

DIGITAL-LOGIC

smart embedded computers

TECHNICAL USER'S MANUAL FOR:

MICROSPACE[®]

PC/104 and peripheral board

MSMJ104+



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REVISION HISTORY:

Prod.-Serialnumber: From: To:	Product Version	Document Version	Date/Vis:	Modification: Remarks, News, Attention:
	V1.0	V1.0	01.02/ BEL	Beta Version
	V1.0	V1.0a		Link added Bios setting picture description added
		V1.0B	04/02/BEL	PCI Jumper correction

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Table of Contents

1	PREFACE.....	4
1.1	HOW TO USE THIS MANUAL.....	4
1.2	TRADEMARKS	4
1.3	DISCLAIMER.....	4
1.4	WHO SHOULD USE THIS PRODUCT	4
1.5	RECYCLING INFORMATION	5
1.6	TECHNICAL SUPPORT.....	5
1.7	LIMITED WARRANTY.....	5
2	OVERVIEW	6
2.1	ORDERING INFORMATION	6
2.2	GENERAL INFORMATION	6
3	SOFTWARE	8
4	CONNECTOR AND JUMPER DESCRIPTION	9
4.1	PRODUCT VIEW.....	9
4.2	CONNECTOR REFERENCES AND TYPES.....	9
4.2.1	<i>ZV-Port connector signals</i>	<i>10</i>
4.3	JUMPER DESCRIPTIONS	11
4.3.1	<i>JP1: Flash program chip select (resistor-jumper).....</i>	<i>11</i>
4.3.2	<i>JP2: ZV-Port clamping voltage (resistor-jumper).....</i>	<i>11</i>
4.3.3	<i>JP3: PCI IO voltage (resistor-jumper).....</i>	<i>11</i>
4.3.4	<i>JP4: PCCARD IO voltage (resistor-jumper)</i>	<i>11</i>
4.3.5	<i>JP7: Reset source jumper</i>	<i>11</i>
4.3.6	<i>JP12: Suspend jumper</i>	<i>11</i>
4.3.7	<i>JP16: IRQSER line recovery jumper</i>	<i>11</i>
4.3.8	<i>JP17: Pollmode jumper.....</i>	<i>11</i>
4.4	DEFAULT SETTINGS.....	12
4.5	SPECIAL NOTES ABOUT PCI SETTINGS	12
4.5.1	<i>Jumper PCI IDSEL</i>	<i>12</i>
4.5.2	<i>Jumper PCI REQ.....</i>	<i>12</i>
4.5.3	<i>Jumper PCI GNT.....</i>	<i>12</i>
4.5.4	<i>Jumper PCI INT.....</i>	<i>13</i>
4.5.5	<i>Jumper PCI Clock.....</i>	<i>13</i>
5	DIMENSIONS, CONNECTOR AND JUMPER LOCATIONS	14
5.1	TOP VIEW	14
5.2	BOTTOM VIEW.....	15
6	GETTING STARTED	16
6.1	ISA IRQ RESERVATION AND DRIVER INSTALLATION	16
6.1.1	<i>ISA IRQ BIOS reservation</i>	<i>16</i>
6.1.2	<i>Device installation and use under DOS.....</i>	<i>17</i>
6.1.3	<i>Device installation and use under windows.....</i>	<i>17</i>
6.1.4	<i>Installation example</i>	<i>18</i>
7	INDEX.....	22

1 PREFACE

This manual is for integrators and programmers of systems based on the MICROSPACE card family. It contains information on hardware requirements, interconnections, and details of how to program the system. The specifications given in this manual were correct at the time of printing; advances mean that some may have changed in the meantime. If errors are found, please notify DIGITAL-LOGIC AG at the address shown on the title page of this document, and we will correct them as soon as possible.

1.1 *How to use this Manual*

This manual is written for the original equipment manufacturer (OEM) who plans to build computer systems based on the single board MICROSPACE-PC. It provides instructions for installing and configuring the MSM486SL or MSM386SN board, and describes the system and setup requirements.

1.2 *Trademarks*

Chips & Technologies	SuperState R
MICROSPACE, MicroModule	DIGITAL-LOGIC AG
DOS Vx.y, Windows	Microsoft Inc.
PC-AT, PC-XT	IBM
NetWare	Novell Corporation
Ethernet	Xerox Corporation
DR-DOS, PALMDOS	Digital Research Inc. / Novell Inc.
ROM-DOS	Datalight Inc.

1.3 *Disclaimer*

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1.4 *Who should use this Product*

- Electronic engineers with know-how in PC-technology.
- Without electronic know-how we expect you to have questions. This manual assumes, that you have a general knowledge of PC-electronics.
- Because of the complexity and the variability of PC-technology, we can't give any warranty that the product will work in any particular situation or combination. Our technical support will help you to may find a solution.
- Pay attention to the electrostatic discharges. Use a CMOS protected workplace.
- Power supply OFF when you are working on the board or connecting any cables or devices.

**This is a high technology product.
You need know-how in electronics and PC-technology
to install the system !**

1.5 Recycling Information

Hardware:

- **Print:** epoxy with glass fiber
wires are of tin-plated copper
- **Components:** ceramics and alloys of gold, silver
check your local electronic recycling

Software:

- **no problems:** re-use the diskette after formatting

1.6 Technical Support

1. Contact your local Digital-Logic Technical Support in your country.
2. Use Internet Support Request form on <http://www.digitallogic.com> -> support -> support request form
3. Send a FAX or an E-mail to DIGITAL-LOGIC AG with a description of your problem.

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Internet: www.digitallogic.com

- ➔ Support requests will only be accepted with detailed informations about the product (BIOS-, Board-version) !

1.7 Limited Warranty

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

During the one 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, customers are required to contact the company.

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. Neither, if the user has not enough knowledge of these technologies or has not consulted the product manual or the technical support of DIGITAL-LOGIC AG and therefore the product has been damaged.

Except, as expressly 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.

2 OVERVIEW

2.1 Ordering Information

Ordering Information:	
MSMJ104+	Standard Version with dual slot for PCMCIA compatible cards

2.2 General Information

The product MSMJ104+ can be described as following:

- PC/104+ PCI Bus 120 pin with selectable PCI slot
- PCI1450 PC Card controller
- PCI rev. 2.1,2.2 compliant
- Hot insertion and removal (up to two compatible PC cards)
- ZV-Port Interface

BUS:	
Standard:	PC/104+
Size and Type:	PCI multiplexed 32 Bit Address/Data Bus

Controller:	
Type:	Texas Instrument PCI1450
Package:	BGA 256 pins

Power Supply:	
Power supply: V1.0	5V through PC/104+, PC/104 3.3V through PC/104+ 12V on board converter MAX732 (200mA DC output capability)

Interfaces:	
PCMCIA	Dual 16-bit card slot with DMA capability Compatible to PCMCIA rev. 2.1
CardBus	Dual 32-bit Card-Bus supporting 32bit data transfer at 33MHz
ZV-Port	Zoom Video Port 16-bit interface

(*) Combinations of 32bit CardBus compatible cards and PCMCIA are also possible.

Physical Characteristics:	
Dimensions:	Length: 90mm
	Width: 96mm
	Height: 15mm

Operating Environment:

Relative humidity:	5 - 90% non condensing		
Vibration:	5 to 2000 Hz		
Shock:	10g		
Temperature:	Operating:	Standard version:	-25°C to +70°C
		Industry version:	-25°C to +85°C (ask DIGITAL-LOGIC AG)
	Storage:	-55°C to +85°C	

Ordering Information:

MSMJ104+	
----------	--

3 SOFTWARE

The device does not require special drivers for Windows because they are already implemented in the operating system drivers default database. DOS drivers are licensed from other companies. If you wish to use MSMJ104+ under DOS, you must purchase them separately.

If you wish to implement MSMJ104+ under DOS, NT or other OS, you can for example contact Systemsoft company

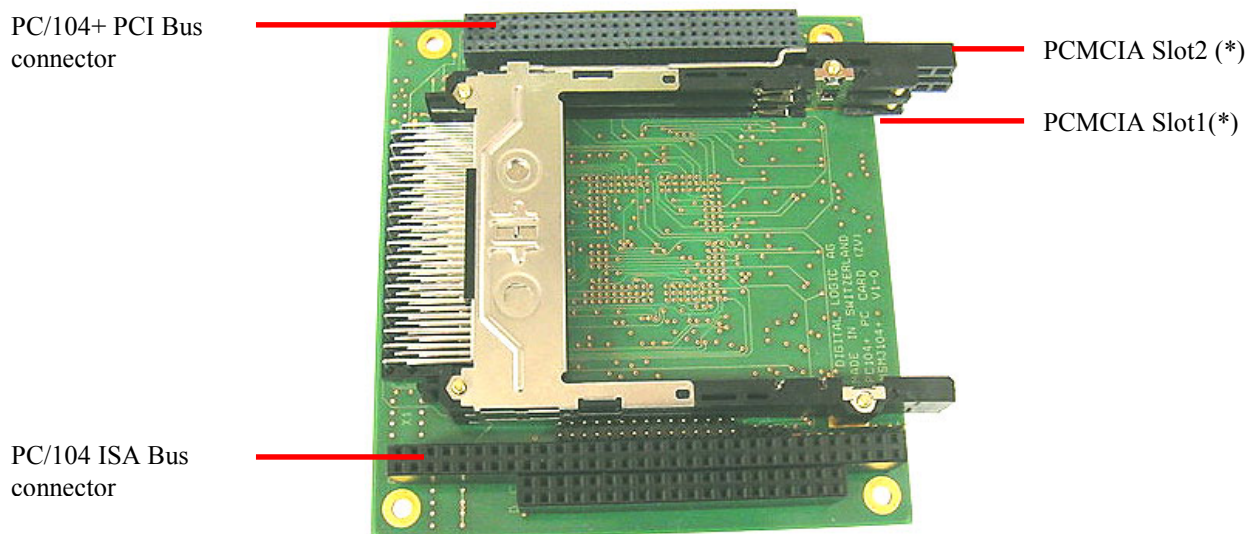
www.systemsoft.com/l-2/l-3/products-pccardaccess.htm DOS solution
www.systemsoft.com/l-2/l-3/products-cardwizard.htm Solution for WinNT

4 CONNECTOR AND JUMPER DESCRIPTION

4.1 *Product view*

The following picture shows a top view from MSMJ104+ Version 1.0. The connector references are further explained in section 5.2

Figure 5.1a: Interface connectors on MSMJ104+



(*) Both Slot1 or slot2 could also be used as CardBus slot

4.2 *Connector references and types*

Please refer to figure XXX for detailed position of the referenced connectors.

PC/104+ PCI Bus	
Type	4x30p connector
Reference	J1

PC/104 ISA Bus	
Type	2x30p and 2x20p connector
Reference	J2

PCMCIA/ CARDBUS DUAL	
Type	PCMCIA Berg double holder
Reference	X1

ZV-Port	
Type	2x15p header
Reference	J3

ZV-Port audio	
Type	1x5p header
Reference	J4

ZV-Port Control	
Type	1x3p header
Reference	J6

4.2.1 ZV-Port connector signals

The following table provides the pin to pin connection to the ZV-Port connector J3.

J3 Pin	Signal	J3 Pin	Signal
1	ZV_Y0 ⁽¹⁾	2	ZV_Y1
3	ZV_Y2	4	ZV_Y3
5	ZV_Y4	6	ZV_Y5
7	ZV_Y6	8	ZV_Y7
9	ZV_UV0	10	ZV_UV1
11	ZV_UV2	12	ZV_UV3
13	ZV_UV4	14	ZV_UV5
15	ZV_UV6	16	ZV_UV7
17	Not connected	18	ZV_PCLK ⁽²⁾
19	ZV_HREF ⁽³⁾	20	ZV_VSYNC ⁽⁴⁾
21	Not connected	22	Not connected
23	Not connected	24	Not connected
25	Not connected	26	Not connected
27	Not connected	28	VCC (5V)
29	Not connected	30	GND

⁽¹⁾ Video data to ZV-Port YV:4:2:2 format

⁽²⁾ Pixel clock to ZV-Port

⁽³⁾ Horizontal sync signal to ZV-Port

⁽⁴⁾ Vertical sync signal to ZV-Port

J4 Pin	Signal	J4 Pin	Signal
1	ZV_SDATA ⁽⁵⁾	2	ZV_SCLK ⁽⁶⁾
3	ZV_LRCLK ⁽⁷⁾	4	ZV_MCLK ⁽⁸⁾

⁽⁵⁾ Audio SDATA PCM

⁽⁶⁾ Audio SCLK PCM

⁽⁷⁾ Audio LRCLK PCM

⁽⁸⁾ Audio MCLK PCM

J6 Pin	Signal	J6 Pin	Signal
1	ZV_SENS	2	GND
3	ZV_STAT		

4.3 Jumper descriptions

This chapter provides description for all the jumper present on MSMJ104+. **Highlighted settings** are default factory settings.

4.3.1 JP1: Flash program chip select (resistor-jumper)

JP1 Pin	Function	JP1 Pin	
1-2	Flash programming 12V on board supply	2-3	Flash programming 12V from PC/104 ISA

4.3.2 JP2: ZV-Port clamping voltage (resistor-jumper)

JP2 Pin	Function	JP2 Pin	
1-2	VCC 5V	2-3	VCC3 3V

4.3.3 JP3: PCI IO voltage (resistor-jumper)

JP3 Pin	Function	JP3 Pin	
1-2	VCC 5V	2-3	VCC3 3V

4.3.4 JP4: PCCARD IO voltage (resistor-jumper)

JP4 Pin	Function	JP4 Pin	
1-2	VCC 5V	2-3	VCC3 3V

4.3.5 JP7: Reset source jumper

JP7 Pin	Function	JP7 Pin	
1-2	PCIRST	2-3	GRST

4.3.6 JP12: Suspend jumper

JP12 Pin	Function	JP12 Pin	
1-2	Software suspend	2-3	Suspended (GND)

4.3.7 JP16: IRQSER line recovery jumper

JP16 Pin	Function	JP16 Pin	
1-2	IRQSER driven high	2-3	IRQSER three stated

4.3.8 JP17: Pollmode jumper

JP17 Pin	Function	JP17 Pin	
1-2	Continuous mode	2-3	Quiet mode

4.4 *Default settings*

The default settings given in the previous section should be restored if any problem occurs regarding product functionality. All factory tests made concerning MSMJ104+ are based on this correct jumper setting. Please be sure to remove any made changes before contacting our support.

4.5 *Special notes about PCI settings*

MSMJ104+ device is planned to be used on any PC/104+ CPU board. However, Digital-Logic specific BIOS (on Pentium and Pentium III based design) allows PCMCIA controller on a special IDSEL channel (PCI address AD28) with PCI interrupts C and D. The PCI settings on MSMJ104+ use this IDSEL slot.

It is possible to change these settings at your own risk, if you plane to use for example another PC/104+ CPU board with a BIOS that is not compatible to MSMJ104+ PCI settings.

The following resistor jumpers can be used to change PCI slot settings. The default settings are also highlighted like in previous section.

4.5.1 *Jumper PCI IDSEL*

JP6 Position	Function	JP5 Position	
A	IDSEL=AD28	B	<i>IDSEL= PC/104+ IDSELX selected from JP5</i>

JP5 Position	Function	JP5 Position	
A	IDSEL=PC/104+ IDSEL0	B	IDSEL=PC/104+ IDSEL1
C	<i>IDSEL=PC/104+ IDSEL2</i>	D	IDSEL=PC/104+ IDSEL3

4.5.2 *Jumper PCI REQ*

JP8 Position	Function	JP8 Position	
A	REQ=REQ0	B	REQ=REQ1
C	<i>REQ=REQ2</i>		

4.5.3 *Jumper PCI GNT*

JP9 Position	Function	JP9 Position	
A	GNT=GNT0	B	GNT=GNT1
C	<i>GNT=GNT2</i>		

4.5.4 Jumper PCI INT

JP10 Position	Function	JP10 Position	
A	INT=INTA	B	INT=INTB
C	INT=INTC	D	INT=INTD

4.5.5 Jumper PCI INT 2

JP13 Position	Function	JP10 Position	
A	INT=INTA	B	INT=INTB
C	INT=INTC	D	INT=INTD

4.5.6 Jumper PCI Clock

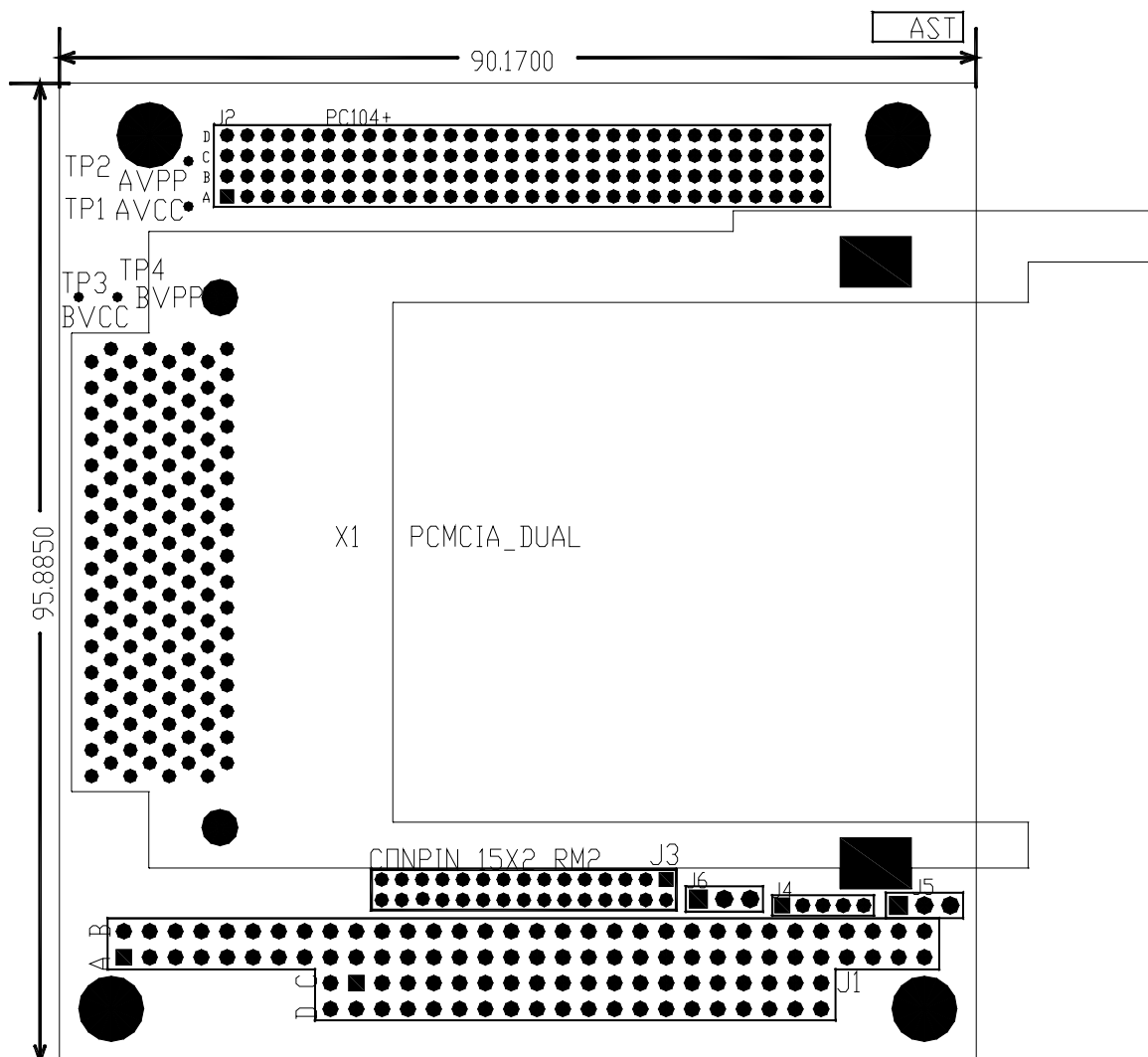
JP11 Position	Function	JP11 Position	
A	PCI_CLK=CLK0	B	PCI_CLK=CLK1
C	PCI_CLK=CLK2	D	PCI_CLK=CLK3

5 DIMENSIONS, CONNECTOR AND JUMPER LOCATIONS

The following two figures show the dimension of the MSMV104+ V1.2, standard PC/104+ product. For the connector references please consult the dedicated chapter 5.

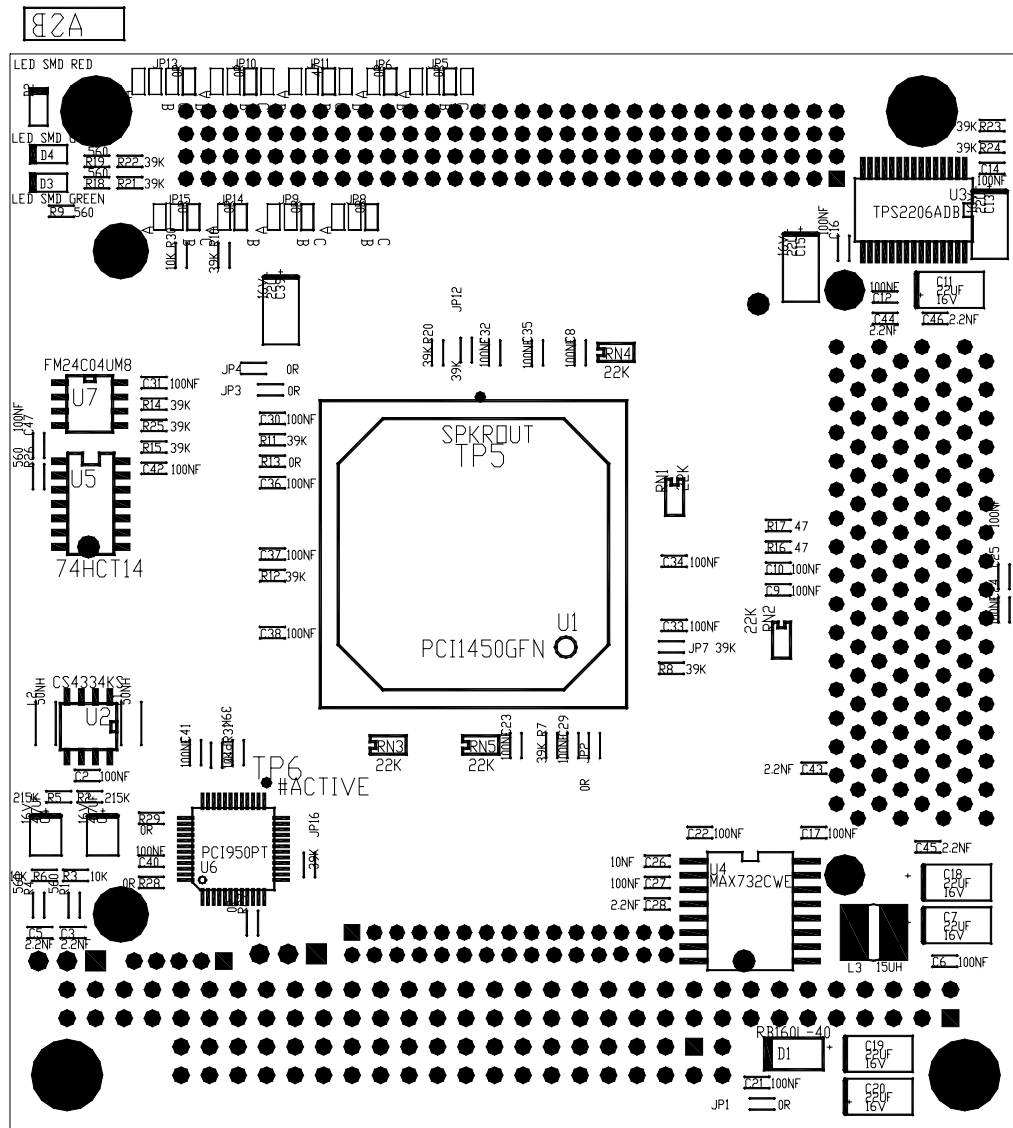
5.1 Top view

Figure 5.1: Top view with connector references and dimensions of the board



5.2 Bottom view

Figure 5.2: Bottom view with connector references



6 GETTING STARTED

This chapter is intended to show both the functionalities of MSMJ104+ and the way to access them under a windows operating system.

6.1 *ISA IRQ reservation and Driver installation*

This chapter deals with ISA IRQ reservation and exclusion so that the driver installation be successful and the MSMJ104+ could be used without any problem under windows or DOS operating systems

6.1.1 *ISA IRQ BIOS reservation*

Before the card could be used under windows or DOS, two ISA IRQ must be set free in the BIOS settings. PCMCIA card indeed needs one free ISA IRQ per slot so that if you plane to use two 16 bit PCMCIA card, you need to free the interrupt lines. Card bus cards can be used without problem while based on PCI communication architecture and PCI interrupts that can be shared.

Figure 6.1.1a: Bios setup utility

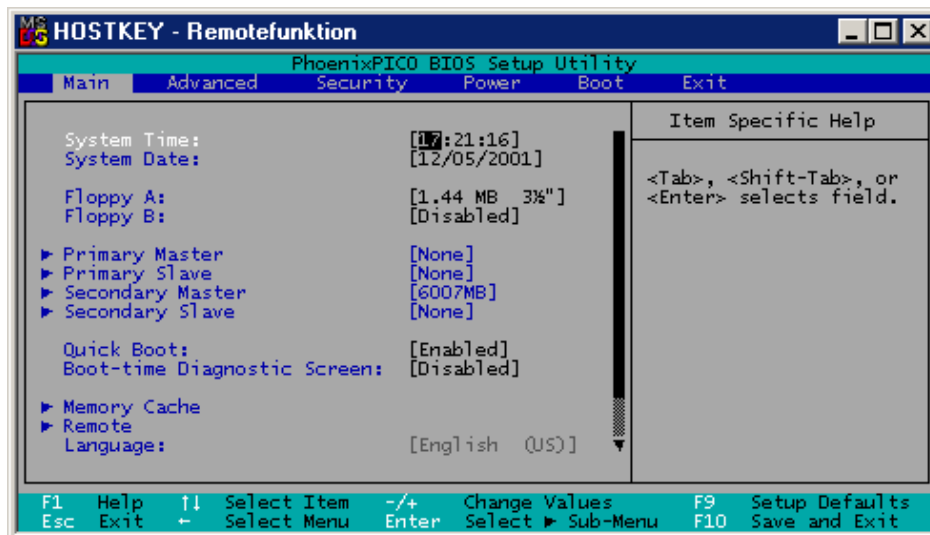
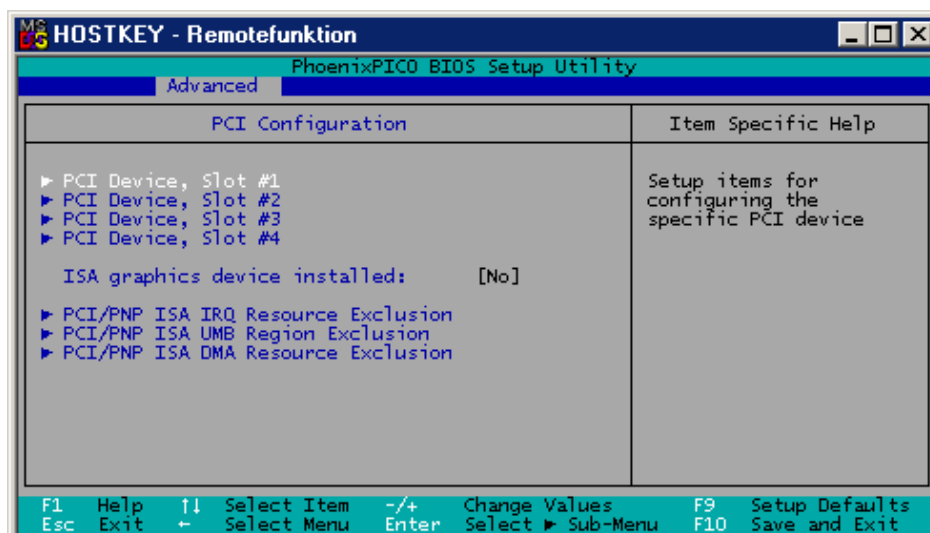


Figure 6.1.1b: Under menu, *Advanced > PCI Configuration > PCI/PNP ISA IRQ Exclusion* you can reserve some IRQ for ISA only



Here one example of a working configuration using MSMJ104+ and two PCMCIA 16 bit cards:

- Updating your BIOS settings, under *Advanced > I/O Device configuration* disable LPT port, that will free IRQ7, then choose *Advanced > PCI Configuration > PCI/PNP ISA IRQ Exclusion* and reserve IRQ5 and 7 for ISA use only.

To summarize, the controller itself requires one PCI interrupt and **ISA IRQs which must be reserved in BIOS settings prior to installation, according to the number of PCMCIA 16 bit card planned to be used (up to two IRQ for two cards)**

6.1.2 Device installation and use under DOS

For ISA device on PCMCIA cards to be used under DOS, special kind of driver is needed. These drivers are licensed and must be purchased separately.

6.1.3 Device installation and use under windows

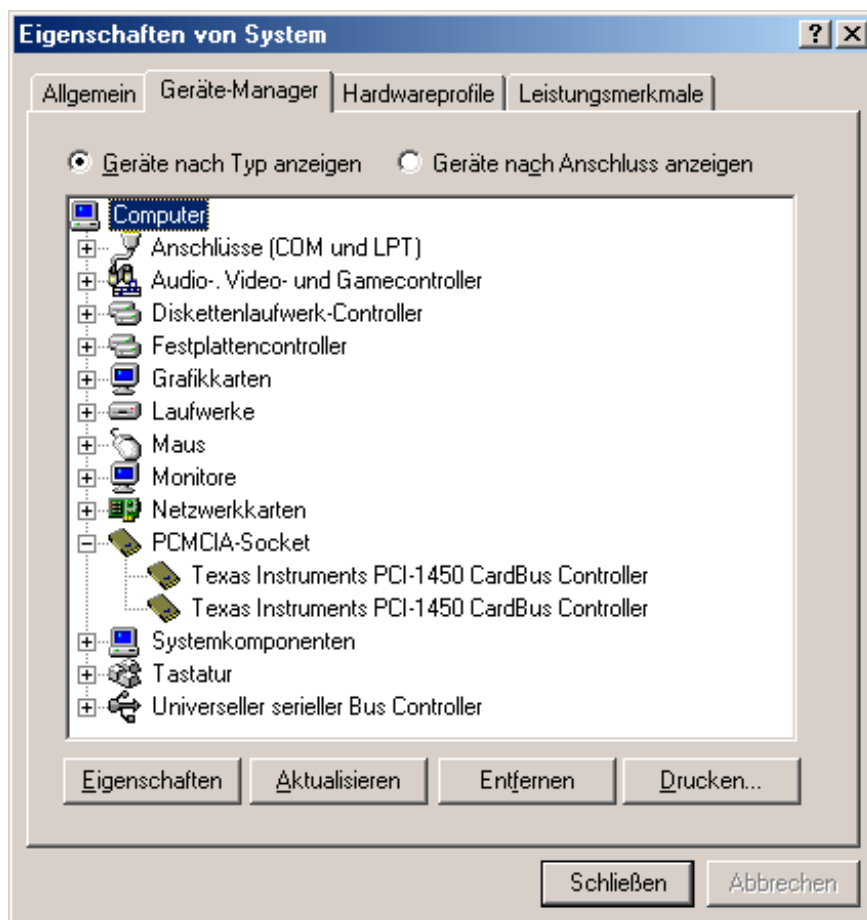
Booting a windows operating system, there is no need to install a driver because the OS will detect and install the device automatically. Once controller drivers are installed, additional drivers have to be installed to enable functionality (these are card specific drivers which are generally provided or must be purchased by the card producer).

6.1.4 Installation example

This section gives a simple example, the installation of two simple storage PCMCIA cards under Windows ME, including their hot insertion and removal capability. This chapter is not intended to be the general method to install PCMCIA card and the results obtained can vary according to the type of card required (PCMCIA or CardBus, storage or video frame grabber...)

6.1.4.1 Device driver installation

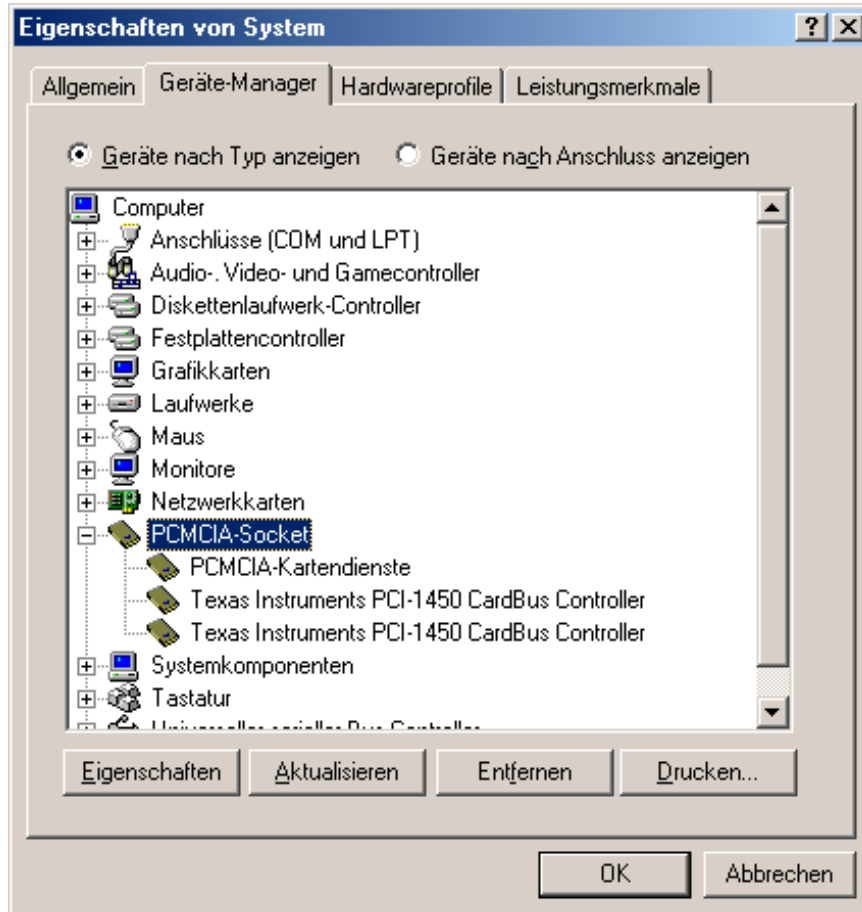
Figure 6.1.4.1a: Installed driver under WinME, MSMJ104+ requires two. The first one for the chip controller and the second for the cards



6.1.4.2 Card installation

Once a PCMCIA card is inserted, an additional device driver will be installed.

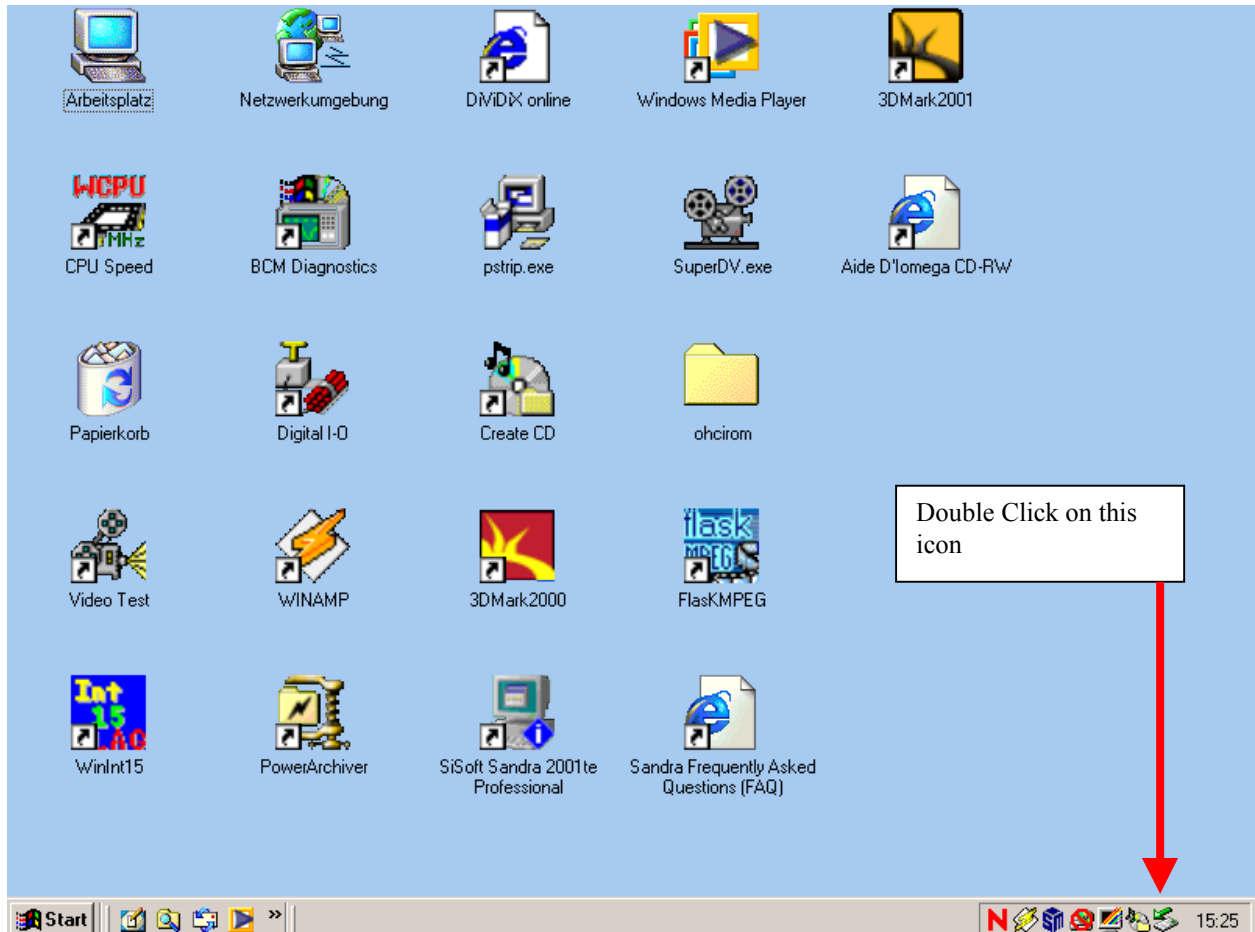
Figure 6.1.4.2: Device driver named PCIMCIA Kartendienst installation while hot insertion



6.1.4.3 Card access

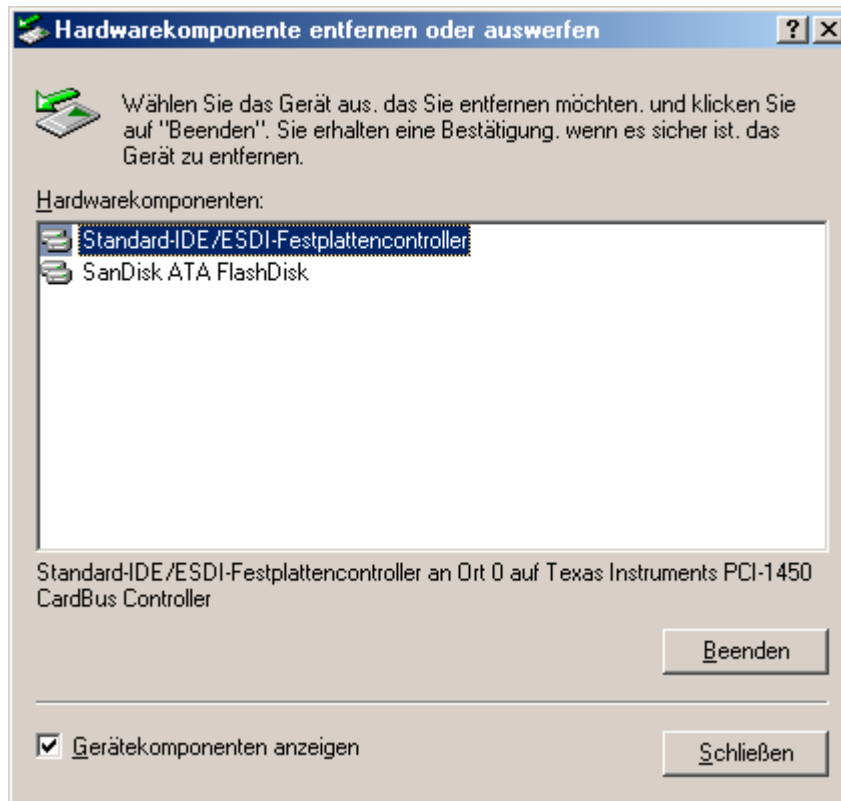
In this particular case, the two cards are of storage type. Their properties can be accessed under Windows Me. Windows ME provides a simple method to scan the whole PCMCIA bus. The following pictures shows how to access PCMCIA bus content.

Figure 6.1.4.3a: PCMCIA bus content access under Win ME



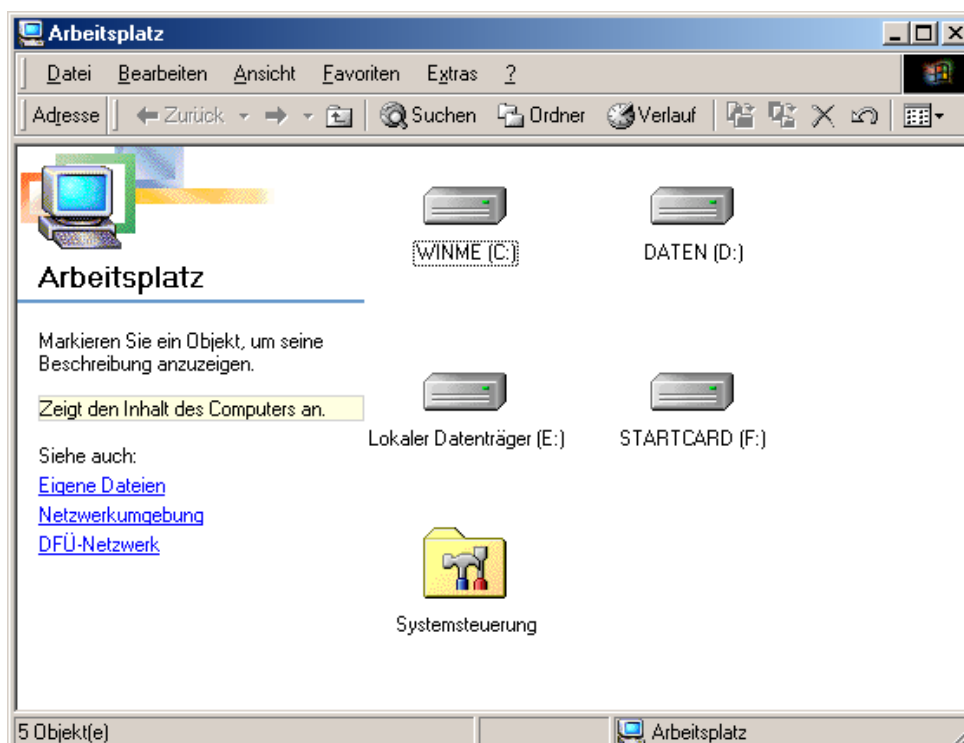
The following figure shows the PCMCIA device present on the bus.

Figure 6.1.4.3b: PCMCIA bus content with the two storage cards



In this particular case, the cards are also accessible as single drive in the Windows Explorer

Figure 6.1.4.3b: Obtained drive after successful installation of the two PCMCIA cards (drive E: and drive F:)



7 INDEX

B

Bus 6

C

Controller 6

I

Interfaces 6

P

PC/104 9

PC/104+ 9

PCMCIA connector 9

Power Supply 6

T

Technical Support 5

Z

ZV audio 10

ZV Port control 10

ZV-Port 10