DIGITAL-LOGIC
smart embedded computers

CONDENSED USER MANUAL FOR:

MPCV800/I/M

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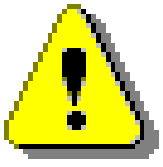
For internal use only:
File: MPCV800_Condensed_V0.5A.doc
Path: R:\HANDBUCH\MPCV\MPCV800\MPCV800_Condensed_V0.5A.doc

About this Manual and How to Use It

This manual is written for the original equipment manufacturer (OEM) who plans to build computer systems based on the single board MICROSPACE-PC. It is for integrators and programmers of systems based on the MICROSPACE-Computer family. This manual provides instructions for installing and configuring the board, and describes the system and setup requirements. This document contains information on hardware requirements, interconnections, and details of how to program the system. Please check the Product CD for further information and manuals.

REVISION HISTORY:

Document Version	Date/Initials:	Modification: Remarks, News, Attention:
V0.1	03.2006 KUF	Initial Version
V0.2	11.2006 DAR	Preliminary Version
V0.3	02.2007 DAR	Preliminary
V0.4	04.2007 KUF	Document Redesign
V0.5	05.2007 WAS/DAR	Revision History format change / Filename & Path moved
V0.5A	***01.2008 SEP/WAS***	***ACPI S3 (Suspend to RAM) not available / 1.12 & 1.13 added***



Attention!
1. All information in this manual, and the product, are subject to change without prior notice.
2. Read this manual prior to installation of the product.
3. Read the security information carefully prior to installation of the product.

Table of Contents

1. PREFACE

The information contained in this manual has been carefully checked and is believed to be accurate; it is subject to change without notice. Product advances mean that some specifications may have changed. DIGITAL-LOGIC AG assumes no responsibility for any inaccuracies, or the consequences thereof, that may appear in this manual. Furthermore, DIGITAL-LOGIC AG does not accept any liability arising from the use or application of any circuit or product described herein.

1.1. Trademarks

DIGITAL-LOGIC, DIGITAL-LOGIC-Logo, MICROSPACE, and smartModule are registered trademarks owned worldwide by DIGITAL-LOGIC AG, Luterbach (Switzerland). In addition, this document may include names, company logos, and registered trademarks which are, therefore, proprietary to their respective owners.

1.2. Disclaimer

DIGITAL-LOGIC AG makes no representations or warranties with respect to the contents of this manual, and specifically disclaims any implied warranty of merchantability or fitness, for any particular purpose. DIGITAL-LOGIC AG shall, under no circumstances, be liable for incidental or consequential damages or related expenses resulting from the use of this product, even if it has been notified of the possibility of such damage.

1.3. Environmental Protection Statement

This product has been manufactured to satisfy environmental protection requirements wherever possible. Many of the components used (structural parts, printed circuit boards, connectors, batteries, etc.) are capable of being recycled. Final disposal of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

1.4. Who should use this Product

- Electrical engineers with know-how in PC-technology.
- Because of the complexity and the variability of PC-technology, we cannot guarantee that the product will work in any particular situation or set-up. Our technical support will try to help you find a solution.
- Pay attention to electrostatic discharges; use a CMOS protected workplace.
- Power supply must be OFF when working on the board or connecting any cables or devices.

1.5. Recycling Information

All components within this product fulfill the requirements of the RoHS (Restriction of Hazardous Substances Directive). The product is soldered with a lead free process.

1.6. Technical Support

1. Contact your local DIGITAL-LOGIC Technical Support, in your country.
2. Use the Internet Support Request form at http://support.digitallogic.ch/ → embedded products → New Support Request

Support requests are only accepted with detailed information about the product (i.e., BIOS-, Board-version)!

1.7. Limited Two Year Warranty

DIGITAL-LOGIC AG guarantees the hardware and software products it manufactures and produces to be free from defects in materials and workmanship for two years following the date of shipment from DIGITAL-LOGIC AG, Switzerland. This warranty is limited to the original purchaser of the product and is not transferable.

During the two year warranty period, DIGITAL-LOGIC AG will repair or replace, at its discretion, any defective product or part at no additional charge, provided that the product is returned, shipping prepaid, to DIGITAL-LOGIC AG. All replaced parts and products become property of DIGITAL-LOGIC AG.

Before returning any product for repair, direct customers of DIGITAL-LOGIC AG, Switzerland are required to register a RMA (Return Material Authorization) number in the Support Center at http://support.digitallogic.ch/

All other customers must contact their local distributors for returning defective materials.

This limited warranty does not extend to any product which has been damaged as a result of accident, misuse, abuse (such as use of incorrect input voltages, wrong cabling, wrong polarity, improper or insufficient ventilation, failure to follow the operating instructions that are provided by DIGITAL-LOGIC AG or other contingencies beyond the control of DIGITAL-LOGIC AG), wrong connection, wrong information or as a result of service or modification by anyone other than DIGITAL-LOGIC AG. Nor if the user has insufficient knowledge of these technologies or has not consulted the product manuals or the technical support of DIGITAL-LOGIC AG and therefore the product has been damaged.

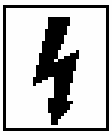
Empty batteries (external and onboard), as well as all other battery failures, are not covered by this manufacturer's limited warranty.

Except, as directly set forth above, no other warranties are expressed or implied, including, but not limited to, any implied warranty of merchantability and fitness for a particular purpose, and DIGITAL-LOGIC AG expressly disclaims all warranties not stated herein. Under no circumstances will DIGITAL-LOGIC AG be liable to the purchaser or any user for any damage, including any incidental or consequential damage, expenses, lost profits, lost savings, or other damages arising out of the use or inability to use the product.

1.8. Explanation of Symbols

CE Conformity
This symbol indicates that the product described in this manual is in compliance with all applied CE standards.

Caution, Electric Shock!
This symbol and title warn of hazards due to electrical shocks (> 60V) when touching products or parts of them. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your equipment.



Caution, Electric Shock!
This symbol and title warn of hazards due to electrical shocks (> 32V) when touching products or parts of them. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your equipment

Warning, ESD Sensitive Device!
This symbol and title inform that electronic boards and their components are sensitive to Electro Static Discharge (ESD). In order to ensure product integrity at all times, care must always be taken while handling and examining this product.

Attention!
This symbol and title emphasize points which, if not fully understood and taken into consideration by the reader, may endanger your health and/or result in damage to your equipment.

Note...
This symbol and title emphasize aspects the user should read through carefully for his, or her, own advantage.

Warning, Heat Sensitive Device!
This symbol indicates a heat sensitive component.

Safety Instructions
This symbol shows safety instructions for the operator to follow.

This symbol warns of general hazards from mechanical, electrical, and/or chemical failure. This may endanger your life/health and/or result in damage to your equipment.

1.9. Applicable Documents and Standards

The following publications are used in conjunction with this manual. When any of the referenced specifications are superseded by an approved revision, that revision shall apply. All documents may be obtained from their respective organizations.

- Advanced Configuration and Power Interface Specification Revision 2.0c, August 25, 2003 Copyright © 1996-2003 Compaq Computer Corporation, Intel Corporation, Microsoft Corporation, Phoenix Technologies Ltd., Toshiba Corporation. All rights reserved. http://www.acpi.info/
- ANSI/TIA/EIA-644-A-2001: Electrical Characteristics of Low Voltage Differential Signaling (LVDS) Interface Circuits, January 1, 2001. http://www.ansi.org/
- ANSI INCITS 361-2002: AT Attachment with Packet Interface - 6 (ATA/ATAPI-6), November 1, 2002. http://www.ansi.org/
- ANSI INCITS 376-2003: American National Standard for Information Technology – Serial Attached SCSI (SAS), October 30, 2003. http://www.ansi.org/
- Audio Codec '97 Revision 2.3 Revision 1.0, April 2002 Copyright © 2002 Intel Corporation. All rights reserved. http://www.intel.com/labs/media/audio/
- Display Data Channel Command Interface (DDC/CI) Standard (formerly DDC2Bi) Version 1, August 14, 1998 Copyright © 1998 Video Electronics Standards Association. All rights reserved. http://www.vesa.org/summary/sumddcci.htm
- ExpressCard Standard Release 1.0, December 2003 Copyright © 2003 PCMCIA. All rights reserved. http://www.expresscard.org/
- IEEE 802.3-2002, IEEE Standard for Information technology, Telecommunications and information exchange between systems–Local and metropolitan area networks–Specific requirements – Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications. http://www.ieee.org
- IEEE 802.3ae (Amendment to IEEE 802.3-2002), Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications, Amendment: Media Access Control (MAC) Parameters, Physical Layers, and Management Parameters for 10 GB/s Operation. http://www.ieee.org
- Intel Low Pin Count (LPC) Interface Specification Revision 1.1, August 2002 Copyright © 2002 Intel Corporation. All rights reserved. http://developer.intel.com/design/chipsets/industry/lpc.htm
- PCI Express Base Specification Revision 1.1, March 28, 2005, Copyright © 2002-2005 PCI Special Interest Group. All rights reserved. http://www.pcisig.com/
- PCI Express Card Electromechanical Specification Revision 1.1, March 28, 2005, Copyright © 2002-2005 PCI Special Interest Group. All rights reserved. http://www.pcisig.com/
- PCI Local Bus Specification Revision 2.3, March 29, 2002 Copyright © 1992, 1993, 1995, 1998, 2002 PCI Special Interest Group. All rights reserved. http://www.pcisig.com/
- PCI-104 Specification, Version V1.0, November 2003. All rights reserved. http://www.pc104.org
- PICMG® Policies and Procedures for Specification Development, Revision 2.0, September 14, 2004, PCI Industrial Computer Manufacturers Group (PICMG®), 401 Edgewater Place, Suite 500, Wakefield, MA 01880, USA, Tel: 781.224.1100, Fax: 781.224.1239. http://www.picmg.org/
- Serial ATA: High Speed Serialized AT Attachment Revision 1.0a January 7, 2003 Copyright © 2000-2003, APT Technologies, Inc, Dell Computer Corporation, Intel Corporation, Maxtor Corporation, Seagate Technology LLC. All rights reserved. http://www.sata-io.org/

- Smart Battery Data Specification Revision 1.1, December 11, 1998. www.sbs-forum.org
- System Management Bus (SMBus) Specification Version 2.0, August 3, 2000 Copyright © 1994, 1995, 1998, 2000 Duracell, Inc., Energizer Power Systems, Inc., Fujitsu, Ltd., Intel Corporation, Linear Technology Inc., Maxim Integrated Products, Mitsubishi Electric Semiconductor Company, Power-Smart, Inc., Toshiba Battery Co. Ltd., Unitrode Corporation, USAR Systems, Inc. All rights reserved. http://www.smbus.org/
- Universal Serial Bus Specification Revision 2.0, April 27, 2000 Copyright © 2000 Compaq Computer Corporation, Hewlett-Packard Company, Intel Corporation, Lucent Technologies Inc., Microsoft Corporation, NEC Corporation, Koninklijke Philips Electronics N.V. All rights reserved. http://www.usb.org/

1.10. For Your Safety

Your new DIGITAL-LOGIC product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long, fault-free life. However, this life expectancy can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and for the correct operation of your new DIGITAL-LOGIC product, please comply with the following guidelines.

Attention!
All work on this device must only be carried out by sufficiently skilled personnel.

Caution, Electric Shock!
Before installing your new DIGITAL-LOGIC product, always ensure that your mains power is switched off. This applies also to the installation of piggybacks or peripherals. Serious electrical shock hazards can exist during all installation, repair and maintenance operations with this product. Therefore, always unplug the power cable and any other cables which provide external voltage before performing work.

Warning, ESD Sensitive Device!
Electronic boards and their components are sensitive to static electricity. In order to ensure product integrity at all times, be careful during all handling and examinations of this product.

1.11. RoHS Commitment

DIGITAL-LOGIC AG is committed to develop and produce environmentally friendly products according to the Restriction of Hazardous Substances (RoHS) Directive (2002/95/EC) and the Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC) established by the European Union. The RoHS directive was adopted in February 2003 by the European Union and came into effect on July 1, 2006. It is not a law but a directive, which restricts the use of six hazardous materials in the manufacturing of various types of electronic and electrical equipment. It is closely linked with the Waste Electrical and Electronic Equipment Directive (WEEE) 2002/96/EC, which has set targets for collection, recycling and recovery of electrical goods and is part of a legislative initiative to solve the problem of huge amounts of toxic e-waste.

Each European Union member state is adopting its own enforcement and implementation policies using the directive as a guide. Therefore, there could be as many different versions of the law as there are states in the EU. Additionally, non-EU countries like China, Japan, or states in the U.S. such as California may have their own regulations for green products, which are similar, but not identical, to the RoHS directive.

RoHS is often referred to as the "lead-free" directive but it restricts the use of the following substances:

- Lead
- Mercury
- Cadmium
- Chromium VI
- PBB and PBDE

The maximum allowable concentration of any of the above mentioned substances is 0.1% (except for Cadmium, which is limited to 0.01%) by weight of homogeneous material. This means that the limits do not apply to the weight of the finished product, or even to a component but to any single substance that could (theoretically) be separated mechanically.

1.11.1. RoHS Compatible Product Design

All DIGITAL-LOGIC standard products comply with RoHS legislation.

Since July 1, 2006, there has been a strict adherence to the use of RoHS compliant electronic and mechanical components during the design-in phase of all DIGITAL-LOGIC standard products.

1.11.2. RoHS Compliant Production Process

DIGITAL-LOGIC selects external suppliers that are capable of producing RoHS compliant devices. These capabilities are verified by:

1. A confirmation from the supplier indicating that their production processes and resulting devices are RoHS compliant.
2. If there is any doubt of the RoHS compliancy, the concentration of the previously mentioned substances in a produced device will be measured. These measurements are carried out by an accredited laboratory.

1.11.3. WEEE Application

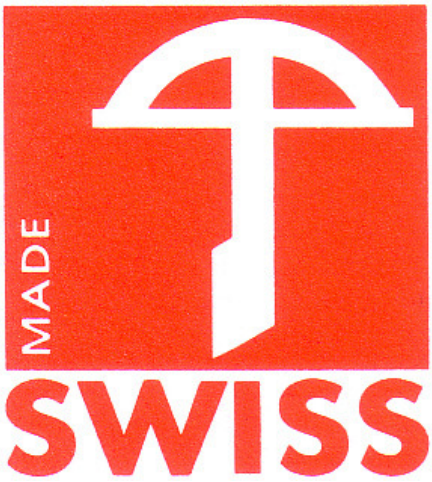
The WEEE directive is closely related to the RoHS directive and applies to the following devices:

- Large and small household appliances
- IT equipment
- Telecommunications equipment (although infrastructure equipment is exempt in some countries)
- Consumer equipment
- Lighting equipment – including light bulbs
- Electronic and electrical tools
- Toys, leisure and sports equipment
- Automatic dispensers

It does not apply to fixed industrial plants and tools. The compliance is the responsibility of the company that brings the product to market, as defined in the directive. Components and sub-assemblies are not subject to product compliance. In other words, since DIGITAL-LOGIC does not deliver ready-made products to end users the WEEE directive is not applicable for DIGITAL-LOGIC. Users are nevertheless encouraged to properly recycle all electronic products that have reached the end of their life cycle.

1.12. Swiss Quality

- 100% Made in Switzerland
- DIGITAL-LOGIC is a member of "Swiss-Label"
- This product was ***not*** manufactured by employees earning piecework wages
- This product was manufactured in humane work conditions
- All employees who worked on this product are paid customary Swiss market wages and are insured
- ISO 9000:2001 (quality management system)



1.13. The Swiss Association for Quality and Management Systems

The Swiss Association for Quality and Management Systems (SQS) provides certification and assessment services for all types of industries and services. SQS certificates are accepted worldwide thanks to accreditation by the Swiss Accreditation Service (SAS), active membership in the International Certification Network, IQNet, and co-operation contracts/agreements with accredited partners.

www.sqs.ch

The SQS Certificate ISO 9001:2000 has been issued to DIGITAL-LOGIC AG, the entire company, in the field of development, manufacturing and sales of embedded computer boards, embedded computer modules and computer systems. The certification is valid for three years at which time an audit is performed for recertification.

2. OVERVIEW

2.1. Packing List

Check the packing list after opening the box:

- MICROSPACE-PCV800-x
- Users Manual
- Produce CD with drivers and documentation

2.2. System Overview

The MICROSPACE-PCV800 is a miniaturized PC system incorporating the major elements of a PC/AT compatible computer. It includes standard PC/AT compatible elements, such as:

- AMD Geode LX800 with 500MHz Clock
- 0k L2-Cache
- DDR-RAM Memory 256-1024MByte (SODIMM200)
- Hard disk: 40GByte up to 80GB
- CompactFlash Type-II socket
- Direct-X compatible Video controller XVGA with up to 16MByte Video memory
- 2 channel video (CRT1 and LVDS)
- USB controller up to 4 channels
- COM1, COM2
- LAN 1GBase-T controller
- LAN 100/10Base-T controller
- 12/24Volt Supply Input
- Fanless Low Power system (option)

MPCV800M:
- DVI-Interface
- Audio Interface 5.1 and SPDif

MPCV800I:
- COM3 RS232, Option: RS485 / RS422
- COM4 RS232, Option: RS485 / RS422
- PS2 Keyboard and Mouse

Optional:
- Wireless Network integrated (option)
- 2 PC/104plus expansion boards

For more details, see the following subsection.

2.3. Differences between MPCV800, MPCV800I, MPCV800M

The product has different functions:

Option	MPCV800	MPCV800-I	MPCV800-M
DVI-Interface			yes
COM3		yes	
COM4		yes	
LPT1		yes	
Mouse Keyboard 1xPS/2		yes	
Mouse Keyboard 2xPS/2		yes	
Line Output 5.1			yes
Line Output AC3			yes
Line Input Stereo			yes

2.4. Assembly Options

The product has different assembly options.

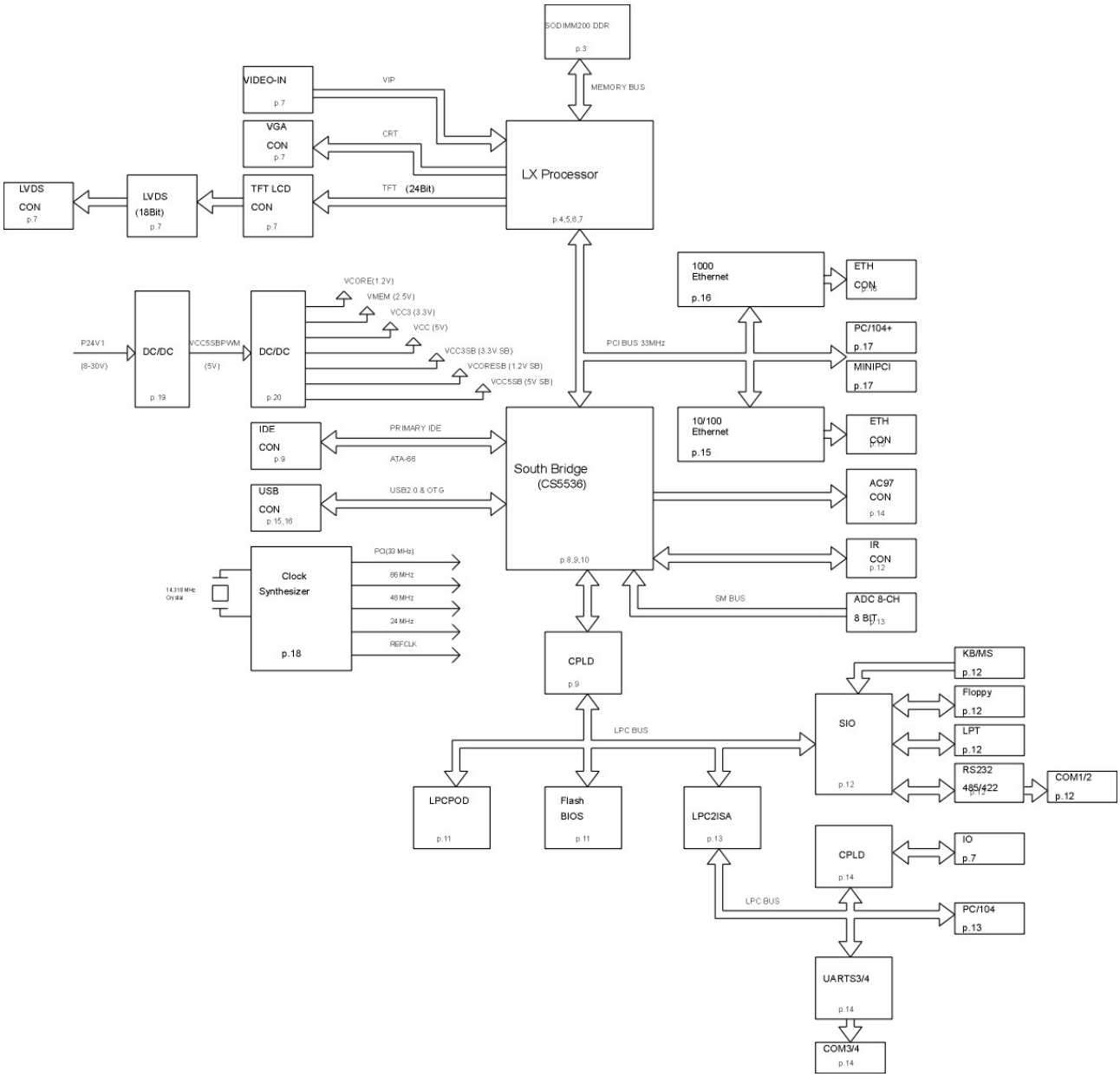
Ask the factory for detailed information about the currently available options and combination of options.

MPCV800:

Option:	Part.No.		Comments:
Hard disk drive 80GB	807365	U	Replace standard HDD 2.5” 40GB by 80GB
CompactFlash	807xxx	U	See price list
DDR-RAM 1024MB	807363	U	Replace DDR-RAM SODIMM Module 512MB by 1024MB
AC Adapter 90W	807385	D	Remove AC Adapter

U = Upgrade, D = Downgrade

2.5. Functional Block Diagram



2.6. Technical Specifications

CPU	Specification
MPCV800	AMD Geode LX800
Compatibility	80x86 CPU
Level 1 Cache	16k data and 16k code
Level 2 Cache	0kByte
Socket	direct soldered
Clock	500MHz
Performance	500MHz
FSB	100MHz
Power management	The LX800 supports ACPI and APM Version 1.2. The following ACPI Sleep States are supported: - S1 (Standby) - S3 (Suspend to RAM) not available - S4 (Hibernation)
FPU	Integrated

Chipset	Specification
Northbridge	AMD Geode LX800
Southbridge	AMD 5536
LAN 100Mbit	82C551 Intel
LAN 1Gbit	82C541 Intel
Audio	Integrated AC97
Firewire IEEE1394	-
Video	AMD Geode
Framegrabber/TV-Input	Digital-Video input 16bit VESA 2.0

Memory	Specification
Main Memory	DDR-SDRAM, 64bit, up to 1024MByte in DDR-SODIMM200 socket
Flash-BIOS	256kByte Flash
Setup EEPROM	2kByte for CMOS-backup in battery less applications
Flash-Video BIOS	Serial-Flash
Video RAM	16 MByte

Video controller	Specification
Controller	Geode internal video controller
Video memory	16-64Mbyte
Channel 1	CRT VGA up to 1600 x 1280 pixels
Channel 2	24bit Digital Interface
Bootup-Resolution	640x480/800 x 600/1024 x 768 selectable
2D-Grafic	Integrated accelerator
3D-Grafic	Integrated accelerator
Direct-X Version	
PnP	no PnP function in the Video-BIOS The DVI-Monitor cannot be hot-plug changed.

External Interface	Specification
Video interfaces	CRT1, DVI, LVDS
TV-Interfaces	none
USB V2.0	4 channels (front)
IEEE1394	none
LPT1	LPT1
COM1	RS232
COM2	RS232
COM3	RS232 or RS422/485
COM4	RS232 or RS422/485
Keyboard	PS/2
Mouse	PS/2
Audio	Stereo I/O

Power Supply	Specification
Input	Nominal 12/24VDC (range 10V to 28VDC)
Protection	Load dump resistant, wrong polarity resistant, EMI filtered
Compliancy	MIL-STD-1275 compliant

Power Consumption	Specification
At 12V	Typical 1.5Amp. at 12Volt
Standby	Typical 100mA at 12Volt
Power-off	Typical 2mA at 12Volt

Physical Characteristics	Specification
Dimensions	Length: 292mm Depth: 145mm Height: 81mm
Weight	3kg

Operating Environment	Specification
Relative Humidity	5-90% non-condensing IEC68-2-30 at +5 to +50°C operating
Vibration operating	IEC68-2-6 10-50Hz, 0.075mm and 55-500Hz, 1.0G
Vibration non-operating	IEC68-2-6 10-50Hz, 0.15mm and 55-500Hz, 2.0G
Shock operating	IEC68-2-27 10G, 11ms ½ sine
Shock non-operating	IEC68-2-27 50G, 11ms, ½ sine
Altitude	IEC68-2-13 4571meter operating
Temperature operating	IEC68-2-1,2,14: +5°C to +60°C (0.5GHz)
Temperature storage	IEC68-2-1,2,14: -40°C to +70°C

EMI / EMC Tests	Specification
EMC emission EN61000-6-2:2001	
Conducted disturbance	EN55022 Class B
Radiated disturbance	EN55022 Class B
EMC immunity EN61000-6-2	
Electrostatic discharge (ESD)	EN61000-4-2 Voltage = 4kV contact / 8kV air Criteria A
Radiated RF-Field	EN61000-4-3 Level = 10V/m Criteria A
Electrical fast transients (Burst)	EN61000-4-4 Grade 2: DC-Power lines = 1000V (5/50ns) Grade 2: AC-Power lines = 2000V (5/50ns) Grade 2: Signal lines = 500V (5/50ns) Criteria B
Surge	EN61000-4-5 Grade 2: DC-Power lines = 1kV, (1.2/50us) Grade 2: AC-Power lines = 2kV, (1.2/50us) Criteria B
Conducted disturbance	EN61000-4-6 Voltage = 10V coupled by case Criteria A

Security	Specification
e1	Not planned
UL	Not planned
ETL 301	Not planned
SEV	
Safety	AR385-16

2.7. EC – Declaration of Conformity MPC21

DIGITAL-LOGIC
smart embedded computers

CE – Konformitätserklärung
CE-Declaration of Conformity

Dokument Nr.: 016/07 — Monat, Jahr: 01/2007
Document No. — *Month, Year:*

Hersteller: DIGITAL-LOGIC AG
Manufacturer

Anschrift: Nordstrasse 11/F
Address CH-4542 Luterbach, Switzerland

Produktbezeichnung: MPCV800M
Name of product, type or model

Dieses Produkt erfüllt die Anforderungen der folgenden Europäischen Richtlinien:
The product complies with the requirements of the following European directives:

73/23/EEC Amended by directive 93/68/ECC

EN 60950-1: 2006

89/336/EEC Amended by directive 91/263/EEC, 92/31/EEC and 93/68/EEC

EN 55022: 1998 + A2: 2003 class B
EN 61000-4-2: 1995 + A2: 2001
EN 61000-4-3: 2006
EN 61000-4-4: 2004
EN 61000-4-5: 1995 + A1: 2001
EN 61000-4-6: 1996 + A1: 2001
EN 61000-4-11: 2004

Aussteller: Leiter Qualitätsmanagement
Issuer *Director Quality Management*

Ort, Datum: CH-Luterbach, 18.01.07
Place, date

Konformitätsbeauftragter der DIGITAL-LOGIC AG
Representative for conformity

Felix Kunz (CEO & Leiter Qualitätsmanagement)
(CEO & Director Quality Management)

3. SAFETY REGULATIONS

Safety verifications follow the guidelines adapted from the US Army Communication and Electronics Command Supplement (1992 version) 1 to AR385-16.

3.1. Safety: Power-On Indicator

The green power indicator is located in the front of the computer system. [MIL-STD-1472D]

3.2. Safety: Coded and Marked Connectors

All connectors (plugs and receptacles) are coded and marked to prevent insertion of the wrong plug into a receptacle or other mating unit [MIL-STD-1472D]. Depending on the mounted replicator unit, the connectors are PC-Style, DSUB or MIL versions. The male connectors are de-energized when disconnected. [MIL-STD-454M]

3.3. Protection of the Supply Input Current

Note…
The computer system protects the internal supply from overcurrent by an external fuse of 6.3amp. In case of an overcurrent the fuse opens the main circuit and interrupts the fault current. [MIL-STD-454M]

3.4. Safety: Wrong Polarization on the Power Input

Attention!
The supply input is protected against wrong polarization with a serial diode. This diode withstands current up to 28Volts.

3.5. Safety: Protection of the Output Currents

The computer system limits the current of all peripheral supply outputs by using fuses or with electronic current limiters. The following table shows the maximum available currents at each peripheral connector:

Connector	Nominal Maximum Current	Maximum Current
USB	0.5 Amp. @ 5V	1 Amp with resistor limiter
KB/MS	0.1 Amp. @ 5V	0.2 Amp with polyfuse
VGA	0.1 Amp. @ 5V	0.2 Amp with polyfuse
Firewire	0.5 Amp. @ 12V	2 Amp with electronic limiter

3.6. Safety: Load Dump Protection in 12V/24V systems

Currently there are two types of TVS devices integrated into the computer system, for the 12/24V automotive systems, to protect against load dump: silicon-based single junction Zener diodes and zinc oxide based metal oxide varistors (MOV). Even though Zener diodes and MOVs operate on different physical mechanisms, they both offer a typical 28V clamp voltage for the 12/24V systems.

Input Varistor: B72220S300K (Infineon) Vbreak=30V

3.7. Ground Potential

All interface connectors are permanently in contact with the ground (earth). The system must be grounded with a ground wire (colors green with yellow stripes). [NFPA 7087]

The ground must have the capacity to safely conduct any current that might be imposed thereon. The ground is wired separately from the electrical ground.

The leakage current is: 5 uA at 28 V.

The ground cable must be connected separately to the chassis or through the power connector.

Pin	Left	Middle	Right
Signal	Power 10-30V	Shield	GND

3.8. Safety: Power On/Off Switch

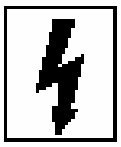
The power switch is clearly identified and located on the front panel. [MIL-STD-545M]

The power on/off switch does not cut all electricity to the system. In the “off” position, a microcontroller is still working, to supervise wakeup events (switch, remote-on, Wake on LAN, wake on events). [MIL STD 454M] In this state, the system is consuming approximately 10mW.

The power switch is protected from contact causing an accidental on/off: the power switch must be pressed over a defined period of 1-3 seconds.

To open the system, the replicator unit must be removed therefore cutting external power to the system. Be careful because the internal battery is still connected and providing power.

3.9. Safety: Batteries Inside the Device



Caution, Electric Shock!
The system has one integrated backup lithium battery (RTC). The battery compartment is not vented. The system casing prevents the operator from a possible exploding battery cell.

3.10. Protection against Over-Heating

The computer system integrates temperature-sensitive components such as:

- A Hard disk (max. 55°C)
- The CPU with a max. junction temperature of 105°C

In the BIOS, the temperature level of the thermal protection of the CPU may be defined and enabled. If so, the system will reduce the CPU-Clock automatically should the temperature rise above the defined limit.

Do not cover the device with paper, textiles or other objects. The minimum space between the housing and the next object is 50mm on each side. Make sure to allow enough airflow to the computer system when the device is assembled.

Protect the computer system from solar radiation or other thermal energy exposure.

Never place the functioning computer system in a closed case or box; or the inside air will heat above the maximum temperature and the system will be destroyed.

Keep the surface of the computer system free of dust, oil and other isolating materials, to prevent a reduction of the cooling efficiency.

3.11. Mechanical Safety: Safe Assembly and Mounting

The computer system must be fixed with a minimum of 4 screws using the mounting brackets. It is very dangerous to place the device on the seat of a vehicle (car, truck, train, boat), while driving. In case of an accident, the device may hit a passenger or window.

Never drill new mounting holes into the chassis of the computer system because the internal electronics or hard disk may be damaged. Use only the mounting holes for assembly.

3.12. Environmental Safety: At 25°C No "Hot" Surfaces

Note…
When the system runs at +25°C ambient temperature, no surfaces or other operating elements will have temperatures above +60°C. [MIL-STD-454M]

3.13. Environmental Safety: No Release of Toxins

Note…
As long as the computer system is used in the specified operating temperature range, no toxic, corrosive, or explosive fumes or vapors are exposed. [MIL-STD-454M]

3.14. Environmental Safety: Laser Devices

Note…
No assembled CD/DVD-Drive included.

3.15. Environmental Safety: Noise Emission

Note…
This computer system is a low noise system; the level is less than 15 dbA.

3.16. Environmental Safety: Hazardous Environs

The computer system must not be used in a hazardous area because there is nothing to prevent spontaneous combustion. Never use the system in explosive gas or vapor, flammable dusts or ignitable fibers and filings.

3.17. Environmental Safety: Humidity and Water Spray

The computer system is not protected from splashing water.

The protection is IP40.

3.18. Safety: Independent Software

Note…
The system is divided into 3 different software parts, each running on its own microcontroller or CPU. All 3 systems communicate over the SM-Bus (System Management Bus).

1. Power management CPU and software are always running, even when the system's power is off.
2. Batter charger controller is always running.
3. Pentium-CPU main processor is controlled from the power management CPU.

3.19. Safety: Recycling the Computer System

Disposal:
Never dispose of old batteries or the entire computer system as domestic waste. Return it to the manufacturer for proper disposal.

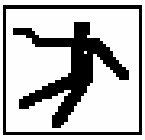
3.20. Safety: Static Electricity

Warning, ESD Sensitive Device!

Excessive static electricity can damage the system. Before you handle the chassis or its components, use the grounding wrist strap provided with the system to discharge static electricity. Instructions for using the wrist strap are printed on the strap's envelope.

Handle the components by the grips or the front panel to help prevent accidental damage caused by static discharge.

3.21. Safety: Operator Security



Safety Instructions

It is important to protect yourself and your equipment before you perform any of the procedures outlined in this, or the extended, manual.

Before handling the equipment or when making changes to the configuration, power-off the system and disconnect all power cords from their source.

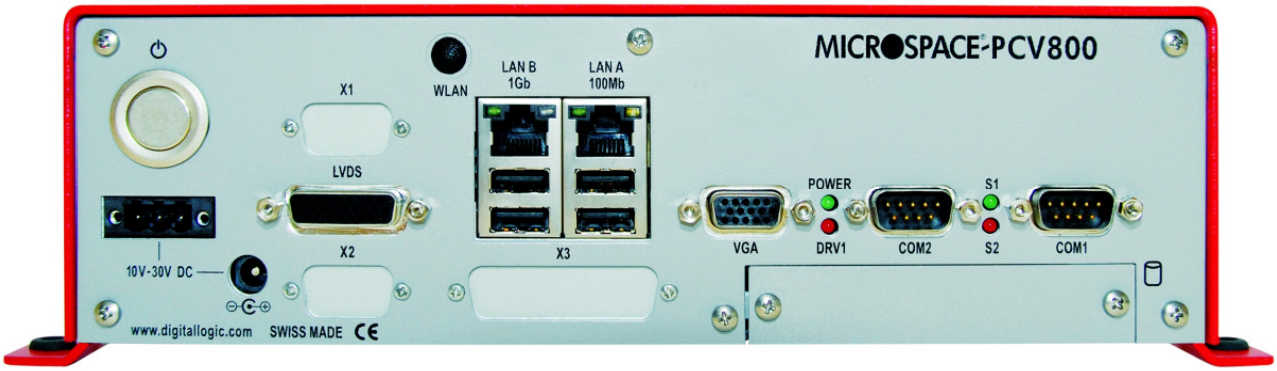
Use a grounding wrist strap or other static-dissipating device to prevent accidental damage caused by static discharge.

Only qualified, experienced electronics service personnel should access and handle the equipment.

4. FUNCTIONS

4.1. Connectors

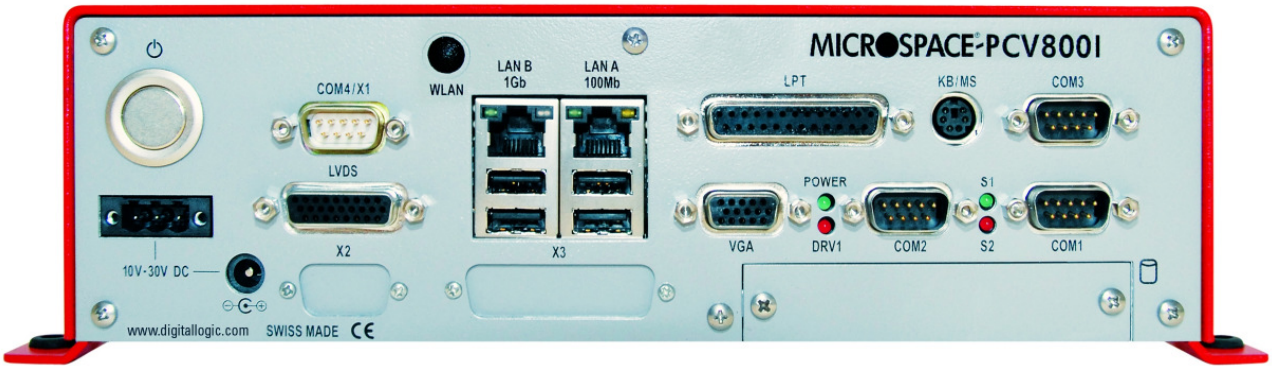
4.1.1. MPCV800



Connectors:

LAN-Port A:	100MB / with activity / link – LED for Port A
LAN-Port B:	1GB / with activity / link – LED for Port B
VGA:	Analog VGA channel 1
LVDS:	LVDS
WLAN:	Antenna for WLAN (only if ordered as an Option)
USB:	4 x USB 2.0 connectors
COM1:	Serial Interface RS232
COM2:	Serial Interface RS232
DC-Input:	Power supply input with remote on/off

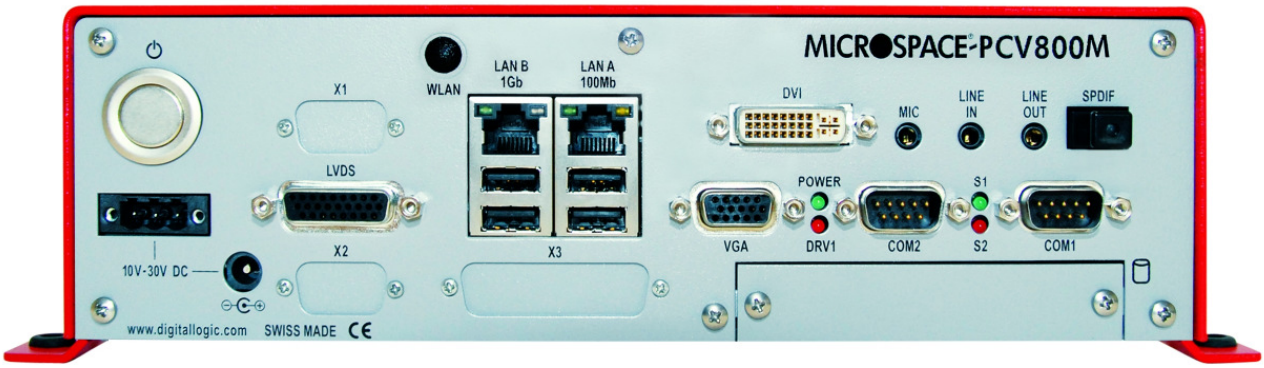
4.1.2. MPCV800I



Connectors:

KB/MS:	Keyboard (directly connected) or Keyboard/Mouse with a Y-cable
LAN-Port A:	100MB / with activity / link – LED for Port A
LAN-Port B:	1GB / with activity / link – LED for Port B
VGA:	Analog VGA channel 1
LVDS:	LVDS
WLAN:	Antenna for WLAN (only if ordered as an Option)
USB:	4 x USB 2.0 connectors
COM1:	Serial Interface RS232
COM2:	Serial Interface RS232
COM3:	Serial Interface RS232 / RS485 (depending what is ordered)
COM4:	Serial Interface RS232/ RS485 (depending what is ordered)
LPT1:	Line Printer Interface
DC-Input:	Power supply input with remote on/off

4.1.3. MPCV800M



Connectors:

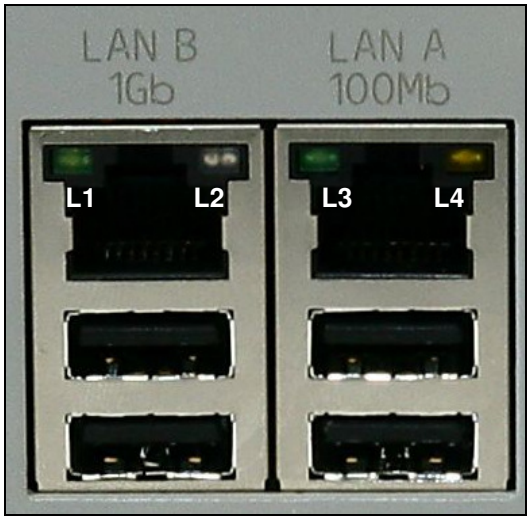
LAN-Port A:	100MB / with activity / link – LED for Port A
LAN-Port B:	1GB / with activity / link – LED for Port B
VGA:	Analog VGA channel 1
LVDS:	LVDS
DVI:	DVI-I
WLAN:	Antenna for WLAN (only if ordered as an Option)
USB:	4 x USB 2.0 connectors
COM1:	Serial Interface RS232
COM2:	Serial Interface RS232
Sound:	Audio Line Out
Sound:	Audio Line IN
Sound:	Audio MIC IN
Sound:	SPDIF
DC-Input:	Power supply input with remote on/off

4.1.4. Operating Elements on the Front

ON / OFF Switch

4.1.5. Indicator LED's on the Front

Name	Indicates
Power	Power ON of the device
DRV1	Primary Master IDE device
Temp	
DRV2	Secondary device not available.
L1 (Green)	LAN Activity
L2 (Green)	LAN Link
L3 (Green)	LAN Activity
L4 (Yellow)	LAN Link



4.2. Power Supply

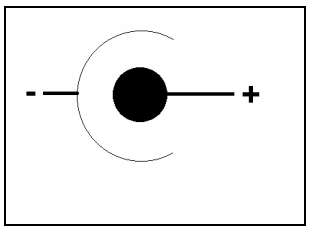
4.2.1. Power Supply Connector

BLZ 5.08/3F SN SW (Part number: 1803050000) available from www.weidmueller.com

Signal definition:

+ Power	10-28V power supply
GND	0V or ground of the power supply
Shield	Earth of the MPCV

Pin	Left	Middle	Right
Signal	Power 10-30V	Shield	GND



4.3. DC-Power Input Specifications

4.3.1. Nominal DC-Power Input Voltage

The nominal DC-power input is within the 10Volt to 28Volt range. This means the device may be used with 12V or 24V batteries, usually found in boats, cars and trucks.

The DC-input is protected from overcurrent using an internal fuse.

To prevent high voltage spikes, different voltage suppressor diodes are integrated. Short spikes up to 100V may be limited to 28V, in order to protect the internal electronic components.

4.3.2. Minimal DC-Power Input Voltage Specifications

The MPCV runs with a minimal power of 7.2V, measured at the input of the rear connector. If installed in a vehicle that is starting its motor, the power supply voltage may drop for a moment under 8V.

The following limits are specified:

DC-Input Voltage	Duration	Comment
Over 30V	Protection circuit will work	
28V	Highest static input voltage	
12/24V	Always: nominal operating	
10Volt	Lowest static voltage	
8Volt	30sec limit	***The current is too high!***
7.2Volt	5sec limit	The high current will probably saturate the filters.
6.5Volt	10ms limit	Determined by the input capacitor energy at a given load.

4.4. Hard Disk 2.5” - Standard Type

The internal hard disk is mounted onto a caddy

Technical Specifications (without the shock absorbers):	
Capacity	20-80GByte
Manufacturer	IBM Travelstar Model: IC25N020ATCS04 (20GB) IBM Travelstar Model: IC25N040ATCS04 (40GB) IBM Travelstar Model: IC25N060ATCS04 (60GB)
Sector size	512Byte
Data heads	16
Disks	2 or 4
Rotation speed	4200 RPM
Latency	7ms
Operating temperature	+5°C to +55°C
Relative humidity	8% to 90%
Power-on hours	333h / month
Max. read/write duty cycles	20%
Vibration operating	0.67G (5-500Hz) random
Vibration non-operating	3G (5-500Hz)
Shock non-operating	800G / 1ms

4.5. Serial and Parallel Interfaces on the MPV800-I

4.5.1. Serial Interface

The serial channels are fully compatible with 16C550 UARTS. COM1 is the primary serial port, and is supported by the board's ROM-BIOS as the PC-DOS “COM1” device. The secondary serial port is COM2 and is supported as the “COM2” device.

Standard: COM 1/2: 16C550: 2 x 16C550 with 16Byte FIFO

The serial ports are interfaced with a RS232C transmitter/receiver. As an option, the RS232C may be replaced with a RS422 or RS485 transmitter.

4.5.2. Parallel Port Interface

A standard bi-directional LPT port is integrated into the MICROSPACE PC, with DMA7 support. Further information about these signals is available in numerous publications, including the IBM technical reference manuals for the PC and AT computers and from other reference documents.

The current is: IOH = 12mA IOL = 24mA

4.6. VGA, LCD

4.6.1. VGA / LCD Controller of the Geode LX800

- Highly integrated Flat Panel and CRT GUI Accelerator & Multimedia Engine, Palette/DAC, Clock Synthesizer, and integrated frame buffer
- HiQColor™ Technology implemented with TMED (Temporal Modulated Energy Distribution)
- Hardware Windows Acceleration
- Hardware Multimedia Support
- High-Performance Flat Panel Display resolution and color depth at 3.3V
- 18/24Bit direct interface to color TFT panels (X1)
- Advanced Power Management features minimize power usage in:
  - Normal operation
  - Standby (Sleep) modes
  - Panel-Off Power-Saving Mode
- VESA Standards supported
- Fully Compatible with IBM® VGA
- Driver Support for Windows XP, Windows 2000, Windows 98, Windows NT4.0

4.6.2. Graphic Modes

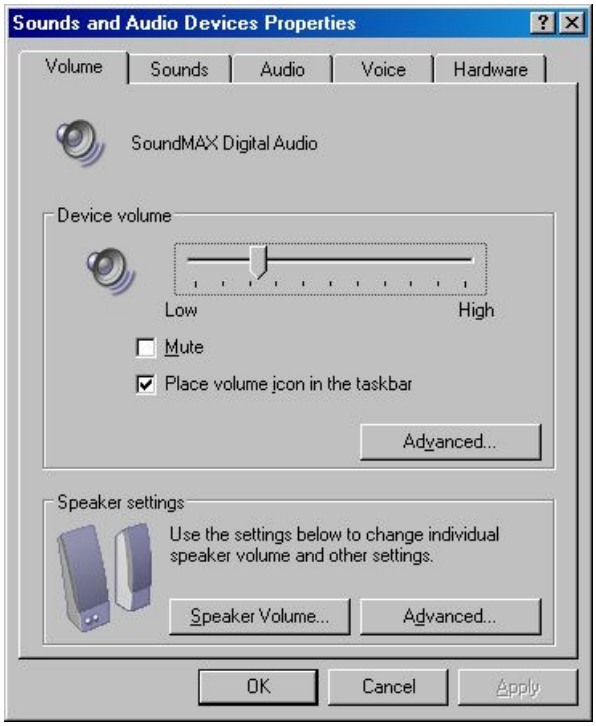
BIOS settings: 16MByte Video Memory (shared)

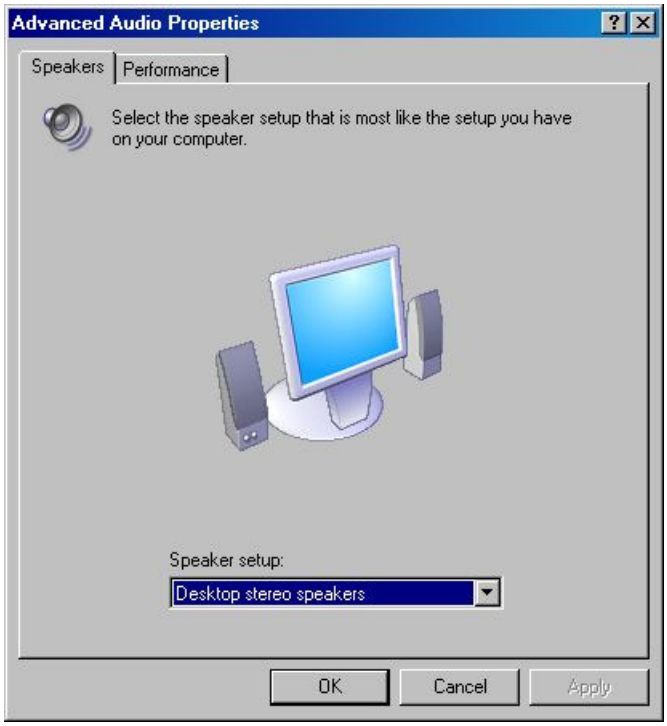
Resolution	Col. Dept.	Frequency
800x600	16Bit/32Bit	60Hz - 100Hz
1024x768	16Bit/32Bit	60Hz - 100Hz
1152x864	16Bit/32Bit	60Hz - 100Hz
1280x1024	16Bit/32Bit	60Hz - 100Hz
1600x1200	16Bit/32Bit	60Hz

➔ TFT 1600x1200, 60Hz, 32Bit

4.7. AC97 Sound 5.1

Sound Settings:

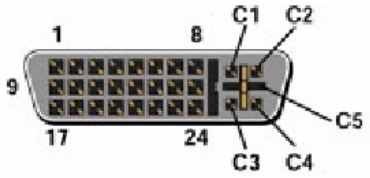




4.8. LCD PanelLink™ (DVI) on the MPCV800M

4.8.1. DVI-Integrated (DVI-I):

The system supports both analog and digital connections to the display. This 29 Pin connector can carry single, or dual-link, all-digital video/data signals on 24 Pins and uses 5 Pins to carry analog video/data signals and ground. It is easily distinguishable by the plus-shaped slot surrounded by four pins used to carry the analog connection.



DVI-I
Receptacle Connector

COMBINED ANALOG AND DIGITAL CONNECTOR PIN ASSIGNMENTS					
Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. Data2-	9	T.M.D.S. Data1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data2+	10	T.M.D.S. Data1+	18	T.M.D.S. Data0+
3	T.M.D.S. Data2/4 Shield	11	T.M.D.S. Data1/3 Shield	19	T.M.D.S. Data0/5 Shield
4	T.M.D.S. Data4-	12	T.M.D.S. Data3-	20	T.M.D.S. Data5-
5	T.M.D.S. Data4+	13	T.M.D.S. Data3+	21	T.M.D.S. Data5+
6	DDC Clock	14	+5V Power	22	T.M.D.S. Clock Shield
7	DDC Data	15	Ground (return for +5V, Hsync, and Vsync)	23	T.M.D.S. Clock+
8	Analog Vertical Sync	16	Hot Plug Detect	24	T.M.D.S. Clock-
C1	Analog Red	C2	Analog Green	C3	Analog Blue
C4	Analog Horizontal Sync	C5	Analog Ground (analog R,G, &B return)		

4.9. WLAN Option

A MiniPCI wireless LAN module can be installed. Option MPC2x WLAN MiniPCI consists of Intel's PRO/Wireless 2915ABG Network Connection MiniPCI card and a HF connector cable.

Intel PRO/Wireless 2915ABG Network Connection MiniPCI card specifications:

Form Factor Mini PCI Type 3A
Dimensions: Width 2.85 in x Length 1.75 in x Height 0.20 in (59.75 mm x 50.95 mm x 5 mm)
Weight: 0.7 oz. (12.90 g.)
Antenna Interface Connector: Hirose U.FL-R-SMT mates with cable connector U.FL-LP-066
Dual Diversity Antenna: On-board dual diversity switching
Connector Interface: 124-pin SO-DIMM edge connector
Voltage: 3.3 Volt
Operating Temperature: 0 to +70 degrees Celsius
Humidity: 50 to 85% non-condensing

Frequency Modulation: 5 GHz (802.11a) 2.4 GHz (802.11b/g)

Frequency Band: 5.15 - 5.85 GHz, 2.400 - 2.472 GHz (dependent on country)
Modulation: BPSK, QPSK, 16 QAM, 64 QAM CCK, DQPSK, DBPSK
Wireless Medium: 5 GHz UNII: Orthogonal Frequency Division Multiplexing (OFDM)
2.4 GHz ISM: Orthogonal Frequency Division Multiplexing (OFDM)
Channels: 4 to 12 non-overlapping, dependent on country
Channel 1-11 (US only); Channel 1-13 (Japan & Europe)
Data Rates: 54, 48, 36, 24, 18, 12, 9, 6 Mbps / 11, 5.5, 2, 1 Mbps

General

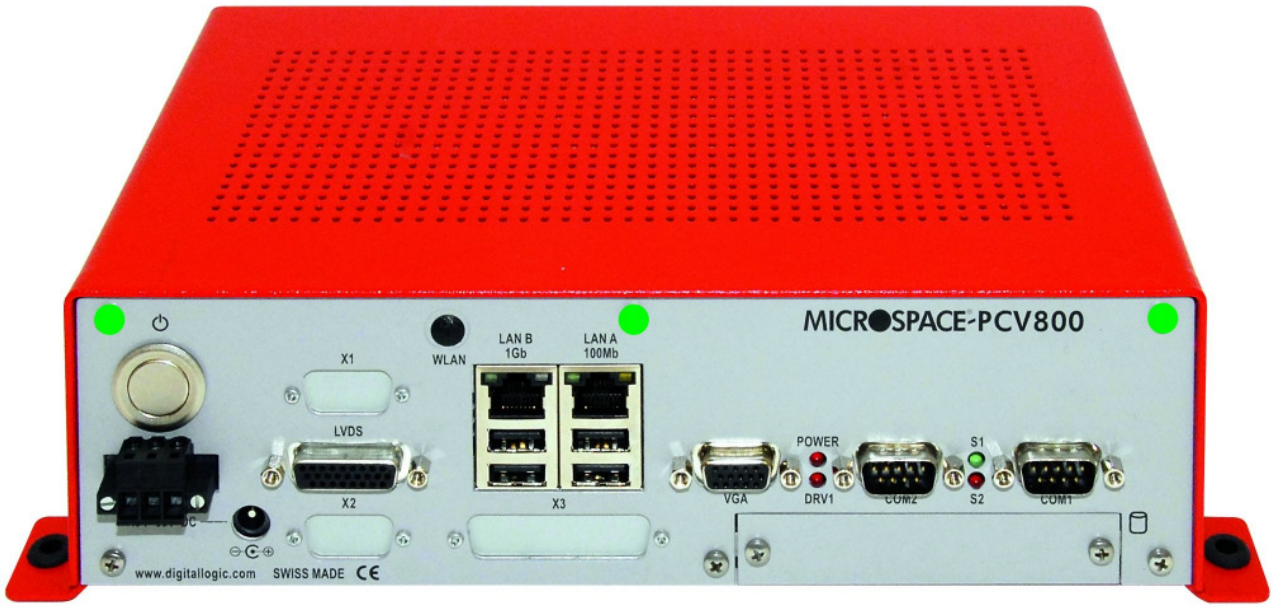
Operating Systems: Microsoft Windows XP, Microsoft Windows 2000
Wi-Fi® Alliance Certification for 802.11b, 802.11g, 802.11a, WPA, WPA2, WMM, EAP-SIM, LEAP, PEAP, TKIP, EAP-FAST, EAP-TLS, EAP-TTLS, MD5
Cisco Compatible Extensions Certification v3.0
WLAN Standard IEEE 802.11g, 802.11b, 802.11a
Product Safety: UL, C-UL, CB (IEC 60590)

5. HARDWARE INSTALLATION

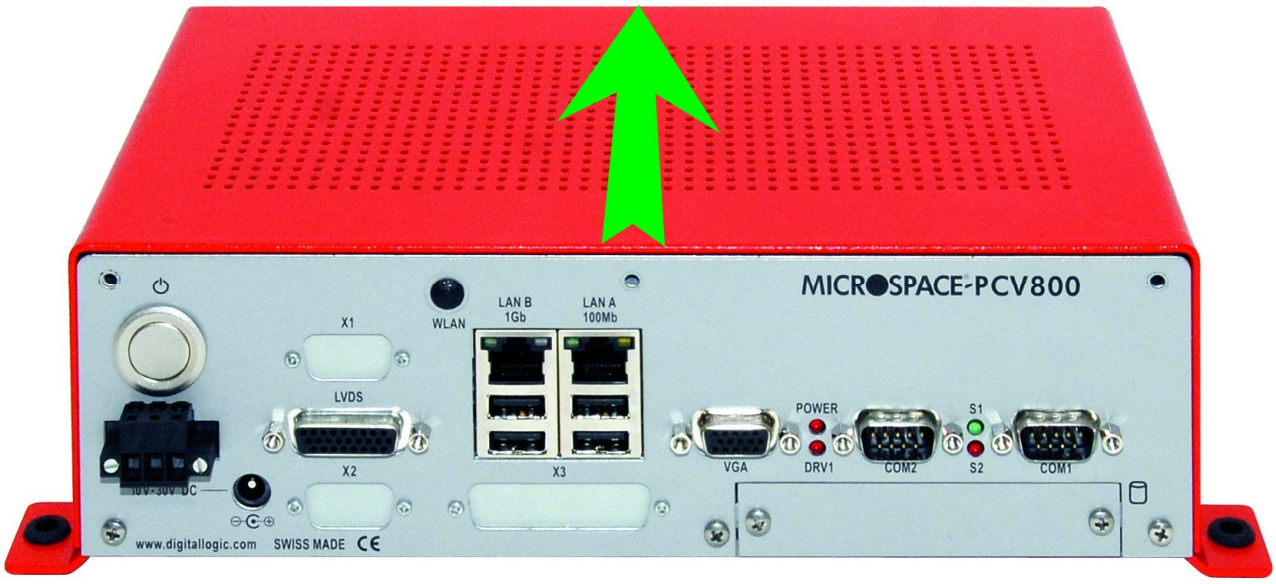
5.1. Install additional PC/104 and/or PC/104+ cards

To add one or two PC/104 / PC/104+ cards, open the device as described here:

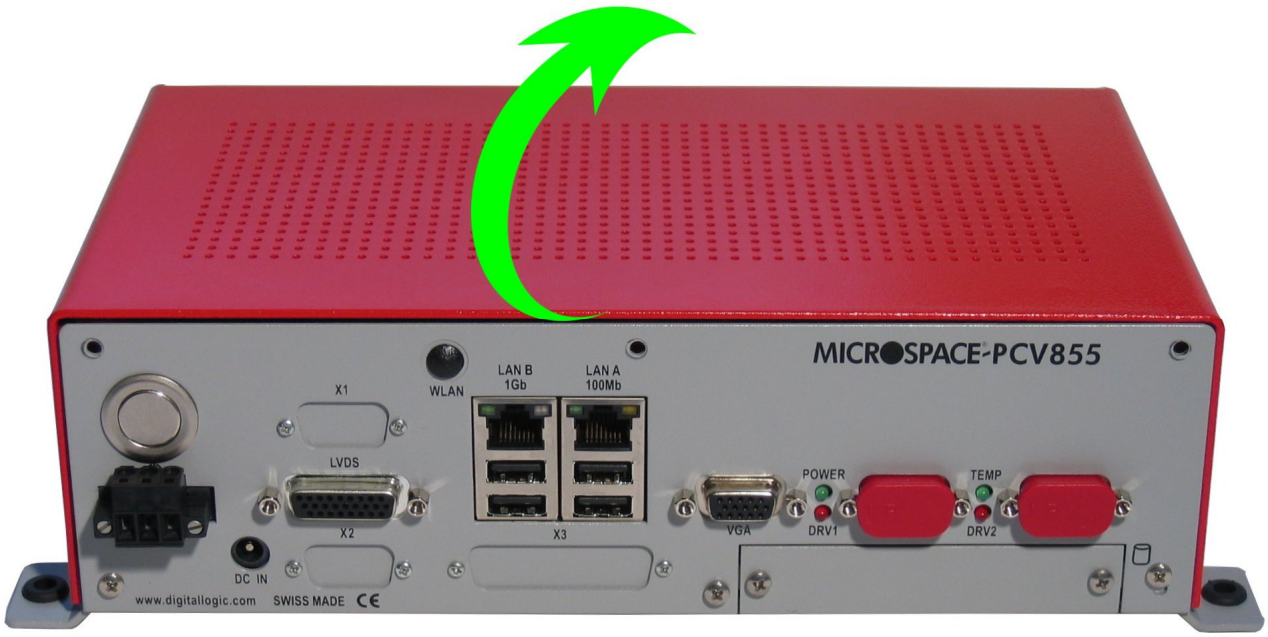
1. Open the case by removing the 3 recessed-head screws on the front (marked here in green) and the screw on the rear (not marked):



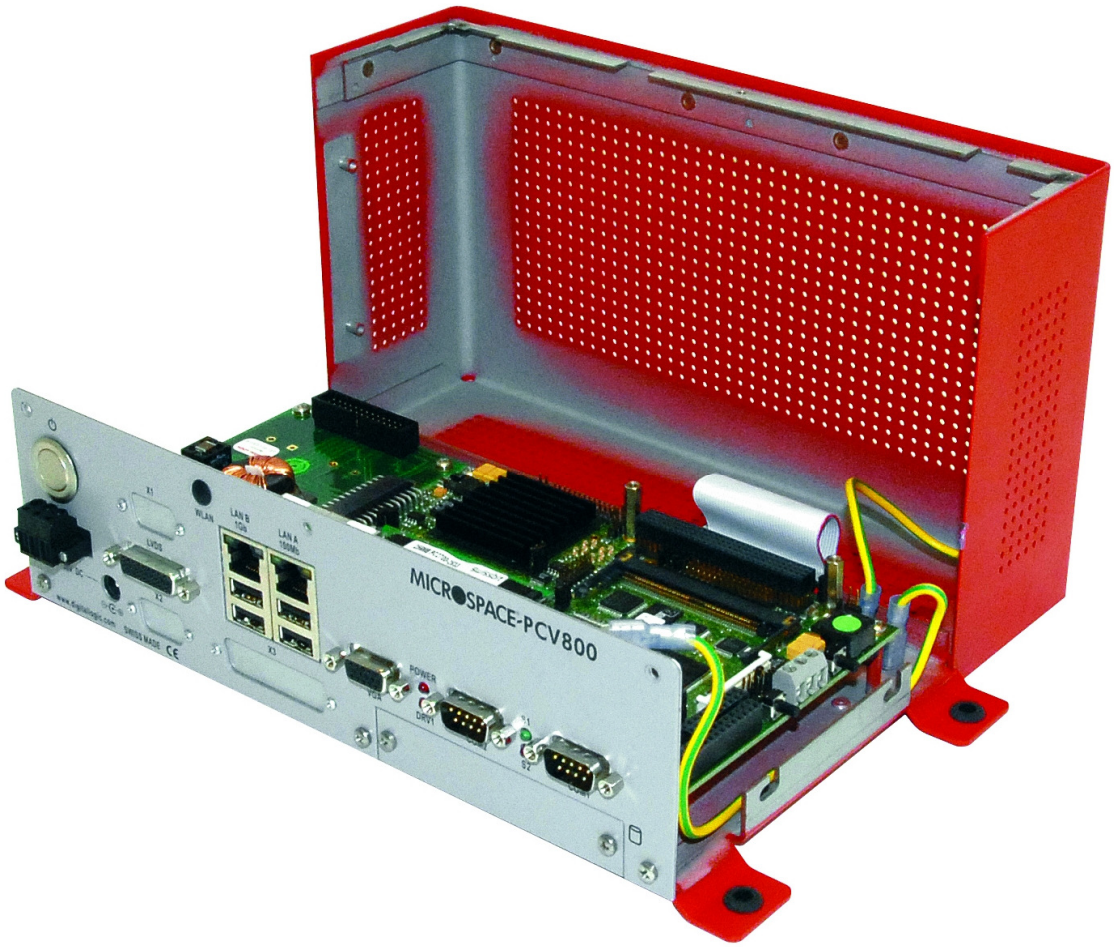
2. Push the case in the direction of the green arrow (toward the back):



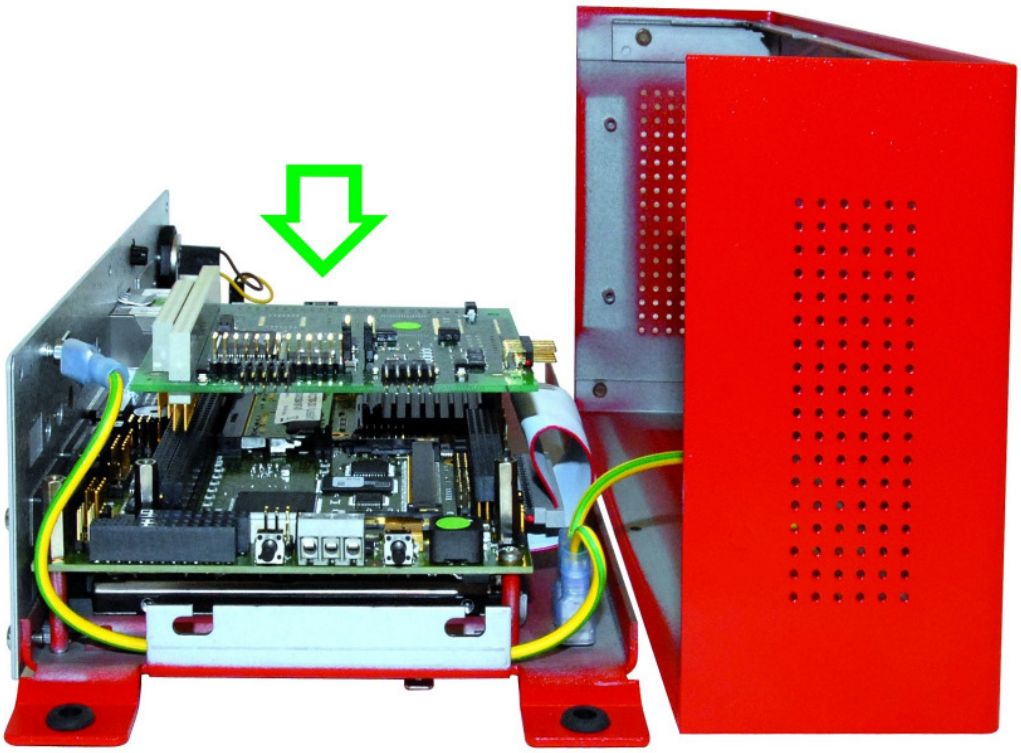
3. Lift the case to open the device



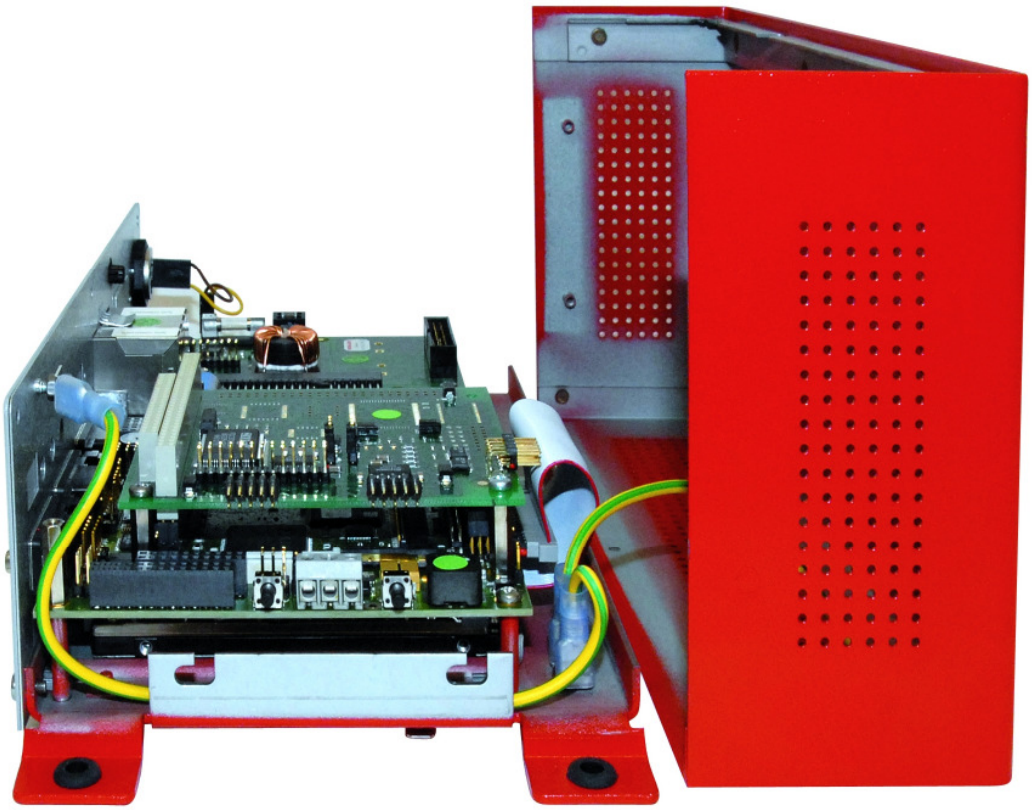
4. The photo below shows the MPCV800 with an open case.



5. Install the desired PC/104 / PC/104+ card as shown below.

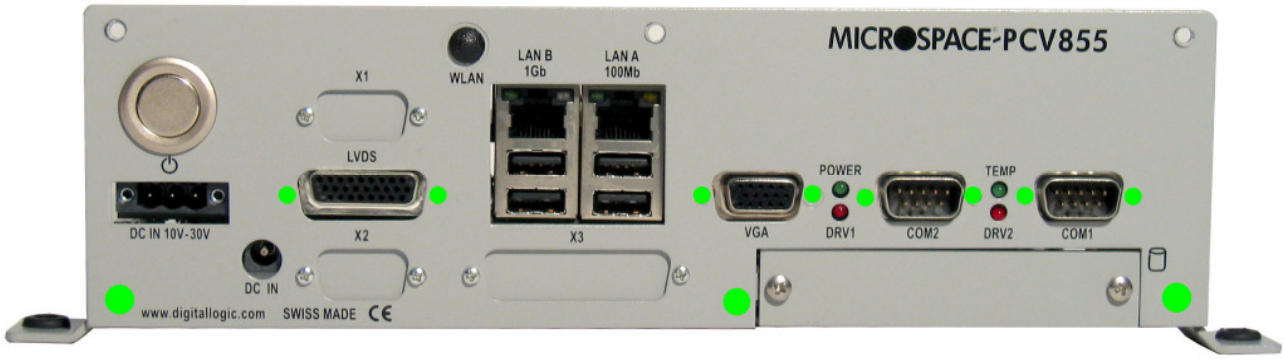


6. The photo below shows an MPCV855 with an installed PC/104 peripheral card.

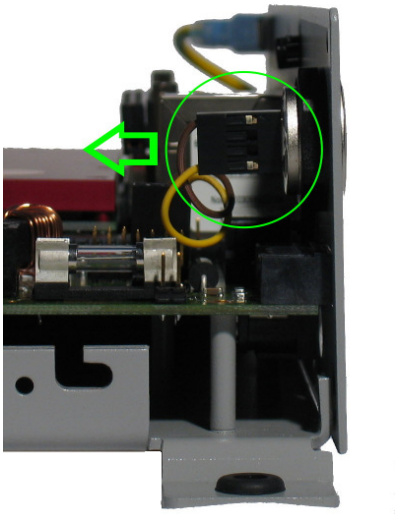


7. If you want to cable the peripheral board to the cover plate, first remove the cover plate as follows.

   a. Remove the screws (marked here in green); the 3 lower screws with a recessed-head screwdriver and the 8 others with a hexagonal bolt screwdriver.



   b. Remove the connector from the power button.



   c. Now remove the cover plate.

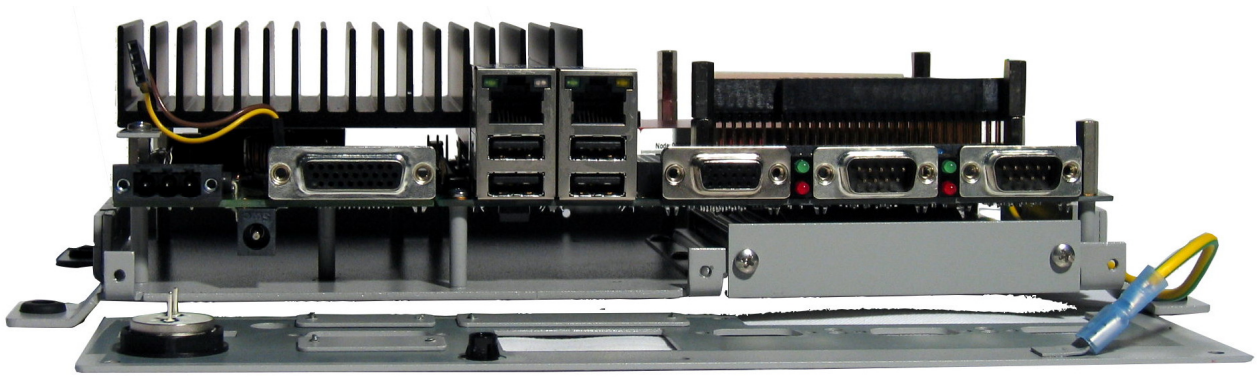
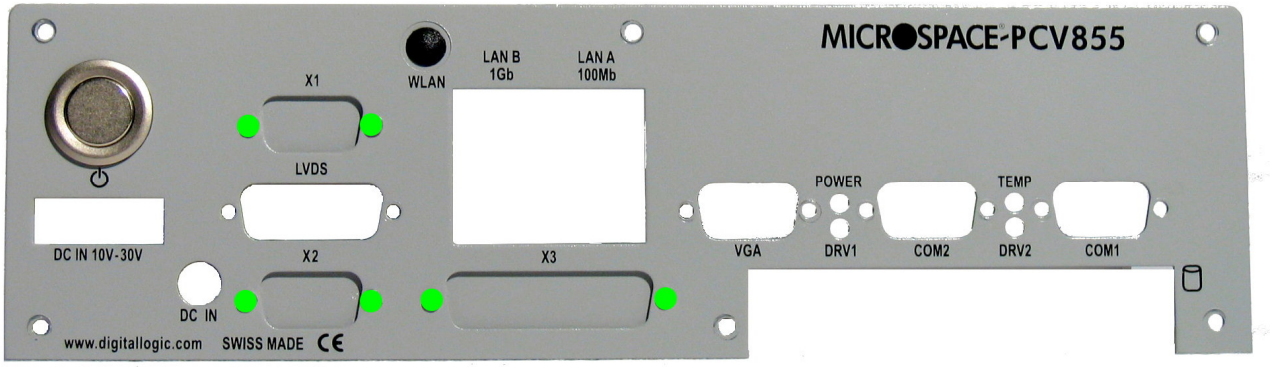
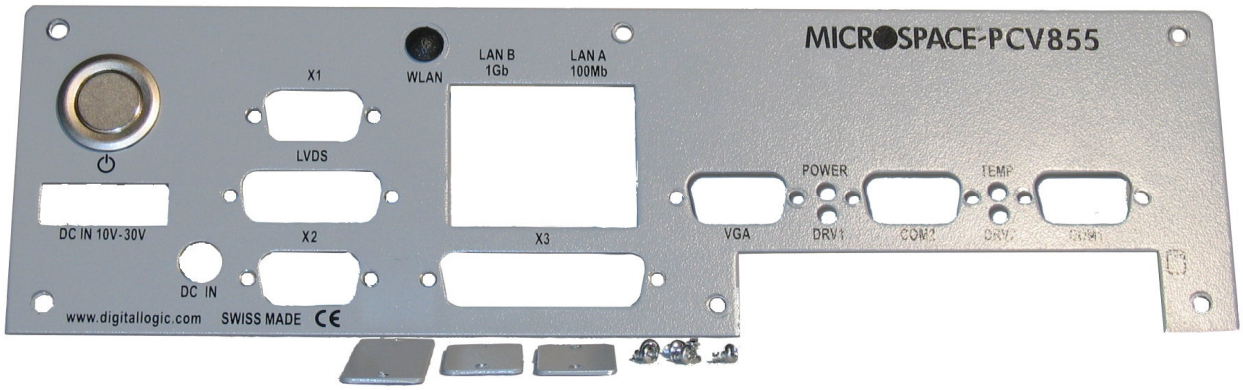


Photo of an MPCV855

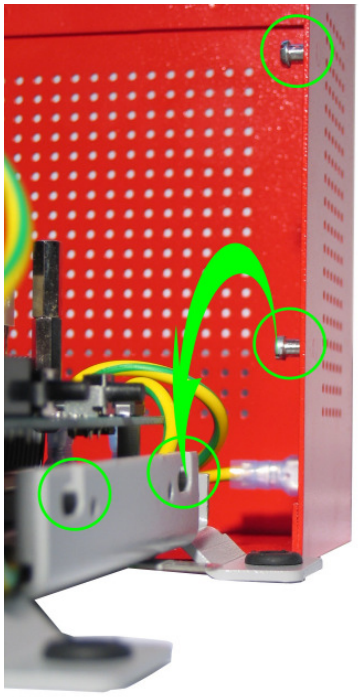
d. To attach the D-SUB; or customized; connectors, remove the cover panels marked X1/X2/X3 by removing the recessed-head screws (marked below in green).



This leaves the cover plate looking like the photo below.

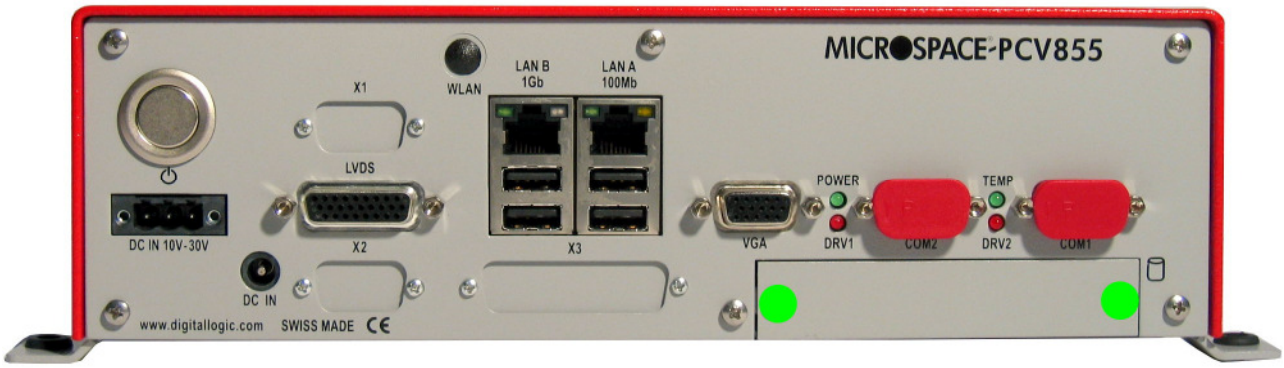


Attention!
If you put the casing back onto the system, please pay attention to the mounting pins marked in the photo to the right.



5.2. Hard Drive Exchange

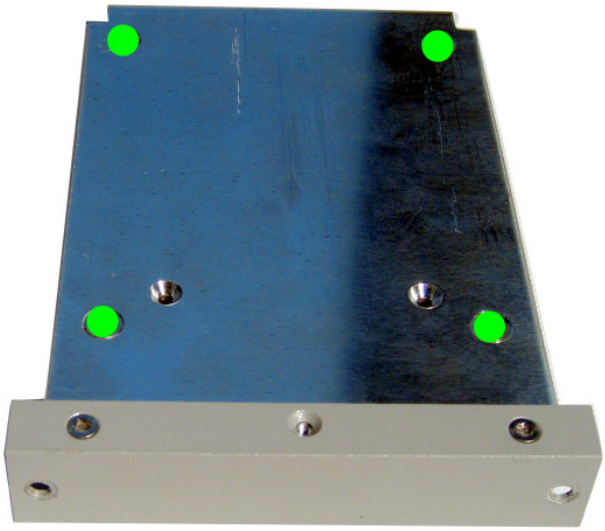
1. To pull out the hard disk tray, remove the two recessed-head screws (marked green).



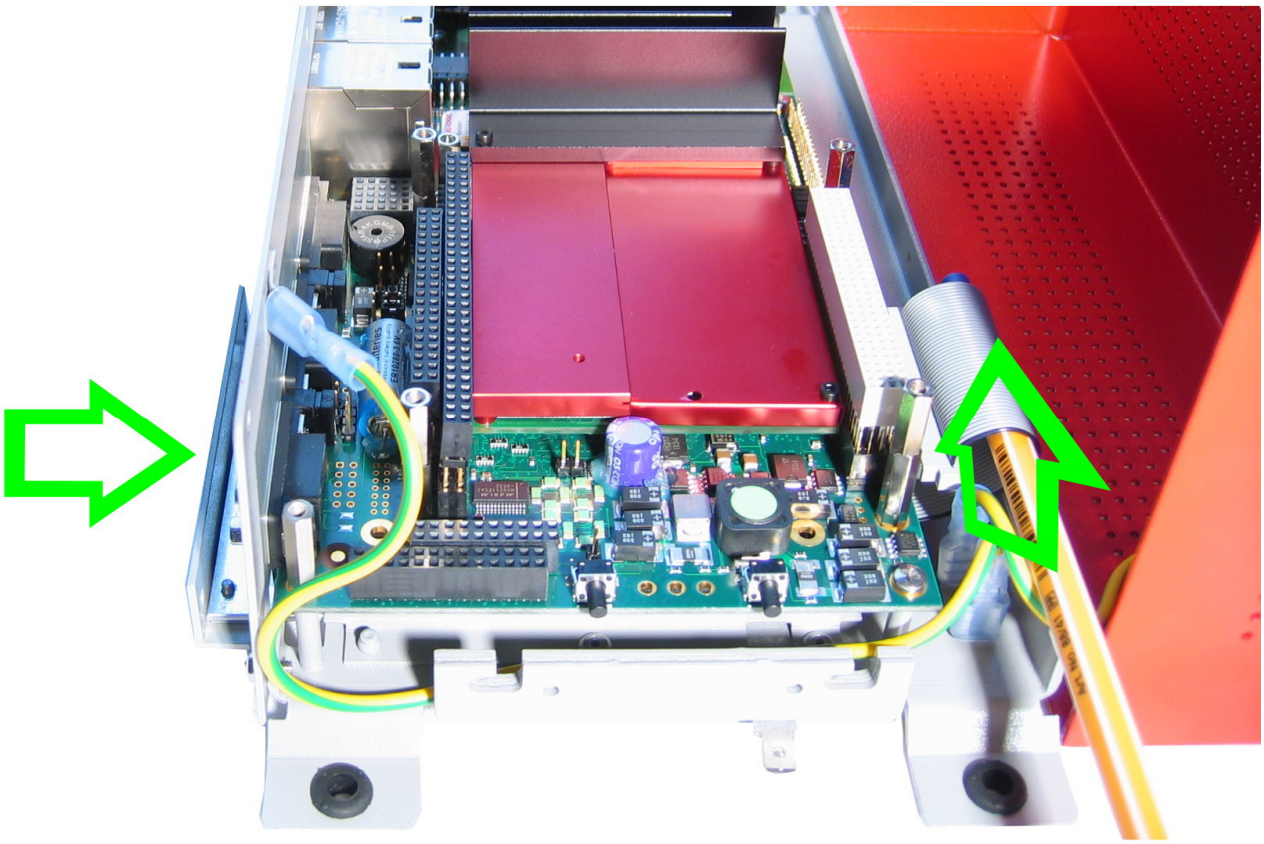
2. Pull the tray in the direction marked by the green arrow.

3. Remove the ribbon cable from the hard disk.

4. Unscrew the hexagonal bolt screws (marked green) to release the hard disk from its front plate.



Attention!
If the cable crimps while pushing the hard drive back in, the system will have to be opened as described in Section 5.1. Then use a pencil, as shown below, to pull up the cable while pushing in the hard drive.



6. PREPARE THE COMPUTER SYSTEM

Warning, ESD Sensitive Device!
Place the embedded computer board on an isolated, ESD-protected surface. Also ensure that all equipment, tools and people are fully protected against ESD.

6.1. Print the Detailed Manuals from the Product CD

Note…
- Place the Product-CD into a personal computer that is connected to a printer.
- Open the CD; open the directory MPCV800.

Since the internal computer board is the MSEP800 embedded computer, that manual must also be used for detailed information.

Printout the following detailed manuals:

1. The technical/hardware manual: MPCV800_Detailed.pdf
2. The technical/hardware manual: MSEP800_Detailed.pdf
3. The driver/software/BIOS manual: GEODE_LX800.pdf

6.2. Connect Peripherals to the Board

Prepare the following peripherals:

- VGA Monitor (LCD or CRT) with a resolution up to 1024x768pixel
- USB Keyboard
- USB Mouse
- LAN-Cable, if available
- USB CD-Drive or Floppy drive
- Power supply with 12Volt and minimum 30Watt

1. Connect the VGA Monitor to the 15pin HD-Subconnector.
2. Connect the USB Keyboard to one of the USB connectors.
3. Connect the USB-Mouse to one of the USB connectors.
4. Connect a USB-CD-drive or a USB-Floppy drive to one of the USB connectors.
5. Connect the 12Volt power supply to the power input of the computer board.

The polarity must be correct or the electronic board may be destroyed.

6. Insert a boot device: USB-Stick, Floppy or bootable CompactFlash or use a PXE/RPL server to boot from LAN A.

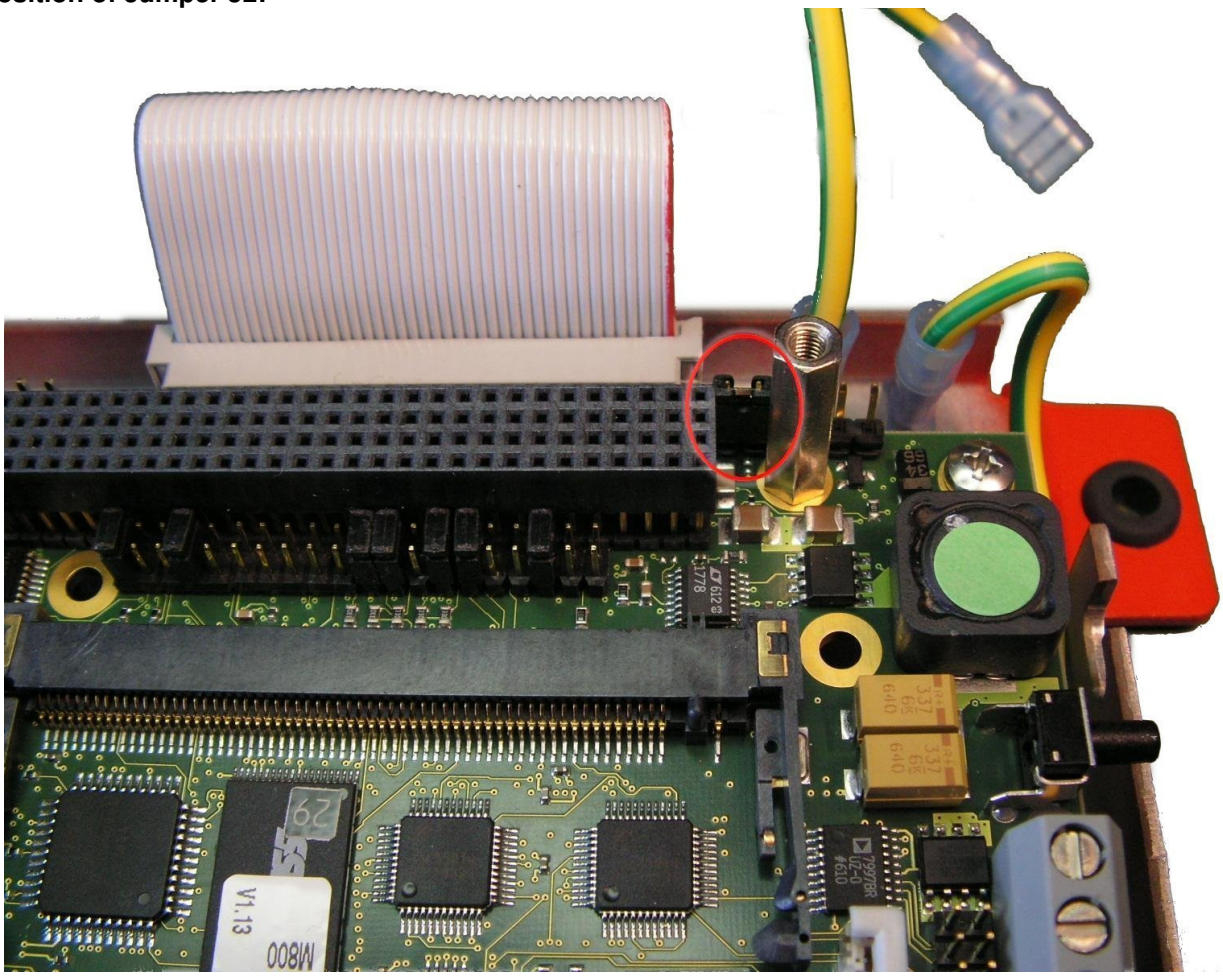
7. POWER-ON THE SYSTEM

Attention!
Check that the voltage is regulated to +12V and that the polarity is correct.

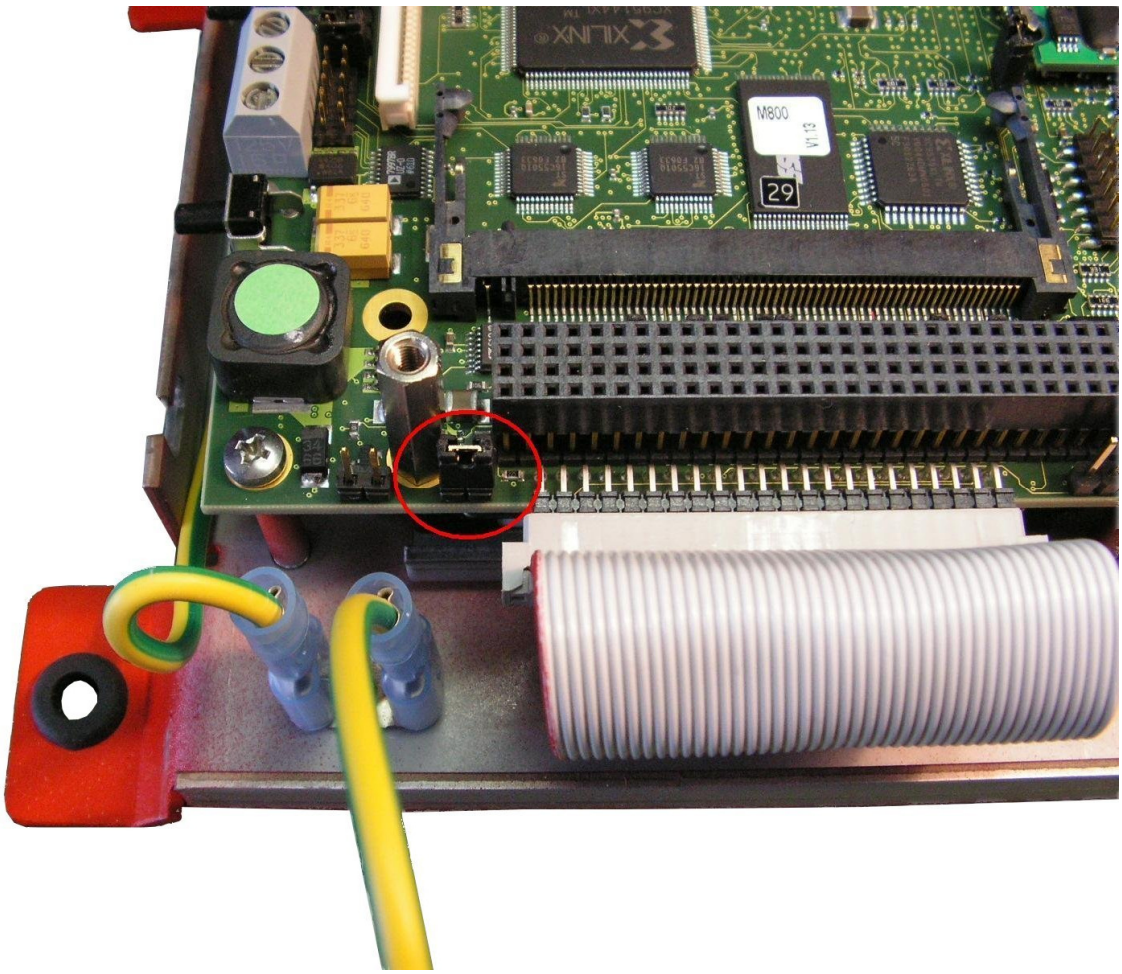
The power supply voltage must be in the range of 8V to maximum 32Volt.

Jumper J2 determines the behavior after power-on. The autostart function is disabled by default from the factory.

Position of Jumper J2:



Reverse angle of Jumper J2:



In autostart mode the board automatically enters the boot sequence and the green power LED will come on.

In non-autostart mode the board will remain in standby mode until the power button is pressed for at least one second or a Wake on LAN (WOL) event occurs. WOL events only trigger the boot sequence when jumper J5 enables WOL.

Now switch on the external 12V power supply. The green power-LED should light.

After a few seconds the screen should display the BIOS initial message/picture.

Refer to the manuals on the Product CD which should also be printed out:

1. The technical/hardware manual: MSEP800_Detailed.pdf
2. The driver/software/BIOS manual: GEODE_LX800.pdf

7.1. BIOS

7.1.1. Setup

Since the BIOS is auto-configuring during the start-up procedure, normally the user does not enter the BIOS setup. Manual setup is needed only to change the default settings. Refer to the "GEODE_LX800" manual.

For the MPCV8xxx: The RTC clock and date **must** be correct as TOD is adjusted in the production field test.

7.1.2. Core BIOS

The XpressROM™ Setup Menu contains a number of features and options. DIGITAL-LOGIC recommends that the customer evaluate the menu options **prior** to shipment of the platform to ensure the removal of options that may have negative consequences if the items are changed.

The controls in the setup menu are:

Function	Key
BIOS setup	F1
Change values	ENTER
Jump	ARROWS / SPACE
Save	X
Back / exit	ESC

7.2. Boot Up the Operating System and Install the Drivers

Depending on which boot drive is available, boot up the operating system from the CompactFlash or hard disk (if installed as an option).

To install the drivers, see the "GEODE_LX800" manual and also refer to the "MSEP800_Detailed" manual.

7.3. FreeDOS, DSLinux und ELinOS Bootflash

7.3.1. Free DOS

FreeDOS 0.9 (http://www.freedos.org/) is available on the boot device and contains a variety of useful programs for configuring a computer system. With these tools, partitions can be manipulated and data can be transferred.

The most important of these programs are:
Fdisk, Format, Sys, XCOPY, Edit, Dos Navigator (dn) and UnZip.

7.3.2. DSLinux (DSL)

The Linux installed on the boot device is based on DSLinux 3.3 (http://www.damnsmalllinux.org/). It boots with a graphical interface and includes many useful applications.

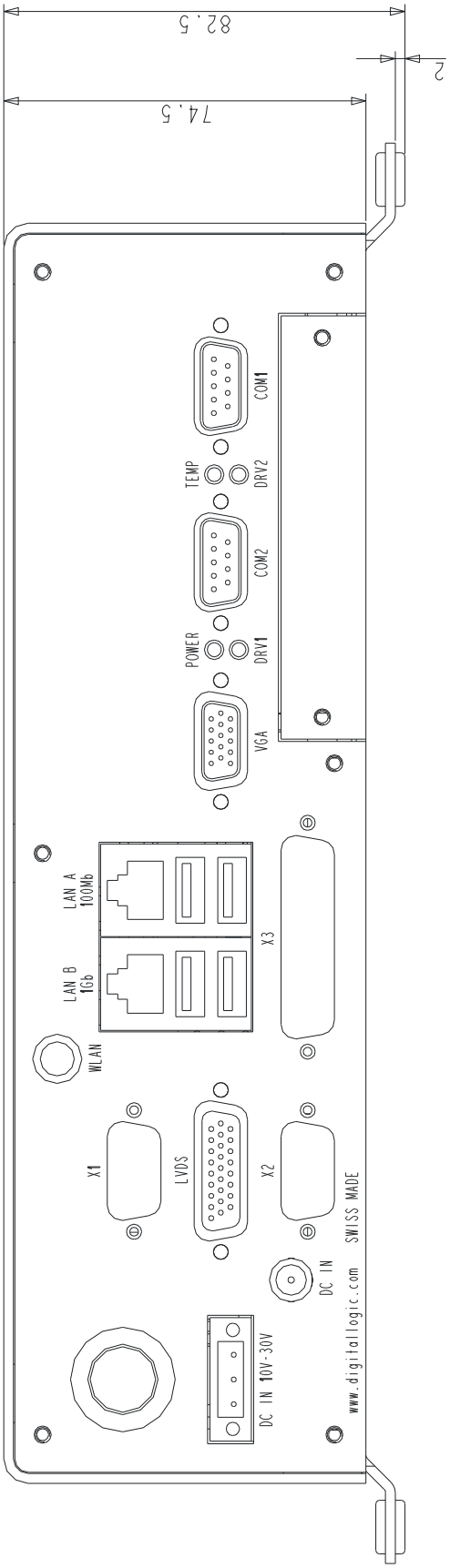
The most important of these are:
Web browser, xine, Mplayer (Multimedia Player) and PDF-Viewer.

7.3.3. ELinOS Demo

This demo is a Linux Tetris game generated with **ELinOS 4.0** (http://www.sysgo.com/). It shows how fast imbedded Linux can boot up and how little storage space it requires.

8. DIMENSIONS AND DIAGRAMS

8.1. Front View



MPCV800 Version V1.0

Unit: mm (millimeter)
Tolerance: +/- 1mm

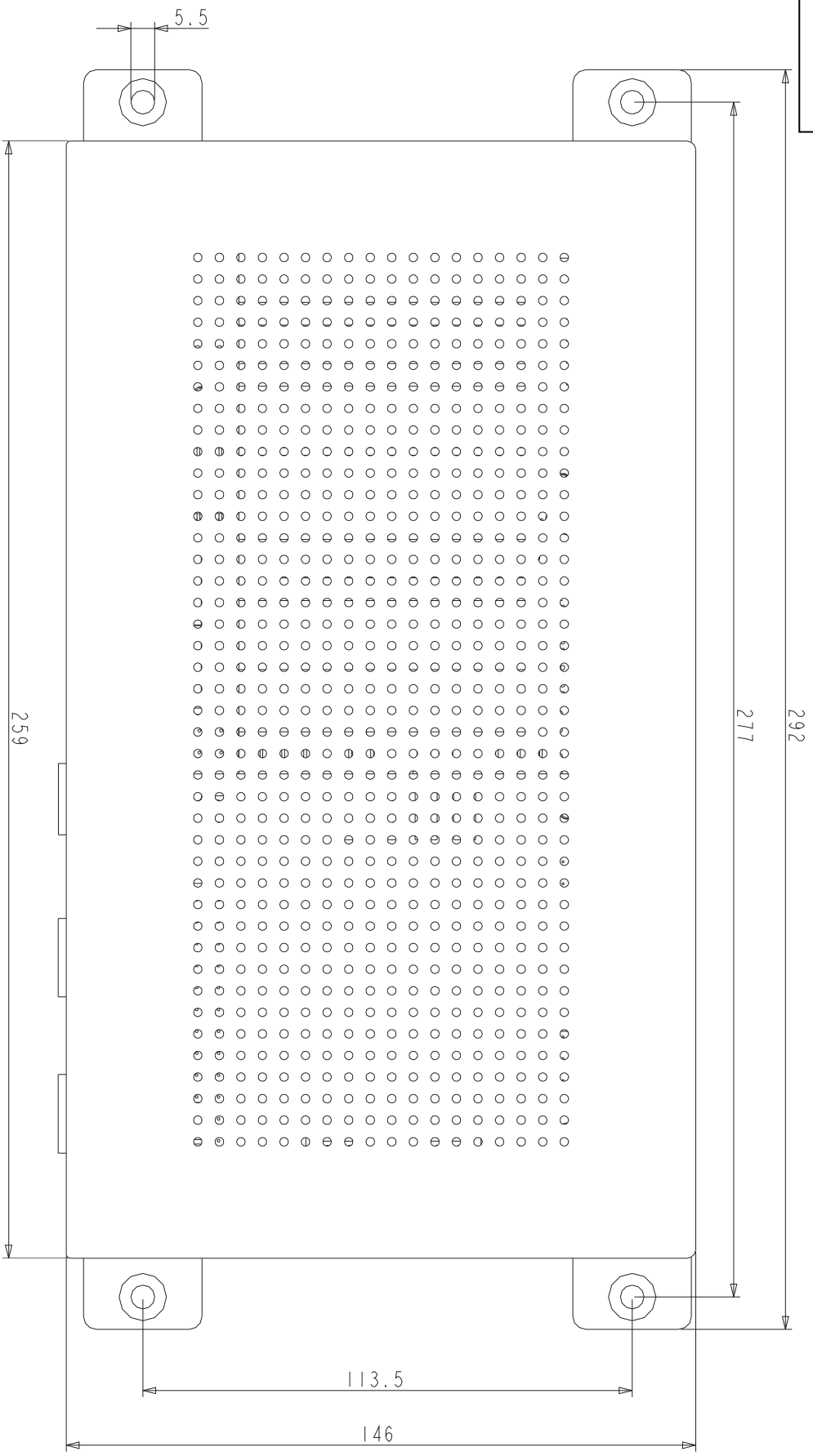
Date: 13.03.2006
Author: BRR

8.2. Top View

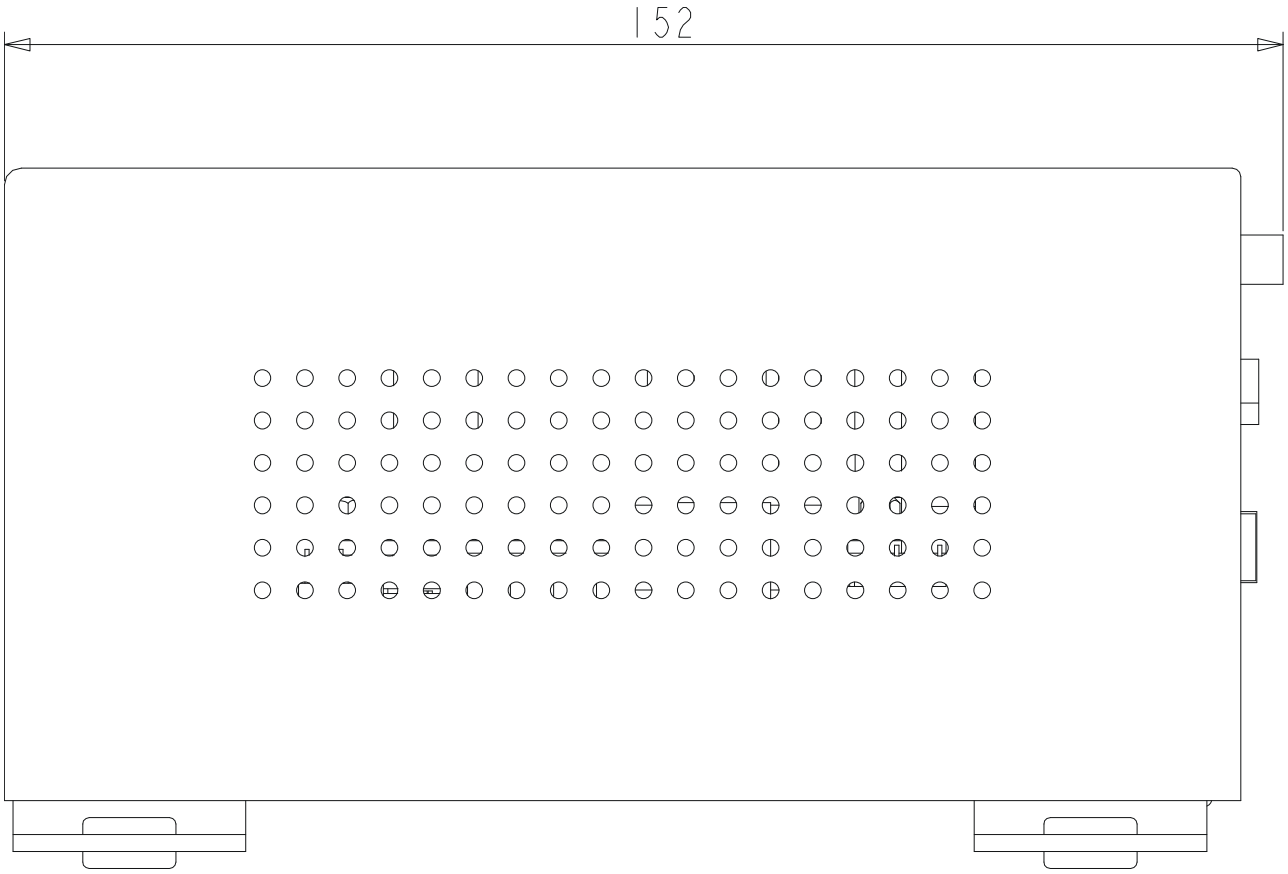
MPCV855 Version V1.0

Unit: mm (millimeter)
Tolerance: +/- 1mm

Date: 13.03.2006
Author: BRR



8.3. Side View



MPCV800 Version V1.0

Unit: mm (millimeter)
Tolerance: +/- 1mm

Date: 26.04.2006
Author: BRR

9. Q&A – QUESTIONS AND ANSWERS

Problem	Solution

10.INDEX

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