Solution Guide

MICROSPACE®
Computer Systems
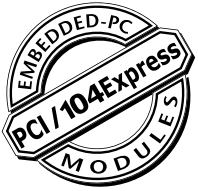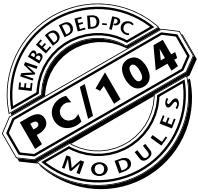English

DIGITAL-LOGIC
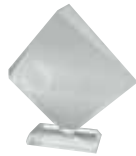
smart embedded computers

2009 | 2010

MEMBERSHIPS

PC/104 MODULES — EMBEDDED-PC

PICMG — PCI INDUSTRIAL COMPUTERS EUROPE

SWISS ICT

intel Embedded and Communications Alliance — Affiliate

Microsoft® Windows® Embedded Partner

PCI/104Express MODULES — EMBEDDED-PC

AMD Embedded Solutions PARTNER

AWARDS

JUNGUNTERNEHMERPREIS 1. PREIS SCHWEIZ 1997

FDP KMU-Award 2001

Finalist as Entrepreneur of the Year 2003

VDC — 2003 PLATINUM VENDOR: PC/104 FAMILY

VDC — 2004 GOLD VENDOR: PC/104 FAMILY

iF design award 2005

MEDIACENTER AWARD SWITZERLAND 2006 — BEST DESIGN

VDC 2006 GOLD VENDOR

SOLOTHURNER UNTERNEHMERPREIS 2009

IQNet

Felix Kunz Chairman and CEO

World-wide technological leader

DIGITAL-LOGIC not only develops, produces and markets computer modules and computer boards but also complete MICROSPACE® computer systems using embedded computer technology. These computer systems are PC compatible, extremely energy efficient, noiseless, incredibly robust and very small. x86 compatibility allows the use of all the usual PC software and operating systems (Windows, Linux, RT-OS, DOS).

Founded in 1992, the Swiss high-tech company DIGITAL-LOGIC continually supplies the world-wide embedded computer market with its innovative products. The MICROSPACE® computer systems work with a large input voltage range from 12-110VDC and 240VAC and in a broad temperature range in part from -40 to +85 degrees Celsius. This is achieved through a patented passive cooling method. The casing is manufactured with a shaped aluminum alloy or stainless chromium steel whereby the high durability and watertightness is achieved.

DIGITAL-LOGIC also leads in the development of standards used worldwide such as the PCI/104-express bus and smartCoreExpress modules.

Long-term availability

When choosing component parts, DIGITAL-LOGIC engineers pay special attention to their long-term availability. Flip chips from the embedded long-life programs of AMD and Intel are mostly used. All software codes (BIOS, drivers) are on hand as source codes to ensure very long-term support. DIGITAL-LOGIC products are available for a minimum of 5 years and practically for up to 10 years. All SMX945 and Atom based computer systems can be scaled for future computer technology. The SMX945 can be scaled with the SMXG45 or SMX945-N270; within a year the SMA200 (Atom) will be scaled with the next Atom generation (more performance with less power consumption).

MICROSPACE® computer systems for mobile applications

Computer systems for mobile applications have additional demands made on them. The hard disk is replaced by a solid-state drive (up to 32GB). Board voltages (vehicle, rail, aircraft) require protective circuits against over and under voltage which are defined in special standards (see the standards overview). With every mobile application, the lowest possible power consumption is expected. Therefore, in vehicle computers, the current demand in the off-state is reduced to under 1mW. All mobile computers have GPS (satellite navigation), WLAN and GSM (UMTS) functions available (optional).

MADE SWISS

The company

DIGITAL-LOGIC operates worldwide and exports over 90% of their Swiss-made computer products. The computer boards are manufactured on automated assembly lines, then inspected and tested, and finally made into computer systems. Pentium-M, Multicore and Atom processors from Intel are used. Quality management is ISO-9001 certified and the products have application-specific accreditation (vehicle license e1, rail standard EN50155, medical license EN60601). All products are RoHS compliant. The company employs in their headquarters in Luterbach approximately 110 workers plus 16 apprentices and approximately 10 people in their subsidiaries. DIGITAL-LOGIC is represented worldwide through subsidiaries and distribution partners.

Product support

Each computer system has available a configurations log in its internal database. All serial numbers, configuration dates and manufacture dates are stored and, in the case of service, updated. During manufacture, all individual component data are automatically captured allowing complete traceability. The standard guarantee is 24 months which can be extended to 36 months if desired.

Sales by industry
As of 01. 2009

Industry + POI 25%

Medical technology 9%

Vehicle 10%

Railway 29%

Military/Aviation 27%
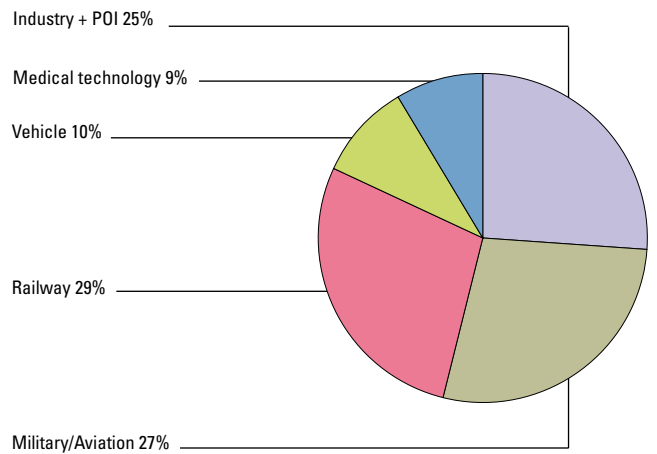
The MICROSPACE® computer systems market segment

DIGITAL-LOGIC manufactures specially designed computer systems for its target markets which optimally and individually satisfy the application profiles of the individual markets. Consequently, reliable operation with high availability (high MTBF) is a given.

The industrial market

The MICROSPACE® computer systems for the industrial market cover applications for measurement engineering, for industrial automation and control, and include data capture for stationary information terminals (POI). Power supply is through the 12V or 24V PLC or with a power adaptor (110/220VAC). Mounting possibilities include desktop, DIN top-hat rails, 19" or wall mounts. The MPCV product family can also be easily expanded with additional options.

Medical market

The MICROSPACE® computer systems for the medical field are EN60601 certified and fulfill security restrictions so that if patient contact occurs there will be no improper high current flow. The systems possess medical grounding clamps and are insulated accordingly. Systems have been installed in operating theaters and intensive care stations but also in doctor's offices and patient's rooms.

Vehicular market

MICROSPACE® computer systems for mobile use in vehicles (battery input of 12V, 24V, 28V, 42V) have e1 clearance and function in a broad temperature range. The input power packs coded V1248 are especially protected in vehicular environments (overcurrent, over-voltage, current reduction at motor start, reverse polarity protection). Special automotive hard disks, CompactFlash or solid-state drives are used as mass storage devices. These computers include optional GPS, GSM-UMTS and WLAN.

Rail market

The MICROSPACE® computer systems for rail applications fulfill the EN50155 rail standard and function on inputs of 24VDC to 110VDC. In addition, certified and insulated power supply packs are used (voltage code I24-I110). Together with a SSD mass storage device, these computers function from -40 to +85 degrees Celsius. All fittings are coded and lockable. The temperatures and voltages are monitored and logged. Redundant supplies, interfaces and battery buffering are options. These computers include optional GPS, GSM-UMTS and WLAN.

Military market

The MICROSPACE® computer systems for military applications are extremely robust and protected. The MPCX27MIL computer can therefore be totally immersed in water. Military connectors are used. The operating temperature range is -40 to +85 degrees Celsius and achieves the highest vibration and shock resistance. Additionally, a 3D acceleration sensor is built into the MPCX27MIL product family allowing measurement in each axel of values from 1mG to 6G. For expandability, a PCI/104-Express slot is available with 48 reserve input and output signals over a MIL connector. These computers include optional GPS, GSM-UMTS and WLAN.
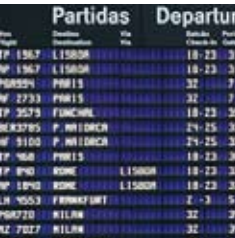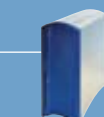
Application	Place	Supply	Temp.	Normen	Max. Memory	Protection	Disk	Option GPS	Option GSM	Option WLAN	Option CAN	LAN Ports	DVD	PC/104+ Extension	Slot Extension	Firewire	Video input	ESATA	G-Sensor	WOL	WOR	WOM	Boot from LAN
Industry + POI	stationary top-hat rail	10-30VDC	+5°C bis +50°C	CE	1GB	IP40	160/320GB	-	-	x	x	2	-	1	-	-	-	-	-	(x)²⁾	-	-	x
	stationary top-hat rail	10-30VDC	+5°C bis +50°C	CE	1GB	IP40	160/320GB	-	-	x	x	2	-	1	-	-	-	-	-	(x)²⁾	-	-	x
	stationary top-hat rail	10-30VDC	+5°C bis +70°C	CE	1GB	IP40	160/320GB	-	-	x	-	2	-	1-2	-	-	-	-	-	(x)²⁾	-	-	x
	stationary	10-30VDC	+5°C bis +50°C	CE	1GB	IP50	160GB	-	-	x	-	1/3	ja	-	-	x	x⁴⁾	-	-	-	(x)³⁾	-	x
	stationary flat	10-30VDC	+5°C bis +50°C	CE	3GB	IP40	SATA 320GB	-	-	x	-	2/4	-	-	-	-	-	-	-	-	-	-	x
	stationary	110/220VAC	+5°C bis +50°C	SEV	3GB	IP40	2x SATA max 2TB	-	-	x	-	2	ja	-	2	x	-	-	-	-	-	-	x
	19"-Rack stationary	110/220VAC	+5°C bis +50°C	SEV	3GB	IP40	2x SATA max 2TB	-	-	x	-	2	ja	2	1	-	x	-	-	x	-	-	x
Medical	stationary	110/220VAC	+5°C bis +50°C	EN60601	1GB	IP52	320GB	-	-	x	-	2	ja	2	-	-	-	-	-	x	x	-	x
	stationary	110/220VAC	+5°C bis +50°C	EN60601	3GB	IP40	250GB max 2TB	-	-	x	-	2	ja	2	1	-	-	-	-	-	-	-	x
Vehicles	mobile	8-30VDC	-20°C bis +70°C	e1	1GB	IP52	40GB SSD16GB	x	x	x	x	1	opt.	1¹⁾	-	-	x	-	-	-	x	-	x
	mobile	8-48VDC	-20°C bis +70°C	e1	1GB	IP54	80GB SSD32GB	x	x	x	x	2	-	1¹⁾	-	-	-	x	-	-	x	x	-	x
	mobile	8-48VDC	-20°C bis +70°C	e1	3GB	IP50	80GB SSD32GB	x	x	x	x	2	-	2	1	-	x	-	-	x	-	-	x
Railway	mobile top-hat rail	24-110VDC	-40°C bis +85°C	EN50155 TX	1GB	IP65	SSD32GB	x	x	x	-	2	-	1¹⁾	-	-	-	-	x	x	x	x	x
	mobile	24-110VDC	-40°C bis +85°C	EN50155 TX	1GB	IP52	SSD32GB	x	x	x	x	2	-	1¹⁾	-	-	-	x	-	-	x	x	-	x
	mobile, flat	24-110VDC	-25°C bis +85°C	EN50155 TX	3GB	IP50	80GB SSD32GB	x	x	x	x	2	-	2	1	-	-	-	-	x	-	-	x
	mobile, 19"-Rack	24-110VDC	-25°C bis +85°C	EN50155 TX	3GB	IP50	80GB SSD32GB	x	x	x	x	2/6	-	2	1	-	x	-	-	x	-	-	x
Military Aviation	mobile top-hat rail	12-48VDC 24-110VDC	-40°C bis +85°C	EN50155 MIL810	1GB	IP67	SSD32GB	x	x	x	x	2	-	1¹⁾	-	-	-	-	x	x	x	x	x
	mobile	8-30VDC	-40°C bis +70°C	EN50155 MIL810	1GB	IP65	SSD, CF	x	x	x	x	1	-	1¹⁾	-	-	x	-	-	-	-	-	x

¹⁾ factory extension   ²⁾ only Atom products   ³⁾ only MPCX48A   ⁴⁾ only MPC40/C

	LX800 0.5GHz	ZC Prozessor 1.0GHz	Atom 5x 0 1.1/1.6GHz	Pentium®-M 1.4GHz	Core 2 Duo 2x 1.5GHz	Upgrade/Scalable Atom N270	Upgrade/Scalable Atom2	Upgrade/Scalable Core 2 Quad
	MPC20		MPC25					
	MPC21		MPC26					
	MPCV800	MPCV855	MPCV200				x	
			MPCX48A	MPC40/A/C				
					MPCF50	x		x
					MPC50	x		x
					MPCR50	x		x
			MPCV200M				x	
					MPC50M	x		x
		MPCX48		MPCX47				
			MPCX28				x	
					MPCX50	x		x
			MPCX27R				x	
			MPCX28R				x	
					MPCF50R	x		x
					MPCR50R	x		x
			MPCX27MIL				x	
				MPCX47MIL				

Vibration

The computer systems are tested for vibration and shock resistance in accordance with IEC68-2-6, respectively MIL-STD-810E. They are tested on the vibration test stand between 1Hz and 1kHz and with acceleration values up to 2G. With the MPCX47, MPCR50R, the hard drive is mounted on special vibration dampers so it can also be used in vehicles.

For applications with very strong vibrations, the computer systems can be equipped with a Solid State Disk which allows vibrations up to 16G, shock resistance to 1500G and extreme working temperatures in the range of -40°C to +85°C (MPCX27).

IP protection classes

Industrial systems are subject to different stress than desktop PCs in an office environment. For industrial usage, protection classes and standards are defined which specify the environmental loads a system can be subjected to without suffering damage with regard to contact and protection from foreign bodies/moisture. The protection classes are defined in the IP standard, DIN EN 60529: Housing protection classes (IP code).

The IP code consists of a two-digit number combination that indicates the respective protection level, e.g. IP54. The first digit, 5, specifies the protection class for contact and foreign body protection; the second digit, 4, specifies water and moisture protection. The MPCX27MIL is rated IP67 and therefore has maximum protection from moisture.

Example: IP 5 ④

| 5 | **Protection from hard objects** |

IP	TESTS	
0		no protection
1	Ø 50 mm	Protection from objects that are bigger than 50mm (e.g. unintentional hand contact)
2	Ø 12.5 mm	Protection from fixed objects that are bigger than 12.5mm (e.g. finger of a hand)
3	Ø 2.5 mm	Protection from fixed objects that are bigger than 2.5mm (e.g. tools/cables)
4	Ø 1 mm	Protection from fixed objects that are bigger than 1mm (e.g. tools/small cables)
5		Protection from dust (no damaging deposits)
6		Full protection against dust

| 4 | **Protection from liquids** |

IP	TESTS	
0		no protection
1		Protection from vertically falling water droplets (condensation)
2		Protection from water droplets falling at an angle of 15° in relation to vertical
3		Protection from water droplets falling at an angle of 60° in relation to vertical
4		Protection from water droplets from all directions
5		Full protection from water jets with the equivalent force of large waves
6/7		Protection against strong hose water/ protection against temporary imersion in water

Temperature Requirements of EN50155 Standard

Category	Internal cabinet temperature range	Ambient board temperature range
T1	-25°C / +55°C	-25°C / +70°C
T2	-40°C / +55°C	-40°C / +70°C
T3	-25°C / +70°C	-25°C / +85°C
TX	-40°C / +70°C	-40°C / +85°C

Isolation Requirements of EN50155 Standard

Railway electronic equipment shall be protected against dielectric strength through different isolation barriers. The levels are defined in different standards such as EN50155, NF F 670001 or NF 05-510 and are resumed in the following table.

Input Nominal	Rolling stock EN50155 requirements	Rolling stock NF F 670001 requirement	Ground equipment NF F 05-510 requirements
24 VDC	500Veff/50Hz/1min.	group A : 1500Veff./1min.	2000Veff./50Hz/1min.
48 VDC	500Veff/50Hz/1min.	group A : 1500Veff./1min.	2000Veff./50Hz/1min.
72 – 125 VDC	1000Veff/50Hz/1min.	group A : 1500Veff./1min.	20500Veff./50Hz/1min.
125 – 315 V	1500Veff/50Hz/1min.	group A : 1500Veff./1min.	2000Veff./50Hz/1min.

STANDARDS

MICROSPACE® power supply options

Indication	Nom. Voltage	Range	Transients (0.6/1.4) Low (0.1s)	High (1s)	Isolation Voltage	Systems	Voltage Disruption S1=0ms / S2=10ms	Market
N1224	12, 24	10-28V	10V	28V	-	MPC4x MPC2x MPCV8xxx/I/M	S1	Industrie / POI
N1248	12, 24, 48	10-55V	10V	58V		MPCV200/M	S1	Industrie / POI
I24	24VDC	17-30V	14V	34V	1500V	MPCR50R, F50R MPCX28R MPCX27R	S2	Railway
I36	36VDC	25-45V	22V	51V	1500V	MPCR50R, F50R MPCX28R MPCX27R	S2	Railway, Military
I48	48VDC	34-60V	29V	67V	1500V	MPCR50R, F50R MPCX28R MPCX27R	S2	Railway
I72	72VDC	50-90V	43V	101V	1500V	MPCR50R, F50R MPCX28R MPCX27R	S2	Railway
I110	110VDC	77-137V	66V	154V	1500V	MPCR50R MPCX28R MPCX27R	S2	Railway
V1248	12-48VDC	10-58V	8V	67V	-	MPCX27/28	S2	Vehicle, Military
V2448	24-48VDC	17-58V	14V	67V	-	MPCX50	S2	Vehicle
V1224	12, 24VDC	10-28V	8V	30V		MPCX48 MPCX47	S2	Vehicle

Nxxyy = Normal power supply (xx to yy volt)   **I**xx = Isolated EN50155 DC power supply (xx volt)   **V**xxyy = Vehicle battery power supply (xx to yy volt)

Permanent, Transients and Brown-out requirements

The table hereafter specifies (according to 3 different standards) for each nominal input voltage (Vin) provided directly from batteries with no voltage stabilization, the permanent input excursion, the brown-out voltage during 100ms and the transient for 100ms or 1 sec.

	Europe EN50155 standard			France NF F 01-510 standard			United Kingdom RIA12 standard			
Nominal input	Permanent input range (0,7-1,25 Vin)	Brownout 100ms (0,6xVin)	Transient 1s (1,4xVin)	Permanent input range	Brownout 100ms (0,5xVin)	Transient 100ms	Permanent input range (0,7-1,25 Vin)	Brownout 100ms (0,6xVin)	Transient 1s (1,5xVin)	Transient 20ms (3,5xVin)
24 V	16,6 - 30 V	14,4 V	33,6 V	18 - 34 V	12 V	40 V	16,6 - 30 V	14,4 V	36 V	84 V
37,5 V	26 - 47 V	22,5 V	52,5 V	/	/	/	26 - 47 V	22,5 V	56,25 V	131,25 V
48 V	33,6 - 60 V	28,8 V	67,2 V	/	/	/	33,6 - 60 V	28,8 V	72 V	168 V
72 V	50,4 - 90 V	43,2 V	100,8 V	50 - 90 V	36 V	115 V	50,4 - 90 V	43,2 V	112,5 V	252 V
96 V	67,2 - 120 V	57,6 V	134,4 V	/	/	/	67,2 - 120 V	57,6 V	144 V	336 V
110 V	77 - 137,5 V	66 V	154 V	77 - 137	55 V	176 V	77 - 137,5 V	66 V	165 V	385 V

EMC Measurements for Standard Systems and Rail Systems

	Generic Industrial Standard	EN 50121-3 and -4	Rail EN 50155	Rail NF F 05-510
Radio electrical conducted emission <30MHz 0,15 - 0,5 MHz (quasi peak) 0,5 - 5 MHz (quasi peak) 5 - 30 MHz (quasi peak)	EN55022 EN55011	EN55011 level +20 dB : 79 dB/µV/m+20dB (quasi peak) 73 dB/µV/m+20dB (quasi peak) 73 dB/µV/m+20dB (quasi peak)	Level : 70 dB/µV/ qp 70 dB/µV/ qp 70 dB/µV/ qp	Level : < 46 dB/µA 26 dB/µA 26 dB/µA
Radio magnetic emission qp at 10m >30MHz 30 - 80 MHz 80 - 230 MHz 230 - 1.000 MHz	EN55022 EN55011	EN55011 level class B : 40 dB/µV/m (quasi peak) 40 dB/µV/m (quasi peak) 47 dB/µV/m (quasi peak)	Level : 70 dB/µV/m < 70 dB/µV/m < 70 dB/µV/m	Level : 56 db/µV/m 56 db/µV/m 63 dB/µV/m
Electrostatic discharge immunity (Internal)	EN61000-4-2 or IEC-801-2	Level : 6KV contact cond. B Level : 8KV air cond. B	/ /	/ /
Radio frequency electromagnetic fields immunity (80 - 1.000 MHz)	EN 61000-4-3 or IEC-801-3 EN50140	Level : 10V/m condition A Level : 20V/m condition A	Level : 10V/m Level : 20V/m	Level : 10V/m /
Fast transient burst immunity (DC power port and I/O ports)	EN 61000-4-4 or IEC-801-4	Level : 0.5KV condition A Level : 2KV condition A	Level : 2 KV	Level : 2KV
Surges immunity (see table below)	EN 61000-4-5 or IEC-801-5	Level : 2KV condition B Impedance 42 Ohm	Level : 1,8 KV	/
Conducted disturbances induced by radio frequency fields immunity (150KHz-80MHz) (DC power port and I/O port)	EN50141 or EN 61000-4-6 EN50121-4	Level : 3V condition A Modulation 80% AM Impedance 150 Ohm Level : 10V condition A	/	/
Damped oscillatory magnetic field immunity	EN 61000-4-10	Level : 30 A/m condition B	/	/

Surge Requirements

Railway electronic equipment shall be protected from surges either directly induced or indirectly coupled such that no damage or failure occurs during operations. The magnitude, duration and source impedance of these surges for design purposes are defined in EN 50155, RIA 12 or the international standard IEC-801-5 renamed EN61000-4-5 as follow :

	EN50155 standard			BRB/RIA 12 standard			EN61000-4-5 standard		
	Level	Waveform	Source impedance	Level	Waveform	Source impedance	Level	Waveform	Source impedance
Direct spikes Line to line coupling	1.800 V 1.800 V 8.400 V	5/50 µs 5/50 µs 0,05/0,1 µs	100 W 5 W 100 W	800 V 1.500 V 3.000 V 4.000 V 7.000 V	10/100µs 5/50µs 0,5/5µs 0,1/1µs 0,05/0.1µs	5 W 5 W 100 W 100 W 100 W	1 : 500 V 2 : 1.000 V 3 : 2.000 V 4 : 4.000 V	1,2/50 µs 1,2/50 µs 1,2/50 µs 1,2/50 µs	2 W 2 W 2 W 2 W
Direct spikes Line to earth coupling	1.800 V 1.800 V 8.400 V	5/50 µs 5/50 µs 0,05/0,1 µs	100 W 5 W 100 W	800 V 1.500 V 3.000 V 4.000 V 7.000 V	10/100µs 5/50µs 0,5/5µs 0,1/1µs 0,05/0.1µs	5 W 5 W 100 W 100 W 100 W	1 : 500 V 2 : 1.000 V 3 : 2.000 V 4 : 4.000 V	1,2/50 µs 1,2/50 µs 1,2/50 µs 1,2/50 µs	12 W 12 W 12 W 12 W

STANDARDS

EN60601-1 Standard for Medical Devices

The discharge current

_ The office device standard DIN EN60950 allows a discharge current of up to 3.5mA for „normal PCs"

_ The DIN EN60601-1-1 (VDE0750 Part 1) allows a maximum discharge current of 0.5mA for the protection of patients, users and 3rd parties.

EN60601 Compliant Interfaces

EN60601 Serial Interfaces

On the MPCV200M, COM1/2 is galvanically isolated against 500V external using an optical coupler. This results in 100% protection against unwanted discharge currents. For the MPC50M, galvanically insulated COM interfaces can be built in.

EN60601 USB Interfaces

The MPCV200M USB input (5V, 0.5Amp) is galvanically isolated external using a DC/DC converter on the USB interface. This gives 100% protection against unwanted discharge currents. The differential USB data lines are protected against overvoltage. On the MPC50M, the USB interfaces are mechanically protected against contact.

EN60601 LAN Interfaces

On the MPCV200M, MPC50M and all MICROSPACE® computer systems, the LAN interfaces use a transformer for galvanic external insulation. This results in 100% protection against unwanted discharge currents

EN60601 PS2 Interfaces

There are no PS/2 interfaces on the MPCV200M and MPC50M.

EN60601 FireWire Interfaces

The MPC50M FireWire interfaces are decoupled with a capacitor. The 12V FireWire supply must not be taken from the MPC50M but is generated from a peripheral device using a power adaptor. This gives 100% protection against unwanted discharge currents.

PC SYSTEM

HOUSING DISCHARGE CURRENT
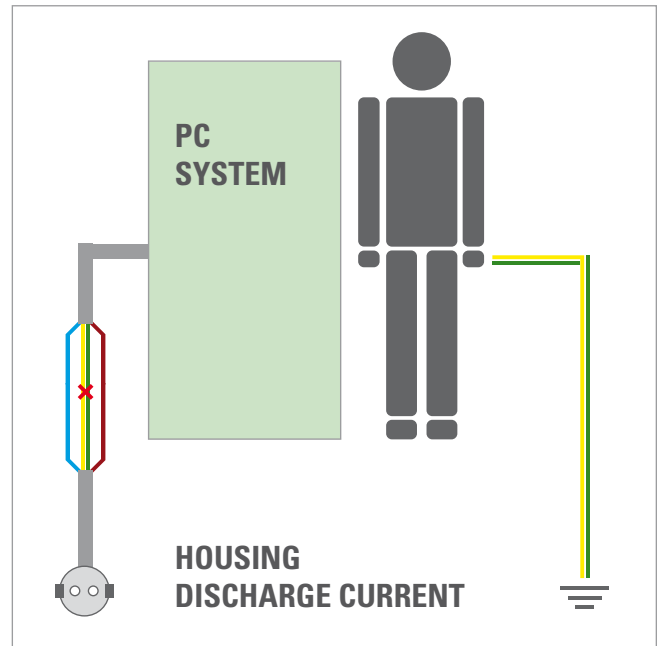
EN60601 Audio and Video Interfaces

These interfaces are not within possible contact with patients and are therefore not isolated.

Computer for Hygiene Environments (medicine, food products)

Both the MPC50M and MPCV200M have a stainless steel casing, a passive and internal cooling design (no dirt catching cooling ribs), and can be cleaned with all normal cleaning materials. The MPCV200M is rated IP52, therefore optimally protected against invasive moisture, and can be intensively cleaned. In this case the MPCV200M must be mounted with the connecters facing downwards to allow the stainless steel protective housing to be effective.

Additional Medical Grounding Connection

The MPC50M and MPCV200M include the standard medical potential compensatory connectors.

MIL-STD-810

The MIL-STD-810 series of standards are issued by the United States Army's Developmental Test Command, to specify various environmental tests to simulate conditions that the tested item will encounter in the field. The current revision, as of 2008, is revision G (i.e. MIL-STD-810G), issued October 31, 2008, superseding revision F (MIL-STD 810F) from January 1, 2000 (last changed May 5, 2003). The methods listed below, along with others, simulate specific environmental conditions, and are referred to by the specification for the device. There is no certification, qualification or approval from the military although in the course of complying with a contract to supply material that the vendor has tested using MIL-STD-810 procedures, the procuring activity may accept such results as compliant with the contract specification.

For instance (where the older 810E is an example):

_ **MIL-STD 810E Method 500.3**
Low Pressure (aka Altitude testing)

_ **MIL-STD 810E Method 501.3**
High Temperature (Both storage and operating)

_ **MIL-STD 810E Method 502.3**
Low Temperature (Both storage and operating)

_ **MIL-STD 810E Method 503.3**
Temperature Shock (how well does the device handle going from high to low temps, and back)

_ **MIL-STD 810E Method 506.3**
Rain (how does the device do in wind blown rain)

_ **MIL-STD 810E Method 507.3**
Humidity (can the device handle high Humidity)

_ **MIL-STD 810E Method 508.4**
Fungus (device is exposed to warm moist air in the presence of Fungus to see if it grows on the device)

_ **MIL-STD 810E Method 509.3**
Salt Fog (does the device rust/fail when exposed to salt fog)

_ **MIL-STD 810E Method 510.3**
Sand and Dust (how well does the device work when exposed to sand and dust)

_ **MIL-STD 810E Method 511.3**
Explosive Atmosphere (does the device create enough sparks/ etc to cause an explosive atmosphere to blow up)

_ **MIL-STD 810E Method 512.3**
Leakage

_ **MIL-STD 810E Method 513.4**
Acceleration (constant acceleration)

_ **MIL-STD 810E Method 516.4**
Shock (either Shock Response Spectrums, or triangle / sine / square wave shocks) — also transport shock

_ **MIL-STD 810E Method 519.4**
Gunfire Vibration

_ **MIL-STD 810E Method 520.1**
Temp, Humidity, Vibration (Traditionally sine wave (pre D), later random vibration — combined with Temp testing)

_ **MIL-STD 810E Method 521.1**
Icing, Freezing Rain

DIGITAL-LOGIC'S INTERFACES

Versatile Options for Computer Power-On

Wake On LAN (WOL)

Computers with this function can be wakened from standby mode over the network from another computer sending a special TCP/IP wake packet. The computer must be configured accordingly for this in advance. The typical application is remote maintenance.

Wake On Ring (WOR)

Computers with this function can be wakened from a „soft off" state by an impulse over the ring line of the COM1. For example, a call from a modem or over GSM can turn on the remote computer. The computer must be accordingly configured for this in advance. The typical application is remote maintenance.

Wake On Move (WOM)

Computers with this function can be wakened from standby mode through mechanical motion in a specific way or along any axes. A 3D acceleration sensor measures the movement and starts the computer when a pre-defined acceleration value is exceeded. Accordingly, the computer must be configured for this in advance. The typical application is property protection and/or tracking systems.

Scalable Products

MICROSPACE® PCs are scalable over several technologies and performance levels. This lengthens the product availability and allows for application specific voltage performance.

Long Availability Intel® processors

Product	CPU Takt (GHz)	FSB (MHz)	L2 Cache	max. power dissipation CPU	Chipset	available until	Housing	
**90nm process technology	32bit CPU**								
Celeron® M 373ULV	1.0	400	512kB	5.5W	6W	2014	uFC-BGA	scalable
Processor 140 ULV	1.0	400	0kB	5.0W	6W	2014	uFC-BGA	scalable
**90nm process technology	32bit CPU**								
Pentium® M 745	1.8	400	2MB	21W	6W	2014	uFC-PGA	
Pentium® M 738LV	1.4	400	2MB	10W	6W	2014	uFC-BGA	
**65nm process technology	32bit CPU**								
Core™ Duo L2400 LV	2x 1.6	667	2MB	15W	10W	2016	uFC-BGA	
Core™ 2 Duo L7400 LV	2x 1.5	667	4MB	17W	10W	2016	uFC-BGA	
**45nm process technology	64bit CPU**								
Core™ 2 Extreme Processor QX9300	4x 2.5	1066	4x 3MB	45W	14W	2020	uFC-PGA	scalable
Core™ 2 Extreme Processor SL9400	2x 1.9	1066	4x 3MB	17W	14W	2020	uFC-BGA	scalable
**Intel® Atom processors	45nm Hi-k processor technology CPU**								
Atom N270	1.6	533	512kB	4W	10W	2018	BGA	
Atom Z510	1.1	400	512kB	2W	8W	2018	SFF	scalable
Atom Z530	1.6	533	512kB	2W	8W	2018	SFF	scalable
Atom 2	2.0	533	?	3W	2W	2020	BGA	scalable

AMD processors long-life status

Geode™ LX800	0.5	333	128kB	4W	4W	2016	BGA	

CPU comparison of performance and power consumption
(determined by DIGITAL-LOGIC)

■ CPU Mark 2002   ■ Power consumption
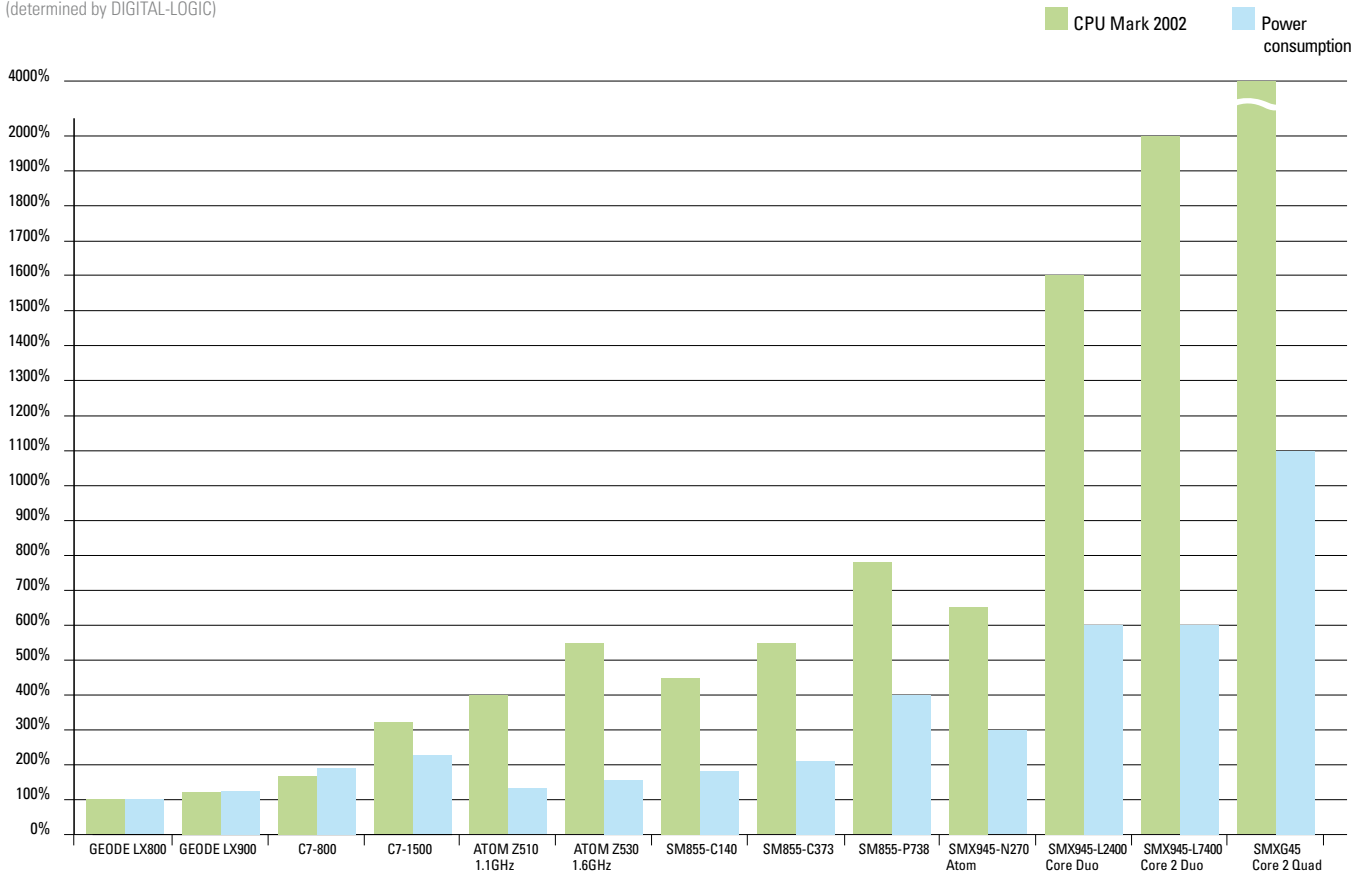
LCD/BIOS adaptation

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.

Atom video BIOS/driver standard resolutions

Resolution	DVI (60Hz)	LVDS**
640 x 480	●	●
800 x 600	●	●
1024 x 768	●	●
1152 x 864		**
1280 x 720		**
1280 x 768	●	**
1280 x 960		**
1280 x 1024	●	●
1600 x 1200	●	

Intel® video BIOS/driver standard resolutions

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

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

Hard Disk and Solid State Disk Information

DIGITAL-LOGIC uses only top quality hard drives in its MICROSPACE® computer systems. Special hard drives can be ordered (optional) for use in harsh in-vehicle environments or for continuous 24-hour operation. The following comparitive table shows the technical details and the different order numbers:

Model	Hard Disk Standard	Hard Disk Standard	16GB SSD	Solid State Disk SATA	Harddisk 40GB HD 24h Automotive	Harddisk 80GB HD 24h Automotive
Capacity	160GB	320GB	16GB	32GB	40GB	80GB
Interface	PATA-6	SATA2	PATA-6	SATA-2	PATA-6	SATA
Disks	2	2	Flash	Flash	1	1
Rotation (rpm)	4200	7200	-	-	5400	5400
Write speed	100MB/sec	300MB/sec	50MB/sec	60MB/sec	100MB/sec	150MB/sec
Read speed	100MB/sec	150MB/sec	70MB/sec	150MB/sec	100MB/sec	150MB/sec
Power consumption (writing)	2.2W	1.8W	0.5W	0.5W	1.7W	1.8W
Operating air temperature	+5°C to +55°C	+5°C to +55°C	-40°C to +85°C	-40°C to +85°C	-30°C to +85°C	-30°C to +85°C
Operating temperature at the cover	no data	no data	no data	no data	max. +90°C	max. +90°C
Temperature reduction	no data	no data	no data	no data	-1°C/ 300 altitude diff.	-1°C/ 300 altitude diff.
Operating altitude	max. 3000m	max. 3000m	max. 20'000m	max. 20'000m	-300m to +4420m	-300m to +4420m
Shock (1/2 sine wave) (MIL-STD810F)	200Gs (2ms)	200Gs (2ms)	1500Gs (2ms)	1500Gs (2ms)	300Gs (2ms)	300Gs (2ms)
Vibration sine wave	1G (5-500Hz)	1G (5-500Hz)	16G (20-2000Hz)	16G (20-2000Hz)	2G (10-500Hz)	2G (10-500Hz)
MTBF	no data	no data	2 Mio. h (25°)	4 Mio. h	750'000h (70°C)	750'000h (70°C)
Operating hours	333h/month=10h/day	333h/month=10h/day	24h / day	24h / day	8760h/yr= 24h/day	8760h/yr= 24h/day
Write cycles	no data	no data	5 Mio.	5 Mio.	no data	no data
RoHS	yes	yes	yes	yes	yes	yes
Replacement Part No.	890003	890005	890100	890114	890002	890019

DIGITAL-LOGIC Compact Flash

CompactFlash Standard Grade-Temperature Range 0°C to +70°C, DIGITAL-LOGIC Brand, SLC-NAND, Ultra DMA, Fixed Disk, 2 Mio. h MTBF, 5 Mio. write cycles

Article	No.	Description / Application
CF 256MB	890021	CompactFlash Card 256MB, Type 256-XIC4
CF 1.0GB	890022	CompactFlash Card 1024MB, Type 1GO-XIC4
CF 2.0GB	890023	CompactFlash Card 2048MB, Type 2GO-XIC4

CompactFlash Industrial Grade-Temperature Range -40°C to +85°C, SLC-NAND, Ultra DMA, Fixed Disk, 4 Mio. h MTBF, 5 Mio. write cycles

Article	No.	Description / Application
CF 128MB-IG-E48	890032	CompactFlash Card 128MB, Type SSD-CnnMI-3512
CF 512MB-IG-E48	890034	CompactFlash Card 512MB-IG, Type SSD-CnnMI-3512
CF 1.0GB-IG-E48	890036	CompactFlash Card 1024MB-IG, Type SSD-CnnMI-3512
CF 2.0GB-IG-E48	890038	CompactFlash Card 2048MB-IG, Type SSD-CnnMI-3512

Board Support Package (BSP)

Board Support Packages are free of charge and may be downloaded from our website or ordered using the following part numbers.
BSPs contain all drivers and installation tools for most operating systems:

Article	No.	Operating system	Product Range
BSP-CD855	816210	DOS, Linux, WIN-XP	Intel 855GME
BSP-CD945	816212	Linux, WIN-XP, Vista	Intel 945GME
BSP-CDLX800	816213	DOS, Linux, WIN-XP, CE5	AMD LX800/900
BSP-CDP5T3	816214	DOS, Linux, WIN-XP	Intel Tualatin, AMD ELAN520
BSP-CDA200	816216	Linux, WIN-XP, Vista, CE6	Atom Z510, Z530
BSP-CDG45	816217	Linux, WIN-XP, Vista	Intel G45

Internet

LAN_2

XVGA LCD

LAN_1

Local
Application
Management

Thermal Printer

USB

Multifunctional Printer

Pole Display

4x RS-232/
422/485/CAN

3x USB 2.0
(480MB/s)

USB

Scanner

Touch Screen

USB

Storage Device

(only MPC21A)

802.11b/g

4 Dig. Input (opto-isol.)

Smart Card Reader

Stereo
Audio

(only MPC21)

Network
WLAN

4 Relay Output
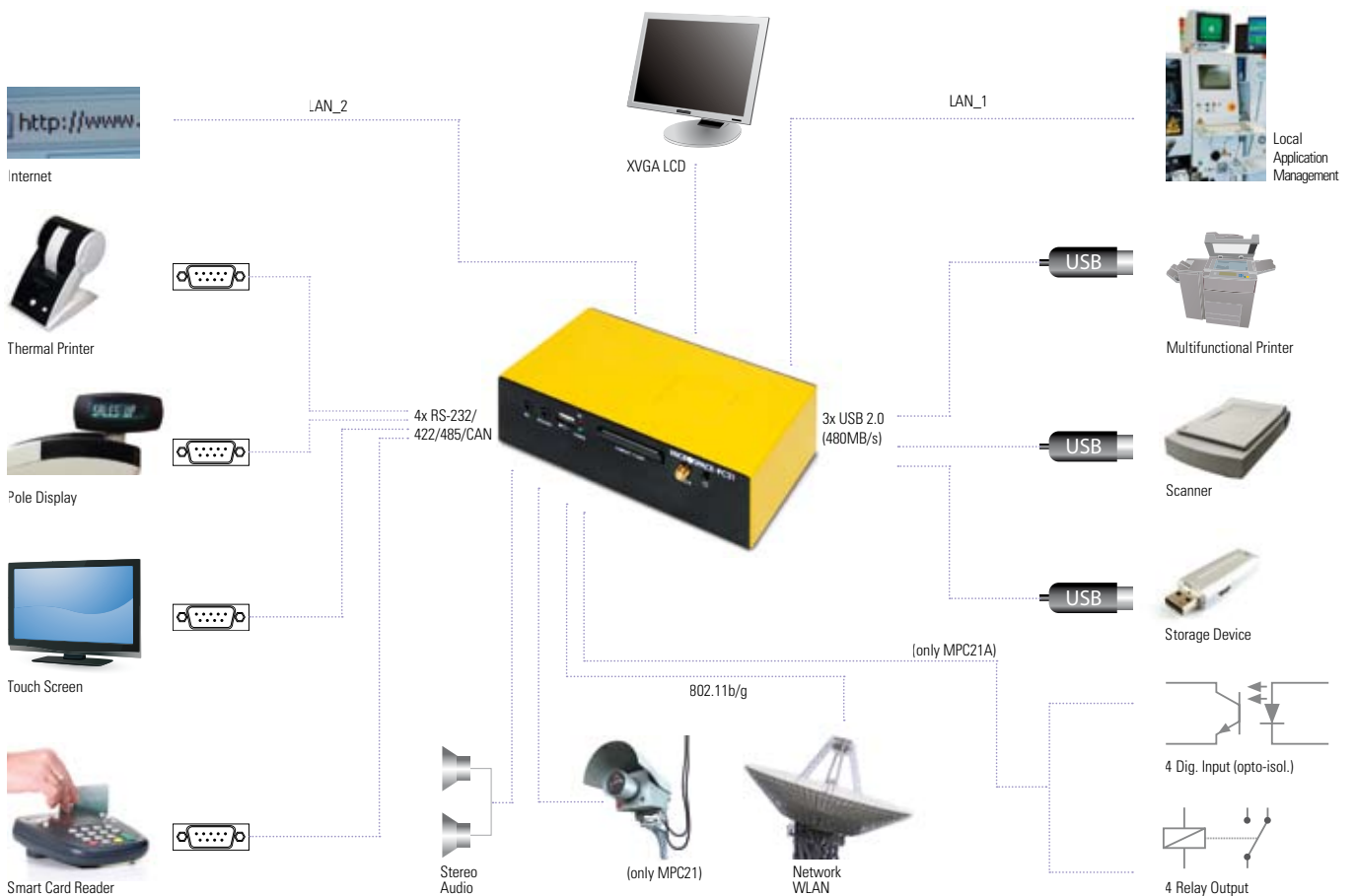
MPC20   MPC20L

MPC20/L

The smallest, fanless industrial computer

The MPC20 has all the standard interfaces (USB, LAN, VGA, audio). With the LX processor, the system typically only needs 10 Watts. For mass storage, besides the CompactFlash on the front, an optional hard drive is available. The housing is of rugged sheet steel with various mounting options (see Accessories).

Applications

_ Information terminals

_ Linux microcomputer

_ Firewall

_ External 110/220VAC power pack

Ordering information

Item	No.	Description
Upgrade 256MB to 512MB DDR	815060	512Mb RAM assembled
Upgrade 256MB to 1GB DDR	815062	1GB RAM assembled
MPC20/21 Option 160GB HD.	807461	160GB HD PATA assembled for MPC20/21 incl. cable
Option MPC20/21 WLAN	812028	Intel 2915 AGB MiniPCI, incl. antenna + mounting
PowerSupply 19V/60W	812029	ACin:110-240V,60W Uout:19V,3Amp. without: powercord
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply
MPC2x HD Assemblykit	812018	MPC20/21 HD Assemblykit
Lizenzkleber PXE-LanBoot	809108	

For mounting accessories see page 30.

Technical data

Type	MPC20	MPC20L
CPU	LX800	LX800
ISA-BUS	-	-
PCI-BUS	MiniPCI-socket	MiniPCI-socket
PCI Express-BUS	-	-
Performance (MHz)	500	500
DRAM Min-Max (MB)	256 (max. 1GB)	256 (max. 1GB)
CompactFlash socket (type I/II)	yes, CF 256MB installed	yes
Keyboard, mouse (PS/2)	yes	-
Boot drive	CF, USB, LAN, opt. HD	CF, USB, LAN, opt. HD
IDE interface P-ATA	(1x option)	(1x option)
Digital In	-	-
Digital Out	-	-
COM1	-	-
COM2	-	-
COM3	-	
COM4	-	-
LPT1	-	-
USB (2.0)	4x (of which 1x internal)	4x (of which 1x internal)
CAN1-V2.0	-	-
CAN2-V2.0	-	-
LAN Port A	10/100BASE-T	10/100BASE-T
LAN Port B	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	-	-
Watchdog	yes	yes
Power normal, N1224	10V-28V/typ.10W	10V-28V/typ.10W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	900mAh (>10 years)	900mAh (>10 years)
Cooling type	passive	passive
Operating temperature (without hard disk)	-25°C to +70°C	-25°C to +70°C
Operating temperature (with hard disk)	0°C to +50°C	0°C to +50°C
Protection class		
Size (W x L x H in mm)	165 x 110 x 27	165 x 110 x 27
Weight	500 g	500 g
MTBF (25°C)	100'000h (without HD)	100'000h (without HD)
Special features 1	fan-less	fan-less
Special features 2	-	-
Special features 3	FreeDOS + Linux installed on CF	-
Part no.	812020*	812019

*Including DC power cable (Part no. 812036)

MPC21/A/B/C

The fan-free, energy-efficient mini-industrial computer

The MPC21/A/B/C includes all the standard interfaces (COMs, USB, LAN, VGA, audio) and is internally expandable with a PCI/104 card. With the LX800 processor, the system typically needs only 10 Watts. Besides the CompactFlash on the front, an optional hard drive is available for mass storage. The robust sheet steel housing has various mounting possibilities (see Accessories).

Applications

_ Information terminals

_ Cash register systems

_ Measurement technology, data capture

_ External 110/220VAC power pack

Ordering information

Item	No.	Description
Upgrade 256MB to 512MB DDR	815060	512Mb RAM assembled
Upgrade 256MB to 1GB DDR	815062	1GB RAM assembled
MPC20/21 Option 160GB HD.	807461	160GB HD PATA assembled for MPC20/21 incl. cable
Option MPC20/21 WLAN	812028	Intel 2915 AGB MiniPCI, incl. antenna + mounting
PowerSupply 19V/60W	812029	ACin:110-240V,60W Uout:19V,3Amp. without: powercord
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply
MPC2x HD Assemblykit	812018	MPC20/21 HD Assemblykit
Lizenzkleber PXE-LanBoot	809108	
MPC21/26A Opt. COM3-RS422	812041	RS422 assembled on COM3
MPC21/26A Opt. COM3-RS485	812042	RS485 assembled on COM3
MPC21/26A Opt. COM4-RS422	812043	RS422 assembled on COM4
MPC21/26A Opt. COM4-RS485	812044	RS485 assembled on COM4

For mounting accessories see page 30.

*Isolation voltage 1600V (60 sec.) or 50VDC. Option only for the MPC21A.

Technical data

Type	MPC21	MPC21A	MPC21B	MPC21C
CPU	LX800	LX800	LX800	LX800
ISA-BUS	-	-	-	-
PCI-BUS	1 PCI/104 slot	-	-	1 PCI/104 slot
PCI Express-BUS	-	-	-	-
Performance (MHz)	500	500	500	500
DRAM Min-Max (MB)	256 (max. 1GB)	256 (max. 1GB)	256 (max. 1GB)	256 (max. 1GB)
CompactFlash socket (Type I/II)	yes, CF 256MB inst.	yes, CF 256MB inst.	yes, CF 256MB inst.	yes, CF 256MB inst.
Keyboard, mouse (PS/2)	yes	yes	yes	yes
Boot drive	CF, USB, LAN, opt. HD	CF, USB, LAN, opt. HD	CF, USB, LAN, opt. HD	CF, USB, LAN, opt. HD
IDE interface P-ATA	(1x option)	(1x option)	(1x option)	(1x option)
Digital input (only MPC21A)	-	4x opto isol. 5V-24V*	-	-
Digital output (only MPC21A)	-	4x opto isol. 50V/1A*	-	-
COM1	RS232C, 9pol	RS232C, 9pol	RS232C, 9pol	RS232C, 9pol
COM2	-	RS232C, 9pol	RS232C, 9pol	RS232C, 9pol
COM3/CAN1	-	RS232C, 9pol	CAN1, 9pol	-
COM4/CAN2	-	RS232C, 9pol	CAN2, 9pol	-
LPT1	yes	yes	yes	-
USB (2.0)	4x (1x internal)	4x (1x internal)	4x (1x internal)	4x (1x internal)
LAN Port 1	10/100BASE-T	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN Port 2	10/100BASE-T	10/100BASE-T	10/100BASE-T	10/100BASE-T
Audio	Stereo In/Out	Stereo In/Out	Stereo In/Out	Stereo In/Out
Video controller	LX800	LX800	LX800	LX800
Video memory (MB)	16 (UMA)	16 (UMA)	16 (UMA)	16 (UMA)
LCD interface	-	-	-	-
DVI interface	-	-	-	-
CRT interface	yes	yes	yes	yes
Video input	yes	yes	yes	yes
Watchdog	yes	yes	yes	yes
Power normal, N1224	10V-28V/typ.10W	10V-28V/typ.10W	10V-28V/typ.10W	10V-28V/typ.10W
Power suspend	0.1W	0.1W	0.1W	0.1W
Power management	yes	yes	yes	yes
RTC battery onboard	900mAh (>10 years)	900mAh (>10 years)	900mAh (>10 years)	900mAh (>10 years)
Cooling type	passive	passive	passive	passive
Operating temperature (without hard disk)	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
Operating temperature (with hard disk)	0°C to +50°C	0°C to +50°C	0°C to +50°C	0°C to +50°C
Protection class				
Size (W x L x H in mm)	165 x 110 x 46	165 x 110 x 46	165 x 110 x 46	165 x 110 x 46
Weight	700 g	700 g	700 g	700 g
MTBF (25°C)	100'000h (without HD)	100'000h (without HD)	100'000h (without HD)	100'000h (without HD)
Special features 1	MiniPCI-socket	MiniPCI-socket	MiniPCI-socket	MiniPCI-socket
Special features 2	PCI/104-slot	-	-	PCI/104-slot
Special features 3	FreeDOS + Linux inst.	FreeDOS + Linux inst.	FreeDOS + Linux inst.	FreeDOS + Linux inst.
Part no.	812021****	812022****	812023****	812024****

***Including DC power cable (Part no. 812036).
**** Including DC power cable (Part no. 812035).

MPC25/L

The smallest, fanless, multimedia Atom computer

The MPC25/L has all the standard interfaces (USB, LAN, DVI, audio). With the Atom processor, the system only typically needs 12 Watts. For mass storage, besides the CompactFlash on the front, an optional SATA hard drive is available. The housing is of rugged sheet steel with various mounting options (see Accessories).

Applications

_ Information terminals

_ NetPC, XP embedded

_ Hardware MPEG4 decoder

_ Firewall

_ External 110/220VAC power pack

Ordering information

Item	No.	Description
Option MPC25/6 320GB HD	807466	assembled in MPC25/26 incl. cable and material
Option MPC25/26 WLAN	812048	Intel 4965-AGN Minicard, incl. antenna + assembly
PowerSupply 19V/60W	812029	ACin:110-240V,60W Uout:19V,3Amp. without: powercord
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply
MPC25/6 HD Assemblykit	812017	MPC25/6 HD Assemblykit
Lizenzkleber PXE-LanBoot	809108	

For mounting accessories see page 30.

Technical data

Type	MPC25-1.6G-1GB	MPC25L-1.1G-05GB
CPU	Intel® Atom Z530	Intel® Atom Z510
ISA-BUS	-	-
PCI-BUS	-	-
PCI Express-BUS	PCIexpress MiniCard	PCIexpress MiniCard
Performance (GHz)	1.6	1.1
DRAM Min-Max (GB)	1GB soldered	0.5GB soldered
CompactFlash socket (Type I/II)	yes, CF 256MB inst.	yes
Keyboard, mouse (PS/2)	-	-
Boot drive	CF, USB, LAN, Opt. HD	CF, USB, LAN, Opt. HD
IDE interface SATA2	option	option
Digital in	-	-
Digital out	-	-
COM1	-	-
COM2	-	-
COM3	-	-
COM4	-	-
LPT1	-	-
USB (2.0)	6x (1x internal)	6x (1x internal)
CAN1-V2.0	-	-
CAN2-V2.0	-	-
LAN Port A	1GB-LAN (PCIe)	1GB-LAN (PCIe)
LAN Port B	100MB-LAN	-
Audio	Stereo In/Out	Stereo In/Out
Video controller	Intel®	Intel®
Video memory (MB)	128	128
LCD interface	-	-
DVI interface	yes	yes
CRT interface	-	-
Video input	-	-
Watchdog	yes	yes
Power normal, N1224	10V-28V/typ.12W	10V-28V/typ.12W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	225mAh (>5 years)	225mAh (>5 years)
Cooling type	passive	passive
Operating temperature (without hard disk)	-25°C to +50°C	-25°C to +50°C
Operating temperature (with hard disk)	0°C to +40°C	0°C to +40°C
Protection class		
Size (W x L x H in mm)	165 x 110 x 27	165 x 110 x 27
Weight	500 g	500 g
MTBF (25°C)	>100'000h (without HD)	>100'000h (without HD)
Special features 1	-	-
Special features 2	-	-
Special features 3	FreeDOS + Linux inst.	-
Part no. with 0.5GB RAM	-	812070
Part no. with 1GB RAM	812081	-
Part no. with 2GB RAM	-	-

MPC26/A/L

The fan-free, energy-efficient Atom mini-industrial computer

The MPC26/A/L includes all the standard interfaces (COMs, USB, LAN, DVI, audio) and is internally expandable with a PCI/104 card. With the Atom processor, the system typically only needs 12 Watts. Besides the CompactFlash on the front, an optional SATA hard drive is available for mass storage. The robust sheet steel housing has various mounting possibilities (see Accessories).

Applications

_ Information terminals

_ Hardware MPEG4 decoder

_ Measurement technology, data capture

_ External 110/220VAC power pack

Ordering information

Item	No.	Description
Option MPC25/6 320GB HD	807466	assembled in MPC25/26 incl. cable and material
Option MPC25/26 WLAN	812048	Intel 4965-AGN Minicard, incl. antenna + assembly
PowerSupply 19V/60W	812029	ACin:110-240V,60W Uout:19V,3Amp. without: powercord
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply
MPC25/6 HD Assemblykit	812017	MPC25/6 HD Assemblykit
Lizenzkleber PXE-LanBoot	809108	

For mounting accessories see page 30.

Technical data

Type	MPC26A-1.6G-1GB	MPC26-1.6G-1GB	MPC26L-1.1G-05GB
CPU	Intel® Atom Z530	Intel® Atom Z530	Intel® Atom Z510
ISA-BUS	-	-	-
PCI-BUS	-	1 PCI/104 slot	1 PCI/104 slot
PCI Express-BUS	PCIexpress MiniCard	PCIexpress MiniCard	PCIexpress MiniCard
Performance (GHz)	1.6	1.6	1.1
DRAM Min-Max (GB)	1GB soldered	1GB soldered	0.5GB soldered
CompactFlash socket (Type I/II)	yes, CF 256MB inst.	yes, CF 256MB inst.	yes
Keyboard, mouse (PS/2)	-	-	-
Boot drive	CF, USB, LAN, Opt. HD	CF, USB, LAN, Opt. HD	CF, USB, LAN, Opt. HD
IDE Interface SATA2	option	option	option
Digital in	-	-	-
Digital out	-	-	-
COM1	RS232	RS232	RS232
COM2	RS232	RS232	RS232
COM3	RS232	-	-
COM4	RS232	-	-
LPT1	-	-	-
USB (2.0)	6x (1x internal)	6x (1x internal)	6x (1x internal)
CAN1-V2.0	-	-	-
CAN2-V2.0	-	-	-
LAN Port A	1GB-LAN (PCIe)	1GB-LAN (PCIe)	1GB-LAN (PCIe)
LAN Port B	100MB-LAN	100MB-LAN	-
Audio	Stereo In/Out	Stereo In/Out	Stereo In/Out
Video controller	Intel®	Intel®	Intel®
Video memory (MB)	128	128	128
LCD interface	-	-	-
DVI interface	yes	yes	yes
CRT interface	-	-	-
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal	10V-28V/typ.12W	10V-28V/typ.12W	10V-28V/typ.12W
Power suspend	0.1W	0.1W	0.1W
Power management	yes	yes	yes
RTC battery onboard	225mAh (>5 years)	225mAh (>5 years)	225mAh (>5 years)
Cooling type	passive	passive	passive
Operating temperature (without hard disk)	-25°C to +50°C	-25°C to +50°C	-25°C to +50°C
Operating temperature (with hard disk)	0°C to +40°C	0°C to +40°C	0°C to +40°C
Protection class			
Size (W x L x H in mm)	165 x 110 x 27	165 x 110 x 27	165 x 110 x 27
Weight	500 g	500 g	500 g
MTBF (25°C)	>100'000h (without HD)	>100'000h (without HD)	>100'000h (without HD)
Special features 1	-	-	-
Special features 2	-	-	-
Special features 3	FreeDOS + Linux inst.	FreeDOS + Linux inst.	-
Part no. with 0.5GB RAM	-	-	812071
Part no. with 1GB RAM	812101	812091	-
Part no. with 2GB RAM	-	-	-

Accessories for MPC2x models

Top-hat rail mounting kit (Part no. 812031) ··
Mounting plate with retaining clips for installing the MPC2x on
a DIN top-hat rail (in the control cabinet). The MPC2x is screwed
onto the mounting plate.
(top hat rail not included)

90° top-hat rail mounting kit (Part no. 812030) ·····················
Mounting bracket with retaining clips for vertical installation
of the MPC2x on a DIN top-hat rail (in the control cabinet).
The mounting kit is screwed onto the MPC2x.
(top hat rail not included)

Wall mounting kit (Part no. 812032) ···
Mounting plate for easy installation of the MPC2x on a wall
(wood, metal, cement, plaster). The MPC2x is screwed onto the
mounting plate.

Mounting base (for MPC20/25, Part no. 812033) (for MPC21/26, Part no. 812034) ················
Mounting base for vertical installation of the MPC2x on a table. The MPC2x is
screwed onto the mounting base.

DC power plug (Part no. 812035) ···
DC power plug for cable fanning suitable for all MPC2x models.

DC power cable (Part no. 812036) ·····························
Suitable for MPC20 and MPC25 models.

SLAX Linux for MPC2x models

SLAX is a bootable CompactFlash containing the Linux operating system. It requires 185MByte and runs directly from the CF without installation. SLAX-Linux is based on the Slackware Linux distribution and the customer can also download this directly as an ISO file (www.slax.org). All scripts and source codes are freely available and may be used to develop one's own Live CF/CD.

SLAX CompactFlash (CompactFlash 816030) contains:

_ Linux kernel 2.6, offering excellent hardware support

_ the newest ALSA sound drivers

_ KDE 3.5, an excellent desktop software

_ webconfig feature allowing you to save your session data
  to slax's web

BIOS Self-Test

Integrated in all MPC20/2A and MPC25/26 devices is a diagnostic tool to self-test the system functions of the BIOS. This self-test can be started in the BIOS with <Alt> + <D> without a boot of the operating system.

Simple PASS or FAIL indicators w/ corresponding background color

Program Exit

Run once or choose a continous loop

Start Test

Stop Test

Print Results

Help Menu

Internet

LAN_2

XVGA LCD

LAN_1

Local
Application
Management

Thermal Printer

Pole Display

Touch Screen

Smart Card Reader

4x RS-232/
422/485/CAN

Stereo
Audio

LCD/LVDS

LCD/DVI

USB
Keyboard

USB
Mouse

USB
Storage Device

USB
Digital + Analog I/O

4x USB 2.0
(480MB/s)

802.11b/g

Network - WLAN

MPCV200

The fanless, energy-efficient, expandable Atom industrial computer

The MPCV200 has all the standard interfaces (COMs, USB, LAN, VGA) and is internally expandable with two PCI/104 cards. The system typically only requires 12 Watts with the Atom processor. An exchangeable SATA hard drive on the front is available for mass storage. For additional functional expansion, Dsub interfaces X1, X2 and X3 are already prepared on the front plate. The housing is of rugged sheet steel with an integrated passive, maintenance-free cooling design. Customer specific functions such as Ring On Wake, Event Wake Up or Wake On LAN can be realized using FPGA and a microcontroller.

Applications

_ Software PLC, control computer
_ Measurement technology, data capture
_ External 110/220VAC power pack

Ordering information

Item	No.	Description
Upgrade MPCV200 SSD 32GB	815056	SATA2 SLC 2.5"-SSD Intel, for -25°C to +60°C
Option MPCV WLAN PCIex	815082	Intel 4965-AGN MiniCard incl. Antenna & assembly
MPCV AC-Supply 90W	815070	ACin:110-240V,90W Uout:19V,5Amp. without: powercord (693061/62/63)
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply
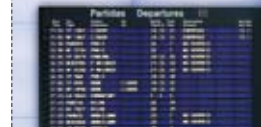
Technical data

Type	MPCV200
CPU	Intel® AtomTM, 1.6GHz
Chipset	Intel® US15W
Memory	512MB (max. 1GB)
Hard drive SATA	320GB, 2.5"
Optical drive	-
Video controller	Intel® US15W
Video memory	64MB
3D-Support	DirectX 9
Video interface 1	QXGA
Video interface 2	-
Video interface 3	LVDS, 18Bit
Resolution	1600 x 1200 (@ 60Hz)
Keyboard, mouse	USB
Serial interface COM1 (Ringwake)	RS232C/RS422/85
Serial interface COM2	RS232C/RS422/85
Serial interface COM3	-
Serial interface COM4	-
Parallel interface	-
USB V2.0	4x
Firewire IEEE1394	-
TV input/Frame grabber	-
LAN Port A (with LAN boot), Wake on LAN	1GB (RJ45)
LAN Port B	1GB (RJ45)
LAN Port C	-
Audio controller	-
Line output	-
Line input/mic. input	-
SPDif output	-
Option 1	WLAN PCIe-Mini Card
Option 2	-
Option 3	-
Option 4	-
Digital input/output	24 programmable I/O
Remote power on/off	-
Voltage input/power, N1248	10V-55V DC / typ. 12Watt
Plug-in power supply	110/220V AC
Expansion	PCIe-Mini Card, PCI/104ex (max. 2 2 cards)
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC
Protection class	IP40
Size (W x L x H in mm)	292 x 146 x 83
Weight	3 kg
Housing	Metal
Colour	grey/red
Noise level	<20dB(A)
Operating temperature (with HD)	+5°C to +50°C
Extended operating temperature	with SSD: -25°C to +60°C
Vibration/shock incl. HD/CD/DVD	1/10G
MTBF (25°C)	60'000h
For operating systems	WIN2000, WIN XP, LINUX
Part no.	815300

MPCV800/I, MPCV855M

The fan-free, expandable industrial computer

The MPCV8xx includes all the standard interfaces (COMs, USB, LAN, VGA) and is internally expandable with two PCI/104 cards. For mass storage, an exchangeable SATA hard drive or CompactFlash on the front is available. For additional functional expansion, Dsub interfaces X1, X2 and X3 are already prepared on the front plate. The robust sheet steel housing has an integrated passive, maintenance-free cooling design.

Applications

_ Software PLC, control computer

_ With an MPCV855M as a dual-screen computer

_ Measurement technology, data capture

_ External 110/220VAC power pack

Ordering information

Item	No.	Description
Upgrade 512MB to 1GB RAM	807363	1GB RAM installed
Upgrade MPCV8xx SSD 16GB	815052	PATA 16GB 2.5"-SSD, for -25°C to +70°C Temp.
Downgrade MPCV8xx Harddisk	815050	Harddisk disassembled and CF mounted
Option MPCV WLAN miniPCI	815080	Intel 2915 MiniPCI WLAN, incl. antenna + mounting
MPCV AC-Supply 90W	815070	ACin:110-240V,90W Uout:19V,5Amp. without: powercord (693061/62/63)
Option RS422 MSEP/MPCV.	804020	Optoisol.RS422 1 Channel
Option RS485 MSEP/MPCV.	804021	Optoisol.RS485 1 Channel
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply

*Isolation voltage 1600V (1 sec.) or 50VDC
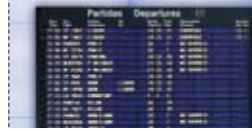
Technical data

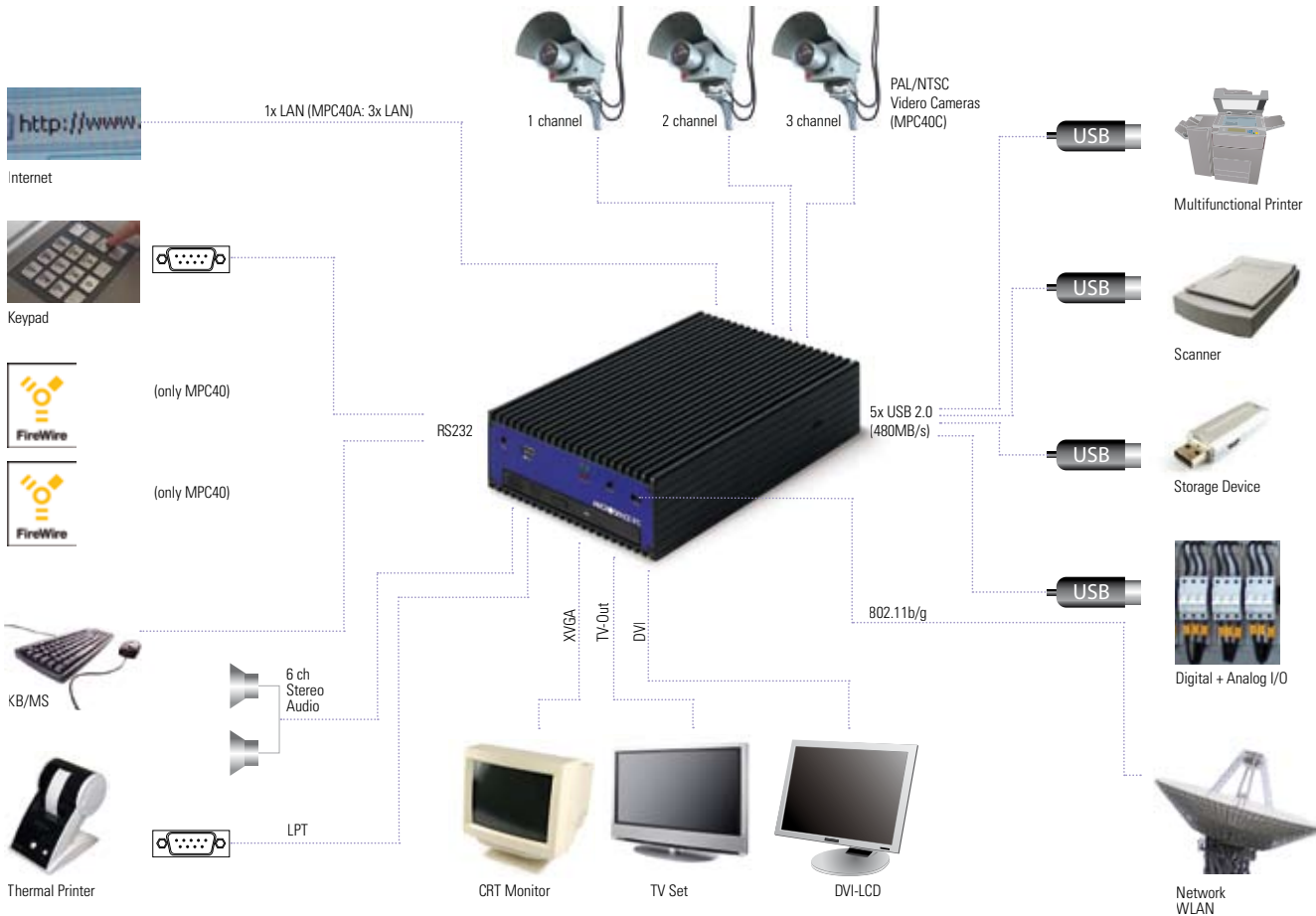| Type	MPCV800	MPCV800I	MPCV855M
CPU	AMD Geode™ LX800, 500MHz	AMD Geode™ LX800, 500MHz	Intel® Processor® C140, 1GHz
Chipset	LX800	LX800	Intel® 855GME
Memory	512MB (max. 1GB)	512MB (max. 1GB)	512MB (max. 1GB)
Hard drive	160GB, 2.5"	160GB, 2.5"	160GB, 2.5"
Optical drive	-	-	-
Video controller	Geode™	Geode™	Intel® 855GME
Video memory	16MB	16MB	64MB
3D-Support	-	-	DirectX 9
Video interface 1	XGA	XGA	QXGA
Video interface 2	-	-	DVI, 24Bit
Video interface 3	LVDS, 18Bit	LVDS, 18Bit	LVDS, 18Bit
Resolution	2048 x 1536 (@ 75Hz)	2048 x 1536 (@ 75Hz)	2048 x 1536 (@ 75Hz)
Keyboard, mouse	USB	PS/2 (Y cable)	USB
Serial interface COM1	RS232C	RS232C	RS232C
Serial interface COM2	RS232C	RS232C	RS232C
Serial interface COM3	-	RS232C, option RS422/485	-
Serial interface COM4	-	RS232C, option RS422/485	-
Parallel interface	-	LPT	-
USB V2.0	4x	4x	4x
Firewire IEEE1394	-	-	-
TV input/Frame grabber	-	-	-
LAN Port A (with LAN boot)	10/100BASE-T (RJ45)	10/100BASE-T (RJ45)	10/100BASE-T (RJ45)
LAN Port B	1GB (RJ45)	1GB (RJ45)	1GB (RJ45)
LAN Port C	-	-	-
Audio controller	-	-	AC97-2.3
Line output	-	-	Stereo
Line input/mic. input	-	-	Stereo
SPDif output	-	-	yes, optical
Option 1	WLAN MiniPCI	WLAN MiniPCI	WLAN MiniPCI
Option 2	SSD 16GB ext. temp.	isolated RS422 (for COM3/4)	SSD 16GB ext. temp.
Option 3	-	isolated RS485 (for COM3/4)	-
Option 4	-	SSD 16GB ext. temp.	-
Digital input/output	24 programmable I/O	24 programmable I/O	24 programmable I/O
Remote power on/off	-	-	-
Voltage input/power, N1224	10V-28V DC / typ. 18W	10V-28V DC / typ. 18W	10V-28V DC / typ. 18W
Plug-in power supply	110/220V AC	110/220V AC	110/220V AC
Expansion	MiniPCI, PC/104-*Plus* (max. 2 cards)	MiniPCI, PC/104-*Plus* (max. 2 cards)	MiniPCI, PC/104-*Plus* (max. 2 cards)
Power save function	Suspend/Resume, SoftOff, Instant On	Suspend/Resume, SoftOff, Instant On	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC	CE, FCC	CE, FCC
Protection class	IP40	IP40	IP40
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
Housing	Metal	Metal	Metal
Colour	grey/red	grey/red	grey/red
Noise level	<20dB(A)	<20dB(A)	<20dB(A)
Operating temperature (with HD)	+5°C to +50°C	+5°C to +50°C	+5°C to +50°C
Extended operating temperature	with SSD/CF: -25°C to +70°C	with SSD/CF: -25°C to +70°C	with SSD/CF: -25°C to +60°C
Vibration/shock incl. HD/CD/DVD	1/10G	1/10G	1/10G
MTBF (25°C)	60'000h	60'000h	40'000h
For operating systems	WIN2000, WIN XP, LINUX	WIN2000, WIN XP, LINUX	WIN2000, WIN XP, LINUX
Part no.	815100	815110	815020

Internet

1x LAN (MPC40A: 3x LAN)

1 channel

2 channel

3 channel

PAL/NTSC
Videro Cameras
(MPC40C)

USB

Multifunctional Printer

Keypad

USB

Scanner

(only MPC40)

FireWire

RS232

5x USB 2.0
(480MB/s)

USB

Storage Device

(only MPC40)

FireWire

USB

802.11b/g

Digital + Analog I/O

KB/MS

6 ch
Stereo
Audio

XVGA

TV-Out

DVI

Thermal Printer

LPT

CRT Monitor

TV Set

DVI-LCD

Network
WLAN

MPC40

The fanless industrial computer

The MPC40/A/C is based on the Intel Pentium-M with 2 independent video displays (DVI, VGA, LVDS). For mass storage, a hard drive is built-in. Several variations of FireWire, 3x LAN or 3x video frame grabber are available. A rugged aluminum profile integrates passive, fanless cooling for absolutely noiseless and maintenance-free operation.

Applications

_ Video surveillance

_ Firewall, communication bridge

_ Data capture computer

_ FireWire camera computer

Ordering information

Item	No.	Description
Upgrade 512MB to 1GB RAM	807363	1GB RAM installed
Upgrade HD 40GB-E38	807374	40GB Ext.Temp.Harddisk assembled, for 24/24h, HD
Upgrade HD to 16GB SSD	807390	16Gb SSD assembled with -40°C to +70°C in MPC4x,MPCF40 SanDisk SDAXA-016G-000
Option MPC40x COM2	807382	COM2 DSub9 assembled and remove the LPT port
Downgrade Celeron-M140.	807356	Downgrade Celeron-M 140 for MPC40/A/B/C,41, X47 0kB 2L. Cache, 1.0GHz
Downgrade Celeron-M373.	807357	Downgrade Celeron-M 373 for MPCxxx 0.5kB 2L.Cache, 1.0GHz
Downgrade no HD	807377	No HD assembled
Downgrade no CD/DVD	807376	No DVD-Drive assembled for MPC40/C/F,MPC41
Downgrade no AC-Supply	807385	220VAC Supply removed, added DC-cable
Option MPC40x WLAN	813087	Intel 2915 AGB MiniPCI, incl. antenna + mounting
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply
MPC-Mounting Kit.	812120	MPC-Mounting Kit
Buchse 3p. Kabel Zugentl.	439146	

Technical data

Type	MPC40	MPC40A	MPC40C
CPU	Intel® Pentium® M 738, 1.4GHz	Intel® Pentium® M 738, 1.4GHz	Intel® Pentium® M 738, 1.4GHz
Chipset	Intel® 855GME	Intel® 855GME	Intel® 855GME
Memory	512MB (max. 1GB)	512MB (max. 1GB)	512MB (max. 1GB)
Hard drive	160GB, 2.5"	160GB, 2.5"	160GB, 2.5"
Optical drive	CD-RW/DVD-R drive	CD-RW/DVD-R-Drive	CD-RW/DVD-R drive
Video controller	Intel® 855GME	Intel® 855GME	Intel® 855GME
Video memory	64MB	64MB	64MB
3D-Support	DirectX 9	DirectX 9	DirectX 9
Video interface 1	QXGA	QXGA	QXGA
Video interface 2	DVI	DVI	DVI (Opt. DC+USB)
Video interface 3	TV	TV	TV
Resolution	2048 x 1536 (@ 75Hz)	2048 x 1536 (@ 75Hz)	2048 x 1536 (@ 75Hz)
Keyboard, mouse	2x PS/2 (Y cable)	2x PS/2 (Y cable)	2x PS/2 (Y cable)
Serial interface COM1	RS232C (RS485)	RS232C (RS485)	RS232C (RS485)
Serial interface COM2	opt. RS232C	-	-
Serial interface COM3	-	-	-
Serial interface COM4	-	-	-
Parallel interface	LPT	LPT	LPT
USB V2.0	4x back, 1x front	4x back	4x back, 1x front
Firewire IEEE1394	2x back	-	-
TV input/Frame grabber	BT878A, SVideo	-	3x BT878A, coax BNC
LAN Port A (with LAN boot)	10/100BASE-T (RJ45)	10/100BASE-T (RJ45)	10/100BASE-T (RJ45)
LAN Port B	-	10/100BASE-T (RJ45)	-
LAN Port C	-	10/100BASE-T (RJ45)	-
Audio controller	AC97-2.3	AC97-2.3	AC97-2.3
Line output	5.1 Sound	-	Stereo
Line input/mic. input	Stereo	-	Stereo
SPDif output	yes	-	yes
Option 1	WLAN MiniPCI	WLAN MiniPCI	WLAN MiniPCI
Option 2	Solid State Disk	Solid State Disk	Solid State Disk
Option 3	-	-	-
Option 4	-	-	-
Digital input/output	-	-	-
Remote power on/off	yes	yes	yes
Voltage input/power, N1224	10V-28V DC / typ. 35W	10V- 28V DC / typ. 35W	10V-28V DC / typ. 35W
Plug-in power supply (included)	110/220V AC (+693061)	110/220V AC (+693061)	110/220V AC (+693061)
Expansion	MiniPCI	MiniPCI	MiniPCI/ PC card slot 2x II/ 1x III/ PC104-*Plus*
Power save function	Suspend/Resume, SoftOff, Instant On	Suspend/Resume, SoftOff, Instant On	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC	CE, FCC	CE, FCC
Protection class	IP50	IP50	IP50
Size (W x L x H in mm)	159 x 245 x 66	159 x 245 x 66	159 x 245 x 66
Weight	3 kg	3 kg	3 kg
Housing	Aluminium	Aluminium	Aluminium
Colour	anthracite/blue anodized	anthracite/red anodized	anthracite/brown anodized
Noise level	<20dB(A)	<20dB(A)	<20dB(A)
Operating temperature (with HD/CD)	+5°C to +50°C	+5°C to +50°C	+5°C to +50°C
Extended operating temperature	-40°C to +70°C (SSD, no CD/DVD)	-40°C to +70°C (SSD, no CD/DVD)	-40°C to +70°C (SSD, no CD/DVD)
Vibration/shock incl. HD/CD/DVD	1/10G	1/10G	1/10G
MTBF (25°C)	40'000h	40'000h	40'000h
For operating systems	WIN2000, WIN XP, LINUX	WIN2000, WIN XP, LINUX	WIN2000, WIN XP, LINUX
Part no.	812400	812450	812420

MPCX48A

The compact industrial computer

The MPCX48A is based on the Intel Pentium ZC with 2 independent video displays (DVI, VGA, LVDS). A hard drive, a CompactFlash card and two USB memory stick brackets are built-in as mass storage. Expansion options include GPS, GSM and WLAN. Absolutely noiseless and maintenance-free operation is achieved through a robust aluminum profile which integrates passive and fan-free cooling.

Applications

_ Digital I/Os, optional CAN

_ Software PLC computer, data capture computer

_ Measurement technology capture

_ For 12-24V power supplies

Ordering information

Item	No.	Description
Upgrade to Celeron 373	814305	MPCX48 Upgrade to C373 with 1GHz
Upgrade 512MB to 1GB RAM	807363	1GB RAM installed
Opt. MPCX48 3x dig Out.	814320	3x Relais Output
Opt. MPCX48 Front Cover.	814325	IP52 Protectioncover
Opt. MPCX48 WLAN MiniPCI	814330	WLAN Intel 2915 AGB
Opt. MPCX48 GPS	814335	GPS for MPCX48
Opt. MPCX48 GSM/UMTS.	814346	GSM/UMTS 4-Band for MPCX48 Siemens HC25
Opt. MPCX48 GSM/EDGE.	814341	GSM/EDGE 4-Band for MPCX48 Siemens MC75
MPCX 47/48 Netzteil 3pol.	814380	Powersupply to MPCX47/48, Ignition=ON signal 90W/19VDC, 3pol.
USB-Boot DOS/Linux	814350	Boot inst.OS 1GB f.LX800
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply
USB Cruzer Micro 1GB	840152	
USB Cruzer Micro 2GB	840153	

Technical data

Type	MPCX48A
CPU	Intel® Processor® C140, 1GH
Chipset	Intel® 855GME
Memory	512MB (max. 1GB)
Hard drive	160GB, 2.5" (-20°C to +50°C)
Optical drive	-
Video controller	Intel® 855GME
Video memory	64MB
3D-Support	DirectX 9
Video interface 1	QXGA
Video interface 2	DVI
Video interface 3	-
Resolution	2048 x 1536 (@ 75Hz)
Keyboard, mouse	USB
Serial interface COM1	RS232C
Serial interface COM2	RS232C
Serial interface COM3	-
Serial interface COM4	-
Parallel interface	LPT
USB V2.0	4x back, 2x front
TV input/Frame grabber	BT878A, SVideo, 3 channels
LAN Port A (with LAN boot)	10/100BASE-T (RJ45)
LAN Port B	-
Audio controller	AC97-2.3
Line output	Stereo
Line input/mic. input	Stereo
SPDif output	yes
Option 1	WLAN MiniPCI
Option 2	Dual-CAN
Option 3	GSM
Option 4	GPS
Digital input/output	Option: 3x isol. in/ 3x relay out
Remote power on/off	yes
Voltage input/power V1224	8V-30V DC / typ. 15W
Plug-in power supply (included)	110/220V AC (+693061)
Expansion	MiniPCI, no PC/104
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, e1
Protection class	IP52
Size (W x L x H in mm)	159 x 190 x 66
Weight	3 kg
Housing	Aluminium
Colour	anthracite/black anodized
Noise level	<20dB(A)
Operating temperature	+5°C to +40°C
Extended operating temperature (CF)	-40°C to +70°C (without HD)
Vibration/shock incl. HD/CD/DVD	1/10G
Vibration/shock incl. SSD	16/150G
MTBF (25°C)	40'000h
For operating systems	WIN2000, WIN XP, LINUX
Part no.	814301

Internet

LAN_2 (MPCF50)

KB/MS

Multifunctional Printer

Internet

LAN_1

PS2

Scanner

6 ch
Stereo
Audio

6x USB 2.0
(480MB/s)

Storage Device

802.11b/g

Thermal Printer

XVGA

DVI

Keyboard

LCD

PDP

Network - WLAN

Mouse

USB

USB

USB

USB

USB

USB
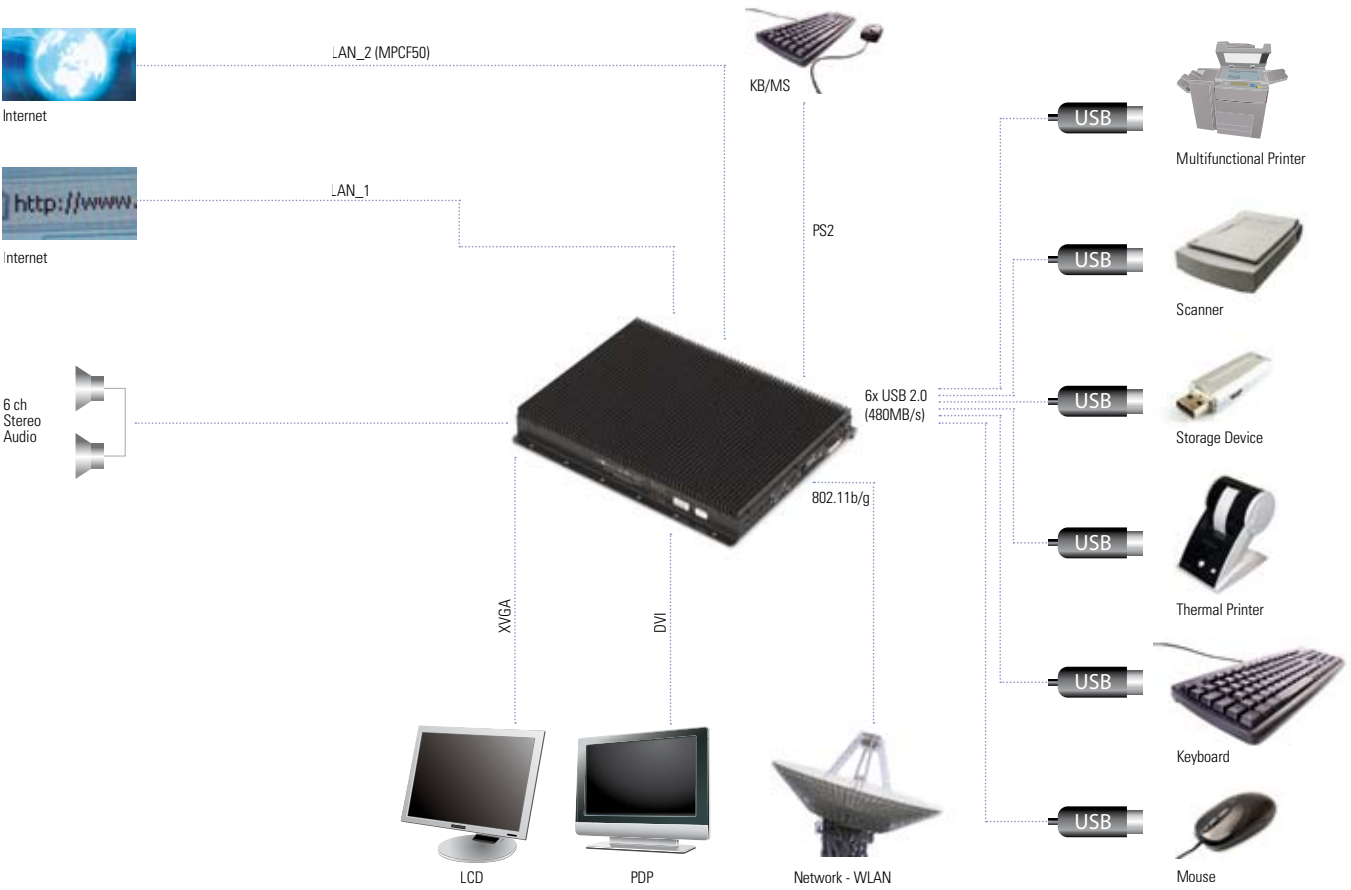
MPCF50/A

The fan-free, 42mm thin wall-mountable computer

The MPCF50/A operates on a Core Duo multiprocessor with 2GByte memory. This system includes all the standard interfaces (USB, LAN, DVI, VGA, sound) and is extremely thin (42mm) allowing it to fit behind every monitor. A passively cooled SATA300 hard drive is built-in for mass storage. The housing is made of rugged aluminum with integrated passive, maintenance-free cooling. The MPC-F50A version has 4 integrated LAN ports.

Ordering information

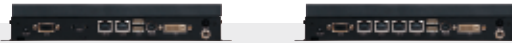| Item	No.	Description
Upgrade 1GB to 2GB RAM	807364	2Gb RAM installed for MPCF50
Upgrade 3GB with SMX945B	807406	Upgrade SMX945B with 3GB from the SMX945 with 2GB
Upgrade 32GB SSD	807418	SATA2 SLC 2.5"-SSD Intel
Downgrade no HD	807377	No HD assembled
Downgrade no AC-Supply	807385	220VAC Supply removed, added DC-cable
Option MPCF50/A WLAN	809517	Intel 4965 AGN MiniCard, incl. antenna + mounting
MPCFxx Mounting Kit.	814056	MPCFxx Mounting Kit

Applications

_ Information terminals

_ Digital entertainment, multimedia

_ Two separate video outputs

_ Advertising in kiosks, warehouses

_ For maintenance-free, 24 hour, continuous operation applications

Technical data

Type	MPCF50	MPCF50A
CPU	Intel® Pentium® Core™Duo-L2400, 2x1.6GHz	Intel® Pentium® Core™Duo-L2400, 2x1.6GHz
Chipset	Intel® 945GM	Intel® 945GM
Memory	1GB (max. 2GB), SMX945B (max. 3GB)	1GB (max. 2GB), SMX945B (max. 3GB)
Hard drive (SATA)	320GB	320GB
Optical drive	-	-
Video controller	Intel® 945GM	Intel® 945GM
Video memory	256MB	256MB
3D-Support	DirectX 9	
Video interface 1	QXGA	QXGA
Video interface 2	DVI	DVI
Video interface 3	-	-
Resolution	2048 x 1536 (@ 75Hz)	2048 x 1536 (@ 75Hz)
Keyboard, mouse	2x PS/2 (Y cable)	2x PS/2 (Y cable)
Serial interface COM1	-	-
Serial interface COM2	-	-
Parallel interface	-	-
USB V2.0	6x	6x
LAN Port A (with LAN boot)	10/100BASE-T (RJ45)	10/100BASE-T (RJ45)
LAN Port B, C, D	1x 1GB LAN (RJ45)	3x 1GB LAN
Audio controller	AC97-2.3	-
Line output	Stereo	-
Line input/mic. input	Stereo	-
SPDif output	-	-
Option 1	WLAN MiniPCI	WLAN MiniPCI
Option 2	-	-
Digital input/output	-	-
Remote power on/off	yes	yes
Voltage input/power, N1224	10V-28VDC / typ. 35W	10V-28VDC / typ. 35W
Plug-in power supply (accompanying)	110/220VAC	110/220VAC
Expansion	Mini Card Express	Mini Card Express
Power save function	Suspend/Resume, SoftOff, Instant On	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC	CE, FCC
Protection class	IP40	IP40
Size (W x L x H in mm)	310 x 256 x 42	310 x 256 x 42
Weight	3 kg	3 kg
Housing	Aluminium, Metal	Aluminium, Metal
Colour	anthracite/anodized	anthracite/anodized
Noise level	<20dB(A)	<20dB(A)
Operating temperature (with HD)	+5°C to +50°C	+5°C to +50°C
Extended operating temperature (with SSD)	-25°C to +70°C	-25°C to +70°C
Vibration/shock incl. HD	1/10G	1/10G
Vibration/shock only SSD	16/150G	16/150G
MTBF (25°C)	60'000h	100'000h
For operating systems	WIN2000, WIN XP, LINUX	WIN2000, WIN XP, LINUX
Part no.	809505	809506

Internet

LAN_2

LAN_1

802.11b/g

Network - WLAN

Internet

FireWire

FireWire

USB — Multifunctional Printer

5x USB 2.0
(480MB/s)

USB — Scanner

Line/SPDiF

USB — Storage Device

8 ch.
Stereo
Audio

LVDS

7" Operator Display

USB — Keyboard

XVGA

DVI

USB — Mouse

XVGA Projector

LCD

PDP

Mouse

IR-Receiver
(Option 815632)

ON/OFF

HD/DVD
Activity
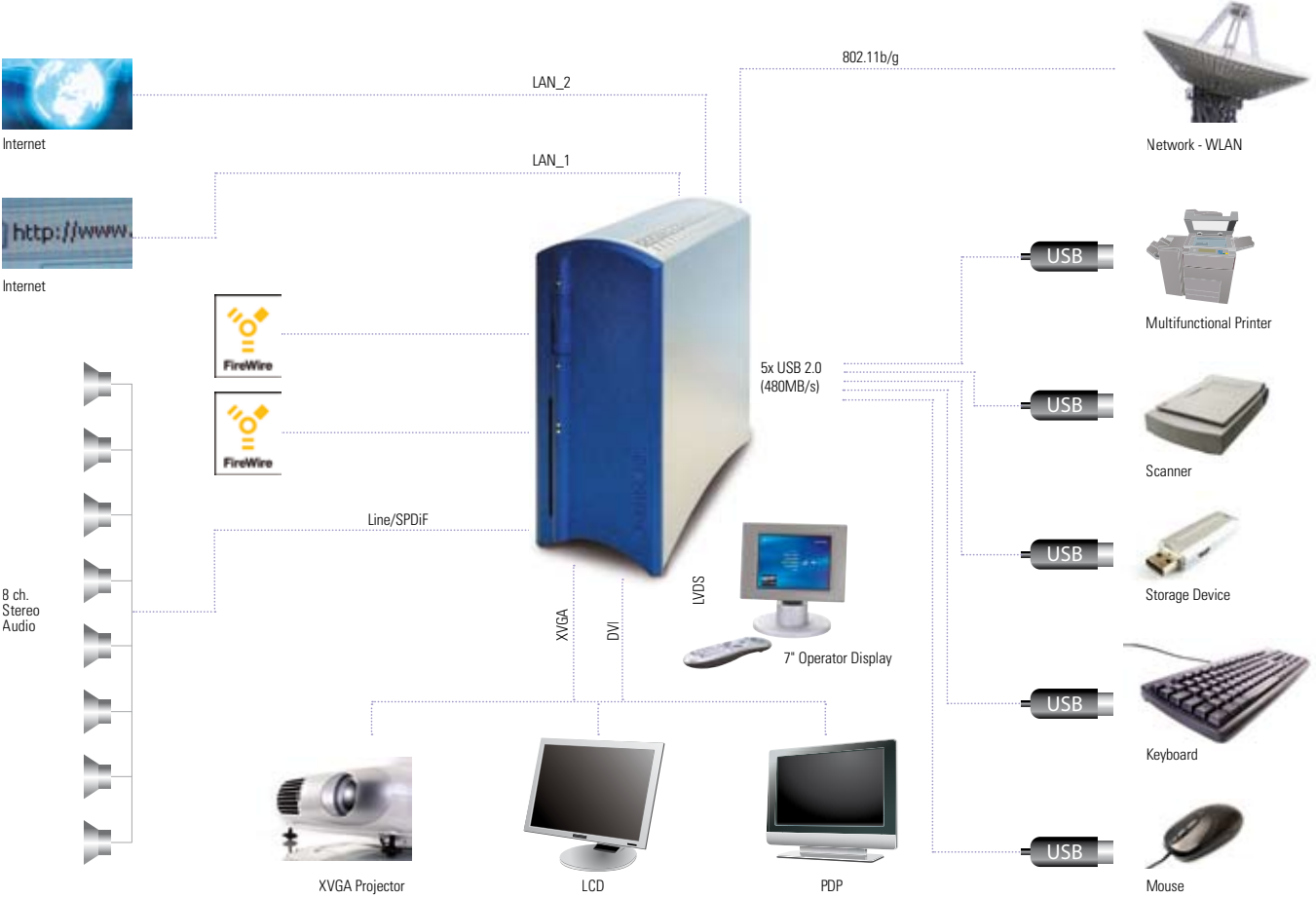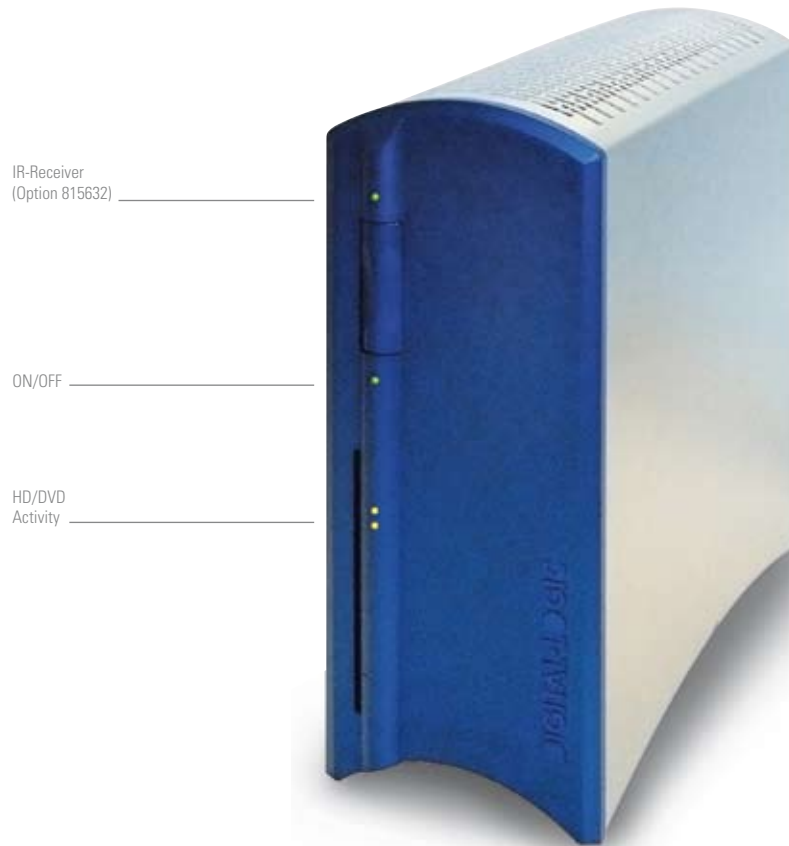
MPC50
The fanless, high performance, graphics computer

The MPC50 operates on a Core2Duo multiprocessor with 2GByte memory. This system has all the standard interfaces (USB, LAN, DVI, VGA, sound, FireWire) and is expandable with two PCI cards or two PCIe cards. For mass storage, a passively cooled SATA300 hard drive with up to 1TB capacity is built-in (a second drive is optionally available). The robust aluminum housing has an integrated passive, maintenance-free cooling design. Two passively cooled video cards (PEG/PCIexpress) are available as options to be built-in, allowing 4 monitors to be connected.

Applications

_ Video/audio data processing for studio technology
_ Multimedia applications
_ Optional high performance graphics with four separate video outputs
_ Built-in 110/220VAC power pack
_ For maintenance-free, 24 hour, continuous operation applications

Ordering information

Item	No.	Description
Upgrade 250GB-HD to 1TB	815651	Replace the 250GB HD with a 1TByte SATA-Harddisk
Upgrade 3GB with SMX945B	807406	Upgrade SMX945B with 3GB from the SMX945 with 2GB
MPC50-Option 2nd HD 1TB	815650	2nd Harddisk with 1TB assembled into the MPC50x
MPC50-Option WLAN	815634	Intel 2915ABG incl. Antenna assembled
MPC50-Option 2xPCI Slot	815620	2slot PCI 32bit Caddy assembled in the MPC50x
MPC50-Option 2xPCIe-Slot	815621	2slot PCIe Caddy assembled in the MPC50x
MPC50-DualSlot-PEG&PCIe	815622	MPC50 Caddy PEG 1slot PEG 1slot PCIexpress (x1)
MPC50 Dual HD Interface	815630	For thermal interface of the two caddyslots
MPC50 PCIe-Videocard	815631	With Heatpipe for passiv cooling

Technical data

Type	MPC50
CPU	Intel® Pentium® Core™ 2 Duo/Quad
Chipset	Intel® 945GM
Memory	2GB (max. 3GB)
Hard drive (SATA)	1x 250GB-SATA (max. 2x 1TB-SATA)
Optical drive (PATA)	DVD-R/W, CD-R/W
Video controller	Intel® 945GM
Video memory	256MB
3D-Support	DirectX 9
Video interface 1	QXGA (analog)
Video interface 2	DVI
Video interface 3	LVDS with USB2
Resolution	2048 x 1536 (@ 75Hz)
Keyboard, mouse	USB
Serial interface COM1	internal
Serial interface COM2	internal
Serial interface COM3	-
Serial interface COM4	-
Parallel interface	internal
USB V2.0	1x front, 4x back, 2x internal
Firewire IEEE1394	2x back
TV input/Frame grabber/Remote	Dual tv tuner (option 845632)
LAN Port A (with LAN boot)	10/100BASE-T (RJ45)
LAN Port B	1GB LAN (RJ45)
Audio controller	AC97-2.3 HD Audio
Line output	7.1 sound jack
Line input/mic. input	Stereo
SPDif output	yes
SPDif input	yes
Option 1 (815634)	WLAN MiniPCI
Option 2 (815630)	Terminal interface
Option 3	-
Plug-in power supply	110/220V AC
Expansion (optional)	MiniPCI, 2x PCI32Bit slot, PCI Express
Expansion slots	-
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC
Protection class	IP40
Size (W x L x H in mm)	300 x 280 x 160
Weight	6 kg
Housing	Aluminium
Colour	silver/blue/anodized
Noise level	<20dB(A)
Operating temperature	+5°C to +50°C
Extended operating temperature	tbd
Vibration/shock incl. HD/CD/DVD	1/10G
MTBF	60'000h
For operating systems	Vista, WIN XP, LINUX
Part no.	815600

*A, B, C, D interfaces depend on the built-in PCI/104e cards or their respective slots

MPCR50

The fan-free, Core2Duo, 19" computer system

The MPCR50 has many interfaces (COMs, USB, LAN, DVI, sound, video input) and is expandable with PCI slots and PC/104express cards (e.g., CAN, measurement cards). For mass storage, a „hot plug" exchangeable SATA300 hard drive is built-in (a second drive is optionally available); RAID interconnection is also possible. The RTC battery is monitored and service-friendly, being accessible from the front. For expansion there are optional GPS, GSM and WLAN as well as slots for CompactFlash and Express cards. The housing is made of rugged chromium steel with integrated passive, maintenance-free and fanless cooling. Customer specific functions such as Ring On Wake, GSM Wake, Event Wake Up or Wake On LAN can be realized using FPGA and a microcontroller. By means of a color LCD display and 6 function buttons, various security functions and system information (voltages, temperatures, error reports, POD diagnostics, operating log, RTC battery voltage) can be queried.

Applications

_ Integration in stationary 19" rack systems

_ Studio technology, traffic surveillance

_ Security technology, video server

_ Multimedia server

_ Built-in 110/220VAC feed
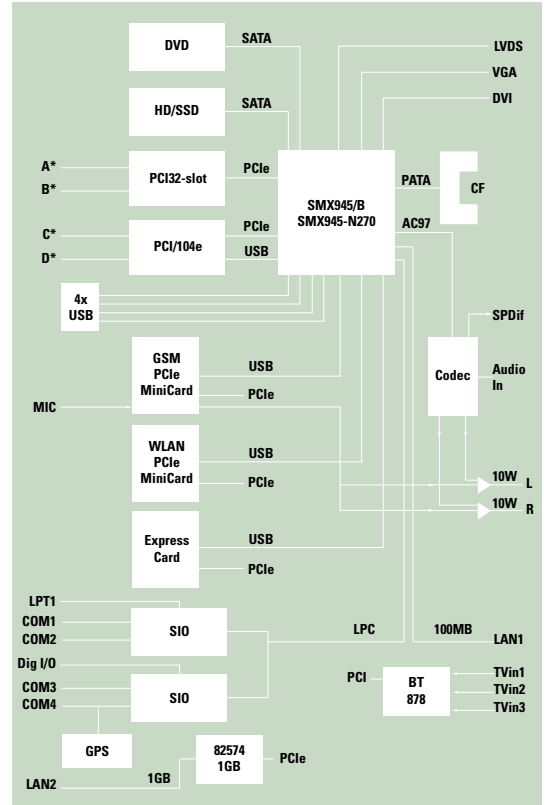
Ordering information

Item	No.	Description
Option MPCR50/R WLAN	807414	MiniCard Intel 4965AGN with antenna cable
MPCR50 19"-Mountingkit	814617	
Upgrade 3GB with SMX945B	807406	Upgrade SMX945B with 3GB from the SMX945 with 2GB
Upgrade 250GB-HD to 1TB	815651	Replace the 250GB HD with a 1TByte SATA-Harddisk
MPC50-Option 2nd HD 1TB	815650	2nd Harddisk with 1TB assembled into the MPC50x
Downgrade w. SMX945-N270	807404	Atom N270 with 1.6GHz, 2GB RAM assembled
MPCxxx RTC-Battery Kit	807470	Maintenancekit

Technical data

Type	**MPCR50**
CPU	Intel® Pentium® Core™ 2 Duo/Atom
Chipset	Intel® 945GM / N270
Memory	2GB (max. 3GB)
Hard drive	1x 250GB to 2x 1TB in 3.5"-BAY
CF	1x
Video controller	Intel® 945GM
CD/DVD	-
1st video interface	QXGA
2nd video interface	DVI
Resolution	2048 x 1536 (@ 75Hz)
TV input	-
Serial interface COM1	DB 9pol, RS232
Serial interface COM2	DB 9pol, RS232
Serial interface COM3	-
Serial interface COM4	-
Parallel interface	optional
USB V2.0 Standard	4x front
USB V2.0 M12	-
LAN Port A (with LAN boot)	10/100BASE-T (M12) RJ45
LAN Port B	1GB-LAN-RJ45
Audio controller	AC97-2.3
Audio output	Stereo 2x 10W amplifier
Audio Input	Stereo Line
Options	WLAN, GSM-UMTS
	CAN, IBIS, GPS
Digital input/output	4x opto output, 4x opto input
Remote power on/off	-
DC Voltage input (not isolated), V1248	-
DC Voltage input (isolated 1.5kV), Ixx	-
AC power supply	110/220VAC/typ.50W
Expansion	2x PCIexpress MiniCard,
	2x PCI/104express slot
	1x PCI ExpressCard slot
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC
Protection class	IP40
Size (W x L x H in mm)	480 x 132 x 250
Weight	6 kg
Housing	Chromium steel
Colour	chrome
Noise level	<20dB(A)
Operating temperature (with HD)	-20°C bis +50°C
Extended operating temperature (with SSD)	-40°C bis +70°C (SSD, no HD)
Vibration/shock incl. HD/CD/DVD	1/10G
Vibration/shock incl. SSD	10G/150G
MTBF	60'000h
For operating systems	Vista, WIN XP, LINUX
Part no. MPCR50	814610

Internet

LAN_2

XVGA LCD

LAN_1

Local
Application
Management

Thermal Printer

USB

Multifunctional Printer

4x RS-232/
422/485/CAN

3x USB 2.0
(480MB/s)

USB

Scanner

USB

Storage Device

802.11b/g

Smart Card Reader

Stereo
Audio

Network
WLAN
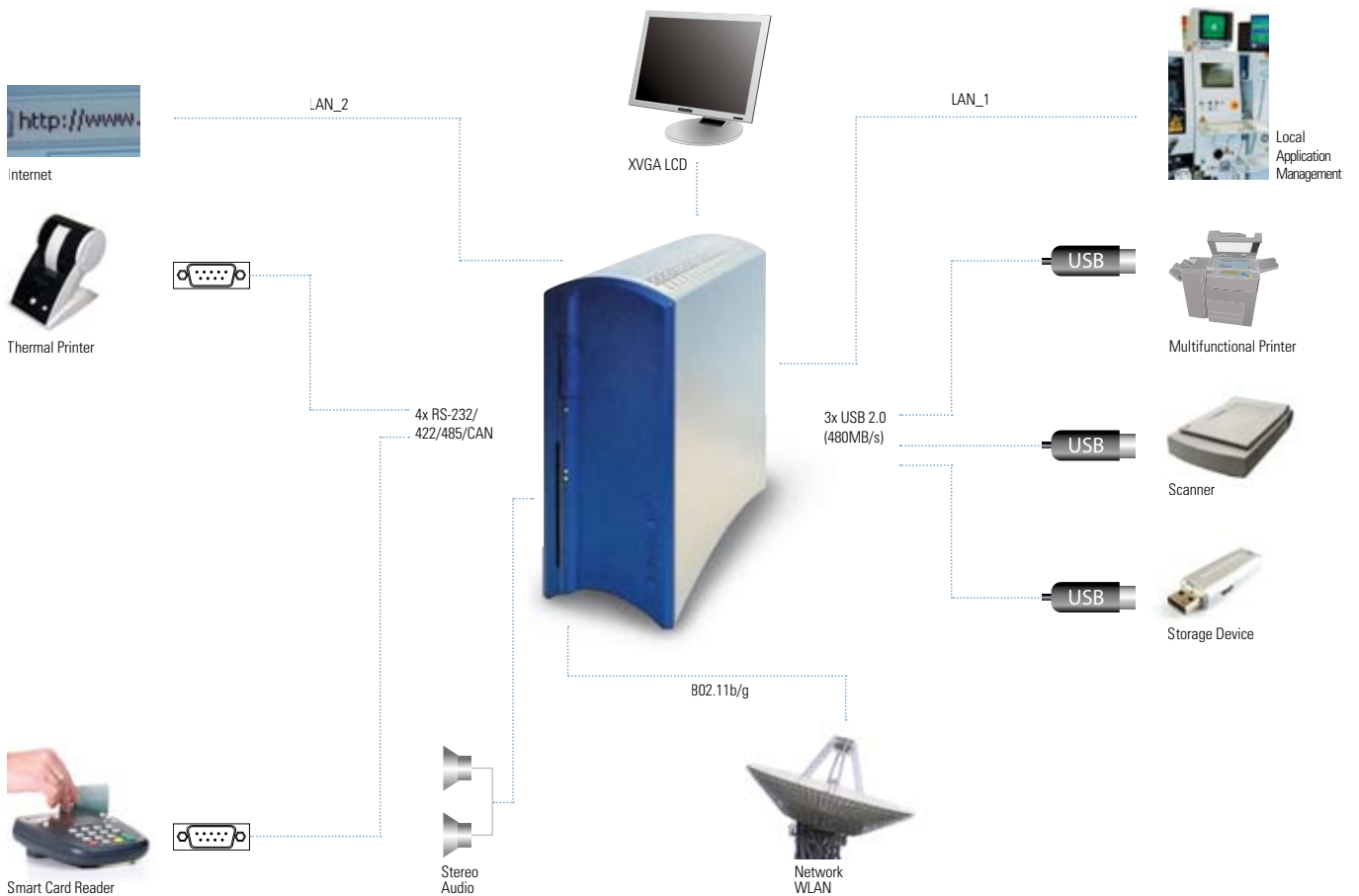
MPCV200M

The fanless, EN60601 certified, energy efficient medical computer (Atom based)

The MPCV200M includes all standard interfaces (COMs, USB, LAN, VGA) and is internally expandable with two PC/104express cards. A SATA300 hard drive is built-in for mass storage. The system is protected against too high patient discharge currents and has a medical technological grounding connection. The rugged, closed and easy-care chromium steel housing uses an integrated, passive, maintenance-free cooling design. The omission of a fan prevents any contaminants from infiltrating the computer.

Applications

_ Approved computer for doctors offices and hospitals

_ For communication with systems coming into contact with patients

_ Patient entertainment, patient information

_ External 110/220VAC power pack

_ EN60601 certified, USB and COM interfaces are galvanically separated

Ordering information

Item	No.	Description
Upgrade MPCV200 SSD 32GB	815056	SATA2 SLC 2.5"-SSD Intel, for -25°C to +60°C
Option MPCV WLAN PCIex	815082	Intel 4965-AGN MiniCard incl. Antenna & assembly
MPCX200M Medical Supply	815313	Vin=110/220VAC, Vout=19V Power Supply 90W EN60601
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply

Technical data

Type	MPCV200M
CPU	Intel® AtomTM, 1.6GHz
Chipset	Intel® US15W
Memory	1 GByte
Hard drive SATA	320GB, 2.5"
Optical drive	-
Video controller	Intel® US15W
Video memory	64MB
3D-Support	DirectX 9
Video interface 1	QXGA
Video interface 2	-
Video interface 3	LVDS, 18Bit
Resolution	1600 x 1200 60TBD US15W
Keyboard, mouse	USB
Serial interface COM1	RS232C/RS422/85 optoisolated
Serial interface COM2	RS232C/RS422/85 optoisolated
Serial interface COM3	-
Serial interface COM4	-
Parallel interface	-
USB V2.0	4x isolated
Firewire IEEE1394	-
TV input/Frame grabber	-
LAN Port A (with LAN boot)	1GB (RJ45) isolated
LAN Port B	1GB (RJ45) isolated
LAN Port C	-
Audio controller	-
Line output	-
Line input/mic. input	-
SPDif output	-
Option 1	WLAN PCIe-Mini Card
Option 2	-
Option 3	-
Option 4	-
Digital input/output	24 programmable I/O
Remote power on/off	-
Voltage input/power, N1248	10V-55V DC / typ. 12W
Plug-in power supply	110/220V AC EN60601
Expansion	PCIe-Mini Card, PCI/104ex (max. 2 2 cards)
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, EN60601
Protection class	IP52, medical earthcontact
Size (W x L x H in mm)	292 x 146 x 83
Weight	3 kg
Housing	V4A-Chromium steel
Colour	white/silver
Noise level	<20dB(A)
Operating temperature (with HD)	+5°C to +40°C
Extended operating temperature	with SSD: -25°C to +60°C
Vibration/shock incl. HD/CD/DVD	1/10G
MTBF	60'000h
For operating systems	WIN2000, WIN XP, LINUX
Part no.	815310

ON/OFF ————————————————

HD/DVD
Activity ————————————————

MPC50M

**The fan-free, EN60601 certified, medical computer
(with video graphics)**

The MPC50M operates on a Core2Duo multiprocessor with 2GByte memory. This system has all the standard interfaces (COMs, USB, LAN, DVI, VGA) and is expandable with two PCI cards or two PCIe cards. For mass storage, a passively cooled SATA300 hard drive with up to 1TB capacity is built-in (a second drive is optionally available). The system is protected against too high patient discharge currents and has a medical technological grounding connection. The robust, easy-care aluminum housing has an integrated passive, maintenance-free cooling design. The omission of a fan prevents any contaminants from infiltrating the computer. Two passively cooled video cards (PEG/PCIexpress) are available as options to be built-in.

Applications

_ Approved computer for doctors offices and hospitals
_ For communication with systems coming into contact with patients
_ High performance graphics with four separate video outputs
_ Built-in EN60601 110/220VAC power pack
_ EN60601 certified

Ordering information

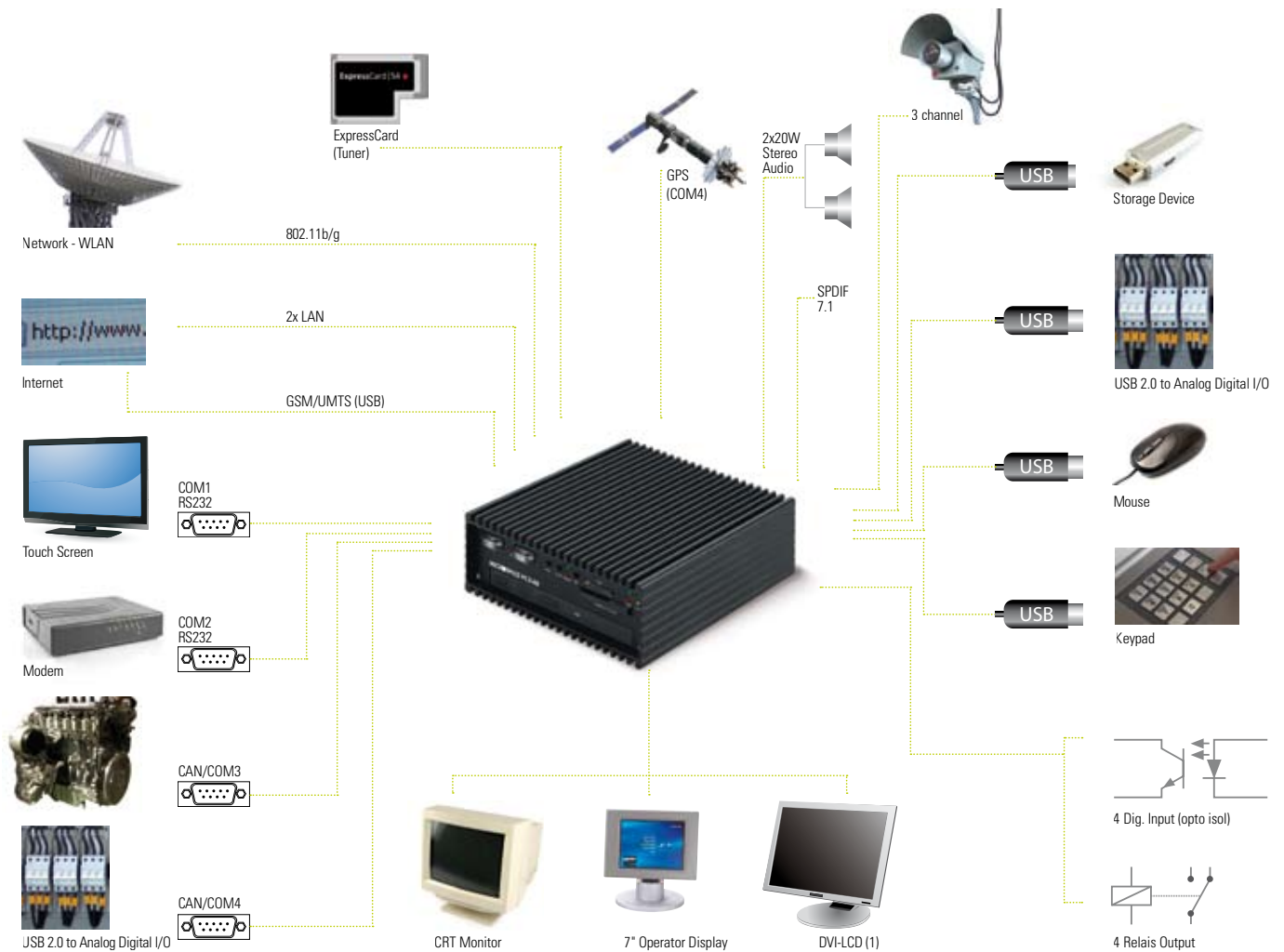| Item	No.	Description
Upgrade 250GB-HD to 1TB	815651	Replace the 250GB HD with a 1TByte SATA-Harddisk
Upgrade 3GB with SMX945B	807406	Upgrade SMX945B with 3GB from the SMX945 with 2GB
Upgrade 4GB SMXG45*	807408	Upgrade SMXG45 with 4GB from the SMX945 with 2GB
MPC50-Option 2nd HD 1TB	815650	2nd Harddisk with 1TB assembled into the MPC50x
MPC50-Option WLAN	815634	Intel 2915ABG incl. Antenna assembled
MPC50-Option 2xPCI Slot	815620	2slot PCI 32bit Caddy assembled in the MPC50x
MPC50-Option 2xPCIe-Slot	815621	2slot PCIe Caddy assembled in the MPC50x

*available from 2010 with the Core 2 Quad

Technical data

Type	**MPC50M**
CPU	Intel® Pentium® Core™ Duo / Quad
Chipset	Intel® 945GM / G45
Memory	2GB (max. 3GB) / (max. 4GB)
Hard drive (SATA)	1x 250GB-SATA (max. 2x 1TB-SATA)
Optical drive (PATA)	DVD-R/W, CD-R/W
Video controller	Intel® 945GM
Video memory	256MB
3D-Support	DirectX 9
Video interface 1	QXGA
Video interface 2	DVI
Video interface 3	LVDS with USB2
Resolution	2048 x 1536 (@ 75Hz)
Keyboard, mouse	USB
Serial interface COM1	9pol DSub*
Serial interface COM2	9pol DSub*
Serial interface COM3	-
Serial interface COM4	-
Parallel interface	internal
USB V2.0	1x front, 4x back, 2x internal*
Firewire IEEE1394	2x back
TV input/Frame grabber	-
LAN Port A (with LAN boot)	10/100BASE-T (RJ45)
LAN Port B	1GB LAN (RJ45)
Audio controller	AC97-2.3
Line output	-
Line input/mic. input	-
SPDif output	yes
SPDif input	yes
Option 1	WLAN MiniPCI
Option 2	-
Plug-in power supply	110/220V AC/typ. 40W
Expansion	MiniPCI, 2x PCI32Bit slot, PCI Express
Expansionslots	-
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, EN60601
Protection class	IP40, medical ground contact
Size (W x L x H in mm)	300 x 280 x 160
Weight	6 kg
Housing	Aluminium
Colour	silver/blue/anodized
Noise level	<20dB(A)
Operating temperature	+5°C to +35°C
Extended operating temperature	tbd
Vibration/shock incl. HD/CD/DVD	1/10G
MTBF	60'000h
For operating systems	Vista, WIN XP, LINUX
Part no.	815605

* galv. isolated on request

ExpressCard (Tuner)

3 channel

GPS (COM4)

2x20W Stereo Audio

USB — Storage Device

Network - WLAN

802.11b/g

SPDIF 7.1

USB — USB 2.0 to Analog Digital I/O

Internet

2x LAN

GSM/UMTS (USB)

USB — Mouse

Touch Screen

COM1 RS232

Modem

COM2 RS232

USB — Keypad

CAN/COM3

4 Dig. Input (opto isol)

USB 2.0 to Analog Digital I/O

CAN/COM4

CRT Monitor

7" Operator Display

DVI-LCD (1)

4 Relais Output

MPCX28
with mounted
option 814325,
front cover

MPCX28

The compact and energy-efficient vehicle computer

The MPCX28 is based on the Intel Atom processor and typically only needs 12 Watts power consumption. On the front is an exchangeable, robust SATA hard disk (a flash disk is optional) as well as a CF bracket. Expansion options include GPS, GSM and WLAN. Absolutely noiseless operation is achieved through a rugged aluminum profile which integrates passive and fan-free cooling. Other functions (e.g. CAN) can be integrated by the manufacturer through PCI/104 cards. . Customer specific functions such as Ring On Wake, Event Wake Up or Wake On LAN can be realized using FPGA and a microcontroller.

Applications

_ Integration in cars, busses, trucks

_ Passenger entertainment, communication, measurement computer

_ For 12-48V motor vehicle battery power supplies

_ e1 certified

Ordering information

Item	No.	Description
Option 80GB 24h SATA	807411	80GB Harddisk automotive, SATA, 24h, seagate
Option 32GB SSD	807417	SATA2 SLC 2.5"-SSD Intel
Opt. MPCX48/28 Front cover	814325	IP52 Protectioncover
Option MPCX28 WLAN MCex	807430	MiniCard Intel 4965AGN with antenna cable
Option MPCX28 GPS A1080	807432	GPS assembled with antenna cable
Opt. MPCX28 GSM UMTS/GPRS	807434	PCIex MiniCard UMTS ass., with antenna cable
Opt. MPCX48 2xCAN PEAK.	814369	2xPeak CAN opto-isolated
MPCxx Poweradapter	807436	110/220VAC , 90W Supply, with M12 connector (19V)
MPCxx M12 Powerconnector	814690	M12-Plug with 2m cable for DC input 12-48VDC
MPCxx M12 USB to Std.USB	814691	M12-Plug with 2m cable to Standard USB connector
MPCxx M12 LAN to Std.LAN	814692	M12-Plug with 2m cable to Standard RJ45-LAN

Technical data

Type	MPCX28
CPU	Intel® Atom™, 1.6GHz
Chipset	Intel®
Memory	1GB
Ext. Temp. Harddisk SATA exchangeable[1]	0GB, option: 2.5" 80GB or 32GB SSD
Optical drive	-
Video controller	Intel®
3D-Support	DirectX 9
Video interface 1 (digital)	DVI-I
Video interface 2 (analog)	DVI-I
Resolution	2048 x 1536 (@ 75Hz)
Keyboard, mouse	USB
Serial interface COM1/CAN (Ringwake)	RS232C, RS422/85
Serial interface COM2/CAN	RS232C, RS422/85
Parallel interface	Digital I/O (opt. LPT/CAN)
USB V2.0 Standard	2x Rückseite, 2x Frontseite
USB V2.0 M12	-
Ext. SATA interface (ESATA)	300MB/sec
LAN Port A (with LAN boot), (WOL)	1Gbit/s (RJ45)
LAN Port B	1Gbit/s (RJ45)
Audio controller	AC97-2.3, DSub + jack
Line output	Stereo, DSub
Line input/mic. input	Stereo, DSub
Option 1	WLAN Mini Card
Option 2	Dual-CAN, IBIS (PC/104)
Option 3	GSM Mini Card UMTS/GPRS
Option 4	GPS AC80
Digital input/output	4x out/4x opto in
Remote power on/off	yes
DC voltage input (not isolated), V1248	8-58VDC/typ.15W
DC voltage input (1.5kV isolated), Ixx	-
Plug-in power supply	110/220V AC Option
Expansion	2x PCIe Mini Card, 1x PCI/104
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, e1
Protection class	IP52
Size (W x L x H in mm)	159 x 190 x 66
Weight	3 kg
Housing	Aluminium
Colour	anthracite/black anodized
Noise level	<20dB(A)
Operating temperature (with HD)	-30°C to +60°C
Extended operating temperature (with SSD)	-40°C to +70°C (SSD, no HD)
Vibration/shock incl. HD/CD/DVD	1/10G
Vibration/shock incl. SSD	16/150G
MTBF (25°C)	60'000h
For operating systems	WIN2000, WIN XP, LINUX
Part no. MPCX28-V1248	814420

[1] Must be ordered separately.

+70°C

-40°C

MPCX47

The versatile measurement technology vehicle computer

The MPCX47 is based on the Intel Pentium-M with 2 independent video displays (DVI, VGA, LVDS). For mass storage, a rugged hard drive (a flash disk is optional), a CompactFlash card and two USB memory stick brackets are built-in. The mass storage is service-friendly, being accessible from the front. Expansion options include COM3/4, CAN, GPS, GSM and WLAN. A robust aluminum profile integrates passive, fanless cooling for absolutely noiseless operation.

Applications

_ Integration in cars, busses, trucks
_ Mobile control and measurement technology (analog, digital)
_ For 12-24V motor vehicle battery power supplies
_ e1 certified

Ordering information

Item	No.	Description
MPCX47 Mediapack 1.	814250	MPCX-47 Mediapack 1 Harddisk 40MB DVD-R/CD-RW Combodrive
MPCX47 Mediapack 2.	814252	MPCX-47 Mediapack 2 No Harddisk, No CD 2x Slot CompactFlash
MPCX47 Mediapack 3.	814254	40GB HD Ext.Temp-E28, 1x CompFlash (2.Master), No CD/DVD assembled, DOS/Linux Bootimage incl.
Opt. MPCX47 WLAN	814262	WLAN card MiniPCI Intel (R) Pro 2915ABG
Opt. MPCX47 GSM/EDGE.	814154	GSM/EDGE 4-Band for MPCX47 Siemens MC75
Opt. MPCX47 GSM/UMTS	814156	GSM/UMTS for MPCX47 Siemens HC25
Opt. MPCX47 GPS Jupit.21	814141	MPCX47 GPS-Receiver Modul Jupiter 21
Opt. MPCX47 COM3/4.	814275	COM3,COM4 as RS-232
Opt. MPCX47 2xCAN Vector.	814271	2xVector CAN
Opt. MPCX47 2xCAN PEAK.	814269	2xPeak CAN
MPCX 47/48 Netzteil 3pol.	814380	Powersupply to MPCX47/48, Ignition=ON signal 90W / 19VDC, 3pol.
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply
Buchse 3p. Kabel Zugentl.	439146	
MPCX DC Autokabel	814052	
MPC DC power cable 1m.	814054	power cable 1m for MPC systems (ignition signal)

Technical data

Type	**MPCX47**
CPU	Intel® Pentium® M 738, 1.4GHz
Chipset	Intel® 855GME
Memory	1GB
Ext. temp. hard drive[1]	40GB, 2.5"
Optical drive [1]	CD-RW/DVD-R drive (Mediapack 1)
Video controller	Intel® 855GME
Video memory	64MB
3D-Support	DirectX 9
Video interface 1	QXGA
Video interface 2	DVI
Video interface 3	TV
Resolution	2048 x 1536 (@ 75Hz)
Keyboard, mouse	2x PS/2
Serial interface COM1	RS232C
Serial interface COM2	RS232C
Serial interface COM3	Optional
Serial interface COM4	Optional
Parallel interface	LPT
USB V2.0	2x back, 2x front
Firewire IEEE1394	1x front, 1x back option
TV input/Frame grabber	BT878A, SVideo, 3 channels
LAN Port A (with LAN boot)	10/100BASE-T (RJ45)
LAN Port B	-
Analog Input	8x 8Bit
Audio controller	AC97-2.3
Line output	5.1 Sound
Line input/mic. input	Stereo or 5.1 + headset
Replicator	Typ. 3 (814224 included)
Option 1	WLAN MiniPCI
Option 2	Dual-CAN (814225)
Option 3	GSM
Option 4	GPS
Digital input/output	8x isol. in/8x relay out
Remote power on/off	yes
Voltage input/power	8V-30V DC / typ. 35W
Plug-in power supply	110/220V AC option
Expansion	MiniPCI, PC/104-*Plus*
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, e1
Protection class	IP54
Size (W x L x H in mm)	159 x 300 x 66
Weight	4 kg
Housing	Aluminium
Colour	anthracite/black anodized
Noise level	<20dB(A)
Operating temperature (with CD/HD)	0°C to +50°C @ 1.4GHz
Extended operating temperature (with CF)	-40°C to +70°C @ 1.4GHz (with SSD/CF)
Vibration/shock incl. HD/CD/DVD	1/10G
Vibration/shock incl. CF	16/150G
MTBF (25°C)	60'000h
For operating systems	WIN2000, WIN XP, LINUX
Part no.	814200

[1] Must be ordered separately as Mediapack.

+70°C

-40°C

MPCX48
with mounted
option 814325,
front cover
and DVD/CD

MPCX48

The compact vehicle computer

The MPCX28 is based on the Intel Pentium ZC with 2 independent video displays (DVI, VGA, LVDS). For mass storage, a robust hard drive (a flash disk is optional), a CompactFlash card and two USB memory stick brackets are built-in. Expansion options include GPS, GSM and WLAN. Absolutely noiseless operation is achieved through a robust aluminum profile which integrates passive and fan-free cooling.

Applications

_ Integration in cars, busses, trucks

_ Passenger entertainment, communication

_ For 12-24V motor vehicle battery power supplies

_ e1 certified

Ordering information

Item	No.	Description
Upgrade to Celeron 373	814305	MPCX48 Upgrade to C373 with 1GHz
Upgrade 512MB to 1GB RAM	807363	1GB RAM installed
Opt. MPCX48 DVD-Writer	814316	DVD-RW for MPCX48
Opt. MPCX48 3x dig Out.	814320	3x Relais Output
Opt. MPCX48 Front Cover.	814325	IP52 Protectioncover
Opt. MPCX48 WLAN MiniPCI	814330	WLAN Intel 2915 AGB
Opt. MPCX48 GPS	814335	GPS for MPCX48
Opt. MPCX48 GSM/UMTS.	814346	GSM/UMTS 4-Band for MPCX48 Siemens HC25
Opt. MPCX48 GSM/EDGE.	814341	GSM/EDGE 4-Band for MPCX48 Siemens MC75
Opt. MPCX48 2xCAN PEAK.	814369	2xPeak CAN opto-isolated
MPCX 47/48 Netzteil 3pol.	814380	Powersupply to MPCX47/48 Ignition=ON signal 90W/19VDC,3pol.
USB-Boot DOS/Linux	814350	Boot inst.OS 1GB f.LX800
MPC/X Car Mountingkit.	814055	MPC/X Car Mountingkit
MPC/X Active Cooler.	814190	Cooler with activ fan for car applications
MPCX DC Autokabel	814052	
MPC DC power cable 1m.	814054	power cable 1m for MPC systems (ignition signal)
Opt. MPCX48 40GB 24h	814314	40GB Harddisk automotive
Opt. MPCX48 16GB SSD	814317	PATA 2.5"-SSD for -40°C to +70°C

Technical data

Type	**MPCX48**
CPU	Intel® Processor® C140, 1GHz
Chipset	Intel® 855GME
Memory	512MB (max. 1GB)
Ext. temp. hard drive[1]	0GB, 2.5" (max. 40GB)
Optical drive[1]	Optional (814315)
Video controller	Intel® 855GME
Video memory	64MB
3D-Support	DirectX 9
Video interface 1	QXGA
Video interface 2	DVI
Video interface 3	-
Resolution	2048 x 1536 (@ 75Hz)
Keyboard, mouse	USB
Serial interface COM1/CAN	RS232C
Serial interface COM2/CAN	RS232C
Serial interface COM3	-
Serial interface COM4	-
Parallel interface	LPT (opt. CAN)
USB V2.0	4x back, 2x front
TV input/Frame grabber	BT878A, SVideo, 3 channels
LAN Port A (with LAN boot)	10/100BASE-T (RJ45)
LAN Port B	-
LAN Port C	-
Audio controller	AC97-2.3
Line output	Stereo
Line input/mic. input	Stereo + headset
SPDif output	yes
Option 1	WLAN MiniPCI
Option 2	Dual-CAN
Option 3	GSM
Option 4	GPS
Digital input/output	Option: 3x isol. in/ 3x relay out
Remote power on/off	yes
Voltage input/power V1224	8V-30V DC / typ. 15W
Plug-in power supply	110/220V AC Option
Expansion	MiniPCI, PC/104-*Plus*
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, e1
Protection class	IP52
Size (W x L x H in mm)	159 x 190 x 66
Weight	3 kg
Housing	Aluminium
Colour	anthracite/black anodized
Noise level	<20dB(A)
Operating temperature (with HD/CD)	-20°C to +50°C
Extended operating temperature (with CF)	-40°C to +70°C (CF, no CD/HD)
Vibration/shock incl. HD/CD/DVD	1/10G
Vibration/shock (only CF)	16/150G
MTBF (25°C)	60'000h
For operating systems	WIN2000, WIN XP, LINUX
Part no.	814300

[1] Must be ordered separately.

*A, B, C, D interfaces depend on the built-in PCI/104e cards or their respective slots

MPCX50

The fan-free, expandable Core2Duo vehicle computer

The MPCX50 has many interfaces (COMs, USB, LAN, digital I/O, video input) and is expandable with PCI slots and PC/104express cards (e.g., CAN, measurement cards). For mass storage, a rugged hard disk or SSD drive is built-in. The RTC battery is monitored and service-friendly, being accessible from the front. as slots for CompactFlash and Express cards. The housing is made of rugged chromium steel with integrated passive and fanless cooling. Customer specific functions such as Ring On Wake, GSM Wake, Event Wake Up or Wake On LAN can be realized using FPGA and a microcontroller. By means of a color LCD display and 6 function buttons, various security functions and system information (voltages, temperatures, error reports, POD diagnostics, operating log, RTC battery voltage) can be queried. An external 12V secondary battery can be connected to bridge power failures of the primary feed.

Applications

_ Integration in cars, busses, trucks (e1 certified)

_ Passenger entertainment, passenger safety

_ Expandable, e.g. with 8x COM, 8x LAN

_ Built in video frame grabber
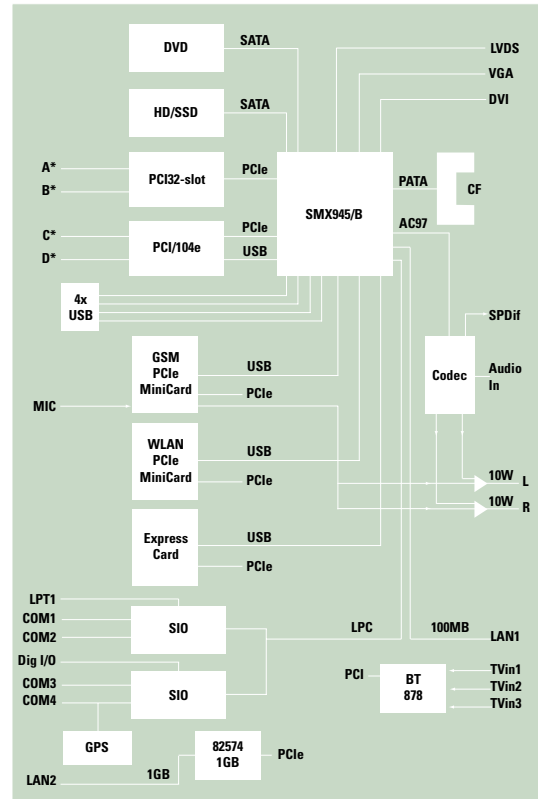
Ordering information

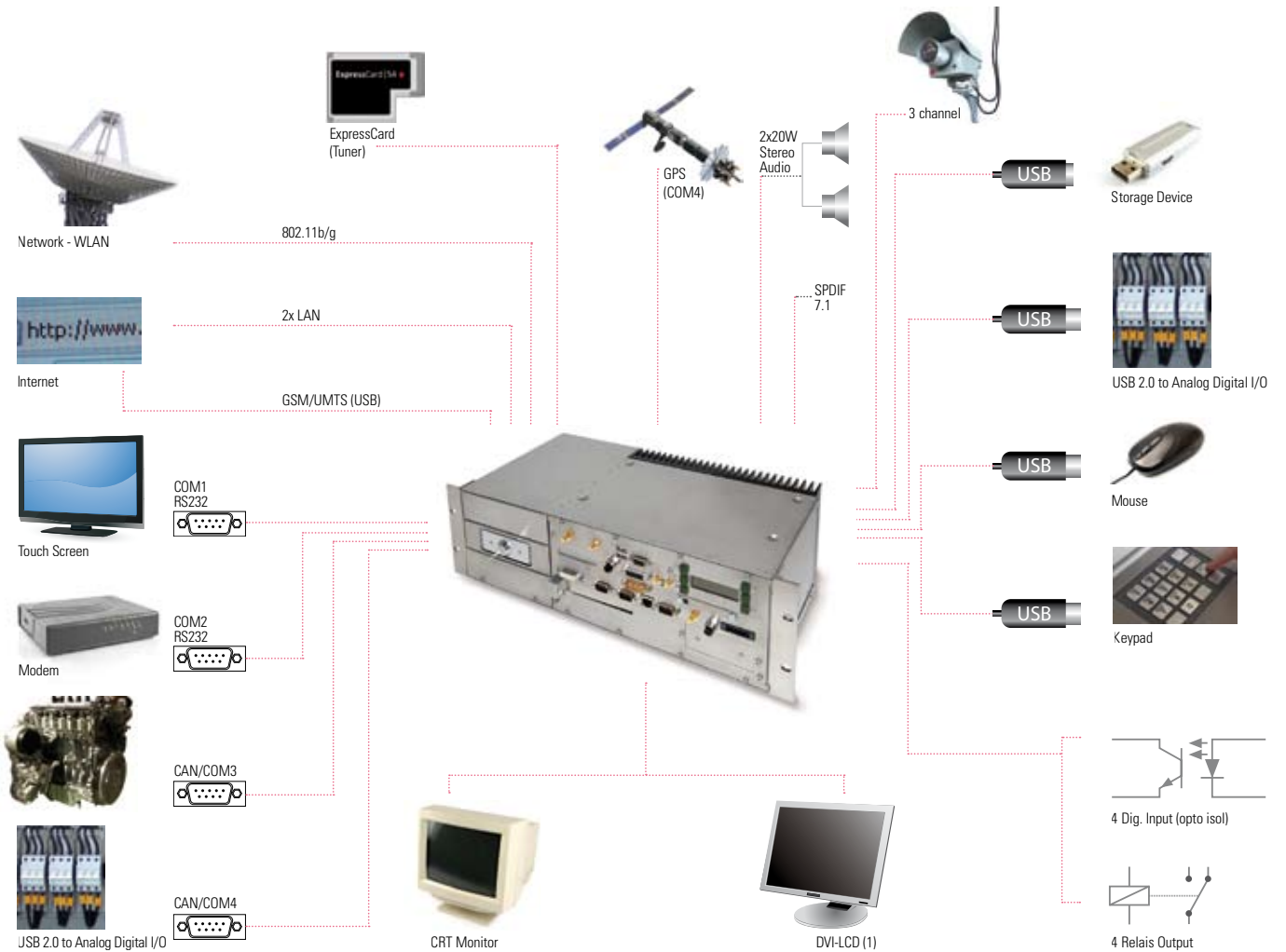| Item	No.	Description
Option MPCR50/R WLAN	807414	MiniCard Intel 4965AGN with antenna cable
Option MPCR50/R GPS	807412	GPS A1080 assembled with antenna cable
Option GSM GPRS/UMTS	807413	MiniCard Expr. assembled, GMS with antenna cable
MPCxx M12 Powerconnector	814690	M12-Plug with 2m cable for DC input 12-48VDC
MPCX50 Mountingkit	814637	
MPCxx M12 Poweradapter	807436	110/220VAC , 90W Supply, with M12 connector (19V)
MPCxxx RTC-Battery Kit	807470	Maintenancekit
MPCxx M12 USB to Std.USB	814691	M12-Plug with 2m cable to Standard USB connector
MPCxx M12 LAN to Std.LAN	814692	M12-Plug with 2m cable to Standard RJ45-LAN
Upgrade 3GB with SMX945B	807406	Upgrade SMX945B with 3GB from the SMX945 with 2GB
Option 32GB SSD	807417	SATA SLC 2.5"-SSD Intel
Downgrade no HD	807377	No HD assembled

Technical data

Type	**MPCX50**
CPU	Intel® Pentium® Core™ 2 Duo
Chipset	Intel® 945GM
Memory	2GB (max. 3GB)
Ext. Temp. Hard drive (SATA) - E38	80GB (opt. 32GB SSD)
CF	yes
Video controller	Intel® 945GM
CD/DVD	-
1st video interface	QXGA
2nd video interface	DVI
Resolution	2048 x 1536 (@ 75Hz)
TV input	BT878, 2 channel
Serial interface COM1	DSub 9pol, RS232
Serial interface COM2	DSub 9pol, RS232
Serial interface COM3	DSub 9pol, RS232 (opt. CAN)
Serial interface COM4	DSub 9pol, RS232 (opt. CAN)
Parallel interface	optional
USB V2.0 Standard	2x front
USB V2.0 M12	1x front
LAN Port A (with LAN boot)	10/100BASE-T (RJ45)
LAN Port B	1GB-LAN
Audio controller	AC97-2.3
Audio output	Stereo 2x 20W amplifier
Audio Input	-
Options	WLAN, GSM-UMTS/GPRS
	CAN, IBIS, GPS
Digital input/output	4x output, 4x opto input
Remote power on/off	yes (ignition)
DC voltage input (not isolated), V1248	8-58VDC, 35W
DC voltage input (1.5kV isolated), Ixx	24/36/48/72/110VDC/typ.35W
AC power supply	-
Expansion	2x PCIexpress MiniCard,
	2x PCI/104express slot
	1x ExpressCard
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, e1
Protection class	IP40
Size (W x L x H in mm)	320 x 132 x 250
Weight	5 kg
Housing	Chromium steel
Colour	chrome
Noise level	<20dB(A)
Operating temperature (with HD)	-20°C bis +50°C
Extended operating temperature (with SSD)	-40°C bis +70°C (SSD, no HD)
Vibration/shock incl. HD/CD/DVD	1/10G
Vibration/shock incl. SSD	10G/150G
MTBF	60'000h
For operating systems	Vista, WIN XP, LINUX
Part no. MPCX50-V1248	814630

ExpressCard
(Tuner)

3 channel

2x20W
Stereo
Audio

GPS
(COM4)

USB — Storage Device

Network - WLAN

802.11b/g

SPDIF
7.1

USB — USB 2.0 to Analog Digital I/O

Internet

2x LAN

GSM/UMTS (USB)

USB — Mouse

COM1
RS232

Touch Screen

COM2
RS232

USB — Keypad

Modem

CAN/COM3

4 Dig. Input (opto isol)

USB 2.0 to Analog Digital I/O

CAN/COM4

CRT Monitor

DVI-LCD (1)

4 Relais Output

MPCX27R/RL

The EN50155 certified, IP65 protected, Atom rail computer (with display)

The MPCX27R is well sealed against water and has waterproof N/M12 cable connections. For mass storage, a flash disk is built-in (SATA SSD or optional CompactFlash). The RL version has a built-in 3.5" VGA touch screen. For navigation and communication expansion, the options GPS, GSM and WLAN with watertight antenna connections are available. The aluminum housing is totally watertight and includes passive, fanless cooling. The Atom processor offers high computer performance with only 15 Watt power consumption. Customer specific functions such as Ring On Wake, Event Wake Up or Wake On LAN can be realized using FPGA and a microcontroller.

Applications

_ Integration in railway vehicles

_ Communication computer, passenger safety

_ For 24-110V galv. 1.5kV isolated rail power supply

_ EN50155, TX certified, M12 connectors, 1500V isolation

Ordering information

Item	No.	Description
Option MPCX27 WLAN	807420	MiniCard Intel 4965AGN with antenna cable
Opt. MPCX27 GSM UMTS/GPRS	807424	GSM assembled with antenna cable
Option MPCX27 GPS A1080	807422	GPS assembled with antenna cable
MPCxx M12 Powerconnector	814690	M12-Plug with 2m cable for DC input 12-48VDC
MPCxx M12 USB to Std.USB	814691	M12-Plug with 2m cable to Standard USB connector
MPCxx M12 LAN to Std.LAN	814692	M12-Plug with 2m cable to Standard RJ45-LAN
MPCxx M12 COM to DSub9	814693	M12-Plug with 2m cable to 9p-DSub COM connector
MPCxx N-Coax Antennacable	814694	N-Coax with 2m cable to SMA-Plug connector
MPCxx Poweradapter	807436	110/220VAC , 90W Supply, with M12 connector (19V)

Technical data

Type	MPCX27R-xxx	MPCX27RL-xxx
CPU	Intel® Atom 510, 1.1GHz	Intel® Atom 510, 1.1GHz
Chipset	Intel® US15W	Intel® US15W
Memory	1GB	1GB
SSD-Drive (2.5") SATA2	32GB	32GB
Optical drive	-	-
Video controller	US15W	US15W US15W
Video interface 1	QXGA MDSub	QXGA MDSub
Video interface 2	intern	3.5"-LCD 640x 480
Resolution	1600 x 1200 (@ 60Hz)	1600 x 1200 (@ 60Hz)
Keyboard, mouse	USB	USB
Serial interface COM1 M12 (Ringwake)	RS232C	RS232C
Serial interface COM2 M12	RS232C or GPS	RS232C or GPS
Parallel interface	-	-
USB V2.0 Standard	-	-
USB V2.0 M12	2x	2x
LAN Port A (with LAN boot), (LAN wake)	100/10MB-LAN (M12)	100/10MB-LAN (M12)
LAN Port B	100/10MB-LAN (M12)	100/10MB-LAN (M12)
Audio controller	AC97-2.3	AC97-2.3
Line output	-	-
Line input/mic. input	-	-
Option 1	WLAN PCIe MiniCard	WLAN PCIe MiniCard
Option 2	-	-
Option 3	GSM PCIe MiniCard	GSM PCIe MiniCard
Option 4	GPS A1080	GPS A1080
Digital input/output	-	-
Remote power on/off	yes	yes
DC voltage input (not isolated), V1248	8-58VDC/typ.15W	8-58VDC/typ.15W
DC voltage input (1.5kV isolated), Ixx	24/36/48/72/110VDC, 15W	24/36/48/72/110VDC, 15W
Plug-in power supply	-	-
Expansion	PCI/104ex	PCI/104ex
Power save function	Suspend/Resume, SoftOff, Instant On	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, e1, EN50155	CE, FCC, e1, EN50155
Protection class	IP65	IP65
Size (W x L x H in mm)	130 x 180 x 68	130 x 180 x 68
Weight	1 kg	1 kg
Housing	Aluminium	Aluminium
Colour	olive green	olive green
Noise level	0dB(A)	0dB(A)
Operating temperature (TX/T2)	-40°C to +85°C @ 1.1GHz	-40°C to +70°C @ 1.1GHz
Vibration/shock incl. SSD	16/150G	16/150G
MTBF	100'000h	80'000h
For operating systems	WIN2000, WIN XP, LINUX	WIN2000, WIN XP, LINUX
Part no. MPCX27-V1248	814700	814740
Part no. MPCX27-I24	814701	814741
Part no. MPCX27-I36	814702	814742
Part no. MPCX27-I48	814703	814743
Part no. MPCX27-I72	814704	814744

MPCX28
with mounted
option 814325,
front cover

MPCX28R

The fanless Atom rail computer EN50155

The MPCX28R includes all the standard interfaces (COMs, Video, Sound, USB, LAN) as well as an additional external eSATA300 connector. On the front is an exchangeable SATA300 hard disk or SSD drive as well as a CF bracket for mass storage. The RTC battery is service-friendly, being accessible from the front. Expansion options include GPS, GSM and WLAN. The housing is a robust aluminum profile which integrates passive, maintenance-free and fan-free cooling. Customer specific functions such as Ring On Wake, Event Wake Up or Wake On LAN can be realized using FPGA and a microcontroller.

Applications

_ Integration in railway vehicles

_ Passenger entertainment, passenger safety

_ For 24-110V galv. 1.5kV isolated rail power supply

_ EN50155, TX certified, M12 connectors, 1500V isolation

Ordering information

Item	No.	Description
Option 80GB 24h SATA	807411	80GB Harddisk automotive, SATA 24h Seagate
Option 32GB SSD SATA	807417	SATA2 SLC 2.5"-SSD Intel
Opt. MPCX48/28 Front cover	814325	IP52 Protectioncover
Option MPCX28 WLAN	807430	MiniCard Intel 4965AGN with antenna cable
Option MPCX28 GPS A1080	807432	GPS assembled with antenna cable
Opt. MPCX28 GSM UMTS/GPRS	807434	PCIex MiniCard UMTS ass., with antenna cable
Opt. MPCX48 2xCAN PEAK.	814369	2xPeak CAN opto-isolated
MPCxx Poweradapter	807436	110/220VAC , 90W Supply, with M12 connector (19V)
MPCxx M12 Powerconnector	814690	M12-Plug with 2m cable for DC input 12-48VDC

Technical data

Type	MPCX28R-xxx
CPU	Intel® Atom™, 1.6GHz
Chipset	Intel®
Memory	1GB
Ext. Temp. Harddisk (SATA) exchangeable	0GB, option: 80GB or 32GB SSD
Optical drive	-
Video controller	Intel®
3D-Support	DirectX 9
Video interface 1 (digital)	DVI-I
Video interface 2 (analog)	DVI-I
Resolution	2048 x 1536 (@ 75Hz)
Keyboard, mouse	USB
Serial interface COM1/CAN (Ringwake)	RS232C, RS422/85
Serial interface COM2/CAN	RS232C, RS422/85
Parallel interface	Digital I/O (opt. LPT/CAN)
USB V2.0 standard	2x back side, 3x front side
USB V2.0 M12	1x back side
Ext. SATA interface (ESATA)	300MB/sec
LAN Port A (with LAN boot), (LAN wake)	100BASE-T (M12)
LAN Port B	100BASE-T (M12)
Audio controller	AC97-2.3, DSub + jack
Line output	Stereo, DSub
Line input/mic. input	Stereo, DSub
Option 1	WLAN Mini Card
Option 2	Dual-CAN, IBIS (PC/104)
Option 3	GSM Mini Card
Option 4	GPS AC80
Digital input/output	4x out/4x opto in
Remote power on/off	yes
DC-Spannungseingang (nicht isoliert), V1248	8-58VDC/typ.15W
DC-Spannungseingang (isoliert 1.5kV), Ixx	24/36/48/72/110VDC/typ.15W
Plug-in power supply	110/220V AC Option
Expansion	2x PCIe Mini Card, 1x PCI/104
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, e1, EN50155
Protection class	IP52, EN50155
Size (W x L x H in mm)	159 x 190 x 66
Weight	3 kg
Housing	Aluminium
Colour	anthracite/black anodized
Noise level	<20dB(A)
Operating temperature (with HD) T1	-25°C to +55°C
Extended operating temperature (with SSD) TX	-40°C to +85°C
Vibration/shock incl. HD/CD/DVD	1/10G
Vibration/shock incl. SSD	16/150G
MTBF (25°C)	60'000h
For operating systems	WIN2000, WIN XP, LINUX
Part no. MPCX28R-V1248	814430
Part no. MPCX28R-I24	814431
Part no. MPCX28R-I36	814432
Part no. MPCX28R-I48	814433
Part no. MPCX28R-I72	814434
Part no. MPCX28R-I110	814435

*A, B, C, D interfaces depend on the built-in PCI/104e cards or their respective slots
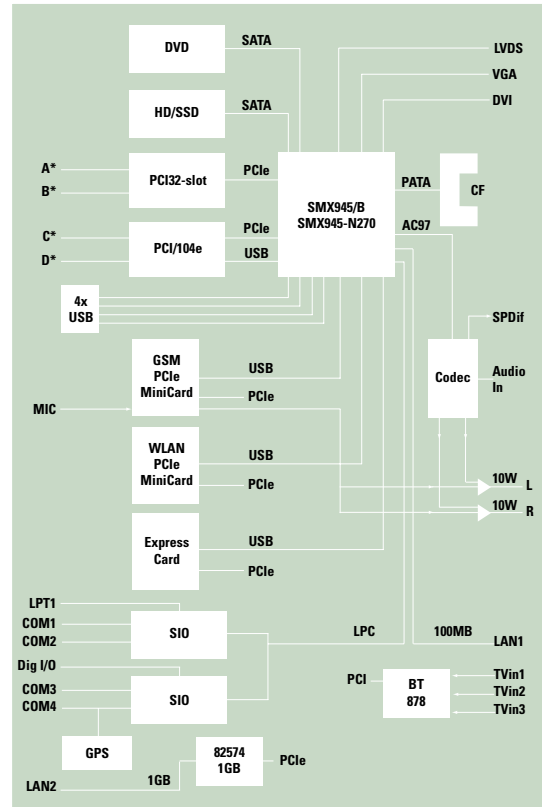
MPCR50R

The fan-free, Core2Duo, 19" rail computer EN50155

The MPCR50 has many interfaces (COMs, USB, LAN, Digital I/O, video input) and is expandable with PCI slots and PC/104express cards (e.g., CAN, measurement cards). For mass storage, a shock-absorbing, „hot plug" exchangeable SATA300 hard drive or SSD drive is built-in (a second drive is optionally available) The RTC battery is monitored and service-friendly, being accessible from the front. For expansion there are optional GPS, GSM and WLAN as well as slots for CompactFlash and Express cards. The housing is made of rugged chromium steel with integrated passive, maintenance-free and fanless cooling. Customer specific functions such as Ring On Wake, GSM Wake, Event Wake Up or Wake On LAN can be realized using FPGA and a microcontroller. By means of a color LCD display and 6 function buttons, various security functions and system information (voltages, temperatures, error reports, POD diagnostics, operating log, RTC battery voltage) can be queried. An external 12V secondary battery can be connected to bridge power failures of the primary feed.
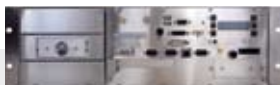
Applications

_ Video server in railway vehicles, passenger entertainment, passenger safety

_ Expandable, e.g. with 8x COM, 8x LAN

_ For 24-110V galv. 1.5kV isolated rail power supply

_ EN50155, TX certified, M12 connectors

Ordering information

Item	No.	Description
Option MPCR50/R WLAN	807414	MiniCard Intel 4965AGN with antenna cable
MPCR50 19"-Mountingkit	814617	
Option 32GB SSD	807417	SATA SLC 2.5"-SSD
Option 2. Drive removable	807419	with 80GB Harddisk SATA
Option MPCR50/R GPS	807412	GPS A1080 assembled with antenna cable
Option GSM GPRS/UMTS	807413	MiniCard Expr. assembled, GMS with antenna cable
Option MPCR50R 2xCAN isol	807415	Option: 2xCAN isolated PEAK CAN
MPCxx M12 Powerconnector	814690	M12-Plug with 2m cable for DC input 12-48VDC
MPCxxx RTC-Battery Kit	807470	Maintenancekit
MPCxx M12 USB to Std.USB	814691	M12-Plug with 2m cable to Standard USB connector
MPCxx M12 LAN to Std.LAN	814692	M12-Plug with 2m cable to Standard RJ45-LAN
Downgrade w. SMX945-N270	807404	Atom N270 with 1.6GHz, 2GB RAM assembled

Technical data

Type	MPCR50R-xxx
CPU	Intel® Pentium® Core™ 2 Duo/Atom
Chipset	Intel® 945GM / N270
Memory	2GB
Hard drive	80GB 2.5" or 32GB SSD
CF	yes
Video controller	Intel® 945GM
CD/DVD	-
1st video interface	QXGA
2nd video interface	DVI
Resolution	2048 x 1536 (@ 75Hz)
TV input	BT878, 2 channel
Serial interface COM1	DB 9pol, RS232
Serial interface COM2	DB 9pol, RS232
Serial interface COM3	DB 9pol, RS232 (CAN)
Serial interface COM4	DB 9pol, RS232 (CAN)
Parallel interface	optional
USB V2.0 Standard	2x front
USB V2.0 M12	1x front
LAN Port A (with LAN boot)	10/100BASE-T (M12)
LAN Port B	1GB-LAN (RJ45)
Audio controller	AC97-2.3
Audio output	Stereo 2x 10W amplifier
Audio Input	Stereo Line
Options	WLAN, GSM-UMTS/GPRS
	CAN, IBIS, GPS
Digital input/output	4x opto output, 4x opto input
Remote power on/off	yes (ignition)
DC Voltage input (not isolated), V1248	8-58VDC/typ.40W
DC Voltage input (isolated 1.5kV), Ixx	24/36/48/72/110VDC/typ.40W
AC power supply	-
Expansion	2x PCIexpress MiniCard,
	2x PCI/104express slot
	1x PCI ExpressCard slot
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, e1, EN50155
Protection class	IP40
Size (W x L x H in mm)	480 x 132 x 250
Weight	6 kg
Housing	Chromium steel
Colour	chrome
Noise level	<20dB(A)
Operating temperature (with HD) T1	-25°C bis +55°C
Extended operating temperature (with SSD) TX	-40°C bis +85°C
Vibration/shock incl. HD/CD/DVD	1/10G
Vibration/shock incl. SSD	10G/150G
MTBF	60'000h
For operating systems	Vista, WIN XP, LINUX
Part no. MPCR50R-V1248	814600
Part no. MPCR50R-I24	814601
Part no. MPCR50R-I36	814602
Part no. MPCR50R-I48	814603
Part no. MPCR50R-I72	814604
Part no. MPCR50R-I110	814605
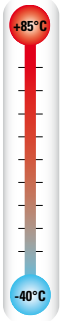
MPCF50R

The fanless and thin, passenger information rail computer

The MPCF50R has the same interfaces as the MPCR50R (COMs, USB, LAN, VGA, DVI) and uses the same computer electronics. The system is built mechanically very thin (<60mm) so that it finds room behind any LCD display. An onboard CompactFlash, a 2.5" SATA hard drive (80GB) or a 2.5" SSD (32GB) is available for mass storage. Customer specific security functions can be realized using FPGA and a microcontroller and visualized over a color LCD display.

Applications

_ Passenger entertainment and information
_ Advertising displays in busses and railway vehicles

Ordering information

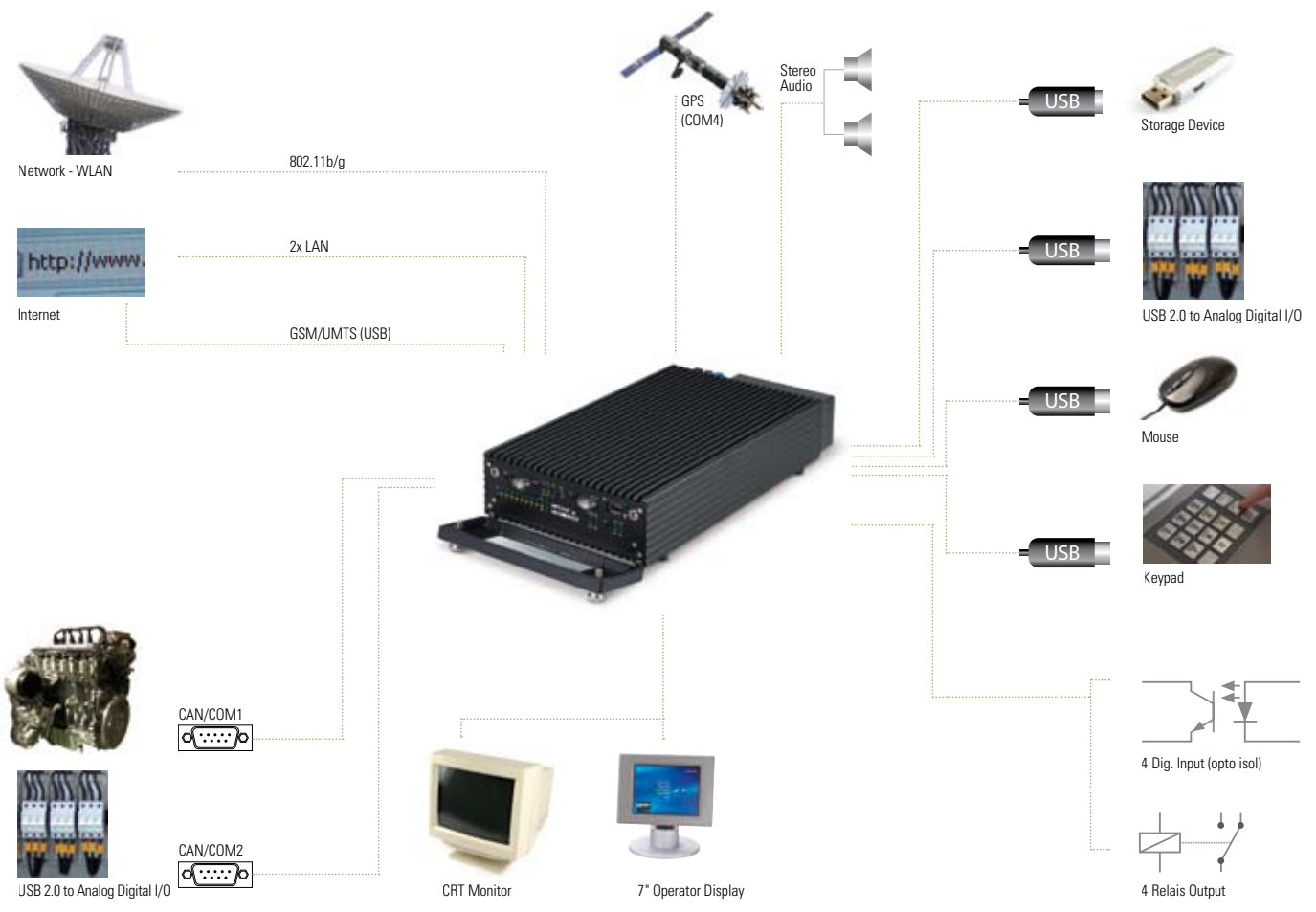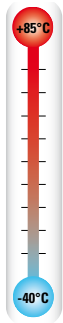| Item	No.	Description
Option MPCR50/R WLAN	807414	MiniCard Intel 4965AGN with antenna cable
Option MPCR50/R GPS	807412	GPS A1080 assembled with antenna cable
Option GSM GPRS/UMTS	807413	MiniCard Expr. assembled, GMS with antenna cable
MPCxx M12 Powerconnector	814690	M12-Plug with 2m cable for DC input 12-48VDC
MPCX50 Mountinkit	814637	
MPCxx M12 Poweradapter	807436	110/220VAC , 90W Supply, with M12 connector (19V)
MPCxxx RTC-Battery Kit	807470	Maintenancekit
MPCxx M12 USB to Std.USB	814691	M12-Plug with 2m cable to Standard USB connector
MPCxx M12 LAN to Std.LAN	814692	M12-Plug with 2m cable to Standard RJ45-LAN
Upgrade 3GB with SMX945B	807406	Upgrade SMX945B with 3GB from the SMX945 with 2GB
Option 32GB SSD	807417	SATA SLC 2.5"-SSD Intel
Downgrade no HD	807377	No HD assembled

Core 2 Duo   2x 1.5GHz   Railway   PCI/104ex   EN50155

Technical data

Type	MPCF50R-xxx
CPU	Intel® Pentium® Core™ 2 Duo/Atom
Chipset	Intel® 945GM / N270
Memory	2GB (max. 3GB)
Hard drive	80GB 2.5" or 32GB SSD
CF	yes
Video controller	Intel® 945GM
CD/DVD	-
1st video interface	QXGA
2nd video interface	DVI
Resolution	2048 x 1536 (@ 75Hz)
TV input	-
Serial interface COM1	DB 9pol, RS232
Serial interface COM2	DB 9pol, RS232
Serial interface COM3	DB 9pol, RS232 (CAN)
Serial interface COM4	DB 9pol, RS232 (CAN)
Parallel interface	optional
USB V2.0 Standard	2x front
USB V2.0 M12	1x front
LAN Port A (with LAN boot)	10/100BASE-T (M12)
LAN Port B	1GB-LAN (RJ45)
Audio controller	AC97-2.3
Audio output	Stereo 2x 10W amplifier
Audio Input	Stereo Line
Options	WLAN, GSM-UMTS/GPRS
	CAN, IBIS, GPS
Digital input/output	4x opto output, 4x opto input
Remote power on/off	yes (ignition)
DC Voltage input (not isolated), V1248	8-58VDC/typ.35W
DC Voltage input (isolated 1.5kV), Ixx	24/36/48/72/110VDC/typ.35W
AC power supply	-
Expansion	2x PCIexpress MiniCard,
	2x PCI/104express slot
	1x PCI ExpressCard slot
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, e1, EN50155
Protection class	IP40
Size (W x L x H in mm)	300 x 320 x 60
Weight	3 kg
Housing	Chromium steel
Colour	chrome
Noise level	<20dB(A)
Operating temperature (with HD) T1	-25°C bis +55°C
Extended operating temperature (with SSD) TX	-40°C bis +85°C
Vibration/shock incl. HD/CD/DVD	1/10G
Vibration/shock incl. SSD	10G/150G
MTBF	60'000h
For operating systems	Vista, WIN XP, LINUX
Part no. MPCF50R-V1248	814670
Part no. MPCF50R-I24	814671
Part no. MPCF50R-I36	814672
Part no. MPCF50R-I48	814673
Part no. MPCF50R-I72	814674
Part no. MPCF50R-I110	814675

Network - WLAN

802.11b/g

Internet

2x LAN

GSM/UMTS (USB)

GPS (COM4)

Stereo Audio

USB — Storage Device

USB — USB 2.0 to Analog Digital I/O

USB — Mouse

USB — Keypad

CAN/COM1

USB 2.0 to Analog Digital I/O

CAN/COM2

CRT Monitor

7" Operator Display

4 Dig. Input (opto isol)

4 Relais Output

MPCX27MIL

The IP67 protected computer with MIL connectors

The MPCX27MIL is well sealed against water and has waterproof MIL cable connections. A flash disk is built-in (SATA 40GB SSD or optional CompactFlash) for mass storage. The Atom processor offers high computer performance with only 12 Watt power consumption. For expansion, optional GPS, GSM and WLAN with waterproof N-type antenna connectors are available. Functional expansion is possible with an internal PCI/104express card and the signals use a 48pin MIL connector. A very robust aluminum housing integrates passive, fanless cooling to allow a broad working temperature range.

Applications

_ Integration in military vehicles and aircraft

_ MIL-STD 810G certified, -40C to +85C

_ For 24-48V battery power supplies

_ 16G vibration, 150G shock

Ordering information

Item	No.	Description
Option MPCX27 WLAN	807420	MiniCard Intel 4965AGN with antenna cable
Opt. MPCX27 GSM UMTS/GPRS	807424	GSM assembled with antenna cable
Option MPCX27 GPS A1080	807422	GPS assembled with antenna cable
MPCX27MIL-Cablekit	807428	1x 37pin female I, 1x 37pin female II, 1x 53pin female
MPCxx N-Coax Antennacable	814694	N-Coax with 2m cable to SMA-Plug connector

Technical data

Type	MPCX27MIL
CPU	Intel® Atom 510, 1.1GHz
Chipset	Intel® US15W
Memory	1GB
SSD-Drive	32GB
Optical drive	-
Video controller	US15W
Video interface 1	QXGA (MIL)
Video interface 2	LVDS (MIL)
Resolution	2048 x 1536 (@ 75Hz)
Keyboard, mouse	USB
Serial interface COM1 (Ringwake)	RS232C (MIL)
Serial interface COM2	RS232C or GPS (MIL)
Parallel interface	-
USB V2.0	4x (MIL)
Firewire IEEE1394	-
LAN Port A (with LAN boot), (LAN wake)	100/10MB-LAN (MIL)
LAN Port B	100/10MB-LAN (MIL)
Audio controller	AC97-2.3
Line output	Stereo (MIL)
Line input/mic. input	Stereo (MIL)
Acceleration sensor	0.001-6G, 3-Achsen
Option 1	WLAN PCIe MiniCard UMTS/GPRS
Option 2	48 user I/O pins on X3
Option 3	GSM PCIe MiniCard
Option 4	GPS
Digital input/output	-
Remote power on/off	yes
DC-Voltage input/power V1248	8V-58VDC / typ. 15W (MIL)
DC-Voltage input (isol.)	-
Expansion	PCI/104ex
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, MIL810
Protection class	IP67
Size (W x L x H in mm)	110 x 150 x 60
Weight	1 kg
Housing	Aluminium
Colour	olivegreen
Noise level	0dB(A)
Operating temperature	-40°C to +85°C @ 1.1GHz MIL810
Extended operating temperature	-
Vibration/shock incl. SSD	16/150G MIL810
MTBF	100'000h
For operating systems	WIN2000, WIN XP, LINUX
Part no. MPCX27MIL-V1248	814720

MPCX47MIL

The IP65 protected, water-proof computer with MIL connectors

The MPCX47MIL is well sealed against water and has waterproof MIL cable connections. For mass storage, a flash disk is built-in (PATA SSD or Compact-Flash and 2x USB sticks). The mass memory can be swapped out from the front. For expansion, optional GPS, GSM and WLAN with waterproof FAKRA antenna connectors are available. The aluminum housing integrates passive, fan-free cooling. Customer specific functions such as Ring On Wake, GSM Wake or Wake On LAN can be realized using FPGA and a microcontroller.

Applications

_ Integration in cars, busses, trucks

_ For use outdoors

_ For 12/24V battery power supplies

_ e1 certified

Ordering information

Item	No.	Description
MPCX47 Mediapack 2.	814252	MPCX-47 Mediapack 2 No Harddisk, No CD 2x Slot CompactFlash
MPCX47 Mediapack 3SSD.	814255	SolidStateDisk 16GB E48, 1x CompFlash (2.Master), No CD/DVD assembled, DOS/Linux Bootimage incl.
MPCX47 Mediapack 4SSD.	814257	MPCX-47 Mediapack 4SSD 2xSolidStateDisk 16GB E48 no CF, no CD
Opt. MPCX47 WLAN	814262	WLAN card MiniPCI Intel (R) Pro 2915ABG
Opt. MPCX47 GSM/EDGE.	814154	GSM/EDGE 4-Band for MPCX47 Siemens MC75
Opt. MPCX47 GSM/UMTS	814156	GSM/UMTS for MPCX47 Siemens HC25
Opt. MPCX47 GPS Jupit.21	814141	MPCX47 GPS-Receiver Modul Jupiter 21

Technical data

| Type	MPCX47MIL
CPU	Intel® Pentium® M 738, 1.4GHz
Chipset	Intel® 855GME
Memory	1GB
Ext. temp. hard drive	CF or 16GB SSD (dependant on media pack)
Optical drive	-
Video controller	Intel® 855GME
Video memory	64MB
3D-Support	DirectX 9
Video interface 1	QXGA
Video interface 2	-
Video interface 3	TV
Resolution	2048 x 1536 (@ 75Hz)
Keyboard, mouse	2x PS/2
Serial interface COM1	RS232C
Serial interface COM2	RS232C
Serial interface COM3	Optional
Serial interface COM4	Optional
Parallel interface	LPT
USB V2.0	2x back, 2x front
Firewire IEEE1394	1x front, 1x back option
TV input/Frame grabber	BT878A, SVideo, 3 channels
LAN Port A (with LAN boot)	10/100BASE-T (RJ45)
LAN Port B	-
Analog Input	8x 8Bit
Audio controller	AC97-2.3
Line output	5.1 Sound
Line input/mic. input	Stereo or 5.1 + headset
Replicator	Typ 4 mounted
Option 1	WLAN MiniPCI
Option 2	Dual-CAN
Option 3	GSM
Option 4	GPS
Digital input/output	8x isol. in/8x relay out
Remote power on/off	yes
Voltage input/power	8V-30V DC / typ. 35W
Plug-in power supply	110/220V AC option
Expansion	MiniPCI, PC/104-*Plus*
Power save function	Suspend/Resume, SoftOff, Instant On
Conformity	CE, FCC, e1
Protection class	IP65
Size (W x L x H in mm)	159 x 300 x 66
Weight	4 kg
Housing	Aluminium
Colour	anthracite/black anodized
Noise level	0dB(A)
Operating temperature	-40°C to +70°C @ 1.4GHz MIL810
Extended operating temperature	-
Vibration/shock incl. SSD	16/150G
MTBF (25°C)	60'000h
For operating systems	WIN2000, WIN XP, LINUX
Part no.	814290 (without media pack)

MSMD160

Multiple display solution via USB

The MSMD160 allows expansion of up to 6 monitors (DVI/VGA) using the USB 2.0 interfaces. The displays can be defined as clones (copies) or display expansions (separate display contents). Drivers are available for Windows Vista, XP and LINUX. Other options via USB are sound output (2x 10W stereo) and a touch screen.

Applications

_ Simulators
_ Large displays
_ Multimedia
_ Passenger information in vehicles/aircraft

CRT Monitor   DVI-LCD
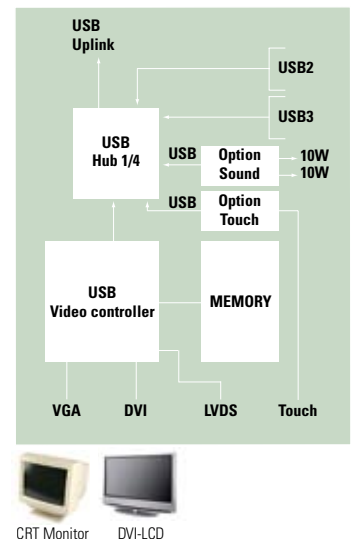
Technical data

Type	MSMD160	MSMD160R
Function	Multi-display	Multi-display
ISA-BUS	-	-
PCI-BUS	-	-
USB-In	USB2	M12-USB
USB-Out	USB2	M12-USB
Controller	X160	X160
Memory	Local	Local
1st interface	VGA	VGA
2nd interface	DVI	DVI
Hot plug support	yes	yes
Power normal	12, 24, 36, 42, 48V (8V-58V)	12, 24, 36, 42, 48V (8V-58V) (EN50155)
Power management	-	-
Operating temperature	-25°C to + 70°C	-25°C to + 70°C
Extended operating temperature	-	-
Size (W x L x H in mm)	165 x 110 x 27	165 x 110 x 27
Weight	400 g	400 g
Software support	Vista, XP, Linux	Vista, XP, Linux
MTBF	80'000h	
Special features 1	max. resolution 1600 x 1200	max. resolution 1600 x 1200
Special features 2		Sound with 2x 10W amplifier
Part no. standart	814550	814552
Part no. with Audio	814551	814553

## Example of 8x multiple display

DIGITAL-LOGIC's SOFTWARE
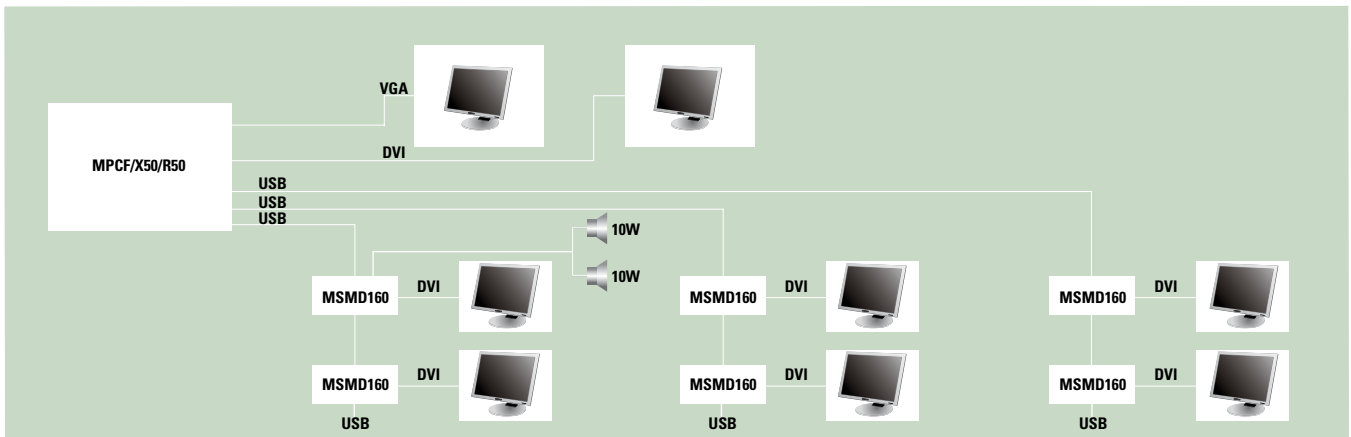
Operating systems evaluation

Pre-installed operating systems on USB sticks or CompactFlash cards are available for most products.
The data carrier is inserted into the system and the boot process begins.

Article on USB-Stick 2GB	No.	Operating system	Suitable for the following products:
EVOSXPLX800USB	816015	Windows XP Embedded	all LX800/900 products
EVOSCE6LX800USB	816051	Windows CE 6.0	all LX800/900 products
EVOSXP855USB	816011	Windows XP Embedded	all 855 products
EVOSXP945USB	816013	Windows XP Embedded	all 945 products
EVOSXPA200USB	816061	Windows XP Embedded	all A200 products
EVOSCE6A200USB	816071	Windows CE 6.0	all A200 products
USB-BOOT DOS/Linux	814350	Linux + DOS 1GB	all LX800/900 products

Article on CompactFlash 2GB	No.	Operating system	Suitable for the following products:
EVOSXPLX800CF	816014	Windows XP Embedded	all LX800/900 products
EVOSCE6LX800CF	816050	Windows CE 6.0	all LX800/900 products
EVOSXP855CF	816010	Windows XP Embedded	all 855 products
EVOSXP945CF	816012	Windows XP Embedded	all 945 products
EVOSXPA200CF	816060	Windows XP Embedded	all A200 products
EVOSCE6A200CF	816070	Windows CE 6.0	all A200 products
EVOS Linux LX800CF	816030	Linux + DOS	all LX800/900 products
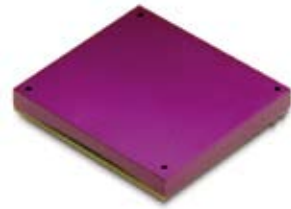
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MPCXHMI

**The user interface for all functionality in the
DIGITAL-LOGIC vehicle computer MPCX48/50**

MPCXHMI is a user interface that has been specially programmed for the two
DIGITAL-LOGIC, MPCX48 and MPCX50 vehicle computers with touch screen
monitors. This is based upon Microsoft Windows XP Embedded. The interface
uses large, ergonomically designed controls (buttons, dials) that are easy to
operate via the touch screen while driving.

Ordering information

Item	No.	Description
MPCX47HMI	814500	SW-Package
MPCX48HMI	814510	SW-Package

The MPCXHMI operating concept

In order to provide a clear and uniform display of all information and content, the MPCXHMI is clearly divided into:

_ The display line

_ The application

_ The main menu

_ The sub menu

The menu buttons at the bottom edge of the screen allow the current application to be accessed easily. Only the menu items that are currently needed are displayed.
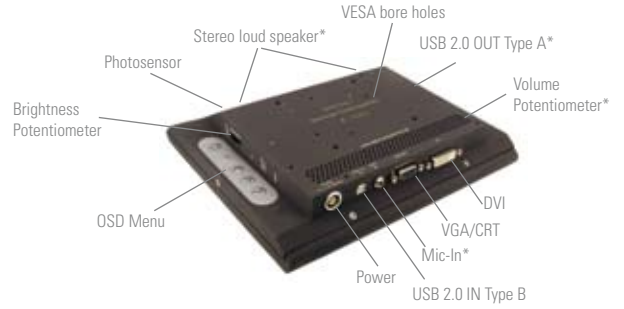
The following unique characteristics have been integrated:

_ Ergonomic operation for the vehicle workplace

_ Intuitive operation without a user guide

_ Text entry using an on-screen keyboard on the
   touch screen or a wireless keyboard

_ Day and night design (reduced brightness)

_ Integration of Windows standard applications

_ Operation of all functions such as:

• Navigation

• DVD player

• Audio CD player

• MP3 player

• Video player

• Picture viewer

• Telephone with SMS

• E-mail

• Internet browser (UMTS)

• Control of digital outputs

• Display of digital inputs

• Display and recording of video input channels

• Office

12.1"   10.4"   8.4"   6.5"

Stereo loud speaker*
VESA bore holes
Photosensor
USB 2.0 OUT Type A*
Brightness
Potentiometer
Volume
Potentiometer*
OSD Menu
DVI
VGA/CRT
Mic-In*
Power
USB 2.0 IN Type B

DV monitor 8.4" T

DV monitor 12"-T with spherical head,
aluminium bracket Part no. 814456

Part no. 814452   Part no. 814450   Part no. 814458   Part no. 814460   Part no. 814467   Part no. 814468

VEHICLE MONITORS

The DV monitor is a universally deployable LCD monitor for mobile and vehicle applications

It is becoming increasingly important in the public sector to have up-to-date information. Images and films with audio are presented on plasma or LCD displays using computers. Displays and computers are subjected to considerable temperature fluctuations and dust in locations that are difficult to access, often on walls or ceilings in buildings or outdoors.

Applications

_ Display computers for control terminals
_ Advertising display systems
_ In-vehicle installation
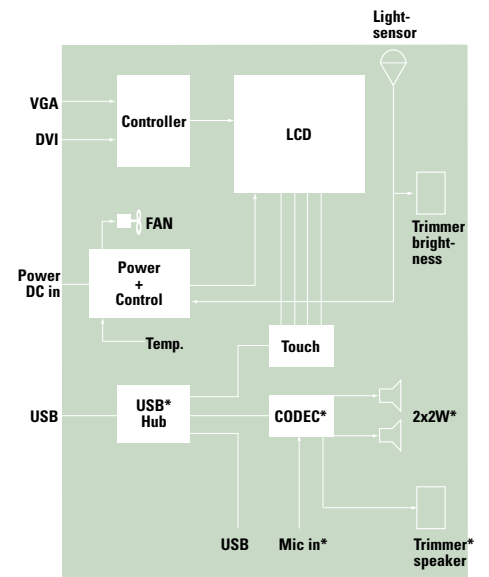
*Option 814454

Ordering information

Item	No.	Description
DV monitor 6.5-T	814406	6.5" LCD with DVI touch screen, VGA, USB interface, power supply 8V-28V
DV monitor 8.4-T	814408	8.4 LCD with DVI touch screen, VGA, USB interface, power supply 8V-33V
DV monitor 10.4-T	814410	10.4" LCD, LED backlight with DVI touch screen, VGA, USB interface, power supply 8V- 33V
DV monitor 12-T	814412	12" LCD with DVI touch screen, VGA, USB interface, power supply 8V-33V
DV bracket	814450	Spherical head bracket with prism bracket for VESA base
DV VESA base	814452	VESA installation base with retaining prism
DV bracket 2109	814456	Spherical head aluminium bracket with height adjustable VESA base (pic.)
DV bracket 2105	814458	Standard spherical head bracket with height adjustable VESA base
DV bracket 1022	814460	Heavy duty monitor bracket with metal spherical head and clamp foot
DV bracket 1301	814467	Stationary stand with suction cup bracket
DV bracket 1300	814468	Stationary stand with star handle
DVI cable 2M	814462	DVI cable, 2 metres
DVI cable 3M	814463	DVI cable, 3 metres
DVI cable 5M	814465	DVI cable, 5 metres
Option-USB-Sound	814454	USB hub plus USB sound for 8.4"-12.1" DV monitors incl. 2x 2W speakers
Option HHDV12	814451	Handhold for DV-12-T
Option SLT8.4"	814453	Sunlight readable touchscreen for 8.4"

Technical data — DV monitor 12.1" - T

Display	12.1" LCD TFT monitor, LED backlight
Resolution	1024 x 768 XGA, 262k colours
Brightness	1000 cd/m2 adjustable (Poti, Sensor)
Contrast	800 : 1
Touchscreen	Analog resistive
Video input	VGA-CRT, DVI
Touch output	USB, option: USB hub + sound
Power supply	8-33VDC, protected, 27W
Cabling	3 separate single cables (Video, DC, USB)
Dimensions, weight:	292 x 232 x 43mm, 1.7kg
Colour	Black, aluminium casing
Attachment/installation	VESA standard 75 x 75mm, M4
Operating temperature	-20°C bis +60°C, IP30, e1

Technical data — DV monitor 6.5" - T

Display	6.5" LCD TFT monitor (2x CCFL)
Resolution	640 x 480 VGA
Brightness	600 cd/m2 adjustable (Poti, Sensor)
Contrast	600 : 1
Touchscreen	Analog resistive
Video input	VGA-CRT
Touch output	USB
Power supply	8-28VDC, protected
Cabling	3 separate single cables (Video, DC, USB)
Dimensions, weight:	207 x 151 x 35mm
Colour	Black, aluminium casing
Attachment/installation	VESA standard 75 x 75mm, M4
Operating temperature	-10°C to +70°C, IP30, e1

DV monitor 8.4" - T

Display	8.4" LCD TFT monitor (2x CCFL)
Resolution	800 x 600, SVGA
Brightness	650 cd/m2 adjustable (Poti, Sensor)
Contrast	600 : 1
Touchscreen	Analog resistive
Video input	VGA-CRT, DVI
Touch output	USB, option: USB hub + sound
Power supply	8-33VDC, protected, 11W
Cabling	3 separate single cables (Video, DC, USB)
Dimensions, weight:	218 x 182 x 39mm, 1kg
Colour	Black, aluminium casing
Attachment/installation	VESA standard 75 x 75mm , M4
Operating temperature	-10°C to +70°C, IP30, e1

DV monitor 10.4" - T

Display	10.4" LCD TFT monitor, LED backlight
Resolution	1024 x 768, XGA, 16Mio. colors
Brightness	1000 cd/m2 adjustable (Poti, Sensor)
Contrast	800 : 1
Touch sceen	Analog resistive
Video input	VGA-CRT, DVI
Touch outout	USB, option: USB hub + sound
Power supply	8-33VDC, protected, 27W
Cabling	3 separate single cables (Video, DC, USB)
Dimensions, weight:	250 x 201 x 43mm, 1.3kg
Colour	Black, aluminium casing
Attachment/installation	VESA standard 75 x 75mm, M4
Operating temperature	-10°C to +60°C, IP30, e1

TECHNICAL INFORMATION

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)

CAN allocation: connector, 9-Pin, DSub:

Pin	I/O	Description
1		
2	< >	CAN-L
3		CAN-Ground
4		
5	< >	termination
6		Shield
7	< >	CAN-H
8		
9	< >	termination
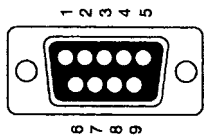
Male connector view (PC-side)

RJ45

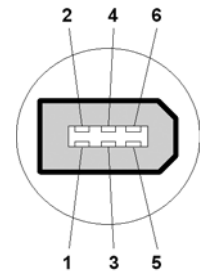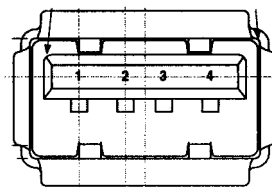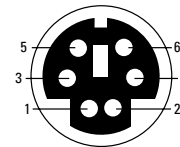| 10/100Mb		1Gb	
1	TXP	1	MDI0 (+)
2	TXN	2	MDI0 (-)
3	RXP	3	MDI1 (+)
4	GND (75 Ohm)	4	MDI2 (+)
5	GND (75 Ohm)	5	MDI2 (-)
6	RXN	6	MDI1 (-)
7	GND (75 Ohm)	7	MDI3 (+)
8	GND (75 Ohm)	8	MDI3 (-)
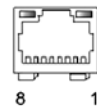
PS/2 keyboard and mouse cable

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 connector

| 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+	Twisted-pair B, differential signals
5	TPA-	Twisted-pair A, differential signals
6	TPA+	Twisted-pair A, differential signals

Display cable

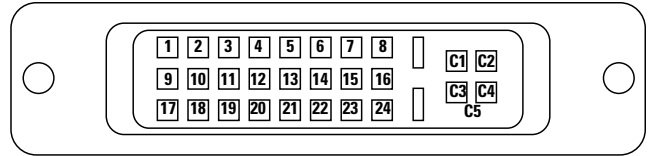**Connector: female 15-Pin DSub, cable requires male.**

Cable coming fromCRT: male. PC-side: female.

VGA RGB Display:

Pin	I/O	Description
1	>	Red
2	>	Green
3	>	Blue
4		reserved
5		Digital Gnd
6	<	Red return
7	<	Green return
8	<	Blue return
9		Plug
10		Digital Gnd
11		reserved
12		DD-DAT
13	>	H. Drive
14	>	V. Drive
15		DD-CLK
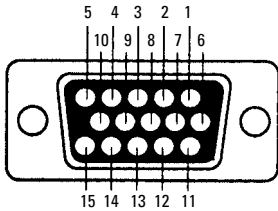
DVI-I

Pin	Beschreibung	Pin	Beschreibung	Pin	Beschreibung
1	TMDS Data 2-	9	TMDS Data 1-	17	TMDS Data 0-
2	TMDS Data 2+	10	TMDS Data 1+	18	TMDS Data 0+
3	TMDS Data 2/4 Shield	11	TMDS Data 1/3 Shield	19	TMDS Data 0/5 Shield
4	TMDS Data 4-	12	TMDS Data 3-	20	TMDS Data 5-
5	TMDS Data 4+	13	TMDS Data 3+	21	TMDS Data 5+
6	DDC Clock	14	+5V Power	22	TMDS Clock Shield
7	DDC Data	15	Gnd (+5, Analog V/H Sync)	23	TMDS Clock+
8	Analog Vertical Sync	16	Hot Plug Detect	24	TMDS Clock-C1
C1	Analog Red Video	C2	Analog Green Video	C3	Analog Blue Video
C4	Analog H Sync	C5	Analog Gnd (RGB)		

M12-LAN
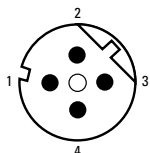
Pol	Color of conductor	Signal Ethernet
1	WH/GR (white/green)	TD+
2	WH/OG (white/orange)	RD+
3	GR (green)	TD-
4	OG (orange)	RD-

4 pole (pin side)   Screen on housing   System = Socket (F)

Pole figure M12 (D-coded)   Ethernet allocation   Cable = Connector (M)

M12-USB
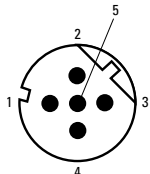
Pol	Signal USB
1	D+
2	D-
3	5V
4	GND

5 pole (pin side)   USB allocation   System = Socket (F)

Pole figure M12   Cable = Connector (M)

M12-CAN
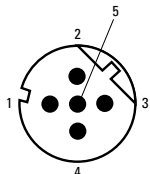
Pol	Signal CAN
1	Shield
2	-
3	CAN-GND
4	CAN-H
5	CAN-L

5 pole (pin side)   CAN allocation   System=Connector (M)

Pole figure M12   Cable = Socket (F)

M12-DC supply
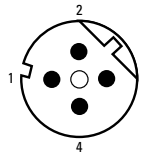
Pol	Signal Power
1	+DC
2	GND
3	IGN
4	reserved

4 pole (pin side)   Screen on housing   System = Connector (M)

Pole figure M12   supply allocation   Cable = Socket (F)

M12-V24
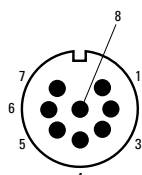
Pol	Signal V24
1	TxD
2	RTS
3	DTR
4	RxD
5	CTS
6	DSR
7	GND
8	RI

8 pole (pin side)   V24 allocation   System = Connector (M)

Pole figure M12   Cable = Socket (F)

M12-VGA
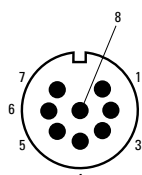
Pol	Signal VGA
1	red
2	green
3	blue
4	H-Synch
5	V-Synch
6	DD-CLK
7	DD-DAT
8	RI

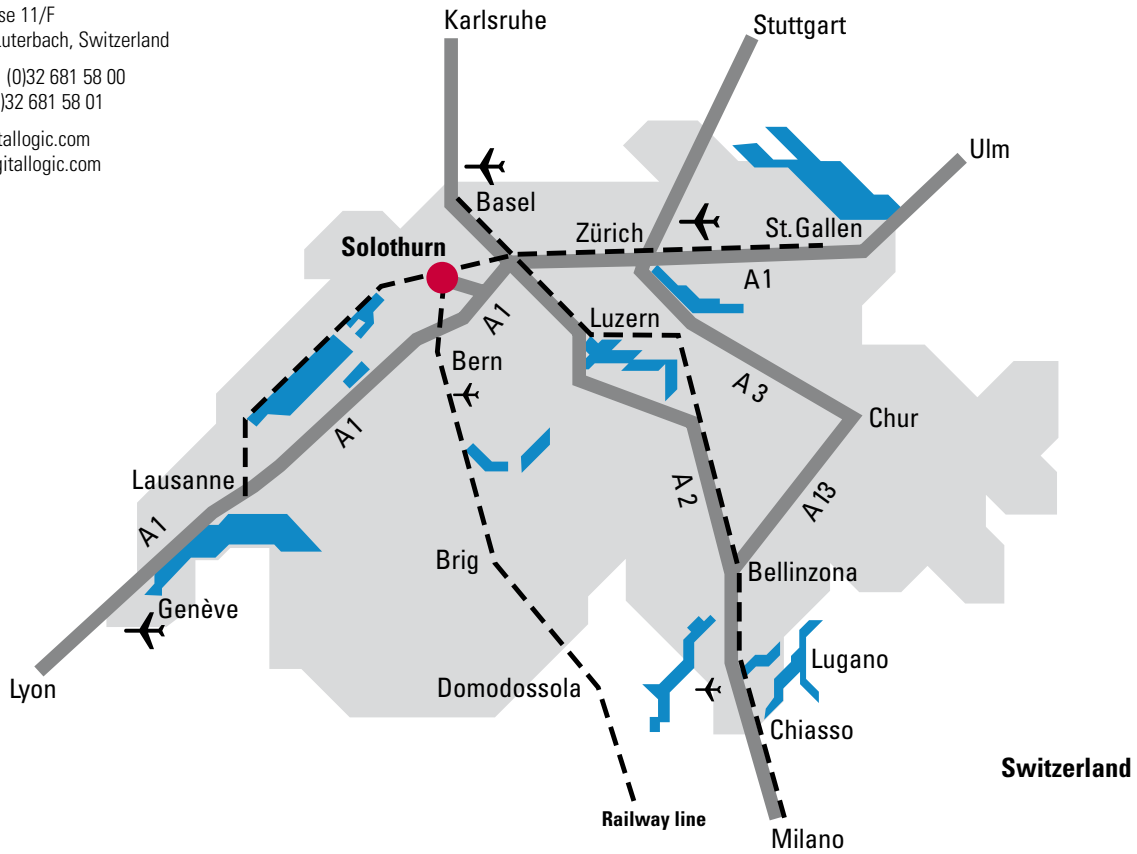8 pole (pin side)   VGA allocation   System = Socket (F)

Pole figure M12   Cable = Connector (M)

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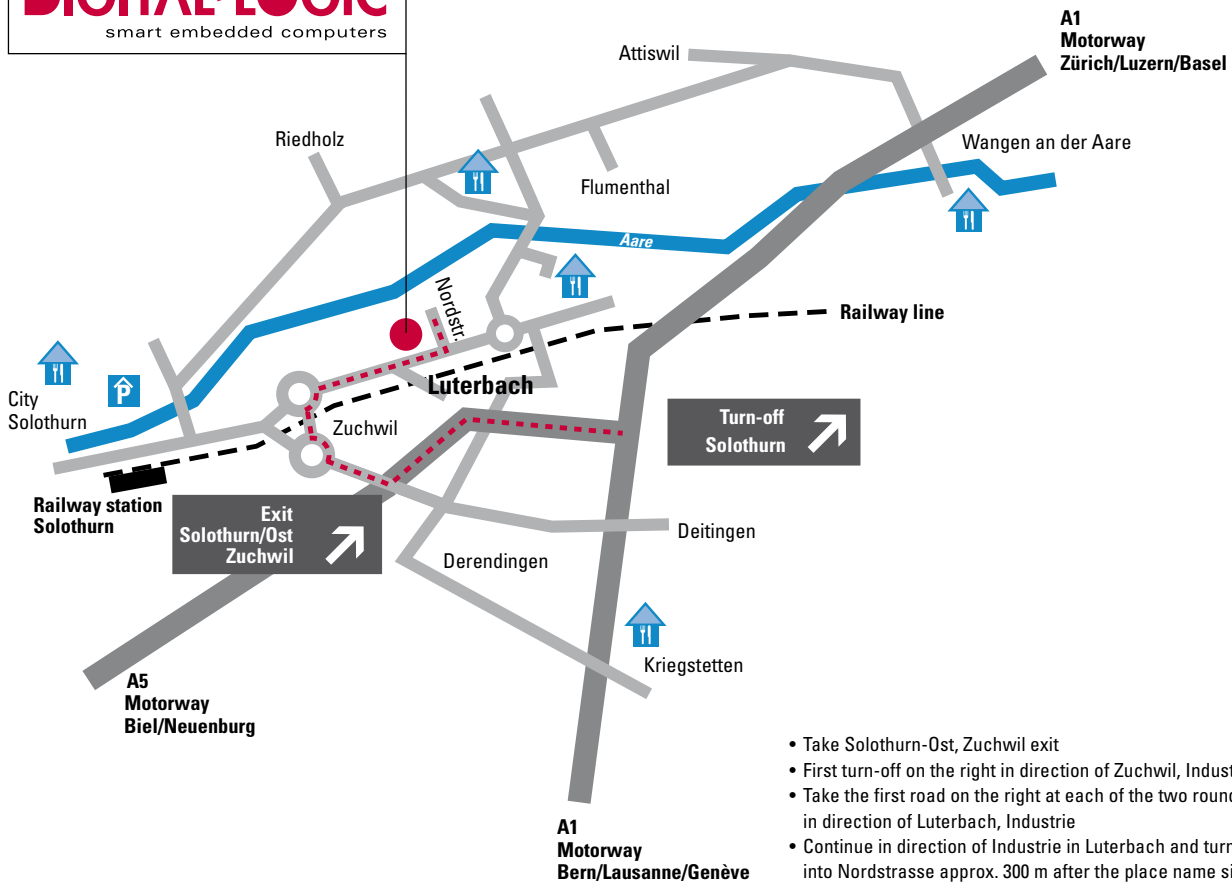Nordstrasse 11/F
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- Continue in direction of Industrie in Luterbach and turn left
  into Nordstrasse approx. 300 m after the place name sign

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