-LOGIC EPIC board.





MSEP800/L

Description

The MICROSPACE® EPIC single board computer has all standard PC functions plus a second LAN, digital and analogue IOs and an expansion bus (PC/104-*Plus* and MiniPCI). All interfaces are connected by means of standardized plugs so that housing integration is nearly cableless. The typical power consumption of 10W means that no fan is necessary. The wide range power supply saves power costs.

Applications

_ Security technology (video input)
_ Control technology (field bus)
_ Measurement engineering

Ordering information

Option/accessories	No.	Description
DDR-RAM256	890670	DDR-SODIMM-Module 256MB
DDR-RAM512	890671	DDR-SODIMM-Module 512MB
DDR-RAM1024	890672	DDR-SODIMM-Module 1024MB
MSEP8xx-CK	802250	MSEP8xx cablekit

Technical data

Type	MSEP800	MSEP800L
CPU	LX800	LX800
ISA-BUS	8/16Bit	8/16Bit
PCI-BUS	yes, PC/104-*Plus*	Option 807003
PCI Express-BUS	-	-
2nd Level cache (kB)	128	128
Performance (MHz)	500	500
DRAM Min-Max (MB)	128-1024	128-1024
CompactFlash socket	yes	-
Keyboard, mouse (PS/2) (option 804012)	Option	-
BootDrive	HD, CF, USB, LAN, FD	HD, USB, LAN
Floppy interface	yes	-
IDE interface P-ATA	1x	1x
IDE interface S-ATA	-	-
COM1	RS232C (9pin DSub), RS422/485	RS232C (9pin DSub)
COM2	RS232C (9pin DSub), RS422/485	RS232C (9pin DSub)
COM3 (option 804012 and option 804020/21)	RS232C, RS485/22	-
COM4 (option 804012 and option 804020/21)	RS232C, RS485/22	-
LPT1 (option 804012)	yes	-
USB (2.0)	4x	4x
LAN port 1 onboard trafo	10/100BASE-T	10/100BASE-T
LAN port 2 onboard trafo	1GB-LAN	-
Audio (option 804011)	Stereo In/Out, MIC, SPDIF	Stereo In/Out, MIC, SPDIF
Video controller	LX800	LX800
Video memory (MB)	16 (UMA)	16 (UMA)
LCD interface	18Bit-LVDS (1600 x 1200)	-
DVI interface (option 804011)	Option	Option
CRT interface	yes	yes
Video input	Option 804055	-
Watchdog	yes	yes
Power normal	8V-30V/10W	8V-30V/10W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	400mAh (>10 years)	(external)
Cooling type	passive	-
Operating temperature	-25°C to +70°C	0°C to +60°C
Extended operating temperature	-40°C to +85°C	-
Size (W x L x H in mm)	165 x 115 x 25	165 x 115 x 25
Weight	200 g	200 g
MTBF	>200'000h	>200'000h
Special features 1	MiniPCI-socket, POD80	-
Special features 2	8ch x 8Bit analog input	-
Special features 3	24 Digital I/O	-
Part no.	804050	804060

Option/accessories

Article	Description	No.	No.	No.
MSEP800CONM	DVI + sound	804011	804011	
MSEP8xxCONI	CON3/4+LPT+PS2	804012	-	
MSEP8xxPWR	Filtered power	804014	804014	
ISO-RS422	Isolated RS422 for 804012	804020	-	
ISO-RS485	Isolated RS485 for 804012	804021	-	
Opt. LX800VINP	Videoinput LX800	804055	-	
Opt. EPIC-PC/104	Opt. PC/104-*Plus*	-	807003	

Part no. 815100

MPCV800

Description

This absolutely soundless and fanless DIGITAL-LOGIC computer for visualization and control applications is based on the AMD® Geode™ LX800 with passive cooling. The hard disk can be replaced by another hard disk or a rugged CompactFlash disk (art. no.815050) without needing to open the housing. Two internal PC/104-*Plus* (ISA & PCI) slots are available for functional extensions. For wiring additional functions there are 3 connector openings (X1, X2, X3) in the replaceable front panel. Power is supplied by means of a power supply unit or using terminals. There are 24 digitally programmable IO lines for the control system.

Applications

_ Control system computers
_ Automation computers
_ Data recording computers

Ordering information

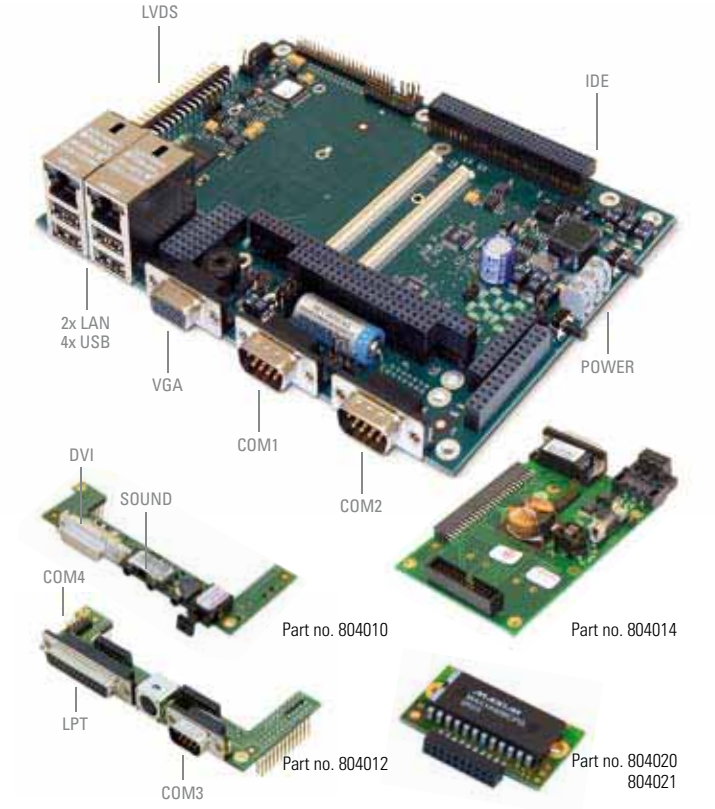
Option/accessories	No.	Description
Upgrade	815060	256 to 512MB memory
Upgrade	815062	256 to 1GB memory
Downgrade	815050	1x CompactFlash holder instead of hard drive

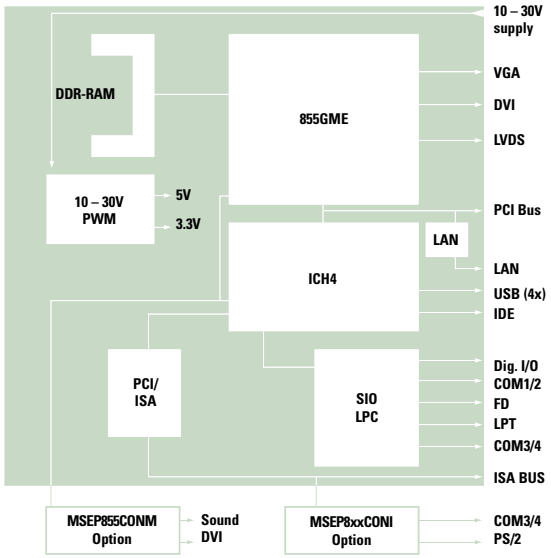
Technical data

Type	MPCV800	MPCV800I	MPCV800M
CPU	LX800	LX800	LX800
ISA-BUS	8/16Bit	8/16Bit	8/16Bit
PCI-BUS	PC/104-*Plus*	PC/104-*Plus*	PC/104-*Plus*
PCI Express-BUS	-	-	-
2nd Level cache (kB)	128	128	128
Performance (MHz)	500	500	500
DRAM Min-Max (MB)	256 (max. 1GB)	256 (max. 1GB)	256 (max. 1GB)
CompactFlash socket	Option	Option	Option
Keyboard, mouse (PS/2)	-	yes	-
BootDrive	HD, CF, USB, LAN	HD, CF, USB, LAN	HD, CF, USB, LAN
Floppy interface	-	-	-
IDE interface P-ATA	1x, 40GB-HD	1x, 40GB-HD	1x, 40GB-HD
IDE interface S-ATA	-	-	-
COM1	RS232C (9pin DSub)	RS232C (9pin DSub)	RS232C (9pin DSub)
COM2	RS232C (9pin DSub)	RS232C (9pin DSub)	RS232C (9pin DSub)
COM3 (option 804020/21)	-	RS232C, RS485/22	-
COM4 (option 804020/21)	-	RS232C, RS485/22	-
LPT1	-	yes	-
USB (2.0)	4x	4x	4x
LAN port 1 onboard trafo	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2 onboard trafo	1GB-LAN	1GB-LAN	1GB-LAN
Audio	-	-	Stereo, mic, SPDIF
Video controller	LX800	LX800	LX800
Video memory (MB)	16	16	16
LCD interface	18Bit-LVDS (1600 x 1200)	18Bit-LVDS (1600 x 1200)	18Bit-LVDS (1600 x 1200)
DVI interface	-	-	24Bit DVI-D
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal	8V-30V/18W	8V-30V/18W	8V-30V/18W
Power suspend	0.1W	0.1W	0.1W
Power management	yes	yes	yes
RTC battery onboard	400mAh (>10 years)	400mAh (>10 years)	400mAh (>10 years)
Cooling type	passive, IP40	passive, IP40	passive, IP40
Operating temperature	0°C to +60°C	0°C to +60°C	0°C to +60°C
Extended operating temperature	-	-	-
Size (W x L x H in mm)	292 x 146 x 83	292 x 146 x 83	292 x 146 x 83
Weight	3 kg	3 kg	3 kg
MTBF	50'000h	50'000h	50'000h
Special features 1	MiniPCI-socket, POD80	MiniPCI-socket, POD80	MiniPCI-socket, POD80
Special features 2	WLAN option	WLAN option	WLAN option
Special features 3	24 Digital I/O	24 Digital I/O	24 Digital I/O
Part no.	815100	815110	815120

Option/accessories

Article	Description	No.	No.	No.
ISO-RS422	Isolated RS422 interface	-	804020	-
ISO-RS485	Isolated RS485 interface	-	804021	-
WLAN	Option WLAN	815080	815080	815080
Supply	110/220V90W	815070	815070	815070





MSEP855/L

Description

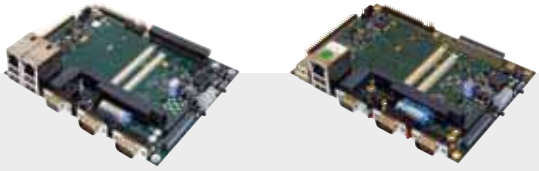
The MICROSPACE® EPIC single board computer has all standard PC functions plus a second LAN, digital IOs and an expansion bus (PC/104-*Plus* and MiniPCI). All interfaces are connected by means of standardized plugs so that housing integration is nearly cableless. The cooling design depends on the choice of processor and its power loss. The wide range power supply saves power costs.

Anwendung

_ Dual screen applications
_ DVI, analogue QXGA
_ Control technology (field bus)
_ Network technology (2 LAN channels)

Ordering information

Option/accessories	No.	Description
DDR-RAM256	890670	DDR-SODIMM-Module 256MB
DDR-RAM512	890671	DDR-SODIMM-Module 512MB
DDR-RAM1024	890672	DDR-SODIMM-Module 1024MB
SM855-C140	805192	Intel® Processor C140 (1.0GHz)
SM855-C373	805163	Intel® Celeron® C-373 (1.0GHz)
SM855-P738	805164	Intel® Pentium® M-738 (1.4GHz)
SM855-P745	805168	Intel® Pentium® M-745 (1.8GHz)
Passive cooling EP855	804030	MSEP855 cooling without fan
Active cooling EP855	804031	MSEP855 cooling with fan
MSEP8xx-CK	802250	MSEP8xx cablekit



Technical data

Type	MSEP855	MSEP855L
CPU	SM855-xxx	SM855-xxx
ISA-BUS	8/16Bit	8/16Bit
PCI-BUS	yes, PC/104-*Plus*	Option 807003
PCI Express-BUS	-	-
2nd Level cache (kB)	0-2048	0-2048
Performance (MHz)	600-1800	600-1800
DRAM Min-Max (MB)	128-1024	128-1024
CompactFlash socket	yes	-
Keyboard, mouse (PS/2) (option 804012)	Option	-
BootDrive	HD, CF, USB, LAN, FD	HD, USB, LAN
Floppy interface	yes	-
IDE interface P-ATA	2x	2x
IDE interface S-ATA	-	-
COM1	RS232C (9pin DSub)	RS232C (9pin DSub)
COM2	RS232C (9pin DSub)	RS232C (9pin DSub)
COM3 (option 804012 and option 804020/21)	RS232C, RS485/22	-
COM4 (option 804012 and option 804020/21)	RS232C, RS485/22	-
LPT1 (option 804012)	yes	-
USB (2.0)	6x	6x
LAN port 1 onboard trafo	10/100BASE-T	10/100BASE-T
LAN port 2 onboard trafo	1GB-LAN	-
Audio (option 804010)	Stereo, mic, SPDIF	Stereo, mic, SPDIF
Video controller	855GME	855GME
Video memory (MB)	16-64	16-64
LCD interface	18Bit-LVDS (1600 x 1200)	-
DVI interface (option 804010)	Option	Option
CRT interface	yes	yes
Video input	-	-
Watchdog	yes	yes
Power normal	8V-30V/10W-20W	8V-30V/10W-20W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	400mAh (>10 years)	(external)
Cooling type	passive/active	passive/active
Operating temperature	-25°C to +70°C [1]	0°C to +60°C [1]
Extended operating temperature	see SM855-xxx	see SM855-xxx
Size (W x L x H in mm)	165 x 115 x 25	165 x 115 x 25
Weight	200 g	200 g
MTBF	>200'000h	>200'000h
Special features 1	MiniPCI-socket, POD80	-
Special features 2	24 Digital I/O	-
Special features 3	-	-
Part no. (without DDR-RAM-Module without SM855)	804000	804002

Option/accessories

Article	Description	No.	No.	No.
MSEP855CONM	DVI + sound	804010	804010	
MSEP8xxCONI	COM3/4+LPT+PS2	804012	-	
MSEP PWR	Filtered power	804014	804014	
ISO-RS422	isolated RS422 for 804012	804020	-	
ISO-RS485	isolated RS485 for 804012	804021	-	
Opt. EPIC-PCI104	Opt. PC104-*Plus*	-	807003	

[1] Depending on cooler and CPU-performance.

Part no. 815020

MPCV855

Description

This absolutely soundless and fanless DIGITAL-LOGIC computer for visualization and control applications is based on the Intel® Processor® 1000MHz with passive cooling. It features two LAN ports, service-friendly hard disk or CompactFlash in the Caddy, and expansion with two PC/104-*Plus* cards. The hard disk can be replaced by another hard disk or a rugged CompactFlash disk (art. no.815050) without needing to open the housing. Two internal PC/104-*Plus* (ISA & PCI) slots are available for functional extensions. For wiring additional functions there are 3 connector openings (X1, X2, X3) in the replaceable front panel. There are 24 digitally programmable IO lines available for the control system.

Applications

_ Control system computers
_ Automation computers
_ Data recording computers

Ordering information

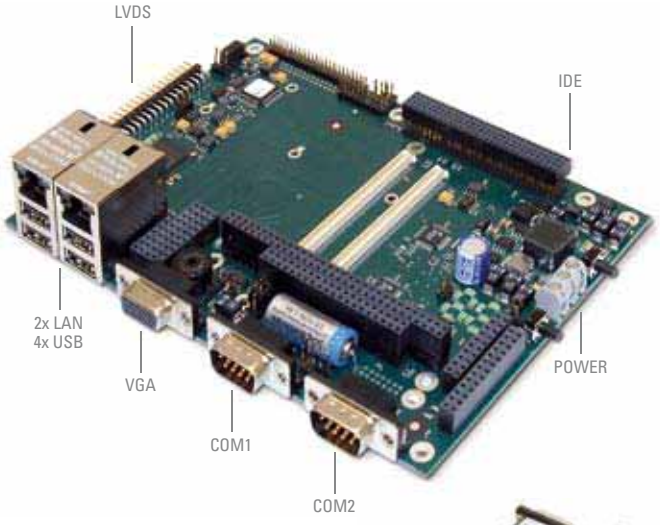
Option/accessories	No.	Description
Upgrade	815060	256 to 512MB memory
Upgrade	815062	256 to 1GB memory
Downgrade	815050	1x CompactFlash holder instead of hard drive

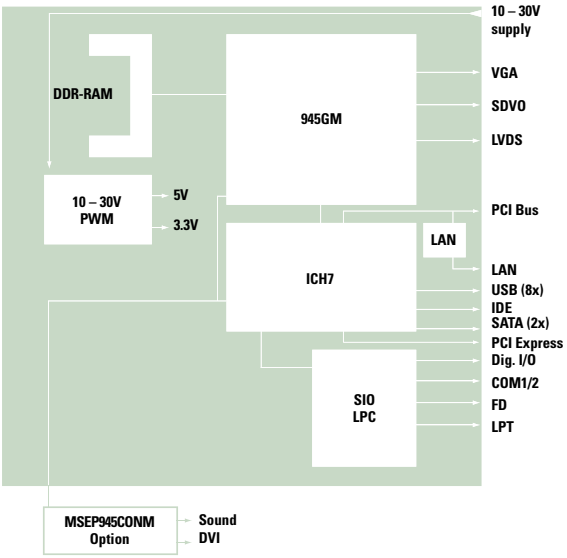
Technical data

Type	MPCV855	MPCV855I	MPCV855M
CPU	SM855-C140	SM855-C140	SM855-C140
ISA-BUS	8/16Bit	8/16Bit	8/16Bit
PCI-BUS	PC/104-*Plus*	PC/104-*Plus*	PC/104-*Plus*
PCI Express-BUS	-	-	-
2nd Level cache (kB)	0	0	0
Performance (MHz)	1000	1000	1000
DRAM Min-Max (MB)	256 (max. 1GB)	256 (max. 1GB)	256 (max. 1GB)
CompactFlash socket	-	-	-
Keyboard, mouse (PS/2)	-	yes	-
BootDrive	HD, CF, USB, LAN	HD, CF, USB, LAN	HD, CF, USB, LAN
Floppy interface	-	-	-
IDE interface P-ATA	2x, 40GB-HD	2x, 40GB-HD	2x, 40GB-HD
IDE interface S-ATA	-	-	-
COM1	RS232C (9pin DSub)	RS232C (9pin DSub)	RS232C (9pin DSub)
COM2	RS232C (9pin DSub)	RS232C (9pin DSub)	RS232C (9pin DSub)
COM3 (option 804020/21)	-	RS232C, RS485/22	-
COM4 (option 804020/21)	-	RS232C, RS485/22	-
LPT1	-	yes	-
USB (2.0)	6x	6x	6x
LAN port 1 onboard trafo	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2 onboard trafo	1GB-LAN	1GB-LAN	1GB-LAN
Audio	-	-	Stereo, mic, SPDIF
Video controller	855GME	855GME	855GME
Video memory (MB)	16-64	16-64	16-64
LCD interface	LVDS	LVDS	LVDS
DVI interface	-	-	DVI
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal	8V-30V/18W	8V-30V/18W	8V-30V/18W
Power suspend	0.1W	0.1W	0.1W
Power management	yes	yes	yes
RTC battery onboard	400mAh (>10 years)	400mAh (>10 years)	400mAh (>10 years)
Cooling type	passive	passive	passive
Operating temperature	0°C to +50°C	0°C to +50°C	0°C to +50°C
Extended operating temperature	-	-	-
Size (W x L x H in mm)	292 x 146 x 83	292 x 146 x 83	292 x 146 x 83
Weight	3 kg	3 kg	3 kg
MTBF	60'000h	60'000h	60'000h
Special features 1	MiniPCI-socket, POD80	MiniPCI-socket, POD80	MiniPCI-socket, POD80
Special features 2	WLAN option	WLAN option	WLAN option
Special features 3	24 Digital I/O	24 Digital I/O	24 Digital I/O
Part no.	815000	815010	815020

Option/accessories

Article	Description	No.	No.	No.
ISO-RS422	Isolated RS422 interface	-	804020	-
ISO-RS485	Isolated RS485 interface	-	804021	-
WLAN	Option WLAN	815080	815080	815080
Supply	110/220V90W	815070	815070	815070





Part no. 804009

Part no. 804014

MSEP945/L

Description

The MICROSPACE® EPIC single board computer has all standard PC functions plus a second LAN, and an expansion bus (PC/104-*Express* and MiniPCI). All interfaces are connected by means of standardized plugs so that housing integration is nearly cableless. The cooling design depends on the choice of processor and its power loss. The wide range power supply saves power costs.

Applications

_ Dual screen applications
_ DVI, analogue QXGA
_ Up to 4 PCI Express expansion cards for high-performance IO applications

Ordering information

Option/accessories	No.	Description
DDR2-RAM256	890674	SODIMM DDR2-RAM-Module 256MB
DDR2-RAM512	890675	SODIMM DDR2-RAM-Module 512MB
DDR2-RAM1024	890676	SODIMM DDR2-RAM-Module 1024MB
DDR2-RAM2048	890677	SODIMM DDR2-RAM-Module 2048MB*
Passive cooling	804032	SM945 cooling without fan for EPIC945
Active cooling	804033	SM945 cooling with fan for EPIC945
SMX945-L7400	805352	Intel® Core™2 Duo-L7400, OMB RAM
SMX945-L2400	805350	Intel® Core™ Duo-L2400, OMB RAM
SMX945-C423	805360	Intel® Celeron® M 423, OMB RAM
SMX945B-L7400	805452	Intel® Core™2 Duo-L7400, OMB RAM
SMX945B-L2400	805450	Intel® Core™ Duo-L2400, OMB RAM
SMX945B-C423	805460	Intel® Celeron® M 423, OMB RAM
MSEP945-CK	802251	MSEP945 cablekit

* For 4GB RAM it is necessary to have two 2GB RAM modules and a SMX945B-xxx.

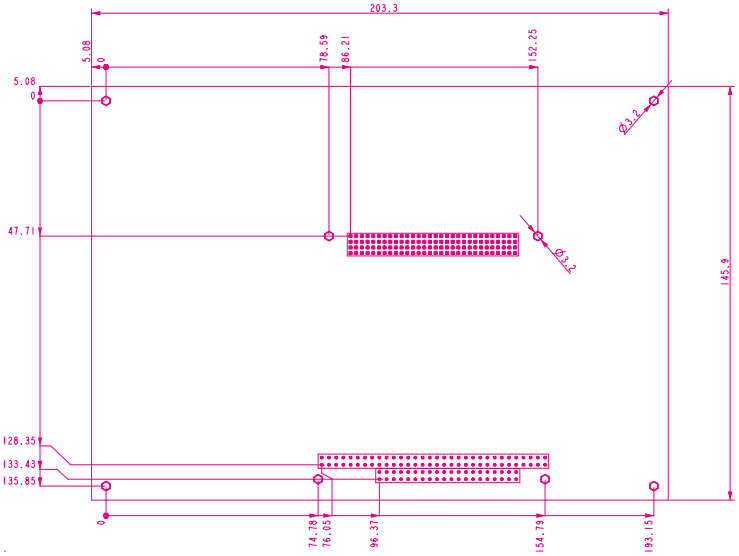
Technical data

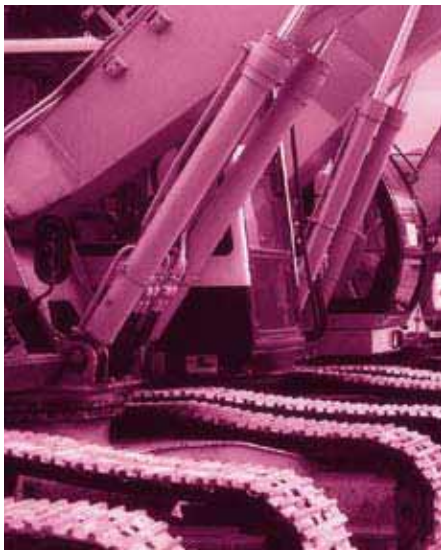
Type	MSEP945	MSEP945L	MSEP945/L
CPU	SMX945-xxx	SMX945-xxx	SMX945B-xxx
ISA-BUS	-	-	-
PCI-BUS	PCI/104-*Express*	PCI/104-*Express*	PCI/104-*Express*
PCI Express-BUS	PCI/104-*Express*	PCI/104-*Express*	PCI/104-*Express*
2nd Level cache (kB)	0-4096	0-4096	0-4096
Performance (MHz)	1000, 2x 1600	1000, 2x 1600	1000, 2x 1600
DRAM Min-Max (MB)	256-2048	256-2048	512-4096
CompactFlash socket	yes	-	yes/-
Keyboard, mouse (PS/2)	-	-	-
BootDrive	FD, HD, USB, LAN, CF	FD, HD, USB, LAN	FD, HD, USB, LAN, CF
Floppy interface	-	-	-
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA	2x	2x	2x
COM1	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
COM2	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
COM3	-	-	-
COM4	-	-	-
LPT1	yes	yes	yes
USB (2.0)	8x	8x	8x
LAN port 1 onboard trafo	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2 onboard trafo	1GB-LAN PCIe	-	1GB-LAN (PCIe)/-
Audio (option 804009)	AC97-7.1 option	AC97-7.1 option	AC97-7.1 option
Video controller	i945GME	i945GME	i945GME
Video memory (MB)	16-256	16-256	16-256
LCD interface	LVDS	LVDS	LVDS
DVI interface (option 804009)	Option	Option	Option
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal	8V-30V / 12-25W	8V-30V / 12-25W	8V-30V / 12-25W
Power suspend	0.1W	0.1W	0.1W
Power management	yes	yes	yes
RTC battery onboard	400mAh (10 years)	400mAh (10 years)	400mAh (10 years)
Kühlung	passive/active	passive/active	passive/active
Operating temperature	-25°C to +70°C [1]	-25°C to +70°C [1]	-25°C to +70°C [1]
Extended operating temperature	see SMX945-xxx	see SMX945-xxx	see SMX945B-xxx
Size (W x L x H in mm)	165 x 115 x 25	165 x 115 x 25	165 x 115 x 25
Weight	200 g	200 g	200 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	MiniPCI-socket	MiniPCI-socket	MiniPCI-socket
Special features 2	-	-	-
Special features 3	-	-	-
Part no. (without RAM, without SMX945)	804070	804072	804070/804072

Option/accessories

Article	Description	No.	No.	No.
MSEP945CONM	DVI + sound	804009	804009	804009
MSEP8xxPWR	Filtered power	804014	804014	804014

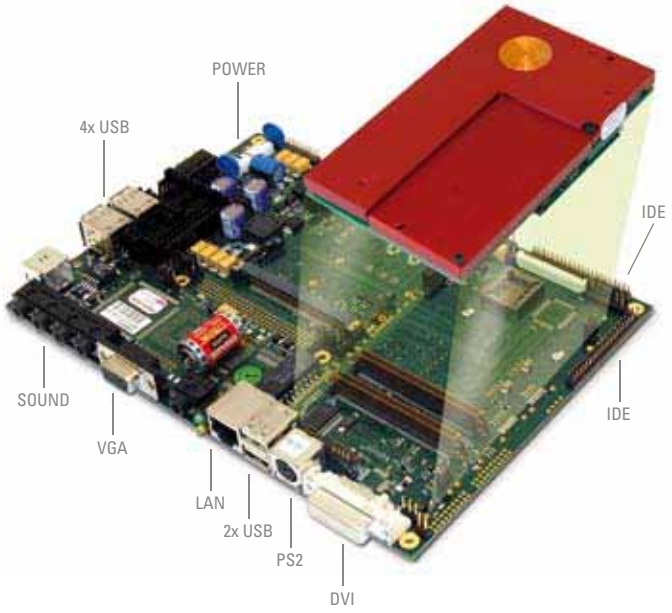
[1] Depending on cooler and CPU-performance.

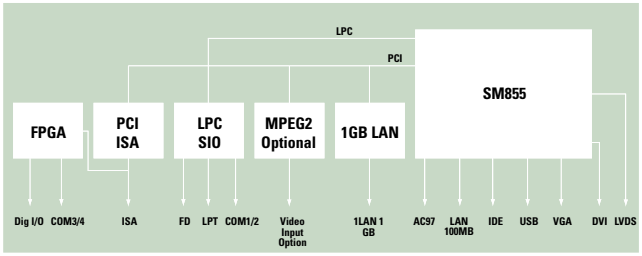




EBX form factor

The EBX form factor is a well-known open industry standard for embedded computers since 1992. Size: 146 x 203 mm. Like the EPIC boards, all interface plugs are integrated on the board as EMC-filtered standardized plugs. This makes them nearly cableless. On DIGITAL-LOGIC's EBX single board computer there is a PC/104-*Plus* slot which permits up to 4 ISA and/or PCI-PC/104-*Plus* cards. The new MSEBX945 provides a PCI/104-*Express* expansion slot. The EBX boards are available in a wide performance bandwidth, from the Processor M (600MHz) to the future Core™2 Duo (2x 1.6 GHz and 4GB RAM). Different configuration variants can be ordered in each performance class. The EBX boards can be integrated in a housing with virtually no cables. The power supply is available in a broad, cost-saving voltage range. For cooling, passive heat dissipaters or heat pipes can be fitted to the housing. Separate development kits are available for the evaluation of the EBX embedded single board computers.





MSEBX855

Description

The MICROSPACE® EBX embedded computer board MSEBX855 has all of the standard PC interfaces plus a second Ethernet LAN, a video input for connecting a video camera, COM3/4, 24 bit digital IO, dual screen video (DVI, LVDS, VGA) and an AC97-5.1 sound controller. In contrast to the PC/104-*Plus* cards, all interfaces are connected to standard plugs; this means low-cost, cableless housing integration. The PC/104-*Plus* bus (32 bit PCI, ISA), the MiniPCI base and 6 USB interfaces are available as functional extensions. The power consumption (12W to 25W), the cooling method, the ambient working temperature, and performance are all directly related to the choice of smartModule855-xxxx.

Applications

_ Image processing
_ Dual screen information terminals
_ Control of interactive devices via USB or up to 4x COM

Ordering information

Option/accessories	No.	Description
DDR-RAM256	890670	DDR-SODIMM-Module 256MB
DDR-RAM512	890671	DDR-SODIMM-Module 512MB
DDR-RAM1024	890672	DDR-SODIMM-Module 1024MB
Passive cooling	805170	SM855 cooling without fan
Active cooling	805171	SM855 cooling with fan
Option -L+	807006	PC/104-*Plus*, long connector
Option -P+	807005	PC/104-*Plus*, short connector
Option -I-/S	807015	PC/104 ISA, short connector
Option -I-/L	807016	PC/104 ISA, long connector
Option CF	807007	CompactFlash socket type II
Option-PCICON	811205	PCI-riserboard 1x PCI slot
MSEBX855DK	805027	Development-Kit for SM855DK
MSEBX855-CK	811212	MSEBX855 cablekit



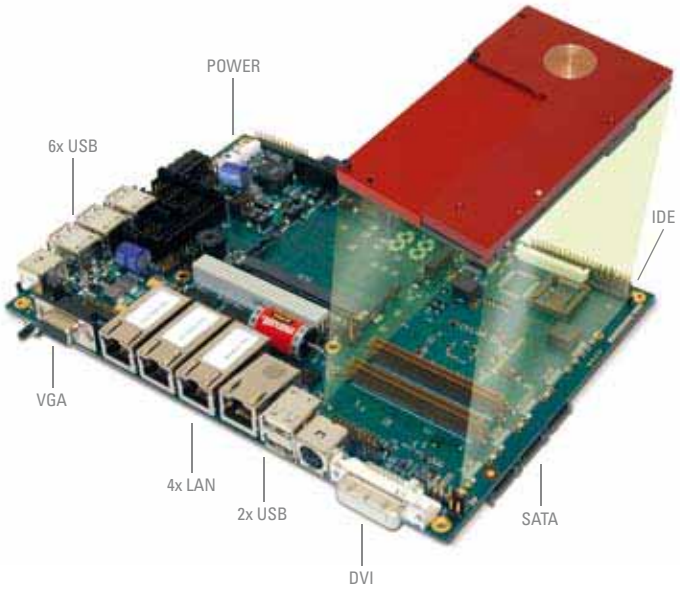
Technical data

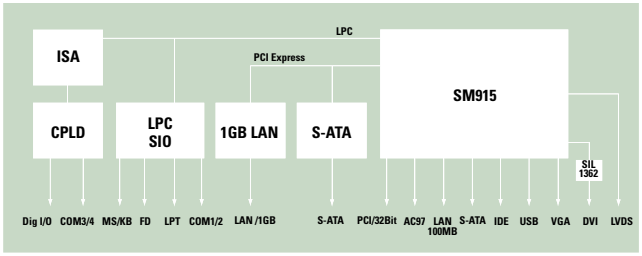
Type	MSEBX855-B	MSEBX855-M	MSEBX855-S
CPU	SM855-xxx	SM855-xxx	SM855-xxx
ISA-BUS (option 807015/16)	8Bit, PC/104 option	8Bit, PC/104 option	8Bit, PC/104 option
PCI-BUS (option 807005/6)	(4slot) PC/104-*Plus* option	(4slot) PC/104-*Plus* option	(3slot) PC/104-*Plus* option
PCI Express-BUS (PCI/104-*Express*)	-	-	-
2nd Level cache (kB)	0-2048	0-2048	0-2048
Performance (MHz)	600-1800	600-1800	600-1800
DRAM Min-Max (MB)	256-1024	256-1024	256-1024
CompactFlash socket (option 807007)	Option	Option	Option
Keyboard, mouse (PS/2)	yes	yes	yes
BootDrive	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF
Floppy interface	yes	yes	yes
IDE interface P-ATA	2 x	2 x	2 x
IDE interface S-ATA	-	-	-
COM1	RS232C	RS232C	RS232C
COM2	RS232C	RS232C	RS232C
COM3	RS232C/RS422/485	-	-
COM4	RS232C/RS422/485	-	-
LPT1	yes	yes	yes
USB (2.0)	6 x	6 x	6 x
LAN port 1 onboard trafo	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2 onboard trafo	-	-	1GB-100BASE-T
Audio	AC97-5.1	AC97-5.1	AC97 stereo
Video controller	i855GME	i855GME	i855GME
Video memory (MB)	16-64	16-64	16-64
LCD interface	LVDS, 18Bit, 1600 x 1200	LVDS, 18Bit, 1600 x 1200	LVDS, 18Bit, 1600 x 1200
DVI interface	yes	yes	yes
CRT interface	yes	yes	yes
Video input	-	MPEG2, 1 x SVideo, 3 x CVBS	-
Watchdog	yes	yes	yes
Power normal	10V-30V/12-25W	10V-30V/12-25W	10V-30V/12-25W
Power suspend	0.1W	0.1W	0.1W
Power management	yes	yes	yes
RTC battery onboard	400mAh (10 years)	400mAh (10 years)	400mAh (10 years)
Cooling type	passive/active	passive/active	passive/active
Operating temperature	-25°C to +70°C [1]	-25°C to +70°C [1]	-25°C to +70°C [1]
Extended operating temperature	see SM855-xxx	see SM855-xxx	see SM855-xxx
Size (W x L in mm)	203 x 146 x 29	203 x 146 x 29	203 x 146 x 29
Weight	350 g	350 g	350 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	-	MPEG2 hardware	-
Special features 2	24Bit Digital I/O	24Bit Digital I/O	24Bit Digital I/O
Special features 3	-	TV-Output	-
Part no. (without RAM, without SM855)	811200	811201	811202

CPU's

Article	Description	No.	No.	No.
SM855-C140	Intel® Processor C-140 (1.0GHz)	805192	805192	805192
SM855-C373	Intel® Celeron® M-373 (1.0GHz)	805163	805163	805163
SM855-P738	Intel® Pentium® M-738 (1.4GHz)	805164	805164	805164
SM855-P745	Intel® Pentium® M-745 (1.8GHz)	805168	805164	805164

[1] Depending on cooler and CPU-performance.





MSEBX915

Description

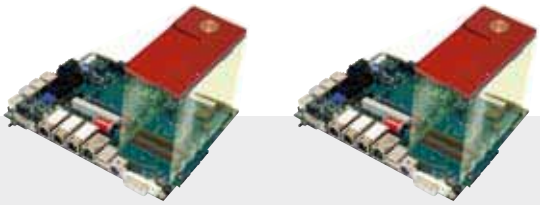
The MICROSPACE® EBX embedded computer board MSEBX915 has all of the standard PC interfaces plus 3x Ethernet LAN, COM3/4, 24 bit digital IO, dual screen video (DVI, LVDS, VGA) and an AC97-7.1 sound controller. In contrast to the PC/104-*Plus* cards, all interfaces are connected to standard plugs; this means low-cost, cableless housing integration. The PC/104-*Plus* bus (32 bit PCI, ISA), the MiniPCI base and 8 USB interfaces are available as functional extensions. The power consumption (12W to 25W), the cooling method, the ambient working temperature, and performance are all directly related to the choice of smartModule915-xxxx.

Applications

_ Image processing
_ Dual screen information terminals
_ Control of interactive devices via USB or up to 4x COM

Ordering information

Option/accessories	No.	Description
DDR2-RAM256	890674	SODIMM DDR2-RAM-Module 256MB
DDR2-RAM512	890675	SODIMM DDR2-RAM-Module 512MB
DDR2-RAM1024	890676	SODIMM DDR2-RAM-Module 1024MB
DDR2-RAM2048	890677	SODIMM DDR2-RAM-Module 2048MB
Passive cooling	805370	SM945 cooling without fan
Active cooling	805371	SM945 cooling with fan
Option -L+	807006	PC/104-*Plus*, long connector
Option -P+	807005	PC/104-*Plus*, short connector
Option -I-/S	807015	PC/104 ISA, short connector
Option -I-/L	807016	PC/104 ISA, long connector
Option CF	807007	CompactFlash socket type II
Option-PCICON	811205	PCI-riserboard 1x PCI slot
MSEBX915DK	805029	Development-Kit for SM915DK
MSEBX915-CK	811312	MSEBX915 cablekit



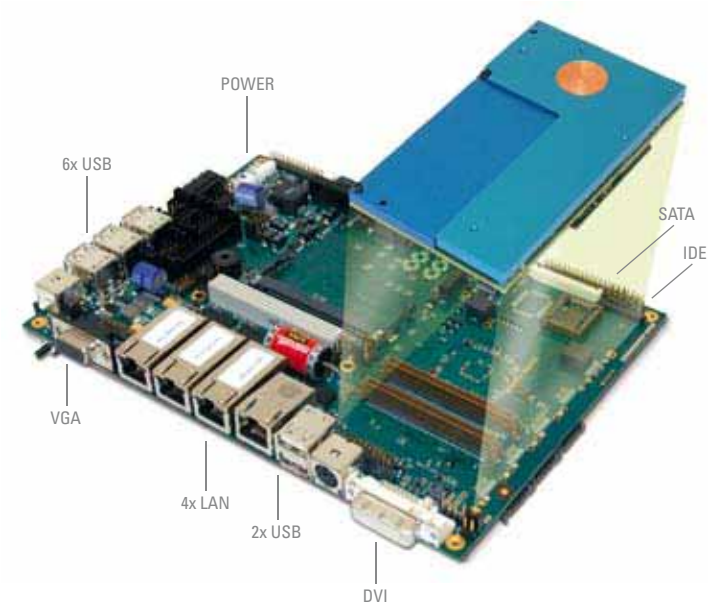
Technical data

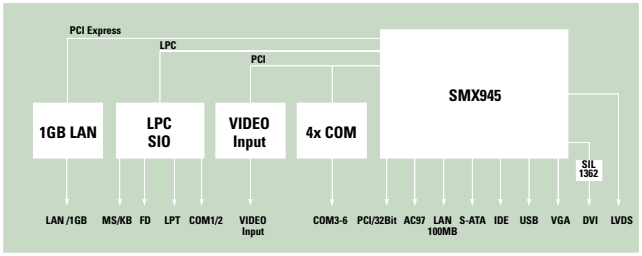
Type	MSEBX915-B	MSEBX915-S
CPU	SM915-xxx	SM915-xxx
ISA-BUS (option 807015/16)	8Bit, PC/104 option	8Bit, PC/104 option
PCI-BUS (option 807005/6)	(5slot) PC/104-*Plus* option	(3slot) PC/104-*Plus* option
PCI Express-BUS (PCI/104-*Express*)	-	-
2nd Level cache (kB)	0-2048	0-2048
Performance (MHz)	2000	2000
DRAM Min-Max (MB)	256-2048	256-2048
CompactFlash socket (option 807007)	Option	Option
Keyboard, mouse (PS/2)	yes	yes
BootDrive	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF
Floppy interface	yes	yes
IDE interface P-ATA	2x	2x
IDE interface S-ATA	2x	8x
COM1	RS232C	RS232C
COM2	RS232C	RS232C
COM3	RS232C/RS422/485	RS232C/RS422/485
COM4	RS232C/RS422/485	RS232C/RS422/485
LPT1	yes	yes
USB (2.0)	8x	8x
LAN port 1 onboard trafo	10/100BASE-T	10/100BASE-T
LAN port 2 onboard trafo	1x 1GB-100BASE-T, PCIe	3x 1GB-100BASE-T, PCIe
Audio	AC97-7.1, HDA	AC97-7.1, HDA
Video controller	i915GM	i915GM
Video memory (MB)	8-128	8-128
LCD interface	LVDS, 18Bit, 1600 x 1200	LVDS, 18Bit, 1600 x 1200
DVI interface	yes	yes
CRT interface	yes	yes
Video input	-	-
Watchdog	yes	yes
Power normal	10V-30V/12-25W	10V-30V/12-25W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	400mAh (10 years)	400mAh (10 years)
Cooling type	passive/active	passive/active
Operating temperature	-25°C to +60°C [1]	-25°C to +60°C [1]
Extended operating temperature	see SM915-xxx	see SM915-xxx
Size (W x L in mm)	203 x 146 x 29	203 x 146 x 29
Weight	350 g	350 g
MTBF	>200'000h	>200'000h
Special features 1	POD	POD
Special features 2	24Bit Digital I/O	24Bit Digital I/O
Special features 3	-	-
Part no. (without RAM, without SM915)	811300	811302

CPU's

Article	Description	No.	No.	No.
SM915-P760	Intel® Procesor M-760 (2.0GHz)	805180	805180	

[1] Depending on cooler and CPU-performance.





MSEBX945

Description

The MICROSPACE® EBX embedded computer board MSEBX945 has all of the standard PC interfaces plus up to 4 Ethernet LANs (incl. 3x 1GB), a 3-channel input for connecting a video camera, COM3/4/5/6, SATA interface, dual screen video (2x DVI, LVDS, VGA) and an AC97-7.1 sound controller. All interfaces are connected by means of standardized plugs, enabling cost-efficient, cableless housing integration. The PC/104 Express bus (32 bit PCI, PCI Express), the MiniPCI base and 8 USB interfaces are available as functional extensions. The power consumption (12W to 15W), the cooling method, the ambient working temperature, and performance are all directly related to the choice of smartModule945-xxxx.

Applications

_ Image processing
_ Dual screen multimedia information terminals
_ Control of interactive devices

Ordering information

Option/accessories	No.	Description
DDR2-RAM256	890674	SODIMM DDR2-RAM-Module 256MB
DDR2-RAM512	890675	SODIMM DDR2-RAM-Module 512MB
DDR2-RAM1024	890676	SODIMM DDR2-RAM-Module 1024MB
DDR2-RAM2048	890677	SODIMM DDR2-RAM-Module 2048MB
Passive cooling	805370	SM945 cooling without fan
Active cooling	805371	SM945 cooling with fan
Option 2.DVI	811330	second DVI
Option Stereo	tbd	
Option 7.1	tbd	SPPDiF In/Out
Option CF	807007	CompactFlash socket typ II
MSEBX945DK	811345	Development-Kit MSEBX945 without EBX945board
MSEBX945-CK	811347	MSEBX945 cablekit



Technical data

Type	MSEBX945-E2	MSEBX945-E4	MSEBX945-E2/E4
CPU	SMX945-xxx	SMX945-xxx	SMX945B-xxx
ISA-BUS	-	-	-
PCI-BUS	PCI/104-*Express* (short)	PCI/104-*Express* (short)	PCI/104-*Express* (short)
PCI Express-BUS (PCI/104-*Express*)	PCI/104-*Express*	PCI/104-*Express*	PCI/104-*Express*
2nd Level cache (kB)	0-4096	0-4096	0-4096
Performance (MHz)	1000, 2x 1600	1000, 2x 1600	1000, 2x 1600
DRAM Min-Max (MB)	256-2048	256-2048	512-4096
CompactFlash socket (option 807007)	Option	Option	Option
Keyboard, mouse (PS/2)	yes	yes	yes
BootDrive	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF
Floppy interface	yes	yes	yes
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA	2x	2x	2x
COM1	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
COM2	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
COM3/4	RS232C	RS232C	RS232C
COM5/6	TTL	TTL	TTL
LPT1	yes	yes	yes
USB (2.0)	6x + (2x on PCI/104-*Express*)	6x + (2x on PCI/104-*Express*)	6x + (2x on PCI/104-*Express*)
LAN port 1 onboard trafo	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2	1x 1GB-LAN PCIe	3x 1GB-LAN PCIe	1x / 3x 1GB-LAN PCIe
Audio	AC97-7.1 option	AC97-7.1 option	AC97-7.1 option
Video controller	i945GME	i945GME	i945GME
Video memory (MB)	8-224	8-224	8-224
LCD interface	LVDS	LVDS	LVDS
DVI interface	yes (option 2.DVI)	yes (option 2.DVI)	yes (option 2.DVI)
CRT interface	yes	yes	yes
Video input	BT878, 3 channels	BT878, 3 channels	BT878, 3 channels
Watchdog	yes	yes	yes
Power normal (Single 12Volt supply)	10V-30V/12W-25W	10V-30V/12W-25W	10V-30V/12W-25W
Power suspend (Single 12Volt supply)	0.1W	0.1W	0.1W
Power management	yes	yes	yes
RTC battery onboard	400mAh (10 years)	400mAh (10 years)	400mAh (10 years)
Cooling type	passive/active	passive/active	passive/active
Operating temperature	-25°C to +70°C[1)]	-25°C to +70°C[1)]	-25°C to +70°C[1)]
Extended operating temperature	see SMX945-xxx	see SMX945-xxx	see SMX945-xxx
Size (W x L in mm)	204 x 146 x 29	204 x 146 x 29	204 x 146 x 29
Weight	350 g	350 g	350 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	LPC-POD	LPC-POD	LPC-POD
Special features 2	8Bit Digital I/O	8Bit Digital I/O	8Bit Digital I/O
Special features 3	COM5/6 (TTL)	COM5/6 (TTL)	COM5/6 (TTL)
Part no. (without RAM, without SMX945)	811341	811342	811341/811342

CPU's

Article	Description	No.	No.	No.
SMX945-L7400	Intel® Core™2 Duo-L7400, 0MB RAM	805352	805352	805452
SMX945-L2400	Intel® Core™ Duo-L2400, 0MB RAM	805350	805350	805450
SMX945-C423	Intel® Celeron® M 423, 0MB RAM	805360	805360	805460

[1)] Depending on cooler and CPU-performance.

Intel® PRO/Wireless 2915ABG Network Connection

Description

The Intel® PRO/Wireless Network Connection is an embedded 802.11a/b/g MiniPCI adapter operating in the 2.4Hz and 5GHz spectrum. This solution is based on the MiniPCI Type 3B form factor designed to meet the space and size requirements for thin and lightweight notebook computer systems.

Applications

_ IEEE 802.11a/b/g standard tri-mode Wi-Fi CERTIFIED Wireless LAN support (2.4GHz and 5GHz
_ Up to 54Mbps at 2.GHz and 5GHz (Note: 802.11b up to 11Mbps and 802.11a/g up to 54Mbps throughput)
_ Industry-standard Wireless LAN security support is available (802.1X, 802.11i, WEP, WPA, WPA2, Hardware AES)
_ Cisco Compatible Extension (including LEAP, CKIP, EAP-FAST) support available
_ Support for antenna diversity enables optimized WLAN performance for multiantenna systems
_ Intel® Wireless Coexistence System Phase 2 capability enables Bluetooth co-existence including Bluetooth Priority Signaling
_ Support for Wi-Fi Multimedia (WMM)

Intel® PROSet/Wireless Software v9.0[5]

Intel® PROSet/Wireless software enables a superior mobile experience by providing:

- New, easy-to-use user interface
- Intel® Smart Wireless Solution support including:
  - Wireless Network Configuration Wizard allows secure, easy AP/client setup
  - Security Assistant automates WLAN security configuration
  - Wireless Troubleshooter assists user with WLAN connectivity
- IT Configuration Utility enabling administrators to manage notebooks remotely
- Single Sign On support enabling a single set of credentials to authenticate the user to both WLAN network and the machine/domain
- Centralized Profile Management simplifies IT profile distribution

New Look and Feel
- Single screen provides overview of WLAN environment
- Allows easy access to commonly used functions to simplify user connectivity

Available Networks
- Automatically detects available networks
- Displays signal strength, Network Name (SSID), infrastructure/ad hoc, security status, and network type

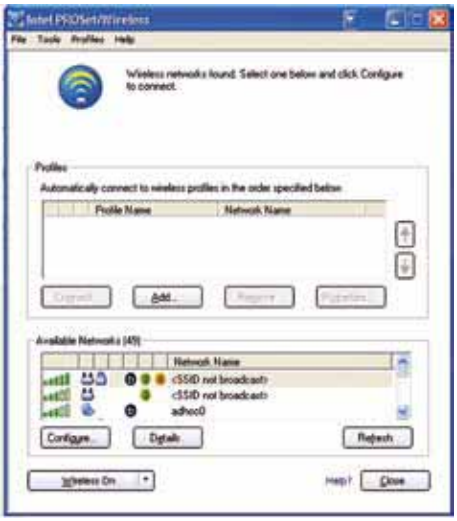
Radio Off
- One click turns off the WLAN radio in SW

Menu Bar
- Launch advanced functions, including third-party tools from within the application

Signal Status
- Overview of current connection

Profiles
- Profile Wizard simplifies profile setup
- Import/export profiles

Additional Screens
- Advanced settings, security, diagnostics, wireless helper, etc.



Technical data

Model Name	Intel® PRO/Wireless 2915ABG Network Connection (WM3B2915ABG)
Dimensions	(H x W x D) 1.75 in x 2.35 in x 0.19 in (44.60mm x 59.75mm x 4.9mm)
Weight	13 g
Antenna interface connector	Hirose U.FL-R-SMT mates with cable connector U.FL-LP-066
Dual-diversity antenna	On-board dual-diversity switching support for systems designed with two antennas
Radio ON/OFF control[5]	Supported by both hardware and software
Connector interface	MiniPCI Type III edge connector
LEDs output	Link, Activity
Operating system	Microsoft Windows XP (Professional, Home, Tablet), 2000
Wi-Fi alliance	Wi-Fi CERTIFIED for 2.4GHz and 5GHz band, WMM, WPA, and WPA2
WHQL	Yes
MiniPCI compliant	Yes
WLAN standard	IEEE 802.11a, IEE 802.11b, IEEE 802.11g, 802.11d, 802.1h, 802.11i, and 80211e
Architecture	Infrastructure or ad hoc (peer-topeer). Ad hoc mode limited in some IEE 802.11a frequencies.
Roaming	802.11a/b/g compliant for seamless roaming between respective access points (802.11a, 802.11g, 80211b)
Security authentication / encryption	LEAP, WPA, 802.1X, EAP-TLS, EAP-FAST, PEAP / CKIP, TKIP, 128-bit and 64-bit WEP, Hardware AES
Product safety	UL, C-UL, CB (IEC 60590)
Compliance	Cisco Compatible Extension, Wi-Fi Alliance

Highlights

_ A PC card for all real time Ethernet systems
_ A PC card for master and slave
_ Handling of the entire protocol stack
_ Data exchange using dual port memory or direct memory access
_ Uniform user interface for the various protocols
_ Variant with PCI or PCI Express
_ 10-year supply guarantee
_ SYCON.net as configurator based on FDT/DTM

MiniPCI-Feldbus-netX™

Description

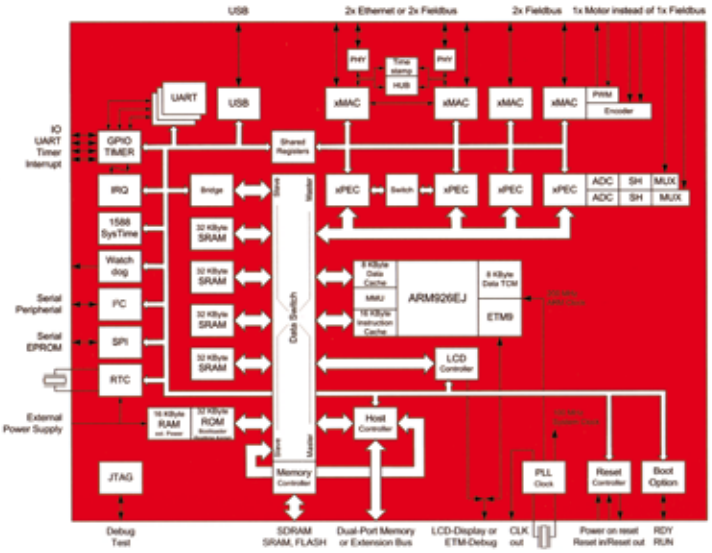
Ethernet in automation arrived with the challenge of moving great volumes of data at high speeds at all levels of the communication pyramid, and that with low office component cost. In reality, we need different systems, a minimum of jitter and line topology; additional hardware enables only partial or limited use of standard components. The often required 10-year supply guarantee leads ultimately again to special PC cards for automation.

With the cifX, Hilscher offers a solution that supports all systems, is reduced to the network controller netX and a SDRAM, and offers maximum performance, functionality and flexibility at a fair price.

The protocols for the cifX are delivered as loadable firmware on a CD. If the driver finds firmware in a folder during startup, it is downloaded to the card. This makes it possible to re-configure to a different real time Ethernet system in the simplest possible way. If the cifX is operated as master or together with the OPC server, a license code is required. This can be ordered with the cifX or later and is saved on the card.

The limitation to one card type for the entire range of real time Ethernet systems results in considerable cost savings for storage, logistics, engineering, commissioning and maintenance.

Fieldbusses and Real-Time Ethernet on MiniPCI card



Ordering information

Option/accessories	No.	Description
netX™	807180	MiniPCI-netX™ Card

Protocols

EtherCAT	Slave
Cyclical data	max. 128Bytes
Non-cyclical data	SDO master/slave SDO slave/slave
Functions	PDO mapping COE (CANopen over EtherCAT) EOE (Ethernet over EtherCAT) Complex slave 3 FMMUs and 4 SYNC-manager

EtherNet/IP	Adapter
IO data	max. 3584Bytes max. 504Bytes per connection point
Unscheduled data	max. 247Bytes per telegram max. 16 connections
Server services	Get_Attribute_Single Get_Attribute_All Set_Attribute_Single Set_Attribute_All

Modbus TCP/IP	Client / Server
Function codes	1, 2, 3, 4, 5, 6, 7, 15, 16
Register (16Bit)	max. 100 register per telegram
Coil (1Bit)	max. 255 coils per telegram
Message mode	Client/Server Input/output data ready not used
IO mode	max. 3584Byte IO data

Powerlink	Controlled node
Version	V2
Poll Request/Response	Response time 1µ
Functions	SDO upload/download SDO over ASND and UDP PDO mapping

PROFINET IO	Device
Communication	PROFINET RT VLAN and priority tagging cyclical and non-cyclical
Functions	Process and diagnostic alarm DCP Context management with CLRPC Diagnosis Target/actual comparison of configuration

PROFINET IO	Controller
Communication	PROFINET RT VLAN and priority tagging cyclical, non-cyclical
Functions	Alarm handling DCP Context management with CLRPC Diagnosis

SERCOS III	Slave
Functions	Real time data Service channel Synchronization Phase acceleration Redundancy Ring and line structure

Contents of cable kits

Part no.	Article	Number COM 9pol Dsub L=30cm	Number LPT 25pol DSub L=30cm	Number PS2 KB/MS L=30cm	Number HD-Kabel 44pin 2mm L=20cm	Number USB 4pol twisted L=30cm	Number Power 8pol L=30cm	Number LAN 10pol 2mm L=30cm	Number VGA 15pol HDSub L=30pol	802600 Number Floppy, 26pin L=15cm	Number other cable
802012	MSBC-CK	4	1		2					1	1x LCD
802032	MSM855-CK	2	1	1	1	4	1		1	1	
802035	MSGM-CK	2	1	1	1	2	1	1	1	1	1x LVDS
802605	MSM-CK	2	1	1	1	2	1	1	1	1	1x LCD
802208	MSB800-CK				1						
802250	MSEP8xx-CK				2						
802251	MSEP945-CK				1						2x SATA
811212	MSEBX855-CK	4	1		2					1	
811312	MSEBX915-CK	4	1		1						2x SATA
811347	MSEBX945-CK	6	1		1						2x SATA

Connector kits

Part no.	Article	RJ45 without trafo	RJ45 without trafo	Battery 400mAh	DVI Connector	DVI InterfaceChip	Sound Connector	Codec Chip	USB2 Connector	TV-Out Cinch	LVDS-out 26pol HDSub
803020	MSM855-LANCON		1	1							
803021	MSM855B-LANCON	1		1							
803022	MSM855B-LANCON	1									
803030	MSM855-CKCON		1	1			6		4		
803034	MSM855B-CKCON	1		1			6		4		
803040	MSM855-DVICON				1	1				1	1
803035	MSM800-CKCON	1		1			6		4	1	
803046	MSM800B-CKCON	1		1			6		4	1	
803042	MSM800-DVICON				1	1					
803044	MSM800-LVDSCON										
803220	MSM945-LANCON	1		1							
802230	MSM945-CKCON	1		1			6		4		
802240	MSM945-DVICON				1	1					

Spacerkit

Article	No.	Description
Spacerkit PC/104	802050	Spacerkit PC/104
Spacerkit PC/104+	802051	Spacerkit PC/104+
MSFLOPPY	891001	TEAC Micro Floppy 3.5"

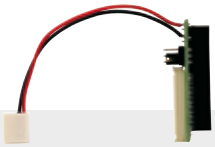
Boardsupportpackages

Some DIGITAL-LOGIC products have different board support packages available.

DIGITAL-LOGIC collaborates on Linux (ELINOS) with the SYSGO company and collaborates on Windows CE with the Pfaadt Soft company.

Available OS's:

Part no.	Operating system	Suitable for
810150	WIN-CE	MSM586, SM520
810152	ELINOS	MSM800, MSEP800
810150	WIN-CE	MSM800, MSEP800
810152	ELINOS	MSM855, MSEP855, MSEBX855
810150	WIN-CE	MSM855, MSEP855, MSEBX855
810152	ELINOS	MSM945, MSEBX855
810153	XPe	MSM855, MSEP855, MSEBX855, MSM945, MSEP945, MSEBX945
810151	XPe	MSM800, MSEP800



Technical data

Type	MSKEY	MSCF	MSFC
Function	Keymatrix decoder	CompactFlash, converter to IDE	Microfloppy-adapter
Controller	PIC	Converter	Converter
Connector	8 x 8 keys	44pin IDE	26pin/34pin
Power normal	5V/200mA (typ.)	5V	5V
Power suspend	5V/200mA (typ.)	5V	5V
Operating temperature	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
Extended operating temperature	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Weight	12 g	10 g	20 g
MTBF	> 200'000h	> 200'000h	> 200'000h
Ordering information	808000	801072	801071
Status	cont. availability	for new designs	for new designs

Technical data

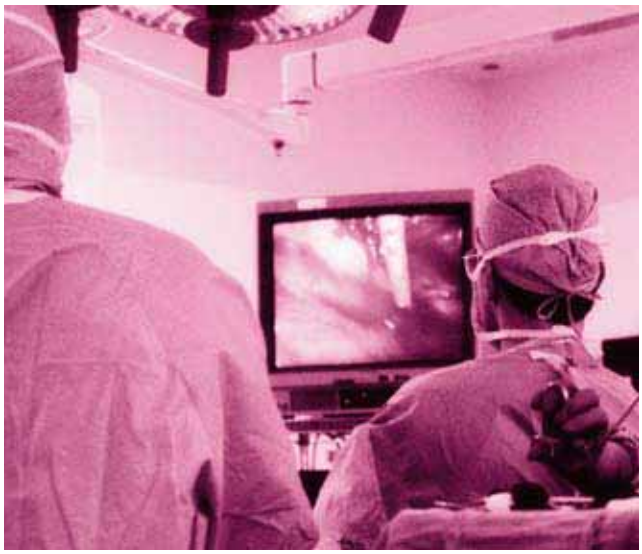
Type	CompactFlash
Function	Flashdisk
Controller	IDE-ATA
Connector	CF
Flash capacity	to 4GB
Power normal	5V/60mA (typ.)
Power suspend	5V/60mA (typ.)
Operating temperature	0°C to +70°C
Extended operating temperature	-40°C to +85°C
Weight	15 g
MTBF	> 200'000h
Status	for new designs

Ordering information

Option/accessories	No.	Description
Temperaturrange: 0°C to +70°C		
CF 128MB	890016	CompactFlash card 128MB
CF 256MB	890017	CompactFlash card 256MB
CF 512MB	890018	CompactFlash card 512MB
CF 1024MB	890035	CompactFlash card 1024MB
CF 2048MB	890037	CompactFlash card 2048MB
CF 4096MB	890039	CompactFlash card 4096MB
Temperaturrange: -40°C to +85°C		
CF 128MB-IG-E48	890032	CompactFlash card 128MB-IG (industrail grade) SS
CF 256MB-IG-E48	890033	CompactFlash card 256MB-IG (industrail grade) SS
CF 512MB-IG-E48	890034	CompactFlash card 512MB-IG (industrail grade) SS
CF 1024MB-IG-E48	890036	CompactFlash card 1024MB-IG (industrail grade) SS
CF 2048MB-IG-E48	890038	CompactFlash card 2048MB-IG (industrail grade) SS
CF 4096MB-IG-E48	890031	CompactFlash card 4096MB-IG (industrail grade) SS

Would you like to know more about our small, quiet all-rounders?

You can order our Mobile Computer Systems Catalog free of charge at www.digitallogic.com.



A wide range of uses

... Medical technology devices (e.g. EEG devices), industrial control systems, navigation systems, aviation computers for unmanned aircraft, information terminals, telephone systems, digital TV with integrated Internet browsers, passenger entertainment, mobile data logging devices, rugged military and outdoor applications, etc.

Custom system solutions

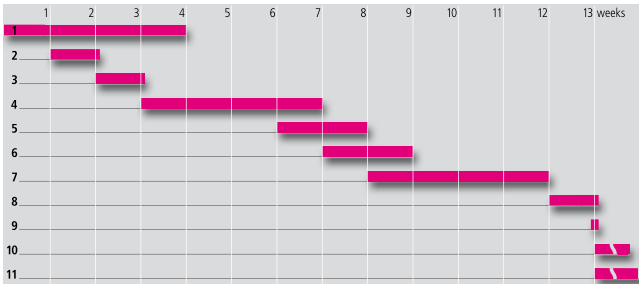
Market success and competitiveness are optimized the more innovative a product is and the faster it achieves state-of-the-art high tech. This is why DIGITAL-LOGIC is entrusted with developing projects to meet these demands. Yet not every company can or wants to implement the necessary integration work themselves. In that case it commissions DIGITAL-LOGIC with carrying out its project.

DIGITAL-LOGIC with a team of competent engineers in its DesignIn Center and in the development department is highly specialized in order to work out a custom system solution for each customer.

Project planning

The following workflow and procedures are necessary for customer-specific system solutions:

1. Determine specifications
2. Draw up and submit quotation
3. Project leader coordinates schedule
4. Develop, review and approve the circuit diagram
5. Develop, review and approve the CAD placement
6. Create and review the layout
7. Produce and commission prototypes
8. Perform EMC, thermal and vibration tests
9. Hand over the prototypes
10. Acceptance, redesign if required
11. Start of series production



Time until the first production run lot is 8-12 weeks, depending on volumes and the procurement situation for special components and circuit boards.

RS232C cables

Serial adapter connector: Male 25-Pin DSb unlisted pins have no connection.

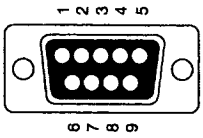
Pin	I/O	Description
1		NC (Shield GND. Other End)
2	>	TX (Transmit Data)
3	<	RX (Receive Data)
4	>	RTS (Request to Send)
5	<	CTS (Clear to Send)
6	<	DSR (Data Set Ready)
7		GND (Signal Ground)
8	<	DCD (Data Carrier Detect)
9	>	+Transmit Current Loop Data
11	>	-Transmit Current Loop Data
18	<	+Receive Current Loop Data
20	>	DTR (Data Terminal Ready)
22	<	RI (Ring Indicator)
25	<	-Receive Current Loop Data

Alternate adapter connector: Male 9-Pin, DSub:

Pin	I/O	Description
1	<	DCD (Data Carrier Detect)
2	<	RX (Receive Data)
3	>	TX (Transmit Data)
4	>	DTR (data Terminal Ready)
5		GND (Signal Ground)
6	<	DSR (Data Set Ready)
7	>	RTS (Request to Send)
8	<	CTS (Clear To Send)
9	<	RI (Ring Indicator)

To wire a 25-Pin connector to a 9-Pin connector:

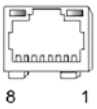
DB-9	DB25	Description
1	8	DCD (Data Carrier Detect)
2	3	RX (Receive Data)
3	2	TX (Transmit Data)
4	20	DTR (Data Terminal Ready)
5	7	GND (Signal Ground)
6	6	DSR (Data Set Ready)
7	4	RTS (Request To Send)
8	5	CTS (Clear To Send)
9	22	RI (Ring Indicator)



male connector view (PC-side)

RJ45

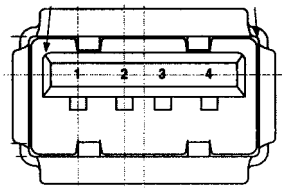
10/100Mb		1000Mb	
1	TXP	1	MDI0 (+)
2	TXN	2	MDI0 (-)
3	RXP	3	MDI1 (+)
4	GND (75 Ohm)	4	MDI2 (+)
5	GND (75 Ohm)	5	MDI2 (-)
6	RXN	6	MDI1 (-)
7	GND (75 Ohm)	7	MDI3 (+)
8	GND (75 Ohm)	8	MDI3 (-)

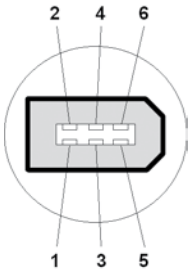


PS/2 Keyboard and mouse cable

Connector: 6-Pin miniature DIN Female, cable requires male.
Used for laptops and PS/1 and 2 keyboard and mouse.
Keyboard: male
PC-side: female

Pin	Name
1	+Keyboard data
2	unused
3	Ground
4	+5 Volts
5	Keyboard Clock
6	unused





USB connector

PIN	Description	I / O
1	VBus	
2	D –	<>
3	D +	<>
4	GND	
Shell	Shield	

Firewire connetor

PIN	Description	I / O
1	Power DC	12 V no load when operating with battery or power adapter
2	Ground	Ground return for power and inner cable shield
3	TPB-	Twisted-pair B, differential signals
4	TPB+ T	wisted-pair B, differential signals
5	TPA-	Twisted-pair A, differential signals
6	TPA+	Twisted-pair A, differential signals

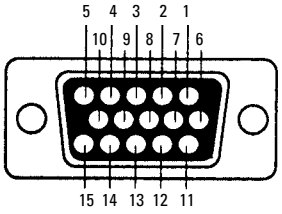
Display cable

Connector: Female 15-Pin DSub, cable requires male.

Cable coming fromCRT: Male. PC-side: Female.

VGA RGB Display:

Pin	I/O	Description	Mono Use	Color Use
1	>	Red		Red
2	>	Green	Mono	Green
3	>	Blue		Blue
4		reserved		
5		Digital Gnd	Self Test	Self Test
6	<	Red return	key	R. return
7	<	Green return	Mono return	G. return
8	<	Blue return		B. return
9		Plug		
10		Digital Gnd	Gnd	Gnd
11		reserved		Gnd
12		reserved		Gnd
13	>	H. Drive	H. Drive	H. Drive
14	>	V. Drive	V. Drive	V. Drive
15		reserved		

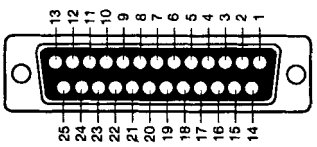


Female connector view (PC-side)

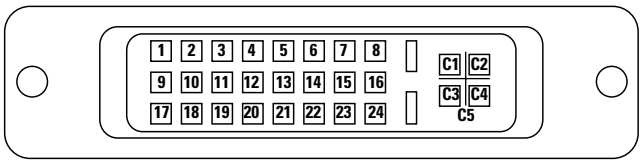
Parallel printer cable

PC (D-25 male) -Prn (Amphenol 57-30360 male)

Description	PC-Pin	Direct.	Prn-Pin
-Strobe	1	<>	1
+Data Bit 0	2	<>	2
+Data Bit 1	3	<>	3
+Data Bit 2	4	<>	4
+Data Bit 3	5	<>	5
+Data Bit 4	6	<>	6
+Data Bit 5	7	<>	7
+Data Bit 6	8	<>	8
+Data Bit 7	9	<>	9
-Acknowledge	10	<	10
+Busy	11	<	11
+Paper End	12	<	12
+Select	13	<	13
Auto Feed	14	>	14
-Error/Fault	15	<	32
-Printer Init	16	>	31
-Select	17	>	36
Ground	18-25		19-30
-Printer Init	16	>	31
-Error/Fault	15	<	32
Ground			33
Not Used			34
+5v through 4.7K			35
-Select	17	<	36



DVI-I



Pin	Description	Pin	Description	Pin	Description
1	TMDS Data 2-	9	TMDS Data 1-	19	TMDS Data 0-
2	TMDS Data 2+	10	TMDS Data 1+	20	TMDS Data 0+
3	TMDS Data 2/4	11	TMDS Data 1/3 Shield	21	TMDS Data 0/5
4	TMDS Data 4-	12	TMDS Data 3-	22	TMDS Data 5-
5	TMDS Data 4+	13	TMDS Data 3+	23	TMDS Data 5+
6	DDC Clock	14	+5V Power	24	TMDS Clock Shield
7	DDC Data	15	Gnd (+5, Analog V/H Sync)	25	TMDS Clock+
8	Analog Vertical Sync	16	Hot Plug Detect	26	TMDS Clock-C1
C1	Analog Red Video	17	Analog Green Video	27	Analog Blue Video
C4	Analog H Sync	18	Analog Gnd (R, G&B)		

NOTES

NOTES

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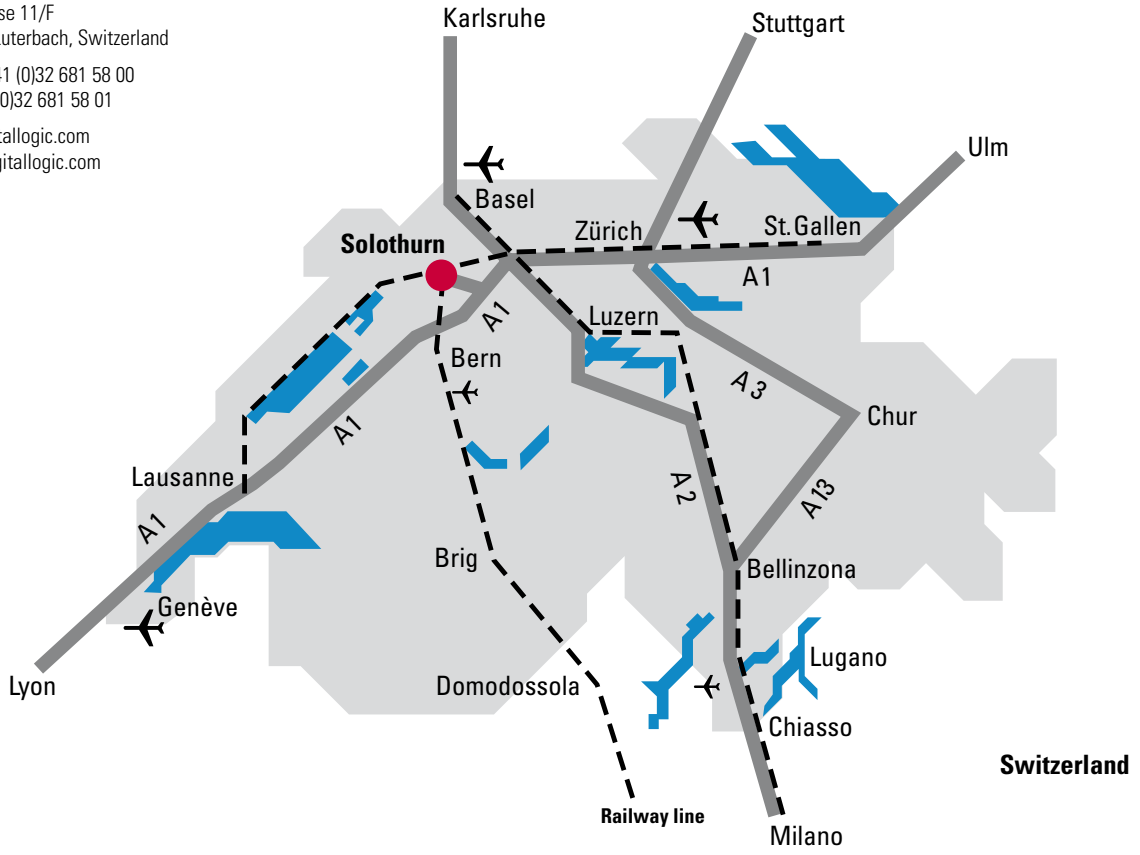

- Take Solothurn-Ost, Zuchwil exit
- First turn-off on the right in direction of Zuchwil, Industrie
- Take the first road on the right at each of the two roundabouts in direction of Luterbach, Industrie
- Continue in direction of Industrie in Luterbach and turn left into Nordstrasse approx. 300 m after the place name sign

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