

IDE2CF

The IDE2CF is a cost effective and easy to use adapter for connecting Compact Flash Cards (CF-Cards) to the standard IDE port of a single board computer (SBC) from MPL or other manufacturers.

For mechanical fixing in MPL's PIP family, the IDE2CF can be connected to the PC/104 slot. The CF-Card slot is then available on the right side of the PIP case. For mounting on top of other SBCs, the mounting holes defined in the PC/104 specification are available.

The IDE signals are connected to the IDE2CF via a standard 40 or 44 pin IDE cable. The power is distributed either with the 44 pin IDE cable or through the PC/104 connector.

There are two standard variants of the IDE2CF available. Others are possible on request:

- IDE2CF-1A44: With CF-Card interface, 44 pin IDE connector and PC/104 connector.
(For PIPx / MIPx with the possibility to install an additional PC/104 card on top of it)
- IDE2CF-1N44: With CF-Card interface, 44 pin IDE connector without PC/104 connector
(For general use with any kind of SBC with IDE port)

At the time of writing of this manual the following MPL products are supported:

- PIP405
- PIP5, PIP6, PIP7, PIP8
- MIP405
- MIP520

Features:

- Easy to use & inexpensive
- PC/104 form factor
- Optional separate power connector
- 44 pin (optional 40 pin) IDE connector
- Master / Slave selection possible
- For bigger order quantities several assembly options are available. Please feel free to contact MPL AG for further information.

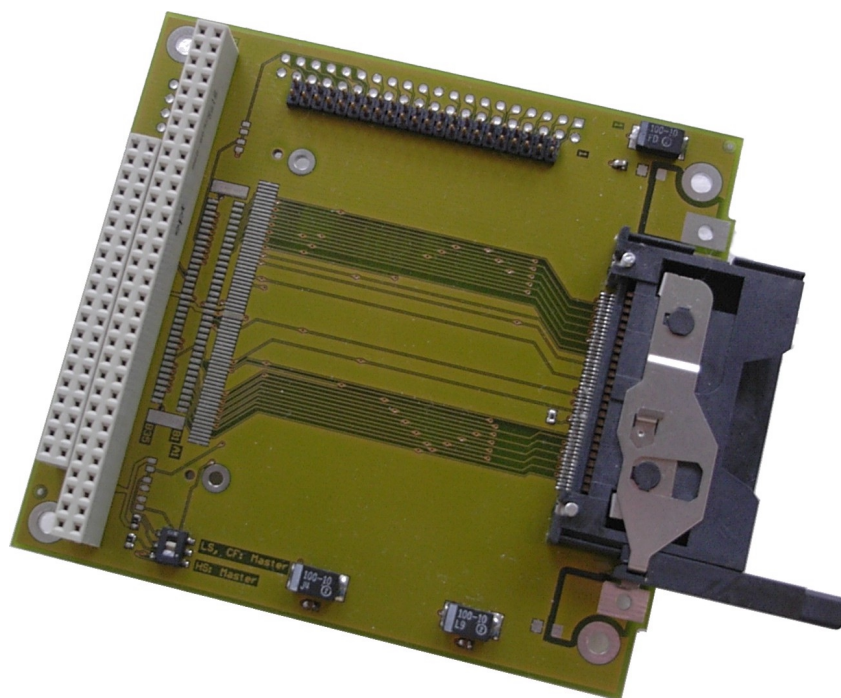


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1. INTRODUCTION

1.1 ABOUT THIS MANUAL

This manual provides all the information necessary to handle and configure the IDE2CF. The manual is written for technical personnel responsible for integrating and using the IDE2CF into their systems.

1.2 SAFETY PRECAUTIONS AND HANDLING

For personal safety and safe operation of the IDE2CF, follow all safety procedures described here and in other sections of the manual.

- Remove power from the system before installing (or removing) the IDE2CF to prevent the possibility of personal injury (electrical shock) and / or damage to the product.
- Handle the product carefully; i.e. dropping or mishandling the IDE2CF can cause damage to assemblies and components.
- Do not expose the equipment to moisture.

NOTE:

There are no user-serviceable components on the IDE2CF.

1.3 ELECTROSTATIC DISCHARGE (ESD) PROTECTION

Though there are no components on the IDE2CF that are sensible to electrostatic discharge some precautions were taken to protect the circuits of the IDE interface connected to the IDE2CF. The electrostatic charge of the PC-Card to be inserted is shunt to the system ground during insertion via the card rails. The connector pins itself do not have additional protection!

1.4 EQUIPMENT SAFETY

Great care is taken by MPL that all its products are thoroughly and rigorously tested before leaving the factory to ensure that they are fully operational and conform to specification. However, no matter how reliable a product, there is always the remote possibility that a defect may occur. The occurrence of a defect on this device may, under certain conditions, cause a defect to occur in adjoining and/or connected equipment. It is your responsibility to protect such equipment when installing this device. MPL accepts no responsibility whatsoever for such defects, however caused.

2. GENERAL INFORMATION

2.1 DESCRIPTION

The IDE2CF is a cost effective and easy to use adapter for connecting Compact Flash Cards (CF-Cards) to the standard IDE port of a single board computer (SBC) from MPL or other manufacturers.

**With IDE2CF the Compact Flash Storage Cards
are used like IDE hard disks.
They are not hot plug capable in IDE2CF.
If you require hot plug use the PCCARD of MPL AG.**

2.2 SPECIFICATIONS

2.2.1 SUPPORTED CARD TYPES

Compact Flash Storage Cards (CF-Cards) are supported. These cards are memory cards and have a true IDE mode. So they can be directly connected to the standard IDE/ATA interface via IDE2CF. For I/O cards like MODEM, LAN, .. please use MPL's PCCARD (www.mpl.ch).

2.2.2 POWER SUPPLY

- IDE2CF supports only 5 V to CF-Cards, but all CF-Cards are specified to work with 3.3 V and 5 V and therefore this is no restriction.
- Care has to be taken with defective storage cards. There are no protection circuits on the IDE2CF against increasing current flow. All the current provided by the SBC can flow to the storage card.

2.2.3 OPERATING ENVIRONMENT

- Temperature range: -20° C to +65° C
- Relative humidity: 95% maximum (non condensing)

2.2.4 STORAGE ENVIRONMENT

- Temperature range: -20°C to +65°C
- Relative humidity: 95% maximum (non condensing)

3. ASSEMBLY OF THE IDE2CF

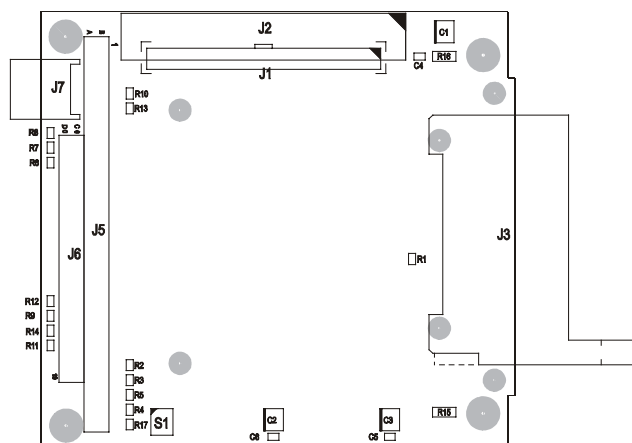


Figure 1: IDE2CF-2 With Compact Flash Slot

- J4 / J3 PCMCIA Slot / Compact Flash Slot
- J5 / J6 PC/104 connectors (stack trough)
- J1 44 pin IDE connector
- J2 optional 40 pin IDE connector (instead of the 44 pin IDE connector)
- J7 optional separate 4 pin power connector (with 40 pin IDE connector)
- S1 Slide switch for Master / Slave selection

4. PIN ASSIGNMENT AND SIGNAL DESCRIPTION

4.1 44 PIN IDE CONNECTOR (J1)

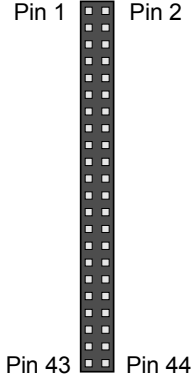
Pin	Signal	Description		Description	Signal	Pin
1	/RESET	Reset		Ground	GND	2
3	D7	Data bit 7		Data bit 8	D8	4
5	D6	Data bit 6		Data bit 9	D9	6
7	D5	Data bit 5		Data bit 10	D10	8
9	D4	Data bit 4		Data bit 11	D11	10
11	D3	Data bit 3		Data bit 12	D12	12
13	D2	Data bit 2		Data bit 13	D13	14
15	D1	Data bit 1		Data bit 14	D14	16
17	D0	Data bit 0		Data bit 15	D15	18
19	GND	Ground		Key / not connected	KEY	20
21	DRQ	DMA request		Ground	GND	22
23	IOW	I/O write strobe		Ground	GND	24
25	IOR	I/O read strobe		Ground	GND	26
27	IORDY	I/O ready		Not connected on IDE2CF	NC (CSEL)	28
29	DACK	DMA acknowledge		Ground	GND	30
31	IRQ	Interrupt request		I/O chipselect16	IOCS16	32
33	A1	Address 1		Passed diagnostic	/PDIAG	34
35	A0	Address 0		Address 2	A2	36
37	CS0	Chip select 0		Chip select 1	CS1	38
39	/DASP	Device active, device 1 present		Ground	GND	40
41	VCC5	+5 V		+5 V	VCC5	42
43	GND	Ground		Ground	GND	44

Table 1: Pin Numbering On The 44 Pin IDE Connector J1

4.2 40 PIN IDE CONNECTOR (J2)

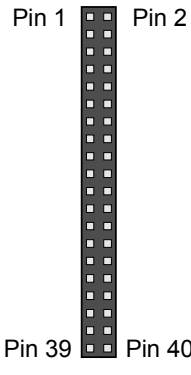
Pin	Signal	Description		Description	Signal	Pin
1	/RESET	Reset		Ground	GND	2
3	D7	Data bit 7		Data bit 8	D8	4
5	D6	Data bit 6		Data bit 9	D9	6
7	D5	Data bit 5		Data bit 10	D10	8
9	D4	Data bit 4		Data bit 11	D11	10
11	D3	Data bit 3		Data bit 12	D12	12
13	D2	Data bit 2		Data bit 13	D13	14
15	D1	Data bit 1		Data bit 14	D14	16
17	D0	Data bit 0		Data bit 15	D15	18
19	GND	Ground		Key / not connected	KEY	20
21	DRQ	DMA request		Ground	GND	22
23	IOW	I/O write strobe		Ground	GND	24
25	IOR	I/O read strobe		Ground	GND	26
27	IORDY	I/O ready		Not connected on IDE2CF	NC (CSEL)	28
29	DACK	DMA acknowledge		Ground	GND	30
31	IRQ	Interrupt request		I/O chip select 16	IOCS16	32
33	A1	Address 1		Passed diagnostic	/PDIAG	34
35	A0	Address 0		Address 2	A2	36
37	CS0	Chip select 0		Chip select 1	CS1	38
39	/DASP	Device active, device 1 present		Ground	GND	40

Table 2: Pin Numbering On The 40 Pin IDE Connector J2

4.3 PC/104 CONNECTOR (J5 / J6)

The PC/104 Connector connects the PC/104 signals from add on cards through the IDE2CF to the PIPx / MIPx. Only the power supply lines are required by the IDE2CF in certain assembly variants.

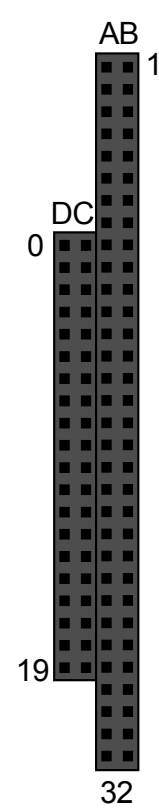
Number	Row A	Row B	Row C	Row D	Pinout
0	--	--	GND	GND	
1	/IOCHCK	GND	/SBHE	/MEMCS16	
2	SD7	RSTDRV	LA23	/IOCS16	
3	SD6	+5 V	LA22	IRQ10	
4	SD5	IRQ9	LA21	IRQ11	
5	SD4	(-5 V)*1	LA20	IRQ12	
6	SD3	DRQ2	LA19	IRQ15	
7	SD2	-12 V	LA18	IRQ14	
8	SD1	/ENDXFR	LA17	/DACK0	
9	SD0	+12 V	/MEMR	DRQ0	
10	IOCHRDY	GND (Key)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

Table 3: PC/104 Connector

NOTE: Only the shaded fields are connected to the IDE2CF PCB

4.4 OPTIONAL 4 PIN POWER CONNECTOR (J7)

The power connector corresponds to a standard 3.5 inch floppy drive power connector. A sample part number of the used connector is 171 826-4 from Tyco AMP. A mating counterpart is the 171822-4 from Tyco AMP.

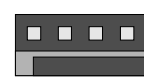
Number	Signal	Description	Pinout
1	VCC12	+12 V	
2	GND	Ground	
3	GND	Ground	
4	VCC5	+5 V	

Table 4: Optional Power Connector

5. USE OF THE IDE2CF

5.1 SELECTION OF THE NEEDED IDE2CF

The signals for connecting a CF-Card to the IDE bus are distributed to the IDE2CF via a 40-pin or a 44-pin IDE cable. Dependent on the available IDE port on the SBC system you must select a IDE2CF with 40-pin or one with 44-pin IDE connector.

The power is distributed to the IDE2CF either via the PC/104 connector, the 44 pin IDE connector or the separate power connector.

On MPL's PIP family the IDE2CF is mounted on the PC/104 connector and fixed through the PC/104 mounting holes. A IDE2CF with PC/104 connector is needed for stacking through the PC/104 signals from PIPx to other PC/104 cards.

5.2 SLIDE SWITCH CONFIGURATION

The slide switch on IDE2CF is for master / slave configuration of the CF-Card slots on the IDE bus.

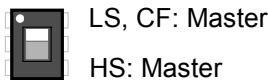


Figure 2: Slide Switch for Master/Slave Selection

Switch setting	Effect
LS, CF: Master	CF-Card Slot: Master
HS: Master	CF-Card Slot: Slave

Table 5: Slide Switch Settings

**Change the Master / Slave configuration only while the power is off.
CF-Cards detect this setting only during power up.**

5.3 INSTALLING THE IDE2CF

Depending on the assembly variant of your IDE2CF the following procedure may vary slightly. However the principal installing steps remain the same.

- Plug the IDE cable to your systems IDE connector.
- Plug the IDE2CF onto the PC/104 connector of your system or fasten it mechanically into your chassis if you don't use the PC/104 for mounting.
- Plug the other end of the IDE cable to J1 / J2 of the IDE2CF. **Caution:** Be sure that pin 1 of J1 / J2 of the IDE2CF meets pin 1 of the host systems IDE port and that the cable connectors fit properly to the board connectors.
- If not powered by the PC/104 bus plug your power supply to J7 of the IDE2CF.
- Select your desired operating mode with S1 (refer to 5.2)
- Insert your CF-Card.

5.4 USE OF THE CF-CARDS

**With IDE2CF the storage cards are used like IDE hard disks.
They are not hot plug capable in IDE2CF.
If you require hot plug use the PCCARD of MPL AG.**

5.5 BOOT FROM IDE2CF

The IDE interface basically supports two different addressing modes: CHS (Cylinder, Head and Sector number) according to the hard disk architecture (the hard disks which are normally installed to the IDE port are internally organized in Cylinders Heads and Sectors) and LBA (Logical Block Addressing) which addresses the hard disk memory in a linear way.

IDE devices (CF-Cards in the IDE2CF are working in true IDE mode) are in general not for use in different computer systems. Because the several BIOS' have an other translation of the CHS numbers. There is no guarantee that a PC-Card formatted and installed in a laptop or an other PC-System also can be used in e.g. a PIP6 (or also a third computer system). That is a systematic PC architecture problem.

The best way for avoiding troubles with booting: Low level format (erase the Boot Sector) the needed CF-Card, format it and make the installation of the operating system in the computer system that is intended to boot from this CF-Card (just the way you do it with a new fix installed hard-drive).

The other possibility is if you don't want to install the CF-Card on the end system, you must insure that the computer system you take for installing the CF-Card and the computer system you take to use the CF-Card have a BIOS that use the same IDE addressing (you reach the best results by using LBA mode).

6. MECHANICAL DATA

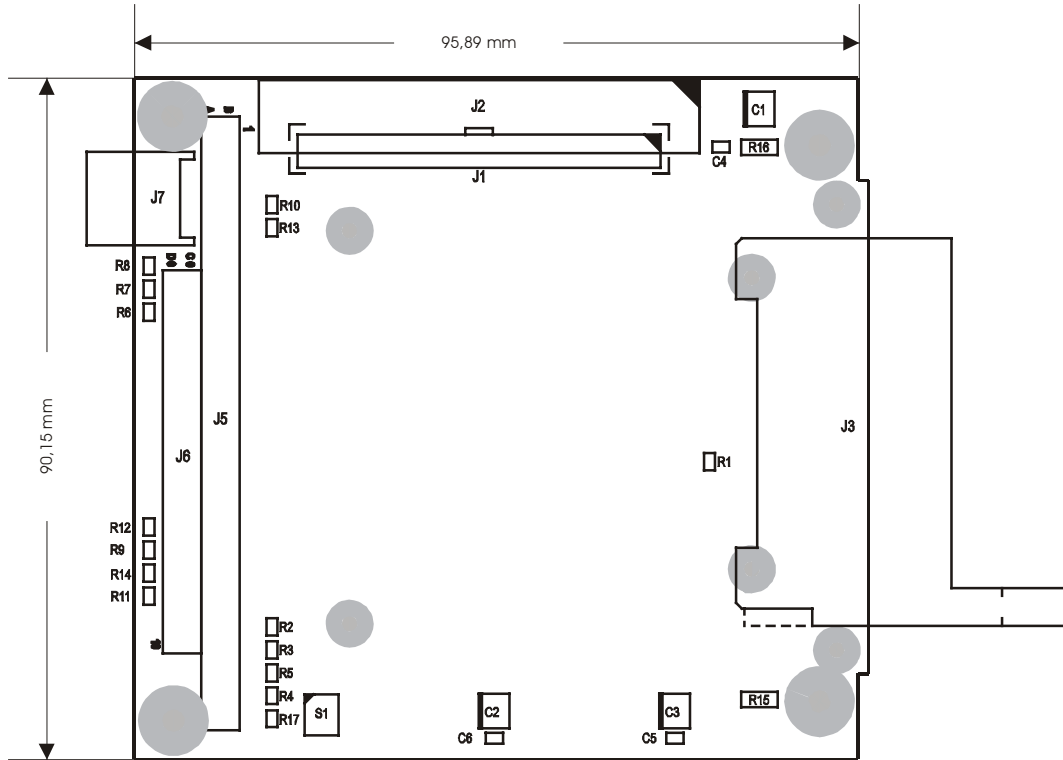


Figure 3: Mechanical Dimensions

Length: 90.2 mm
 With: 95.9 mm / 97.3 mm
 Holes: Pad 6.4mm / hole 3.2mm

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7. COPYRIGHT, REVISION HISTORY

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This Manual reflects the revision A of the IDE2CF.
Publication Date: November 2002

Manual Revision	Date	Description
A	26.11.2002	Initial write

8. DISCLAIMER

MPL AG has fully tested the IDE2CF module and reviewed the documentation. However, MPL AG makes no warranty or representation, either expressed, or implied, with respect to this product, its quality, performance, merchantability, or fitness for a particular purpose.

In no event will MPL AG be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect in the product or its documentation, even if advised of the possibility of such damages. In particular MPL AG shall have no liability for any parts connected to this product.

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9. SUPPORT

In case of questions please feel free to contact us at our homepage (www.mpl.ch) or per email (support@mpl.ch).

Our Local Distributor: